

STANDARDIZED ENVIRONMENTAL ASSESSMENT

2017-2021 Sinkhole Filling Abandoned Mine Lands Projects Various Problem Areas and Locations in North Dakota

Prepared by

North Dakota Public Service Commission

In Cooperation with

**United States Department of the Interior Office of Surface Mining Reclamation
and Enforcement Casper Field Office
Casper Field Office**

(Revised 2021)

Table of Contents

Chapter 1: Introduction	3
A. Need for the Action	3
B. Project Background	3
Chapter 2: Description of the Proposed Project and Alternatives	6
A. No Action Alternative	6
B. Proposed Action	6
C. Other Reasonable Alternatives	7
Chapter 3: Environmental Impacts	8
A. Cultural or historic resource values	8
B. Water quality values	8
C. Wetlands values	8
D. Floodplain values	8
E. Wildlife	8
F. Prime and unique farmland values	9
G. Recreational resource values	9
H. Air quality	9
I. Socioeconomic factors	9
J. Political factors	9
K. Existing Vegetative Cover	9
L. Threatened and Endangered Plant Species	10
M. Anticipated dates of Reclamation	10
N. Estimated Construction Cost	10
O. Off-site Borrow and Disposal Areas	10
P. Noise Pollution	11
Q. Environmental Justice Policy	11
Chapter 4: Consultation and Coordination	12
Preparers	12

Chapter 1: Introduction

A. Need for the Action

The principal objective of the Abandoned Mine Lands (AML) Division of the Public Service Commission (PSC) is to reclaim hazardous abandoned surface and underground coal mines.

Some of the most hazardous, widespread and frequent mine-related problems in North Dakota are deep sinkholes caused by underground mine collapse. The AML Division has received reports of personal injury, loss of livestock and property damage caused by underground mine collapse sinkholes. Since 2005, nearly 2,500 dangerous sinkholes have been filled in western North Dakota. Most of these were reported by property owners and renters, state and local government agents and the public. Sinkholes are a serious hazard to landowners and the public. This environmental assessment is for sinkhole filling projects that are expected to be conducted in the five year period between 2017 and 2021.

B. Project Background

Most of western North Dakota is underlain by lignite coal and it has been estimated that North Dakota contains 25 billion tons of strippable lignite reserves. At the current rate of mining, it would take more than 800 years to exhaust North Dakota's supply of economically recoverable lignite. (from Strippable Lignite Deposits of North Dakota, Murphy, E. 2001, North Dakota Geological Survey, Miscellaneous Map #34)

Lignite mining was an important part of the settlement of western North Dakota. The earliest documented commercial underground lignite mine opened near Sims, about 30 miles west of Bismarck, in 1873. By 1910, more than 80 commercial mines were in operation producing over 400,000 tons annually. Production from North Dakota underground coal mines peaked in the 1930s, as the steam shovel made strip mines more efficient and cheaper. The last commercial underground coal mine in North Dakota closed in the 1960s. The AML Division estimates there are at least 500 abandoned underground coal mines in twenty-three counties in western North Dakota.

Mined lignite seams in North Dakota are thick, from 6-40 feet, usually overlain with less than 100 feet of soft overburden soils. Underground mining leaves large subsurface voids. As these mine voids collapse, they create large and deep sinkholes that often may occur suddenly and can be a serious hazard to landowners and the public.

The AML Division has been conducting projects to fill sinkholes since the AML program began. One of the earliest projects was conducted near Scranton, ND, from 1982-87 (see Photo 1).



Photo 1: Sinkholes near Scranton, ND, circa 1980

Since the early 1990s, the AML Division has used a two-pronged approach for underground mine reclamation. On high-use areas that are undermined, such as residential and commercial developments and public roads, drilling and grouting projects are conducted in order to prevent mine subsidence. Holes are drilled into the underground mine voids and cementitious grout is pumped to fill them and prevent collapse.

