

ENVIRONMENTAL ASSESSMENT

United States Bureau of Indian Affairs

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



Simray

Three Bakken Formation Exploratory Wells at Three Locations:

**Soward 1-05H
Levings Estate 1-08H
JM Hall 1-19H**

Fort Berthold Indian Reservation

October 2009

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

October 2009.

Finding of No Significant Impact

Simray

**Soward 1-05H
Levings Estate 1-08H
JM Hall 1-19H**

Fort Berthold Indian Reservation Dunn County, North Dakota

The U.S. Bureau of Indian Affairs (BIA) has received a proposal for three oil/gas wells, access roads and related infrastructure on the Fort Berthold Indian Reservation to be located in Section 5 of Township 149 North, Range 93 West, Section 8 of Township 149 North, Range 93 West, and Section 19 of Township 148 North, Range 93 West. Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

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

This determination is based on the following factors:

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


Regional Director

10-7-09
Date

Notice of Availability and Appeal Rights

Simray: Soward 1-05H
Levings Estate 1-08H
JM Hall 1-19H

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

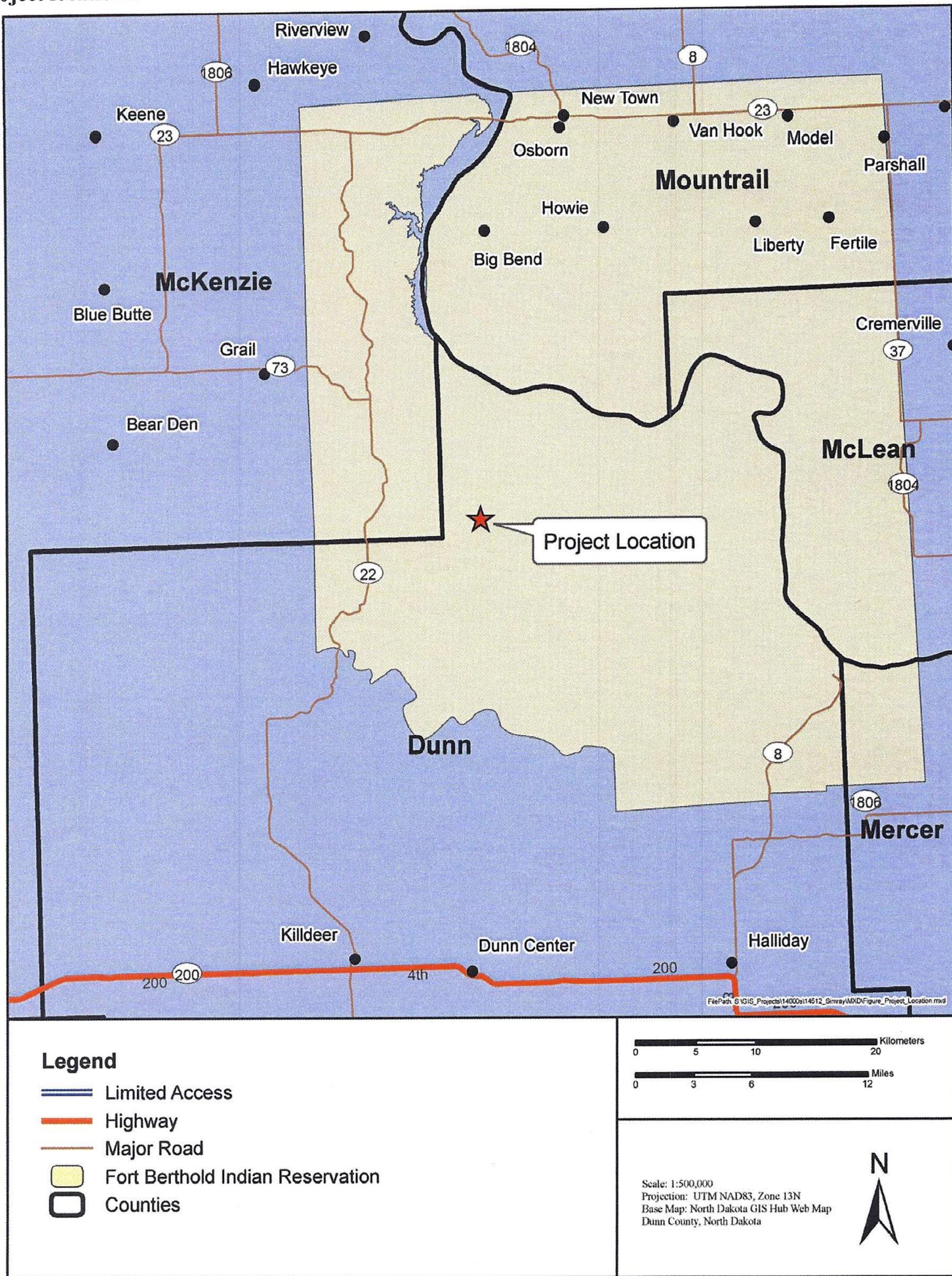
An environmental assessment (EA) determined that proposed activities will not cause significant impacts to the human environment. An environmental impact statement is not required. Contact Howard Bemer, Superintendent at 701-627-4707 for more information and/or copies of the EA and the Finding of No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

The FONSI is only a finding on environmental impacts – it is not a decision to proceed with an action and *cannot* be appealed. BIA's decision to proceed with administrative actions *can* be appealed until November 7, 2009, 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.





United States Department of the Interior

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



IN REPLY REFER TO:

DESCRM
MC-208

OCT 07 2009

MEMORANDUM

TO: Superintendent, Fort Berthold Agency

FROM: Regional Director, Great Plains Region 

SUBJECT: Environmental Assessment and Finding of No Significant Impact

In compliance with the regulations of the National Environmental Policy Act (NEPA) of 1969, as amended, for three proposed exploratory drilling wells by Simray on *Soward 1-05H, Levings Estate 1-08H and JM Hall 1-19H* on the Fort Berthold Reservation, an Environmental Assessment (EA) has been completed and a Finding of No Significant Impact (FONSI) has been issued.

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

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

Attachment

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

ENVIRONMENTAL ASSESSMENT

United States Bureau of Indian Affairs

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



Simray

Three Bakken Formation Exploratory Wells at Three Locations:

**Soward 1-05H
Levings Estate 1-08H
JM Hall 1-19H**

Fort Berthold Indian Reservation

October 2009

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

Finding of No Significant Impact

Simray

**Soward 1-05H
Levings Estate 1-08H
JM Hall 1-19H**

**Fort Berthold Indian Reservation
Dunn County, North Dakota**

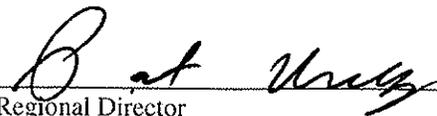
The U.S. Bureau of Indian Affairs (BIA) has received a proposal for three oil/gas wells, access roads and related infrastructure on the Fort Berthold Indian Reservation to be located in Section 5 of Township 149 North, Range 93 West, Section 8 of Township 149 North, Range 93 West, and Section 19 of Township 148 North, Range 93 West. Associated federal actions by BIA include determinations of effect regarding cultural resources, approvals of leases, rights-of-way and easements, and a positive recommendation to the Bureau of Land Management regarding the Applications for Permit to Drill.

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

This determination is based on the following factors:

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

ACTING Regional Director



Date

10-7-09

TABLE OF CONTENTS

1.	Purpose and Need for the Proposed Action	1
2.	Proposed Action and Alternatives	3
2.1	Field Camps	3
2.2	Access Roads	3
2.3	Well Pads	7
2.4	Drilling	9
2.5	Casing and Cementing	10
2.6	Completion and Evaluation	10
2.7	Commercial Production	10
2.8	Reclamation	11
2.9	Construction Details at Individual Sites	13
2.10	Preferred Alternative	19
3.	The Affected Environment and Potential Impacts	20
3.1	No Action Alternative	20
3.2	Air Quality	21
3.3	Public Health and Safety	22
3.4	Water Resources	24
3.5	Wetland/Riparian Habitat and Threatened or Endangered Species	34
3.6	Soils	35
3.7	Vegetation and Invasive Species	37
3.8	Cultural Resources	38
3.9	Socio-Economics	39
3.10	Environmental Justice	41
3.11	Mitigation and Monitoring	42
3.12	Irreversible and Irrecoverable Commitment of Resources	42
3.13	Short-Term Use Versus Long-Term Productivity	42
3.14	Cumulative Impacts	42
4.0	Consultation and Coordination	46
5.0	List of Preparers	51
6.0	References and Acronyms	52
	Attachment A.....	56
	Attachment B.....	60

Tables

2a	Surface and Mineral Ownership of the Exploratory Well Sites	3
2b	Distance and Direction from the Wells to Nearby Towns	3
3	Drilling Information for Three Middle Bakken Exploratory Wells	9
3.2	Air Quality Standards and Data for Dunn, McKenzie, and Mercer Counties, ND.....	21
3.3a	Distance from Wells to Nearest Homes	22
3.3b	Number of Homes within a 5-mile Radius of Each Proposed Well	22
3.4a	Common Domestic and Stock Aquifers in Dunn County (Croft 1985)	27
3.4b	Existing Water Wells within One Mile of the Project Area	27
3.5a	Potential Effect of Threatened and Endangered Species to Occur	34
3.5b	Straight-line Distance to Lake Sakakawea and the Little Missouri River	34
3.6a	Percentage of the Project Area Comprising Specific Soil Types	37
3.9a	Population and Demographics	39
3.9b	Income and Unemployment	40
3.9c	Housing Units-2000 (U.S. Census Bureau 2007-2008)	40
3.14a	Confidential, Active, and Permitted Wells within a 1, 5, 10, & 20 mile Radius	44
3.14b	Nearest Active, Confidential, Dry, and Water Wells to Proposed Well Sites	44

Figures

1	Project Locations	2
2.2a	Proposed Access Road to JM Hall 1-19H Location Looking South.....	4
2.2b	Proposed Access Road to JM Hall 1-19H Location looking North.....	5
2.2c	Proposed Access Road to JM Hall 1-19H Location Looking West.....	5
2.2d	Proposed Access Road to Soward 1-05H Well Site.....	6
2.2e	Proposed Access Road to Levings Estate 1-08H Well Site.....	6
2.3a	J.M. Hall 1-19H Pad Location Overview, Facing South.....	7
2.3b	Soward 1-05H Well Pad Location Overview, Facing South.....	8

2.3c	Levings Estage 1-08H Well Pad Location Overview, Facing East	8
2.4	Typical Drilling Rig	9
2.7	Typical Commercial Operation	10
2.8	Example of Reclamation from the Gold Book	12
2.9a	Topographic Map of J.M. Hall 1-19H, Showing Spacing Units	13
2.9b	J.M. Hall 1-19H Project Map	14
2.9c	Topographic Map of Soward 1-05H, Showing Spacing Units	15
2.9d	Soward 1-05H Project Map	16
2.9e	Topographic Map of Levings Estate 1-08H, Showing Spacing Units	17
2.9f	Levings Estate 1-08H Project Map	18
3.4a	Runoff Direction-JM Hall 1-19H	25
3.4b	Runoff Direction-Soward 1-05H and Levings Estate 1-08H	26
3.4c	Watersheds, Aquifers, and Water Wells	33
3.14	Active, confidential and permitted wells within a 5-, 10-, and 20 mile radius	43

1. Purpose and Need for the Proposed Action

Simray Production Company, LP (Simray) is proposing to drill three (3) oil/gas wells on the Fort Berthold Indian Reservation (Reservation) to evaluate and possibly develop the commercial potential of natural resources. Developments have been proposed on allotted land and land held in trust by the United States in Dunn County, North Dakota. The BIA is the surface management agency for potentially affected tribal lands and individual allotments. The BIA also holds title to subsurface mineral rights. As illustrated in Figure 1, developments have been proposed in the following locations:

- **Soward 1-05H:** SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 5, T149N, R93W, Dunn County, North Dakota
- **Levings Estate 1-08H:** SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 8, T149N, R93W, Dunn County, North Dakota
- **JM Hall 1-19H:** NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 19, T148N, R93W, Dunn County, North Dakota

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

These proposed federal actions require compliance with the *National Environmental Policy Act* of 1969 (NEPA) and regulations of the Council on Environmental Quality (CEQ, 40 CFR 1500-1508). Analysis of the proposed projects' potential to impact the human environment will be documented and will guide federal decision making. APDs submitted by Simray, included in Section 8 of this document, describe developmental, operational and reclamation procedures and practices that contribute to the technical basis of this Environmental Assessment (EA). The procedures and practices described in the applications are critical elements in both the project proposals and the BIA's decisions regarding environmental impacts. This EA will result in either a Finding of No Significant Impact (FONSI) or a decision to prepare an Environmental Impact Statement (EIS).

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

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

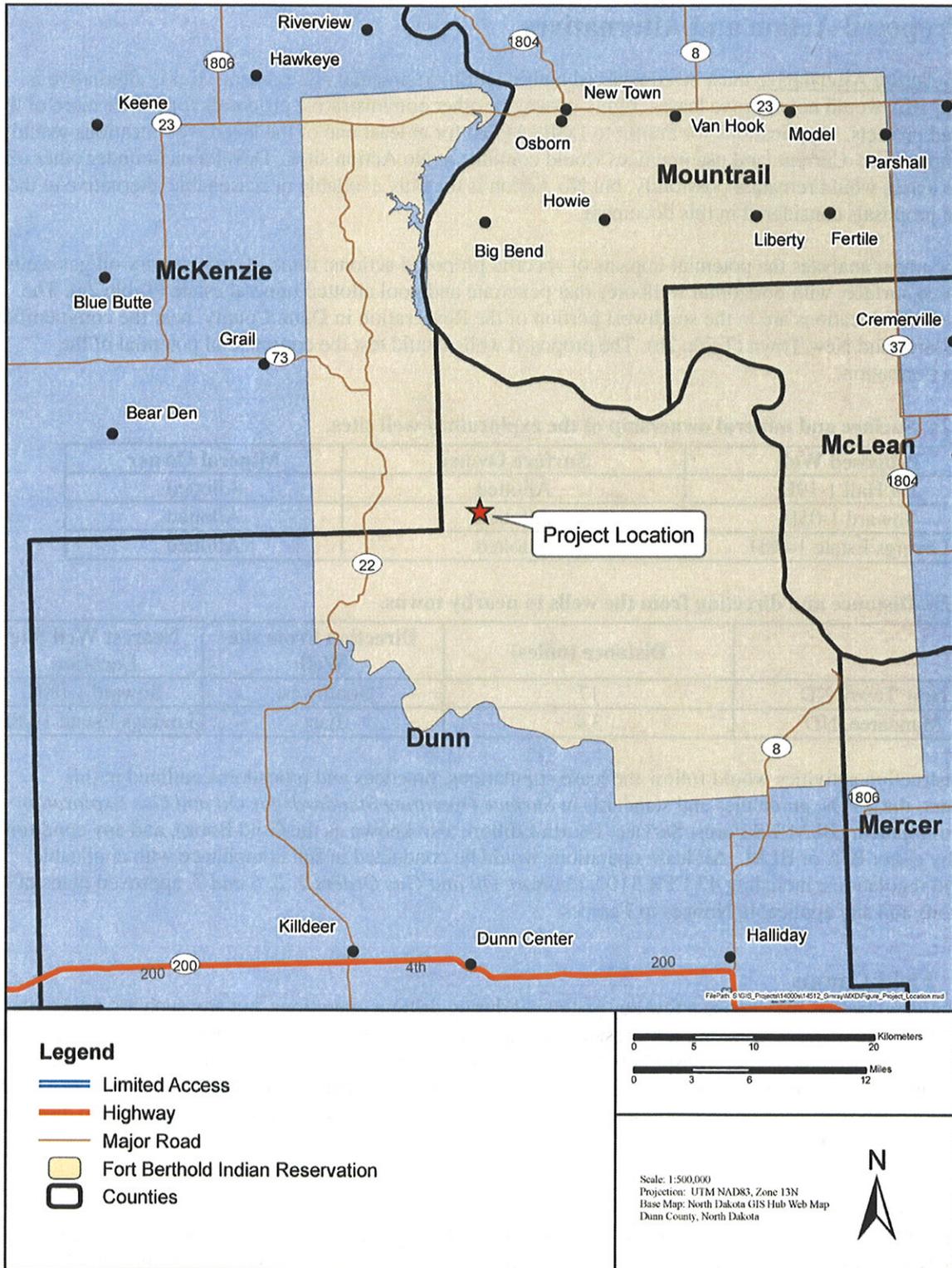


Figure 1: Project locations.

2. Proposed Action and Alternatives

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

This document analyzes the potential impacts of specific proposed actions: three (3) exploratory oil/gas wells, on allotted surface, with horizontal wellbores that penetrate and pool allotted mineral estate (Table 2a). The proposed well locations are in the southwest portion of the Reservation in Dunn County, near the communities of Mandaree and New Town (Table 2b). The proposed wells would test the commercial potential of the Bakken Formation.

Table 2a. Surface and mineral ownership of the exploratory well sites.

Proposed Well	Surface Owner	Mineral Owner
JM Hall 1-19H	Allotted	Allotted
Soward 1-05H	Allotted	Allotted
Levings Estate 1-08H	Allotted	Allotted

Table 2b. Distance and direction from the wells to nearby towns.

	Distance (miles)	Direction From the Well	Nearest Well Site Location
New Town, ND	17	Southwest	Soward 1-05H
Mandaree, ND	3.4	East	Levings Estate 1-08H

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

2.1 Field Camps

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

2.2 Access Roads

Up to 5,128 feet (0.97 miles) of existing access roads would be upgraded and up to 13,350 feet (2.53 miles) of new access roads would be constructed to the three proposed well locations. Signed agreements would be in place allowing road construction across affected surface allotments and private land surfaces, and any applicable approach permits and/or easements would be obtained prior to any construction activity. A maximum disturbed ROW width of 66 feet for each access road would result in up to 28.0 acres of surface disturbance. Access to the JM Hall 1-19H location would begin at the north end of an improved road that connects to BIA 17. Access to the Soward 1-05H location connects to BIA 10. Access to the Levings Estate 1-

08H location connects to BIA 12. Simray would reclaim the disturbance back to approximately 20 feet, leaving a roadway of approximately 15 feet in width. Photographs of the proposed road alignments are provided in Figures 2.2a through 2.2e.

Construction would follow road design standards outlined in the BLM guidebook *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (The Gold Book) (USDI and USDA 2007). Care would be taken during road construction to avoid disturbing or disrupting any buried utilities that may exist along BIA Roads 10, 12, 14, and Loop 17. Details of road construction are addressed in the APDs.



Figure 2.2a: Proposed access road to the JM Hall 1-19H location from the top of the hill looking south to existing Peak wells.

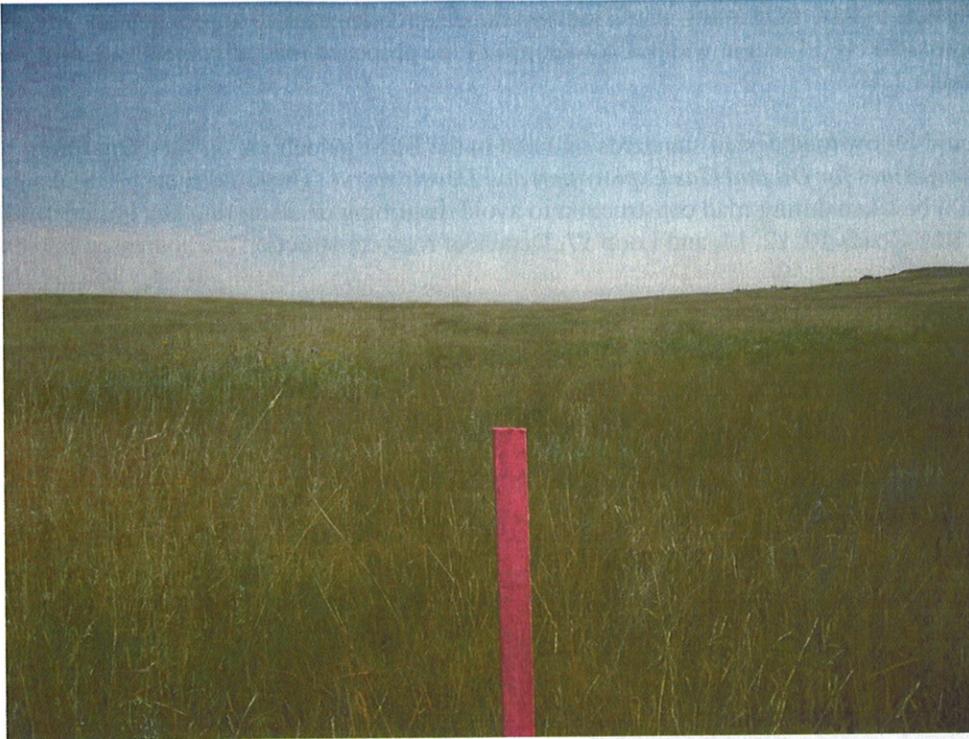


Figure 2.2b: Proposed access road to the JM Hall 1-19H location looking north to the existing primitive road.



Figure 2.2c: Proposed access road to the JM Hall 1-19H location looking west at the intersection of the primitive road and the proposed new construction.



Figure 2.2d: Proposed Access Road to the Soward 1-05H Well Site.



Figure 2.2e: Proposed Access Road to the Levings Estate 1-08H Well Site.

2.3 Well Pads

The proposed well pads would consist mainly of 1) an area leveled for the drilling rig and related equipment; and 2) a pit excavated for drilling fluids and drill cuttings. Well pad areas would be cleared of vegetation, stripped of topsoil and graded to the specifications in the approved APDs. Topsoil would be stockpiled and stabilized until disturbed areas were reclaimed and re-vegetated. Excavated subsoil would be used in pad construction, with the finished well pads graded to ensure positive water drainage away from the drill site. Erosion control would be maintained through prompt re-vegetation and by constructing all necessary surface water drainage controls, including berms, diversion ditches and waterbars.

