


Five-Year Review Report
Third Five-Year Review Report
for
Minot Landfill
EPA ID NDD980959548

Minot
Ward County, North Dakota

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For:
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Region 8
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5/3/11

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**Third Five-Year Review Report
for
Minot Landfill Superfund Site
Minot
Ward County, North Dakota**

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Contaminant of Concern
E&E FIT	Ecology & Environment Field Investigation Team
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FDHU	First District Health Unit
FS	Feasibility Study
FYR	Five-Year Review
HRS	Hazard Ranking System
IC	Institutional Control
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
µg/L	micrograms per liter
NDDH	North Dakota Department of Health
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PAH	Polycyclic aromatic hydrocarbons
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SMCL	Secondary Maximum Contaminant Level
TBCs	To Be Considered Criteria
UAO	Unilateral Administrative Order
USBR	United States Bureau of Reclamation

Executive Summary

Introduction

The Minot Landfill site (the Site), a closed waste disposal facility, is approximately 26 acres in size and is located approximately one mile southwest of downtown Minot in Ward County, North Dakota. The landfill operated from 1961 to October 1971, receiving shipments of municipal and industrial wastes. These shipments included drums of oil, spent battery casings, calcium carbide and lime sludge. The original landfill waste had been placed at the base of a coulee. When the landfill was originally closed, the ridges making up the valley walls were used as final cover. The waste was covered with three feet of clay material and seeded. Subsequent recreational activities and traffic on the original cap caused erosion across the Site. In mid-1985, the county health department investigated the Site due to reports of foul odors and gas bubbles in standing water. Further investigation by the North Dakota Department of Health (NDDH) and the United States Environmental Protection Agency (EPA) revealed soil, groundwater, surface water (localized ponding), sediment and landfill gases were contaminated with: benzene, toluene, halogenated aliphatics, phenol and phenol-related compounds; polycyclic aromatic hydrocarbons (PAHs); and arsenic, barium and other metals.

EPA listed the Site on the National Priorities List (NPL) in March 1989. After the site cleanup and remedial actions were completed, the Site was officially deleted from the NPL on April 1, 1997. The triggering action for this Five-Year Review (FYR) was the signing of the previous FYR on September 15, 2006. The site is all in one Operable Unit (OU), and defined as OU1.

Technical Assessment

The review of documents, Applicable or Relevant and Appropriate Requirement (ARARs), risk assumptions and the site inspection indicate that the remedy is functioning as intended by the ROD and the subsequent Explanation of Significant Difference (ESD). ARARs have not changed since the Site's June 1993 ROD and April 1996 ESD. There have been no other changes in exposure assumptions or toxicity data that could call into question the protectiveness of the remedy. There are not currently any proposed reuse plans at the Site that would affect the protectiveness of the remedy.

Contaminated soils in the vicinity of leachate seeps were excavated, consolidated, stabilized/solidified and isolated under the landfill cap. The original landfill cap was improved to limit precipitation infiltration and control storm water runoff. The cap over the source area and adjacent slope areas has a well-established vegetative cover, although there is a small area of erosion on the northeastern slope. The condition of the drainage swales, riprap and other water control structures on the Site are intact and functioning as designed. However, some of the drainage swales were choked with excess vegetation. Two wild Russian olive trees were observed adjacent to, not on top of, the landfill cap. Access to the Site is restricted by a locked security fence, signs are present around the perimeter of the Site and the Site is regularly inspected and maintained in accordance with the Operations and Maintenance (O&M) Plan.

Water quality data from the last five years for the Site's seven monitoring wells and leachate reports were reviewed. Concentrations of all organic and inorganic contaminants of concern were well below state and federal Maximum Contaminant Level (MCLs) and Maximum Contaminant Level Goals (MCLGs).

Institutional controls, in the form of City Ordinances, are in place to prohibit land use that could damage the cap and prohibit installation of groundwater supply wells on the landfill or in the immediate vicinity of the landfill. Combined with landfill capping and passive gas vents, these institutional controls minimize the potential for exposure to humans from waste materials and/or landfill off-gas. The passive gravity drain system manages leachate levels in the landfill to reduce the potential for leachate migration into the groundwater. Groundwater monitoring data suggest that this system is effective in meeting this goal.

Conclusion

The remedy at OU-1 (and consequently site wide) of the Minot Landfill currently protects human health and the environment because all routes of potential exposure have been cut off. Contaminated source material has been excavated and is being contained on the Site beneath a landfill cap. Institutional controls are in place to prevent future land uses that could damage the remedial components in place and to prohibit installation of groundwater supply wells on the Site or in the immediate vicinity of the Site. No groundwater at the Site or in the area surrounding the Site is currently being used. Leachate and landfill gas are managed and controlled appropriately. However, in order for the Site's remedy to be protective in the long-term the following actions need to be taken:

- Areas of erosion on the landfill cap need to be addressed.
- Trees bordering the cap need to be removed.
- Drainage swales need to be cleaned out and inspected on a regular basis.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Minot Landfill		
EPA ID (from WasteLAN): NDD980959548		
Region: 8	State: ND	City/County: Minot/Ward
SITE STATUS		
NPL status: <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs?* <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Construction completion date: 09/18/1996
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
Author name: Rhode Bicknell and Treat Suomi (Reviewed by EPA)		
Author title: Associate and Senior Associate		Author affiliation: Skeo Solutions
Review period**: 10/15/2010 to 06/30/2011		
Date(s) of site inspection: 11/09/2010		
Type of review:		
<input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
Review number: <input type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input checked="" type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)		
Triggering action:		
<input type="checkbox"/> Actual RA On-site Construction at OU# <input type="checkbox"/> Actual RA Start at OU# <input type="checkbox"/> Construction Completion <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify)		
Triggering action date (from WasteLAN): 09/19/2006		
Due date (five years after triggering action date): 09/19/2011		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form (continued)

Issues:

1. Small area of erosion exists on the north end of the landfill cap.
2. Two wild Russian olive trees are on the southwest and northeast areas bordering the landfill cap.
3. Drainage swales are choked with excess vegetation and debris.

Recommendations:

1. Fill the eroded area with clean material and re-vegetate.
2. Remove the two Russian olive trees bordering the cap.
3. Clean drainage swales out and inspect on a regular basis.

Protectiveness Statement(s):

The remedy at OU-1 of the Minot Landfill currently protects human health and the environment because it is functioning as intended by the Site's decision documents, the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection are still valid, and no other information has come to light that could call into question the protectiveness of the remedy. Contaminated source material has been excavated and is being contained on the Site beneath a landfill cap. Institutional controls are in place to prevent future land uses that could damage the remedial components in place and to prohibit installation of groundwater supply wells on the Site or in the immediate vicinity of the Site. No groundwater at the Site or in the area surrounding the Site is currently being used. However, in order for the Site's remedy to be protective in the long-term the following actions need to be taken:

- Areas of erosion on the landfill cap need to be addressed.
- Trees bordering the cap need to be removed.
- Drainage swales need to be cleaned out and inspected on a regular basis.

Other Comments:

Environmental Indicators

Current human exposures at the Site are under control.

Current groundwater migration is under control.

Are Necessary Institutional Controls in Place?

All Some None

Has the Site Been Designated as Site-Wide Ready for Anticipated Use?

Yes No

Third Five-Year Review Report for Minot Landfill Superfund Site

1.0 Introduction

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings and conclusions of FYRs are documented in FYR reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The EPA prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

“If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.”

EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

“If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.”

Skeo Solutions, an EPA Region 8 contractor, conducted the FYR and prepared this FYR Report regarding the remedy implemented at the Minot Landfill site (the Site) in Minot, Ward County, North Dakota. This FYR was conducted from October 2010 to June 2011. The City of Minot is the lead agency for developing and implementing the potentially responsible party (PRP)-financed cleanup at the Site. The North Dakota Department of Health (NDDH), as the support agency representing the State of North Dakota, has reviewed all supporting documentation and provided input to EPA during the FYR process.

This is the third FYR for the Site. The triggering action for this statutory review is the Site's 2006 FYR. The FYR is required due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one operable unit (OU1), which is addressed in this FYR.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
Initial discovery	June 17, 1985
Site proposed to National Priorities List (NPL)	June 24, 1988
Site finalized on NPL	March 31, 1989
Removal action (RA) initiated by City of Minot	July 18, 1990
Removal assessment #1	August 30, 1990
Consent Decree signed	September 28, 1990
Removal assessment #2	April 20, 1992
Remedial investigation/feasibility study (RI/FS) completed; Record of Decision (ROD) signature	June 21, 1993
Remedial design (RD) started	January 23, 1996
Explanation of Significant Differences (ESD)	April 10, 1996
RD completed	April 26, 1996
RA construction started	June 25, 1996
Construction completion date	September 18, 1996
Preliminary Close-out Report completed	September 23, 1996
RA completed	September 25, 1996
Operation & Maintenance activities (O&M) started	October 1996
Final Close-out Report completed	December 2, 1996
Site Deleted from NPL	April 1, 1997
First FYR signed	September 12, 2001
Second FYR signed	September 15, 2006

3.0 Background

3.1 Physical Characteristics

The 26-acre Site is located in Section 27, Township 155 North, Range 85 West, approximately one mile southwest of downtown Minot in Ward County, North Dakota (see Figures 1 and 2). The Site is known locally as the “Old Minot Landfill” to differentiate it from the local active landfill. The Site is situated approximately 2,000 feet south of the Souris River and is located to the east of the intersection of Burdick Expressway and the combined U.S. Highways 2 and 52 Bypass.

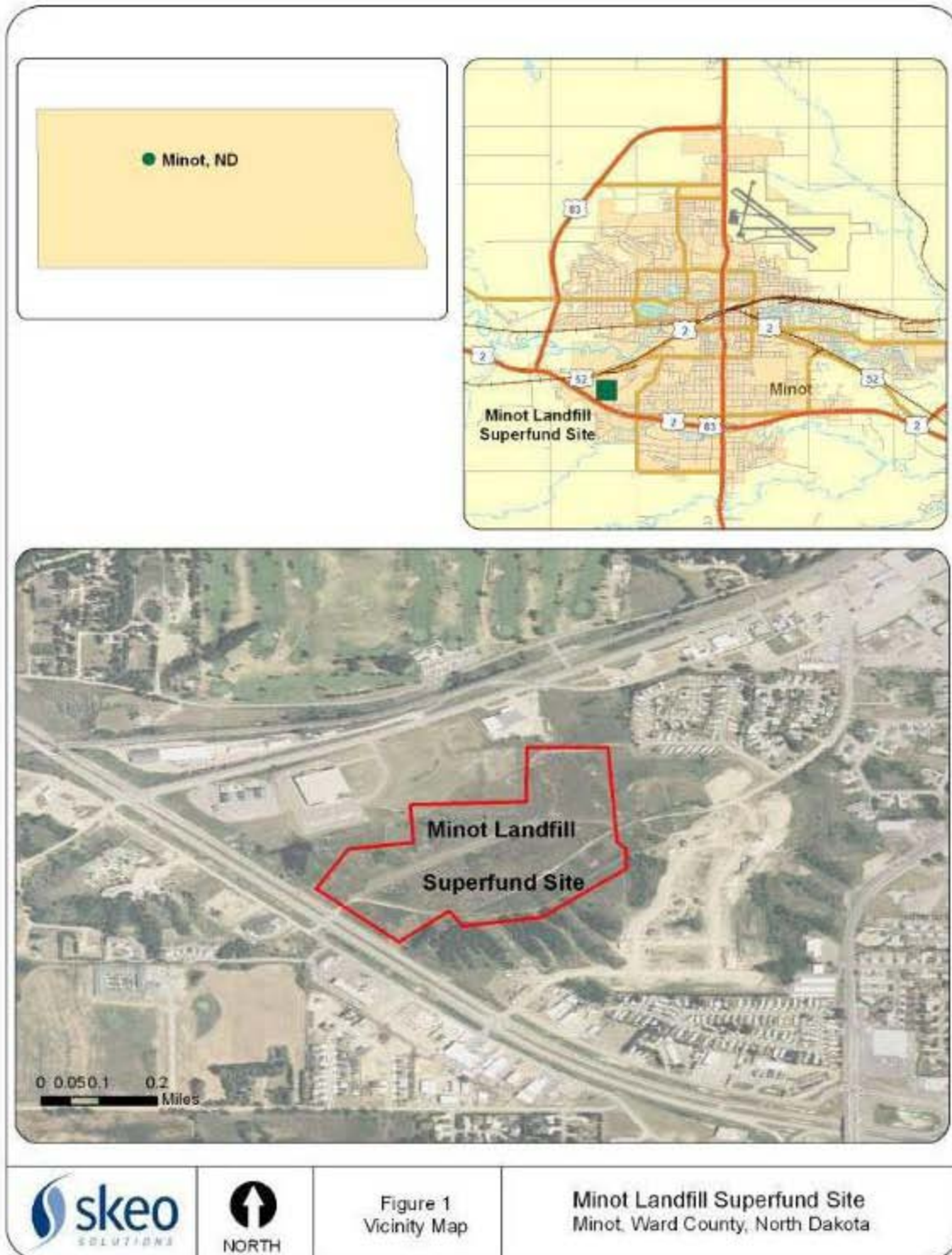
The Site is located in a rural residential and commercial area, with agricultural areas located southwest of the Site. There is a new housing development located immediately adjacent to the northeastern fence line of the Site. Bordering the west side of the landfill are commercial businesses that include an ice rink. There are no structures located on the Site. The entire Site is covered in grass, which is harvested twice a year for hay, and there are a few trees around the perimeter of the cap. The entire boundary of the Site is fenced and secured with locks.