Sinkhole filling projects are conducted on areas where mine collapse has already occurred and dangerous sinkholes are present. In these projects, topsoil is removed and saved from within and around the sinkholes. Then the sinkholes are excavated and filled, and compacted usually with soil materials. Topsoil is replaced and the areas are tilled and seeded. In 2020, approximately 180 dangerous sinkholes were filled by the Public Service Commission AML Division at locations near Beulah, Bowman, Dickinson, Haynes, Havelock, SW Tioga, White Earth, Williston and Wilton. Table 1 is a summary of sinkhole filling projects conducted between 2011 and 2020.

Occasionally, as needed, emergency and maintenance AML work is included with sinkhole filling projects. In 2015, emergency coal refuse fires were extinguished near Haynes and Williston. Also in 2015, minor maintenance work was conducted at the Richter Mine near Glen Ullin. This surface coal mine was reclaimed in a 2013 AML project, but there were a few barren spots where vegetation was not successful. Maintenance included salvaging and respreading topsoil and seeding eight barren spots comprising about 1 acre of this 55-acre mine site.

Table 1: North Dakota Sinkhole Filling Projects 2011-2020

Year	Locations (Nearest Cities)	Sinkholes	Cost
2011	Burlington, Noonan, Hanks, Beach, Haynes, Dickinson, Richardton, New Salem, Parshall, Garrison, Wilton, Washburn	172	\$153,250.50
2012	Haynes Dickinson, Wilton, Velva, Baldwin	41	\$61,772.75
2013	Beulah, Zap, Richardton, Dickinson, Williston, Hanks, Noonan, Velva, Washburn, Wilton, Haynes, Scranton	180	\$128,709.00
2014	Haynes, Dickinson, Richardton, New Salem, Beulah, Garrison, Wilton	174	\$81,487.00
2015	Beulah, Zap, Glen Ullin (Surface), New Leipzig, Scranton, Dickinson, Wilton	207	\$77,224.00
2016	Velva, Noonan, Dickinson, Haynes, Bowman, Wilton, Baldwin, Beulah	138	\$87,892.96
2017	Beulah, Bowman, Garrison, Hanks, New Salem, Noonan, Velva, Williston and Wilton	163	\$103,990.50
2018	Beulah, Bowman, Garrison, Hanks, Heil, New Leipzig, New Salem, Noonan, Richardton, Velva, Williston, Wilton and Zenith	177	\$105,723.50
2019	Beulah, Williston, Wilton	104	\$72,081.16
2020	Potential Sites: Beulah, Bowman, Dickinson, Haynes, Havelock, SW Tioga, White Earth, Williston, Wilton	180	\$116,210.06
2021	Potential Sites: Beulah, Garrison, Hanks, Haynes, Noonan, Parshall, Scranton, Velva, Williston, Wilton, Zap		
	Totals	1,536	\$988,341.43

Chapter 2: Description of the Proposed Project and Alternatives

A. No Action Alternative

The no action option does not solve the potentially hazardous conditions AML conditions at the site.

B. Proposed Action

The current standard requirements for sinkhole filling projects are as follows.

1. Remove and stockpile topsoil or other suitable plant growth material from around/within sinkhole and borrow areas.
2. Excavate the sinkhole (as directed) with a backhoe or excavator.
3. Backfill sinkhole with approved fill material; if trucks are used, compaction with backhoe bucket and wheels is required between dumps. If a scraper is used, holes shall be ramped into and filled in such a way to get maximum compaction.
4. Grade area to blend with adjacent topography and re-establish drainage.
5. Respread topsoil evenly over disturbed areas and finish-grade.
6. Seed disturbed areas with the required mixture of locally adapted native grasses.

Sinkhole filling projects have been conducted annually since the early 1990s. These projects are usually conducted in the fall, after harvest, at locations where dangerous sinkholes have been observed or reported. The sinkholes are usually filled with soil materials taken from nearby borrow areas. In special cases where the sinkhole extends underneath a building foundation or roads, cementitious grout may be used injected into the voids.

Borrow areas, where fill dirt is taken, must be approved in advance by the Commission's project manager. These borrow areas will be located as near as possible to the sinkholes. Usually, these borrow areas are spoil piles from a nearby abandoned surface mine or come from "over-excavating" a large sinkhole(s) on a hillside and grading it into a shallow swale consistent with the surrounding topography.

