

Project Summary 2015 Sinkhole Filling Contract AM-720-15



**North Dakota Public Service Commission
Abandoned Mine Lands Division
600 East Boulevard Avenue, Department 408
Bismarck, ND 58505-0480**

January 2016

**North Dakota Public Service Commission
2015 Sinkhole Filling AML Project Summary**

Project Type:	Surface backfilling of dangerous sinkholes caused by subsidence of underground mines and respreading topsoil and seeding areas at a reclaimed surface mine
Primary Locations:	Fifteen properties near the cities of Beulah, Zap, Glen Ullin, New Leipzig, Scranton, Dickinson and Wilton North Dakota
Project Dates:	June 24 to July 1 and October 19 to December 4, 2015
Contractor:	Earthworm Excavating of Tolna, ND
Project Cost:	\$77,224 during this period. This is a two-year project that will continue through 2016.

The Public Service Commission administers the Abandoned Mine Lands (AML) Program on behalf of the State of North Dakota. The AML program is charged with eliminating existing and potential public hazards resulting from abandoned surface and underground coal mines. It is funded by a federal production tax on lignite coal mined in the state.

The 2015 Sinkhole Filling Project was conducted to fill dangerous sinkholes caused by collapse of abandoned underground coal mines in Western North Dakota. Work was also conducted to spread topsoil and reseed barren areas at a reclaimed surface mine site. Approximately 207 sinkholes were filled near the cities of Beulah, Zap, Glen Ullin, New Leipzig, Scranton, Dickinson and Wilton North Dakota between June 25 and July 1 and between October 19 and December 4, 2015. Standard requirements for sinkhole filling under this contract were as follows:

1. Remove and stockpile topsoil or suitable plant growth material from around/within sinkhole.
2. Excavate the sinkhole (as directed) with a backhoe or excavator.
3. Backfill the sinkhole with approved fill material, compaction with loader or excavator required between lifts.
4. Grade area to blend with adjacent topography and re-establish drainage.
5. Respread topsoil over disturbed areas and finish-grade.
6. Seed (broadcast spreader allowed) disturbed areas with required mixture.
7. Drag the seeded areas with a spike-tooth harrow or equivalent.

The required seed mixture for native grassland areas consisted of the following varieties and rates.

<u>Species</u>	<u>Rate/Acre – Lbs. (PLS)</u>
Thickspike Wheatgrass	4
Streambank Wheatgrass	4
Western Wheatgrass	4
Slender Wheatgrass	2
Green Needle Grass	2
Sideoats Grama	2
Switchgrass	4

This AML Project reduced the likelihood of death or injuries to property owners and the public and minimized the probability of property damage by filling numerous deep and dangerous sinkholes. However, there are many more sinkholes that need to be repaired and new sinkholes are reported each year. Sinkhole filling projects such as these have been conducted annually in North Dakota and will likely continue into the foreseeable future.

Cover Photo: *The cover photo shows Matt Fischer, NDPSC, standing near a sinkhole on the south ditch of North Dakota Highway 200, about a mile north of Beulah. It was reported by Russ Duppong, Beulah City Administrator, on January 14, 2015. A fiber-optic cable was exposed in the hole and the owner of the cable, West River Telephone constructed a safety fence around the sinkhole. This sinkhole was about 13 feet diameter and 8 feet deep. It was filled and reclaimed on June 24, 2015.*