The leveled well pads used for drilling and completion operations (including a reserve pit for drill cuttings) would each disturb an area approximately 420 by 300 feet (2.89 acres). Cut and fill slopes on the edges of the pads could cause an extra 1 acre of disturbance, resulting in a total possible disturbance of 9.67 acres. Other details of pad construction and reclamation are diagrammed in the attached pad layout diagrams and in the Surface Use Plan attached to each APD. Photographs of the proposed pad locations are provided in Figures 2.3a through 2.3c.



Figure 2.3a: J.M. Hall 1-19H Well Pad Location Overview, Facing South.



Figure 2.3b: Soward 1-05H Well Pad Location Overview, Facing South.



Figure 2.3c: Levings Estate 1-08H Well Pad Location Overview, Facing East.

2.4 Drilling

After securing mineral leases, Simray submitted the APDs to the BLM on October 29, 2008.

Table 3: Drilling Information for Three Middle Bakken Exploratory Wells

Well ID	Initial Vertical Depth (feet)	Setback minimum achieved by directional drilling (feet)	Depth (vertical) at which drilling would become roughly horizontal (feet)	Depth (measured) at which drilling would become roughly horizontal (feet)	Completed drill string measured depth (feet)
J.M. Hall 1-19H	10,361	550	10,770	11,005	15,283
Soward 1-05H	10,375	550	10,784	11,018	15,279
Levings Estate 1-08H	10,365	550	10,771	10,980	15,092

The Middle Bakken drilling targets for the three proposed wells are as follows:

- J.M. Hall 1-19H: 550 feet from the south line (FSL) and 1,910 feet from the west line (FWL) in the SE ¼ SW ¼ of Section 19, T148N, R93W; approximately 4,689 feet southeast of the surface location.
- Soward 1-05H: 550 feet from the north line (FNL) and 550 feet FWL in the NW ¼ NW ¼ of Section 5, T149N, R93W; approximately 4,672 feet northwest of the surface.
- Levings Estate 1-08H: 550 feet FNL and 2,090 feet from the east line (FEL) in the NW ¼ NE ¼ of Section 8, T149N, R93W; approximately 4,634 feet northwest of the surface location.

Rig transport and on-site assembly for each well would take roughly seven days. Drilling would require about 35 days to reach target depth, using a rotary drilling rig rated for drilling to approximately 15,100 feet (measured depth). For the first 1,975 feet drilled, a freshwater-based mud system with non-hazardous additives would be used to minimize contaminant concerns. Water would be obtained from a commercial source for this drilling stage, using approximately 1.27 gallons of water per foot drilled (totaling 2,500 gallons).

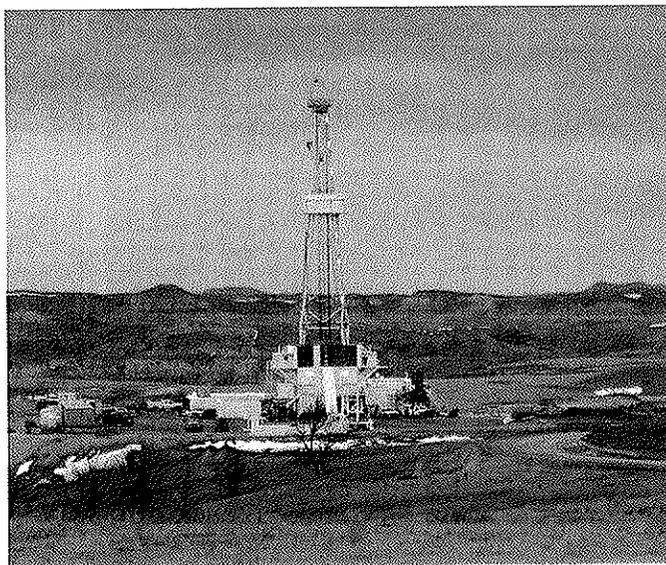


Figure 2.4: Typical Drilling Rig

After setting and cementing the near-surface casing, an oil-based mud system (80% diesel fuel and 20% water) would be drilled down to about 10,980 feet. Oil-based drilling fluids can reduce the potential for hole sloughing while drilling through water-sensitive formations (shales). Approximately 400 gallons of water and 1,600 gallons of diesel fuel would be used to complete vertical drilling. The lateral reach of the borehole would be drilled using 3,500 gallons of fresh water as mud and adding polymer sweeps as necessary to clean the hole. On the surface, toxic fluids would be contained in steel tanks placed on plastic/vinyl liners, then collected during drilling by centrifuging returns to separate the cuttings from fluids. Fluids would be recycled back into the steel tanks for re-use. Upon completion of drilling operations at each location, oil-based fluids would be collected to

the extent possible and recycled for use elsewhere. Any free fluids remaining in the reserve pits would be removed and disposed of in accordance with North Dakota Industrial Commission (NDIC) rules and regulations.

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

2.5 Casing and Cementing

Surface casing for each well would be set at an approximate depth of 1,975 feet and cemented back to the surface during drilling, isolating all near-surface freshwater aquifers in the project area. A 7-inch production casing would be installed to a depth of approximately 10,980 feet. The casing would be cemented from 10,980 feet up to 500 feet above the Dakota Formation, approximately 4,550 feet from the surface. A 4.5-inch liner would be installed along the horizontal extent of the borehole. Casing and cementing operations would be conducted in full compliance with *Onshore Oil and Gas Order 2*.

2.6 Completion and Evaluation

After a well has been drilled and cased, a completion (work-over) unit would be moved onto the site. For wells of the depth proposed, about thirty (30) days are usually needed to clean out the well bore, pressure test the casing, perforate and fracture the horizontal portion of the hole, and run production tubing for commercial production. If the target formation is to be fractured to stimulate production, the typical procedure is to pump a mixture of sand and a carrier (e.g., water and/or nitrogen) under extreme pressure downhole. The resulting fractures are propped open by the sand, increasing the capture zone of the well and maximizing efficient drainage of the field. After fracturing, the well is typically flowed back to the surface to recover the fracture fluids and remove excess sand. Fluids utilized in the completion procedure would be captured either in the reserve pit or in tanks for disposal in strict accordance with NDIC rules and regulations.

2.7 Commercial Production

If drilling, testing, and production support commercial production from any of the three proposed locations, additional equipment would be installed, including a pumping unit at the well head, a vertical heater/treater,



Figure 2.7: Typical Commercial Operation

tanks (six 400-barrel steel tanks), and a flare pit. Initially, oil would be collected in tanks and periodically trucked to an existing oil terminal for sales. Any produced water would be captured in tanks and periodically trucked to an approved disposal site. The frequency of trucking activities for both product and water would depend upon volumes and rates of production. Simray anticipates each of the three proposed wells would produce approximately 500 barrels (bbls) of oil per day, dropping to approximately 250 bbls per day after the first six

months. Produced water, mostly recovered frac fluids, would flow at a rate

of approximately 300 bbls per day, dropping to only 2 bbls per day after the first six months. In the future, Simray would complete a ROW application for oil and water pipelines and for an electric line, all of which would be located within existing disturbances along access and arterial roads.

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

2.8 Reclamation

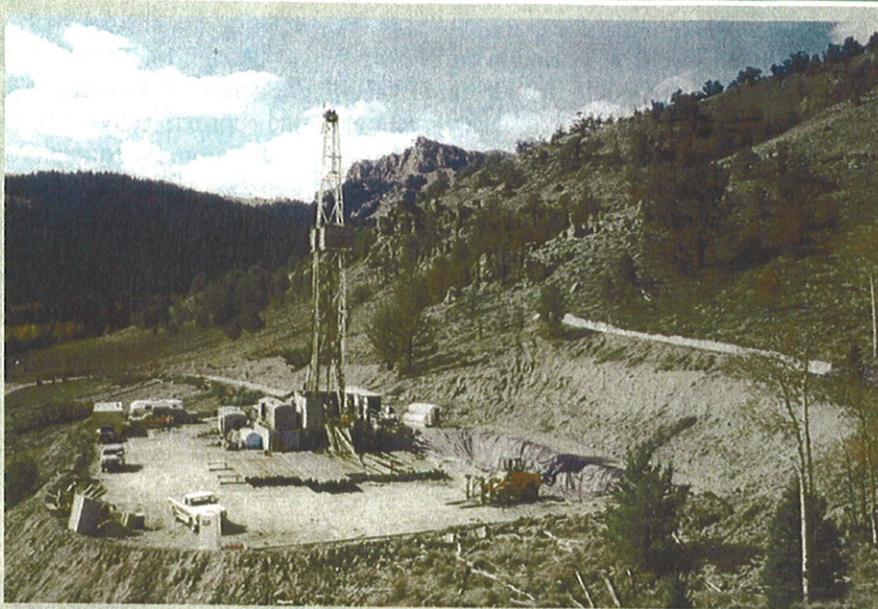
The reserve pit and drill cuttings would be treated, solidified, backfilled and buried as soon as possible after well completion. Any oily residue is dispersed and captured, preventing coalescence and release to the environment at significant rates in the future. Controlled mixing of cuttings with a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

If commercial production equipment is installed, the well pad would be reduced in size to about 300' x 200', with the rest of the original pad reclaimed. The working area of each well pad and the running surface of access roads would be surfaced with scoria or crushed rock obtained from a previously approved location. Other interim reclamation measures to be accomplished within the first year include reduction of the cut and fill slopes, redistribution of stockpiled topsoil, installation of erosion control measures, and reseeded. The back slope portions of roads would be covered with stockpiled topsoil and re-seeded with a seed mixture determined by the BIA, reducing the residual access-related disturbance to about 28' wide.

Final reclamation would occur either in the very short term if the proposed well is commercially unproductive, or later upon final abandonment of commercial operations. All disturbed areas would be reclaimed, reflecting the BIA view of oil and gas exploration and production as temporary intrusions on the landscape. All facilities would be removed, well bores would be plugged with cement and dry hole markers would be set. Access roads and work areas would be leveled or backfilled as necessary, scarified, re-contoured and re-seeded. Exceptions to these reclamation measures might occur if the BIA approves assignment of an access road either to the BIA roads inventory or to concurring surface allottees. The Surface Use Plan within each APD contains additional details regarding both interim and final reclamation measures. Figure 2.8 shows an example of reclamation from the Gold Book.

48

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



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



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

Figure 2.8: Example of reclamation from the Gold Book

2.9 Construction Details at Individual Sites

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

J.M. Hall 1-19H

The proposed J.M. Hall 1-19H well would be located in the NW¼NW¼ of Section 19, T148N, R93W and would access a 320-acre spacing unit that would include the SE¼SW¼ of Section 19. Existing improved access from Loop 17 would not need to be upgraded. A new section of road approximately 3,618 feet long would have to be constructed from the existing access to the proposed well location. Photographs of the proposed well location and access road are provided in Figures 2.2a through 2.2c and 2.3a. Vertical drilling would initially be completed at approximately 10,361 feet, at which point drilling would turn roughly horizontal to an approximate total vertical depth (TVD) of 10,770 feet. The entire drill string would total approximately 15,283 feet at the TVD, including approximately 4,922 feet of lateral reach into the Middle Bakken Formation, terminating at the bottom hole location in the SE¼SW¼ of Section 19 (Figure 2.9a). The project location is shown in Figure 2.9b.

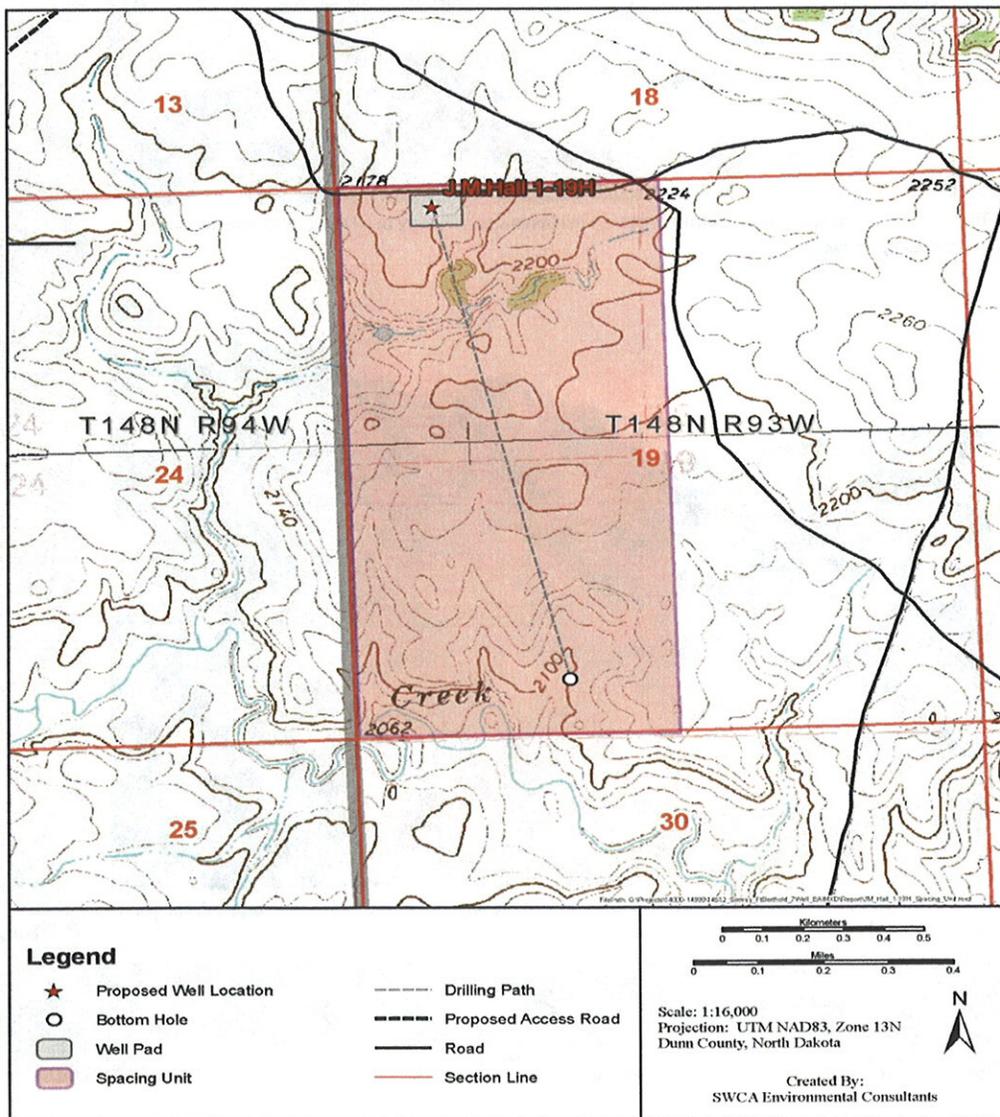


Figure 2.9a: Topographic Map of J.M. Hall 1-19H, showing spacing units

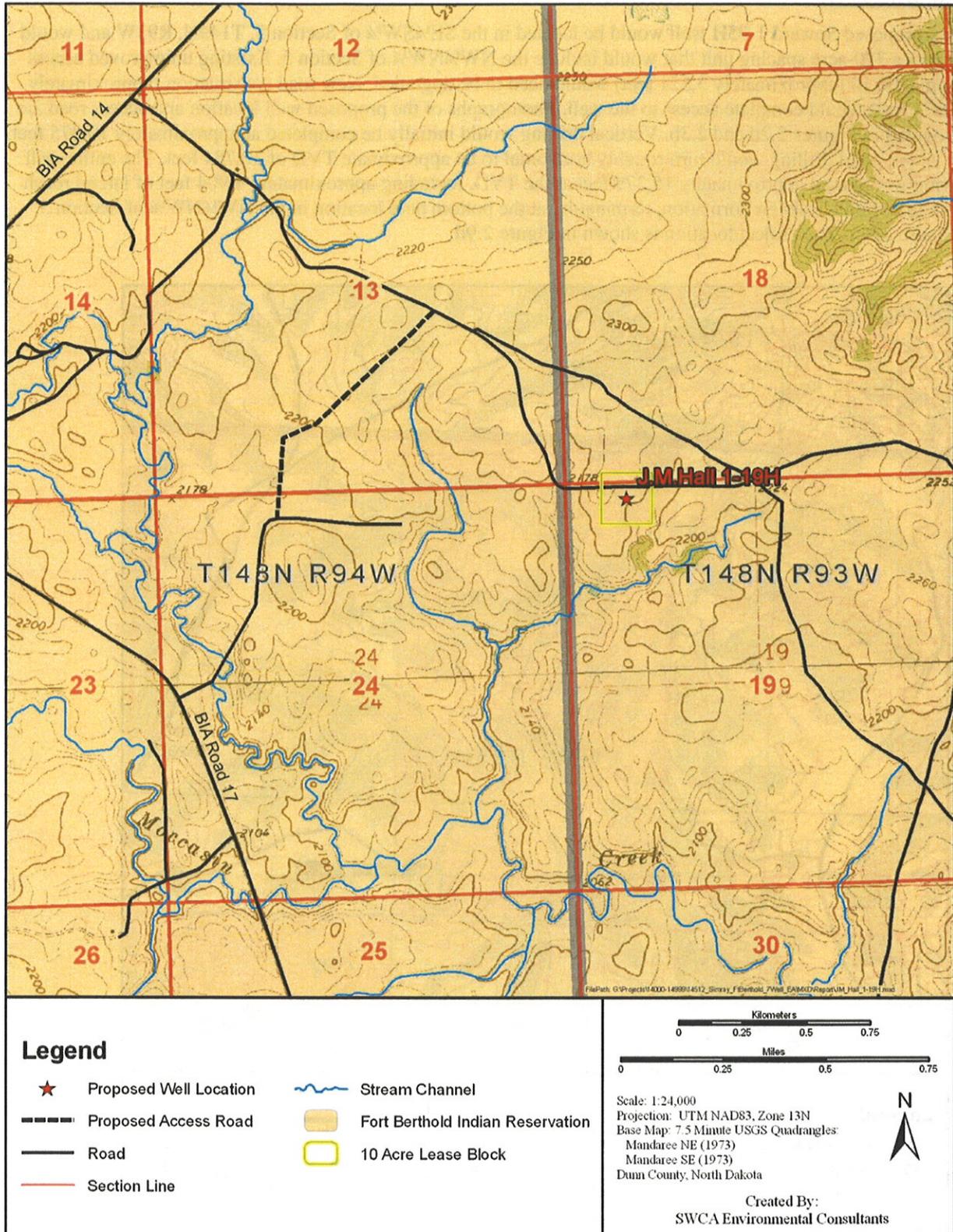


Figure 2.9b: JM Hall 1-19H project map

Soward 1-05H

The proposed Soward 1-05H well would be located in the SE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 5, T149N, R93W and would access a 320-acre spacing unit that would include the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 5. Existing unimproved access from BIA 10 (approximately 3,521 feet) would need to be upgraded. New road construction (approximately 4,073 feet) would complete access to the well. Photographs of the proposed well location and access road are provided in Figures 2.2d and 2.3b. Vertical drilling would initially be completed at approximately 10,375 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,784 feet. The entire drill string would total approximately 15,279 feet at the TVD, including approximately 4,904 feet of lateral reach into the Middle Bakken Formation, terminating at the bottom hole location in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 5 (Figure 2.9c). The project location is shown in Figure 2.9d.