It is impossible to predict exactly where sinkholes will occur during the period from 2021. However, it is expected that nearly all of them will occur in areas where sinkhole filling has been conducted previously. Maps of areas where sinkhole filling projects have been conducted between 2005 and 2020 are included as attachments to this document as well as potential sites for 2021.

The total areas of disturbance for sinkhole filling projects vary, but are restricted to the immediate area of the sinkholes and borrow area(s). The total area disturbed by the 2020 Sinkhole Filling AML Project was approximately 8 acres. Considering that 180

sinkholes were filled, the average area disturbed for each sinkhole was less than 0.04 acres.

Sinkhole filling projects are a relatively low-cost means of eliminating immediate hazards of abandoned underground mines that directly affect the public. These projects are a benefit to farmers, ranchers, property owners and the public. The main drawback is that sinkhole filling only addresses the immediate problem of existing sinkholes and does not prevent subsequent occurrences.

C. Other Reasonable Alternatives

Other reclamation options may include complete excavation (daylighting), drilling and grouting, blasting, fencing, property buyout or condemnation. Complete excavation (daylighting), drilling and grouting and blasting are cost-prohibitive. Fencing is not considered a long-term viable option. Property buyout or condemnation does not address the AML problems at these sites.

Chapter 3: Environmental Impacts

A. Cultural or historic resource values (the Archaeological Resources Protection Act of 1979; the Archaeological and Historic Preservation Act of 1974; the National Historic Preservation Act of 1986, as amended; the Antiquities Act of 1906, Executive Order 11593, concerning the protection and enhancement of the cultural environment; the American Indian Religious Freedom Act of 1978; the Historic Sites Act of 1935; and OMB Circular A-102).

Reclamation activities will be conducted in a manner that should have no significant effect on cultural or historic resources. This will include minimizing disturbances and restricting them to the immediate area of the sinkholes and borrow area(s).

B. Water quality values (Clean Water Act, as amended)

Reclamation activities will be conducted in a manner that should have no significant effect on surface or groundwater quality or quantity. This will include minimizing disturbances and restricting them to the immediate area of the sinkholes and borrow area(s). If necessary, erosion may be controlled with best management practices including mulching, installation of wattles, rip-rap, flexamat, and others.

C. Wetlands values (Clean Water Act, Executive Order 11990, and Army/EPA Memorandum of Agreement (MOA) Concerning the Determination of Mitigation under Section 404(b) (1) Guidelines)

Reclamation activities will be designed in a way that will not diminish the size or function of any wetlands. Reclamation activities should not affect any wetland areas.

D. Floodplain values (Executive Order 11988)

No planned activities will adversely affect an identified floodplain.

E. Wildlife (Endangered Species Act and Fish and Wildlife Coordination Act)

Reclamation activities will be conducted in a manner that should have no significant effect on wildlife. Threatened, Endangered or Candidate species in North Dakota identified by the U.S. Fish and Wildlife Service include Interior Least Tern (*Sterna antillarum*), Whooping Crane (*Grus Americana*), Pallid Sturgeon (*Scaphirhynchus albus*), Gray Wolf (*Canis lupus*), Piping Plover (*Charadrius melodus*), Northern Long-Eared Bat (*Myotis septentrionalis*), Sprague's Pipit (*Anthus spragueii*), Black-footed Ferret (*Mustela nigripes*), Poweshiek Skipperling (*Oarisma poweshiek*), Rusty Patched Bumble Bee (*Bombus affinis*), Dakota skipper (*Hesperia dacotae*), and Rufus Red Knot (*Calidris canutus rufa*). None of these species are likely to be found or disturbed by the 2020-2021 Sinkhole Filling AML Project.

F. Prime and unique farmland values (Farmland Protection Policy Act)

Reclamation activities will be designed in a way that will not diminish the integrity or utility of prime farmland.

