



United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Great Plains Regional Office
115 Fourth Avenue S.E., Suite 400
Aberdeen, South Dakota 57401



IN REPLY REFER TO:

DESCRM
MC-208

NOV 21 2011

MEMORANDUM

TO: Superintendent, Fort Berthold Agency

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

SUBJECT: Environmental Assessment and Finding of No Significant Impact

In compliance with the regulations of the National Environmental Policy Act (NEPA) of 1969, as amended, an Environmental Assessment has been completed and a Finding of No Significant Impact (FONSI) has been issued. The environmental assessment authorizes land use for nine Bakken and Three Forks oil and gas wells atop three pads on the Fort Berthold Indian Reservation.

All the necessary requirements of the National Environmental Policy Act have been completed. Attached for your files is a copy of the EA Addendum, FONSI and Notice of Availability. The Council on Environmental Quality (CEQ) regulations require that there be a public notice of availability of the FONSI (40 C.F.R. Part 1506.6(b)). Please post the attached notice of availability at the Agency and Tribal buildings for 30 days.

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

Attachment

cc: Tex Hall, Chairman, Three Affiliated Tribes (with attachment)
Elgin Crows Breast, Tribal Historic Preservation Officer (with attachment)
Derek Enderud, BLM, Bureau of Land Management (with attachment)
LB Myers, EOG Resources (with attachment)
Jonathon Shelman, Corps of Engineer
Jeff Hunt, Fort Berthold Agency

ENVIRONMENTAL ASSESSMENT

**United States Department of the Interior
Bureau of Indian Affairs**

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

Cooperating Agency:

Bureau of Land Management

**North Dakota State Office
Dickinson, North Dakota**



EOG Resources, Inc.

**Bear Den 08-1621H Pad (4 wells)
Mandaree 111-07H Pad (3 wells)
Mandaree 104-1716H Pad (2 wells)**

Fort Berthold Indian Reservation

November 2011

For information contact:
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Finding of No Significant Impact

EOG Resources, Inc

Environmental Assessment for Nine Bakken and Three Forks Oil Wells atop Three Pads:

Bear Den 08-1621H Pad (4 wells)
Mandaree 111-07H Pad (3 wells)
Mandaree 104-1716H Pad (2 wells)

Fort Berthold Indian Reservation
McKenzie County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal to drill up to nine oil and gas wells atop three pads, access roads and related infrastructure on the Fort Berthold Indian Reservation in McKenzie County, North Dakota.

Bear Den 08-1621H	SE¼ SW¼ of Section 16, Township (T) 150 North (N), Range (R) 94 West (W)	Bear Den 08-1621H Bear Den 24-1621H Bear Den 25-16H Bear Den 17-16H
Mandaree 111-07H	SW¼ SE ¼, Section 7, T149N, R94W	Mandaree 111-07H Mandaree 18-07H <i>Future Mandaree Section 7 well</i>
Mandaree 104-1716H	NE¼ NW¼, Section 17, T149N, R94W	Mandaree 104-1716H <i>Future Mandaree Section 17 well</i>

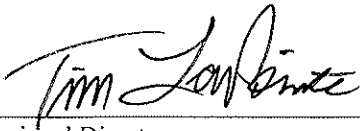
Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

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

This determination is based on the following factors:

1. Agency and public involvement was solicited and environmental issues related to the proposal were identified.
2. Protective and prudent measures were designed to minimize impacts to air, water, soil, vegetation, wetlands, wildlife, public safety, water resources, and cultural resources. The remaining potential for impacts was disclosed for both the Proposed Action and the No Action Alternative.
3. Guidance from the U.S. Fish and Wildlife Service has been fully considered regarding wildlife impacts, particularly in regard to threatened or endangered species. This guidance includes the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.) (MBTA), the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.) (NEPA), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250) (BGEPA), Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds", and the Endangered Species Act (16 U.S.C. 1531 et seq.) (ESA).
4. The proposed actions are designed to avoid adverse effects to historic, archeological, cultural and traditional properties, sites and practices. The Tribal Historic Preservation Officer has concurred with BIA's determination that no historic properties will be affected.

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

11 - 21 - 2011
Date

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

EOG Resources, Inc. (EOG) proposes to drill and complete up to nine horizontal oil wells on three well pads to explore for and develop productive subsurface formations underlying oil and gas leases owned by EOG within the Fort Berthold Indian Reservation (Reservation). If oil is produced in paying quantities, EOG would install production facilities at each location and transport commercial quantities of oil to nearby markets via trucks or pipelines. These developments have been proposed on lands held in trust by the United States in McKenzie County, North Dakota (Figure 1). The Bureau of Indian Affairs (BIA) is the surface management agency for the potentially affected tribal lands and individual allotments. The BIA manages surface lands held in title by the tribe and tribal members and subsurface mineral rights associated with the surface ownership. Developments have been proposed in locations that target specific areas of known oil reserves located in the Bakken or Three Forks formations.

Initially, seven wells would be drilled. However, depending on results of the initial wells, one additional well may be drilled from the Mandaree 111-07H well pad and one additional well may be drilled from the Mandaree 104-1716H well pad. The additional wells would be drilled within the proposed well pad disturbance. The proposed well pad locations are provided in Table 1; the two additional wells are currently unnamed and listed as future wells.

Table 1. Proposed Well Pad Locations.

Well Pad Name	Well Pad Surface Location	Wells
Bear Den 08-1621H	SE¼ SW¼ of Section 16, Township (T) 150 North (N), Range (R) 94 West (W)	Bear Den 08-1621H Bear Den 24-1621H Bear Den 25-16H Bear Den 17-16H
Mandaree 111-07H	SW¼ SE ¼, Section 7, T149N, R94W	Mandaree 111-07H Mandaree 18-07H <i>Future Mandaree Section 7 well</i>
Mandaree 104-1716H	NE¼ NW¼, Section 17, T149N, R94W	Mandaree 104-1716H <i>Future Mandaree Section 17 well</i>

The Bear Den 08-1621H (previously Bear Den 08-21H) well pad and access road were previously approved as part of the environmental assessment (EA) titled *Environmental Assessment: EOG Mandaree 02-09H, Mandaree 04-15H, Mandaree 05-16H, Mandaree 06-20H, Mandaree 12-07H, Bear Den 08-21H, Clarks Creek 01-21H, Clarks Creek 03-08H, and Riverview 01-32H* (prepared by SWCA Environmental Consultants December 2009). The BIA signed the Finding of No Significant Impact (FONSI) for the EA on January 20, 2010. A second well on this pad was approved through an Addendum to this EA and the FONSI was signed on March 21, 2011. Construction of the approved well pad and access road has not commenced. EOG would like to relocate the well pad in an effort to reduce impacts to the current environmental setting as well as reduce potential future risks. The BIA is required to prepare a new EA for Bear Den 08-1621H based on the relocation and the expanded size of the well pad (see Section 2.9.1 for more details).

Environmental Assessment: EOG Resources, Inc.
Bear Den 08-1621H, Mandaree 111-07H, and Mandaree 104-1716H Well Pads

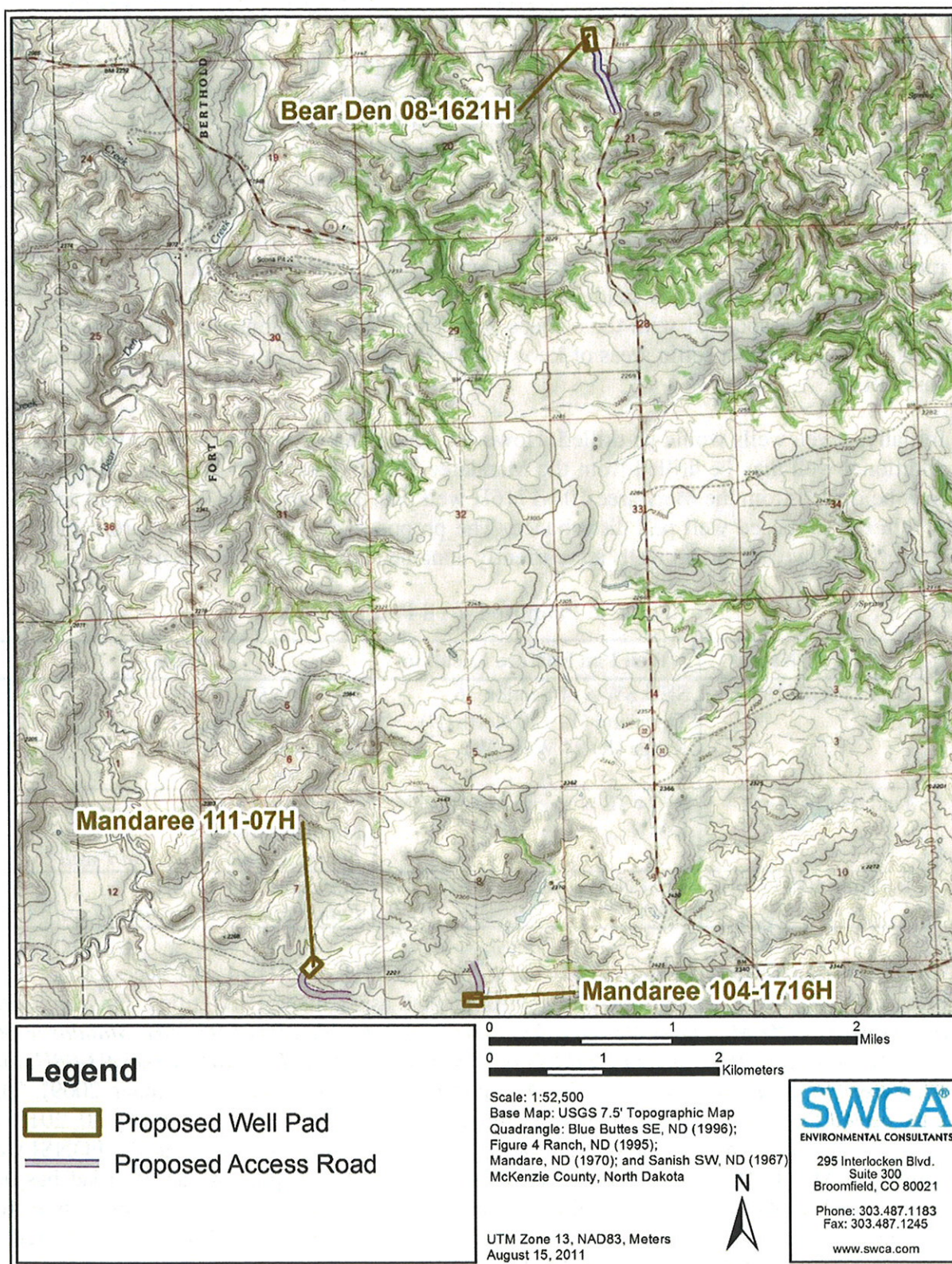


Figure 1. Proposed well pads and access road locations.

The BIA's general mission is to represent the interests, including the Trust Resources, belonging to members of the Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara (MHA Nation), as well as individual tribal members. All members of the MHA Nation and individual tribal members would benefit substantially from the development of oil and gas resources on the Reservation. Oil and gas exploration and development is under the authority of the Energy Policy Act of 2005 (42 United States Code [USC] 15801, et seq.), the Federal Onshore Oil and Gas Royalty Management Act of 1982 (30 USC 1701, et seq.), the Indian Mineral Development Act of 1982 (25 USC 2101, et seq.), and the Indian Mineral Leasing Act of 1938 (25 USC 396a, et seq.). The BIA's role in the proposed project includes approving easements, leases, and rights-of-way (ROWs); determining effects on cultural resources; and making recommendations to the Bureau of Land Management (BLM).

The BLM is responsible for the final approval of all Applications for Permit to Drill (APDs) after receiving a recommendation for approval from the BIA. The BLM is also tasked with on-site monitoring of construction and production activities, as well as resolution of any dispute that should arise as a result of any of the aforementioned actions.

Compliance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality (CEQ) regulations (Title 40 Code of Federal Regulations [CFR] 1500–1508) is required due to the project's location on federal land. APDs have been submitted by EOG to describe proposed procedures (i.e., development, reclamation) and technical practices. This EA will either result in a FONSI or result in the preparation of an environmental impact statement (EIS).

The Proposed Action includes various components associated with the construction and subsequent operation of the well sites. The well pads and access roads would be constructed to accommodate drilling activities. Cuttings pits would be constructed on the well pad for drilled cuttings and would be reclaimed once drilling has been completed. Assuming production is established from the wells, production facilities would be constructed on the well pad. After final plugging and abandonment of a well, all components (i.e., roads, well pads, supporting facilities) would be reclaimed unless formally transferred, with federal approval, to either the BIA or the landowner.

This EA only addresses the potential effect associated with the installation and possible long-term operation of the above-listed well pads and directly related infrastructure and facilities. Further oil and gas exploration and development resulting in additional surface disturbance would require additional NEPA analysis and federal actions. If authorized, this project must comply with all applicable federal, state, and tribal laws, rules, policies, regulations, and agreements. No disturbance of any kind can begin until all required clearances, consultations, determinations, easements, leases, permits, and surveys are in place.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO ACTION ALTERNATIVE

The No Action Alternative is the only alternative to the Proposed Action considered in this EA. The U.S. Department of the Interior's (USDI's) authority to implement a "no action" alternative is limited. An oil and gas lease grants the lessee the "right and privilege to drill for, extract, remove, and dispose of all oil and gas deposits" in the lease lands, "subject to the terms and conditions incorporated in the lease." If the No Action Alternative is approved, the BIA would not approve the APD or grant a ROW for the proposed location, and land would remain in its current state.

2.2 PROPOSED ACTION

This EA analyzes the potential impacts of up to nine horizontal oil wells on three well pads and the associated facilities and infrastructure located on individual allotted surface lands administered in trust by the BIA. The Proposed Action would require constructing well pads, as well as constructing and maintaining ROWs for access roads, gathering lines, utilities, and powerlines. The proposed project sites have been chosen by the proponent in consultation with the tribal and BIA resource managers to assist in defining further potential production. The well pads would be on tribal surface. The line of production of the horizontal wells would pass through fee simple, individual allotted, and tribal subsurface. Table 2 presents the surface and bottom hole locations and lease numbers of the seven proposed wells. The bottom hole locations for the two additional wells are not available at this time.

Table 2. Proposed Well Leases.

Well	Surface Location	Bottom Hole Location	BIA Lease Number
Bear Den 08-1621H	SE¼ SW¼ Section 16, Township (T) 150 North (N), Range (R) 94 West (W); 165 feet FSL, 1,543 feet FWL	SW¼ SW¼ Section 21, T150N, R94W; 200 feet FSL, 1,300 feet FWL	7420A49448 7420A48476 7420A49448 7420A49428
Bear Den 24-1621H	SE¼ SW¼ Section 16, T150N, R94W; 214 feet FSL, 1,539 feet FWL	SE¼ SW¼ Section 21, T150N, R94W; 200 feet FSL, 2,300 feet FWL	7420A48478 7420A48476 7420A48956
Bear Den 25-16H	SE¼ SW¼ Section 16, T150N, R94W; 264 feet FSL, 1,535 feet FWL	NE¼ NW¼ Section 16, T150N, R94W; 200 feet FNL, 2,300 feet FWL	7420A48478 7420A48476 7420A49732 7420A49001
Bear Den 17-16H	SE¼ SW¼ Section 16, T150N, R94W; 314 feet FSL, 1,530 feet FWL	NW¼ NW¼ Section 16, T150N, R94W; 200 feet FNL, 1,300 feet FWL	7420A48478 7420A49732
Mandaree 111-07H	SW¼ SE¼ Section 7, T149N, R94W; 356 feet FSL, 2,062 feet FEL	SW¼ SW¼ Section 7, T149N, R94W; 2,100 feet FNL, 500 feet FWL	7420A49048 7420A49278

Well	Surface Location	Bottom Hole Location	BIA Lease Number
Mandaree 18-07H	SW¼ SE¼ Section 7, T149N, R94W; 391 feet FSL, 2,025 feet FEL	NW¼ NW¼ Section 7, T149N, R94W; 200 feet FNL, 500 feet FWL	7420A49048 7420A49278
Mandaree 104-1716H	NE¼ NW¼ Section 17, T149N, R94W; 705 feet FNL, 2,413 feet FWL	SE¼ SW¼ Section 16, T149N, R94W; 200 feet FSL, 2,400 feet FWL	7420A41945

FEL = from the east line; FNL = from the north line; FSL = from the south line; FWL = from the west line

The specific pad locations, access road routes, and pipeline routes were determined after pre-construction on-site inspections by the proponent, the civil surveyor, the environmental consultant, the BIA environmental specialist, and the Tribal Historic Preservation Office (THPO) oil field monitor on 17 May and 16 June 2011. Resource surveys were conducted at the time of pre-construction on-site inspections to determine potential impacts to cultural and natural (i.e., biological and physical) resources. The locations were inspected in consideration of topography, location of topsoil/subsoil stockpiles, natural drainage and erosion control, flora, fauna, habitat, historical and cultural resources, and other surface issues. The final locations were determined in consideration of these issues. Avoidance measures and other protective measures were incorporated into the final project design to minimize impacts to evaluated resources, as appropriate (see Section 2.11). During the on-site inspections, the BIA gathered information needed to develop site-specific mitigation measures that would be incorporated into the final APDs.

The APD, EA, lease stipulations, and any special actions required by the BIA or BLM would be followed during construction. The proponent would secure all required permits, easements, and approvals following procedures established by the MHA Nation, the BIA, the North Dakota Industrial Commission (NDIC), and the BLM, as appropriate, prior to construction and drilling. The proponent would adhere to all applicable federal, state, county, and tribal regulations while performing all operations associated with the Proposed Action. Surface-disturbing activities would be constructed and maintained to the standards detailed in *Surface Operating Standards for Oil and Gas Exploration and Development, 4th Edition* (Gold Book) (USDI and U.S. Department of Agriculture [USDA] 2007), BLM Manual Section 9113, and according to BIA/tribal specifications. Operations would be in full compliance with applicable laws and regulations, including Title 43 CFR 3100; Onshore Oil and Gas Order Nos. 1, 2, 6, and 7; approved operation plans; and Notices to Lessees (NTLs). The proponent would maintain any production facilities for the lives of the wells, which is estimated to be 30 to 50 years.

This EA assumes that details of construction, drilling, completion, and reclamation provided in the APDs, Surface Use Plans (SUPs), drilling plan, and EOG's Safe Practices Manual (2007) are indicative of procedures that would be followed by the proponent and are incorporated by reference.

2.3 ACCESS ROADS, PIPELINES, AND UTILITY LINES

A 150-foot ROW is requested to accommodate access roads; underground oil, gas, and water gathering pipelines; waterlines; fiber optic lines; and underground utility lines. The 150-foot width is necessary to build ditches appropriate to handle large volumes of snow and runoff and is consistent with county and township roads in North Dakota. Approximately 0.64 mile (11.64 acres) of new ROW would be required to access the proposed well locations (see Table 4 in Section 2.12). The ROWs are located on tribal lands.

2.3.1 Access Roads

The well pads would require construction of all-weather, 24-foot-wide running surface, double-lane access roads with a 40-foot subgrade. The 24-foot road width is necessary to ensure safe passage of oil tanker trucks. A minimum of 6 inches of topsoil would be stripped from each access road footprint to provide access to the subsoil, which is better suited for shaping and compaction. The topsoil would be temporarily stored along the sides of a road and subsequently spread on the back slopes in preparation for seeding during interim reclamation. Maximum grade of the new access roads would be less than 4%. Native or commercially obtained materials would be used to surface the well pads and access roads. Access roads would be crowned and ditched with water turnouts to ensure proper drainage. Water control features would be constructed as necessary to control erosion. All access roads crossing drainages would be constructed as low water crossings. Culverts, consisting of corrugated metal pipes, would be installed along the access roads, as determined during the on-site inspections and shown on the plats that accompany each APD. As directed by the Authorized Officer (AO), EOG would install cattle guards where an access road would cross an existing fence line to maintain control of livestock.

The access roads would be surfaced with native or commercially obtained materials and would be maintained to prevent soil erosion and ensure safe conditions during the life of a well. Construction would follow road design standards outlined in the BLM Gold Book (USDI and USDA 2007), and details of road construction will be addressed in the APD. A typical cross section is shown in Figure 2. EOG would be responsible for road maintenance and upkeep for the life of the wells, unless a formal road maintenance agreement is in place designating another entity for maintenance. The access roads would be fully reclaimed (see Section 2.10) once the wells are depleted and abandoned, unless the BIA or surface owners assume responsibility for the roads through a formal agreement.

2.3.2 Pipelines

Multiple underground pipelines including natural gas, oil, and water gathering lines from wells would be installed in the 150-foot ROW. Gathering lines would be connected to trunk lines approved under other NEPA documents. All pipelines are clearly marked following the U.S. Department of Transportation's (USDOT's) rules and regulations, 49 CFR Parts 192 and 195. Markers would be placed within 1,000 feet of one another, at all public road crossings, railroad crossings, creek crossings, fence crossings, and at all points of major direction change.

Gathering lines are designed and sized to prevent erosion—which is an internal pipe condition caused by excessive abrasion of fine particles in the pipeline system or by excessive velocity

of the transported product—by a safety factor of approximately two. Based on these criteria, the oil and gas pipelines would be steel and 12 inches or less in diameter and the water pipelines would be Fiberspar and 6 inches or less in diameter. The gathering lines would be coated with between 14 and 16 millimeters of fusion bonded epoxy, which helps protect the pipelines against corrosive elements in the soil. Field joints are also protected by shrink sleeves. Specialty coatings are also used, as applicable, for underground fittings and bore crossings, to provide additional levels of protection from leakage or corrosion. The coating and shrink sleeves are inspected thoroughly at the time of installation, both visually and electronically.

To prevent potential erosion or rupturing of the pipeline within critical areas near Lake Sakakawea or in drainages, the placement and bore depth of gathering lines is designed based on soil types in the area and surface drainage area within the vicinity of the bore. Gathering lines will be bored underneath drainages at a minimum depth of 8 feet. Additionally, bore pipes will be coated with specialty abrasion-resistant coating that provides substantial protection on the off chance that large erosion or flooding events occur.

Pipelines are also equipped with check valves and manual valves between the trunk line and gathering line, or lateral line, which provide connections to help limit the volume of potential spills. A Spill Response Plan (Plan) for pipeline construction and operation activities has been developed and will be followed by the EO and the pipeline installation company. The Plan includes spill preventative measures and monitoring protocols, notification procedures, spill detection and on-scene spill mitigation procedures, response activities, contacts, training and drill procedures, and response plan review and update procedures. EOG and the pipeline installation company are committed to adhering to the Plan as well as the procedures and requirements set forth by federal law (49 CFR Part 194). The proponent will provide the SPCC Plan to the BIA prior to construction activities.

Following installation of the gathering lines, the lines will be cleaned and inspected via internal tools (e.g., cleaning pigs and smart pigs), which helps to identify issues in the pipes. Hydrostatic testing is conducted to ensure that there is no leakage of the pipe. A cathodic survey using test stations, rectifier pads, and other means designed by cathodic protection specialists is also conducted. Any stress or damage issues identified in the pipelines can be quickly identified and remedied prior to backfill. Throughout the life of the gathering lines, an appropriate amount of cathodic active current is placed on pipeline segments and monitored in accordance with the strict pipeline safety requirements set forth in the USDOT's rules and regulations. In order to assure the quality of the installation and the effectiveness of its corrosion control systems, pig launchers and receivers are also installed on the trunk lines and primary laterals to identify pipeline conditions both internally and externally, in order to maintain the integrity.

2.3.3 Utility Lines

All utility lines would be buried within the 150-foot ROW.

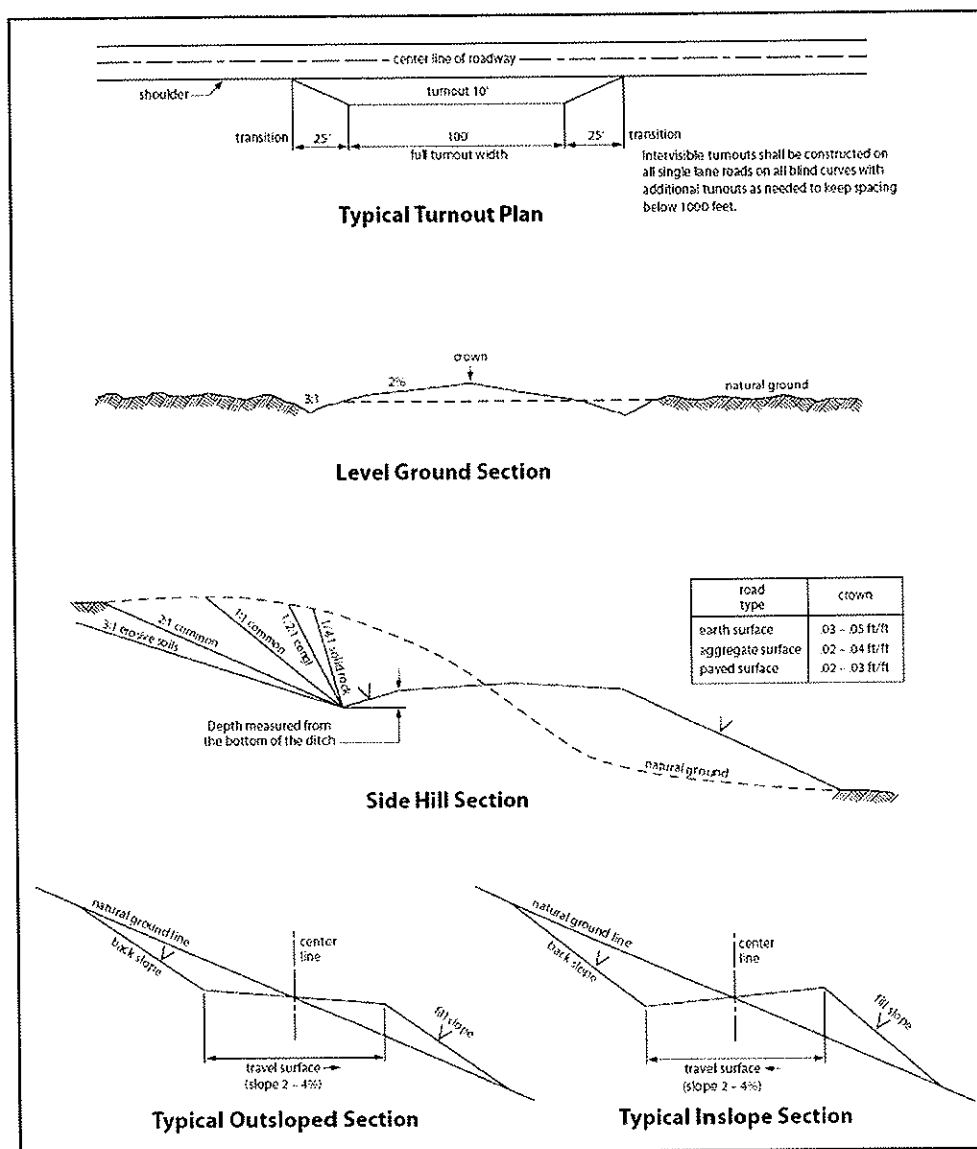


Figure 2. Typical road cross sections (USDI and USDA 2007).

2.4 WELL PADS

The well pads have been designed to accommodate drilling multiple wells within the initial area of disturbance (Table 1). Wells pads measure approximately 500 by 700 feet, depending on the number of wells per pad, including the area for fill slopes, stockpiles, and cuttings pits. See Section 2.9 and Table 4 in Section 2.12 for a summary of surface disturbance.

The locations would be leveled by balancing cut and fill areas. Subsoil and the rock remaining from the cuttings pits cut would be used to construct the location. Topsoil would be stored in stockpiles for use during reclamation. During the well pad onsite, EOG and the BIA discussed efforts to maintain the integrity of the well pads given the amount of annual

precipitation and runoff. Per those discussions the BIA and EOG agreed upon the installation of diversion ditches or berming along the perimeter of the well pads to reduce erosion and prevent runoff from flowing across the well pads.

A temporary pit for drill cuttings would be constructed within the cut portion of a well pad; no drilling liquids would be stored in the pit. The pit would be constructed so as not to leak, break, or allow discharge and in a way that minimizes the accumulation of precipitation runoff into the pit. A pit liner would have permeability less than 10^{-7} centimeters per second and burst strength greater than or equal to 300 pounds per square inch (psi) or puncture strength greater than or equal to 160 psi and grab tensile strength greater than or equal to 150 psi. A liner would be resistant to deterioration by hydrocarbons and would not be installed directly on a rock surface. Where necessary, bedding materials, such as sand or geotextile fiber liner, would be installed to prevent contact with exposed rock.

Prior to drilling, well pads would be fenced to prevent ingress by livestock or wildlife, and a cattle guard would be installed at the entrance to well pads at the fence line, as determined at pre-construction on-site meetings.

2.5 DRILLING

For each well, drilling operations would consist of drilling the surface hole, running and cementing surface casing, drilling the production hole, and running and cementing production casing. The proposed wells would be drilled from the well pad vertically to the Bakken or Three Forks formations at an approximate depth of 11,000 feet below the surface. Then a wellbore (i.e., lateral leg) would be drilled horizontally until total depth is reached. Appropriately sized pressure control equipment would be used for drilling activities. Water would be hauled by truck to each location from a commercial source, using approximately 1,200 barrels of fresh water to drill each well. Drilling operations would use both freshwater-based mud and oil-based drilling mud. For each well, approximately 1,500 barrels of drilling mud would be recycled for subsequent wells.

The wells would be drilled using a semi-closed-loop mud system and a pit for drill cuttings would be installed on the well pad. Drilling liquids would be temporarily stored in tanks on the well pad; no liquids would be stored in open pits. Each cuttings pit would be fenced on three sides during drilling and completion operations. The fourth side of the pit would be fenced as soon as the completion rig is moved off a location to prevent ingress by livestock or wildlife. The pits would generally be closed within 10 days of completing drilling operations.

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

No chemicals subject to reporting under Superfund Amendments and Reauthorization Act (SARA) Title III (hazardous materials) in an amount greater than 10,000 pounds would be used, produced, stored, transported, or disposed of in association with the drilling of these wells. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in

threshold planning quantities would be used, produced, stored, transported, or disposed of in association with drilling operations.

2.6 CASING AND CEMENTING

After drilling, steel production casing would be run and cemented in place in accordance with the well design, as specified in the APD and Conditions of Approval. Evaluation logs may be run subsequent to setting and cementing production casing. The casing and cementing program would be designed to isolate and protect the shallower formations encountered in the well bore and to prohibit pressure communication or fluid migration between zones. Casing and cementing operations would be conducted in full compliance with Onshore Oil and Gas Order No. 2 (43 CFR 3160) and NDIC regulations.

2.7 COMPLETION AND EVALUATION

Completion operations would consist of perforating the production casing, stimulating the formation(s) using hydraulic fracturing techniques, flow back of fracturing fluids, flow testing to determine post-fracture productivity, and installation of production equipment. After production casing is perforated, stimulation would consist of hydraulically fracturing the producing formation. A water/sand slurry would be used with non-toxic chemical additives to ensure the quality of the fracture fluid. Fluid would be pumped down the wellbore through perforations in the casing and into the formation. Pumping pressures would be increased to the point at which fractures radiate outward from the perforations into the formation and the slurry flows rapidly into the fractures. The resulting fractures are propped open by the sand after the pressure drops, thereby allowing reservoir fluids to move more readily into the well. Hydraulic fracturing is a well understood and commonly employed technology used on potentially productive reservoirs at depths below usable aquifers. Approximately 25,000 barrels of fresh water would be used for hydraulic fracturing operations for each well.

2.8 COMMERCIAL PRODUCTION

2.8.1 Production Facilities

Production facilities at the well pads would include well heads and pump jacks, a flare pit, a heater-treater, a recirculating pump, and a tank battery. Production facilities would be installed on the disturbed portion of the well pad, a minimum of 25 feet from the toe of the back slope, where practical.

Production fluids would be stored on the well pad in tanks. Multiple 400-barrel oil tanks and water tanks would be located inside of a berm, which would be constructed completely around production facilities that contain fluids (i.e., production tanks, produced water tanks, and/or heater-treater). A berm would consist of impervious compacted subsoil and would hold 110% of the capacity of the largest tank plus one day's production. The amount of onsite production facilities would be reduced once the wells are connected to gathering lines. The proponent would develop and maintain site-specific Spill Prevention, Control, and Countermeasure Plans (SPCCPs) for each production facility.

2.8.2 Production Traffic

Produced water and oil would initially be transported from the tanks on each location by trucks unless or until the well can be connected to gathering pipelines. Table 3 presents estimates of truck traffic anticipated to be necessary to initially haul fluids from each well. Trucks for normal production operations would use the existing and proposed access roads. Produced water would be transported to the Rink 1 disposal site (located in Section 21, T150N, R96W, McKenzie County, North Dakota) or other approved disposal facility. The proposed wells typically would be visited daily by a pumper. All truck drivers would be required to follow posted load limits, speed limits, and all other traffic laws in accordance with EOG's Safe Practices Manual (2007).

Table 3. Estimated Tanker Truck Traffic.

Time Period	Average Daily Tanker Truck Roundtrips Per Well
Production Days 1–30	5
Production Days 31–60	2
Production Days 61–ongoing	1

Note: Estimates based on projected production volumes for exploratory wells and are subject to change based on actual production volumes. Estimates assume all fluids transported via truck from each well.

Initially, natural gas produced in association with the liquid hydrocarbons would be flared, unless gas gathering lines are in place at initial production. A flare pit would be located a minimum of 150 feet from a well head to ensure safe operations. The proponent may construct natural gas-gathering pipelines within the ROW approved under this EA. The timing of installation of gas gathering pipelines would be dependent on the ability to tie-in to a larger gas system (trunk lines). Production traffic will be reduced upon the wells connection to gathering lines. Flaring operations would be conducted in compliance with applicable regulations and would be in accordance with NTLs and adopted NDIC regulations, which prohibit unrestricted flaring for more than the initial year of operation (North Dakota Century Code [NDCC] 38-08-06.4).