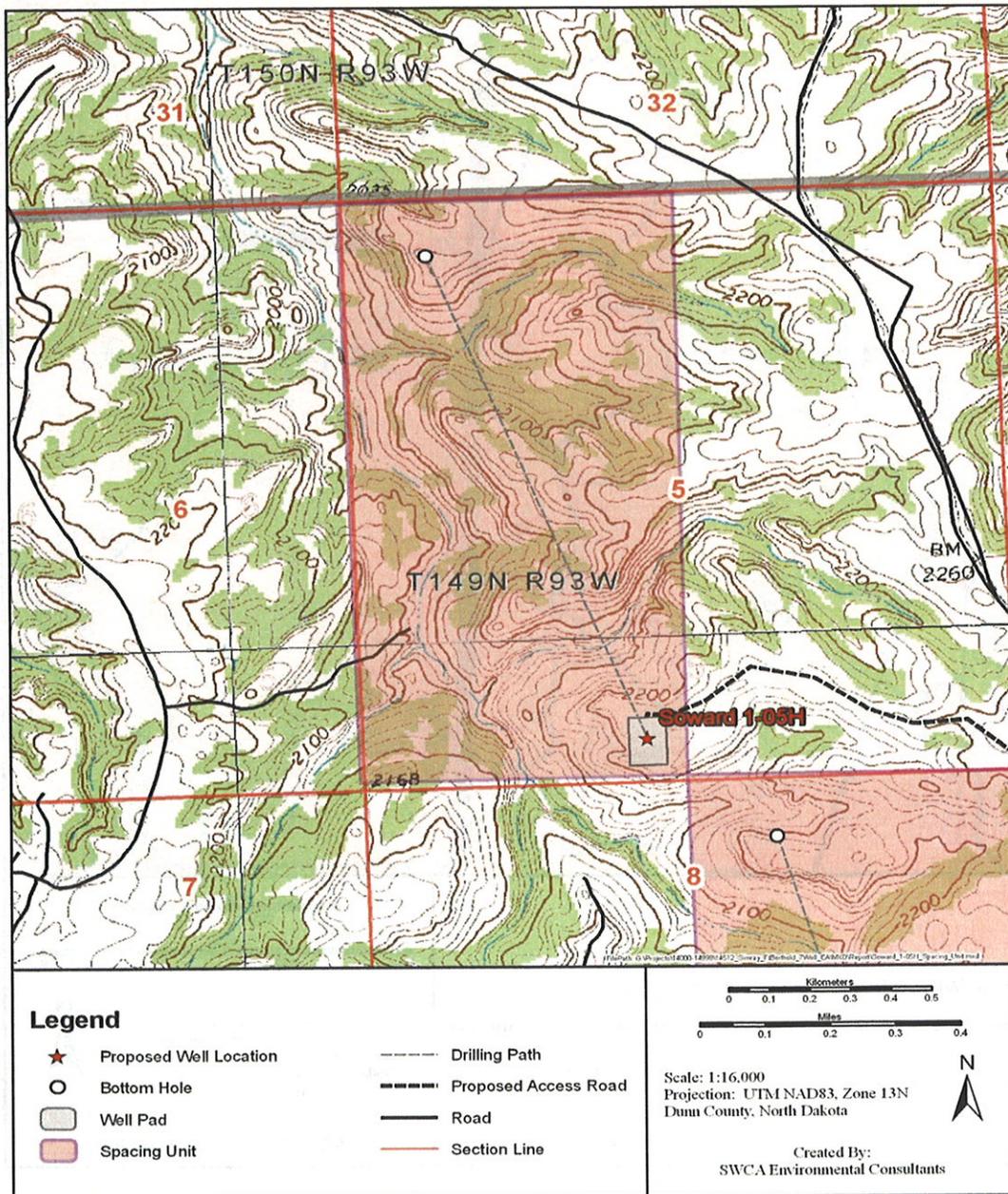


Figure 2.9c: Topographic Map of Soward 1-05H, showing spacing units

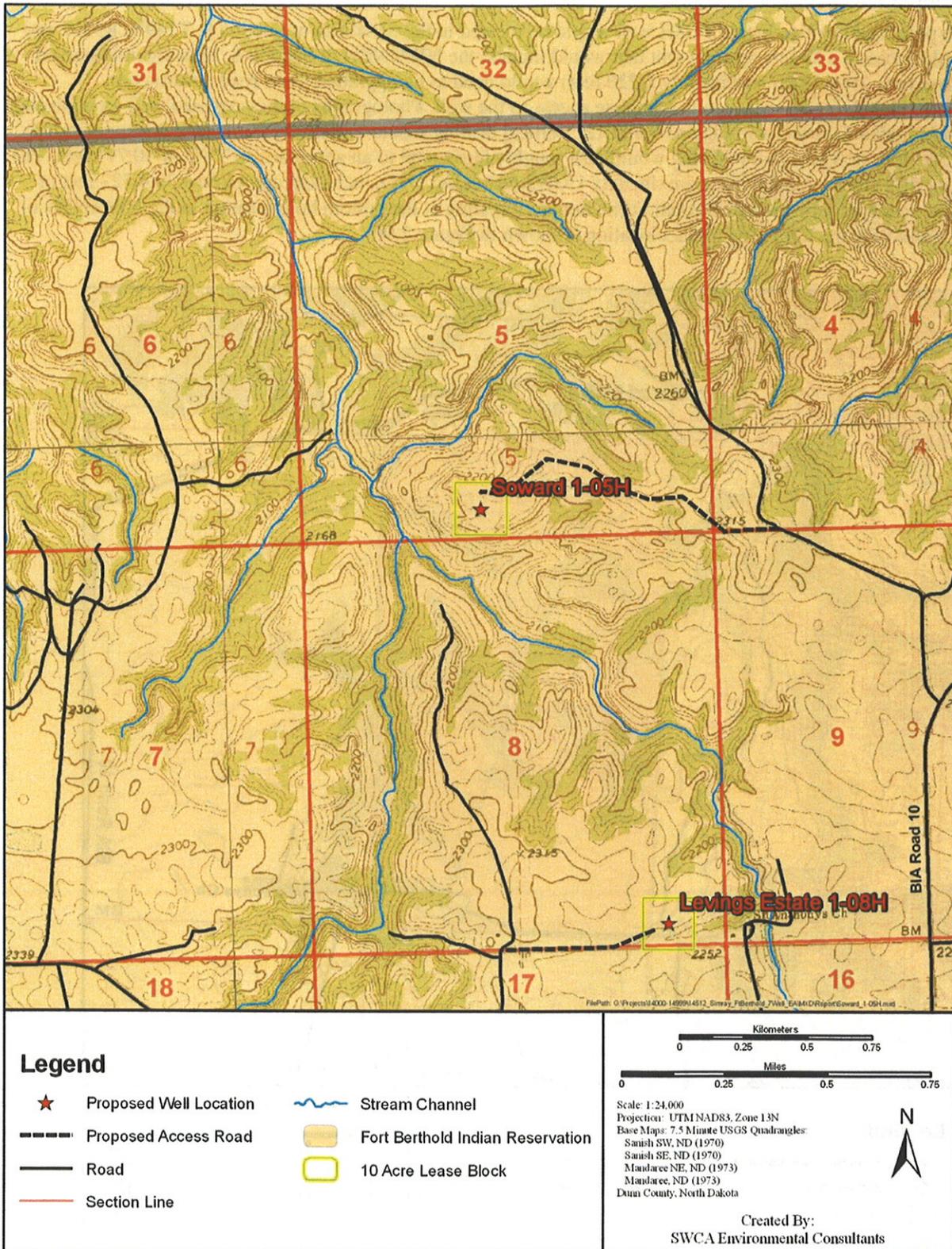


Figure 2.9d: Soward 1-05H project map

Levings Estate 1-08H

The proposed Levings Estate 1-08H well would be located in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 8, T149N, R93W and would access a 320-acre spacing unit that would include the NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 8. Existing unimproved access from BIA 12 (approximately 1,720 feet) would need to be upgraded. New road construction (approximately 2,025 feet) would complete access to the well. Photographs of the proposed well location and access road are provided in Figures 9 and 12. Vertical drilling would initially be completed at approximately 10,365 feet, at which point drilling would turn roughly horizontal to an approximate TVD of 10,771 feet. The entire drill string would total approximately 15,092 feet at the TVD, including approximately 4,727 feet of lateral reach into the Middle Bakken Formation, terminating at the bottom hole location in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 8 (Figure 2.9e). The project location is shown in Figure 2.9f.

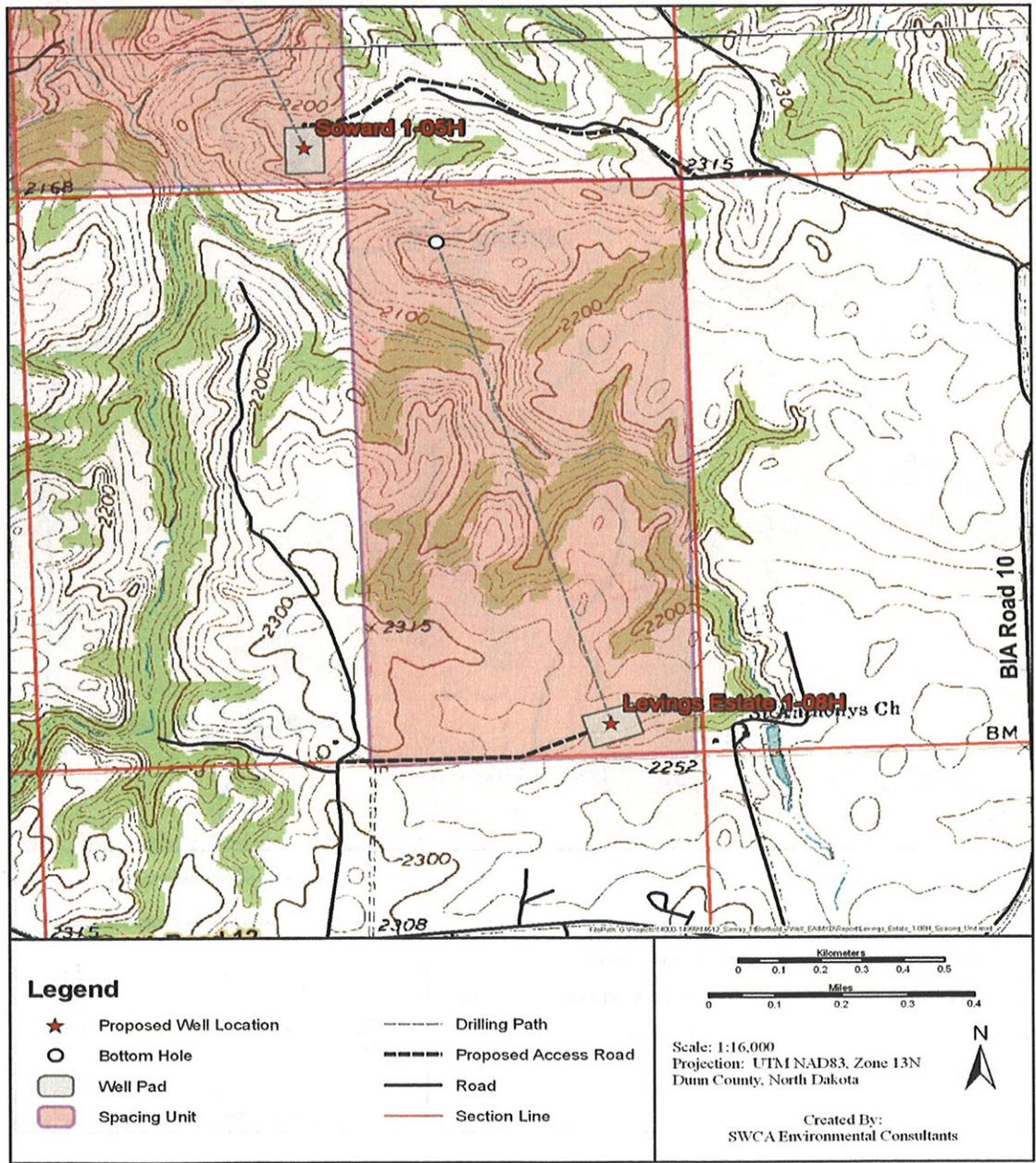


Figure 2.9e: Topographic Map of Levings Estate 1-08H, showing spacing units

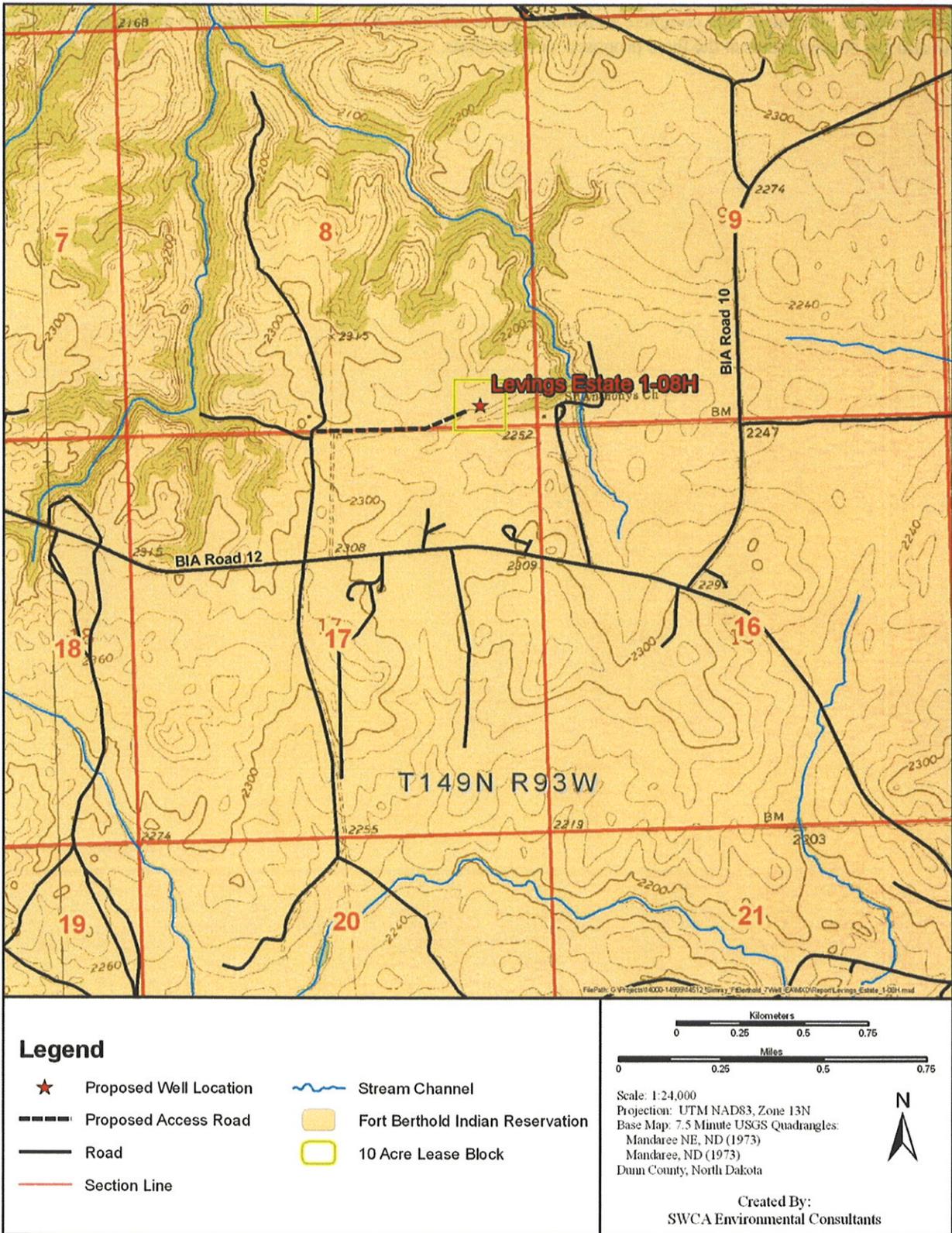


Figure 2.9f: Levings Estate 1-08H project map

2.10 Preferred Alternative

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

3. The Affected Environment and Potential Impacts

The Fort Berthold Indian Reservation is the home of the Three Affiliated Tribes of the MHA Nation. Located in west-central North Dakota, the Reservation encompasses more than one million acres, of which almost half are held in trust by the United States for either the MHA Nation or individual allottees. The remainder of the land is owned in fee simple title, sometimes by the MHA Nation or tribal members, but usually by non-Indians. The Reservation occupies portions of six counties, including Dunn, McKenzie, McLean, Mercer, Mountrail and Ward. In 1954, the Garrison Dam was completed, inundating much of the Reservation. The remaining land was divided into three sections by Lake Sakakawea, an impoundment of the Missouri River upstream of the Garrison Dam.

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

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

The proposed well sites and spacing units are in a rural area consisting of grassland (79%) and shrubland (19%) that is currently either idle or used to graze livestock. The landscape has been previously disturbed by dirt trails and graveled and paved roadways. There are no residences within 1,000 feet of the proposed well sites. Existing conditions within the proposed drilling units are described below. The broad definition of the human and natural environment under NEPA leads to the consideration of the following elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, socioeconomic conditions, and environmental justice. Potential impacts to these elements are analyzed for both the No Action Alternative and the Preferred Alternative. Impacts may be beneficial or detrimental, direct or indirect, and short-term or long-term. This EA also analyzes the potential for cumulative impacts and ultimately makes a determination as to the significance of any impacts. In the absence of significant negative consequences, it should be noted that a significant benefit from the project does *not* in itself require preparation of an EIS.

3.1 The No Action Alternative

Under the No Action Alternative, the proposed projects would not be constructed, drilled, installed, or operated. Existing conditions would not be impacted for the following critical elements: air quality, public health and safety, water resources, wetland/riparian habitat, threatened and endangered species, soils, vegetation and invasive species, cultural resources, and environmental justice. There would be no project-related ground disturbance, use of hazardous materials, or trucking of product to collection areas. Surface disturbance, deposition of potentially harmful biological material, trucking, and other traffic would not change from present levels. Under the No Action Alternative, the MHA Nation, Tribal members, and allottees would not have the opportunity to realize potential financial gains resulting from the discovery of resources at these well locations.

3.2 Air Quality

The North Dakota Department of Health (NDDH) network of Ambient Air Quality Monitoring (AAQM) stations includes Watford City in McKenzie County, Dunn Center in Dunn County, and Beulah in Mercer County. These stations are located west, south and southeast of the proposed well sites. Criteria pollutants tracked under National Ambient Air Quality Standards (NAAQS) of the Clean Air Act include sulfur dioxide (SO₂), particulate matter (PM₁₀), nitrogen dioxide (NO₂) and ozone (O₃). Two other criteria pollutants – lead (Pb) and carbon monoxide (CO) – are not monitored by any of three stations. Table 3.2 summarizes federal air quality standards and available air quality data from the three-county study area.

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

Pollutant	Averaging Period	NAAQS (µg/m ³)	NAAQS (ppm)	County		
				Dunn	McKenzie	Mercer
SO ₂	24-Hour	365	0.14	0.004 ppm	0.004 ppm	0.011 ppm
	Annual Mean	80	0.030	0.001 ppm	0.001 ppm	0.002 ppm
PM ₁₀	24-Hour	150	--	50 (µg/m ³)	35 (µg/m ³)	35 (µg/m ³)
	Annual Mean	50	--	--	--	--
PM _{2.5}	24-Hour	35	--	--	--	--
	Weighted Annual Mean	15	--	--	--	--
NO ₂	Annual Mean	100	0.053	0.002 ppm	0.001 ppm	0.003 ppm
CO	1-Hour	40,000	35	--	--	--
	8-Hour	10,000	9	--	--	--
Pb	3-Month	1.5	--	--	--	--
O ₃	1-Hour	240	0.12	0.071 ppm	0.072 ppm	0.076 ppm
	8-Hour	--	0.08	0.061 ppm	0.066 ppm	0.067 ppm

Source: U.S. Environmental Protection Agency (EPA) 2006. µg/m³ = micrograms per cubic meter. ppm = parts per million.

North Dakota was one of only nine states in 2006 that met standards for all criteria pollutants. The state also met standards for fine particulates and the eight-hour ozone standards established by the U.S. Environmental Protection Agency (EPA) (NDDH 2007). The three counties addressed in Table 3.2 are also in full attainment and usually far below established limits (American Lung Association 2006). The Clean Air Act mandates prevention of significant deterioration in designated attainment areas. Class I areas are of national significance and include national parks greater than 6,000 acres in size, national monuments, national seashores, and federal wilderness areas larger than 5,000 acres and designated prior to 1977. There is a Class I airshed at nearby Theodore Roosevelt National Park, which covers about 110 square miles in three units within the Little Missouri National Grassland between Medora and Watford City, 30-40 miles west of the proposed well sites. The Reservation can be considered a Class II attainment airshed, which affords it a lower level of protection from significant deterioration.

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

3.3 Public Health and Safety

Health and safety concerns include naturally-occurring toxic gases, hazardous materials used or generated during installation or production, and hazards posed by heavy truck traffic associated with drilling, completion and production activities. No residences were identified within 1,000 feet of the proposed sites. Tables 3.3a and 3.3b provide distances to nearest home sites and homes within a five mile radius.

Table 3.3a. Distance from wells to nearest homes.

Proposed Well	Feet to Nearest Home	Direction to Nearest Home
JM Hall 1-19H	6,969	West
Soward 1-05H	5,208	West
Levings Estate 1-08H	1,033	East

Table 3.3b. Number of homes within a 5-mile radius of each proposed well.

Proposed Well	North	East	South	West	Total
JM Hall 1-19H	15	5	0	8	28
Soward 1-05H	1	7	27	152	187
Levings Estate 1-08H	2	9	25	149	185

Hydrogen sulfide gas (H₂S) is extremely toxic in concentrations above 500 parts per million, but it has not been found in measurable quantities in the Bakken Formation. Before reaching the Bakken, however, drilling would penetrate the Mission Canyon Formation, which is known to contain varying concentrations of H₂S. Release of H₂S at dangerous concentrations is very unlikely. Contingency plans submitted to BLM comply fully with relevant portions of *Onshore Oil and Gas Order 6* to minimize potential for gas leaks during drilling. Emergency response plans protect both the drilling crew and the general public within one mile of a well; precautions include automated sampling and alarm systems operating continuously at multiple locations

October 2009.

on each well pad. No homes are within 1000 feet of the proposed well pads. No direct impacts from H₂S are anticipated.

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

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

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

3.4 Water Resources

Surface Water

The proposed Soward 1-05H well is located in the Boggy Creek watershed (hydrologic unit code [HUC] 101101012101.), part of the Missouri region, Little Missouri sub-region, and Lake Sakakawea basin and sub-basin. Runoff from the well pad will flow to the west into an ephemeral unnamed tributary of Boggy Creek (HUC 10110101001130) and travel approximately 3.0 miles to reach perennial waters in Lake Sakakawea.

The proposed Levings Estate 1-08H well is located in the Boggy Creek watershed (hydrologic unit code [HUC] 101101012101.), part of the Missouri region, Little Missouri sub-region, and Lake Sakakawea basin and sub-basin. Runoff from the well pad will flow to the south into an ephemeral unnamed tributary of Boggy Creek (HUC 10110101001131) and travel approximately 4.8 miles to reach perennial waters in Lake Sakakawea.

The proposed J.M. Hall 1-19H well is located in the Lower Moccasin Creek/Moccasin Creek Bay watershed (HUC 101102050605.) and is also part of the Missouri region, Little Missouri sub-region, Little Missouri basin, and Lower Little Missouri sub-basin. Runoff from the well pad will flow to the south into an ephemeral unnamed tributary of Moccasin Creek (HUC 10110205001648) and travel approximately 14.0 miles to reach perennial waters in Lake Sakakawea.

Given the topography of the individual sites, runoff occurs largely as sheet-flow. Runoff that concentrates near the proposed project wells flows to Boggy Creek or Moccasin and onto Lake Sakakawea (see Figures 3.4a and 3.4b). However, the proposed projects will be engineered and constructed to minimize the concentration of runoff and to avoid disruption of drainages. Additionally, erosion control and reclamation best management practices (BMPs) will be applied to prevent the mobilization of disturbed soils in each project area, and stop any sediment from being transported to channelized areas via runoff water. No surface water will be used in well drilling operations. Any chemicals or potentially hazardous materials will be handled in accordance with Simray's SPCC plan. Provisions established under this plan will minimize potential impacts to any surface waters associated with an accidental spill.

The proposed projects have been sited to avoid direct impacts to surface water and minimize disruption of drainages. Roadway engineering and erosion control measures would limit migration of sediments downhill or downstream. No measurable increase in runoff or impacts to surface waters is expected as a result of project approvals.

