

March 8, 2019

Via Priority Mail, Return Receipt Requested

Mr. Craig Boomgaard
UIC Program - Salt Water Disposal
U.S. Environmental Protection Agency, Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

**RE: UIC Permit Application
LOW CAP SWD 1
SWNW Section 17, T149N R91W
Dunn County, North Dakota**

Dear Mr. Boomgaard:

I hereby submit the enclosed Underground Injection Control (UIC) permit application for the LOW CAP SWD 1. This is a new well that Independence ND, LLC seeks to drill and operate as a Class II, Type D salt water disposal well.

Please review the enclosed application and accompanying attachments and notify me if you discover any deficiencies.

Sincerely, 

/JC JOHNSON/

JC Johnson
President
Independence ND, LLC
701-627-4831

701-421-8407

Enclosures

3-8-19

UIC Class II Permit Application Completeness Review Checklist

Permit Writer:	Date Received:	Date Completed:
Permit Applicant: Independence ND, LLC	Prospective Permit #:	

✓	Description
X	Has the Permit Application (7520-6) been completed and does it include a signature from an authorized company official?
X	Attachment A: AREA OF REVIEW METHODS - Give the methods and, if appropriate, the calculations used to determine the size of the area of review (fixed radius or equation). The area of review shall be a fixed radius of 1/4 mile from the well bore unless the use of an equation is approved in advance by the Director.
X	<p>Attachment B: MAPS OF WELL/AREA AND AREA OF REVIEW – Submit a topographic map extending one mile beyond the property boundaries, showing...</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> the injection well(s) or project area for which a permit is sought and the applicable area of review. The map must show all... <input checked="" type="checkbox"/> intake and discharge structures, <input checked="" type="checkbox"/> hazardous waste treatment, storage, or disposal facilities and, <input checked="" type="checkbox"/> (<i>For area permit application only</i>) the distribution manifold applying injection fluid to all wells in the area, including all system monitoring points. <p>Within the area of review, the map must show...</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> the number, or name, and location of all producing wells, <input checked="" type="checkbox"/> injection wells, <input checked="" type="checkbox"/> abandoned wells, <input checked="" type="checkbox"/> dry holes, <input checked="" type="checkbox"/> surface bodies of water, <input checked="" type="checkbox"/> springs, mines (surface and subsurface), <input checked="" type="checkbox"/> quarries, and <input checked="" type="checkbox"/> other pertinent surface features, including residences and roads, and faults, if known or suspected. <p>In addition, the map must identify those...</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> wells, springs, other surface water bodies, and drinking water wells located within one quarter mile of the facility property boundary. <p>Only information of public record is required to be included in this map.</p>
X	Attachment C: CORRECTIVE ACTION PLAN AND WELL DATA - Submit a tabulation of data reasonably available from public records or otherwise known to the applicant on...

✓	<p>Description</p> <p><input checked="" type="checkbox"/> all wells within the area of review, including those on the map required in B, which penetrate the proposed injection zone. No wells penetrate injection zone within a half-mile AOR</p> <p>Such data shall include a description of each well's...</p> <ul style="list-style-type: none"> <input type="checkbox"/> types, <input type="checkbox"/> construction, <input type="checkbox"/> date drilled, <input type="checkbox"/> location, <input type="checkbox"/> depth, <input type="checkbox"/> well bore diagrams, CBL, completion records of AOR wells, <i>if available</i> <input type="checkbox"/> record of plugging and/or completion, and <input type="checkbox"/> AOR CAP, <i>if applicable</i>
	<p>Attachment E: NAME AND DEPTHS OF FORMATION FROM SURFACE TO TOTAL DEPTH, INCLUDING USDW(S) AND CONFINING ZONE(S). – Submit the following information and identify if the formation is the injection zone, USDW, or confining.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> formation name <input checked="" type="checkbox"/> depth <input checked="" type="checkbox"/> formation lithology and <input checked="" type="checkbox"/> formation TDS
	<p>Attachment G: ADDITIONAL INJECTION ZONE INFORMATION</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> fracture pressure (known or estimated)
	<p>Attachment H: OPERATING DATA - Submit the following proposed operating data for each well (including all those to be covered by area permits):</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> average and maximum daily rate and volume of the fluids to be injected <input checked="" type="checkbox"/> average and maximum injection pressure; <input checked="" type="checkbox"/> composition of annulus fluid; <input checked="" type="checkbox"/> source and analysis of the chemical, physical, radiological and biological characteristics, including density and corrosiveness, of injection fluids. NA** NA**
	<p>Attachment I: FORMATION TESTING PROGRAM - Describe the proposed formation testing program. The program must be designed to obtain...</p>

** H. OPERATING DATA - Submit the following proposed operating data for each well (including all those to be covered by area permits): (1) average and maximum daily rate and volume of the fluids to be injected; (2) average and maximum injection pressure; (3) nature of annulus fluid; (4) for Class I wells, source and analysis of the chemical, physical, radiological and biological characteristics, including density and corrosiveness, of injection fluids; (5) for Class II wells, source and analysis of the physical and chemical characteristics of the injection fluid; (6) for Class III wells, a qualitative analysis and ranges in concentrations of all constituents of injected fluids. If the information is proprietary, maximum concentrations only may be submitted, but all records must be retained.

✓	<p>Description</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> fluid pressure <input checked="" type="checkbox"/> injection formation fracture pressure <input checked="" type="checkbox"/> physical and chemical characteristics of the formation fluids.
X	Attachment J: STIMULATION PROGRAM - Describe any proposed stimulation program.
X	Attachment K: INJECTION PROCEDURES - Describe the proposed injection procedures including pump, surge, tank, etc.
X	<p>Attachment L: CONSTRUCTION PROCEDURES – Describe the anticipated injection well construction (meeting regulations under 40 CFR §146.12). This should include...</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> details of the casing and cementing program <input checked="" type="checkbox"/> logging procedures <input checked="" type="checkbox"/> deviation checks <input checked="" type="checkbox"/> the drilling, testing and coring program, and <input checked="" type="checkbox"/> proposed annulus fluid. <input checked="" type="checkbox"/> if applicable, a request justifying the use of an alternative to a packer
X	Attachment M: CONSTRUCTION DETAILS - Submit schematic or other appropriate drawings of the surface and subsurface construction details of the well.
X	Attachment O: PLANS FOR WELL FAILURES - Outline contingency plans to cope with all shut-ins or wells failures, so as to prevent migration of fluids into any USDW.
X	<p>Attachment P: MONITORING PROGRAM - Discuss the planned monitoring program. This should be thorough, including...</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> maps showing the number and location of monitoring wells as appropriate and discussion of monitoring devices, sampling frequency, and parameters measured. <p>NA <input type="checkbox"/> (If a manifold monitoring program is utilized, pursuant to §146.23(b)(5), describe the program and compare it to individual well monitoring.)</p>
X	<p>Attachment Q: PLUGGING AND ABANDONMENT PLAN - Submit a plan for plugging and abandonment of the well including...</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> the type, number, and placement (including the elevation of the top and bottom) of plugs to be used; <input checked="" type="checkbox"/> the type, grade, and quantity of cement to be used; and <input checked="" type="checkbox"/> the method to be used to place plugs, including the method used to place the wells in a state of static equilibrium prior to placement of the plugs. <input checked="" type="checkbox"/> Submit this information on EPA Form 7520-14, Plugging and Abandonment Plan.
X	Attachment R: NECESSARY RESOURCES - Submit evidence such as a surety bond or financial statement to verify that the resources necessary to close, plug or abandon the well are available.

✓	Description
X	<p>Attachment S: AQUIFER EXEMPTIONS – If an aquifer exemption is requested, submit data necessary to demonstrate that the aquifer meets the following criteria... To be submitted at a later date if required</p> <ul style="list-style-type: none"> <input type="checkbox"/> it does not serve as a source of drinking water; <input type="checkbox"/> cannot now and will not in the future serve as a source of drinking water; <input type="checkbox"/> the TDS content of the ground water is more than 3,000 and less than 10,000 mg/l and <input type="checkbox"/> is not reasonably expected to supply a public water system. <input type="checkbox"/> Data to demonstrate that the aquifer is expected to be mineral or hydrocarbon producing. A timetable for proposed development must also be included. <p>For additional information on aquifer exemptions, see 40 CFR §§ 144.7 and 146.04.</p>
X	<p>Attachment T: EXISTING EPA PERMITS - List any existing EPA permits including program name (e.g. SDWA, NPDES, PSD, RCRA, etc.) and permit number (e.g. AK1I001-A) associated with the facility.</p>
X	<p>Attachment U: DESCRIPTION OF BUSINESS - Give a brief description of the nature of the business.</p>

Well Information

Well Name: LOW CAP SWD 1
Well Type/Class: Commercial Salt Water Disposal (2D)
Reservation Name: ND | Fort Berthold
N/E/C: New
Operation Date: ASAP
Oil Field Name: Heart Butte
API # (xx-xxx-xxxxx): TBD
SPUD Date: ASAP (mm/dd/yyyy)
Comments: Drop down does not offer ND | Heart Butte Field and not allowed to enter footage call of 2145 FNL.

Well Location

1/4 Sec Section: SWNW Township: 17 N/S: 149 N Range: 91 E/W: W

Latitude: 47 Deg 43 Min 34 Sec OR Decimal

Longitude: -102 Deg 21 Min 44 Sec OR Decimal

Footage Calls: 2145 feet from N/S line 588 feet from E/W line

State: ND

County: Dunn

Well Construction

Ground Elevation	2230	feet
Kelly Bushing	15	feet
Total Depth of Well (KB)	5665	feet
Plugged Back Total Depth (KB)	5625	feet
Packer Depth (KB)	5105	feet

All Depths Measured in KB

Casing Type	Casing Description	Hole	Casing	Casing	Casing	Cement	Cement
		Diameter (in.)	Diameter (in.)	Top (ft)	Bottom(ft)	Top (ft)	Bottom(ft)
Surface	J-55 36 lb/ft	13.500	9.625	0	2315	0	2315
Production	J-55 36 lb/ft	8.750	7.000	0	5665	0	5665

Perforations

	Perf 1	Perf 2	Perf 3	Perf 4	Perf 5	Perf 6	Perf 7	Perf 8	Perf 9	Perf 10
Perf Status	Proposed									
Top Depth (ft KB)	5135									
Bot Depth (ft KB)	5450									

Maximum Injection Pressure	Value	1380 psi	Source of value	Other
Specific Gravity	Value	1.21	Source of value	Water Sample
Fracture Gradient	Value	0.80 psi/ft	Source of value	Other
Depth	Value	5055 ft KB		
Friction Loss	Value	197 psi		
Comments	MAIP & friction calculated in Attach H; 0.80 accepted standard for Mowry Fm.			

Provide "Source of Value" if "Other" selected.



United States Environmental Protection Agency
**Underground Injection Control
 Permit Application**
 (Collected under the authority of the Safe Drinking
 Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number		
	T/A	C
U		

Read Attached Instructions Before Starting
 For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address			III. Operator Name and Address		
Owner Name INDEPENDENCE ND, LLC			Owner Name INDEPENDENCE ND, LLC		
Street Address 301 1ST AVE E BAKERSFIELD		Phone Number (701) 627-4831	Street Address 301 1ST AVE E BAKERSFIELD		Phone Number (701) 627-4831
City NEWTOWN	State ND	ZIP CODE 58763-4405	City NEWTOWN	State ND	ZIP CODE 58763-4405

IV. Commercial Facility	V. Ownership	VI. Legal Contact	VII. SIC Codes
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Owner <input type="checkbox"/> Operator	1311

VIII. Well Status (Mark "x")			
<input type="checkbox"/> A Operating	Date Started mo day year	<input type="checkbox"/> B. Modification/Conversion	<input checked="" type="checkbox"/> C. Proposed

IX. Type of Permit Requested (Mark "x" and specify if required)			
<input checked="" type="checkbox"/> A. Individual	<input type="checkbox"/> B. Area	Number of Existing Wells	Number of Proposed Wells
			1
		Name(s) of field(s) or project(s) HEART BUTTE	

X. Class and Type of Well (see reverse)			
A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code "A," explain	D. Number of wells per type (if area permit)
II	D		

XI. Location of Well(s) or Approximate Center of Field or Project											XII. Indian Lands (Mark "x")			
Latitude			Longitude			Township and Range							<input type="checkbox"/> Yes <input type="checkbox"/> No	
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line	
47	43	33.8	-102	21	44.2	17	149	91	NW	2145	N	588	W	

XIII. Attachments
 (Complete the following questions on a separate sheet(s) and number accordingly; see instructions)
 For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

XIV. Certification	
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)	
A. Name and Title (Type or Print)	B. Phone No. (Area Code and No.)
JC JOHNSON	(701) 627-4831
C	D. Date Signed
JC JOHNSON	4-5-18

UIC PERMIT APPLICATION ATTACHMENTS

LOW CAP SWD 1 – Independence ND, LLC

SWNW Section 17-149-91

Heart Butte Field - Dunn County, ND

A. AREA OF REVIEW METHODS

Independence ND, LLC (Independence ND) used an estimated maximum rate of 29,500 bbls/day, a potential well life span of 10 years and the calculated average porosity and injection zone thickness of the offsetting FBIR BEAKS 24X-8B well (NDIC Well File No. 19800) to calculate a 0.49-mile radius of influence. A safety margin of 500 bbls/day was then added to the calculation to arrive at a radius of influence of 0.50-mile. Independence ND is proposing that the Area of Review reflect this 0.50-mile fixed radius of influence from the well bore of the proposed LOW CAP SWD 1. Please note the supporting calculations in Attachment A1 and CND Log of the proposed injection zone in Attachment A2.



CALCULATION OF THE RADIUS OF INFLUENCE - LOW CAP SWD 1
10 Year Life Span 29,500 Bbbls/day Rate - Attachment A1

Injection Zone	Inyan Kara
Avg. Porosity of Injection Zone (Θ)	26.5%
Thickness of Injection Zone (H)	118.0 Feet
Water Saturation of Injection Zone (Sw=1)	1.0
Formation Volume Factor (FVF)	1.1
Efficiency Factor (Ef=1)	1.0
Bbbls Per Acre-Ft	7,758
Ft ² PER ACRE	43,560
Well Life Span	10 Years
Maximum Injection Rate	29,500 Bbbls/day
End of Life Span Injection Volume	107,675,000 Bbbls

$$\text{Area (Acres)} = \frac{\text{Bbbls} * \text{FVF} * \text{Sw} * \text{Ef}}{7758 * \Theta * H}$$

$$\text{Radius of Influence(Feet)} = \left[\frac{43,560 * \text{Acres}}{\pi} \right]^{1/2}$$

Therefore;

$$\text{Radius} = \left[\frac{\text{Bbbls} * \text{FVF} * \text{Sw} * \text{Ef} * 43,560}{7758 * \Theta * H * \pi} \right]^{1/2}$$

$$\text{Radius} = \left[\frac{107,675,000 * 1.1 * 1.0 * 1.0 * 43,560}{7758 * .265 * 118 * 3.14159} \right]^{1/2}$$

Radius = 2,602 feet

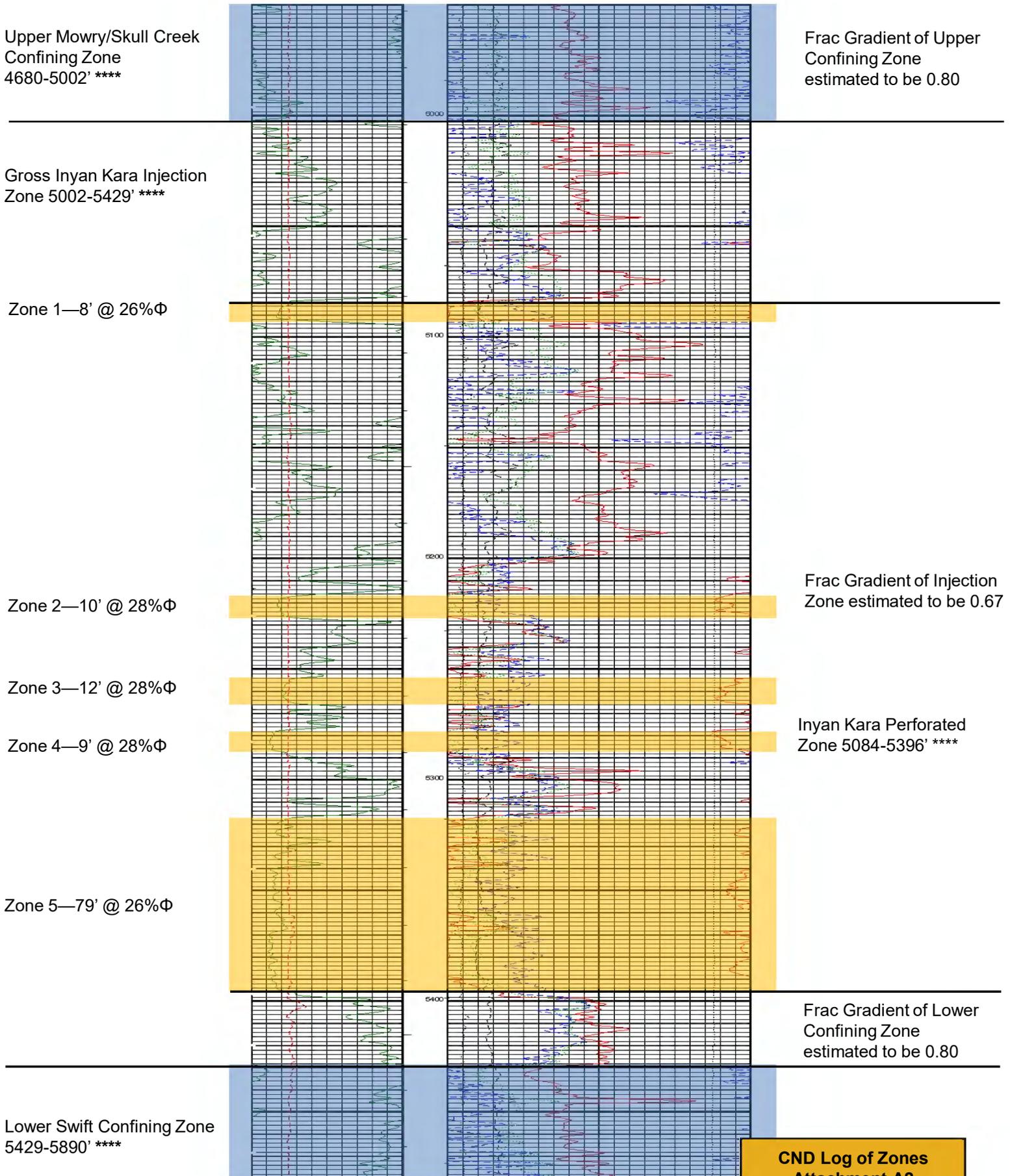
Radius of Influence at Given Rates		
Rates (Bbbls/day)	29,500	30,000
10 Year Inj. (Bbbls)	107,675,000	109,500,000
Radius (feet)	2,602	2,624
Radius (miles)	0.49	0.50

*** Safety Factor- Expanding the Area of Review to 0.5-mile represents a 500 Bbl/day increase over the proposed maximum rate throughout the expected 10 year life span.

Injection Formation Data ****						
Injection Formation	Zone	Top ft	Bottom ft	Interval ft	Porosity %	
Inyan Kara	Zone 1	5084	5092	8	26%	0.0176271
Inyan Kara	Zone 2	5217	5227	10	28%	0.0237288
Inyan Kara	Zone 3	5254	5266	12	28%	0.0284746
Inyan Kara	Zone 4	5278	5287	9	28%	0.0213559
Inyan Kara	Zone 5	5317	5396	79	26%	0.1740678
Total				118	Avg Porosity	26.5%
Perforation Interval		5084-5396				

**** Formation depths are referenced from the CND Log of the offsetting FBIR BEAKS 24X-8B well (NDIC Well File No. 19800) but **are not** corrected for the elevation changes at the proposed location.

Calculation of ROI
Attachment A1
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND



**** Formation depths are referenced from the CND Log of the offsetting FBIR BEAKS 24X-8B well (NDIC Well File No. 19800) but **are not** corrected for the elevation changes at the proposed location.

**CND Log of Zones
Attachment A2**
LOW CAP SWD 1
Independence ND, LLC
SWNW Section 17-149-91
Heart Butte Field
Dunn County, ND

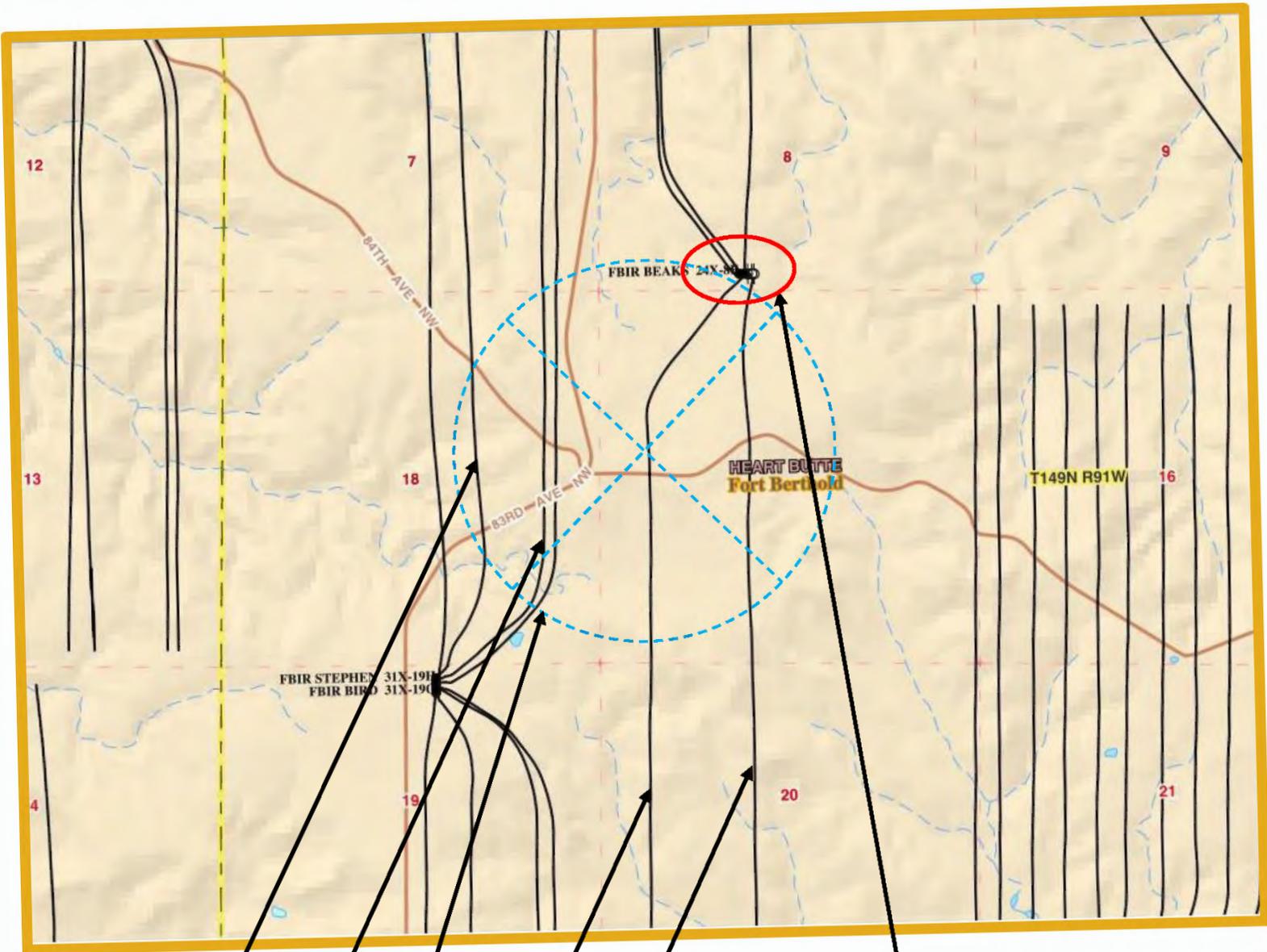
B. MAPS OF WELL/AREA AND AREA OF REVIEW (See Attachments B1-B7)

Independence ND, LLC

301 1st Ave E Bakersfield

Newtown, ND 58763-4405



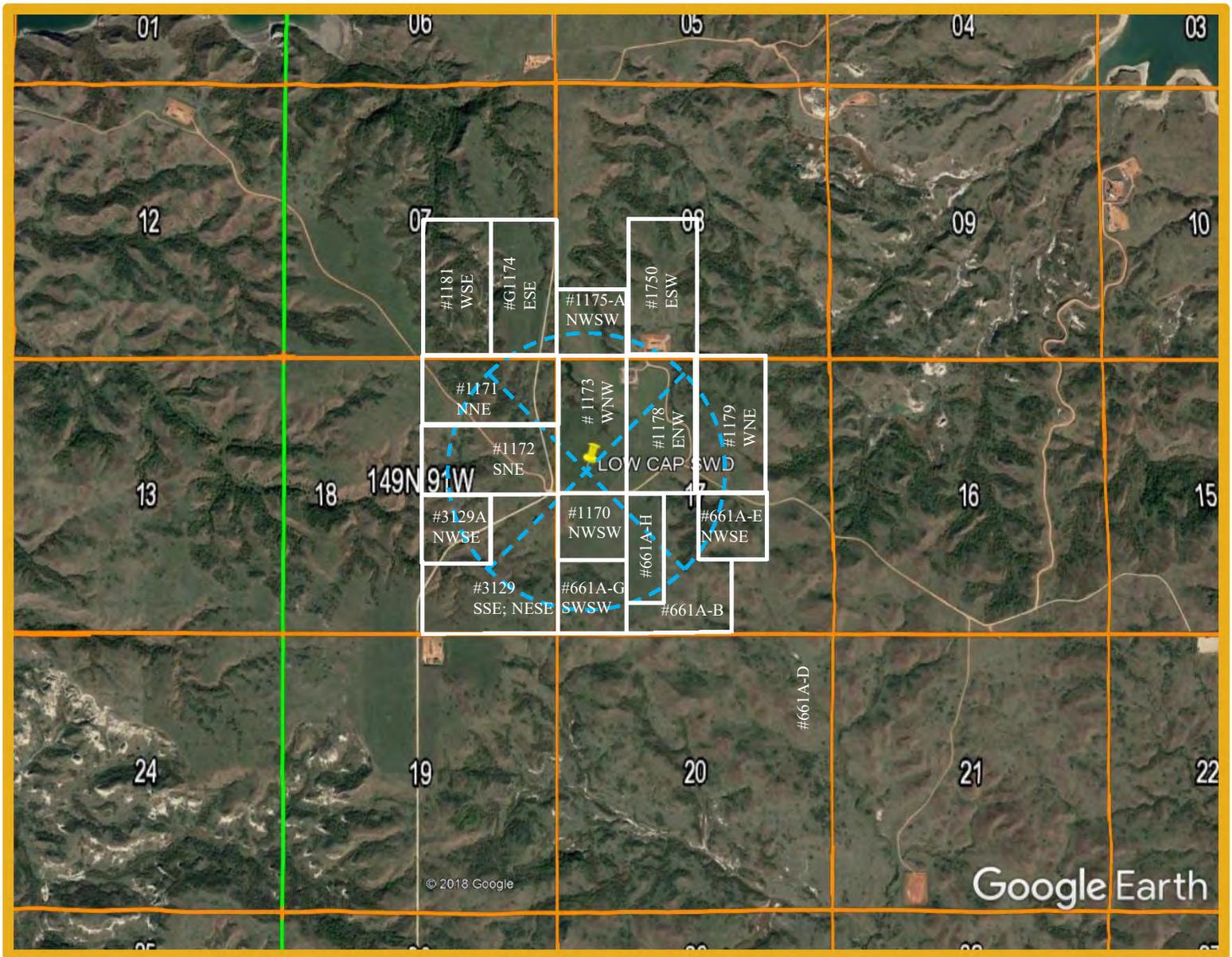


 0.50-Mile Area of Review

- WF-24084
- WF-23885
- WF-23884
- WF-19801
- WF-23693

- WF-19800
 - WF-19801
 - WF-23690
 - WF-23691
 - WF-23692
 - WF-23693
 - WF-23694
 - WF-23933
- Vertical wellbores through injection zone are >.52 miles from LOW CAP SWD 1

0.50 Mile Area of Review Attachment B1
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND



 0.50-Mile Area of Review

**Landowner Map
Attachment B2**
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

Landowners Within 0.50-Miles of the Proposed LOW CAP SWD 1

Tract 301 1170 is held by the United States of America in trust for an individual.

Tract 301 1171 is held by the United States of America in trust for the Three Affiliated Tribes, the Three Affiliated Tribes-FMHA, and other individuals as well as fee simple interest for the Kenneth Odell Harrington Estate.

Tract 301 1172 is held by the United States of America in trust for the Three Affiliated Tribes, the Three Affiliated Tribes-FMHA, and other individuals as well as fee simple interest for the Kenneth Odell Harrington Estate.

Tract 301 1173 is held by the United States of America in trust for an individual.

Tract 301 G 1174 is held by the United States of America in fee simple interest for the United States of America.

Tract 301 1175 -A is held by the United States of America in trust for an individual.

Tract 301 1178 is held by the United States of America in trust for an individual.

Tract 301 1179 is held by the United States of America in trust for an individual.

Tract 301 1181 is held by the United States of America in trust for an individual.

Tract 301 1750 is held by the United States of America in trust for individuals.

Tract 301 T 3129 is held by the United States of America in trust for the Three Affiliated Tribes.

Tract 301 T 3129 A is held by the United States of America in trust for the Three Affiliated Tribes.

Tract 301 661A -B is held by the United States of America in trust for an individual.

Tract 301 661A -E is held by the United States of America in trust for individuals.

Tract 301 661A -G is held by the United States of America in trust for individuals.

Tract 301 661A -H is held by the United States of America in trust for an individual.

Proper notification for the above tracts should be addressed to:

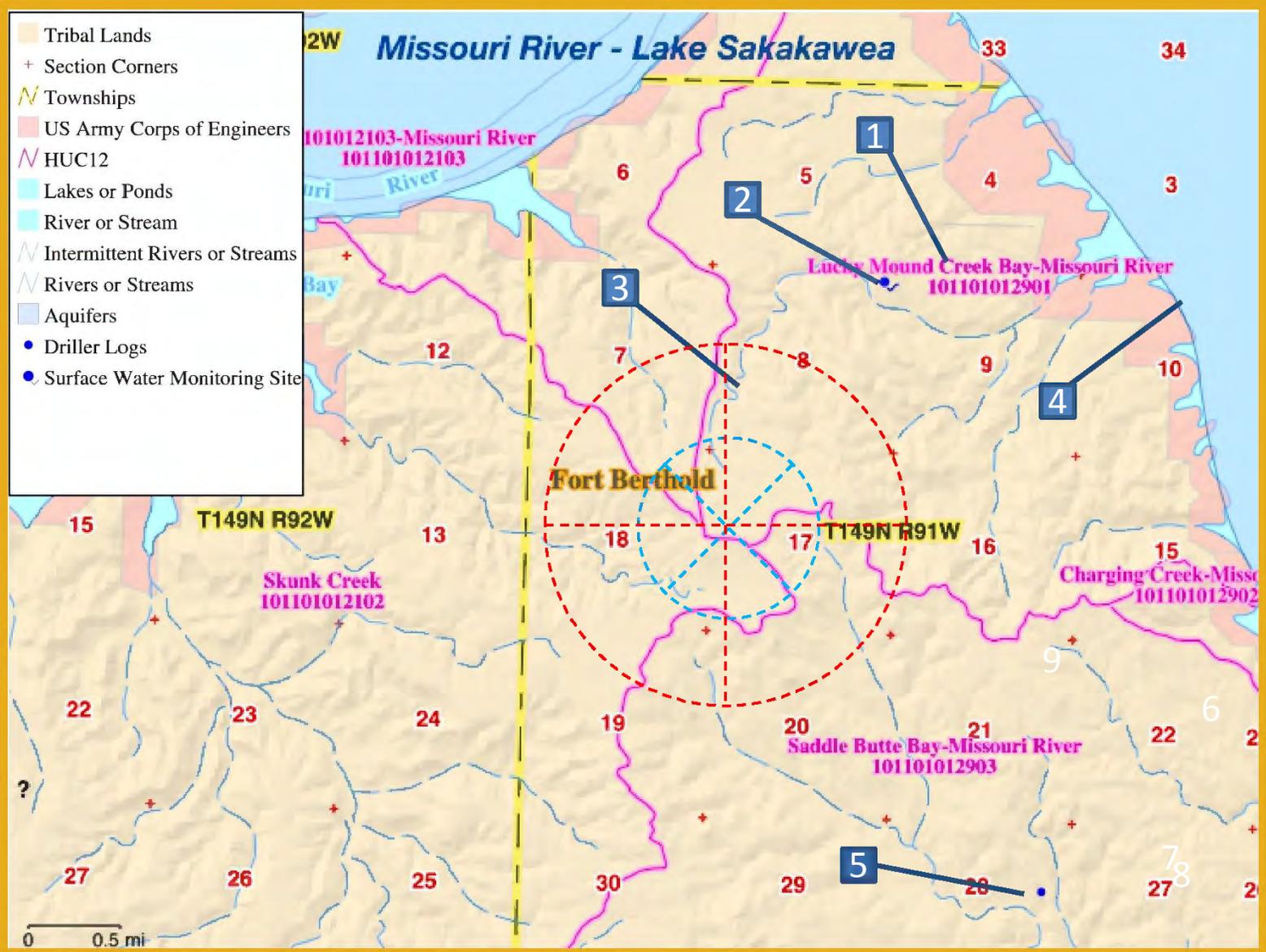
US DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS
PO BOX 370
NEW TOWN, ND 58763-0370

KENNETH ODELL HARRINGTON ESTATE
C/O SUPERINTENDENT
FORT BERTHOLD AGENCY
NEW TOWN, ND 58763

THREE AFFILIATED TRIBES
NATURAL RESOURCE DEPT
404 FRONTAGE ROAD
NEW TOWN, ND 58763-9402

THREE AFFILIATED TRIBES-FMHA
THREE AFFILIATED TRIBES
ATTN TREASURER
404 FRONTAGE ROAD
NEW TOWN, ND 58763-9402

Landowner Description
Attachment B2.1
LOW CAP SWD 1
Independence ND, LLC
SWNW Section 17-149-91
Heart Butte Field
Dunn County, ND



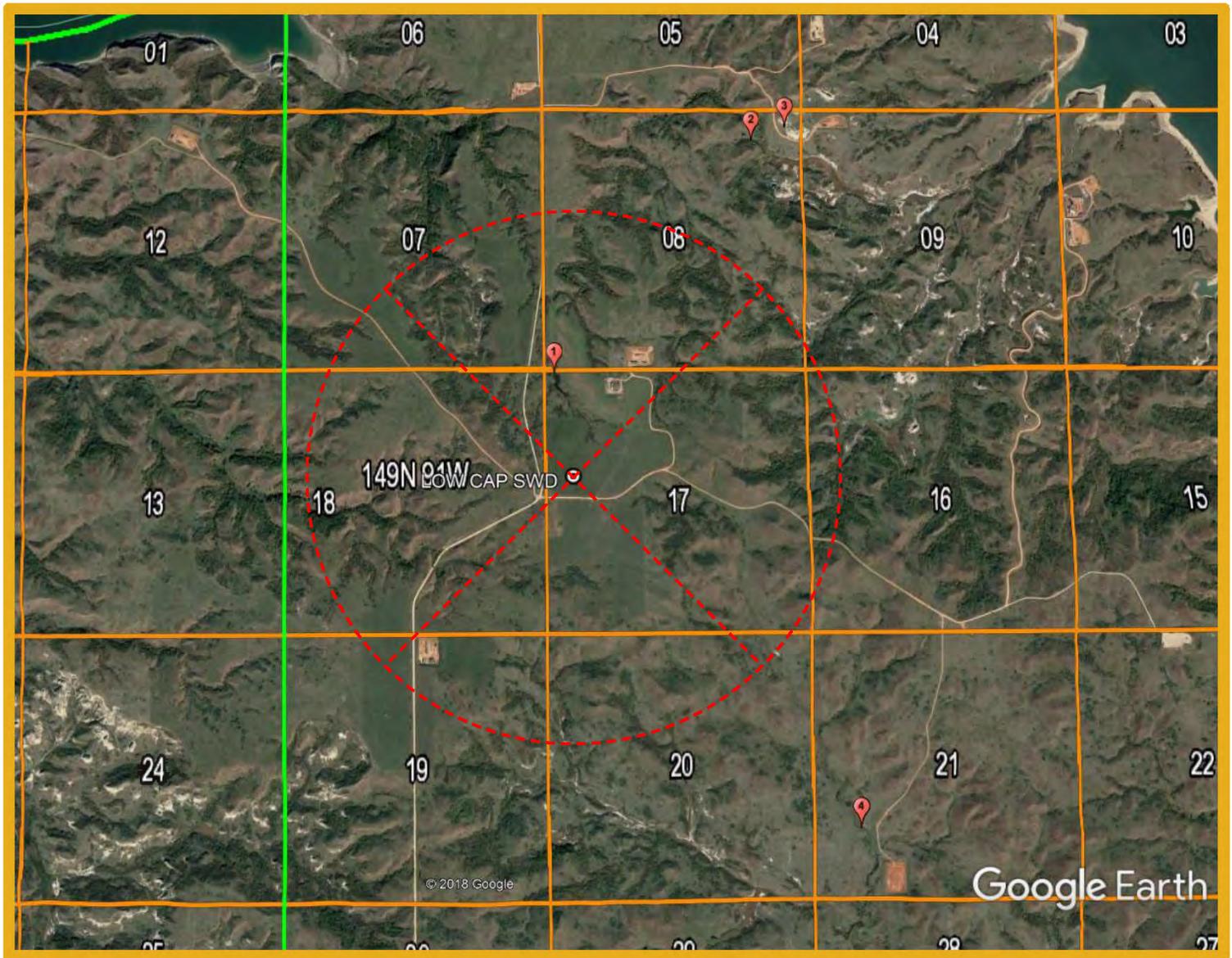
 0.50-Mile Area of Review
  1-Mile Area of Review

Pertinent Surface Feature Details

1. Site is located within the Lucky Mound Creek Bay-Missouri River sub-watershed which is composed of 40.79 square miles or 26,109 acres.
2. NDSWC Surface Water Monitoring Site 149-091-08 AAA. Reported coordinates of (47.745366, -102.344647)
3. An intermittent stream appears to originate more than ¼-mile from the proposed site. This intermittent stream eventually leads to the Missouri River- Lake Sakakawea reservoir system. Independence ND, LLC is confident that the proposed primary and secondary containments of 5,827 & 40,678 Bbls respectively, distance, and a host of safety features will minimize any potential risk.
4. The Missouri River Aquifer is approximately 2.7 miles northeast of the proposed LOW CAP SWD 1 site.
5. NDSWC Domestic Driller Log Site 149-091-28AD (Lester Crows Heart). Reported coordinates of (47.697626, -102.324088) are more than 2.5 miles from the proposed site. This is the nearest driller log to the proposed location.

**** There are no known wellhead protection areas or faults near the proposed facility that would preclude this site from being an acceptable location for a saltwater disposal facility.

Pertinent Surface Features
Attachment B3
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND



 1-Mile Area of Review

Freshwater Investigation

A thorough investigation for freshwater features including the review of the North Dakota State Water Commission GIS website, Google Earth mapping, scoping, driving and walking the area revealed no freshwater wells near the 1-mile area of review. The two nearest surface water source discovered were a stock dam in the NWNW of Section 17-149-91 and a flowing spring in the NENE of Section 8-149-91.