All permanent (on-site six months or longer) aboveground structures constructed or installed, including pumping units, would be painted a Shale Green color, as determined at the on-site inspection. The proponent would control noxious weeds within the exterior boundaries of access roads, well sites, or other applicable facilities by spraying or mechanical removal. Weed control would be conducted in accordance with procedures established by BIA, BLM, state, and county guidelines. Drainage ditches and/or culverts would be maintained for the life of the well to ensure free-flowing conditions.

2.9 CONSTRUCTION DETAILS

2.9.1 Bear Den 08-1621H

The proposed Bear Den 08-1621H well pad would be located approximately 7 miles northwest of the town of Mandaree in Section 16, T150N, R94W (Figures 3 and 4). The

proposed 500- by 800-foot well pad, sized to accommodate drilling up to four wells, would disturb approximately 9.52 acres including fill slopes, stockpiles, and cuttings pit. A new access road, approximately 0.38 mile long, would be constructed to connect the proposed well site with Highway 22 (Figures 4 and 5). The new road would be within a 150-foot-wide ROW which would disturb approximately 6.94 acres. Total new disturbance including the well pad, road, and buried pipelines would be 16.46 acres (see Table 4 in Section 2.12). This well replaces the previously approved Bear Den 08-21H, which required 7.85 acres for the well pad and access road. The Bear Den 08-1621H has been designed to accommodate four wells as opposed to the Bear Den 08-21H well pad which was designed for two wells. A portion of the Bear Den 08-1621H access road would overlap the previously approved route.

The spacing unit consists of 1,280 acres (+/-) with two bottom holes located south of the surface hole location in Section 21, T150N, R94W and two bottom holes located north in Section 16, T150N, R94W (Figure 4). Specific information on the location of the drilling targets and leases are described in Table 2. A setback of at least 200 feet from the north and south section lines and 500 feet from the east and west section lines of the spacing unit would be maintained.



Figure 3. Bear Den 08-1621H well pad area, facing northwest.

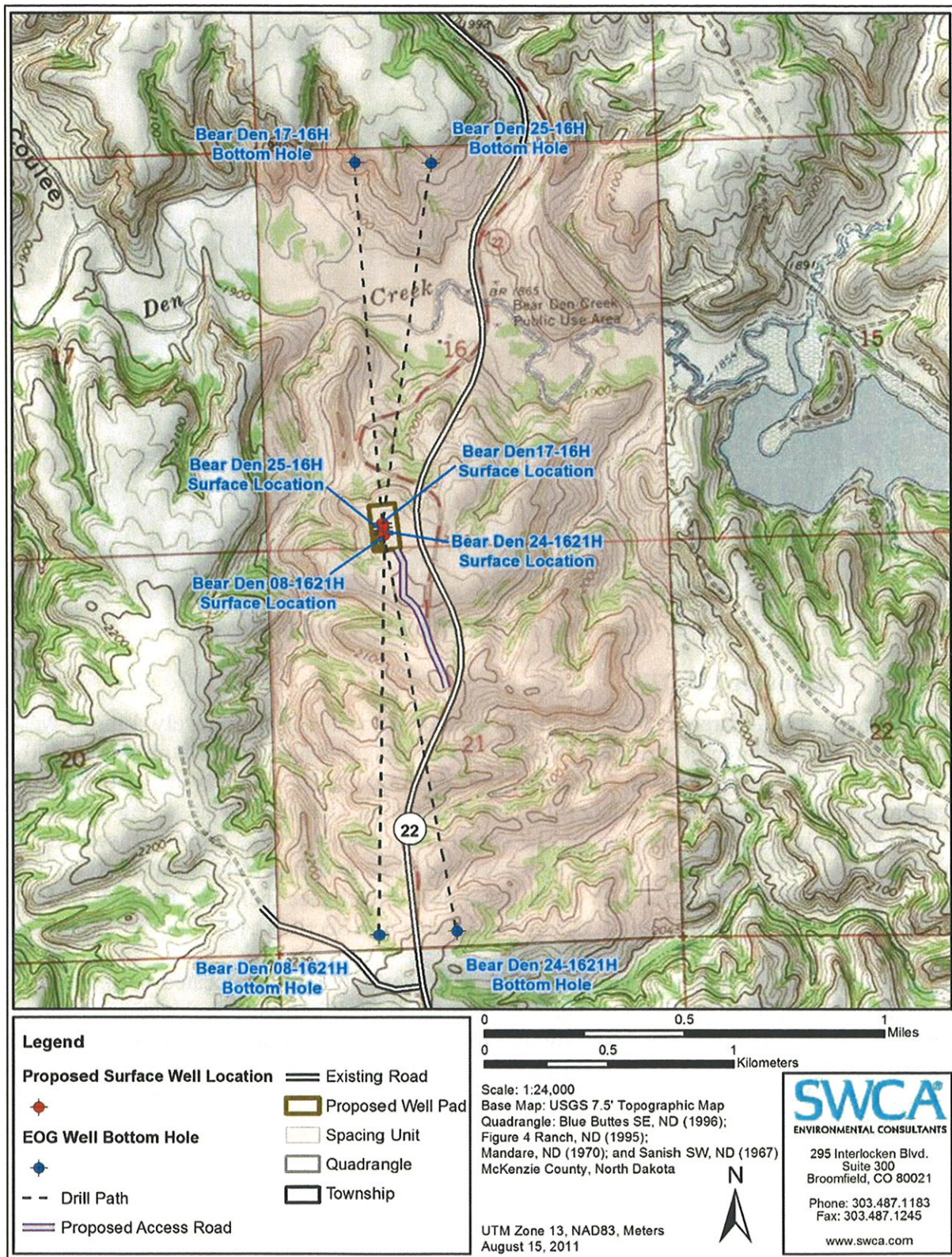


Figure 4. Bear Den 08-1621H proposed surface and bottom hole locations.



Figure 5. Bear Den 08-1621H access road, facing south.

2.9.2 Mandaree 111-07H

The proposed Mandaree 111-07H well pad would be located approximately 4 miles west of the town of Mandaree in Section 7, T149N, R94W (Figures 6 and 7). The proposed 500- by 700-foot well pad, sized to accommodate drilling up to three wells, would disturb approximately 8.10 acres including fill slopes, stockpiles, and cuttings pit. A new access road, approximately 0.18 mile long, would be constructed to connect the proposed well site with Highway 22 (Figures 6 and 8). The new road would be within a 150-foot-wide ROW which would disturb approximately 3.23 acres. Total new disturbance including the well pad, road, and buried pipelines would be 11.33 acres (see Table 4 in Section 2.12).

The spacing unit consists of 640 acres (+/-) with two bottom holes located northwest of the surface hole location in the same Section (Section 7). The bottom hole location of the third well is not known at this time. Specific information on the location of the drilling targets and leases are described in Table 2. A setback of at least 200 feet from the north and south section lines and 500 feet from the east and west section lines of the spacing unit would be maintained.

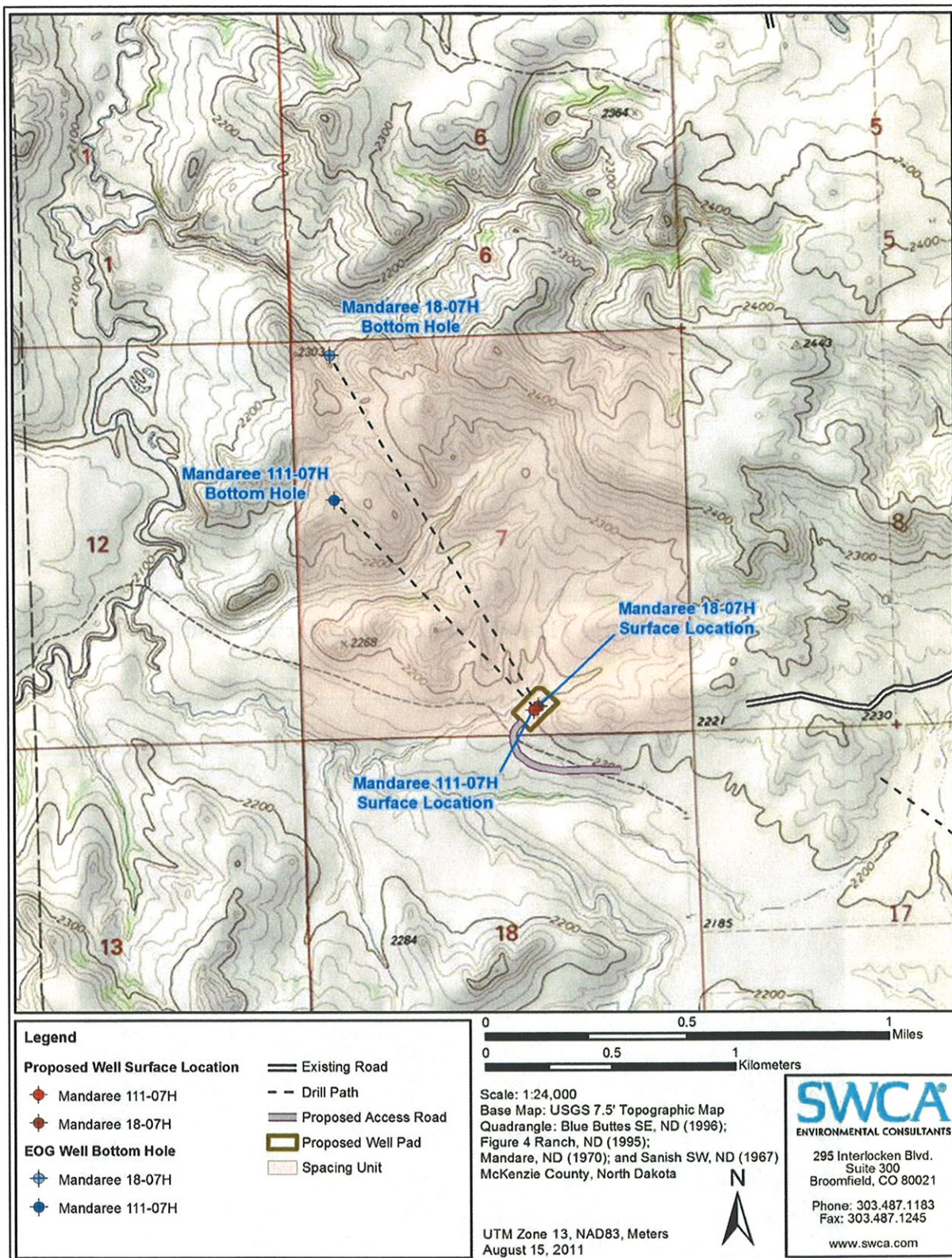


Figure 6. Mandaree 111-07H proposed surface and bottom hole locations.



Figure 7. Mandaree 111-07H well pad area, facing southwest.



Figure 8. Mandaree 111-07H access road, facing south.

2.9.3 Mandaree 104-1716H

The proposed Mandaree 104-1716H well pad would be located approximately 3 miles west of the town of Mandaree in Section 17, T149N, R94W (Figures 9 and 10). The proposed 500- by 600-foot well pad, sized to accommodate drilling up to two wells, would disturb approximately 6.09 acres including fill slopes, stockpiles, and cuttings pit. A new access road, approximately 0.09 mile long, would be constructed to connect the proposed well site with Highway 22 (Figures 10 and 11). The new road would be within a 150-foot-wide ROW which would disturb approximately 1.60 acres. Total new disturbance including the well pad, road, and buried pipelines would be 7.69 acres (see Table 4 in Section 2.12).

The spacing unit consists of 1,280 acres (+/-) with one bottom hole located southeast of the surface hole location in Section 16, T149N, R94W (Figure 10). The bottom hole location of the second well is unknown at this time. Specific information on the location of the drilling targets and leases are described in Table 2. A setback of at least 200 feet from the north and south section lines and 500 feet from the east and west section lines of the spacing unit would be maintained.



Figure 9. Mandaree 104-1716H well pad area, facing west.

Environmental Assessment: EOG Resources, Inc.
 Bear Den 08-1621H, Mandaree 111-07H, and Mandaree 104-1716H Well Pads

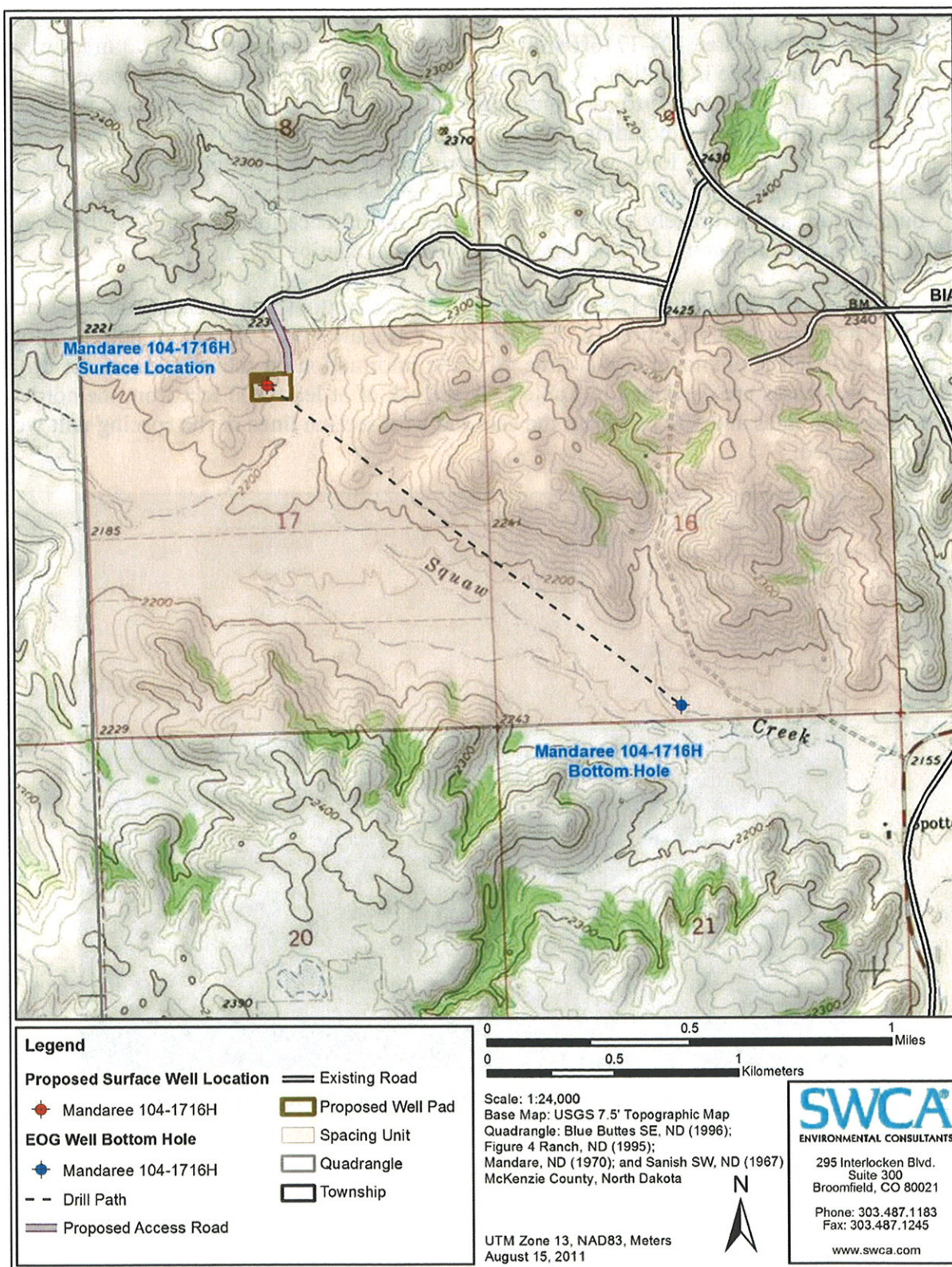


Figure 10. Mandaree 104-1716H proposed surface and bottom hole locations.



Figure 11. Mandaree 104-1716H access road, facing east.

2.10 RECLAMATION

2.10.1 Interim Reclamation

Interim reclamation would consist of reclaiming all areas not needed for production operations.

2.10.1.1 Well Pads/Access Roads

Rat and mouse holes would be filled and compacted from bottom to top immediately after release of the drilling rig. Immediately after well completion, all equipment and materials unnecessary for production operations would be removed from a location and surrounding area. The cuttings pit would be netted until final reclamation and closure of the pit, which would occur approximately 10 days following drilling of all wells on a pad. Prior to being backfilled the edges of the pit liner would be folded in towards the center of the cuttings pit. The surface above the cuttings pit would be seeded to re-establish native/desired vegetation. Topsoil would be spread along a road's cut and fill slopes. The portion of the well pad not needed for production would be recontoured and covered with 6 inches of topsoil. Areas on a contour would be ripped to a depth of 1 foot using ripper teeth set on 1-foot centers. All seed would be drilled on a contour and planted between 0.25 and 0.50 inch deep. Where drilling is not possible, for example, on steep slopes and rocky terrain, the seed would be broadcast, and the area would be raked or chained to cover the seed. Seed types and application rates would be determined by the AO. The remaining well pad would comprise long-term disturbance for the life of the well.

The proponent would control noxious weeds within the exterior boundaries of the access road, well site, or other applicable facilities by spraying or mechanical removal. Weed control would be conducted in accordance with procedures established by all applicable authorities. Drainage ditches and/or culverts would be maintained to free-flowing conditions.

2.10.1.2 Pipeline/Gathering Line Corridor

Following trench backfilling and compaction, disturbed areas would be restored to the original land contour and the subsoil on the working side of the ROW and other work areas would be ripped to alleviate compaction. Topsoil would be redistributed over the ROW and graded and erosion control measures would be installed as appropriate. Replaced topsoil would be left in a roughened condition to discourage erosion and additional stabilization techniques may be required on steeper slopes, in areas that have highly erodible soils, and in areas adjacent to, or within, drainages. No unnatural depressions would be left that would trap water or form ponds; the trench would be compacted at 1- to 2-foot lifts to avoid subsidence. In no instance would the ROW or expanded work areas be lower than the natural grade.

No reclamation work would be completed when soils are frozen or overly wet and no depressions would be left to trap water or form ponds. If construction is stopped before interim reclamation can be completed due to winter weather conditions, the topsoil will be respread over the ROW after the trench is backfilled and matting or straw will be placed over the all bare ground as a barrier to aid in the prevention of subsidence. If construction is planned for winter months, the trench will be partially filled with useable, non-frozen, backfill soil to the extent possible. The trench would be backfilled and the topsoil distributed as soon as practicable after the soil has defrosted. Topsoil piles would be covered to eliminate the potential for rill erosion and subsequent loss of soil during spring snow melt and precipitation events.

Seeding and noxious weed control would occur as described for well pads and access roads in section 2.10.1.1.

2.10.2 Final Reclamation

2.10.2.1 Well Pads/Access Roads

A depleted well bore would be plugged and abandoned in accordance with applicable state or federal regulations. Typically, all surface facilities associated with a well would be removed during final reclamation. Disturbed surfaces would be returned to the approximate original contours of the land prior to reseeding. Cut and fill slopes would be graded to a 3:1 ratio or less. All topsoil would be re-stripped from areas where interim reclamation had been performed and redistributed over the entire location and access road. The entire disturbed area would be scarified to a depth of 12 inches on 8-inch intervals. Best management practices (BMPs) such as water bars, straw wattles (fiber rolls), or matting would be constructed according to BLM Gold Book standards (USDI and USDA 2007). The entire disturbed area, including the former access road and well pad, would be reseeded with the specified seed mixture. Figure 12 shows an example of appropriate reclamation.

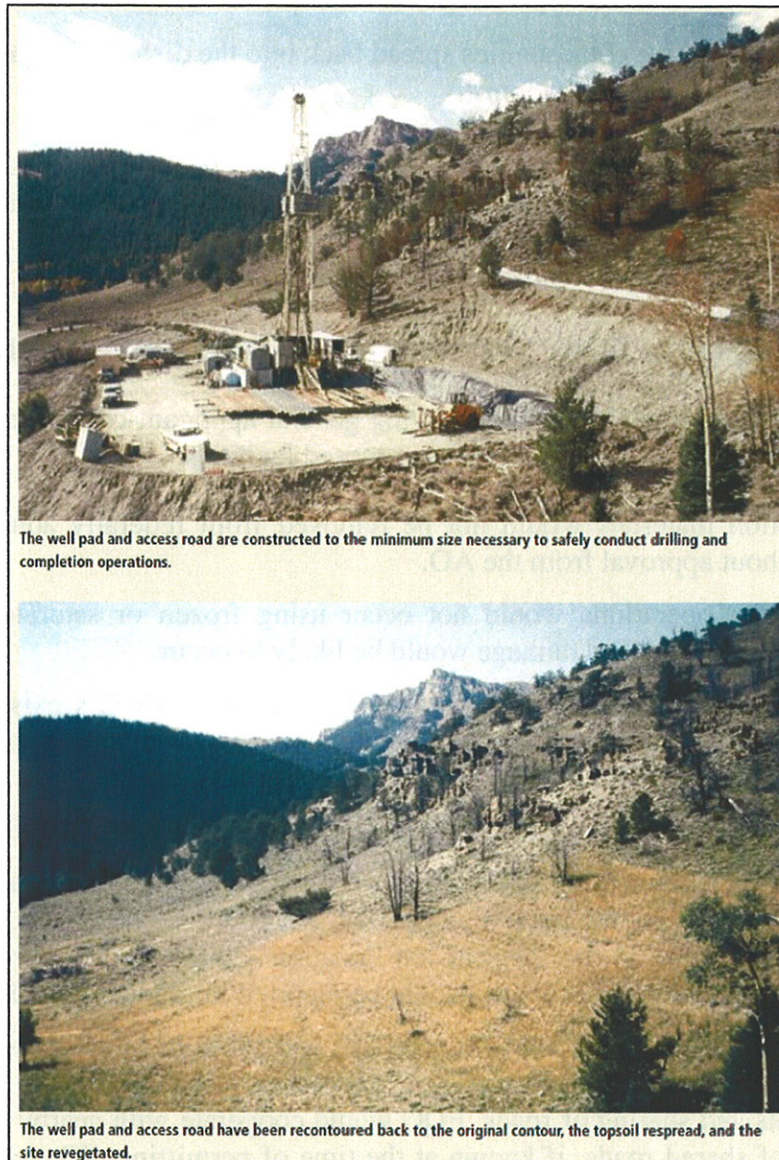


Figure 12. Example of reclamation from the BLM Gold Book (USDI and USDA 2007).

2.10.2.2 Pipeline/Gathering Line Corridor

Final reclamation would occur when the pipeline is decommissioned. All facilities would be removed and disturbed areas would be reclaimed. Work areas would be leveled or backfilled as necessary, scarified, recontoured, and seeded. It is economically and environmentally unfeasible to excavate and remove the decommissioned pipeline. Instead it would be purged with water of any natural gas remaining in the lines and abandoned in place.

2.10.3 Monitoring

The well pads and ROW would be monitored for erosion, subsidence, or noxious weeds. In areas where problems are found to occur, reclamation efforts would continue until the BIA feels the ROW is successfully reclaimed. Reclamation is considered successful when:

- seeded areas are established;

- adjacent vegetative communities spread back into the disturbed areas; and
- noxious weeds are under control.

If after two growing seasons the new seeding is not successful, the BIA may require additional efforts to establish vegetation. For noxious weeds, a survey was conducted on the ROW prior to the construction commencing. The BIA has developed a weed management plan to treat known or likely to occur noxious weed species.

2.11 RESOURCE PROTECTION MEASURES AND COMMITMENTS

The proponent would implement the following general applicant-committed measures during construction, operation, and reclamation of proposed facilities.

1. Construction materials would not be removed from federally administered or tribal lands without approval from the AO.
2. Construction operations would not occur using frozen or saturated soils or during periods when watershed damage would be likely to occur.
3. When conditions warrant, water would be applied to EOG's existing and proposed access roads and well pads during construction operations to minimize soil loss from wind transport.
4. Wells would be drilled as soon as possible after approval of the federal and state APD.
5. EOG has incorporated all safety measures in the design, construction, operation, and maintenance procedures for the proposed wells and their facilities. A designated EOG representative would be present on location during all construction operations. Accidents to persons or property would be reported immediately to the AO.
6. EOG is committed to working with the BIA and tribes in future transportation planning efforts. EOG would cooperate with landowner, tribal, and BIA requests for road alignments and sharing of roads. EOG would cooperate with nearby operators on siting and use of shared roads, if known at the time of permitting. Where EOG would share an access road with another operator(s), EOG would cooperate with the other operator(s) to develop a mutually agreed-upon road maintenance plan, which would incorporate tribal, BIA, and BLM standards.
7. EOG would drill the wells as semi-closed-loop mud systems; drilling liquids would not be stored in pits. Drill cuttings would be stored in cuttings pits. EOG would fence each cuttings pit in accordance with BIA specifications, specific APDs, and directions specified at pre-construction on-site inspections.
8. EOG would fence the well pad and install a cattle guard or panel gate in the access road at the entrance of the well pad, if necessary.
9. EOG would dike tanks with a minimum 4-foot berm and install a catch trench on the down-sloping side of each well pad to contain any waste/fluids from the well pad. In the case of a spill, fluids that accumulate would be pumped out and disposed of properly. Where needed, topsoil and erosion control devices would be placed to divert

surface water flow away from the well pad location to limit potential of surface contamination from sediment transport.

10. Covers would be installed under drip buckets and spigots.
11. EOG would cease construction or other activity if there is a confirmed sighting of a whooping crane within 1 mile of the project area and notify the U.S. Fish and Wildlife Service (USFWS). EOG personnel who have been trained in a formal program sponsored by EOG on the field identification of whooping crane can make a confirmed sighting.
12. EOG would mow (and/or clear) migratory bird habitat to deter nesting within the project area if construction would occur during nesting season. Mowing would occur outside of the February 1 to July 15 nesting season.
13. Where potential nesting habitat exists, EOG would have a biologist survey the project area for bald or golden eagle nests early in the nesting season from March 1 to May 15 prior to leaf out. If nests are discovered, the BIA and USFWS would be notified. A minimum 0.5-mile buffer would be maintained from any previously documented or surveyed active eagle nest during the nesting season. For newly constructed or undocumented active nests within the 0.5-mile buffer of a project location, EOG would move facilities where possible or request the option to have a biologist monitor active eagle nests during the nesting season to resume activity once the birds fledge.
14. EOG would comply with all Tribal Employment Rights Office requirements.
15. Any utility/electrical lines would be installed below ground.

BMPs would be installed at the toe of the fill, within roadside ditches, and along large areas of slopes at all well locations. During on-site visits with BIA and BLM in June 2011, the following site-specific BMPs were discussed.

Bear Den 08-1621H:

- Avoid the wooded drainage and trees to the northwest of well pad (Figure 3).
- Use an 18-inch berm on the corner of well pad, and straw wattles at bottom of fill for secondary containment.
- Mow the location in the fall or conduct migratory bird surveys if construction is to occur between February 1 and July 15.
- Construct berming or other BMPs along exterior of well pad to reduce on and offsite stormwater flow.

Mandaree 111-07H:

- Slide and rotate well pad, as well as round well pad corners, in order to avoid the wooded drainage and trees to the west of well pad (Figure 7).
- Install an 18-inch berm and other BMPs such as fiber matting and straw wattles to reduce erosion potential.
- Install fiber matting along entire western slope of well pad to reduce erosion potential
- Mow the location in the fall or conduct migratory bird surveys if construction is to occur between February 1 and July 15.

- Utilize Williams/Dakota-3 Plenty Sweet Grass 18-19 well access road to reduce the length of the access road and the amount of ground disturbance.
- Place production facilities as far away as possible from the drainage located west of the well pad.

Mandaree 104-1716H:

- Mow the location in the fall or conduct migratory bird surveys if construction is to occur between February 1 and July 15.
- Construct berming or other BMPs along exterior of well pad to reduce on and offsite stormwater flow.
- Install fiber matting along the south and east side slopes of well the pad.

2.12 TOTAL SURFACE DISTURBANCE

In total, approximately 23.71 acres would be disturbed for well pad construction and 11.77 acres for construction of 0.65 mile of access road. All surface disturbance would be on tribal lands. Table 4 summarizes the surface disturbance estimates for the Proposed Action.

Table 4. Surface Disturbance Details.

Location	Access Road and Pipeline ROW			Well Pad			Total Disturbance (acres)
	Length (feet)	ROW width (feet)	ROW Disturbance (acres)	Length (feet)	Width (feet)	Well Pad Disturbance ¹ (acres)	
Bear Den 08-1621H	2,016	150	6.94	800	500	9.52	16.46
Mandaree 111-07H	938	150	3.23	700	500	8.10	11.33
Mandaree 104-1716H	464	150	1.60	600	500	6.09	7.69
Total	3,418		11.77			23.71	35.48

¹ Area of maximum disturbance including well pad, fill slopes, stockpiles, and cuttings pits.

2.13 PERSONNEL REQUIREMENTS AND SCHEDULING

The quantification of personnel and vehicles presented in Table 5 are typical average values. Actual personnel and vehicles on location at any particular time may vary.

Table 5. Personnel Requirements and Scheduling.

Activity	Duration of Activity (average days per well)	Daily Personnel (average number per well)	Daily Passenger Vehicle Trips (per well)
Construction	5	6	2
Drilling	30	15	18
Completion/Installation of Facilities	20	10	15

Production	ongoing – life of well	2	2
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Two to three pieces of heavy equipment, such as bulldozers and motor graders, would be used to perform the earth-moving operations during construction operations. Duration of drilling operations would likely vary depending on depth and conditions encountered while drilling. The time required for drilling operations includes the time needed to rig up and rig down. EOG anticipates drilling each well sequentially, or as the timing of APD approval allows.

2.14 BIA-PREFERRED ALTERNATIVE

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

3.0 THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

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 the Proposed Action in the following sections. 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.

Under the No Action Alternative, the proposed project would not be constructed, drilled, installed, or operated. Existing conditions would not be impacted for the critical elements listed above. There would be no project-related ground disturbance, use of hazardous materials, or trucking of product to collection areas. Surface disturbance, 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.

PHYSICAL AND GEOLOGICAL SETTING

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

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

The proposed well sites are in a rural area consisting of mostly grassland, shrubland, and cropland that is currently farmed, idle, or used to graze livestock. The landscape has been previously disturbed by dirt trails and gravel and paved roadways. Based on aerial imagery, four houses are located within 1 mile of the proposed well pads. Three of the houses are within approximately 1 mile of the Mandaree 104-1716H well pad (two southeast of the well

pad, one northeast of the well pad). The remaining house is approximately 0.5 mile north of the Bear Den 08-1621H well pad. No houses were identified within 1 mile of the Mandaree 111-07H well pad.

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 Williston Basin consists of deep layers of sedimentary rock deposited over time above a Precambrian geologic basement. The wells would target the Bakken and Three Forks formations, known oil reserves. Although earlier oil and gas exploration activity within the Reservation was limited and commercially unproductive, recent economic changes and technological advances now make accessing oil in the Bakken and Three Forks formations feasible.

3.1 AIR QUALITY

The federal Clean Air Act (CAA) (USC § 7401–7671, as amended in 1990) established national ambient air quality standards (NAAQS) for criteria pollutants to protect public health and welfare. It also set standards for other compounds that can cause cancer, regulated emissions that cause acid rain, and required federal permits for large sources. NAAQS have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead (U.S. Environmental Protection Agency [EPA] 2010a). The primary NAAQS are set for pervasive compounds that are generally emitted by industry or motor vehicles. Standards for each pollutant meet specific public health and welfare criteria; thus, they are called the ‘criteria pollutants.’

The CAA mandates prevention of significant air quality deterioration in certain designated attainment areas and has designated more stringent air quality standards, known as Secondary Standards, for these areas. Class I attainment areas have national significance and include national parks greater than 6,000 acres, national monuments, national seashores, and federal wilderness areas larger than 5,000 acres that were designated prior to 1977 (Ross 1990). The Class I regulations (40 CFR 51.307) attempt to protect visibility through a review of major new and modified sources of pollutants, and requiring strict air quality emission standards if they will have an adverse impact on visibility within the Class I area (National Park Service 2010).

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

Some states have adopted more stringent standards for criteria pollutants, or have chosen to adopt new standards for other pollutants. For instance, the NDDH has established a standard for hydrogen sulfide (H_2S) (NDDH 2010).

3.1.1 Air Quality Standards for Criteria Pollutants

Criteria pollutants and their health effects include the following.

Sulfur dioxide (SO_2) is a colorless gas with a strong, suffocating odor. SO_2 is produced by burning coal, fuel oil, and diesel fuel, and can trigger constriction of the airways, causing particular difficulties for asthmatics. Long-term exposure is associated with increased risk of mortality from respiratory or cardiovascular disease. SO_2 emissions are also a primary cause of acid rain and plant damage (EPA 2010a).

Inhalable Particulate Matter (PM_{10} and $PM_{2.5}$) is a class of compounds that can lodge deep in the lungs, causing adverse health problems, depending on their size, concentration, and content. Based on extensive health studies, particulate matter is regulated under two classes: PM_{10} is the fraction of total particulate matter 10 microns or smaller, and $PM_{2.5}$ is two and a half microns or smaller. Inhalable particulate matter can range from inorganic wind-blown soil to organic and toxic compounds found in diesel exhaust. Toxic compounds such as benzene often find a route into the body via inhalation of fine particulate matter (EPA 2010a).

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

Ozone (O_3) is a colorless gas with a pungent, irritating odor and creates a widespread air quality problem in most of the world's industrialized areas. Ozone smog is not emitted directly into the atmosphere but is primarily formed through the reaction of hydrocarbons and nitrogen oxides (NO_x) in the presence of sunlight. Health effects from O_3 can include reduced lung function, aggravated respiratory illness, and irritated eyes, nose, and throat. Chronic exposure can cause permanent damage to the alveoli of the lungs. O_3 can persist for many days after formation and travel several hundred miles (EPA 2010a).