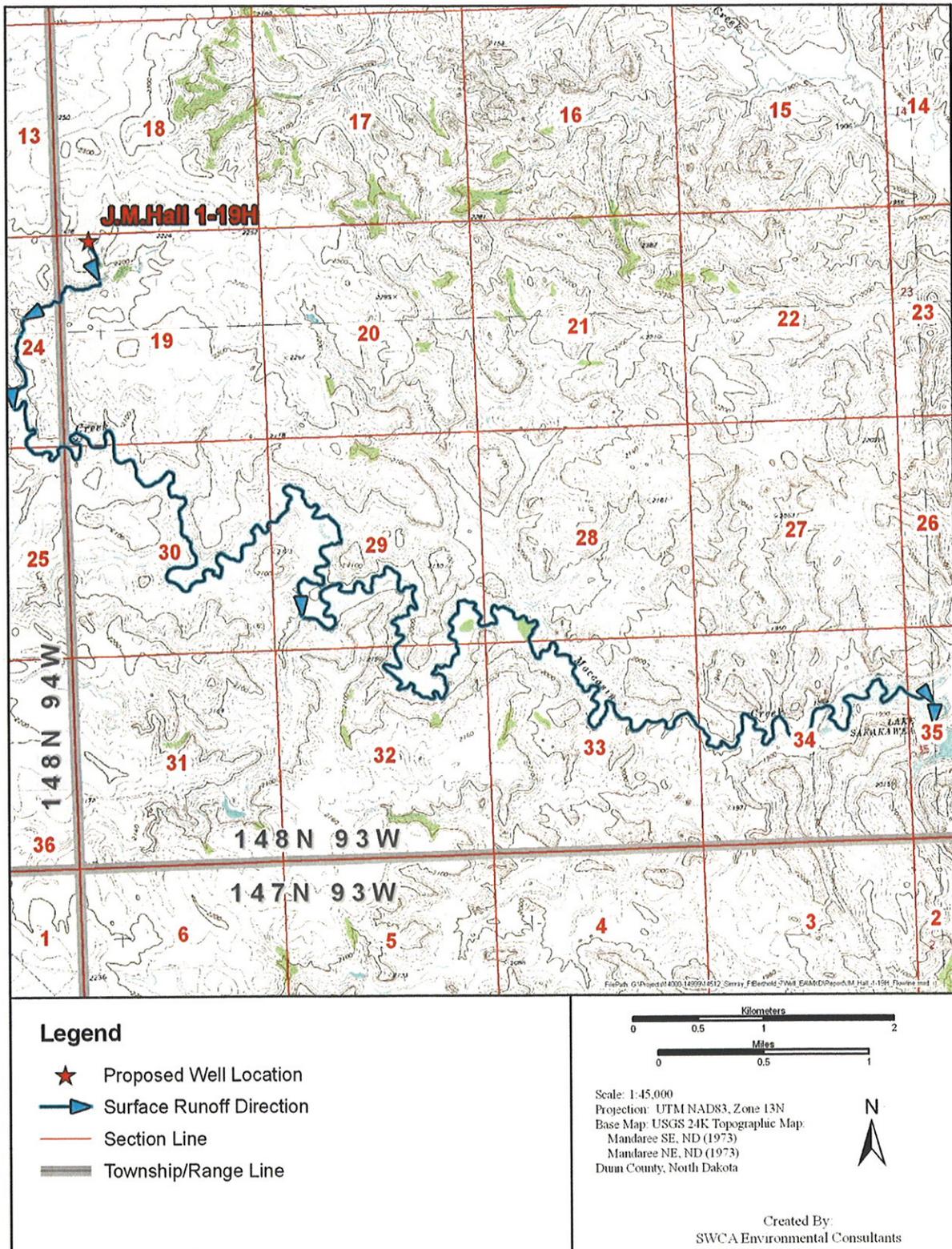


Figure 3.4a: Runoff direction – JM Hall 1-19H.

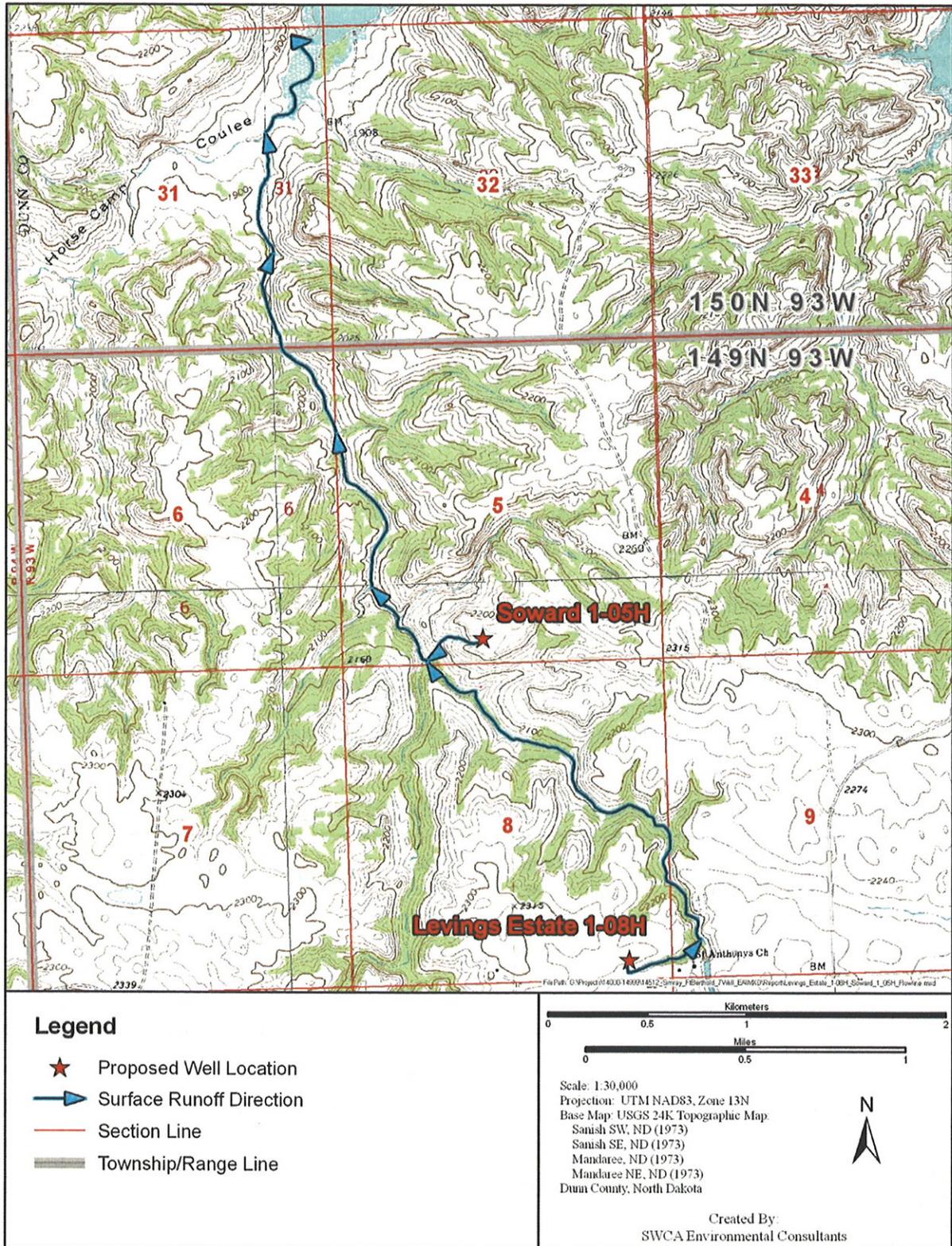


Figure 3.4b: Runoff direction – Soward 1-05H and Levings Estate 1-08H.

Groundwater

Aquifers in the project areas include, from deepest to shallowest, the Cretaceous Fox Hills and Hell Creek formations and the Tertiary Ludlow, Tongue River, and Sentinel Butte formations (Table 3.4a). Several shallow aquifers related to pre-glacial drainage and post-glacial outwash are located in Dunn County; however, none are within the project areas. An unnamed shallow aquifer of similar lithology is located approximately 3 miles southwest of the proposed Levings Estate 1-08H well site (Figure 3.4c). The shallow Sentinel Butte Formation, commonly used for domestic supply in the area, outcrops in Dunn County and meets standards of the NDDH (Croft 1985). Detailed analyses are available from the North Dakota Geological Survey, Bulletin 68, Part II, 1976.

Table 3.4a: Common Domestic and Stock Aquifers in Dunn County (Croft 1985)

Period	Formation	Depth Range (feet)	Thickness (feet)	Lithology
Tertiary	Sentinel Butte	0–300	0–300	Silty, clay, sand and lignite
	Tongue River	140–500	400	Silty, clay, sand and lignite
	Ludlow	>500	>500	Fine to medium sandstone, siltstone and lignite
Cretaceous	Fox Hills and Hell Creek	1,100–1,800	200–400	Sandstone and shale

Review of electronic records of the North Dakota State Water Commission revealed 82 existing water wells within an approximate 5 mile radius of the proposed project areas (Table 3.4b and Figure 3.4c). Since none of the proposed project areas lie within the boundaries of the post-glacial outwash aquifers, low porosity bedrock near the project wells will act as confining layers to prevent impacts to groundwater resources. Additionally, project well completion methods will prevent cross contamination between aquifers or the introduction of hazardous materials into aquifers. The majority of the identified groundwater wells are also at a great distance from the project wells, and therefore have minimal hydrologic connection.

Table 3.4b: Existing Water Wells within One Mile of the Project Area

Well Number	Owner	Date Drilled	Sec	Twn/Rng	Type/Use	Depth	Aquifer	Nearest Well	Miles to Prop Well
147-093-03DBB	Tribal	Unknown	3	147-93	Unused	223	Sentinal Butte	J.M. Hall 1-19H	4.75
147-093-05CDD	Carter Oil Co.	1954	5	147-93	Unused	11105	Unknown	J.M. Hall 1-19H	4.08
147-094-02AD	Tribal	1950	2	147-94	Unused	315	Unknown	J.M. Hall 1-19H	3.81
148-094-01DDD	NDSWC	1971	1	148-94	Unused	80	Unknown	J.M. Hall 1-19H	2.10
148-094-02	Garland Beston	1982	2	148-94	Domestic	196	Unknown	J.M. Hall 1-19H	2.98
148-094-03ABB	Tribal	1950	3	148-94	Unused	450	Unknown	J.M. Hall 1-	3.90

Well Number	Owner	Date Drilled	Sec	Twn/ Rng	Type/ Use	Depth	Aquifer	Nearest Well	Miles to Prop Well
								19H	
148-094-11AAA2	USGS	1994	11	148-94	Monitoring	58	Unknown	J.M. Hall 1-19H	2.33
148-094-12DCC	USGS	1992	12	148-94	Monitoring	51	Unknown	J.M. Hall 1-19H	1.22
148-094-13AAD	Tribal	1950	13	148-94	Unused	450	Unknown	J.M. Hall 1-19H	0.84
148-094-13BBD	R. Hall	1967	13	148-94	Domestic\Stock	30	Sentinal Butte Tongue River	J.M. Hall 1-19H	1.26
148-094-14AAB	USGS	1992	14	148-94	Monitoring	315	Tongue River	J.M. Hall 1-19H	1.36
148-094-14DAC	R. Hall	1968	14	148-94	Stock	100	Buried Glaciofluvial	J.M. Hall 1-19H	1.65
148-094-14AAB2	NDSWC	1992	14	148-94	Monitoring	315	Tongue River	J.M. Hall 1-19H	1.65
148-094-15CCC2	USGS	1994	15	148-94	Monitoring	36	Unknown	J.M. Hall 1-19H	3.05
148-094-17DCD2	USGS	1994	17	148-94	Monitoring	70	Unknown	J.M. Hall 1-19H	4.44
148-094-20DDD	Tribal	Unknown	20	148-94	Unused	135	Till	J.M. Hall 1-19H	4.26
148-094-21AAB1	USGS	1994	21	148-94	Monitoring	190	Unknown	J.M. Hall 1-19H	3.32
148-094-21AAB2	USGS	1994	21	148-94	Monitoring	125	Unknown	J.M. Hall 1-19H	3.32
148-094-21AAB2	USGS	1994	21	148-94	Monitoring	150	Unknown	J.M. Hall 1-19H	3.32
148-94-25CCC	J. Chase	Unknown	25	148-94	Unused	120	Unknown	J.M. Hall 1-19H	2.18
148-094-26AAA	Matt Young Bird	1973	26	148-94	Domestic	124	Unknown	J.M. Hall 1-19H	1.54
148-094-26DCA	Tribal	Unknown	26	148-94	Unused	290	Sentinal Butte	J.M. Hall 1-	2.26

October 2009.

Well Number	Owner	Date Drilled	Sec	Twn/ Rng	Type/ Use	Depth	Aquifer	Nearest Well	Miles to Prop Well
								19H	
148-094-28	Matt Young Bird	1982	28	148-94	Domestic	225	Unknown	J.M. Hall 1-19H	3.90
148-094-33ACD	Tribal	Unknown	33	148-94	Unused	147	Sentinal Butte	J.M. Hall 1-19H	4.24
148-093-04CAB1	NDSWC	1973	4	148-93	Monitoring	340	Tongue River	J.M. Hall 1-19H	3.26
148-093-04CAB2	NDSWC	1973	4	148-93	Monitoring	190	Sentinal Butte Tongue River	J.M. Hall 1-19H	3.26
148-093-04	Indian Health Services	1985	4	148-93	Public Supply	71	Unknown		3.43
148-093-04CAB1	NDSWC	1973	4	148-93	Unused	340	Tongue River	J.M. Hall 1-19H	3.24
148-093-04CAB2	NDSWC	1973	4	148-93	Unused	190	Sentinal Butte	J.M. Hall 1-19H	3.26
149-093-05CDC	NDSWC	1961	5	149-93	Unknown	84	Sentinal Butte Tongue River	Soward 1-05H	0.14
148-093-05CCA1	O. Standish	Unknown	5	148-93	Unused	102	Sentinal Butte	J.M. Hall 1-19H	2.46
148-093-05CCA2	O. Standish	1968	5	148-93	Domestic	72	Buried Glaciaofluvia l	J.M. Hall 1-19H	2.45
148-093-06CCA	Rudolph Sanders	1981	6	148-93	Stock	120	Unknown	J.M. Hall 1-19H	2.19
148-093-07ADA	R. Goodbird	Unknown	7	148-93	Unused	Unkno wn	Unknown	J.M. Hall 1-19H	1.92
148-093-09BBC	Tribal	1950	9	148-93	Unused	40	Buried Glaciaofluvia l	J.M. Hall 1-19H	2.66
148-093-10CCC	NDSWC	1974	10	148-93	Unused	103	Sentinal Butte	J.M. Hall 1-19H	3.06
148-093-14CDC	NDSWC	1974	14	148-93	Unused	57	Sentinal Butte	J.M. Hall 1-19H	4.14
148-093-	NDSWC	1971	15	148-93	Unknown	40	Unknown	J.M.	3.47

October 2009.

Well Number	Owner	Date Drilled	Sec	Twn/Rng	Type/Use	Depth	Aquifer	Nearest Well	Miles to Prop Well
15ACB								Hall 1-19H	
148-093-17BBD	J. McKinze	Unknown	17	148-93	Unused	160	Sentinal Butte	J.M. Hall 1-19H	1.34
148-093-20BCA	Tribal	1950	20	148-93	Unused	450	Unknown	J.M. Hall 1-19H	1.04
148-093-32CDB	Tribal	1950	32	148-93	Unused	400	Unknown	J.M. Hall 1-19H	2.97
149-093-02ACB	C. Perkins	1962	2	149-93	Unknown	647	Sentinal Butte Tongue River	Levings Estate 1-08H	3.16
149-093-08DCC	M. Fox	1960	8	149-93	Unknown	500	Sentinal Butte Tongue River	Levings Estate 1-08H	0.30
149-093-09ABD	Dale McGrady	1981	9	149-93	Stock	150	Unknown	Levings Estate 1-08H	1.13
149-093-09CCC	St. Anthony's Mission	1988	9	149-93	Domestic	440	Unknown	Levings Estate 1-08H	0.21
149-093-09CCD	St. Anthony's Mission	1952	9	149-93	Unknown	65	Sentinal Butte Tongue River	Levings Estate 1-08H	0.33
149-093-10AAA	Tribal	1950	10	149-93	Unused	450	Unknown	Levings Estate 1-08H	2.26
149-093-12AB	Ivan Johnson	1976	12	149-93	Stock	Unknown	Unknown	Levings Estate 1-08H	3.85
149-093-14CCC	Tribal	Unknown	14	149-93	Unused	432	Sentinal Butte	Levings Estate 1-08H	2.40
149-093-14CDD2	USGS	1994	14	149-93	Monitoring	35	Unknown	Levings Estate 1-08H	2.77
149-093-16BDD	Paul Rosario	1994	16	149-93	Domestic	450	Unknown	Levings Estate 1-08H	0.76
149-093-18DDB	Tribal	Unknown	18	149-93	Unused	465	Sentinal Butte	Levings Estate 1-08H	1.37
149-093-21DCA	E. Wicker	Unknown	21	149-93	Unknown	35	Sentinal Butte	Levings Estate 1-	2.04

October 2009.

Well Number	Owner	Date Drilled	Sec	Twn/ Rng	Type/ Use	Depth	Aquifer	Nearest Well	Miles to Prop Well
							Tongue River	08H	
149-093-21AAD	Gerald Fox	2000	21	149-93	Domestic	99	Unknown	Levings Estate 1-08H	1.64
149-093-22CCD	Arla Muzzy	2002	22	149-93	Domestic	92	Unknown	Levings Estate 1-08H	2.40
149-093-23ACD	Unknown	Unknown	23	149-93	Unused	34	Sentinal Butte	Levings Estate 1-08H	3.20
149-093-24AC	Mobile Oil	Unknown	24	149-93	Unknown	11331	Unknown	Levings Estate 1-08H	4.01
149-093-24ACC2	USGS	1994	24	149-93	Monitoring	33	Unknown	Levings Estate 1-08H	3.97
149-093-24ABB	USGS	1994	24	149-93	Monitoring	35	Unknown	Levings Estate 1-08H	3.86
149-093-27CAD	USGS	1994	27	149-93	Monitoring	165	Unknown	Levings Estate 1-08H	3.15
149-093-27BAA	USGS	1994	27	149-93	Monitoring	60	Unknown	Levings Estate 1-08H	2.64
149-093-27ABA	Patricia McKenzie	2004	27	149-93	Domestic	89	Unknown	Levings Estate 1-08H	2.77
149-093-27ABA	M. Youngbird	Unknown	27	149-93	Domestic	65	Sentinal Butte	Levings Estate 1-08H	2.77
149-093-34ACA	Tribal	Unknown	34	149-93	Unused	357	Sentinal Butte	Levings Estate 1-08H	3.83
149-094-14	Mandaree School	1994	14	149-94	Monitoring	16	Unknown	Soward 1-05H	3.32
149-094-14	Mandaree School	1988	14	149-94	Monitoring	16	Unknown	Soward 1-05H	3.32
149-094-14	BIA	2002	14	149-94	Monitoring	29	Unknown	Soward 1-05H	3.32
149-094-14	BIA	2002	14	149-94	Monitoring	28	Unknown	Soward 1-05H	3.32
149-094-14	BIA	2002	14	149-94	Monitoring	30	Unknown	Soward 1-05H	3.32
149-094-14	BIA	2000	14	149-94	Monitoring	25	Unknown	Soward 1-05H	3.32
149-094-14ACD	Mike Mason	1973	14	149-94	Domestic	66	Unknown	Soward 1-05H	3.14

October 2009.

Well Number	Owner	Date Drilled	Sec	Twn/ Rng	Type/ Use	Depth	Aquifer	Nearest Well	Miles to Prop Well
149-094-14BA	Mandaree 3	1970	14	149-94	Public Supply	1745	Hell Creek Fox Hills	Soward 1-05H	3.27
149-094-15AAA	Sandy Youngbird	2006	15	149-94	Domestic	278	Unknown	Soward 1-05H	3.67
149-094-15ABD	Tilly Lone Fight	2005	15	149-94	Domestic	335	Unknown	Soward 1-05H	3.95
149-094-22BBB	NDSWC	1980	22	149-94	Unused	140	Unknown	Soward 1-05H	4.86
149-094-22BCB	NDSWC	1980	22	149-94	Unused	80	Unknown	Soward 1-05H	4.96
149-094-23ACD	USGS	1994	23	149-94	Monitoring	109	Unknown	Levings Estate 1-08H	3.49
149-094-23BBA	USGS	1994	23	149-94	Monitoring	58	Unknown	Levings Estate 1-08H	3.82
149-094-27ACD	George Wolf	1973	27	149-94	Domestic	36	Unknown	Levings Estate 1-08H	4.83
150-093-19ACB	Waterford City	1988	19	150-93	Municipa;	95	Unknown	Soward 1-05H	3.75
150-093-31ADD	Tribal	1961	31	150-93	Unknown	336	Sentinal Butte Tongue River	Soward 1-05H	1.59
150-093-33CAA	W. Face	1960	33	150-93	Unknown	388	Sentinal Butte Tongue River	Soward 1-05H	1.71

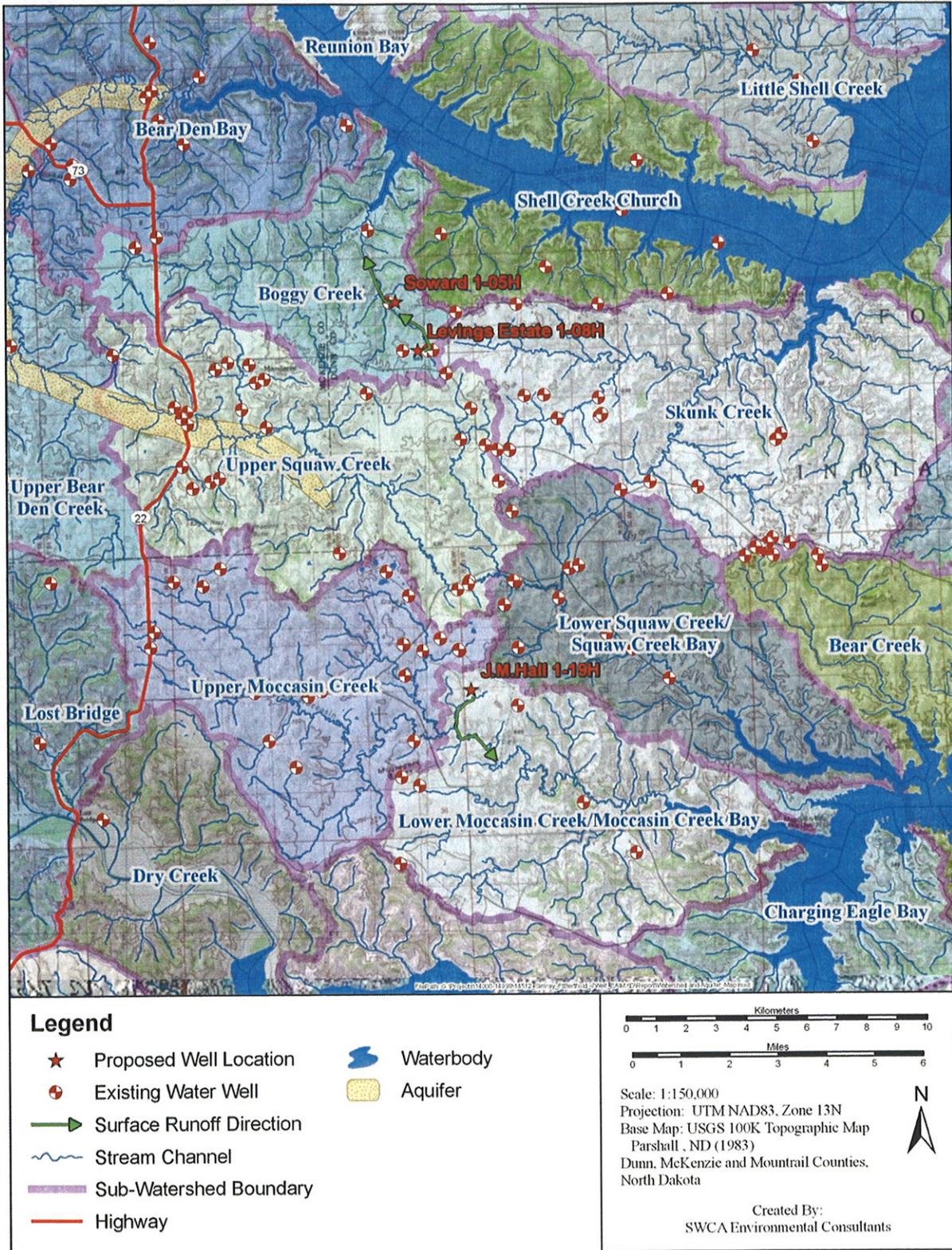


Figure 3.4c: Watersheds, Aquifers, and Water Wells.