3.2 Land and Resource Use

Residential, commercial, recreational and agricultural areas are located in the immediate vicinity of the Site, and nearly one quarter of Minot's population (8,000 people) lives within a one-mile radius of the Site. Since late 1989, most of the Site has been enclosed with a chain-link fence and, consequently, public access to the Site is restricted. Future uses for the areas adjacent to the Site are expected to be primarily commercial and light industrial land uses.

There is a mobile home community located across the highway from the landfill. The closest residence to the landfill is a mobile home located approximately 500 feet northeast of the landfill. An indoor skating rink, which was completed in 2000, is located 500 feet from the landfill fence line and 1,000 feet from the northwest edge of the landfill. The mobile home community, nearby residences and businesses access the City of Minot's municipal water system. In 2006, The City of Minot proposed an extension of the road which accesses the new housing development along the east margin of the landfill adjacent to the cap. The proposal was rejected by NDDH. Currently, there are no plans to reuse the Site.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site, and is not intended for any other purpose.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site, and is not intended for any other purpose.

3.3 History of Contamination

A landfill operated at the Site from 1961 to approximately October 1971. The facility was set up under the direction of the Minot City Council, within a natural coulee, or valley, southwest of the City of Minot.

Although the exact composition of wastes disposed of at the Site is not known, refuse included drums of oil, spent battery casings, calcium carbide and lime sludge. Discussions with past landfill operators indicated that refuse was received from the City of Minot, other neighboring towns, farms, industries and military sites.

The landfill was closed by the City of Minot in fall 1971. Because the waste was placed at the base of a coulee, the ridges that made up the valley walls were used as a final cover. The refuse was covered with about three feet of clay material from the valley walls and seeded.

In mid-1985, the First District Health Unit (FDHU) of Ward County received a complaint of gas bubbles escaping from the surface of the Site. Upon inspection of the Site, FDHU's Chief Sanitarian contacted the NDDH, Environmental Health Section, regarding observations of foul odors, gas bubbles in standing water and water drainage from waste. The NDDH Division of Hazardous Waste Management and Special Studies responded to FDHU's request with a site inspection to confirm earlier observations. NDDH arranged a meeting at the Site in late summer with the City of Minot and the landowners. NDDH requested that the previous landowners control surface water drainage, repair eroded channels and install a gas venting system. NDDH contacted EPA's Region 8 office to discuss the investigative approach for the Site. EPA proposed an initial study of the Site under the Superfund program.

3.4 Initial Response

A preliminary assessment/site inspection was conducted at the Site in June 1986. Four borings were completed and four monitoring wells were installed at the landfill by Water Supply, Inc., under the direction of the Ecology & Environment Field Investigation Team (E&E FIT), an EPA contractor. Two wells were located upgradient of the landfill to provide background water quality data and two wells were located downgradient of the landfill. One boring was made through refuse to characterize the waste. Soil samples, groundwater samples, and sediment and surface water samples were collected for analysis. Air samples were also collected in summer 1986. Investigations by NDDH and EPA revealed that soil, groundwater, surface water, sediment and landfill gases at the Site were contaminated.

In September 1986, NDDH conducted a site inspection to see if the corrective measures requested in 1985 had been implemented. The site inspection noted that some erosional channels and depressions had been filled across the site and a road (18th Street Southwest) had been constructed across the southern edge of the fill. However, adequate landscaping and a gas ventilation system were not in place and were once again requested of the previous landowners. As a result, Deucalion Research, Inc. proposed construction of a gas recovery system at the Site and utilization of the gas as an energy source.

The results of the sampling by E&E FIT became available in late September 1986. Soil boring and sediment samples contained several organic chemicals. Metals were also detected at concentrations slightly above background sample concentrations in the soil and sediment samples. Off-site sediment samples collected near the Souris River and the city's public water intake contained several aromatic hydrocarbons as well as fluoranthene and pyrene. Samples of water in an on-site ditch near a leachate seep contained organic contaminants and metals. Analysis of groundwater samples collected on site detected several organic contaminants and metals. Air monitoring detected traces of organics at concentrations that varied depending on wind velocity and direction.

EPA developed a preliminary hazard ranking system (HRS) score for the Site in late 1986 and proposed the Site for listing on the NPL in June 1988. In March 1989, the Site was finalized on the NPL.

EPA Region 8's Emergency Response Branch requested that the U.S. Bureau of Reclamation (USBR) prepare a background report of existing conditions at the Site. Recommendations were made by USBR to control surface erosion, investigate groundwater conditions more thoroughly and determine the cause of leakage around gas recovery test wells. As a result, removal actions were initiated in 1989 by the City of Minot. These removal actions consisted of the installation of a perimeter fence around the landfill, construction of surface runoff erosion control (including swales and storm sewer piping), and seeding of areas disturbed by construction and exposed slopes along the southern edge of the Site. In 1990, additional work to repair discharge ditches and swales was performed to complete the removal actions.

In March 1990, SEC Donohue, an EPA Contractor, split samples with EPA during a confirmation sampling of three of the four wells originally sampled in 1986. The 1990 contaminant levels in the refuse well were similar to those detected in 1986. EPA's review of the sampling data concluded that the release of hazardous constituents to groundwater and surface water at the Site did not pose an immediate threat, but that the groundwater system and waste boundaries needed to be further defined, and that monitoring of groundwater, surface water and air should continue.

The City of Minot and other PRPs received a Statement of Work and draft Administrative Order on Consent (Consent Order) in June 1990 that was prepared by EPA for implementing a remedial investigation/feasibility study (RI/FS). During negotiations on the draft Consent Order, the City of Minot had concerns regarding some of the specific financial agreements. Consequently, a Unilateral Administrative Order (UAO) and Statement of Work were issued by EPA on September 28, 1990. The City of Minot, which was identified as a PRP in the UAO, agreed to comply with the order (letter dated October 10, 1990) and retained SEC Donohue to prepare the RI/FS Work Plan for the Site. The Site's RI Report was submitted in February 1992. The Site's FS was finalized in 1992.

3.5 Basis for Taking Action

In January 1992, a baseline risk assessment was completed on behalf of EPA. The risk assessment addressed risk to human health and the environment at the Site.

Because no complete exposure pathways were identified, the risk to current users was estimated to be insignificant. However, land use changes in the future and/or contaminant migration from the landfill to off-site areas would create the potential for exposure and risk. Therefore, the results of the risk assessment for both adults and children were based on potential future exposure scenarios. The results indicated that site ground and surface water, sediment, soil and landfill gases were the media of concern. The Site's 1993 ROD identified contaminants of concern at the Site. Table 2 presents them below.

Table 2: Contaminants of Concern

Compound	COC (Contaminated Media)	
Benzene and Compounds	Benzene (air, water, sediment, soil, solid waste)	Toluene (air, water, sediment, soil, surface water)
Halogenated Aliphatics	Bromomethane (water, sediment, soil, solid waste, surface water)	Methylene chloride (water, sediment, soil, surface water)
	Bromodichloromethane (water, sediment, soil, solid waste, surface water)	Tetrachloroethene (water, sediment, surface water)
	1,2-Dichloroethene (water)	Vinyl chloride (air, water, sediment, soil, solid waste, surface water)
	t-1,2-Dichloroethylene (water, sediment, soil, solid waste, surface water)	
Inorganics	Arsenic (water, sediment, soil, solid waste, surface water)	Lead (water, sediment, soil, solid waste, surface water)
	Barium (water, sediment, soil, solid waste, surface water)	Nickel (water, sediment, soil, solid waste, surface water)
	Chromium (water, sediment, soil, solid waste, surface water)	Vanadium (water, sediment, soil, solid waste, surface water)
	Copper (water, sediment, soil, solid waste, surface water)	Zinc (water, sediment, soil, solid waste, surface water)
	Cobalt (water, sediment, soil, solid waste, surface water)	
Phenyl and Compounds	Benzoic acid (water, sediment, soil, surface water)	Diethylphthalate (water, sediment, soil, solid waste, surface water)
	Bis(2-ethylexyl)phthalate (sediment, soil, surface water)	Di-n-octylphthalate (water, sediment, soil, solid waste, surface water)
	Butylbenzylphthalate (sediment, soil, solid waste, surface water)	4-Methylphenol (water, sediment, soil, surface water)
	Di-n-butylphthalate (water, sediment, soil, solid waste, surface water)	Phenol (water, sediment, soil, solid waste, surface water)
PAHs	Benz(a)anthracene (water, sediment, soil, solid waste, surface water)	2-Methylnaphthalene (water, sediment, soil, surface water)
	Benzo(a)pyrene (water, sediment, soil, solid waste, surface water)	Naphthalene (water, sediment, soil, solid waste, surface water)
	Indeno(1,2,3-cd)pyrene (water, sediment, soil, solid waste, surface water)	Phenanthrene (water, sediment, soil, solid waste, surface water)
Solvents	Acetone (water, sediment, soil, solid waste, surface water)	
Others	Aroclor 1254 (sediment, soil, solid waste, surface water)	

The Site's RI Report identified and evaluated hydrogeologic conditions, primary contaminant sources, release mechanisms, migration pathways and receptors. The following conclusions were derived from the RI Report:

- Contaminants were detected in landfill leachate, landfill gas, soil at a leachate seep and in one groundwater monitoring well located immediately adjacent to the landfill.
- Both the physical and chemical data indicate that there has been no significant migration of contaminants away from the Site within the groundwater system.
- Uncontrolled release of contaminants at low levels does occur from leachate seeps and landfill gas release.
- Leachate seeps and gas releases have been identified at the surface within the fill boundaries of the landfill.
- Site geologic conditions consisting of clay till and discontinuous sand lenses minimize the potential for leachate migration to the surrounding groundwater system.
- The leachate is in hydraulic contact with the groundwater flow system; therefore, measures to minimize the potential for future release and continued monitoring of groundwater should be considered in the FS.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria include:

1. Overall Protectiveness of Human Health and the Environment.
2. Compliance with ARARs.
3. Long-Term Effectiveness and Permanence.
4. Reduction of Toxicity, Mobility or Volume of Contaminants through Treatment.
5. Short-term Effectiveness.
6. Implementability.
7. Cost.
8. State Acceptance.
9. Community Acceptance.

4.1 Remedy Selection

The Site's 1993 ROD outlined the selected remedy for the Site, taking into consideration comments from the public and the results of the RI/FS. The site remedy was selected to eliminate or reduce potential threats to humans and the environment posed by soil and groundwater, resulting from future migration of leachate and gas emissions from the Site through containment and institutional controls.

The Site's ROD was signed on June 21, 1993. The Remedial Action Objectives (RAOs) identified in the ROD included:

- Prevent direct contact with landfill contents including the solid waste, leachate and gas.
- Limit future leachate migration out of the landfill to ensure a low risk to potential groundwater receptors and to maintain groundwater quality outside the landfill within drinking water standards.
- Treat or isolate soils in the immediate vicinity of leachate seeps to prevent contact or ingestion that would result in unacceptable carcinogenic or noncarcinogenic risks.
- Control leachate seeps to prevent the movement of contaminants by surface flow to off-site soil and surface water.
- Manage landfill gas to ensure a low risk to air receptors.
- Manage landfill gas to reduce gas pressure within the landfill in order to protect the cap.
- Manage landfill gas to reduce pressure head buildup of leachate on the landfill base to minimize leachate migration to groundwater.