2015-16Sinkhole Project

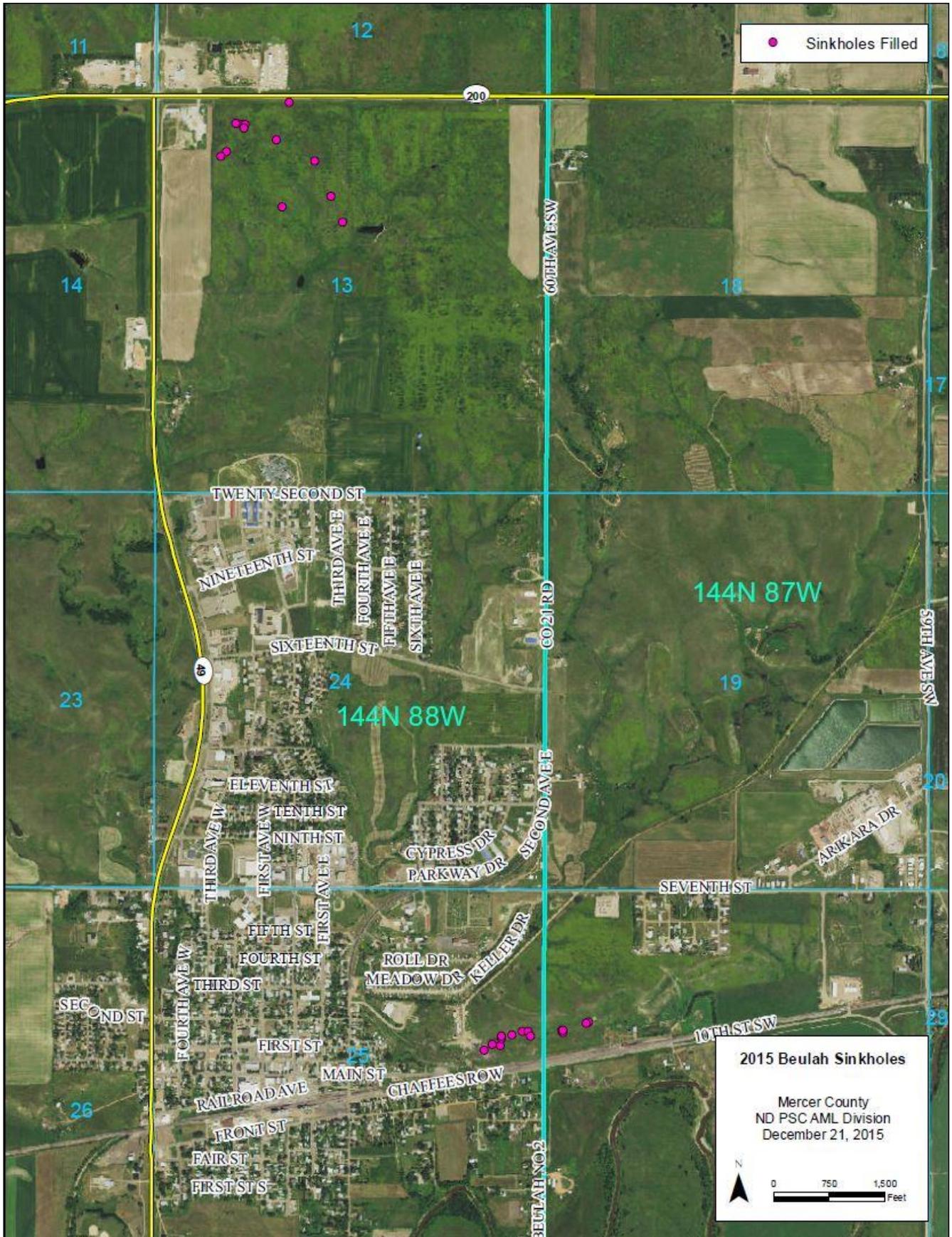
2015 Sites

Data by Site

Project	Site	Owner/Renter	Dates	Twp	Location				Sinkholes	CYD	Cost
					Rg	Sec	Part				
2015 Sinkholes	Beulah/Zap	NDDOT, Schnaidt, Bieber, Dettman	June 24-July 1	144	88	13	NW	12			
		Dschaak, Saylor, Helm, Hauser		144	88	25	NE	9			
				144	87	30	NW	5			
				144	89	23	SE	14			
				144	89	26	SE	2	1425	\$15,225.00	
	Richter/Glen Ullin*	Richter	Oct. 19	139	88	13	NE	N/A	222	\$4,000.00	
	New Leipzig	Ackerman Trust	Oct 20-21	134	91	24	SE	16	285	\$4,065.00	
	Scranton	Scranton Equity, Shumacher, Seifert	Oct. 21-26	131	100	24	SW	5			
				131	100	26	NE	1	220	\$3,130.00	
	Dickinson	Stark Co, Husky Ind, Binek	Oct. 27-29	139	95	18	NE	2			
				139	95	8	SW	27	1061	\$11,329.00	
	Wilton	Schaefer, McGinnis, Bailey,	Nov.19-Dec 4	142	79	5	All	64			
		Krzmarzick, Speten		142	79	6	All	8			
				142	80	36	SE	42	4005	\$39,475.00	
	TOTALS							207	7218	\$77,224.00	

* Maintenance work at Richter Site included repairing erosion and topsoiling and seeding barren spots on a reclaimed surface mine.