Carbon monoxide (CO) is a colorless, odorless gas that is a byproduct of incomplete combustion. CO concentrations typically peak nearest a source, such as roadways or areas with high fireplace use, and decrease rapidly as distance from the source increases. Ambient levels are typically found during periods of stagnant weather, such as on still winter evenings with a strong temperature inversion. CO is readily absorbed into the body from the air. It decreases the capacity of the blood to transport oxygen, leading to health risks for unborn children and people suffering from heart and lung disease. The symptoms of excessive exposure are headaches, fatigue, slow reflexes, and dizziness (EPA 2010a).

The Primary and Secondary NAAQS for criteria pollutants are shown in Table 6. NEPA assessments require analysis of both near-field and far-field as part of the cumulative effects of proposals on air quality. Therefore, the North Dakota Ambient Air Quality Standards (AAQS) are shown as well as federal standards.

Table 6. NAAQS and Other Air Quality Standards.

Pollutant	Averaging Period	Primary Standard (NAAQS)	Secondary Standard (National Parks)	North Dakota AAQS
SO ₂ in parts per million of air (ppm)	3-hour	-	0.5	0.273 (1-hour)
	24-hour	0.14	-	0.099
	Annual Mean	0.03	-	0.023
PM ₁₀ in micrograms per cubic meter of air (µg/m ³)	24-hour	150		150
	Expected Annual Mean	50		50
PM _{2.5} (µg/m ³)	24-hour	35	35	35
	Weighted Annual Mean	15	15	15
NO ₂ (ppm)	Annual Mean	0.053	0.053	0.053
CO (ppm)	8-hour	9	-	9
	1-hour	35	-	35
O ₃ (ppm)	8-hour	0.075	0.075	-
	1-hour	-	-	0.12
Lead (µg/m ³)	3-month Arithmetic Mean within a 3-year period	0.15	0.15	1.5 (quarterly mean)
Hydrogen Sulfide (H ₂ S) (ppm)	Instantaneous	-	-	10
	1-hour	-	-	0.20
	24-hour	-	-	0.10
	3-month	-	-	0.02

Sources: EPA 2010a, NDDH 2010.

North Dakota has separate state standards for SO₂ and H₂S that are different from the federal criteria standards. All other state criteria pollutant standards are the same as federal. North Dakota was one of 13 states that met standards for all federal criteria pollutants in 2008.

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

3.1.2 Greenhouse Gas Emissions and Responses to the Threat of Climate Change

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

Carbon Dioxide (CO₂): CO₂ enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). CO₂ is also removed from the atmosphere (or “sequestered”) when it is absorbed by plants as part of the biological carbon cycle.

Methane (CH₄): CH₄ is emitted during the production and transport of coal, natural gas, and oil. CH₄ emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

Nitrous Oxide (N₂O): N₂O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

Fluorinated Gases: Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are typically emitted in small quantities, but are potent GHGs thought to contribute significantly to global warming processes (EPA 2010b).

CO₂ is the primary GHG responsible for approximately 90 percent of radiative forcing (the rate of energy change as measured at the top of the atmosphere; can be positive [warmer] or negative [cooler]) (EPA 2010b). To simplify discussion of the various GHGs, the term ‘Equivalent CO₂’ or ‘CO₂e’ has been developed. CO₂e is the amount of CO₂ that would cause the same level of radiative forcing as a unit of one of the other GHGs. For example, one ton of CH₄ has a CO₂e of 22 tons; therefore, 22 tons of CO₂ would cause the same level of radiative forcing as one ton of CH₄. N₂O has a CO₂e value of 310. Thus, control strategies often focus on the gases with the highest CO₂e value.

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

Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases. The IPCC Working Group I Fourth Assessment compiles and analyzes global data on climate change, and reports that warming of the climate system is evident from global observations of

increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level (IPCC 2007). Globally, 11 out of 12 years between 1995 and 2007 ranked among the 12 warmest years in the instrumental record of global surface temperature since 1850 (IPCC 2007). The National Oceanic and Atmospheric Agency monitored data indicate that 21 of the previous 30 years (1979–2009) have had above average temperatures in the contiguous United States, with departures from average temperatures occurring with increasing frequency (National Oceanic and Atmospheric Agency 2010).

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

IPCC experts concluded that most of the observed increase in globally averaged temperature since the mid-twentieth century is very likely due to the observed increase in anthropogenic GHG concentrations (IPCC 2007). Therefore, the EPA collects data on and encourages limiting or reducing emissions of anthropogenic sources of GHGs to the earth's atmosphere (EPA 2010c). Many U.S. states have adopted goals and actions to reduce GHGs. The EPA and the National Highway Traffic Safety Administration have increased corporate fuel economy standards to promote national energy security and reduce GHGs. Standards will equal 35 miles per gallon by 2020, with an estimated savings to drivers of \$100 billion annually (EPA 2010c).

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

Energy production and supply was estimated to emit up to 25.9% of GHGs world-wide in 2004 (Pew Center 2009). Methane gas (CH₄), with a high radiative forcing CO₂e ratio, is a common fugitive gas emission in oil and gas fields (EPA 2010b). Oil and gas production, however, is highly variable in potential GHG emissions. Oil and gas producers in the United States are not considered large GHG emitters by the EPA, and are not the subject of any current federal proposals that would regulate GHG emissions.

3.1.3 Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are a class of compounds known to cause cancer, mutation, or other serious health problems. HAPs are usually a localized problem near the emission source. HAPs are regulated separately from criteria air pollutants. There are several hundred HAPs recognized by the EPA and State of North Dakota. Health effects of HAPs may occur at exceptionally low levels; for many HAPs it is not possible to identify exposure levels that do not produce adverse health effects. Major sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), wood smoke, and motor vehicle exhaust. Unlike regulations for criteria pollutants, there are no ambient air quality standards for HAPs. Examples of HAPs found in gases released by oil field development and operation include benzene, toluene, xylene, and formaldehyde (BLM 2010). HAP emissions receive evaluation based on the degree of exposure that can cause risk of premature mortality, usually from cancer.

Risk assessments express premature mortality in terms of the number of deaths expected per one million persons. The NDDH typically reviews projects and either requires an applicant to prepare a risk assessment or assign the state engineers to do the work. For new sources emitting HAPs with known negative health effects, an applicant must demonstrate that the combined impact of new HAP emission does not result in a maximum individual cancer risk greater than one in one hundred thousand.

3.1.4 Existing Air Quality in the Project Area

Federal air quality standards apply in the project area, which is designated as a Class II attainment area. Although the State of North Dakota does not have jurisdiction over air quality matters on the Reservation and no air quality monitoring stations occur within the boundaries of the Reservation, monitoring efforts are being made by the state and industry in the area. The NDDH operates a network of monitoring stations around the state that continuously measure pollution levels. Industry also operates monitoring stations as required by the state. The data from all these stations are subject to quality assurance, and when approved, it is published on the World Wide Web and available from EPA and NDDH (NDDH 2010).

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

Criteria pollutants measured at the two monitoring stations include SO₂, PM₁₀, NO₂, and ozone. Lead and CO are not monitored by any of the stations. Table 7 summarizes the NAAQS and the maximum levels of criteria pollutants. The highest value at either of the two monitoring locations is shown for each year from 2007 through 2009.

Table 7. Maximum Levels of Monitored Pollutants, 2007–2009, as Measured at Dunn Center and Theodore Roosevelt National Park North Unit Monitoring Stations.

Criteria Pollutant	Averaging Period	Primary Standard (NAAQS)	Maximum Reported Level from Dunn Center and TRNP-NU Monitoring Stations		
			2009	2008	2007
SO ₂ (parts per million [ppm])	24-hour	0.14	0.006	0.004	0.004
	Annual Mean	0.03	0.0005	0.0004	0.0011
PM ₁₀ (micrograms per cubic meter [µg/m ³])	24-hour	150	54	108	57.4
	Expected Annual Mean	50	11.3	14.2	13.2
PM _{2.5} (µg/m ³)	24-hour	35	15	35.7	22.2
	Weighted Annual Mean	15	3.4	3.7	3.6
NO ₂ (ppm)	Annual Mean	0.053	0.0015	0.0018	0.0015
O ₃ (ppm)	8-hour	0.08	0.057	0.0063	0.0071

Source: NDDH 2010.

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

3.1.5 Typical Air Emissions from Oil Field Development

According to EPA Emission Inventory Improvement documents, oil field emissions encompass three primary areas: combustion, fugitive, and vented. Typical processes that occur during exploration and production include the following.

- Combustion emissions include SO₂, ozone precursors called volatile organic compounds (VOCs), GHGs, and HAPs. Sources include engine exhaust, dehydrators, and flaring.
- Fugitive emissions include criteria pollutants, H₂S, VOCs, HAPs, and GHGs. Sources of fugitive emissions include mechanical leaks from well field equipment such as valves, flanges, and connectors that may occur in heater/treaters, separators, pipelines, wellheads, and pump stations. Pneumatic devices such as gas actuated pumps and pressure/level controllers also result in fugitive emissions. Other sources include evaporation ponds and pits, condensate tanks, storage tanks, and wind-blown dust (from truck and construction activity).
- Vented emissions include GHGs, VOCs, and HAPs. Primary sources are emergency pressure relief valves and dehydrator vents.

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

3.1.6 Air Quality Best Management Practices

Under the CAA, federal land management agencies have an affirmative responsibility to protect air quality. Tribes, federal land managers, and private entities can make emission controls part of a lease agreement. BMPs can be adopted for various portions of an oil/gas well's lifecycle. BMPs fall into the following six general categories.

- Transportation BMPs to reduce the amount of fugitive dust and vehicle emissions
 - Use directional drilling to drill multiple wells from a single well pad;
 - use centralized water storage and delivery, well fracturing, gathering systems;
 - use telemetry to remotely monitor and control production;
 - use water or dust suppressants to control fugitive dust on roads;
 - control road speeds; and
 - use van or carpooling.
- Drilling BMPs to reduce rig emissions
 - Use cleaner diesel (Tier 2, 3, and 4) engines;
 - use natural gas-powered engines; and
 - use “green” completions to recapture product that otherwise would have been vented or flared.
- Unplanned or emergency releases
 - Use high-temperature flaring if gas is not recoverable.
- Vapor recovery
 - Use enclosed tanks instead of open pits to reduce fugitive VOC emissions; and
 - use vapor recovery units on storage tanks.
- Inspection and maintenance
 - Use and maintain proper hatches, seals, and valves;
 - optimize glycol circulation and install a flash tank separator;
 - use selective catalytic reduction; and
 - replace high-bleed with low-bleed devices on pneumatic pumps.

- Monitoring and repair
 - Use directed inspection and maintenance methods to identify and cost-effectively fix fugitive gas leaks; and
 - install an air quality monitoring station.

3.1.7 Potential Air Quality Impacts

Based on the existing air quality of the region, the effects of typical air emissions from similar oil field projects, and implementation of BMPs identified in Section 3.1.6, the Proposed Action would not produce significant increases in criteria pollutants, GHGs, or HAPs.

3.2 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.

H₂S is extremely toxic in concentrations above 500 parts per million, but it has not been found in measurable quantities in the Bakken or Three Forks formations. Before reaching the Bakken, however, drilling would penetrate the Mission Canyon Formation, which is known to contain varying concentrations of H₂S. Contingency plans submitted to the BLM comply fully with relevant portions of Onshore Oil and Gas Order No. 6 to minimize potential for gas leaks during drilling. Emergency response plans protect both the drilling crew and the general public within 1 mile of a well; precautions include automated sampling and monitoring by drilling personnel stationed at each well site.

The principle downwind direction in the area is northwest, according to 2008 data from the AAQM site at the Dunn Center monitoring site (NDDH 2010). Satellite imagery identified three houses within approximately 1 mile of the Mandaree 104-07H well pad (two southeast of the well pad, one northeast of the well pad). One house was identified approximately 0.5 mile north of the Bear Den 08-1621H well pad. Release of H₂S at dangerous concentration levels is very unlikely, and no direct impacts from H₂S are anticipated with implementation of standard mitigation measures.

Other potential negative impacts from construction would be largely temporary. Noise, fugitive dust, and traffic hazards would be present for about 55 days during construction, drilling, and well completion, and then diminish sharply during commercial operations. For each of the proposed well sites, it is estimated that two passenger vehicle trips would be needed during construction and 15 to 18 trips during drilling and well completion. Any wells that prove productive would require that one pumper truck visit the pad once a day to check the pump. Typical Bakken wells drilled in the project vicinity produce both oil and water at a high rate initially. Gas would be flared initially, while oil and produced water would be stored on each well pad in tanks and hauled out by tankers until the well could be connected to gathering pipelines. Up to eight 400-barrel oil tanks and one 400-barrel water tank per well would be located on the pad inside a berm of impervious compacted subsoil. The berm would be designed to hold 110% of the capacity of the largest tank. The proponent would develop and maintain site-specific SPCCPs for each production facility.

Tanker trips would depend on production, but an estimate of trips per well pad is presented in Table 3. Trucks for normal production operations must use the existing and proposed access roads. Produced water would be transported to the Rink 1 disposal site or other approved disposal facility. All traffic would be confined to approved routes and conform to established load restrictions and speed limits for state and BIA roadways and haul permits would be acquired as appropriate.

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

A temporary pit for drill cuttings would be constructed within the disturbed area of each well pad and constructed to not leak, break, or allow discharge and in a way that minimizes the accumulation of precipitation runoff into the pit. A pit liner would have permeability less than 10^{-7} centimeters per second; a burst strength greater than or equal to 300 psi or puncture strength greater than or equal to 160 psi; and grab tensile strength greater than or equal to 150 psi.

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

3.3 WATER RESOURCES

This section identifies the existing water resources within the project area and potential effects of the project. Specific subjects discussed in this section include surface water and surface water quality, groundwater resources, hydraulic fracturing, and the potential short-term and long-term impacts of the proposed project on these water resources.

3.3.1 Surface Water

According to the NDDH Division of Water Quality, the Bear Den 08-1621H well pad and associated access road are located within the Bear Den Bay watershed (Hydrologic Unit Code 101101012004), which is part of the Missouri River Basin. Mandaree 104-1716H and 111-07H well pads and roads are located in the Upper Bear Den Creek watershed (Hydrologic Unit Code 101101012001), which is also part of the Missouri River Basin. Figure 13 shows the general direction of surface runoff near each well and the direction of concentrated surface flow through the localized draws. Sheet flow and concentrated runoff near the proposed well areas would flow through nearby draws towards Bear Den Creek. The creek subsequently flows in a general northeasterly direction towards Lake Sakakawea, approximately 2.6 to 19.4 river miles from the well pads. Other surface waters include National Wetland Inventory (NWI) mapped wetlands. The distance to surface water resources is shown in Table 8.

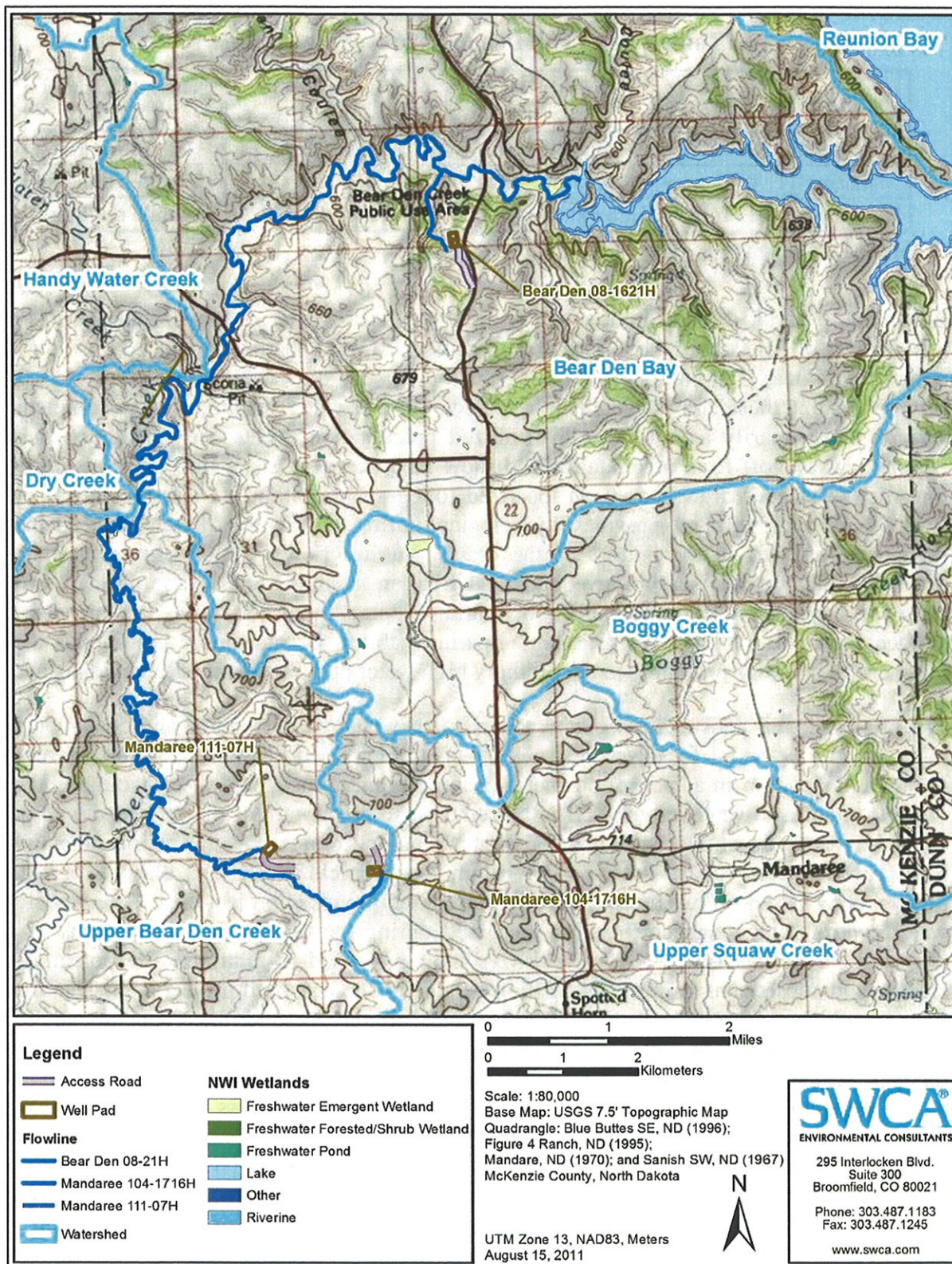


Figure 13. Watersheds, surface water, and wetlands near proposed wells.

Table 8. Well Pad Distances to Surface Waters.

Well Pad Name	Nearest Perennial Stream	River Miles to Lake Sakakawea	Nearest Wetland (NWI)
Bear Den 08-1621H	0.5 mile north	2.6 miles	0.5 mile north
Mandaree 111-07H	1.0 mile northwest	17.9 miles	0.9 mile northeast
Mandaree 104-1716H	1.8 miles northwest	19.4 miles	0.4 mile northeast

NWI = National Wetland Inventory

Based on an aerial desktop review and in-field verification, no perennial water bodies are located near or adjacent to the proposed well pads or ROWs. There is a wooded draw 50 feet northwest of Bear Den 08-1621H (Figure 3) and a wooded draw west of Mandaree 111-07H (Figure 7), but these draws would be avoided. Surface water resources in the immediate vicinity are primarily associated with localized precipitation events and snow melt during spring thaw. Runoff from precipitation and snow melt occurs as sheet flow which is directed towards the steeper draws based on localized topography. Within the steeper draws, sheet flow is concentrated and provides hydrological influx to the intermittent or ephemeral drainages observed in the bottom of the draws. Surface flows through these intermittent drainages may support seasonal wetlands and riparian habitats within these defined draws; however, the continuity of wetlands and riparian habitats along the draws is dependent on surface water availability. Wetlands and riparian habitats become more continuous along these draws in closer proximity to the ordinary high water pool elevation of Lake Sakakawea.

The proposed well pads and associated access roads would be engineered and constructed to minimize the potential for suspended solid (i.e., turbidity) concentration of surface runoff, sediment deposition in adjacent ephemeral or intermittent drainages, and to avoid any direct impacts to surface water resources. The placement and orientation of the proposed well pads and access infrastructure considered topography, natural drainage, and erosion potential at each proposed well pad and access road location. On-site field inspections allowed for further project siting based on resources discovered along the proposed project area. Potential storm water controls and management were discussed during the on-site field inspections of the project area. Both active and passive BMPs would be used to minimize the potential for erosion and subsequent sediment deposition outside of the proposed project area. The access roads would be crowned and ditched with water turnouts to minimize concentrated flows through the bar ditch of the road. Other BMPs would be implemented based on localized topography, potential catchments and drainage size, soil texture and particle cohesiveness, native vegetation, and restoration potential. If the access roads cross ephemeral drainages, they would be designed as either a low water crossing or culvert crossing to maintain down gradient water quality and flow continuity. Corrugated metal pipe culverts would be installed along the access road to help distribute and minimize any concentrated surface flow through the bar ditch of the roads. The access roads would be maintained to prevent erosion, off site deposition, and to ensure yearlong safe conditions during the life of a well.

No surface water within the project area would be used for well drilling and completion activities. Water required for drilling and completion operations would be obtained from commercially approved sources and would be trucked by tanker to the project area. Produced

water resulting from operations would be initially stored on the well pad in a designed tank battery before being transported from the tanks via tanker trucks to the permitted Rink 1 produced water disposal site or other approved disposal facility. Any chemicals or potentially hazardous materials would be handled in accordance with the operator's SPCCP. Provisions established under this plan, addressing accidental spills and releases, would help minimize both potential direct and indirect impacts to receiving waters outside of the proposed project area.

3.3.2 Groundwater

Aquifers in the project vicinity include, from deepest to shallowest, the Cretaceous Fox Hills and Hell Creek formations and the Tertiary Ludlow, Tongue River, and Sentinel Butte formations (Table 9). Several shallow aquifers related to post-glacial outwash composed of till, silt, sand, and gravel are located in the area. According to North Dakota State Water Commission (NDSWC), the Fox Hills aquifer is approximately 0.1 to 0.4 mile of the proposed well pads (Figure 14).

Table 9. Common Aquifers in the Proposed Project Area and Surrounding Region.

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

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

Environmental Assessment: EOG Resources, Inc.
 Bear Den 08-1621H, Mandaree 111-07H, and Mandaree 104-1716H Well Pads

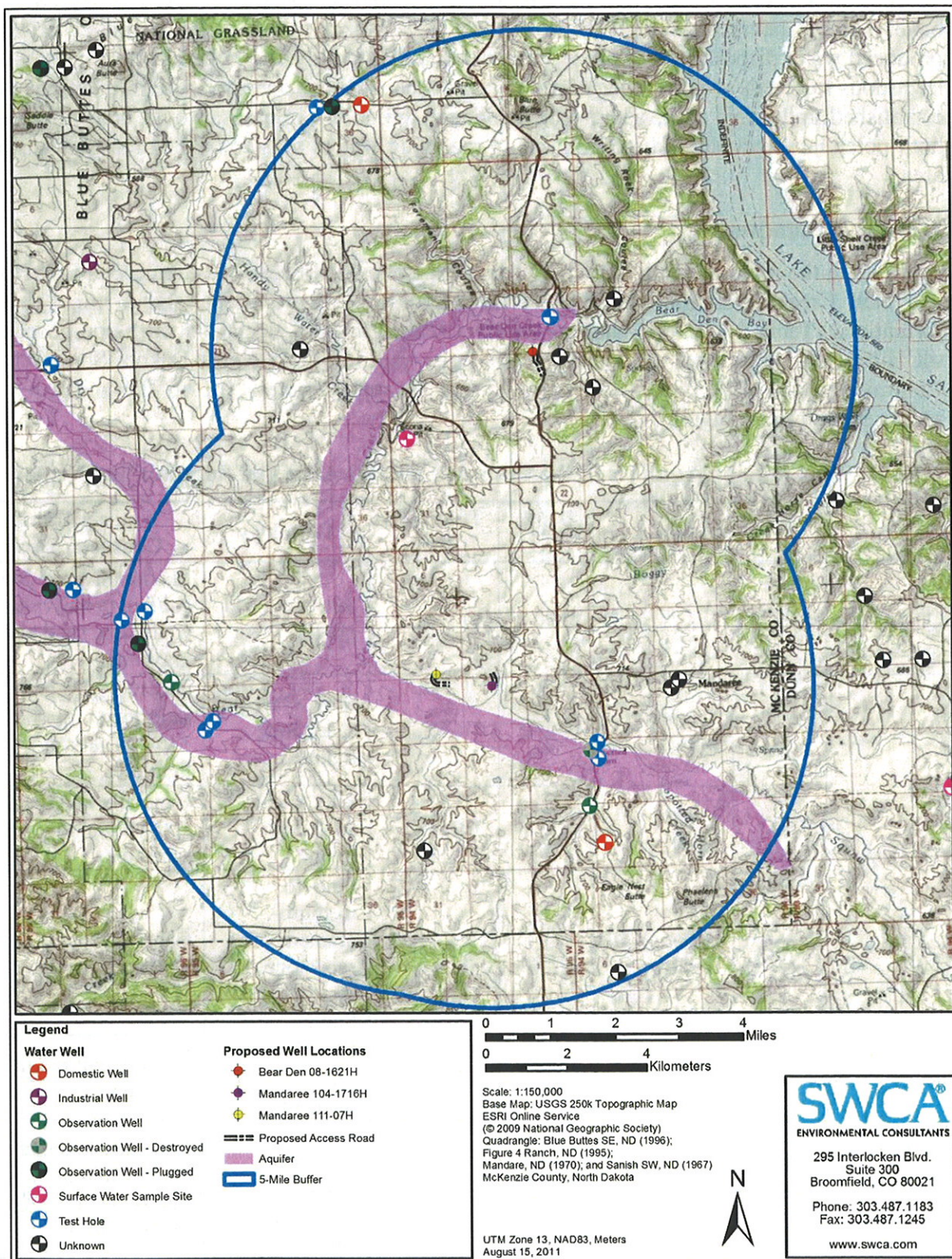


Figure 14. Water wells and aquifers near the proposed well pads.

Review of electronic records of the NDSWC (2010) revealed 25 permitted water wells within an approximate 5-mile boundary of the proposed project areas (Table 10; Figure 14). Water wells within 5 miles of the subject area receive water from the Fort Union, Fox Hills, and Tongue River aquifers. There are two domestic water wells within 5 miles of well pads. The other wells are either plugged or active observation wells, wells for unknown uses (likely agricultural), or are test holes bored in the early 1950s by the U.S. Geological Survey (USGS 2010). A test hole by definition is an uncased or temporarily cased well drilled for water, geologic, or hydrogeologic testing (USGS 2010). Water quality would be protected by implementing proper BMPs and construction practices. Drilling would proceed in compliance with Onshore Oil and Gas Order No. 2, Drilling Operations (43 CFR 3160).

Fresh water use for the proposed wells would include approximately 1,200 barrels per well for drilling and 25,000 barrels per well for hydraulic fracturing. The fresh water used to drill and complete the wells would be obtained from a permitted commercial source and would be hauled by small tanker truck to each location. A pit would be used for the storage of cuttings and tanks would be used to temporarily store produced fluids at the well site.

Implementation of proper hazardous materials management and using appropriate casing and cementing during well completion, in addition to the distance to known aquifers, would prevent cross contamination between aquifers or the introduction of hazardous materials into aquifers. The majority of identified groundwater wells are test holes and are not in service. The other water wells are over 1 mile from project wells and likely have minimal hydrologic connections.

Table 10. Existing Water Wells within 5 Miles of Proposed Well Pads.

Well Index	Well #	Purpose	Owner	Township/ Range	Section	Aquifer	Bear Den 08-1621H	Mandaree 111-07H	Mandaree 104- 1716H
7660	Unknown	Unknown	Youngwolf	150N/94W	21	Fort Union	0.4 mile	5.3 miles	5.2 miles
25812	11360	Test Hole	NDSWC	150N/94W	16	No Obs Well Installed	0.6 mile	5.8 miles	5.8 miles
25813	11361	Test Hole	NDSWC	150N/94W	16	No Obs Well Installed	0.6 mile	5.8 miles	5.8 miles
7661	Unknown	Unknown	Youngwolf	150N/94W	22	Fort Union	1.1 miles	5.1 miles	4.9 miles
7659	Unknown	Unknown	Nick Fox	150N/94W	15	Fort Union	1.5 miles	6.4 miles	6.3 miles
22825	Unknown	Surface Water Sampling	Mandaree #3 Well	150N/94W	30	Surface Water	2.4 miles	3.7 miles	4.1 miles
7663	Unknown	Unknown	Carole Berwald	150N/95W	14	Fort Union	3.6 miles	5.5 miles	6.0 miles
26120	Unknown	Domestic	Jim Hall	151N/95W	36	Undefined	4.7 miles	8.9 miles	9.2 miles
7769	6053	Observation - Plugged	NDSWC	151N/95W	36	Tongue River- Ludlow	4.9 miles	9.0 miles	9.3 miles
7640	Unknown	Unknown	Mandaree #3 Well	149N/94W	14	Fox Hills	5.5 miles	3.8 miles	2.9 miles
7639	Unknown	Unknown	Mandaree Well	149N/94W	14	Sentinel Butte- Tongue River	5.6 miles	3.7 miles	2.8 miles
25790	11351	Test Hole	NDSWC	149N/94W	22	No Obs Well Installed	6.1 miles	2.7 miles	1.9 miles
25789	11352	Observation - Destroyed	NDSWC	149N/94W	21	Undefined	6.2 miles	2.7 miles	1.8 miles
25791	11353	Test Hole	NDSWC	149N/94W	22	No Obs Well Installed	6.4 miles	2.8 miles	2.0 miles
21501	Unknown	Observation	USGS	149N/94W	28	Tongue River	7.1 miles	3.1 miles	2.4 miles
21502	Unknown	Observation	USGS	149N/94W	28	Sentinel Butte- Tongue River	7.1 miles	3.1 miles	2.4 miles
25792	11357	Test Hole	NDSWC	149N/95W	4	No Obs Well Installed	7.3 miles	4.6 miles	5.5 miles
25796	11354	Test Hole	NDSWC	149N/95W	15	No Obs Well Installed	7.6 miles	3.5 miles	4.4 miles

*Environmental Assessment: EOG Resources, Inc.
Bear Den 08-1621H, Mandaree 111-07H, and Mandaree 104-1716H Well Pads*

Well Index	Well #	Purpose	Owner	Township/ Range	Section	Aquifer	Bear Den 08-1621H	Mandaree 111-07H	Mandaree 104- 1716H
7643	6275	Observation	NDSWC	149N/95W	9	Fox Hills	7.6 miles	4.1 miles	5.0 miles
25795	11356	Observation - Plugged	NDSWC	149N/95W	8	Undefined	7.6 miles	4.6 miles	5.5 miles
26071	Unknown	Domestic	George Wolf	149N/94W	27	Undefined	7.7 miles	3.7 miles	3.0 miles
25793	11358	Test Hole	NDSWC	149N/95W	5	No Obs Well Installed	7.7 miles	4.9 miles	5.8 miles
25797	11355	Test Hole	NDSWC	149N/95W	16	No Obs Well Installed	7.8 miles	3.7 miles	4.5 miles
7641	Unknown	Unknown	Ted Loneflight	149N/94W	30	Fort Union	7.9 miles	2.7 miles	2.8 miles
5222	Unknown	Unknown	United Tribes	148N/94W	6	Sentinel Butte- Tongue River	9.7 miles	5.4 miles	4.8 miles

Source: NDSWC 2010.

3.4 WETLANDS

NWI maps and a digital inventory maintained by the USFWS identify several wetlands areas in the vicinity of the Proposed Action (USFWS 2009a). Based on the USFWS inventory database, five freshwater emergent wetlands, two riverine wetlands, and six lakes are located within 1 mile of the Bear Den 08-1621H well pad (Figure 13). Three freshwater ponds are within 1 mile of the Mandaree 104-1716H well pad, one of which is also within 1 mile of the Mandaree 111-07H well pad. The closest NWI wetlands are 0.4 to 0.9 mile from the well pads (Table 8). Indirect impacts such as down-gradient sediment and decreased water quality to receiving waters would be expected to be minimal with proper implementation of appropriate BMPs for sediment and erosion.

In addition, the operator's SPCCPs for each production facility on the well pad will address project storm water management. Permitting with the U.S. Army Corps of Engineers for the discharge of fill material into potential waters of the U.S., including wetlands, is not anticipated at this time. However, if it is determined that the discharge of fill material in any potential jurisdictional surface water would be required due to changes in the project design or layout, the proponent would coordinate any permitting with the BIA, the U.S. Army Corps of Engineers, and appropriate state and federal agencies. The proponent would comply with all conditions of permits and authorizations during construction.

3.5 WILDLIFE

The habitat within the project area and vicinity is herbaceous upland, wooded drainages, pasture, and mixed prairie grassland used for grazing. These habitats can support grassland birds, ungulates, and small mammals. Wildlife observed during field visits to the proposed project areas is listed in Table 11.

Table 11. Wildlife Observation in Project Area.

Location	Survey Date	Observations
Bear Den 08-1621H	June 16, 2011	Habitat: Herbaceous upland in project area. Wooded drainage 50 feet to the northwest of well pad. Wildlife: None observed. Migratory bird habitat at location and raptor habitat in drainage.
Mandaree 111-07H	May 17, 2011	Habitat: Herbaceous upland in project area. Wooded drainage to the west of well pad. Wildlife: Western meadowlark (<i>Sturnella neglecta</i>), yellow warbler (<i>Dendroica petechia</i>), clay-colored sparrow (<i>Spizella pallida</i>), northern harrier (<i>Circus cyaneus</i>), and turkey vulture (<i>Cathartes aura</i>). Migratory bird habitat at location and raptor habitat in drainage.
Mandaree 104-1716H	June 16, 2011	Habitat: Herbaceous upland. Wildlife: Black-tailed prairie dog (<i>Cynomys ludovicianus</i>), badger (<i>Taxidea taxus</i>), and western meadowlark. Migratory bird habitat.