- Manage leachate to prevent exceedances of water quality standards in natural surface waters due to stormwater runoff from the site or discharge from a treatment facility.

The selected remedy for the Site in the 1993 ROD included the following components:

- Institutional controls to prohibit construction on the landfill and the use of water beneath the landfill or in the immediate vicinity of the landfill for drinking water purposes.
- Leachate extraction and treatment in the City of Minot's wastewater treatment facility.
- Consolidation of contaminated soil in the vicinity of leachate seeps under the cap, and cap improvements to limit precipitation infiltration and control stormwater runoff.
- Groundwater monitoring to allow detection of future releases of contaminants to the groundwater.
- Landfill gas collection using an active collection system and a tall stack for dispersion venting. EPA may modify the system design to accommodate site conditions, following installation of the leachate collection system.

EPA issued an ESD on May 2, 1996 to document the following modifications to the remedy selected in the ROD:

- A passive gravity drain system replaced the proposed active leachate extraction system. The passive system was more cost effective while achieving the same goal of managing leachate levels in the landfill preventing leachate seeps through the cap and reducing the potential for leachate migration from the landfill into the groundwater.
- The cap design was clarified: the three-foot clay cap specified in the ROD performance standard became 18 inches of clay, 12 inches of root zone material and six inches of topsoil.
- Passive gas vents replaced the proposed active gas extraction system and tall stack. The gas vents were more cost effective while achieving the same goal of controlling landfill gas reducing pressures in the landfill that can damage the landfill cap and increase the potential for leachate migration.
- The limits of buried waste were extended based on the May 1993 geophysical survey investigation information.

In consideration of potential future risks to human health, 33 COCs (see Table 2) were identified through the baseline risk assessment. Monitoring of these contaminants is ongoing.

All contaminated soils and sediment were excavated and placed under the landfill cap. Table 3 lists contaminant cleanup goals for site groundwater identified in the Site's 1993 ROD.

Table 3: Groundwater Cleanup Goals for Contaminants of Concern (COCs)

Groundwater COC (µg/L) ^d	1993 ROD Cleanup Goal (µg/L)
Benzene	5 ^a
Toluene	1,000 ^a
Tetrachloroethene	5 ^a
Trans-1,2-dichloroethene	100 ^a
Vinyl chloride	2 ^a
Barium	2,000 ^a
Chromium	100 ^a
Copper	1,300 ^b
Zinc	5,000 ^c
a. Primary Maximum Contaminant Level (MCL). b. Federal Maximum Contaminant Level Goal (MCLG). c. Secondary MCL (SMCL). d. µg/Lmicrograms per liter	

4.2 Remedy Implementation

In the 1995 Consent Decree, the City of Minot agreed to perform remedial design/remedial action (RD/RA) and O&M at the site. The plan was finalized on January 23 1996. In July 1996, several test pits were excavated to verify the presence of waste and determine its configuration. Supplementary test pits dug during the RA also demonstrated the limits of the original cap used to cover and close the landfill in the southernmost area because additional waste was found outside the fence. Identified waste was excavated, and placed under a new cap. The new cap was improved so that a uniform, minimum thickness of capping material was in place across the landfill. The improved cap layer consisted of, from bottom to top: 18 inches of clay, 12 inches of loosely placed root zone material, and a six-inch layer of topsoil. This approach met the substantive requirement of the North Dakota Solid Waste Management Act to prevent direct contact with landfill contents. The existing silt fence around catch basins was replaced by riprap. Additionally, erosion matting was installed in the swales between catch basins, in perimeter ditches, and in the cap improvement area in the swale adjacent to 18th Street. The entire Site was seeded and fertilized to ensure that the landfill surface was adequately vegetated. The permanent fence at the Site completely encompasses this containment area. This work was completed in September 1996.

Leachate within the landfill is drained by gravity into a drain pipe system located approximately eight feet below the surface of the landfill. The slope of the drain system extends from the south to the north, where the leachate discharges into a sanitary sewer system. The sanitary sewer system carries the leachate to the City of Minot's wastewater treatment facility. Riser pipes extending upward from the leachate drain serve as passive gas vents and clean-outs. Removable wind turbines, installed at the top of each of the riser pipes, help remove the gas from the landfill by inducing a vacuum.

Seven groundwater monitoring wells and four piezometers have been constructed around the perimeter of the landfill. Leachate in the wells during abandonment was disposed of in the City of Minot's municipal sanitary sewer system.

The City of Minot has implemented institutional controls. These controls are local land use ordinances that restrict activities that could damage the landfill cap and prohibit installation of groundwater supply wells within or in the immediate vicinity of the landfill. The institutional controls, which were adopted by Minot City Council on November 4, 1996, can be found in Appendix H.

EPA and NDDH concluded that the RA had been successfully implemented. NDDH conducted a preliminary final inspection on August 27, 1996 and conducted the final inspection on September 18, 1996. The Site's Final Remedial Action Completion Report was completed on November 8, 1996.

4.3 Operation and Maintenance (O&M)

The O&M period for the Site, as detailed in the Site's Monitoring Operations and Contingency Plan, began in October 1996. The City of Minot is performing all site O&M work, which includes groundwater monitoring, inspecting gas vents, managing leachate, implementing additional response actions (or contingencies) that may be necessary to meet the performance standards, and all maintenance work. Additionally, the City of Minot mows the area regularly and actively works to reseed and correct any areas of erosion.

Seven groundwater monitoring wells and four piezometers are located around the perimeter of the landfill. The groundwater wells were sampled quarterly for the first year after the RA construction completion and annually thereafter, in accordance with the 1993 ROD.

Leachate within the landfill is drained by gravity into a drain pipe located approximately eight feet below the surface of the landfill. The drain discharges the leachate to a sanitary sewer system that carries it to the City of Minot's wastewater treatment facility. Riser pipes extending upward from the leachate drain serve as passive gas vents and clean-outs. This system continues to be operated and maintained by the City of Minot.

Most of the stormwater from the landfill is routed to catch basins; the stormwater then flows off site via storm sewers. A six-foot-high security fence with locked gates surrounds the landfill.

Table 4: Annual O&M Costs

Year	Total Cost (rounded to the nearest \$1,000)
2007	\$4,000
2008	\$4,000
2009	\$4,000
2010	\$6,000

O&M costs during this period all fell below the projected annual cost of \$39,700. These O&M costs are for groundwater monitoring, implementation of additional response actions that may be necessary to meet the performance standards, and all maintenance work (which includes mowing the area regularly and actively reseeding or correcting any areas of erosion). All of the O&M activities are being accomplished in a timely fashion. Expenditures for 2010 are higher than previous years due to the repair of fence damage from a June 17, 2010 storm.

5.0 Progress Since the Last Five-Year Review

The protectiveness statement from the 2006 FYR for the Site stated the following:

The inspection performed by the State of North Dakota and the City of Minot and the review of the groundwater data by the City of Minot's contractor, WSI, indicates there continues to be no threat to the community from the landfill, the landfill gas, or leachate. Institutional controls for the Site have been adopted and are protective of human health and the environment.

The 2006 FYR included three issues and recommendations (Table 5). Each recommendation and its current status are discussed below.

Table 5: Progress on Recommendations from the 2006 FYR

Section	Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
5.1	Re-seed areas lacking sufficient vegetation.	City of Minot	09/30/2006	Complete: Areas lacking sufficient vegetation were re-seeded.	03/27/2007
5.2	Filling voids with clean material.	City of Minot	09/30/2006	Complete: Small areas or erosion on cap were filled.	11/30/2006
5.3	Affix new labels on affected monitoring wells.	City of Minot	09/30/2006	Complete: New labels were affixed to all monitoring wells.	03/24/2007

5.1 Re-seed areas lacking sufficient vegetation

During the 2006 site inspection, small areas lacking vegetation cover were discovered. EPA recommended the reseeded of those areas. All areas lacking sufficient vegetation were re-seeded in March 2007.

5.2 Filling voids with clean material

During the 2006 site inspection, small areas of erosion on the landfill cap were noted and EPA recommended that the voids be filled in with clean material. Small areas of erosion on the cap were filled with black dirt and re-seeded in fall 2006.

5.3 Affix new labels on affected monitoring wells

In order to facilitate the groundwater monitoring, EPA recommended replacing the weathered monitoring well labels. New labels were affixed to all monitoring wells in March 2007.

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 8 initiated the FYR in October 2010 and scheduled its completion for September 2011. The EPA site review team was led by EPA Remedial Project Manager (RPM) Kerri Fiedler, EPA Community Involvement Coordinator (CIC) John Dalton and contractor support provided to EPA by Skeo Solutions. A review schedule was established that consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

In October 2010, a public notice was published in the *Minot Daily News* newspaper announcing the commencement of the FYR process for the Site, providing contact information for EPA RPM Kerri Fiedler, EPA CIC John Dalton, and the Assistant Director of the North Dakota Solid Waste Program, Steve Tillotson, and inviting community participation. The press notice is available in Appendix B. No people contacted EPA or NDDH as a result of this advertisement. Community interviews were conducted and are discussed in Section 6.6 of this FYR Report.

Previously, the designated site repository was located at the North Dakota Department of Health, Environmental Health Section, 918 East Divide Avenue, in Bismarck, North Dakota. Because Bismarck is located more than 110 miles from the Site, EPA was able to secure a new site repository during this FYR process. The new site repository is the Minot Public Library, located at 516 2nd Avenue SW, Minot, North Dakota 58701. This FYR Report will be made available to the public once it has been finalized. Copies of this document will be placed in the newly designated site document repository. Upon completion of the FYR, a public notice will be placed in the *Minot Daily News* newspaper to announce the availability of the final FYR Report in the Site's document repository.

6.3 Document Review

This FYR included a review of relevant, site-related documents, including the Site's ROD, ESD, RA Reports, and recent monitoring data. A complete list of the documents reviewed can be found in Appendix A.

ARARs Review

Remedial actions are required to comply with the chemical-specific ARARs identified in the Site's ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy were reviewed.

Groundwater ARARs

According to the Site's 1996 Final RD Report, cleanup goals for nine groundwater COCs in the 1993 ROD were based on federal MCLs, maximum contaminant level goals (MCLGs) and secondary MCLs (SMCLs). NDDH also enforces SDWA standards under its Drinking Water program. ARARs from the 1993 ROD were compared to current national primary and secondary drinking water regulations (40 CFR 141-143) (Table 6). Chemical-specific ARARs for the Site remain unchanged.

Table 6: Previous and Current ARARs for Groundwater COCs

COCs	1993 ARAR (µg/L)	Current ^a ARARs (µg/L)	ARARs Change
<i>Benzene and Compounds</i>			
Benzene	5 ^b	5	None
Toluene	1,000 ^b	1,000	None
<i>Halogenated Aliphatics</i>			
Tetrachloroethene ^c	5 ^b	5	None
Trans-1,2-dichloroethene ^d	100 ^b	100	None
Vinyl chloride	2 ^b	2	None
<i>Inorganics</i>			
Barium	2,000 ^b	2,000	None
Chromium	100 ^b	100	None
Copper	1,300 ^e	1,300 ^{e,f}	None
Zinc	5,000 ^g	5,000 ^g	None
<p>a. National Primary and Secondary Drinking Water MCLs are available at: http://water.epa.gov/drink/contaminants/index.cfm (accessed 1/27/2011).</p> <p>b. Primary MCL.</p> <p>c. Tetrachlorethene is also known as tetrachloroethylene.</p> <p>d. Trans-1,2-dichloroethene is also known as trans-1,2-dichloroethylene.</p> <p>e. Federal MCLG.</p> <p>f. Based on the action level for copper, which is regulated by a treatment technique.</p> <p>g. SMCL.</p>			

6.4 Data Review

Groundwater sampling data from April 2007 through May 2010 were reviewed. The data included results for the seven monitoring wells and results for leachate samples. The results of

the sampling data were provided by the City of Minot's contractor, MVTL Laboratories, Inc. The data did not reveal any groundwater exceedances. The groundwater data are presented in Appendix G.

6.5 Site Inspection

The site inspection was held on November 9, 2010. Participants included EPA RPM Kerri Fiedler; EPA CIC John Dalton; Kirk Johnson, NDDH; Dan Jonasson and Jeff Richards, City of Minot; and Treat Suomi and Rhode Bicknell of Skeo Solutions. The group toured the Site and wells, fencing and general conditions were noted and photographed (Appendix E). Skeo Solutions also interviewed site inspection participants. Results of the Site inspection are available in the completed site inspection checklist in Appendix D. A site visit report from Kirk Johnson, NDDH is included in Appendix F. Photographs were taken to record site conditions (Appendix E).