3.5 Wetland/Riparian Habitat and Threatened or Endangered Species

National Wetland Inventory maps maintained by the U.S. Fish and Wildlife Service (USFWS) (2008) do not identify any jurisdictional wetlands within the project areas that would be affected by surface-disturbing activities associated with construction and drilling of wells and the associated infrastructure. Physical inventories conducted on September 21, 2008, identified one Palustrine Emergent Mud/Salt Flat wetland within the original route of the access road (NW¼NW¼ of Section 19, T148N, R93W). Based on this information, the access road was re-routed so that no riparian or wetland habitats would be impacted by the proposed roads, pipelines, or well locations.

Species may be listed by the USFWS as threatened or endangered under the *Endangered Species Act* (ESA) (Table 3.5a). Tribes and states may recognize additional species of concern; such lists are taken under advisement by federal agencies, but are not legally binding in the manner of the ESA.

The USFWS identifies seven federally listed species occurring in Dunn and/or McKenzie counties. An informal Section 7 consultation has not yet occurred, but can be conducted based on the information presented below. The following is a discussion of potentially affected habitat associated with these species.

Table 3.5a. Potential effect of threatened and endangered species to occur in the project area.

Common Name	Scientific Name	Potential Effect
Black-footed ferret	<i>Mustela nigripes</i>	no effect
Dakota skipper	<i>Hesperia dacotae</i>	may affect, but is not likely to adversely affect
Gray wolf	<i>Canis lupus</i>	no effect
Interior least tern	<i>Sterna antillarum</i>	may affect, but is not likely to adversely affect
Pallid sturgeon	<i>Scaphirhynchus albus</i>	may affect, but is not likely to adversely affect
Piping plover	<i>Charadrius melodus</i>	may affect, but is not likely to adversely affect
Whooping crane	<i>Grus americana</i>	may affect, but is not likely to adversely affect

No adverse effects on listed species are expected due to the unlikely nature of their occurrence within the project areas. Interim reclamation and the use of BMPs over the life of the projects would further reduce long-term impacts to all wildlife. Site visits were conducted in September and October of 2008 and August of 2009. Specialists observed no wildlife in the project areas.

Due to the distance from the wells to both the lake and river, disturbance from construction and the running of the wells should not have a direct impact. Table 3.5b summarizes the straight-line distances to Lake Sakakawea and the Little Missouri River from the well.

Table 3.5b. Straight-line distance to Lake Sakakawea and the Little Missouri River from the proposed wells.

Proposed Well	Miles to Lake Sakakawea	Miles to Little Missouri River
JM Hall I-19H	9.5	7.5
Soward I-05H	2	14
Levings Estate I-08H	3	12.8

Potential impacts to wildlife include construction of the three proposed well pads, reconstruction of existing two-track trails, construction of new roads, and potential future commercial operations. Site visits to the proposed locations determined that no critical or unique habitats would be impacted. Precautions benefitting wildlife include netting of the reserve pit during the period between drilling and reclamation of the pit. Initial reclamation would restore more than half of the disturbed area in the short term. If the well is unproductive, final and complete reclamation would proceed immediately, or in due course when the well is decommissioned. Reclamation of disturbed areas over the life of each project would further reduce long-term impacts to all wildlife. No impacts are expected to listed or special species.

3.6 Soils

An onsite visit was conducted on October 20, 2008 to document existing soil conditions at each well location and the associated proposed access roads. On August 13, 2009, another site visit was conducted to decide on another access route to the JM Hall 1-19 H location due to the steep topography and presence of an ephemeral drainage. Specialists determined that the existing portions of the access roads are in good condition with no signs of erosion. Table 3.6a describes the NRCS soils mapped for the area.

Individual Site Descriptions

J.M. Hall # 1-19H

The proposed access road for this location would extend north at the end of an improved road that connects to BIA Loop 17. The new access road length would equal 3,618 feet.

Well Pad

- At a depth of 0 to 10 inches, the soil texture is a silty loam, Munsell color 10YR 4/2 (dark grayish brown).
- No redoximorphic concentrations or depletions were observed within the soil profile.
- The pit was excavated on a slope of approximately 0° to 1°

This location has a Soil Erodibility Factor (K) of 0.32. Using the Revised Universal Soil Loss Equation (RUSLE), there could be 8.92 tons/acre/year of soil loss from the site. The site would be monitored during and after construction and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.

Conclusions

1. The J.M. Hall #1-19H well pad and access road are dominated (i.e., 78.5% & 83.9%, respectively) by the Rhoades soil series (Table 3.6a)
2. The soil series description for hue, value, chroma, and texture provided by the Natural Resources Conservation Service (NRCS) (2009) concur with field data derived from the excavation of a soil pit at the well pad site.
3. The Rhoades soil series may have variable run-off depending on the slope, which ranges between 0 and 25 percent for the Rhoades series (NRCS 2009).
4. Reclamation of vegetative communities should be easily obtainable due to the affinity of native grassland species to this soil type (NRCS 2009).
5. High levels of soil erosion are not anticipated with the dominant soil types.

Soward #1-05H

The proposed access road originates at BIA 10 and extends northwest to the proposed well location. The total length of new access road proposed is 7,716 feet.

Well Pad

- At a depth of 0 to 16 inches, the soil texture is a silty clay loam, Munsell color 10YR 3/2 (very dark grayish-brown).
- No redoximorphic concentrations or depletions were observed within the soil profile.
- The pit was excavated on a slope of approximately 0° to 1°

This location has a Soil Erodibility Factor (K) of 0.32. Using the RUSLE, there could be 8.92 tons/acre/year of soil loss from the site. The site would be monitored during and after construction and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.

Conclusions

1. The Soward #1-05H well pad and new access road are dominated (i.e., 84.4% & 99.6%, respectively) by the Cabba soil series (Table 3.6a).
2. The soil series description for hue, value, chroma, and texture provided by the NRCS (2009) concur with moist soil field data derived from the excavation of a soil pit at the proposed well pad site.
3. The Cabba soil series is found on slopes typically ranging from 2 to 70 percent. (NRCS 2009).
4. The Cabba soil series is capable of supporting native prairie vegetative communities (NRCS 2009) which may substantially increase the probability for successful and permanent reclamation
5. High levels of soil erosion are not anticipated with the dominant soil types.

Levings Estate #1-08H

Access to the Levings Estate 1-08H connects to BIA 12. The total length of new access road proposed is 2,016 feet.

Well Pad

- At a depth of 0 to 16 inches, the soil texture is a silty clay loam, Munsell color 10YR 3/2 (very dark grayish brown).
- No redoximorphic concentrations or depletions were observed within the soil profile.
- This pit was excavated on a slope of approximately 0° to 1°.

This location has a Soil Erodibility Factor (K) of 0.28. Using the RUSLE, there could be 3.03 tons/acre/year of soil loss from the site. The site would be monitored during and after construction and BMPs would be used to prevent erosion, minimize runoff and loss of sediment, and ensure soil stabilization.

Conclusions

1. The Levings Estate #1-08H well pad and access road are dominated (i.e., 100% & 43.9%, respectively) by the Williams soil series (Table 3.6a).
2. The soil series description for hue, value, chroma, and texture provided by the NRCS (2009) concur with moist soil field data derived from the excavation of a soil pit at the proposed well pad site.
3. The Williams soil series is known to be found on slopes typically ranging from 0 to 35 percent.
4. The Williams soil series is capable of supporting native short- and mid-grass prairie communities (NRCS 2009) which may substantially increase the probability for successful and permanent reclamation.
5. High levels of soil erosion are not anticipated with the dominant soil types.

Table 3.6a: Percentage of the project area comprising specific soil types.

J.M. Hall # 1-19H			
<i>Feature</i>	<i>Soil Series</i>	<i>Percentage of Location</i>	<i>Acres</i>
Well Pad	Rhoades silt loam, 0 to 6 percent slopes	78.5%	2.48
Well Pad	Cabba loam, 15 to 45 percent slopes	21.5%	0.68
Access Road	Rhoades silt loam, 0 to 6 percent slopes	83.9%	4.66
Access Road	Vehear fine sandy loams, 9 to 15 percent slopes	16.1%	0.894
Levings Estate #1-08H			
<i>Feature</i>	<i>Soil Series</i>	<i>Percentage of Location</i>	<i>Acres</i>
Well Pad	Williams loam, 6 to 9 percent slopes	100.0%	3.19
Access Road	Williams loam, 3 to 6 percent slopes	43.9%	1.381
Access Road	Amor-Cabba loams, 9 to 15 percent slopes	26.8%	0.843
Access Road	Cabba-Chama silt loams, 6 to 9 percent slopes	22.9%	0.722
Access Road	Williams loam, 6 to 9 percent slopes	6.5%	0.203
Soward #1-05H			
<i>Feature</i>	<i>Soil Series</i>	<i>Percentage of Location</i>	<i>Acres</i>
Well Pad	Cabba loam, 15 to 45 percent slopes	84.4%	2.81
Well Pad	Badland-Cabba-Arikara complex, 25 to 70 percent slopes	15.6%	0.52
Access Road	Cabba loam, 15 to 45 percent slopes	99.6%	6.530
Access Road	Badland-Cabba-Arikara complex, 25 to 70 percent slopes	0.4%	0.024

3.7 Vegetation and Invasive Species

Josh Ruffo, SWCA Environmental Consultants (SWCA) NEPA biologist, conducted a site visit in September 2008 to document existing vegetation and to assess site condition.

J.M. Hall 1-19H. This site is located in pasture that appears to be grazed by cattle. The vegetation appeared to be mostly introduced and invasive grasses. The project location was dominated by Bermuda grass (*Cynodon dactylon*) and wormwood (*Artemisia abinthium*). The proposed access road, including both new construction and an upgrade to an existing primitive road, had fringed sage (*Artemisia frigida*), Kentucky bluegrass (*Poa pratensis*), sweet clover (*Melilotus* spp), Purple coneflower (*Echinacea purpurea*), green needlegrass (*Stipa viridula*), Russian knapweed (*Acroptilon repens*), and Western snowberry (*Symphoricarpos occidentalis*).

Soward 1-05H. This site is located in pasture that appears to be grazed by horses. Native vegetation present within the project area includes native grasses and western snowberry. Introduced and invasive vegetation is also present, including Bermuda grass and wormwood. The native vegetation is sparse throughout the location due to the dominance of the introduced and invasive vegetation. Trees and shrubs were adjacent to the southwest corner of the site at the head of a ravine. Green ash (*Fraxinus pennsylvanicus*) and burr oak (*Quercus macrocarpa*) were present in this area. The proposed access road includes an existing two-track with the same quality vegetation.

Levings Estate 1-08H. This site is located in pasture that appears to be grazed by cattle. The vegetation appeared to be mostly introduced and invasive grasses. The project location was dominated by Bermuda grass, field brome (*Bromus arvensis*), and wormwood. Shrubs were located on the perimeter of the location near the ravine that is in the southeast corner. The proposed access road is an existing two-track with the same quality vegetation.

The proposed projects would create approximately 37.7 acres of temporary surface disturbance, during which removal of existing vegetation could introduce noxious weeds into the project areas. The APDs and this EA require the developer to control noxious weeds within the project area. BMPs that would help prevent the spread of noxious weeds include:

- cleaning vehicles that have been driven in areas that contain non-native species with high-pressure water spray equipment before entering the project area;
- prohibiting vehicles and equipment from driving outside road ROWs and well pad locations;
- adding mulch to disturbed areas;
- planting cover crops to compete with weed species;
- using mechanical weed control or herbicides; and
- educating project personnel about the importance of preventing the spread of noxious weeds.

No surface disturbance, including disturbance created by driving equipment or vehicles, outside of the approved ROWs or well pads would occur. Simray would conduct interim reclamation, as required by Onshore Order #1, to restore areas not needed following construction. Areas stripped of topsoil, with the exception of long-term disturbance on the well pads, would be reclaimed at the earliest opportunity. Reseeding would occur after cessation of construction activities in the fall (September to November). If fall seeding cannot be completed, spring seeding should take place in February or March, as conditions dictate. Certified weed-free straw and seed would be used for all construction, seeding, and reclamation efforts.

3.8 Cultural Resources

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

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

Whatever the nature of the cultural resource addressed by a particular statute or tradition, implementing procedures invariably include consultation requirements at various stages of a federal undertaking. The MHA Nation has designated a Tribal Historic Preservation Officer (THPO) by Tribal Council resolution, whose office and functions are certified by the National Park Service. The THPO operates with the same authority exercised in most of the rest of North Dakota by the State Historic Preservation Officer (SHPO). As a result, BIA consults and corresponds with the THPO on all projects proposed within the exterior boundaries of the Fort Berthold Reservation. The SHPO may have useful information, but has no official role regarding

proposed federal actions on trust land. The MHA Nation has also designated responsible parties for consultations and actions under NAGPRA and cultural resources generally.

Cultural resource inventories of these well pads and access roads were conducted by personnel of SWCA Environmental Consultants using a pedestrian methodology. For the Soward 1-05H project approximately 19.2 acres were intensively inventoried (Ferris 2008a); for the Levings Estate 1-08H project approximately 14.58 acres were inventoried (Ferris 2008b); for the J. M. Hall 1-19H project approximately 11.13 acres were inventoried (Ferris 2008c). These three surveys were done on September 22 and 29, 2008. No historic properties were located within any of these project areas that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. As the lead federal agency, and as provided for in 36 CFR 800.5, on the basis of the information provided, BIA reached a determination of **no historic properties affected** for these undertakings. This determination was communicated to the THPO on October 7, 2008, and the THPO concurred on October 14, 2008 (see Part 4). However, for the J. M. Hall 1-19H project, both the well pad and two alternate access roads had to be moved because of “topography issues” and an additional cultural resource inventory of 31.26 acres was conducted on August 13, 2009 (Cooper 2009). One previously recorded archaeological site (32DU78) was located within the project area of potential effect which may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.6) for inclusion on the National Register. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (16 USC 1996). BIA reached a determination of **no historic properties affected** for this undertaking, provided that site 32DU78 be avoided. This determination was communicated to the THPO on September 1, 2009, however, no response was received from the THPO within the allotted 30-day comment period (see Part 4).

3.9 Socioeconomics

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

Table 3.9a: Population and Demographics

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

Source: U.S. Census Bureau 2007.

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

As shown in Table 3.9b, counties overlapping the Reservation tend to have per capita incomes, median household incomes, and employment rates that are lower than North Dakota statewide averages. Reservation residents have lower average incomes and higher unemployment rates compared to the encompassing counties. MHA Nation members are in turn disadvantaged relative to overall Reservation incomes and unemployment rates that average in non-Indian data. The most recent census found that per capita income for residents of the Reservation is \$10,291 (less than 1/3 the state average). Overcrowded housing skews the median reservation household income upward to \$26,274 (about 1/2 the state average). A BIA report in 2003 found that 33% of employed MHA Nation members were living below federal poverty levels. The unemployment rate for tribal members is 22 %, compared to 11.1% for the reservation as a whole and 4.6% statewide.

Table 3.9b: Income and Unemployment

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

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

Availability and affordability of housing could impact oil and gas development and operations. Housing information is summarized in Table 3.9c. The tribal Housing Authority manages a majority of the housing units within the reservation. Housing typically consists of mutual help homes built through various government programs, low-rent housing units, and scattered-site homes. Private purchase and rental housing are available in New Town. New housing construction has recently increased within much of the analysis area, but availability remains low.

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

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

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

would provide some economic benefit. Long-term commercial operations would provide significant royalty income and indirect economic benefits.

3.10 Environmental Justice

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

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

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

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

The owners of allotted surface within the project areas may not hold mineral rights. In such cases, surface owners do not receive oil and gas lease or royalty income and their only related income would be compensatory for productive acreage lost to road and well pad construction. Tribal members without either surface or mineral rights would not receive any direct benefits whatsoever. Indirect benefits of employment and general tribal gains would be the only potential offsets to negative impacts.

Potential impacts to tribes and tribal members include disturbance of cultural resources. There is potential for disproportionate impacts, especially if the impacted tribes and members do not reside within the Reservation and therefore do not share in direct or indirect benefits. This potential is significantly reduced following the surveys of proposed well locations and access road routes and determination by the BIA that there will be no historic properties affected. Nothing is known to be present, furthermore, that qualifies for protection under the *American Indian Religious Freedom Act*. Potential for disproportionate impacts is further mitigated by requirements for immediate work stoppage following an unexpected discovery of cultural resources of any type. Mandatory consultations will take place during any such work stoppage, affording an opportunity for all

affected parties to assert their interests and contribute to an appropriate resolution, regardless of their home location or tribal affiliation.

The proposed projects have not been found to pose significant impacts to any other critical element—air, public health and safety, water, wetlands, wildlife, soils or vegetation—within the human environment. Avoiding or minimizing such impacts also makes unlikely disproportionate impacts to low-income or minority populations. The proposed projects offers many positive consequences for tribal members, while recognizing Environmental Justice concerns. Procedures summarized in this document and in the APDs are binding and sufficient. No laws, regulations or other requirements have been waived; no compensatory mitigation measures are required.

3.11 Mitigation and Monitoring

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

3.12 Irreversible and Irretrievable Commitment of Resources

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

3.13 Short-Term Use Versus Long-Term Productivity

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

3.14 Cumulative Impacts

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

Figure 3.14 shows active, confidential, and permitted wells within a 1-, 5-, 10-, and 20-mile radius of the project areas. When this EA support document was prepared, approximately 260 oil and gas wells had been staked within the Reservation (D. Turcotte, BIA Natural Resources Officer, personal communication with Josh Ruffo, SWCA, July 13, 2009).

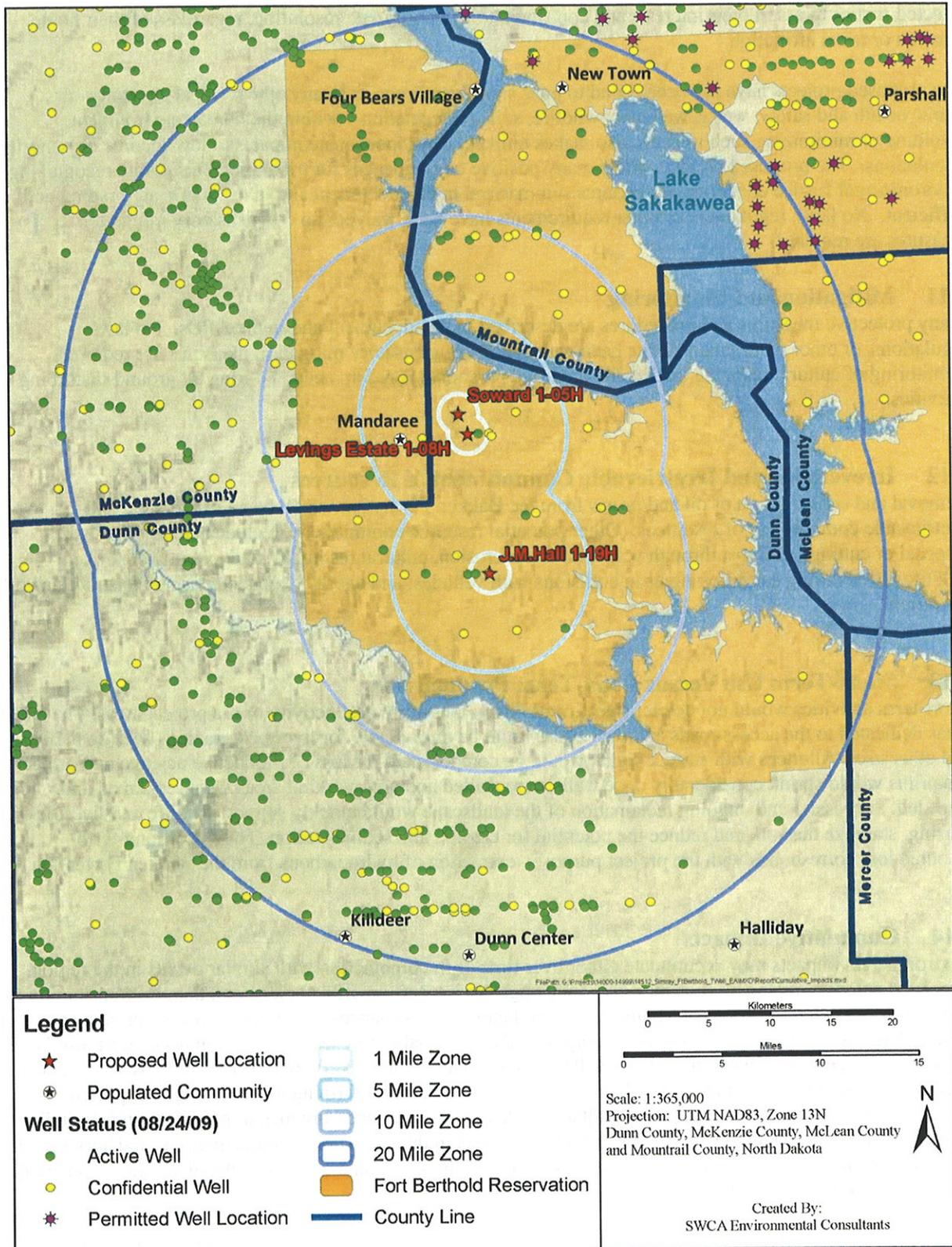


Figure 3.14: Active, confidential, and permitted wells within a-, 5-, 10-, and 20-mile radius of the project location.