2015 Sinkhole Filling Approximate Locations of Sinkholes at Beulah Sites



2015 Sinkhole Filling, Beulah Sites

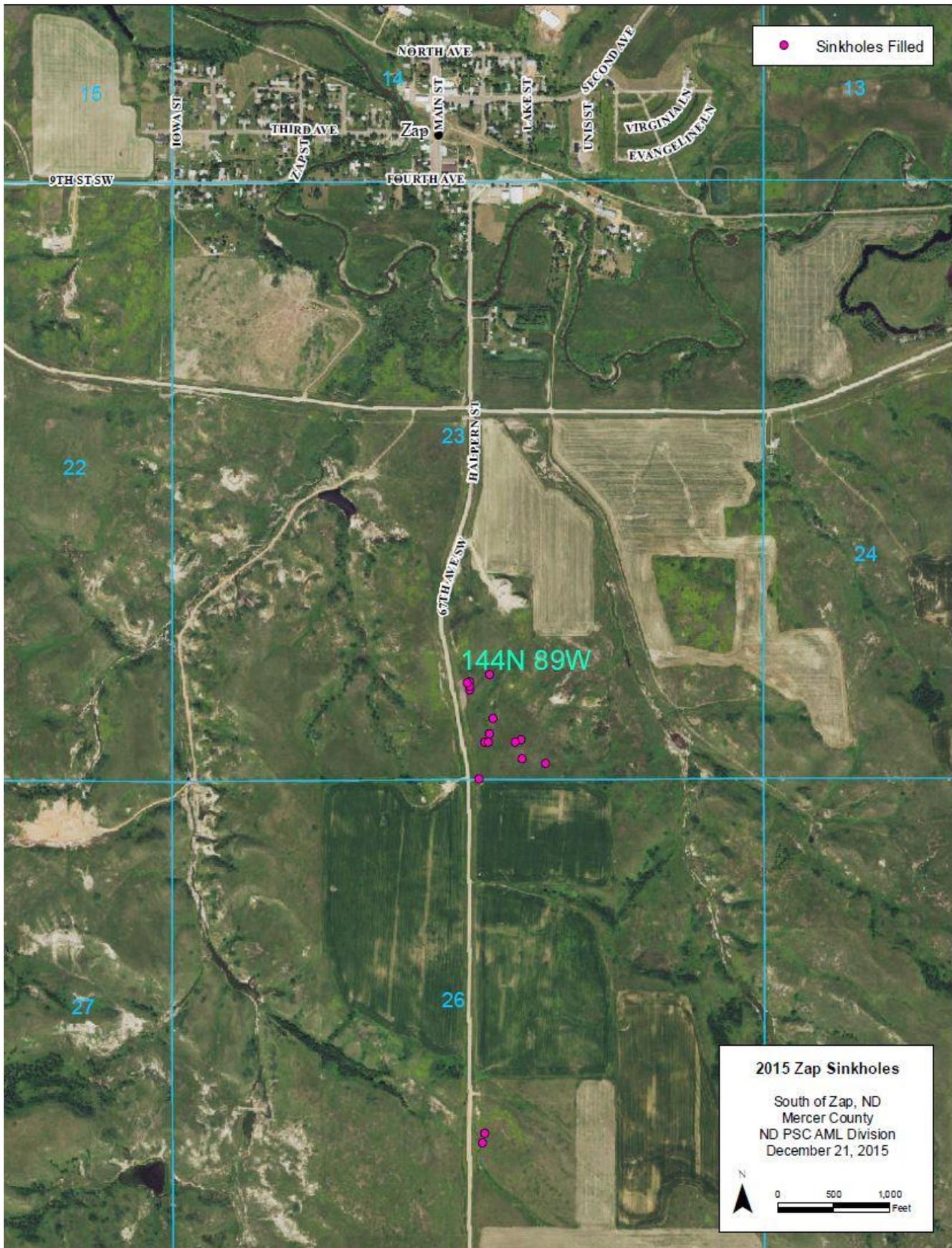


Sinkhole filling began June 24 on the south ditch of Highway 200 about a mile north of Beulah (see cover photo). This shows Anthony Humes, KFYP TV, interviewing contractor, Ross Smith, at the site just before work began.