1. A stock dam located in NWNW of Section 17-149-91 investigated on 10/12/2018. Analysis included as Attachment B4.1
2. A flowing spring located in the NENE of Section 8-149-91 investigated on 10/12/2018. Analysis included as Attachment B4.2
3. Reported location in the NENE of Section 8-149-91 of NDSWC Surface Water Monitoring Site 149-091-08 AAA. Water analysis of sample taken by NDSWC on 8/16/1972 is included as Attachment B4.3
4. A pond located in the NWSW of Section 21-149-91 investigated 10/12/2018. Analysis included as Attachment B4.4

**Freshwater Investigation
Attachment B4**
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

MVTL

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890

2616 E. Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 MEMBER

51 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885

ACIL

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

AN EQUAL OPPORTUNITY EMPLOYER

Page: 2 of 2

Report Date: 1 Nov 18

Lab Number: 18-W3449

Work Order #: 82-2719

Account #: 048755

Date Sampled: 12 Oct 18 11:17

Date Received: 15 Oct 18 8:00

Sampled By: Client

Independence ND LLC
301 1st Ave E Bakersfield
Newtown ND 58763-4405

Project Name: Independence
Sample Description: LC Section 8 Cabin Spring
Sample Site: 47.74463, -102.34740
Sample Location: NENE Sec 8 T149 R91

Temp at Receipt: 5.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Potassium - Total	5.8	mg/l	1.0	6010D	18 Oct 18 13:59	BB
Barium - Total	< 0.1	mg/l	0.10	6010D	26 Oct 18 11:59	BB
Iron - Total	0.97	mg/l	0.10	6010D	26 Oct 18 11:59	BB
Manganese - Total	0.21	mg/l	0.05	6010D	26 Oct 18 11:59	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	30 Oct 18 19:00	CC

* Holding time exceeded

Approved by:

Claudette K. Carroll

Stacy Zander

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

Stacy Zander, Energy Laboratory Supervisor, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016

[Back](#)

14909108AAA

General Info

Date Sampled	1972-08-16	Downhole Temp	
Time Sampled	00:00:00	Dissolved O2	
Pump Time		Field Conductivity	
Yield	6	Field pH	
Water Level	2	Field Temp	9.5
Sampling Method		Lab Conductivity	1880
Stage		Lab pH	7.3
Surface Depth	0	Lab ID	

General Characteristics

Suspended Solids (mg/l)		Alk. as CaCO3	
TDS Determined (mg/l)	1290	SAR	5.9
TDS Calculated (mg/l)	1280	RSC	4
Hardness	463	Percent Sodium	57

Non-Carbonate Hardness 0

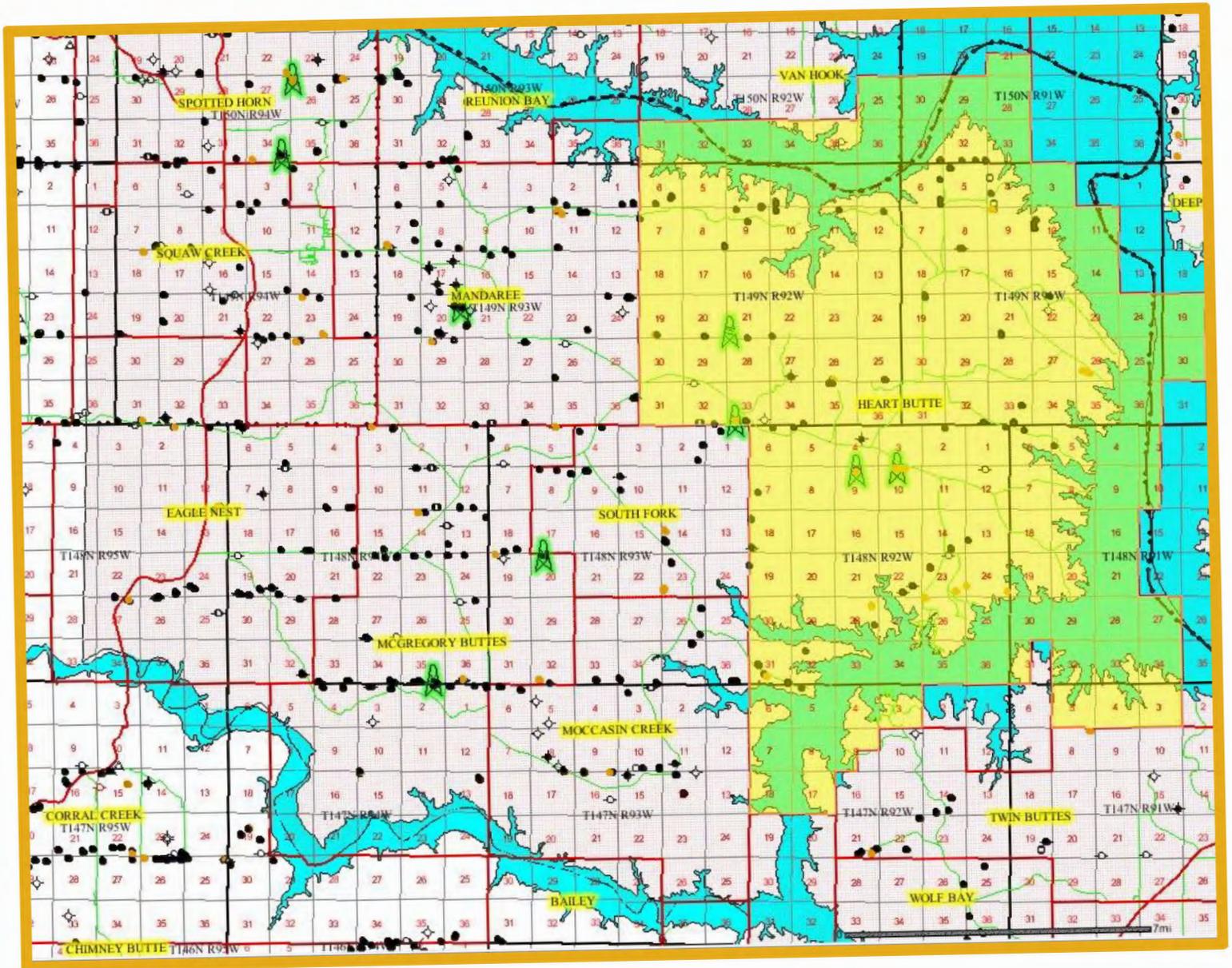
Major Cations and Anions

Silica (mg/l)	15	Flouride (mg/l)	0.2
Calcium (mg/l)	71	Bicarbonate (mg/l)	790
Magnesium (mg/l)	69	Carbonate (mg/l)	0
Potassium (mg/l)	5.7	Sulfate (mg/l)	435
Sodium (mg/l)	291	Chloride (mg/l)	0
		Bromide (mg/l)	
		Nitrate (mg/l)	2.7
		Hydroxide (mg/l)	
		Phosphate (mg/l)	
		Boron (mg/l)	0.46
		Iron (mg/l)	0.1
		Manganese (mg/l)	0.18

Trace Elements

Selenium (ug/l)		Lithium (ug/l)	
Lead (ug/l)		Molybdenum (ug/l)	
Mercury (ug/l)		Stroutium (ug/l)	
Arsenic (ug/l)		Cadmium (ug/l)	

FW Analysis 3
Attachment B4.3
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND



**** Generally, producing wells within the Heart Butte Field.

Potential Market Area
Attachment B5
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

Market Area Source Wells in the Area ****

Field	Well Name	File No.	API No.	Well Type	Well Status	Status Date	Location	Operator
HEART BUTTE BAKER	20-34H	18809	33025010660000	OG	A	8/8/2011	SWSE 20-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE BAKER	29-31H	19769	33025011890000	OG	A	7/27/2011	SWSE 20-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE BIRON	20-24H	18810	33025010670000	OG	A	7/17/2011	SWSE 20-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE BLACKWIDOW	149-92-32D-29H	35130	33025035260000	OG	LOC	7/12/2018	SESW 32-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE CACTUS	149-92-35B-05H TF	29788	33025027140000	OG	A	7/11/2015	NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE COBWEB	149-92-32D-29H	34067	33025033720000	OG	LOC	9/27/2017	SESW 32-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE CURVE	149-92-19C-18H TF	22237	33025015850000	Confidential	Confidential	Confidential	SESW 19-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE DESERT ROSE	149-92-35A-04H TF	32985	33025032180000	OG	A	3/9/2017	NWNE 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE DEUCE	149-92-30B-31H TF	22239	33025015870000	Confidential	Confidential	Confidential	SESW 19-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE EUPHORBIA	149-92-35B-05H	29789	33025027150000	OG	A	4/15/2017	NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE FINCH	148-92-22A-21H	32528	33025031260000	OG	A	4/26/2017	SWNW 23-148-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE HUNTSMAN	149-92-32D-29H-TF1	35131	33025035270000	OG	LOC	7/12/2018	SESW 32-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE KNUCKLE	149-92-19C-18H	22238	33025015860000	OG	A	7/21/2012	SESW 19-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE MARATUS	149-92-32C-29H-TF1	34066	33025033710000	OG	LOC	9/27/2017	SESW 32-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE NET	149-92-30B-31H	22240	33025015880000	OG	A	7/21/2012	SESW 19-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE OCOTILLO	149-92-35A-04H	31288	33025029470000	OG	A	3/9/2017	NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE ORBWEAVER	149-92-32C-29H	34063	33025033680000	OG	LOC	9/27/2017	SESW 32-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE POTATO	148-92-19B-20H-TF	32957	33025032170000	OG	A	5/25/2017	LOT2 19-148-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE REBUTIA	149-92-35B-05H	29819	33025027190000	OG	A	7/11/2015	NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE RECLUSE	149-92-32C-29H-TF1	34062	33025033670000	OG	LOC	9/27/2017	SESW 32-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE ROBIN	148-92-23B-24H	32527	33025031250000	OG	A	4/26/2017	SWNW 23-148-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE SAGUARO	149-92-35A-04H	29790	33025027160000	OG	A	3/9/2017	NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE SPIDER	149-92-32D-29H-TF1	34068	33025033730000	OG	LOC	9/27/2017	SESW 32-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE TARANTULA	149-92-32C-29H	34065	33025033700000	OG	LOC	9/27/2017	SESW 32-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE TRAPDOOR	149-92-32C-29H-TF1	34064	33025033690000	OG	LOC	9/27/2017	SESW 32-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE WHEAT	148-92-19B-20H	32956	33025032160000	OG	A	5/25/2017	LOT2 19-148-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE WOOLY TORCH	149-92-35A-04H	31187	33025029330000	OG	A	3/9/2017	NENW 35-149-92	ENERPLUS RESOURCES USA CORPORATION
HEART BUTTE MHA	1-05-08H-147-92	20116	33025012470000	OG	A	7/8/2011	LOTS 5-147-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-06-31H-150-92	18322	33025009710000	OG	A	5/29/2010	SESW 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-32-33H-148-92	20964	33025013940000	OG	A	1/5/2012	NENW 32-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-04-03H-149-91	20488	33025013190000	OG	A	11/3/2011	SESE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-05-08H-147-92	20115	33025012460000	OG	A	7/6/2011	LOTS 5-147-92	QEP ENERGY COMPANY
HEART BUTTE MHA	6-06-01H-149-92	29715	33025027050000	OG	A	6/28/2015	LOT4 5-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	6-32-29H-150-91	29716	33025027060000	OG	A	6/25/2015	LOT4 5-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	8-06-01H-149-92	29714	33025027040000	OG	A	6/30/2015	LOT4 5-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-03-02H-149-92	23337	33025018070000	OG	A	12/6/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-03-34H-150-92	23331	33025018010000	OG	A	3/30/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-03-35H-150-92	23333	33025018030000	OG	A	3/25/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-04-03H-149-91	20487	33025013180000	OG	A	10/23/2011	SESE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-04-33H-150-92	24398	33025019900000	OG	A	7/24/2013	SENE 9-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-06-01H-149-92	18665	33025010370000	OG	A	10/15/2017	SESE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-06-05H-149-92	23096	33025017530000	OG	A	9/11/2013	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-06-07H-147-92	24846	33025020510000	OG	A	6/16/2014	LOT3 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-06-32H-150-92	23101	33025017580000	OG	A	9/15/2017	NESE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-10-11H-149-91	25406	33025021270000	OG	A	3/2/2014	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-10-14H-149-91	25410	33025021310000	OG	A	3/30/2017	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-10-15H-149-91	25414	33025021350000	OG	A	11/25/2013	NWSW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-25-36H-148-92	31300	33025029520000	Confidential	Confidential	Confidential	NWSW 24-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-26-23H-149-91	27173	33025023870000	Confidential	Confidential	Confidential	SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-26-24H-149-91	27169	33025023830000	Confidential	Confidential	Confidential	SESW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-26-25H-149-91	27165	33025023790000	Confidential	Confidential	Confidential	SESW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-26-35H-148-92	31298	33025029500000	Confidential	Confidential	Confidential	NWNW 26-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-27-34H-148-92	26703	33025023140000	OG	A	1/15/2015	SWSE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-28-29H-148-92	26353	33025022660000	Confidential	Confidential	Confidential	NENE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	1-31-25H-150-92	21561	33025014760000	OG	A	5/8/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-31-30H-150-91	21554	33025014700000	OG	A	10/20/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-31-36H-150-92	21557	33025014720000	OG	A	5/16/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	1-32-29H-150-91	20490	33025013210000	OG	A	10/7/2011	SESE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	2-03-02H-149-92	23339	33025018090000	OG	A	12/10/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	2-03-35H-150-92	23335	33025018050000	OG	A	3/22/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	2-04-03H-149-91	24367	33025019880000	OG	A	7/12/2013	NWSW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	2-04-33H-150-92	24400	33025019920000	OG	A	7/28/2013	SWNE 9-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	2-05-04H-148-91	22092	33025015670000	OG	IA	8/15/2018	NWSW 5-148-91	QEP ENERGY COMPANY
HEART BUTTE MHA	2-06-01H-149-92	18666	33025010380000	OG	A	10/15/2017	SESE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	2-06-05H-149-92	23094	33025017510000	OG	A	9/15/2013	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	2-06-07H-147-92	21905	33025015430000	OG	A	8/17/2012	SESE 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	2-06-31H-150-92	23097	33025017540000	OG	A	8/15/2017	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	2-06-32H-150-92	23099	33025017560000	OG	A	2/21/2013	NESE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	2-10-11H-149-91	25404	33025021250000	OG	A	2/24/2014	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	2-10-14H-149-91	25408	33025021290000	OG	A	3/25/2017	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	2-10-15H-149-91	25412	33025021330000	OG	A	2/24/2017	NWSW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	2-25-36H-148-92	32061	33025030290000	Confidential	Confidential	Confidential	SESE 24-148	
HEART BUTTE MHA	2-26-23H-149-91	27175	33025023890000	Confidential	Confidential	Confidential	SWSW 26-149	
HEART BUTTE MHA	2-26-24H-149-91	27171	33025023850000	Confidential	Confidential	Confidential	SWSW 26-149	
HEART BUTTE MHA	2-26-25H-149-91	27167	33025023810000	Confidential	Confidential	Confidential	SESW 26-149	
HEART BUTTE MHA	2-26-35H-148-92	26285	33025022490000	Confidential	Confidential	Confidential	SESE 23-148	
HEART BUTTE MHA	2-27-34H-148-92R	32789	33025031690000	OG	A	5/10/2017	NESE 22-148	
HEART BUTTE MHA	2-28-29H-148-92	26364	33025022720000	OG	A	7/14/2016	NESE 28-148	

**Market Area Source Wells
Attachment B5.1 (4 pages)**
LOW CAP SWD 1
Independence ND, LLC
SWNW Section 17-149-91
Heart Butte Field
Dunn County, ND

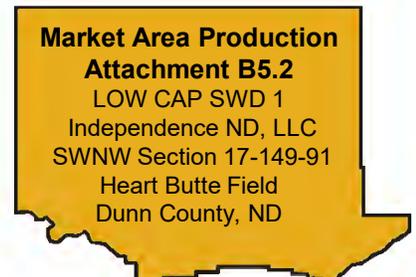
HEART BUTTE MHA	2-31-25H-150-92	21552	33025014680000	OG	A	10/24/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	2-32-29H-150-91	22028	33025015620000	OG	A	11/26/2012	SESW 32-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	2-32-33H-148-92	21908	33025015450000	OG	A	8/22/2012	SESE 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-03-02H-149-92	23338	33025018080000	OG	A	12/8/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-03-34H-150-92	23332	33025018020000	OG	A	3/28/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-03-35H-150-92	23334	33025018040000	OG	A	3/24/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-04-33H-150-92	24399	33025019910000	OG	A	7/26/2013	SWNE 9-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-06-01H-149-92	21404	33025014550000	OG	A	11/15/2017	SENE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-06-07H-147-92	24845	33025020500000	OG	A	5/13/2014	LOT3 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-06-31H-150-92	23093	33025017500000	OG	A	8/15/2017	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-06-32H-150-92	23100	33025017570000	OG	A	2/23/2013	NESE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-10-11H-149-91	25405	33025021260000	OG	A	2/22/2014	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-10-14H-149-91	25409	33025021300000	OG	IA	7/15/2018	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-10-15H-149-91	25413	33025021340000	OG	A	11/27/2013	NWSW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-25-36H-148-92	31301	33025029530000	Confidential	Confidential	Confidential	NWSW 24-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-26-23H-149-91	27174	33025023880000	Confidential	Confidential	Confidential	SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-26-24H-149-91	27170	33025023840000	Confidential	Confidential	Confidential	SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-26-25H-149-91	27166	33025023800000	Confidential	Confidential	Confidential	SESW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-26-35H-148-92	31299	33025029510000	Confidential	Confidential	Confidential	NWNW 26-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-27-34H-148-92	26702	33025023130000	OG	A	1/17/2015	SWSE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-28-29H-148-92	26352	33025022650000	Confidential	Confidential	Confidential	NENE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	3-31-25H-150-92	21551	33025014670000	OG	A	10/26/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-31-30H-150-91	21556	33025014710000	OG	A	10/19/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-31-36H-150-92	21558	33025014730000	OG	A	5/14/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-32-29-150-91	20489	33025013200000	OG	A	11/1/2011	SESE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	3-32-33H-148-92	20965	33025013950000	OG	A	1/7/2012	NENW 32-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-03-02H-149-92	23340	33025018100000	OG	A	12/12/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-03-35H-150-92	23336	33025018060000	OG	A	12/4/2013	SWSW 3-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-04-03H-149-91	24366	33025019870000	OG	A	7/15/2013	NWSW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-04-33H-150-92	24401	33025019930000	OG	A	7/30/2013	SWNE 9-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-05-04H-148-91	22093	33025015680000	OG	A	10/8/2012	NWSW 5-148-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-06-01H-149-92	21405	33025014510000	OG	A	2/3/2012	SENE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-06-07H-147-92	21904	33025015420000	OG	A	8/19/2012	SESE 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-06-31H-150-92	23102	33025017590000	OG	A	8/15/2017	NWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-06-32H-150-92	23098	33025017550000	OG	A	2/19/2013	NESE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-10-11H-149-91	25403	33025021240000	OG	A	2/27/2014	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-10-14H-149-91	25407	33025021280000	OG	A	3/24/2017	SWNW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-10-15H-149-91	25411	33025021320000	OG	A	2/22/2017	NWSW 10-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-25-36H-148-92	32060	33025030280000	Confidential	Confidential	Confidential	SESE 24-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-26-23H-149-91	27176	33025023900000	Confidential	Confidential	Confidential	SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-26-24H-149-91	27172	33025023860000	Confidential	Confidential	Confidential	SWSW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-26-25H-149-91	27168	33025023820000	Confidential	Confidential	Confidential	SESW 26-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-26-35H-148-92	26286	33025022500000	Confidential	Confidential	Confidential	SESE 23-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-27-34H-148-92R	32790	33025031700000	OG	A	5/9/2017	NESE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-28-29H-148-92	26365	33025022730000	OG	A	5/29/2015	NESE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	4-31-25H-150-92	21553	33025014690000	OG	A	10/22/2012	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-32-29H-150-91	22029	33025015630000	OG	A	11/29/2012	SESW 32-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	4-32-33H-148-92	21906	33025015440000	OG	A	8/15/2012	SESE 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	5-04-03H-149-91	29970	33025027350000	OG	LOC	11/13/2017	SWNW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	5-04-33H-150-92	24209	33025019490000	OG	A	5/29/2013	NENE 9-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	5-06-01H-149-92	29975	33025027400000	OG	A	9/14/2017	SESE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	5-06-05H-149-92	23095	33025017520000	OG	A	9/15/2017	SWSE 6-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	5-06-07H-147-92	24848	33025020530000	OG	A	5/20/2014	LOT3 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	5-25-36H-148-92	31303	33025029550000	Confidential	Confidential	Confidential	NWSW 24-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	5-26-35H-148-92	31296	33025029480000	Confidential	Confidential	Confidential	NWNW 26-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	5-27-34H-148-92	26705	33025023160000	OG	A	1/11/2015	SWSE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	5-28-29H-148-92	26355	33025022680000	Confidential	Confidential	Confidential	NENE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	5-31-25H-150-92	21559	33025014740000	OG	A	5/12/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	5-32-29H-150-91	30171	33025027860000	OG	A	11/18/2017	SWSE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	6-04-03H-149-91	33056	33025032210000	OG	LOC	10/5/2017	SWSW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	6-04-33H-150-92	24207	33025019470000	OG	A	8/15/2017	SESE 4-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	6-06-07H-147-92	24850	33025020550000	OG	A	11/10/2013	NESW 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	6-25-36H-148-92	32063	33025030310000	Confidential	Confidential	Confidential	SESE 24-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	6-26-35H-148-92	26283	33025022470000	Confidential	Confidential	Confidential	SESE 23-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	6-28-29H-148-92	26362	33025022700000	OG	A	7/19/2016	NESE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	7-04-03H-149-91	29971	33025027360000	OG	LOC	11/13/2017	SWNW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	7-04-33H-150-92	24208	33025019480000	OG	A	9/15/2017	SESE 4-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	7-06-01H-149-92	29976	33025027410000	OG	A	9/18/2017	SESE 6-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	7-06-07H-147-92	24847	33025020520000	OG	A	10/15/2017	LOT3 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	7-25-36H-148-92	31302	33025029540000	Confidential	Confidential	Confidential	NWSW 24-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	7-26-35H-148-92	31297	33025029490000	Confidential	Confidential	Confidential	NWNW 26-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	7-27-34H-148-92	26704	33025023150000	OG	A	1/13/2015	SWSE 22-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	7-28-29H-148-92	26354	33025022670000	Confidential	Confidential	Confidential	NENE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	7-31-25H-150-92	21560	33025014750000	OG	A	5/10/2013	SESE 31-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	7-32-29H-150-91	30172	33025027870000	OG	A	11/24/2017	SWSE 32-150-91	QEP ENERGY COMPANY
HEART BUTTE MHA	8-04-03H-149-91	33057	33025032220000	OG	LOC	10/5/2017	SWSW 4-149-91	QEP ENERGY COMPANY
HEART BUTTE MHA	8-04-33H-150-92	24206	33025019460000	OG	A	9/15/2017	SESE 4-149-92	QEP ENERGY COMPANY
HEART BUTTE MHA	8-06-07H-147-92	24849	33025020540000	OG	A	11/8/2013	NESW 31-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	8-25-36H-148-92	32062	33025030300000	Confidential	Confidential	Confidential	SESE 24-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	8-26-35H-148-92	26284	33025022480000	Confidential	Confidential	Confidential	SESE 23-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA	8-27-34H-148-92	26732	33025023240000	OG	A	5/11/2017	NESE 22-148-92	QEP ENERGY COMPANY

HEART BUTTE MHA 8-28-29H-148-92	26363	33025022710000	OG	A		7/16/2016	NESE 28-148-92	QEP ENERGY COMPANY
HEART BUTTE MHA 8-32-29H-150-91	29717	33025027070000	OG	A		6/23/2015	LOT4 5-149-91	QEP ENERGY COMPANY
HEART BUTTE SKUNK CREEK 12-7-8-8H	22468	33025016360000	OG	A		10/18/2012	LOT3 7-148-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE SKUNK CREEK 12-7-8-9H	22467	33025016350000	OG	A		10/21/2012	LOT3 7-148-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE SKUNK CREEK 12-7-8-9H3	22466	33025016340000	OG	A		11/22/2012	LOT3 7-148-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE SKUNK CREEK 13-18-17-16H3	21700	33025015000000	OG	A		6/7/2012	SWSW 18-148-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE SKUNK CREEK 13-18-17-9H	21701	33025015010000	OG	A		6/7/2012	SWSW 18-148-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE SKUNK CREEK 4-18-17-1H	24115	33025019260000	OG	A		11/8/2015	LOT1 18-148-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE SKUNK CREEK 4-18-17-1H3	24116	33025019270000	OG	A		10/31/2015	LOT1 18-148-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE SKUNK CREEK 4-18-17-8H	24117	33025019280000	OG	A		11/4/2015	LOT1 18-148-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE SKUNK CREEK 4-18-17-8H3	31170	33025029270000	OG	A		11/3/2015	LOT1 18-148-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 16-8-16H	18022	33025009110000	OG	A		6/21/2009	SESE 8-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 13-21-16-4HU	32694	33025031470000	OG	LOC		4/29/2018	SWSW 21-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 13-21-33-13H3U	32763	33025031670000	OG	LOC		6/16/2018	SWSW 21-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 13-22-16-1H	30643	33025028480000	OG	A		11/15/2017	SWSW 22-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 13-22-16-1H3	30641	33025028460000	OG	A		6/15/2018	SWSW 22-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 13-22-33-16H	30642	33025028470000	OG	A		9/4/2015	SWSW 22-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-21-16-2H3	33733	33025033130000	OG	NC		7/24/2018	SWSE 21-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-21-16-2HS	18987	33025010920000	OG	A		3/3/2013	SESW 21-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-21-33-15H	18988	33025010930000	OG	A		12/14/2010	SESW 21-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-21-33-15H3	33734	33025033140000	OG	NC		7/17/2018	SWSE 21-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-21-33-16H3	18989	33025010940000	OG	A		12/16/2010	SESW 21-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-21-4H	18455	33025010010000	OG	A		12/11/2010	SESW 21-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-33-28H	18051	33025009180000	OG	A		8/9/2009	SESW 33-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-33-6-13H3	34323	33025033970000	OG	LOC		11/22/2017	SESW 33-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-33-6H	18107	33025009340000	OG	A		9/6/2009	SESW 33-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 14-33-7-13HU	34324	33025033980000	OG	LOC		11/22/2017	SESW 33-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 16-8-7H	17981	33025009000000	OG	A		6/7/2009	SESE 8-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 5-7-8-1H	19263	33025011370000	OG	A		10/3/2012	LOT 2 7-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE TWO SHIELDS BUTTE 5-7-8-1H3	20511	33025013250000	OG	A		10/3/2012	LOT 2 7-149-92	RIMROCK OIL & GAS WILLISTON LLC
HEART BUTTE BADLANDS 4-33-28HA	35241	33025035570000	Confidential	Confidential	Confidential		NENE 8-147-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE BADLANDS 5-32-29HT	35242	33025035580000	Confidential	Confidential	Confidential		NENE 8-147-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE BLACK HAWK 15-34H	18875	33025010790000	OG	A		4/28/2011	SESE 34-149-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE CHARLES BLACKHAWK 31-30HA	22649	33025016570000	OG	A		11/8/2012	SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE CHARLES BLACKHAWK 31-30HB	22651	33025016590000	OG	A		11/21/2012	SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE CHARLES BLACKHAWK 31-30HC	22653	33025016610000	Confidential	Confidential	Confidential		SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE CHARLES BLACKHAWK 31-30HD	22655	33025016630000	Confidential	Confidential	Confidential		SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE CHARLES BLACKHAWK 31-30HX	22650	33025016580000	OG	A		11/21/2012	SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE CHARLES BLACKHAWK 31-30HY	22652	33025016600000	Confidential	Confidential	Confidential		SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE CHARLES BLACKHAWK 31-30HZ	22654	33025016620000	Confidential	Confidential	Confidential		SESW 31-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE EDWARD GOODBIRD 9HA	22827	33025016930000	Confidential	Confidential	Confidential		NWNW 9-149-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE EDWARD GOODBIRD 9HC	22829	33025016950000	Confidential	Confidential	Confidential		NWNW 9-149-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE EDWARD GOODBIRD 9HD	22828	33025016940000	OG	A		8/14/2012	NWNW 9-149-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE FREDERICKS 5-11H	17299	33025007630000	OG	A		3/15/2018	LOT 4 5-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE FREDERICKS 6-31H	17634	33025008320000	OG	A		3/15/2018	NWNE 6-148-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE HIGH HAWK 4-9H	18729	33025010520000	OG	A		9/9/2010	NWNW 9-149-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE PACKINEAU 15-32H	20236	33025012660000	OG	A		6/20/2011	SWSE 32-149-92	WPX ENERGY WILLISTON, LLC
HEART BUTTE SARAH YELLOW WOLF 22-27HC	23169	33025017760000	OG	A		10/22/2012	NENW 22-149-91	WPX ENERGY WILLISTON, LLC
HEART BUTTE FBIR BAKER 34X-25	19292	33025011420000	OG	A		7/11/2011	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE FBIR BAKER 34X-25A	23394	33025018210000	OG	A		1/7/2013	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE FBIR BAKER 34X-25E	23395	33025018220000	OG	A		1/15/2018	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE FBIR BAKER 34X-25F	23393	33025018200000	OG	A		1/10/2013	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE FBIR BEAKS 24X-8A	23694	33025018540000	OG	A		1/15/2018	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BEAKS 24X-8B	19800	33025011950000	OG	A		3/4/2012	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BEAKS 24X-8E	23933	33025018810000	OG	A		11/15/2017	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BIRD 31X-19	19806	33025011980000	OG	A		8/8/2011	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BIRD 31X-19D	23883	33025018740000	OG	A		8/25/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BIRD 31X-19G	23881	33025018720000	OG	A		9/3/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BIRD 31X-19H	23882	33025018730000	OG	A		8/31/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21A	32290	33025030730000	OG	A		4/15/2018	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21AXD	32302	33025030760000	OG	A		5/15/2018	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21B	20600	33025013410000	OG	A		6/8/2012	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21C	32280	33025030690000	OG	A		2/15/2018	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21CXD	32282	33025030710000	OG	A		2/15/2018	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21D	32472	33025031070000	OG	A		3/15/2018	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21E	32283	33025030720000	OG	A		5/15/2018	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21EXH	32707	33025031480000	OG	A		9/7/2017	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21F	32291	33025030740000	OG	IA		9/15/2018	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21G	32279	33025030680000	OG	A		4/15/2018	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR BLACKMEDICINE 24X-21H	32281	33025030700000	OG	A		10/13/2017	SESW 21-149-91	XTO ENERGY INC.
HEART BUTTE FBIR DARCIE 34X-14	20114	33025012450000	OG	A		12/4/2011	SWSE 14-148-92	XTO ENERGY INC.
HEART BUTTE FBIR DARCIE 34X-14D	24038	33025019030000	OG	A		6/18/2013	SWSE 14-148-92	XTO ENERGY INC.
HEART BUTTE FBIR DARCIE 34X-14H	24037	33025019020000	OG	A		6/15/2018	SWSE 14-148-92	XTO ENERGY INC.
HEART BUTTE FBIR GEORGEBLACKHAWK 21X-6B	20483	33025013170000	OG	A		7/20/2012	LOT3 6-148-91	XTO ENERGY INC.
HEART BUTTE FBIR GOESEVERYWHERE 31X-11C	20417	33025013010000	OG	A		5/22/2012	NWNE 11-149-92	XTO ENERGY INC.
HEART BUTTE FBIR GRINNELL 34X-33A	30773	33025028620000	OG	A		2/12/2017	SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR GRINNELL 34X-33B	30771	33025028600000	OG	A		9/15/2017	SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR GRINNELL 34X-33C	20419	33025013020000	OG	IA		9/15/2018	SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR GRINNELL 34X-33D	30768	33025028570000	OG	A		4/15/2017	SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR GRINNELL 34X-33E	30772	33025028610000	OG	A		8/15/2017	SWSE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR GRINNELL 34X-33F	30770	33025028590000	OG	A		9/15/2017	SWSE 33-149-91	XTO ENERGY INC.

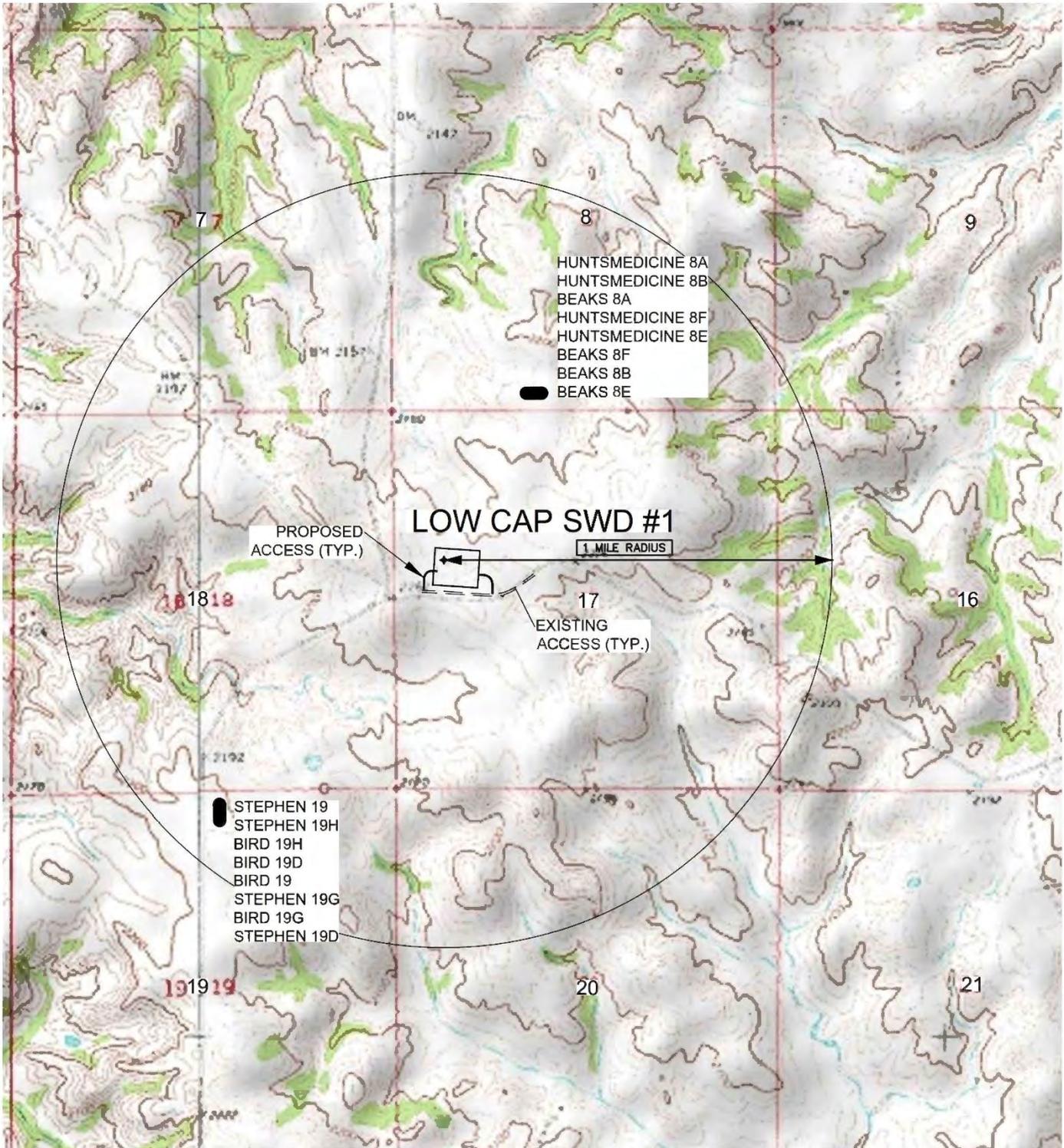
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HEART BUTTE FBIR GRINNELL 41X-1C	20424	33025013030000	OG	A	6/7/2012	LOT1 1-148-92	XTO ENERGY INC.
HEART BUTTE FBIR GUYBLACKHAWK 24X-27A	26879	33025023420000	OG	IA	9/15/2018	SESW 27-149-92	XTO ENERGY INC.
HEART BUTTE FBIR GUYBLACKHAWK 24X-27B	20215	33025012620000	OG	A	5/15/2018	SESW 27-149-92	XTO ENERGY INC.
HEART BUTTE FBIR GUYBLACKHAWK 24X-27ER	27443	33025024300000	OG	A	6/24/2014	SESW 27-149-92	XTO ENERGY INC.
HEART BUTTE FBIR GUYBLACKHAWK 24X-27F	26878	33025023410000	OG	A	7/10/2014	SESW 27-149-92	XTO ENERGY INC.
HEART BUTTE FBIR HEADLESSTURTLE 44X-32C	20273	33025012780000	OG	A	9/17/2012	SESE 32-149-91	XTO ENERGY INC.
HEART BUTTE FBIR HUNTSALONG 31X-2	21120	33025014180000	OG	A	9/13/2012	LOT2 2-148-92	XTO ENERGY INC.
HEART BUTTE FBIR HUNTSMEDICINE 24X-8B	19801	33025011960000	OG	A	2/29/2012	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE FBIR HUNTSMEDICINE 24X-8E	23693	33025018530000	OG	A	12/8/2013	SESW 8-149-91	XTO ENERGY INC.
HEART BUTTE FBIR IRONWOMAN 21X-10	19948	33025012200000	OG	IA	8/15/2018	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR IRONWOMAN 21X-10A	23941	33025018860000	Confidential	Confidential	Confidential	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR IRONWOMAN 21X-10AXD	34886	33025034940000	Confidential	Confidential	Confidential	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR IRONWOMAN 21X-10B	34885	33025034930000	Confidential	Confidential	Confidential	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR IRONWOMAN 21X-10E	23939	33025018840000	Confidential	Confidential	Confidential	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR IRONWOMAN 21X-10F	23940	33025018850000	Confidential	Confidential	Confidential	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR IRONWOMAN 31X-10C	34472	33025034330000	Confidential	Confidential	Confidential	NWNE 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR IRONWOMAN 31X-10D	34474	33025034350000	Confidential	Confidential	Confidential	NWNE 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR IRONWOMAN 31X-10G	34473	33025034340000	Confidential	Confidential	Confidential	NWNE 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR LAWRENCE 24X-26B	20143	33025012500000	OG	A	5/11/2012	SESW 26-149-92	XTO ENERGY INC.
HEART BUTTE FBIR LAWRENCE 24X-26E	26970	33025023600000	Confidential	Confidential	Confidential	SESW 26-149-92	XTO ENERGY INC.
HEART BUTTE FBIR NELLIEOLDMOUSE 13X-13B	20632	33025013480000	OG	A	5/24/2012	NWSW 13-148-92	XTO ENERGY INC.
HEART BUTTE FBIR REESE 43X-33A	31215	33025029400000	OG	A	2/24/2016	NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR REESE 43X-33B	31217	33025029420000	OG	A	2/28/2016	NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR REESE 43X-33C	31219	33025029440000	OG	A	3/5/2016	NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR REESE 43X-33D	31221	33025029460000	OG	A	3/7/2016	NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR REESE 43X-33E	31216	33025029410000	OG	A	2/26/2016	NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR REESE 43X-33F	31218	33025029430000	OG	A	3/2/2016	NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR REESE 43X-33G	31220	33025029450000	OG	A	3/7/2016	NESE 33-149-91	XTO ENERGY INC.
HEART BUTTE FBIR SMITH 11X-10A	23403	33025018250000	OG	A	1/29/2013	NWNW 10-149-92	XTO ENERGY INC.
HEART BUTTE FBIR SMITH 11X-10B	20036	33025012290000	OG	A	10/20/2011	NWNW 10-149-92	XTO ENERGY INC.
HEART BUTTE FBIR SMITH 11X-10E	23401	33025018230000	OG	IA	9/15/2018	NWNW 10-149-92	XTO ENERGY INC.
HEART BUTTE FBIR SMITH 11X-10F	23402	33025018240000	OG	A	1/24/2013	NWNW 10-149-92	XTO ENERGY INC.
HEART BUTTE FBIR STEPHEN 31X-19	19805	33025011970000	OG	A	8/10/2011	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE FBIR STEPHEN 31X-19D	23884	33025018750000	OG	A	8/21/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE FBIR STEPHEN 31X-19G	24084	33025019190000	OG	A	8/11/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE FBIR STEPHEN 31X-19H	23885	33025018760000	OG	A	8/16/2013	NWNE 19-149-91	XTO ENERGY INC.
HEART BUTTE FBIR WALKER 31X-36D	33998	33025033530000	OG	NC	2/24/2018	NWNE 36-149-92	XTO ENERGY INC.
HEART BUTTE FBIR WALKER 31X-36DXA	34347	33025033990000	OG	NC	4/7/2018	NWNE 36-149-92	XTO ENERGY INC.
HEART BUTTE FBIR WALKER 31X-36G	34290	33025033910000	OG	NC	2/8/2018	NWNE 36-149-92	XTO ENERGY INC.
HEART BUTTE FBIR WALKER 31X-36H	33999	33025033540000	OG	NC	3/24/2018	NWNE 36-149-92	XTO ENERGY INC.
HEART BUTTE FBIR WALKER 31X-36HXE	34289	33025033900000	OG	NC	3/30/2018	NWNE 36-149-92	XTO ENERGY INC.
HEART BUTTE FBIR WALKER 34X-25	19293	33025011430000	OG	A	7/13/2011	SWSE 25-149-92	XTO ENERGY INC.
HEART BUTTE FBIR WALTERPACKSWOLF 31X-12C	19696	33025011790000	OG	A	6/15/2018	NWNE 12-149-92	XTO ENERGY INC.
HEART BUTTE FBIR WALTERPACKSWOLF 31X-12D	24132	33025019320000	OG	A	7/6/2013	NWNE 12-149-92	XTO ENERGY INC.
HEART BUTTE FBIR WALTERPACKSWOLF 31X-12G	24130	33025019300000	OG	A	6/7/2013	NWNE 12-149-92	XTO ENERGY INC.
HEART BUTTE FBIR WALTERPACKSWOLF 31X-12H	24131	33025019310000	OG	A	6/25/2013	NWNE 12-149-92	XTO ENERGY INC.
HEART BUTTE FBIR YELLOWWOLF 21X-10	19940	33025012190000	OG	IA	8/15/2018	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YELLOWWOLF 21X-10A	23938	33025018830000	Confidential	Confidential	Confidential	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YELLOWWOLF 21X-10E	23942	33025018870000	Confidential	Confidential	Confidential	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YELLOWWOLF 21X-10F	23937	33025018820000	Confidential	Confidential	Confidential	NENW 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YELLOWWOLF 31X-10C	34685	33025034560000	Confidential	Confidential	Confidential	NWNE 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YELLOWWOLF 31X-10D	34686	33025034570000	Confidential	Confidential	Confidential	NWNE 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YELLOWWOLF 31X-10DXA	34687	33025034580000	Confidential	Confidential	Confidential	NWNE 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YELLOWWOLF 31X-10G	34688	33025034590000	Confidential	Confidential	Confidential	NWNE 10-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YOUNGBEAR 31X-9A	25430	33025021370000	OG	A	2/27/2014	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YOUNGBEAR 31X-9B	20117	33025012480000	OG	A	5/16/2012	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YOUNGBEAR 31X-9BXC	35031	33025035110000	Confidential	Confidential	Confidential	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YOUNGBEAR 31X-9C	35033	33025035130000	Confidential	Confidential	Confidential	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YOUNGBEAR 31X-9D	35035	33025035150000	Confidential	Confidential	Confidential	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YOUNGBEAR 31X-9E	25431	33025021380000	OG	IA	8/15/2018	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YOUNGBEAR 31X-9F	25429	33025021360000	OG	A	3/3/2014	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YOUNGBEAR 31X-9G	35032	33025035120000	Confidential	Confidential	Confidential	NWNE 9-148-92	XTO ENERGY INC.
HEART BUTTE FBIR YOUNGBEAR 31X-9H	35034	33025035140000	Confidential	Confidential	Confidential	NWNE 9-148-92	XTO ENERGY INC.