Table 3.14a summarizes the number of confidential, active, and dry wells within a radius of 1, 5, 10, and 20 miles of the project areas. The nearest active, confidential, dry, and water wells to each proposed project site are listed in Table 3.14b.

Table 3.14a Confidential, active, and permitted wells within a 1, 5, 10, and 20 mile radius of the project areas

J.M. Hall 1-19H								
Reservation (On/Off)	1-mile		5-miles		10-miles		20-miles	
	On	Off	On	Off	On	Off	On	Off
Active Wells	1	-	6	-	18	0	21	148
Proposed Wells	0	-	0	-	0	0	3	0
Confidential	1	-	6	-	20	0	36	46
Levings Estate 1-08H								
Reservation (On/Off)	1-mile		5-miles		10-miles		20-miles	
	On	Off	On	Off	On	Off	On	Off
Active Wells	1	-	1	-	15	1	39	143
Proposed Wells	0	-	0	-	0	0	1	0
Confidential	0	-	7	-	23	0	50	37
Soward 1-05H								
Reservation (On/Off)	1-mile		5-miles		10-miles		20-miles	
	On	Off	On	Off	On	Off	On	Off
Active Wells	0	-	2	-	18	1	46	138
Proposed Wells	0	-	0	-	0	0	1	0
Confidential	1	-	7	-	27	0	50	44

Table 3.14b. Nearest active, confidential, dry, and water wells to the proposed well sites

	Active	Confidential	Dry	Water (Owner)
JM Hall 1-19H	Voigt 24-21H	Dakota-3 Ethan Hall 2-14H	Moreland 1	Tribal
Soward 1-05H	Tekakwitha 9-24H	Dakota -3 Alisia Fox 16-9H	Two Crow 1-5	149-093-05CDC (Owner unknown)
Levings Estate 1-08H	Tekakwitha 9-24H	Dakota -3 Alisia Fox 16-9H	Harmon 1	St. Anthonys

Current impacts from oil and gas-related activities are still fairly dispersed, and the required BMPs would constrain proposed impacts. No significant negative impacts are expected to any critical element of the human environment; impacts would generally be low and mostly temporary. Should these wells prove productive, the proposed projects may share access roads with other actual or proposed wells.

Simray has committed to conduct interim reclamation of the roads and well pads immediately following construction and completion. Implementation of both interim and permanent reclamation measures would decrease the magnitude of cumulative impacts.

Commercial success at the proposed sites might result in additional oil/gas exploration proposals, but such developments remain speculative at this time, as no other APDs have been submitted to the BLM or the BIA by Simray. Additional cumulative impact analyses and BIA approvals are required before the surface is disturbed at any other location. No significant cumulative impacts are reasonably foreseen from existing and proposed activities, other than increasingly positive impacts to the Reservation economy.

Reasonably foreseeable oil and gas development can be difficult to accurately track as new proposals are being submitted to the BIA on a regular basis. Simray has suggested, but not yet formally proposed, that up to six more wells may eventually be drilled from three new well pads in the same general area as the proposed projects, utilizing many of the same main access roads and minimizing the disturbance as much as possible.

The Proposed Action, when combined with other oil and gas projects, may contribute to the depletion of oil and gas resources in the area if the wells prove to be productive. In addition, construction of well pads and access roads for the Proposed Action, combined with the disturbances from future oil and gas projects, road building, and construction of agricultural projects, would incrementally alter the topographic character of the area.

It is anticipated that the pace and level of 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 cumulatively 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 well construction—would be localized, largely temporary, and limited in comparison with regional emissions. Therefore, it is unlikely that the project would significantly impact the cumulative air quality of the region.

No surface discharge of water would occur under the Proposed Action, nor would any surface or groundwater be used during project development. The Proposed Action, when combined with other actions (cattle grazing, other oil and gas development, and agriculture) that are likely to occur in and near the project areas in the future would increase sedimentation and runoff rates. Sediment yield from active roadways could occur at higher rates than background rates and continue indefinitely. Thus, the Proposed Action could incrementally add to existing and future sources of water quality degradation in the Boggy Creek and Lower Moccasin Creek watersheds, but increases in degradation would be reduced by Simray's commitment to minimizing disturbances, using erosion control measures as necessary, and implementing BMPs designed to reduce impacts.

Unlike well pads, active roadways are not typically reclaimed, thus sediment yield from roads can continue at rates two to three times above background rates indefinitely. The Proposed Action would create additional lengths of unpaved roadway in the project areas. Thus, the Proposed Action would incrementally add to existing and future impacts to soil resources in the general area. However, Simray 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 side slopes; planting cover crops to stabilize soil following construction and before permanent seeding takes place; and placing straw bales around the well pads.

Vegetation resources across the region could be affected by various activities including additional energy development and surface disturbance of quality native prairie areas that to date have been largely undisturbed by development activities, grazing, and agriculture. Indirect impacts to native vegetation are also a possibility if soil loss and compaction and the increased encroachment of invasive weed species are not managed. 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.

Significant archaeological resources are irreplaceable and often unique; any destruction or damage of such resources can be expected to diminish the archaeological record as a whole. However, no such damage or destruction of significant archaeological resources would be anticipated as a result of the Proposed Action or the No Action alternative, as these resources would be avoided, negating the cumulative impacts to the archaeological record.

The Proposed Action would incrementally add to existing and future socioeconomic impacts in the general area. The Proposed Action includes three (3) wells, which would be an additional source of revenue for some residents of the Reservation. Increases in employment would be temporary during the construction, drilling, and completion phases of the proposed projects. Therefore, little change in employment would be expected over the long term.

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

4. Consultation and Coordination

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

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

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



United States Department of the Interior

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



IN REPLY REFER TO:
 DESCRM
 MC-208

OCT 07 2008

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

Dear Mr. Brady:

We have considered the potential effects on cultural resources of three oil well pads and access roads in Dunn County, North Dakota. Approximately 44.91 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the areas depicted in the enclosed reports. No historic properties were located that appear to possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No resources are known to be present that appear to qualify for protection under the American Indian Religious Freedom Act (16 USC 1996).

As the surface management agency, and as provided for in 36 CFR 800.5, we have therefore reached a determination of **no historic properties affected** for these undertakings. Catalogued as **BIA Case Number AAO-1567/FB/09**, the proposed undertakings, locations, and project dimensions are described in the following reports:

Ferris, Kade M.

- (2008) A Cultural Resource Inventory of the Lonestar/Simray Soward 1-05H Well Pad and Access Road on the Fort Berthold Indian Reservation in Dunn County, North Dakota. SWCA Environmental Consultants for Lonestar/Simray, Richardson, TX.
- (2008) A Cultural Resource Inventory of the Lonestar/Simray J. M. Hall 1-19H Well Pad and Access Road on the Fort Berthold Indian Reservation in Dunn County, North Dakota. SWCA Environmental Consultants for Lonestar/Simray, Richardson, TX.
- (2008) A Cultural Resource Inventory of the Lonestar/Simray Levings Estate 1-08H Well Pad and Access Road on the Fort Berthold Indian Reservation in Dunn County, North Dakota. SWCA Environmental Consultants for Lonestar/Simray, Richardson, TX.

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

FILE COPY
 OFFICE
 TAKE PRIDE
 IN AMERICA 2008

SURNAME

B Bruce

DATE

10/6/08

OFFICE

208

SURNAME

Munday

DATE

10/4/08

OFFICE

208

SURNAME

10/4

DATE

06 oct 08

OFFICE

102

SURNAME

amtb

DATE

10/6/08

OFFICE

102

SURNAME

10/6

DATE

10/6

OFFICE

102

SURNAME

10/7

DATE

10/7

OFFICE

102

DATE

10/7

OFFICE

102

SURNAME

10/7

DATE

MAILED
 10/7/08

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

Sincerely,

(sgd) Michael S. Black

Regional Director

Enclosure

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

208:CMURDY:bkb:X7656::O:\cultural resources\NHPA\project files\A04-
FtBerthold\2008\AAO1567fb.prj.DOC
bcc: Subject/Reading file

10/20/2008 10:32 7818622498

TRIBLHISTOPRESVOFFIC

PAGE 02



TRIBAL HISTORIC PRESERVATION

Mandan Hidatsa Arikara
Perry 'No Tears' Brady, Director.
404 Frontage Road,
New Town, North Dakota 58763
Ph/701-862-2474 fax/701-862-3401
pbrady@bhamanation.com

RECEIVED
2008 OCT 20 PM 12:35
B.I.A. REGIONAL
DIRECTOR'S OFFICE
GREAT PLAINS

October 14, 2008

Mike Black
Regional Director
Bureau of Indian Affairs
115 4th Avenue SE
Aberdeen, SD, 57401

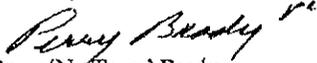
RE: Project # AAO-1567/FB/09
Wellpads: Lonestar/Simray Soward 1-05H
Lonestar/Simray JM Hall 1-19H
Lonestar/Simray Levings Estate 1-08H

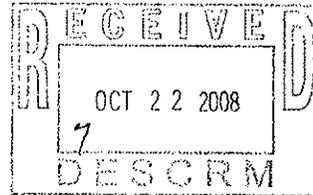
Mr. Black

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

We respectfully request to be notified should any NAGPRA issues arise as the Project progresses.

Sincerely,


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



Route	Initial	Date
Regional Director		
Deputy Regional Director		
208		10/21/08



United States Department of the Interior

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



IN REPLY REFER TO:
DESCRM
MC-208

SEP 01 2009

Perry 'No Tears' Brady, THPO
Mandan, Hidatsa and Arikara Nation
404 Frontage Road
New Town, North Dakota 58763

Dear Mr. Brady:

We have considered the potential effects on cultural resources of an oil well pad and access road in Dunn County, North Dakota. Approximately 31.26 acres were intensively inventoried using a pedestrian methodology. Potential surface disturbances are not expected to exceed the area depicted in the enclosed report. One previously reported archaeological site (32DU78) was located within the project area of potential effect which may possess the quality of integrity and meet at least one of the criteria (36 CFR 60.4) for inclusion on the National Register of Historic Places. No properties were located that appear to qualify for protection under the American Indian Religious Freedom Act (16 USC 1996).

As the surface management agency, and as provided for in 36 CFR 800.5, we have therefore reached a determination of **no historic properties affected** for this undertaking, as site 32DU78 will be avoided. Catalogued as **BIA Case Number AAO-1664/FB/09**, the proposed undertaking, location, and project dimensions are described in the following report:

Cooper, Judith R.
(2009) A Class I and Class III Cultural Resource Inventory of the Simray J.M. Hall 1-19H Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Simray Production Company, Richardson, TX.

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

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

Sincerely,

Regional Director

Enclosure

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

5. List of Preparers

An interdisciplinary team contributed to this document, following guidance in Part 1502.6 of CEQ regulations. Portions of this document were drafted by SWCA Environmental Consultants under contract to Simray under the direction of BIA. Preparers, reviewers, consultants and federal officials include the following:

- Joey Sheeley Natural Resources Planner, SWCA Environmental Consultants
Project Manager
- Brent Sobotka Hydrologist, SWCA Environmental Consultants
Groundwater and Aquifers
- Jon Markman Archaeologist/Field Coordinator, SWCA Environmental Consultants
Site Survey
- Josh Ruffo Wildlife Biologist, SWCA Environmental Consultants
Site Assessment
- Judy Cooper Archaeologist, SWCA Environmental Consultants
Site Report
- Mike Cook Ecologist, SWCA Environmental Consultants
Resource Reports
- BIA Division of Environmental, Safety and Cultural Resource Management

6. References and Acronyms

- American Lung Association. 2006. State of the Air 2006. Available online at http://lungaction.org/reports/sota06_analyses5.html#region8. Accessed 4/22/08.
- Bryce, S., J.M. Omernik, D.E. Pater, M. Ulmer, J.Schaar, J. Freeouf, R. Johnson, P. Kuck, and S.H. Azevedo. 1998. Ecoregions of North Dakota and South Dakota. Jamestown, North Dakota: Northern Prairie Wildlife Research Center Online. <http://www.npwrc.usgs.gov/resource/habitat/ndsdeco/index.htm>. Accessed June 2008.
- Bureau of Indian Affairs (BIA). 2003. American Indian Population and Labor Force Report. U.S. Department of the Interior, Bureau of Indian Affairs, Office of Tribal Affairs. Washington, D.C. 34pp.
- Bureau of Land Management (BLM). 1997. Draft Environmental Impact Statement of the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project, Natrona County, Wyoming. DEIS 97-4. Prepared by the Casper District Office, Bureau of Land Management. Casper, Wyoming. 251 pp. Available online at www.blm.gov/wy/st/en/info/NEPA/cfodocs/cavegulch.htm.
- _____. 2003. Environmental Assessment of Bill Barrett Corporation's Proposed Wallace Creek Raderville Formation Field Development Project, Natrona County, Wyoming. EA Number WY-060-03-108. Prepared by the Casper Field Office, Bureau of Land Management. Casper, Wyoming. 50 pp. Available online at www.blm.gov/wy/st/en/info/NEPA/cfodocs/wallace.htm.
- _____. 2005. Environmental Assessment for the Cave Gulch Infill Development Project, Natrona County, Wyoming. U.S. Department of the Interior, Bureau of Land Management, Casper Field Office. Casper, Wyoming. EA Number WY-060-EA05-17. 143 pp. + appendices. Available online at www.blm.gov/wy/st/en/info/NEPA/cfodocs/cavegulch.htm.
- Bureau of Land Management and U.S. Forest Service. 2006. *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. The Gold Book*. BLM/WO/ST-06/021+3071. Denver, CO.
- Cooper, Judith R.
(2009) A Class I and Class III Cultural Resource Inventory of the Simray J.M. Hall 1-19H Well Pad and Access Road, Fort Berthold Indian Reservation, Dunn County, North Dakota. SWCA Environmental Consultants for Simray Production Company, Richardson, TX.
- Environmental Protection Agency (EPA). 1998. Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. Office of Federal Activities, U.S. Environmental Protection Agency. Washington, D.C. 70 pp + appendices.
- Fagerstone, K.A. 1987. Black-footed ferret, long-tailed weasel, and least weasel. Pages 548-573. In: Wild Furbearer Management and Conservation in North America edited by M. Novak, J.A. Baker, M.E. Obbard, and B. Malloch. Ministry of Natural Resources. Ontario, Canada.
- Ferris, Kade M.
(2008a) A Cultural Resource Inventory of the Lonestar/Simray Soward 1-05H Well Pad and Access Road on the Fort Berthold Indian Reservation in Dunn County, North Dakota. SWCA Environmental Consultants for Lonestar/Simray, Richardson, TX.
- Ferris, Kade M.
(2008b) A Cultural Resource Inventory of the Lonestar/Simray Levings Estate 1-08H Well Pad and Access Road on the Fort Berthold Indian Reservation in Dunn County, North Dakota. SWCA Environmental Consultants for Lonestar/Simray, Richardson, TX.
-

Ferris, Kade M.

(2008c) A Cultural Resource Inventory of the Lonestar/Simray J. M. Hall 1-19H Well Pad and Access Road on the Fort Berthold Indian Reservation in Dunn County, North Dakota. SWCA Environmental Consultants for Lonestar/Simray, Richardson, TX.

Grah, O.J. 1997. Soils, Water, and Vegetation Resources Technical Report. Report prepared for the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project Environmental Impact Statement. Prepared for the Casper District Office, Bureau of Land Management and Gary Holsan Environmental Planning, Thayne, Wyoming by ECOTONE Environmental Consulting, Inc. Logan, Utah. 101 pp.

Grondahl, C., and K. Martin. n.d. North Dakota's endangered and threatened species. North Dakota State Game and Fish Department's Nongame Program, Bismarck, North Dakota. Jamestown, North Dakota: Northern Prairie Wildlife Research Center Online. Available at: <http://www.npwr.usgs.gov/resource/wildlife/endanger/index.htm> (Version 16JUL97). Accessed August 27, 2008.

High Plains Regional Climate Center (HPRCC). 2008. Historical Climate Data Summaries. Available online at <http://www.hprcc.unl.edu/data/historical>. Accessed May 2008.

Hillman, C.N. and T.W. Clark. 1980. *Mustela nigripes*. Mammalian Species, Number 126. 3 pp.

Kotliar, N.B., B.W. Baker, A.D. Whicker, and G. Plumb. 1999. A critical review of assumptions about the prairie dog as a keystone species. *Environmental Management* 24(2):177-192.

McCabe, T.L. 1981. The Dakota skipper, *Hesperis dacotae* (Skinner): range and biology, with special reference to North Dakota. *Journal of the Lepidopterist Society* 35(3):179-193.

Natural Resources Conservation Service (NRCS). 2008. Web Soil Survey. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soils data for portions of Sections 21, 22, and 27, Township 147 North, Range 91 West were downloaded from the NRCS websoil survey site in May 2008. Available online at <http://websoilsurvey.nrcs.usda.gov> and <http://soildatamart.nrcs.usda>.

North Dakota Department of Agriculture (NDDA). 2007. 2006 Noxious Weed List Survey - Reported Acres. North Dakota Department of Agriculture. Bismarck, North Dakota. 2 pp. Available online at agdepartment.com/Programs/Plant/noxiousweeds.html.

_____. 2008. North Dakota Noxious Weed Law. Available online at <http://www.agdepartment.com/Programs/Plant/NoxiousWeeds.html>.

North Dakota Department of Health (NDDH). 2007. Annual Report: North Dakota Air Quality Monitoring Data Summary 2006. North Dakota Department of Health. Bismarck, North Dakota. 70 pp. Report downloaded 5/2008 and available at www.health.state.nd.us/AQ/AmbientMonitoring.htm.

North Dakota Industrial Commission (NDIC). 2008. Data on previous oil/gas exploration activity in Township 147 North, Range 91 West downloaded from the NDIC, Oil and Gas Division website 5/2008 and available online at www.dmr.nd.gov/oilgas.

North Dakota Natural Heritage Biological Conservation Database (NDNH). 2007. Email reporting negative results received from the NDNH on December 13, 2007. Natural Resource Division, North Dakota Parks & Recreation Department. Bismarck, North Dakota.

North Dakota State Water Commission (NDWC). 2008a. Watershed data downloaded from the NDWC Mapservice website 6/2008 and available online at <http://mapservice.swc.state.nd.us>.

_____. 2008b. Data on existing/approved (surface and ground) water permits in Township 147 North, Range 91 West downloaded from the NDWC website 1/2008 and available online at www.swc.state.nd.us.

Northern Plains Agroecosystems Laboratory (NPAL). 2008. Vegetation of the Northern Great Plains by William T. Barker and Warren C. Whitman. Animal & Range Sciences, College of Agriculture, North Dakota State University. Fargo, North Dakota. 19 pp. Report downloaded 1/2008 and available online at www.npal.ndsu.nodak.edu/vegetation.htm.

Rathge, R., M. Clemson, and R. Danielson. 2002. North Dakota Population Projections 2005–2020. North Dakota State Data Center at North Dakota State University. Fargo, North Dakota. September.

Three Affiliated Tribes. 2008. Mandan, Hidatsa, Arikara Website. Available online at http://www.mhanation.com/main/history/history_economic_social.html. Accessed April 2008.

United States Census Bureau. 2008. Selected Demographic Data for both North Dakota and the Fort Berthold Indian Reservation from Census 2000. U.S. Census Bureau, Census 2000. Information downloaded 5/2008 and available online at <http://factfinder.census.gov>.

United States Fish and Wildlife Service (USFWS). 2006. Gray Wolf Populations in the United States, 2006. Available online at http://www.fws.gov/home/feature/2007/gray_wolf_factsheet_populations.pdf. Accessed August 27, 2008.

_____. 2007. Federal Threatened and Endangered Species and Designated Critical Habitat Found in Dunn County, North Dakota. North Dakota Field Office, U.S. Fish and Wildlife Service. Bismarck, North Dakota.

_____. 2008a. National Wetlands Inventory: Wetlands Online Mapper. Available online at <http://wetlandsfws.er.usgs.gov/wtlnds/launch.html>. Accessed July 2008.

_____. 2008b. Dakota Skipper. Available online at http://www.fws.gov/northdakotafieldoffice/endspecies/species/dakota_skipper.htm.

United States Geological Survey. 2008. Ecoregions of North and South Dakota. North Dakota Ecoregion Map. Ecoregion 43A: Missouri Plateau. Northern Prairie Wildlife Research Center, USGS. Available online at www.npwrc.usgs.gov/resource/habitat/ndsdeco/43a.htm.

Williams, B. B., and M. E. Bluemle. 1978. Status of Mineral Resource Information for the Fort Berthold Indian Reservation, North Dakota. Administrative report BIA-40. 35 pp.