The site inspection was led by EPA RPM Kerri Fiedler, who explained the present status of site activities. The Site is construction complete, has been deleted from the NPL and is currently monitored and maintained according to the Site's O&M Plan. The site inspection team, along with review of the groundwater data, observed that the remedy had performed as intended since implementation. The on-site landfill is surrounded by a chain link perimeter fence and gate, which were secured and in good condition. Access gates were closed and secured and signage prohibiting trespassing was posted on all sections of the security fence. All monitoring wells were locked and clearly labeled. The methane vents that are connected to the Site's centerline leachate collection system piping appeared intact and undamaged.

The cap over the area of source contamination and adjacent slope areas had a well-established vegetative cover. The cap and slopes had been mowed prior to the site inspection. Some signs of erosion were evident along the northeastern slope. The 2006 FYR also referenced some erosion on the cap. The small areas of previous erosion on the cap were filled with black dirt and reseeded in March 2007. It is unknown if the current erosion is on the same area or a new location. The condition of the drainage swales, riprap and other water control structures on the Site appeared intact and functioning as designed. However, some of the drainage swales were choked with excess vegetation.

Two wild Russian olive trees were observed adjacent to the landfill cap. There was discussion as to the proximity of these trees and, although not on top of the cap, Mr. Jonasson and Mr. Richards agreed to remove the trees to eliminate the potential for deep-rooted exotic trees to take root within the cap.

As part of the site inspection, Skeo Solutions staff and EPA CIC John Dalton visited the site document repository, located at the Minot Public Library, 516 2nd Avenue SW in Minot. EPA had recently sent decision documents and the 2006 FYR to the Minot Public Library and these documents were awaiting shelving in the library's reference section. The repository had previously been located at the North Dakota Department of Health, Environmental Health Section, 918 East Divide Avenue, in Bismarck, North Dakota.

Table 7 lists the institutional controls associated with the Site. A copy of the Minot City ordinance is included in Appendix H. The 1993 ROD called for institutional controls to prohibit future land use at the landfill that could cause unacceptable exposure to landfill contents or gas. The city ordinance includes prohibition of land use that could damage the cap and prohibition of the installation of groundwater supply wells through the landfill or in the immediate vicinity of the landfill. During the site visit on November 9, 2010, no breaches of the institutional controls were observed.

Table 7: Institutional Control (IC) Summary Table

Media	ICs Needed	ICs Called for in the Decision Documents	IC Objective	Instrument in Place
Groundwater	Yes	Yes	Restrict installation of groundwater wells	City ordinance No. 3406, § 1 Section 16-51
Soil	Yes	Yes	Restrict subsurface boring on premises or within 150 feet of the no-entry premises	City ordinance No. 3406, § 1 Section 16-51

6.6 Interviews

During the FYR process, interviews were conducted with parties impacted by the Site, including representatives from surrounding businesses, local residents and regulatory agencies involved in site activities or aware of the Site. The purpose of the interviews was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy that have been implemented to date. The interviews were conducted during the site inspection on November 9, 2010 and later via phone with some of the local business owners. A reverse phone directory was used to obtain phone numbers for nearby residents. Of the people contacted, no one was interested in providing comments or participating in the interview process. Interviews are summarized below and complete interviews are included in Appendix C.

Alan Walter: Mr. Alan Walter is an employee of the City of Minot. Mr. Walter believes that the remedy is performing well.

Mark Jantzer: Mr. Mark Jantzer of the City of Minot believes that the remedy is performing well, and noted that the only problems with unusual or unexpected activities at the Site are that, during the past 15 years, the fence has been cut twice. In both instances, the fence was repaired the next day.

Kirk Johnson: Kirk Johnson of NDDH believes that the cap and passive systems seem to be working and the current performance of the remedy in place is holding well. He also noted that not much discussion about the reuse of the land has taken place.

Jeff Richards: Mr. Jeff Richards, City of Minot, believes that the remedy in place is performing as designed. He recommends changing groundwater monitoring to every other year. (Groundwater monitoring is currently required to be completed every other year however, it is conducted annually for coordination purposes with the required schedule at the operating (New) Minot Landfill.)

Dan Jonasson: Mr. Dan Jonasson of the City of Minot believes that the remedy is functioning adequately and the cap is working. He thinks the city needs to take a closer look at the trees, as they may be getting too close to the cap.

Kerri Fiedler: EPA RPM Kerri Fiedler has a generally positive impression of the project. She has not heard of any complaints, problems or issues with the project and plans to investigate reuse possibilities.

Local Business Owner 1: Business Owner 1 is the manager at Maysa Ice Arena. He believes that the remedy is performing well, and stated that he did not know of any problems with unusual or unexpected activities at the Site. Business Owner 1 did not have any questions or concerns about the Site, but is anxious for it to be put back into reuse.

Local Business Owner 2: Business Owner 2 is the manager of Wholesale Distributing and Western Plumbing and Steel, a business next door to the Site. The manager felt well-informed about site activities and noted that the current signage at the Site is clear and prohibits access to

the Site. The manager was not aware of any impacts of the Site on the surrounding community and did not have any concerns about the Site's safety or the protectiveness of the Site's remedy.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

Yes. The review of documents, ARARs, risk assumptions and the site inspection indicate that the remedy is functioning as intended by the Site's ROD and the subsequent ESD.

Contaminated soils in the vicinity of leachate seeps were excavated, consolidated, stabilized/solidified and isolated under the landfill cap. The original landfill cap was improved to limit precipitation infiltration and control storm water runoff. The cap over the source area and adjacent slope areas has a well-established vegetative cover, although there was a small area on the northeastern slope that showed some signs of erosion during the November 9, 2010 site inspection. The condition of the drainage swales, riprap and other water control structures on the Site are intact and functioning as designed. However, some of the drainage swales were choked with excess vegetation. Two wild Russian olive trees were observed adjacent to, not on top of, the landfill cap. Representatives from the City of Minot agreed to remove the trees to eliminate the potential for deep-rooted exotic trees to take root within the cap. Access to the Site is restricted by a locked security fence, signs are present around the perimeter of the Site and the Site is regularly inspected and maintained in accordance with the O&M Plan.

Water quality data from the last five years for the Site's seven monitoring wells and leachate reports were reviewed. Concentrations of all organic and inorganic contaminants of concern were well below state and federal MCLs and MCLGs.

A city ordinance prohibits land uses that could damage the cap and installation of groundwater supply wells on the landfill or in the immediate vicinity of the landfill. Combined with landfill capping and passive gas vents, this ordinance minimizes the potential exposures to humans from waste materials and/or landfill off-gas. Land use institutional controls are in place to limit specific activities, such as installation of groundwater wells or subsurface boring on the premises or within 150 feet of the no-entry premises. The passive gravity drain system manages leachate levels in the landfill to reduce the potential for leachate migration into the groundwater. Groundwater monitoring data suggest that this system is effective in meeting this goal.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Yes. There have been no changes to ARARs for the COCs. There have been no other changes in exposure assumptions to human health and the environment, or toxicity data that would call into question the protectiveness of the remedy. There are currently no proposed reuse plans at the Site that would affect the protectiveness of the remedy.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. No other information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The review of documents, ARARs, risk assumptions and the site inspection indicate that the remedy is functioning as intended by the ROD and the subsequent ESD.

Contaminated soils in the vicinity of leachate seeps were excavated, consolidated, stabilized/solidified and isolated under the landfill cap. The original landfill cap was improved to limit precipitation infiltration and control storm water runoff. The cap over the source area and adjacent slope areas has a well-established vegetative cover, although there is a small area of erosion on the northeastern slope. The condition of the drainage swales, riprap and other water control structures on the Site are intact and functioning as designed. However, some of the drainage swales were choked with excess vegetation. Two wild Russian olive trees were observed adjacent to, not on top of, the landfill cap. Access to the Site is restricted by a locked security fence, signs are present around the perimeter of the Site and the Site is regularly inspected and maintained in accordance with the O&M Plan.

Water quality data from the last five years for the Site's seven monitoring wells and leachate reports were reviewed. Concentrations of all organic and inorganic contaminants of concern were well below state and federal MCLs and MCLGs.

ARARs have not changed since the Site's June 1993 ROD and April 1996 ESD. There have been no other changes in exposure assumptions or toxicity data that could call into question the protectiveness of the remedy. There are not currently any proposed reuse plans at the Site that would affect the protectiveness of the remedy.

Institutional controls are in place in the form of City Ordinances. These prohibit land use that could damage the cap and prohibit installation of groundwater supply wells on the landfill or in the immediate vicinity of the landfill. Combined with landfill capping and passive gas vents, these institutional controls minimize the potential for exposure to humans from waste materials and/or landfill off-gas. The passive gravity drain system manages leachate levels in the landfill to reduce the potential for leachate migration into the groundwater. Groundwater monitoring data suggest that this system is effective in meeting this goal.

8.0 Issues

Table 8 summarizes the current site issues.

Table 8: Current Issues, Old Minot Landfill, OU1

Issue	Affects Current Protectiveness (Yes or No)	Affects Future Protectiveness (Yes or No)
Small area of erosion exists on the north end of the landfill cap.	No	Yes
Two wild Russian olive trees are bordering the landfill cap.	No	Yes
Drainage swales are choked with excess vegetation and debris.	No	Yes

9.0 Recommendations and Follow-up Actions

Table 9 provides recommendations to address the current site issues.

Table 9: Recommendations to Address Current Issues, Old Minot Landfill, OU1

Issue	Recommendations / Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date
Small area of erosion exists on the north end of the landfill cap.	Fill eroded areas with clean material and re-vegetate.	City of Minot	EPA	02/01/2012
Two wild Russian olive trees are bordering the landfill cap.	Remove the two Russian olive trees bordering the cap.	City of Minot	EPA	02/01/2012
Drainage swales are choked with excess vegetation and debris.	Clean drainage swales out and inspect on a regular basis.	City of Minot	EPA	02/01/2012

10.0 Protectiveness Statements

The remedy at OU1 of the Minot Landfill currently protects human health and the environment because it is functioning as intended by the Site's decision documents, the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection are still valid, and no other information has come to light that could call into question the protectiveness of the remedy. Contaminated source material has been excavated and is being contained on the Site beneath a landfill cap. Institutional controls are in place to prevent future land uses that could damage the remedial components in place and to prohibit installation of groundwater supply wells on the Site or in the immediate vicinity of the Site. No groundwater at the Site or in the area surrounding the Site is currently being used. However, in order for the Site's remedy to be protective in the long-term the following actions need to be taken:

- Areas of erosion on the landfill cap need to be addressed.
- Trees bordering the cap need to be removed.
- Drainage swales need to be cleaned out and inspected on a regular basis.

11.0 Next Review

As long as waste is left on site that does not allow for unrestricted use and unlimited exposure, this site will undergo a five year review as required via statute. The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

- Consent Decree, United States of America and City of Minot, 1996 (including the Statement of Work which is an Appendix to the Consent Decree), February 7, 1996.
- Explanation of Significant Differences to the Record of Decision, Old Minot Landfill, April 1996, United States Environmental Protection Agency Region 8, 1996.
- Final Remedial Action Completion Report, Minot Landfill Superfund Site, November 1996, Wenck, 1996.
- First Five-Year Review Report for Minot Landfill Site. United States Environmental Protection Agency Region 8, September 2001.
- Groundwater Monitoring @ Minot Old Landfill Spring Event, MVTL Laboratories, Inc., April 2007.
- Groundwater Monitoring @ Minot Old Landfill Spring Event, MVTL Laboratories, Inc., April 2008.
- Groundwater Monitoring @ Minot Old Landfill Spring Event, MVTL Laboratories, Inc., April 2009.
- Groundwater Monitoring @ Minot Old Landfill Spring Event, MVTL Laboratories, Inc., April 2010.
- Monitoring, Operations and Contingency Plan, Wenck, 1996.
- Old Minot Landfill Superfund Site Report, United States Environmental Protection Agency Region 8, May 1996.
- Remedial Investigation Report, Old Minot Landfill Superfund Site, Volumes 1 through 4, February 1992, Donohue, 1992.
- Record of Decision (ROD), Old Minot Landfill, United States Environmental Protection Agency Region 8, June 1993.
- Second Five-Year Review Report for Minot Landfill Site. United States Environmental Protection Agency Region 8, September 2006.