Last Reported Monthly Production Within Market Area of the Proposed LOW CAP SWD 1****					
Field	Date	BBLS Oil	BBLS Water	MCF Gas	Wells Producing
Heart Butte-Bakken	Jun-18	537354	626424	470745	212
		537,354	626,424	470,745	212

**** Generally, producing wells within the Heart Butte Field



QUAD MAP
 INDEPENDENCE ND LLC
 301 1ST AVENUE E BAKERSFIELD, NEWTOWN, ND 58763
 LOW CAP SWD #1
 588 FEET FROM WEST LINE AND 2145 FEET FROM NORTH LINE
 SECTION 17, T149N, R91W, 5th P.M., DUNN COUNTY, NORTH DAKOTA



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5/10
 SHEET NO.

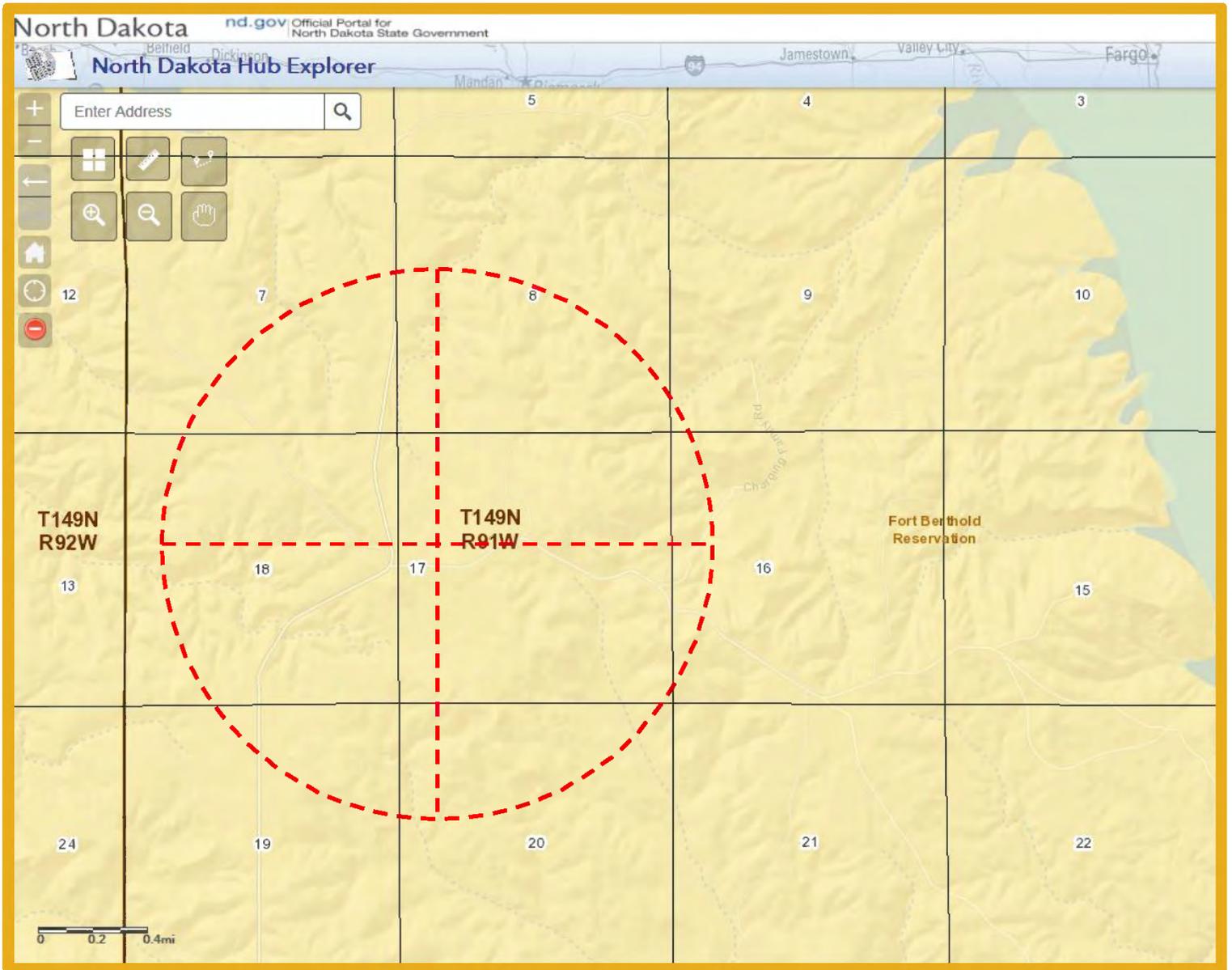
INTERSTATE ENGINEERING
 Professionals you need, people you trust

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 141 2nd Avenue Southwest
 Belfield, North Dakota 58622
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 Fax (701) 575-2251
 www.interstateeng.com
 Other offices in Minnesota, Montana and South Dakota

INDEPENDENCE ND LLC
 QUAD MAP
 SECTION 17, T149N, R91W
 DUNN COUNTY, NORTH DAKOTA

Drawn By: J.D.M.	Project No.: E18-17-01
Checked By: R.L.P.	Date: JULY 2018

Topographic Map Attachment B6
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND



 1-Mile Area of Review

The North Dakota Hub Explorer information portal does not reveal a surficial or sensitive aquifer, abandoned mine, wind turbines, wellhead protection area, solid waste or special waste facility within a mile of the proposed LOW CAP SWD 1 disposal well. Additionally, during its freshwater investigation Independence ND, LLC found no evidence of a hazardous waste treatment, storage, or disposal facility or quarry in the 1-mile AOR.

**ND HUB Explorer Map
Attachment B7**
LOW CAP SWD 1
Independence ND, LLC
SWNW Section 17-149-91
Heart Butte Field
Dunn County, ND

C. CORRECTIVE ACTION PLAN AND WELL DATA

There are no vertical wellbores within the 0.50-mile area of review. However, there are five completed wells that have horizontal laterals (not the vertical wellbore) that fall within the 0.50-mile area of review. The FBIR HUNTSMEDICINE 24X-8B (WF-19801); FBIR HUNTSMEDICINE 24X-8E (WF-23693); FBIR STEPHEN 31X-19D (WF-23884); FBIR STEPHEN 31X-19H (WF-23885); and FBIR STEPHEN 31X-19G (WF-24084) are all completed within the Bakken or Three Forks Pool which are separated from the Dakota injection zone by multiple confining zones composed of shale or salt that eliminate any potential communication. The completion reports for these wells have been included in this application as Attachment C1-C5.

No corrective action is required.





WELL COMPLETION OR RECOMPLETION REPORT - FORM 6

INDUSTRIAL COMMISSION OF NORTH DAKOTA
 OIL AND GAS DIVISION
 600 EAST BOULEVARD DEPT 405
 BISMARCK, ND 58505-0840
 SFN 2468 (04-2010)

Well File No. **19801**



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
 PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion
 Oil Well EOR Well Recompletion Deepened Well Landed Horizontal Leg Extended Horizontal Leg
 Gas Well SWD Well Water Supply Well Other.

Well Name and Number: **FBIR HuntsMedicine 24X-8** Spacing Unit Description: **All of Sec. 17 & 20-149N-91W**

Operator: **XTO Energy, Inc.** Telephone Number: **303-397-3600** Field: **Heart Butte**

Address: **P.O. Box 6501** Pool: **Bakken**

City: **Englewood** State: **CO** Zip Code: **80155** Permit Type: Wildcat Development Extension

LOCATION OF WELL

At Surface: **250 F S L** **1980 F W L** Qtr-Qtr: **SESW** Section: **8** Township: **149 N** Range: **91 W** County: **Dunn**

Spud Date: **10/6/2011** Date TD Reached: **12/3/2011** Drilling Contractor and Rig Number: **Nabors #109** KB Elevation (Ft): **2202** Graded Elevation (Ft): **2179**

Type of Electric and Other Logs Run (See Instructions): **MWD/GR, Mud Log, CBL/GR**

CASING & TUBULARS RECORD (Report all strings set in well)

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	Surface	9 5/8	0	2033	13 1/2	36			550	0
Lateral1	Intermediate	7	0	10523	8 3/4	29, 32			960	2050
Lateral1	Liner	4 1/2	9753	20490	6	13.5				
Vertical Hole	Tubing	2 7/8		9648		6.5	9648			

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD Ft)		Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
			Top	Bottom						
Lateral1	20522	Open Hole	10523	20522	9760					0

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft): **10,523' - 20,522'** Name of Zone (If Different from Pool Name): **Bakken**

Date Well Completed (SEE INSTRUCTIONS): **2/29/2012** Producing Method: **Flowing** Pumping-Size & Type of Pump: Well Status (Producing or Shut-In): **Producing**

Date of Test: **4/1/2012** Hours Tested: **24** Choke Size: **20 /64** Production for Test: Oil (Bbls): **1045** Gas (MCF): **1308** Water (Bbls): **1073** Oil Gravity-API (Corr.): **42.3 °** Disposition of Gas: **Sold**

Flowing Tubing Pressure (PSI): Flowing Casing Pressure (PSI): **1705** Calculated 24-Hour Rate: Oil (Bbls): **1045** Gas (MCF): **1308** Water (Bbls): **1073** Gas-Oil Ratio: **1252**

Completion Report-19801 Attachment C1 (3 pages)
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

Well Specific Stimulations

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
2/24/2012	Bakken	10571	20490	24	64388	Barrels
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Sand Frac		3306501	9140	50.0		
Details						
24 stages of frac as follows: 1: 20,207' - 20,490' 2: 19,748' - 20,047' 3: 19,324' - 19,622' 4: 18,899' - 19,197' 5: 18,520' - 18,778' 6: 18,092' - 18,390' 7: 17,667' - 17,965' 8: 17,242' - 17,541' 9: 16,818' - 17,116' 10: 16,396' - 16,692' 11: 16,010' - 16,276' 12: 15,590' - 15,886' 13: 15,165' - 15,464' 14: 14,742' - 15,039' 15: 14,317' - 14,615' 16: 13,895' - 14,191' 17: 13,474' - 13,770' 18: 13,095' - 13,353' 19: 12,664' - 12,963' 20: 12,241' - 12,538' 21: 11,819' - 12,115' 22: 11,397' - 11,693' 23: 10,972' - 11,270' 24: 10,571' - 10,850'						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Details						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Details						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Details						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)		
Details						

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

--	--	--

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address	Date
	Lorri_bingham@xtoenergy.com	6/28/2012
Signature	Printed Name	Title
	Lorri Bingham	Regulatory Analyst



WELL COMPLETION OR RECOMPLETION REPORT - FORM 6

INDUSTRIAL COMMISSION OF NORTH DAKOTA
 OIL AND GAS DIVISION
 600 EAST BOULEVARD DEPT 405
 BISMARCK, ND 58505-0840
 SFN 2468 (04-2010)

Well File No. **23693**



PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
 PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion
 Oil Well EOR Well Recompletion Deepened Well Added Horizontal Leg Extended Horizontal Leg
 Gas Well SWD Well Water Supply Well Other:

Well Name and Number: **FBIR HuntsMedicine 24X-8E** Spacing Unit Description: **Section: 17 & 21 - T149N-91W Secs 17+20**

Operator: **XTO Energy, Inc.** Telephone Number: **303-397-3600** Field: **Heart Butte**

Address: **P.O. Box 6501** Pool: **Bakken**

City: **Englewood** State: **CO** Zip Code: **80155** Permit Type: Wildcat Development Extension

LOCATION OF WELL

At Surface	236 F S L	1922 F W L	Qtr-Qtr	Section	Township	Range	County
			SESW	8	149 N	91 W	Dunn
Spud Date	Date TD Reached	Drilling Contractor and Rig Number		KB Elevation (Ft)	Graded Elevation (Ft)		
6/6/2013	7/19/2013	Nabors #109		2206	2181		

Type of Electric and Other Logs Run (See Instructions)
MWD/GR, Mud Log, CBL/GR

CASING & TUBULARS RECORD (Report all strings set in well)

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	Surface	9 5/8	0	2163	13 1/2	36			650	0
Lateral1	Intermediate	7	0	10683	8 3/4	29			770	
Lateral1	Liner	4 1/2	9816	20937	6	13.5				

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft)		Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perfd or Drilled	Date Isolated	Isolation Method	Sacks Cement
			Top	Bottom						
Lateral1	20995	Open Hole	10683	20995	9797					0

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft): **10,683'- 20,995'** Name of Zone (If Different from Pool Name): **Middle Bakken**

Date Well Completed (SEE INSTRUCTIONS): **12/8/2013** Producing Method: **Flowing** Pumping-Size & Type of Pump: Well Status (Producing or Shut-In): **Producing**

Date of Test: **12/10/2013** Hours Tested: **24** Choke Size: **40 /64** Production for Test: Oil (Bbls): **2249** Gas (MCF): **3149** Water (Bbls): **2114** Oil Gravity-API (Corr.): **41.7 °** Disposition of Gas: **Sold**

Flowing Tubing Pressure (PSI): Flowing Casing Pressure (PSI): **1441** Calculated 24-Hour Rate: Oil (Bbls): **2249** Gas (MCF): **3149** Water (Bbls): **2114** Gas-Oil Ratio: **1400**

**Completion Report-23693
 Attachment C2 (3 pages)
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND**

Well Specific Stimulations

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
11/19/2013	Middle Bakken	10808	20790	30	54117	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLs/Min)
Sand Frac		3480840	8529	36.0

Details
 30 Frac Stages: 1: 20786-20790 2: 20438-20442 3: 20093-20096 4: 19746-19749 5: 19400-19403 6: 19057-19060 7: 18712-18716 8: 18369-18373
 9: 18023-18026 10: 17678-17681 11: 17333-17335 12: 16992-16995 13: 16648-16651 14: 16304-16308 15: 15958-15962 16: 15614-15618 17: 15268-
 15271 18: 14927-14930 19: 14585-14588 20: 14242-14245 21: 13924-13927 22: 13584-13587 23: 13358-13361 24: 12900-12903 25: 15557-12560 26:
 12218-12221 27: 11880-11883 28: 11538-11541 29: 11196-11199 30: 10808-10854

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLs/Min)

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLs/Min)

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLs/Min)

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLs/Min)

Details

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address	Date
	Sandra_Haggard@xtoenergy.com	21-Jan-14

Signature	Printed Name	Title
	Sandra Haggard	Regulatory Analyst



WELL COMPLETION OR RECOMPLETION REPORT - FORM 6

INDUSTRIAL COMMISSION OF NORTH DAKOTA
 OIL AND GAS DIVISION
 600 EAST BOULEVARD DEPT 405
 BISMARCK, ND 58505-0840
 SFN 2468 (04-2010)



Well File No. **23884**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
 PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion				
<input checked="" type="checkbox"/> Oil Well	<input type="checkbox"/> EOR Well	<input type="checkbox"/> Recompletion	<input type="checkbox"/> Deepened Well	<input type="checkbox"/> Added Horizontal Leg
<input type="checkbox"/> Gas Well	<input type="checkbox"/> SWD Well	<input type="checkbox"/> Water Supply Well	<input type="checkbox"/> Other:	<input type="checkbox"/> Extended Horizontal Leg
Well Name and Number FBIR Stephen 31X-19D			Spacing Unit Description Sections: 7 & 18 - T149N-R91W	
Operator XTO Energy, Inc.		Telephone Number 303-397-3600	Field Heart Butte	
Address P.O. Box 6501			Pool Bakken	
City Englewood	State CO	Zip Code 80155	Permit Type <input type="checkbox"/> Wildcat <input checked="" type="checkbox"/> Development <input type="checkbox"/> Extension	

LOCATION OF WELL

At Surface 235 F N L	2398 F E L	Qtr-Qtr NWNE	Section 19	Township 149 N	Range 91 W	County Dunn
Spud Date 3/5/2013	Date TD Reached 4/22/2013	Drilling Contractor and Rig Number Nabors # 109		KB Elevation (Ft) 2229	Graded Elevation (Ft) 2205	
Type of Electric and Other Logs Run (See Instructions) MWD/GR, Mud Log, CBL/GR						

CASING & TUBULARS RECORD (Report all strings set in well)

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)		Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
			Top	Bottom							
Surface Hole	Surface	9 5/8	0		2038	13 1/2	36			625	0
Lateral1	Intermediate	7	0		10858	8 3/4	29			755	2730
Lateral1	Liner	4 1/2	9659	21091	6	13.5				0	

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft)		Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
			Top	Bottom						
Lateral1	21126	Open Hole	10858	21126	9700					0

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) 10858'-21126'						Name of Zone (If Different from Pool Name) Middle Bakken			
Date Well Completed (SEE INSTRUCTIONS) 8/21/2013			Producing Method Flowing	Pumping-Size & Type of Pump		Well Status (Producing or Shut-In) Producing			
Date of Test 8/22/2013	Hours Tested 24	Choke Size 34 /64	Production for Test	Oil (Bbbls) 1436	Gas (MCF) 2010	Water (Bbbls) 1655	Oil Gravity-API (Corr.) 41.7 °	Disposition of Gas Flared	
Flowing Tubing Pressure (PSI) 1354		Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbbls) 1436	Gas (MCF) 2010	Water (Bbbls) 1655	Gas-Oil Ratio 1400	

**Completion Report-23884
 Attachment C3 (3 pages)
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND**

Well Specific Stimulations

Date Stimulated 7/23/2013	Stimulated Formation Middle Bakken	Top (Ft) 10894	Bottom (Ft) 20943	Stimulation Stages 30	Volume 61510	Volume Units Barrels
Type Treatment Sand Frac	Acid %	Lbs Proppant 3477137	Maximum Treatment Pressure (PSI) 7659		Maximum Treatment Rate (BBLs/Min) 42.0	

Details
 30 Frac Stages: 1: 20940'-20943' 2: 20643'-20646' 3: 20303'-20306' 4: 19959'-19962' 5: 19617'-19620' 6: 19275'-19278' 7: 18932'-18936' 8: 18589'-18593' 9: 18248'-18251' 10: 17905'-17908' 11: 17562'-17566' 12: 17218'-17221' 13: 16875'-16878' 14: 16532'-16535' 15: 16187'-16190' 16: 15844'-15848' 17: 15501'-15504' 18: 15159'-15162' 19: 14815'-14818' 20: 14471'-14474' 21: 13980'-14222' 22: 13605'-13839' 23: 13289'-13501' 24: 12933'-13165' 25: 12596'-12831' 26: 12264'-12493' 27: 11921'-12157' 28: 11589'-11826' 29: 11217'-11482' 30: 10894'-11116'

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLs/Min)	

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLs/Min)	

Details

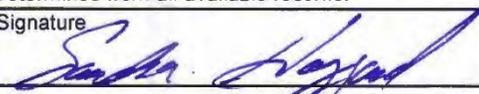
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLs/Min)	

Details

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLs/Min)	

Details

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address Sandra_Haggard@xtoenergy.com	Date 10-Sep-13
	Signature 	Printed Name Sandra Haggard



WELL COMPLETION OR RECOMPLETION REPORT - FORM

INDUSTRIAL COMMISSION OF NORTH DAKOTA
 OIL AND GAS DIVISION
 600 EAST BOULEVARD DEPT 405
 BISMARCK, ND 58505-0840
 SFN 2468 (04-2010)



Well File No. **23885**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
 PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion

Oil Well EOR Well Recompletion Deepened Well Added Horizontal Leg Extended Horizontal Leg
 Gas Well SWD Well Water Supply Well Other:

Well Name and Number: **FBIR Stephen 31X-19H** Spacing Unit Description: **Sections: 7 & 18 - T149N-R91W**

Operator: **XTO Energy, Inc.** Telephone Number: **303-397-3600** Field: **Heart Butte**

Address: **P.O. Box 6501** Pool: **Bakken**

City: **Englewood** State: **CO** Zip Code: **80155** Permit Type: Wildcat Development Extension

LOCATION OF WELL

At Surface	205 F N L	2398 F E L	Qtr-Qtr	Section	Township	Range	County
			NWNE	19	149 N	91 W	Dunn
Spud Date	Date TD Reached	Drilling Contractor and Rig Number		KB Elevation (Ft)	Graded Elevation (Ft)		
3/7/2013	5/3/2013	Nabors # 109		2230	2205		

Type of Electric and Other Logs Run (See Instructions)
MWD/GR, Mud Log, CBL/GR

CASING & TUBULARS RECORD (Report all strings set in well)

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Lateral1	Intermediate	7	0	10718	8 3/4	29			725	3450
Lateral1	Liner	4 1/2	9785	21007	6	13.5			0	

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft)		Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
			Top	Bottom						
Lateral1	21032	Open Hole	10718	21032	9700					0

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) 10718'-21032'						Name of Zone (If Different from Pool Name) Three Forks				
Date Well Completed (SEE INSTRUCTIONS) 8/16/2013			Producing Method Flowing		Pumping-Size & Type of Pump			Well Status (Producing or Shut-In) Producing		
Date of Test 8/16/2013	Hours Tested 24	Choke Size 34 /64	Production for Test		Oil (Bbbls) 1566	Gas (MCF) 2192	Water (Bbbls) 2149	Oil Gravity-API (Corr.) 41.3 °	Disposition of Gas Flared	
Flowing Tubing Pressure (PSI) 1554		Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbbls) 1566	Gas (MCF) 2192	Water (Bbbls) 2149	Gas-Oil Ratio 1400		

**Completion Report-23885
 Attachment C4 (3 pages)
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND**

Well Specific Stimulations

Date Stimulated 7/24/2013	Stimulated Formation Three Forks	Top (Ft) 10760	Bottom (Ft) 20860	Stimulation Stages 30	Volume 61294	Volume Units Barrels
Type Treatment Sand Frac	Acid %	Lbs Proppant 3440530	Maximum Treatment Pressure (PSI) 8384		Maximum Treatment Rate (BBLs/Min) 39.0	
Details 30 Frac Stages: 1: 20857'-20860' 2: 20475'-20479' 3: 20138'-20142' 4: 19793'-19797' 5: 19451'-19454' 6: 19114'-19117' 7: 18774'-18777' 8: 18429'-18433' 9: 18087'-18090' 10: 17747'-17750' 11: 17406'-17410' 12: 17022'-17026' 13: 16692'-16696' 14: 16350'-16353' 15: 16010'-16013' 16: 15666'-15669' 17: 14327'-15331' 18: 14995'-14998' 19: 14699'-14703' 20: 14311'-14314' 21: 13825'-14065' 22: 13480'-13720' 23: 13148'-13381' 24: 12814'-13055' 25: 12488'-12720' 26: 12125'-12380' 27: 11765'-12001' 28: 11427'-11666' 29: 11093'-11326' 30: 10760'-10996'						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLs/Min)	
Details						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLs/Min)	
Details						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLs/Min)	
Details						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLs/Min)	
Details						

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

--	--	--

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address Sandra_Haggard@xtoenergy.com	Date 10-Sep-13
	Signature 	Printed Name Sandra Haggard



WELL COMPLETION OR RECOMPLETION REPORT - FORM 6

INDUSTRIAL COMMISSION OF NORTH DAKOTA
 OIL AND GAS DIVISION
 600 EAST BOULEVARD DEPT 405
 BISMARCK, ND 58505-0840
 SFN 2468 (04-2010)



Well File No. **24084**

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
 PLEASE SUBMIT THE ORIGINAL AND ONE COPY.

Designate Type of Completion			
<input checked="" type="checkbox"/> Oil Well	<input type="checkbox"/> EOR Well	<input type="checkbox"/> Recompletion	<input type="checkbox"/> Deepened Well
<input type="checkbox"/> Gas Well	<input type="checkbox"/> SWD Well	<input type="checkbox"/> Water Supply Well	<input type="checkbox"/> Other:
Well Name and Number FBIR Stephen 31X-19G		Spacing Unit Description Sections: 7 & 18 - T149N-R91W	
Operator XTO Energy, Inc.		Telephone Number 303-397-3600	
Address P.O. Box 6501		Field Heart Butte	
City Englewood	State CO	Zip Code 80155	Permit Type <input type="checkbox"/> Wildcat <input checked="" type="checkbox"/> Development <input type="checkbox"/> Extension

LOCATION OF WELL

At Surface 175 F N L	2399 F E L	Qtr-Qtr NWNE	Section 19	Township 149 N	Range 91 W	County Dunn
Spud Date 3/9/2013	Date TD Reached 5/18/2013	Drilling Contractor and Rig Number Nabors # 109		KB Elevation (Ft) 2230	Graded Elevation (Ft) 2205	
Type of Electric and Other Logs Run (See Instructions) MWD/GR, Mud Log, CBL/GR						

CASING & TUBULARS RECORD (Report all strings set in well)

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	Surface	9 5/8	0	2065	13 1/2	36			625	0
Lateral1	Intermediate	7	0	10627	8 3/4	29			725	3146
Lateral1	Liner	4 1/2	9875	20585	6	13.5				

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft)		Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
			Top	Bottom						
Lateral1	20608	Open Hole	10627	20608	9910					0

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) 10627'-20608'						Name of Zone (If Different from Pool Name) Middle Bakken				
Date Well Completed (SEE INSTRUCTIONS) 8/11/2013			Producing Method Flowing		Pumping-Size & Type of Pump			Well Status (Producing or Shut-In) Producing		
Date of Test 8/12/2013	Hours Tested 24	Choke Size 36 /64	Production for Test		Oil (Bbbls) 1241	Gas (MCF) 1737	Water (Bbbls) 2294	Oil Gravity-API (Corr.) 41.6 °	Disposition of Gas Flared	
Flowing Tubing Pressure (PSI) 1245		Flowing Casing Pressure (PSI)		Calculated 24-Hour Rate	Oil (Bbbls) 1241	Gas (MCF) 1737	Water (Bbbls) 2294	Gas-Oil Ratio 1400		

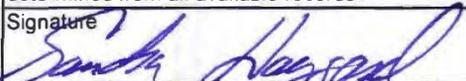
Completion Report-24084 Attachment C5 (3 pages)
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

Well Specific Stimulations

Date Stimulated 7/17/2013	Stimulated Formation Three Forks	Top (Ft) 10663	Bottom (Ft) 20438	Stimulation Stages 30	Volume 59080	Volume Units Barrels
Type Treatment Sand Frac	Acid %	Lbs Proppant 3398376	Maximum Treatment Pressure (PSI) 8382		Maximum Treatment Rate (BBLS/Min) 36.0	
Details 30 Frac Stages: 1: 20434'-20438' 2: 20091'-20094' 3: 19747'-19751' 4: 19403'-19406' 5: 19066'-19070' 6: 18768'-18771' 7: 18425'-18429' 8: 18083'-18086' 9: 17739'-17742' 10: 17401'-17404' 11: 17104'-17108' 12: 16762'-16765' 13: 16421'-16425' 14: 16078'-16081' 15: 15739'-15742' 16: 15396'-15399' 17: 15099'-15102' 18: 14756'-14759' 19: 14418'-14421' 20: 14079'-14082' 21: 13640'-13879' 22: 13296'-13539' 23: 12970'-13211' 24: 12665'-12901' 25: 12360'-12561' 26: 11985'-12226' 27: 11647'-11886' 28: 11310'-11546' 29: 10970'-11211' 30: 10663'-10879'						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLS/Min)	
Details						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLS/Min)	
Details						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLS/Min)	
Details						
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLS/Min)	
Details						

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

--	--	--

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address Sandra_Haggard@xtoenergy.com	Date 10-Sep-13
	Signature 	Printed Name Sandra Haggard

D. MAPS AND CROSS SECTION OF USDWs (N/A to Class II wells)

E. NAME AND DEPTH OF USDWs (CLASS II)

Underground Sources of Drinking Water in Dunn County, ND can be found in both preglacial rocks and glacial drift. Glacial drift in Dunn County consists of till and glaciofluvial sand and gravel deposits. The major glacial drift aquifers in Dunn County are the Killdeer, Horse Nose Butte, Knife River, and Goodman Creek aquifers. However, these aquifers are not located near the proposed LOW CAP SWD 1 site.

The Geologic Map of North Dakota reveals an isolated remnant of glacial sediment exposed near the site. Isolated remnants of glacial sediment overlying the Sentinel Butte Formation in Dunn County are typically composed of till and are not known to yield water to wells in the county.

Preglacial sedimentary rocks in Dunn County were deposited in intermittently subsiding Williston basin. The preglacial aquifers found in these sedimentary rocks near the proposed LOW CAP SWD 1 occur in the Upper Cretaceous Fox Hills and Hell Creek Formations and in the Tertiary Cannonball, Ludlow, Tongue River, and Sentinel Butte Formations.

Sentinel Butte Formation

The Sentinel Butte Formation consists of interbedded clay, shale, claystone, siltstone, poorly consolidated sandstone, and lignite. It is continental in origin and occurs throughout Dunn County except in a few areas where it has been eroded. In the area of the proposed LOW CAP SWD 1 location (the Site) it is approximately 550 feet thick.

The aquifers within the Sentinel Butte Formation consist of poorly consolidated sandstone and fractured lignite. Most of the freshwater wells in Dunn County tap sandstone or lignite aquifers in the upper part of the Sentinel Butte Formation.

Sandstone aquifers — The sandstone aquifers within the Sentinel Butte Formation are composed largely of fine sand enclosed in a matrix of clay and silt. They range in thickness from a few feet to a maximum of about 119 feet and occur at depths throughout the formation. Water from the sandstone aquifers is typically a hard to very hard, sodium bicarbonate type that has a mean dissolved solids concentration of 1,742 mg/L.

Lignite aquifers – Lignite beds can be found randomly spaced throughout the entire thickness of the Sentinel Butte Formation. They range in thickness from 1 to about 20 feet and occur at depths ranging from about 15 to 600 feet. Water from the lignite aquifers is typically a hard to very hard, sodium bicarbonate or sodium bicarbonate-sulfate type that has a mean dissolved solids concentration of 1,526 mg/L.

The sandstone and lignite aquifers in the Sentinel Butte Formation are recharged by infiltration of precipitation.

Tongue River Formation

(Currently recognized as the Bullion Creek Formation)

The Tongue River Formation consists of interbedded siltstone, claystone or shale, poorly consolidated sandstone, lignite, and occasional limestone lenses or concretions. It is continental in origin and underlies all of Dunn County. The formation underlies the site at an estimated 600 feet and is approximately 350 feet thick.



Aquifers in the Tongue River Formation consist of very fine to fine-grained sandstone beds that range in thickness from 10 to 100 feet. These sandstone beds frequently pinch out or grade laterally into siltstone or sandy clay. Aquifers in the Tongue River Formation are recharged by leakage from aquifers in the overlying Sentinel Butte Formation. Water from the aquifers is typically a soft, sodium bicarbonate type that has a mean dissolved solids concentration of 2,043 mg/L.

Undifferentiated Cannonball-Ludlow Formations

The Cannonball Formation, which is marine in origin, and the Ludlow Formation, which is continental in origin, are interfingering throughout Dunn County. The undifferentiated Cannonball-Ludlow Formations consist of interbedded siltstone, poorly consolidated sandstone, shale or clay, and lignite. The formation underlies the Site at an estimated 950 feet and is approximately 600 feet thick.

The aquifers in the undifferentiated Cannonball-Ludlow Formations consist mostly of fine to very fine silty sandstone beds that range in thickness from about 10 to 125 feet. There is no evidence of a hydraulic connection between the beds. Therefore, each bed is considered to be a separate aquifer. Lower aquifers in the formation are recharged beyond Dunn County while aquifers in the upper section are likely recharged by downward movement of water from the Tongue River Formation. Water from the aquifers is typically a soft, sodium bicarbonate type with a mean dissolved solids concentration of 1,855 mg/L.

Hell Creek Formation

The Hell Creek Formation is composed of interbedded siltstone, shale or claystone, poorly consolidated sandstone, and a few thin lignite beds. It is continental in origin and underlies all of Dunn County. The formation underlies the Site at an estimated 1,550 feet and it is approximately 200 feet thick.

The aquifers within the Hell Creek Formation consist of fine-grained sandstone beds that range in thickness from about 10 to 60 feet and have a maximum aggregate thickness of about 106 feet. Because there is no evidence of a hydraulic connection between the beds, each of the sandstone beds is considered to be a separate aquifer. Recharge to the aquifers in the Hell Creek Formation occurs outside of Dunn County. Water from the aquifers is a soft, sodium bicarbonate type with a mean dissolved solids concentration of 1,588 mg/L.

Fox Hills Formation

The Fox Hills Formation is composed of interbedded sandstone, shale, and siltstone. It is marine in origin and underlies all of Dunn County. The formation underlies the Site at an estimated 1,750 feet and is approximately 280 feet thick. It is underlain by the Pierre Formation.

The aquifers within the Fox Hills Formation are generally composed of very fine to medium-grained sandstone beds that range in thickness from about 6 to 92 feet and have a maximum aggregate thickness of about 158 feet. Recharge to the Fox Hills aquifer probably occurs where the formation crops out in the extreme southwestern part of North Dakota and in eastern Montana. Water from the aquifer is generally a soft, sodium bicarbonate type with a mean dissolved solids concentration of 1,486 mg/L.

Klausing, R. 1979. Ground-Water Resources of Dunn County, North Dakota. U.S. Geological Survey.



F. MAPS AND CROSS SECTIONS OF GEOLOGIC STRUCTURE OF AREA (N/A to Class II wells)

G. GEOLOGIC DATA ON INJECTION AND CONFINING ZONES

Upper Confining Zones:

Name: *Cretaceous Mowry Formation*

Lithologic Description: Shale; medium to dark gray; soft; flaky; traces of bluish gray bentonitic claystone; top is marked by a persistent bentonite that has a strong response on a gamma-ray log.

Offshore marine deposits.

Estimated thickness: 105'

Estimated top: 4,720'

Industry accepted standard shale frac gradient = approximately 0.80

Estimated fracture pressure at bottom of zone: $4,825' \times 0.80 = 3,860$ psi

&

Name: *Cretaceous Skull Creek Formation*

Lithologic description: Shale; medium to dark gray; micaceous; soft, flaky to lumpy and sandstone; light gray; glauconitic, calcareous; fine-grained; friable.

Estimated thickness: 215'

Estimated top: 4,825'

Industry accepted standard shale frac gradient = approximately 0.80

Estimated fracture pressure at bottom of zone: $5,040' \times 0.80 = 4,032$ psi

Injection Zone:

Name: *Cretaceous Inyan Kara Formation*

Lithologic Description

- Upper part: Sandstone; light gray; quartzose; fine-grained to course-grained. Shale: gray; silty; lumpy. Marine to nonmarine.
- Lower part: Sandstone; gray; quartzose; medium-grained to course-grained; angular to subrounded; occasional lenses of shale; gray; bentonitic; contains manganese and siderite spheres. Most oilfield brine injection occurs in this unit. Primarily nonmarine.

Estimated thickness of gross zone: 425'

Estimated gross zone: 5,040'-5,465'

Estimated perforated interval: 5,120-5,435'

Industry accepted standard Inyan Kara frac gradient = approximately 0.67

Estimated fracture pressure at top of zone: $5,040' \times 0.67 = 3,377$ psi

Lower Confining Zone:

Name: *Jurassic Swift Formation*

Lithologic description: Shale; dark gray to greenish gray; interbedded with siltstone and sandstone; calcareous; fissile; waxy and grayish green, glauconitic sandstone. Shallow marine deposit

Estimated thickness: 465'

Estimated top: 5,465'

Industry accepted standard shale frac gradient = approximately 0.80

Estimated fracture pressure at top of zone: $5,465' \times 0.80 = 4,372$ psi

Lithologic Description: Shale; dark gray to greenish gray; interbedded with siltstone and sandstone; calcareous; fissile; waxy and grayish green, glauconitic sandstone. Shallow marine deposit.

**** Lithology Reference: North Dakota Stratigraphic Column.

Depths calculated from the NDIC's call of geologic tops in the offsetting FBIR BEAKS 24X-8B well (NDIC Well File No. 19800) and the estimated finished pad elevation of 2,230'. KB Elevation estimated to be 2,245' (add 15' to depths above).

Independence ND, LLC

301 1st Ave E Bakersfield

Newtown, ND 58763-4405



H. OPERATING DATA

1. Average and maximum daily injection rate: Average of 15,000 bbl/day, maximum of 29,500 bbl/day
2. Average and maximum injection pressure: Average 600 psi, maximum 1380 psi

Maximum injection pressure was determined utilizing the following formula in accordance with § 146.23:

$$FP = [fg - (0.433 * sg)] * d$$

Where:

- FP = formation fracture pressure (measured at surface)
- fg = fracture gradient of confining zone (**** § 146.23) = 0.80 psi/ft
- sg = specific gravity of injected fluid- (See Attachment H1) = 1.21
- d = depth to top of injection zone = 5,040 ft

Therefore:

$$FP = [0.8 \text{ psi/ft} - (0.433 * 1.21)] * 5,040 \text{ ft}$$

$$FP = 1391 \text{ psi}$$

$$FP \sim 1380 \text{ psi}$$

3. Annulus Fluid: A mixture of fresh water and corrosion/scale inhibitors
4. Injection Water Analysis: (See Attachment H1)
5. Hazen-Williams calculation of friction loss at average and maximum rates

$$P_d = \frac{4.52 * Q^{1.85} * L}{C^{1.85} * d^{4.8655}}$$

Where:

- P_d = pressure drop over the length of pipe in psig due to friction
- L = length of pipe in feet (estimated top perf @ 5,120')
- $Q_{(avg)}$ = flow, gpm (average rate of 15,000 bbls/day or 437 gallons/minute)
- $Q_{(max)}$ = flow, gpm (maximum rate of 29,500 bbls/day or 860 gallons/minute)
- C = pipe roughness coefficient (150 – thin coating over steel pipe)
- d = inside pipe diameter, in (4"-conservative value does not include drift dia. or coating thickness)

$$P_{\text{friction}(avg)} = \frac{4.52 * 437^{1.85} * 5,120}{150^{1.85} * 4^{4.8655}}$$

$$P_{\text{friction}(max)} = \frac{4.52 * 860^{1.85} * 5,120}{150^{1.85} * 4^{4.8655}}$$

$$P_{\text{friction}(avg)} = \frac{4.52 * 76716 * 5,120}{10611 * 849}$$

$$P_{\text{friction}(max)} = \frac{4.52 * 268424 * 5,120}{10611 * 849}$$

$$P_{\text{friction}(avg)} = 197 \text{ psi}$$

$$P_{\text{friction}(max)} = 689 \text{ psi}$$



******§ 146.23 Operating, monitoring, and reporting requirements.**

(a) Operating requirements. Operating requirements shall, at a minimum, specify that:

(1) Injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that the pressure during injection does not initiate new fractures or propagate existing fractures in the confining zone adjacent to the USDWs. In no case shall injection pressure cause the movement of injection or formation fluids into an underground source of drinking water.



MINNESOTA VALLEY TESTING LABORATORIES, INC.