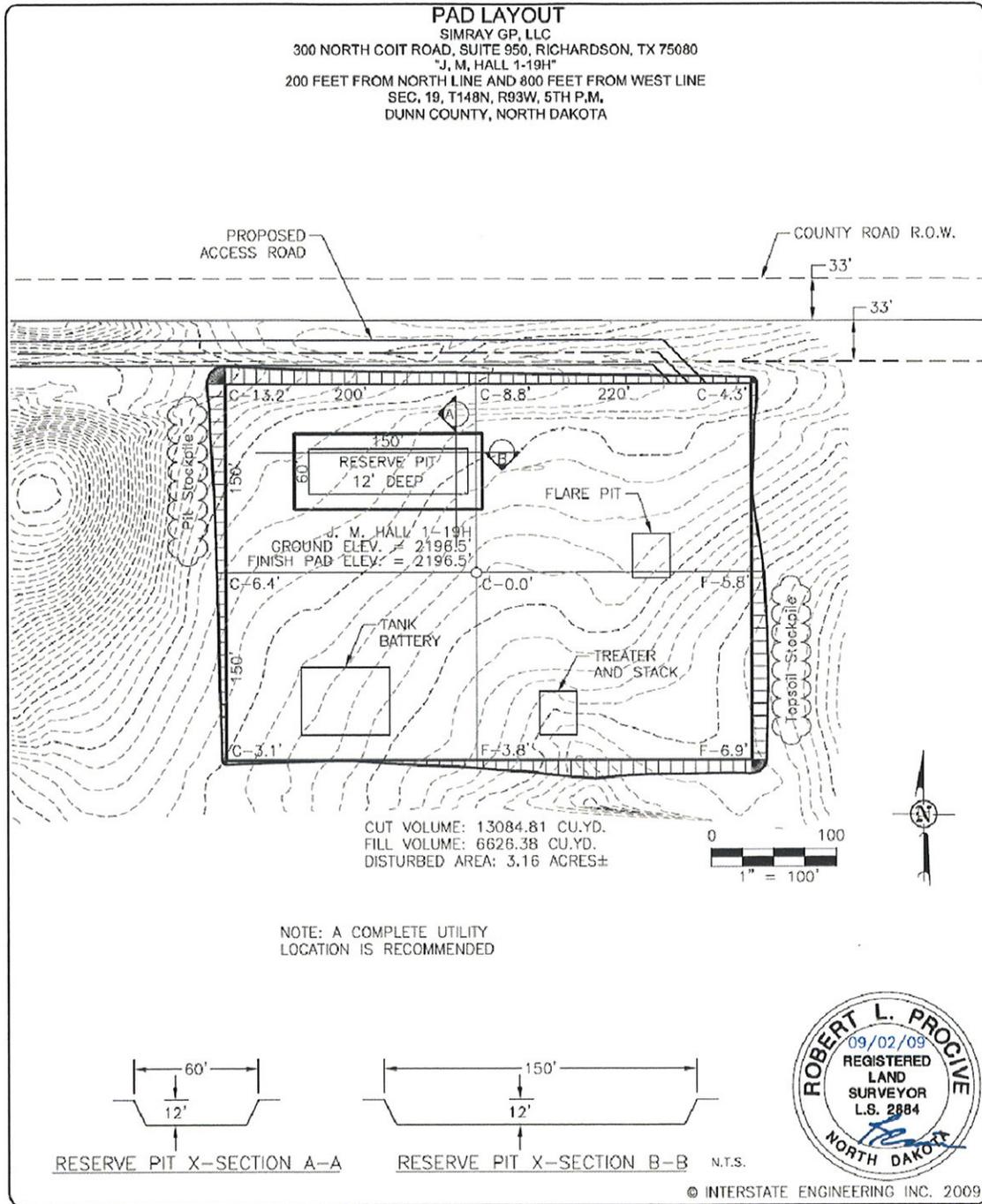
Acronyms

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

NPAL	Northern Plains Agroecosystems Laboratory	TERO	Tribal Employment Rights Office
NRCS	Natural Resources Conservation Service	THPO	Tribal Historic Preservation Officer
NRHP	National Register of Historic Places	TVD	Total Vertical Depth
NTL	Notice to Lessees	USC	United States Code
SHPO	State Historic Preservation Officer	USFS	U.S. Forest Service
TCP	Traditional Cultural Property	USFWS	U.S. Fish and Wildlife Service
		USGS	U.S. Geological Survey

Attachment A
Well Pad Schematics

October 2009.

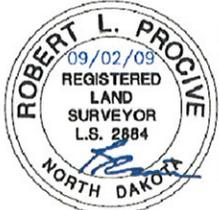


SHEET
3
OF
6

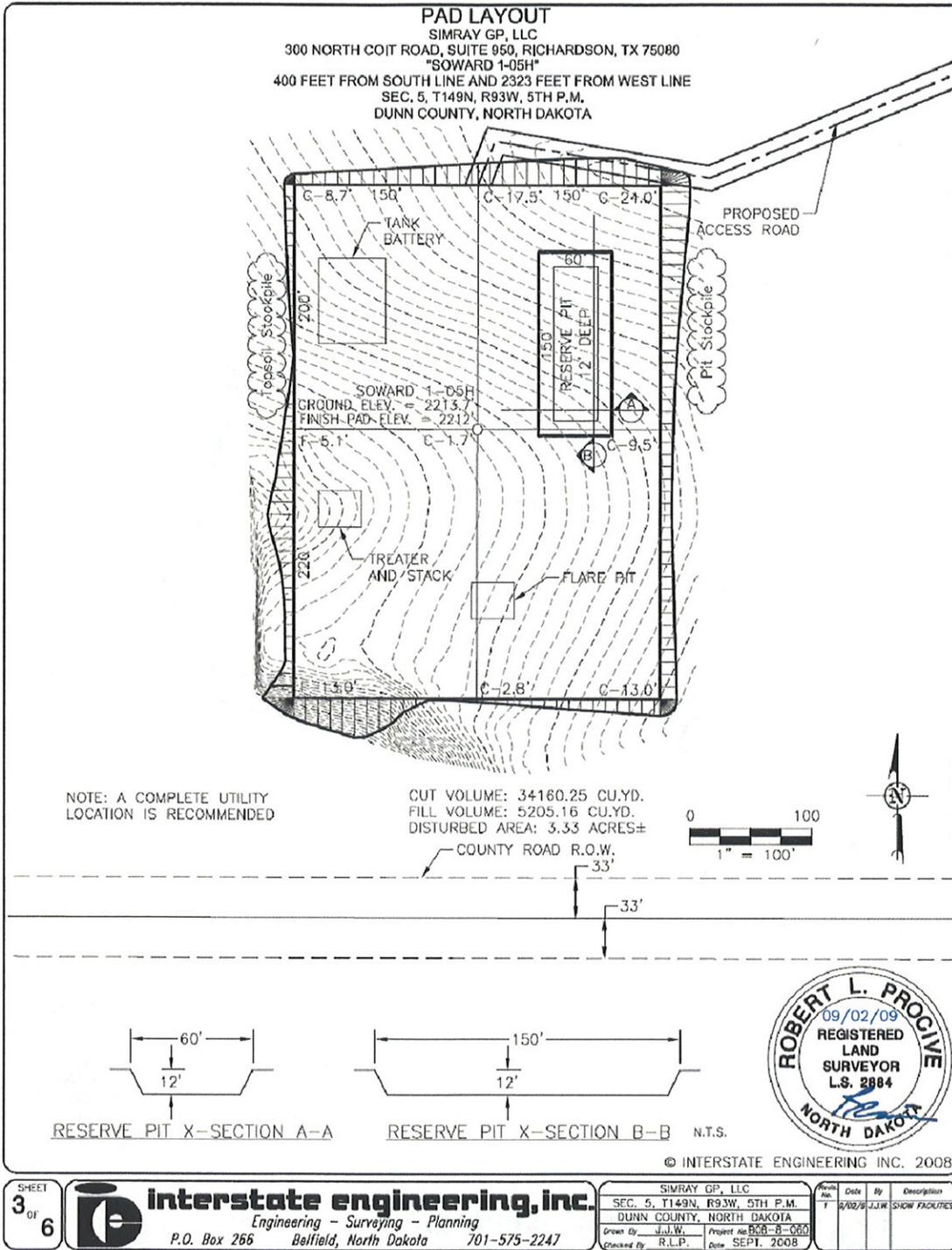
interstate engineering, inc.
Engineering - Surveying - Planning
P.O. Box 266 Belfield, North Dakota 701-575-2247

SIMRAY GP, LLC	
SEC. 19, T148N, R93W, 5TH P.M.	
DUNN COUNTY, NORTH DAKOTA	
Drawn By: J.J.W.	Project No: 208-B-062
Checked By: R.L.P.	Date: OCT. 2008

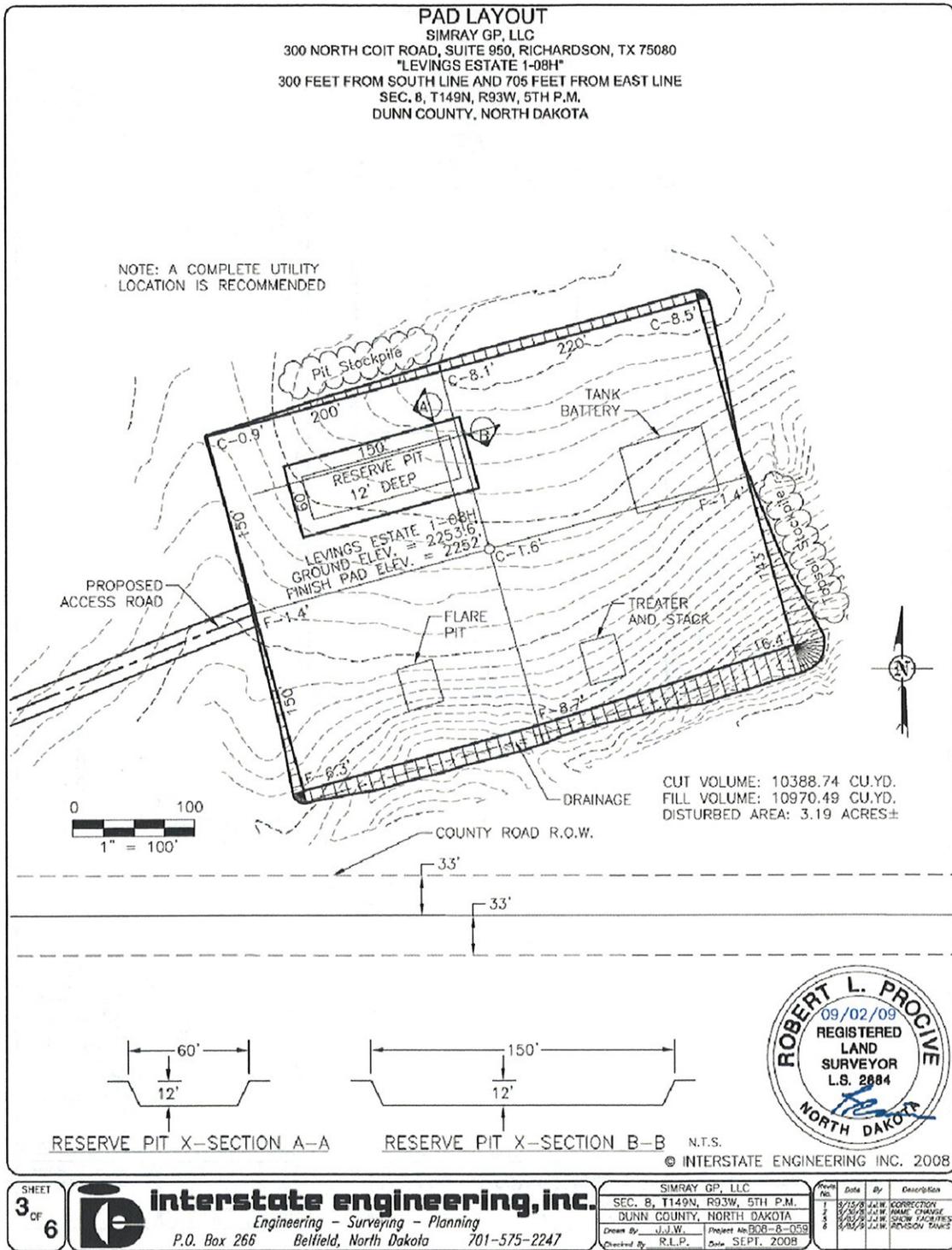
Rev#	Date	By	Description
1	8/17/09	J.J.W.	BELL MOVE
2	9/02/09	J.J.W.	SHOW FACILITIES



October 2009.



October 2009.



Attachment B
Resource Reports

October 2009.

Simray Well Pad Site J.M. Hall 1-19H Resource Report

Prepared for

**Simray Production Company, LP
300 North Coit Road
Suite 950
Richardson, TX 75080**

Prepared by

**SWCA Environmental Consultants
115 North 4th Street, Suite 1
Bismarck, ND 58501
(701) 258-6622
www.swca.com**

September 1, 2009

Introduction

Simray Production Company, L.P. has proposed to construct an oil well pad (i.e., Simray J.M. Hall 1-19H) and associated access road located in the Fort Berthold Indian Reservation. The proposed well pad and access road, herein referred to as the project area, will be located in the NW quarter of the NW quadrant of Section 19, Township 148 North, Range 93 West, Dunn County, North Dakota (Figures 1 through 3). On August 13, 2009, SWCA Environmental Consultants (SWCA) ecologists conducted a field survey to determine the composition of floral and faunal resources including habitat present within the project area. The following report outlines the findings of the aforementioned field survey.



Figure 1. View facing west toward the proposed well pad from the existing two track access road.



Figure 2. View facing north from the proposed well pad site toward the access road.



Figure 3. View facing west toward the intersection of proposed access road and existing access road.

Wildlife

During the field survey, SWCA ecologist Josh Ruffo observed no primary or secondary indicators of federally listed (i.e. threatened or endangered) or state listed wildlife within or around the project area. Mr. Ruffo observed no signs of wildlife; however the project area is viable foraging habitat for large mammals including *Odocoileus spp.* and other ungulates. Small mammals and birds may also use the project area cover, foraging, and nesting.

Vegetation

Josh Ruffo observed several species of vegetation during his field visit including:

Artemisia frigida (fringed sagewort)

This species is undesirable to most wildlife and therefore has a relatively low forage value. It is used in a small capacity by some ungulates, small mammals, *Tympanuchus phasianellus* (sharp-tailed grouse), and *Centrocercus urophasianus* (greater-sage grouse) (Sedivec and Barker, 1998).

Nasella viridula (green needle grass)

Cool season grass which provides good forage for domestic livestock, large mammals (i.e. ungulates), and small mammals. This species is most often found on dry soils in the prairie and grows best in loamy to heavy clay soils. This species can also obtain adequate growth on sandy soils when moisture is not limiting (Sedivec and Barker, 1998).

Symphoricarpos occidentalis (western snowberry)

This small shrub provides good forage for various species of wildlife. *Tympanuchus phasianellus* (sharp-tailed grouse) and other non-game birds feed on the fruit, which ripens during the fall. *Odocoileus spp.* and *Antilocapra americana* (pronghorn) are known to feed on the foliage and twigs while upland nesting waterfowl, gamebirds, and small mammals utilize western snowberry as both protective and nesting cover (Sedivec and Barker, 1998).

Poa pratensis (Kentucky bluegrass)

This species provides excellent forage for ungulates and small rodents. *Poa pratensis* seeds may provide between 2 and 5 percent of upland game bird and songbird diets. However, this species is known to dominate a plant community which decreases the available nesting habitat for some ground nesting bird species (Sedivec and Barker, 1998).

Echinacea angustifolia (purple coneflower)

Warm season forb which provides nutritious forage for browsing and grazing mammals such as livestock, large mammals (i.e. ungulates), and many small mammals. This species is found abundantly on upland soils. However, it prefers weakly developed soils in dry prairies or on rocky sidehills (Sedivec and Barker, 1998).

Melilotus officinalis (yellow sweet clover)

This plant species is invasive to native prairies and is actively planted for livestock foraging and other agricultural uses related to livestock. This plant species provides excellent forage value and cover for large mammals (i.e. ungulates) and cover for various furbearer species including *Canis latrans* (coyotes) and *Vulpes vulpes* (red fox).

Acroptilon repens (Russian knapweed)

This plant is an introduced species which is considered a noxious weed throughout much of the Great Plains.

Water Resources

Mr. Ruffo observed no wetlands, perennial, or intermittent waterbodies, within the project area. However, an ephemeral drainage feature was observed outside of the project area. According to the U.S. Fish and Wildlife Service's (USFWS), National Wetland Inventory keyhole markup language (kml) layer (USFWS, 2009), one palustrine emergent wetland is located at a distance of approximately 0.16-mile from the project area. The wetland is located at a bearing of 52.68°.

Soils

The Natural Resource Conservation Service (NRCS, 2009) derived soil map below indicates the approximate distribution of various soil types within and around the project area (Figure 4). Additionally, the soil map unit descriptions for each soil series found within the project area can be found below.

Rhoades

The Rhoades series consists of deep and very deep, well to moderately well drained, very slowly permeable soils found on swales and uplands with slopes ranging from approximately 0 to 25 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16-inches and mean annual air temperature is approximately 42^{oF}. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type includes: *Pascopyrum smithii* (western wheatgrass) and *Bouteloua gracilis* (blue grama) (NRCS, 2009).

Vebar

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

Dogtooth

The Dogtooth series consists of moderately deep, well drained, very slowly permeable soils found in uplands where the predominant slope is between 0 and 25 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15-inches and mean annual air temperature is approximately 42^{oF}. The most common vegetation species found on this soil type are range and pasture grasses including *Pascopyrum smithii* (western wheatgrass) and *Bouteloua gracilis* (blue grama) (NRCS, 2009).

Cabba

The Cabba series consists of shallow, well drained, moderately permeable soils found on hills, escarpments, and sedimentary plains. The soil slopes broadly range between 2 and 70 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16-inches and mean annual air temperature is approximately 43°F. The most common vegetation species found on this soil type are *Schizachyrium scoparium* (little bluestem), *Nasella viridula* (green-needle grass), and other various herbs, forbs, and shrub species (NRCS, 2009).

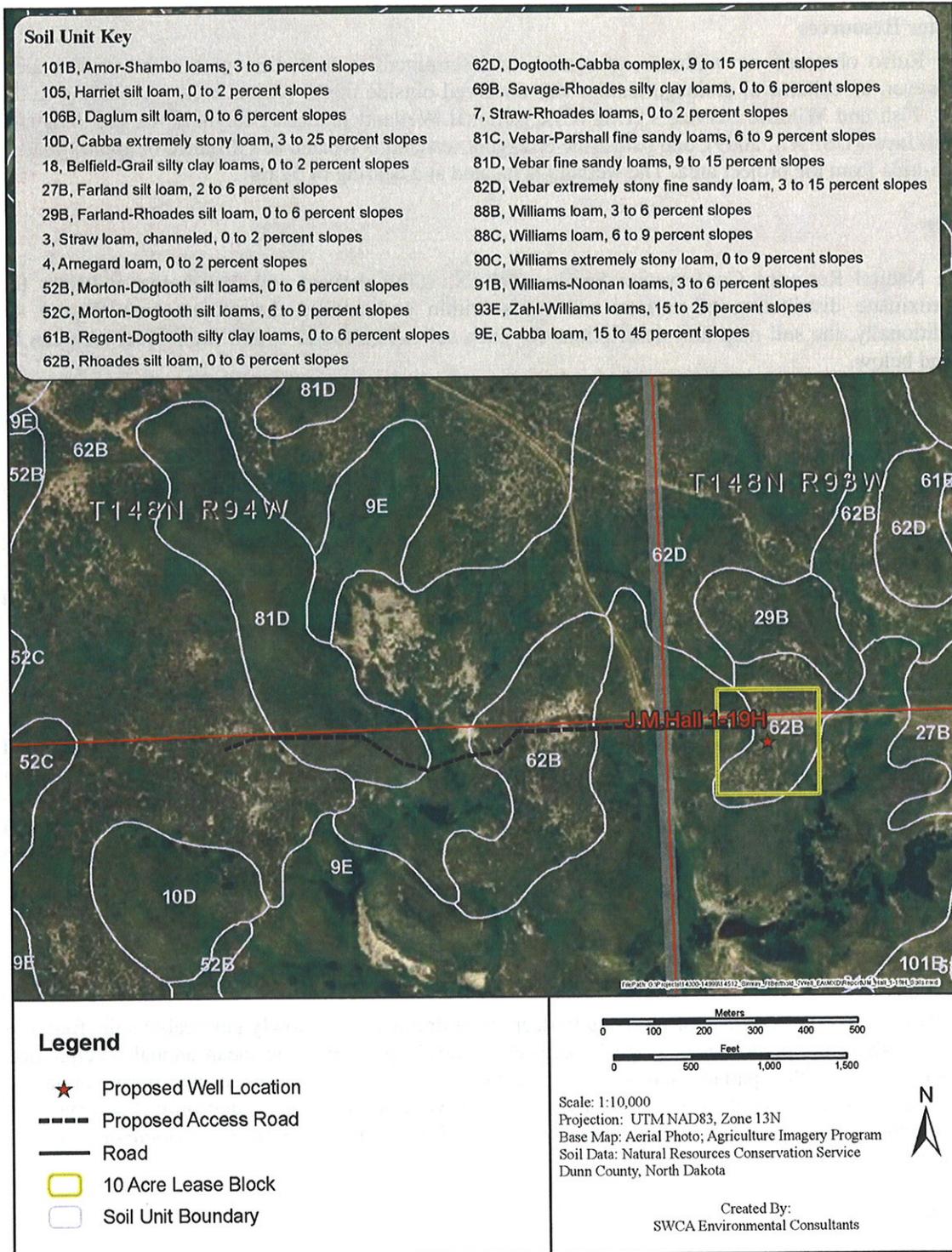


Figure 4. Approximate distribution of various soil types within and around the project area.