The primary impacts to wildlife species in the project areas and vicinity would be as a result of the construction of new access roads and well pads, drilling activity, potential commercial production, and the associated vehicular traffic. Ground clearing might impact habitat for wildlife species, including small birds and small mammals. Some individual animals would be affected by temporary disturbances (noise, traffic, dust, human presence, etc.) during construction and drilling, but no long-term impacts would be anticipated to the persistence of wildlife species in the project area. Oil present in reserve pit fluids can entrap and kill birds and other wildlife (USFWS 2009b). However, EOG proposes to use a semi-closed-loop drilling system so that fluids are not stored in open pits. Drill cuttings would be stored in cuttings pits on the well pads; no fluids, other than rainwater, would be present in cuttings pits.

Several measures designed to mitigate the impacts to wildlife are described in Section 2.11 of this EA. The proponent would also comply with any measures indicated in the APDs, SUPs, and EOG's Safe Practices Manual (2007) that may limit or reduce the possible impact to wildlife species in the vicinity of the Proposed Action. These measures would include, but not be limited to, fencing of well pads, dust suppression, noxious weed control, and the use of trash cages for refuse storage. Interim and final reclamation would begin without delay if a well is determined to be unproductive or upon completion of commercial production.

3.5.1 Migratory Birds

No raptor nests or other bird nests were observed in the project area during surveys, but it is anticipated that raptors and other migratory birds would use the habitat within the project area intermittently for hunting, foraging, and potentially nesting. The Bald and Golden Eagle Protection Act (16 USC 668–668d, 54 Stat. 250) and the Migratory Bird Treaty Act of 1918 (916 USC 703–711) protect nesting migratory bird species.

The bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are species of special concern to the BIA, BLM, and the USFWS. Suitable nesting or foraging habitat for bald eagles includes old growth trees relatively close (usually less than 1.24 miles [Hagen et al. 2005]) to perennial water bodies. The Bear Den 08-1621H well pad is approximately 1 mile from Lake Sakakawea and the Mandaree well pads are over 6 miles from the lake. Bald eagles primarily feed on fish, but will also feed on other small animals and carrion. In winter, bald eagles congregate and roost in tall trees near open water. The golden eagle prefers habitat characterized by open prairie, plains, and forested areas. Golden eagles usually occupy open areas such as grasslands and shrub habitat where their preferred prey (e.g., small mammals) can be found. They also eat carrion, birds, and reptiles. Usually, golden eagles can be found in proximity to cliffs and bluffs that provide nesting habitat.

The North Dakota Game and Fish Department (2010) eagle nest database was checked for known nests within 0.5 mile of the proposed project components. No known nests occur within 0.5 mile of proposed wells. The closest known golden eagle nests are approximately 0.9 mile east of the Bear Den 08-1621H well pad (inactive nest GE271) and 3.4 miles north of the Mandaree well pads (inactive nest GE092). For any newly constructed or undocumented active eagle nests discovered in the area, a minimum 0.5-mile buffer would be maintained during nesting season. EOG would move facilities outside of the buffer, where possible, or

request the option to have a biologist monitor active eagle nests during the nesting season to resume activity once the birds fledge.

Grassland birds have experienced widespread population declines over the last 25 years due to habitat loss and landscape changes from agriculture, livestock grazing, fire suppression, and development (Herkert 1994; Samson and Knopf 1994; Vickery et al. 2000). Fragmentation of native prairie habitat can detrimentally affect migratory grassland species. The proposed well pads and access roads would impact approximately 35 acres of herbaceous upland habitat. Proposed project activities may affect raptor and migratory bird species through direct mortality, habitat degradation, and/or displacement of individual birds. Such impacts are prohibited by the Migratory Bird Treaty Act and would be avoided or minimized by protective measures described in Section 2.11, including mowing habitat prior to nesting season in order to deter birds from the project area.

3.5.2 Special Status Wildlife

Several wildlife species that may exist in McKenzie County are listed as threatened or endangered under the Endangered Species Act (ESA) (16 USC 1531 et seq.). Listed species in the county are black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*), interior least tern (*Sterna anillarum*), piping plover (*Charadrius melodus*), whooping crane (*Grus americana*), and pallid sturgeon (*Scaphirhynchus albus*). In addition, the Dakota skipper (*Hesperia dacotae*) and Sprague's pipit (*Anthus spragueii*) are candidates for listing. No listed species were observed within the project area during surveys. Prairie habitat that potentially could be used by whooping crane, pipit, and Dakota skipper is present in the area. Special-status species are described below.

The North Dakota Parks and Recreation Department conducted a review of the North Dakota Natural Heritage biological conservation database for known occurrences of species of concern within a 1-mile radius of the project areas (see attached scoping comments). There were no known occurrences of special-status species within or adjacent to the project area, although this may be due to a lack of survey data for the area.

Effects of the project on listed species could result from human disturbance and increases in vehicular traffic during drilling and commercial production, as well as indirectly from habitat degradation, sedimentation, or accidental release of drilling fluids or hazardous materials from the drilling, construction, or operation of the wells. Considering the lack of suitable habitat, it is unlikely that listed species occur regularly within the proposed project areas. Based on the analysis below and applicant-committed mitigation measures described in Section 2.11, no impacts on special status wildlife are anticipated. Letters were sent to the USFWS on August 5 and 15, 2011, requesting input on the following affects determinations for listed species. On October 6, 2011, USFWS concurred with the determinations based on the mitigation measures provided in this EA.

3.5.2.1 Black-footed Ferret (*Mustela nigripes*)

Status: Endangered

Affects Determination: No Effect

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily due to range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem (Kotliar et al. 1999). They have been listed by the USFWS as endangered since 1967, and have been the object of extensive re-introduction programs (USFWS 2010a). Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts (USFWS 1988a). Although a prairie dog town is present to the east of the Mandaree 104-17H well pad, prairie dog towns of adequate size to support black-footed ferret are not found in the project area. In addition, this species has not been observed in the wild for more than 20 years. The proposed project **may affect, but is not likely to adversely affect** this species.

3.5.2.2 Gray Wolf (*Canis lupus*)

Status: Endangered

Affects Determination: No Effect

The gray wolf, listed as endangered in the United States in 1978, was believed extirpated from North Dakota in the 1920s and 1930s with only sporadic reports from the 1930s to present (Licht and Huffman 1996). The presence of wolves in most of North Dakota consists of occasional dispersing animals from Minnesota and Manitoba (Licht and Fritts 1994; Licht and Huffman 1996). Most documented gray wolf sightings that have occurred within North Dakota are believed to be young males seeking to establish territory (Hagen et al. 2005). The Turtle Mountains region in north-central North Dakota provides marginal habitat that may be able to support a very small population of wolves. The closest known pack of wolves is the Minnesota population located approximately 28 kilometers (km) from the northeast corner of North Dakota, over 400 km from the project area.

The gray wolf uses a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desert scrub (USFWS 2010b). Due to a lack of forested habitat and distance from Minnesota and Manitoba populations, as well as the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats (Licht and Huffman 1996), the re-establishment of gray wolf populations in North Dakota is unlikely. Additionally, habitat fragmentation, in particular road construction as a result of oil and gas development, may further act as a barrier against wolf recolonization in western North Dakota. Therefore, the proposed project would have **no effect** on the gray wolf.

3.5.2.3 Whooping Crane (*Grus americana*)

Status: Endangered

Affect Determination: May Affect, Is Not Likely to Adversely Affect

The whooping crane was listed as endangered in 1970 in the United States by the USFWS, and in 1978 in Canada. Historically, population declines were caused by shooting and

destruction of nesting habitat in the prairies from agricultural development. Current threats to the species includes habitat destruction, especially suitable wetland habitats that support breeding and nesting, as well as feeding and roosting during their fall and spring migration (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007).

The July 2010 total wild population was estimated at 383 (USFWS 2010c). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, where approximately 83% of the wild nesting sites occur (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007; USFWS 2010c). Dunn and McKenzie counties, including the project area, are within the primary migratory flyway of whooping cranes.

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

Whooping cranes are unlikely to forage in the project area. However, project precautionary measures would be implemented if a whooping crane is sighted in or near the project area. EOG would cease construction or other activity if there is a confirmed sighting of a whooping crane within 1 mile of the project area and notify the USFWS. EOG personnel who have been trained in a formal program sponsored by EOG on the field identification of whooping crane can make a confirmed sighting. Underground utility lines will be utilized for this project. With these measures in place, the proposed project **may affect, but is not likely to adversely affect** the endangered whooping crane.

3.5.2.4 Piping Plover (*Charadrius melodus*)

Status: Threatened

Affect Determination: May Affect, Is Not Likely to Adversely Affect

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

Plovers in the Great Plains make their nests on open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands, and on beaches, sand bars, and dredged material islands of major river systems (USFWS 2002, 2010d). The shorelines of lakes of the Missouri River constitute significant nesting areas for the bird. Piping plovers nest on the ground, making

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

Suitable shoreline habitat for breeding and nesting plovers does not occur in the project area, and Lake Sakakawea is approximately 2.6 river miles from the Bear Den 08-1621H well pad and 18 river miles from the Mandaree well pads and access roads. It is unlikely that migrating plovers would visit the project area during their migration. Additionally, semi-closed- or closed-loop drilling systems would be used, the project would comply with BIA Conditions of Approval (COAs), the interior floor of the drilling pads would be sloped away from drainage ways, and cutting pit liners would be a minimum of 20 milliliters (ml) thick. Therefore, the proposed project **may affect, but is not likely to adversely affect** piping plovers.

3.5.2.5 Designated Critical Habitat of Piping Plover

Affect Determination: No Effect

The USFWS has designated critical habitat for the Great Lakes and Northern Great Plains populations of piping plover (USFWS 2002). Designated critical habitat for the piping plover includes 183,422 acres and 1,207.5 river miles of habitat, including areas near the proposed project, along the shoreline of Lake Sakakawea in McKenzie County, North Dakota (USFWS 2002). Since the project would not modify, alter, disturb, or affect the shoreline of Lake Sakakawea or any of its tributary streams in any way, **no effect** to designated critical habitat of the piping plover would occur.

3.5.2.6 Interior Least Tern (*Sterna antillarum*)

Status: Endangered

Affect Determination: May Affect, Is Not Likely to Adversely Affect

The interior population of the least tern is listed as endangered by the USFWS (1985b). This bird is the smallest member of the gull and tern family, measuring approximately 9 inches in length. Terns remain near flowing water, where they feed by hovering over and diving into standing or flowing water to catch small fish (USFWS 2010e). The interior population of least terns breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems, where they nest in small colonies. From late April to August, terns nest in a shallow hole scraped in an open sandy area, gravel patch, or exposed flat and bare sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. The adults continue to care for chicks after they hatch. Least terns in North Dakota will often be found sharing sandbars with the piping plover, a threatened species (USFWS 2010e).

Census data indicate over 8,000 least terns in the interior population. In North Dakota, the least tern is found mainly on the Missouri River from Garrison Dam south to Lake Oahe, and

on the Missouri and Yellowstone rivers upstream of Lake Sakakawea (USFWS 1990a, 2010e). Approximately 100 pairs breed in North Dakota (USFWS 2010e). Details of their migration are not known, but their winter range is reported to include the Gulf of Mexico and Caribbean Islands (USFWS 1990a, 2010e).

Loss of suitable breeding and nesting habitat for terns has resulted from dam construction and river channelization on major rivers throughout the Mississippi, Missouri, and Rio Grande River systems. River and reservoir changes have led to reduced sandbar formation and other shoreline habitats for breeding, resulting in population declines. In addition, other human shoreline disturbances affect the species (USFWS 1990a). Critical habitat has not been designated for the species (USFWS 2010e). Current conservation strategies include identification and avoidance of known nesting areas, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 2010e).

Suitable shoreline habitat for breeding and nesting terns does not occur in the project area, and Lake Sakakawea is approximately 2.6 river miles from the Bear Den 08-1621H well pad and 18 river miles from the Mandaree well pads and access roads. It is unlikely that terns would visit the upland habitats present in the project area. Additionally, semi-closed- or closed-loop drilling systems would be used, the project would comply with BIA COAs, the interior floors of the drilling pads would be sloped away from drainage ways, and cutting pit liners would be a minimum of 20 ml thick. Therefore, the proposed project **may affect, but is not likely to adversely affect** endangered least terns.

3.5.2.7 Pallid Sturgeon (*Scaphirhynchus albus*)

Status: Endangered

Affect Determination: May Affect, Is Not Likely to Adversely Affect

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

The pallid sturgeon population which is found near the project area occurs from the Missouri River below Fort Peck Dam to the headwaters of Lake Sakakawea and the lower Yellowstone River up the confluence of the Tongue River, Montana (USFWS 2007a). This population consists of approximately 136 wild adult pallid sturgeon (USFWS 2007a). Hatchery reared sturgeon have also been stocked since 1998. The pallid sturgeon has been found to utilize the 25 km of riverine habitat that would be inundated by Lake Sakakawea at full pool (Bramblett 1996 per USFWS 2007a). Larval pallid sturgeons have also been found to drift into Lake Sakakawea. While the majority of pallid sturgeons are found in the headwaters of Lake Sakakawea, North Dakota Game and Fish have caught and released pallid sturgeon in nets set

in 80 to 90 feet of water between the New Town and Van Hook area. Based on this information, pallid sturgeon could be found throughout Lake Sakakawea (personal communication, email from Steve Krentz, Pallid Sturgeon Project Lead, U.S. Fish and Wildlife Service, to Mike Cook, Aquatic Ecologist, SWCA Environmental Consultants, September 3, 2010).

Suitable habitat for pallid sturgeon does not occur in the project area, and Lake Sakakawea is approximately 2.6 river miles from the Bear Den 08-1621H well pad and 18 river miles from the Mandaree well pads and access roads. However, Bear Den Creek, which drains the project area, is a perennial tributary to the Missouri River in Lake Sakakawea. Potential pollution and sedimentation occurring within the project area are concerns for downstream populations of endangered pallid sturgeon. However, semi-closed- or closed-loop drilling systems would be used, the project would comply with BIA COAs, the interior floors of the drilling pads would be sloped away from drainage ways, and cutting pit liners would be a minimum of 20 ml thick. Activities associated with the construction, production, or reclamation of the proposed project area are not anticipated to adversely affect water quality and subsequently the pallid sturgeon. Therefore, the proposed project **may affect, but is not likely to adversely affect** pallid sturgeon.

3.5.2.8 Dakota Skipper (*Hesperia dacotae*)

Status: Candidate

Effects of Project: No Adverse Effects Anticipated

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

3.5.2.9 Sprague's Pipit (*Anthus spragueii*)

Status: Candidate

Effects of Project: No Adverse Effects Anticipated

The Sprague's pipit is a small passerine, 10 to 15 centimeters in length, endemic to the Northern Great Plains (USFWS 2010f). The Sprague's pipit requires large treks of unplowed native prairie habitats throughout their life cycle. Because native grasslands are disturbance-dependent, Sprague's pipits prefer grassland habitats that are regularly disturbed. The

frequency of disturbance required for habitat maintenance depends on how quickly grasses grow to an intermediate height (4 to 12 inches) following a disturbance event.

In North Dakota, Sprague's pipit has been found in areas of moderate grazing. Sprague's pipits are sensitive to patch size and avoid edges between grasslands and other habitat features (USFWS 2010f). They may avoid non-grassland features including roads, trails, oil wells, croplands, woody vegetation, and wetlands. The Sprague's pipit is reported to stay up to 350 meters (m) away from anthropogenic features such as roads, oil wells, and wind turbines (USFWS 2010f). The USFWS has estimated that each new oil well and associated road in North Dakota results in potential impacts approximately 51 acres (21 hectares) of pipit habitat due to avoidance and habitat fragmentation (USFWS 2010f). Due to increasing habitat fragmentation, especially by energy development, throughout the Sprague's pipit range and the loss of native prairie habitat, the Sprague's pipit was listed as a Candidate Species under the ESA in 2010 (USFWS 2010f).

In North Dakota, Sprague's pipit breeds throughout the state except for the easternmost counties. During the breeding season they prefer large patches of well-drained, open native grassland with a minimum size of 358.3 acres (range = 170 to 776 acres). They have not been observed in areas smaller than 71.6 acres on their breeding grounds (USFWS 2010f).

Sprague's pipits were not observed within the project area during surveys in spring 2011. Native prairie habitat with grasses of intermediate height does occur within the project area. However, the habitat within and surrounding the project area has been previously disturbed by agriculture, roads, and oil and gas development. The proposed project is unlikely to directly affect habitat due to lack of adequate patch sizes required by the Sprague's pipit for breeding grounds in the immediate project area, but may indirectly contribute to reduced use of any nearby suitable grassland habitat patches within 350 m of the proposed new facilities. Therefore, no adverse impacts to this species are anticipated.

3.6 SOILS

The proposed project area is located toward the center of the Williston Basin. Soils in this area developed primarily from limestone substrate from the Greenhorn Formation and subsequent formations. The Greenhorn Formation consists of thin limestone and dark gray to black organic-rich shale that is found near the surface to a depth of approximately 4,000 feet. Other soils derived from Pleistocene- and Tertiary-aged formations of similar substrate, including Sauk, Tippecanoe, Kaskaskia, Absaroka, Zuni, and Tejas formations. Additional soil variability is due to the topography, vegetation, climate, and hydrology in which the soil was developed.

3.6.1 Natural Resources Conservation Service Soil Data

The Natural Resources Conservation Service (NRCS) has mapped soils in the proposed project area (NRCS 2010). Soils complexes identified by the NRCS and derived from different soils series that are present within the well pad and access road locations. The Proposed Action would impact various types of soils due to surface disturbance for well pad and road construction.

Individual soil series can vary in value as a source for topsoil salvage and reclamation utilization. One soil series in a soil complex or association may have greater reclamation potential than other soil series in the complex. Soil types in the project area include the Dogtooth-Janesburg-Cabba complex, Cabba-Chama-Havrelon silt loams, Cabba-Badland, Daglum-Belfield complex, Noonan-Williams loams, Lambert-Slickspots-Rhoades complex, and Cabba-Sen-Chama silt loams (Figures 15 and 16) (NRCS 2010). These upland soils are largely used for rangeland, pasture, cropland, and other agricultural purposes, as well as wildlife habitat. Each soil type is summarized in the following subsections and their respective acreages within the project area are summarized in Table 12. The acreage shown is based on the spatial extent of soil series combinations derived from NRCS data; therefore, the acreage is approximate and used as a best estimate of soil series distribution at each of the proposed project areas.

Table 12. Soil Types in the Project Area.

Project Area	Map Key	Soil Series	Erosion Factor K	Topsoil Potential	Acres
Bear Den 18-1621H Well Pad	211F	Cabba-Badland, outcrop complex-Arikara complex, 9 to 70 percent slopes	0.43	Poor	0.20
	341C	Noonan-Williams loams, 6 to 9 percent slopes	0.37	Poor to Good	4.35
Bear Den 18-1621H Access Road	211F	Cabba-Badland, outcrop complex-Arikara complex, 9 to 70 percent slopes	0.43	Poor	4.28
	43C	Williams-Zahl loams, 6 to 9 percent slopes	0.28	Good	1.51
	341C	Noonan-Williams loams, 6 to 9 percent slopes	0.32	Poor to Good	1.42
Mandaree 111-07H Well Pad	84F	Cabba-Chama-Havrelon silt loams, 3 to 70 percent slopes	0.32	Poor to Good	3.75
Mandaree 111-07H Access Road	84F	Cabba-Chama-Havrelon silt loams, 3 to 70 percent slopes	0.32	Poor to Good	0.47
	38B	Dogtooth-Janesburg silt loams, 0 to 6 percent slopes	0.28	Poor	3.08
	34B	Daglum-Belfield complex, 0 to 6 percent slopes	0.32	Poor to Fair	3.23
Mandaree 104-17H Well Pad	232C	Lambert-Slickspots-Rhoades complex, 0 to 9 percent slopes	0.37	Poor to Fair	2.32
	54F	Cabba-Sen-Chama silt loams, 15 to 70 percent slopes	0.32	Poor	0.03
	38F	Dogtooth-Janesburg-Cabba complex, 6 to 30 percent slopes	0.32	Poor	1.53
Mandaree 104-17H Access Road	232C	Lambert-Slickspots-Rhoades complex, 0 to 9 percent slopes	0.37	Poor to Fair	3.63

Source: NRCS 2010

3.6.1.1 Dogtooth-Janesburg-Cabba Complex

The Dogtooth-Janesburg-Cabba complex consists of a dominant soil that is of moderate depth, well drained, and formed from weathered shale, sandstone, and mudstone. The less prominent Cabba series is relatively shallow compared to the dominant Dogtooth and Janesburg series. Percent slope typically ranges between 0% and 25%, but can reach 70% in some areas. Permeability ranges between very slow to slow with a moderate shrink-swell potential. The soil has a moderately saline and sodic horizon within 30 inches of the soil surface.

3.6.1.2 Cabba-Chama-Havrelon Silt Loams

These soils occur on ridges on uplands. The parent materials consist of fine-silty residuum or fine-loamy alluvium weathered from sedimentary rock and siltstone. The natural drainage class is well drained and water movement in the most restrictive layer is moderately low. Shrink-swell potential is low and there is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2%. The soil has a slightly sodic horizon and a very slightly saline horizon within 30 inches of the soil surface.

3.6.1.3 Cabba-Badland, Outcrop-Arikara Complex

Cabba-Badland complex occurs on ridges on uplands. Major uses include rangeland and wildlife habitat. The parent materials consist of fine-loamy residuum weathered from sedimentary rock and loamy colluvium derived from mudstone. The natural drainage class is well drained and water movement in the most restrictive layer is moderately low. Shrink-swell potential is low and there is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2%. The soil has a slightly sodic horizon within 30 inches of the soil surface.

3.6.1.4 Daglum-Belfield Complex

This complex occurs on alluvial fans on uplands. The major use is cropland. The parent material consists of clayey alluvium derived from sedimentary rock. The natural drainage class is moderately well drained and water movement in the most restrictive layer is low to moderately low. Available water to a depth of 60 inches is moderate to high and shrink-swell potential is high. Organic matter content in the surface horizon is about 3% to 4%. The soil has a moderately saline and sodic horizon within 30 inches of the soil surface.

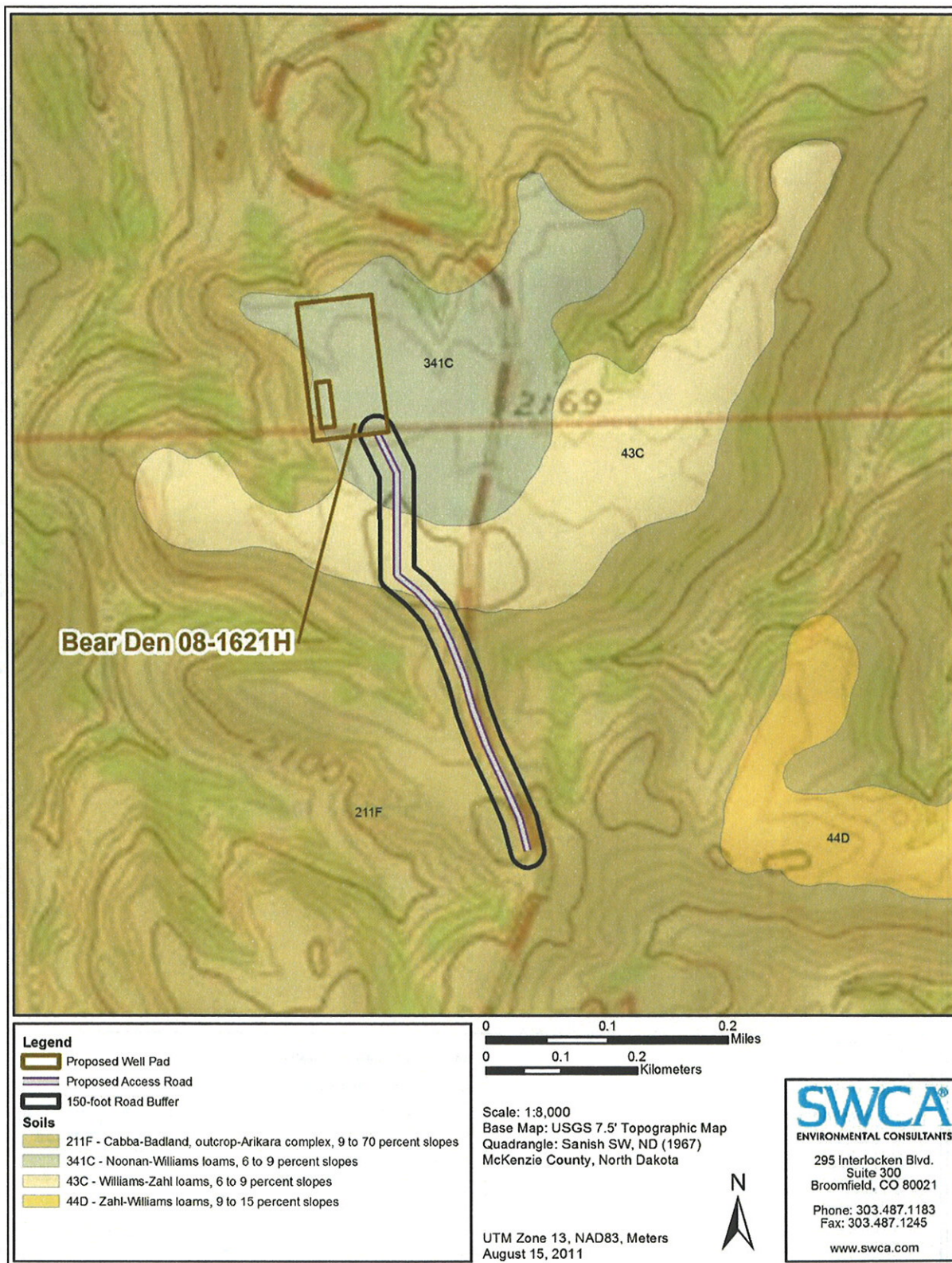


Figure 15. Soil types within the Bear Den 18-1621H Well Pad and Access Road.

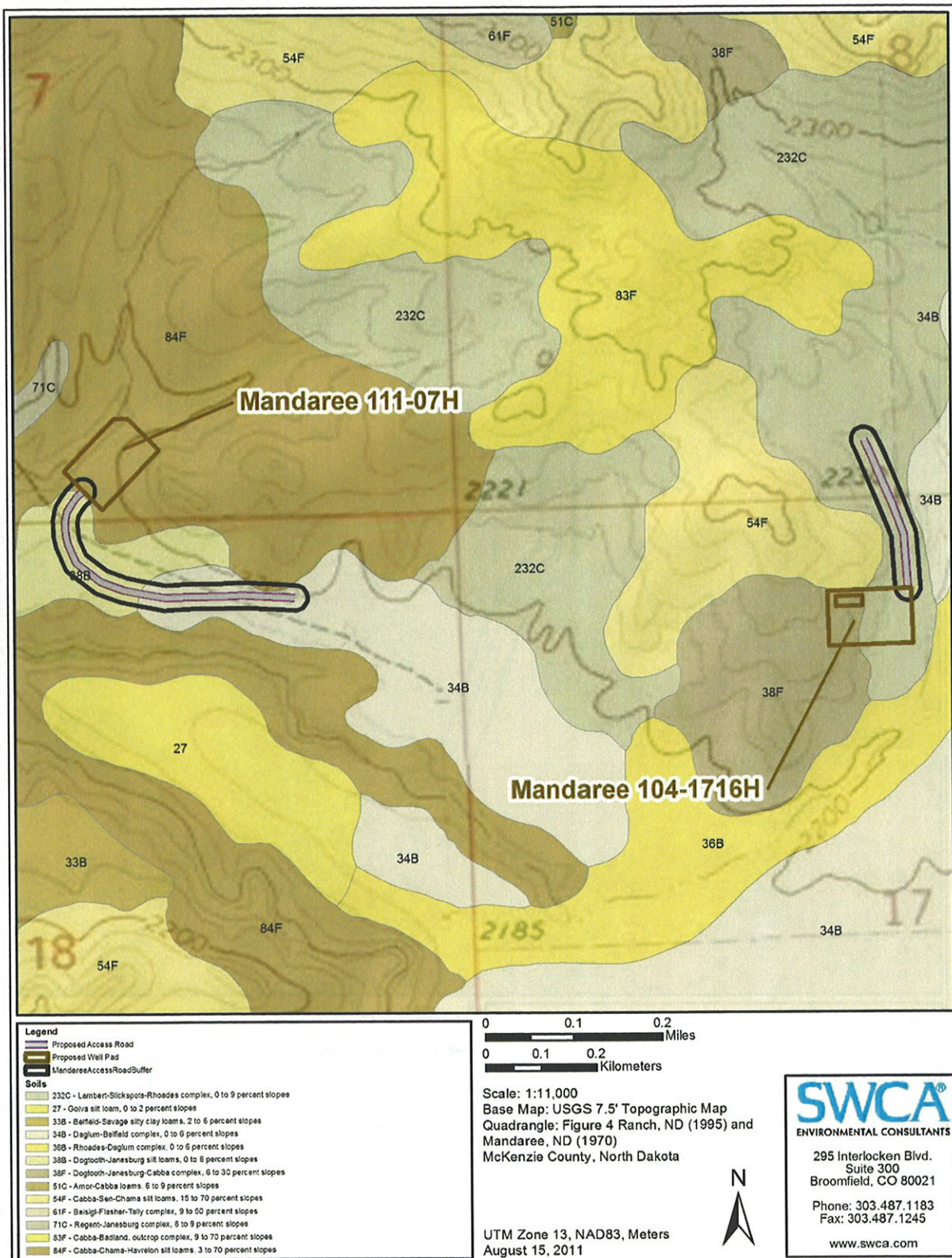


Figure 16. Soil types within the Mandaree 111-07H and Mandaree 104-1716H Well Pads and Access Roads.

3.6.1.5 Noonan-Williams Loams

These soils occur on knolls and ridges on till plains and are used for cropland, pasture, or hayland. The parent material consists of fine-loamy till. The natural drainage class is well drained and water movement in the most restrictive layer is low to moderately low. Available water to a depth of 60 inches is moderate to high and shrink-swell potential is moderate. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4%. The soil has a moderately sodic horizon within 30 inches of the soil surface.

3.6.1.6 Lambert-Slickspots-Rhoades Complex

These soils occur on alluvial fans and uplands. Major uses include rangeland and wildlife habitat. The parent materials consist of fine-silty alluvium derived from sedimentary rock and clayey alluvium derived from shale and siltstone. The natural drainage class is well drained and water movement in the most restrictive layer is low to moderately low. Available water to a depth of 60 inches is high and shrink-swell potential is moderate to high. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2-3%. The soil has a moderately saline and sodic horizon within 30 inches of the soil surface.

3.6.2 Soil Limitations

The erosion factor for each soil complex is shown in Table 12 as the Erosion Factor K. The erosion factor indicates the erodibility of soil particles less than 2 millimeters in size to sheet and rill erosion by water forces. The Erosion Factor K value can range from 0.02 (lowest erosion potential) to 0.69 (greatest erosion potential). The K value in the project area ranges from 0.28 to 0.43, indicating a moderate erosion potential.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the construction area (NRCS 2010). Soils in the project area are generally limited in topsoil potential due to slope and depth to restrictive layers, fine-textured soils, and salinity, sodicity, and carbonate constraints. The information is not site-specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

3.6.3 Field-derived Soil Data

Soil data derived from on-site excavated soil pits, including the matrix value, hue, chroma, and color name, are summarized in Table 13. Additionally, redoximorphic features (i.e., reduced/oxidized iron or manganese) deposits and soil texture were noted at each soil pit. A Munsell Soil Color Chart was used to determine the color of soil samples.

Table 13. Soil Data Obtained through the Excavation of Soil Pits within the Proposed Project Area.

Area	Pit Depth (inches)	% of Sample	Soil Matrix Color (color name)	Redoximorphic Feature Color	Texture	Slope
Bear Den 08-1621H Data Point 1	0–5	100	10YR2/2 (very dark brown)	None Observed	Silty Loam	1%–5%
	5–20	100	10YR3/3 (dark brown)	None Observed	Sandy Loam	
Mandaree 111-07H Data Point 1	0–20	60	10YR3/1 (very dark gray)	None Observed	Clay Loam	1%–5%
	0–20	40	10YR4/3 (brown)	None Observed	Clay Loam	
Mandaree 111-07H Data Point 2	0–8	100	10YR3/2 (very dark grayish-brown)	None Observed	Clay Silt Loam	1%–5%
	8–20	100	10YR3/2 (very dark grayish-brown)	None Observed	Clay Loam	
Mandaree 104-1716H Data Point 1	0–20	100	10YR3/1 (very dark gray)	None Observed	Clay	2%–5%
Mandaree 104-1716H Data Point 2	0–6	100	10YR3/1 (very dark gray)	None Observed	Clay Loam	5%–15%
	6–20	100	2.5Y3/2 (brown)	None Observed	Clay Loam	

3.6.4 General Impacts

The project area and proposed well pad locations contain primarily loamy and clay soils which are less prone to erosion, compared to more sandy soils, due to their cohesive properties of individual soils particles. Potential erosion is further reduced due to project administrative BMPs such as minimal slope angles within the proposed well pads and access roads (maximum 4% grade). Due to the types of soils observed in the project area, and with implementation of administrative and structural BMPs, potential soils erosion and off-site deposition is expected to be minimal during construction and development of the Proposed Action. However, some soil erosion is expected to occur, primarily from wind, due to exposed soils on the proposed well pads and access roads during construction. Following construction, reclamation and production operations would minimize long-term erosions by the implementation of the operator's SPCCPs. For well pad and access road construction, a minimum of 6 inches of topsoil would be stripped from each access road, and temporarily stored along the sides of the road, to provide access to the subsoil, which is better suited for shaping and compaction. This movement of soil may lead to some soil erosion due to wind and water forces. However, proven practices are known to significantly reduce erosion of various types of soil, including those in the project areas (BLM Instruction Memorandum 2004-124; Grah 1997). The implementation of administrative and structural BMPs by the operator is expected to minimize the potential for erosion and loss of soils.

Reclamation potential for the soil complexes varies by soil series. Some soils may require soil amendments to achieve successful reclamation within a reasonable timeframe. During interim reclamation, the stripped 6 inches of topsoil would be spread on the back slopes in preparation for seeding. Any areas stripped of vegetation during construction would be reseeded once construction activities have ceased. All seed would be drilled on slope contours, as feasible, and planted between 0.25 and 0.50 inch deep. Where drilling is not possible, for example, on steep slopes and rocky terrain greater than 8% to 10% slopes, the seed would be broadcast, and the area would be raked or chained to cover the seed. Seed types and application rates would be determined by the AO.