Appendix B: Press Notice

**AFFIDAVIT OF PUBLICATION
STATE OF NORTH DAKOTA**

SS.

County of Ward

AMY BOYLE

of said County and State, being first duly sworn, on oath says: That the **MINOT DAILY NEWS** is a daily newspaper of general circulation, printed and published in the City of Minot, in said County and State. That the **MINOT DAILY NEWS** now is and during all times in the foregoing affidavit mentioned has been a newspaper qualified to do legal printing, in accordance with the Statutes of the State of North Dakota, and that I am clerk of the **MINOT DAILY NEWS** and during all such time covering the publication of this notice have occupied such position on said newspaper, and have personal knowledge of all the facts stated in this affidavit; and that the advertisement headed

FIVE YEAR REVIEW OF MINOT LANDFILL SUPERFUND SITE

a printed copy of which is herewith attached was printed and published in said newspaper

ONE times to-wit:

OCTOBER 15, 2010

Amy Boyle, Clerk.

Subscribed and sworn to before me this 15th Day of October 2010

Shannon Peterson
Notary Public, Ward Co, N.D.

D38943

NOTICE OF FIVE YEAR REVIEW
Old Mines Landfill Superfund Site
Minot, Ward County, North Dakota

The Old Mines Landfill Superfund Site was used by the City of Minot as a landfill for residential and industrial wastes from 1961 - 1971. Contaminants of concern at the site included air benzene, copper, zinc, phthal compounds and volatile organic compounds. The Environmental Protection Agency (EPA) placed the site on its National Priorities List (NPL) for cleanup consideration in 1989. The cleanup of the site involved joint state, state and federal action. Old Mines Landfill Superfund Site was deleted from the NPL in 1997.

In September 2006, EPA conducted a Five-Year Review that determined the site's remedy remained protective of human health and the environment.

EPA now invites comment and input from the public for the next Five-Year Review, to be completed by September 2011.

Comments for the 2011 Five-Year Review should be received by **November 30, 2010**.

To submit comments on the site, or obtain more information, contact:

Karen Fiedler, EPA Project Manager EPA (800) 227-8917 ext. 312-6495 Ch (800) 312-6495 E-mail: k.fiedler@epa.gov	Steve Tilletson, Assistant Director North Dakota Solid Waste Program Phone: (701) 328-3100 stilletson@nd.gov
John Dalmon, EPA Community Involvement EPA (800) 227-8917 ext. 312-6633 Ch (800) 312-6633 E-mail: john.dalmon@epa.gov	

When complete, the 2011 Five-Year Review for the Old Mines Landfill Superfund Site will be placed in the following information repositories for reference and review by the public:

North Dakota Department of Health 618 East Divide Avenue Bismarck, ND 58501-1947	EPA Superfund Records Center 1395 Wadsworth Street Denver, CO 80202-1129
----------------------------------------------------------------------------------------	--------------------------------------------------------------------------------

October 15, 2010

PUBLICATION FEES

No. Lines 18 INCHES

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SHANNON PETERSON
Notary Public
State of North Dakota
My Commission Expires Oct. 8, 2015

Appendix C: Interview Forms

Minot Landfill Superfund Site

Five-Year Review Interview Form

Site Name:	<u>Minot Landfill</u>	EPA ID No.:	<u>NDD980959548</u>	
Interviewer Name:	<u>John Dalton</u>	Affiliation:	<u>EPA Region 8</u>	
Subject Name:	<u>Alan Walter</u>	Affiliation:	<u>City of Minot</u>	
Subject Contact Information:	<u>701-857-4140</u>			
Time:	<u>4:00 PM</u>	Date:	<u>11/09/2010</u>	
Interview Location:	<u>1025 31st St SE Minot, ND 58701</u>			
Interview Format (circle one):	<input checked="" type="checkbox"/> In Person	Phone	Mail	Other:

Interview Category: **Potentially Responsible Parties (PRPs) and O & M**

1. What is your overall impression of the project; including cleanup, maintenance, and reuse activities (as appropriate)?
Good. It seems to be working well.
2. What have been the effects of the Site on the surrounding community, if any?
None.
3. What is your assessment of the current performance of the remedy in place at the Site?
I was the engineer on the project. I think it is holding.
4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?
None that I am aware of.
5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?
I remain well informed about the site.
6. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?
No suggestion.
7. Do you think the Site puts anybody at risk?
Absolutely not. At most, once in a while if you put your nose right up the gas vent, you might get a whiff of something.
8. Are you aware of any changes to ICs?
I am not aware of any changes to the ICs.
9. Have you thought about projections for future land use?
We plan to turn it over to the park system after we are "released by EPA."
10. How often does anyone request any information on the Site?
Once every three years someone might ask about the Site.
11. What is the best way to get information to the community about the website.
Through the city website.

Minot Landfill Superfund Site

Five-Year Review Interview Form

Site Name:	<u>Minot Landfill</u>	EPA ID No.:	<u>NDD980959548</u>	
Interviewer Name:	<u>John Dalton</u>	Affiliation:	<u>EPA Region 8</u>	
Subject Name:	<u>Mark Jantzer</u>	Affiliation:	<u>City of Minot</u>	
Subject Contact Information:	<u>701-838-3967</u>			
Time:	<u>4:00 PM</u>	Date:	<u>11/09/2010</u>	
Interview Location:	<u>1025 31st St SE Minot, ND 58701</u>			
Interview Format (circle one):	<input checked="" type="checkbox"/> In Person	Phone	Mail	Other:

Interview Category: **Potentially Responsible Parties (PRPs) and O & M**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?
Yes.
2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?
Yes, I feel well informed. The City keeps me up to date on all issues regarding the site.
3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
A couple of times in the past 15 years, someone has called about kids cutting the fence and getting in. The fence was mended the next day.
4. Are you aware of any changes in projected land use(s) at the Site?
No. We plan to turn it over to the park system. They might expand the golf course.
5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?
Use the city website.
6. Do you have any comments, suggestions or recommendations regarding the project?
None that I can think of. Thanks so much for coming out here.

Minot Landfill Superfund Site

Five-Year Review Interview Form

Minot Landfill	EPA ID No.:	NDD980959548	
Interviewer Name:	<u>Rhode Bicknell</u>	Affiliation:	<u>Skeo Solutions</u>
Subject Name:	<u>Kirk Johnson</u>	Affiliation:	<u>ND Health Department</u>
Subject Contact Information:			
Time:	<u>10:00 AM</u>	Date:	<u>11/09/2010</u>
Interview Location:	Starbucks, 220 Burdick Expressway, West, Minot North Dakota		
Interview Format (circle one):	<input checked="" type="checkbox"/> In Person	<input type="checkbox"/> Phone	<input type="checkbox"/> Mail <input type="checkbox"/> Other:

Interview Category: **State Agency**

1. What is your overall impression of the project; including cleanup, maintenance and reuse activities (as appropriate)?
My impression is that the cap and passive systems seem to be working. In 2006, I visited the site and it appeared clean. Grass was growing well except in the identified erosion area.
2. What is your assessment of the current performance of the remedy in place at the Site?
It is holding up well.
3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?
None that are known by the NDDH is aware of.
4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.
None, except for a request to extend a neighborhood road that would have gone through the landfill site, very near the cap. The request was rejected.
5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?
No negative changes that would affect the remedy.
6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?
Yes.
7. Are you aware of any changes in projected land use(s) at the Site?
They have been planting hay since the last FYR. It grows well there. Not much discussion about the reuse of the land has taken place. There are new housing developments surrounding the site.
8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
No.

Minot Landfill Superfund Site

Five-Year Review Interview Form

Minot Landfill	EPA ID No.:	NDD980959548	
Interviewer Name:	<u>Treat Suomi</u>	Affiliation:	<u>Skeo Solutions</u>
Subject Name:	<u>Jeff Richards</u>	Affiliation:	<u>City of Minot</u>
Subject Contact Information:	<u>701-857-4140</u>		
Time:	<u>3:00 PM</u>	Date:	<u>11/09/2010</u>
Interview Location:	<u>Old Minot Landfill</u>		

Interview Format (circle one): In Person Phone Mail Other:

Interview Category: O&M Contractor

1. What is your overall impression of the project; including cleanup, maintenance and reuse activities (as appropriate)?
Trouble free. Chain link fence washed out this summer by heavy rains. FEMA covered the cost to replace the fence.
2. What is your assessment of the current performance of the remedy in place at the Site?
Working well. Twice a year, they try to bail hay on the site.
3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site?
Not familiar.
4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence.
Yes, two times per year he visits and checks on fence and site condition.
5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.
None.
6. Have there been unexpected O&M difficulties or costs at the Site since start-up or in the last five years? If so, please provide details.
Chain link issue previously stated – FEMA paid for the repair.
7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies.
None.
8. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?
No, except moving to sampling every other year.

Minot Landfill Superfund Site

Five-Year Review Interview Form

Site Name: Minot Landfill EPA ID No.: NDD980959548
Interviewer Name: Rhode Bicknell Affiliation: Skeo Solutions
Subject Name: Dan Jonasson Affiliation: City of Minot
Subject Contact Information: 701-833-9667
Time: 3:00 PM Date: 11/09/2010
Interview Location: Old Minot Landfill

Interview Format (circle one): In Person Phone Mail Other:

Interview Category: **Potentially Responsible Parties (PRPs)**

1. What is your overall impression of the remedial activities at the Site?
Overall, appropriate; no erosion; nothing negative showing up.
2. What have been the effects of this Site on the surrounding community, if any?
Not that I am aware of. There does not appear to be any interest in rebuilding the Site itself.
3. What is your assessment of the current performance of the remedy in place at the Site?
Adequate and holding up. Cap is working.
4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?
Some kids broke through the fence a few years back and went dirt biking.
5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?
Yes, when there are public input meetings, there is no big response. We put an ad in the paper and get no response. Maybe put on county or city website.
6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
I think we need to take a closer look at the trees. They may be getting too close to the cap. The grass is well established; good vegetation. No glowing deer seem to be present.
7. What is the path if someone wants to complain about the Site?
All calls are routed to the County Assessor's office and then to the City of Minot, Alan's office.

Minot Landfill Superfund Site

Five-Year Review Interview Form

Minot Landfill	EPA ID No.:	NDD980959548	
Interviewer Name:	Rhode Bicknell	Affiliation:	Skeo Solutions
Subject Name:	Kerri Fiedler	Affiliation:	EPA Region 8
Subject Contact Information:	(303) 312-6493		
Time: 4:00 PM	Date:	11/15/2010	
Interview Location:	_____		

Interview Format (circle one):	In Person	Phone	Mail	<input checked="" type="checkbox"/> Other: E-mail
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Interview Category: EPA Remedial Project Manager

1. What is your overall impression of the project; including cleanup, maintenance and reuse activities (as appropriate)?
I have generally a positive impression of the project, and have not heard of any complaints, problems or issues with the project. There has been some discussion on reuse possibilities and I am looking into that.
2. What have been the effects of the Site on the surrounding community, if any?
I am not aware of any effects the Site has had on the surrounding community within the last year.
3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities since the implementation of the cleanup?
I am not aware of any complaints or inquiries regarding site-related environmental issues.
4. What is your assessment of the current performance of the remedy in place at the Site?
My assessment of the current performance is that the remedy is operating as intended and is protective of human health and the environment.
5. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?
We verified the institutional controls have been implemented at the Site and confirmed they are being followed via our site visit on Nov. 9, 2010.
6. Are you aware of any community concerns regarding the Site or the operation and management of its remedy? If so, please provide details.
I am not aware of any community concerns regarding the Site.
7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
As mentioned earlier, I am looking into possible reuse activities and will continue to work with the City of Minot and the State of North Dakota on this.

Minot Landfill Superfund Site

Five-Year Review Interview Form

Site Name: Old Minot Landfill EPA ID No.: FLD050432251
Interviewer Name: Rhode Bicknell Affiliation: Skeo Solutions
Subject Name: Business Representative 1 Affiliation: Maysa Park Ice Arena
Subject Contact Information: Maysa Park Ice Arena
Time: 2:00 PM Date: 12/2/2010
Interview Location: Phone

Interview Format (circle one): In Person Phone Mail Other:

Interview Category: **Nearby Facilities**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?
Yes.
2. What is your overall impression of the project; including cleanup, maintenance and reuse activities (as appropriate)?
Seems to be going good. There have not been any issues that I know of.
3. What have been the effects of this Site on your facility, if any?
None.
4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
Just a bunch of snow dumped up there.
5. Has EPA kept involved parties and surrounding businesses informed of activities at the Site? How can EPA best provide site-related information in the future?
This is the first time I have talked to anyone about the Site. I have not noticed any notice in the newspaper. Would like to use for a toboggan hill. Best way for EPA to get information to me is to call me.
6. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
Hurry up and take the fence down.