MVTL

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890

2616 E. Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724

51 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885

MEMBER
ACIL

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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Page: 1 of 2

Amended 5Nov18 (Specific Gravity)

Independence ND LLC
301 1st Ave E Bakersfield
Newtown ND 58763-4405

Report Date: 1 Nov 18
Lab Number: 18-W3447
Work Order #: 82-2719
Account #: 048755
Date Sampled: 12 Oct 18 10:00
Date Received: 15 Oct 18 8:00
Sampled By: Client

Project Name: Independence
Sample Description: FBIR Black Medicine 24X-21A
Sample Site: 47.70397, -102.336100
Sample Location: SESW Sec 21 T149 R91

Temp at Receipt: 5.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	16 Oct 18	SVS
pH	* 6.0	units	N/A	SM4500 H+ B	15 Oct 18 17:00	SVS
Conductivity (EC)	216210	umhos/cm	N/A	SM2510-B	15 Oct 18 17:00	SVS
Total Alkalinity	91	mg/l CaCO3	20	SM2320-B	15 Oct 18 17:00	SVS
Phenolphthalein Alk	< 20	mg/l CaCO3	20	SM2320-B	15 Oct 18 17:00	SVS
Bicarbonate	91	mg/l CaCO3	20	SM2320-B	15 Oct 18 17:00	SVS
Carbonate	< 20	mg/l CaCO3	20	SM2320-B	15 Oct 18 17:00	SVS
Hydroxide	< 20	mg/l CaCO3	20	SM2320-B	15 Oct 18 17:00	SVS
Tot Dis Solids (Summation)	289000	mg/l	12.5	SM1030-F	26 Oct 18 12:08	Calculated
Percent Sodium of Cations	78.7	%	NA	N/A	18 Oct 18 13:59	Calculated
Total Hardness as CaCO3	42000	mg/l	NA	SM2340-B	18 Oct 18 13:59	Calculated
Hardness in grains/gallon	2450	gr/gal	NA	SM2340-B	18 Oct 18 13:59	Calculated
Cation Summation	4440	meq/L	NA	SM1030-F	26 Oct 18 11:59	Calculated
Anion Summation	5240	meq/L	NA	SM1030-F	26 Oct 18 12:08	Calculated
Percent Error	-8.27	%	NA	SM1030-F	26 Oct 18 12:08	Calculated
Sodium Adsorption Ratio	170		NA	USDA 20b	18 Oct 18 13:59	Calculated
Specific Gravity	1.210 @ 65F		NA	ASTM D1298	16 Oct 18 13:14	RAG
Fluoride	1.01	mg/l	0.10	SM4500-F-C	15 Oct 18 17:00	SVS
Sulfate	11600	mg/l	5.00	ASTM D516-07	26 Oct 18 12:08	EV
Chloride	177000	mg/l	1.0	SM4500-C1-E	25 Oct 18 15:42	EV
Nitrate-Nitrite as N	< 0.5 @	mg/l	0.10	EPA 353.2	17 Oct 18 15:37	RAG
Calcium - Total	14500	mg/l	1.0	6010D	18 Oct 18 13:59	BB
Magnesium - Total	1400	mg/l	1.0	6010D	18 Oct 18 13:59	BB

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix

= Due to concentration of other analyte

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: ND # ND-00016

**Injection Fluid Analysis
Attachment H1 (2 pages)**
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

MVTL

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890

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MEMBER ACIL

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Page: 2 of 2

Amended 5Nov18 (Specific Gravity)

Independence ND LLC
301 1st Ave E Bakersfield
Newtown ND 58763-4405

Report Date: 1 Nov 18
Lab Number: 18-W3447
Work Order #: 82-2719
Account #: 048755
Date Sampled: 12 Oct 18 10:00
Date Received: 15 Oct 18 8:00
Sampled By: Client

Project Name: Independence
Sample Description: FBIR Black Medicine 24X-21A
Sample Site: 47.70397, -102.336100
Sample Location: SESW Sec 21 T149 R91

Temp at Receipt: 5.0C

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Sodium - Total, Potassium - Total, Barium - Total, Iron - Total, Manganese - Total, and Chromium - Total.

* Holding time exceeded

Approved by:

Claudette K. Carroll

Stacy Zander

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

Stacy Zander, Energy Laboratory Supervisor, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND 4 ND-00016

I. FORMATION TESTING PROGRAM

Independence ND plans on testing the formation in accordance with the requirements of the final EPA permit. The testing program may include the following:

FORMATION TESTING PROGRAM	
TYPE OF TEST	DATE DUE
Injection Zone Water Sample	Required prior to receiving authorization to inject. A representative water sample (determined by stabilized specific conductivity from three consecutive swab runs) from the injection zone shall be analyzed for TDS, pH, specific gravity and specific conductivity. Analysis will determine whether an aquifer exemption is required.
Fluid Level	Record fluid level while swabbing well. This measurement will be utilized along with the specific gravity to perform the pore pressure test below.
Pore Pressure	May be required in the final permit prior to receiving authorization to inject.
Standard Annulus Pressure	Required prior to receiving authorization to inject and at least every five (5) years after the last successful test to demonstrate mechanical integrity.
Radioactive Tracer Survey	May be required prior to receiving authorization to inject if CBL does not show adequate cement. Also required every five (5) years after the last successful test.
Temperature Log	May be required prior to receiving authorization to inject if radioactive tracer survey is inconclusive. Also, required every five (5) years after the last successful test.
Step Rate Test	May be required to be completed within a limited 180-day authorization to inject. Step rate test must be as prescribed in final permit or pre-approved by EPA.
Pressure Fall-Off Test	May be required to be completed within a limited 180-day authorization to inject. Fall-off test must be as prescribed in final permit or pre-approved by EPA.



J. STIMULATION PROGRAM (Optional for Class II wells)

Independence ND, LLC is not proposing a stimulation program at this point in time. If, after receiving final approval to inject, Independence ND determines that a stimulation program is needed, they will work diligently with authorities at the EPA Region 8 and the NDIC to draft an acceptable stimulation program and submit a request for approval. Independence ND, LLC will not commence with a stimulation program until they have received written approval from all regulating agencies.

K. INJECTION PROCEDURES (See Attachment K1 – Operations Manual)



Independence ND, LLC

Operations Manual – Version 1.0

- Health, Safety, and Environmental Guidelines
- Facility Layout and Process Flow
- Daily Operations
- Inspection and Maintenance Schedule

Health, Safety, and Environmental Guidelines

- Safety Culture
 - Independence ND facility operators are responsible for the safe operation of the disposal facility and for the safety of all personnel on location
- Personal Protective Equipment (PPE) Requirements
 - OSHA PPE requirements (29 CFR 1926) will always be followed
 - Safety glasses and Face Protection (when job requires)
 - Hard hat
 - Hearing protection
 - Reflective safety vest
 - Steel-toe boots
 - FR clothing (29 CFR 1910 standard)
- Hazardous Atmospheres
 - A four-gas monitor must always be worn
 - Special care must be taken when gauging tanks; always review tank-gauging guidelines carefully prior to taking measurements
- Daily Pre-Job Safety Analysis
 - At each shift change, a handover meeting must take place between operators
 - Review current operating conditions, forecasted weather, and any unusual conditions
 - Review any maintenance required, what tools and PPE will be required, and any additional precautions needed
- Stop-Job Authority
 - All operators have authority to shutdown injection and/or trucking operations if any conditions are observed that pose a threat to the safety of personnel, equipment, or the environment

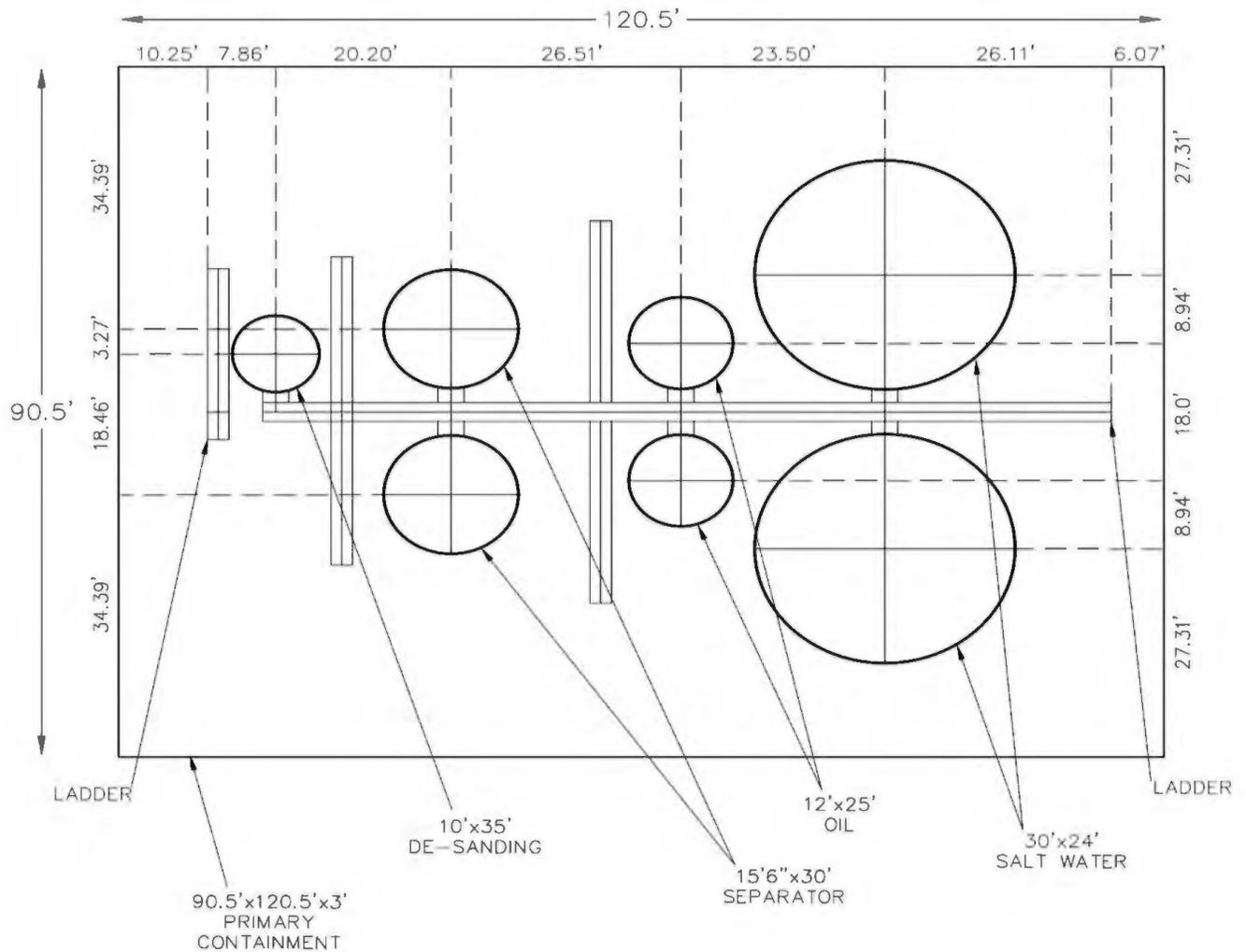
- Facility Design and Safety Controls
 - Following permit approval, the disposal facility will be designed and signed off by a Professional Engineer using “API Recommended Practice 14” standards

- Spill Prevention
 - All primary, secondary, and tertiary containment systems must be maintained in good working condition
 - Continuous monitoring with the aide of automated shut downs and alarms will be employed to safeguard the facility
 - Tubing and casing pressures
 - Pump intake and discharge pressures
 - Tank Levels
 - In the unlikely event of a spill, all Tribal, state, and federal requirements will be followed with respect to cleanup and notifications
 - Reference SPCC Plan

- Hazardous Materials Disposal
 - Filter socks and tank bottom solids will be hauled to approved disposal facilities

Facility Layout and Process Flow

- Trucked production water is offloaded at the facility where it is first sent through a solids strainer and then metered
- Water is piped through a de-sander to settle out solids
- Water then is piped into the HWSB skim tanks where oil/water separation occurs
 - Oil can be recycled back through the HWSB tanks and is sent to the oil tanks for sale
 - Water is sent to the water tanks prior to injection into the well
- Water is gravity fed from the water storage tanks through piping to charge pumps
- Water is then piped through filter pots that remove fine particulates before reaching the primary injection pump (horizontal pump)
- Water is pumped from the horizontal pump through a meter and then to the injection tubing head



Daily Operations

- Follow Independence ND's HSE guidelines
- Monitor SCADA system pressures and watch for alarms
- Follow facility inspection/maintenance-frequency guidelines listed below in Table 1
- Assist truck operators in offloading water
 - Check and clean offload water strainers
 - Sample truck loads to confirm quality is acceptable
 - Collect a completed water ticket that clearly states the operator name, trucking company name, driver name, well name and location, quantity delivered, date and time, and any pertinent notes
 - If delivered water plugs the offload screens or remains cloudy, refuse to accept the delivery
 - Only accept produced water that originated from Bakken- or Three Forks-producing wells

- Monitor truck hookup and offload process to ensure no shortcuts are taken
- Walk the entire location and facility looking for leaks and any maintenance needs
- Gauge all water and oil storage tanks
 - Sample and test oil prior to scheduling pickup
 - Recycle oil through HWSB tanks to meet BS&W requirements
- Inspect filter socks and change out when needed
- Check solids levels in de-sander and storage tanks

Inspection and Maintenance Schedule

Equipment Inspection/Monitoring Frequency			
	Continuous	Daily	Weekly
Wellhead Tubing Pressure			
H Pump: Flowrate and Pressure			
SCADA System			
Wellhead Casing Pressure			
Location Perimeter Containment			
Facility Visual Check for Leaks			
Surface Flowlines			
Horizontal Pump			
Charge Pumps			
Offload Strainers			
Sample Truck Loads			
Storage Tanks: Check Fluid Levels and Visual Inspection			
Inspect Pump Seals			
Wellhead Casing Valves			
Offload/Recycle Pumps			
Storage Tanks: Thorough Visual Check (Valves, Fittings, Lines)			

Table 1

L. CONSTRUCTION PROCEDURES

Ground Elevation 2,232.9'
 Estimated Finished Pad Elevation 2,230'
 Estimated KB Elevation 2,245' (add 15' to depths below)

Mud Program
 Surface Fresh Water
 Production Salt Water Gel System

Deviation Program Tests (i.e. Totco drop surveys) to determine the deviation from the vertical shall be taken at least every 1000'

Casing Program
 Surface 9-5/8" J-55, 36 lb/ft set at least 50' into the Pierre Shale to ~2,300'
 Production 7" J-55, 26 lb/ft set to ~ 5,650'

Cementing Program
 Surface Cemented to surface with an estimated 830 sacks ****
 Production Cemented to surface with an estimated 655 sacks ****

Logging Program (*Minimum-others as required by EPA permit letter)
 Cement Bond Log Run from TD to at least 100' above TOC
 Gamma Ray Run from TD to surface

Perforating Program Anticipated to be 5,120' to 5,435' confirmed with GR ****

Anticipated Formation Tops (Estimated) ****

Pierre 2,030' GL
 Greenhorn 4,325' GL
 Mowry 4,720' GL
 Skull Creek Formation 4,825' GL
 Inyan Kara (Gross Inj. Zone) 5,040' GL
 Swift 5,465' GL
 PBD 5,610' GL
 TD 5,650' GL

Drilling Plan Summary

Independence ND, LLC plans to drill an Inyan Kara Formation (Dakota Group) salt water disposal well to 5,650' with rotary tools. This will be a new well in the Heart Butte Field. A 13-1/2" surface hole will be drilled with fresh water mud to a depth of at least 50' below the base of the Fox Hills Formation. 9-5/8", 36ppf surface casing will be set and cemented to surface with approximately 830 sacks of cement. A 8-3/4" bit will be used to drill out of the surface casing with a salt water gel system to an anticipated TD of 5,650'. 7", 26ppf production casing will be set and cemented to surface with approximately 655 sacks. **A closed loop system will be utilized during the drilling of this well. Drilling fluids will be recirculated through a series of steel open-top storage tanks instead of an earthen pit. Cuttings will be captured and dried through the use of a shale shaker, mud cleaner, and decanter centrifuge and deposited in a 3-sided steel tank. Amendments may be added to help solidify the cuttings if necessary. All cuttings will be hauled off the site to the Indian Hills Waste Disposal located at 14070 43rd St NW, Alexander ND 58831.**

**** Depth to base of lowest freshwater zone was calculated from the Pierre Shale Top MM 23 map--drilling oversight will be required to ensure that surface casing is set at least 50' into the Pierre Formation. Cement volumes are estimates for ideal conditions--actual cement volumes will be adjusted accordingly by operator/cement contractor to compensate for deviations in drilling plan, wellbore, cement type, formation influences, etc. and achieve the required isolation under existing regulations for both surface and production strings. Injection Interval is also estimated--actual Injection Interval will be determined from logs performed on the well during completion. All depths referenced from the proposed finished pad elevation of 2,230'. KB Elevation estimated to be 2,245' (add 15' to depths above)



M. CONSTRUCTION DETAILS (See Attachment M1.1-M4)

Independence ND, LLC

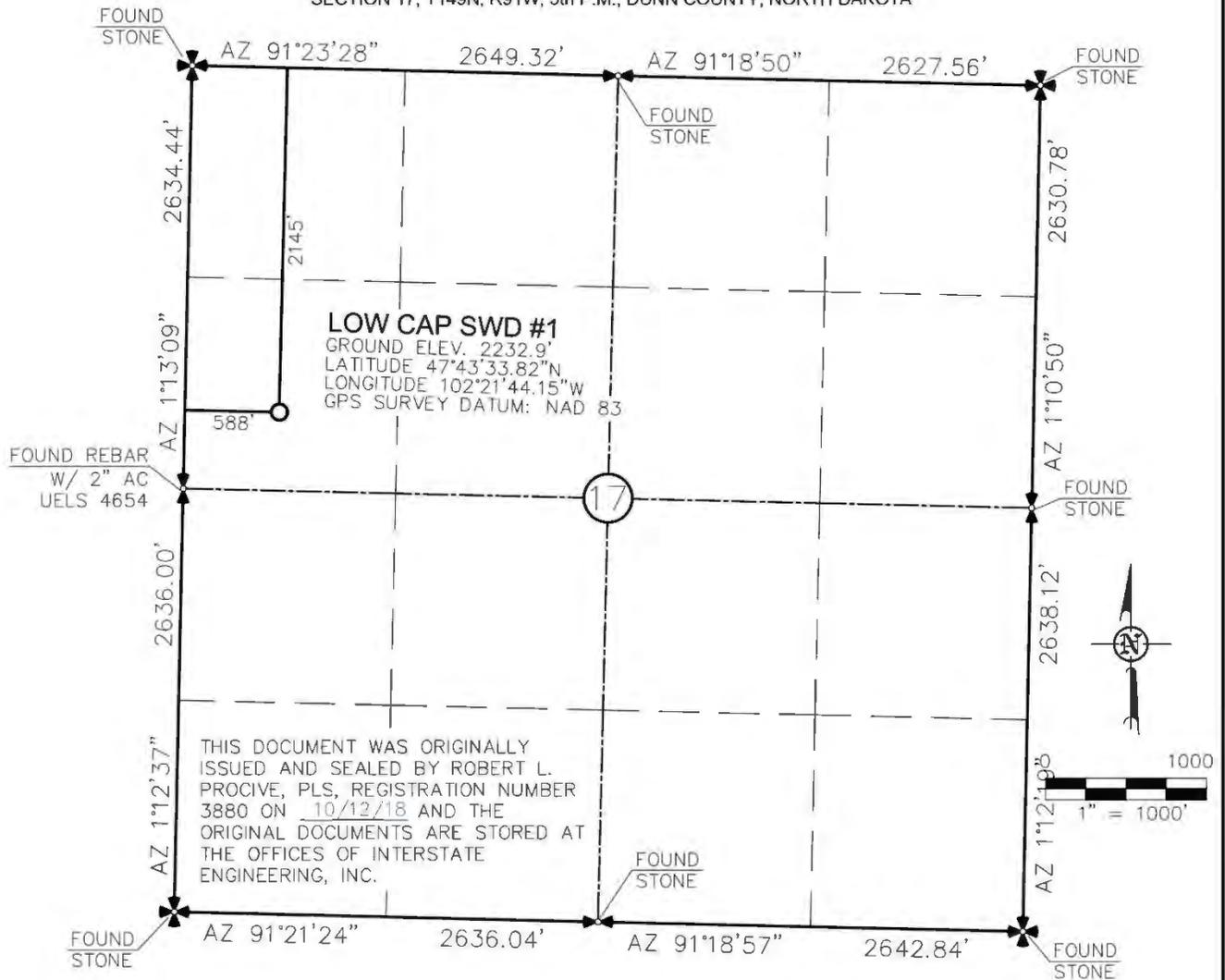
301 1st Ave E Bakersfield

Newtown, ND 58763-4405



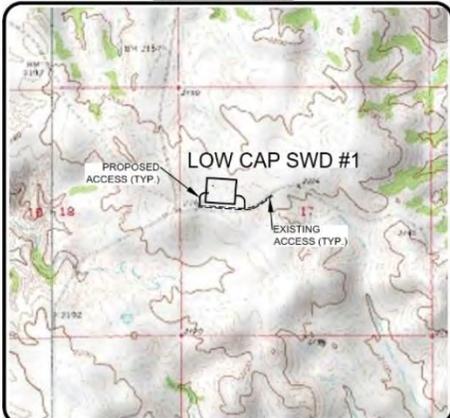
WELL LOCATION PLAT

INDEPENDENCE ND LLC
 301 1ST AVENUE E BAKERSFIELD, NEWTOWN, ND 58763
 LOW CAP SWD #1
 588 FEET FROM WEST LINE AND 2145 FEET FROM NORTH LINE
 SECTION 17, T149N, R91W, 5th P.M., DUNN COUNTY, NORTH DAKOTA



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VICINITY MAP



- MONUMENT - RECOVERED
- MONUMENT - NOT RECOVERED

STAKED ON 7/23/18
 VERTICAL CONTROL DATUM WAS BASED UPON
 CONTROL POINT 13-2 WITH AN ELEVATION OF 2272.8'

THIS SURVEY AND PLAT IS BEING PROVIDED AT THE
 REQUEST OF CHRIS DANEILSON OF NESET CONSULTING
 SERVICES. I CERTIFY THAT THIS PLAT CORRECTLY
 REPRESENTS WORK PERFORMED BY ME OR UNDER MY
 SUPERVISION AND IS TRUE AND CORRECT TO THE
 BEST OF MY KNOWLEDGE AND BELIEF.



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ROBERT L. PROCIVE, LS-2884

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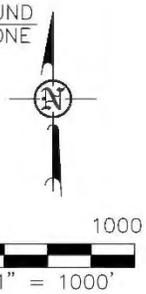
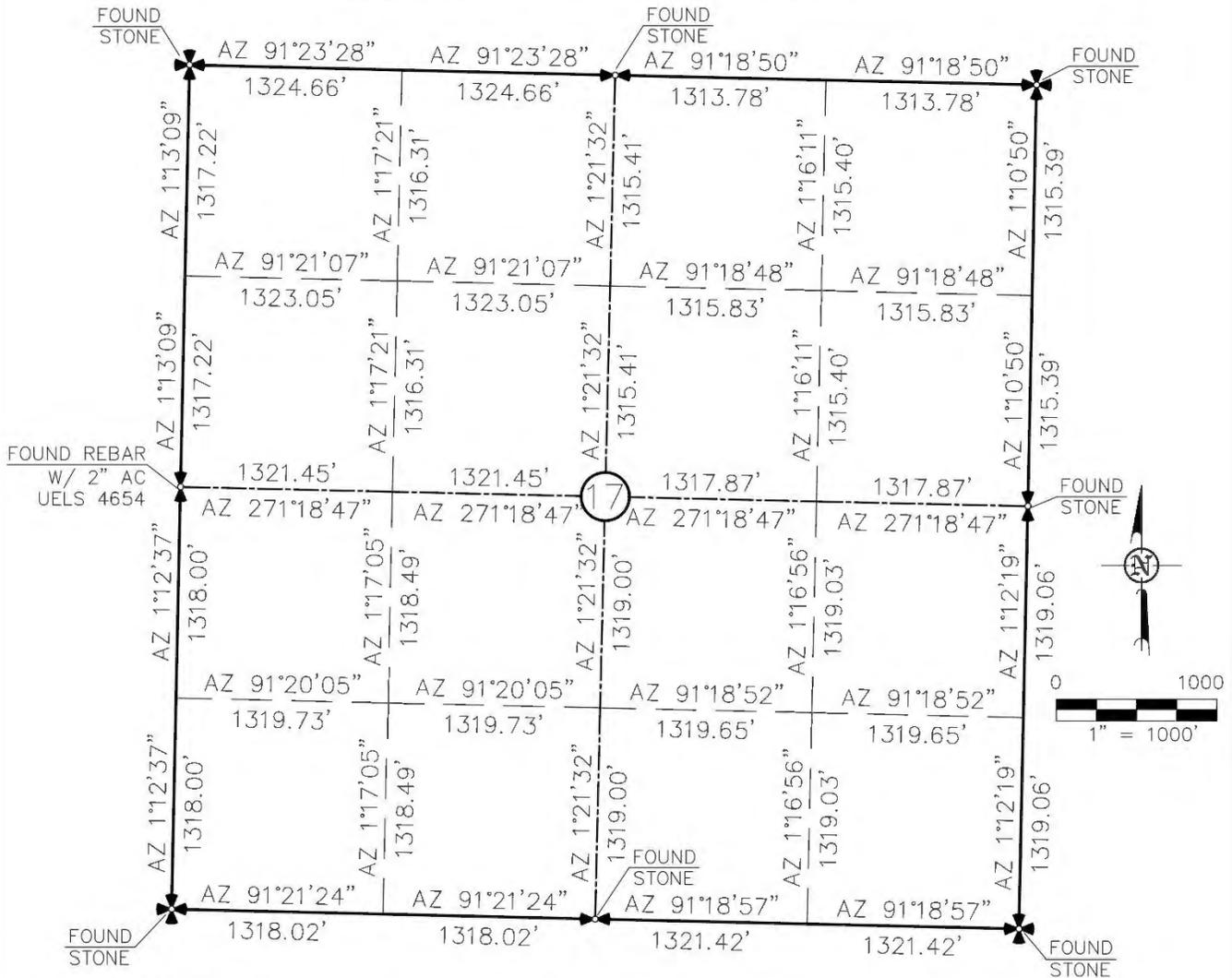
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 Fax (701) 575-2251
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Other offices in Minnesota, Montana and South Dakota

INDEPENDENCE ND LLC
 WELL LOCATION PLAT
 SECTION 17, T149N, R91W
 DUNN COUNTY, NORTH DAKOTA
 Drawn By: J.D.M. Project No.: E18-17-031
 Checked By: R.L.P. Date: JULY 2018

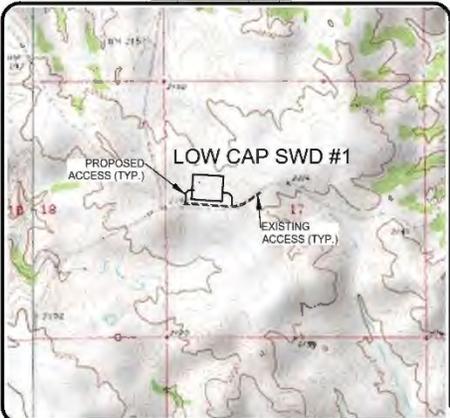
**Well Location Plat
 Attachment M1.1**
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

SECTION BREAKDOWN

INDEPENDENCE ND LLC
 301 1ST AVENUE E BAKERSFIELD, NEWTOWN, ND 58763
 LOW CAP SWD #1
 588 FEET FROM WEST LINE AND 2145 FEET FROM NORTH LINE
 SECTION 17, T149N, R91W, 5th P.M., DUNN COUNTY, NORTH DAKOTA



VICINITY MAP



-  - MONUMENT - RECOVERED
-  - MONUMENT - NOT RECOVERED

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ALL AZIMUTHS ARE BASED ON G.P.S. OBSERVATIONS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1901. THE CORNERS FOUND ARE AS INDICATED AND ALL OTHERS ARE COMPUTED FROM THOSE CORNERS FOUND AND BASED ON G.L.O. DATA. NORTH DAKOTA STATE PLANE NORTH ZONE.



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INDEPENDENCE ND LLC
 SECTION BREAKDOWN
 SECTION 17, T149N, R91W
 DUNN COUNTY, NORTH DAKOTA
 Drawn By: J.D.M. Project No.: E18-17-031
 Checked By: R.L.P. Date: JULY 2018

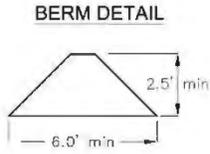
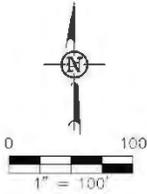
**Section Breakdown
 Attachment M1.2**
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND



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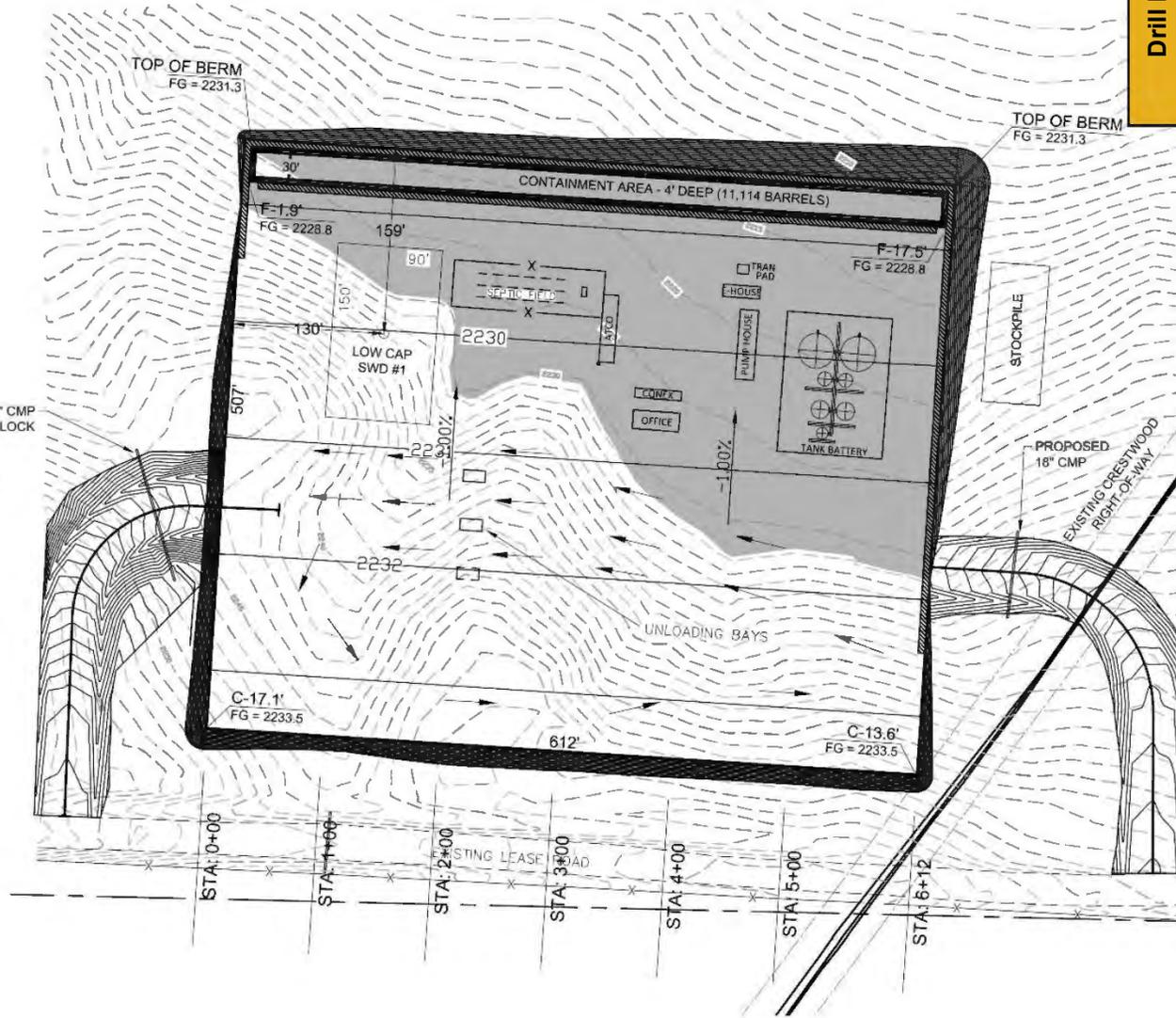
CATASTROPHIC CONTAINMENT
 ASSUMING 0.5 FOOT FREE BOARD ON THE BERM AROUND THE CONTAINMENT POND AND CONTAINMENT WATER IS ALLOWED TO BACK UP ONTO THE PAD, THE TOTAL DESIGNED OVERALL CONTAINMENT VOLUME WILL BE 40,678 BARRELS

— Proposed Contours
 - - - Original Contours



NOTE: All utilities shown are preliminary only, a complete utilities location is recommended before construction.

PAD LAYOUT
 INDEPENDENCE ND LLC
 301 1ST AVENUE E BAKERSFIELD, NEWTOWN, ND 58763
 LOW CAP SWD #1
 588 FEET FROM WEST LINE AND 2145 FEET FROM NORTH LINE
 SECTION 17, T149N, R91W, 5th P.M., DUNN COUNTY, NORTH DAKOTA

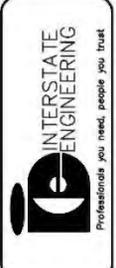


**Drill Pad Layout
 Attachment M1.3**
 LOW CAP SWD #1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

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INDEPENDENCE ND LLC
 PAD LAYOUT
 SECTION 17, T149N, R91W
 DUNN COUNTY, NORTH DAKOTA
 Drawn By: JDM
 Project No.: E-18-12-031
 Checked By: ELP
 Date: JULY 2018

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 Office: 141 2nd Avenue Southwest, Belfield, ND 58922



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NOTE: All utilities shown are preliminary only, a complete utilities location is recommended before construction.

ACCESS APPROACH

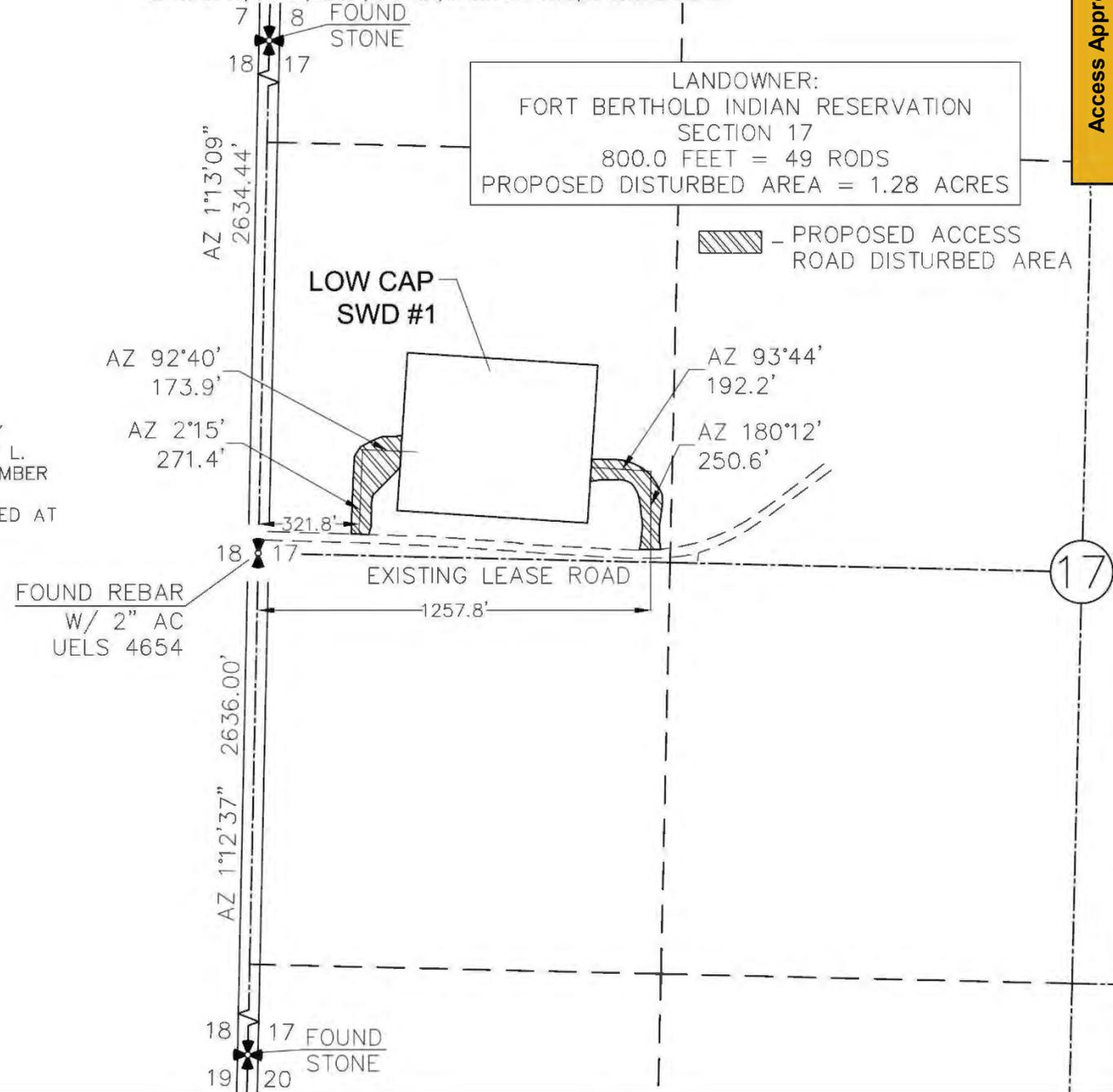
INDEPENDENCE ND LLC
 301 1ST AVENUE E BAKERSFIELD, NEWTOWN, ND 58763
 LOW CAP SWD #1
 588 FEET FROM WEST LINE AND 2145 FEET FROM NORTH LINE
 SECTION 17, T149N, R91W, 5th P.M., DUNN COUNTY, NORTH DAKOTA

LANDOWNER:
 FORT BERTHOLD INDIAN RESERVATION
 SECTION 17
 800.0 FEET = 49 RODS
 PROPOSED DISTURBED AREA = 1.28 ACRES

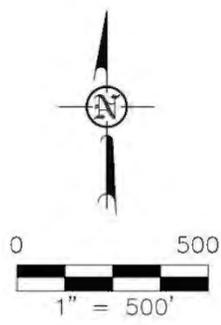
**Access Approach
 Attachment M1.4**
 LOW CAP SWD #1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND



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— PROPOSED ACCESS ROAD DISTURBED AREA



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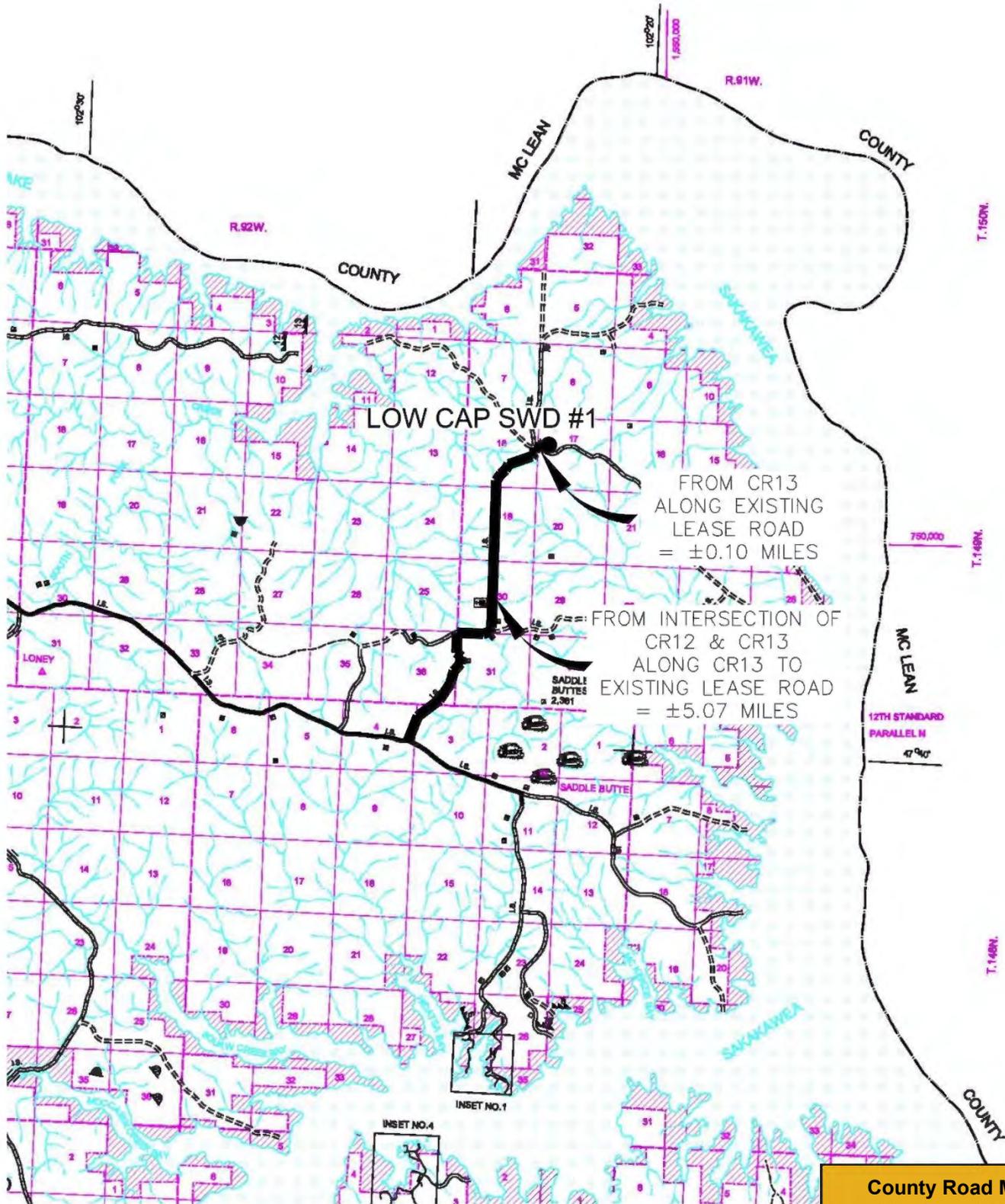
INDEPENDENCE ND LLC
 ACCESS APPROACH
 SECTION 17, T149N, R91W
 DUNN COUNTY, NORTH DAKOTA
 Drawn By: J.D.M. Project No.: E18-174
 Checked By: R.L.P. Date: JULY 20

