



Received

September 14, 2017

SEP 20 2017

ND Oil & Gas  
Division

Mr. Todd Holweger  
Permit Manager  
North Dakota Industrial Commission  
Oil and Gas Division  
600 East Boulevard Avenue, Dept. 405  
Bismarck, ND 58505-0840

Dear Mr. Holweger:

Subject: Affidavit of Landowner Notification

Please accept this letter as an affidavit of compliance associated with Permit #97-0280 requirements. Aurora Energy Solutions, Bismarck, North Dakota, acting as an agent of the Energy & Environmental Research Center, did provide hard copies of North Dakota Century Code (NDCC) Section 38-08.1-04.1 (Exploration Permit) and NDCC Chapter 38.11.1 (Oil and Gas Production Damage Compensation) to landowners within 1/2 mile of the geophysical activities.

If you have any questions, please e-mail me at [wpeck@undeerc.org](mailto:wpeck@undeerc.org) or call me at (701) 777-5195.

Sincerely,

Wesley D. Peck  
Principal Geologist, Geosciences  
Group Lead

WDP/krh



**GEOPHYSICAL EXPLORATION AFFIDAVIT OF COMPLETION REPORT - FORM GE 6B**  
 INDUSTRIAL COMMISSION OF NORTH DAKOTA  
 OIL AND GAS DIVISION  
 600 EAST BOULEVARD DEPT 405  
 BISMARCK, ND 58505-0840  
 SFN 51456 (03-2011)

Received

SEP 20 2017

ND Oil & Gas  
 Division

PERMIT NAME (Required): North Dakota Carbon SAFE 2-D Seismic Line

PERMIT NUMBER: 97-0280

**AFFIDAVIT OF COMPLETION (GEOPHYSICAL CONTRACTOR)**

STATE OF North Dakota )

COUNTY OF Grand Forks )

Before me, Deelynn Heisler, a Notary Public in and for the said

County and State, this day personally appeared Wes Peck

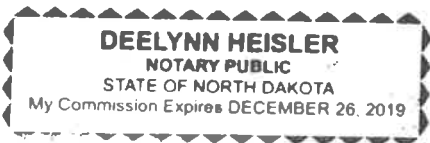
who being first duly sworn, deposes and says that (s)he is employed by

Energy & Environmental Research Center, that (s)he has read North Dakota

Century Code Section 38-08.1, that the foregoing seismic project has been completed in accordance with North Dakota Administrative Code Rule 43-02-12 and that the statements on the reverse side of this document are true.

Geophysical Contractor Representative

Subscribed in my presence and sworn before me this 15<sup>th</sup> day of September, 2017.



Notary Public

My Commission Expires December 26<sup>th</sup> 2019



# GEOPHYSICAL EXPLORATION COMPLETION REPORT FORM GE 6A

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 51456 (03-2011)

Received

SEP 20 2017

ND Oil & Gas  
Division

Permit No. <b>97-0280</b>	
Shot Hole Operations	*Non-Explosive Operations <b>Weight-drop source</b>

## SECTION 1

Geophysical Contractor <b>Energy &amp; Environmental Research Center</b>	
Project Name and Number <b>North Dakota Carbon SAFE 2-D Seismic Line</b>	County(s) <b>Oliver</b>
Township(s) <b>141N, 142N</b>	Range(s) <b>84W</b>
Drilling and Plugging Contractors <b>NA</b>	
Date Commenced <b>September 5, 2017</b>	Date Completed <b>September 8, 2017</b>