Minot Landfill Superfund Site

Five-Year Review Interview Form

Site Name:	<u>Old Minot Landfill</u>	EPA ID No.:	<u>FLD050432251</u>	
Interviewer Name:	<u>Rhode Bicknell</u>	Affiliation:	<u>Skeo Solutions</u>	
Subject Name:	<u>Business Representative 2</u>	Affiliation:	<u>Wholesale Distributing</u>	
Subject Contact Information:	<u>701-852-4035</u>	Date:	<u>1/27/2011</u>	
Time:	<u>11:00 AM</u>			
Interview Location:	<u>Phone</u>			
Interview Format (circle one):	<u>In Person</u>	<u>Phone</u>	<u>Mail</u>	<u>Other:</u>

Interview Category: Nearby Facilities

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?
Yes.
2. What is your overall impression of the project; including cleanup, maintenance and reuse activities (as appropriate)?
Fine, no problems at all.
3. What have been the effects of this Site on your facility, if any?
None. Whatever they did to clean up. No qualms about the cleanup
4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
No, it is all fenced off so no one can get to it.
5. Has EPA kept involved parties and surrounding businesses informed of activities at the Site? How can EPA best provide site-related information in the future?
Back when they cleaned up, yes. Now when they are testing they always stop by. Best way to reach me is stop by, call or e-mail.
6. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
None that I can think of.

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.). Fill in all that apply.

Agency EPA
 Contact Name Kerri Fiedler Title: RPM Date: 11/09/10 Phone No.: (303) 312-6493
 Problems; suggestions; Report attached

Agency City of Minot
 Contact Name Dan Jonasson Title: PRP Date: 11/09/10 Phone No.: 701-833-9667
 Problems; suggestions; Report attached _____

Agency ND Health Department
 Contact Name Kirk Johnson Title: _____ Date: 11/09/10 Phone No.: _____
 Problems; suggestions; Report attached

Agency City of Minot
 Contact Name Mark Jantzer Title: _____ Date: 11/09/10 Phone No.: 701-838-3967
 Problems; suggestions; Report attached

Agency _____
 Contact Name _____ Title _____ Date _____ Phone No. _____
 Problems; suggestions; Report attached

4. **Other interviews** (optional) Report attached

Interviews were conducted with area businesses and are included in Appendix C. Local residents were contacted, but were uninterested in participating in an interview about the site.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

- | | | | |
|------------------------------------------------------|-------------------------------------------------------|-------------------------------------|------------------------------|
| <input checked="" type="checkbox"/> O&M manual | <input checked="" type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input type="checkbox"/> N/A |
| <input type="checkbox"/> As-built drawings | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> Maintenance logs | <input checked="" type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input type="checkbox"/> N/A |

Remarks: _____

2. **Site-Specific Health and Safety Plan** Readily available Up to date N/A

Contingency plan/emergency response plan Readily available Up to date N/A

Remarks: _____

3. **O&M and OSHA Training Records** Readily available Up to date N/A

Remarks: _____

4.	Permits and Service Agreements			
	<input type="checkbox"/> Air discharge permit	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Effluent discharge	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Waste disposal, POTW	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Other permits _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	Remarks: _____			
5.	Gas Generation Records	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	Remarks: _____			
6.	Settlement Monument Records	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	Remarks: _____			
7.	Groundwater Monitoring Records	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
	Remarks: _____			
8.	Leachate Extraction Records	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	Remarks: _____			
9.	Discharge Compliance Records			
	<input type="checkbox"/> Air	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Water (effluent)	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	Remarks: _____			
10.	Daily Access/Security Logs	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	Remarks: _____			
IV. O&M COSTS				
1.	O&M Organization			
	<input type="checkbox"/> State in-house	<input type="checkbox"/> Contractor for State		
	<input checked="" type="checkbox"/> PRP in-house	<input type="checkbox"/> Contractor for PRP		
	<input type="checkbox"/> Federal Facility in-house	<input type="checkbox"/> Contractor for Federal Facility		
	<input type="checkbox"/> _____			

2. O&M Cost Records			
<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date		
<input type="checkbox"/> Funding mechanism/agreement in place	<input type="checkbox"/> Unavailable		
Original O&M cost estimate <u>\$39,000 a year</u>	<input type="checkbox"/> Breakdown attached		
Total annual cost by year for review period if available			
From 1/1/07	To 12/31/07	<u>\$ 4,000</u>	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From 1/1/08	To 1/31/08	<u>\$ 4,000</u>	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From 1/1/09	To 12/31/08	<u>\$ 4,000</u>	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From 1/1/10	To 12/31/10	<u>\$ 6,000</u>	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
3. Unanticipated or Unusually High O&M Costs During Review Period			
Describe costs and reasons: _____			
V. ACCESS AND INSTITUTIONAL CONTROLS <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
A. Fencing			
1. Fencing damaged	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Gates secured	<input type="checkbox"/> N/A
Remarks:			
2. "No Entry Premises"	<input type="checkbox"/> Signs present	<input checked="" type="checkbox"/> Signs adequate	<input type="checkbox"/> N/A
Remarks:			
B. Other Access Restrictions			
1. Signs and other security measures	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A	
Remarks:			

C. Institutional Controls (ICs)			
1.	Implementation and enforcement		
	Site conditions imply ICs properly implemented	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Groundwater wells were installed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	No subsurface boring has occurred	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Remarks:		
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Violations have been reported	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Other problems or suggestions: <input type="checkbox"/> Report attached		
2.	Adequacy	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A
	Remarks:		
D. General			
1.	Vandalism/trespassing	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident
	Remarks: _____		
2.	Land use changes on site	<input checked="" type="checkbox"/> N/A	
	Remarks:		
3.	Land use changes off site	<input type="checkbox"/> N/A	
	Remarks: <u>Since the 2006 FYR, a new housing development has been built on area to the northeast of the landfill.</u>		
4.	Potential for redevelopment and reuse of site	<input type="checkbox"/> N/A	
	Remarks: <u>The Site has potential for redevelopment and reuse although no current plans exist.</u>		
VI. GENERAL SITE CONDITIONS			
A. Roads <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	Roads damaged	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/>
	N/A		
	Remarks:		
B. Other Site Conditions			
	Remarks:		

VII. LANDFILL COVERS		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
A. Landfill Surface			
1.	Settlement (Low spots)	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Settlement not evident
	Arial extent _____		Depth _____
	Remarks: _____		
2.	Cracks	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Cracking not evident
	Lengths _____	Widths _____	Depths _____
	Remarks: _____		
3.	Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident
	Arial extent _____		Depth _____
	Remarks: <u>Erosion was not evident on landfill cover. See subsection C below for erosion on letdown channels.</u>		
4.	Holes	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Holes not evident
	Arial extent _____		Depth _____
	Remarks: _____		
5.	Vegetative Cover	<input checked="" type="checkbox"/> Grass	<input checked="" type="checkbox"/> Cover properly established
	<input checked="" type="checkbox"/> No signs of stress	<input checked="" type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram)	
	Remarks: <u>The density and diversity of the final cover native grass vegetation was very thick and in good condition with few weeds. Two wild Russian olive trees were noted adjacent to the landfill cap.</u>		
6.	Alternative Cover (armored rock, concrete, etc.)		<input checked="" type="checkbox"/> N/A
	Remarks: _____		
7.	Bulges	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Bulges not evident
	Arial extent _____		Height _____
	Remarks: _____		
8.	Wet Areas/Water Damage	<input checked="" type="checkbox"/> Wet areas/water damage not evident	
	<input type="checkbox"/> Wet areas	<input type="checkbox"/> Location shown on site map	Arial extent _____
	<input type="checkbox"/> Ponding	<input type="checkbox"/> Location shown on site map	Arial extent _____
	<input type="checkbox"/> Seeps	<input type="checkbox"/> Location shown on site map	Arial extent _____
	<input type="checkbox"/> Soft subgrade	<input type="checkbox"/> Location shown on site map	Arial extent _____
	Remarks: _____		

9.	Slope Instability	<input type="checkbox"/> Slides	<input type="checkbox"/> Location shown on site map
	<input checked="" type="checkbox"/> No evidence of slope instability		
	Aerial extent _____		
	Remarks: _____		
B. Benches			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	Flows Bypass Bench	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
	Remarks: _____		
2.	Bench Breached	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
	Remarks: _____		
3.	Bench Overtopped	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
	Remarks: _____		
C. Letdown Channels			
	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A	
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	Settlement (Low spots)	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of settlement spots
	Aerial extent _____	Depth _____	
	Remarks: _____		
2.	Material Degradation	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of degradation
	Material type _____	Aerial extent _____	
	Remarks: _____		
3.	Erosion	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of erosion
	Aerial extent _____	Depth _____	
	Remarks: <u>Some erosion was noted on the letdown channel on the north end of the cap. The City of Minot indicated they would replace the topsoil and reseed the area.</u>		
4.	Undercutting	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting
	Aerial extent _____	Depth _____	
	Remarks: _____		

5.	Obstructions	Type _____	<input checked="" type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Arial extent _____	
	Size _____		
	Remarks: _____		
6.	Excessive Vegetative Growth	Type _____	
	<input checked="" type="checkbox"/> No evidence of excessive growth		
	<input checked="" type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Arial extent _____	
	Remarks: _____		
7.	Drainage Swales		
	<input type="checkbox"/> Clear of Debris	<input checked="" type="checkbox"/> Needs Maintenance	
	Remarks: <u>Drainage swales were choked with excess vegetation and debris. The swales should be cleaned and inspected routinely.</u>		
D. Cover Penetrations			
	<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A	
1.	Gas Vents	<input type="checkbox"/> Active	<input checked="" type="checkbox"/> Passive
	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks: _____		
2.	Gas Monitoring Probes		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> N/A
	Remarks: _____		
3.	Monitoring Wells (within surface area of landfill)		
	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks: _____		
4.	Extraction Wells Leachate		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> N/A
	Remarks: _____		

5.	Settlement Monuments	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed	<input checked="" type="checkbox"/> N/A
Remarks: _____				
E. Gas Collection and Treatment		<input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	Gas Treatment Facilities	<input type="checkbox"/> Flaring	<input type="checkbox"/> Thermal destruction	<input type="checkbox"/> Collection for reuse
		<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
Remarks: _____				
2.	Gas Collection Wells, Manifolds and Piping	<input checked="" type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
Remarks: <u>The methane vents that are connected to the Site's leachate collection system piping appeared intact and undamaged.</u>				
3.	Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	<input checked="" type="checkbox"/> N/A
Remarks: _____				
F. Cover Drainage Layer		<input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	Outlet Pipes Inspected	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A	
Remarks: _____				
2.	Outlet Rock Inspected	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A	
Remarks: _____				
G. Detention/Sedimentation Ponds		<input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		
1.	Siltation	Area extent _____	Depth _____	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Siltation not evident			
Remarks: _____				
2.	Erosion	Area extent _____	Depth _____	
	<input type="checkbox"/> Erosion not evident			
Remarks: _____				
3.	Outlet Works	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A	
Remarks: _____				
4.	Dam	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A	
Remarks: _____				
H. Retaining Walls		<input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A		

1.	Deformations	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement _____	Vertical displacement _____	
	Rotational displacement _____		
	Remarks: _____		
2.	Degradation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks: _____		
I. Perimeter Ditches/Off-Site Discharge		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Siltation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Area extent _____	Depth _____	
	Remarks: _____		
2.	Vegetative Growth	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Area extent _____	Type _____	
	Remarks: <u>There is some vegetative growth in ditch, but it does not appear to impede surface water flow.</u>		
3.	Erosion	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Area extent _____	Depth _____	
	Remarks: _____		
4.	Discharge Structure	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks: _____		
VIII. VERTICAL BARRIER WALLS		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Settlement	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Area extent _____	Depth _____	
	Remarks: _____		
2.	Performance Monitoring	Type of monitoring _____	
	<input type="checkbox"/> Performance not monitored		
	Frequency _____	<input type="checkbox"/> Evidence of breaching	
	Head differential _____		
	Remarks: _____		
IX. GROUNDWATER/SURFACE WATER REMEDIES		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A

1.	Pumps, Wellhead Plumbing, and Electrical	<input checked="" type="checkbox"/> Good condition	<input checked="" type="checkbox"/> All required wells properly operating	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
Remarks: _____					
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances	<input checked="" type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance		
Remarks: _____					
3.	Spare Parts and Equipment	<input type="checkbox"/> Readily available	<input type="checkbox"/> Good condition	<input type="checkbox"/> Requires upgrade	<input type="checkbox"/> Needs to be provided <input checked="" type="checkbox"/> N/A
Remarks: _____					
B. Surface Water Collection Structures, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A					
1.	Collection Structures, Pumps, and Electrical	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance		
Remarks: _____					
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance		
Remarks: _____					
3.	Spare Parts and Equipment	<input type="checkbox"/> Readily available	<input type="checkbox"/> Good condition	<input type="checkbox"/> Requires upgrade	<input type="checkbox"/> Needs to be provided
Remarks: _____					
C. Treatment System <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A					
1.	Treatment Train (Check components that apply)				
<input type="checkbox"/> Metals removal		<input type="checkbox"/> Oil/water separation		<input type="checkbox"/> Bioremediation	
<input type="checkbox"/> Air stripping		<input type="checkbox"/> Carbon adsorbers			
<input type="checkbox"/> Filters _____		<input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____			
<input type="checkbox"/> Others _____					
<input type="checkbox"/> Good condition		<input type="checkbox"/> Needs Maintenance			
<input type="checkbox"/> Sampling ports properly marked and functional			<input type="checkbox"/> Sampling/maintenance log displayed and up to date		
<input type="checkbox"/> Equipment properly identified			<input type="checkbox"/> Quantity of groundwater treated annually _____		
<input type="checkbox"/> Quantity of surface water treated annually _____					
Remarks: _____					

2.	Electrical Enclosures and Panels (properly rated and functional)
	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: _____
3.	Tanks, Vaults, Storage Vessels
	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks: _____
4.	Discharge Structure and Appurtenances
	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: _____
5.	Treatment Building(s)
	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks: _____
6.	Monitoring Wells (pump and treatment remedy)
	<input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks: _____
D. Monitoring Data	
1.	Monitoring Data
	<input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality
2.	Monitoring data suggests:
	<input type="checkbox"/> Groundwater plume is effectively contained <input checked="" type="checkbox"/> Contaminant concentrations are declining
E. Monitored Natural Attenuation	

1. **Monitoring Wells** (natural attenuation remedy)

Monitoring Well OW 101 A

- | | | | |
|----------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> Properly secured/locked | <input checked="" type="checkbox"/> Functioning | <input checked="" type="checkbox"/> Routinely sampled | <input checked="" type="checkbox"/> Good condition |
| <input checked="" type="checkbox"/> All required wells located | <input checked="" type="checkbox"/> Labeled Maintenance | <input type="checkbox"/> Needs | <input type="checkbox"/> N/A |

Remarks:

Monitoring Well OW 102 A

- | | | | |
|----------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> Properly secured/locked | <input checked="" type="checkbox"/> Functioning | <input checked="" type="checkbox"/> Routinely sampled | <input checked="" type="checkbox"/> Good condition |
| <input checked="" type="checkbox"/> All required wells located | <input checked="" type="checkbox"/> Labeled Maintenance | <input type="checkbox"/> Needs | <input type="checkbox"/> N/A |

Remarks:

Monitoring Well OW 103 A

- | | | | |
|----------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> Properly secured/locked | <input checked="" type="checkbox"/> Functioning | <input checked="" type="checkbox"/> Routinely sampled | <input checked="" type="checkbox"/> Good condition |
| <input checked="" type="checkbox"/> All required wells located | <input checked="" type="checkbox"/> Labeled Maintenance | <input type="checkbox"/> Needs | <input type="checkbox"/> N/A |

Remarks:

Monitoring Well OW 104 A

- | | | | |
|----------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> Properly secured/locked | <input checked="" type="checkbox"/> Functioning | <input checked="" type="checkbox"/> Routinely sampled | <input checked="" type="checkbox"/> Good condition |
| <input checked="" type="checkbox"/> All required wells located | <input checked="" type="checkbox"/> Labeled Maintenance | <input type="checkbox"/> Needs | <input type="checkbox"/> N/A |

Remarks:

Monitoring Well OW 105 A

- | | | | |
|----------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> Properly secured/locked | <input checked="" type="checkbox"/> Functioning | <input checked="" type="checkbox"/> Routinely sampled | <input checked="" type="checkbox"/> Good condition |
| <input checked="" type="checkbox"/> All required wells located | <input checked="" type="checkbox"/> Labeled Maintenance | <input type="checkbox"/> Needs | <input type="checkbox"/> N/A |

Remarks:

Monitoring Well OW 106 A

- | | | | |
|----------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> Properly secured/locked | <input checked="" type="checkbox"/> Functioning | <input checked="" type="checkbox"/> Routinely sampled | <input checked="" type="checkbox"/> Good condition |
| <input checked="" type="checkbox"/> All required wells located | <input checked="" type="checkbox"/> Labeled Maintenance | <input type="checkbox"/> Needs | <input type="checkbox"/> N/A |

Remarks:

Monitoring Well OW 107 A

- | | | | |
|----------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> Properly secured/locked | <input checked="" type="checkbox"/> Functioning | <input checked="" type="checkbox"/> Routinely sampled | <input checked="" type="checkbox"/> Good condition |
| <input checked="" type="checkbox"/> All required wells located | <input checked="" type="checkbox"/> Labeled Maintenance | <input type="checkbox"/> Needs | <input type="checkbox"/> N/A |

Remarks:

X. OTHER REMEDIES	
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
XI. OVERALL OBSERVATIONS	
A.	Implementation of the Remedy
The selected remedy as outlined in the ROD includes institutional controls to prohibit construction on the landfill and the use of water beneath the landfill or in the immediate vicinity of the landfill for drinking water purposes; leachate extraction and treatment in the City of Minot wastewater treatment facility; consolidation of contaminated soil in the vicinity of leachate seeps under the cap; and groundwater monitoring to allow detection of future releases of contaminants to the groundwater and landfill gas collection using a passive collection system. The remedy is effective and functioning as intended by the decision documents for the Site.	
B.	Adequacy of O&M
No issues or observations related to the implementation and scope of O&M activities were observed or noted. The Site is regularly inspected and maintained in accordance with the O&M Plan.	
C.	Early Indicators of Potential Remedy Problems
None.	
D.	Opportunities for Optimization
None at this time.	

Appendix E: Photographs from Site Inspection Visit



Fence surrounding landfill



Landfill and monitoring well



Passive landfill gas vent



Groundwater monitoring well



Area of slight erosion



Landfill



Mobile home community adjacent to landfill



Skating arena adjacent to landfill

Appendix F: Site Visit Report



DATE OF INSPECTION: November 9, 2010

FACILITY: Old Minot Landfill

PERMIT NO.: None

LOCATION: Minot, ND

CONTACT: Dan Jonasson, City of Minot

TYPE OF INSPECTION: The Five-Year Review Site Visit

PARTICIPANTS: Kerri Fiedler, EPA
John Dalton, EPA
Rhode Bicknell, E2, Inc.
Treat Suomi, E2, Inc.
Dan Jonasson, City of Minot
Jeff Richards, City of Minot
Kirk Johnson, NDDoH

WEATHER CONDITIONS: Cloudy, breezy and approximately 30°F

TIME IN: 9 a.m.

TIME OUT: 2:42 p.m.

On September 29, 2010, the North Dakota Department of Health received correspondence from the U.S. Environmental Protection Agency (EPA) Region VIII regarding the Old Minot Landfill. By statute, the EPA must prepare a five-year review for the site. The Department conducted this inspection in support of the five-year review process, together with two consultants from E2, Inc., and the city of Minot. The EPA proposed to the Department and the city of Minot that the review inspection proceed on the landfill on November 9, 2010. The old landfill covered approximately 26 acres, and is situated in southwest Minot within Township 155N, Range 83W, lying approximately within the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$; the SW $\frac{1}{4}$ of the NE $\frac{1}{4}$; the NE $\frac{1}{4}$ of the SW $\frac{1}{4}$; and the NW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 27.

The initial meeting on November 9, 2010, with Ms. Kerri Fiedler and Mr. John Dalton of EPA, and Ms. Rhode Bicknell and Mr. Treat Suomi, consultants contracted by EPA for the Old Minot Landfill, took place at a local coffee shop in Minot at 9 a.m. A review of pertinent landfill documentation took place in anticipation of the old landfill five-year review inspection.

At 10:28 a.m., we arrived at the south entrance gate into the closed and locked landfill facility. We did not enter the old landfill at this time, but drove around on streets west and north of the facility, and viewed the extent of the fenced property and the dimensions of the final landfill cap. The drive revealed that two wild Russian olive trees existed within the fenced landfill boundaries adjacent to the final cap, but not on it. It was agreed that these two trees should be removed to eliminate any immediate potential for deep-rooted exotic trees from taking root within the final cap. We then drove around to the north end of the landfill on Cottonwood Avenue to view final cover and the location where the city initially proposed an extension of Cottonwood Avenue along the east margin of the landfill adjacent to the cap. This tentative plan had been reviewed and rejected by the Department in 2006.

The perimeter fencing around the entire facility was still in good condition, with no holes or evidence of tampering or wildlife damage. We then reviewed the city residential housing that had been constructed east and north of the landfill property since the June 2006 landfill inspection. While housing construction northeast of the landfill had increased since 2006, it appeared that there was still a sufficiently wide enough buffer zone surrounding the old landfill, so encroachment is not a cause of immediate concern. We then departed from the streets bordering the landfill property.

At 1 p.m., the EPA, E2 team and Department inspector met Mr. Dan Jonasson and Mr. Jeff Richards at the old landfill's south entrance. Access to the old landfill facility is controlled by locked gates that have "No Trespassing" signs posted.

Entering the facility, we drove several vehicles on the interior road, which while not maintained, was still in usable condition. We observed that both the density and diversity of the final cover native grass vegetation was very thick and in good condition, with few weeds. There appeared to be only one site approximately 5 by 15 feet on the north end of the landfill cap that was relatively devoid of any vegetation. This site also appeared to lack suitable plant growth material (topsoil) cover. The city should replace topsoil and reseed the barren site with adapted native grass seed in May or June 2011.

The condition of the drainage swales, riprap, and other surface water control structures at the site appeared to be intact and functioning as designed. Some of the drain head control structures within the final cover, however, appeared to be choked with excess vegetation and some soil, and should be cleaned out in the spring of 2011.

The sites of the seven groundwater monitoring wells and four piezometers were also reviewed during the inspection, and these were all locked with no evidence of frost heaving or other damage. The city of Minot staff had attached new legible well identification labels on the well casings in response to the comments on inadequate well labels during the June 21, 2006, five-year inspection.

The methane vents that are connected to the site's centerline leachate collection system piping appeared intact and undamaged. Only a faint odor was detected when we were immediately adjacent to the methane vents. We did not have the city of Minot open a manhole connected to the landfill's leachate collection system to observe the flow of leachate within the system. Such an inspection of the collection system should be conducted again in the near future.

The Department, EPA and E2 then discussed with the city representatives the issues of the small area that should be re-vegetated on the final cap, the removal of the two wild Russian olive trees on the southwest and northeast areas bordering the cap, and the clean-up of the drain heads within the landfill. Mr. Jonasson and Mr. Richards agreed to remediate the small bare area within the cap, clean the drain heads and remove the two wild trees adjacent to the cap.

We then reviewed with the city representatives the newer housing construction north and east of the landfill that has been completed since the June 2006 inspection. Mr. Jonasson mentioned that there is a 25-foot municipal buffer zone around the landfill fenced property, and that the city may propose again to create a new Cottonwood Avenue extension road. He stated, however, that this extension proposal would be sited for development outside of the landfill's eastern boundary fence.

After a final review of documents, the EPA, E2 and Department staff thanked Mr. Jonasson and Mr. Richards for their time, and we left the landfill site at approximately 2:42 p.m.