This dangerous sinkhole was located on property owned by Mike Dettman just east of Beulah. Fourteen sinkholes were filled on Mike's property and twenty six sinkholes were filled near Beulah on June 24-26. The approximate cost at Beulah was \$11,622.

2015 Sinkhole Filling Approximate Locations of Sinkholes at Zap Sites



● Sinkholes Filled

2015 Zap Sinkholes
South of Zap, ND
Mercer County
ND PSC AML Division
December 21, 2015

N
0 500 1,000
Feet

2015 Sinkhole Filling, Zap Sites



This shows the filling of a sinkhole on the east side of Mercer County Road 13, about 1½ miles south of Zap on June 26. Sixteen sinkholes were filled at the Zap sites and the approximate cost was \$3603.



This shows a bulldozer respreading topsoil on a reclaimed sinkhole near Zap prior to seeding. All sinkholes at this site were tilled and seeded to a native grassland seed mix.

2015 Maintenance, Richter Site near Glen Ullin

Approximate Locations of Topsoil Respreading and Seeding



2015 Maintenance, Richter Site (Glen Ullin)

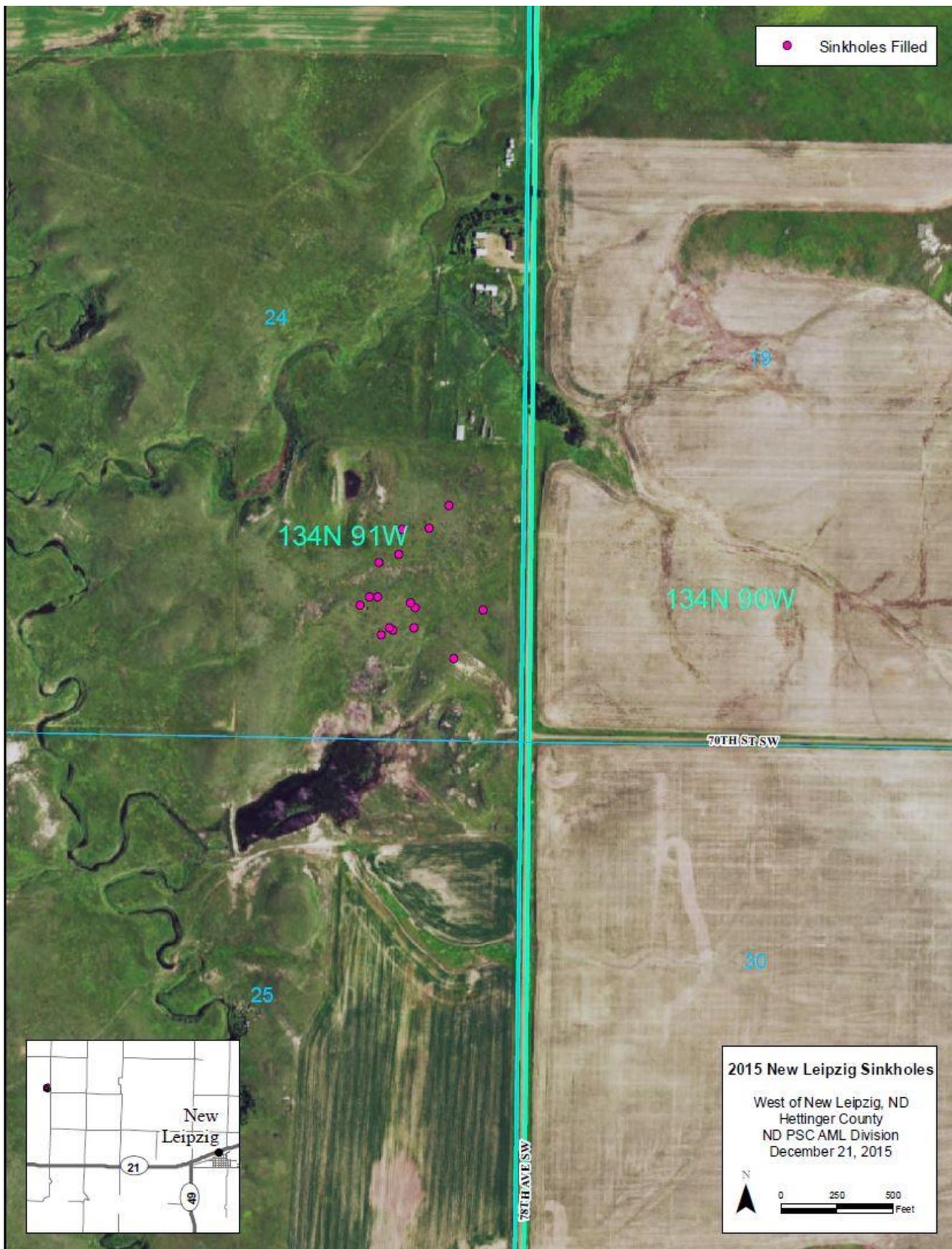


This shows a truck dumping topsoil on a barren spot at the Richter abandoned surface mine site, reclaimed in 2013. The site is located just south of I-94, exit 113, about 8 miles northeast of Glen Ullin. This maintenance work was done on October 19.



Approximately 222 cubic yards (about 20 truckloads) of topsoil and other suitable strata were respread on eight barren spots, comprising about one acre of this 55 acre site. All areas were tilled and seeded to native grasses. The cost was \$4000.

2015 Sinkhole Filling Approximate Locations of Sinkholes at New Leipzig (Ackerman) Site



2015 Sinkhole Filling, New Leipzig Site



This shows one of the sinkholes at the New Leipzig site, approximately five miles northwest of the City of New Leipzig. This hole was about eleven feet in diameter and five feet deep. Tall grass made it difficult to see and very dangerous.



Sixteen sinkholes were filled at the New Leipzig site on October 20-21. Topsoil was saved and respread and all reclaimed areas were seeded to native grasses. The cost for this work was \$4065.