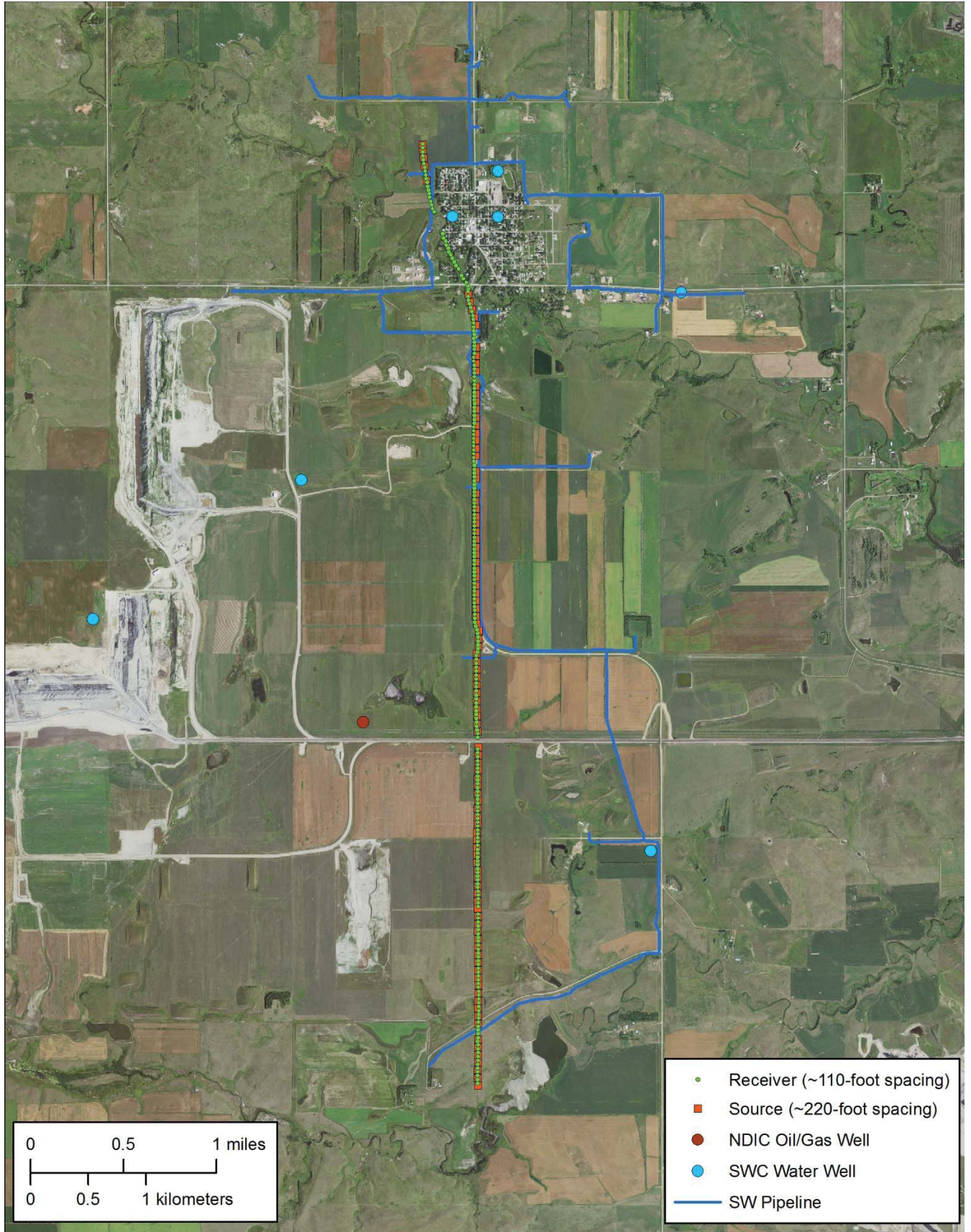
## SECTION 2

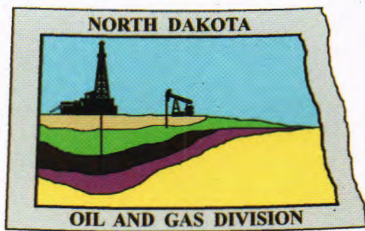
First S.P. #												Last S.P. #
Loaded Holes (Undetonated Shot Points)												
S.P.#'s												
Charge Size												
Depth												
Reasons Holes Were Not Shot												

## SECTION 3

Flowing Holes and/or Blowouts S.P.#'s
Procedure for Plugging Flowing Holes and/or Blowouts
Include a 7.5 minute USGS topographic quadrangle map or a computer generated post-plot facsimile of the approximate scale displaying each individual shot hole, SP #, line #, and legal location.

\*Non-Explosive Operations - Complete Section 1 and Affidavit (Form GE 6B).





# Oil and Gas Division

Lynn D. Helms - Director      Bruce E. Hicks - Assistant Director

## Department of Mineral Resources

Lynn D. Helms - Director

## North Dakota Industrial Commission

[www.dmr.nd.gov/oilgas/](http://www.dmr.nd.gov/oilgas/)

August 21, 2017

Mr. Nick Kalenze  
Civil Engineer  
15 N. 23<sup>rd</sup> Street  
Stop 9018  
Grand Forks, ND 58202-9018

RE: NORTH DAKOTA CARBON SAFE 2-D SEISMIC LINE  
GEOPHYSICAL EXPLORATION PERMIT #97-0280  
OLIVER COUNTY  
NON EXPLOSIVE METHOD

Dear Mr. Kalenze:


Please be advised that we are in receipt of your Geophysical Exploration permit application and it is conditionally approved; effective for one year from August 21, 2017. **PURSUANT TO NDAC 43-02-12-05 (DISTANCE RESTRICTION) non-explosive exploration method may not be conducted not less than 300 feet from a water well, building, underground cistern, pipelines, and flowing spring. In addition, pursuant to NDAC 43-02-12-06 (NOTIFICATION OF WORK PERFORMED), "The director is authorized to suspend operations of the entire geophysical project, or any portion thereof, if further activity will cause excessive damage to the surface of the land".** Review the following conditions for your permit:

1. A pre-program meeting with state seismic inspector Tom Torstenson is required. You must contact him at 701-290-1546 (cell) or 701-227-7436 at least 24 hours prior to any exploration operations. Also, a copy of the entire permit is required for all contractors at the pre-program meeting.
2. All variances for distance restrictions are to be furnished, and a pre-plot map displaying any source points that do not comply with the distance restriction rule must be supplied to the inspector.
3. The following information must be submitted within 30 days of the completion of the project by the Geophysical Company:
  - a. Completion Report,
  - b. Completion Affidavit,
  - c. Post Plot Map. It must show all water wells, buildings, underground cisterns, pipelines, and flowing springs that fall within the program area and within one half mile of the perimeter of the program.

- d. Must provide a GIS layer using NAD83 in an Esri shape file format and an Image file (.img) on a Flash Drive or email: [ttorstenson@nd.gov](mailto:ttorstenson@nd.gov) with all source and receiver points,
  - e. Affidavit stating that the Geophysical Company has given all surface owner's a copy of the Section and Chapter of the NDCC as stated in paragraph 4.
4. It is required that within seven days of initial contact between the permitting agent and the operator of the land, the permitting agent shall provide the operator of the land and each landowner owning land within one-half mile of the land on which geophysical exploration activities are to be conducted a written copy of NDCC Section 38-08.1-04.1 (Exploration Permit) and NDCC Chapter 38-11.1 (Oil and Gas Production Damage Compensation). The permitting agent shall file an affidavit with this office confirming compliance with such notification. For your convenience, copies of both Sections are enclosed.
  5. The permit agent shall notify the operator of the land at least seven days before commencement of any geophysical exploration activity, unless waived by mutual agreement of both parties. The notice must include the approximate time schedule and the location of the planned activity.
  6. Information regarding the location of water wells, springs, etc.; refer to the following ND State Water Commission Mapservice website, at: <http://mapservice.swc.state.nd.us/>
  7. The entire permit can be viewed, as well as the status of various seismic projects in the state, at: <https://www.dmr.nd.gov/oilgas/seismic/seismicstats.asp>

Should you have any questions regarding this matter, feel free to contact me at 701-328-8020, or Tom Torstenson at the number listed in paragraph 1.

Sincerely,



Todd L. Holweger  
Permit Manager



**GEOPHYSICAL EXPLORATION PERMIT - FORM GE 1**  
 INDUSTRIAL COMMISSION OF NORTH DAKOTA  
 OIL AND GAS DIVISION  
 600 EAST BOULEVARD DEPT 405  
 BISMARCK, ND 58505-0840  
 SFN 51459 (03-2011)

**RECEIVED**  
**AUG 16 2017**  
**ND Oil & Gas Div.**

1) a. Company <b>UND EERC</b>		Address <b>15 N 23rd St, Stop 9018, Grand Forks, ND 58202-9018</b>			
Contact <b>Wes Peck</b>		Telephone <b>(701) 777-5195</b>		Fax <b>(701) 777-5181</b>	
Surety Company <b>Bank of North Dakota (Cash Bond)</b>		Bond Amount <b>\$25,000</b>		Bond Number <b>GEO 200</b>	
2) a. Subcontractor(s)		Address		Telephone	
b. Subcontractor(s)		Address		Telephone	
3) Party Manager <b>Shaughn Burnison</b>		Address (local) <b>See above</b>		Telephone (local) <b>(650) 815-1619</b>	
4) Project Name or Line Numbers <b>North Dakota Carbon SAFE 2-D Seismic Line</b>					
5) Exploration Method (Shot Hole, Non-Explosive, 2D, 3D, Other) <b>2-D line using weight-drop source</b>					
6) Distance Restrictions (Must check all that apply)					
<input checked="" type="checkbox"/> 300 feet - NonExplosive - Distance setbacks apply to water wells, buildings, underground cisterns, pipelines, and flowing springs.					
<input type="checkbox"/> 660 feet - Shot Hole - Distance setbacks apply to water wells, buildings, underground cisterns, pipelines, and flowing springs.					
7) Size of Hole	Amt of Charge	Depth	Source points per sq. mi.	No. of sq. mi.	
3-D					
Size of Hole	Amt of Charge	Depth	Source points per ln. mi.	No. of ln. mi.	
2-D <b>NA</b>	<b>NA</b>	<b>Surface</b>	<b>24</b>	<b>5</b>	
8) Approximate Start Date <b>September 5, 2017</b>			Approximate Completion Date <b>September 14, 2017</b>		