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COUNTY ROAD MAP
 INDEPENDENCE ND LLC
 301 1ST AVENUE E BAKERSFIELD, NEWTOWN, ND 58763
 LOW CAP SWD #1
 588 FEET FROM WEST LINE AND 2145 FEET FROM NORTH LINE
 SECTION 17, T149N, R91W, 5th P.M., DUNN COUNTY, NORTH DAKOTA



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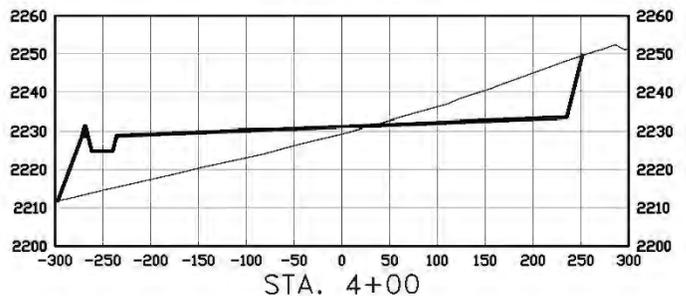
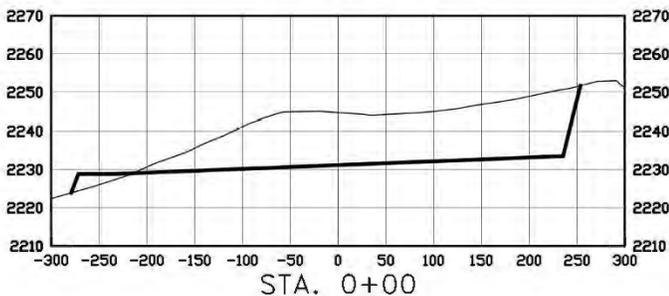
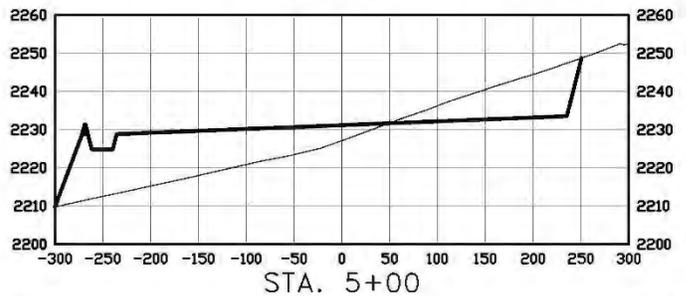
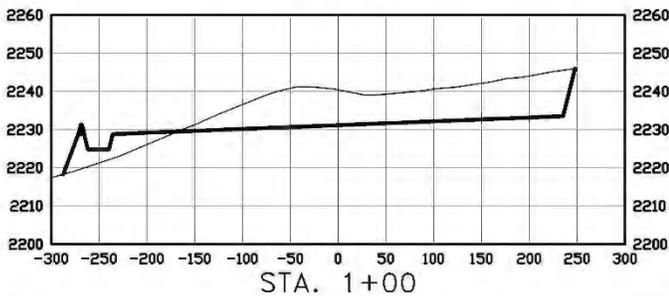
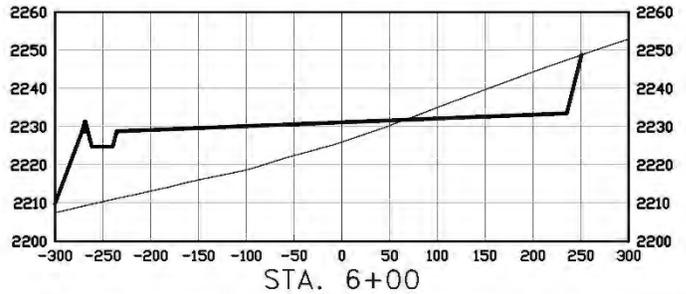
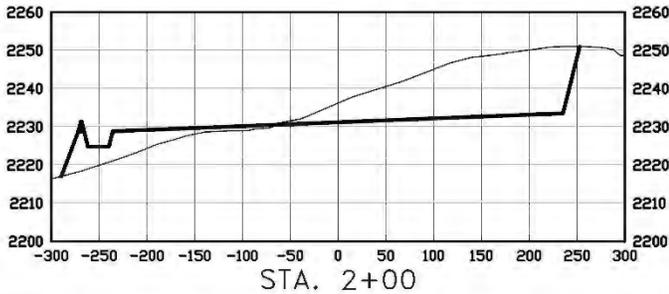
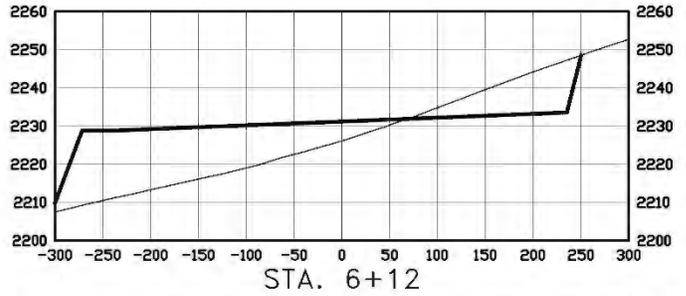
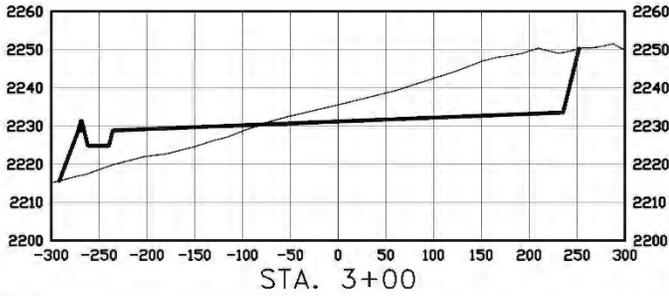
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 Fax (701) 575-2251
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INDEPENDENCE ND LLC
 COUNTY ROAD MAP
 SECTION 17, T149N, R91W
 DUNN COUNTY, NORTH DAKOTA

Drawn By: J.D.M.	Project No.: E18-17-0
Checked By: R.L.P.	Date: JULY 2018

County Road Map Attachment M1.6
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

CROSS SECTIONS
 INDEPENDENCE ND LLC
 301 1ST AVENUE E BAKERSFIELD, NEWTOWN, ND 58763
 LOW CAP SWD #1
 588 FEET FROM WEST LINE AND 2145 FEET FROM NORTH LINE
 SECTION 17, T149N, R91W, 5th P.M., DUNN COUNTY, NORTH DAKOTA



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SCALE
 HORIZ 1"=200'
 VERT 1"=50'

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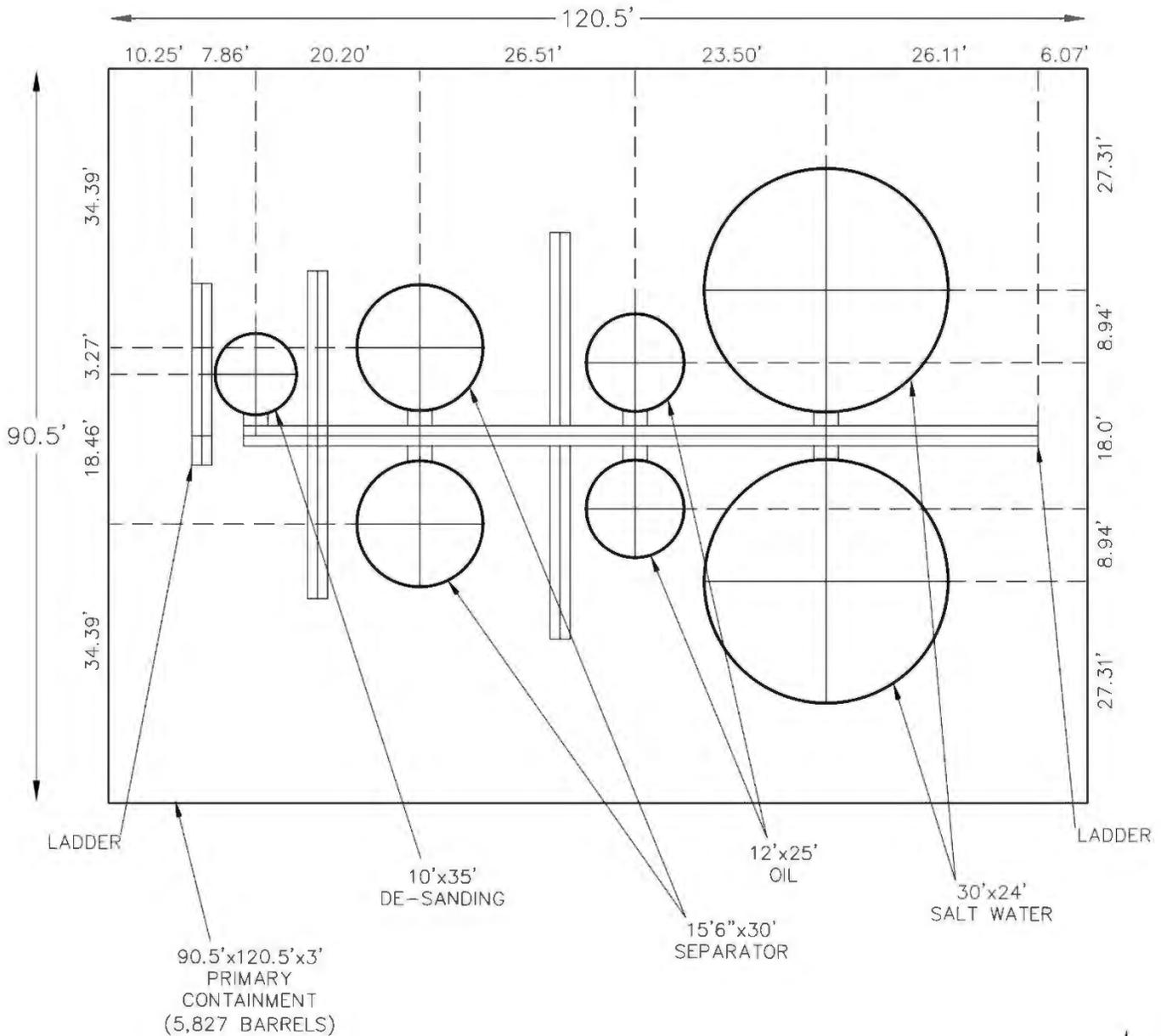
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INDEPENDENCE ND LLC
 CROSS SECTIONS
 SECTION 17, T149N, R91W
 DUNN COUNTY, NORTH DAKOTA

Drawn By: J.D.M.	Project No.: E18-17-03
Checked By: R.L.P.	Date: JULY 2018

Cross Sections Attachment M1.7
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

TANK DETAIL
 INDEPENDENCE ND LLC
 301 1ST AVENUE E BAKERSFIELD, NEWTOWN, ND 58763
 LOW CAP SWD #1
 588 FEET FROM WEST LINE AND 2145 FEET FROM NORTH LINE
 SECTION 17, T149N, R91W, 5th P.M., DUNN COUNTY, NORTH DAKOTA



NOTE: HDPE LINER TO ENCOMPASS BASE OF TANK CONTAINMENT



**Tank Size & Purpose
Attachment M2**
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

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INDEPENDENCE ND LLC
 TANK DETAIL
 SECTION 17, T149N, R91W
 DUNN COUNTY, NORTH DAKOTA

Drawn By: J.D.M.	Project No.: E18-17-031
Checked By: R.L.P.	Date: JULY 2018

GSE HD Smooth Geomembrane

GSE HD is a smooth high density polyethylene (HDPE) geomembrane manufactured with the highest quality resin specifically formulated for flexible geomembranes. This product is used in applications that require excellent chemical resistance and endurance properties.



AT THE CORE:
An HDPE geomembrane used in applications that require excellent chemical resistance and endurance properties.

Product Specifications

These product specifications meet GRI GM 13

Tested Property	Test Method	Frequency	Minimum Average Value				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	30 27	40 36	60 54	80 72	100 90
Density, g/cm ³	ASTM D 1505	200,000 lb	0.940	0.940	0.940	0.940	0.94
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lb	114 63 700 12	152 84 700 12	228 126 700 12	304 168 700 12	380 210 700 12
Tear Resistance, lb	ASTM D 1004	45,000 lb	21	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lb	54	72	108	144	180
Carbon Black Content, % (Range)	ASTM D 1603*/4218	20,000 lb	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	Note ⁽¹⁾	Note ⁽¹⁾	Note ⁽¹⁾	Note ⁽¹⁾	Note ⁽¹⁾
Notched Constant Tensile Load, hr	ASTM D 5397, Appendix	200,000 lb	500	500	500	500	500
Oxidative Induction Time, mins	ASTM D 3895, 200°C; O ₂ , 1 atm	200,000 lb	>100	>100	>100	>100	>100
TYPICAL ROLL DIMENSIONS							
Roll Length ⁽²⁾ , ft			1,120	870	560	430	340
Roll Width ⁽²⁾ , ft			22.5	22.5	22.5	22.5	22.5
Roll Area, ft ²			25,200	19,575	12,600	9,675	7,650

NOTES:

- ⁽¹⁾Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
- ⁽²⁾Roll lengths and widths have a tolerance of ±1%.
- GSE HD is available in rolls weighing approximately 3,900 lb.
- All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
- * Modified.

**** The LOW CAP SWD 1 primary tank containment will be lined with a 30mil geomembrane with similar specifications.

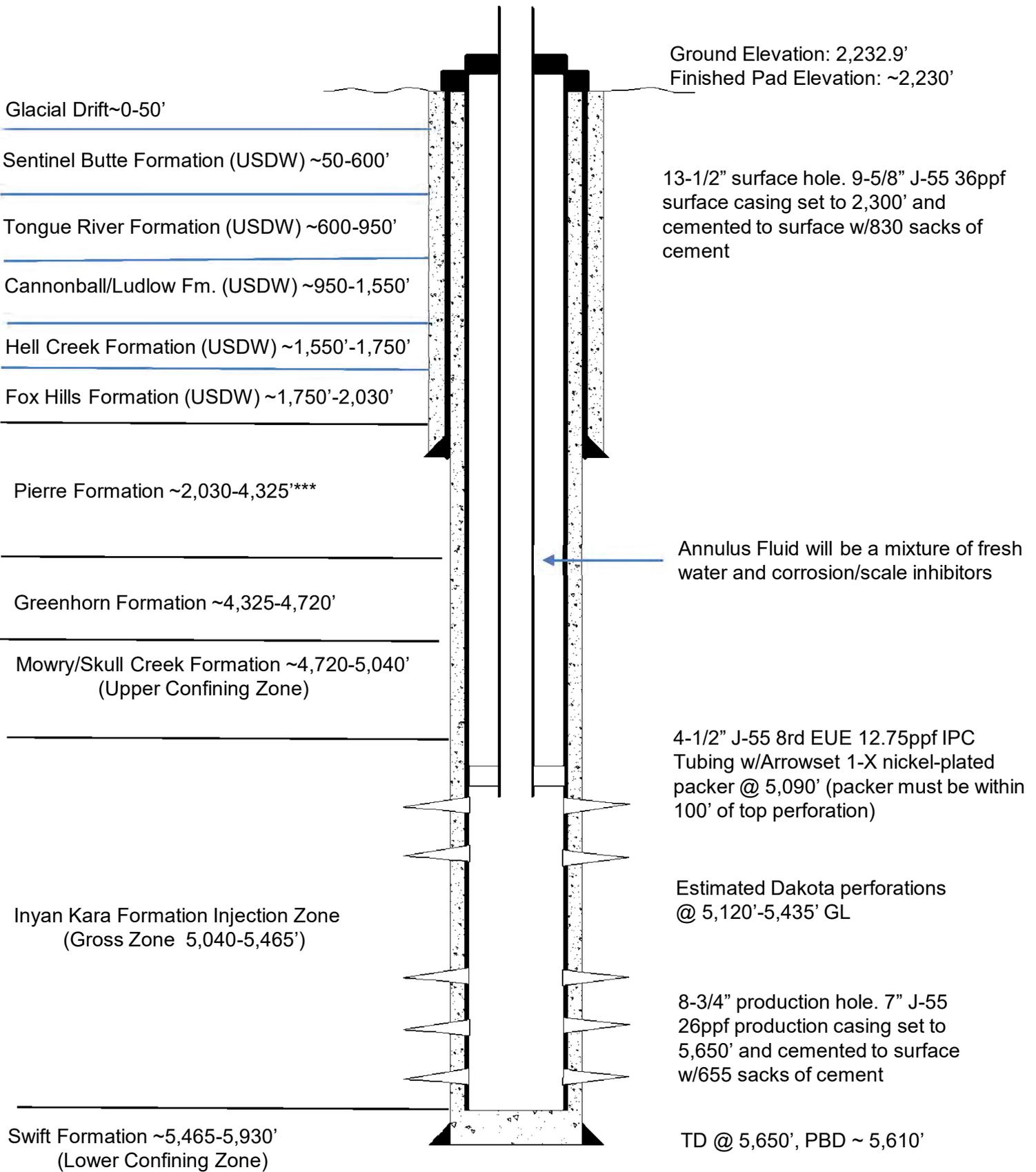
GSE is a leading manufacturer and marketer of geosynthetic lining products and services. We've built a reputation of reliability through our dedication to providing consistency of product, price and protection to our global customers.

Our commitment to innovation, our focus on quality and our industry expertise allow us the flexibility to collaborate with our clients to develop a custom, purpose-fit solution.

[DURABILITY RUNS DEEP] For more information on this product and others, please visit us at GSEworld.com, call 800.435.2008 or contact your local sales office.



**Liner Specification Sheet
Attachment M2.1**
LOW CAP SWD 1
Independence ND, LLC
SWNW Section 17-149-91
Heart Butte Field
Dunn County, ND



**** Not to Scale. All depth referenced from proposed 2,230' finished pad elevation. KB Elevation estimated to be 2,245' (add 15' to depths above).

Proposed Wellbore Attachment M3
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

LOW CAP SWD 1 - Cement Volume Calculator

Casing Description	Cement Description	Cement Interval	Cement Length	CUFT/FT	Volume CUFT	Excess Factor	Volume w/Excess CUFT	Yield CUFT/Sack	Cement Sacks
9-5/8" Casing in 13-1/2" Hole	Surface Lead Set C	0-2050'	2050	0.4887	1001.8	1.5	1502.8	2.45	615
9-5/8" Casing in 13-1/2" Hole	Surface Tail G (250')	2050-2300'	250	0.4887	122.2	2	244.4	1.15	215
								Total Cement Sacks for Surface>>	830
7" Casing in 9-5/8" 36# Casing	Production Lead Lite	0-2300'	2300	0.1668	383.6	1.35	517.9	2.17	240
7" Casing in 8-3/4" Hole	Production Lead Lite	2300-4500'	2200	0.1503	330.7	1.35	446.4	2.17	210
7" Casing in 8-3/4" Hole	Production Tail 1000' G (500' above IK)	4500-5650'	1150	0.1503	172.8	1.35	233.3	1.15	205
								Total Cement Sacks for Production>	655

**Cement Detail
Attachment M4**
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

N. CHANGES IN INJECTED FLUID (N/A to Class II wells)

O. PLANS FOR WELL FAILURES

Independence ND does not anticipate any well failures, but if a scheduled Mechanical Integrity Test (MIT) or our monitoring program reveals a loss of mechanical integrity, the well would immediately be shut in for repairs and the EPA and NDIC would be notified within 24 hours. Independence ND would work diligently with the EPA and NDIC to diagnose and repair the well. Following the repairs, Independence ND would perform a subsequent MIT in the presence of a regulatory authority and results would be submitted to the EPA and the NDIC prior to returning to injection operations.

P. MONITORING PROGRAM

Independence ND plans to install a SCADA system that would constantly monitor all aspects of the operation including injection rate, receipt rate, tank levels, pressures, spill detection, and other sensors that would prevent the receipt of additional fluids and shut the system in if any anomaly occurred. Additionally, Independence ND will physically monitor the system in accordance with the details of the final permit. This monitoring program will likely include the following:

OBSERVE WEEKLY AND RECORD AT LEAST ONCE EVERY THIRTY DAYS	
OBSERVE AND RECORD	Injection pressure (psig)
	Annulus pressure(s) (psig)
	Injection rate (bbl/day)
	Fluid volume injected since the well began injecting (bbls)

ANNUALLY	
ANALYZE	Injected fluid total dissolved solids (mg/l)
	Injected fluid specific gravity
	Injected fluid specific conductivity
	Injected fluid pH

ANNUALLY	
REPORT	Each month's maximum and averaged injection pressures (psig)
	Each month's maximum and minimum annulus pressures(s) (psig)
	Each month's injected volume (bbl)
	Fluid volume injected since the well began injecting (bbls)
	Written results of annual injected fluid analysis
	Sources of all fluids injected during the year



Q. PLUGGING AND ABANDONMENT PLAN (Also note Attachments Q1-Q3)

Well Information as Proposed

Ground Elevation: 2,232.9'

Estimated Finished Pad Elevation: ~ 2,230'

Estimated KB: ~2,245'

Estimated PBD: ~5,610'

Surface Casing: 9-5/8" J-55 36ppf set to 2,300' and cemented to surface w/830 sacks of cement

Production Casing: 7" J-55 26ppf set to 5,650' and cemented to surface w/655 sacks of cement

Tubing: 4-1/2" J-55 8rd EUE 12.75ppf Internally Plastic Coated set to 5,100'

Packer: Arrowset 1-X nickel-plated packer set at 5,090'

**** Note: A squeeze of the surface casing will NOT be required if surface/production casing annulus is isolated as proposed. All plugs will be placed in 7" J-55 26ppf production casing. All depths referenced from the estimated finished pad elevation of 2,230'. Add 15' to depths below for estimated KB measurement.

Plug and Abandonment Procedure

1. Review CBL to ensure production string is adequately isolated to surface.
2. Notify EPA Director of proposed plugging at least 45 days prior and submit changes to previously approved plugging and abandonment plan on new EPA Form 7520-14. Await approval.
3. Submit plugging and abandonment plan on sundry request to NDIC and await approval.
4. Notify NDIC field inspector, EPA, and BLM at least 48 hours prior to commencing with operations.
5. MIRU workover rig. Pressure test annulus to 500 psi for 15 minutes. LD surface equipment. ND injection wellhead, NU BOP.
6. Release 1-X packer and TOH w/injection string and packer, inspect, and lay down.
7. PU CICR, RIH and set at 5,020' (~100' above top perforation). Pressure test tubing. Roll hole with clean 10 PPG brine. Establish injection rate into Dakota perforations.
8. Spot cement at end of tubing, sting into retainer and squeeze 100 sacks of Class G cement below CICR and into perforations.
 - If no pump pressure is observed during cement placement, the perforations will be cleared and a second attempt with an additional 100 sacks of Class G cement will be made to isolate the Dakota injection zone.
 - If the second attempt is unsuccessful, a 30 sack/150' Class G cement plug will be set on top of the retainer.
9. If pump pressure is observed during squeeze, sting out and spot 10 sacks of Class G cement on top of retainer. Estimated TOC at 4,970'.
10. Trip out of hole to 2,350' (50' below surface casing shoe). Spot 50 sack, 250' Class G plug in 7", 26ppf production casing to 2,100'.
11. Pull up and circulate tubing clean. Wait on cement. Tag plug and record.
12. Trip out of hole to 100'. Pump 20 sacks Class G plug to surface.
13. Wait on cement. Cut well head 4' below plow level and weld on marker plate.
14. Complete Form 7 Plug & Abandonment report and submit to NDIC.
15. Complete and submit EPA Form 7520-13 to Director within 60 days of plugging.
16. Notify NDIC Field Inspector, EPA, and BLM prior to restoring location.



Glacial Drift ~0-50'

Sentinel Butte Formation (USDW) ~50-600'

Tongue River Formation (USDW) ~600-950'

Cannonball/Ludlow Fm. (USDW) ~950-1,550'

Hell Creek Formation (USDW) ~1,550'-1,750'

Fox Hills Formation (USDW) ~1,750'-2,030'

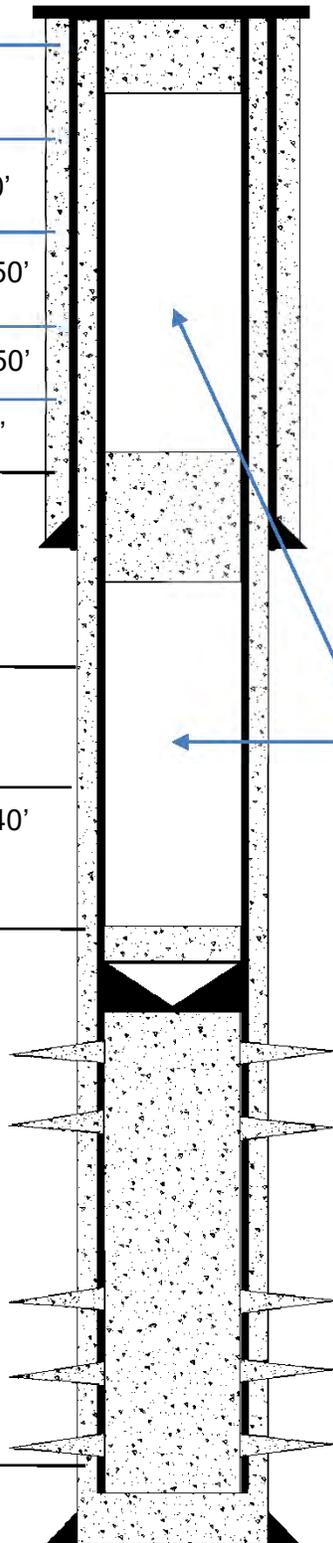
Pierre Formation ~2,030-4,325'***

Greenhorn Formation ~4,325-4,720'

Mowry/Skull Creek Formation ~4,720-5,040'
(Upper Confining Zone)

Inyan Kara Formation Injection Zone
(Gross Zone 5,040-5,465')

Swift Formation ~5,465-5,930'
(Lower Confining Zone)



Surface restored to approximate original 2,232.9' ground elevation

Casing(s) cut 4' below plow depth and steel plate with identification marker welded on top

20 sack 100' Class G cement plug in 7" production casing from surface to 100'

13-1/2" surface hole. 9-5/8" J-55, 36 PPF surface casing set to 2,300' and cemented to surface w/830 sacks of cement

50 sack 250' balanced Class G cement plug in 7" production casing from 2,100' to 2,350'

10 PPG clean brine plugging fluid

7" CICR @ 5,020' w/10 sacks of Class G cement on top

Inyan Kara perforations @ 5,120-5,435' squeezed with 100 sacks of Class G cement

7" J-55, 26 PPF production casing set to 5,650' and cemented to surface w/655 sacks of cement

TD @ 5,650', PBD ~ 5,610

**** Not to Scale. All depths referenced from proposed 2,230' finished pad elevation. KB Elevation estimated to be 2,245' (add 15' to depths above)

Proposed P&A'd Wellbore Attachment Q1
 LOW CAP SWD 1
 Independence ND, LLC
 SWNW Section 17-149-91
 Heart Butte Field
 Dunn County, ND

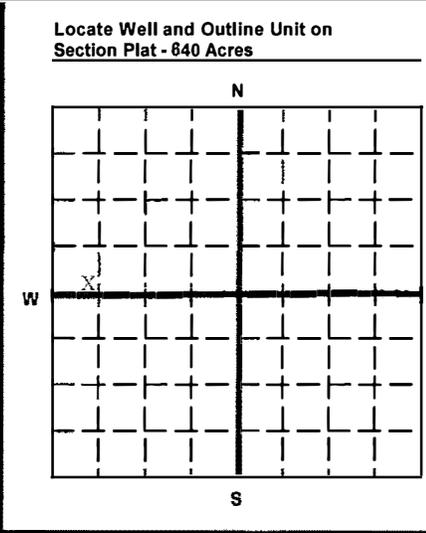


United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility
LOW CAP SWD 1
(Mailing address to be determined)

Name and Address of Owner/Operator
INDEPENDENCE ND, LLC
301 1ST AVE E BAKERESFIELD | NEWTOWN ND | 58763-4405



State ND County DUNN Permit Number _____

Surface Location Description
Sec 1/4 of SW 1/4 of SW 1/4 of NW 1/4 of Section 17 Township 149 Range 91

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 2143 ft. frm (N/S) N Line of quarter section and 588 ft. from (E/W) W Line of quarter section.

TYPE OF AUTHORIZATION
 Individual Permit
 Area Permit
 Rule
 Number of Wells 1

Lease Name _____

WELL ACTIVITY
 CLASS I
 CLASS II
 Brine Disposal
 Enhanced Recovery
 Hydrocarbon Storage
 CLASS III

Well Number _____

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
9-5/8"	36	2300	2300	13-1/2"
7"	26	5650	5650	8-3/4"

METHOD OF EMPLACEMENT OF CEMENT PLUGS

The Balance Method
 The Dump Baller Method
 The Two-Plug Method
 Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (Inche):	7"	7"	7"				
Depth to Bottom of Tubing or Drill Pipe (ft)	5020	2350	100				
Sacks of Cement To Be Used (each plug)	110	50	20				
Slurry Volume To Be Pumped (cu. ft.)	126.5	57.5	23				
Calculated Top of Plug (ft.)	4970	2100	0				
Measured Top of Plug (If tagged ft.)		TBD					
Slurry Wt. (Lb./Gal.)	15.8	15.8	15.8				
Type Cement or Other Material (Class III)	Class G	Glass G	Class G				

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
5120	5435		

Estimated Cost to Plug Wells

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print) JC JOHNSON Signature J.C. Johnson Date Signed 11-5-18

Attachment Q3 - Plugging Estimates

Independence ND, LLC

Plug & Abandonment - Estimate #1

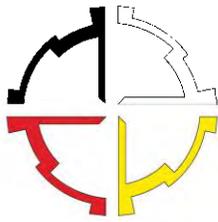
Category	Vendor	Amount	Description
Service Rig	Baker Consulting	\$ 19,000.00	Rig Estimate w/BOP & Tools
Cement	BJ Services	\$ 17,771.44	P&A Cement Bid
Tools	Baker Hughes	\$ 3,500.00	CICR for 7" 26 lb/ft Casing
Site Supervision	Elk River Consulting	\$ 5,950.00	Jobsite Coordinator
Total Bid		<u>\$ 46,221.44</u>	

Plug & Abandonment - Estimate #2

Category	Vendor	Amount	Description
Service Rig	Neptune Operating	\$ 27,900.00	Rig Estimate w/BOP & Tools
Cement	Schlumberger	\$ 21,281.48	P&A Cement Bid
Tools	Halliburton	\$ 6,438.85	CICR for 7" 26 lb/ft Casing
Site Supervision	Elk River Consulting	\$ 5,950.00	Jobsite Coordinator
Total Bid		<u>\$ 61,570.33</u>	

Plug & Abandonment - Estimate #3

Category	Vendor	Amount	Description
Turnkey P&A	Triple C	\$ 100,000.00	All-In Bid for Entire P&A
Site Supervision	Elk River Consulting	\$ 5,950.00	Jobsite Coordinator
Total Bid		\$ 105,950.00	



**BAKER
CONSULTING**

Baker Consulting, LLC
2820 102nd Ave NW
Mandaree, ND 58757
701.759.3292
www.jpbakerconsulting.com

Monday, November 05, 2018
Independence ND, LLC
ATTN: James Owen
jowen@independence-llc.com

Proposal for Prairie Chicken SWD 1 P & A project on Fort Berthold Indian Reservation (FBIR).

Dear Mr. Owen,

Thank you for the opportunity to provide P&A services to Independence. We are pleased to submit this bid for our services per your RFP to service Independence on FBIR.

Baker Consulting has been in business since 2010, and has steadily built a reputation of integrity, professionalism, and safety. We are an established oilfield service company, and have successfully completed projects in all aspects of our operations (upstream, midstream, and downstream) across western North Dakota and eastern Montana.

In response to this RFP, we have prepared a proposal outlining all of the services and supporting roles we are able to provide to you at this time to complete your project. Baker Consulting is a TERO approved Tier One Certified Indian Contractor approved to provide this, and many other services, on FBIR. We have maintained a satisfactory grade in ISNet, (account #400-196952 to support our operations. We have the resources and experience to handle many job designs and tasks. Our maintenance and safety programs are comprehensive and create highly efficient operations. We have completed all types of unique and challenging jobs in this basin with continued success. I have no doubt the Baker team will exceed your expectations.

Per your request, we have completed pricing for this with the following items included to complete the SOW in your RFP package. This is to include one of our service rigs, tool pusher, crew, pump, mobilization, demobilization, and capping of well. We will work with your concrete vendor to circulate and pump in the desired zones and cut and cap the well per the NDIC regulations. "Tier 1 fees" are not broken out in our bids or invoicing as separate lines items as we ensure pricing submitted is the total amount, no extra fees. We have direct involvement within this service offering and have all of the necessary equipment, labor force, certifications, and knowledge to complete this project successfully.

Thank you again for this opportunity to work with you on this project. Please contact me with any questions about the proposal package.

Total Price: \$19,000.00

M. Ryan Buday

M. Ryan Buday
307-413-6536
Chief Operating Officer
ryan@jpbakerconsulting.com

BJ Cementing Services | Quotation

Independence ND, LLC | **Prairie Chicken SWD 1** |

7.000 (in) | **Plug & Abandon**

| **Dickinson, ND** | **Nov 07,2018**

PREPARED FOR		PREPARED BY		SERVICE REPRESENTATIVES	
CLIENT CONTACT	James Owen	QUOTE WRITER	Devon Hanson	ACCOUNT REP	Thomas Irwin
TITLE		TITLE	Field Engineer I, Cement	TITLE	Driver Trainer
COMPANY	Independence ND, LLC	OFFICE PHONE		OFFICE PHONE	701-290-9129
OFFICE PHONE		EMAIL	Devon.Hanson@bjservices.com	MOBILE	
MOBILE	720-530-3198	MOBILE	701-590-5946	EMAIL	Thomas.Irwin@BJSERVICES.COM
EMAIL	jowen@independence-llc.com				



Job at a Glance

P&A

Job Code	Plug & Abandon
Depth (TVD) (ft)	6,050.000
Depth (MD) (ft)	6,050.000
Hole Size (in)	
Casing Size (in)/Weight (lb/ft)	
Pump Via	Tubing
Total Mix Water Required (gals)	896.000

CEMENTING FLUIDS

FLUID	VOL (bbls)	DEN (ppg)	YIELD (Cu Ft/sk)
SQUEEZE SLURRY : CICR @ 5,555	22.40	15.8000	1.1510
DISPLACEMENT : Displacement 1	31.80	8.3400	
PLUG SLURRY : Balance Plug 2,100'-2,350'	10.20	15.8000	1.1480
DISPLACEMENT : Displacement 2	12.00	8.3400	
PLUG SLURRY : Surface Plug	4.10	15.8000	1.1645

Well Data

INNER / OUTER GEOMETRY

TYPE	OD (in)	ID (in)	WEIGHT (lbs/ft)	MD (ft)	TVD (ft)	EXCESS (%)	GRADE
Previous Casing	7.000	6.276	26.000	6,050.000	6,050.000		J-55
Tubing	2.875	2.441	6.400	5,555.000	5,555.000		

PARAMETERS

Landing Collar Depth (ft)	6,050.00
Mud Density (ppg)	
Mud Type	
Estimated Static Temp (°F)	
Estimated Circulating Temp (°F)	

VOLUME CALCULATIONS

0 ft x 0.03250 cf/ft with 0 % excess = 0.000 cf

Fluid Specifications

	DEN (ppg)	YIELD (Cu Ft/sk)	PLN TOP OF FLUID (Ft)	LG (Ft)	VOL (Cu Ft)	VOL (sks)	VOL (bbls)
SQUEEZE SLURRY : CICR @ 5,555	15.8000	1.1510	5,505.00	0.00	126.00	110	22.40
CEMENT, CLASS G, 100.0000 PCT							
DISPERSANT, CD-32, 0.3000 BWOB							
FLUID LOSS, FL-52, 0.4000 BWOB							
DISPLACEMENT : Displacement 1	8.3400		0.00		0.00		31.80
PLUG SLURRY : Balance Plug 2,100'-2,350'	15.8000	1.1480	2,100.00	0.00	57.00	50	10.20
CEMENT, CLASS G, 100.0000 PCT							
DISPLACEMENT : Displacement 2	8.3400		0.00		0.00		12.00
PLUG SLURRY : Surface Plug	15.8000	1.1645	0.00	0.00	23.00	20	4.10
CEMENT, CLASS G, 100.0000 PCT							
ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS, 2.0000 BWOB							

Cement Properties

	MIX WATER (gals/sk)	MIX FLUID (gals/sk)
SQUEEZE SLURRY : CICR @ 5,555	4.96	4.96
PLUG SLURRY : Balance Plug 2,100'-2,350'	5.00	5.00
PLUG SLURRY : Surface Plug	5.00	5.00

Notes

Customer will be charged for any additional hours, 6 hours after requested time of service.



Price Estimates

PRODUCT CHARGES

PRODUCT	QUANTITY	UOM	UNIT PRICE	GROSS AMOUNT	DISC. %	NET UNIT PRICE	NET AMOUNT
CEMENT, CLASS G	180.0000	SK	\$47.08	\$8,474.40	40.000	\$28.25	\$5,084.64
DISPERSANT, CD-32	32.0000	LB	\$8.32	\$266.24	40.000	\$4.99	\$159.74
FLUID LOSS, FL-52	42.0000	LB	\$23.28	\$977.76	40.000	\$13.97	\$586.66
ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	38.0000	LB	\$2.40	\$91.20	40.000	\$1.44	\$54.72
FOAM PREVENTER, FP-6L	10.0000	GAL	\$131.36	\$1,313.60	40.000	\$78.82	\$788.16
RETARDER, R-8L	10.0000	GAL	\$44.72	\$447.20	40.000	\$26.83	\$268.32
PRODUCT SUBTOTAL:				\$11,570.40			\$6,942.24

SERVICE CHARGES

SERVICE	QUANTITY	UOM	UNIT PRICE	GROSS AMOUNT	DISC. %	NET UNIT PRICE	NET AMOUNT
Bulk delivery Charges	536.5080	TMI	\$5.20	\$2,789.84	50.000	\$2.60	\$1,394.92
Bulk materials Blending Charge	182.8982	CU FT	\$5.23	\$956.56	50.000	\$2.62	\$478.28
Cement Crew Mobilization-Demobilization Fee	1.0000	EA	\$10,880.00	\$10,880.00	50.000	\$5,440.00	\$5,440.00
Cement pump charge, 5,001-6,000 feet/1,501 -1,800 m	1.0000	6/HR	\$7,032.00	\$7,032.00	50.000	\$3,516.00	\$3,516.00
Cement pump charge, Additional Hours	0.0000	HR	\$2,720.00	\$0.00	50.000	\$0.00	\$0.00
SERVICE SUBTOTAL:				\$21,658.40			\$10,829.20
TOTALS:				\$33,228.80	46.52		\$17,771.44

Client will be charged for all 'SPECIAL PROPPANTS' delivered to location, whether they are pumped or not. All proppants other than standard grade frac. Sand are considered 'SPECIAL PROPPANTS'. The technical data contained in this proposal is based on the best information available at the time of writing and is subject to further analysis and testing. The pricing data contained in this proposal are estimates only and may vary depending on the work actually performed. Pricing does not include federal, state and local taxes or royalties. This quotation is based on BJ Services being awarded the work on a first call basis and within thirty (30) days of the proposal date. These prices will be subject to review if the work is done after thirty (30) days from the proposal date, or on a second or third call basis.