Kirk D. Johnson, Env. Scientist
Solid Waste Program
Division of Waste Management
February 16, 2011

Appendix F: Site Visit Report (continued)

FILE: Uncontrolled Sites – Old Minot Landfill

February 16, 2011

Kerri Fiedler
USEPA Region 8
Superfund Remedial Unit B (EPR-SR)
1595 Wynkoop St.
Denver, CO 80202

Alan Walter
Public Works Supt.
City of Minot
PO Box 5006
Minot, ND 58702

Dear Ms. Fiedler and Mr. Walter:

This letter concerns the inspection of the "Old Minot Landfill" in North Dakota conducted on November 9, 2010. The inspection was conducted with John Dalton and Kerri Fiedler of Region 8 EPA; Treat Suomi and Rhode Bicknell, consultants with E2, Inc.; Dan Jonasson and Jeff Richards of the city of Minot; and me. The inspection was completed as part of the mandatory five-year review process for this closed landfill that was a Superfund site decommissioned after satisfactory cleanups were conducted from July to September 1996. The EPA then deleted the site from the National Priorities Listing in March 1997.

The results of this inspection indicated that the landfill cover appeared to be well maintained and functioning as designed. The native grass cover appeared thick and healthy with few weeds on the final cap. As was noted on the enclosed inspection report, however, there was one location (approximately 5 by 15 feet) within the final cover on the north end of the landfill that was relatively devoid of any vegetation. This site also appeared to lack suitable plant growth material (topsoil) cover. This appeared to be one of the sites that were remediated by city staff after the June 2006 inspection. After consultations, the city agreed to add additional topsoil and reseed the barren site with adapted native grass seed in May or June 2011.

Two other issues noticed during the inspection concerned two wild Russian olive trees on the southwest and northeast areas bordering the cap, and removing excess dead vegetation that partially covered the drain heads within the landfill. After the inspection, in addition to remediating the bare site, the city also agreed to clean the drain heads and remove the two wild trees adjacent to the landfill final cover to ensure that the wild trees do not develop seedlings upon the capped area.

The Department appreciated this opportunity to assist the EPA in the inspection and monitoring of this facility. If you have any further questions, comments or concerns, please contact the Department in Bismarck at 701-328-5166, or me at 701-624-5332 or by email at kijohnson@nd.gov.

Sincerely,

Kirk Johnson, Env. Scientist
Solid Waste Program
Division of Waste Management

Enc.

cc: Treat Suomi, E2, Inc.
Rhode Bicknell, E2, Inc.
Dan Jonasson, City of Minot

Appendix G: Monitoring Data

Groundwater Monitoring Data: Barium, Chromium, Copper and Zinc

Well	Date	Metal and Detected Concentrations (µg/L)			
		Barium	Chromium	Copper	Zinc
		Cleanup Goals			
		2,000 (mg/L) ^a	100 (mg/L)	1,300 (mg/L)	5,000 (mg/L)
OW-MW-1	2007	<0.1	<0.05	<0.05	<0.05
	2008	<0.1	<0.05	<0.05	<0.05
	2009	<0.1	<0.05	<0.05	<0.05
	2010	<0.1	<0.05	<0.05	<0.05
OW-101A	2007	<0.1	<0.05	<0.05	<0.05
	2008	<0.1	<0.05	<0.05	<0.05
	2009	<0.1	<0.05	<0.05	<0.05
	2010	<0.1	<0.05	<0.05	<0.05
OW-102A	2007	<0.1	<0.05	<0.05	<0.05
	2008	<0.1	<0.05	<0.05	<0.05
	2009	<0.1	<0.05	0.08	0.07
	2010	<0.1	<0.05	<0.05	<0.05
OW-103A	2007	<0.1	<0.05	<0.05	<0.05
	2008	<0.1	<0.05	<0.05	<0.05
	2009	<0.1	<0.05	<0.05	<0.05
	2010	<0.1	<0.05	<0.05	<0.05
OW-104A	2007	<0.1	<0.05	<0.05	<0.05
	2008	<0.1	<0.05	<0.05	<0.05
	2009	0.13	<0.05	0.11	0.06
	2010	<0.1	<0.05	<0.05	<0.05
OW-105A	2007	<0.1	<0.05	<0.05	<0.05
	2008	<0.1	<0.05	<0.05	<0.05
	2009	<0.1	<0.05	<0.05	<0.05
	2010	<0.1	<0.05	<0.05	<0.05
OW-107A	2007	<0.1	<0.05	<0.05	<0.05
	2008	0.11	<0.05	<0.05	0.07
	2009	<0.1	<0.05	0.08	0.06
	2010	<0.1	<0.05	0.05	<0.05
a. milligrams per liter					

Appendix G: Monitoring Data (continued)

Monitoring Data: Benzene, trans-1, 2-Dichloroethene, Tetrachloroethene, Toluene and Vinyl Chloride

Well	Date	Benzene	trans-1, 2 - Dichloroethene	Tetrachloroethene	Toluene	Vinyl Chloride
		Cleanup Goals				
		5 (ug/L) ^a	100 (ug/L)	5 (ug/L)	1,000 (ug/L)	2 (ug/L)
OW-MW-1	2007	<1	<1	<1	<1	<1
	2008	<0.4	<0.5	<0.4	<0.5	<0.6
	2009	<0.4	<0.5	<0.4	<0.5	<0.6
	2010	<0.4	<0.5	<0.4	<0.5	<0.6
OW-101A	2007	<1	<1	<1	<1	<1
	2008	<0.4	<0.5	<0.4	<0.5	<0.6
	2009	<0.4	<0.5	<0.4	<0.5	<0.6
	2010	<0.4	<0.5	<0.4	<0.5	<0.6
OW-102A	2007	<1	<1	<1	<1	<1
	2008	<0.4	<0.5	<0.4	<0.5	<0.6
	2009	<0.4	<0.5	<0.4	<0.5	<0.6
	2010	<0.4	<0.5	<0.4	<0.5	<0.6
OW-103A	2007	<1	<1	<1	<1	<1
	2008	<0.4	<0.5	<0.4	<0.5	<0.6
	2009	<0.4	<0.5	<0.4	<0.5	1.6
	2010	<0.4	<0.5	<0.4	<0.5	<0.6
OW-104A	2007	<1	<1	<1	<1	<1
	2008	<0.4	<0.5	<0.4	<0.5	<0.6
	2009	<0.4	<0.5	<0.4	<0.5	<0.6
	2010	<0.4	<0.5	<0.4	<0.5	<0.6
OW-105A	2007	<1	<1	<1	<1	<1
	2008	<0.4	<0.5	<0.4	<0.5	<0.6
	2009	<0.4	<0.5	<0.4	<0.5	<0.6
	2010	<0.4	<0.5	<0.4	<0.5	<0.6
OW-107A	2007	<1	<1	<1	<1	<1
	2008	<0.4	<0.5	<0.4	<0.5	<0.6
	2009	<0.4	<0.5	<0.4	<0.5	<0.6
	2010	<0.4	<0.5	<0.4	<0.5	<0.6
MW-X	2007	<1	<1	<1	<1	<1
	2008	<0.4	<0.5	<0.4	<0.5	<0.6
	2009	<0.4	<0.5	<0.4	<0.5	<0.6
	2010	<0.4	<0.5	<0.4	<0.5	<0.6

^a Micrograms per liter

Appendix H: Institutional Control

Below is the Minot City Ordinance (Code of Ordinances Chapter 16, Health and Safety) implementing land use restrictions at the Site and ground water well restrictions within or in the immediate vicinity of the Site. A copy of the ordinance can be found at http://library.municode.com/HTML/10154/level3/COOR_CH16HESA_ARTIIISUINCO.html#COOR_CH16HESA_ARTIIISUINCO_S16-50LEPU.

ARTICLE III. - SUPERFUND INSTITUTIONAL CONTROLS

Sec. 16-50. - Legislative purpose.

The city is a party to an action brought by the United States of America acting on behalf of the Environmental Protection Agency (EPA), under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. Section 9601 et seq. (Superfund). By means of a consent decree, the city was ordered and agreed to perform certain cleanup and remedial work at the Old Minot Landfill Superfund Site (site), an old sanitary landfill which the city operated until the late 1960's or early 1970's. As part of its commitments in the consent decree, the city agreed to implement the cleanup measures selected in the EPA's record of decision (ROD), issued on June 21, 1993. The ROD was subsequently modified by an April 10, 1996, explanation of significant differences (ESD).

The ROD and the ESD require the city to adopt local land use restrictions and controls designed to prevent the disturbance of the cleanup or recontamination of the site. These land use restrictions are called "institutional controls." The "institutional controls" for this site place restrictions upon activities that would damage the city and soil cap which the city will place over the landfill and upon the installation of groundwater supply wells within or in the immediate vicinity of the site.

(Ord. No. 349, § 5)

Sec. 16-51. - No-entry premises—Restrictions upon certain activities.

- (a) Except as approved by the director of public works, no person may enter upon, by vehicle or by foot, the property herein defined as "no-entry premises." The director of public works shall first have approval to enter the no-entry premises to those persons who are performing cleanup or remedial action work, including inspection and monitoring activities, required under the consent decree referenced in section 16-50.
- (b) No person may install groundwater supply wells or undertake any subsurface boring, i.e., geotechnical boring, on any property herein defined as the no-entry premises or within one hundred (100) feet of the no-entry premises.

(Ord. No. 349, § 5)

Sec. 16-52. - Same—Description.

The no-entry premises referred to in subsection (a) of section 16-51 are located in Ward County, North Dakota, and are described legally as:

- (1) **Edgeview Estates First Addition**
- a. Block 5: Beginning at the northwest corner of Block 5, being the intersection of the east boundary of 19th Street southwest with Block 11 and Block 5; thence along a curve to the right, a distance of 275.64 feet, said curve contains 47,475.69 square feet.
 - b. Block 6: Beginning at the northwest corner of Block 6, being the intersection of the east boundary of 19th Street southwest with Block 7 and Block 6; thence along a curve to the left a distance of 276.69 feet, said curve contains 58,367.59 square feet.
 - c. Block 7: Beginning at the northeast corner of Block 7, being the intersection of the east boundary of 19th Street SW a distance of 473.70 feet; thence along a curve to the right, a distance of 66.28 feet, said curve contains a distance of 322.33 feet; thence along a curve to the left, a distance of 45.16 feet, said curve having a radius of 36,570.35 square feet.
 - d. Blocks 8, 10, and 11: As shown on the plat.
- (2) **Edgeview Estates Second Addition**
- a. Block 2: Beginning at the south right-of-way line of 22nd Street SW, to the north/south existing point of beginning. Described tract contains 1.25 acres.

http://library.municode.com/HTML/10154/level3/COOR_CH16HESA_ARTIIISUINCO.html#COOR_CH16HESA_ARTIIISUINCO_S16-50LEPU

ARTICLE III. - SUPERFUND INSTITUTIONAL CONTROLS

b. Block 4

along the east line of said Block 4 to the point of beginning. Described tract contains 8.04 acres.

(3) Ward County, North Dakota.

- a. From the southeast corner of Lot A of Outlot 15 of Section 27-155-83, go along the south property line of said Lot A west a distance of 95 feet; then go north a distance of 40 feet; then go east to the east property line of said Lot A; then go southeasterly along the east property line of said Lot A to the southeast property corner.
- b. From the southwest corner of Lot B of Outlot 15 of Section 27-155-83, go east along the south property line a distance of 130 feet; then go north a distance of 40 feet; then go west to the west property line of said Lot B; then go southeasterly along the west line of said Lot B to the southwest corner of said Lot B.

(Ord. No. 3496, § 1; Ord. No. 3487)

Sec. 16-53. - Savings clause.

The city is imposing the restrictions provided for in this article under the powers of its Home Rule Charter, and particularly the police power of the State of North Dakota as invoked by or through that Charter, and the constitutional and statutory provisions attendant to the Charter. In the opinion of the city, such power is adequate to authorize the city to impose these restrictions without accomplishing a "taking" under either the federal or state constitutions, and, for that reason, the city is not obligated to pay compensation to any private property owner who may be adversely affected by such restrictions. Nevertheless, in the event a court of competent jurisdiction holds otherwise, and is sustained upon appeal (if any), it is the intention of the city that, rather than these restrictions being invalidated, it instead be allowed to pay a fair and just compensation for whatever compensable damages as may be suffered by private property owners who are adversely affected by these restrictions. In other words, the city would prefer to settle an "inverse condemnation" claim, or to have such claim adjudicated by the courts, instead of allowing the restrictions to be invalidated because they accomplish an uncompensated taking forbidden by law.

(Ord. No. 3496, § 1)