**THE COMMISSION MUST BE NOTIFIED AT LEAST 24 HOURS IN ADVANCE OF COMMENCEMENT OF GEOPHYSICAL OPERATIONS**

9) Location of Proposed Project - County <b>Oliver</b>					
Section(s), Township(s) & Range(s)	Section	T.	R.		
	<b>2, 3, 10, 11</b>	<b>141N</b>	<b>84W</b>		
	Section	T.	R.		
	<b>15, 22, 23, 26, 27, 34, 35</b>	<b>142N</b>	<b>84W</b>		
	Section	T.	R.		
	Section	T.	R.		

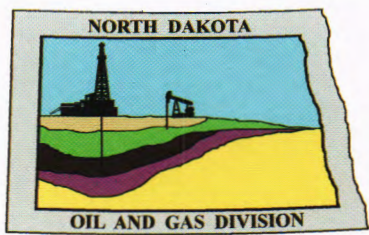
I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records. Date **8-16-17**

Signature <i>Nick Kalenze</i>	Printed Name <b>Nick Kalenze</b>	Title <b>Civil Engineer</b>
Email Address(es) <i>nkalenze@undeerc.org</i>		

(This space for State office use)		<b>Permit Conditions</b>
Permit No. <b>97-0280</b>	Approval Date <b>8/21/2017</b>	
Approved by <i>[Signature]</i>		
Title <b>Mineral Resources Permit Manager</b>		* Permit in hand required at pre-program meeting with field inspector and be aware of all NDIC Rules and Regulations (i.e. distance restrictions).
		* See attached letter.

\*See Instructions On Reverse Side

*CK# 3001350 \$100 8-16-17 MH*



# Oil and Gas Division

Lynn D. Helms - Director      Bruce E. Hicks - Assistant Director

**Department of Mineral Resources**

Lynn D. Helms - Director

**North Dakota Industrial Commission**

[www.dmr.nd.gov/oilgas/](http://www.dmr.nd.gov/oilgas/)

August 21, 2017

The Honorable Judith Hintz  
Oliver County Auditor  
P.O. Box 188  
Center, ND 58530-0188

RE: Geophysical Exploration  
Permit # 97-0280

Dear Ms. Hintz:

Pursuant to Section 38-08.1-04.2 of the North Dakota Century Code, please be advised that the UND Energy & Environmental Research Center was issued the above captioned permit on August 21, 2017 and will remain in effect for a period of one year. The entire permit can be viewed on our website at: <https://www.dmr.nd.gov/oilgas/seismic/seismicstats.asp>

Should you have any questions, please contact our office.