Once production ceases, final reclamation would begin with all topsoil re-stripped from areas where interim reclamation had been performed and redistributed over the entire location and access road. The entire disturbed area would be scarified to a depth of 12 inches on 8-inch intervals. Water bars would be installed to minimize concentrated surface flows on finish grades of less than 8%. The entire disturbed area, including the former access road and well pad, would be reseeded with the specified seed mixture. 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 proponent would implement BMPs related to the reclamation effort and conduct all surface activities, including reclamation activities, in accordance with the BLM Gold Book (USDI and USDA 2007).

3.7 VEGETATION AND INVASIVE SPECIES

The proposed project area occurs in the Missouri Plateau Ecoregion (Missouri Slope), which is a western mixed-grass and short-grass prairie ecosystem (Bryce et al. 1998). Native grasses include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), sideoats grama (*Bouteloua curtipendula*), green needlegrass (*Nassella viridula*), and western wheatgrass (*Pascopyrum smithii*). Common wetland vegetation includes various sedge species (*Carex* spp.), bulrush (*Scirpus* spp.), and cattails (*Typha* spp.). Common plant species found in woody draws, coulees, and drainages include chokecherry (*Prunus virginiana*), silver buffaloberry (*Shepherdia argentea*), and western snowberry (*Symphoricarpos occidentalis*).

“Invasive species” is a general term used to describe plants that are not native to a given area, spread rapidly, and have adverse ecological and economic impacts. These species may have high reproduction rates and are usually adapted to occupy a diverse range of habitats occupied by native species. “Noxious weeds” are invasive plants that have the potential to detrimentally affect public health, ecological stability, and agricultural practices. These species may subsequently out-compete native plant species for resources causing a reduction in native plant populations and an increase in noxious weed populations. NDCC Chapter 63-01.1 recognizes 11 plant species in the state as noxious; McKenzie County lists five additional weeds as noxious (Table 14).

During the on-site assessments conducted in May and June 2011, biologists evaluated dominant vegetation at the well pad sites and access roads and noted if any noxious weeds were present. The project areas are located in herbaceous uplands. Vegetation noted in the herbaceous uplands included western wheatgrass, Kentucky bluegrass (*Poa pratensis*), prairie

sagewort (*Artemisia ludoviciana*), white sagebrush (*Artemisia ludoviciana*), and silver sagebrush (*A. cana*). Wooded drainages were located near the Bear Den 08-1621H and Mandaree 111-07H well pads. Vegetation noted in the drainages included green ash (*Fraxinus pennsylvanica*), silver buffaloberry, and bur oak (*Quercus macrocarpa*). No noxious weeds were noted in the project areas.

Removal of existing vegetation and disturbing soils for well pad and road construction could facilitate the spread of invasive species. The APD and this EA require the operator to control noxious weeds throughout project areas. Surface disturbance and vehicular traffic must not take place outside approved ROWs or the well pad. Areas that are stripped of topsoil must be reseeded and reclaimed at the earliest opportunity. Additionally, certified weed-free straw and seed must be used for all construction, seeding, and reclamation efforts. Prompt and appropriate construction, operation, and reclamation are expected to maintain minimal levels of adverse impacts to vegetation and would reduce the potential establishment of invasive vegetation species.

Table 14. Occupied Area for Recognized Noxious Weeds in McKenzie County, North Dakota.

Common Name	Scientific Name	McKenzie County (acres)
North Dakota Noxious Weeds		
absinth wormwood	<i>Artemisia absinthium</i>	15
Canada thistle	<i>Cirsium arvense</i>	33,600
diffuse knapweed	<i>Centaurea diffusa</i>	1
leafy spurge	<i>Euphorbia esula</i>	26,200
musk thistle	<i>Carduus nutans</i>	0
purple loosestrife	<i>Lythrum salicaria</i>	0
Russian knapweed	<i>Acroptilon repens</i>	0
spotted knapweed	<i>Centaurea stoebe</i>	5
yellow toadflax	<i>Linaria vulgaris</i>	0
Dalmatian toadflax	<i>Linaria dalmatica</i>	1
salt cedar	<i>Tamarix ramosissima</i>	2,400
McKenzie County Noxious Weeds		
black henbane	<i>Hyoscyamus niger</i>	0
common burdock	<i>Arctium minus</i>	0
houndstongue	<i>Cynoglossum officinale</i>	0
halogeton	<i>Halogeton glomeratus</i>	0
baby's breath	<i>Gypsophila muralis</i>	0
Total		62,222

Source: North Dakota Department of Agriculture 2007

3.8 CULTURAL RESOURCES

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

undertaking, that the federal agency take into account the effect of that undertaking on any district, site, building, structure, or object that is included in the National Register of Historic Places (National Register) before the expenditure of any federal funds or the issuance of any federal license. Cultural resources is a broad term encompassing sites, objects, or practices of archaeological, historical, cultural, and religious significance. Eligibility criteria (36 CFR 60.4) 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 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 (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. Thus, BIA consults and corresponds with the THPO regarding cultural resources on all projects proposed within the exterior boundaries of the Reservation.

Cultural resource inventories of the Bear Den 08-1621H, Mandaree 111-07H, and Mandaree 104-1716H well pads and access roads were conducted by personnel of SWCA Environmental Consultants, using an intensive pedestrian methodology. For the Bear Den 08-1621H project, approximately 26.2 acres were inventoried on June 16 and July 26, 2011 (Bear 2011a). No historic properties were located that appear to possess sufficient integrity and that meet at least one of the criteria (36 CFR 60.4) 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 August 3, 2011.

For the Mandaree 111-07H project, approximately 47.1 acres were inventoried on May 17 and July 26, 2011 (Fife and Baer 2011). Two isolated finds (32MZX1138 and 32MZX1139) were newly recorded during the inventory. These two historic properties do not appear to possess sufficient integrity and do not meet at least one of the criteria (36 CFR 60.4) 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 August 26, 2011.

For the Mandaree 104-1716H project, approximately 16.0 acres were inventoried on May 17 and June 16, 2011 (Baer 2011b). No historic properties were located that appear to possess sufficient integrity and that meet at least one of the criteria (36 CFR 60.4) 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 August 16, 2011.

3.9 SOCIOECONOMICS

This section discusses community characteristics such as population, housing, demographics, employment, and economic trends within the Analysis Area. Also included are data relating to the State of North Dakota and the United States, which provide a comparative discussion when compared to the Analysis Area. Information in this section was obtained from various sources including, but not limited to, the U.S. Census Bureau, the U.S. Bureau of Economics, and the North Dakota State Government.

3.9.1 Socioeconomic Analysis Area

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

3.9.2 Population and Demographic Trends

Historic and current population counts for the Analysis Area, compared to the state, are provided below in Table 15. The state population showed little change between the previous two census counts (1990–2000), however in 2010 the state population increased by 4.7% to 672,594 (U.S. Census Bureau 2011a). Populations in McKenzie and Mountrail counties have increased slightly from 2000 to 2009 while McLean and Dunn counties had a rate of decline of -10.8% and -6.5%, respectively (U.S. Census Bureau 2011b). These declines can be attributed to more people moving to metropolitan areas, which are perceived as offering more opportunities for growth. However, population on or near the Reservation has increased approximately 13.3% from 2000 to 2005 (BIA 2005). While Native Americans are the predominant group on the Reservation, they are considered the minority in all other areas of North Dakota.

As presented in Table 15, population growth on the Reservation (13.3%) exceeds the overall growth in the state of North Dakota (4.7%) and four counties in the Analysis Area. This trend in population growth for the Reservation is expected to continue in the next few years (Fort Berthold Housing Authority 2008).

Table 15. Population and Demographics.

County or Reservation	Population in 2009	% of State Population	% Change Between 1990–2000	% Change Between 2000–2009	Predominant Group in 2009 (%)	Predominant Minority in 2009 (Percent of Total Minority Population)
Dunn	3,365	0.5	-10.1	-6.5	Caucasian (85.3%)	American Indian (13.6%)
McKenzie	5,799	0.9	-10.1	1.1	Caucasian (76.7%)	American Indian (21.5%)
McLean	8,310	1.3	-11.0	-10.8	Caucasian (91.2%)	American Indian (7.1%)
Mountrail	6,791	1.0	-5.6	2.4	Caucasian (62.7%)	American Indian (35.1%)
On or Near Fort Berthold Indian Reservation ¹	11,897	1.8	178.0 ²	+13.3 ³	American Indian	Caucasian (~27%)
Statewide	672,594 ⁴	100	0.5	4.7 ⁴	Caucasian (91.1)	American Indian (5.6%)

Source: U.S. Census Bureau 2011b.

¹ BIA 2005. Population shown reflects the total enrollment in the tribe in 2005. 2008 data unavailable. All information related to the Fort Berthold Indian Reservation reflects 2005 data, including state population. 11,897 reflects tribal enrollment on or near the Reservation. According to the BIA, near the Reservation includes those areas or communities adjacent or contiguous to the Reservation.

² BIA 2001. Reflects percent change between 1991 and 2001.

³ Reflects percent change between 2001 and 2005.

⁴ Reflects population levels in 2010 (U.S. Census Bureau 2011a).

3.9.3 Employment

The economy in the state of North Dakota, including the Reservation and four counties in the Analysis Area, has historically depended on agriculture, including grazing and farming. However, 2010 economic data indicate that the major employers in North Dakota include government and government enterprises, which employed 16.6%; health care and social assistance, which employed 11.9%; and retail trade, which employed at 10.8% of the state's labor force (U.S. Bureau of Economic Analysis 2011a). Energy development and extraction, power generation, and services related to these activities have become increasingly important over the last several years and many service sector jobs are directly and indirectly associated with oil and gas development.

In 2010, total employment in the state of North Dakota was approximately 355,000 (Table 16). The average weekly wage for all employees on private nonfarm payrolls was \$697 in North Dakota. The four counties in the Analysis Area showed average weekly wages that were higher than the state and national averages in 2010 (Table 16).

In 2010, the statewide unemployment rate was 3.8% of the workforce (Table 16). This is the lowest unemployment rate in the nation (Bureau of Labor Statistics 2011a). While some

counties in the Analysis Area experienced a slight increase in unemployment, others were unchanged or experienced a decreased unemployment since 2005.

Table 16. 2010 Total Employment, Average Weekly Wages, and Unemployment Rates.

Location	Total Employment	Average Weekly Wage	Unemployment Rate	Change in Unemployment Rate (2005–2010)
United States	139,909,000	\$781	9.4%	+4.3%
North Dakota	355,000	\$697	3.8%	+0.4%
Dunn County	1,684	\$829	3.3%	-0.1%
McKenzie County	2,625	\$1,006	2.6%	-1.1%
McLean County	2,674	\$820	3.8%	-1.2%
Mountrail County	4,713	\$947	2.4%	-3.6%
On or Near Fort Berthold Indian Reservation*	1,287	N/A	71%	N/A

Sources: Bureau of Labor Statistics 2011a, 2011b; U.S. Department of Agriculture 2010; Bureau of Indian Affairs 2005.

* Represents 2005 data only.

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

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

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

3.9.4 Income

Per capita income is often used as a measure of economic performance, but it should be used with changes in earnings for a realistic picture of economic health. Since total personal income includes income from 401(k) plans as well as other non-labor income sources like transfer payments, dividends, and rent, it is possible for per capita income to rise even if the average wage per job declines over time. The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. Per capita income, median household income, and poverty rates for the Analysis Area and North Dakota are presented in Table 17.

Table 17. Income and Poverty in Analysis Area, 2008.

Unit of Analysis	Per Capita Income (2000)	Per Capita Income ¹ (2008)	Median Household Income ² (2009)	Percent of all People in Poverty ³ (2009)
Dunn County	\$21,031	\$29,558	\$44,681	11.2%
McKenzie County	\$22,269	\$36,862	\$49,465	12.8%
McLean County	\$23,125	\$42,466	\$49,212	10.3%
Mountrail County	\$23,045	\$34,590	\$49,884	12.4%
Fort Berthold Indian Reservation ⁴	\$8,855	\$10,291 ⁴	\$26,977 ⁴	N/A
North Dakota	\$25,624	\$39,874	\$47,898	11.7%

¹ U.S. Bureau of Economic Analysis 2011a, 2011b

² U.S. Department of Agriculture 2010

³ U.S. Department of Agriculture 2009

⁴ Bureau of Indian Affairs 2005. Population shown reflects the total enrollment in the tribe in 2005. 2008 data unavailable. All information related to the Fort Berthold Indian Reservation reflects 2005 data, including state population.

From 2000 to 2008, per capita income increased by 28.8% for Dunn County, 39.6% for McKenzie County, 45.5% for McLean County, and 33.4% for Mountrail County. These figures compare to a 35.7% increase for the State of North Dakota per capita personal income (U.S. Bureau of Economic Analysis 2009).

According to a 2008 report published by the Fort Berthold Housing Authority, the average per capita income for the Reservation was \$8,855 in 1999, compared to \$25,624 for the state and the national average of \$21,587 at that time (Fort Berthold Housing Authority 2008). The median household income on the Reservation was \$26,977, compared to the national median of \$41,994.

With the exception of McLean County, counties that overlap the Reservation tend to have per capita incomes below North Dakota statewide averages; however, only Dunn County has a median household income below the state average. As presented in Table 16, unemployment rates in all counties were equal to or below the state average of 3.8%, while the unemployment rate for the Reservation was above the state average. Subsequently,

Reservation residents and MHA Nation members tend to have per capita incomes and median household incomes below the averages of the encompassing counties, as well as statewide, but a higher unemployment rate.

3.9.5 Housing

Workforce-related housing can be a key issue associated with development. Historical information on housing in the four counties in the Analysis Area was obtained from the U.S. Census Bureau, 2000 Census, with 2009 updates (U.S. Census Bureau 2011c). Because the status of the housing market and housing availability changes often, current housing situations can be difficult to characterize quantitatively. Therefore, this section discusses the historical housing market. Table 18 provides housing unit supply estimates for the Analysis Area and the Reservation.

Table 18. Housing Development Data for the Reservation and Encompassing Counties.

Region	Total Housing Units						% Change 2000– 2009
	Occupied	Owner Occupied	Renter Occupied	Vacant	Total	Total	
	2000	2000	2000	2000	2000	2009	
Dunn	1,378	1,102	276	587	1,965	1,985	+1.0
McKenzie	2,151	1,589	562	568	2,719	2,801	+2.9
McLean	3,815	3,135	680	1,449	5,264	5,461	+3.6
Mountrail	2,560	1,859	701	878	3,438	3,607	+4.7
Reservation	1,908	1,122	786	973	2,881	N/A	N/A
North Dakota	257,152	171,299	85,853	32,525	289,677	316,435	+8.5

Source: U.S. Census Bureau 2011c.

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

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

In addition to the relatively low percent change of the total housing units compared to the state average, these four counties are ranked extremely low for both the state and national housing starts and have minimal new housing building permits, as presented in Table 19.

Table 19. Housing Development Data for the Encompassing Counties 2000–2008.

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

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

3.9.6 Potential Impacts to Area Socioeconomics

Impacts to socioeconomic resources of the Analysis Area would be minimal and therefore would not adversely impact the local area. Short-term impacts to socioeconomic resources would generally occur during the construction/drilling and completion phase of the proposed wells. Long-term effects would occur during the production phase, should the wells prove successful. As presented in Table 20, implementation of the proposed wells is anticipated to require between 14 and 28 workers per well in the short term. If the wells prove successful, EOG would install production facilities and begin long-term production. To ensure successful operations, production activities require between one and four full-time employees to staff operations. It is anticipated that a mixture of local and EOG employees would work in the project area. Therefore, any increase in workers would constitute a minor increase in population in the project area required for short-term operations and would not create a noticeable increase in demand for services or infrastructure on the Reservation or the communities near the project area.

Table 20. Duration of Employment during Proposed Project Implementation.

Activity	Duration of Activity (Average Days per Well)	Daily Personnel (Average Number per Well)
Construction (access road and well pad)	5–8 days	3–5
Drilling	30–35 days	8–15
Completion/Installation of Facilities	Approx. 10 days	3–8
Production	Ongoing – life of well	1–4

Although some counties within the Analysis Area have experienced a recent decline in population between 2000 and 2009 (as shown in Table 15), the population on the Reservation itself has increased. This has not led to significant housing shortages. The historic housing vacancy rate (Table 18) indicates that housing has remained available despite the growth of the population on the Reservation. The levels of available housing are therefore anticipated to be able to absorb the projected slight increase in population related to this proposed project. As such, the proposed project would not have measurable impacts on housing availability or community infrastructure in the area.

Implementation of the proposed project would likely result in direct and indirect economic benefits associated with industrial and commercial activities in the area, including the

Reservation, State of North Dakota, and potentially local communities near the Reservation. Direct impacts would include increased spending by contractors and workers for materials, supplies, food, and lodging in Dunn County and the surrounding areas, which would be subject to sales and lodging taxes. Other state, local, and Reservation tax payments and fees would be incurred as a result of the implementation of the proposed project, with a small percentage of these revenues distributed back to the local economies. Wages due to employment would also impact per capita income for those that were previously unemployed or underemployed. Indirect benefits would include increased spending from increased oil and gas production, as well as a slight increase in generated taxes from the short-term operations. Mineral severance and royalty taxes, as well as other relevant county and Reservation taxes on production would also grow directly and indirectly as a result of increased industrial activity in the oil and gas industry.

3.10 ENVIRONMENTAL JUSTICE

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

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

EJ is an evolving concept with potential for disagreement over the scope of analysis and the implications for federal responsiveness. Nevertheless, due to the population numbers, tribal members on the Great Plains qualify for EJ consideration as both a minority and low-income population. Table 21 summarizes relevant data regarding minority populations for the Analysis Area.

Table 21. Minority Population Data by North Dakota County and Race, 2000–2009.

Race	Dunn		McKenzie		McLean		Mountrail		North Dakota	
	2000	2009	2000	2009	2000	2009	2000	2009	2000	2009
Total Population	3,600	3,365	5,737	5,799	9,311	8,310	6,629	6,791	642,204	646,844
Non-Hispanic	3,573	3,330	5,679	5,696	9,230	8,199	6,542	6,589	634,418	632,126
Hispanic or Latino ¹	27	35	58	103	81	111	87	202	7,786	14,718

Race	Dunn		McKenzie		McLean		Mountrail		North Dakota	
	2000	2009	2000	2009	2000	2009	2000	2009	2000	2009
Races										
Caucasian	3,123	2,827	4,457	4,450	8,632	7,577	4,546	4,259	596,722	589,112
African American	1	4	4	12	2	15	7	31	4,157	7,813
American Indians and Alaska Natives	448	459	1,216	1,249	568	587	1,988	2,385	31,440	36,258
Asian / Pacific Islanders	8	3	4	8	12	19	17	17	3,912	5,646
Two or More Races	25	30	39	80	97	112	71	99	5,973	8,015
All Minorities	477	538	1,280	1,349	679	733	2,083	2,532	45,482	57,732
% Minority Population	13.2	15.9	22.3	23.2	7.3	8.8	31.4	37.2	7.1	8.9
Change in Minority Population (2000–2009)	+12.8%		+5.3%		+7.9%		+21.5%		+26.9%	

¹ Hispanic or Latino may be of any race.

² U.S. Census Bureau estimates of population demographics were made in July 2009.
Source: U.S. Census Bureau 2011d.

In July 2009, the U.S. Census Bureau estimated that North Dakota's total minority population comprised approximately 57,732 persons, or 8.9% of the state's total population (i.e., 646,844 residents). This represents an increase of 26.9% over the 2000 minority population of the state. Within the Analysis Area, the number of Caucasian residents decreased, while minorities in nearly all categories increased, producing a strong increase in the percentage of minority population in each of the counties in the Analysis Area during the period from 2000 until 2009 (Table 21) (U.S. Census Bureau 2011a). The four counties of the Analysis Area showed an increase of 5.3% to 21.5% in minority population, compared with the statewide increase of 26.9%.

In 2009, the counties in the Analysis Area had a higher percentage of American Indian and Alaska Natives, ranging from 7.1% in McLean County to nearly 35.1% in Mountrail County, compared with the state as a whole which had approximately 5.6% in this category (U.S. Census Bureau 2011d). The North Dakota Indian Affairs Commission (NDIAC) reports that American Indian population (race alone or in combination) in North Dakota has increased 12% from 35,228 in 2000 to 35,666 in 2008 (NDIAC 2011), with estimates for the future American Indian population (one race only) of 47,000 in 2015 and 59,000 in 2025 in North Dakota (NDIAC 2011). The Reservation had a total population of 5,915 in the 2000 census,

with 67.4 % American Indian, mostly with tribal affiliations with MHA Nation (NDIAC 2010).

Poverty rate data for the counties in the Analysis Area are summarized in Table 22. The data show that poverty rates have decreased in the Analysis Area during the period from 2000 to 2009 (USDA 2009). McKenzie and Mountrail counties continue to have poverty rates that exceed the statewide poverty rate of 11.7%. Only Dunn County has a lower median household income than the statewide household income of \$47,898.

Table 22. Poverty Rates and Median Household Income for the Analysis Area.

Location	2000	2009	2009 Median Household Income
Dunn County	13.3%	11.2%	\$44,681
McKenzie County	15.7%	12.8%	\$49,465
McLean County	12.3%	10.3%	\$49,212
Mountrail County	15.7%	12.4%	\$49,884
North Dakota	10.4%	11.7%	\$47,898

Source: U.S. Department of Agriculture 2009.

3.10.1 Potential Impacts to Environmental Justice

The Analysis Area, having larger and increasing minority populations, compared with statewide numbers, could result in disproportionately beneficial impacts from the proposed oilfield development. These would derive from direct and indirect economic opportunities for tribal members. Generally, existing oil and gas leasing has already benefited the MHA Nation government and infrastructure from tribal leasing, fees, and taxes. Current oil and gas leasing on the Reservation has also already generated revenue to MHA Nation members who hold surface and/or mineral interests. However, owners of allotted surface within the Analysis Area may not necessarily hold mineral rights. In such cases, surface owners do not receive oil and gas lease or royalty income, and their only related income would be compensation for productive acreage lost to road and well pad construction. Those with mineral interests also may benefit from royalties on commercial production if the wells prove successful. Profitable production rates at proposed locations might lead to exploration and development of additional tracts owned by currently non-benefitting allottees. In addition to increased revenue for land and mineral holders, exploration and development would increase employment on the Reservation with oversight from the Tribal Employment Rights Office, which would help alleviate some of the poverty prevalent on or near the Reservation. Tribal members without either surface or mineral rights would not receive any direct benefits, except through potential employment, should they be hired. Indirect benefits of employment and general tribal gains would be the only potential offsets to negative impacts. Poverty rates in the Analysis Area have already begun to decrease since oil and gas development began after 2000, as shown in Table 22. There is potential for adverse economic impacts to tribal members who do not reside within the Reservation and therefore do not share in direct or indirect benefits.

Potential adverse impacts could occur to tribes and tribal members, as well, such as the potential disturbance of any traditional cultural properties and cultural resources. These potential impacts are reduced through surveys of proposed well locations and access road routes, mitigation measures required by the BIA, and thorough reviews and determinations by the BIA that there would be no effect to historic properties. The possibility of disproportionate impacts to tribes or tribal members is further reduced by the requirement for immediate work stoppage following an unexpected discovery of cultural resources of any type. Mandatory consultation would take place during any such work stoppage, affording an opportunity for all affected parties to assert their interests and contribute to an appropriate resolution, regardless of their home location or tribal affiliation.

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

3.11 MITIGATION AND MONITORING

Many protective measures and procedures are described in this document and in the APDs. Applicant-committed measures are listed in Section 2.11. No laws, regulations, or other requirements have been waived; no compensatory mitigation measures are required. Monitoring of cultural resource impacts by qualified personnel is recommended during all ground-disturbing activities. Each phase of construction and development through production would be monitored by the BLM, the BIA, and representatives of the MHA Nation to ensure the protection of cultural, archaeological, and natural resources. In conjunction with 43 CFR 46.30, 46.145, 46.310, and 46.415, a report would be developed by the BLM and BIA that documents the results of monitoring in order to adapt the projects to eliminate any adverse impact on the environment.

3.12 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

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

3.13 SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Short-term activities would not detract significantly from long-term productivity of the project area. The development of access roads and well pad areas would eliminate any forage or

habitat use by wildlife and/or livestock. Any allottees would be properly compensated for land disturbance. The initial disturbance area would decrease considerably once the wells are drilled and non-necessary areas have been reclaimed. Access roads and work areas would be leveled or backfilled as necessary, scarified, recontoured and reseeded. Rapid reclamation of the project area would facilitate revived wildlife and livestock usage, stabilize the soil, and reduce the potential for erosion and sedimentation. 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 foremost resource loss associated with long-term activities is the extraction of hydrocarbons from the Bakken and Three Forks formations targeted by this project.

3.14 CUMULATIVE IMPACTS

Environmental impacts may accumulate either over time or in combination with similar events in the area. Unrelated and dissimilar activities may also have negative impacts on critical elements, thereby contributing to the cumulative degradation of the environment. Past and current disturbances in the vicinity of the project area include farming, grazing, roads, and other oil and gas wells. Reasonably foreseeable future impacts must also be considered. Should development of these wells prove productive, it is likely that EOG and possibly other operators would pursue additional development in the area. Current farming and ranching is expected to continue with little change because virtually all available acreage is already organized into range units. Undivided interests in the land surface, range permits, and agricultural leases are often held by different tribal members than those holding mineral rights; at this time, oil and gas development is not expected to have more than a minor effect on land use patterns.

The major foreseeable activity with potential to impact critical elements of the human environment is oil field development. Over the past several years, exploration and development of the Bakken and Three Forks formations has accelerated. Most of this exploration has occurred outside the Reservation boundary on fee land, but for purposes of cumulative impact analyses, land ownership and the Reservation boundary are immaterial. Current impacts from existing activity in the area, such as other road development and oil and gas-related activities are still fairly dispersed.

Figure 17 shows the active, confidential, and permitted oil and gas wells currently existing within 1, 5, 10, and 20 miles of the proposed wells. No active wells are within 1 mile of the proposed well pads (Table 23). There are currently 758 active, confidential, and permitted oil and gas wells within 20 miles of the proposed well pads.

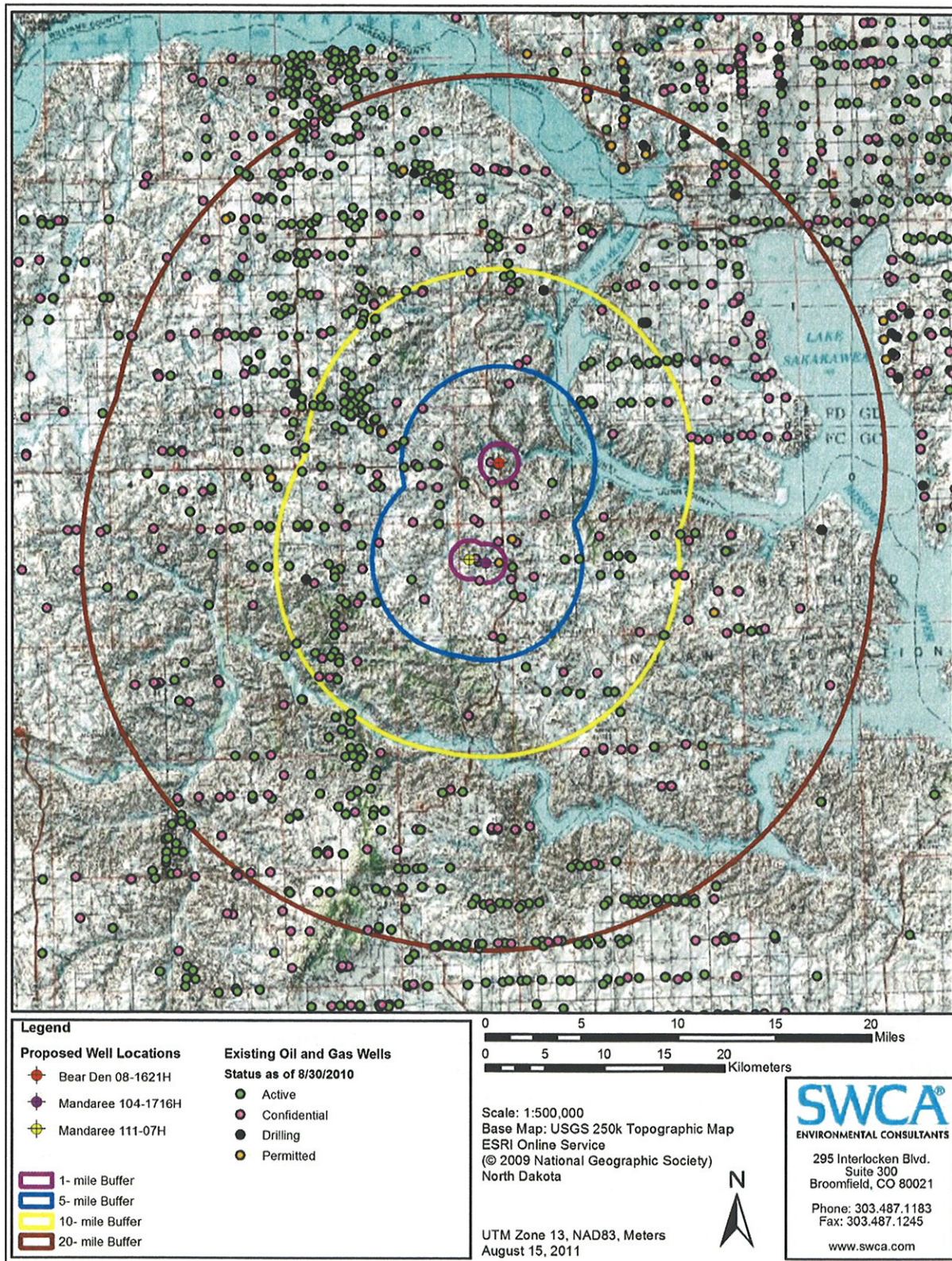


Figure 17. Active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the proposed well pads.

Table 23. Wells within 1, 5, 10, and 20 Miles of the Proposed Well Pads.

Radius	Active	Confidential	Drilling	Permitted	Total
0-1 mile	0	5	0	1	6
1-5 miles	16	21	0	1	38
5-10 miles	113	36	3	2	154
10-20 miles	352	180	16	12	560
Total	481	242	19	16	758

Potential cumulative impacts of the proposed project plus existing and other foreseeable future oil and gas development on the Reservation could include habitat fragmentation from construction of other well pads and roads, with potential effects on migratory grassland birds and other wildlife. The Proposed Action would create new long-term disturbance of 35.35 acres. Similar levels of surface disturbance have occurred at 758 existing or permitted oil and gas wells within a 20-mile radius of the project area (Table 23). This level of development is estimated to have disturbed approximately 7,580 acres (assuming 10 acres per well) within the 20-mile radius. The cumulative disturbance due to surface disturbance from the existing and these proposed wells is estimated to be 0.8% of the land in a 20-mile radius.

Unlike well pads, active roadways are not typically reclaimed, thus sediment yield from roads can continue at an increased rate over the background rate during the life of the project or indefinitely if the roads are formally transferred to either the BIA or landowner. The Proposed Action would create approximately 0.64 mile of new unpaved roadway in the project area. As such, the Proposed Action would incrementally add to existing and future impacts to soil resources in the general area. EOG is committed to using BMPs to mitigate these effects. BMPs would include implementing erosion and sedimentation control measures, such as installing culverts with energy-dissipating devices at culvert outlets to avoid sedimentation in ditches, constructing water bars along slopes, and planting cover crops to stabilize soil following construction and before permanent seeding takes place.

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

Surface disturbance and wildlife habitat fragmentation have existed in varying degrees within and surrounding the project area, and have increased over time with continuing oil and gas exploration, development, and production activities. Additional disturbance would likely cause new behavioral adaptations, movement, and/or temporary avoidance of activity areas. The cumulative effects to all wildlife species in general would come from further habitat

fragmentation due to road and well site construction, increased traffic and associated noise, and increased human activity across the landscape. As roads are developed within and adjacent to the project area, habitat is fragmented and roads serve as barriers to some animal movement. As wildlife avoid dust, noise, and vehicular activity associated with roads, wildlife in adjacent habitats may also be impacted. Grassland-obligate species would be affected by the cumulative removal of habitat (reduction or fragmentation of patch size and/or vertical habitat structure) throughout the area.

Significant archaeological resources are irreplaceable and often unique; any destruction or damage of such resources can be expected to diminish the archaeological record as a whole. No cultural resource sites were newly recorded in the area of potential effect of the proposed well. As such, no damage or destruction of archaeological resources is anticipated as a result of the Proposed Action.

It is anticipated that the pace and level of oil and natural gas development within this region of the state would continue at the current rate over the next few years and contribute to cumulative air quality impacts. The Proposed Action would incrementally contribute to emissions occurring within the region. In general, however, the increase in emissions associated with the Proposed Action—most of which would occur during the short-term construction and drilling phase (i.e., wells and roads)—would be localized, largely temporary, and limited in comparison with regional emissions. Therefore, it is unlikely that the Proposed Action would noticeably impact the cumulative air quality of the region.

No surface discharge of water would occur under the Proposed Action, nor would any surface water or groundwater be used during project development, as all water would be hauled in by truck from a commercial source. However, the Proposed Action, when combined with other actions (e.g., cattle grazing, other oil and gas development, and agriculture) likely to occur in and near the project area in the future, would increase sedimentation and runoff rates. Sediment yield from active roadways could occur at higher rates than background rates and continue during the life of the project or indefinitely if the roads are formally transferred to either the BIA or landowner. The Proposed Action could incrementally add to existing and future sources of water quality degradation in the Antelope Creek watershed. However, increases in water quality degradation would be reduced by EOG's commitment to minimizing surface disturbance, using erosion control measures as necessary, and implementing BMPs designed to reduce impacts.