2015 Sinkhole Filling Approximate Locations of Sinkholes at Scranton Sites



2015 Sinkhole Filling, Scranton Sites

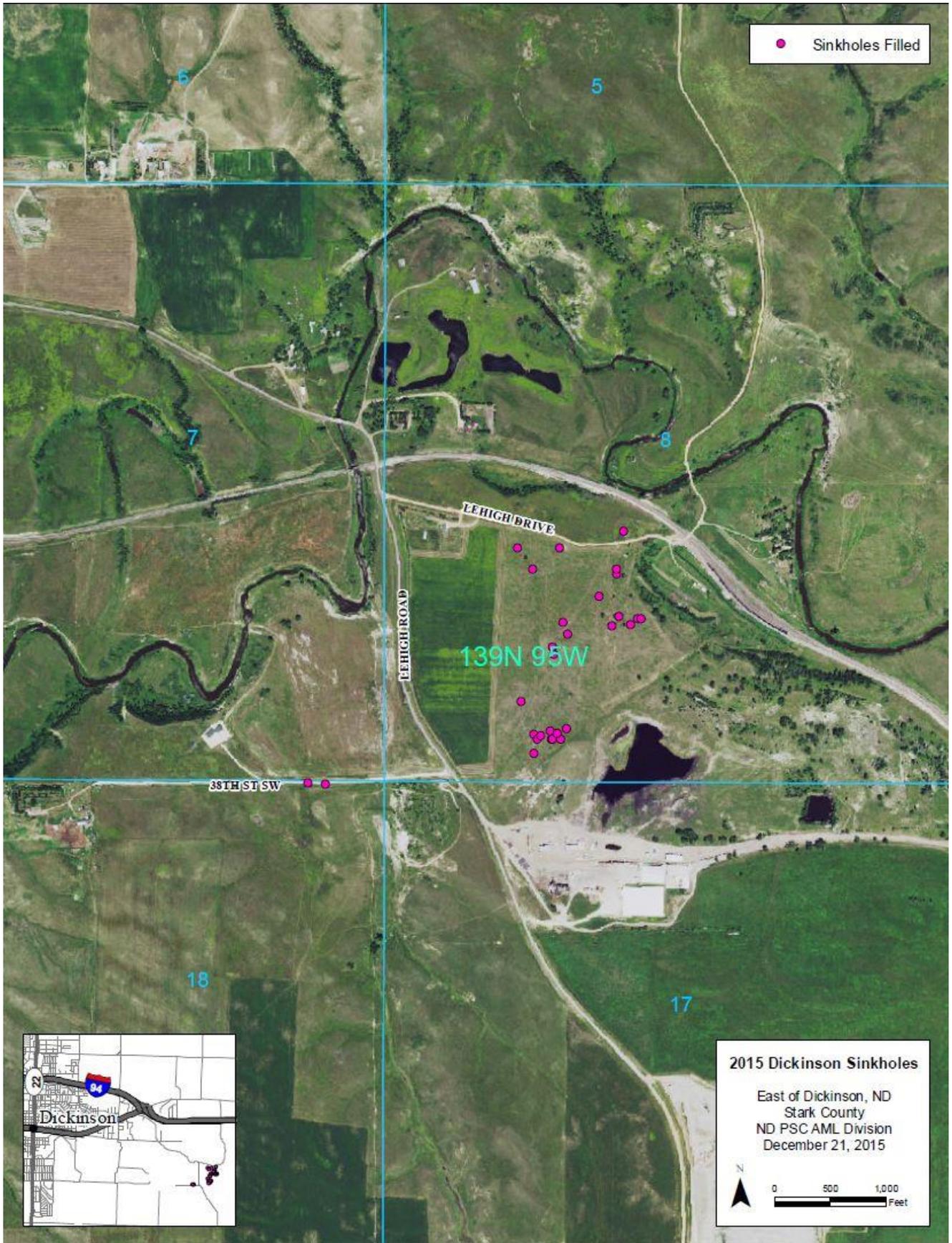


This photo was taken of a sinkhole on Tracy Schumacher's property, east of Scranton Equity Exchange, on January 28, 2015.



This shows the same sinkhole as it was being excavated and filled on October 21, 2015. Six sinkholes were filled on three properties near Scranton and the cost for this work was \$3130.

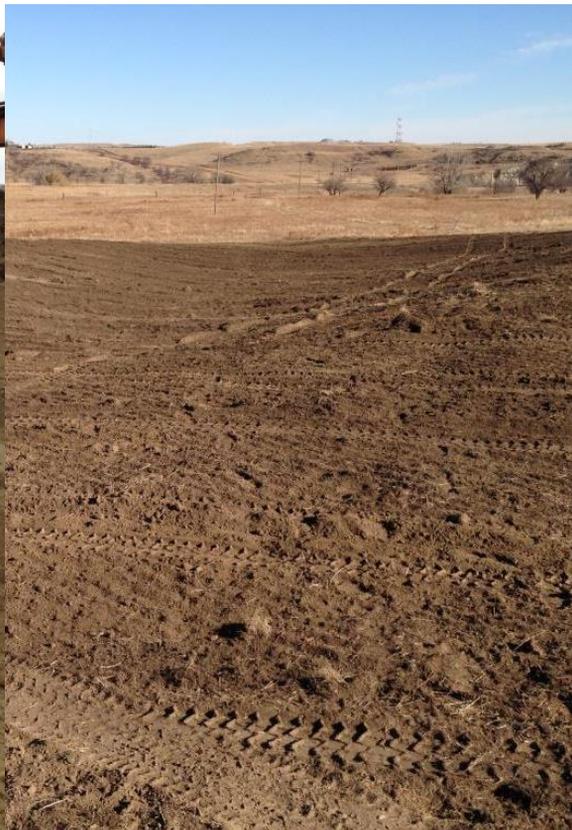
2015 Sinkhole Filling Approximate Locations of Sinkholes at Dickinson Sites



2015 Sinkhole Filling, Dickinson Sites



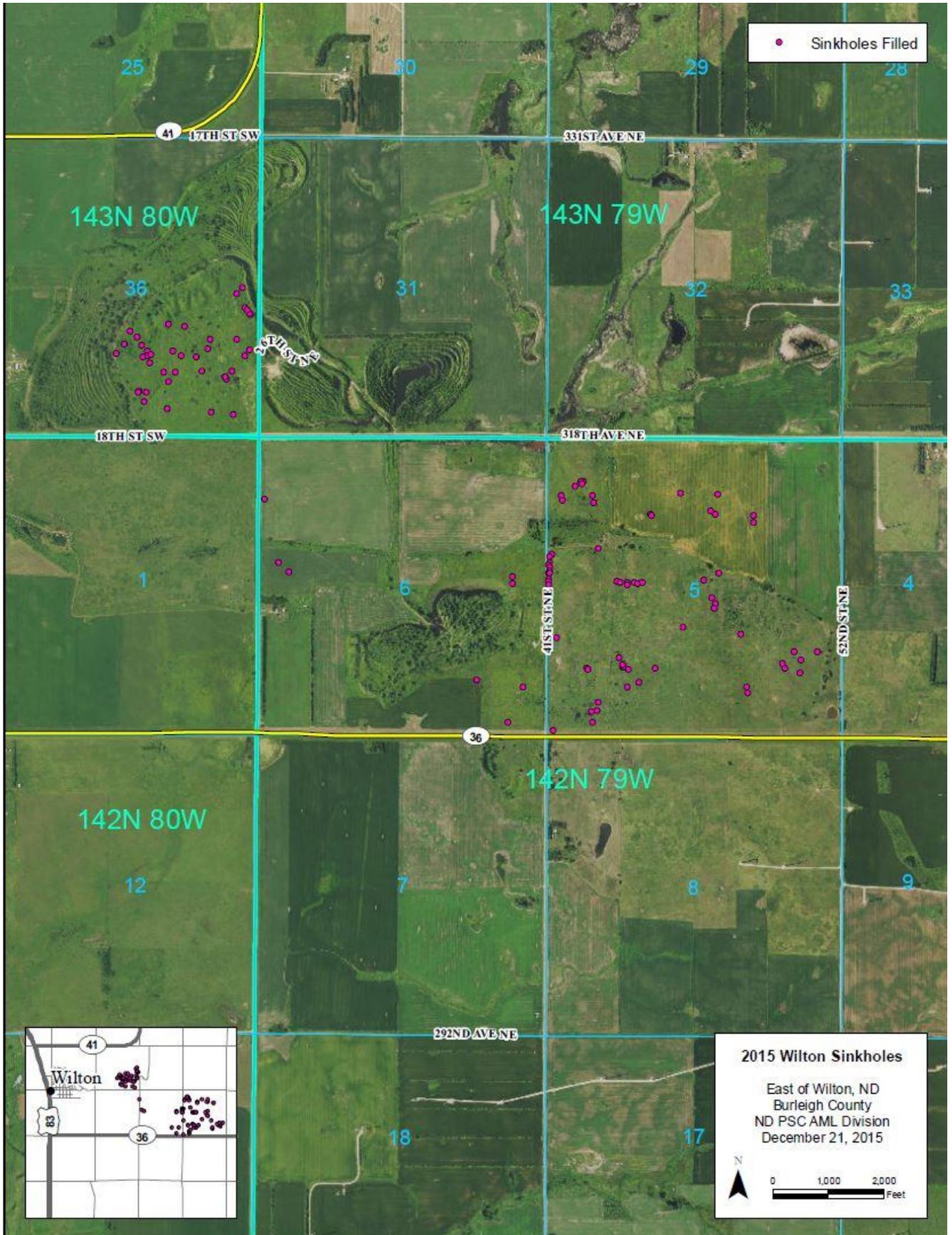
These are before/after photos of a sinkhole on the ditch of 38th Street Southwest, 3 miles southeast of Dickinson. Arnie Binek reported this sinkhole on March 17 and it was reclaimed October 29. It was about 18 feet long, 12 feet wide and 9 feet deep.



A truck dropped into this sinkhole while it was being excavated Oct. 28. The right side shows the area after it was topsoiled, reclaimed, tilled and seeded on Oct. 29. This large sinkhole was over-excavated and dirt was taken from it to fill all the other holes. Twenty nine sinkholes were filled at the Dickinson sites between Oct. 27 and 29 and the cost was \$11,329.

2015 Sinkhole Filling

Approximate Locations of Sinkholes at Wilton Sites



2015 Sinkhole Filling, Wilton Sites



The picture on the left shows a sinkhole, about 8 feet in diameter and 17 feet deep, on a harvested soybean field near Wilton. The photo on the right shows reclamation work on the same field. Eight sinkholes were filled on this field on November 19.



Approximately 114 sinkholes were filled at the Wilton sites between November 19 and December 4, 2015, and the cost was \$39,475. Dangerous sinkholes have been filled near Wilton almost every year since the mid-1980s. Drilling and grouting projects have been conducted to prevent AML subsidence under public roads in this area and another is planned for 2016.