Field-Derived Soil Data

Ecologists recorded detailed notes regarding soil profiles including the color of the soil (using Munsell Soil Color Charts), the depth and extent of that soil color within the entire soil profile, the concentration and color of any redoximorphic concentrations, and the texture of the soil at each depth where a color change was observed. Table 1 represents the data derived during SWCA's field visit. Additionally, ecologists noted no hydrologic indicators such as saturation or inundation within the soil profile.

Table 1. Representative soil profile taken at the pad site within the project area

Depth (inches)	%	Matrix Color	%	Redoximorphic Color	Location	Texture
0-10	100	10YR 4/2	N/A	None Observed	N/A	Silty Loam

References

- Sedivec, K. K. and W.T. Barker. 1998. *Selected North Dakota and Minnesota Range Plants*. NDSU Extension Service. North Dakota State University, Fargo, ND
- Natural Resources Conservation Service. Official Soil Series Descriptions website. United States Department of Agriculture. USDA-NRCS, Lincoln, NE.
<http://soils.usda.gov/technical/classification/osd/index.html> [Accessed 10 July 2009].
- U.S. Fish and Wildlife Service. 2009. National Wetland inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.
<http://www.fws.gov/wetlands/data/GoogleEarth.html> [Updated 19 February 2009]

Simray Well Pad Site Soward 1-05H Resource Report

Prepared for
Simray Production Company, LP
300 North Coit Road
Suite 950
Richardson, TX 75080

Prepared by
SWCA Environmental Consultants
115 North 4th Street, Suite 1
Bismarck, ND 58501
(701) 258-6622
www.swca.com

September 1, 2009

Introduction

Simray Production Company, L.P. has proposed to construct an oil well pad (i.e., Simray Soward 1-05H) and associated access road located in the Fort Berthold Indian Reservation. The proposed well pad and access road, herein referred to as the project area, will be located in the NE quarter of the SW quadrant of Section 5, Township 149 North, Range 93 West, Dunn County, North Dakota (Figures 1 through 3). On October 20, 2009 SWCA Environmental Consultants (SWCA) ecologists conducted a field survey to determine the composition of floral and faunal resources including habitat present within the project area. The following report outlines the findings of the aforementioned field survey.



Figure 1. View facing the existing two track access road.



Figure 2. View facing north from the proposed well pad site.



Figure 3. View facing west from the proposed well pad site.

Wildlife

During the field survey, SWCA ecologist Josh Ruffo observed no primary or secondary indicators of federally listed (i.e. threatened or endangered) or state listed wildlife within or around the project area. Mr. Ruffo observed no signs of wildlife; however the project area is viable foraging habitat for large mammals including *Odocoileus spp.* and other ungulates. Small mammals and birds may also use the project area for cover, foraging, and nesting.

Vegetation

Josh Ruffo observed the following species during his field visit including:

Artemisia frigida (fringed sagewort)

This species is undesirable to most wildlife and therefore has a relatively low forage value. It is used in a small capacity by some ungulates, small mammals, *Tympanuchus phasianellus* (sharp-tailed grouse), and *Centrocercus urophasianus* (greater-sage grouse) (Sedivec and Barker, 1998).

Symphoricarpos occidentalis (western snowberry)

This small shrub provides good forage for various species of wildlife. *Tympanuchus phasianellus* (sharp-tailed grouse) and other non-game birds feed on the fruit, which ripens during the fall. *Odocoileus spp.* and *Antilocapra americana* (pronghorn) are known to feed on the foliage and twigs while upland nesting waterfowl, gamebirds, and small mammals utilize western snowberry as both protective and nesting cover (Sedivec and Barker, 1998).

Schizachyrium scoparium (little bluestem)

This species grows in a variety of habitats but is often found in highest densities on dry ridges, hillsides, and sandhill areas. This species acts as a good source of seed for songbirds and some small mammals. When an individual plant is young it provides good forage material to ungulates, changing to fair as the plant matures. Additionally, this species provides fair nesting cover to some ground nesting bird species (Sedivec and Barker, 1998).

Water Resources

Mr. Ruffo observed no wetlands, perennial, or intermittent waterbodies, within the project area. However, an ephemeral drainage feature was observed outside of the project area. According to the U.S. Fish and Wildlife Service's (USFWS), National Wetland Inventory keyhole markup language (kml) layer (USFWS, 2009), three palustrine emergent wetlands are located at a distance of approximately 1.03 miles, 1.06 miles, and 1.09 miles at a bearing of 104.46°, 255.07°, and 132.65°, respectively from the proposed project area.

Soils

The Natural Resource Conservation Service (NRCS, 2009) derived soil map below indicates the approximate distribution of various soil types within and around the project area (Figure 4). Additionally, the soil map unit descriptions for each soil series found within the project area can be found below.

Badland

The Badland or Badland outcrop is not listed as a USDA-NRCS Soil Series. However, this soil series is listed in the McKenzie County, North Dakota Soil Survey, which is applicable from 1988 to 1999.

Cabba

The Cabba series consists of shallow, well drained, moderately permeable soils found on hills, escarpments, and sedimentary plains. The soil slopes broadly range between 2 and 70 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16-inches and mean annual air temperature is approximately 43^oF. The most common vegetation species found on this soil type are *Schizachyrium scoparium* (little bluestem), *Nasella viridula* (green-needle grass), and other various herbs, forbs, and shrub species (NRCS, 2009).

Arikara

The Arikara series consists of very deep, well drained soils found on wooded slopes. Permeability is moderate with slopes ranging from approximately 9 to 70 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15-inches and mean annual air temperature is approximately 40^oF. This soil type is used most often for woodland grazing. Native vegetation species common to this soil type includes: *Quercus macrocarpa* (bur oak), *Fraxinus pennsylvanica* (green ash), *Populus tremuloides* (quaking aspen), *Betula papyrifera* (paper birch), and *Juniperus scopulorum* (Rocky Mountain juniper) (NRCS, 2009).

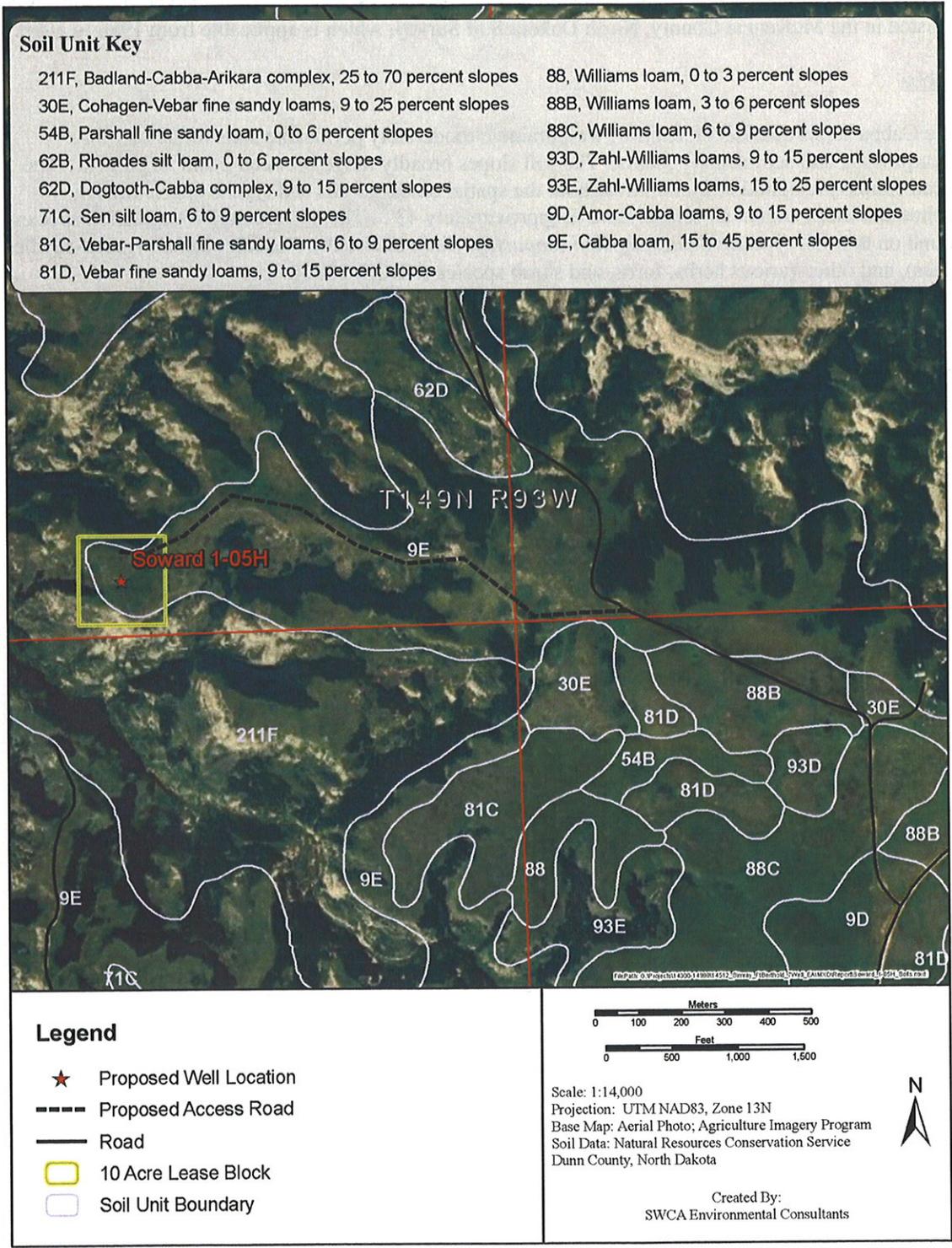


Figure 4. Approximate distribution of various soil types within and around the project area.

Field-Derived Soil Data

Ecologists recorded detailed notes regarding soil profiles including the color of the soil (using Munsell Soil Color Charts), the depth and extent of that soil color within the entire soil profile, the concentration and color of any redoximorphic concentrations, and the texture of the soil at each depth where a color change was observed. Table 1 represents the data derived during SWCA's field visit. Additionally, ecologists noted no hydrologic indicators such as saturation or inundation within the soil profile.

Table 1. Representative soil profile taken at the pad site within the project area

Depth (inches)	%	Matrix Color	%	Redoximorphic Color	Location	Texture
0-16	100	10YR 3/2	N/A	None Observed	N/A	Silty Clay Loam

References

- Sedivec, K. K. and W.T. Barker. 1998. *Selected North Dakota and Minnesota Range Plants*. NDSU Extension Service. North Dakota State University, Fargo, ND
- Natural Resources Conservation Service. Official Soil Series Descriptions website. United States Department of Agriculture. USDA-NRCS, Lincoln, NE.
<http://soils.usda.gov/technical/classification/osd/index.html> [Accessed 10 July 2009].
- U.S. Fish and Wildlife Service. 2009. National Wetland inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.
<http://www.fws.gov/wetlands/data/GoogleEarth.html> [Updated 19 February 2009]

Simray Well Pad Site Levings Estate 1-08H Resource Report

Prepared for

Simray Production Company, LP
300 North Coit Road
Suite 950
Richardson, TX 75080

Prepared by

SWCA Environmental Consultants
115 North 4th Street, Suite 1
Bismarck, ND 58501
(701) 258-6622
www.swca.com

September 1, 2009

Introduction

Simray Production Company, L.P. has proposed to construct an oil well pad (i.e., Simray Levings Estate 1-08H) and associated access road located in the Fort Berthold Indian Reservation. The proposed well pad and access road, herein referred to as the project area, will be located in the SE quarter of the SE quadrant of Section 8, Township 149 North, Range 93 West, Dunn County, North Dakota (Figures 1 through 3). On October 20, 2008 SWCA Environmental Consultants (SWCA) ecologists conducted a field survey to determine the composition of floral and faunal resources including habitat present within the project area. The following report outlines the findings of the aforementioned field survey.



Figure 1. View facing the existing two track access road.



Figure 2. View facing north from the proposed well pad site.



Figure 3. View facing west from the proposed well pad site.

Wildlife

During the field survey, SWCA ecologist Josh Ruffo observed no primary or secondary indicators of federally listed (i.e. threatened or endangered) or state listed wildlife within or around the project area. Mr. Ruffo observed no signs of wildlife; however the project area may act as viable foraging habitat for large mammals including *Odocoileus spp.* and other ungulates. Small mammals and birds may also use the project area cover, foraging, and nesting.

Vegetation

Josh Ruffo observed the following vegetation species during his field visit including:

Artemisia frigida (fringed sagewort)

This species is undesirable to most wildlife and therefore has a relatively low forage value. It is used in a small capacity by some ungulates, small mammals, *Tympanuchus phasianellus* (sharp-tailed grouse), and *Centrocercus urophasianus* (greater-sage grouse) (Sedivec and Barker, 1998).

Nasella viridula (green needle grass)

Cool season grass which provides good forage for domestic livestock, large mammals (i.e. ungulates), and small mammals. This species is most often found on dry soils in the prairie and grows best in loamy to heavy clay soils. This species can also obtain adequate growth on sandy soils when moisture is not limiting (Sedivec and Barker, 1998).

Bromus arvensis (field brome)

This plant species provides good erosion control due to the presence of a fibrous root system. *Odocoileus spp.*, *Antilocapra americana*, *Branta canadensis* (Canada geese), songbirds, and rodents (Family: Muridae) are known to utilize *Bromus arvensis* as a food source (Sedivec and Barker, 1998).

Water Resources

Mr. Ruffo observed no wetlands, perennial, or intermittent waterbodies, within the project area. However, an ephemeral drainage feature was observed outside of the project area. According to the U.S. Fish and Wildlife Service's (USFWS), National Wetland Inventory keyhole markup language (kml) layer (USFWS, 2009), two palustrine emergent wetlands are located at a distance of approximately 0.47-mile and 0.50-mile at a bearing of 54.79° and 202.70°, respectively, from the project area.

Soils

The Natural Resource Conservation Service (NRCS, 2009) derived soil map below indicates the approximate distribution of various soil types within and around the project area (Figure 4). Additionally, the soil map unit descriptions for each soil series found within the project area can be found below.

Williams

The Williams series consists of very deep, slowly permeable, well drained soils found on glacial till plains and moraines with slopes at approximately 0 to 35 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14-inches and mean annual air temperature is approximately 40^oF. This soil type is largely used for cultivation. Native vegetation species common to this soil type includes: *Pascopyrum smithii* (western wheatgrass), *Hesperostipa comata* (needle and thread), *Bouteloua gracilis* (blue grama), and *Nasella viridula* (green needlegrass) (NRCS, 2009).

Cabba

The Cabba series consists of shallow, well drained, moderately permeable soils found on hills, escarpments, and sedimentary plains. The soil slopes broadly range between 2 and 70 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16-inches and mean annual air temperature is approximately 43^oF. The most common vegetation species found on this soil type are *Schizachyrium scoparium* (little bluestem), *Nasella viridula* (green-needle grass), and other various herbs, forbs, and shrub species (NRCS, 2009).

Chama

The Chama soil series consists of well drained soils found on uplands in materials weathered from soft siltstone, mudstone, and shale. These soils are moderately or moderately slowly permeable. The slope ranges from 0 to 45 percent. Mean annual air temperature is 42^oF, and mean annual precipitation is 15 inches. Soils are cultivated to small grains and also used in a large part as pastureland. The native vegetation is principally *Pascopyrum smithii* (western wheatgrass), *Stipa comata* (needle-and-thread), and *Bouteloua gracilis* (blue grama).

Morton

The Morton series consists of moderately deep, well drained, moderately permeable soils found in matter weathered from soft calcareous silty shales, siltstones, and fine grained sandstones. These Morton soils are on uplands and have slopes of 0 to 15 percent. The mean annual air temperature is 42 degrees F, and the mean annual precipitation is 15 inches. Cultivated areas are used for growing small grains, flax, corn, hay, and pasture. Native vegetation is mid- and short-prairie grasses such as *Pascopyrum smithii* (western wheatgrass), *Nasella viridula* (green needlegrass), and *Bouteloua gracilis* (blue grama). (NRCS, 2009).

Dogtooth

The Dogtooth series consists of moderately deep, well drained, very slowly permeable soils found in uplands where the predominant slope is between 0 and 25 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15-inches and mean annual air temperature is approximately 42^oF. The most common vegetation species found on this soil type are range and pasture grasses including *Pascopyrum smithii* (western wheatgrass) and *Bouteloua gracilis* (blue grama) (NRCS, 2009).

Zahl

The Zahl series consists of very deep, slowly permeable, well drained soils found on glacial till plains, moraines, and valley side slopes at approximately 1 to 60 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 14-inches and mean annual air temperature is approximately 40^oF. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type includes: *Pascopyrum smithii* (western wheatgrass), *Schizachyrium scoparium* (little bluestem), and *Hesperostipa comata* (needle and thread) (NRCS, 2009).

Amor

The Amor series consists of moderately deep, well drained, moderately permeable soils found on sandstone bedrock uplands with slopes ranging from approximately 0 to 25 percent. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 15-inches and mean annual air temperature is approximately 42^oF. This soil type is largely used for cultivation of small grains, flax, and corn. Native vegetation species common to this soil type includes: *Hesperostipa comata* (needle and thread), *Pascopyrum smithii* (western wheatgrass), and *Bouteloua gracilis* (blue grama) (NRCS, 2009).

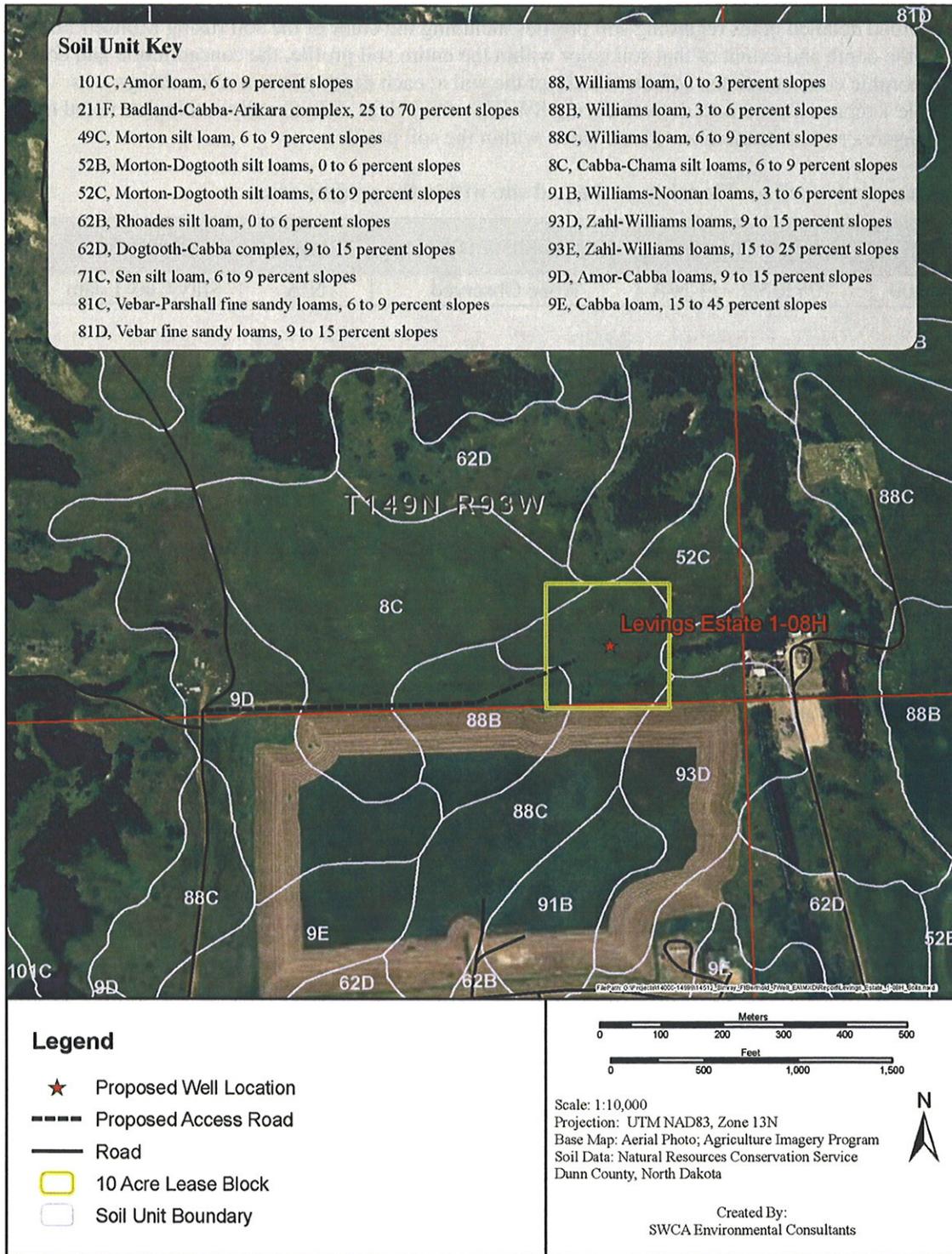


Figure 4. Approximate distribution of various soil types within and around the project area.

Field-Derived Soil Data

Ecologists recorded detailed notes regarding soil profiles including the color of the soil (using Munsell Soil Color Charts), the depth and extent of that soil color within the entire soil profile, the concentration and color of any redoximorphic concentrations, and the texture of the soil at each depth where a color change was observed. Table 1 represents the data derived during SWCA's field visit. Additionally, ecologists noted no hydrologic indicators such as saturation or inundation within the soil profile.

Table 1. Representative soil profile taken at the pad site within the project area

Depth (inches)	%	Matrix Color	%	Redoximorphic Color	Location	Texture
0-16	100	10YR 3/2	N/A	None Observed	N/A	Silty Clay Loam

References

- Sedivec, K. K. and W.T. Barker. 1998. *Selected North Dakota and Minnesota Range Plants*. NDSU Extension Service. North Dakota State University, Fargo, ND
- Natural Resources Conservation Service. Official Soil Series Descriptions website. United States Department of Agriculture. USDA-NRCS, Lincoln, NE. <http://soils.usda.gov/technical/classification/osd/index.html> [Accessed 10 July 2009].
- U.S. Fish and Wildlife Service. 2009. National Wetland inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. <http://www.fws.gov/wetlands/data/GoogleEarth.html> [Updated 19 February 2009]