

2002 Abandoned Mine Land Award Nomination

Project Name: 2001 Beulah (Sailer) Emergency Project

Project Location: Beulah, North Dakota

Agency: North Dakota Public Service Commission
Abandoned Mine Lands Division
600 East Boulevard Avenue
Bismarck, North Dakota 58505-0480
(701) 328-4096

Project Dates: February 14 to February 15, 2001

Construction Cost: \$3222.50

Funding Agency: North Dakota Public Service Commission

Contractor: Basaraba Excavating and Dirt Works, L.L.C.
Wilton, North Dakota 58579

Narrative Description of 2001 Beulah (Sailer) Emergency Project

On February 7, 2001, Garner Sailer, a Beulah, North Dakota farmer, called the North Dakota Public Service Commission to report that part of the floor of his machine shed had caved into an abandoned mine shaft. He also reported that his four-wheel-drive tractor had dropped nose-down into the resulting twelve-foot deep sinkhole (see Figure 1). He asked for help to remove the tractor and repair the underground mine subsidence.

Sinkholes like this one have been an intermittent problem for residents in and around Beulah (population 3363) for many years. These sinkholes are the result of collapse of abandoned mine workings. Approximately fifty coal mines have been located within 20 miles of Beulah, making it one of the most heavily mined areas in the state.

The Knife River Coal Mining Company's Underground Mine underlies this project site. It was an underground room and pillar mine that undermined an area of more than 1000 acres within and around Beulah. The Knife River Underground Mine operated from 1915 until 1953. Total production from this mine exceeded ten million tons. The mine supported a maximum work force of about 300 people.

Geologic conditions around the Beulah area have contributed to the likelihood for underground mine subsidence. The overburden is fairly shallow, about 30-100 feet in thickness, and is composed mainly of unconsolidated glacial till. The mined coal seam was relatively thick, about twenty feet. Subsidence of the Knife River Underground Mine has frequently resulted in the sudden collapse of deep sinkholes with steep sides that have created serious hazards to the public and landowners.

Several emergency reclamation projects have been conducted in the Beulah area to repair hazardous sinkholes. In 1993, a twenty-foot diameter sinkhole collapsed beneath the Black Diamond Lounge, north of Beulah, severing water and electrical lines and ruining two air conditioning units. This sinkhole was repaired under North Dakota's Emergency AML Program. In 1998, an emergency reclamation project was conducted to repair a deep sinkhole that collapsed in the front yard of Mrs. Della Bauer, 408 1st Avenue, Beulah.

In addition, several remote backfilling projects have been conducted to prevent subsidence in and around Beulah. These projects involved drilling holes into the underground mine workings and filling them with a cementitious grout mixture. Projects like these have been conducted underneath highways, residential areas, and several businesses. In some of these projects, holes were drilled and grout pumped directly through the floors of buildings. Since 1981, more than \$5.6 million have been spent to reclaim abandoned mine problems in the Beulah area.

But enough history, let's get back to the tractor in the sinkhole.

On February 8, 2001, North Dakota AML employees Bruce Beechie and Bill Dodd investigated the sinkhole in Mr. Sailer's machine shed. They found two deep and steep-sided sinkholes inside the structure. The first contained the tractor. A combine and other farm equipment were hanging precariously over the edge of another even larger hole near the back of the shed. Reports, supporting documents and digital photographs of the sinkholes were e-mailed to OSM's Casper Field Office. On February 9th OSM issued a finding that these sinkholes constituted an AML Emergency and were eligible for emergency reclamation funds.

The North Dakota AML Division telephoned thirteen contractors and invited them to an on-site bidders meeting. On February 12, the meeting was held at Sailer's machine shed. Eight contractors attended the meeting and submitted bids. The low bidder was Basaraba Excavating and Dirt Works, L.L.C., of Wilton, North Dakota.

Basaraba began work on February 14. The temperature hovered around -15°F. The first obstacle was to raise a combine that slid into the hole and was resting on the tractor. A large timber was placed underneath the combine and one of its wheels was removed to allow clearance for the tractor. Basaraba then excavated a ramp into the sinkhole and used an excavator and a backhoe to pull the tractor out of the hole. This took most of the first day because as the ramp was excavated, the tractor continued to slip farther into the hole. The tractor sustained some damage but was later repaired at Mr. Sailer's expense.

After the tractor was removed, the first sinkhole was filled with 195 cubic yards (about 15 truckloads) of dirt. Next, all remaining farm implements were removed from the building. This was difficult because several pieces were located above or near the second sinkhole. Then the second sinkhole was excavated and filled with an additional 210 cubic yards of dirt. Lastly, the floor was graded to its approximate original condition. The project was completed on February 15 and the total contract cost was \$3222.50.

This was certainly not a large, expensive, or high-tech reclamation project. However, it was conducted to remedy a serious mine-related problem that presented a real and immediate hazard. The project was made more difficult by the cold winter weather, the tightly packed farm equipment, and the low clearance inside the building. This was the kind of project for which Title IV of SMCRA was intended.

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Photo Captions

1. (Cover) This mine collapse feature (sinkhole) in a machine shed near Beulah, North Dakota, was approximately 20' diameter and 10-15' deep. A tractor dropped into the hole and one wheel of a combine was also hanging over the hole.
2. Collapsing underground mined workings in this building constituted a danger to public safety and required emergency abatement.
3. Another dangerous sinkhole was beneath a combine and swather in the northeast corner of the machine shed. Although the surface diameter was only about four feet, it was much larger just below ground.
4. Work on this emergency reclamation project began February 14, 2001. The contractor was Basaraba Excavation of Wilton, ND. The first task was to excavate a ramp into the sinkhole and remove the tractor. The first sinkhole was filled with 195 cubic yards of dirt taken from a nearby spoil pile.
5. The second sinkhole was larger than the first. It was collapsed with a backhoe after the farm equipment was moved and then filled with 210 cubic yards of dirt.
6. Work was completed February 15, 2001. The total contract cost was \$3222.50