BJ Services Terms and Conditions

ALL WORK ORDERS FOR SERVICES ("SERVICES" OR "WORK") AND PURCHASE ORDERS FOR THE SUPPLY OF PRODUCTS OR CHEMICALS ("PRODUCTS") (COLLECTIVELY, "WORK ORDERS") TO BE PROVIDED IN THE UNITED STATES AND/OR CANADA BY BJ SERVICES, LLC OR ITS SUBSIDIARIES OR AFFILIATES (COLLECTIVELY "BJ") TO ITS CUSTOMERS (EACH A "CUSTOMER") ARE SUBJECT TO ACCEPTANCE BY BJ, AND ANY WORK ORDERS SO ACCEPTED WILL BE GOVERNED BY THE PROFORM PROPOSAL, THE WORK ORDER, AND THESE TERMS AND CONDITIONS, UNLESS THE CUSTOMER AND BJ (COLLECTIVELY THE "PARTIES") HAVE EXECUTED A MASTER SERVICE AGREEMENT, WHICH TERMS SHALL CONTROL.

1. PAYMENT TERMS

UNLESS ALTERNATE PAYMENT TERMS ARE SPECIFIED OR APPROVED BY THE BJ CREDIT DEPARTMENT, ALL CHARGES BILLED BY BJ MUST BE PAID WITHIN THIRTY (30) DAYS OF THE DATE OF INVOICE. FOR INVOICES UNPAID AFTER THIRTY (30) DAYS, DISCOUNTS FROM LIST PRICE MAY BE REVOKED. INTEREST MAY BE CHARGED AT THE RATE OF TEN PERCENT (10%) PER ANNUM OR THE MAXIMUM LEGAL RATE. LIENS AND SECURITY INTERESTS MAY BE FILED AND REGISTERED, AND CUSTOMER SHALL PAY BJ ALL COSTS OF COLLECTION, INCLUDING REASONABLE ATTORNEYS' FEES AND COURT COSTS, IN ADDITION TO OTHER AMOUNTS DUE. OPERATING, PRODUCTION OR WELL CONDITIONS THAT PREVENT SATISFACTORY OPERATION OF SERVICES OR PRODUCTS DO NOT RELIEVE CUSTOMER OF ITS PAYMENT RESPONSIBILITY. BJ RESERVES THE RIGHT TO REQUIRE PAYMENT COD BASED ON CREDIT REVIEW AT TIME OF WORK.

2. CANCELLATION AND RETURNS

A. PRODUCTS: PRODUCT ORDERS MAY ONLY BE CANCELED WITH WRITTEN AUTHORIZATION FROM BJ. CUSTOMER MAY BE CHARGED A RESTOCKING CHARGE OF TWENTY-FIVE PERCENT (25%), PLUS ANY PACKING AND TRANSPORTATION COSTS INCURRED. PRODUCTS SPECIALLY MANUFACTURED TO CUSTOMER SPECIFICATIONS, OR ORDERS FOR SUBSTANTIAL QUANTITIES MAY NOT BE CANCELED. DELIVERED PRODUCTS MAY ONLY BE RETURNED FOR CREDIT (LESS THE RESTOCKING FEE AND TRANSPORT COSTS) IN UNUSED, REUSABLE CONDITION, IN ORIGINAL UNOPENED CONTAINERS.

B. SERVICES: IN THE EVENT CUSTOMER CANCELS AN ORDER FOR SERVICES WITHOUT CAUSE, CUSTOMER SHALL BE LIABLE FOR ALL REASONABLE COSTS INCURRED BY BJ INCLUDING MOBILIZATION/DEMobilIZATION.

3. THIRD-PARTY CHARGES, TAXES

CUSTOMER SHALL PAY ALL THIRD-PARTY CHARGES, IN COMPLIANCE WITH BJ'S CURRENT PRICE LIST, AND ANY SALES, USE, RENTAL OR OTHER TAXES THAT MAY BE APPLICABLE. CUSTOMER SHALL PAY ALL APPLICABLE CUSTOMS, DUTY, IMPORT AND OTHER DUTIES UNLESS OTHERWISE AGREED IN WRITING BY BJ. CUSTOMER SHALL PROVIDE NECESSARY IMPORT LICENSES AND EXTENSIONS.

4. INDEPENDENT CONTRACTOR

IT IS EXPRESSLY UNDERSTOOD THAT BJ IS AN INDEPENDENT CONTRACTOR, AND THAT NEITHER BJ NOR ITS PRINCIPALS, PARTNERS, SHAREHOLDERS, MEMBERS, DIRECTORS, OFFICERS, EMPLOYEES OR SUBCONTRACTORS ARE SERVANTS, AGENTS OR EMPLOYEES OF CUSTOMER. WHERE BJ PROVIDES SERVICES IN LOUISIANA, THE SERVICES PROVIDED BY BJ AND ITS SUBCONTRACTORS ARE AN INTEGRAL PART OF, AND ARE ESSENTIAL TO THE ABILITY OF CUSTOMER TO GENERATE CUSTOMER'S GOODS, PRODUCTS, AND SERVICES, AND THEREFORE BJ AND CUSTOMER AGREE THAT CUSTOMER IS THE STATUTORY EMPLOYER OF BJ'S EMPLOYEES AND ITS SUBCONTRACTORS' EMPLOYEES UNDER LA. R.S. 23:1061 (A) (B).

5. LIABILITIES, RELEASES AND INDEMNIFICATION:

A. IN THESE TERMS AND CONDITIONS (I) "BJ GROUP" MEANS BJ, ITS SUBSIDIARY AND AFFILIATED COMPANIES; ITS SUBCONTRACTORS AT ANY TIER; AND THE OFFICERS, DIRECTORS, EMPLOYEES, CONSULTANTS, AND AGENTS OF ALL OF THE FOREGOING; (II) "CLAIMS" MEANS ALL CLAIMS, DEMANDS, CAUSES OF ACTION, LIABILITIES, DAMAGES, JUDGMENTS, FINES, PENALTIES, AWARDS, LOSSES, COSTS, EXPENSES (INCLUDING, WITHOUT LIMITATION, ATTORNEYS' FEES AND COSTS OF LITIGATION) OF ANY KIND OR CHARACTER ARISING OUT OF, OR RELATED TO, THE PERFORMANCE OF THE SERVICES OR PRODUCTS PROVIDED; (III) "CONSEQUENTIAL DAMAGES" MEANS ANY INDIRECT, SPECIAL, PUNITIVE, EXEMPLARY OR CONSEQUENTIAL DAMAGES OR LOSSES UNDER APPLICABLE LAW; (IV) "CUSTOMER GROUP" MEANS CUSTOMER, ITS PARENT, SUBSIDIARY AND AFFILIATED OR RELATED COMPANIES; ITS LESSEES, CO-OWNERS, PARTNERS, JOINT OPERATORS AND JOINT VENTURES; ITS CLIENT OR CUSTOMER IF IT IS NOT THE END USER OF THE SERVICES OR PRODUCTS; ITS OTHER CONTRACTORS AT ANY TIER; AND THE OFFICERS, DIRECTORS, EMPLOYEES, CONSULTANTS, AND

AGENTS OF ALL OF THE FOREGOING; (V) "POLLUTION CLAIMS" MEANS ALL CLAIMS RELATING TO POLLUTION OR CONTAMINATION OF WATER, LAND, OR AIR, INCLUDING WITHOUT LIMITATION, ADVERSE EFFECTS ON THE ENVIRONMENT OR ANY FORM OF PROPERTY, OR ANY VIOLATION OR ALLEGED VIOLATION OF ENVIRONMENTAL STATUTES, ORDINANCES, LAWS, ORDERS, RULES AND REGULATIONS; (VI) "TOOLS" MEANS ANY OF BJ GROUP'S INSTRUMENTS, EQUIPMENT, OR TOOLS, AND (VII) "WASTE" MEANS ANY CUTTINGS, MUDS, WASTE, WATER, OR MATERIALS FROM THE WELL THAT WHERE SERVICES ARE PERFORMED BY BJ.

B. BJ SHALL RELEASE, INDEMNIFY, DEFEND AND HOLD CUSTOMER GROUP HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS ARISING OUT OF OR RELATED TO (I) PERSONAL OR BODILY INJURY, ILLNESS, SICKNESS, DISEASE OR DEATH OF ANY MEMBER OF BJ GROUP, AND (II) LOSS, DAMAGE OR DESTRUCTION OF REAL OR PERSONAL PROPERTY, WHETHER OWNED, LEASED, OR CHARTERED, OF ANY MEMBER OF BJ GROUP.

C. CUSTOMER SHALL RELEASE, INDEMNIFY, DEFEND AND HOLD BJ GROUP HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS ARISING OUT OF OR RELATED TO (I) PERSONAL OR BODILY INJURY, ILLNESS, SICKNESS, DISEASE OR DEATH OF ANY MEMBER OF CUSTOMER GROUP, AND (II) LOSS, DAMAGE OR DESTRUCTION OF REAL OR PERSONAL PROPERTY WHETHER OWNED, LEASED, OR CHARTERED, OF ANY MEMBER OF CUSTOMER GROUP.

D. SUBJECT TO THE PERSONAL INJURY PROVISIONS OF ARTICLE 5(B) ABOVE, BJ SHALL PROTECT, DEFEND AND INDEMNIFY CUSTOMER GROUP FROM AND AGAINST ALL CLAIMS, DEMANDS AND CAUSES OF ACTION, INCLUDING POLLUTION CLAIMS, ARISING FROM POLLUTION OR CONTAMINATION WHICH ORIGINATES ABOVE THE SURFACE OF THE LAND OR WATER AND IS DIRECTLY ASSOCIATED WITH BJ GROUP'S EQUIPMENT OR OTHER EQUIPMENT IN ITS CONTROL, AND SHALL ASSUME ALL RESPONSIBILITY FOR CONTROL AND REMOVAL OF SAME.

E. SUBJECT TO THE PERSONAL INJURY PROVISIONS OF 5(C) ABOVE, CUSTOMER SHALL PROTECT, DEFEND AND INDEMNIFY BJ GROUP FROM AND AGAINST ALL CLAIMS, DEMANDS, AND CAUSES OF ACTION ARISING DIRECTLY OR INDIRECTLY FROM ANY EXISTING POLLUTION AT THE SITE AND FROM ALL OTHER POLLUTION OR CONTAMINATION, INCLUDING BUT NOT LIMITED TO POLLUTION RESULTING FROM FIRE, BLOWOUT, CRATERING, SEEPAGE OR OTHER UNCONTROLLED FLOW OF OIL, GAS, OR OTHER SUBSTANCE; OR RELATED TO THE TRANSPORTATION, STORAGE, TREATMENT, DISPOSAL OR HANDLING OF WASTE, AND SHALL ASSUME ALL RESPONSIBILITY FOR CONTROL AND REMOVAL OF SAME.

F. NOTWITHSTANDING ANYTHING TO THE CONTRARY HEREIN, CUSTOMER SHALL RELEASE, PROTECT, DEFEND, AND INDEMNIFY BJ GROUP FROM AND AGAINST ALL CLAIMS, DEMANDS, AND CAUSES OF ACTION OF EVERY KIND AND CHARACTER, IN THE EVENT OF CATASTROPHIC LOSSES INCLUDING BUT NOT LIMITED TO: (I) LOSS OR DAMAGE TO A HOLE(S) OR WELL(S), INCLUDING ITS CASING, (II) LOSS OR DAMAGE TO ANY GEOLOGICAL FORMATION, STRATA OR OIL OR GAS RESERVOIR OR MINERAL OR WATER RESERVE, (III) IMPAIRMENT OF PROPERTY RIGHTS OR OTHER INTERESTS IN OR TO LAND, OIL, GAS, MINERAL, OR WATER RESOURCES, OR THE QUIET ENJOYMENT THEREOF, (IV) SUBSURFACE TRESPASS, (V) DAMAGE FROM ANY RADIOACTIVE SOURCES AND (VI) REGAINING CONTROL OF ANY WILD WELL OR OUT OF CONTROL WELL, UNDERGROUND OR ABOVE THE SURFACE, INCLUDING REMOVAL OF WRECK AND DEBRIS, MEDIATING ENVIRONMENTAL DAMAGE AND ALL COSTS RELATED THERETO.

G. CUSTOMER SHALL RELEASE, DEFEND, INDEMNIFY AND HOLD BJ GROUP HARMLESS FROM AND AGAINST ANY CLAIMS FOR CONSEQUENTIAL DAMAGES ASSERTED BY OR IN FAVOR OF ANY MEMBER OF CUSTOMER GROUP. BJ SHALL RELEASE, DEFEND, INDEMNIFY AND HOLD CUSTOMER GROUP HARMLESS FROM AND AGAINST ANY CLAIMS FOR CONSEQUENTIAL DAMAGES ASSERTED BY OR IN FAVOR OF ANY MEMBER OF BJ GROUP.

H. THE EXCLUSIONS OF LIABILITY, RELEASES AND INDEMNITIES SET FORTH IN THIS ARTICLE APPLY TO ANY CLAIM(S) WITHOUT REGARD TO THE CAUSE(S) THEREOF, INCLUDING BUT NOT LIMITED TO PRE-EXISTING CONDITIONS, WHETHER SUCH CONDITIONS BE PATENT OR LATENT, THE UNSEAWORTHINESS OF ANY VESSEL OR VESSELS, IMPERFECTION OF MATERIAL, DEFECTOR FAILURE OF PRODUCTS OR EQUIPMENT, BREACH OF REPRESENTATION OR WARRANTY (EXPRESS OR IMPLIED), ULTRA-HAZARDOUS ACTIVITY, STRICT LIABILITY, TORT, BREACH OF CONTRACT, BREACH OF DUTY (STATUTORY OR OTHERWISE), BREACH OF ANY SAFETY REQUIREMENT OR REGULATION, OR THE NEGLIGENCE, GROSS NEGLIGENCE, OR OTHER LEGAL FAULT OR RESPONSIBILITY OF ANY PERSON, PARTY, OR ENTITY (INCLUDING THE INDEMNIFIED OR RELEASEE).

BJ Services Terms and Conditions

PERSON, PARTY, OR ENTITY (INCLUDING THE INDEMNIFIED OR RELEASED PARTY), WHETHER SUCH FORM OF NEGLIGENCE BE SOLE, JOINT OR CONCURRENT, ACTIVE OR PASSIVE.

6. INSURANCE

EACH PARTY AGREES TO SUPPORT THE INDEMNITY OBLIGATIONS CONTAINED IN ARTICLE 5 BY CARRYING INSURANCE (OR QUALIFIED SELF-INSURANCE) WITH REPUTABLE INSURANCE COMPANIES IN THE FOLLOWING MINIMUM AMOUNTS:

A. WORKERS' COMPENSATION INSURANCE COMPLYING WITH APPLICABLE STATE, PROVINCIAL AND FEDERAL LAWS, AND EMPLOYERS' LIABILITY INSURANCE IN THE AMOUNT OF \$1,000,000 EACH ACCIDENT FOR BODILY INJURY BY ACCIDENT/\$1,000,000 EACH EMPLOYEE FOR BODILY INJURY BY DISEASE/ \$1,000,000 POLICY LIMIT.

B. COMMERCIAL GENERAL LIABILITY INSURANCE INCLUDING PRODUCTS AND COMPLETED OPERATIONS AGGREGATE, SUDDEN AND ACCIDENTAL POLLUTION (WHICH MAY BE PROVIDED FOR IN A SEPARATE POLICY), IN THE AMOUNT OF \$1,000,000 COMBINED SINGLE LIMIT PER OCCURRENCE/\$200,000 IN THE AGGREGATE.

C. AUTOMOBILE LIABILITY INSURANCE IN THE AMOUNT OF \$1,000,000 COMBINED SINGLE LIMIT FOR BODILY INJURY AND PROPERTY DAMAGE, INCLUDING COVERAGE FOR ALL OWNED, HIRED, AND NON-OWNED VEHICLES.

D. EXCESS LIABILITY INSURANCE OVER THAT REQUIRED IN A (FOR EMPLOYER'S LIABILITY ONLY), B AND C IN THE MINIMUM AMOUNT OF \$5,000,000 EACH OCCURRENCE AND IN THE AGGREGATE, SPECIFICALLY INCLUDING CONTRACTUAL LIABILITY COVERAGE. UPON WRITTEN REQUEST, EACH PARTY SHALL FURNISH TO THE OTHER PARTY CERTIFICATES OF INSURANCE EVIDENCING THAT ADEQUATE INSURANCE TO SUPPORT EACH PARTY'S OBLIGATIONS HAS BEEN SECURED. TO THE EXTENT OF EACH PARTY'S RELEASE AND INDEMNITY OBLIGATIONS, EACH PARTY AGREES THAT ALL SUCH INSURANCE POLICIES SHALL (I) BE PRIMARY TO THE OTHER PARTY'S INSURANCE, (II) INCLUDE THE OTHER PARTY, ITS PARENT, SUBSIDIARY AND AFFILIATED OR RELATED COMPANIES, ITS SUBCONTRACTORS AND OTHER CONTRACTORS, AND ITS AND THEIR RESPECTIVE OFFICERS, DIRECTORS, EMPLOYEES, CONSULTANTS AND AGENTS AS ADDITIONAL INSURED, AND (III) BE ENDORSED TO WAIVE SUBROGATION AGAINST THE OTHER PARTY, ITS PARENT, SUBSIDIARY AND AFFILIATED OR RELATED COMPANIES, ITS SUBCONTRACTORS AND OTHER CONTRACTORS, AND ITS AND THEIR RESPECTIVE OFFICERS, DIRECTORS, EMPLOYEES, CONSULTANTS AND AGENTS.

7. CONFIDENTIALITY

EACH PARTY SHALL MAINTAIN ALL DATA AND INFORMATION OBTAINED FROM THE OTHER PARTY IN STRICT CONFIDENCE, SUBJECT ONLY TO DISCLOSURE REQUIRED BY LAW OR LEGAL PROCESS. THE DESIGN, CONSTRUCTION, APPLICATION AND OPERATION OF BJS SERVICES AND PRODUCTS EMBODY PROPRIETARY AND CONFIDENTIAL INFORMATION. CUSTOMER SHALL MAINTAIN THIS INFORMATION IN STRICT CONFIDENCE AND SHALL NOT DISCLOSE IT TO OTHERS, SUBJECT ONLY TO DISCLOSURE REQUIRED BY LAW OR LEGAL PROCESS.

8. ACCESS TO WELL AND WELL SITE STORAGE

CUSTOMER SHALL PROVIDE AT ITS EXPENSE ADEQUATE ACCESS TO AND FROM THE WELL SITE, AND SHALL OBTAIN ALL PERMITS, LICENSES OR OTHER AUTHORIZATION REQUIRED FOR BI TO ENTER UPON WORK AREAS FOR THE PURPOSES CONTEMPLATED. CUSTOMER SHALL PROVIDE PROPER STORAGE SPACE AT THE WELL SITE, MEETING ALL APPLICABLE SAFETY AND SECURITY REQUIREMENTS AND CONSISTENT WITH GOOD INDUSTRY PRACTICES, FOR THE TOOLS AND PRODUCTS, INCLUDING, WITHOUT LIMITATION, ALL RADIOACTIVE MATERIALS. BI RESERVES THE RIGHT NOT TO PERFORM WORK IF THE JOB OR CONDITIONS OF THE LOCATION RENDER SUCH PERFORMANCE INADVISABLE.

9. STANDARD OF PERFORMANCE

A. SERVICES: BI WARRANTS (I) THAT ALL SERVICES SHALL BE PERFORMED IN COMPLIANCE WITH ALL LAWS, RULES AND REGULATIONS (INCLUDING ALL SAFETY CODES, STATUTES, REGULATIONS, PRECAUTIONS, AND PROCEDURES) AND UTILIZING ALL NECESSARY

ACCORDANCE WITH THE TERMS HEREOF, THE SPECIFICATIONS SET FORTH IN THE APPLICABLE ORDER, AND GOOD INDUSTRY STANDARDS OF PERFORMANCE AND IN A TIMELY MANNER; AND (III) THAT BI, ITS SUBCONTRACTORS AND THEIR EMPLOYEES ARE SUFFICIENTLY EXPERIENCED AND SUITABLY TRAINED TO PERFORM THE SERVICES. IN THE EVENT THAT THE SERVICES FAIL TO CONFORM TO SUCH SPECIFICATIONS, BI SHALL REPERFORM THAT PART OF THE NON-CONFORMING SERVICES, PROVIDED BI IS NOTIFIED IN WRITING BY CUSTOMER PRIOR TO DEMOBILIZATION.

B. PRODUCTS: BI WARRANTS THAT THE PRODUCTS SHALL CONFORM TO BJS PUBLISHED SPECIFICATIONS OR THE SPECIFICATIONS AGREED TO IN WRITING. IF ANY OF THE PRODUCTS FAIL TO CONFORM, BI SHALL REPAIR OR REPLACE THE NON-CONFORMING PRODUCTS, OR ISSUE CREDIT TO THE CUSTOMER. IN THE EVENT BI IS REQUESTED TO DEVELOP, MANUFACTURE, TEST OR USE PRODUCTS THAT ARE INTENDED TO SATISFY A UNIQUE NEED IDENTIFIED BY CUSTOMER AND ARE NOT "STANDARD" PRODUCTS OF BI ("SPECIALTY PRODUCTS"), CUSTOMER RECOGNIZES AND AGREES THAT SPECIALTY PRODUCTS MAY NOT HAVE OR CONTAIN THE SAME OR SIMILAR CHARACTERISTICS AS BJS STANDARD PRODUCTS, INCLUDING HISTORICAL PERFORMANCE AGAINST WHICH FUTURE PERFORMANCE CAN BE MEASURED. IN DEVELOPING, MANUFACTURING, TESTING AND USING ANY SPECIALTY PRODUCT, BI WILL BE RELYING UPON INFORMATION AND SPECIFICATIONS PROVIDED BY CUSTOMER REGARDING ITS UNIQUE NEEDS, AND WILL HAVE NO RESPONSIBILITY FOR THE DESIGN, MANUFACTURE OR ENGINEERING OF ANY SUCH SPECIALTY PRODUCT. UPON INSPECTION, IF THE SPECIALTY PRODUCT FAILS TO MEET THE SPECIFICATIONS AGREED TO IN WRITING BY CUSTOMER, THEN BI SHALL, AT ITS OPTION, REPAIR OR REPLACE THE NON-CONFORMING SPECIALTY PRODUCTS WITH THE TYPE ORIGINALLY FURNISHED TO CUSTOMER OR SUBSTITUTE WITH STANDARD PRODUCTS. BI'S WARRANTY OBLIGATIONS ARE NON-TRANSFERABLE AND VOID IF THE NON-CONFORMITY WERE CAUSED BY (I) CUSTOMER'S FAILURE TO PROPERLY STORE OR MAINTAIN THE PRODUCTS, (II) ABNORMAL WELL CONDITIONS, ABRASIVE MATERIALS, CORROSION DUE TO AGGRESSIVE FLUIDS OR INCORRECT SPECIFICATIONS PROVIDED BY CUSTOMER, (III) UNAUTHORIZED ALTERATION OF THE PRODUCTS, (IV) LOSS OR DAMAGE WHILE ON CUSTOMER'S SITE DUE TO ANY NEGLIGENCE, VANDALISM OR FORCE MAJEURE, OR (V) USE OR HANDLING BY CUSTOMER IN A MANNER INCONSISTENT WITH BI'S RECOMMENDATIONS. FURTHER, BI'S WARRANTY OBLIGATIONS SHALL TERMINATE IF CUSTOMER FAILS TO PERFORM ITS OBLIGATIONS UNDER THESE TERMS AND CONDITIONS. ALL TRANSPORTATION CHARGES AND REMOVAL AND REINSTALLATION CHARGES RELATED TO THE REPAIR OR REPLACEMENT OF NON-CONFORMING PRODUCTS SHALL BE BORNE BY CUSTOMER, INCLUDING SHIPMENT TO BI'S FACILITY.

C. GOODS: BI SHALL ASSIGN ANY VENDOR OR SUPPLIER'S WARRANTY TO CUSTOMER FOR ANY PRODUCTS OR GOODS PURCHASED, TO THE EXTENT SUCH WARRANTIES ARE ASSIGNABLE.

D. RECOMMENDATIONS: INTERPRETATIONS, RESEARCH, ANALYSIS, RECOMMENDATIONS, ADVICE OR INTERPRETATIONAL DATA (SPECIFICALLY INCLUDING, WITHOUT LIMITATION, ANY ENGINEERING DESIGNS, GEOLOGICAL STUDIES OR ANALYSIS, WELL PROGRAMS, RESERVOIR MODELS, PRODUCTION OPTIMIZATION OR MANAGEMENT PROGRAMS) ("RECOMMENDATIONS") FURNISHED BY BI ARE OPINIONS BASED UPON MODELS, PRODUCTION OPTIMIZATION OR MANAGEMENT PROGRAMS ("RECOMMENDATIONS") FURNISHED BY BI ARE OPINIONS BASED UPON INFERENCES FROM MEASUREMENTS, EMPIRICAL RELATIONSHIPS AND ASSUMPTIONS, AND INDUSTRY PRACTICE. THE INFERENCES, ASSUMPTIONS AND PRACTICES ARE NOT INFALLIBLE, AND WITH RESPECT TO WHICH PROFESSIONAL GEOLOGISTS, ENGINEERS, DRILLING CONSULTANTS, AND ANALYSTS MAY DIFFER. ACCORDINGLY, BI DOES NOT WARRANT THE ACCURACY, CORRECTNESS, OR COMPLETENESS OF ANY INTERPRETATIONS OR RECOMMENDATIONS, OR THAT RELIANCE ON ITS INTERPRETATIONS AND/OR RECOMMENDATIONS WILL ACCOMPLISH ANY PARTICULAR RESULTS. CUSTOMER ASSUMES FULL RESPONSIBILITY FOR THE USE OF SUCH RECOMMENDATIONS AND FOR ITS DECISIONS. OTHER THAN THE PROVISIONS IN THIS ARTICLE 9, BI MAKES NO WARRANTY OR GUARANTEE OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE REGARDING ANY SERVICES, EQUIPMENT OR PRODUCTS. IN NO EVENT SHALL BI BE LIABLE FOR CONSEQUENTIAL DAMAGES INCURRED BY CUSTOMER GROUP AS A RESULT OF DEFECTIVE OR NON-CONFORMING SERVICES, EQUIPMENT OR PRODUCTS.

BJ Services Terms and Conditions

10. INTELLECTUAL PROPERTY

A. BJ INTENDS TO PROTECT ITS INTELLECTUAL PROPERTY. CUSTOMER SHALL NOT RESELL THE PRODUCTS (OR DRAWINGS RELATED THERETO) TO OTHERS OR REVERSE ENGINEER OR PERMIT OTHERS TO REVERSE ENGINEER FOR THE PURPOSE OF MANUFACTURING SIMILAR PRODUCTS. BJ OWNS AND HAS LEGAL RIGHTS TO PRACTICE CERTAIN COPYRIGHTS, TRADEMARKS, INDUSTRIAL DESIGNS, PATENTS OR PENDING APPLICATIONS ON CERTAIN TECHNOLOGY AND ITEMS RELATED TO THE SERVICES OR PRODUCTS FURNISHED. IN THE EVENT THAT BJ MAKES ANY IMPROVEMENTS ON SUCH TECHNOLOGY, THEN BJ SHALL OWN ALL SUCH IMPROVEMENTS, INCLUDING DRAWINGS, SPECIFICATIONS, CALCULATIONS AND OTHER DOCUMENTS.

B. BJ WARRANTS THAT THE USE OR SALE OF PRODUCTS WILL NOT INFRINGE VALID PATENTS OF OTHERS BY REASON OF THE USE OR SALE OF SUCH PRODUCTS, AND HEREBY AGREES TO RELEASE, DEFEND, INDEMNIFY AND HOLD CUSTOMER GROUP HARMLESS FROM AND AGAINST ALL CLAIMS FOR INFRINGEMENT OF ANY SUCH PATENT, PROVIDED THAT CUSTOMER SHALL PROMPTLY NOTIFY BJ IN WRITING UPON RECEIPT OF ANY CLAIM FOR INFRINGEMENT, OR UPON THE FILING OF ANY SUCH SUIT FOR INFRINGEMENT, WHICHEVER FIRST OCCURS, AND SHALL AFFORD BJ FULL OPPORTUNITY, AT BJ'S OPTION AND EXPENSE, TO ANSWER SUCH CLAIM OR THREAT OF SUIT, ASSUME THE CONTROL OF THE DEFENSE OF SUCH SUIT, AND SETTLE OR COMPROMISE SAME IN ANY WAY BJ SEES FIT. BJ DOES NOT WARRANT THAT SUCH PRODUCTS: (I) WILL NOT INFRINGE ANY SUCH PATENT WHEN NOT OF BJ'S MANUFACTURE, OR SPECIALLY MADE, IN WHOLE OR IN PART TO THE CUSTOMER'S DESIGN CERTIFICATIONS; OR (II) IF USED OR SOLD IN COMBINATION WITH OTHER MATERIALS OR APPARATUS OR USED IN THE PRACTICE OF PROCESSES, WILL NOT, AS A RESULT OF SUCH COMBINATION OR USE, INFRINGE ANY SUCH PATENT, AND BJ SHALL NOT BE LIABLE; AND CUSTOMER SHALL RELEASE, DEFEND, INDEMNIFY AND HOLD BJ HARMLESS FOR DAMAGES OR LOSSES OF ANY NATURE WHATSOEVER RESULTING FROM ALLEGED PATENT INFRINGEMENT ARISING PURSUANT TO (I) AND (II) ABOVE.

11. FORCE MAJEURE

IF EITHER PARTY IS UNABLE BECAUSE OF FORCE MAJEURE TO CARRY OUT ANY OF ITS OBLIGATIONS UNDER THESE TERMS AND CONDITIONS, OTHER THAN OBLIGATIONS TO PAY MONEY, THEN ON SUCH PARTY GIVING NOTICE AND PARTICULARS IN WRITING TO THE OTHER PARTY WITHIN A REASONABLE TIME AFTER THE OCCURRENCE OF THE CAUSE RELIED UPON, SUCH OBLIGATIONS SHALL BE SUSPENDED. "FORCE MAJEURE" SHALL INCLUDE ANY EVENT THAT IS BEYOND THE REASONABLE CONTROL OF THE PARTY SO AFFECTED INCLUDING, WITHOUT LIMITATION, ACTS OF GOD, LAWS AND REGULATIONS, GOVERNMENT ACTION, WAR, CIVIL DISTURBANCES, HIJACK, PIRACY, CRIMINAL ACTION BY A THIRD PARTY, THREATS OR ACTS OF TERRORISM, STRIKES AND LABOR PROBLEMS, DELAYS OF VENDORS OR CARRIERS, LIGHTENING, FIRE, FLOOD, WASHOUT, STORM, BREAKAGE OR ACCIDENT TO EQUIPMENT OR MACHINERY, AND SHORTAGE OF RAW MATERIALS. IF ANY SUSPENSION DUE TO FORCE MAJEURE EXCEEDS TEN (10) CONSECUTIVE DAYS, EITHER PARTY MAY TERMINATE THESE TERMS AND CONDITIONS BY WRITTEN NOTICE TO THE OTHER PARTY AND CUSTOMER SHALL BE LIABLE FOR DEMOBILIZATION AND ANY OTHER REASONABLE COSTS INCURRED BY BJ INCIDENTAL TO SUCH TERMINATION.

12. LAWS, RULES, REGULATIONS, AND EXPORT CONTROL

BJ AND CUSTOMER AGREE TO COMPLY WITH ALL LAWS, RULES, REGULATIONS AND DECREES OF ANY GOVERNMENTAL OR REGULATORY BODY HAVING JURISDICTION OVER THE SERVICES OR PRODUCTS TO BE PROVIDED BY BJ OR THE WORK SITE OR THAT MAY OTHERWISE BE APPLICABLE TO BJ'S OR CUSTOMER'S PERFORMANCE UNDER THESE TERMS AND CONDITIONS SERVICES AND PRODUCTS AND/OR RELATED TECHNICAL DATA COVERED BY THESE TERMS AND CONDITIONS MAY BE SUBJECT TO U.S. CANADIAN AND/OR FOREIGN TRADE CONTROLS. CUSTOMER AGREES THAT IT WILL NOT SELL, RE-EXPORT OR TRANSFER PRODUCTS AND/OR RELATED TECHNICAL DATA EXCEPT IN FULL COMPLIANCE WITH ALL GOVERNMENTAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO ECONOMIC SANCTIONS AND EXPORT CONTROLS ADMINISTERED BY THE U.S. DEPARTMENT OF TREASURY, U.S. DEPARTMENT OF COMMERCE AND U.S. DEPARTMENT OF STATE.

CUSTOMER AGREES TO COMPLY WITH ALL BJ REQUESTS FOR TRADE COMPLIANCE INFORMATION, STATEMENTS, AND OTHER ASSURANCES INCLUDING, WITHOUT LIMITATION, REQUESTS FOR END USER AND ROUTED TRANSACTION CERTIFICATIONS. BJ RESERVES THE RIGHT TO REFUSE TO FULFILL ANY WORK ORDER OR OTHERWISE PERFORM UNDER THESE TERMS AND CONDITIONS IF BJ IN ITS SOLE DISCRETION DETERMINES THAT SUCH ACTION MAY VIOLATE ANY LAW OR REGULATION.

13. GOVERNING LAW, JURY WAIVER, AND VENUE

FOR ALL WORK PERFORMED ON A WORKSITE WITHIN THE UNITED STATES OF AMERICA, THIS MSA SHALL BE EXCLUSIVELY GOVERNED BY THE LAWS OF THE STATE OF TEXAS, WITHOUT REGARD TO ANY CHOICE OF LAWS OR CONFLICTS OF LAW PROVISIONS. VENUE SHALL BE EXCLUSIVELY IN THE STATE OR FEDERAL COURTS OF HARRIS COUNTY, TEXAS AND CUSTOMER CONSENTS TO PERSONAL JURISDICTION THEREIN. IN THE EVENT TEXAS LAW CANNOT BE APPLIED TO SUCH WORK, THE LAW OF THE STATE WHERE THE WORK WAS PERFORMED WILL GOVERN.

FOR ALL WORK PERFORMED ON A WORKSITE WITHIN CANADA, THIS MSA SHALL BE CONSTRUED AND THE LEGAL RELATIONS DETERMINED IN ACCORDANCE WITH THE LAWS OF THE PROVINCE OF ALBERTA. THE PARTIES AGREE TO SUBMIT TO BINDING ARBITRATION IN CALGARY, ALBERTA, CANADA. EACH PARTY WAIVES ANY OBJECTION THAT THE DESIGNED COURTS ABOVE ARE AN INCONVENIENT FORUM OR VENUE. REFERENCES IN THESE TERMS AND CONDITIONS TO ANY ACT, LAW, STATUTE, RULE OR REGULATION SHALL BE DEEMED TO INCLUDE REFERENCES TO SUCH AS THE SAME MAY BE AMENDED, REPLACED, OR REENACTED FROM TIME TO TIME.

EACH PARTY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY IN RESPECT TO ANY ACTION, CLAIM, SUIT OR PROCEEDING ARISING OUT OF OR RELATING TO THESE TERMS AND CONDITIONS.

14. ASSIGNMENT

BJ SHALL HAVE THE RIGHT TO ASSIGN THESE TERMS AND CONDITIONS TO ANY OF ITS AFFILIATED COMPANIES WITHOUT THE CONSENT OF CUSTOMER.

15. GENERAL

FAILURE OF EITHER PARTY TO ENFORCE ANY OF THESE TERMS AND CONDITIONS SHALL NOT BE A WAIVER OF THE RIGHT TO ENFORCE THESE TERMS AND CONDITIONS CONTAIN ALL REPRESENTATIONS OF THE PARTIES AND SUPERSEDES ALL PRIOR ORAL OR WRITTEN AGREEMENTS OR REPRESENTATIONS AND MAY ONLY BE AMENDED BY AN AGREEMENT EXECUTED BY BOTH PARTIES. IN THE EVENT OF CONFLICT BETWEEN THE PROVISIONS OF THESE TERMS AND CONDITIONS AND ANY OTHER TERMS IN CUSTOMER'S PURCHASE ORDERS, FIELD WORK ORDERS, WORK TICKETS, INVOICES, STATEMENTS, OR ANY OTHER TYPE OF MEMORANDUM OR OTHER DOCUMENTS USED BY CUSTOMER, WHETHER ORAL OR WRITTEN, THE PROVISIONS OF THESE TERMS AND CONDITIONS SHALL GOVERN.



Customer: James Owens
Field:
Well:
Lease:

Proposal : James Owens
Revision :
Date Prepared: 11/13/2018
District: Dickinson, ND

Item	Size	Weight	Thread	Grade	Depth
Casing	7	26-lb/ft		L-80	10,000'
Tie Back					
Liner					
Workstring				L-80	

Item	Qty	Material	Description of Equipment and Services Saleables	Unit Amount	Discount	Net Amount
1	1	H400213BB70STD	3BB Cement Retainer	\$2,080.00		\$2,080.00
2	1					
3	1					
4	1					

Saleables Total: \$2,080.00

Rental & Service						
Item	Qty	Material	Description of Equipment and Services	Unit Amount	Discount	Net Amount
5	1	H400603500RT	K-1 Runing Tool - Per Run	\$ 300.00		\$300.00
6						

Rentals Total: \$300.00

Personnel & Mileage						
Item	Qty	Material	Description of Equipment and Services	Unit Amount	Discount	Net Amount
7	1	10001347	Tool Supervisor First 8 Hrs	\$1,120.00		\$1,120.00
			Tool Supervisor Additional Hrs	\$140.00		
8	0	10005155	Round trip Mileage from Williston, ND (per mile)	\$3.75		
9	0	10073025	Environmental Waste Charge	\$247.50		

Personnel & Mileage Total: \$1,120.00

Estimated Job Total less Tax: \$3,500.00

Elk River Consulting, LLC

532 S Clarkson St.

Denver, CO 80209

720-530-3198

Cost Estimate Description

Plug and Abandonment Cost Estimate Provided for Independence ND, LLC

- Jobsite supervision for the plugging and abandonment of a 6,000 ft. deep SWD
- Ensure job meets or exceeds all Tribal, state, and federal regulations and requirements
- Oversee jobsite safety and environmental compliance
- Supervise simultaneous operations with workover rig, cement team and all supporting equipment and personnel

Job Duration Estimate

3 Days

Costs

Consulting & Supervision, per day	\$1,300.00
Per Diem	\$100.00
Travel (1 Day)	\$1,300.00
Vehicle Mileage @ \$1.50/mile	\$450.00
Estimated Total	\$5,950.00

Neptune Operating Company
4402 13th St NW Lot 28
Garrison, ND 58540

January 19, 2019

Independence ND, LLC
301 1ST AVE E Bakersfield
New Town, ND 58763

Dear Mr. Johnson,

Please see below for details on Neptune Operating Company's estimate to provide service rig, BOP, and support equipment for the plug and abandonment of Independence ND's Prairie Chicken SWD #1. Our estimate is based on an estimated job duration of three days, but we've included our hourly and day rates for additional time and add-on services. Please contact me with any questions.

Sincerely,

Kelsey Mitchell

Equipment Description:

- Rig Details:
 - 250 Horsepower
 - Max pull rating: 250,000 lbs
 - Derrick Height: 104 ft
 - Base Beam
 - Hydraulic Catwalk
 - Triplex Mud Pump
 - Power Swivel
- Well Control:
 - 5,000 psi BOP
 - Accumulator
 - Choke manifold

Cost Detail:

- Rig Rate \$ 500/hr
- Toolpusher: \$750/day
- Additional Crew Member: \$75/hr
- Crew Travel: \$250/hr
- Circulating Equipment (5,000 psi pump, flat tank, and iron): \$1,000/day
- Rig Standby Rate \$3,000/day
- Pipe Wrangler, Racks: \$800/day
- Front End Loader, w/Attachments: \$275/day
- Power Swivel: \$750/day
- Rig Heater: \$275/day
- Light Plant: \$150/day

Cost Estimate Summary:

Rig Rate (500/hr for 3 days)	\$18,000
Toolpusher (\$750/day for 3 days)	\$2,250
Crew Travel (3 hrs/day for 3 days)	\$2,250
Rig Pump (\$1,000/day for 3 days)	\$3,000
Pipe Handling Equipment (\$800/day for 3 days)	\$2,400
3 – Day Estimated Total	\$27,900



Schlumberger Cementing

Company	Independence ND, LLC
Prepared For	James Owen
Well Name	Prairie Chicken SWD 1
Surface Location	47.6813469, -102.7603438

UWI Number	TBD
Well Master Number	TBD
Service from District	Williston
District Phone	720-255-1637
Proposal Number	v0
Date	11/13/2018
Primary Contact	Matthew Cleveland

Objective	Plug and Abandon Treatment: Squeezes and Plugs
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Executive Summary – P&A

This proposal is in response to your inquiry to secure cementing services for Stab In.