The Proposed Action would incrementally add to existing and future socioeconomic impacts in the general area. The proposed wells, if successful, would be an additional source of revenue for some residents of the Reservation. These wells would also provide additional revenue to McKenzie County and the State of North Dakota, subject to relevant royalties and taxes. Increases in employment would be temporary during the construction, drilling, and completion phases of the Proposed Action. Although, short-term, additional tax revenue, such as sales and lodging taxes, would also be generated for the area, and would add to the current tax base from existing oil and gas operations.

Current impacts from oil and gas-related activities are still fairly dispersed, and the required BMPs and commitments contained in the APD would limit potential impacts. No significant

negative impacts are expected to affect any critical element of the human environment; impacts would generally be low and mostly temporary. EOG has committed to implementing interim reclamation of the well pads immediately following construction and completion. Roads would also be reclaimed after the life of the project, unless formally transferred to the BIA or landowner. Implementation of both interim and permanent reclamation measures would decrease the potential for cumulative impacts.

4.0 CONSULTATION AND COORDINATION

The BIA must continue to make efforts to solicit the opinions and concerns of all stakeholders. For the purpose of this EA, a stakeholder is considered any agency, municipality, or individual person which the Proposed Action may affect either directly or indirectly in the form of public health, environmental, or socioeconomic issues. Scoping letters declaring the location of the proposed project and explaining the actions proposed were sent in advance of this EA to allow stakeholders ample time to submit comments or requests for additional information. The scoping letters describing the well facilities and associated access roads were mailed on August 5 and 15, 2011. The scoping comments received for both announcements are summarized in Table 24 and copies are provided as an attachment. A copy of this EA will be submitted to all federal agencies with interests either in, near, or potentially affected by the Proposed Action.

List of Preparers

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

EOG Resources, Inc.

- Heather Smith, NEPA Coordinator
- LB Myers, Environmental Specialist

SWCA Environmental Consultants

- Chad Baker, Project Manager/Environmental Specialist
Prepared the EA
- Kara Altvater, Biologist/Environmental Specialist
Prepared the EA
- Jason Bivens, Wildlife Biologist
Conducted natural resource surveys
- Judy Cooper, Archaeologist/Principal Investigator
Supervised cultural resource surveys, prepared the technical reports
- Sarah Baer, Archaeologist
Conducted cultural resources surveys, prepared technical reports and the cultural resources section of the EA
- Ashley Fife, Archaeologist
Conducted cultural resources surveys, prepared technical reports and the cultural resources section of the EA
- Alex Wesson, Archaeologist/Project Coordinator
Coordinated preparation of technical reports and the cultural resources section of the EA
- Robin Roberts, GIS Specialist
Created maps and spatially derived data

Table 24. Public Scoping Comments.

Name	Organization	Comment	Response to Comment
Bagley, Lonny	Bureau of Land Management	No Comment	
Benson, Barry	Three Affiliated Tribes	No Comment	
Bercier, Marilyn	Bureau of Indian Affairs	No Comment	
Berg, George	NoDak Electric Cooperative, Inc.	No Comment	
Boyd, Bill	Midcontinent Cable Company	No Comment	
Brady, Perry	THPO, Three Affiliated Tribes	No Comment	
Bruhn, V. Judy	Three Affiliated Tribes	No Comment	
Cayko, Richard	McKenzie County	No Comment	
Chevance, Nick	National Park Service, Midwest Region	No Comment	
Christenson, Ray	Southwest Water Authority	No Comment	
Cimarosti, Daniel	U.S. Army Corps of Engineers	Provided information on Nationwide Permit 12 and 14.	Noted.
Crows Heart, Lester	Fort Berthold Rural Water Director	No Comment	
Davis, Scott	Indian Affairs Commission	No Comment	
Desjarlais, Lyndon	Fort Berthold Agency	No Comment	
Dhieux, Joyce	U.S. Environmental Protection Agency	No Comment	
Dixon, Doug	Montana Dakota Utilities	No Comment	
Dressler, Patricia	Federal Aviation Administration	No objection provided the FAA is notified of construction or alterations.	Noted.
Erickson, Carroll	Ward County Board of Commissioners	No Comment	
Feris, Kade	Turtle Mountain Band of Chippewa	No Comment	
Fox, Fred	Three Affiliated Tribes	No Comment	
Garrison Project Office	U.S. Army Corps of Engineers	No Comment	
Glatt, David	North Dakota Department of Health	The department believed that environmental impacts from the proposed construction would be minor and could be controlled by proper construction methods.	Noted.

Name	Organization	Comment	Response to Comment
Hanson, Jesse	North Dakota Parks and Recreation	Reviewed the North Dakota Natural Heritage biological conservation database. No occurrences of species of concern within 1 mile of the project area.	Information included in the wildlife section of this EA.
Hauck, Reinhard	Dunn County	No Comment	
Hefferman, Dan	U.S. Environmental Protection Agency	No Comment	
Hoffman, Warren	Killdeer, Weydahl Field	No Comment	
Hudson-Schenfisch, Julie	McLean County Board of Commissioners	No Comment	
Hynek, David	Chair, Mountrail Board of County Commissioners	No Comment	
Johnson, Harley	New Town Municipal Airport	No Comment	
Kadmas, Ray	Dunn County	No Comment	
Kuehn, John	Parshall-Hankins Field Airport	No Comment	
Kyner, Dave	Federal Emergency Management Agency	No Comment	
Land Department	Northern Border Pipeline Company	No Comment	
Latimer, Tom	Red Willow Great Plains, LLC	No Comment	
Laux, Eric	U.S. Army Corps of Engineers	Recommends coordination with ND State Water Commission, EPA, USFWS, and SHPO. A Section 404 permit would be required for any placement of dredged or fill material into waters of the U.S.	Noted.
Levings, Marcus	Chairman, Three Affiliated Tribes	No Comment.	
Lindemann, Larry	Airport Manager, Barnes County Municipal Airport	No Comment	
Link, Greg	North Dakota Game and Fish Department	Concerned about habitat fragmentation. Recommend avoiding native prairie, wooded draws, riparian corridors, and wetland areas. Suggests botanical and aerial raptor nest surveys.	Noted.
Manager	Xcel Energy	No Comment	

*Environmental Assessment: EOG Resources, Inc.
Bear Den 08-1621H, Mandaree 111-07H, and Mandaree 104-1716H Well Pads*

Name	Organization	Comment	Response to Comment
McPhillips, Kelly	Bureau of Reclamation	There are waterlines in the vicinity of some of the proposed wells and their access roads. Request proponent coordinates construction with Lester Crows Heart, Fort Berthold Rural Water Director.	Noted. A scoping letter was sent to the Fort Berthold Rural Water Director.
Mercer County	Mercer County Board of Commissioners	No Comment	
Missile Engineer, Chief	Minot Air Force Base	No Comment	
Murphy, Charles	Chairman, Standing Rock Sioux Tribe	No Comment	
NAGPRA Office	Three Affiliated Tribes	No Comment	
Nash, Mike	Bureau of Land Management	No Comment	
Natural Resources Department	Three Affiliated Tribes	No Comment	
Nelson, Richard	U.S. Bureau of Reclamation	No Comment	
Nordquist, Don	Petro-Hunt, LLC	No Comment	
Obenauer, Steve	Federal Aviation Administration	No Comment	
Olson, Frances	McKenzie County	No Comment	
Paaverud, Merlan Jr.	State Historical Society	Requests that a copy of the cultural resources site forms and reports be sent to their office.	Noted.
Packineau, Mervin	Three Affiliated Tribes	No Comment	
Paulson, Gerald	Western Area Power Administration	No Comment	
Pearson, Myra	Spirit Lake Sioux Tribe	No Comment	
Peterson, Walter	North Dakota Department of Transportation	No Comment	
Poitra, Fred	Three Affiliated Tribes	No Comment	
Prechal, Doug	North Dakota Parks and Recreation Department	No Comment	
Rudolph, Reginald	McLean Electric Cooperative, Inc.	No Comment	
Schelkoph, David	West Plains Electric Cooperative, Inc.	No Comment	
Selvae, Michael	Chairman, Sisseton-Wahpeton Sioux Tribe	No Comment	
Short Bull, Marietta	Fort Berthold Agency	No Comment	

*Environmental Assessment: EOG Resources, Inc.
Bear Den 08-1621H, Mandaree 111-07H, and Mandaree 104-1716H Well Pads*

Name	Organization	Comment	Response to Comment
Sorenson, Charles	Army Corps of Engineers	Recommends measures to minimize impacts to nearby waters and threatened/endangered species, and to reduce spread of noxious weeds.	Noted.
Strahs, Arnold	Three Affiliated Tribes	No Comment	
Svoboda, Larry	U.S. Environmental Protection Agency	No Comment	
Schaar, Jerome	U.S. Department of Agriculture, Natural Resources Conservation Service	Recommended avoiding wetland impacts or minimize using provided guidelines.	Noted.
Thompson, Brad	U.S. Army Corps of Engineers	No Comment	
Thorson, Gary	McKenzie Electric Cooperative	No Comment	
Towner, Jeffrey	U.S. Fish and Wildlife Service	Concurred with the affects determinations for ESA listed species. Stated that the applicant-committed protection measures demonstrate EOG's commitment to protect migratory birds.	Concurrence noted in the wildlife section of this EA.
White Calfe, Frank	Three Affiliated Tribes	No Comment	
Williams, Damon	Three Affiliated Tribes	No Comment	
Wolf, Malcolm	Three Affiliated Tribes	No Comment	

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6.0 ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AO	Authorized Officer
APD	Application for Permit to Drill
AQI	Air Quality Index
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
EA	environmental assessment
EIS	environmental impact statement
EJ	environmental justice
EOG	EOG Resources, Inc.
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
H ₂ S	hydrogen sulfide
HAP	hazardous air pollutant
IPCC	Intergovernmental Panel on Climate Change
MHA Nation	Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDIAC	North Dakota Indian Affairs Commission
NDIC	North Dakota Industrial Commission
NDSWC	North Dakota State Water Commission
NEPA	National Environmental Policy Act
N ₂ O	nitrous oxide
NO ₂	nitrogen dioxide
NRCS	Natural Resources Conservation Service
NTL	Notice to Lessees
NWI	National Wetland Inventory
O ₃	ozone
PM	particulate matter
psi	pounds per square inch
Reservation	Fort Berthold Indian Reservation
ROW	right-of-way
SO ₂	sulfur dioxide

SPCCP	Spill Prevention, Control, and Countermeasure Plan
SUP	Surface Use Plan
SWCA	SWCA Environmental Consultants
THPO	Tribal Historic Preservation Officer
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound



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August 4, 2011

Dear Interested Party:

The Bureau of Indian Affairs (BIA) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) for the construction, drilling, completion, and production of up to four wells on one well pad on the Fort Berthold Indian Reservation by EOG Resources, Inc. (EOG). EOG also requests a 150-foot-wide right-of-way (ROW) for a new access road, utility lines, and natural gas and liquids gathering lines. The proposed well and access road would be located within McKenzie County, North Dakota. State Highway 22 and BIA Route 27 provide access to the location.

The Bear Den 08-21H well pad and access road were previously approved as part of the EA titled *Environmental Assessment: EOG Mandaree 02-09H, Mandaree 04-15H, Mandaree 05-16H, Mandaree 06-20H, Mandaree 12-07H, Bear Den 08-21H, Clarks Creek 01-21H, Clarks Creek 03-08H, and Riverview 01-32H* (prepared by SWCA Environmental Consultants December 2009). The scoping letter for that EA was sent on November 9, 2009. BIA signed the Finding of No Significant Impact (FONSI) for the EA on January 20, 2010. A second well on this pad was approved through an Addendum to this EA and the FONSI was signed on March 21, 2011.

Construction of the approved Bear Den 08-21H well pad and road has not commenced. EOG would like to relocate Bear Den 08-21H in an effort to reduce impacts to the current environmental setting as well as reduce potential future risks. Originally Sections 16 and 21 were separate, 640-acre spacing units which necessitated one well pad per Section. Sections 16 and 21 have now been combined into a 1,280-acre spacing unit which allows EOG to combine multiple wells onto a single well pad and provides more leeway in situating the well pad. Also, given the recent severe winter and spring weather conditions consisting of heavy snowfall and precipitation, EOG decided that this well-pad should be located farther from steep slopes. The proposed location is approximately 1/8 mile east of the approved location and the environmental impacts are expected to be similar to those described in the previous EA. Given the relocation of the proposed well pad, EOG plans to rename this pad the Bear Den 8-1621H.

The BIA is required to prepare a new EA for Bear Den 08-1621H based on the relocation described above and the expanded size of the well pad. The proposed well pad would be larger than the approved well pad in order to accommodate up to four wells (rather than the two wells that were approved). The ROW for the access road would be slightly longer than the approved ROW in order to reach the proposed location; however, approximately 1,334 feet of the approved ROW would be utilized to access the relocated well pad. The surface locations for the approved well pad and proposed relocated well pad are compared in the following table. Also see the attached map for the well pad and road locations.

Well Pad	Surface Location	Surface Disturbance (Acres)		
		Well Pad	ROW	Total
Approved Bear Den 08-21H	NW¼ NW¼ of Section 21, Township (T) 150N, Range (R) 94W	4.81	3.04	7.85
Proposed Bear Den 08-1621H	SE¼ SW¼ of Section 16, T150N, R94W	9.52	6.81	16.33

The proposed well pad would require approximately 9.52 acres of surface disturbance, including areas for associated stockpiles, cuttings pits, and production facilities. Approximately 1,977 feet of ROW would be needed for the new access road, utility lines, and natural gas and liquids gathering lines. Surface disturbance for the ROW would be approximately 6.81 acres. Production facilities such as well heads and pump jacks, a flare pit, a heater-treater, a recirculating pump, and a tank battery would be installed if the well is productive. Production fluids would be stored in tanks on the well pad unless gathering lines were installed immediately. After gathering line installation, at least one tank would still be on the well pad to hold fluids under certain limited conditions.

An onsite inspection and resource survey was conducted in June 2011. The inspection included a review of the proposed pad location, access road route, and pipeline route. The final location of the well pad will be adjusted, if necessary, based on relevant information gathered by the BIA during the inspection. Site-specific mitigation measures will be developed and incorporated into an approved Application for Permit to Drill (APD). The well would be drilled as soon as possible after approval of its APD.

To ensure that social, economic, and environmental effects are analyzed accurately, we solicit your views and comments on the proposed action, pursuant to Section 102(2)(D)(IV) of NEPA, as amended. We are interested in developments proposed or underway that should be considered in connection with the proposed project. We also ask your assistance in identifying any property or resources that you own, manage, oversee, or otherwise value that might be adversely impacted. Please send your replies and requests for additional project information to:

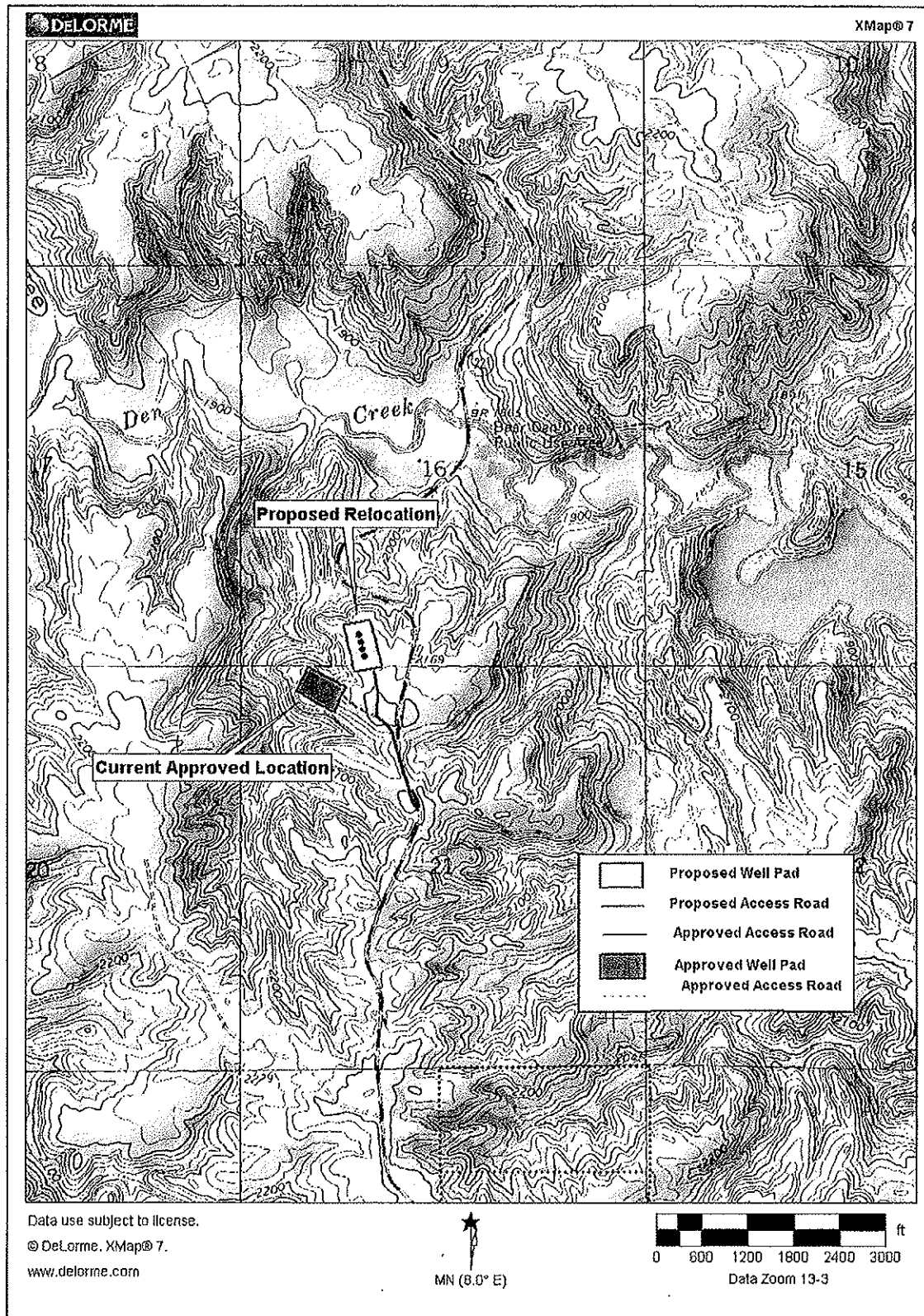
SWCA Environmental Consultants
Chad Baker, Project Manager
295 Interlocken Boulevard, Suite 300
Broomfield, Colorado 80021
(303) 487-1183
cbaker@swca.com

Comments should be submitted by September 2, 2011, so that they may be addressed in the final EA. Questions for the BIA can be directed to Marilyn Bercier, Division Chief, BIA Division of Environmental, Safety, and Cultural Resource Management, at (605) 226-7656.

Sincerely,



Chad Baker
Project Manager





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Tel 303.487.1183 Fax 303.487.1245
www.swca.com

August 15, 2011

Dear Interested Party:

The Bureau of Indian Affairs (BIA) is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) for the construction, drilling, completion, and production of up to five wells on two well pads on the Fort Berthold Indian Reservation by EOG Resources, Inc. (EOG). EOG also requests a 150-foot-wide right-of-way (ROW) for a new access road, utility lines, and natural gas and liquids gathering lines. State Highway 22 and BIA Route 12 provide access to the proposed well pads and access roads. The following table summarizes the surface locations for the well pads within McKenzie County, North Dakota. Also, the attached map illustrates the proposed well pad and road locations.

Well Pad	Surface Location	Number of Wells	Surface Disturbance (Acres)		
			Well Pad	ROW	Total
Mandaree 111-07H	SW¼ SE¼ Section 7, Township (T) 149N, Range (R) 94W	3	8.10	4.89	12.99
Mandaree 104-1716H	NE¼ NW¼ Section 17, T149N, R94W	2	6.09	1.60	7.69

The two well pads would require approximately 14.19 acres of surface disturbance, including areas for associated stockpiles, cuttings pits, and production facilities. Production facilities such as well heads and pump jacks, a flare pit, a heater-treater, a recirculating pump, and a tank battery would be installed if a well is productive. Production fluids would be stored in tanks on the well pad unless gathering lines were installed immediately. After gathering line installation, at least one tank would still be on the well pad to hold fluids under certain limited conditions.

Approximately 1.68 miles of ROW would be needed for the new access roads, utility lines, and natural gas and liquids gathering lines. Surface disturbance for the ROWs would total approximately 6.49 acres. However, EOG is analyzing an alternative access route for Mandaree 111-07H. The alternative access road would be approximately 938 feet in length and would disturb approximately 3.23 acres (compared to 1,419 feet and 4.89 acres).

On-site inspections and resource surveys were conducted in May and June 2011. The inspections included a review of the proposed pad locations, access road routes, and pipeline routes. The final location of the well pads and access roads will be adjusted, if necessary, based on relevant information gathered by the BIA during the inspections. Site-specific mitigation measures will be developed and incorporated into an approved Application for Permit to Drill (APD). The wells would be drilled as soon as possible after approval of the APD.

To ensure that social, economic, and environmental effects are analyzed accurately, we solicit your views and comments on the proposed action, pursuant to Section 102(2)(D)(IV) of NEPA, as amended. We are interested in developments proposed or underway that should be considered in connection with the proposed project. We also ask your assistance in identifying any property or resources that you own, manage, oversee, or otherwise value that might be adversely impacted. Please send your replies and requests for additional project information to:

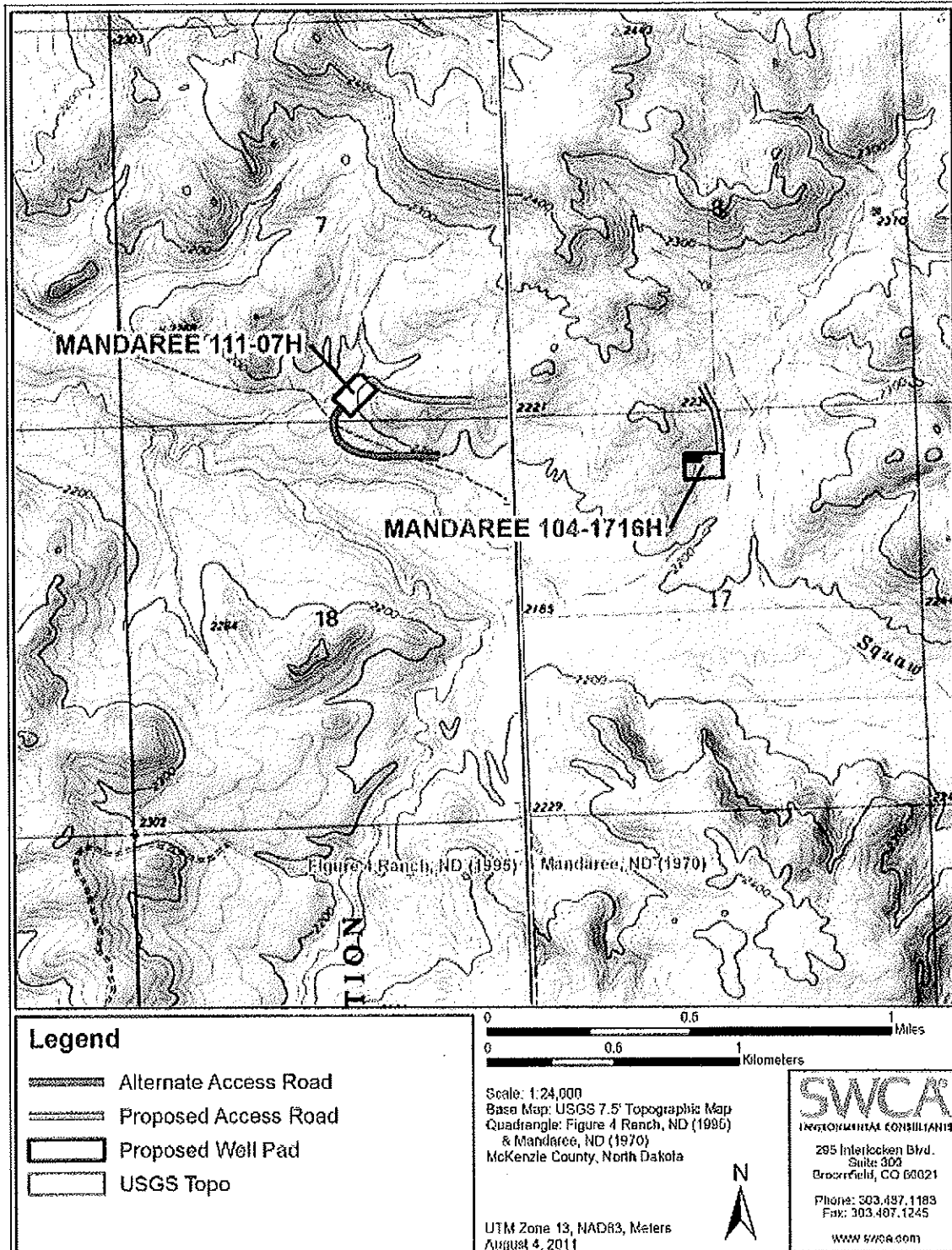
SWCA Environmental Consultants
Chad Baker, Project Manager
295 Interlocken Boulevard, Suite 300
Broomfield, Colorado 80021
(303) 487-1183
cbaker@swca.com

Comments should be submitted by September 12, 2011, so that they may be addressed in the final EA. Comments may be combined with those for the Bear Den 08-1621 well pad and access road project (scoping letter sent by SWCA on August 4, 2011), as the three well pads will be analyzed in one EA. Questions for the BIA can be directed to Marilyn Bercier, Division Chief, BIA Division of Environmental, Safety, and Cultural Resource Management, at (605) 226-7656.

Sincerely,



Chad Baker
Project Manager



Mandaree 111-07H and Mandaree 104-1716H project location.

Bear Den 08-21H



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
1513 SOUTH 12TH STREET
BISMARCK ND 58504-6640

August 11, 2011

North Dakota Regulatory Office

SWCA Environmental Consultants
Attn: Chad Baker, Project Manager
295 Interlocker Boulevard, Suite 300
Broomfield, Colorado 80021

Dear Mr. Baker:

This is in response to your solicitation letter on behalf of **EOG Resources, Inc.**, received on August 08, 2011 requesting Department of the Army (DA), United States Army Corps of Engineers (Corps) comments for four wells on one one well pad within the Fort Berthold Indian Reservation. The proposed wells are **EOG Mandaree 02-09H, Mandaree 04-15H, Mandaree 05-16H, Mandaree 06-20H, Mandaree 12-07H, Bear Den 08-21H, Clarks Creek 01-21H, Clarks Creek 03-08H, and Riverview 01-32H** located within McKenzie County, North Dakota.

Corps Regulatory Offices administer Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Section 10 of the Rivers and Harbors Act regulates work in or affecting navigable waters. This would include work over, through, or under Section 10 water. Section 10 waters in North Dakota are the Missouri River (including Lake Sakakawea and Lake Oahe), Yellowstone River, James River south of Jamestown, North Dakota, Bois de Sioux River, Red River of the North, and the Upper Des Lacs Lake. Section 404 of the Clean Water Act regulates the discharge of dredge or fill material (temporarily or permanently) in waters of the United States. Waters of the United States may include, but are not limited to, rivers, streams, ditches, coulees, lakes, ponds, and their adjacent wetlands. Fill material includes, but is not limited to, rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mines or other excavation activities and materials used to create any structure or infrastructure in waters of the United States.

For any proposed well where the well line and/or bottom hole is under or crosses under Lake Sakakawea, regardless of depth, we require that project proponent provide a DA permit application (ENG Form 4345) to the Corps.

Enclosed for your information is the fact sheet for Nationwide Permit 12, Utility Line Activities. Pipeline projects are already authorized by Nationwide Permit 12 **provided the utility line can be placed without any change to pre-construction contours and all other proposed construction activities and facilities are in compliance with the Nationwide's permit conditions and 401 Water Quality Certification is obtained**. Please note the pre-construction notification requirements on page 2 of the fact sheet. **If a project involves any one of the seven notification requirements, the project proponent must submit a DA application**. Furthermore, a project must also be in compliance with the "Regional Conditions for Nationwide Permits within the State of North Dakota", found on pages 12 and 13 of the fact sheet. [The following info is for activities on a reservation] Please be advised that the United States Environmental Protection Agency (EPA), Region 8 has denied 401 Water Quality Certification for activities in perennial drainages and wetlands. Furthermore, EPA has placed conditions on activities in ephemeral and intermittent drainages. It is recommended you contact the U.S. Environmental Protection Agency, Region 8, Attn: Brent Truskowski, 1595 Wynkoop Street, Denver, Colorado 80202-1129 to review the conditions pursuant to Section 401 of the Clean Water Act prior to any construction.

Also enclosed for your information is the fact sheet for Nationwide Permit 14, Linear Transportation Projects. Road crossings are already authorized by Nationwide Permit 14 **provided the discharge does not cause the loss of greater than ½ acre of waters of the United States per crossing and all other proposed construction activities are in compliance with the Nationwide's permit conditions**. Please note the pre-construction notification requirements on the front page of the fact sheet. **If a project involves (1) the loss of waters of the United States exceeding 1/10 acre per crossing; or (2) there is a discharge in a special aquatic site, including wetlands, the project proponent must submit a DA application prior to the start of construction.** Please reference General Condition 27, Pre Construction Notification on page 8 of the fact sheet. Furthermore, a project must also be in compliance with the "Regional Conditions for Nationwide Permits within the State of North Dakota", found on pages 11 and 12 of the fact sheet. [The following is included for activities on a reservation] Enclosed is a copy of the United States Environmental Protection Agency, Region 8's; General Conditions for all Nationwide Permits and specific conditions for Nationwide Permit 14.

In the event your project requires approval from the U.S. Army Corps of Engineers and cannot be authorized by Nationwide Permit(s), a Standard or Individual Permit will be required. A project that requires a Standard or Individual Permit is intensely reviewed and will require the issuance of a public notice. A Standard or Individual Permit generally requires a minimum of 120 days for processing but based on the project impacts and comments received through the public notice may extend beyond 120 days.

This correspondence letter is neither authorization for the proposed construction nor confirmation that the proposed project complies with the Nationwide Permit(s).

If any of these projects require a Section 10 and/or Section 404 permit, please complete and submit the enclosed Department of the Army permit application (ENG Form 4345) to the U.S. Army Corps of Engineers, North Dakota Regulatory Office, 1513 South 12th Street, Bismarck, North Dakota 58504. If you are unsure if a permit is required, you may submit an application; include a project location map, description of work, and construction methodology.

If we can be of further assistance or should you have any questions regarding our program, please do not hesitate to contact this office by letter or phone at (701) 255-0015.

Sincerely,



Daniel E. Cimarosti
Regulatory Program Manager
North Dakota

Enclosure
ENG Form 4345
Fact Sheet NWP 12 and 14
EPA 401 Conditions for Nationwide Permits

CF w/o encl
EPA Denver (Brent Truskowski)



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
1513 SOUTH 12TH STREET
BISMARCK ND 58504-6640

August 24, 2011

North Dakota Regulatory Office

SWCA Environmental Consultants
Attn: Mr. Chad Baker, Project Manager
295 Interlocken Boulevard, Suite 300
Broomfield, Colorado 80021

Dear Mr. Baker:

This is in response to your solicitation letter on behalf of **EOG Resources, Inc.**, received on August 18, 2011 requesting Department of the Army (DA), United States Army Corps of Engineers (Corps) comments for five proposed oil and gas exploratory wells from two well pads within the Fort Berthold Indian Reservation. The proposed well pad and road locations are within McKenzie County, North Dakota.

Well Pad	Surface Location	Number of Wells
Mandaree 111-07H	SW ¼ Section 7, Township 149 North, Range 94 West	3
Mandaree 104-1716H	NE ¼ NW ¼ Section 17, Township 149 North, Range 94 West	2

Corps Regulatory Offices administer Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Section 10 of the Rivers and Harbors Act regulates work in or affecting navigable waters. This would include work over, through, or under Section 10 water. Section 10 waters in North Dakota are the Missouri River (including Lake Sakakawea and Lake Oahe), Yellowstone River, James River south of Jamestown, North Dakota, Bois de Sioux River, Red River of the North, and the Upper Des Lacs Lake. Section 404 of the Clean Water Act regulates the discharge of dredge or fill material (temporarily or permanently) in waters of the United States. Waters of the United States may include, but are not limited to, rivers, streams, ditches, coulees, lakes, ponds, and their adjacent wetlands. Fill material includes, but is not limited to, rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mines or other excavation activities and materials used to create any structure or infrastructure in waters of the United States.

For any proposed well where the well line and/or bottom hole is under or crosses under Lake Sakakawea, regardless of depth, we require that project proponent provide a DA permit application (ENG Form 4345) to the Corps.

Enclosed for your information is the fact sheet for Nationwide Permit 12, Utility Line Activities. Pipeline projects are already authorized by Nationwide Permit 12 **provided the utility line can be placed without any change to pre-construction contours and all other proposed construction activities and facilities are in compliance with the Nationwide's permit conditions and 401 Water Quality Certification is obtained**. Please note the pre-construction notification requirements on page 2 of the fact sheet. **If a project involves any one of the seven notification requirements, the project proponent must submit a DA application.** Furthermore, a project must also be in compliance with the "Regional Conditions for Nationwide Permits within the State of North Dakota", found on pages 12 and 13

of the fact sheet. [The following info is for activities on a reservation] Please be advised that the United States Environmental Protection Agency (EPA), Region 8 has denied 401 Water Quality Certification for activities in perennial drainages and wetlands. Furthermore, EPA has placed conditions on activities in ephemeral and intermittent drainages. It is recommended you contact the U.S. Environmental Protection Agency, Region 8, Attn: Brent Truskowski, 1595 Wynkoop Street, Denver, Colorado 80202-1129 to review the conditions pursuant to Section 401 of the Clean Water Act prior to any construction.

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In the event your project requires approval from the U.S. Army Corps of Engineers and cannot be authorized by Nationwide Permit(s), a Standard or Individual Permit will be required. A project that requires a Standard or Individual Permit is intensely reviewed and will require the issuance of a public notice. A Standard or Individual Permit generally requires a minimum of 120 days for processing but based on the project impacts and comments received through the public notice may extend beyond 120 days.