G. Recreational resource values (Wild and Scenic Rivers Act, Clean Air Act)

There are no lands in this area classified as wilderness areas or lands to be studied for wilderness designation.

There are no lands in this area identified as areas of critical environmental concern.

There are no lands in this area included in the Wild and Scenic Rivers category.

There are no parks or areas of critical ecological or aesthetic concern in this area.

H. Air quality (Clean Air Act)

These areas are not in or near a Class I Air Quality Region. Watering of construction areas could be required if needed to control fugitive dust, but most sites will be so small that it will not be necessary.

I. Socioeconomic factors

Sinkhole filling is expected to be conducted mainly on undeveloped agricultural lands and impacts on minority or low-income populations are expected to be minimal.

Work contracted for sinkhole filling may result in slightly higher local employment and revenues. Sinkhole filling should also make the lands safer and more useful, and this will be a benefit to the property owners and the public.

J. Political factors

Zoning jurisdictions for these areas are generally held by County and local township authorities. Property is privately and publicly owned and used mainly for agricultural activities and wildlife habitat. Consent for right-of-entry is obtained prior to any reclamation activities and property owners or managers are usually notified before work begins.

K. Existing Vegetative Cover

Existing vegetation varies with land use on areas affected by sinkholes. This may include cropland, tame grass and legume pastures, native grasslands, wildlife habitat, road ditches, shelterbelts and farmstead areas. Topsoil will be saved to the extent

possible on all affected areas and respread evenly after the sinkholes are filled. All affected hay land and grassland areas will be reseeded with locally adapted grass species native to western North Dakota.

L. Threatened and Endangered Plant Species

Reclamation activities will be conducted in a manner that should have no significant effect on threatened or endangered plant species, species of concern or significant ecological communities. This will include minimizing disturbances and restricting them to the immediate area of the sinkholes and borrow area(s). The only federally-listed threatened or endangered plant species known to exist in North Dakota is the Western Prairie Fringed Orchid (*Platanthera praeclar*). Known locations of this plant are within moist, tall grass prairie and sedge meadows of the Sheyenne National Grasslands in the southeastern corner of the state.

M. Anticipated dates of Reclamation

Sinkhole filling activities are expected to be conducted every year in the period from 2017-2021. It is expected that most of the non-emergency sinkhole filling work will be conducted in between late summer and fall, after harvest.

N. Estimated Construction Cost

The AML Division had divided the sinkhole work into two contracts based on location. The total yearly estimate of the combined contracts is \$90,000 for 2021. The estimated total cost for all sinkhole filling projects from 2017-2021 is \$500,000.

O. Off-site Borrow and Disposal Areas

Borrow areas, where fill dirt is taken, must be approved in advance by the Commission's project manager. These borrow areas will be located as near as possible to the sinkholes. Usually, these borrow areas are spoil piles from a nearby abandoned surface mine or come from "over-excavating" a large sinkhole and grading it into a shallow swale consistent with the surrounding topography. If off-site borrow or disposal issues arise, they will be addressed through consultation with the North Dakota Department of Environmental Qualities.

P. Noise Pollution

Noise pollution problems are not anticipated; however, if problems arise, remedial action measures could be addressed in consultation with the North Dakota Department of Environmental Quality.

Q. Environmental Justice Policy

Construction work may result in a slight increase in employment and revenues, but no significant direct or indirect on minority or low-income populations is expected.

Chapter 4: Consultation and Coordination

A letter was sent to the State Historical Society of North Dakota on June 21, 2021 requesting concurrence for the 202 Sinkhole Filling AML Project.

A letter was sent to the U.S. Fish and Wildlife Service on June 21, 2021 requesting concurrence for the 2021 Sinkhole Filling AML Project.

A letter was sent to the North Dakota Department of Environmental Quality on June 21, 2021 requesting concurrence for the 2021 Sinkhole Filling AML Project.

A letter was sent to the Natural Heritage Program of the North Dakota Parks and Recreation Department on June 21, 2021 requesting concurrence for 2021 Sinkhole Filling AML Project.

Preparer

Joan Breiner
Assistant Director - AML Division
ND Public Service Commission