The estimated total cost of our services is \$21,281.48. This proposal/agreement is only a summary of Schlumberger's offerings and any prices provided are for illustrative purposes only. Actual cost will be dependent on time, material and equipment used during the project and any costs associated with unanticipated circumstances. Taxes are not included and all dates and services are dependent on the availability of cementing services and credit approval from Schlumberger's credit department. Attached for your convenience is Schlumberger's Commercial and General Terms and Conditions for your consideration, the final version of which is subject to mutual agreement and management approval before execution.

This proposal shall remain valid for sixty (60) days from the submission date provided above and a minimum notice of twenty four (24) hours prior to a job is required to deliver quoted price(s).

Thank you for considering Schlumberger. Please do not hesitate to contact me with any questions or concerns.

Sincerely,

Matthew Cleveland
WIT Sales Engineer
MCleveland@exchange.slb.com
Office: +1 303 352 1225
Cell: +1 701 509 4409



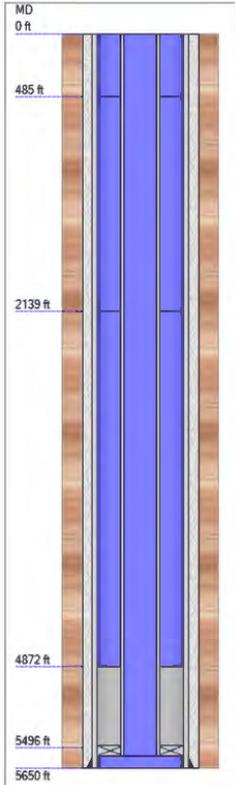
Schlumberger

Well Data – P&A

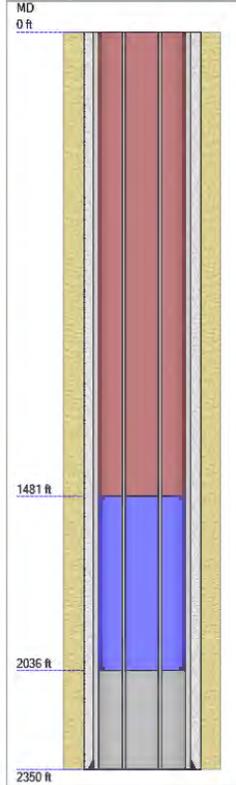
IMPORTANT

The well data shown on this page is based on information available when this treatment program was prepared. This data must be confirmed on location with the customer representative prior to the treatment. Any changes in the well design need to be reviewed for their impact on the treatment design.

Squeeze 1



Plug 2



Well Data

Job Type:	Stab In
Total Depth (Measured):	5,650.0 ft
TVD:	5,650.0 ft
BHST (Tubular Bottom Static Temperature):	150.0 degF
BHCT (Tubular Bottom Circulating Temperature):	150.0 degF
Drilling Fluid:	-

Open Hole

Excess Type	OH Diameter	MD	Annular Excess	Equiv. OH Diameter	Annular Capacity
Annular	8.750 in	5,650.0 ft	0.0 %	8.750 in	0.055 bbl/ft

Previous Casing

OD, in	Weight, lbm/ft	Grade	Inner Capacity, bbl/ft	Bottom Depth, ft	Casing Capacity, bbl/ft
7	26.0	P-110	0.038	5,650.0	0.03826

Drill Pipe

OD, in	Weight, lbm/ft	Grade	Inner Capacity, bbl/ft	Bottom Depth, ft	Casing Capacity, bbl/ft
2 7/8	6.8				



Fluid Systems – P&A

Fresh Water			
System	Wash		
Density	8.32 lb/gal		
Total Volume	217.2 bbl		
Additives	Code	Description	Concentration

15.8 ppg Squeeze Slurry (110 sacks, 94.0 lbm per sack of Blend) – Squeeze 1			
System	Conventional		
Density	15.80 lb/gal		
Yield	1.16 ft ³ /sk		
Mix Water	5.10 gal/sk		
Mix Fluid	5.10 gal/sk		
Total Volume	22.7 bbl		
Additives	Code	Description	Concentration
	D907	Cement	94.00 lb/sk BWOB
	D013	Retarder	0.30 % BWOB
	D065	Dispersant	0.30 % BWOB

Contingency Additional Cement for Squeeze 1 (100 sacks, 94.0 lbm per sack of Blend)			
System	Conventional		
Density	15.80 lb/gal		
Yield	1.16 ft ³ /sk		
Mix Water	5.10 gal/sk		
Mix Fluid	5.10 gal/sk		
Total Volume	20.6 bbl		
Additives	Code	Description	Concentration
	D907	Cement	94.00 lb/sk BWOB
	D013	Retarder	0.30 % BWOB
	D065	Dispersant	0.30 % BWOB

15.8 Neat G (50 sacks, 94.0 lbm per sack of Blend) – Plug 2			
System	Conventional		
Density	15.80 lb/gal		
Yield	1.16 ft ³ /sk		
Mix Water	5.13 gal/sk		
Mix Fluid	5.13 gal/sk		
Total Volume	10.2 bbl		
Additives	Code	Description	Concentration
	D907	Cement	94.00 lb/sk BWOB

15.8 Neat G (20 sacks, 94.0 lbm per sack of Blend) – Top Out			
System	Conventional		
Density	15.80 lb/gal		
Yield	1.16 ft ³ /sk		
Mix Water	5.13 gal/sk		
Additives	Code	Description	Concentration
	D907	Cement	94.00 lb/sk BWOB

Some of the chemicals specified in this program may have toxic properties. All personnel should be familiar with the inherent dangers and appropriate safeguards to prevent accidental injury. Use of these chemicals may be governed by certain laws and regulations and should only be used in accordance with such. Please refer to the MSDS for the recommended safety precautions and required minimum personal protective equipment.



Schlumberger

Price Estimate – P&A

Primary Pricebook Code: BBVI

Equipment and Services						
Code	Standard Description	Quantity	Unit List Price	Total List Price	Discount Rate	Discounted Price
				\$	%	\$
48019100	Cement Bulk Unit	1 EA	1,380.00	1,380.00	12.00	1,214.40
49100000	Cement Service Charge	283 CF	2.80	792.40	12.00	697.31
49102000	Cement Transport	791 MI	2.50	1,977.50	12.00	1,740.20
58498001-JOB	Remedial Cementing Day Rate	1 JOB	9,500.00	9,500.00	12.00	8,360.00
59200002	Equipment Mileage	120 MI	5.91	709.20	12.00	624.10
59200005	Car/PU Mileage	120 MI	3.47	416.40	12.00	366.43
59697004	Job Monitoring	1 JOB	880.00	880.00	12.00	774.40
	Subtotals:		USD	15,655.50	USD	13,776.84

Materials						
Code	Standard Description	Quantity	Unit List Price	Total List Price	Discount Rate	Discounted Price
				\$	%	\$
D013	Retarder	60 LB	3.30	198.00	12.00	174.24
D065	TIC Dispersant	60 LB	9.10	546.00	12.00	480.48
D907	Cement, Class G	280 CF	27.80	7,784.00	12.00	6,849.92
	Subtotals:		USD	8,528.00	USD	7,504.64

Total List Price:	USD	24,183.50
Applied Discount:	USD	2,902.02
Job Price Estimate:	USD	21,281.48



From: John Isom <john@cachetrucking.com>

Sent: Thursday, December 6, 2018 8:02 AM

To: James Owen

Subject: Re: Independence ND, LLC: P&A Estimate

Hi James

We bid on several PA jobs and we partnered with CnJ to do the cement

A rough all in cost was 100,000

Call me with any questions

John Isom

7016091442

R. NECESSARY RESOURCES

Independence ND will submit evidence such as a surety bond or financial statement to verify that the resources necessary to close, plug and abandon the well are available in the final draft of the application.

S. AQUIFER EXEMPTIONS

Independence ND has been unable to locate an analysis of a nearby Inyan Kara source well which would confirm the need for an aquifer exemption. Independence ND seeks to proceed with the permit application contingent on the requirement to sample and analyze the water from the well and receiving full EPA authorization prior to proceeding with an injection or a stimulation program.



T. EXISTING EPA PERMITS

Under 40 C.F.R. Section 124.3(a)(2), which incorporates by reference the application requirements of 40 CFR Section 144.31, this application is required to provide a listing of all permits or construction approvals received or applied for under any of the following programs:

- (i) § 144.31(e)(6)(i) Hazardous Waste Management program under RCRA.
- (ii) § 144.31(e)(6)(ii) UIC program under SDWA.
- (iii) § 144.31(e)(6)(iii) NPDES program under CWA.
- (iv) § 144.31(e)(6)(iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act.
- (v) § 144.31(e)(6)(v) Nonattainment program under the Clean Air Act.
- (vi) § 144.31(e)(6)(vi) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act.
- (vii) § 144.31(e)(6)(vii) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act.
- (viii) § 144.31(e)(6)(viii) Dredge and fill permits under section 404 of CWA.
- (ix) § 144.31(e)(6)(ix) Other relevant environmental permits, including State permits.

Hazardous Waste Management: The LOW CAP SWD 1 will be a Class II Disposal well and not a treatment, storage or disposal facility requiring a TSDF permit. Solid waste (including filter socks or oily waste from tank bottoms or filters) will be disposed of by contractors, currently including Clean Harbors and OWL.

UIC Permit: A permit application under the North Dakota UIC program will be submitted to the North Dakota Industrial Commission (NDIC).

NPDES Permit Program: The construction will involve more than one acre on the Fort Berthold Indian Reservation and will be managed in accordance with EPA's 2017 Construction and Development General Permit. Stormwater discharges during the operation of the installation will be managed in accord with EPA's multi-sector general permit (MSGP). An appropriate Stormwater Pollution Prevention Plan (SWP3) will be developed in accord with that permit. Additionally, the installation will not have a process wastewater discharge to surface waters.

Clean Air Act Permits: North Dakota is in attainment for criteria pollutants.

<https://www.epa.gov/green-book/green-book-national-area-and-county-level-multi-pollutant-information>

Additionally, the proposed installation will be powered electrically and will emit far less emissions needed to trigger the application for the PSD and NESHAPS programs.

Ocean Dumping Permits: Not applicable.

Dredge-fill permits: The proposed facility does not include jurisdictional wetlands and does not trigger the application of section 404 of the Clean Water Act.

Other permits: Biological & Cultural Resource Investigations have been performed and are detailed in Attachments T1 and T2.



BIOLOGICAL ASSESSMENT



LOW CAP SWD

Prepared for

Juniper, LLC
315 East Broadway Avenue
Bismarck, ND 58501

On behalf of
Independence ND, LLC, New
Town, ND

Prepared by

Sedivec Natural Resource Consultation
Kevin K. Sedivec, Ph.D., Range Scientist/Botanist/Wildlife Biologist
373 – 160th Ave NE
Cummings, ND 58223

Date: October 1, 2018

**Biological Assessment
Attachment T1 (45 pages)**
LOW CAP SWD 1
Independence ND, LLC
SWNW Section 17-149-91
Heart Butte Field
Dunn County, ND

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Executive Summary

Juniper Environmental Consulting is submitting this Biological Assessment (BA) to the Environmental Protection Agency, as part of a consultation process pursuant to Section 7(a)(2) of the Endangered Species Act (ESA). This BA was prepared by Sedivec Natural Resource Consultation in accordance with legal requirements set forth in Section 7 of the ESA (16 U.S.C. 1536; see also 50 CFR Part 402). This BA defines and evaluates the potential effects of constructing a new well pad on Section 17, Township 149N, R91W 5th P.M. in Dunn County, North Dakota.

This specific activity constitutes of the Proposed Action for purposes of this consultation and evaluated for potential effects to listed and candidate species, or designated critical habitat found in Dunn County. This activity on the site for pad development and associated land impacted by this project relates to: building a new well pad on land currently in a grass/alfalfa hay field directly north and east of maintained gravel roads. This BA defines the Proposed Action on the land, and evaluates potential effects on listed and candidate species and their designated critical habitats attributed to the Proposed Action.

The land proposed for construction was previously farmed and currently classified as hay land that was planted to a smooth brome grass (*Bromus inermis*), alfalfa (*Medicago sativa*) plant community. The Proposed Action area has a cropping history of at least 1997 (Google Earth 2018), located approximately 2.6 miles from the Missouri River and Lake Sakakawea, and approximately 29 miles from the closest Dakota skipper (*Hesperia dacotae*) designated critical habitat (ND Unit 11, 12; USDI Fish and Wildlife Service 2016).

The Proposed Area does lie within the piping plover's breeding range (USDI Fish and Wildlife Service 2011); however, it doesn't lie within the designated critical habitat zone (USDI Fish and Wildlife Service 2002). The Missouri River is designated critical habitat for piping plover (*Charadrius melodus*), a bird classified as a threatened species by the US Department of Interior Fish and Wildlife Service (1985); however, the Proposed Action area is not within proximity of the flight patterns of breeding and foraging adults associated with the piping plover designated critical habitat.

This project has “no effect” on all threatened and endangered species, candidate species, and designated critical habitat, except Dakota skipper, gray wolf (*Canis lupus*) and northern long-eared bat (*Myotis septentrionalis*). Suitable habitat for the Dakota skipper, gray wolf and northern long-eared bat was not present on the Proposed Action area; however, habitat for these three species was found within the Action Area (0.5 mile radius of the Proposed Area), thus a “may impact, not likely to adversely affect” status was determined.

Introduction

This biological assessment (BA) analyzes the potential effects of the proposed construction of a well pad in northeast Dunn County. The Endangered Species Act (ESA) of 1973 (16 U.S.C. 153 et seq.), as amended (ESA or Act) requires the need for a permit from a federal agency under federal jurisdiction to conserve and recover listed species and use their authorities to further the purposes of the Act by carrying out programs for the conservation of threatened and endangered species, candidate species, and critical habitat, and determine impacts (50 CFR § 402). The ESA directs all federal agencies to consult (referred to as section 7 consultation) with the US Fish and Wildlife Service (USFWS) when activities “may affect” a listed species or designated critical habitat (USDI US Fish and Wildlife Service 2018b). The Act also mandates that federal agencies contribute to the conservation of federally listed species by utilizing their authorities to conserve (recover) federally listed species so that listing is no longer necessary. Federally, state, or locally listed threatened and endangered, candidate animal and plant species, and designated critical habitat meeting the following criteria are addressed in this assessment:

1. Known to occur in the Dunn County, based on confirmed sightings;
2. May occur in Dunn County, based on unconfirmed sightings;
3. Potential habitat exists for the species in Dunn County; or
4. Potential effects may occur to these species.

Consultation History

This section presents a brief summary of consultation history with a description of proposed actions identified. Consultation between Kevin Sedivec, Range Scientist/Wildlife Biologist and US Fish and Wildlife Service staff include the following correspondences, **Table 1**.

Table 1. Consultation History of Sedivec with agencies

DATE	MEETING ATTENDEES	DISCUSSION
August 28, 29 2018	Kevin Shelley (USFWS, Region Director)	Discussions regarding biological assessments and threatened and endangered species.

Project Location

The proposed construction (Project Area) includes the development of a new well pad disturbing approximately 7.95 acres, with the pad 1.28 acres in size when completed, **Table 2**. The project is located in Township 149N, Range 91W, Section 17 (general latitude: 47°43’36” N, longitude: 102°21’44” W). The Project Area is in northeast Dunn County, ND, and borders county road 13 to the east and north of an existing lease road. The area surveyed consisted of 39 acres from which the Project Area is located within, **Figure 1**.

Table 2. Project proposer and location information of Project and Action Area.

ITEM	DETAIL
Project proposer	Independence ND, LLC
Project name	LOW CAP SWD
Project implementation/timeline	Construction commencing in Spring 2019, pending final approvals
Project duration	Contractor Dependent ~30 days, typical well location development using standard construction equipment.
Project type	Survey of Proposed Project Area, Analysis Area (0.5 mile radius of Project Area)
County/State	Dunn County, North Dakota
Survey location	S17, T149N, R91W 39 acres for Project Area, 500 acres Analysis Area



Figure 1. Area surveyed that included proposed Project Area in north east Dunn County, ND (Google Earth 2018).

Project Description

This is standard well construction using standard construction equipment. The plat has the metric details as far as cut fill and disturbances. Anticipated spring 2019 construction with 30 day construction period. All work will be confined to the pad area not additional staging or equipment areas. The project is related to the overall development in the area and is not dependent upon certain project. It's interrelated too many different project because it is a disposal well location.

Impact Avoidance and Minimization Measures

Impact avoidance and minimization measures are discussed for threatened and endangered species, and candidate species that may be impacted during the construction phase of this project, or designated critical habitat impacted by the project. Although three species may occur (Dakota skipper, gray wolf, and northern long-eared bat) within the Action Area (Proposed Area and Analysis Area) and two species may fly over during the breeding season (piping plover and least tern), no species would use the Proposed Area. The impact would be “no effect” for all species; except Dakota skipper, northern long-eared bat and gray wolf.

The piping plover and least tern may be found along the shores of Missouri River and Lake Sakakawea. The Analysis Area is 1.9 miles from the shoreline of Lake Sakakawea, thus a “no impact” on these two birds was designated as no breeding or foraging habitat is found within the Action Area or 0.5 miles from Action Area.

Piping plover designated critical habitat is 2.4 miles from the Project Area and 1.9 miles from the Action Area, thus “no impact” on designated critical habitat. The nearest Dakota skipper designated critical habitat is ND Unit 12 in McKenzie County and found 29 miles from the Project Area. The nearest location of a historic Dakota skipper record is 8 miles west in northwest Dunn County (USDI Fish and Wildlife Service 2016).

Loafing and breeding habitat for Dakota skipper (upland prairie containing little bluestem (*Schizachryium scoparium*), prairie sandreed (*Calamovilfa longifolia*), flowering forbs) is present within the Analysis Area (not found in Project Area). Avoidance and minimization measures should be incorporated to eliminate or reduce the impact on the Dakota skipper habitat and include:

- 1) Avoid disturbance of native rangeland found within the Action Area.

The northern long-eared bat may use the green ash (*Fraxinus pennsylvanica*) draws (green ash trees with cavities may be used for roosting and nurse habitat) found within the Analysis Area

(no green ash draws occurred in the Project Area). Avoidance and minimization measures should be incorporated to eliminate or reduce the impact on the northern long-eared bat and include:

- 1) Avoid removal of trees within the Analysis Area.
- 2) If trees need to be removed, they should be harvested between October 1 and April 1 when no adult northern long-eared bats are found in North Dakota.

Noise and human activity would more than likely deter the gray wolf, thus precluding the “may affect, not likely to adversely affect” status. An active well pad and a storage battery site occur within the Analysis Area, so human activity and noise is constant at this time. It will be impossible to reduce noise and human activity (minimization measure) due to the presence of a well pad and a battery site, and the construct of this project. Impact avoidance would also be impossible during the construction phase of the project if a gray wolf migrated through. However, preferred habitat is plentiful away from the construction site.

A resource protection area should be created on the adjacent hay land that was previously cropped directly east of Project Area and could be used for large equipment, fuel, oil and storage tanks. This area shall be kept clean and free from discarded material. A closed loop fuel delivery system and dual-walled fuel storage tanks should prevent the spread of liquids in case of leaking in the tanks or piping. Such dike, curbed area or device shall have a capacity at least equal in volume to that of the tanks plus 10 percent.

After the project is completed, disturbed areas should be restored to pre-project conditions. Reclamation following the completion of the project should include trees planted to replace removed trees (if occur) and grasslands planted to match pre-project plant community. Consult the local NDSU County Extension office or USDA Natural Resource Conservation Service for recommended tree species and native plants to reclaim the disturbed area.

Action Area

The proposed location of the project spans the hay land and adjacent native rangelands that contain upland prairie and green ash draws. The Action Area includes all areas directly or indirectly impacted

by the proposed project. The Action Area includes the Project Area and Analysis Area, **Figure 2**. The Project Area refers to the vicinity of the proposed project disturbances. The Project Area includes the locations of the expected construction activities (~ 9 acres) and a reasonable buffer (~ 10 acres).

The Analysis Area (0.5-mile radius of the proposed project) for conducting this BA encompassed a larger area and was reviewed to provide documentation of the existing conditions to aid in the evaluation of cumulative effects. The Analysis Area includes hay land, native upland prairie, native green ash draws, gravel roads (3), well pad, and storage tank pad. **Figure 2** shows the Action Area which includes the Project Area (yellow boundary) and added Analysis Area (red boundary).

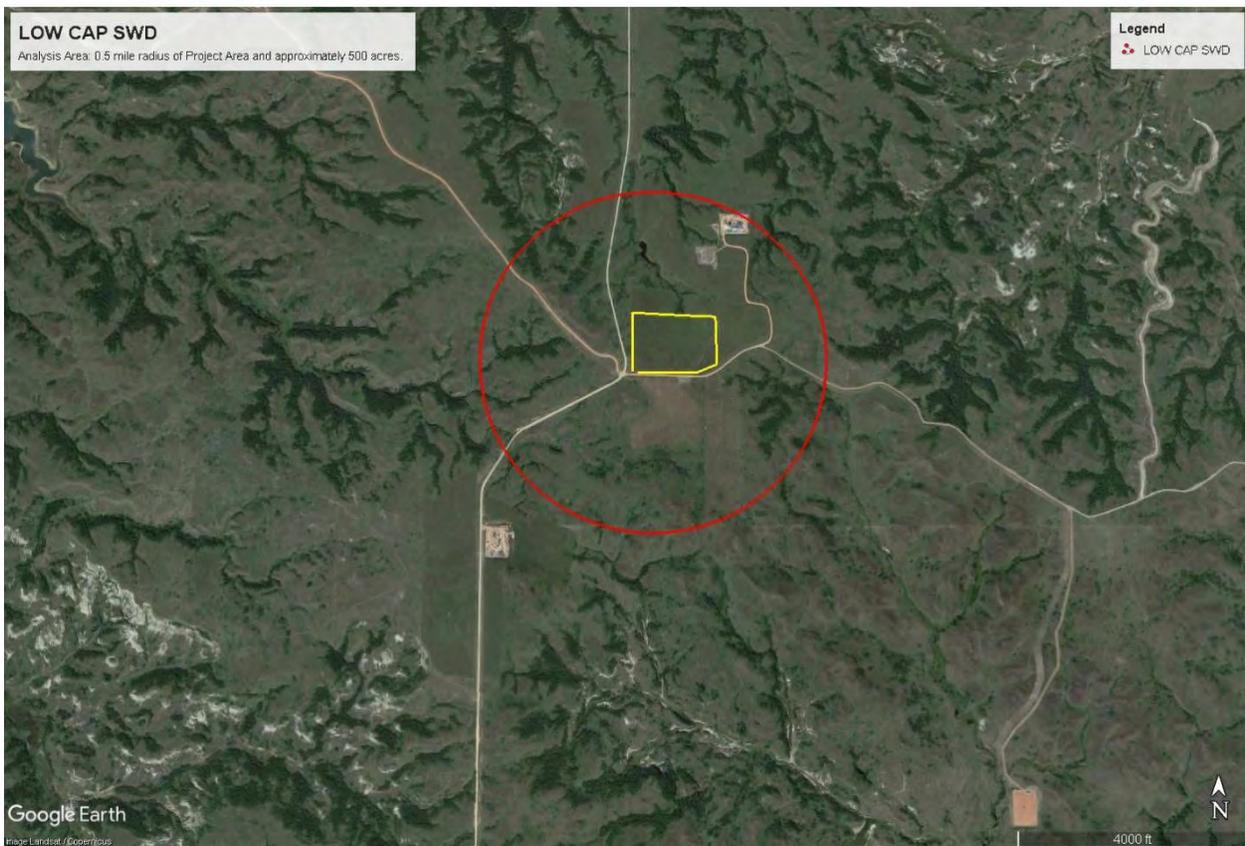


Figure 2. Location of Project Area and Analysis Area (Action Area) for the project LOW CAP SWD found in north east Dunn County, ND.

The native rangeland surrounding the Project Area was surveyed for Dakota skipper habitat and trees that could be used by northern long-eared bats. Land uses, habitat, weeds, wildlife, and wildlife locations were identified and described. Structural features were identified with aerial photography and existing GIS data (GIS Hub, 2017). Their existence was verified in the field when reasonably accessible.

The vegetation in the Project Area was classified as smooth brome grass/Kentucky bluegrass (*Poa pratensis*)/alfalfa plant community (see **Appendix A** for list of plant species found during the survey). The Project Area was a hay field and has been used for hay since at least 1997, **Figure 3**.

Native rangeland comprised of loamy and thin loamy ecological sites occurred within the Analysis Area and comprised approximately 30 percent of the area. The loamy prairie was classified as a Kentucky bluegrass/wheatgrass/needlegrass plant community and not considered Dakota skipper habitat. The thin loamy was classified as little bluestem/Kentucky bluegrass/needlegrass/forb plant community and classified as marginal Dakota skipper habitat due to low diversity of flowering forbs.

Green ash draws were common outside the Project Area and within the Analysis Area. Five green ash draws were found within the Analysis Area, **Figure 2**. Other tree species found in the draws include box elder (*Acer negundo*) and bur oak (*Quercus macrocarpa*). Although northern long-eared bats would rarely use this area due to distance from Missouri River systems, they are found within the Missouri River system, thus these draws would be classified as habitat. **Figure 3** shows the green ash draws that surround the Project Area.



Figure 3. View of the hay field that the project will be constructed on. Picture taken September 6, 2018.

Species and Habitat Information

Species and Critical Habitat Addressed in BA

Federally Listed and Proposed Threatened and Endangered Species

Assessments for federally listed Threatened and Endangered Species were conducted by evaluating historic and current occurrences and determining if potential habitat exists within the Project and Analysis Area. A determination was made concerning direct, indirect, and cumulative effects of the proposed activities on each species and designated critical habitat. Determinations made for federally listed species and critical habitat are:

“No effect”

“May affect, not likely to adversely affect”

“Beneficial impact”

“May affect, likely to adversely affect”

“Likely to jeopardize/adversely modify proposed species/critical habitat”

“Not likely to jeopardize the continued existence or adversely modify proposed critical habitat”

Potential impacts, avoidance, and mitigation practices are provided under the species discussion unless a ***“no effect”*** determination is made. If a determination of ***“no effect”*** is made, avoidance or mitigation practices are not necessary.

Excluded Species: “No Effect”

Species were excluded from further evaluation and discussion if habitat requirements and known range do not exist within the Project or Analysis Areas (Action Area), and lack of confirmed sightings of the species have been made within the designated area or near vicinity. Species excluded from further evaluation are listed in **Table 3**.

The black-footed ferret (*Mustela nigripes*), until recently, has been extirpated from North Dakota for decades. Although two individuals have been recently (2014) found along the North and South Dakota border near McLaughlin, South Dakota; no occurrences have been found in Dunn County for decades. The black-footed ferret also depends exclusively on prairie dog burrows for shelter (Black-footed Ferret Recovery Team, 2009; USDI Fish and Wildlife Service 2015a), with no known prairie dog colonies found within 0.5 miles of Action Area.

Historically, the rusty patched bumble bee (*Bombus affinis*) was broadly distributed across the eastern United States and Upper Midwest, from Maine in the U.S. and southern Quebec and Ontario in Canada, south to the northeast corner of Georgia, reaching west to the eastern edges of North and South Dakota. Since 2000, this bumble bee has been reported from only 13 states and 1 Canadian province: Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Minnesota, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, Wisconsin – and Ontario, Canada. Based on this bumble bees most westerly historic range being Stutsman County, ND, this bee has never been recorded as far west as Stutsman County (US Fish and Wildlife Service 2018b).

The western prairie fringed orchid (*Platanthera praeclara*) and Poweshiek skipperling (*Oarisma Poweshiek*) are not found in Dunn County (USDI Fish and Wildlife Service, 2018b). The Poweshiek skipperling is classified as extirpated from North Dakota. No preferred habitat exists for either species within the Action Area.

Approximately 100 pairs of interior least tern (*Sternula antillarum*) breed and nest on sandbars along the Yellowstone and Missouri River systems in North Dakota (USDI Fish and Wildlife Service 2015b). The interior least tern nest is a small, bowl-shaped depression on barren sands. They nest in colonies, with nesting period between mid-May and mid-August. Least terns nest on barren to sparsely vegetated sandbars along rivers, sand and gravel pits, lake and reservoir shorelines, and occasionally gravel rooftops (USDI Fish and Wildlife Service 2015b). There were 706 least tern adults counted on the Missouri River in 2009, dropping below the threshold recognized as the recovery goal for the first time in four years (800 adults, as set in the 1990 Interior Least Tern Recovery Plan). Much of the “drop-in” populations may be attributable to higher storage levels in the reservoirs, particularly Lake Oahe and Lake Sakakawea (US Army Corps of Engineers, 2010). No preferred habitat exists within the Action Area for the least tern.

The pallid sturgeon is found in the Mississippi, Missouri, and Yellowstone River systems. Although the pallid sturgeon (*Scaphirhynchus albus*) has been historically found in the Missouri River, the current recovery plan shows present day range from the confluence of the Yellowstone and Missouri River as the eastern most range in North Dakota, with the exception of the tailrace below the Garrison dam (Dryer and Sandvol 1993, USDI Fish and Wildlife Service 2014a). Secondly, preferred habitat is the bottom of large, turbid, relatively warm, free-flowing rivers (Dryer and Sandvol 1993, Montana Fish, Wildlife and Parks 2014). No preferred habitat exists within the Action Area for the pallid sturgeon.

At one time during the 19th century, whooping cranes (*Grus americana*) nested in North Dakota. Currently, whooping cranes only migrate through North Dakota in the spring and fall. Along their migration route, whooping crane use large, shallow marshes for roosting and loafing while feeding in harvested grain fields. Pearse et al. (2015) identified 1,095 20-square-kilometer grid cells that contained stopover sites for whooping cranes and categorized occupied grid cells based

on density of stopover sites and the amount of time cranes spent in the area. This assessment resulted in four categories of stopover site use: unoccupied, low intensity, core intensity, and extended-use core intensity. The Action Areas lie within the migration corridor of Aransas-Wood Buffalo whooping cranes (Esri, U.S. Fish and Wildlife Service, and U.S. Geological Survey digital data, various resolutions – taken from Pearse et al. 2015); however, the cells that this proposed project lies within are classified as unoccupied cells for whooping crane stopover use (Pearse et al. 2015).

North Dakota's piping plover population was 496 breeding pairs in 1991, reducing to 399 breeding pairs by 1996; and 897 adults on Missouri River in 2009 (US Army Corps of Engineers, 2010). The USDI Fish and Wildlife Service (2011) reported approximately 75% of piping plovers in North Dakota nest on prairie alkali lakes and 25% use the Missouri River. However, Wiltermuth et al. (2015) showed piping plovers also use mainland and island shorelines of reservoirs that were created when large hydroelectric dams were constructed between 1940 and 1964. By 2005, 64 % of plovers counted along Missouri River used reservoir habitat, while 43 % of Missouri River plovers were observed at Lake Sakakawea (Wiltermuth et al 2015). No preferred habitat exists within the Action Area for the piping plover.

Red knot rufas (*Calidris canutus*) winter and migrate in large flocks containing hundreds of birds. While we can guess at some of the benefits of traveling in large flocks, such as protection from predators, we can also see the downside - susceptibility to habitat change and loss, oil spills, diseases, collisions with wind turbines, storms, and hunting. The red knot's life history depends on suitable habitat, food, and weather conditions from across the Western Hemisphere, from the extreme south of Tierra del Fuego to the far north of the central Canadian Arctic. Further, red knots need to encounter these favorable habitats, food, and weather conditions within narrow seasonal windows as the birds hopscotch along migration stopovers between wintering and breeding areas. For example, the red knot population decline that occurred in the 2000s was caused primarily by reduced food availability from increased harvests of horseshoe crabs, exacerbated by small changes in the timing that red knots arrived at the Delaware Bay. Red knots may also be particularly vulnerable to global climate change, which is likely to affect

the arctic tundra ecosystem where the knots breed; the quality and quantity of coastal habitats due to rising sea levels; the quantity and timing of invertebrate food resources throughout the bird's range; and the severity, timing, and location of storm and weather patterns (USDI Fish and Wildlife Service 2013). Although recognized as a coastal bird, the red knot rufa has been sighted at four locations in North Dakota (NatureServe 2016). The closest location would be south of Bismarck along the Missouri River. Since the red knot rufa breeds in the tundra and the Arctic Cordillera in the far north of Canada, Europe, and Russia (Baker et al. 2013); these sightings would be classified as migratory sightings. No preferred habitat exists within the Action Area for the red knot rufas.

Impacted Species

Dakota skipper (*Hesperia dacotae*)

The Dakota skipper recently became protected under the ESA, listed threatened (final rule effective November 23, 2014; Federal Register Vol. 79, No. 206 (Oct. 24, 2014) with the closest proposed designated (Federal Register Vol. 78, No. 206, Oct. 24, 2013) critical habitat in McKenzie County. The Dakota skipper is a thick bodied, small butterfly with a one (1) inch wingspan. This small butterfly undergoes four stages of life; egg, larvae, pupa, and adult. Adults emerge for an approximate three (3) week lifespan in June through July. During this time, females lay eggs on the understory of leaves, whereby eggs hatch into larvae (caterpillars) approximately ten (10) days later. Larvae inhabit at or below ground, feeding at night, summer through autumn, and are dormant through the winter, residing at the bases of native bunchgrasses.

Habitat requirements for the Dakota skipper include upland prairie environments that are dominated with bluestem grasses and diverse native flowering forb. High quality habitat is characterized by black samson (*Echinacea angustifolia*) along with abundant bluestem grasses and needlegrass. Dakota skippers are also found in moist bluestem prairie environments with wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zygadenus elegans*).

The Dakota skipper preferred habitat is lightly grazed grasslands, favoring little bluestem (*Schizachyrium scoparium*) with diverse flowering native forb. Royer (1988) described critical habitat as rangeland or grassland containing diverse native forb plant species. Key forb species include black samson, tiger lily (*Lilium lancifolium*), and smooth camas. Upland preferred sites include a diverse plant community with a high concentration of black samson, as well as the presence of tiger lilies. Lowland preferred habitats almost always contain smooth camas (Royer 2014), as well as the presence of tiger lily. The dominate vegetation associated with this project is a smooth brome grass/alfalfa plant community. However, the upland sites within the native rangeland has some black samson along the backslopes of the upland sites, but no tiger lilies or smooth camas in the Analysis Area. The vegetation on the uplands found in Analysis Area is classified as a little bluestem/Kentucky bluegrass/needlegrass plant community. This habitat type, although marginal, would be classified as Dakota skipper habitat.

Gray Wolf (*Canis lupus*)

Gray wolves historically ranged throughout North America. With the exception of Minnesota, Wisconsin, Michigan, Montana, Idaho, and Washington, the gray wolf is absent from the lower 48 states. Although the gray wolf has been documented in North Dakota since 1990, their presence is sporadic and consisted of occasional dispersing animals from Minnesota and Manitoba, Canada (USDI Fish and Wildlife Service 2008). The gray wolf's habitat varies from woodland to grasslands, but they generally avoid populated areas and areas with high road densities (Johnson 1999). The Project Area that would be impacted by the proposed project has a cropping history and currently seeded to a smooth brome grass/alfalfa hay mixture. Since gray wolf prefer wooded habitat, the green ash draws found within the Analysis Area would be classified as preferred habitat.

Table 3. Threatened, endangered, candidate/proposed species with the potential to occur within the Action and Analysis area. The USDI Fish and Wildlife Service (2018b) species list was obtained and reviewed, and species not having the potential to occur were excluded from further review with no effect determination.

SPECIES COMMON AND SCIENTIFIC NAME	STATUS ¹	POTENTIAL TO OCCUR	RATIONALE FOR EXCLUSION ²	HABITAT DESCRIPTION AND RANGE IN NORTH DAKOTA
ENDANGERED SPECIES				
Black-footed ferret (<i>Mustela nigripes</i>)	E	No	(HAB)	Requires expansive black-tailed prairie dog (<i>Cynomys ludovicianus</i>) colonies for food and habitat. 80 acres is the typical minimum black-tailed prairie dog colony size that can support the black-footed ferret. Black-footed ferrets were historically found in SW North Dakota; current occurrence is unlikely to questionable and no reintroduction sites have occurred in ND at this time.
Gray wolf (<i>Canis lupus</i>)	E	Yes	--	Has been documented in North Dakota since 1990s. Habitat varies from woodland to grassland, typically avoiding populated areas with high road densities.
Interior least tern (<i>Sterna antillarum</i>)	E	No	(HAB)	Sandbars along Yellowstone and Missouri River systems; nest in barren sands, in colonies.
Pallid sturgeon (<i>Scaphirhynchus albus</i>)	E	No	(HAB)	The Missouri River does support pallid sturgeon. Current range is from the confluence of the Yellowstone and Missouri River as the eastern most range in North Dakota with the exception of the tailrace below the Garrison dam. Preferred habitat is at the bottom of large, turbid, relatively warm, free-flowing rivers.
Poweshiek skipperling (<i>Oarisma poweshiek</i>)	E	No	(ODR/HAB)	Adult butterflies feed on nectar from prairie flowers; purple coneflower (<i>Echinacea angustifolia</i>), blackeyed susan (<i>Rudbeckia hirta</i>), and lobelia (<i>Lobelia spicata</i>). For larvae, native, fine-stemmed grasses and sedges (little bluestem (<i>Schizachyrium scoparium</i>) and prairie dropseed (<i>Sporobolus heterolepis</i>).
Whooping crane (<i>Grus Americana</i>)	E	No	(HAB)	Only migrate through North Dakota in spring and fall, using large, shallow marshes for roosting and loafing while feeding on harvested grain fields.

SPECIES COMMON AND SCIENTIFIC NAME	STATUS ¹	POTENTIAL TO OCCUR	RATIONALE FOR EXCLUSION ²	HABITAT DESCRIPTION AND RANGE IN NORTH DAKOTA
Rusty patched bumble bee (<i>Bombus affinis</i>)	E	No	(ODR/HAB)	Rusty patched bumble bees once occupied grasslands and tallgrass prairies of the Upper Midwest and Northeast, but most grasslands and prairies have been lost, degraded, or fragmented by conversion to other uses. Bumble bees need areas that provide nectar and pollen from flowers, nesting sites (underground and abandoned rodent cavities or clumps of grasses), and overwintering sites for hibernating queens (undisturbed soil).
THREATENED SPECIES				
Western fringed prairie orchid (<i>Platanthera praeclara</i>)	T	No	(ODR/HAB)	Mesic to wet unplowed tallgrass prairies and meadows; also found in old fields and road-ditches. This plant is known not to be found in North Dakota outside the southeast corner of the state.
Piping plover (<i>Charadrius melodus</i>)	T	No	(HAB)	Prefer sparsely vegetated sandbars and shorelines and large alkaline wetlands with shoreline. Breeding pairs exist; though have slightly decreased in past decades.
Dakota skipper (<i>Hesperia dacotae</i>)	T	Yes	-	Preferred habitat includes moist bluestem prairie with blooming wildflower species (wood lily (<i>Lilium philadelphicum</i>), harebell (<i>Campanula rotundifolia</i>) and smooth camas (<i>Zygadenus elegans</i>)); other preferred habitat is relatively dry upland prairie found on ridges and hillsides. In North Dakota, Dakota skippers are found in scattered, mostly isolated sites that are lightly grazed, favoring little bluestem with flowering native forbs.
Northern long-eared bat (<i>Myotis septentrionalis</i>)	T	Yes	-	Habitat varies by season; winter habitat requires caves or mines, summer habitat requires large trees for roosting, occasionally roost in barns or structures. This bat occurs in North Dakota from May through September. Green ash trees are found in the Analysis Area. These trees may provide suitable roosting and nursery habitat as some of these large trees contain holes and caverns. This project is found adjacent to their summer territory and the Missouri River is considered primary habitat in North Dakota.
Red knot rufa (<i>Calidris canutus</i>)	T	No	(HAB)	Shorelines during migration with a few occasional inland migrants. Four known locations with sightings found in North Dakota (NatureServe, 2016).