This correspondence letter is neither authorization for the proposed construction nor confirmation that the proposed project complies with the Nationwide Permit(s).

If any of these projects require a Section 10 and/or Section 404 permit, please complete and submit the enclosed Department of the Army permit application (ENG Form 4345) to the U.S. Army Corps of Engineers, North Dakota Regulatory Office, 1513 South 12th Street, Bismarck, North Dakota 58504. If you are unsure if a permit is required, you may submit an application; include a project location map, description of work, and construction methodology.

If we can be of further assistance or should you have any questions regarding our program, please do not hesitate to contact this office by letter or phone at (701) 255-0015.

Sincerely,



Daniel E. Cimarosti
Regulatory Program Manager
North Dakota

Enclosure
ENG Form 4345
Fact Sheet NWP 12 and 14
EPA 401 Conditions for Nationwide Permits

CF w/o encl
EPA Denver (Brent Truskowski)

August 15, 2011
Page 2

To ensure that social, economic, and environmental effects are analyzed accurately, we solicit your views and comments on the proposed action, pursuant to Section 102(2)(D)(IV) of NEPA, as amended. We are interested in developments proposed or underway that should be considered in connection with the proposed project. We also ask your assistance in identifying any property or resources that you own, manage, oversee, or otherwise value that might be adversely impacted. Please send your replies and requests for additional project information to:

SWCA Environmental Consultants
Chad Baker, Project Manager
295 Interlocken Boulevard, Suite 300
Broomfield, Colorado 80021
(303) 487-1183
cbaker@swca.com

Comments should be submitted by September 12, 2011, so that they may be addressed in the final EA. Comments may be combined with those for the Bear Den 08-1621 well pad and access road project (scoping letter sent by SWCA on August 4, 2011), as the three well pads will be analyzed in one EA. Questions for the BIA can be directed to Marilyn Bercier, Division Chief, BIA Division of Environmental, Safety, and Cultural Resource Management, at (605) 226-7656.

Sincerely,



Chad Baker
Project Manager

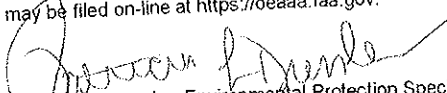
RECEIVED

AUG 18 2011



US Department
of Transportation
Federal Aviation
Administration

No objection provided the Federal Aviation Administration is notified of construction or alterations as required by Federal Aviation Regulations, Part 77, Objects Affecting Navigable Airspace, Paragraph 77.9. Notice may be filed on-line at <https://oeaaa.faa.gov>.


Patricia L. Dressler, Environmental Protection Specialist
FAA/Bismarck Airports District Office
2301 University Drive, Building 23B
Bismarck, ND 58504

Date Aug 23, 2011

Well Pad	Surface Location	Surface Disturbance (Acres)		
		Well Pad	ROW	Total
Approved Bear Den 08-21H	NW¼ NW¼ of Section 21, Township (T) 150N, Range (R) 94W	4.81	3.04	7.85
Proposed Bear Den 08-1621H	SE¼ SW¼ of Section 16, T150N, R94W	9.52	6.81	16.33

The proposed well pad would require approximately 9.52 acres of surface disturbance, including areas for associated stockpiles, cuttings pits, and production facilities. Approximately 1,977 feet of ROW would be needed for the new access road, utility lines, and natural gas and liquids gathering lines. Surface disturbance for the ROW would be approximately 6.81 acres. Production facilities such as well heads and pump jacks, a flare pit, a heater-treater, a recirculating pump, and a tank battery would be installed if the well is productive. Production fluids would be stored in tanks on the well pad unless gathering lines were installed immediately. After gathering line installation, at least one tank would still be on the well pad to hold fluids under certain limited conditions.

An onsite inspection and resource survey was conducted in June 2011. The inspection included a review of the proposed pad location, access road route, and pipeline route. The final location of the well pad will be adjusted, if necessary, based on relevant information gathered by the BIA during the inspection. Site-specific mitigation measures will be developed and incorporated into an approved Application for Permit to Drill (APD). The well would be drilled as soon as possible after approval of its APD.

To ensure that social, economic, and environmental effects are analyzed accurately, we solicit your views and comments on the proposed action, pursuant to Section 102(2)(D)(IV) of NEPA, as amended. We are interested in developments proposed or underway that should be considered in connection with the proposed project. We also ask your assistance in identifying any property or resources that you own, manage, oversee, or otherwise value that might be adversely impacted. Please send your replies and requests for additional project information to:

SWCA Environmental Consultants
Chad Baker, Project Manager
295 Interlocken Boulevard, Suite 300
Broomfield, Colorado 80021
(303) 487-1183
cbaker@swca.com

Comments should be submitted by September 2, 2011, so that they may be addressed in the final EA. Questions for the BIA can be directed to Marilyn Bercier, Division Chief, BIA Division of Environmental, Safety, and Cultural Resource Management, at (605) 226-7656.

Sincerely,

Chad Baker

Chad Baker
Project Manager



U.S. Department
of Transportation
Federal Aviation
Administration

Date *Aug 10, 2011*

No objection provided the Federal Aviation Administration is notified of construction or alterations as required by Federal Aviation Regulations, Part 77, Objects Affecting Navigable Airspace, Paragraph 77.9. Notice may be filed on-line at <https://oeaaa.faa.gov>.

Patricia L. Bressler
Patricia L. Bressler, Environmental Protection Specialist
FAA/Bismarck Airports District Office
2301 University Drive, Building 23B
Bismarck, ND 58504



NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov



August 19, 2011

Chad Baker, Project Manager
SWCA Environmental Consultants
295 Interlocken Boulevard, Suite 300
Broomfield, CO 80021

Re: Up to Four Proposed Oil & Gas Wells on the Bear Den 08-21H Well Pad, a
New Access Road and Associated Utility Lines and Pipelines by EOG Resources, Inc.
Fort Berthold Indian Reservation, McKenzie County, North Dakota

Dear Mr. Baker:

This department has reviewed the information concerning the above-referenced project submitted under date of August 4, 2011, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Development of the production facilities and any access roads, well pads or pipelines should have a minimal effect on air quality provided measures are taken to minimize fugitive dust. However, operation of the wells has the potential to release air contaminants capable of causing or contributing to air pollution. We encourage the development and operation of the wells in a manner that is consistent with good air pollution control practices for minimizing emissions. Detailed guidance is available at www.ndhealth.gov/AQ/OilAndGasWells.htm.

Any questions about air pollution control or permitting requirements should be addressed to Ms. Kathleen Paser at the U.S. Environmental Protection Agency, Region 8. She may be reached at (303) 312-6526 or Paser.Kathleen@epa.gov.

2. Aggregate to be used for road construction should not contain any erionite. Aggregate sources should be tested for erionite following guidelines found at www.ndhealth.gov/EHS/Erionite. For questions regarding erionite testing, please call Mark Dihle at 701-328-5188.
3. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance,

Mr. Chad Baker

2.

May 4, 2011

and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.

4. Oil and gas related construction activities located within tribal boundaries in North Dakota may be required to obtain a permit to discharge storm water runoff from the U.S. Environmental Protection Agency. Further information may be obtained from the U.S. EPA's website or by calling the U.S. EPA – Region 8 at (303) 312-6312. Also, cities or counties may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read "L. David Glatt", written over a horizontal line.

L. David Glatt, P.E., Chief
Environmental Health Section

LDG:cc

Attach.

cc: Mark Dihle, Division of Air Quality



Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

Soils

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

Surface Waters

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

Fill Material

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.



NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov



August 24, 2011

Chad Baker, Project Manager
SWCA Environmental Consultants
295 Interlocken Boulevard, Suite 300
Broomfield, CO 80021

Re: Up to Five Oil & Gas Wells on Two Well Pads
Mandaree 111-07H and Mandaree 104-1716H by EOG Resources, Inc.
Fort Berthold Indian Reservation, McKenzie County, North Dakota

Dear Mr. Baker:

This department has reviewed the information concerning the above-referenced project submitted under date of August 15, 2011, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. Development of the production facilities and any access roads, well pads or pipelines should have a minimal effect on air quality provided measures are taken to minimize fugitive dust. However, operation of the wells has the potential to release air contaminants capable of causing or contributing to air pollution. We encourage the development and operation of the wells in a manner that is consistent with good air pollution control practices for minimizing emissions. Detailed guidance is available at www.ndhealth.gov/AQ/OilAndGasWells.htm.

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3. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance,

Environmental Health
Section Chief's Office
701.328.5150

Division of
Air Quality
701.328.5188

Division of
Municipal Facilities
701.328.5211

Division of
Waste Management
701.328.5166

Division of
Water Quality
701.328.5210

and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.

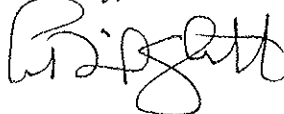
4. Projects disturbing one or more acres are required to have a permit to discharge storm water until the site is stabilized by the reestablishment of vegetation or other permanent cover. Projects located within tribal boundaries are required to obtain a permit from the U.S. Environmental Protection Agency. Further information on the storm water permit may be obtained from the U.S. EPA's website or by calling the U.S. EPA – Region 8 at (303) 312-6312. Also, cities may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,



L. David Glatt, P.E., Chief
Environmental Health Section

LDG:cc

Attach.

cc: Mark Dihle, Division of Air Quality



Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

Soils

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

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Memorandum 11-01, 101-1115



Jack Dabrymple, Governor
Mark A. Zimmerman, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

August 26, 2011

Mr. Chad Baker
SWCA Environmental Consultants
295 Interlocken Blvd.
Suite 300
Broomfield, CO 80021

Re: Fort Berthold Indian reservation – EOG Resources, Inc
Construction, drilling, completion and production of 5 exploratory oil and gas wells
McKenzie County

Dear Mr. Baker,

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced proposal on Fort Berthold Indian Reservation --for Dakota-3 E&P Company, LLC's construction, drilling, completion and production of 4 exploratory oil and gas wells in McKenzie County.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). The project as defined does not affect state park lands that we manage or state Land and Water Conservation Fund (LWCF) project sites that we manage.

The Department is also responsible for coordinating the ND's Scenic Byways and Backways Program. This proposed project is located approximately 1-mile from the Killdeer Mountain Four Bears Scenic Byways and as such we recommend any project development be completed with the least amount of or no visual impact to the immediate and distant views from the above mentioned Backways/Byways. Please contact Jessica Riepl (701-328-5364 or jriepl@nd.gov) if additional LWCF information is needed.

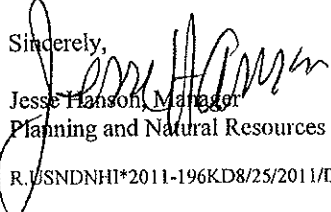
The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any current or historical plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, there are no documented occurrences in our database within or adjacent to project area.

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

The Department recommends that the project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed in the project area to help secure rare species conservation in North Dakota. Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

We appreciate your commitment to rare plant, animal and ecological community conservation, management and inter-agency cooperation to date. For additional information please contact Kathy Duttonhefner (701-328-5370 or kgduttonhefner@nd.gov) of our staff. Thank you for the opportunity to comment on this proposed project.

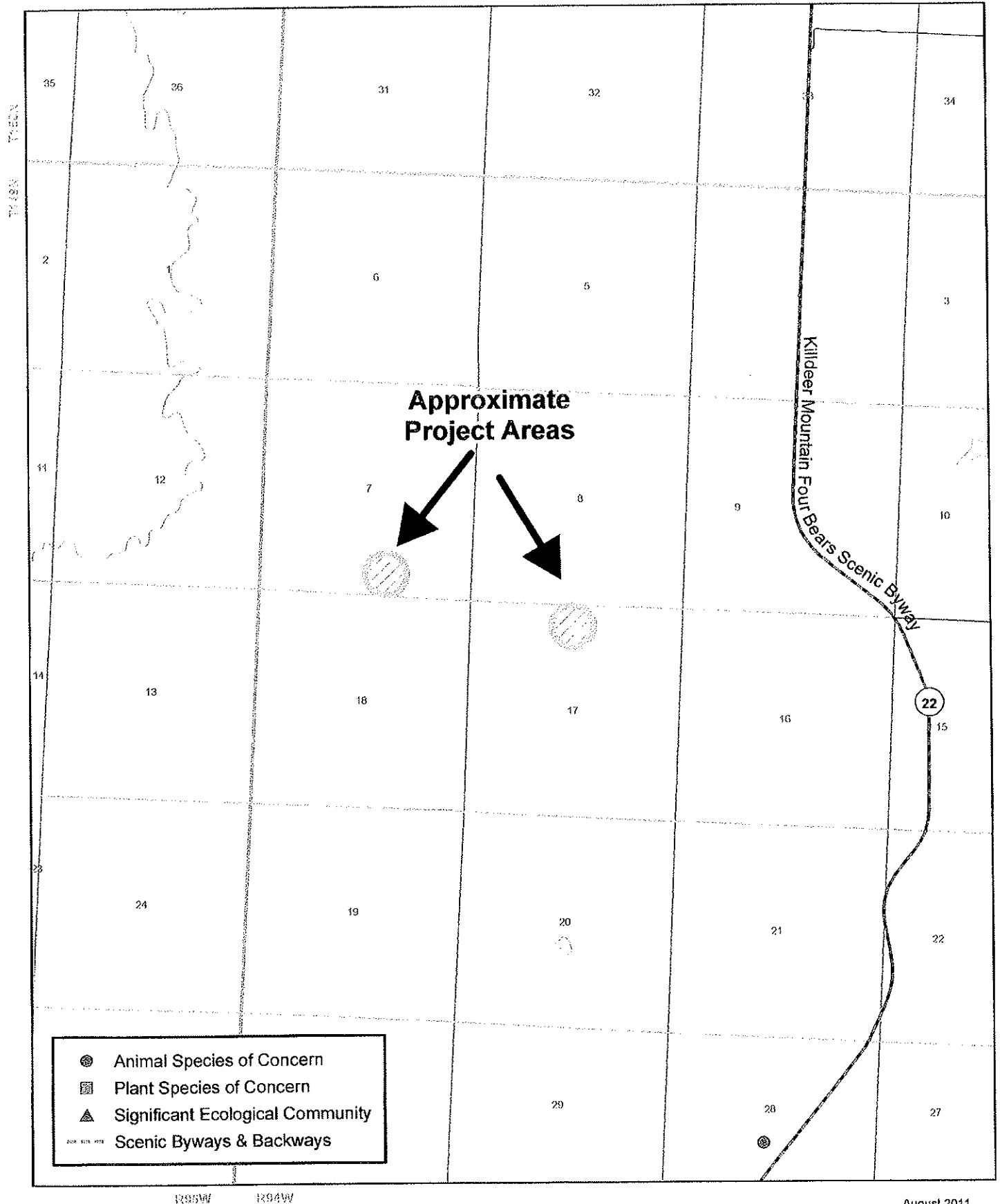
Sincerely,


Jesse Hanson, Manager
Planning and Natural Resources Division

R:\SNDNHI*2011-196KD8\25\2011\DL9.18.2011

... Play in our backyard!

North Dakota Parks and Recreation Department North Dakota Natural Heritage Inventory



Bear Day, 08-16-21



Jack Dahymple, Governor
Mark A. Zimmerman, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

August 26, 2011

Mr. Chad Baker
SWCA Environmental Consultants
295 Interlocken Blvd.
Suite 300
Broomfield, CO 80021

Re: Fort Berthold Reservation – EOG Resources, Inc

Dear Mr. Sheeley,

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced proposal which includes the construction, drilling, completion and production of four oil and gas wells on Fort Berthold Reservation by EOG Resources Corp in Dunn County.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). The project as defined does not affect state park lands that we manage or Land and Water Conservation Fund recreation projects that we coordinate.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, there are no documented occurrences in our database within or adjacent to project area. Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

The Department recommends that the project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed in the project area to help secure rare species conservation in North Dakota. Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

We appreciate your commitment to rare plant, animal and ecological community conservation, management and inter-agency cooperation to date. For additional information please contact Kathy Duttonhefner (701-328-5370 or kgduttonhefner@nd.gov) of our staff. Thank you for the opportunity to comment on this proposed project.

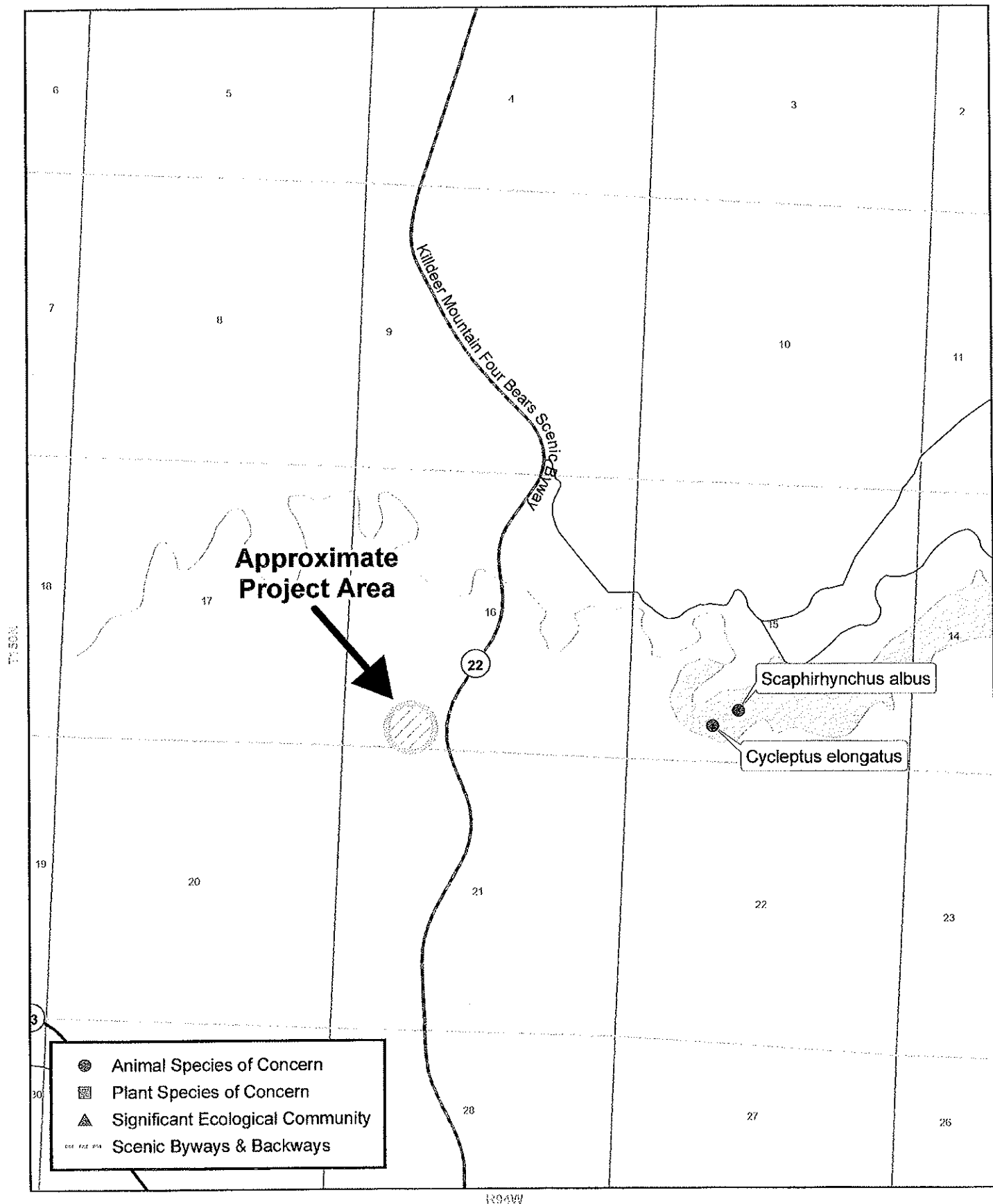
Sincerely,

Jesse Hansen, Coordinator
Planning and Natural Resources Division

R.USNDNH1*2011-188KD8/19/11DL9.9.2011

.....
Play in our backyard!

North Dakota Parks and Recreation Department North Dakota Natural Heritage Inventory



North Dakota Natural Heritage Inventory
Rare Animal and Plant Species and Significant Ecological Communities

State Scientific Name	State Common Name	State Rank	Global Rank	Federal Status	Township Range Section	County	Last Observation	Estimated Representation Accuracy	Precision
Scaphirhynchus albus	Pallid Sturgeon	S1	G2	LE	150N094W - 15; 150N094W - 22; 150N094W - 23; 150N094W - 09; 150N094W - 16; 150N094W - 21; 150N094W - 10; 150N094W - 27; 150N094W - 14; 150N094W - 28; 150N094W - 11	McKenzie	1974-07-10	Low	M
Cyprinus elongatus	Blue Sucker	S3	G3G4		150N094W - 15; 150N094W - 22; 150N094W - 23; 150N094W - 09; 150N094W - 16; 150N094W - 21; 150N094W - 10; 150N094W - 27; 150N094W - 14; 150N094W - 28; 150N094W - 11	McKenzie	1965-08-16		M

North Dakota Natural Heritage Inventory Biological and Conservation Data Disclaimer

The quantity and quality of data collected by the North Dakota Natural Heritage Inventory are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in North Dakota have never been thoroughly surveyed, and new species are still being discovered. For these reasons, the Natural Heritage Inventory cannot provide a definite statement on the presence, absence, or condition of biological elements in any part of North Dakota. Natural Heritage data summarize the existing information known at the time of the request. Our data are continually upgraded and information is continually being added to the database. This data should never be regarded as final statements on the elements or areas that are being considered, nor should they be substituted for on-site surveys.

Estimated Representation Accuracy

Value that indicates the approximate percentage of the Element Occurrence Representation (EO Rep) that was observed to be occupied by the species or community (versus buffer area added for locational uncertainty). Use of estimated representation accuracy provides a common index for the consistent comparison of EO reps, thus helping to ensure that aggregated data are correctly analyzed and interpreted.

Very high (>95%)

High (>80%, ≤ 95%)

Medium (>20%, ≤ 80%)

Low (>0%, ≤ 20%)

Unknown

(null) - Not assessed

Precision

A single-letter code for the precision used to map the Element Occurrence (EO) on a U.S. Geological Survey (USGS) 7.5' (or 15') topographic quadrangle map, based on the previous Heritage methodology in which EOs were located on paper maps using dots.

S - Seconds: accuracy of locality mappable within a three-second radius; 100 meters from the centerpoint

M - Minute: accuracy of locality mappable within a one-minute radius; 2 km from the centerpoint

G - General: accuracy of locality mappable to map or place name precision only; 8 km from centerpoint

U - Unmappable



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
1616 CAPITOL AVENUE
OMAHA NE 68102-4901

August 10, 2011

Planning, Programs, and Project Management Division

SWCA Environmental Consultants
Mr. Chad Baker
295 Interlocken Boulevard, Suite 300
Broomfield, Colorado 80021

Dear Mr. Baker:

The U.S. Army Corps of Engineers, Omaha District (Corps) has reviewed your letter dated August 4, 2011, regarding the proposed construction of four wells on one pad, an access road, and various utility lines on the Fort Berthold Reservation in McKenzie County, North Dakota. The Corps offers the following comments:

The Corps is aware of recent reports that describe environmental impacts associated with the use of oil waste pits in North Dakota. Oil waste pits may be susceptible to flooding, which may threaten drinking water supplies, wildlife, soil and other water resources. Due to the proximity of the proposed wells to Lake Sakakawea, a significant drinking water resource, the Corps requests the applicant consider using a closed loop drilling system. A closed loop drilling system may reduce or eliminate the discharge of toxic drilling wastes and their potential negative impacts to the environment.

Since the proposed project does not appear to be located within Corps owned or operated lands, we are providing no floodplain or flood risk information. To determine if the proposed project may impact areas designated as a Federal Emergency Management Agency special flood hazard area, please consult the following floodplain management office:

North Dakota State Water Commission
Attention: Jeff Klein
900 East Boulevard Avenue
Bismarck, North Dakota 58505-0850
jjkein@nd.gov
T-701-328-4898
F-701-328-3747

Your plans should be coordinated with the U.S. Environmental Protection Agency, which is currently involved in a program to protect groundwater resources. If you have not already done so, it is recommended you consult with the U.S. Fish and Wildlife Service and the North Dakota Game and Fish Department regarding fish and wildlife resources. In addition, the North Dakota State Historic Preservation Office should be contacted for information and recommendations on potential cultural resources in the project area.

Any proposed placement of dredged or fill material into waters of the United States (including jurisdictional wetlands) requires Department of the Army authorization under Section 404 of the Clean Water Act. You can visit the Omaha District's Regulatory website for permit applications and related information. Please review the information on the provided website (<https://www.nwo.usace.army.mil/html/od-r/district.htm>) to determine if this project requires a 404 permit. For a detailed review of permit requirements, preliminary and final project plans should be sent to:

U.S. Army Corps of Engineers
Bismarck Regulatory Office
Attention: CENWO-OD-R-ND/Cimarosti
1513 South 12th Street
Bismarck, North Dakota 58504

If you have any questions, please contact Ms. Kailin Bellows of my staff at (402) 995-2897.

Sincerely,

A handwritten signature in black ink, appearing to read 'Eric Laux', written in a cursive style.

Eric Laux
Acting Chief, Environmental Resources and Missouri
River Recovery Program Plan Formulation Section

Mandate 111-67
104-1716



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
1616 CAPITOL AVENUE
OMAHA NE 68102-4901

REPLY TO
ATTENTION OF

August 24, 2011

Planning, Programs, and Project Management Division

SWCA Environmental Consultants
Attention: Mr. Chad Baker
295 Interlocken Boulevard, Suite 300
Broomfield, Colorado 80021

Dear Mr. Baker:

The U.S. Army Corps of Engineers, Omaha District (Corps) has reviewed your letter dated August 15, 2011 regarding the proposed construction of up to five wells on two well pads on the Fort Berthold Indian Reservation in McKenzie County, North Dakota. The Corps offers the following comments:

The Corps is aware of recent reports that describe environmental impacts associated with the use of oil waste pits in North Dakota. Oil waste pits may be susceptible to flooding, which may threaten drinking water supplies, wildlife, soil and other water resources. Due to the proximity of the proposed wells to Lake Sakakawea, a significant drinking water resource, the Corps requests the applicant consider using a closed loop drilling system. A closed loop drilling system may reduce or eliminate the discharge of toxic drilling wastes and their potential negative impacts to the environment.

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North Dakota State Water Commission
Attention: Jeff Klein
900 East Boulevard Avenue
Bismarck, North Dakota 58505-0850
jjkein@nd.gov
Telephone: 701-328-4898
Fax: 701-328-3747

Your plans should be coordinated with the U.S. Environmental Protection Agency, which is currently involved in a program to protect groundwater resources. If you have not already done so, it is recommended you consult with the U.S. Fish and Wildlife Service and the North Dakota Game and Fish Department regarding fish and wildlife resources. In addition, the North Dakota State Historic Preservation Office should be contacted for information and recommendations on potential cultural resources in the project area.

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U.S. Army Corps of Engineers
Bismarck Regulatory Office
Attention: CENWO-OD-R-ND/Cimarosti
1513 South 12th Street
Bismarck, North Dakota 58504

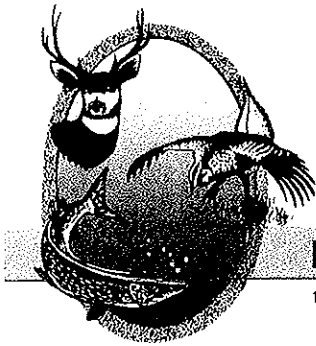
If you have any questions, please contact Mr. Shannon Sjolie of my staff at (402) 995-2887.

Sincerely,



for

Eric Laux
Acting Chief, Environmental Resources and Missouri
River Recovery Program Plan Formulation Section



"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

August 29, 2011

Chad Baker
Project Manager
SWCA Environmental Consultants
295 Interlocken Boulevard, Suite 300
Broomfield, CO 80021

Dear Mr. Baker:

RE: Bear Den #08-1621H
Fort Berthold Indian Reservation
McKenzie County, North Dakota

EOG Resources, Inc. is proposing to relocate the previously approved Bear Den 08-21H in an effort to reduce impacts to the current environmental setting as well as reduce potential future risks.

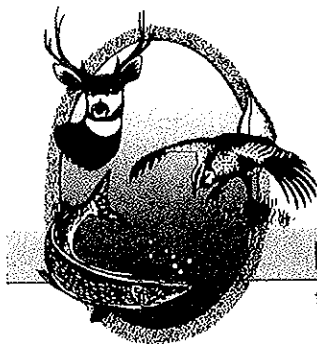
Our primary concern with oil and gas development is the fragmentation and loss of wildlife habitat associated with construction of the well pads and access roads. We recommend that construction be avoided to the extent possible within native prairie, wooded draws, riparian corridors, and wetland areas.

We also suggest that botanical surveys be completed during the appropriate season and aerial surveys be conducted for raptor nests before construction begins.

Sincerely,

Greg Link
Chief
Conservation & Communication Division

js



"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

September 6, 2011

Chad Baker
Project Manager
SWCA Environmental Consultants
295 Interlocken Boulevard, Suite 300
Broomfield, CO 80021

Dear Mr. Baker:

RE: Mandaree 111-07H
Mandaree 104-1716H

EOG Resources, Inc. has proposed up to five oil and gas wells on two well pads on the Fort Berthold Indian Reservation in McKenzie County, North Dakota.

Our primary concern with oil and gas development is the fragmentation and loss of wildlife habitat associated with construction of the well pads and access roads. We recommend that construction be avoided to the extent possible within native prairie, wooded draws, riparian corridors, and wetland areas.

We also suggest that botanical surveys be completed during the appropriate season and aerial surveys be conducted for raptor nests before construction begins.

Sincerely,

Greg Link
Chief
Conservation & Communication Division

js



United States Department of the Interior

BUREAU OF RECLAMATION

Dakotas Area Office

P.O. Box 1017

Bismarck, North Dakota 58502



IN REPLY REFER TO:

DK-5000
ENV-6.00

AUG 19 2011

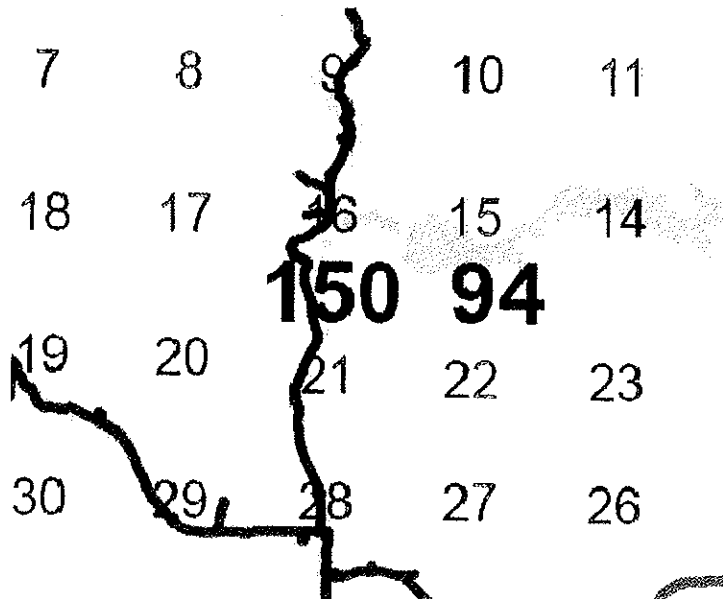
Mr. Chad Baker, Project Manager
SWCA Environmental Consultants
295 Interlocken Boulevard, Suite 300
Broomfield, CO 80021

Subject: Solicitation for an Environmental Assessment for the Proposed Construction of Four Exploratory Oil and Gas Wells on One Relocated, Shared Well Pad and 150 Foot Wide Right-of-Way Access Road, Sections 16 and 21, T 150 N, R 94 W, Sanish SW on the Fort Berthold Indian Reservation in McKenzie County, North Dakota

Dear Mr. Baker:

This letter is written to inform you that we received your letter of August 4, 2011, and the information and map of your proposed relocated four wells at one shared well pad has been reviewed by Bureau of Reclamation staff.

The proposed well pad and access roads are in sections 16 and 21, T 150 N, R 94 W, Sanish SW, North Dakota in McKenzie County. They both appear to be near Reclamation facilities, in this case the rural water pipelines of the Fort Berthold Rural Water System, especially along Highway 22. Please take note that municipal, rural, and industrial water lines commonly follow roads, therefore, we have provided the map below of the general area and associated federal pipelines in the vicinity of your proposed wells and access roads (dark blue and green lines):



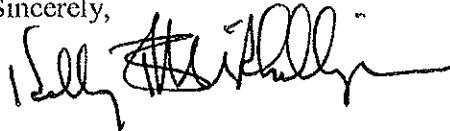
Sections 16 and 21, T150N, R94W, Sanish SW, ND

The map we have provided should aid you in identification of potential for adverse effect to, or crossings of, federal facilities. In addition, should you have need to cross a Fort Berthold Rural Water System pipeline while accessing your proposed project, please refer to the enclosed sheet for pipeline crossing specifications and contact our engineer Colin Nygaard, as shown below.

Since Reclamation is the lead federal agency for the Fort Berthold Rural Water System, we request that any work planned on the reservation be coordinated with Mr. Lester Crows Heart, Fort Berthold Rural Water Director, Three Affiliated Tribes, 308 4 Bears Complex, New Town, North Dakota 58763.

Thank you for providing the information and opportunity to comment. If you have any further environmental questions, please contact me at 701-221-1287 or for engineering questions Colin Nygaard, Civil Engineer, at 701-221-1260.