Sincerely,

Todd L. Holweger  
Permit Manager



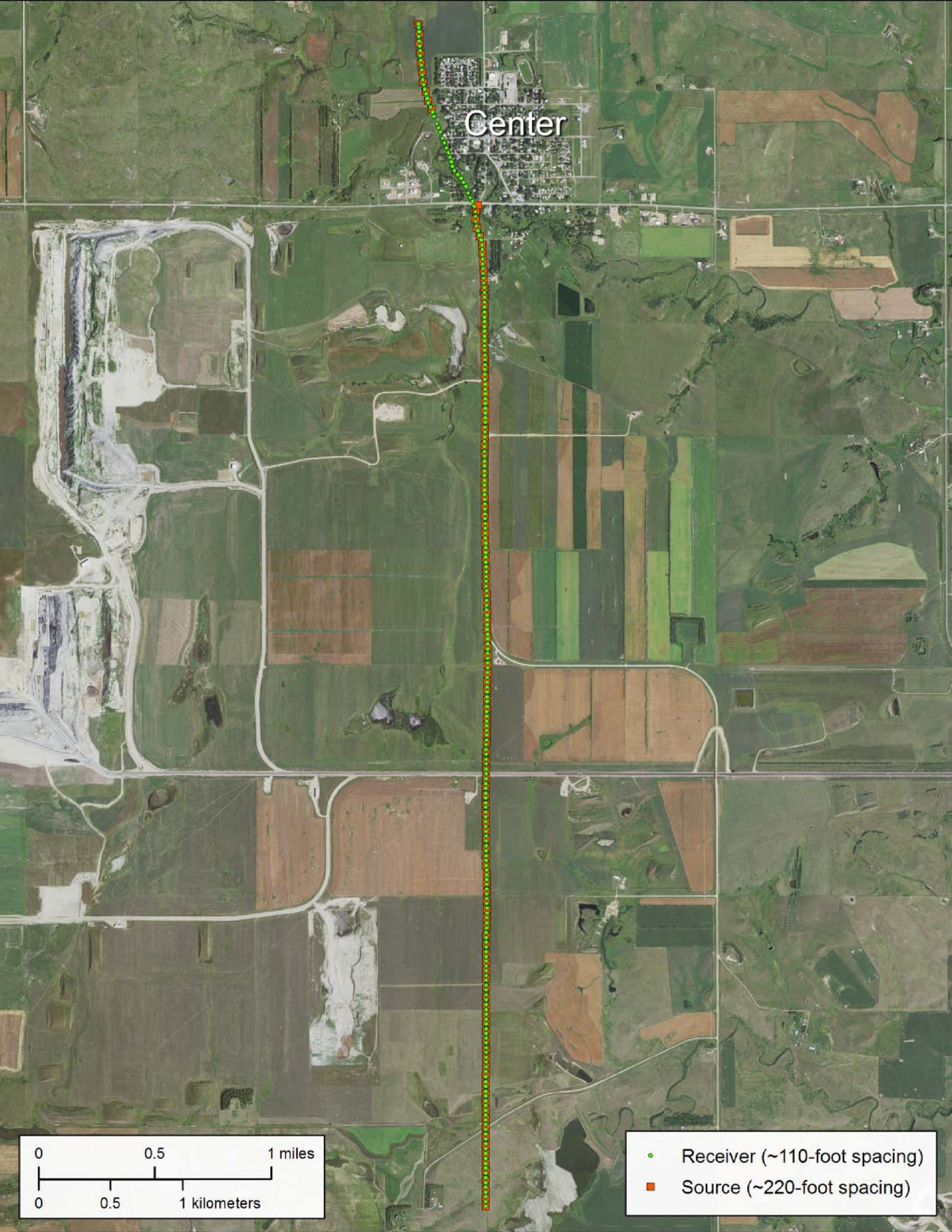
## SAFE, PERMANENT CO<sub>2</sub> GEOLOGIC STORAGE SEISMIC DATA ACQUISITION

The Energy & Environmental Research Center (EERC), through its North Dakota CarbonSAFE project, is investigating the feasibility of developing safe, permanent, commercial-scale CO<sub>2</sub> geologic storage in central North Dakota. A diverse and committed team has been assembled to address the challenges of the project, ensure its success, and promote North Dakota's statewide vision for carbon management. The project team includes the U.S. Department of Energy, North Dakota's Lignite Research Council, Basin Electric Power Cooperative, ALLETE Clean Energy, BNI Energy, North American Coal, Minnkota Power Cooperative (Minnkota), Schlumberger Carbon Services, Computer Modelling Group, Ltd. (CMG), and Prairie Public Broadcasting.

As part of the feasibility study, the Broom Creek and overlying Opeche Formations will be evaluated (core and seismic collection) to better understand their geologic properties with respect to CO<sub>2</sub> storage. The EERC will collect a ~ 5-mile-long 2-D seismic line to tie existing historical 2-D seismic lines to a new stratigraphic test well that will be drilled as part of this project. Collection of the 2-D seismic line will involve the use of the EERC's in-house seismic acquisition system, which employs cable-free autonomous seismic sensors and a GISCO ESS850 850-lb seismic weight-drop source (Figure 1). This seismic source is a trailer-mounted, elastomer-assisted weight-drop that has a much lower impact compared to conventional Vibroseis trucks commonly used for onshore seismic exploration surveys. Typically, no ground motion is detectable by humans beyond about ~50 feet from the source. To compensate for the lower impact, normal practice is to collect 16 shots at each shotpoint. The planned ~5-mile-long seismic line will use existing roadways to minimize off road activity.



Figure 1. Right: Photo of the EERC seismic acquisition team operating the GISCO ESS850 850-lb seismic weight-drop source along an existing roadway in southwestern Montana. Left: Photo of the EERC's autonomous seismic sensors deployed along the same roadway.



Center

- Receiver (~110-foot spacing)
- Source (~220-foot spacing)

0 0.5 1 miles  
0 0.5 1 kilometers