SPECIES COMMON AND SCIENTIFIC NAME	STATUS ¹	POTENTIAL TO OCCUR	RATIONALE FOR EXCLUSION ²	HABITAT DESCRIPTION AND RANGE IN NORTH DAKOTA
CRITICAL HABITAT				
Piping plover (<i>Charadrius melodus</i>) Unit 11 North Dakota Missouri River and Reservoirs	T	No	(HAB)-	Designated riverine and reservoir habitat in North Dakota includes Burleigh, Dunn, Emmons, McKenzie, McLean, Mercer, Morton, Mountrail, Oliver, Sioux, and Williams counties (USDI Fish and Wildlife Service, 2002).
Dakota skipper (<i>Hesperia dacotae</i>)	T	No	(HAB)	Prefer lightly grazed grasslands with little bluestem (<i>Schizachyrium scoparium</i>) with diverse flowering forbs. Flowering forb species include purple prairie coneflower (<i>Echinacea angustifolia</i>), tiger lily (<i>Lilium lancifolium</i>), and death camas (<i>Toxicoscordion venenosum</i>). There are 14 proposed designated critical habitat units within Ransom (2 units) Richland (1), Rolette (1), McHenry (6), McKenzie (3), and Wells (1) counties in North Dakota. None in Dunn County.
Poweshiek skipperling (<i>Oarisma poweshiek</i>)	T	No	(ODR/HAB)	Classified as extirpated from North Dakota.

¹STATUS CODES: E= federal listed endangered; T= federally listed threatened; P= federally proposed for listing; C= federal candidate for listing; CH= designated critical habitat

²EXCLUSION RATIONALE CODES: ODR= outside known distributional range of the species; HAB= no habitat present in analysis area; ELE= outside of elevational range of species; and SEA= species not expected to occur during the season of use/impact

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Northern Long-eared Bat (*Myotis septentrionalis*)

During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures like barns, sheds, and bridge decks (USDI Fish and Wildlife Service 2014b). The Missouri River lies within this bat's primary range in North Dakota (USDI Fish and Wildlife Service 2014b). Green ash and bur oak trees found in the Analysis Area (not found in Project Area) will provide roosting and nursery habitat for the northern long-eared bat.

Critical Habitat

Piping Plover (*Charadrius melodus*) Designated Critical Habitat

The USDI Fish and Wildlife Service (2002) proposed areas of critical habitat to include prairie alkali wetlands and surrounding shoreline; river channels and associated sandbars and islands; and reservoirs and inland lakes and their sparsely vegetated shorelines, peninsulas, and islands. These areas provide primary courtship, nesting, foraging, sheltering, and brood-rearing and dispersal habitat for piping plovers. Dunn County does have designated critical habitat associated with the Missouri River.

Nest locations on barren river sandbars are most likely selected due to their sparse vegetation and relatively narrow beaches (100 – 400 m wide). Adults and juveniles will head for the wintering grounds after fledging (when chicks learn to fly), with most piping plovers departing by the end of August.

Anteau et al. (2014a) summarized the literature on a priori predicted relationship with relative abundance of piping plover and showed piping plover prefer nesting on islands (Powell and Cuthbert, 1992; Anteau et al., 2012) and avoid nesting near high bluffs (> 25 m rise in elevation within 250 m of the shore). The Project Area contains a narrow beach (0.3 – 1 m) with a high bank (~ 3 m) directly adjacent to shoreline. Anteau et al. (2014b) also showed plovers almost completely avoided segments with high bluffs. Shaffer et al. (2013) also concluded plovers breeding on sandbars on the Missouri River avoid bluffs features. The Action Area does not contain designated critical habitat for piping plover.

As defined under the ESA, the environmental baseline includes past and present impacts of all federal, state, and private actions in the Action Area; the anticipated impacts of all proposed federal actions in the area that have undergone formal or early section 7 consultation; and the impact of state and private actions which are contemporaneous with the section 7 consultation process. Future actions and their potential effects are not included in the environmental baseline. This section in combination with the previous section defines the current status of the species and its habitat in the action area and provides a platform to assess the effects of the proposed action under consultation with the USDI Fish and Wildlife Service.

General Setting

A species list from the USDI Fish and Wildlife Service (2018b) with all federally listed and candidate species within Dunn County, North Dakota was reviewed for this analysis. Using this list, we determined which of those species had a potential to occur within the Action Area. Species not known or with no potential of occurring in the Action Area are documented with rationale in **Table 3** and excluded. Excluded species have been dropped from further analysis by meeting one or more of the following conditions:

1. Species does not occur nor is expected in the Action Area during the time period activities would occur;
2. Occurs in habitats that are not present; and/or
3. Is outside of the geographical or elevation range of the species.

Work within the Action Area included an intensive survey for all Threatened and Endangered Species (TES), an evaluation of habitat components necessary to support these species, and documentation of land uses. Dr. Kevin Sedivec conducted a floristic- and faunal based complete search using a belt type transect survey (150 foot belt) and systematic survey of known habitat types. Search efforts were intensified in areas where threatened and endangered species were likely to occur. Intuitive directed searches were conducted in areas with homogenous habitats and vegetation. A complete observed species list of the surveyed areas was compiled during the field survey as required by the survey

protocol (**Appendix A**). Plant and wildlife species were identified in the field. Any unknown species were collected and later identified in the laboratory.

Environmental Baseline

The discussion of environmental baseline conditions will focus on habitat elements that are biological requirements of the species under consultation. Only those subsections that relate to this proposed project will be included. In general, the Environmental Baseline section of the BA should include:

State, tribal, local, and private actions already affecting the species or that will occur contemporaneously with the consultation. Unrelated federal actions affecting the same species or critical habitat that have completed formal or informal consultation are also part of the environmental baseline, as are federal and other actions within the action area that may benefit listed species or critical habitat. We provide:

1. A description of habitat for listed or proposed species in the Action Area and the amount of degradation that has occurred to date.
2. As much specific data as are reasonably available. This includes information from habitat inventories and surveys completed in the action area and the methods used.
3. A description of critical habitat and its condition if the action area includes designated or proposed critical habitat.
4. Maps and figures of specific relevant biological features relative to the proposed action (i.e., Permit and Action Areas).
5. Photographs when they can aid in describing environmental baseline conditions within the Permit and Action Areas.

Terrestrial Species and Habitat

The Project and Analysis Area has been impacted by human activity and disturbance for at least two decades. Since the proposed project area lies on previously disturbed land (cropped) and an

active well pad and pad used for storage tanks lie within the Analysis Area – a high volume of disturbance has occurred.

Grasslands

The grassland portions of the Action Area comprise all of the Project Area and 80 percent of Analysis Area. Approximately 50 percent of this area was heavily disturbed through farming and seeded to a tame grass/alfalfa mixture that is currently used for hay production. The remaining grasslands are classified as native rangelands that were historically inhabited by the Dakota skipper. With the past actions of the federal, state, local government, and the private sector, no preferred habitat exists for the Dakota skipper on the Project Area; however, marginal habitat occurs within the Analysis Area.

Forest Community

The forested community is found within the five green ash draws in the Analysis Area (no forested area is found within the Project Area). The green ash draws are intact forest region and has been disturbed the least by human development (Google Earth, 2018). The forested area would provide habitat for the gray wolf and northern long-eared bat.

The woodland area comprised approximately 20 percent of the Analysis Area. These woodland areas would provide preferred habitat for the gray wolf. However, heavy vehicle traffic occurs on the two gravel roads that lie adjacent (south and west) to the Project Area and with the noise associated with the active well pad found within the Analysis Area and lying north of the Project Area, the likely of a gray wolf using this area would be rare. Also, the North Dakota Game and Fish Department has stated gray wolf sightings in North Dakota are rare with breeding populations known not to occur in North Dakota (North Dakota Game and Fish Department 2016), the likelihood of this area being used by a gray wolf is extremely low – especially with more contiguous woodlands found to the west and north that have less human impact or presence.

The forest community found within the Analysis Area can provide habitat for the northern long-eared bat. Habitat varies by season; but the summer habitat – when this species is found in North

Dakota - requires large trees for roosting, occasionally roost in barns or structures, including bridges. Large trees (green ash) are found in the Analysis Area.

Shoreline

No shoreline is found within the Action Area or within 0.5 miles of the Action Area.

Aquatic Species and Habitat

No aquatic habitat is found within the Action Area or within 0.5 miles of the Action Area.

Analysis of Effects

In this section, a review of the impacts to species that have the potential to occur within the permit area is provided. Effect determinations will be given for the federally listed species and critical habitat. This project may affect (directly or indirectly) Dakota skipper, gray wolf and northern long-eared bat.

Direct Effects

Dakota skipper, gray wolf, northern long-eared bat

Construction activities will have no direct effect on any threatened and endangered species or candidate species. However, suitable habitat exists within the Analysis Area for Dakota skipper, northern long-eared bat and gray wolf. Although this project is not projected to physically disturb the native upland community (used by Dakota skipper) or remove trees from the forested region (green ash draws used by northern long-eared bat and gray wolf), the construction activity will increase noise and human activities which may deter adults from these three species from temporarily using the Action Area temporarily. These direct effects will only deter adults from using the adjacent habitat with risk of an actual “take” none.

There really are no measures within the scope of this project to minimize these direct effects of noise and human activities, as noise and human activity is already high in this area due to

farming and ranching practices, and pumping and hauling oil from adjacent pads. Because this project involves the building of a new well pad, the construction activities will not have any long-term impacts. There is sufficient habitat for foraging, resting and breeding directly west, north and east of the Action Area for adult Dakota skipper and northern long-eared bats to use when disturbed by noise and human activities.

When considering the recovery and management plans that are currently in place by the US Fish and Wildlife Service for the Dakota skipper and northern long-eared bats, this project will have no direct impact on these plans. These plans are designed to protect and enhance nesting and brood-rearing habitat for these species. Since required habitat is known not to occur within the Project Area, this project should not impact these recovery and management plans.

Designated Critical Habitat

No designated critical habitat is found within the Action Area or within 0.5 miles of the Action Area.

Indirect effects

The indirect effects will be addressed by first answering the ten indirect effect questions in the guidance document. If any question results in a “yes” for a threatened and endangered species, we will follow the same exposure/response framework as the direct effects.

1. Will the project create a new facility? “Yes”. A new well pad will be installed near a current well pad. The well pad will be located on unsuitable habitat for all threatened and endangers species, including candidate species; thus this new facility will have no indirect effects.
2. Will the project improve a level of service of an existing facility as established in local GMA plans? “No” The project will not enhance new services as an access road and electrical power already exists near the site.
3. Determine if the transportation project has a causal relationship to a land use change by answering the following questions.

-
- a. Is there a building moratorium in place that is contingent on the proposed improvement? “No”
 - b. Are there any land use changes tied by permit condition to the proposed improvement? “No”
 - c. Do the project’s NEPA documents identify other actions or land use changes caused by or resulting from the project that are reasonably certain to occur? I would assume “No”. I am not privy to the NEPA document if one was written.
 - d. Do development plans include scenarios for the planning area where land use differs based on a “build” and “no build” outcome related to the proposed project? “No”
 - e. Is there land use change that is likely to occur at a different rate as a result of the project? “No”

Cumulative Effects

Cumulative effects are effects resulting from state and private activities that are reasonably certain to occur within the Action Area. This section is necessary only if listed resources will be adversely affected. Based on the baseline evaluation and determined effects, we do not see any resources adversely affected.

Conclusions and Effect Determinations

Dakota skipper (*Hesperia dacotae*)

The project will have *“may effect, not likely to adversely affect”* on the Dakota skipper. No Dakota skippers, as expected due to timing of survey, were observed during the field survey. Suitable habitat, although marginal based on plant species composition, occurred within the Analysis Area. The thin loamy plant community to the west had inclusions of a little bluestem plant community that contained black samson and other flowering forbs – some plants desired

for suitable habitat. The nearest Dakota skipper designated habitat area was 29 miles to the north and the nearest historical record 8 miles west. The likelihood of this area being used by adult Dakota skippers is low, but could occur. This project is not expected to disturb the adjacent upland rangeland area, thus the “*not likely to adversely affect*” was determined.

Gray Wolf (*Canis lupus*)

The project will have “*may effect, not likely to adversely affect*” on the gray wolf. No gray wolves were observed during the field survey. Although limited suitable habitat occurs within the Analysis Area, no known population exist in North Dakota. Due to the close vicinity to well-traveled graveled roads, an active well pad, and lack of desired habitat, if a transient gray wolf appears, they will likely be diverted away from this area.

Interior Least Tern (*Sterna antillarum*)

The project will have “*no effect*” on the interior least tern. No interior least terns were observed during the field survey. No suitable habitat occurs in the Action Area.

Whooping Crane (*Grus Americana*)

The project will have “*no effect*” on the whooping crane. No whooping cranes were observed during the field survey; however, this was expected due to timing of survey. No suitable roosting habitat exists within the Action Area, and no small fields of harvested grain occur within Analysis Area. Although the whooping crane may fly over due to proximity of migration route, they will not land due to lack of foraging or loafing habitat.

Red knot rufa (*Calidris canutus*)

The project will have “*no effect*” on the red knot rufa. No red knot rufa were found during the survey period. This area is not within the breeding range of this species or migratory route. Only one sighting of a red knot rufa has occurred along the Missouri River south of Bismarck, ND.

Piping Plover (*Charadrius melodus*)

The project will have “*no affect*” to the piping plover. No piping plovers or nests were found within the Action Area and no designated critical habitat occurs within the Action Area.

Northern Long-eared Bat (*Myotis septentrionalis*)

The project will have a “*may affect, not likely to adversely affect*” determination on the northern long-eared bat. No northern long-eared bats were found during the survey period. However, the Missouri River, located 2.9 miles from proposed project area, is classified by the US Fish and Wildlife Service as primary range for this bat, specifically forested areas along the river. Suitable habitat in the form of large green ash trees were found within the Analysis Area based on this classification. The live and dead trees would provide primary roosting and nursery habitat for the northern long-eared bat.

The project proposal states no trees will be removed during the construction of this project. This will eliminate any chances of destroying an individual bat, thus this project is “*not likely to adversely affect*” the northern long-eared bat.

Pallid Sturgeon (*Scaphirhynchus albus*)

The project will have “*no effect*” to the pallid sturgeon. No pallid sturgeon habitat occurs within the Analysis Area.

Piping Plover Critical Habitat

Since no piping plover critical habitat occurs within the Analysis Area, this project will “*not likely to jeopardize the continued existence or adversely modify proposed critical habitat*” for piping plover.

Dakota skipper Critical Habitat

Since no Dakota skipper critical habitat occurs within the Analysis Area, this project will “*not likely to jeopardize the continued existence or adversely modify proposed critical habitat*” for Dakota skipper.

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Appendices

Appendix A. Official Species List

FLORAL SURVEY FORM			
Area Surveyed (acres): 500 acres within Analysis Area.	Survey Type: Belt transect and full area; systematic and focused		
Scientific Name ¹	Common Name	Date	Project Site
ACERACEAE - Elm Family <i>Acer negundo</i>	Box-elder	6- Sept. 2018	Low Cap SWD
ANACARDIACEAE – Sumac Family <i>Toxicodendron rydbergii</i>	Posion ivy		
ASCLEPIADACEAE- Milkweed Family <i>Asclepias syriaca</i>	Common milkweed		
ASTERACEAE - Sunflower Family <i>Achillea millefolium</i> <i>Ambrosia psilostachya</i> <i>Antennaria neglecta</i> <i>Arctium minus</i> <i>Artemisia absinthium</i> <i>Artemisia dracuncululus</i> <i>Artemisia frigida</i> <i>Artemisia ludoviciana</i> <i>Cirsium arvense</i> <i>Cirsium flodmanii</i> <i>Conyza canadensis</i> <i>Echinacea angustifolia</i> <i>Helianthus annuus</i> <i>Helianthus maximiliani</i> <i>Helianthus parciflorus</i> <i>Lactuca tatarica</i> <i>Lygodesmia juncea</i> <i>Machaeranthera pinnatifida</i> <i>Oligoneuron rigidum</i> <i>Ratibida columnifera</i> <i>Solidago mollis</i>	Common yarrow Western ragweed Field pussytoes Lesser burdock Absinth wormwood Silky wormwood Prairie sagewort Cudweed sagewort Canada thistle Flodmans thistle Canadian horseweed Black samson Common sunflower Maximilian sunflower Stiff sunflower Blue lettuce Rush skeletonplant Lacy tansyaster Stiff goldenrod Upright prairie coneflower Soft goldenrod		

<i>Symphyotrichum ericoides</i>	White heath aster
<i>Symphyotrichum lanceolatum</i>	White panicle aster
<i>Symphyotrichum oblongifolium</i>	Aromatic aster
<i>Taraxacum officinale</i>	Dandelion
<i>Tragopogon dubius</i>	Goatsbeard
BRASSICACEAE - Mustard Family	
<i>Lepidium densiflorum</i>	Peppergrass
CAPRIFOLIACEAE - Honeysuckle Family	
<i>Symphoricarpos occidentalis</i>	Western snowberry
CARYOPHYLLACEAE – Carnation Family	
<i>Silene antirrhina</i>	Sleepy silene
CHENOPODIACEAE - Goosefoot Family	
<i>Bassia scoparia</i>	Burningbush
<i>Chenopodium album</i>	Lamb's quarters
<i>Salsola kali</i>	Russian thistle
CONVOLVULACEAE – Morning glory Family	
<i>Convolvulus arvensis</i>	Field bindweed
CYPERACEAE – Sedge Family	
<i>Carex inops</i>	Sun sedge
ELAEGANACEAE – Oleaster Family	
<i>Shepherdia argentea</i>	Silver buffaloberry
EQUISETACEAE - Horsetail Family	
<i>Equisetum laevigatum</i>	Smooth horsetail
FAGACEAE – Beach Family	
<i>Quercus macrocarpa</i>	Bur oak
FABACEAE - Legume Family	
<i>Glycyrrhiza lepidota</i>	Wild licorice
<i>Melilotus officinalis</i>	Yellow sweet clover
<i>Medicago sativa</i>	Alfalfa
<i>Pedimelum argophyllum</i>	Silver-leaf scurfpea
<i>Vicia americana</i>	American vetch

LAMIACEAE - Mint Family

Hedeoma hispidum

Rough false pennyroyal

Nepeta cataria

Catnip

Monarda fistulosa

Wild bergamot

MALVACEAE - Mallow Family

Sphaeralcea coccinea

Scarlet globemallow

OLEACEAE - Olive Family

Fraxinus pennsylvanica

Green ash

ONAGRACEAE - Evening Primrose Family

Gaura coccinea

Scarlet gaura

Oenothera biennis

Common evening primrose

POACEAE - Grass Family

Andropogon gerardii

Big bluestem

Aristida purpurea

Purple threeawn

Bouteloua gracilis

Blue grama

Bromus inermis

Smooth brome

Calamovilfa longifolia

Prairie sandreed

Dichanthelium wilcoxianum

Fall rosette grass

Elymus repens

Quackgrass

Hesperostipa comata

Needle-and-thread

Nassella viridula

Green needlegrass

Pascopyron smithii

Western wheatgrass

Poa compressa

Canada bluegrass

Poa pratensis

Kentucky bluegrass

Schizachyrium scoparium

Little bluestem

Setaria pumila

Yellow foxtail

RANUNCULACEAE – Buttercup Family

Anemone cylindrica

Candle anemone

ROSACEAE - Rose Family

Prunus virginiana

Chokecherry

Rosa arkansana

Prairie rose

Rosa woodsii

Wood's rose

SOLANACEAE – Nightshade Family

Physalis virginiana

Virginia ground cherry

ULMACEAE - Elm Family

Ulmus pumila

Siberian elm

¹ Plant nomenclature was determined using the USDA Plants Database (USDA Natural Resources Conservation Service 2016).

BIRD SURVEY FORM		
Area Surveyed (acres): 500 acres within Analysis Area.		Survey Type: Belt transect and full area; systematic and focused
Scientific Name ¹	Common Name	
<i>Ammodramus savannarum</i>	Grasshopper sparrow	
<i>Anas strepera</i>	Gadwall	
<i>Corvus brachyrhynchos</i>	Crow	
<i>Junco hyemalis</i>	Dark eyed junco	
<i>Pica pica</i>	Magpie	
<i>Spizella passerina</i>	Chipping sparrow	
<i>Spizella pusilla</i>	Field sparrow	
<i>Sturnella neglecta</i>	Meadow lark	
<i>Turdus migratorius</i>	American robin	
<i>Zenaida macroura</i>	Mourning dove	

¹ Bird species nomenclature was determined using The Auk: Ornithological Advances (2016).

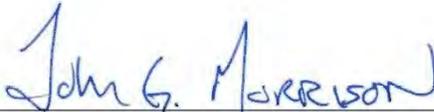
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**LOW CAP SWD:
A CLASS III CULTURAL RESOURCE INVENTORY,
DUNN COUNTY, NORTH DAKOTA**

Prepared For:
Independence ND, LLC
New Town, North Dakota

Principal Investigator:


John G. Morrison

Prepared By:
John G. Morrison
Juniper, LLC
Bismarck, North Dakota

**Class III Cultural Inventory
Attachment T2 (11 pages)**
LOW CAP SWD 1
Independence ND, LLC
SWNW Section 17-149-91
Heart Butte Field
Dunn County, ND

Report of Investigation: 520

October 2018

MANUSCRIPT DATA RECORD FORM

- 1. Manuscript Number:
- 2. SHPO Reference #:
- 3. Author(s): John G. Morrison
- 4. Title: Low Cap SWD: A Class III Cultural Resource Inventory, Dunn County, North Dakota
- 5. Report Date: October 2018
- 6. Number of Pages: 10
- 7. Type I, T, E, O: I
- 8. Acres: 20
- 9. Legal Location(s) with Historic Context Study Unit(s):

COUNTY	TWP	R	SEC	SU
DU	149	92	17	GS

Small Survey Report
Submitted by Juniper, LLC
315 East Broadway Ave., Bismarck, ND 58501
Phone: (701) 400-3575, Email: j.morrison@juniperenvironmental.com

Report Title: Low Cap SWD: A Class III Cultural Resource Inventory, Dunn County, North Dakota

Author: John G. Morrison

Report Date: October 2018

Acres 20 acres

Survey Date: September 12, 2018

Project Sponsor: Independence ND, LLC, New Town, North Dakota

Historic Context: Garrison Study Unit (#6)

Legal Description/Location of Project Area: This project consists of the development of a salt water disposal well and two access road in Section 17, Township (T.) 149 North (N.), Range (R.) 92 West (W.), Dunn County, North Dakota (Figure 1 - Figure 3). The project area lies approximately 15 miles east of Mandaree in a privately owned agricultural field within the Ft. Berthold Indian Reservation.

Description of Proposed Project: The proposed undertaking is the development of a well location in the SW/NW of Section 17, T. 149 N., R. 92 W., with access to and from the exiting county road which runs along the southern side of the well location (Figure 1 - Figure 3). The intensive pedestrian inventory covered a 20 acre block centered on the proposed well pad. Both access roads entering and leaving the well location are contained within the 20 acre block. The inventory was conducted to Class III Intensive Pedestrian Inventory standards of the State Historical Society of North Dakota (SHSND 2018).

Results of File Search: A Class I Literature Review of the State Historical Society of North Dakota's site and manuscript files was conducted for the project area by William Christensen on September 4, 2018 for a one-mile radius around the proposed development (Table 1). There are 19 previously recorded cultural resources and 24 previous cultural resource investigations within a mile of the proposed development. The closest resource is 32DU1661, a prehistoric cairn, approximately 1300' east of the well location on the opposite side of the county road. None of the previously recorded cultural resources will be impacted by the proposed undertaking.

Field Personnel: John G. Morrison (Principal Investigator). Juniper notified and informed the Mandan, Hidatsa, and Arikara Nation Tribal Historic Preservation Office (MHA THPO) of the proposed inventory. The MHA THPO declined to participate with the inventory. Juniper contacts and informs the MHA THPO if prehistoric cultural resources are found during the inventory.

Field Methods and Conditions: Juniper archaeologist inventoried the 20 acre block using parallel pedestrian transects spaced no more than 15 meters apart. The inventory block lies within an recently cut hay field. A county road and its right-of-way ditches runs east to west through the southern edge of the inventory block.

Small Survey Report
Submitted by Juniper, LLC
315 East Broadway Ave., Bismarck, ND 58501
Phone: (701) 400-3575, Email: j.morrison@juniperenvironmental.com

Ground surface visibility (GSV) within the project corridor averaged 40%. Rodent burrows, road cutbanks, and any other areas of increased visibility were intensively investigated for evidence of buried cultural material that may not have a surface expression.

Results and Recommendations: No new or previously recorded cultural resources were encountered during the inventory effort. Because no new or previously recorded resources lie within the inventory block and because the MHA THPO did not express any concerns with the project, Juniper recommends a finding of *No Historic Properties Affected* for the proposed undertaking as described in this document.

References Cited:

State Historical Society of North Dakota (SHSND)

2018 *NDSHPO Manual for Cultural Resource Investigations Revised Edition*. Produced by and available at the Division of Archaeology and Historic Preservation, State Historical Society of North Dakota, Bismarck.

Maps and Photos Sections

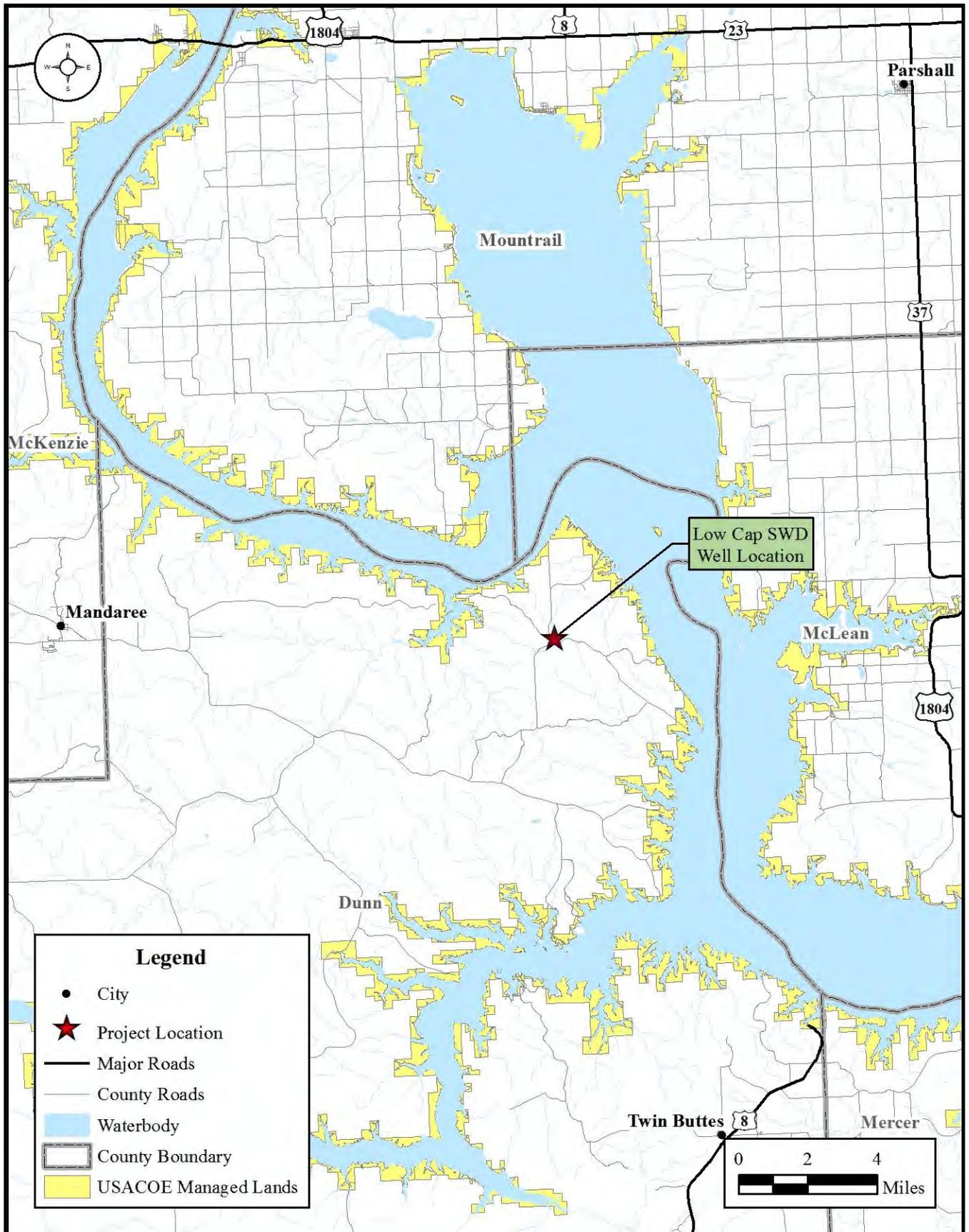


Figure 1: Regional location of the Low Cap SWD Well Location.

Maps and Photos Sections

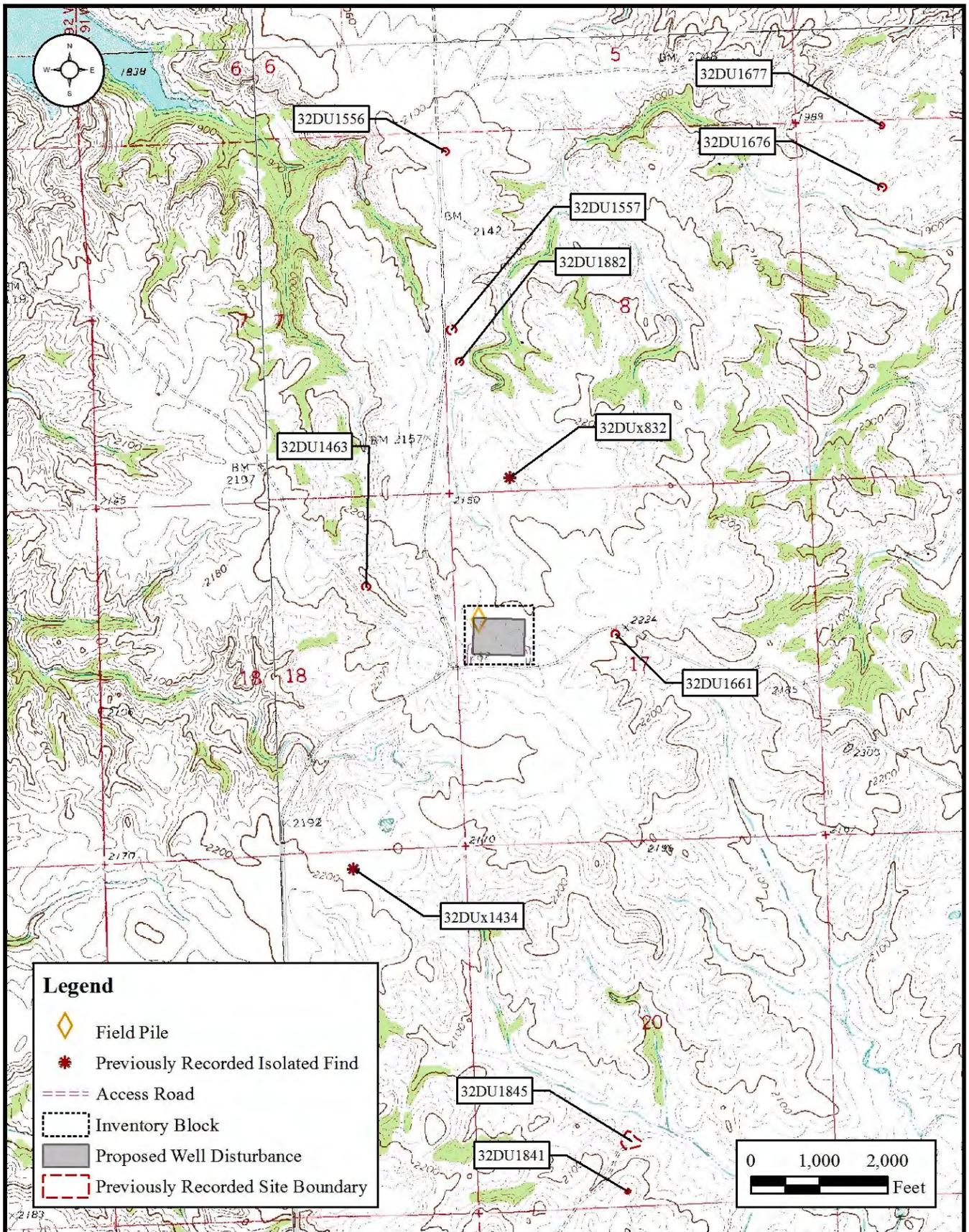


Figure 2: Location of the proposed well disturbance, the inventory block, and previously recorded cultural resources as depicted on the USGS 7.5' New Town SW (1967) and New Town SE (1967), String Buttes (1970) and Saddle Buttes (1970) quadrangle maps.

Maps and Photos Sections



Figure 3: Location of the proposed well disturbance, the inventory block, and previously recorded cultural resources as depicted on the 2017 NAIP Dunn County aerial photograph.

Maps and Photos Sections



Figure 4: Overview from the southwestern portion of the inventory block, view across the block to the east.



Figure 5: Overview from near the northeastern corner of the inventory block, view to the west.

Maps and Photos Sections

Table 1: Results of the Site, Site Lead, and Isolated Find Files Search					
Sec-Twp/Rng	SITS#	Type	Recorder Date	NRHP Status	MS #
7-149/91	No Historic Properties Recorded.				12616, 14307.
8-149/91	32DU1556	Archaeological - Cairn, Depression	Herson/Schleicher 2010	UN	14307, 13931, 12620, 12612, 12916, 13388, 14237, 17414
	32DU1557	Historic - Foundations	Klitzka/Cooper 2010	UN	
	32DU1882	Historic - Foundation, Cultural Materials Scatter	Picka/Yost 2013	UN	
	32DUx832	Isolated Find - Cast Iron Disk Plow	Klitzka 2010	NE	
9-149/91	32DU1676	Archaeological - Cairn	Reinhart/Yost 2011	UN	14037, 15540, 12916, 13605, 14307
	32DU1677	Archaeological - Cairns	Wandler/Cox 2012, Reinhart/Yost 2011	UN	
	32DU1694	Archaeological - Cairn	Picka/McCarty 2012, O' Donnchadha 2011	UN	
	32DU1695	Archaeological - Cairn	Picka/McCarty 2012, O' Donnchadha 2011	UN	
	32DU1846	Archaeological - Cairn	Robinson 2012	UN	
16-149/91	32DU1866	Archaeological - Cairn	Picka/McCarty 2012	UN	13933, 14307, 12940, 12637, 14037
	32DU1867	Archaeological - Cairn	McCarty 2013, Picka/McCarty 2012	UN	
17-149/91	32DU1661	Archaeological - Cairn	Herson/Smith 2011	UN	14238, 16316, 17414, 13928, 12637, 13388, 12940, 12612, 12620, 12616, 13933, 14307
18-149/91	32DU1463	Archaeological - Cairn	Shropshire 2009	UN	14307, 14032, 12616, 12612, 17414, 14451, 16321
19-149/91	32DU1838	Archaeological - Cairn	Leroy 2012	UN	16321, 14451, 12612, 14032, 13927, 14307
	32DUx1083	Isolated Find - Chipped Stone	Leroy 2012	NE	
	32DUx1124	Isolated Find - Chipped Stone	Mitchell 2013	NE	
	32DUx1434	Isolated Find - Chipped Stone	Brooks 2015	NE	
20-149/91	32DU1841	Archaeological - Cairn	Leroy 2012	UN	14307
	32DU1845	Architectural - Farmstead	Robinson/Leroy 2012	UN	
21-149/91	No Historic Properties Recorded.				14307, 13933, 13949, 12940

CMS=Cultural Material Scatter

Maps and Photos Sections

Table 2: Results of the Manuscript Review	
MS#	Reference
12612	Lechert, Stephanie 2010 <i>A Class I and Class III Cultural Resource Inventory of the Arrow Phase 2E BIA 13 Pipeline Connecting to the Arrow Phase 2E and East Mandaree Pipelines on the Fort Berthold Indian Reservation, Dunn Co., ND.</i>
12616	Eisenhauer, Nancy F. 2010 <i>A Class I and Class III Cultural Resource Inventory of the Arrow XTO Walter Packs Wolf Gathering Line, Fort Berthold Indian Reservation, Dunn Co., ND.</i>
12620	Schleicher, Jolene 2010 <i>A Class I and Class III Cultural Resource Inventory of the Arrow Pipeline Questar MHA 2-6-1H Gathering Pipeline on the Fort Berthold Indian Reservation, Dunn Co., ND.</i>
12637	Riordan, Carolyn 2011 <i>A Class I and Class III Cultural Resource Inventory of the Sarah Yellow Wolf #22-27H Well Pad and Utility Corridor, Fort Berthold Indian Reservation, Dunn Co., ND.</i>
12916	Sherman, Martin H 2011 <i>A Class I and Class III Cultural Resource Inventory of the Edward Goodbird #9-9H Well Pad and Utility Corridor, Fort Berthold Indian Reservation, Dunn County, North Dakota & Addendum.</i>
12940	Leroy, Adam 2011 <i>A Class I and Class III Cultural Resource Inventory of the FBIR Black Medicine #24x-21 Gathering Pipeline, Fort Berthold Indian Reservation, Dunn County, North Dakota.</i>
13388	Wandler, Cole B. 2012 <i>A Class I and Class III Cultural Resource Inventory of the Arrow Station #6: Phase 2E-BIA13 Compressor Station, Fort Berthold Indian Reservation, Dunn County, North Dakota.</i>
13605	Leroy, Adam 2012 <i>A Class I and Class III Cultural Resource Inventory of the Arrow Bullet Pod Pipeline System, Fort Berthold Indian Reservation, Dunn County, North Dakota.</i>
13927	Rodgers, Justin 2012 <i>Bird #31x-19G and Stephen #31x-19G Well Pad and Access Road: A Class III Cultural Resource Inventory in Dunn County, North Dakota.</i>
13928	Rodgers, Justin 2012 <i>Beaks #21x-17H and Hunts Medicine #21x-8H Well Pad and Access Road: A Class III Cultural Resource Inventory in Dunn County, North Dakota.</i>
13931	Rodgers, Justin <i>Beaks #24x-8 and Hunts Medicine #24x-8 Well Pad Expansion: A Class III Cultural Resource Inventory in Dunn County, North Dakota.</i>
13933	Klinner, Duane G. 2011 <i>FBIR Black Medicine 24x-21 Well Pad and Access Road: A Class III Cultural Resource Inventory in Dunn County, North Dakota.</i>
13949	Wandler, Cole B 2012 <i>A Class I and Class III Cultural Resource Inventory of the Arrow MHA #1, 2, 3, 4-26-25H-149-91 & #1, 2, 3, 4-26-24H-149-91 (Walleye Pod) Pipeline System, Fort Berthold Indian Reservation, Dunn County, North Dakota.</i>
14032	Cox, Matthew A. 2013 <i>A Class I and Class III Cultural Resource Inventory of the Arrow FBIR Bird #21X-19A Pipeline System, Fort Berthold Indian Reservation, Dunn County, North Dakota.</i>
14037	Wandler, Cole B 2013 <i>Addendum to A Class I and Class III Cultural Resource Inventory of the Arrow Bullet Pod Pipeline System, Fort Berthold Indian Reservation, Dunn County, North Dakota, for an Alternate Alignment.</i>
14237	Wandler, Cole B 2013 <i>Cultural Resource Monitoring of Construction Activities for the Arrow Questar MHA #1, 2-06-01H-149-92 Pipeline System, Fort Berthold Indian Reservation, Dunn County, North Dakota.</i>

Maps and Photos Sections

Table 2: Results of the Manuscript Review	
MS#	Reference
14238	Picka, Craig M. 2013 <i>A Class I and Class III Cultural Resource Inventory of the Arrow Station #6 Loop Line Pipeline System, Fort Berthold Indian Reservation, Dunn County, North Dakota.</i>
14307	Cox, Matthew A. 2013 <i>A Class I and Class III Cultural Resource Inventory of the McKenzie Electric Underground Distribution Line, Phases 1, 2, 3, 4, 5, and 6, Fort Berthold Indian Reservation, Dunn County, North Dakota.</i>
14451	Mitchell, Mary R. 2013 <i>Walterpackswolf 24X-13 Well Pad and Access Road: A Class III Cultural Resource Inventory in Dunn County, North Dakota.</i>
15540	Schleicher, J. et al. 2011 <i>A Cultural Resources Inventory of U. S. Army Corps of Engineers Managed Lands on Lake Sakakawea, Dunn County, North Dakota Volume I.</i>
16316	Picka, Craig M. 2014 <i>An Addendum to A Class I and Class III Cultural Resource Inventory of the Arrow Station #6 Loop Line Pipeline System, Fort Berthold Indian Reservation, Dunn County, North Dakota.</i>
16321	Reiners, Lindsey 2015 <i>Reservoirs, Access Roads, Pipeline tie-ins Project: A Class III Intensive Cultural Resource Inventory in Dunn and McKenzie Counties, North Dakota.</i>
17414	Weston, B 2017 <i>A Class III Cultural Resource Inventory of the XTO Breaks URD Line in Dunn County, North Dakota.</i>

U. DESCRIPTION OF BUSINESS

Independence ND, LLC is a 100% Indian-owned business established on June 21, 2018 for the sole purpose of safely disposing Class II fluids on the Fort Berthold Indian Reservation. Independence ND's headquarters are located at 301 1st Ave. E Bakersfield, New Town, ND 58763-4405.