Sincerely,



Kelly B. McPhillips
Environmental Specialist

Enclosure

cc: Bureau of Indian Affairs
Great Plains Regional Office
Ms. Marilyn Bercier
Acting Regional Director, Indian Services
115 Fourth Avenue S.E.
Aberdeen, SD 57401

Mr. Lester Crows Heart
Fort Berthold Rural Water Director
Three Affiliated Tribes
308 4 Bears Complex
New Town, ND 58763
(w/encl)

DETECTABLE WARNING TAPE

- A. For potable water lines, the warning tape shall be a 3-inch-wide tape detectable tape impregnated with "CAUTION BURIED POTABLE WATER LINE".
- B. For nonpotable water lines, the warning tape shall be a 3-inch-wide purple detectable tape impregnated with "CAUTION BURIED NONPOTABLE WATER LINE".
- C. For gas, oil, and steam (except) lines, the warning tape shall be a 3-inch-wide yellow detectable tape impregnated with "CAUTION BURIED (type) LINE".
- D. For telecommunications, telephone, television, cable(s), the warning tape shall be a 3-inch-wide purple detectable tape impregnated with "CAUTION BURIED TELECOMMUNICATIONS".
- E. For electrical cable(s), the warning tape shall be a 3-inch-wide red detectable tape impregnated with "CAUTION BURIED ELECTRICAL LINE".
- F. A marker sign shall be provided that shows the clearance and electrical line voltage. The warning sign should face incoming traffic and state "DANGER, HIGH VOLTAGE OVERHEAD".

for all conditions.
 needed for construction shall be provided by the Contractor.
 shown on for 120 degrees and final undisturbed top
 the re-vegetation, shall be implemented after completing

object description, and detailed construction plans showing plan
 (including plans of proposed work, utility relocation, etc.)

crosses, excavation plans, and schedules for crossing the

for activities the applicant shall submit AS-BUILT drawings that
 the alignment of all utilities in areas disturbed during

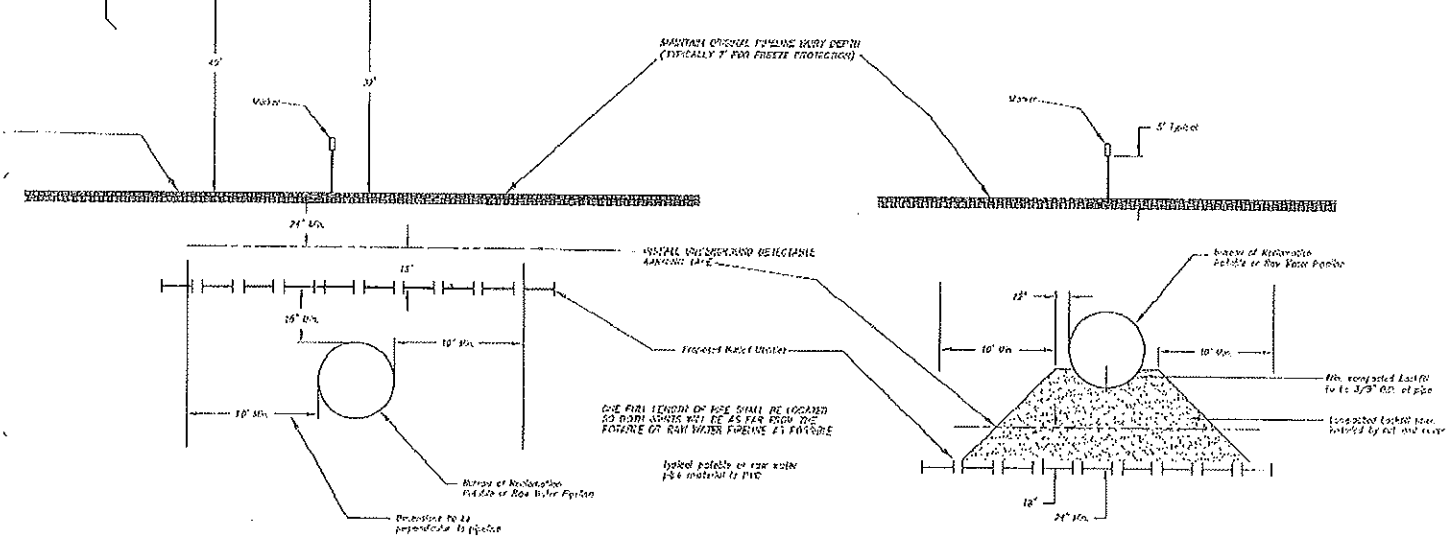
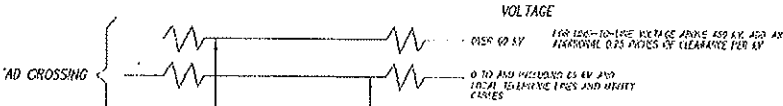
drains or pre-laid for, etc., providing, undisturbed
 with water, shall be designed for a reduced risk of
 (operator's) RWA. The design shall require either
 line with an additional 50 percent working pressure factor, or
 (type casing) for all nonpotable water pipelines.

1. Safety shall be done using hand-held tools only. The
 made in the presence of Reclamation personnel or authorized

vehicles shall be liable for all damages to Reclamation facilities
 of construction and for any other damages or losses suffered
 involved and Reclamation water supply and communication

1. Facilities, Reclamation personnel familiar with the facilities will
 along with showing information about existing buried facilities
 depth of cover, size of pipe, class of pipe, etc.) to the

raw water pipelines are PVC. If metallic pipelines are shown
 (e.g., aluminum (copper)) are incorporated in the existing
 and electrical protection may be required.



TYPICAL SECTION
 POTABLE OR RAW WATER PIPELINE CROSSING



IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF RECLAMATION

Dakotas Area Office

P.O. Box 1017

Bismarck, North Dakota 58502

DK-5000
ENV-6.00

AUG 23 2011

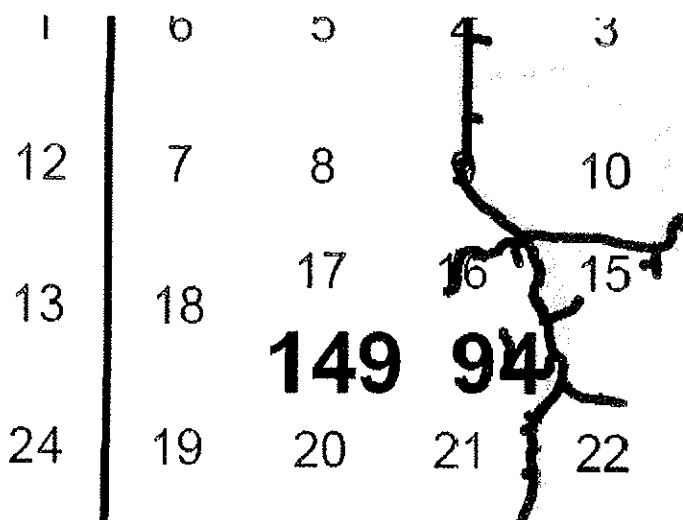
Mr. Chad Baker, Project Manager
SWCA Environmental Consultants
295 Interlocken Boulevard, Suite 300
Broomfield, CO 80021

Subject: Solicitation for an Environmental Assessment for the Proposed Construction of up to Five Wells on Two Well Pads, Sections 7 and 8, 17 and 18, T 149 N, R 94 W, Mandaree, ND on the Fort Berthold Indian Reservation in McKenzie County, North Dakota

Dear Mr. Baker:

This letter is written to inform you that we received your letter of August 15, 2011, and the information and map of your proposed commercial water well at one well pad has been reviewed by Bureau of Reclamation staff.

The proposed well pads and access roads in sections 7, 8, 17, and 18, T 149 N, R 94 W, Mandaree, North Dakota in McKenzie County appear to be clear of federal Reclamation facilities, in this case the rural water pipelines of the Fort Berthold Rural Water System. However, there are pipelines within about 1 mile of your project site. Please take note that municipal, rural, and industrial water lines commonly follow roads, therefore, we have provided the map below of the general area and associated federal pipelines in the vicinity of your proposed wells and access roads (dark blue lines) as below:



Sections 7, 8, 17, 18, T149N, R94W, Mandaree, ND

The map we have provided should aid you in identification of potential for adverse effect to, or crossings of, federal facilities. In addition, should you have need to cross a Fort Berthold Rural Water System pipeline while accessing your proposed project, please refer to the enclosed sheet for pipeline crossing specifications and contact our engineer Colin Nygaard, as shown below.

Since Reclamation is the lead federal agency for the Fort Berthold Rural Water System, we request that any work planned on the reservation be coordinated with Mr. Lester Crows Heart, Fort Berthold Rural Water Director, Three Affiliated Tribes, 308 4 Bears Complex, New Town, North Dakota 58763.

Thank you for providing the information and opportunity to comment. If you have any further environmental questions, please contact me at 701-221-1287 or for engineering questions Colin Nygaard, Civil Engineer, at 701-221-1260.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kelly B. McPhillips', with a long horizontal line extending to the right.

Kelly B. McPhillips
Environmental Specialist

Enclosure

cc: Bureau of Indian Affairs
Great Plains Regional Office
Ms. Marilyn Bercier
Acting Regional Director - Indian Services
115 Fourth Avenue S.E.
Aberdeen, SD 57401

Mr. Lester Crows Heart
Fort Berthold Rural Water Director
Three Affiliated Tribes
308 4 Bears Complex
New Town, ND 58763
(w/encl)

DETECTABLE WARNING TAPE

- A. For potable water lines, the warning tape shall be a 3-inch-wide, non-detectable tape imprinted with "CAUTION BURIED POTABLE WATER LINE".
- B. For non-potable water lines, the warning tape shall be a 3-inch-wide, non-detectable tape imprinted with "CAUTION BURIED NON-POTABLE WATER LINE".
- C. For gas, oil, and steam chemical lines, the warning tape shall be a 3-inch-wide, non-detectable tape imprinted with "CAUTION BURIED (non) LINE".
- D. For telecommunications, telephone, television, and radio lines, the warning tape shall be a 3-inch-wide, non-detectable tape imprinted with "CAUTION BURIED (non) LINE".
- E. For electrical conduits, the warning tape shall be a 3-inch-wide, non-detectable tape imprinted with "CAUTION BURIED ELECTRICAL LINE".
- F. A marker sign shall be provided that shows the clearance and electrical line voltage, the warning sign should have warning letters and state "DANGER HIGH VOLTAGE OVERHEAD".

Do not cut or damage the warning tape or any other markings on this and related sheets.

Do not cut or damage the warning tape or any other markings on this and related sheets.

Do not cut or damage the warning tape or any other markings on this and related sheets.

Do not cut or damage the warning tape or any other markings on this and related sheets.

CROSSING PLAN

VOLTAGE

OVER 60 KV FOR LINE-TO-LINE VOLTAGE AND 30 KV AND AN INSULATED 230 VOLTAGES OF CLEARANCE PER IN.

0 TO AND INCLUDING 15 KV AND LOCAL SERVING LINES AND UTILITY LINES

MINIMUM ORIGINAL PIPELINE BURY DEPTH (TYPICALLY 2' FOR FROST PROTECTION)

Water

2' 1/2'-0"

MINIMUM INTERFERED BURIAL DEPTH

Process Borehole Drilling

DO NOT TENDON OF PEE SHALL BE LOCATED SO THAT POINTS WILL BE AS FAR FROM THE POTABLE OR RAW WATER PIPELINE AS POSSIBLE

Typical potable or raw water pipe material is PVC

Process of Installation Potable or Raw Water Pipeline

Prepared to be perpendicular to pipeline

Process of Installation Potable or Raw Water Pipeline

Min. compacted backfill to be 3/4" O.D. of pipe

Compacted backfill shall be 1/2" O.D. of pipe

TYPICAL SECTION POTABLE OR RAW WATER PIPELINE CROSSING

RECLAMATION

ALWAYS THINK SAFETY

FOR RURAL WATER SYSTEMS
STANDARD CROSSING AND CLEARANCE FOR
POTABLE AND RAW WATER PIPELINES

REVISIONS
DATE
BY
CHECKED
DATE
BY
APPROVED
DATE
BY

769-603-25480

SHEET 1 OF 1



**STATE
HISTORICAL
SOCIETY**
OF NORTH DAKOTA

Jack Dalrymple
Governor of North Dakota

North Dakota
State Historical Board

Gerold Gerntholz
Valley City - President

Calvin Grinnell
New Town - Vice President

A. Ruric Todd III
Jamestown - Secretary

Albert I. Berger
Grand Forks

Richard Kloubec
Fargo

Diane K. Larson
Bismarck

Chester E. Nelson, Jr.
Bismarck

Sara Otte Coleman
*Director
Tourism Division*

Kelly Schmidt
State Treasurer

Alvin A. Jaeger
Secretary of State

Mark Zimmerman
*Director
Parks and Recreation
Department*

Francis Ziegler
*Director
Department of Transportation*

Merlan E. Paaverud, Jr.
Director

*Accredited by the
American Association
of Museums since 1989*

August 10, 2011

Mr. Chad Baker
SWCA Environmental Consultants
Denver Office
295 Interlocken Boulevard, Suite 300
Broomfield CO 80021

**NDSHPO REF. 11-0084A BIA/Mandan Hidatsa Arikara Nation EOG
Resources Well Pads and Access
Bear Den 08-1621H [T150N R94W Sections 16 and 21]
McKenzie County, North Dakota**

Dear Mr. Baker,

We received your correspondence dated August 4, 2011 regarding NDSHPO REF. 11-0084A BIA/Mandan Hidatsa Arikara Nation EOG Resources Well Pads and Access Bear Den 08-1621H [T150N R94W Sections 16 and 21] McKenzie County, North Dakota. We request that a copy of the cultural resource site forms and reports be sent to this office so that the cultural resources archives can be kept current for researchers.

Thank you for your consideration. Consultation is with MHAN THPO. If you have any questions please contact Susan Quinnell, Review & Compliance Coordinator at (701)328-3576 or squinnell@nd.gov

Sincerely,


Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and Director, State Historical Society of North Dakota

C: Mr. Elgin Crows Breast, MHAN THPO
C: Ms. Brenda Shierts, BLM



**STATE
HISTORICAL
SOCIETY**
OF NORTH DAKOTA

Jack Dalrymple
Governor of North Dakota

North Dakota
State Historical Board

Gerold Gerntholz
Valley City - President

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*Director
Parks and Recreation
Department*

Francis Ziegler
*Director
Department of Transportation*

Merlan E. Paaverud, Jr.
Director

*Accredited by the
American Association
of Museums since 1989*

August 19, 2011

Mr. Chad Baker
SWCA Denver Office
295 Interlocken Boulevard, Suite 300
Broomfield CO 80021

NDSHPO REF. 11-2418 EOG Resources Oil pads, utility lines pipelines and roads for Mandaree 111-07H in a portion of [T149N R94W Section 7, SW of SE] and Mandaree 104-1716H in a portion of [T149N R94W Section 17 NE of NW] McKenzie County, North Dakota

Dear Mr. Baker,

We received your correspondence regarding NDSHPO REF. 11-2418 EOG Resources Oil pads, utility lines pipelines and roads for Mandaree 111-07H and Mandaree 104-1716H in a portion of McKenzie County, North Dakota. We request that a copy of cultural resource site forms and reports be sent to this office so that the cultural resources archives can be kept current for researchers.

Thank you for your consideration. Consultation is with MHAN THPO. If you have any questions please contact Susan Quinnell, Review & Compliance Coordinator at (701)328-3576 or squinnell@nd.gov

Sincerely,

Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and Director, State Historical Society of North Dakota

c: Elgin Crows Breast, THPO MHAN
c: Brenda Shierts, BLM, Belle Fourche, SD

United States Department of Agriculture



Natural Resources Conservation Service
P.O. Box 1458
Bismarck, ND 58502-1458

August 30, 2011

Chad Baker
SWCA Environmental Consultants
295 Interlocken Boulevard, Suite 300
Broomfield, CO 80021

RE: Mandaree 111-07H
Mandaree 104-1716H
McKenzie County, ND

Dear Mr. Baker:

The Natural Resources Conservation Service (NRCS) has reviewed your letter dated August 15, 2011, concerning the above mentioned Mandaree wells and well pads in McKenzie County, North Dakota.

Important Farmlands - NRCS has a major responsibility with Farmland Protection Policy Act (FPPA) in documenting conversion of farmland (i.e., prime, statewide, and local importance) to non-agricultural use when the project utilizes federal funds. It appears your proposed project is not supported by federal funding; therefore, FPPA does not apply and no further action is needed.

Wetlands - The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose of, or to have the effect of, making agricultural production possible, loss of USDA benefits could occur. NRCS has developed the following guidelines for the installation of buried utilities. If these guidelines are followed, the impacts to the wetland(s) will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements: 1) Disturbance to the wetland(s) must be temporary, 2) no drainage of the wetland(s) is allowed (temporary or permanent), 3) mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained, 4) temporary side cast material must be placed in such a manner not to be dispersed in the wetland, and 5) all trenches must be backfilled to the original wetland bottom elevation.

Helping People Help the Land

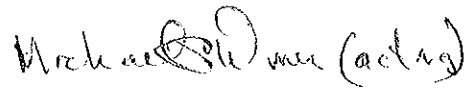
An Equal Opportunity Provider and Employer

Mr. Baker
Page 2

NRCS would recommend that impacts to wetlands be avoided. If the alignment of the project requires passage through a wetland, NRCS can complete a certified wetland determination, if requested by the landowner/operator.

If you have additional questions pertaining to FPPA, please contact Steve Sieler, Liaison Soil Scientist, NRCS, Bismarck, ND at 701-530-2019.

Sincerely,

A handwritten signature in black ink, appearing to read "Jerome M. Schaar (actg)". The signature is fluid and cursive, with the last name "Schaar" being the most prominent part.

JEROME M. SCHAAAR
State Soil Scientist/MO 7 Leader

United States Department of Agriculture



Natural Resources Conservation Service
P.O. Box 1458
Bismarck, ND 58502-1458

August 17, 2011

SWCA Environmental Consultants
Chad Baker
295 Interlocken Boulevard, Suite 300
Broomfield, Colorado 80021

RE: Proposed Bear Den 08-1621H
State Highway 22 and BIA Route 27 provide access to the location
McKenzie County, ND

Dear Mr. Baker:

The Natural Resources Conservation Service (NRCS) has reviewed your letter dated August 4, 2011, regarding previously approved Bear Den 08-21H be relocated to Bear Den 08-1621H in McKenzie County, North Dakota.

Important Farmlands - NRCS has a major responsibility with Farmland Policy Protection Act (FPPA) in documenting conversion of farmland (i.e., prime, statewide, and local importance) to non-agricultural use. It appears your proposed project is not supported by Federal funding or actions; therefore, no further action is required.

Wetlands – The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose of, or to have the effect of, making agricultural production possible, loss of USDA benefits could occur. NRCS has developed the following guidelines for the installation of buried utilities. If these guidelines are followed, the impacts to the wetland(s) will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements: 1) Disturbance to the wetland(s) must be temporary, 2) no drainage of the wetland(s) is allowed (temporary or permanent), 3) mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained, 4) temporary side cast material must be placed in such a manner not to be dispersed in the wetland, and 5) all trenches must be backfilled to the original wetland bottom elevation.

Helping People Help the Land

An Equal Opportunity Provider and Employer

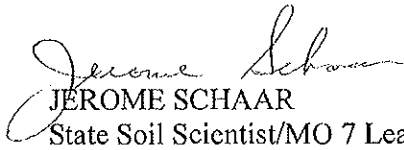
Mr. Baker

Page 2

NRCS would recommend that impacts to wetlands be avoided. If the project requires passage through or disturbance of a wetland, NRCS can complete a certified wetland determination, if requested by the landowner/operator.

If you have additional questions pertaining to FPPA, please contact Steve Sieler, State Soil Liaison, at (701) 530-2019.

Sincerely,


JEROME SCHAAR
State Soil Scientist/MO 7 Leader

From: Sorensen, Charles G NWO [mailto:Charles.G.Sorensen@usace.army.mil]
Sent: Friday, August 26, 2011 8:04 AM
To: Chad Baker
Cc: Ames, Joel O NWO
Subject: Mandaree 111-07H and 104-1716H Well Pad (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Chad

Thank you for letting the U.S. Army Corps of Engineers Garrison Dam/Lake Sakakawea Project comment on EOG's proposed Mandaree 111-07H and 104-1716H Well Pad locations. At this time the U.S. Army Corps of Engineers Garrison Dam/Lake Sakakawea Project request that consideration and if possible the implementation of the following management practices during the exploration phase of those wells listed in the request letter

Due to the close proximity of the well location to major drainages and tributaries that direct their water runoff either through or into lands managed by the U.S. Army Corps of Engineers (USACE) there is a high risk that said runoff from the well locations will enter the Missouri River/Lake Sakakawea. As such the USACE would request that EOG consider the construction/establishment of a impervious lined catch trench located on the down sloping side of the well pad. Said trench would help in containing any hazardous wastes from the well pad. Those fluids that accumulate in the trench should be pumped out and disposed of properly.

As previously mentioned the location of the proposed well site is in close proximity to lands managed by the USACE and as previously stated the possibility for contamination of the Missouri River/Lake Sakakawea is of great concern to this agency. To aid in the prevention of hazardous wastes from entering the aforementioned bodies of water, the USACE would strongly recommend that a Closed Loop Drilling Method be used in the handling of all drilling fluids, and that all cuttings be removed from the location as well.

Should living quarters be established onsite it is requested that all sewage collection systems be of a closed design and all holding tanks are to be either double walled or contained in a secondary containment system. All sewage waste removed from the well site location should be disposed of properly.

That all additional fill material required for the construction of the well pad should be obtained from a private supplier whose construction material has been certified as being free of all noxious weeds.

Prior to the drilling rig and associated equipment being moved/ placed that all equipment be either pressure washed or air blasted off Tribal lands to prevent the possible transportation of noxious or undesirable vegetation onto Tribal lands as well as USACE managed lands.

That no surface occupancy be allowed within ¼ mile of any known Threatened or Endangered Species critical habitat.

If possible, all construction activities should occur between August 15th and April 1st. If trees are present, the appropriate dates are August 15th - February 1st. By constructing during these dates, disruptions to wildlife during the breeding season maybe kept to a minimum.

Cumulative impacts are often overlooked, in the completion of NEPA compliance. To adequately assess cumulative impacts, the following activities should consider.

- a. Has the project area already been degraded, and if so, to what extent?
- b. Are other ongoing activities in the area causing impacts, and if so, to what extent?
- c. What is the likelihood that this project will lead to a number of associated projects?
- d. What are the trends for activities and impacts in the area?

If you have any questions regarding the above recommendations please feel free to contact me

Charles Sorensen
Natural Resource Specialist
U.S. Army Corps of Engineers
Garrison Dam/Lake Sakakawea Project
Riverdale, North Dakota Office
(701) 654 7411 ext 232

Classification: UNCLASSIFIED
Caveats: NONE

Chad Baker

From: Sorensen, Charles G NWO [Charles.G.Sorensen@usace.army.mil]
Sent: Thursday, August 18, 2011 7:12 AM
To: Chad Baker
Cc: Ames, Joel O NWO
Subject: EOG Mandaree, Clarks Creek and Bear Den Well Pad Locations

Chad

Thank you for letting the U.S. Army Corps of Engineers Garrison Dam/Lake Sakakawea Project comment on EOG Resources Mandaree s , Bear Den Clarks Creek and Riverview well locations within the Fort Berthold Reservation

At this time the U.S. Army Corps of Engineers Garrison Dam/Lake Sakakawea Project request that consideration and if possible implement the following management practices during the exploration phase of those wells listed in the request letter

Due to the close proximity of the well locations to lands managed by the U.S. Army Corps of Engineers (USACE) there is a high risk that any storm water runoff from the well location will enter the Missouri River/Lake Sakakawea. As such the USACE would request that EOG Resources consider the construction/establishment of a imperviously lined catch trench located on the down sloping side of the well pads. Said trench would help in containing any hazardous wastes from the well pad. Those fluids that accumulate in the trench should be pumped out and disposed of properly. In addition to the catch trench the USACE would also request that prior to pad construction that an impervious liner be placed over the proposed pad location.

As previously mentioned the location of the proposed well sites are extremely close to lands managed by the USACE and as previously stated the possibility for contamination of the Missouri River/Lake Sakakawea is of great concern to this agency. To aid in the prevention of hazardous wastes from entering the aforementioned bodies of water, the USACE would strongly recommend that a Closed Loop Drilling Method be used in the handling of all drilling fluids

Should living quarters be established onsite it is requested that all sewage collection systems be of a closed design and all holding tanks are to be either double walled or contained in a secondary containment system. All sewage waste removed from the well site location should be disposed of properly.

That all additional fill material required for the construction of the well pad is obtained from a private supplier whose material has been certified as being free of all noxious weeds.

Prior to the drilling rig and associated equipment being moved/ placed that all equipment be either pressure washed or air blasted off Tribal lands to prevent the possible transportation of noxious or undesirable vegetation onto Tribal lands as well as USACE managed lands.

That no surface occupancy be allowed within ½ mile of any known Threatened or Endangered Species critical habitat.

If possible, all construction activities should occur between August 15th and April 1st.

If trees are present, the appropriate dates are August 15th – February 1st. By constructing during these dates, disruptions to wildlife during the breeding season maybe kept to a minimum.

Cumulative impacts are often overlooked, in the completion of NEPA compliance. To adequately assess cumulative impacts, the following activities should consider.

- a. Has the project area already been degraded, and if so, to what extent?
 - b. Are other ongoing activities in the area causing impacts, and if so, to what extent?
 - c. What is the likelihood that this project will lead to a number of associated projects?
- d. What are the trends for activities and impacts in the area?

If you have any questions regarding the above recommendations please feel free to contact me

Charles Sorensen
Natural Resource Specialist
U.S. Army Corps of Engineers
Garrison Dam/Lake Sakakawea Project

Riverdale, North Dakota Office
(701) 654 7411 ext 232



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501



OCT - 6 2011

Mr. Chad Baker, Project Manager
SWCA Environmental Consultants
295 Interlocken Blvd., Suite 300
Broomfield, Colorado 80021

Re: Request for Review and Concurrence on
EOG Proposed Well Bear Den 08-1621H,
Ft. Berthold Reservation, McKenzie County,
North Dakota

Dear Mr. Baker:

This is in response to your August 8, 2011, scoping letter, regarding your request for review and concurrence for a proposed exploratory oil and gas well proposed to be drilled and completed by EOG Resources, Inc. (EOG) on the Fort Berthold Reservation, McKenzie County, North Dakota.

Specific location for the proposed pad is:

Bear Den 08-1621H: T. 150 N., R. 94 W., Section 21, McKenzie County

The Service provided comments on the Bear Den 08-21H well pad on December 8, 2010; the proposed Bear Den 08-1621H will replace that well pad. It is located approximately 1/8-mile northeast of the original location.

On September 20, 2011, the Service returned your August 8, 2011, letter with a stamp stating that we were unable to comment on the project due to insufficient information provided to allow adequate review. Several subsequent emails between Kara Altvater, of SWCA, and Heidi Riddle, of my staff, revealed a Service typing error when entering the project into our records, as well as omission of golden eagle nest survey results by SWCA. Their email correspondence ranging from September 14, 2011, through September 20, 2011, identifies and corrects these errors. The Service is responding to your request for review and concurrence on the Bear Den 08-1621H proposed well pad based on these corrections.

We offer the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.) (MBTA), the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.) (NEPA), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250) (BGEPA), Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds", and the Endangered Species Act (16 U.S.C. 1531 et seq.) (ESA).

Threatened and Endangered Species

In an e-mail dated October 13, 2009, the Bureau of Indian Affairs (BIA) designated SWCA Environmental Consultants (SWCA) to represent the BIA for informal Section 7 consultation under the ESA. Therefore, the U.S. Fish and Wildlife Service (Service) is responding to you as the designated non-Federal representative for the purposes of ESA, and under our other authorities as the entity preparing the NEPA document for adoption by the BIA.

Your letter states that the Bear Den 08-1621H proposed pad is located approximately 2.6 stream-miles from potential habitat for interior least tern, piping plover and pallid sturgeon. A setback distance of 1.0 stream-mile is believed to be adequate to contain most spills before product can reach the lake through draws and drainages. Therefore, the Service concurs with your "may affect, is not likely to adversely affect" determination for interior least tern, piping plover, pallid sturgeon and designated critical habitat for piping plover.

Your letter states that EOG has committed to ceasing work on the proposed site if a whooping crane(s) is sighted within 1.0 mile of the project area and immediately contacting the Service. Work may resume in coordination with the Service after the bird(s) leaves. Additionally, per BIA requirements, all new power lines must be buried. Therefore, the Service concurs with your "may affect, is not likely to adversely affect" determination for whooping crane.

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

The Dakota skipper and Sprague's pipit are candidate species for listing under the ESA; therefore, an effects determination is not necessary for these species. No legal requirement exists to protect candidate species; however, it is within the spirit of the ESA to consider these species as having significant value and worth protecting. Although not required, Federal action agencies such as the BIA have the option of requesting a conference on any proposed action that may affect candidate species such as the Dakota skipper and Sprague's pipit.

Migratory Birds

The letter states that EOG will implement the following measures to avoid/minimize take of migratory birds:

- Construction will be completed outside of the migratory bird nesting season (Feb. 1-July 15). If construction cannot be completed outside of the migratory bird nesting season, EOG will either:
 - Mow, maintain, or completely remove vegetation within the project area prior to and during the breeding season to deter migratory birds from nesting in the project area until construction is underway;
 - If the project areas are not mowed and maintained as indicated above, pre-construction surveys for migratory birds and their nests will be conducted within five days prior to the initiation of construction activities. If birds or nests are discovered, the Service will be contacted for additional information on how to proceed.

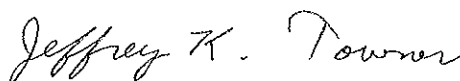
Bald and Golden Eagles

A September 15, 2011, email from Kara Altavater states that a ground survey for cliff, tree and ground raptor nests was conducted within line-of-sight of the proposed project. No eagles or nests were discovered within 0.5-mile of the project area. The eagle nest database maintained by North Dakota Game and Fish Department does not indicate any recorded eagle nests within 0.5-mile of the project area.

The Service believes the commitment to implement the aforementioned measures will assist in complying with the MBTA and the BGEPA.

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

Sincerely,



Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

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



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501



OCT - 6 2011

Chad Baker, Project Manager
SWCA Environmental Consultants
295 Interlocken Blvd., Suite 300
Broomfield, CO 80021

Re: EOG Mandaree 111-07H and Mandaree
104-1716H, Fort Berthold Reservation,
McKenzie County, North Dakota

Dear Mr. Baker:

This is in response to your August 15, 2011, scoping letter and request for concurrence regarding five proposed exploratory oil and gas wells on two pads proposed to be drilled and completed by EOG Resources, Inc. (EOG) on the Fort Berthold Reservation, McKenzie County, North Dakota.

Specific locations for the proposed pads are:

Mandaree 111-07H: T. 149 N., R. 94 W., SW¼ SE¼, Section 7

Mandaree 104-1716H: T. 149 N., R. 94 W., NE¼ NW¼, Section 17

We offer the following comments under the authority of and in accordance with the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 *et seq.*) (NEPA), the Endangered Species Act, as amended (16 U.S.C. 1531 *et seq.*) (ESA), Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*) (MBTA), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250) (BGEPA), and Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds."

Threatened and Endangered Species

In an e-mail dated October 13, 2009, the Bureau of Indian Affairs (BIA) designated SWCA Environmental Consultants (SWCA) to represent the BIA for informal Section 7 consultation under the ESA. Therefore, the U.S. Fish and Wildlife Service (Service) is responding to you as the designated non-Federal representative for the purposes of ESA, and under our other authorities as the entity preparing the NEPA document for adoption by the BIA.

Your letter states that the Mandaree 111-07H and Mandaree 104-1716H proposed pads are located approximately 18 stream-miles from potential habitat for interior least tern, piping plover and pallid sturgeon. A setback distance of 1.0 stream-mile is believed to be adequate to contain most spills before product can reach the lake through draws and drainages. Therefore, the Service concurs with your "may affect, is not likely to adversely affect" determination for interior least tern, piping plover, pallid sturgeon and designated critical habitat for piping plover.

Your letter states that EOG has committed to ceasing work on the proposed site if a whooping crane(s) is sighted within 1.0 mile of the project area and immediately contacting the Service. Work may resume in coordination with the Service after the bird(s) leaves. Additionally, per BIA requirements, all new power lines must be buried. Therefore, the Service concurs with your "may affect, is not likely to adversely affect" determination for whooping crane.

A black-tailed prairie dog town is present just east of the Mandaree 104-12H proposed well pad. Prairie dog towns are potential habitat for black-footed ferrets. EOG has also committed to avoiding any impacts to the prairie dog town. Therefore, the Service concurs with your "may affect, is not likely to adversely affect" determination for black-footed ferret.

The Service acknowledges your no effect determination for gray wolf.

The Dakota skipper and Sprague's pipit are candidate species for listing under the ESA; therefore, an effects determination is not necessary for these species. No legal requirement exists to protect candidate species; however, it is within the spirit of the ESA to consider these species as having significant value and worth protecting. Although not required, Federal action agencies such as the BIA have the option of requesting a conference on any proposed action that may affect candidate species such as the Dakota skipper and Sprague's pipit.

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within five days prior to the initiation of construction activities. If birds or nests are discovered, the Service will be contacted for additional information on how to proceed.

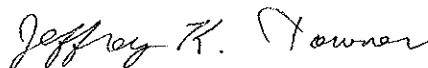
Bald and Golden Eagles

The letter states that a ground survey for cliff, tree and ground raptor nests was conducted within line-of-sight of the proposed project. No eagles or nests were discovered within 0.5-mile of the project area. The eagle nest database maintained by North Dakota Game and Fish Department does not indicate any recorded eagle nests within 0.5-mile of the project area.

The Service believes the commitment to implement the aforementioned measures will assist in complying with the MBTA and the BGEPA.

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

Sincerely,



Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

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

Notice of Availability and Appeal Rights

EOG: Bear Den 08-1621H Pad (4 wells)

Mandaree 111-07H Pad (3 wells)

Mandaree 104-1716H Pad (2 wells)

The Bureau of Indian Affairs (BIA) is planning to issue administrative approvals related to installation of nine oil and gas Bakken and Three Forks Oil Wells atop three pads as shown on the attached map. Construction by EOG is expected to begin in 2011.

An environmental assessment (EA) determined that proposed activities will not cause significant impacts to the human environment. An environmental impact statement is not required. Contact Earl Silk, 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 December 22, 2011, by contacting:

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

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

Project locations:

