

# **Project Summary 2014 Sinkhole Filling Contract AM-679-13**



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

**February 2015**

**North Dakota Public Service Commission  
2013 Sinkhole Filling AML Project Summary  
Fall 2014 Sites**

Project Type:	Surface backfilling of dangerous sinkholes caused by subsidence of underground mines and repair of erosion features
Primary Locations:	Ten properties near the cities of Haynes, Dickinson, Richardton, New Salem, Beulah, Garrison and Wilton, North Dakota
Project Dates:	October 6 to November 14, 2014
Contractor:	Pleasant & Sons Construction of Greenville, KY
Project Cost:	\$81,487 during this period. The total contract cost was \$233,721

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 production tax on lignite coal mined in the state.

The 2013 Sinkhole Filling Project was conducted to fill dangerous sinkholes caused by collapse of abandoned underground coal mines in Western North Dakota. Approximately 180 sinkholes were filled in 2013 and 22 sinkholes were filled in emergency project in May-June 2014. Reports were previously completed for that work. This report is for an additional 174 sinkholes that were filled near the cities of Haynes, Dickinson, Richardton, New Salem, Beulah, Garrison and Wilton between October 6 and November 14, 2014. 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 a sinkhole on property owned by Garner Sailer, north of Beulah. It collapsed suddenly on October 25 or 26, 2014. It was only 6-8 feet across at the surface but about 16 feet in diameter just below and 18 feet deep. If you look at the first picture, you will see indentations where a vehicle was driven right over where the sinkhole collapsed. Those tracks are mine from when I was staking out nearby sinkholes only a day or two before the sinkhole appeared. I drove over the area just a day or two before the sinkhole collapsed. I was lucky not to have dropped into it. **Sinkholes are a serious hazard.***

**2013 Sinkhole Project**

**2014 Sites**

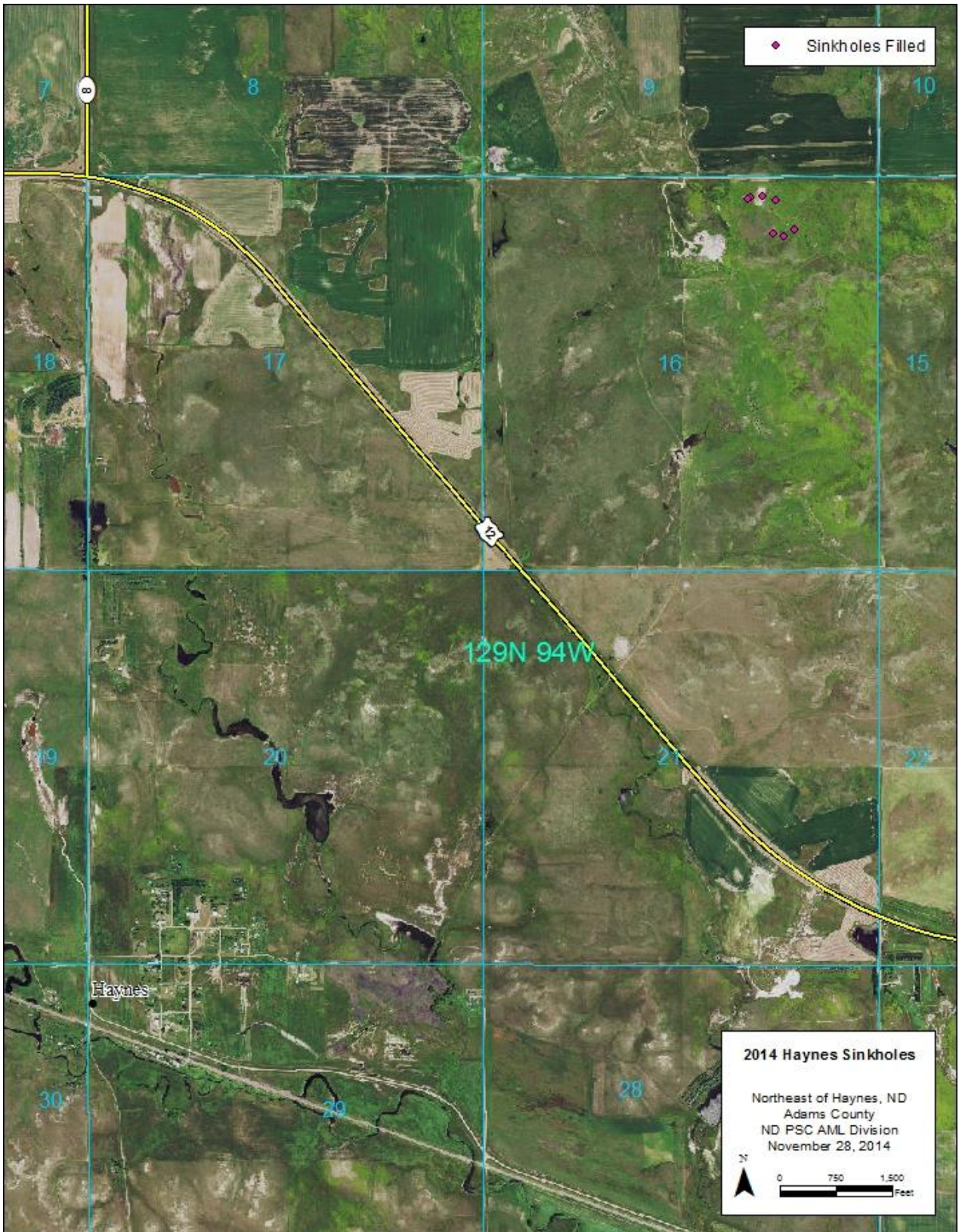
Data by Site and Landowner

**Location**

<b>Project</b>	<b>Site</b>	<b>Owner/Renter</b>	<b>Dates</b>	<b>Twp</b>	<b>Rg</b>	<b>Sec</b>	<b>Part</b>	<b>Sinkholes</b>	<b>CYD</b>	<b>Cost</b>
2014 Sinkholes	Haynes	State Lands	Oct 6	129	94	16	NE	7	232	\$3,320.00
	Dickinson	Wolf	Oct 8	139	95	17	NW	4	142	\$2,420.00
	Richardton	Zimmerman and City*	Oct 9-16	139	92	5	NE	9	1000	\$18,977.00
	Richardton	Gerhardt	Oct 16-17	139	92	4	NW	1	30	\$300.00
	New Salem	Lehde	Oct 16-17	139	85	15	SE	22	213	\$3,130.00
	Beulah	Sailer	Oct 21-31	144	87	7	SE	25	2595	\$26,950.00
	Beulah	Eslinger	Oct 31	144	88	12	NE	8	235	\$2,350.00
	Garrison	Mautz	Nov 4-6	148	84	17	NW	24	597	\$6,970.00
	Wilton	Krzmarzick, McGinnis, Bailey	Nov 6-14	142	79	5 & 6		74	1607	\$17,070.00
	<b>TOTALS</b>							<b>174</b>	<b>6651</b>	<b>\$81,487.00</b>

\*Work on City of Richardton property included erosional repairs and stabilization.

2014 Sinkhole Filling  
Approximate Locations of Sinkholes at Haynes Site



## 2014 Sinkhole Filling, Haynes Site



This picture, taken June 11, 2014, shows a dangerous sinkhole at the Haynes site, near the South Dakota border. It was about 30 feet long, 15 feet wide and 10 feet deep.



Several of the sinkholes at Haynes were very near where sinkholes had been filled in 2013.

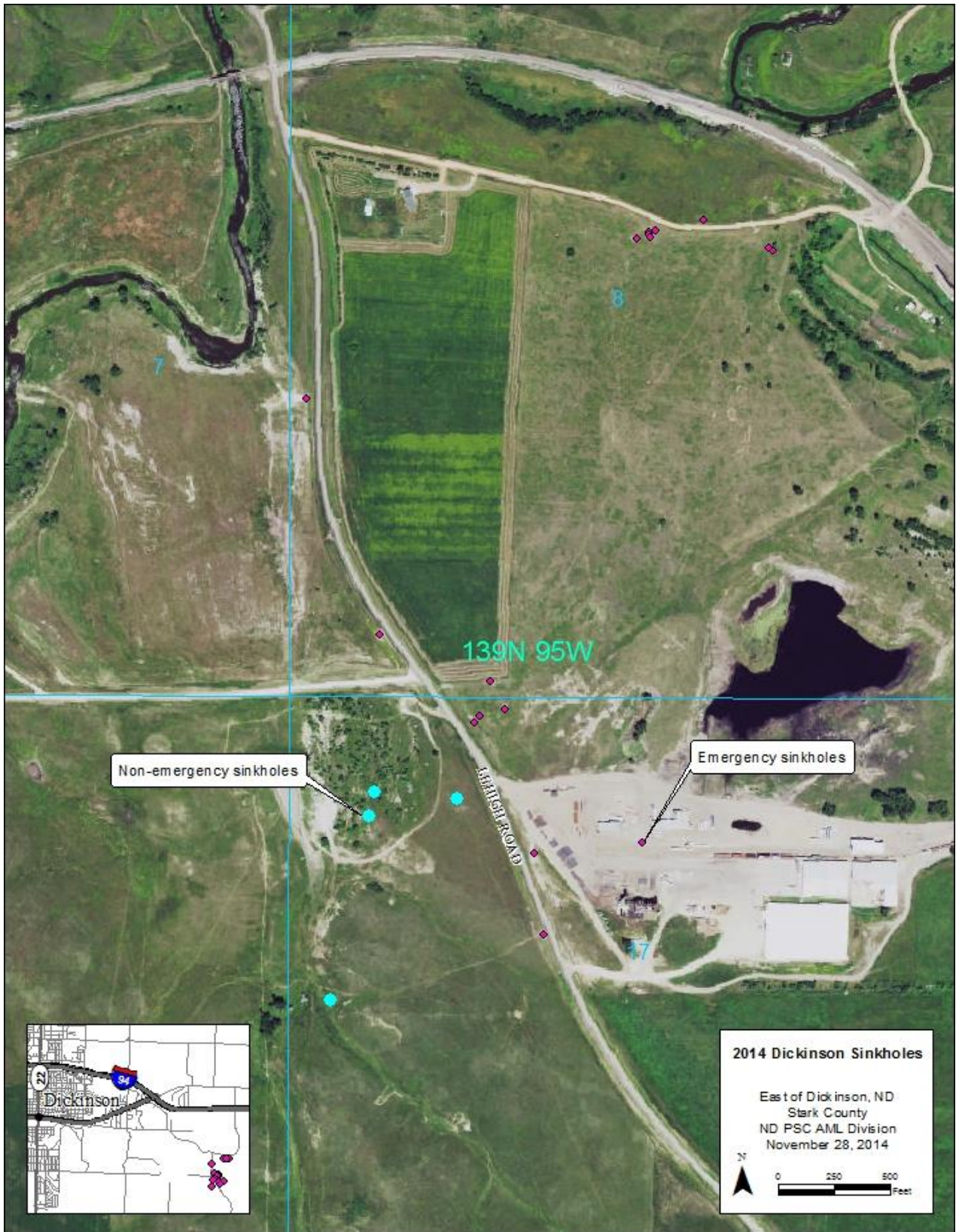


This shows the filling of a sinkhole at the Haynes Site on October 6, 2014. This hole required about 7 truckloads of dirt.



This shows one of the sinkholes at the Haynes site after it was filled but before seeding. Seven sinkholes were filled at the Haynes site and the approximate cost was \$3320.

2014 Sinkhole Filling  
Approximate Locations of Sinkholes at Dickinson Site



## 2014 Sinkhole Filling, Dickinson Site



This sinkhole was reported July 1, 2014, by property owner Mike Wolf. He placed gate panels around it to keep livestock out. It was about 13 feet in diameter and 13 feet deep.



This photo was taken October 8, 2014 while the sinkhole was being excavated. Topsoil was removed and piled beside the hole.

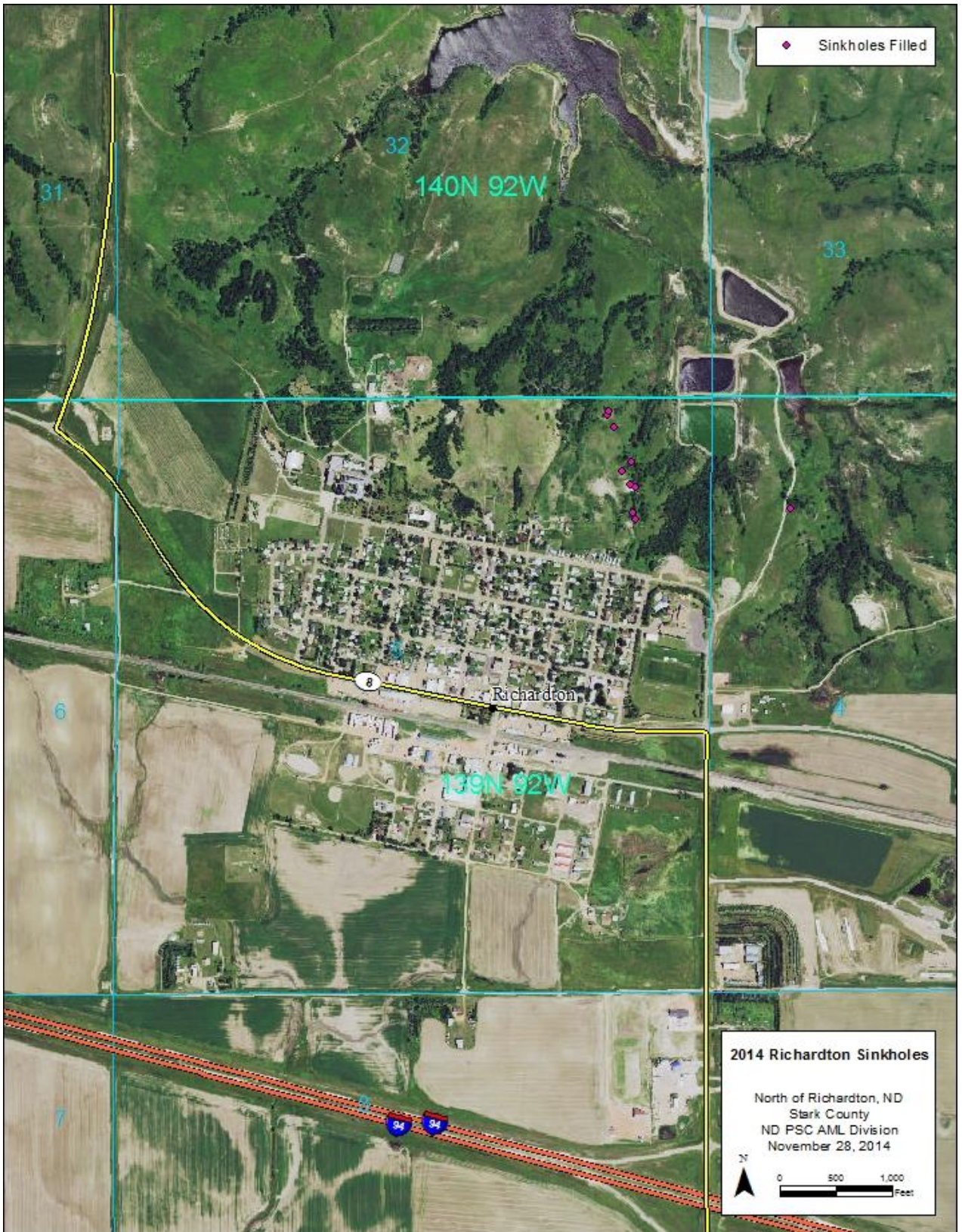


After the sinkhole was filled with nine truckloads of dirt, topsoil was replaced and the area was seeded and tilled.



This shows the same area after all work was completed. Four sinkholes were filled at this site, about 3 miles southeast of Dickinson, and the cost was \$2420.

2014 Sinkhole Filling  
Approximate Locations of Sinkholes at Richardton Sites





## 2014 Sinkhole Filling, Richardton, City and Zimmerman Ownership



This shows erosion leading to a large sinkhole on property owned by Dave Zimmerman, near Richardton. This was the site where a large sinkhole was filled in 2013.



This is a close-up of the sinkhole at the terminus of the erosion features. It was about 25 feet long, 18 feet wide and 22 feet deep.



Work began at this site on October 9, 2014. The excavator had to ramp into the hole in order to completely excavate it.



This picture shows the site after the sinkhole was filled and the erosion repaired. A waterway was constructed to contain runoff and minimize erosion.



The waterway was seeded and lined with Flexamat, a tied concrete block mat used to control erosion. Vegetation can grow between the blocks and completely cover the entire mat.



This shows the area on October 16th after all work was completed. Work at this site included filling nine sinkholes, construction of a lined waterway, and stabilizing a larger area with erosion control blankets. The cost of this work was \$18,977.

## 2014 Sinkhole Filling, Richardton, Gerhardt Ownership



This sinkhole was located on property owned by Rose Marie Gerhardt. It was inspected on May 12, 2014, with renter, Zane Wicks. It was about 6 feet long, 3 feet wide and 12 feet deep.



This photo was taken October 16, 2014 after the sinkhole was filled. The cost of filling this sinkhole was \$300.

# 2014 Sinkhole Filling Approximate Locations of Sinkholes at New Salem Site



## 2014 Sinkhole Filling, New Salem Site



On October 16 and 17, 2014, twenty-two sinkholes were filled on property owned by Wayne Lehde, about a mile east of New Salem. The contract cost for work at this site was \$3130.



This shows one of the sinkholes in a cropland field at the New Salem Site. It was about twenty feet long, ten feet wide and five feet deep. Seven truck loads of dirt were needed to fill it.

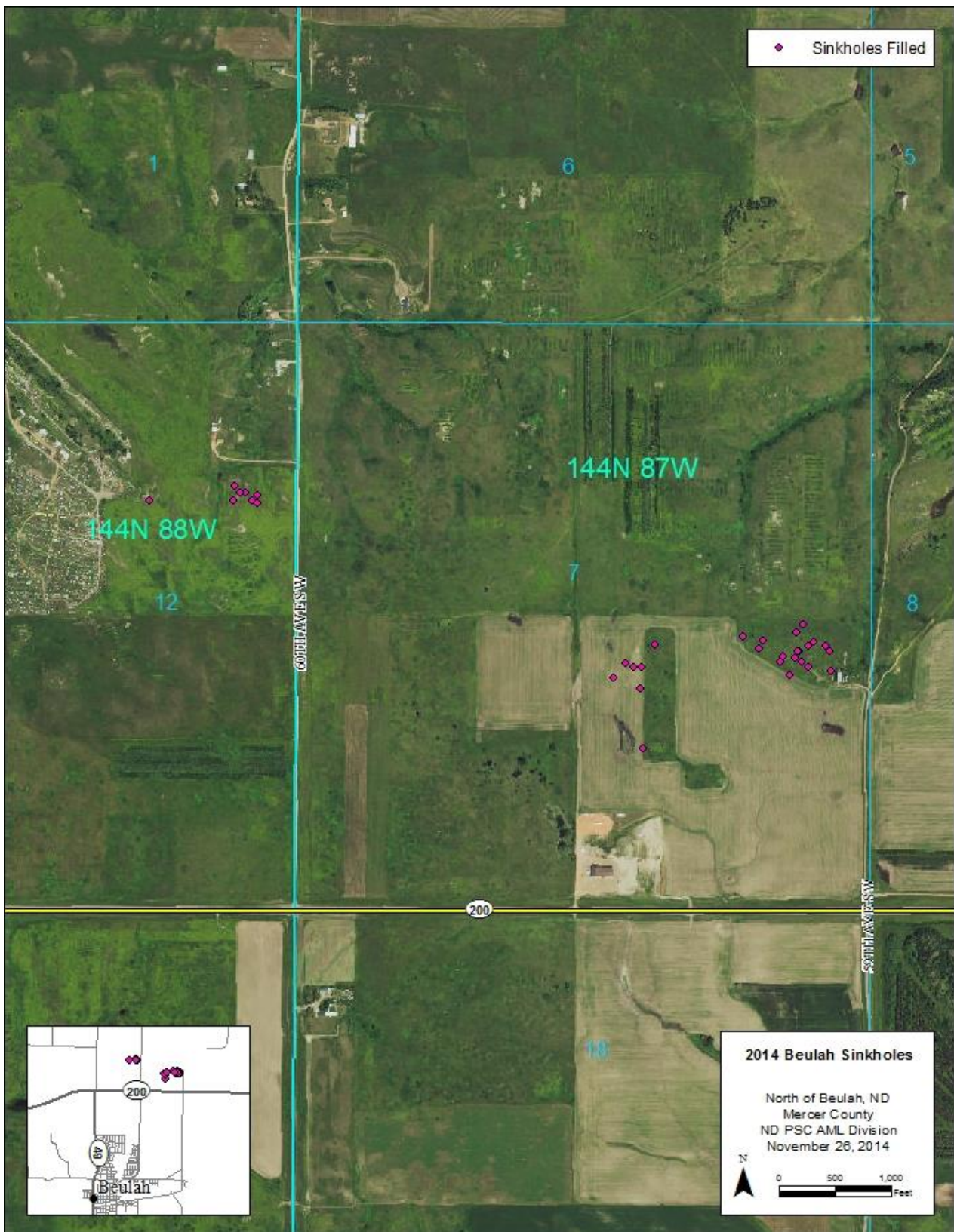


This shows filling of another sinkhole at the New Salem Site. First topsoil was removed, then the hole was excavated, compacted and filled with three truckloads of dirt. Fill dirt was compacted with an excavator, and finally the topsoil was replaced.



This shows one of the northern most sinkholes at the New Salem Site after all work was completed. This is the seventh time sinkholes have been filled at this site since the year 2000.

# 2014 Sinkhole Filling Approximate Locations of Sinkholes at Beulah Sites



## 2014 Sinkhole Filling, Beulah Sites



This sinkhole was on a farm trail on Garner Sailer's property located about 2 miles northeast of Beulah. It was over 20 feet deep and a hunter dropped the front wheel of his Suburban into it.



This shows the same area after the sinkhole was filled. It took about 15 truckloads of dirt to fill.



This is another of the sinkholes that were filled on Garner's property. It was about 32 feet in diameter and 12 feet deep.



It took about 370 truckloads of dirt to fill all the sinkholes on Garner's property between October 21 and 31. The cost was \$26,950.



This shows a sinkhole on property owned by Mike Eslinger, north of Beulah. It was about 8 feet in diameter below the surface and 10 feet deep. It was very dangerous because it was difficult to see until you were right on top of it.



Tilling and seeding was done after all sinkholes were filled and topsoil was replaced. Eight sinkholes were filled on Mike's property and the cost was about \$2350.

2014 Sinkhole Filling  
Approximate Locations of Sinkholes at Garrison Site



## 2014 Sinkhole Filling, Garrison Site



This is a photo of one of the sinkholes at the 2014 Garrison Site, owned by David Mautz. It was about 8 feet across and 8 feet deep.



This shows another sinkhole at Garrison, about 18 feet across and 12 feet deep. Note the coal stringer 3-4 feet below surface. These sinkholes were close to businesses on the south side of Garrison.



Sinkhole filling was conducted at Garrison November 4-6, 2015. Fill dirt was taken from a nearby sand pit.



This shows the proximity of Garrison to the sinkholes. The gas station in the upper right hand corner is about 300 feet from the sinkhole.



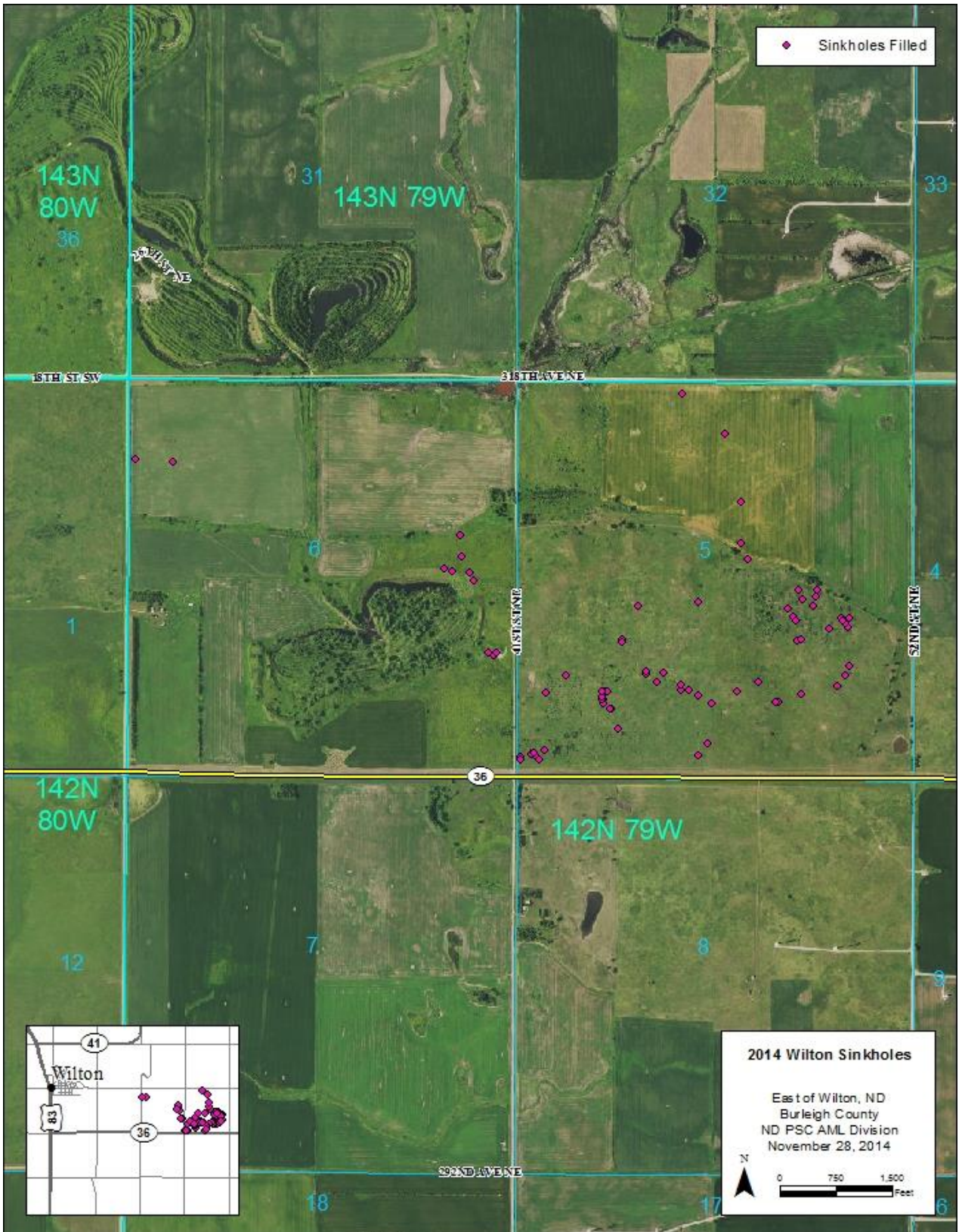
This shows an excavator compacting fill dirt in the sinkhole. Sakakawea RV is in the background and a couple sinkholes were within 20 feet of one of the RV pads.



This shows a sinkhole after topsoil was replaced. The excavator is moving to compact and add topsoil to another. Twenty-four sinkholes were filled at Garrison at the cost of \$6970.



# 2014 Sinkhole Filling Approximate Locations of Sinkholes at Wilton Sites



## 2014 Sinkhole Filling, Wilton Sites



This photo shows two AML Division employees measuring a sinkhole on property owned by Betty McGinnis about 3 miles southeast of Wilton. It was about 12 feet across and 8 feet deep.



Sinkhole filling began at the Wilton Site on November 6, 2014. This shows the excavation of a sinkhole on property owned by Robert Bailey in the NE1/4 of Section 6, T142, R79, 3 miles east of Wilton.



This sinkhole, on Jim Krzmarzick's pasture, was found when the back wheel of a loaded truck dropped into it.



The contractor removed most of the soil from the truck with an excavator and pulled it out of the hole.



This is the same hole after the truck was pulled out and topsoil was removed. It was about 12 feet across and 10 feet deep. No one was injured and the truck was not damaged. A close call.



This was the last sinkhole filled in the project on a cropland field owned by Betty McGinnis. Seventy-four sinkholes were filled at the Wilton Site between November 6 and 14. The cost was \$17,070.