Five-Year Review Report

for

AT&SF (Clovis) Superfund Site
Clovis
Curry County, New Mexico

CERCLIS ID NMD 043158591

September 2008

PREPARED BY:

United States Army Corps of Engineers
Sacramento District
Sacramento, California

PREPARED FOR:

United States Environmental Protection Agency
Region 6
Dallas, Texas

Third Five-Year Review
Protectiveness Summary

ATSF Clovis Superfund Site - NMD043158591

Site Background:

The Atchison, Topeka, and Santa Fe Railway Company (AT&SF) Clovis site is a natural playa lake located in eastern New Mexico and is known locally as Santa Fe Lake (the lake). The lake received hopper car washing rinsate and other discharges from the rail yard. The contaminants of concern were primarily hydrocarbons, chromium, lead, and other heavy metals. Its location is within a semi-rural setting on the outskirts of the town of Clovis, in Curry County. The Site was listed on the NPL in November 1981. A ROD was signed by the Agency on September 23, 1988. The site was officially deleted from the NPL on March 17, 2003.

Summary of 3rd Five Year Review:

The remedy for the AT&SF Clovis Superfund Site included remediation of three environmental media: lake water, lake sediments, and soil.

Remediation at the site included the following:

- Evaporation of lake water and construction of dike around it to prevent run-on
- Treatment of contaminated soils and sediments to reduce TPH concentrations to below 1,000 ppm or achieve soil stabilization
- All treated sediments and soil with TPH concentration greater than 1,000 ppm were excavated and placed in the onsite storage facility (OSF).

Construction Completion was achieved on September 20, 2000, when a Preliminary Close-Out Report was signed on this date. The trigger for completing this five-year review was September 2, 2003, which is five years after the second review was signed. The next five-year review will be due five years from the signature date of this report.

Protectiveness Statement:

The remedy is determined to be protective of human health. However, additional information is required to make the protectiveness determination of the environment. The Remedial Action Objectives (RAOs) have been addressed through (1) isolation of the lake from surface water run-on; (2) evaporation of lake water; (3) dewatering and ex-situ treatment of contaminated lake bottom sediments; (4) In-situ and ex-situ treatment of contaminated soils, both from beneath the lake bottom sediments and from the beach area; (5) containment of all treated sediments in the OSF; (6) containment in the OSF of any treated soils not meeting the clean-up criteria; (7) capping of the OSF following treatment of all sediments and soils; and (8) site restoration.

Additionally, the site has been fenced to prevent unauthorized site access, and a Restrictive Covenant has been filed with the Curry County Clerk's office preventing future disturbance (i.e., excavation or erosion) of the OSF. Long-term protectiveness of the remedial action will be verified through annual ground water monitoring and quarterly OSF inspections. Current data indicates that ground water has not been impacted at the site as a result of the remedial action.

Determination:

The United States Environmental Protection Agency (EPA), Region 6 has determined that the site remedy remains protective of human health. However, Region 6 defers the determination of environmental protectiveness until additional information is available.

Samuel Coleman, P.E.
Director, Superfund Division
U.S. Environmental Protection Agency, Region 6

Date

9/2/2008

CONCURRENCES

Third Five-Year Review

For the

AT&SF (Clovis) Superfund Site

By: _____ Date: 8/27/08
Sairam S. Appaji
Remedial Project Manager

By: _____ Date: 08/27/2008
Henry Parr, Chief
LA/OK/NM Remedial Section

By: _____ Date: 8/27/08
Don Williams, Deputy Associate Director
Superfund Remedial Branch

By: _____ Date: 8/27/08
Amy Salinas
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By: _____ Date: 09/02/08
Mark Peycke, Chief
Superfund Branch, Office of Regional Counsel

By: _____ for Date: 9/2/08
Sam Coleman, Director
Superfund Division

Five-Year Review Report

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Attachments

List of Acronyms

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
AT&SF	Atchison, Topeka and Santa Fe Railroad (became BNSF in 1996)
BNSF	Burlington Northern and Santa Fe Railway Company
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
FS	Feasibility Study
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NCP	National Contingency Plan
NMED	New Mexico Environment Department
O&M	Operation and Maintenance
OSF	On-Site Storage Facility
PPM	Parts Per Million
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SDWA	Safe Drinking Water Act

TPH	Total Petroleum Hydrocarbon
TRPH	Total Recoverable Petroleum Hydrocarbon

Executive Summary

This is the third Five-Year Review for the AT&SF (Clovis) Site. The triggering action for this statutory review is the completion of the second Five-Year Review on September 2, 2003. The Five-Year Review 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 remedy for the AT&SF (Clovis) Superfund site in Clovis, New Mexico included remediation of three environmental media; lake water, lake sediments, and soil. Remediation at the site included the following:

- Evaporation of lake water and construction of dike around it to prevent run-on
- Treatment of contaminated soils and sediments to reduce TPH concentrations to below 1,000 ppm or achieve soil stabilization
- Excavation and placement of all treated sediments and soil with TPH concentration greater than 1,000 ppm in the onsite storage facility (OSF).

The site achieved construction completion with the signing of the Preliminary Close-Out Report on September 20, 2000. The trigger for this Five-Year review was the completion of the second Five-Year review on September 2, 2003.

The assessment of this Five-Year Review found that the remedy was completed in accordance with the requirements of the Record of Decision (ROD) and is functioning as designed. The RAOs have been met at the site and the remedy is protective of human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: AT&SF (Clovis) Superfund Site		
EPA ID *(from WasteLAN)*: NMD043158591		
Region: 6	**State:** NM	**City/County:** Clovis/Curry

SITE STATUS	
NPL status: ☐ Final ☒ Deleted ☐ Other (specify)	
Remediation status (choose all that apply): ☐ Under Construction ☐ Operating ☒ Complete	
Multiple OUs?* ☐ YES ☒ NO	**Construction completion date:** 9 / 20 / 2000
Has site been put into reuse? ☐ YES ☒ NO	

REVIEW STATUS	
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author name: Sairam Appaji	
Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA, Region 6
Review period:** 10 / 1 / 2003 to 9 / 29 / 2008	
Date(s) of site inspection: 3 / 27 / 2008	
Type of review: ☒Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion	
Review number: ☐ 1 (first) ☐2 (second) ☒ 3 (third) ☐ Other (specify)	
Triggering action: ☐ Actual RA Onsite Construction at OU #____ ☐ Construction Completion ☐ Other (specify)	☐ Actual RA Start at OU#____ ☒ Previous Five-Year Review Report
Triggering action date *(from WasteLAN)*: 9 / 2 / 2003	
Due date *(five years after triggering action date)*: 9 / 2 / 2008	

* ["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 cont'd.

Issues:

Fence maintenance on east side of site
Watering vegetative cover on landfill cap
Animals burrowing in landfill cap
Site perimeter grass fires

Recommendations and Follow-up Actions:

Conduct an ecological risk assessment
Clear tree branches from fence on east side of site
Increase watering of vegetation on landfill cap
Mitigate animal burrowing in landfill cap
Control perimeter grass fires
Update signage on perimeter fence

Protectiveness Statement(s):

All immediate threats at the site have been addressed, and the remedy is protective of human health. Protectiveness regarding the environment is deferred until further information is available.

Long-Term Protectiveness:

Long-term protectiveness of the remedial action will be verified by continued groundwater monitoring and post-closure inspections. Current data indicate that the groundwater beneath the site has not been impacted.

Other Comments:

None.

AT&SF (Clovis) Superfund Site
Clovis, New Mexico
Third Five-Year Review Report

I. Introduction

The purpose of the Five-Year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §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.*

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) 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 action no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (EPA), Region 6, conducted the Five-Year review of the remedy implemented at the AT&SF (Clovis) Superfund Site in Clovis, New Mexico. This review was conducted by the Remedial Project Manager (RPM) for the entire site from September 2003 through June 2008. This report documents the results of the review.

This is the third Five-Year Review for the AT&SF (Clovis) Site. The triggering action for this statutory review is the completion of the second Five-Year Review on September 2, 2003. The Five-Year Review 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.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Initial discovery of problem or contamination	**1979**
Administrative Order on Consent Signature	**September 1, 1983**
NPL listing	**September 8, 1983**
Remedial Investigation/Feasibility Study complete	**August 1988**
ROD signature	**September 23, 1988**
Remedial design start	**December 16, 1988**
Remedial design complete	**November 1992**
Phase I – Construction Began	**November 1992**
Phase I – Construction Completed	**March 1993**
Phase II – Bioremediation Began	**June 1993**
Phase II – Bioremediation Completed	**October 1999**
Phase III – Site Restoration Began	**June 2000**
Phase III – Site Restoration Completed	**September 2000**
Final Close-out Report	**November 8, 2002**
Deletion from NPL	**March 17, 2003**
Previous Five-Year reviews	**September 1998, September 2003**

III. Background

Physical Characteristics

The AT&SF (Clovis) Superfund Site ("Site") consists of the Santa Fe Lake, a natural playa lake, and surrounding uplands. The Site is located approximately one mile south of the present-day Burlington Northern and Santa Fe (BNSF) rail yard in Clovis, Curry County, New Mexico and encompasses a quarter section of land (approximately 140 acres). Burlington Northern merged with AT&SF on September 22, 1995 and railroad operations were merged on December 31, 1996. The legal description of this parcel of land is "Southwest Quarter of Section 19, Range 36 East, Township 2 North" (New Mexico Meridian). The Site is bordered on the north by a cattle feed lot and property belonging to Koch Industries, the east by Main Street, the south by Kimberly Lane, and the west by County Road K. Residential properties are located across Main Street from the Site, while agricultural croplands are located across Kimberly Lane and County Road K from the Site as shown in Attachment 1.

Land and Resource Use

As a natural playa lake, the lake basin has received intermittent run-on throughout history, including storm water and wastewater discharge from the rail yard since the early 1900's. However with the construction of the dike in March 1990, storm water and wastewater run-on has been prevented from entering the basin. Following completion of the dike, the water ponded in the basin was dried through a spray evaporation system.

Currently, the basin remains dry and the remains of the dike continue to prevent storm water run-on from entering the basin. Storm water run-on is ponded in a ditch excavated outside of the former dike as shown in Attachment 2. Although wastewater discharge to the site was suspended in October 2000 with the completion of the wastewater treatment plant at the rail yard, BNSF maintains a discharge permit (DP-10) with the New Mexico Environment Department (NMED) to discharge wastewater to the Site. If such discharge were to occur in the future, the remains of the dike would prevent run-on from entering the basin.

The entire Site is currently fenced, preventing unauthorized access. In addition, a restrictive covenant has been filed with Curry County preventing future activities or development from disturbing the capped On-Site Storage Facility. The Restrictive Covenant is included as Attachment 3.

The Ogallala Aquifer underlies the Site at a depth of approximately 275 to 280 feet below ground surface. Although no groundwater contamination has ever been identified at the Site, annual monitoring will continue for at least the next five years, at which time the need for continued monitoring will be evaluated. Regional groundwater flow in the Ogallala is to the

east-southeast, however nearby irrigation and water supply wells have created a localized groundwater flow direction to the south-southwest (Balleau, 2002).

The surrounding land consists of dairy feed lots, irrigated farmland, sewage treatment, and quarry sites, all of which are known to elevate total dissolved solids (TDS) in surface water and groundwater. Located at the northern boundary of the site was a petroleum pipeline formerly owned by the Santa Fe Pipeline Company (Bryant, 1982). A petroleum storage tank farm was located at the northeast corner of the site outside the site boundaries.

History of Contamination

Since the early 1900's, the AT&SF (Clovis) Site received storm water run-off and wastewater discharge from the rail yard. The specific sources of wastewater have changed over time as the needs of the railway company have changed. Activities at the rail yard contributing to the discharge have included hopper car washing operations, boiler blow downs, sanitary sewers, and the oil/water separators at the diesel fueling racks. The amount of wastewater discharged has changed through time as well.

Although no records exist, prior to 1962 only small quantities of wastewater were discharged into the lake. These discharges were estimated to be from 40,000 to 60,000 gallons per day (gpd). When the hopper car washing facility was constructed in 1962, wastewater discharge loading increased significantly. It is estimated that from 1962 to 1975 the discharge averaged 100,000 gpd. The hopper car washing operations peaked from 1975 to 1979. During this period, the lake was receiving between 130,000 and 145,000 gpd and the size of the lake was approximately 37 acres. By 1987, the discharge had decreased to 30,000 gpd and the lake had shrunk to approximately 15 acres in size. . In October 2000, discharge from the rail yard to the lake ceased.

Initial Response

Samples taken from the water in Santa Fe Lake, from the sediment in the bottom of Santa Fe Lake, and from a groundwater monitoring well located near Santa Fe Lake, between September 1979 and 1982 revealed the presence of cyanide, chromium, cadmium, and lead. The EPA determined that the permeability of the lake might allow for migration of these contaminants and that several municipal water wells were located down-gradient from the lake. In September 1983, AT&SF entered into an Administrative Order on Consent (Docket No. CERCLA VI-4-83) with EPA Region 6.

In 1984 and 1985, seepage studies were performed. Based upon the results of those studies, EPA concluded, "The lake is leaking very slowly, if at all" (Superfund Project Update #1, September 1986). Additionally, monitoring wells were installed around the lake and sampled for various constituents. New Mexico Water Quality standards were violated for magnesium and

fluoride in the monitoring wells located on the site. Selenium was elevated in lake water but not in groundwater.

Based on those sampling results, EPA concluded that the levels of magnesium and fluoride in the groundwater may be naturally high. However, the EPA required that AT&SF perform a remedial investigation (RI) in order to evaluate remedial alternatives to eliminate further releases from the lake and restore groundwater to a fully useable condition.

The RI was conducted in 1987 and 1988, and the results were reported in *Remedial Investigation for the Atchison, Topeka and Santa Fe Railway Company at Clovis, New Mexico* (Radian, August 1988). The conclusions of the RI were:

- The only constituents in Santa Fe Lake water, bottom sediments and surrounding soils that may possibly have posed a potential health threat were chromium and hydrocarbons;

- Reasonable assumptions about the nature of the chromium present and the constituents in the hydrocarbons indicated that there are no health-based recommended clean-up levels for the lake water, sediments, and soils;

- More sampling of soils and sediments at the Site was recommended in order to accurately speciate the type of chromium and hydrocarbons present;

- AT&SF performed a response action on the basis of general housekeeping, aesthetics, and the desire to limit future migration of constituents from the lake bottom sediments and soils; and,

- No recommendations were made at that time for the clean-up levels for groundwater, as groundwater sampling was still in progress.

The feasibility study (FS) was conducted in 1988 and was based on the sampling results obtained for the RI. The document *Feasibility Study for the Atchison, Topeka and Santa Fe Railway Company at Clovis, New Mexico* (Radian, July 1988) summarized the findings of the study. The FS focused on evaluation of several remedial options. The primary objective of remedial action was determined to be elimination of the human exposure pathway of inhalation of wind-blown soils and sediments. Thus alternatives were evaluated for remediation of the soils and sediments. In order to remediate the sediments, removal of the water from the lake was required. The FS noted that a secondary benefit of remedial action was that, although leaching does not appear to be a concern at the Site, remediation of the soils and sediments would further reduce any potential for leaching of contaminants.

A preliminary screening of alternatives was performed that consisted of seven alternatives for the lake water, ten alternatives for the sediments and eleven alternatives for the soils. These

alternatives were further screened for their effectiveness, implementability, and cost. The alternatives remaining were subjected to a detailed analysis that included technical, institutional, public health, environmental impact, and overall cost. The selected remedial alternatives were:

- Lake Water Alternative 2 – Pumping, Evaporation and Disposal of Residue;
- Sediment Alternative 6 – Dredge, On-site Bioremediation, Cap Land Treatment Area and Re-vegetate Dredged Area; and
- Soil Alternative 3 – In-Situ Biodegradation and Re-vegetate.

The FS further stated that a security fence would be constructed around the Site, as well as a run-on control system consisting of a dike and ditch around the circumference of the contaminated soils area, and a sprinkler system would be installed within the perimeter of the dike. The system would be used to enhance evaporation of the lake water. A land treatment area would also be constructed for on-site biodegradation of the sediments.

Basis for Taking Action

Parameters of concern

Parameters of concern identified in the ROD and evaluated in detail at the site included:

Groundwater	Lake Water	Sediment	Soil
Chloride	Arsenic	Boron	Barium
Fluoride	Boron	Chromium	Boron
Magnesium	Cadmium	Hydrocarbons	Chloride
Sodium	Chloride	Lead	Hydrocarbons
Sulfate	Chromium	Phenolics	Phenolics
Total Dissolved Solids	Fluoride	Total Organic Carbon	Sulfate
	Lead		
	Phenolics		
	Sulfate		
	Total Dissolved Solids		
	Total Organic Carbon		

Exposures to dust in ambient air from sediments and soils were associated with significant human health risk, due to exceedance of EPA's risk management criteria for either the average or the reasonable maximum exposure scenarios. No groundwater contamination was identified. Exposure to lake water was eliminated, as remedial action included the evaporation of water in the lake basin. The carcinogenic risks were highest for exposures to airborne dust from

sediments due to the high concentration of chromium. Non-carcinogenic risks were highest for exposure to dust from sediment and soil due to the high concentration of hydrocarbons. Exposure pathways were incomplete for ground water and lake water.

IV. Remedial Actions

Remedy Selection

The ROD for the AT&SF (Clovis) Superfund Site was signed on September 23, 1988. A single, primary Remedial Action Objective (RAO) was developed as a result of data collected during the RI to aid in the development and screening of remedial alternatives to be considered for the ROD. The primary RAO was determined to be elimination of the human exposure pathway of inhalation of wind-blown soils and sediments. An additional benefit of the remedial action was the probable elimination of any potential leaching from the soils, sediments, and lake water.

The remedy selected in the ROD was divided into three major phases including:

- Phase I – construction of a rainfall run-on/runoff control system and a lake water evaporation system;
- Phase II – bioremediation of soil and sediments; and
- Phase III – site restoration

Remedy Implementation

In the Administrative Order on Consent (AOC) signed with EPA on September 1, 1983, AT&SF agreed to perform the remedial design/remedial action (RD/RA) and pay costs for cleaning up the site. The Remedial Design (RD) was conducted in conformance with the ROD.

The Remedial Action (RA) took place in three phases. The first phase entailed the construction of a rainfall run-on/runoff control system and a lake water evaporation system. The activities associated with this phase began in November 1989 with the construction of the run-on/runoff control dike and were completed in March 1992 with the completion of the irrigation system and spray evaporation system. The second phase entailed the bioremediation of soil and sediments for organic contamination and included the evaporation of lake water, dewatering and *ex-situ* treatment of contaminated lake bottom sediments, *in-situ* and *ex-situ* treatment of contaminated soils, both from beneath the lake bottom sediments and from the beach area, containment of all treated sediments in the OSF, and containment in the OSF of any treated soils not meeting the clean-up criteria. The activities associated with this phase began in June 1992 and were completed in October 1999. The third phase entailed restoration of the site and included capping of the OSF and establishment of native vegetation. The activities associated with this phase began in June 2000 and were completed in September 2000.

The site achieved construction completion status when the Preliminary Close-Out Report was signed on September 20, 2000. The Final Close-Out Report was signed on November 8, 2002 by the Superfund Division Director.

System Operation/Operation and Maintenance

AT&SF is conducting long-term monitoring and maintenance activities according to the post-closure operations and maintenance (O&M) plan that was approved by EPA in November 2002. The primary activities associated with O&M include the following:

- Visual inspection of the OSF cap with regard to vegetative cover, settlement, stability, and any need for corrective action;
- Annual groundwater monitoring of six monitoring wells through June 2013
- Inspection of the condition of groundwater monitoring wells.

The primary cleanup of the AT&SF (Clovis) Superfund Site took place during the bioremediation phase of the Remedial Action. Therefore, as indicated in the planned elements above, the primary O&M activities have been geared towards monitoring groundwater, inspections, and maintenance of the OSF and lake basin. Analyses performed are in Table 2 below:

Table 2

Analyte	Method
Arsenic	SW846-6010
Barium	
Cadmium	
Chromium	
Lead	
Chloride	EPA 352.2
TRPH*	EPA 418.1
Total Phenolics	SW846-9065/EPA 420.1/420.2

*Total Recoverable Petroleum Hydrocarbons (TRPH) is defined as hydrocarbons remaining after non-petroleum products are removed from the sample through silica gel treatment.

V. Progress since the Last Review

The first Five-Year Review was completed in September 1998. Since the first review, the following milestones have been achieved:

- Bioremediation of all soils and sediments was completed in October 1999;
- Site restoration, including capping of the OSF and seeding of native grasses, was completed in September 2000;
- Site construction was completed on September 20, 2002, and documented through a Preliminary Close-Out Report;
- A Final Close-Out Report was signed on November 8, 2002 by the Superfund Division Director;
- A Direct Final Notice of Deletion from the NPL was published in the Federal Register Notice on January 16, 2003. The public comment period extended through February 18, 2003; and
- Site deletion was completed on March 17, 2003

The second Five-Year Review was completed in September 2003. Since the second review, the following milestones have been achieved

- Establishment of vegetative cover on the OSF and the lake basin.
- Due to establishment of vegetation, a change in the frequency of inspections.
- Change from quarterly to annual groundwater monitoring

There were no issues identified in the previous 5-year review.

VI. Five-Year Review Process

The Five-Year review has been conducted in accordance with the EPA's guidance document for Five-year Review Process (EPA, 2001). The findings of the review are discussed in the following sections.

Administrative Components

This third Five-Year review was led by the EPA's RPM for the site Mr. Sairam Appaji, EPA, Region 6 and conducted by the Sacramento District, US Army Corps of Engineers.

Community Involvement

Public notice for this five-year review was published in the Clovis New Mexico News-Journal on February 15, 2008. Another notice will be published at completion of this five-year review notifying the public of availability of the document. Information about the site is currently available on the Internet at http://www.epa.gov/earth1r6/6sf/6sf.htm. The results of the Five-Year Review will be made available to the public at the Clovis-Carver Public Library, 701 North Main Street, Clovis, New Mexico and the above listed Internet address.

Document Review

A list of documents reviewed is in Attachment 4.

Data Review

Arcadis completed ground water monitoring in 2007 and submitted a report *Summary of 2007 Groundwater Monitoring Program and Post-Closure Operations and Maintenance For The Santa Fe Lake Site, Clovis, NM* to the EPA. Previous annual reports were submitted by TRC Environmental Corporation.

According to the conclusions in the report, as indicated by inspections, native vegetation has been established that meets the requirements of the Post-Closure Operations and Maintenance Plan. As a result, post-closure inspections of the lake basin will no longer be conducted annually. Post-closure inspections of the OSF cap will continue to be performed quarterly. Overall, the groundwater monitoring and post-closure care inspections indicate that the closure measures at the site are effective in ensuring the long-term integrity and effectiveness of the remedial action.

The only significant elevated constituent since closure has been chloride, above the secondary drinking water standard of 250 mg/L in three monitoring wells. At present, groundwater samples collected from monitoring wells MW-D, MW-E and MW-F located in the eastern part of the site have approximately 100 mg/L chloride, presumed to represent background level. Groundwater samples from MW-A and MW-B were as high as 800 mg/L prior to end of remediation but have since declined to about 300 mg/L. MW-A together with MW-G have varied erratically from 200 to 800 mg/L during the 15 year monitoring period from 1992 to 2007.

Mann-Kendall trend analysis has found a significant trend only in MW-B (and presumably MW-A) (Arcadis, 2007), which has been a downward trend.

Chloride in MW-A and MW-B is possibly elevated due to the presence of a cattle feedlot, a culvert leading from an irrigated field, and an emergent wetland in the northwest corner of the site. It seems likely that the elevated chloride in MW-C is due at least in part to the natural process of playa evaporation, which is still occurring outside the limit of the ring dike. There is also a theory that a halite bed in evaporate deposits in the Formation underlying the Ogallala is elevating salinity in the Ogallala as the water table declines (USGS 2003).

The general character of the groundwater under Santa Fe Lake as determined by previous reports as reported by the site consultant (Radian, 1988 figure 4-3, 4-4) is not remarkably different than the water of other playas in the region (NMED, 1996, figure 4.2, 4.3).

Site Inspection

A joint site inspection was conducted by the US EPA, NMED and USACE on March 27, 2008. A completed site inspection checklist is included in Attachment 5.

MW-A has gone dry due to falling water table in the Ogallala aquifer and has been replaced by new monitoring well MW-G. MW-A has not been destroyed but NMED gave verbal approval to maintain the well until groundwater monitoring is completed in case the water table in the Ogallala rises again. The site is secure; access is reasonably restricted and controlled. Excel Energy has limited access to read power meters, and a local radio station maintains a radio tower on the site that they access periodically for maintenance.

As vegetative cover has been established in the de-watered lakebed, irrigation of the dry lakebed has been discontinued and an old fire truck is used for spot watering. Native vegetation was re-seeded by Curtis & Curtis Inc. Land use in the surrounding area hasn't changed significantly, the major activities are dairy feed lots, rendering plants, cheese factories, irrigated lands, and aggregate quarries. Landfills and wastewater treatment plants are also located at the south end of town. To the southeast corner of the site is a small residential neighborhood. The size of the neighborhood remains stable with little change. The Swift meatpacking plant to the southwest is abandoned. A bio-fuel plant is under construction to the west but has not been completed.

Soil and gravel is stockpiled for use as needed. The irrigation system on the landfill cap is in place and operational but used sparingly. The railroad now treats all wastewater onsite and discharges to the publicly owned treatment works. The culvert outfall is dry and the rail yard is no longer a source of water at the site. The adjoining feed lot and irrigated fields continue to discharge to the northwest corner of the property.

The perimeter fence is intact and generally in good repair, but branches of trees growing through the chain link fence on the east side of the site will eventually destroy the fence and must be cut away. Some minor repair of broken chain links might be necessary.

An unidentified animal, probably skunk, is rooting in the landfill cap. The protective liner is not penetrated but it is damaging the vegetative cover.

Interviews

The EPA did not receive written or verbal comments from the public in response to the public notice of this Five-Year Review. The site consultant, Mr. Tim Wippold, PE of Arcadis was interviewed onsite. Allan Pasteris of New Mexico Environment Department and Sai Appaji, EPA, were both present during the interview.

Curry County Commissioner J. Albin Smith, District 4, was contacted, who referred us Lance A. Pyle, Curry County Manager. Mr. Pyle stated that the County has an interest in acquiring the Koch property adjacent to the site for use by its Road Department. Other than that, he offered no comment regarding the site.

Gloria Wicker, a neighboring resident was interviewed by telephone. She offered few comments, but she did remark that on one occasion the site allowed tumbleweed accumulation to get out of hand. She also remarked that she believes the site owners are no longer watering the grama grass sufficiently, that the site is unattractive and she is concerned about the fire hazard from unabated weeds. She also stated that a 200 acre industrial park is planned west of the site and that they wanted to plan to discharge storm water from the park into the playa. She is very much opposed to that plan. The plan was changed to route it through an existing sewer line from the old Swift Meatpacking Plant.

VII. Technical Assessment

The purpose of the Five-Year Review is to determine whether the remedy at the site is protective of human health and the environment. The technical assessment examines the following three questions to determine the protectiveness at the site.

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

Remedy at the site has been achieved and the site has been officially deleted from the NPL. The playa is de-watered and re-vegetated, the contaminated material is capped in an on-site containment cell, and the cap is intact and preventing exposure. Vegetation on the landfill cap is sufficient to prevent wind-blown dust or erosion from occurring. Based on site inspection

and interview with relevant parties (site consultant, NMED representative, RPM) no new evidence of contamination is present at the site.

Remedial action performance

The ring dike is intact and the playa remains de-watered. The landfill cap is intact and the perimeter fence secure. Monitored constituents in groundwater are either declining or indicate no trend.

Systems operations / O&M

Annual groundwater monitoring and quarterly inspections are being conducted in accordance with the Post-Closure Operations and Maintenance Plan (TRC, 2002). Tree branches are growing through the east fence and will eventually destroy the fence if not cut back. Animals are burrowing or rooting in the landfill cap. A means to discourage this from occurring should be developed. The landfill cap consists of six inches of topsoil, 12 inches of clean fill, underlain by a filter cloth, geonet and flexible HDPE liner (TRC, 2000).

Vegetation is stressed in the northeast corner of the landfill cap. Grama grass is being invaded by non-native annual grasses. Grass fires on the perimeter of the site indicate the need for period perimeter mowing.

Opportunities for optimization

Groundwater monitoring is planned to continue for five more years through June 2013. The fourth five-year review will evaluate the need for continued groundwater monitoring. In the interim, consider using Air Force Center for Environmental Excellence (AFCEE) Monitoring and Remediation Optimization System (MAROS) to optimize groundwater monitoring.

BNSF should consider sampling for ammonia, nitrate and total dissolved solids (TDS) to determine if feed lots or irrigated lands are contributing to elevated chloride. Fluctuating chloride levels may be due to ion exchange with carbonate or sulfate, and TDS results might prove more consistent.

TRPH results from the last Quarter of 2007 showed a detection in up-gradient monitoring well MW-E, indicating a possible release from the petroleum pipeline transfer station formerly located on the property north of the site. The Petroleum Storage Tank Bureau of New Mexico is investigating this site. Preliminary results from NMED indicate no contamination in the monitor wells MW-E from the site up gradient. Final results of the investigation should be followed to determine any impact to the AT&SF Clovis site.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and Remedial Action Objectives (RAO) used at the time of the remedy selection still valid?

HUMAN HEALTH

Overall, assumptions made regarding toxicity data, cleanup levels and RAO used at the time of the remedy selection are still valid.

Changes in Toxicity: Soil and Sediment

The standard for arsenic in drinking water changed in 2001, between the first and second five year reviews. The change is incorporated in the annual groundwater monitoring reports.

One approach in evaluating protectiveness for chromium is to compare the historic maximum detected chromium concentration to a conservative screening value, the USEPA Residential Region 6 Medium Specific Screening Level (MSSL) for total chromium. The maximum detected concentration of chromium at Clovis was 190 mg/kg, which is below the MSSL for residential soil (210 mg/kg). Therefore, even if chromium containing soils and sediments were not removed during remedial activities, site soils and sediments do not represent a human health risk based on total chromium.

A remediation goal of 1,000 mg/kg TRPH was specified in the Treatment Plan for the site (Radian, 1994). NMED has subsequently issued TPH Screening Guidelines (NMED, 2006). The remediation goal used at this site meets NMED guidelines for industrial use.

Changes in Exposure

No changes to exposure pathways, toxicity or other contaminant characteristics were noted during this five-year review. Currently a very small portion of the site is used for a radio broadcasting tower and the land use is expected to remain industrial. The risk of exposure due to groundwater use is reduced due to the closing of the Swift Meatpacking Plant and its water production well.

Changes in Risk Assessment Methods

The human health risk assessment method and results for the site are detailed in the Chapter 8 of the Remedial Investigation Report for Clovis (Radian, 1988a).

EPA's Industrial Source Complex Short Term Model (ISCST) first developed in the 1970s was used in the 1988 Remedial Investigation report to determine human health risk and soil/sediment cleanup objectives. EPA replaced ISCST Version 4 with the air dispersion model AERMOD in 2005. Even if the model changes are more conservative than at the time of the risk assessment, the conclusion based on the old air dispersion model resulted in remedial action, so a new air dispersion model is not necessary at this time.

There are no significant changes to risk assessment methodology or exposure assumptions outlined in the risk assessment that indicate a change in the level of protectiveness. The exposure parameters used to develop the corrective action objectives were standard default EPA values. The exposure assumptions are valid and appropriate.

Significant Finding

The information on human health indicates that the standards meet current standards of protectiveness. The protectiveness of the selected remedies is considered adequate.

ENVIRONMENTAL HEALTH (ECOLOGICIAL ASSESSMENT)

A complete ecological risk assessment was not conducted for Clovis. A scoping level assessment was performed, titled an "Endangered Species Assessment", regarding expected use of habitat provided by Clovis. The Endangered Species Assessment concluded that that no significant threat to endangered species survival exists due to infrequent occurrence at the site. However, a quantitative risk assessment was not conducted for infrequent endangered species or potential populations of ecological receptors that utilize the site.

The following six species were listed as endangered in Curry County

- Bald Eagle
- Peregrine Falcon
- Black-Footed Ferret
- Baird's Sparrow
- McCown's Longspur
- Mississippi Kite

The Bald Eagle and Peregrine Falcon have been removed from the federal endangered species list in 2007 and 1999 respectively. The Mississippi Kite is considered threatened but not endangered. The Baird's Sparrow is not on the federal endangered species list as determined in 1999. McCown's Longspur is not on the endangered species list. Of the six, only the black-footed ferret is currently listed as endangered.

However, the New Mexico Department of Game and Fish Biota Information System of New Mexico (BISON-M) provides this information for Curry County (see Table 3).

Table 3

Common Name	Scientific Name	Status
Cuckoo, Yellow-billed	Coccyzus americanus occidentalis (eastern pop)	Federal: FWS Species of Concern State NM: Sensitive taxa (informal)
Eagle, Bald	Haliaeetus leucocephalus alascanus (NM)	State NM: Threatened
Falcon, Peregrine	Falco peregrinus anatum	Federal: FWS Species of Concern State NM: Threatened
Falcon, Peregrine, Arctic	Falco peregrinus tundrius	Federal: FWS Species of Concern State NM: Threatened
Fox, Red	Vulpes vulpes fulva (NM);macroura (NM)	State NM: Sensitive taxa (informal)
Fox, Swift	Vulpes velox velox (NM)	Federal: FWS Species of Concern State NM: Sensitive taxa (informal)
Owl, Burrowing	Athene cunicularia hypugaea (NM,AZ)	Federal: FWS Species of Concern
Plover, Mountain	Charadrius montanus	Federal: FWS Species of Concern State NM: Sensitive taxa (informal)
Prairie Dog, Black-tailed	Cynomys ludovicianus ludovicianus (NM)	Federal: FWS Species of Concern State NM: Sensitive taxa (informal)
Prairie-Chicken, Lesser	Tympanuchus pallidicinctus	State NM: Sensitive taxa (informal)
Rat, Wood, White Sands	Neotoma micropus leucophaea	Federal: FWS Species of Concern
Ringtail	Bassariscus astutus arizonensis (NM,AZ);flavus (NM);yumanensis (AZ);nevadensis (AZ)	State NM: Sensitive taxa (informal)
Shrike, Loggerhead	Lanius ludovicianus excubitorides (NM);sonoriensis (NM);gambeli (NM)	State NM: Sensitive taxa (informal)
Tern, Least	Sterna antillarum athalassos (NM)	Federal: Endangered State NM: Endangered

Significant Finding

Considering the extensive change in listed species, BNSF should conduct an ecological risk assessment prior to the next five-year review. Therefore a protectiveness statement for ecological receptors is deferred until the next five-year review. There is frequently surface water outside the barrier of the former lake which provides habitat for migratory water birds. It is recommended that a quantitative ecological risk assessment be conducted for current species utilizing the Clovis site.

Applicable or Relevant and Appropriate Requirements (ARARs)

Potential ARARs as listed in the Feasibility Study (Radian, 1988) are in Attachment 7 along with a table of drinking water standards. Two ARARs can be found in the Record of Decision

(EPA, 1988). The Comparative Analysis of Alternative states "… including, without limitations, the goals, objectives, and requirements of the Solid Waste Disposal Act". This implies that RCRA Subtitle D applies. Under "Statutory Determinations", it states "The selected remedy will meet all primary state and federal standards for drinking water".

Subsequent changes in chemical-specific standards are in Table 4. The federal standard for arsenic in groundwater has been lowered and the State of New Mexico has added standards for boron and phenols in groundwater. The Safe Drinking Water Act (SDWA) includes a process that EPA must follow to identify and list unregulated contaminants which may require a national drinking water regulation in the future. The EPA must periodically publish this list of contaminants (called the Contaminant Candidate List or CCL) and decide whether to regulate at least five or more contaminants on the list (called Regulatory Determinations). EPA uses this list of unregulated contaminants to prioritize research and data collection efforts to help determine whether a specific contaminant should be regulated. EPA's second contaminant candidate list was announced on February 23, 2005 (http://www.epa.gov/OGWDW/ccl/ccl2.html).

Table 4

Contaminant	Media	Standard		Citation/Year
Arsenic	groundwater	Previous	50 µg/L	SDWA 1986
		New	10 µg/L	66 CFR 6976, 2001
Boron	groundwater	New	0.75 mg/L	NMAC Title 20 Ch. 6 Part 2 s 3103
Phenols	groundwater	New	5 µg/L	NMAC Title 20 Ch. 6 Part 2 s 3103
Pentachlorophenol	groundwater	New	1 µg/L	SDWA 1986
Poly-aromatic Hydrocarbons	groundwater	New	30 µg/L	NMAC Title 20 Ch. 6 Part 2 s 3103
Benzo(a)pyrene	groundwater	New	0.2 µg/L	SDWA 1986
Boron	groundwater	Contaminant Candidate List 2		
2-methyl-phenol (o-cresol)	groundwater	Contaminant Candidate List 2		
2,4,6-Trichlorophenol	groundwater	Contaminant Candidate List 2		
2,4-dichlorophenol	groundwater	Contaminant Candidate List 2		
2,4-dinitrophenol	groundwater	Contaminant Candidate List 2		

There are no known changes in action-specific requirements.

Changes in location-specific requirements are in Table 5. Location-specific ARARs are defined as restrictions on the concentration of hazardous substances or the conduct of activities in environmentally sensitive areas. Unlike ARARs promulgated by EPA under its regulatory authority under CERCLA, compliance with statutory requirements regarding the conduct of activities in environmentally sensitive areas overseen by other Federal agencies are required by law and hence are often not explicitly mentioned in EPA Records of Decision.

Table 5

Location	Requirement		Prerequisite	Citation/Year
Santa Fe Lake	New	Protection of Wetlands	No net loss	EO 11990/1977
	New	Wildlife conservation	Equal consideration with water resources	FWCA/1995

A draft Natural Resources Restoration Plan and Environmental Assessment for the site has been written by the US Fish and Wildlife Service (USFWS, 2007). The record indicates that the location-specific ARAR in Table 5 was considered.

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

There is no new evidence that calls into question the protectiveness of the remedy at the lake basin. However in the last round of groundwater sampling during 2007, TRPH (Method 418.1), total phenols and chromium were detected in monitoring wells MW-D, MW-E and MW-F located along the perimeter of the OSF. The source of these detections in groundwater could be the former Santa Fe Pipeline/Koch Industries site adjacent to the OSF. However the Santa Fe Pipeline/Koch Industries site is currently under investigation by NMED. Until this investigation is completed, a determination cannot be made regarding the source of elevated levels of TPH, phenols and chromium in the monitoring wells at the AT&SF Clovis site. The EPA will follow up on this during the next five-year review.

According to the drawings provided, the OSF has no bottom liner or leachate collection system (RCRA Subtitle D). In the semi-arid climate of the Southern High Plains of the Clovis area, the OSF cover should be sufficient to prevent leaching to the water table 280 feet below ground surface. The EPA has determined that the remedy is protective in the short term because monitoring wells MW-A, MW-B, and MW-C did not detect the presence of any monitored constituent and there is no exposure and hence no risk to human health or the environment. The question of long-term protectiveness cannot be answered with certainty at this time pending resolution by NMED of whether the adjacent property is the source of constituents detected in ATSF Clovis site monitoring wells in 2007.

Recommendations following the current five-year review are listed in Table 6. Ground water will continue to be monitored at the site until June 2013. The EPA will determine if continued monitoring is required beyond 2013.

VIII. Issues

Issues are in Table 6

Table 6

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Fence maintenance	N	Y
Check invasive annual grasses	N	Y
Animal burrowing or rooting in landfill cover	N	Y
Update signage on perimeter fences	N	N
TRPH, phenol and chromium detections in groundwater	N	Unknown

IX. Recommendations and Follow-up Actions

Recommendations and follow up actions are presented in Table 7. Ground water will continue to be monitored at the site until June 2013 and it is determined that it is no longer necessary.

Considering the extensive change in listed ecological receptors, a quantitative ecological risk assessment should be conducted for current species at the site prior to the next five-year review. Protectiveness statement for ecological receptors is deferred until the next five-year review.

An emergent wetland is located in the northwest corner of the property recognized in the National Wetlands Inventory of the US Fish and Wildlife Service. It is classified as palustrine, emergent, persistent, temporarily flooded, and diked or impounded. The area appears to receive runoff from the feedlot north of the property through a culvert under the intervening roadway as well as from the irrigated land to the west. BNSF should check for NPDES storm water permits for discharges to its property and take steps to mitigate the discharges if needed.

While the entire 100 acre property is fenced, there is evidence that evidence of small animals digging into the OSF cap. Preventative steps should be taken to maintain the integrity of the OSF cap if depth of burrows approaches 18 inches.

Tree branches should be cut away from the fence on the east side of the site. Steps should be taken to maintain vegetative cover including control of invasive annual grasses.

Table 7

Issue	Recommendations / Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)?	
					Current	Future
Ecological risk	Conduct an Ecological risk assessment	BNSF	EPA	9/2/12	Deferred	Deferred
Fence maintenance	Cut tree branches away from the east fence	BNSF	EPA	9/30/2009	N	Y
Invasive annual vegetation	Identify cause of stressed grama grass and invasive annual plant species and provide recommendations to reverse the trend	BNSF	EPA	9/30/2009	N	Y
Animal burrowing	Mitigation plan	BNSF	EPA	9/30/2009	N	Y
Update signage	Replace "AT&SF" with "BNSF", update phone numbers	BNSF	EPA	9/30/2009	N	N
Groundwater Detections	Complete investigation of Koch property	Koch	NMED	9/30/2010	N	N

X. Protectiveness Statement(s)

The lake basin remedy is determined to be protective of human health. However, protectiveness of the environment is deferred additional information is available. All environmental threats at the site have been addressed through

(1) Isolation of the lake from surface water run-on;
(2) Evaporation of lake water;
(3) De-watering and *ex-situ* treatment of contaminated lake bottom sediments;

(4) *In-situ* and *ex-situ* treatment of contaminated soils, both from beneath the lake bottom sediments and from the beach area;
(5) Containment of all treated sediments in the OSF;

The OSF remedy is determined to be protective of human health and the environment in the short term by:

(6) Containment in the OSF of any treated soils not meeting the clean-up criteria;
(7) Capping of the OSF following treatment of all sediments and soils; and
(8) Site restoration.

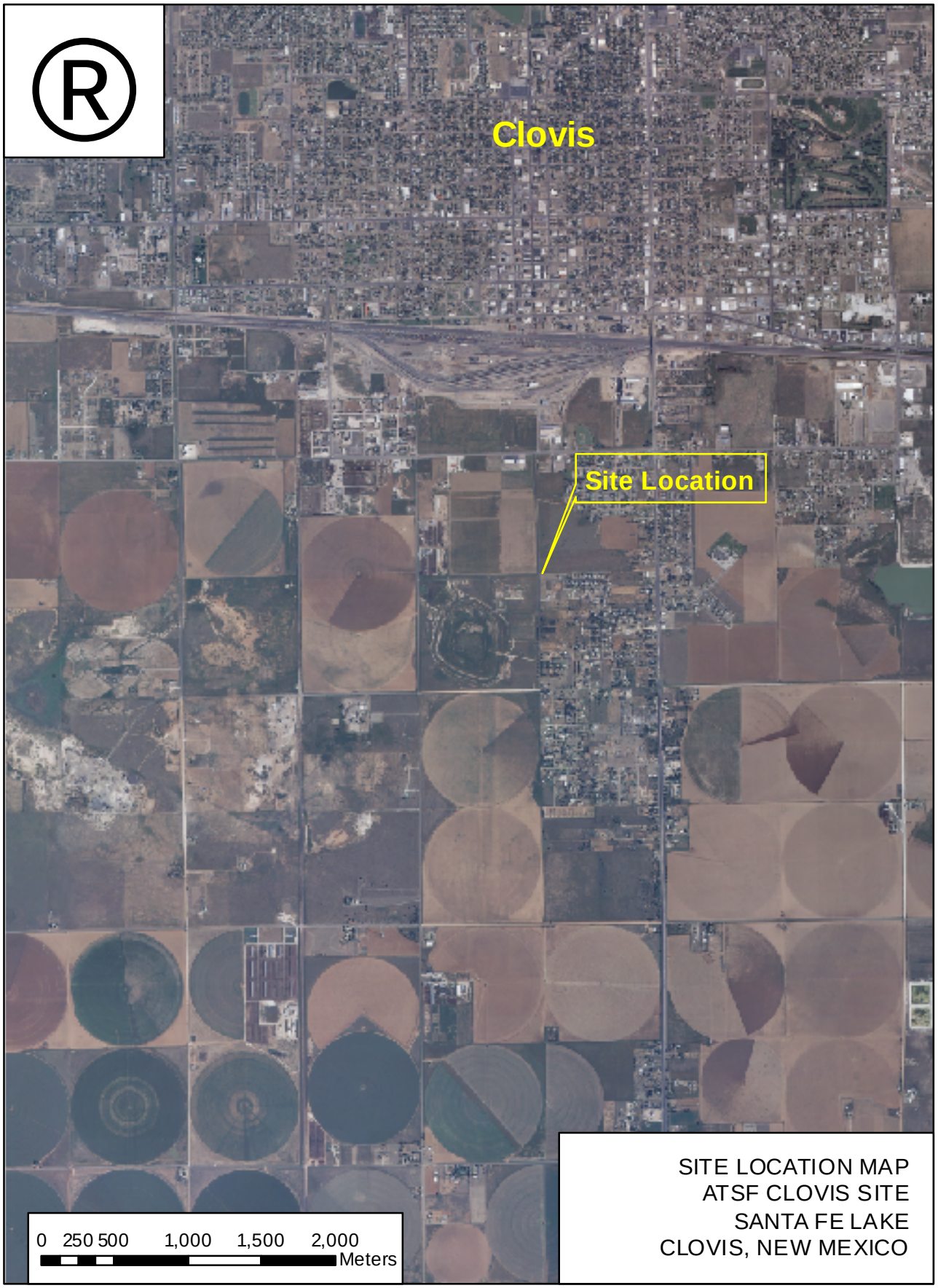
Additionally the site has been fenced to prevent unauthorized site access and a Restrictive Covenant has been filed with the Curry County Clerk's office preventing future disturbance (i.e. excavation or erosion) of the OSF (Attachment 3). Long-term protectiveness of the remedial action is verified through annual groundwater monitoring and quarterly site inspections. The 2007 annual sampling data indicates that groundwater may have been impacted at the site, but it is not yet known if it is due to a release from the adjacent property or leachate from the OSF as a result of the remedial action. Therefore a statement regarding long-term protectiveness of the OSF cannot be made pending resolution of this issue by NMED and Koch Industries.

XI. Next Review

The next Five-Year for the AT&SF (Clovis) Superfund Site is required five years from the signature date of this review.

ATTACHMENT 1

SITE LOCATION



SITE LOCATION MAP
ATSF CLOVIS SITE
SANTA FE LAKE
CLOVIS, NEW MEXICO

ATTACHMENT 2

SITE PLAN

SITE PLAN
ATSF CLOVIS SITE
SANTA FE LAKE
CLOVIS, NEW MEXICO

ATTACHMENT 3

RESTRICTIVE COVENANT

CC0302474

DECLARATION OF RESTRICTIVE COVENANTS
For Property Located at the Santa Fe Lake Site
Clovis, New Mexico

THIS DECLARATION is made this 17th day of March 2003 by The Burlington Northern and Santa Fe Railway Company ("BNSF").

RECITALS:

WHEREAS, BNSF is the owner of certain real property located near Clovis, New Mexico, more particularly described in Exhibit A, attached hereto and incorporated herein (the "Property").

WHEREAS, the U.S. Environmental Protection Agency ("EPA") and The Atchison, Topeka, and Santa Fe Railway Company, predecessor to BNSF have negotiated an Administrative Order on Consent, EPA Region 6, CERCLA Docket No. 06-04-83, to perform investigation activities to determine the nature of any contamination, perform a remedial investigation and implement remedial actions at the Santa Fe Lake Site (the "Site"), as described in EPA's Record of Decision, dated September 23, 1988. With the approval and oversight of EPA, certain materials at the Site were excavated and placed in an On-site Storage Facility established on the Property (the "OSF"). The Property encompasses the OSF and is a portion of the Site as shown generally on the map which is Exhibit B.

WHEREAS, to maintain the integrity of the OSF, this Declaration prohibits, prevents, and prescribes the performance of certain activities on the Property.

WHEREAS, the restrictive covenants herein run with the land, for the benefit of the public and the Enforcing Agencies, and are intended to preserve human health and the environment by ensuring the present and future integrity of the completed Remedial Activities.

ARTICLE I.
DEFINITIONS

Unless the context otherwise specifies or requires, the terms defined in this article shall, as used in this Declaration have the meanings set forth below:

1. Declaration. "Declaration" means this Declaration of Restrictive Covenants for Property located at the Santa Fe Lake Site, near Clovis, Curry County, New Mexico, as more particularly described in Exhibit A attached hereto.

2. Enforcing Parties. "Enforcing Parties" means the Enforcing Agencies and/or BNSF. Enforcing Agencies are EPA, New Mexico Environment Department, and any successor departments, agencies, or instrumentalities of the United States or the State of New Mexico.

3. On-site Storage Facility (OSF). "On-site Storage Facility" is encompassed within the Property described in Exhibit A and means the designed, capped, and revegetated area that is approximately 500 feet wide, 525 feet long, and 11 feet deep and is located in the northeastern corner of the Site. The OSF contains approximately 96,000 cubic feet of treated sediments and soils removed from the Site.

4. Owner. "Owner" means each and every person who now or hereafter owns, occupies, or acquires any right, title, or interest in or to the Property or any portion of the Property and their successors, heirs, representatives and assigns.

5. Property. "Property" means the real property as described in Exhibit A attached hereto. The Property includes the OSF plus a perimeter buffer around the OSF.

ARTICLE II.
SUBJECT PROPERTY

BNSF hereby declares that the Property is and shall be conveyed, encumbered, leased, occupied, built upon or otherwise used, improved, or transferred, in whole or in part, subject to this Declaration. All the covenants, conditions, restrictions, and easements set forth in this Declaration are established for the purpose of preserving the public health and the environment by ensuring the present and future integrity of the OSF. Such covenants, conditions, and restrictions are intended to benefit the public and the Enforcing Agencies by preventing the disturbance, interference, invasion, penetration, erosion, or other adverse impacts to the Property, and by preventing migration or dispersal of hazardous substances on the Property. All of such covenants, conditions, restrictions and easements shall run with all of the Property for all purposes and shall be binding upon the current and future Owner(s) as set forth in this Declaration.

ARTICLE III.
RESTRICTIONS ON USE

No activities or uses are permitted on the Property that will or are likely to disturb, interfere, invade, or adversely impact the OSF, could create a threat to human health or the environment, or cause erosion on or near the OSF. Specifically, future development and use of the Property shall be prohibited, unless approved by one or more of the Enforcing Agencies.

ARTICLE IV.
FAILURE TO ENFORCE IS NO WAIVER

The failure of the Enforcing Agencies to enforce any requirement, covenant, condition, restriction, or standard herein contained shall in no event be deemed to be a waiver of the right to do so thereafter or in other cases, nor shall such failure to enforce waive the Enforcing Agencies' right to enforce any other requirement, covenant, condition, standard or restriction. No provision of this Declaration shall be construed to require the Enforcing Agencies to enforce the requirements, covenants, conditions, restrictions, and/or standards set forth herein. Enforcement of such requirements, covenants, conditions, restrictions and/or standards shall be at the sole and absolute discretion of each of the Enforcing Agencies individually.

ARTICLE V.
RIGHT OF ENTRY

1. During reasonable hours and upon reasonable notice to Owner in possession, and subject to reasonable security and safety requirements, the Enforcing Agencies shall have the right to enter upon and inspect any portion of the Property: (a) to determine whether the requirements of this Declaration have been or are being complied with, and to abate, mitigate, or cure such violation or breach within a reasonable period of time; and (b) for only so long as is required, to complete all remediation, monitoring, sampling, or other response activities required by or to comply with any other requirements imposed by EPA.

2. Violation or breach of any covenant, condition or restriction contained in this Declaration shall entitle the Enforcing Agencies, or any of them, to provide the Owner in possession notice of and demand the prompt abatement, mitigation, or cure of such violation or breach. Should the Owner in possession fail to abate, mitigate, or cure such violation or breach within a reasonable period of time, the Enforcing Agencies shall have the right, privilege, and license to enter upon the Property where such violation or breach exists and to abate, mitigate, or cure such breach at the expense of that Owner. No such entry by the Enforcing Agencies or their agents shall be deemed a trespass, and neither the Enforcing Agencies nor their agents shall be subject to liability to the Owner for such entry and any action taken to remedy or remove the violation of this Declaration.

ARTICLE VI.
GENERAL PROVISIONS

1. Constructive Notices and Acceptance. Every person who now or hereafter owns, occupies, or acquires any right, title, or interest in or to any portion of the Property is and shall be conclusively deemed to have consented and agreed to every covenant, condition, restriction, and easement contained in this Declaration, whether or not any reference to this Declaration is contained in the instrument by which such person acquired an interest in the Property.

2. Runs with Land. All covenants, conditions, restrictions, and easements contained in this Declaration operate as covenants running with the land, for the benefit of the public and the Enforcing Agencies.

3. Enforcement of Declaration. If there is a violation or breach of any covenant, condition, or restriction contained in this Declaration, any of the Enforcing Agencies shall be entitled to commence an action or proceeding to enforce the terms of this Declaration and shall be entitled to any and all remedies available in equity or at law.

4. Warranty of Authority. BNSF hereby represents and warrants that this Declaration has been duly executed by one with authority to bind BNSF and is valid and binding upon it in accordance with its terms.

5. Recording of Declaration. BNSF hereby agrees and acknowledges that this Declaration shall be duly recorded upon its execution. BNSF further agrees and acknowledges that, if for any reason whatsoever this Declaration in its present form is deemed by the recording agency to be unrecordable, BNSF shall execute a substituted form of Declaration that corrects any deficiency preventing recordation but that is in all other respects identical to this Declaration.

6. Severability. The provisions of this Declaration shall be deemed independent and severable, and a determination of invalidity or enforceability of any one provision or portion of the Declaration by a court of competent jurisdiction shall not affect the validity or enforceability of any other provision of this Declaration.

7. Controlling Law. The interpretation and performance of this Declaration shall be governed by the laws of the State of New Mexico.

8. Termination. This Declaration can be terminated at any time upon agreement of all Enforcing Agencies.

IN WITNESS WHEREOF, BNSF has executed this Declaration of Restrictive Covenants as of this day and year first set forth above.

THE BURLINGTON NORTHERN AND SANTA FE RAILWAY COMPANY.

By: Robert E Werner

Its: Robert E. Werner, Mgr Env. Remediation

STATE OF Texas)
COUNTY OF Tarrant)

The foregoing instrument is acknowledged before me this 17 day of March, 2003, by Robert E. Werner.

Judith A. Levy
Notary Public

My commission expires:

Dec 19, 2004

JUDITH A. LEVY
Notary Public, State of Texas
My Commission Expires
December 19, 2004

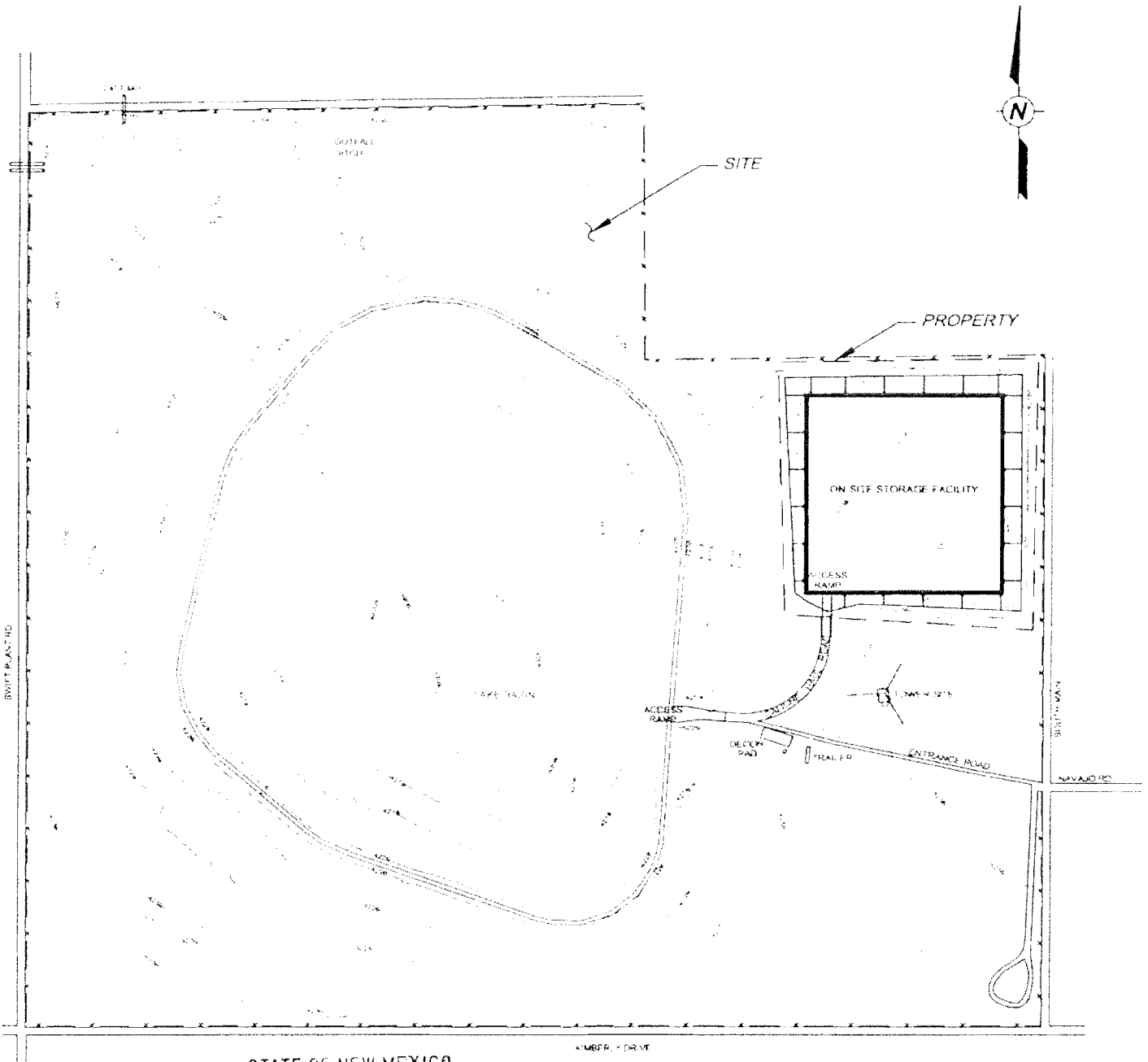
EXHIBIT A

METES AND BOUNDS DESCRIPTION

Legal Description of the **Property at Santa Fe Lake, Curry County, NM**.

A Tract of Land in the Southwest Quarter of Section 19, T2N R36E N.M.P.M Curry County, New Mexico, Being More Particularly Described As Follows:

Beginning at a Point 1047.50 Feet North, Along the North-South Quarter Section Line of Said Section 19, and 40.47 Feet West From the South Quarter Corner of Said Section 19. Thence N 86°14'18" W a Distance of 642.90 Feet; Thence N 01°40'45" W a Distance of 680.58 Feet; Thence N 89°09'24" E a Distance of 671.16 Feet; Thence S 00°45'11" W a Distance of 732.40 Feet to the Point of Beginning. Said Tract Contains 10.640 Acres of Land.



STATE OF NEW MEXICO
COUNTY OF CURRY
FILED FOR RECORD

2003 MAR 26 AM 9:56

BK 422 PG
CO RECORDS
MARG HEIR DO
BY

COUNTY CLERK

0 200 400 800

SCALE IN FEET
1" = 400'-0"

SITE PLAN

BURLINGTON NORTHERN AND SANTA FE RAILWAY
SANTA FE LAKE SITE
CLOVIS, NEW MEXICO

PROJECT NO.: 25617 | DATE: 2-24-03

TRC
Environmental Corporation
Customer Focused Solutions
2313 W. SAM HOUSTON PARKWAY N.
STE. 107
HOUSTON, TEXAS 77043
713-821-7000

EXHIBIT B.

H:\GIS\BNSF - Clovis Lake\Site\Reports\Restrictive Covenant\ BNSF-CLOVIS-LAKE-CLOSURE-SITE-OSF-LOC.dwg 1 03/11/03

ATTACHMENT 4

LIST OF DOCUMENTS REVIEWED

ATTACHMENT 4

List of Documents Reviewed

Dairy Feedlot Contributions to Groundwater Contamination – A Preliminary Study in New Mexico, Journal of Environmental Health, September 1, 1999

EPA Superfund Record of Decision: AT&SF (Clovis), EPA ID NMD-043158591, OU 01, Clovis, NM, EPA/ROD/R06-88/039, 1988

Executive Order 11990, Protection of Wetlands, 1977

Feasibility Study for the Atchison, Topeka and Santa Fe Railway Company at Clovis, New Mexico, Radian, July 1988

Fish and Wildlife Coordination Act, 1934 as amended through 1995

Final Closures Drawings of the On-Site Storage Facility (OSF), April 17, 2000

Five-Year Review Report, AT&SF Clovis Superfund Site, Clovis, New Mexico, 1998

Hydrologic and Ecologic Influence of Playa Basins in the Southern High Plains, Texas and New Mexico, USGS OFR 94-702-W, 1995

Lake Water Quality Assessment Surveys: Playa Lakes 1994, Surveillance and Standards Section, Surface Water Quality Bureau, New Mexico Environment Department, December 1996

Ogallala Aquifer: Where's the Water?, W. Peter Balleau, New Mexico Water Law Conference, August 26-27, 2002,

Playa Lake Basins on the Southern High Plains of Texas and New Mexico Part I: Hydrologic, geomorphic and geologic evidence for their development, GSA Bulletin v. 99 p. 215-223, August 1987

Playa Lake Basins on the Southern High Plains of Texas and New Mexico Part II: A Hydrologic Model and Mass- Balance Arguments for their Development, GSA Bulletin v. 99 p. 224-230, August 1987

Post-Closure Operations and Maintenance Plan, 2002

Remedial Investigation for the Atchison, Topeka and Santa Fe Railway Company at Clovis, New Mexico, Radian, August 1988

Second Five-Year Review Report for AT&SF Clovis Superfund Site, Clovis, Curry County, New Mexico, CERCLIS ID NMD 043158591, 2003

Title 20 (Environmental Protection) Chapter 6 (Water Quality) Part 2 (Ground and Surface Water Protection), New Mexico Water Quality Control Commission

Documents Written Within the Last 5 Years

Ground-Water Quality of the Southern High Plains Aquifer, Texas and New Mexico, 2001: National Water Quality Assessment Program, USGS OFR 03-345, 2003

Health & Safety Plan: BNSF-Clovis, NM, Arcadis, 2007.

Natural Resources Restoration Plan and Environmental Assessment for the AT&SF (Clovis) New Mexico Superfund Site (Draft), New Mexico, US Fish & Wildlife Service, 2006

Natural Resources Restoration Plan and Environmental Assessment for the AT&SF (Clovis) New Mexico Superfund Site, New Mexico (Revised Draft), US Fish & Wildlife Service, 2007

Soil Survey of Curry and Southwest Quay Counties, New Mexico, Natural Resource Conservation Service, 2007

Summary of 2003 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, TRC, 2004

Summary of 2004 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, TRC, 2005

Summary of 2005 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, TRC, 2006

Summary of 2006 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, TRC, 2007

Summary of 2007 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, Arcadis, 2008

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US EPA (1983), Administrative Order on Consent (Docket No. CERCLA VI-4-83)

ATTACHMENT 5

INSPECTION FORM

AT&SF Clovis
Santa Fe Lake
Five-Year Review Site Inspection Checklist

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program. N/A means "not applicable."

I. SITE INFORMATION	
Site Name: AT&SF Clovis	**EPA ID:** NMD043158591
City/State: Clovis, New Mexico	**Date of Inspection:** March 27, 2008
Agency Completing 5 Year Review: EPA	**Weather/temperature:** Sunny, windy, low 70s

Remedy Includes: (Check all that apply)
- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other: Vegetative Cover

Attachments: ☐ Inspection team roster attached ☒ Site map attached

II. INTERVIEWS (Check all that apply)

– **O&M site manager**: BNSF Contractor Representative
Name: Tim Wippold
Title: Project Manager
Date: March 27, 2008
Interviewed: ☒ at site ☐ at office ☐ by phone Phone Number:
Problems, suggestions: ☐ Additional report attached (if additional space required).

2. O&M staff: N/A
Name:
Title:
Date:
Interviewed: ☐ at site ☐ at office ☐ by phone Phone Number:
Problems, suggestions: ☐ Additional report attached (if additional space required).

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: New Mexico Environment Department
Contact: Superfund Oversight Section, Groundwater Quality Bureau
Name: Allan Pasteris
Title: Staff Member
Date: March 27, 2008
Phone Number: 505-827-0039
Problems, suggestions: ☐ Additional report attached (if additional space required).

Agency: USFWS
Contact: Ecological Services Southwest Regional Office
Name: Benjamin Tuggle
Title:Authorized Official
Date: May 2008
Phone Number: (505) 248-6282
Problems, suggestions: ☐ Additional report attached (if additional space required).

Agency:New Mexico Office of Natural Resources Trustee
Contact:
Name: Martin Heinrich
Title: State Trustee
Date: May 2008
Phone Number: (505) 243-8087
Problems, suggestions: ☐ Additional report attached (if additional space required).

Agency: New Mexico Environment Division
Contact: Remediation Oversight Section, Groundwater Quality Bureau
Name: Chris Whitman
Title: Staff Member, Compliance & Enforcement Program
Date:
Phone Number: 505-647-7959
Problems, suggestions: ☐ Additional report attached (if additional space required).

4, Other interviews (optional) ☒ N/A ☐ Additional report attached (if additional space required).

Interview Record Forms are provided in Attachment 2 to the Five-Year Review Report.

III. ONSITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. O&M Documents

☒ O&M Manuals	☒ Readily available	☒ Up to date	☐ N/A
☒ As-Built Drawings	☒ Readily available	☒ Up to date	☐N/A
☒ Maintenance Logs	☒ Readily available	☒ Up to date	☐ N/A

Remarks: Logbook and maintenance logs kept at Arcadis office for up-to-date recordkeeping and referencing.

2. Health and Safety Plan Documents

☒ 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: Arcadis personnel carry training certification on their person.

4. Permits and Service Agreements

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits	☐ Readily available	☐ Up to date	☒ N/A

Remarks:

5. Gas Generation Records ☐ Readily available ☐ Up to date ☒ N/A
Remarks:

6. Settlement Monument Records ☐ Readily available ☐ Up to date ☒ N/A
Remarks: There are no onsite settlement monuments.

7. Groundwater Monitoring Records ☒ Readily available ☒ Up to date ☐N/A
Remarks: Records are maintained at Arcadis office. Logbook is carried to the field for monitoring events and for inspections.

8. Leachate Extraction Records ☐ Readily available ☐ Up to date ☒N/A
Remarks:

9. Discharge Compliance Records ☐ Readily available ☐ Up to date ☒ N/A
Remarks:

10. Daily Access/Security Logs ☒ Readily available ☒ Up to date ☐ N/A
Remarks: Maintained on site for period of August 1999 to present. Previous logs maintained at Arcadis office.

IV. O&M Costs ☐ Applicable ☒ N/A

☐ **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☒ Contractor for PRP
☐ Other:

☐ **O&M Cost Records**
☐ Readily available ☐ Up to date ☐ Funding mechanism/agreement in place
Original O&M cost estimate: $5,000 / yr ☐ Breakdown attached

Total annual cost by year for review period if available

From (Date): _____ To (Date): _____ Total cost: _____ ☐ Breakdown attached

From (Date): _____ To (Date): _____ Total cost: _____ ☐ Breakdown attached

From (Date): _____ To (Date): _____ Total cost: _____ ☐ Breakdown attached

From (Date): _____ To (Date): _____ Total cost: _____ ☐ Breakdown attached

From (Date): _____ To (Date): _____ Total cost: _____ ☐ Breakdown attached

Unanticipated or Unusually High O&M Costs During Review Period ☐ N/A
Describe costs and reasons:

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

☐ **Fencing**

Fencing damaged ☐ Location shown on site map ☒ Gates secured ☐ N/A
Remarks: Tree branches growing through east fence

☐ **Other Access Restrictions**

Signs and other security measures ☒ Location shown on site map ☐ N/A
Remarks: Emergency numbers posted on main gate.

☐ **Institutional Controls**

☐ **Implementation and enforcement**

Site conditions imply ICs not properly implemented: ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced: ☐ Yes ☒ No ☐ N/A
Type of monitoring (e.g, self-reporting, drive by): Self-reporting
Frequency: Montlhly/Quarterly
Responsible party/agency: BNSF
Contact: GMC Environmental - Subcontracted to Arcadis
Name: Tim Wippold. P.E.
Title:
Date: March 27, 2008
Phone Number: 281-509-6489
Reporting is up-to-date: ☒ Yes ☐ No ☐N/A
Reports are verified by the lead agency: ☒ Yes ☐ No ☐ N/A
Specific requirements in deed or decision documents have been met: ☒ Yes ☐ No ☐ N/A
Violations have been reported: ☐ Yes ☐ No ☒N/A
Other problems or suggestions: ☒ Additional report attached (if additional space required).
Copy of IC (deed recordation) attached.

Adequacy ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks:

☐ **General**

1. Vandalism/trespassing ☐ Location shown on site map ☒ No vandalism evident
Remarks:

2. Land use changes onsite ☐ Yes ☒ No ☐N/A
Remarks:

3. Land use changes offsite ☐ Yes ☒ No ☐N/A
Remarks:

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. Roads damaged ☒ Location shown on site map ☒ Roads adequate ☐N/A
Remarks:

B. Other Site Conditions

Remarks:

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement (Low spots)** ☐ Location shown on site map ☒ Settlement not evident
   Areal extent: Depth:
   Remarks:

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
   Lengths: Widths: Depths:
   Remarks:

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
   Areal extent: Depth:
   Remarks:

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
   Areal extent: Depth:
   Remarks:

5. **Vegetative Cover**
   ☒ Cover properly established ☒ No signs of stress ☒ Grass ☐ Trees/Shrubs
   Remarks:

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks: Ballast adequately covering geocell at outlet areas.

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
   Areal extent: Height:
   Remarks:

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
   ☐ Wet areas ☐ Location shown on site map Areal extent:
   ☐ Ponding ☐ Location shown on site map Areal extent:
   ☐ Seeps ☐ Location shown on site map Areal extent:
   ☐ Soft subgrade ☐ Location shown on site map Areal extent:
   Remarks:

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability
   Areal extent:
   Remarks:

☐ **Benches** ☐ Applicable ☒ 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.)

Flows Bypass Bench ☐ Location shown on site map ☐ N/A or okay
Remarks:

Bench Breached ☐ Location shown on site map ☐ N/A or okay
Remarks:

Bench Overtopped ☐ Location shown on site map ☐ N/A or okay
Remarks:

Letdown Channels ☐ Applicable ☒ 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.)

Settlement ☐ Location shown on site map ☐ No evidence of settlement
Areal extent: Depth:
Remarks:

Material Degradation ☐ Location shown on site map ☐ No evidence of degradation
Material type: Areal extent:
Remarks:

Erosion ☐ Location shown on site map ☐ No evidence of erosion
Areal extent: Depth:
Remarks:

Undercutting ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent: Depth:
Remarks:

Obstructions ☐ Location shown on site map ☐ N/A
Type:
Areal extent: Height:
Remarks:

Excessive Vegetative Growth ☐ No evidence of excessive growth
☐ Evidence of excessive growth ☐ Vegetation in channels but does not obstruct flow
☐ Location shown on site map Areal extent:
Remarks:

D. Cover Penetrations ☐ Applicable ☒ N/A

Gas Vents ☐ N/A
☐ Active ☐ Passive ☐ Routinely sampled
☐ Properly secured/locked ☐ Functioning ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O& M
Remarks:

Gas Monitoring Probes ☐ N/A
☐ Routinely sampled
☐ Properly secured/locked ☐ Functioning ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M
Remarks:

Monitoring Wells (within surface area of landfill) ☐ N/A
☐ Routinely sampled
☐ Properly secured/locked ☐ Functioning ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M
Remarks:

Leachate Extraction Wells ☐ N/A
☐ Routinely sampled
☐ Properly secured/locked ☐ Functioning ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M
Remarks:

Settlement Monuments ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks: There are no settlement monuments onsite.

Gas Collection and Treatment ☐ Applicable ☒ N/A

Gas Treatment Facilities ☐ N/A
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs O& M
Remarks:

Gas Collection Wells, Manifolds and Piping ☐ N/A
☐ Good condition ☐ Needs O& M
Remarks:

Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings) ☐ N/A
☐ Good condition ☐ Needs O& M
Remarks:

Cover Drainage Layer ☒ Applicable ☐ N/A

1. Outlet Pipes Inspected ☐ Functioning ☒ N/A
Remarks:

2. Outlet Rock Inspected ☒ Functioning ☐ N/A
Remarks: New ballast rock placed in some areas along northern and western slopes recently. Ballast is providing adequate cover and is less susceptible to erosion than pea gravel previously used. Routine O&M will include inspection and replacement, as needed.

Detention/Sedimentation Ponds	☐ Applicable ☒ N/A	
☐ **Siltation** Areal extent: Depth: Remarks:	☐ Siltation evident	☐ N/A
☐ **Erosion** Areal extent: Depth: Remarks:	☐ Erosion evident	☐ N/A
☐ **Outlet Works** Remarks:	☐ Functioning	☐ N/A
☐ **Dam** Remarks:	☐ Functioning	☐ N/A
Retaining Walls	☐ Applicable ☒ N/A	
1. Deformations Horizontal displacement: Vertical displacement: Remarks:	☐ Location shown on site map	☐ Deformation not evident Rotational displacement:
2. Degradation Remarks:	☐ Location shown on site map	☐ Degradation not evident
Perimeter Ditches/Off-site discharge	☐ Applicable ☒ N/A	
Siltation Areal extent: Depth: Remarks:	☐ Location shown on site map	☐ Siltation not evident
Vegetative Growth Areal extent: Type: Remarks:	☐ Location shown on site map	☐ Vegetation does not impede flow
Erosion Areal extent: Depth: Remarks:	☐ Location shown on site map	☐ Erosion not evident
Discharge Structure ☐ Functioning ☐ Good Condition Remarks:	☐ Location shown on site map	☒ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

Settlement ☐ Location shown on site map ☐ Settlement not evident
Areal extent: Depth:
Remarks:

Performance Monitoring ☐ N/A
☐ Performance not monitored
☐ Performance monitored Frequency:
☐ Evidence of breaching Head differential:
Remarks:

IX. GROUNDWATER PROTECTION/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

☐ **Groundwater Extraction Monitoring Wells, Pumps, and Pipelines** ☒ Applicable ☐ N/A

1. Pumps, Wellhead Plumbing, and Electrical ☐ N/A
☒ All required wells located ☐ Good condition ☒ Needs O& M
Remarks: MW-D was struck by irrigation system tower day before inspection. Anchor for lock of locking cap broken and needs to be welded back on. Casing needs to be repainted. All other wells in good condition.

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances ☒ N/A
☐ System located ☐ Good condition ☐ Needs O& M
Remarks:

3. Spare Parts and Equipment ☐ N/A
☒ Readily available ☐ Good condition
☐ Requires Upgrade ☐ Needs to be provided
Remarks: Dedicated pumps in each well. Maintenance crew available, if required, to perform repairs.

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. Collection Structures, Pumps, and Electrical ☐ N/A
☐ Good condition ☐ Needs O& M
Remarks:

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances ☐ N/A
☐ Good condition ☐ Needs O& M
Remarks:

3. Spare Parts and Equipment ☐ N/A
☐ Readily available ☐ Good condition
☐ Requires Upgrade ☐ Needs to be provided
Remarks:

C. Treatment System	☐ Applicable	☒ N/A

1. Treatment Train (Check components that apply)
   - ☐ Metals removal
   - ☐ Oil/water separation
   - ☐ Bioremediation
   - ☐ Air stripping
   - ☐ Carbon adsorbers
   - ☐ Filters (list type):
   - ☐ Additive (list type, e.g., chelation agent, flocculent)
   - ☐ Others (list): Reverse Osmosis Plant
   - ☐ Good condition
   - ☐ Needs O&M
   - ☐ Sampling ports properly marked and functional
   - ☐ Sampling/maintenance log displayed and up to date
   - ☐ Equipment properly identified
   - ☐ Quantity of groundwater treated annually (list volume): about 43 million gallons recovered Oct 95 - Dec 2001.
   - ☐ Quantity of surface water treated annually (list volume):

   Remarks:

2. Electrical Enclosures and Panels (properly rated and functional) ☐ N/A
   - ☐ Good condition
   - ☐ Needs O& M

   Remarks:

3. Tanks, Vaults, Storage Vessels ☐ N/A
   - ☐ Good condition
   - ☐ Proper secondary containment
   - ☐ Needs O&M

   Remarks:

4. Discharge Structure and Appurtenances ☐ N/A
   - ☐ Good condition
   - ☐ Needs O& M

   Remarks:

5. Treatment Building(s) ☐ N/A
   - ☐ Good condition (esp. roof and doorways)
   - ☐ Needs Repair
   - ☐ Chemicals and equipment properly stored

   Remarks:

6. Monitoring Wells (pump and treatment remedy) ☐ N/A
   - ☐ All required wells located
   - ☐ Properly secured/locked
   - ☐ Functioning
   - ☐ Routinely sampled
   - ☐ Good condition
   - ☐ Needs O&M

   Remarks:

Monitored Natural Attenuation	☐ Applicable	☒N/A

1. Monitoring Wells (natural attenuation remedy) ☒N/A
   - ☐ All required wells located
   - ☐ Properly secured/locked
   - ☐ Functioning
   - ☐ Routinely sampled
   - ☐ Good condition
   - ☐ Needs O&M

   Remarks:

X. OTHER REMEDIES	☐ Applicable	☐ N/A

OSF Cap Vegetative Cover: Vegetative cover is established. Northeast corner showing signs of stress.

Lake Basin Vegetative Cover: Native grasses (blue grama, sideoats grama, clover, squirrel-tail bottle brush, etc.) cover established in lake basin. Some patches of weeds (kochia, russian thistle, etc.) are located throughout the basin. Pivot-point irrigation system has been removed and an old fire engine is used for spot watering and fighting grass fires.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

The OSF cap contains the stabilized soils and sediments and prevents infiltration / leachate to ground water. Regrading of lake basin following completion of treatment has been completed and native vegetation is established.

B. Adequacy of O&M

O&M adequate to ensure proper establishment of vegetative cover, prevent erosion, and maintain OSF cap.

C. Early Indicators of Potential Remedy Failure

No indicators of potential remedy failure noted. Control animal rooting in landfill cover. Cut tree branches from east perimeter fence.

D. Opportunities for Optimization

Consider analyzing for TDS instead of chloride. Investigate the contribution of the dairy feed lot and agricultural irrigation runoff to common ions in groundwater in the northwest corner of the site. If TPH is detected, analyzs for poly-aromatic hydrocarbons and BTEX. If phenol is detected, analyze for cresol and pentachlorophenol. Follow the results of the Koch investigation on the adjacent property. Develop an exit strategy to guide termination of the groundwater monitoring program.

ATTACHMENT 6

PHOTOS DOCUMENTING SITE CONDITIONS

View from center of playa looking south

View from center of playa looking west

View from center of playa looking east

View from center of play looking north

Onsite Storage Facility (OSF)

Top of OSF looking north

OSF looking south

OSF looking west

Vegetative cover on landfill in northeast corner

Repair of soil disturbance on landfill cap

Tree branch penetrating chain link fence

Tree branches penetrating east fence looking north

Evidence of grass fire onsite

Signage on entrance gate

ATTACHMENT 7

ARARS

4.2 Institutional Analysis

This section presents an institutional analysis for each alternative based upon one category: conformance of the alternative with Applicable or Relevant and Appropriate Requirements (ARARs).

EPA policy is to comply with applicable or relevant environmental and public health standards when implementing CERCLA (Comprehensive Environmental Response, Compensation and Liability Act of 1980) remedial actions to the extent possible, and primary consideration will be given to the alternative meeting or exceeding these standards. However, additional regulations, advisories, and guidance may also be considered in developing these remedies. Furthermore, SARA recommends that remedial actions taken shall permanently and significantly reduce the mobility, toxicity, or volume of hazardous material at a Superfund site (Section 121 (b)(1)) to the extent practicable.

The following list details additional regulations pertinent to the implementation of remedial actions at the Clovis site.

1. Resource Conservation and Recovery Act (RCRA) (42 USC 6901) - enacted to regulate the management of hazardous waste and its generation, transport, treatment, storage, and disposal. However, as pointed out in the RI, the lake water, sediments and soils do not possess hazardous characteristics as defined in 40 CFR 261.20.

2. Clean Water Act (CWA) (33 USC 1251) - enacted to restore the chemical, physical, and biological integrity of the nation's waters. The National Pollutant Discharge Elimination System (NPDES) of the CWA governs point source releases into waters of the United States. The discharge into Santa Fe Lake is not covered under the NPDES program.

3. Clean Air Act (CAA) (42 USC 7401) - enacted to protect and enhance the quality of the nation's air.

4. Safe Drinking Water Act (SDWA) (40 CFR 141) - enacted to protect public health by limiting contaminant concentrations present in public drinking water supplies. The Underground Injection Control (UIC) Program (40 CFR 146) of the SDWA governs the use of injection wells for liquid disposal. Any Santa Fe Lake water injected into the subsurface would have to go into a Class I well as defined in 40 CFR 146.5(a).

5. Occupational Safety and Health Act (OSHA) - emphasizes the need for standards to protect the health and safety of workers exposed to potential hazards at their workplace.

6. Department of Transportation (DOT) Shipping Regulations - specify that hazardous materials must be classified, packaged, marked, labelled, and shipped according to specifications in 49 CFR 172.

7. New Mexico Water Quality Regulations - set industrial surface water discharge regulations for those effluents which are not covered by NPDES regulations. Since the discharge to Santa Fe Lake is not covered by NPDES regulations, it is covered by New Mexico Water Quality Regulations.

8. New Mexico Hazardous Waste Management Regulations - enacted to regulate the management of hazardous waste and its generation, transport, treatment, storage, and disposal. The lake water, sediments and soils are not hazardous based on not meeting any of the criteria set forth in Title 201 A.2.a(2) of the regulations.

9. New Mexico Solid Waste Management Regulations - governs solid or semi-solid material characterized as either residential, commercial, institutional, industrial or recreational waste. However, Title 101 of the regulations define industrial waste as a "solid waste in the nature of residential, commercial or industrial waste generated at an industrial establishment, but does not mean solid waste resulting from the industrial process." Since the contaminated sediments and soils at the site result from an industrial process, their management does not fall under these regulations.

Each of the alternatives is evaluated with respect to attaining the requirements of pertinent federal, state, and local regulations. A low rating designates no compliance with pertinent laws, a moderate rating indicates compliance with many of the applicable laws, and a high rating indicates complete compliance with the applicable laws.

The institutional rating is contained in Table 4-2.