FOURTH FIVE-YEAR REVIEW REPORT FOR AT&SF (CLOVIS) SUPERFUND SITE CURRY COUNTY, NEW MEXICO CERCLIS ID # NMD043158591

September 2013

Prepared by

U.S. Environmental Protection Agency
Region 6
Dallas, Texas

Fourth Five-Year Review Report
for
AT&SF (Clovis) Superfund Site
Curry County, New Mexico
CERCLIS ID# NMD043158591

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Attachments

List of Acronyms

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirements
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
mg/L	milligrams per liter
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
ROS	Remediation Oversight Section
RPM	Remedial Project Manager
SDWA	Safe Drinking Water Act
SLERA	Screening Level Ecological Risk Assessment
SOS	Superfund Oversight Section
SVOC	Semi Volatile Organic Compound
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
VOC	Volatile Organic Compound
WQCC	Water Quality Control Commission

Executive Summary

Site Background

The Atchison, Topeka, and Santa Fe Railway Company (AT&SF) Clovis Superfund Site (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 AT&SF rail yard from the early 1900s until 1990. The parameters of concern were primarily hydrocarbons, chromium, lead, and other heavy metals. The Site is located 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 Record of Decision (ROD) was signed by the Environmental Protection Agency (EPA) on September 23, 1988. The Site was officially deleted from the National Priorities List (NPL) on March 17, 2003.

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

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

Construction Completion was achieved and Preliminary Close-Out Report was signed on September 20, 2000. The trigger for completing this five-year review was September 2, 2008, which is five years after the third review was signed.

The objectives of the remedial action 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; (9) annual ground water monitoring. 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.

Progress on Recommendations from the 2008 Third Five-Year Review

The third five-year review found the remedy to be protective for human health, however, the protectiveness determination for the environment was deferred pending additional information. The report identified seven issues and recommendations for follow up. Burlington Northern

Santa Fe (BNSF, formerly AT&SF) has completed all of the on-site recommendations that were verified during a site inspection in January 2013. BNSF also completed a screening level ecological assessment as recommended by EPA in the third five-year review report.

Summary of Fourth Five-Year Review Findings

The review of documents, applicable or relevant and appropriate requirements (ARARs), technical assessment, and the site inspection indicate that the remedies to address the threats associated with contaminated lake water, sediment, and soil appear to be functioning as intended by the Site's decision documents. There is no new evidence that calls into question the protectiveness of the remedy in terms of the observed condition of the lake basin and OSF and the adequacy of O&M. However, concentrations of three Site parameters of concern in ground water sporadically or routinely exceed other federal or state standards or guidelines. No ARARs were established for ground water at this site as it was not an impacted medium.

BNSF 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 O&M activities have been ground water monitoring, inspections, and maintenance of the OSF and lake basin. Ground water monitoring consists of annual measurement of ground water elevations and collection of ground water samples from six monitoring wells. The ground water samples are analyzed for the presence of Site Parameters of Concern.

Ground water elevations recorded for on-site ground water monitoring wells indicate that the direction of ground water flow shifted from a south-southwesterly flow direction in 2008 to a south-southeasterly direction from 2009 through 2012. The 2009 through 2012 annual reports continued to reference monitoring well MW-E as the upgradient "background" well despite the shift in ground water flow direction. Based on the direction and gradient of ground water flow direction provided in the annual reports, monitoring well MW-G appears to be more representative of upgradient conditions from 2009 through 2012. Based on shifting ground water gradients at the Site, the use of on-Site wells to represent "background" conditions is questionable. Truly representative background conditions should be obtained from off-Site upgradient well(s).

Ground water concentrations for three Site parameters of concern sporadically or routinely have exceeded other federal or state standards or guidelines during this five year review period. Concentrations of chloride routinely exceed the 250 milligram per liter (mg/L) limit established in the EPA secondary standards for drinking water (EPA secondary standards) and the New Mexico Water Quality Control Commission (NMWQCC) other standards for domestic water supply. Sporadic detections of total phenolics occasionally exceed the NMWQCC other standards for domestic water supply of 0.005 mg/L for phenols. In addition, sporadic detections of total recoverable petroleum hydrocarbons (TRPH) appear to occasionally exceed NMED Total Petroleum Hydrocarbons (TPH) Screening Guidelines for Potable Ground Water (GW-1)

outlined in NMED Risk Assessment Guidance for Site Investigations and Remediation. The TPH screening guidelines vary depending upon the petroleum product type; the screening guidelines range from 0.2 mg/L for TPH-unknown oil up to 5.92 mg/L for TPH-mineral oil dielectric. The laboratory reporting limits for TRPH during the Site ground water monitoring program have typically ranged from 0.5 to 10 mg/L.

The most consistently elevated constituent at the Site has been chloride. Over the past five years, ground water samples collected from monitoring wells MW-D, MW-E and MW-F located in the eastern part of the Site have remained below the 250 mg/L standards, generally exhibiting concentrations between 70 and 200 mg/L. During the past five years, all of the ground water samples from MW-B, MW-C, and MW-G exceeded the 250 mg/L standards, with the highest concentration of 590 mg/L detected in the sample from MW-C in 2010. Based on the 2012 annual monitoring report, Mann-Kendall trend analysis indicates a significant trend only in MW-C (Arcadis, 2012), which is a decreasing trend. As stated in the last five year review report, nearby land uses (cattle feed lots, irrigated farmland, sewage treatment, and quarry sites) are known to elevate total dissolved solids (TDS) in surface and ground water and elevated chloride is not uncommon to playa lake environments.

Phenolics have been sporadically detected at the Site since at least 2000. During the past five years, phenolics have been detected in MW-D, MW-E, MW-F, and MW-G. Detected concentrations have ranged from 0.013J (estimated concentration) from MW-D in 2012 to 0.745 mg/L from MW-E in 2008. The NMWQCC other standard for domestic water supply for phenols is 0.005 mg/L. Prior to 2006, a regulatory standard for phenol was unavailable. In 2006, the NMWQCC promulgated a standard of 0.005 mg/L for phenols. This was identified in the 2008 Third Five Year Review, but the annual reports continue to state that “there are no federal or state regulatory limits for total phenolics”(phenols).

TRPH had not been detected in samples from any annual Site ground water sampling event prior to 2007. In 2007 it was detected in a ground water sample from MW-E at a concentration of 23.5 mg/L; 2007 detections from MW-C and MW-G were invalidated because of TRPH detection in the blank sample. Samples from MW-C and MW-G were collected on a different date than the sample collected from MW-E. Since 2007, TRPH has been detected at least one time in samples collected from each Site monitoring well and has been detected in each annual sampling event except for 2011. The detections are sporadic and typically range from 0.31 to 1.3 mg/L; the results are consistently deemed to be estimated concentrations (J), because they are below the laboratory reporting limit. The highest concentration during the past five years of 23.1 mg/L was detected in a duplicate ground water sample from MW-C. The NMED TPH screening guidelines for ground water range from 0.2 mg/L for TPH-unknown oil up to 5.92 mg/L for TPH-mineral oil dielectric.

The further need for ground water monitoring is scheduled to be reviewed in 2013. Based on the detections of Site parameters of concern – chloride, phenolics, and TRPH, it is recommended that some form of ground water monitoring be maintained at the Site.

Determination

The remedy is determined to be protective of human health and the environment in the short-term at the surface as unauthorized site access is controlled through fencing and a Restrictive Covenant. Additionally, the lake is isolated from surface water run-on, lake water has evaporated, lake-bottom sediments and soils from beneath the lake-bottom sediments and beach area have been treated, all treated sediments are contained in the OSF, the OSF has been capped, and the site has been restored. However, in order for the remedy to be protective in the long-term to ensure protectiveness, a determination needs to be made that parameters of concern in Site ground water are below action levels or it can be verified that parameters of concern detected in Site ground water monitoring wells are from offsite sources.

Carl Edlund, Director
Superfund Division
U.S. EPA, Region 6

Date 9/18/13

Five-Year Review Summary Form

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

SITE STATUS	
NPL Status: Deleted	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): Sairam Appaji
Author affiliation: U.S. EPA Region 6
Review period: 9/3/2008 – 9/30/2013
Date of site inspection: 1/17/2013
Type of review: Statutory
Review number: 4
Triggering action date: 9/2/2008
Due date *(five years after triggering action date)*: 9/2/2013

Issues/Recommendations				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): NA	**Issue Category: Ground Water Monitoring** **Issue: Gradient/Background** Ground water elevation data indicate that the direction of ground water flow shifted from a south-southwesterly flow direction in 2008 to a south-southeasterly direction from 2009 through 2012. The 2009 through 2012 annual reports continued to reference monitoring well MW-E as the upgradient "background" well despite the shift in ground water flow direction. Based on the direction and gradient of ground water flow direction provided in the annual reports, monitoring well MW-G appears to be more representative of upgradient conditions from 2009 through 2012. The use of on-Site wells to represent "background" conditions is questionable. In 2008, monitoring well MW-E was representative of on-Site upgradient conditions, and from 2009-2012, monitoring well MW-G was representative of on-Site upgradient conditions. **Recommendation:** Continue to assess which well is upgradient during each sampling event. Truly representative background ground water quality should be obtained from off-Site upgradient well(s).			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	No	PRP	EPA	9/30/2014

Five-Year Review Summary Form (continued)

OU(s): NA	**Issue Category: Ground Water Monitoring**			
	Issue: Parameters of Concern in Ground Water Concentrations of chloride routinely exceed the 250 milligram per liter (mg/L) limit established in the EPA secondary standards for drinking water (EPA secondary standards) and the New Mexico Water Quality Control Commission (NMWQCC) other standards for domestic water supply. Sporadic detections of total phenolics occasionally exceed the NMWQCC other standards for domestic water supply of 0.005 mg/L for phenols. In addition, sporadic detections of total recoverable petroleum hydrocarbons (TRPH) appear to occasionally exceed NMED Total Petroleum Hydrocarbons (TPH) Screening Guidelines for Potable Ground Water (GW-1) outlined in NMED Risk Assessment Guidance for Site Investigations and Remediation. The TPH screening guidelines vary depending upon the petroleum product type; the screening guidelines range from 0.2 mg/L for TPH-unknown oil up to 5.92 mg/L for TPH-mineral oil dielectric. The laboratory reporting limits for TRPH during the Site ground water monitoring program have typically ranged from 0.5 to 10 mg/L.			
	Recommendation: Continue ground water monitoring, modify the program to provide information regarding the nature of the TRPH, chloride, and phenols in Site ground water and determine whether they are trespassing or the result of leaching of on-site contamination. These data should be included in the annual ground water monitoring report.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	9/30/2014

Five-Year Review Summary Form (continued)

Protectiveness Statement(s)		
Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date:*
NA	Protective	NA

Protectiveness Statement:

The remedy is determined to be protective of human health and the environment in the short-term at the surface as unauthorized site access is controlled through fencing and a Restrictive Covenant. Additionally, the lake is isolated from surface water run-on, lake water has evaporated, lake bottom sediments and soils from beneath the lake bottom sediments and beach area have been treated, all treated sediments are contained in the OSF, the OSF has been capped, and the site has been restored. However, in order for the remedy to be protective in the long-term to ensure protectiveness, a determination needs to be made that parameters of concern in Site ground water are below action levels or it can be verified that parameters of concern detected in Site ground water monitoring wells are from offsite sources.

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 the Comprehensive Environmental Response, Compensation, and Liability Act (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 2008 through June 2013. A Site Inspection was conducted on January 17, 2013. Participants in the Site Inspection included representatives from the New Mexico Environment Department (NMED), a representative from Burlington Northern and Santa Fe railroad (BNSF), and representatives from BNSF's environmental contractor. This report documents the results of the review.

This is the fourth Five-Year Review for the AT&SF (Clovis) Site. The triggering action for this statutory review is the completion of the third Five-Year Review on September 2, 2008. The response action at the Site, initiated in 1992, included the placement of treated sediments and soils in an onsite storage facility (OSF). 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

The following table identifies the CERCLA related activities at the Site and corresponding dates for those activities.

Table 1 - Chronology of Site Events

Date	Event
1979	Initial discovery of problem or contamination
February 1, 1980	Official EPA Site Discovery Date
April 1, 1980	Preliminary Assessment and Site Investigation complete
September 1, 1983	Administrative Order on Consent Signature
September 8, 1983	NPL listing
August 1988	Remedial Investigation/Feasibility Study complete
September 23, 1988	ROD signature
December 16, 1988	Remedial design start
November 1992	Remedial design complete
November 1992	Phase I – Construction Began
March 1993	Phase I – Construction Completed
June 1993	Phase II – Bioremediation Began
October 1999	Phase II – Bioremediation Completed
June 2000	Phase III – Site Restoration Began
September 2000	Phase III – Site Restoration Completed
September 2000	Preliminary Close-out Report
November 8, 2002	Final Close-out Report
March 17, 2003	Deletion from NPL
September 2, 1998	First Five-Year Review
September 2, 2003	Second Five-Year Review
September 2, 2008	Third Five-Year Review

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 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 a former bulk fuel storage facility 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 a bio-fuel plant has been constructed west of County Road K from the Site as shown in Attachment 1.

The playa lake itself occupies approximately 45 acres in the west central portion of the property. The perimeter of the playa lake is bordered by a berm, constructed during remedial action in 1990, which prevents surface water run-on to the playa basin. The capped OSF, containing treated soils and sediments from the remedial action, occupies nearly 6 acres at the northeast corner of the Site property.

Stratigraphy beneath the Site generally consists of fine, moderately sandy loam surface soils in the uplands and the low permeability Randall Clay at or near the ground surface within the playa basin. These surface soils are underlain by the Ogallala Formation, an alluvial deposit composed of clay, sand, and gravel beds with interspersed caliche formations. Depth to ground water ranges between 270 to 290 feet below grade.

Regional ground water flow direction in the Ogallala is to the east-southeast. Through approximately 2008, nearby irrigation and water supply wells had apparently created a localized flow direction to the south-southwest (Balleau, 2002). As of 2009, the Site ground water flow direction shifted to a south-southeast orientation through 2012. Attachment 2 presents a generalized potentiometric gradient map.

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. The most intensive discharge took place from 1962 through 1982 when wastewater from the washing of hopper cars hauling potash, cement, fertilizer, grain, and coke was routed to the playa. 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 remaining water ponded in the basin was dried through a spray evaporation system.

Currently, the lake basin remains dry and the remains of the dike continue to prevent storm water run-on from entering the basin. Since the last five year review, BNSF has resumed discharge of remediated ground water and storm water to the Site from their remediation treatment system located at the BNSF Rail Yard Remediation Site (located approximately 1 mile north of the Site). BNSF maintains discharge permit DP-10 with NMED for the discharge of remediated ground water and storm water to the Site. Remediated ground water and storm water is discharged onto the Site property at the midpoint of the north property line along the Koch property access road. The effluent flows south approximately 600 feet along the original outfall ditch and ponds around the northern portion of the berm perimeter on the exterior side of the playa lake basin (Attachment 2).

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 OSF. The Restrictive Covenant is included as Attachment 3.

The surrounding land consists of cattle feed lots, irrigated farmland, sewage treatment, and quarry sites, all of which are known to elevate total dissolved solids (TDS) in surface water and ground water. Located at the northern boundary of the Site was a petroleum pipeline formerly owned by the Santa Fe Pipeline Company and currently owned by Koch Pipeline Company, LP. A petroleum storage tank bulk storage facility was located on that property for some time, but was removed between 1998 and 2003. During this five year review period, a bio-fuel facility was constructed approximately 2000 feet west of the west property boundary.

Ground water is the single source of drinking water for Clovis. The Clovis water system has a total of 65 municipal wells that serve approximately 36,798 people and has approximately 15,663 service connections. There are three municipal wells within a two mile radius of the Site.

History of Contamination

Contamination at the Site is considered to be from contaminants in discharges from the AT&SF (Clovis) Rail Yard. Since the early 1900's, the AT&SF (Clovis) Site received storm water run-off and wastewater discharged from the rail yard. The specific sources of wastewater have changed over time as the needs of the railway company 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.

The most intensive discharge took place from 1962 through 1982 when wastewater from the washing of hopper cars hauling potash, cement, fertilizer, grain, and coke was routed to the

playa. Although no records exist, prior to 1962, 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. The hopper car washing operation closed in 1982. By 1987, the discharge had decreased to 30,000 gpd and the lake had shrunk to approximately 15 acres in size. With the construction of the dike in March 1990, storm water and wastewater run-on has been prevented from entering the playa lake.

Initial Response

Between 1979 and 1982, EPA conducted an investigation of the AT&SF Clovis Rail Yard facilities including Santa Fe Lake which received discharge from the rail yard. The investigation included a review of pertinent background information, a field survey, and sample analysis. Santa Fe Lake Samples taken from the water in Santa Fe Lake, from the sediment in the bottom of Santa Fe Lake, and from a ground water monitoring well located near Santa Fe Lake revealed the presence of cyanide, chromium, cadmium, and lead. Based on the findings of the EPA investigation, 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. As a result of these findings, the Site was proposed for the National Priorities List (NPL) in November 1981. In September 1, 1983, AT&SF entered into an Administrative Order of Consent (Docket No. CERCLA VI-4-83) with EPA Region 6, and on September 8, 1983, the Site was added to the NPL.

In 1984 and 1985, seepage studies were performed. Based upon the results of those studies, EPA concluded that only slow leakage was occurring from Santa Fe Lake. Additionally, monitoring wells were installed around the lake and sampled for various constituents. New Mexico Water Quality Control Commission (NMWWCC) standards were exceeded for magnesium and fluoride in the monitoring wells located on the Site. Selenium was elevated in lake water but not in ground water.

Based on those sampling results, EPA concluded that the levels of magnesium and fluoride in the ground water may be naturally high. However, the EPA required that AT&SF perform a remedial investigation (RI) to further evaluate Site contamination. 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 ground water, as ground water 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 actions 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. The FS also identified that in order to remediate the sediments, removal of the water from the lake would be required. The FS noted that a secondary benefit of remedial actions was that, although leaching did 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 in the ROD that included technical, institutional, public health, environmental impact, and overall cost. The selected remedial alternatives in the ROD were:

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

Implementation of the selected remedies included a run-on control system consisting of a dike and ditch around the circumference of the contaminated soils area (playa basin), and a sprinkler system 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

According to the ROD, although no ground water contamination was identified, the potential threat to ground water was of major concern at the Site. Contaminated lake water, soils, and sediments represented sources of contamination that required remediation because the contamination could potentially migrate to ground water. In addition, the lake water was evaporating naturally since hopper car wash water discharges to the playa had been discontinued in 1982, and risk assessment in the FS assumed that the lake bed would eventually dry completely. Exposures to dust in ambient air from sediments and soils from a dry playa bed were associated with significant human health risk, due to exceedences of EPA's risk management criteria for either the average or the reasonable maximum exposure scenarios. 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.

Parameters of concern

Parameters of concern identified in the RI and addressed in the ROD and evaluated in detail at the Site for each media are provided in Table 12:

Table 2 – Parameters of Concern

Ground Water	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		

IV. Remedial Actions

Remedy Selection

The ROD for the AT&SF (Clovis) Superfund Site was signed on September 23, 1988. The ROD does not state specific Remedial Action Objectives (RAOs); however, the FS describes primary and secondary objectives. The primary objective in the FS was to eliminate the human exposure pathway of inhalation of wind-blown soils and sediments from the playa bed assuming future complete evaporation of lake water. The secondary objectives for the selected remedies for lake water, sediment, and soil were intended to mitigate the potential future migration of contamination to ground water. The ROD discussed primary and secondary concerns or risks that would be addressed through remedial action, with ground water protection as the primary concern and elimination of wind-blown sediments and soils as the secondary concern.

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

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

Remedy Implementation

In the Administrative Order on Consent (AOC) signed with EPA on September 1, 1983, AT&SF agreed to investigate the Site and 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 EPA Region 6 Superfund Division Director.

In addition to the remedies at the Site to treat the environmental media, a Restrictive Covenant was placed on the property on March 17, 2003, to restrict access and prevent disturbance to the OSF.

System Operation/Operation and Maintenance

BNSF 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 O&M activities have been ground water monitoring, inspections, and maintenance of the OSF and lake basin. 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 ground water monitoring of six monitoring wells through June 2013
- Inspection of the condition of monitoring wells.

Ground water monitoring consists of collection of annual ground water samples from six monitoring wells. Analyses performed from 2008 through 2012 are in Table 3 below. Results from samples collected during the five year review period are discussed in the Data Review section of this document.

Table 3 - Analytical Methods

Analyte	Method	Standard (mg/L)	
		MCL	NM WQCC
Arsenic	SW846-6010B	0.010	0.1
Barium		2	1.0
Cadmium		0.005	0.01
Chromium		0.1	0.05
Lead		0.015	0.05
Chloride	SM407C/EPA 325.2/EPA 300.0	250^	250^^
TRPH*	EPA 1664A		*

Total Phenolics	SW846-9065/SW846-9066/EPA 420.1/420.2/EPA 420.4		0.005

Table 3 - Analytical Methods – Footnotes

*Total Recoverable Petroleum Hydrocarbons (TRPH) is defined as hydrocarbons remaining after non-petroleum products are removed from the sample through silica gel treatment. The NMED June 2012 Risk Assessment Guidance for Site Investigations and Remediation TPH Screening Guidelines for Potable Ground water (GW-1) are 0.2 mg/L for TPH unknown oil and 5.92 mg/L for mineral oil dielectric.

^National Secondary Drinking Water Regulations

^^NM Water Quality Control Commission (WQCC) Other Standards for Domestic Water Supply

V. Progress since the Last Review

The third Five-Year Review was completed in September 2008 and included the following protectiveness statement in the report

"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."

Issues/Recommendations identified in the third 5-year review and as presented in the five year review summary form included:

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

In addition to the Issues and recommendations identified in the third 5-year review summary form, Section IX – Recommendations and Follow-Up Actions of the document included Table 7 that identified an issue of "Ground water Detections" and provided a recommendation to:

- complete an investigation of Koch property

Since the third review, the following actions or outcomes pertaining to the 2008 issues/recommendations have been accomplished:

- A screening level ecological risk assessment was completed in May 2009. The report concluded that adverse impacts to terrestrial wildlife as a result of exposure to surface soil in the playa lake bed are unlikely or are not ecologically significant.

- The Site maintenance issues were determined to have been adequately addressed during the January 17, 2013, Site inspection.

- The NMED Superfund Oversight Section (SOS) reviewed the NMED Remediation Oversight Section (ROS) site files for the adjacent Koch property to the north. The NMED ROS issued a Final Corrective Action Report approval letter to Koch on September 23, 2008. According to the letter, Site investigation work by Koch had adequately delineated the vertical extent of TPH soil contamination on their property and that no remedial actions were necessary. The determination was based on TPH soil analytical results from the Koch property and volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) ground water analytical results from samples collected from monitoring wells at the AT&SF Clovis Site on August 6, 2008, by NMED ROS personnel. The approval letter is included as Attachment 4. No further investigations of the Koch property are planned.

VI. Five-Year Review Process

This Five-Year review has been conducted in accordance with the Comprehensive Five-Year Review Guidance (EPA, 2001). The findings of the review are discussed in the following sections.

Administrative Components

This Fourth Five-Year review was led by the EPA's RPM for the Site, Mr. Sairam Appaji, EPA, Region 6 and conducted by the New Mexico Environment Department, Ground Water Quality Bureau, Superfund Oversight Section.

Community Involvement

Public notice for this five-year review was published in the Clovis New Mexico News-Journal on October 23, 2012. The public notice submitted to the Clovis newspaper is in Attachment 5. Another notice will be published at the 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 for this fourth five year review is in Attachment 6.

Data Review

The data reviewed for the fourth five year review includes: Annual reports completed for 2008 through 2012 and the *Screening Level Ecological Risk Assessment, AT&SF Clovis Superfund Lake Site, Clovis, New Mexico* to the EPA in May 2009. This section primarily presents a discussion of measurements obtained from ground water monitoring efforts to include ground water elevations and analytical results from ground water samples collected during the five year review period. Discussion of the Ecological Risk Assessment is presented under Question B of this document. Attachment 7 lists a summary of historical ground water analytical results.

Ground Water Elevations

Ground water elevations recorded for on-site ground water monitoring wells indicate that the direction of ground water flow shifted from a south-southwesterly flow direction in 2008 to a south-southeasterly direction from 2009 through 2012. Attachment 2 presents a generalized potentiometric gradient. The 2009 through 2012 annual reports continued to reference monitoring well MW-E as the upgradient "background" well despite the shift in ground water flow direction. The direction and gradient of ground water flow direction provided in the annual reports tends to indicate that monitoring well MW-G is more representative of upgradient conditions from 2009 through 2012. Based on shifting ground water gradients at the Site, the use of on-Site wells to represent "background" conditions is questionable. Truly representative

background conditions should be obtained from off-Site upgradient well(s). A specific cause for the shift in gradient has not been identified. Discharge permit DP-10 monitoring reports indicate that annual discharge volumes have ranged from over 8 million gallons in 2012 to over 35 million gallons in 2011 with a total discharge from 2009 through 2012 of 69,352,431 gallons. Attachment 8 presents annual discharge data for 2008 through 2012 from discharge permit DP-10 monitoring reports.

Ground Water Quality

The third five year review noted a 2007 ground water detection of chromium from MW-E that exceeded the EPA maximum contaminant level (MCL) of 0.1 mg/L and the NMWQCC human health standard of 0.05 mg/L. Chromium had not been detected in ground water at the Site above the primary standards prior to 2007, and has not been detected above the primary standards during the past five years of monitoring.

Although no ground water contamination in excess of primary standards has been identified at the Site other than the 2007 chromium detection in MW-E, concentrations of other Site parameters of concern sporadically or routinely have exceeded other federal or state standards or guidelines during this five year review period. Concentrations of chloride routinely exceed the 250 milligram per liter (mg/L) limit established in the EPA secondary standards for drinking water (EPA secondary standards) and the NMWQCC other standards for domestic water supply. Sporadic detections of total phenolics occasionally exceed the NMWQCC other standards for domestic water supply of 0.005 mg/L for phenols. In addition, sporadic detections of total recoverable petroleum hydrocarbons (TRPH) appear to occasionally exceed NMED Total Petroleum Hydrocarbons (TPH) Screening Guidelines for Potable Ground Water (GW-1) outlined in NMED Risk Assessment Guidance for Site Investigations and Remediation. The TPH screening guidelines vary depending upon the petroleum product type; the screening guidelines range from 0.2 mg/L for TPH-unknown oil up to 5.92 mg/L for TPH-mineral oil dielectric. The laboratory reporting limits for TRPH during the Site ground water monitoring program have typically ranged from 0.5 to 10 mg/L.

The most consistently elevated constituent at the Site has been chloride. Over the past five years, ground water samples collected from monitoring wells MW-D, MW-E and MW-F located in the eastern part of the Site have remained below the 250 mg/L standards, generally exhibiting concentrations between 70 and 200 mg/L. During the past five years, all of the ground water samples from MW-B, MW-C, and MW-G exceeded the 250 mg/L standards, with the highest concentration of 590 mg/L detected in the sample from MW-C in 2010. Based on the 2012 annual monitoring report, Mann-Kendall trend analysis indicates a significant trend only in MW-C (Arcadis, 2012), which is a decreasing trend. As stated in the last five year review report, nearby land uses (cattle feed lots, irrigated farmland, sewage treatment, and quarry sites) are known to elevate total dissolved solids (TDS) in surface and ground water and elevated chloride is not uncommon to playa lake environments.

Phenolics have been sporadically detected at the Site since at least 2000. During the past five years, phenolics have been detected in MW-D, MW-E, MW-F, and MW-G. Detected concentrations have ranged from 0.013J from MW-D in 2012 to 0.745 mg/L from MW-E in 2008. The NMWQCC other standard for domestic water supply for phenols is 0.005 mg/L. Prior to 2006, a regulatory standard for phenol was unavailable. In 2006, the NMWQCC promulgated a standard of 0.005 mg/L for phenols. This was identified in the 2008 Third Five Year Review, but the annual reports continue to state that "there are no federal or state regulatory limits for total phenolics"(phenols).

TRPH had not been detected in samples from any annual Site ground water sampling event prior to 2007. In 2007 it was detected in a ground water sample from MW-E at a concentration of 23.5 mg/L; 2007 detections from MW-C and MW-G were invalidated because of TRPH detection in the blank sample. Samples from MW-C and MW-G were collected on a different date than the sample collected from MW-E. Since 2007, TRPH has been detected at least one time in samples collected from each Site monitoring well and has been detected in each annual sampling event except for 2011. The detections are sporadic and typically range from 0.31 to 1.3 mg/L; the results are consistently deemed to be estimated concentrations (J), because they are below the laboratory reporting limit. The highest concentration during the past five years of 23.1 mg/L was detected in a duplicate ground water sample from MW-C. The NMED TPH screening guidelines for ground water range from 0.2 mg/L for TPH-unknown oil up to 5.92 mg/L for TPH-mineral oil dielectric.

Site Inspection

A joint Site inspection was conducted by the US EPA, NMED and BNSF on January 17, 2013. A completed Site inspection checklist is included in Attachment 9, and Site photos taken during the Site inspection are in Attachment 10.

The Site is secure; access is reasonably restricted and controlled by a fence and locked gate. 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. The perimeter fence is intact and generally in good condition. An unidentified animal has burrowed under the north fence at the boundary between the Site and the Koch pipeline property to the north.

As vegetative cover has been established in the de-watered lake bed, irrigation of the dry lake bed has been discontinued and an old fire truck is used for spot watering. Native vegetation is periodically reseeded as needed.

Land use in the surrounding area hasn't changed significantly; the major activities are 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 Swift meatpacking plant to the southwest is abandoned. A bio-fuel plant has been constructed approximately 2,000 feet west of the Site.

The bar ditch adjacent to the nearest irrigated fields to the west is routed to discharge to the northwest corner of the Site property, but the ditch and culvert were dry. It was noted during the Site inspection that the bar ditch adjacent to the neighboring feedlot to the northwest does not appear to have any outlet to the Site property.

The irrigation system on the OSF cap is in place and operational but used sparingly. Since the last five year review, BNSF has resumed discharge of treated effluent to the Site from their Light Non-Aqueous Phase Liquid (LNAPL) remediation system located at the BNSF rail yard (located approximately 1 mile north of the Site). BNSF maintains discharge permit DP-10 with the NMED Pollution Prevention Section (PPS) to discharge treated effluent to the Site. Remediated ground water and storm water is discharged onto the Site property at the midpoint of the north property line along the Koch property access road. A steady flow of water from the BNSF outfall pipe into the outfall ditch was observed during the inspection. The effluent flows south approximately 600 feet along the original outfall ditch and ponds around the northern portion of the berm perimeter on the exterior side of the playa lake basin. The bermed playa perimeter prevents run-on from entering the lake basin.

Interviews

The EPA did not receive written or verbal comments from the public in response to the public notice of this Five-Year Review. Interviews were conducted via e-mail with the BNSF contractor and subcontractor, and a local official during January 2013. A nearby resident was interviewed in person on January 16, 2013. Interviews were conducted with the following individuals:

- Lance A. Pyle, Curry County Manager
- Gloria Wicker, nearby resident and landowner
- Timothy Wippold, PE, Project Manager; Arcadis (BNSF environmental contractor)
- Michael Flen, GMC Environmental (Arcadis site maintenance subcontractor)

Mr. Lance Pyle, Curry County Manager, did not raise any issues regarding the Site. Gloria Wicker, a neighboring resident, emphasized that opening the property to limited grazing would stimulate the native grasses and control the spread of undesirable weeds to improve the overall appearance of the property. Mr. Timothy Wippold, Arcadis Project Manager, recommended that the frequency of ground water monitoring should be reduced. Mr. Michael Flen, subcontractor

to Arcadis, believes that great strides in cleaning up the Site have been made. Interview responses are included as Attachment 11.

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?

Remedial action performance

Remedial action at the Site has been achieved and the Site has been officially deleted from the NPL as of March 17, 2003. 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.

The ring dike is intact and the playa remains de-watered. The landfill cap is intact and the perimeter fence secure. Monitored constituents in ground water do not appear to indicate specific trends. Three of the Site parameters of concern (chloride, phenolics, TRPH) have been detected at concentrations that exceed either the EPA secondary drinking water standard, the NMWQCC other standard for domestic water supply, or the NMED TPH Screening Guidelines as discussed in the Data Review Section of this report. The remedy has been performing as intended at the site

Systems Operations / O&M

Annual ground water monitoring and quarterly inspections have been conducted in accordance with the Post-Closure Operations and Maintenance Plan (TRC, 2002). According to the conclusions in the annual ground water monitoring reports, as indicated by inspections, native vegetation has been established in the lake basin and on the OSF cap that meets the requirements of the Post-Closure Operations and Maintenance Plan. Overall, the 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.

Summary of Data Review

The further need for ground water monitoring is scheduled to be reviewed in 2013. Based on the detections of Site parameters of concern – chloride, phenolics, and TRPH, it is recommended that some form of ground water monitoring be maintained at the Site. Once it is determined that parameters of concern in Site ground water are below action levels or it can be verified that

parameters of concern detected in Site monitoring wells are from off-site sources, a plan can be developed to guide eventual termination of the ground water monitoring program.

DP-10 effluent monitoring results indicate that measurable concentrations of benzene, toluene, ethylbenzene and total xylenes (BTEX) and 1-methylnaphthalene, 2- methylnaphthalene, and naphthalene (DP-10-specific PAHs) are typically detected in effluent samples collected from the outfall ditch at the north property line of the Site. DP-10 does not require sampling for TRPH, but based on the effluent monitoring results for BTEX and DP-10-specific PAHs, it is possible that the effluent may contain TRPH, which may be impacting ground water at the Site. DP-10 effluent monitoring results for January 2009 through July 2012 excerpted from the August 14, 2012 DP-10 Discharge Permit Renewal Application are included as Attachment 12.

The 2009 through 2012 annual reports continued to reference monitoring well MW-E as the upgradient "background" well despite the shift in ground water flow direction to the south-southeast which would make monitoring well MW-G more representative of upgradient conditions from 2009 through 2012. The use of on-Site wells to represent "background" conditions is questionable. On-site wells may be representative of upgradient on-Site ground water conditions, but a truly representative background sample should be collected upgradient and off-site to ensure that parameters of concern in ground water are not migrating to the Site from other sources.

Institutional controls implemented at the site include fencing to prevent unauthorized site access, and a Restrictive Covenant filed with the Curry County Clerk's office preventing future disturbance (i.e., excavation or erosion) of the OSF. They are both working as designed.

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?

Changes in Exposure and Toxicity

No changes to exposure pathways, toxicity or other contaminant characteristics were noted during this review period. There have been no changes in land use and the Site is fenced to prevent unauthorized access. It should be noted that the contamination detected in the monitoring well should be investigated to determine the source.

The screening level ecological risk assessment evaluated the terrestrial exposure scenario because the lake basin has been dewatered as part of the Site remedy. The berm around the playa prevents discharge and overland surface runoff from entering the basin. Discharge accumulates along the north side of the berm on the exterior side of the playa basin. It can be inferred that the emergent wetland outside the berm is outside the circumference of the contaminated soils and sediment area (the playa basin) addressed by the Site remedy. Therefore, exposure to the emergent wetland does not represent a scenario which entails exposure to Site parameters of

concern. The Screening Level Ecological Risk Assessment Report concluded that adverse impacts to terrestrial wildlife at the Site are unlikely or not ecologically significant, and that further ecological evaluation is not warranted. A screening level ecological risk assessment pertaining to the emergent wetland north of the playa berm would be more appropriately addressed under the authority of the BNSF-Clovis Railyard Remediation Site considering the effluent typically contains detectable VOCs and originates from that project site.

Changes in Standards

Federal and State standards have not changed during this review period. Table 2 lists the federal MCLs, NMWQCC standards, and the NMED Risk Assessment Guidance for Site Investigations and Remediation (updated in June 2012) for the parameters of concern. ARARs listed in the Feasibility Study are listed in Attachment 13.

Prior to 2006, a regulatory standard for phenol was unavailable. In 2006, the NMWQCC promulgated a standard of 0.005 mg/L for phenols. This was identified in the 2008 Third Five Year Review, but the 2008 through 2012 annual reports continue to state that "there are no federal or state regulatory limits for total phenolics"(phenols). Phenolics have been sporadically detected at the Site since at least 2000. During the past five years, phenolics have been detected in MW-D, MW-E, MW-F, and MW-G. Detected concentrations have ranged from 0.013J from MW-D in 2012 to 0.745 mg/L from MW-E in 2008. The NMWQCC other standard for domestic water supply for phenols is 0.005 mg/L. The total phenolics detections should be more thoroughly evaluated in future monitoring reports.

Expected Progress Toward Meeting RAOs

The objectives of the remedial action have been met at the Site and the remedy is protective of human health and the environment in the short-term. The objectives of the remedial action 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. The remedy at the Site included the 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 a 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.

All immediate threats at the Site have been addressed and the remedy is protective of human health and the environment. Long-term protectiveness of the remedial action has historically been verified through annual ground water monitoring and quarterly Site inspections.

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

There are no new or previously unidentified risks and no impacts from natural disasters that could affect performance or protectiveness of the remedy. There is no new evidence that calls into question the protectiveness of the remedy in terms of the observed condition of the lake basin and OSF and the adequacy of O&M. No ARARs were established for ground water at this site as it was not an impacted medium. However, concentrations of three Site parameters of concern in ground water sporadically or routinely exceed other federal or state standards or guidelines. Concentrations of chloride routinely exceed the 250 mg/L limit established in the EPA secondary standards for drinking water (EPA secondary standards) and the NMWQCC other standards for domestic water supply. As stated in the last five year review report, nearby land uses (cattle feed lots, irrigated farmland, sewage treatment, and quarry sites) are known to elevate TDS in surface and ground water and elevated chloride is not uncommon to playa lake environments.

Three of the Site parameters of concern (chloride, phenolics, TRPH) have been detected at concentrations that exceed either the EPA secondary drinking water standard, the NMWQCC other standard for domestic water supply, or the NMED TPH Screening Guidelines as discussed in the Data Review Section of this report.

The third five year review recommended that data from the adjacent Koch pipeline property be reviewed as it represents a potential source of contamination. NMED SOS conducted a file review and found that NMED ROS issued a Final Corrective Action Report approval letter to Koch on September 23, 2008. According to the letter, Site investigation work by Koch had adequately delineated the vertical extent of TPH soil contamination on their property. The determination was based on TPH soil analytical results from the Koch property and VOC and SVOC ground water analytical results from samples collected from monitoring wells at the AT&SF Clovis Site on August 6, 2008 by NMED ROS personnel. The approval letter is included as Attachment 4. No further investigations of the Koch property are planned.

According to the third five year review, 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 question of long-term protectiveness cannot be answered with certainty at this time considering the recurrence of TRPH and phenol detections in excess of current state

ground water standards. Recommendations following the current five-year review are listed in Table 4.

VIII. Issues

Based on this fourth Five-Year Review, the following issues have been identified.

Table 4 - Fourth Five-Year Review Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Ground water monitoring data indicate that the direction of ground water flow shifted from a south-southwesterly flow direction in 2008 to a south-southeasterly direction from 2009 through 2012. The 2009 through 2012 annual reports continued to reference monitoring well MW-E as the upgradient "background" well despite the shift in ground water flow direction. Based on the direction and gradient of ground water flow data provided in the annual reports, monitoring well MW-G appears to be more representative of upgradient conditions from 2009 through 2012. The use of on-Site wells to represent "background" conditions is questionable. In 2008, monitoring well MW-E was representative of on-Site upgradient conditions, and from 2009-2012, monitoring well MW-G was representative of on-Site upgradient conditions.	N	Unknown
Concentrations of chloride routinely exceed the 250 milligram per liter (mg/L) limit established in the EPA secondary standards for drinking water (EPA secondary standards) and the NMWQCC other standards for domestic water supply. Sporadic detections of total phenolics occasionally exceed the NMWQCC other standards for domestic water supply of 0.005 mg/L for phenols. In addition, sporadic detections of total recoverable petroleum hydrocarbons (TRPH) appear to occasionally exceed NMED Total Petroleum Hydrocarbons (TPH) Screening Guidelines for Potable Ground Water (GW-1) outlined in NMED Risk Assessment Guidance for Site Investigations and Remediation. The TPH screening guidelines vary depending upon the petroleum product type; the screening guidelines range from 0.2 mg/L for TPH-unknown oil up to 5.92 mg/L for TPH-mineral oil dielectric. The laboratory	Y	Unknown

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
reporting limits for TRPH during the Site ground water monitoring program have typically ranged from 0.5 to 10 mg/L.		

IX. Recommendations and Follow-up Actions

Recommendations and follow up actions are presented in Table 5. The further need for ground water monitoring is scheduled to be reviewed in 2013. Based on the detections of Site parameters of concern – chloride, phenolics, and TRPH, it is recommended that some form of ground water monitoring be maintained at the Site. It may be beneficial to modify the analytes to aid in evaluating the nature of the chloride, phenolics, and TRPH detections. Once it is determined that parameters of concern in Site ground water are below action levels or it can be verified that parameters of concern detected in Site monitoring wells are from off-site sources, a plan can be developed to guide eventual termination of the ground water monitoring program.

Table 5 - Recommendations and Follow-Up Actions

Issue	Recommendations / Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)?	
					Current	Future
Ground Water Monitoring	Continue to assess which well is upgradient during each sampling event. Truly representative background ground water quality should be obtained from off-Site upgradient well(s).	BNSF	EPA	9/30/2014	N	Unknown

Issue	Recommendations / Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)?	
Ground Water Monitoring	Continue ground water monitoring, modify the program to provide information regarding the nature of the TRPH, chloride, and phenols in Site ground water and possibly determine whether they are trespassing or the result of leaching of on-site contamination.	BNSF	EPA	9/30/2014	N	Unknown

X. Protectiveness Statement(s)

The remedy is determined to be protective of human health and the environment in the short-term at the surface as unauthorized site access is controlled through fencing and a Restrictive Covenant. Additionally, the lake is isolated from surface water run-on, lake water has evaporated, lake bottom sediments and soils from beneath the lake bottom sediments and beach area have been treated, all treated sediments are contained in the OSF, the OSF has been capped, and the site has been restored. However, in order for the remedy to be protective in the long-term to ensure protectiveness, a determination needs to be made that parameters of concern in Site ground water are below action levels or it can be verified that parameters of concern detected in Site ground water monitoring wells are from offsite sources.

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

Attachment 1 - ATSF (Clovis) Superfund Site Location Map

Attachment 2 – Monitor Well Locations and Potentiometric Surface

Attachment 2 – Monitor Well Locations and Potentiometric Surface

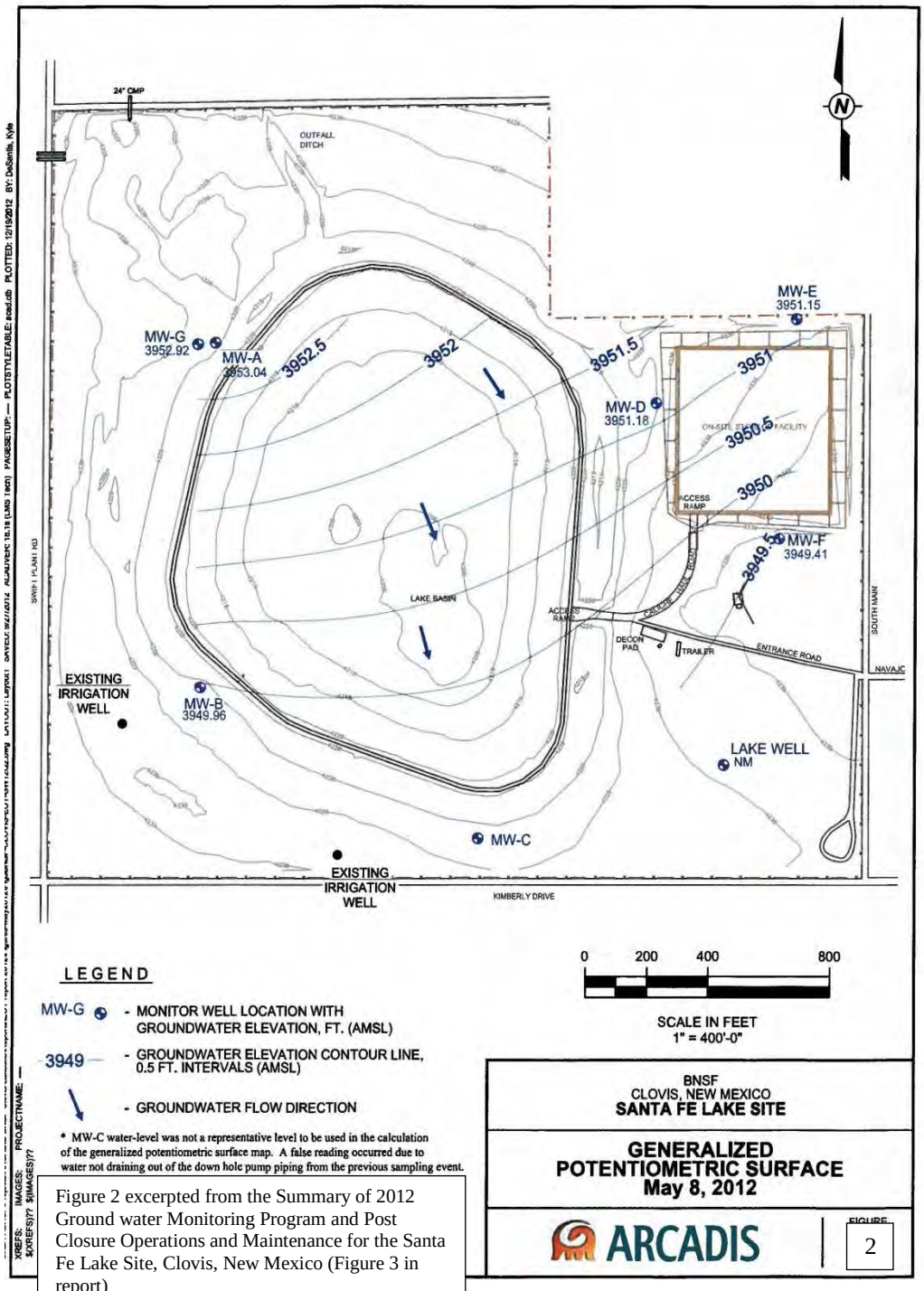


Figure 2 excerpted from the Summary of 2012 Ground water Monitoring Program and Post Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico (Figure 3 in report)

Attachment 3 – Restrictive Covenant

Attachment 3 – Restrictive Covenant

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.

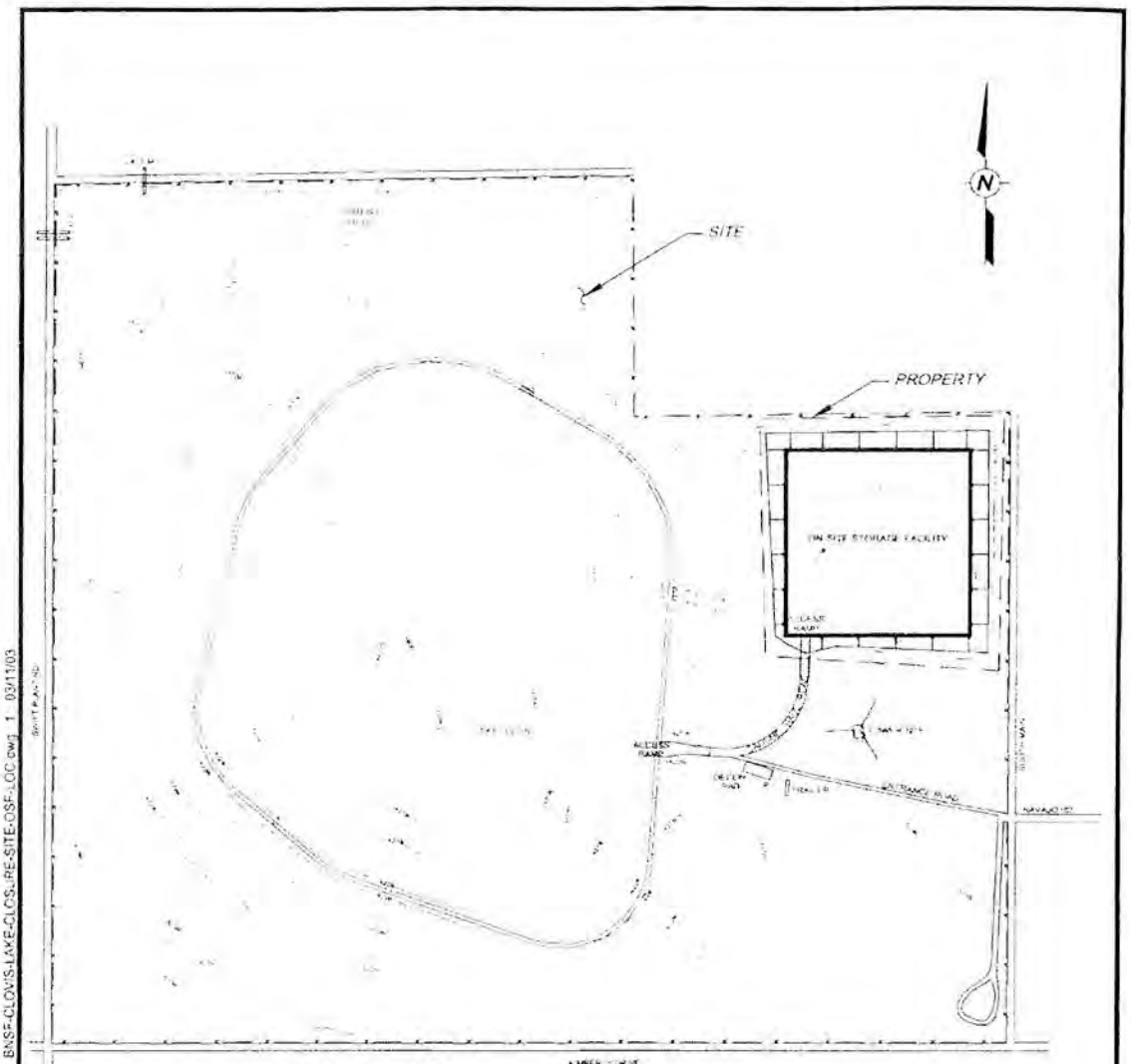
WHEREAS, to maintain the integrity of the OSF, this Declaration prohibits, prevents, and prescribes the performance of certain activities on the Property.

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.



STATE OF NEW MEXICO
COUNTY OF CURRY
FILED FOR RECORD

2003 MAR 26 AM 9:56

432

COUNTY CLERK

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. 75612 | DATE 2-24-03

TRC
Environmental Corporation
Customer Focused Solutions

2105 W. SAM HOUSTON PARKWAY N.
STE 107
HOUSTON, TEXAS 77043
713-821-7000

EXHIBIT
B.

I:\CU C\BNSF - Clovis Lake Site Reports\Deed Covenant - BNSF-CLOVIS-LAKE-CLOS-RE-SITE-OSF-LOC.dwg 1 03/11/03

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.

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

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.

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. 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.

Attachment 4 - Final Corrective Action Approval Letter to Koch Pipeline Company

Attachment 4 - Final Corrective Action Approval Letter to Koch Pipeline Company

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Phone (505) 827-2900 Fax (505) 827-2965
www.nmenv.state.nm.us

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary
Jon Goldstein
Deputy Secretary

September 23 , 2008

Mr. Bobby Hill, Coordinator
Environmental Compliance
Koch Pipeline Company, LP
8606 IH 37
Corpus Christi, TX 78409

RE: Final Corrective Action Report Approval, Former Pipeline Terminal at Clovis, Curry County

Dear Mr. Hill:

The purpose of this letter is for the New Mexico Environment Department (NMED) to approve the final corrective action report (CAR) dated August 6, 2007 for the Koch Pipeline Company's (KPL) former jet and diesel fuel bulk terminal. The site is located one-half mile south of the corner of Brady Avenue and Thornton Streets in Clovis, New Mexico in the southwest quarter of Section 19, Township 2 North, Range 36 East, adjacent to the Santa Fe Lake Superfund Site. The CAR addresses the horizontal and vertical delineation of petroleum contaminants released to soil at the site. This approval is made by NMED pursuant to the New Mexico Water Quality Control Commission (WQCC) Regulations 20.6.2.1203.A NMAC.

The final CAR is entitled *Additional Corrective Action Report – Vertical Delineation Activities* and is dated July 31, 2007. KPL's consultants prepared reports dated December 30, 2004 and February 14, 2006 on contaminant delineation activities at the site. These reports show total petroleum hydrocarbon (TPH) concentrations of 2,700 milligrams per kilogram (mg/Kg) present at a depth of 100 feet below ground surface (bgs). On October 31, 2006, KPL representatives held a teleconference with NMED establishing a site-specific target TPH concentration of 520 mg/Kg and a minimum 40 foot separation from higher TPH concentrations. Soil samples were collected during the weeks of March 19, 2007 and June 4, 2007 beneath the tank bottom discharge pit (borehole CSB-18A) at a depth of 160 feet bgs and the 55,000 barrel diesel above-ground storage tank (borehole CSB-17B) at a depth of 200 feet bgs. The samples were analyzed for TPH and volatile and semi-volatile organic compounds. Analytical results for all samples were below laboratory detection limits for all analytes. Investigation-derived waste were manifested and transported on August 14, 2007 to a permitted disposal facility in Texas. NMED

collected ground water samples from downgradient monitoring wells associated with the Santa Fe Lake Superfund site on August 6, 2008. These ground water samples were analyzed for volatile and semi-volatile organic compounds. Analytical results were below laboratory detection limits for organic compounds. Ground water occurs at a depth of approximately 300 feet.

The CAR is hereby approved pursuant to WQCC Regulation 20.6.2.1203.A.7 NMAC, and no further action is required at this time.

Please be advised that this CAR approval does not relieve KPL or its subsidiaries of responsibility if the CAR failed to adequately assess the extent of contamination at this site. If additional information becomes available indicating that this corrective action was inadequate, further efforts may be required in the future. NMED approval does not relieve KPL of its responsibility for compliance with any other federal, state or local laws and regulations, including zoning requirements and nuisance ordinances.

If you have any questions, please contact Mr. Chris Whitman at (575) 647-7959. Thank you for your continued cooperation in this matter.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

cc: Michael Christopher, Reiss Remediation, 20 E. Greenway Plaza, Houston, TX 77046
Elizabeth Page, Reiss Remediation, 12550 Trinity Blvd., Euless, TX 78040
Chris Whitman, NMED-GWQB, District 3
ROS Reading File

Attachment 5 – Public Notice

Attachment 5 – Public Notice

Sitio de la Fuente de Contaminación de ATSF Clovis Aviso Público La Región 6 de la EPA de los EE.UU. Anuncia la empieza de la Cuarta revisión de Cinco Años octubre 2012

La Agencia de Protección Ambiental de los EE.UU. (EPA, por sus siglas en inglés) anuncia que el Departamento del Medio Ambiente de Nuevo México está conduciendo la cuarta revisión de cinco años del Sitio Superfund de la Fuente de Contaminación de Atchison, Topeka, and Santa Fe Railway Company (AT&SF) Clovis (el Sitio) en Clovis, Condado de Curry, Nuevo México. El propósito de esta revisión, la que por ley es requerido, es asegurar que la salud humana y el medio ambiente estén protegidos por las acciones de remediación en el Sitio. El Sitio es aproximadamente 26 acres de un lago playa (Santa Fe Lake) que era propiedad de la AT&SF desde los principios de la década de 1900. El lago fue utilizado para la eliminación de aguas residuales de varias operaciones a lo largo de los años. Las aguas residuales de lavado de carros de tolva utilizados fueron dispuestas en el lago desde 1962 hasta 1982.

Se planifica que esta revisión de cinco años sea completada en septiembre de 2013. Cuando se ha completado la revisión de cinco años, el reporte estará disponible para revisión al público en la Biblioteca Pública de Clovis-Carver, 701 North Main Street, Clovis, NM 88101. Información adicional sobre el Sitio se encuentra en el internet http://www.epa.gov/region6/6sf/pdffiles/atsf-clo-nm.pdf Para obtener más información, comuníquese con Mark Garman, NMED, llamando al número 505-827-2903, o Sairam Appaji, Gerente del Proyecto de Remediación de la EPA al 214-665-3126.

AT&SF-Clovis Superfund Site Public Notice
U.S. EPA Region 6 begins Fourth Five Year Review
October 2012

The United States Environmental Protection Agency (EPA) announces that the New Mexico Environment Department (NMED) is conducting a fourth five-year review of the Atchison, Topeka, and Santa Fe Railway Company (AT&SF) Clovis Superfund Site in Clovis, Curry County, New Mexico. The purpose of this review, which is required by law, is to assure that human health and the environment are being protected by remedial actions taken at the Site. The Site is comprised of an approximately 26 acre playa lake (Santa Fe Lake) which was owned by the AT&SF since the early 1900's. The lake was used for the disposal of wastewater from various operations throughout the years. Wastewater from the washing of hopper cars were disposed in the lake from 1962 to 1982.

This five year review is scheduled for completion by September 2013. When the five-year review is completed, the report will be made available to the public at the Clovis-Carver Public Library, 701 North Main Street, Clovis, NM 88101. For more information, contact Mark Garman, NMED, at 505-827-2903 or Sairam Appaji, EPA Remedial Project Manager, at 214-665-3126.

Attachment 6 – List of Documents Reviewed

Attachment 6 – List of Documents Reviewed

Additional Corrective Action Report – Vertical Delineation Activities, Koch Pipeline Company LP Former Clovis Terminal ½ Mile South of Intersection of West Brady Avenue and South Thornton Street, Clovis, Curry County, New Mexico, Conestoga-Rovers & Associates, July 31, 2007

Comprehensive Five-Year Review Guidance, EPA 540-R-01-007, OSWER No. 9355.7-03B-P, June 2001

Environmental Protection Agency Drinking Water Contaminants, February 15, 2008

EPA Superfund Record of Decision: AT&SF (Clovis), EPA ID NMD043158591, OU 1, Clovis, NM, EPA/ROD/R06-88/039, 1988

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

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

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

New Mexico Water Quality Control Commission Regulations, July 16, 2006

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

Documents Written Within the Last Five Years

Correspondence from Mr. William Olson, NMED Ground Water Quality Bureau Chief to Mr. Bobby Hill, Koch Pipeline Company LP Environmental Compliance Coordinator, RE: Final Corrective Action Report Approval, Former Pipeline Terminal at Clovis, Curry County, September 23, 2008

New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, February 2012 (updated June 2012)

Screening Level Ecological Risk Assessment, AT&SF Clovis Superfund Lake Site, Clovis, New Mexico, Arcadis, May 2009

Summary of 2008 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, Arcadis, 2009

Summary of 2009 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, Arcadis, 2010

Summary of 2010 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, Arcadis, 2011

Summary of 2011 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, Arcadis, 2012

Summary of 2012 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico, Arcadis, 2013

Attachment 7 – Historical Data, ATSF (Clovis) Superfund Site

Attachment 7 – Historical Data, ATSF (Clovis) Superfund Site

Well ID	Sample Event	Sample ID	Duplicate of:	Arsenic (mg/L)		Barium (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Lead (mg/L)		Chloride (mg/L)		TRPH^ (mg/L)		Total Phenolics (mg/L)	
				0.01 / 0.1	EPA MCL / NMWQCC	2 / 1	EPA MCL / NMWQCC	0.005 / 0.01	EPA MCL / NMWQCC	0.1 / 0.05	EPA MCL / NMWQCC	0.015 / 0.05	EPA MCL / NMWQCC	250* / 250**	EPA MCL / NMWQCC			0.005	WQCC
				Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL
MW-A	G1999-4	G-293		0.00532	0.005	0.15	0.01		0.001		0		0.005	182	10		10		0.01
	G2000-1	G-302		0.0061	0.004	0.137	0.01		0.005		0.01		0.003	191	10		1		0.01
	G2000-2	G-311			0.004	0.136	0.01		0.005		0.01	0.00933	0.003	195	10		0.5		0.01
	G2000-2	G-315	G-311		0.004	0.136	0.01		0.005		0.01	0.00933	0.003	195	10		0.5		0.01
	G2000-3	G-320			0.004	0.136	0.01		0.005		0.01		0.003	216	10		1		0.01
	G2000-4	G-329			0.004	0.155	0.01		0.005		0.01	0.0063	0.003	231 HT	10		1		0.01
	G2001-1	G-338			0.005	0.167	0.005		0.005	0.00767	0.005		0.005	**290**	1.5		1		0.05
	G2001-1	G-342	G-338		0.005	0.163	0.005		0.005		0.005		0.005	**250**	1.5		1		0.05
	G2001-2	G-347			0.005	0.156	0.005		0.005		0.005		0.005	240	1		1		0.05
	G2001-3	G-356			0.005	0.129	0.005		0.005		0.005		0.005	230	1		1		0.05
	G2001-4	G-365			0.005	0.136	0.005		0.005		0.005		0.005	220	1		1		0.005
	G2002-1	G-374			0.005	0.142	0.005		0.005		0.005		0.005	**300**	1		1		0.05
	G2002-1	G-378	G-374		0.005	0.135	0.005		0.005		0.005		0.005	**300**	1		1		0.05
	G2002-2	G-383			0.005	0.12	0.005		0.005		0.005		0.005	**250**	1		1		0.005
	G2002-2	G-387	G-383		0.005	0.116	0.005		0.005		0.005		0.005	**250**	1		1		0.005
	G2002-3	G-392		NS		NS		NS		NS		NS		NS		NS		NS	
	G2002-4	G-401		NS		NS		NS		NS		NS		NS		NS		NS	
	G2003-1	G-415		NS		NS		NS		NS		NS		NS		NS		NS	
	G2003-2	G-429		NS		NS		NS		NS		NS		NS		NS		NS	
	G2004-2	G-448		NS		NS		NS		NS		NS		NS		NS		NS	
	G2005-2	G-460		NS		NS		NS		NS		NS		NS		NS		NS	
	G2006-2	G-472		NS		NS		NS		NS		NS		NS		NS		NS	
	G2007-3	G-484		NS		NS		NS		NS		NS		NS		NS		NS	
	G2008-3	G-515		NS		NS		NS		NS		NS		NS		NS		NS	
	G2009-3	G-516		NS		NS		NS		NS		NS		NS		NS		NS	
	G2010-3	G-528		NS		NS		NS		NS		NS		NS		NS		NS	
	G2011-3	G-540		NS		NS		NS		NS		NS		NS		NS		NS	
	G2012-5			NS		NS		NS		NS		NS		NS		NS		NS	
MW-B	G1999-4	G-294			0.005	0.045	0.01		0.001		0.005		0.005	**417**	10		10		0.01
	G2000-1	G-303		0.00745	0.004	0.0409	0.01		0.005		0.01		0.003	**386**	10		1		0.01
	G2000-2	G-312			0.004	0.0465	0.01		0.005		0.01		0.003	**387**	10		0.5		0.01
	G2000-3	G-321			0.004	0.0444	0.01		0.005		0.01		0.003	**366**	10		1		0.01
	G2000-4	G-330			0.004	0.0479	0.01		0.005		0.01		0.003	**340 HT**	10		1		0.01
	G2001-1	G-339			0.005	0.0532	0.005		0.005		0.005		0.005	**340**	1.5		1		0.05
	G2001-2	G-348			0.005	0.0596	0.005		0.005		0.005		0.005	**340**	1		1		0.05

Well ID	Sample Event	Sample ID	Duplicate of:	Arsenic (mg/L)		Barium (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Lead (mg/L)		Chloride (mg/L)		TRPH^ (mg/L)		Total Phenolics (mg/L)	
				0.01	EPA MCL	2	EPA MCL	0.005	EPA MCL	0.1	EPA MCL	0.015	EPA MCL	250*	EPA MCL				
				0.1	NMWQCC	1	NMWQCC	0.01	NMWQCC	0.05	NMWQCC	0.05	NMWQCC	250**	NMWQCC			0.005	WQCC
				Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL
MW-B	G2001-3	G-357			0.005	0.0547	0.005		0.005		0.005		0.005	**520**	1		1		0.05
	G2001-3	G-360	G-357		0.005	0.0549	0.005		0.005		0.005		0.005	**320**	1		1		0.05
	G2001-4	G-366			0.005	0.0558	0.005		0.005		0.005		0.005	**310**	1		1		0.005
	G2002-1	G-375			0.005	0.0538	0.005		0.005		0.005		0.005	**320**	1		1		0.05
	G2002-2	G-384			0.005	0.0543	0.005		0.005		0.005		0.005	**290**	1		1		0.005
	G2002-3	G-393		0.0015	0.0003	0.0603	0.001		0.0002	0.0009	0.0005		0.0006	**283**	15		1	**0.012**	0.01
	G2002-4	G-402		0.00157	0.0003	0.0568	0.001		0.0002	0.000922	0.0005		0.0006	**318**	30		1		0.01
	G2002-4	G-407	G-402	0.00155	0.0003	0.0579	0.001		0.0002	0.00104	0.0005		0.0006	30.7	3		1		0.01
	G2003-1	G-416		0.013 FB	0.0003	0.0524	0.001	0.00971 F	0.0002	0.00114	0.0005		0.0006	**288**	15		1		0.01
	G2003-1	G-421	G-416	0.0125 FB	0.0003	0.0535	0.001	0.00911 F	0.0002	0.000911	0.0005		0.0006	**288**	15		1		0.01
	G2003-2	G-430			0.00251	0.0457	0.00023		0.00037		0.00078		0.00165	**270 B**	1.75		1		0.00933
	G2004-2	G-449			0.01		0.2		0.002		0.005		0.003	**282**	50		0.5		0.01
	G2005-2	G-461			0.010		0.20		0.0020	0.0052	0.0050		0.0030	**281**	50.0		0.500		0.010
	G2006-2	G-473			0.0100	0.0410	0.0100	0.00700 F	0.00100		0.0100		0.00500	**404**	0.500		0.500		0.130
	G2007-3	G-485			0.0100	0.0620	0.0100		0.00100	0.00600	0.00500		0.00500	**454**	0.500		5.00		0.130
	G2008-3	G-504			0.0100	0.0470	0.00500		0.00200		0.00500		0.00500	**545**	3.00		5.00		0.130
	G2009-3	G-517			0.010	0.066UB	0.020		0.0050		0.010		0.010	**580**	40		3.4		0.0050
	G2010-3	G-529			0.010	0.045	0.020		0.0050		0.010		0.010	**400**	40	0.71J	3.0		0.0050
	G2011-3	G-541			0.010	0.057	0.020	0.00060 J	0.0050	0.0046 J	0.010		0.010	**510**	40		3.1		0.0050
	G2012-2	G-553			0.020	0.057UB	0.005	0.0014J	0.0050		0.010	0.0018JUB	0.005	**450**	5		5.3		0.040
MW-C	G1999-4	G-295			0.005	0.0612	0.01		0.001		0.005		0.005	**415**	10		10		0.01
	G2000-1	G-304		0.00572	0.004	0.0536	0.01		0.005		0.01		0.003	**358**	10		1		0.01
	G2000-2	G-313			0.004	0.0557	0.01		0.005		0.01		0.003	**319**	10		0.5		0.01
	G2000-3	G-322			0.004	0.0602	0.01		0.005		0.01		0.003	**367**	10		1	0.0107	0.01
	G2000-4	G-331			0.004	0.0838	0.01		0.005		0.01		0.003	**615 HT**	10		1		0.01
	G2001-1	G-340			0.005	0.0876	0.005		0.005		0.005		0.005	9.0	1.5		1		0.05
	G2001-2	G-349			0.005	0.0879	0.005		0.005		0.005		0.05	**700 B**	1		1		0.05
	G2001-2	G-351	G-349		0.005	0.0876	0.005		0.005	0.0086	0.005		0.05	**720 B**	1		1		0.05
	G2001-3	G-358			0.005	0.0913	0.005		0.005		0.005		0.005	**680**	1		1		0.05
	G2001-4	G-367			0.005	0.0917	0.005		0.005		0.005		0.005	**690**	1		1		0.005
	G2002-1	G-376			0.005	0.0797	0.005		0.005		0.005		0.005	**640**	1		1		0.05
	G2002-2	G-385			0.005	0.086	0.005		0.005		0.005		0.005	**700**	1		1		0.005
	G2002-3	G-394		0.00167	0.0003	0.0844	0.001	0.000204	0.0002	0.00104	0.0005	0.00128	0.0006	**745**	60		1		0.01
	G2002-4	G-403		0.0018	0.0003	0.0634	0.001		0.0002	0.00102	0.0005		0.0006	**588**	60		1		0.01
	G2003-1	G-417		0.0124FB	0.0003	0.0693	0.001	0.009F	0.0002	0.000913	0.0005	0.000764	0.0006	**627**	60		1		0.01

Well ID	Sample Event	Sample ID	Duplicate of:	Arsenic (mg/L)		Barium (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Lead (mg/L)		Chloride (mg/L)		TRPH^ (mg/L)		Total Phenolics (mg/L)	
				0.01	EPA MCL	2	EPA MCL	0.005	EPA MCL	0.1	EPA MCL	0.015	EPA MCL	250*	EPA MCL				
				0.1	NMWQCC	1	NMWQCC	0.01	NMWQCC	0.05	NMWQCC	0.05	NMWQCC	250**	NMWQCC			0.005	WQCC
				Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL
MW-C	G2003-2	G-431			0.0023	0.0769 B	0.00012		0.00028		0.00094		0.00165	**742**	1.96		1		0.00933
	G2003-2	G-436	G-431		0.0023	0.0793 B	0.00012		0.00028		0.00094	0.00178 J	0.00165	**750**	1.96		1		0.00933
	G2004-2	G-450			0.01		0.2		0.002		0.005		0.003	**427**	50		0.5		0.01
	G2005-2	G-462			0.01		0.2		0.002	0.036	0.005		0.003	**618**	100		0.5		0.01
	G2005-2	G-467	G-462		0.01		0.2		0.002	0.037	0.005		0.003	**626**	100		0.5		0.01
	G2006-2	G-474			0.01	0.042	0.01	0.00500 F	0.001		0.01		0.005	**655**	0.5		0.5		0.13
	G2007-3	G-486			0.0100	0.0620	0.0100		0.00100		0.00500		0.00500	**391**	0.500	9.53 UB	5.00		0.130
	G2008-3	G-505			0.0100	0.0630	0.00500		0.00200		0.00500		0.00500	**534**	3.00		5.00		0.130
	G2008-3	G-510	G-505		0.0100	0.0620	0.00500		0.00200		0.00500		0.00500	**530**	3.00	23.1 J	5.00		0.130
	G2009-3	G-518			0.010	0.061UB	0.020		0.0050	0.0086J	0.010		0.010	**460**	40		3.4		0.0050
	G2010-3	G-530			0.010	0.067	0.020		0.0050	0.0021J	0.010		0.010	**590**	40	0.41J	3.1		0.0050
	G2011-3	G-542			0.010	0.063	0.020	0.00060 J	0.0050	0.0025 J	0.010		0.010	**410**	40		3.1		0.0050
	G2012-2	G-554			0.020	0.19UB	0.005		0.0050		0.010	0.0058UB	0.005	**410**	5		5.0		0.040
MW-D	G1999-4	G-296			0.005	0.0424	0.01		0.001		0.005		0.005	68.8	10		10		0.01
	G1999-4	G-297	G-296		0.005	0.0421	0.01		0.001		0.005		0.005	68	10		10		0.01
	G1999-4	G-299			0.005	0.0395	0.01		0.001		0.005		0.005	72.7	10		10		0.01
	G1999-4	G-300			0.005	0.0405	0.01		0.001		0.005		0.005	70.2	10		10		0.01
	G1999-4	G-301			0.005	0.0417	0.01		0.001		0.005		0.005	70.4	10		10		0.01
	G2000-1	G-305			0.004	0.0404	0.01		0.005		0.01		0.003	67.8	10		1		0.01
	G2000-1	G-306	G-305		0.004	0.0408	0.01		0.005		0.01		0.003	67.5	10		1		0.01
	G2000-1	G-308			0.004	0.0407	0.01		0.005		0.01		0.003	67.3	10		1		0.01
	G2000-1	G-309			0.004	0.0385	0.01		0.005		0.01		0.003	66.4	10		1		0.01
	G2000-1	G-310			0.004	0.0411	0.01		0.005		0.01	0.0157	0.003	68	10		1		0.01
	G2000-2	G-314			0.004	0.0418	0.01		0.005		0.01		0.003	64.6	10		0.5	0.0108	0.01
	G2000-2	G-317			0.004	0.0421	0.01		0.005		0.01		0.003	62.6	10		0.5		0.01
	G2000-2	G-318			0.004	0.0236	0.01		0.005		0.01		0.003	63.9	10		0.5		0.01
	G2000-2	G-319			0.004	0.0407	0.01		0.005		0.01	0.0063	0.003	63.8	10		0.5		0.01
	G2000-3	G-323			0.004	0.043	0.01		0.005		0.01	0.0179	0.003	67.7	10		1		0.01
	G2000-3	G-324	G-323		0.004	0.0427	0.01		0.005		0.01	0.00905	0.003	67.4	10		1		0.01
	G2000-3	G-326			0.004	0.0431	0.01		0.005		0.01		0.003	67.4	10		1		0.01
	G2000-3	G-327			0.004	0.0421	0.01		0.005		0.01		0.003	67.4	10		1		0.01
	G2000-3	G-328		0.00575	0.004	0.0428	0.01		0.005		0.01		0.003	66.5	10		1		0.01
	G2000-4	G-332			0.004	0.044	0.01		0.005		0.01		0.003	67.3 HT	10		1		0.01
	G2000-4	G-333	G-332		0.004	0.0432	0.01		0.005		0.01		0.003	67.8 HT	10		1		0.01
	G2000-4	G-335			0.004	0.0423	0.01		0.005		0.01		0.003	71.3	10		1		0.01

Well ID	Sample Event	Sample ID	Duplicate of:	Arsenic (mg/L)		Barium (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Lead (mg/L)		Chloride (mg/L)		TRPH^ (mg/L)		Total Phenolics (mg/L)	
				0.01	EPA MCL	2	EPA MCL	0.005	EPA MCL	0.1	EPA MCL	0.015	EPA MCL	250*	EPA MCL				
				0.1	NMWQCC	1	NMWQCC	0.01	NMWQCC	0.05	NMWQCC	0.05	NMWQCC	250**	NMWQCC			0.005	WQCC
				Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL
MW-D	G2000-4	G-336			0.004	0.0438	0.01		0.005		0.01	0.0107	0.003	66.9	10		1		0.01
	G2000-4	G-337			0.004	0.0435	0.01		0.005		0.01	0.005	0.003	69.3	10		1		0.01
	G2001-1	G-341			0.005	0.0475	0.005		0.005		0.005		0.005	67	1.5		1		0.05
	G2001-1	G-344			0.005	0.0477	0.005		0.005		0.005		0.005	**330**	1.5		1		0.05
	G2001-1	G-345			0.005	0.0452	0.005		0.005		0.005		0.005	77	1		1		0.05
	G2001-1	G-346			0.005	0.0508	0.005		0.005		0.005		0.005	72	1		1		0.05
	G2001-2	G-350		0.0251	0.005	0.0515	0.005		0.005		0.005		0.05	75 B	1		1		0.05
	G2001-2	G-353			0.005	0.0511	0.005		0.005		0.005		0.005	73	1		1		0.05
	G2001-2	G-354			0.005	0.0532	0.005		0.005		0.005		0.005	76	1		1		0.05
	G2001-2	G-355			0.005	0.0505	0.005		0.005		0.005		0.005	77	1		1		0.05
	G2001-3	G-359			0.005	0.0473	0.005		0.005		0.005		0.005	79	1		1		0.05
	G2001-3	G-362			0.005	0.0490	0.005		0.005		0.005		0.005	79	1		1		0.05
	G2001-3	G-363			0.005	0.0498	0.005		0.005		0.005		0.005	75	1		1		0.05
	G2001-3	G-364			0.005	0.0479	0.005		0.005		0.005		0.005	74	1		1		0.05
	G2001-4	G-368			0.005	0.0536	0.005		0.005		0.005		0.005	75	1		1		0.005
	G2001-4	G-369	G-368		0.005	0.0530	0.005		0.005		0.005		0.005	75	1		1		0.005
	G2001-4	G-371			0.005	0.0502	0.005		0.005		0.005		0.005	81	1	NA	1		0.005
	G2001-4	G-372			0.005	0.0458	0.005		0.005		0.005		0.005	82	1	NA	1		0.005
	G2001-4	G-373			0.005	0.0443	0.005		0.005		0.005		0.005	71	1		1		0.005
	G2002-1	G-377			0.005	0.0503	0.005		0.005		0.005		0.005	95	1		1		0.05
	G2002-1	G-380			0.005	0.0521	0.005		0.005		0.005		0.005	85	1		1		0.05
	G2002-1	G-381			0.005	0.049	0.005		0.005		0.005		0.005	80	1		1		0.05
	G2002-1	G-382			0.005	0.0497	0.005		0.005		0.005		0.005	80	1		1		0.05
	G2002-2	G-386			0.005	0.0468	0.005		0.005		0.005		0.005	78	1		1		0.005
	G2002-2	G-389			0.005	0.0472	0.005		0.005		0.005		0.005	78	1		1	0.0059	0.005
	G2002-2	G-390			0.005	0.0463	0.005		0.005		0.005		0.005	80	1		1		0.005
	G2002-2	G-391			0.005	0.0628	0.005		0.005		0.005	0.012	0.005	79	1		1		0.005
	G2002-3	G-395		0.00209	0.0003	0.0449	0.001		0.0002	0.000986	0.0005		0.0006	78	3		1		0.01
	G2002-3	G-396	G-398	0.00217	0.0003	0.0488	0.001	0.000227	0.0002	0.000905	0.0005		0.0006	79.5	3		1	0.012	0.01
	G2002-3	G-398		0.00211	0.0003	0.0475	0.001		0.0002	0.00102	0.0005	0.00107	0.0006	79.1	3		1		0.01
	G2002-3	G-399		0.00317	0.0003	0.0849	0.001		0.0002	0.00111	0.0005		0.0006	78.9	3		1		0.01
	G2002-3	G-400		0.0023	0.0003	0.0441	0.001		0.0002	0.00142	0.0005		0.0006	79.6	3		1		0.01
	G2002-4	G-404		0.002	0.0003	0.0331	0.001		0.0002	0.000956	0.0005		0.0006	79.8	3		1		0.01
	G2002-4	G-409		0.00241	0.0003	0.0425	0.001	0.000422	0.0002	0.00109	0.0005		0.0006	78	3	R			0.01
	G2002-4	G-411		0.00264	0.0003	0.0419	0.001		0.0002	0.001	0.0005		0.0006	80.7	3	R			0.01
	G2002-4	G-413		0.00202	0.0003	0.0437	0.001	0.000392	0.0002	0.00136	0.0005		0.0006	78.5	3		1		0.01
	G2003-1	G-418		0.014 FB	0.0003	0.0396	0.001	0.00965 F	0.0002	0.0029	0.0005	0.000768	0.0006	79.7	3		1		0.01

Well ID	Sample Event	Sample ID	Duplicate of:	Arsenic (mg/L)		Barium (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Lead (mg/L)		Chloride (mg/L)		TRPH^ (mg/L)		Total Phenolics (mg/L)	
				0.01	EPA MCL	2	EPA MCL	0.005	EPA MCL	0.1	EPA MCL	0.015	EPA MCL	250*	EPA MCL				
				0.1	NMWQCC	1	NMWQCC	0.01	NMWQCC	0.05	NMWQCC	0.05	NMWQCC	250**	NMWQCC			0.005	WQCC
				Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL
MW-D	G2003-1	G-423		0.00517	0.0003	0.031	0.001	0.00956	0.0002	0.00334 B	0.0005	0.000855	0.0006	79.5	3		1		0.01
	G2003-1	G-425		0.00582	0.0003	0.0386	0.001		0.0002		0.0005		0.0006	80.6	3		1		0.01
	G2003-1	G-427 a		0.00243	0.0002	0.046	0.00015		0.0001	0.000734	0.0005	0.000514	0.0001	80.5	3		0.98		0.01
	G2003-1	G-427 b			0.00251	0.0463	0.00023		0.00037	0.00111 J	0.00078		0.00165	74.2	0.392		0.5		0.00933
	G2003-2	G-432		0.00274 J	0.00251	0.0438	0.00023		0.00037		0.00078		0.00165	76.4 B	0.7		1	0.0133 J	0.00933
	G2003-2	G-438		0.00635 JB	0.0023	0.0411	0.00012		0.00028		0.00094		0.00165	77.1	0.35		1	0.0107 J	0.00933
	G2003-2	G-440			0.0023	0.0410 B	0.00012		0.00028	0.00097 J	0.00094		0.00165	77.4	0.35		1	0.0103 J	0.00933
	G2003-2	G-442		NS		NS		NS		NS		NS		NS		NS		NS	
	G2004-2	G-451			0.01		0.2		0.002		0.005		0.003	79.2	50		0.5		0.01
	G2004-2	G-455	G-451		0.01		0.2		0.002		0.005		0.003	77.5	50		0.5	0.012 F	0.01
	G2005-2	G-463			0.01		0.2		0.002		0.005		0.003	71.9	50		0.5		0.01
	G2006-2	G-475			0.01	0.043	0.01	0.00500 F	0.001		0.01		0.005	77.1	0.5		0.5		0.13
	G2007-3	G-487			0.0100	0.0390	0.0100		0.00100		0.00500		0.00500	73.4	0.500		5.00		0.130
	G2007-3	G-488	G-487		0.0100	0.0390	0.0100		0.00100		0.00500		0.00500	72.9	0.500		5.00		0.130
	G2008-3	G-506		0.071	0.0100	0.0380	0.00500		0.00200		0.00500		0.00500	72.7	3.00		5.00	0.247	0.130
	G2009-3	G-519			0.010	0.042B	0.020		0.0050		0.010		0.010	73	4.0	1.2J	3.3		0.0050
	G2009-3	G-523	G-519	0.0034J	0.010	0.051UB	0.020		0.0050		0.010		0.010	73	4.0		3.4		0.0050
	G2010-3	G-523			0.010	0.047	0.020		0.0050		0.010		0.010	79	4.0	0.51J	3.0		0.0050
	G2011-3	G-543		0.0035J	0.010	0.050	0.020	0.00040J	0.0050	0.0021J	0.010		0.010	71	4.0		3.2	0.0026 UB	0.0050
	G2011-3	G-547	G-543		0.010	0.052	0.020		0.0050	0.0017J	0.010		0.010	71	4.0		3.1		0.0050
	G2012-2	G-555			0.020	0.044UB	0.005		0.0050		0.010	0.0024UB	0.005	80	2.0		5.0	0.013J	0.040
MW-E	G2002-4	G-405		0.00251	0.0003	0.0563	0.001		0.0002	0.000924	0.0005		0.0006	107	3		1		0.01
	G2002-4	G-410		0.00244	0.0003	0.0519	0.001		0.0002	0.000655	0.0005		0.0006	87.1	3	R			0.01
	G2002-4	G-412		0.0026	0.0003	0.0500	0.001	0.000512	0.0002	0.000729	0.0005		0.0006	87.3	3	R			0.01
	G2002-4	G-414		0.0025	0.0003	0.0469	0.001		0.0002	0.000745	0.0005		0.0006	85.4	3		1		0.01
	G2003-1	G-419		0.0133 FB	0.0003	0.0429	0.001	0.0106 F	0.0002	0.000942	0.0005		0.0006	81.2	3		1		0.01
	G2003-1	G-424		0.00392	0.0003	0.0361	0.001	0.00941	0.0002	0.00275 B	0.0005		0.0006	81.3	3		1		0.01
	G2003-1	G-426		0.00447	0.0003	0.0283	0.001		0.0002	0.000573	0.0005		0.0006	80.0	3		1		0.01
	G2003-1	G-428 a		0.00274	0.0002	0.0436	0.00015		0.0001	0.000601	0.0005	0.000463	0.0001	334	60	NA			0.01
	G2003-1	G-428 b		0.00337 J	0.00251	0.0436	0.00023		0.00037	0.00102 J	0.00078		0.00165	77.4	0.392		0.5		0.00933

Well ID	Sample Event	Sample ID	Duplicate of:	Arsenic (mg/L)		Barium (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Lead (mg/L)		Chloride (mg/L)		TRPH^ (mg/L)		Total Phenolics (mg/L)	
				0.01	EPA MCL	2	EPA MCL	0.005	EPA MCL	0.1	EPA MCL	0.015	EPA MCL	250*	EPA MCL				
				0.1	NMWQCC	1	NMWQCC	0.01	NMWQCC	0.05	NMWQCC	0.05	NMWQCC	250**	NMWQCC			0.005	WQCC
				Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL
MW-E	G2003-2	G-433		0.00396 J	0.0023	0.0404	0.00023		0.00037		0.00078		0.00165	69.7 B	0.7		1	0.00950 J	0.00933
	G2003-2	G-439		0.00349 JB	0.0023	0.042	0.00012		0.00028		0.00094		0.00165	72.2	0.35		1		0.00933
	G2003-2	G-441			0.0023	0.0438 B	0.00012		0.00028	0.00258 J	0.00094		0.00165	72.5	0.35		1	0.0116 J	0.00933
	G2003-2	G-443			0.0023	0.0428 B	0.00012		0.00028		0.00094		0.00165	87.1	1.96		1		0.00933
	G2003-3	G-444		0.00384 JB	0.0023	0.0468 B	0.00012	B	0.00028		0.00094		0.00165	73.1	0.35		1		0.00873
	G2003-3	G-445			0.00251	0.0438	0.00023		0.00037		0.00078		0.00165	72	0.35		1	NA	
	G2003-3	G-446		0.00276 J	0.00251	0.0419	0.00023		0.00037		0.00078		0.00165	71.8 B	0.35		1		0.00873
	G2003-3	G-447			0.00251	0.0413	0.00023		0.00037		0.00078		0.00165	71.6 B	0.35		1	0.00950 J	0.00873
	G2004-2	G-452			0.01		0.2		0.002		0.005		0.003	74.7	50		0.5		0.01
	G2004-2	G-457			0.01		0.2		0.002		0.005		0.003	73.9	10		0.5		0.01
	G2004-2	G-458			0.01		0.2		0.002		0.005		0.003	63.3	20		0.5		0.01
	G2004-2	G-459			0.01		0.2		0.002		0.005		0.003	66.3	20		0.5		0.01
	G2005-2	G-464			0.01		0.2		0.002		0.005		0.003	73.9	50		0.5		0.01
	G2005-2	G-469			0.01		0.2		0.002		0.005		0.003	77.2	10		0.5	0.012	0.01
	G2005-2	G-470			0.01		0.2		0.002		0.005		0.003	74.1	50		0.5	0.024	0.01
	G2005-2	G-471			0.01		0.2		0.002		0.005		0.003	72.7	20		0.5		0.01
	G2006-2	G-476			0.01	0.04	0.01	0.00500 F	0.001		0.01		0.005	101	0.5		0.5		0.13
	G2006-2	G-481			0.01	0.05	0.01	0.003	0.001		0.01		0.005	97.5	0.5		0.5		0.13
	G2006-2	G-482			0.01	0.038	0.01		0.001		0.01		0.005	83.2	0.5		0.5		0.13
	G2006-2	G-483			0.01	0.049	0.01		0.001		0.005		0.005	79.9	0.5		0.5		0.13
	G2007-3	G-489			0.0100	0.0450	0.0100		0.00100	0.103	0.00500		0.00500	96.0	0.500	8.46 UB	5.00		0.130
	G2007-3	G-493			0.0100	0.0460	0.0100		0.00100	0.067	0.00500		0.0100	94.5	0.500		5.00		0.130
	G2007-3	G-494			0.0100	0.0430	0.0100		0.00100	0.029	0.00500		0.0100	92.7	0.500	23.5	5.00		0.130
	G2007-3	G-495			0.0100	0.0510	0.0100		0.00100		0.0100		0.00500	82.2	0.500		5.00		0.130
	G2007-3	G-496		NS		NS		NS			0.00500	NS		NS			0.500	NS	
	G2008-3	G-507			0.0100	0.0440	0.00500		0.00200		0.00500		0.00500	95.6	3.00		5.00	0.157	0.130
	G2008-3	G-511			0.0100	0.0430	0.00500		0.00200		0.00500		0.00500	96.3	3.00		5.00		0.130
	G2008-3	G-512			0.0100	0.0470	0.00500		0.00200		0.00500		0.00500	95.2	3.00		5.00	0.745	0.130
	G2008-3	G-513			0.0100	0.0450	0.00500		0.00200		0.00500		0.00500	197	3.00		5.00		0.130
	G2009-3	G-520			0.010	0.045B	0.020		0.0050	0.0028J	0.010		0.010	93	4.0		3.3		0.0050
	G2009-3	G-525			0.010	0.047B	0.020		0.0050	0.0032J	0.010		0.010	92	4.0		3.0		0.0050
	G2009-3	G-526			0.010	0.046B	0.020		0.0050	0.0028J	0.010		0.010	97	4.0		3.5		0.0050

Well ID	Sample Event	Sample ID	Duplicate of:	Arsenic (mg/L)		Barium (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Lead (mg/L)		Chloride (mg/L)		TRPH^ (mg/L)		Total Phenolics (mg/L)	
				0.01	EPA MCL	2	EPA MCL	0.005	EPA MCL	0.1	EPA MCL	0.015	EPA MCL	250*	EPA MCL				
				0.1	NMWQCC	1	NMWQCC	0.01	NMWQCC	0.05	NMWQCC	0.05	NMWQCC	250**	NMWQCC			0.005	WQCC
				Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL
MW-E	G2009-3	G-527			0.010	0.047	0.020		0.0050		0.010		0.010	94	4.0		3.4		0.0050
	G2010-3	G-532			0.010	0.045	0.020		0.0050	0.0039J	0.010		0.010	95	4.0	0.51J	3.0		0.0050
	G2010-3	G-537			0.010	0.043	0.020		0.0050		0.010		0.010	96	4.0	0.61J	3.1		0.0050
	G2010-3	G-538		0.012	0.010	0.044	0.020		0.0050		0.010		0.010	94	4.0	0.51J	3.1		0.0050
	G2010-3	G-539			0.010	0.043	0.020		0.0050		0.010		0.010	97	4.0	0.31J	3.1		0.0050
	G2011-3	G-544			0.010	0.045	0.020	0.00040 J	0.0050		0.010		0.010	80	4.0		3.1		0.0050
	G2011-3	G-549			0.010	0.043 UB	0.020		0.0050		0.010		0.010	79	4.0		3.0		0.0050
	G2011-3	G-550			0.010	0.046	0.020		0.0050		0.010		0.010	92	4.0		3.1		0.0050
	G2011-3	G-551			0.010	0.045	0.020		0.0050		0.010		0.010	87	4.0		3.1		0.0050
	G2012-2	G-556			0.020	0.078UB	0.005	0.0014J	0.0050	0.007J	0.010	0.0062UB	0.005	84	1.0		5.0		0.040
	G2012-2	G-561			0.020	0.042	0.005		0.0050		0.010		0.005	83	1.0	1.3J	5.3		0.040
	G2012-2	G-562			0.020	0.042	0.005		0.0050		0.010		0.005	84	2.0		5.0		0.040
	G2012-2	G-563		0.0068J	0.020	0.044	0.005	0.0031J	0.0050		0.010	0.0063	0.005	83	1.0		5.3		0.040
MW-F	G2002-4	G-406		0.00193	0.0003	0.077	0.001		0.0002	0.000806	0.0005		0.0006	137	9		1		0.01
	G2003-1	G-420		0.0306 FB	0.0003	0.691	0.001	0.0151 F	0.0002	0.00673	0.0005	0.00203	0.0006	128	6		1		0.01
	G2003-2	G-434		0.00829 J	0.0023	0.0732	0.00023		0.00037		0.00078		0.00165	121 B	0.7		1		0.00933
	G2004-2	G-453			0.01		0.2		0.002		0.005		0.003	126.0	50.0		0.5		0.01
	G2005-2	G-465			0.01		0.2		0.002		0.005		0.003	129.0	50.0		0.5		0.01
	G2006-2	G-477			0.01	0.052	0.01	0.00400 F	0.001		0.01		0.005	140	0.5		0.5		0.13
	G2007-3	G-490			0.0100	0.560	0.0100		0.00100		0.00500		0.00500	143	0.500	8.46 UB	5.00	1.02	0.130
	G2008-3	G-508			0.0100	0.0550	0.00500		0.00200		0.00500		0.00500	205	3.00		5.00		0.130
	G2009-3	G-521		0.0042J	0.010	0.056UB	0.020		0.0050		0.010		0.010	120	4.0		3.3		0.0050
	G2010-3	G-534			0.010	0.057	0.020		0.0050		0.010		0.010	140	4.0	0.71J	3.0		0.0050
	G2011-3	G-546			0.010	0.061	0.020	0.00040J	0.0050		0.010		0.010	120	4.0		3.1	0.0025 UB	0.0050
	G2012-2	G-557			0.020	0.045UB	0.005		0.0050		0.010	0.0026JUB	0.005	120	2.0		5.0		0.040
	G2012-2	G-560	G-557		0.020		0.005		0.0050		0.010	0.0018JUB	0.005	130	2.0		5.0	0.027J	0.040
MW-G	G2003-2	G-435			0.0023	0.126 B	0.00012		0.00028		0.00094		0.00165	**342**	1.96		1		0.00933
	G2004-2	G-454			0.01	0.2	0.2		0.002		0.005		0.003	**274**	50.00		0.5		0.01
	G2005-2	G-466			0.01		0.2		0.002		0.005		0.003	**304**	50.00		0.5		0.01
	G2006-2	G-478			0.01	0.059	0.01	0.00300 F	0.001		0.01		0.005	**296**	0.50		0.5		0.13
	G2006-2	G-479	G-478		0.01	0.057	0.01	0.00200 F	0.001		0.01		0.005	**286**	1		0.5		0.13
	G2007-3	G-491			0.010	0.0660	0.0100		0.00100		0.00500		0.00500	**297**	0.500	16.0 UB	5.00		0.130

Well ID	Sample Event	Sample ID	Duplicate of:	Arsenic (mg/L)		Barium (mg/L)		Cadmium (mg/L)		Chromium (mg/L)		Lead (mg/L)		Chloride (mg/L)		TRPH^ (mg/L)		Total Phenolics (mg/L)	
				0.01	EPA MCL	2	EPA MCL	0.005	EPA MCL	0.1	EPA MCL	0.015	EPA MCL	250*	EPA MCL				
				0.1	NMWQCC	1	NMWQCC	0.01	NMWQCC	0.05	NMWQCC	0.05	NMWQCC	250**	NMWQCC			0.005	WQCC
				Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL	Value	RL
MW-G	G2008-3	G-509			0.0100	0.0650	0.00500		0.00200		0.00500		0.00500	**333**	3.00		5.00	0.181	0.130
	G2009-3	G-522			0.010	0.077UB	0.020		0.0050		0.010		0.010	**280**	40		3.5		0.0050
	G2010-3	G-533		0.013	0.010	0.081	0.020		0.0050		0.010		0.010	**310**	4.0	0.71J	3.0		0.0050
	G2010-3	G-535	G-533	0.0034J	0.010	0.081	0.020		0.0050		0.010		0.010	**310**	4.0	0.61J	3.1		0.0050
	G2011-3	G-545			0.010	0.086	0.020	0.00060 J	0.0050		0.010		0.010	210	40		3.1		0.0050
	G2012-2	G-558			0.020	0.057UB	0.005	0.0014J	0.0050		0.010	0.0033JUB	0.005	**420**	5.0	0.8J	5.0	0.035J	0.040

Value - Result value reported by laboratory. If no value shown, result was not detected.

RL - Reporting limit.

HT - Holding time exceeded.

F - Analyte detected in the field blank.

B - Analyte detected in the associated Method Blank

J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

NA - Not analyzed. Sample broken prior to receipt by laboratory.

NS - Not sampled. Amount of water contained within well MW-A casing insufficient to provide sample. Sample G-442 not obtained due to pump failure.

R - Rejected. Analysis results are not useable, therefore, are not included. The sample results are rejected due to laboratory quality control (QC) deficiencies. See Appendix B of the 2002 Summary Report for details.

UB - Analyte detected in associated blank sample.

BOLD Exceeds federal maximum contaminant level or State of New Mexico Water Quality Control Commission human health standard.

* - National Secondary Drinking Water Standard

* *- Other Standards for Domestic Water Supply

^ - The NMED June 2012 Risk Assessment Guidance for Site Investigations and Remediation TPH Screening Guidelines for Potable Ground Water (GW-) are 0.2 mg/L for TPH unknown oil and 5.92 mg/L for mineral oil dielectric.

Summary table excerpted from 2012 Groundwater Monitoring Program and Post-Closure Operations and Maintenance for the Santa Fe Lake Site, Clovis, New Mexico (CERCLIS No.: NMD043158591) Appendix D

ATTACHMENT 8 – Discharge Permit DP-10 Monitoring Reports Annual Discharge Tables 2008 through 2012

ATTACHMENT 8 – Discharge Permit DP-10 Monitoring Reports Annual Discharge Tables 2008 through 2012

TABLE 1. MONTHLY DISCHARGE DATA
BNSF SANTA FE LAKE SITE, CLOVIS, NEW MEXICO
JANUARY -DECEMBER 2008

Month	Dischared to the Santa Fe Lake	Days of Discharge	Beginning Counter Number	Ending Counter Number	Total Fluids Discharged (gallons)
January	No	0	NA	NA	0
February	No	0	NA	NA	0
March	No	0	NA	NA	0
April	No	0	NA	NA	0
May	Yes	2	2534290	2781684	247,394
June	No	0	NA	NA	0
July	No	0	NA	NA	0
August	No	0	NA	NA	0
September	No	0	NA	NA	0
October	No	0	NA	NA	0
November	No	0	NA	NA	0
December	No	0	NA	NA	0
Totals					**247,394**

TABLE 1. MONTHLY DISCHARGE DATA
BNSF SANTA FE LAKE SITE, CLOVIS, NEW MEXICO
JANUARY -DECEMBER 2009

Month	Discharged to the Santa Fe Lake	Days of Discharge to Lake	Beginning Counter Number	Ending Counter Number	Total Fluids Discharged to Lake (gallons)
January	No	0	0	0	0
February	No	0	0	0	0
March	Yes	3	23,296	147,601	124,305
April	Yes	23	147,601	1,764,439	1,616,838
May	Yes	31	1764439	4242107	2,477,668
June*	Yes	30	4,335,937	5,335,911	2,110,506
July	Yes	31	0	2,458,485	2,458,485
August	Yes	17	0	1,345,089	1,345,089
September**	Yes	30	0	2,384,822	2,499,727
October	Yes	31	0	2,701,467	2,701,467
November	Yes	28	0	1,127,607	1,127,607
December	No	0	0	0	0
Totals		**224**			**16,461,692**

* Counter was reset on 6/18/09 - an additional 1110532 gallons was added to total fluids.
* *Counter was reset on 9/27/09 - an additional 196,390 gallons was added to total fluids.

TABLE 1. MONTHLY DISCHARGE DATA
BNSF SANTA FE LAKE SITE AND CITY OF CLOVIS WWTP
CLOVIS, NEW MEXICO
JANUARY -DECEMBER 2010

Month	Discharged to the Santa Fe Lake	Days of Discharge to Lake	Beginning Counter Number	Ending Counter Number	Total Fluids Discharged to Lake (gallons)	*Total Fluids Discharged to City (gallons)
January	Yes	24	0	2,365,714	2,365,714	1,613,181
February	Yes	28	0	2,916,208	2,916,208	655,319
March	Yes	31	0	2,785,177	2,785,177	552,926
April	Yes	30	0	2,726,449	2,726,449	1,053,365
May	Yes	30	0	2,718,393	2,718,393	675,785
June	Yes	23	0	2,176,322	2,176,322	755,392
July	Yes	31	0	3,087,458	3,087,458	844,486
August	Yes	29	0	2,550,442	2,550,442	903,829
September	Yes	21	0	1,676,383	1,676,383	160,103
October	Yes	30	0	2,917,208	2,917,208	600,589
November	Yes	28	0	2,403,521	2,403,521	904,851
December	Yes	29	0	3,397,921	3,397,921	649,366
Totals		**334**			**31,721,196**	**9,369,192**

* Monthly discharge to the City of Clovis WWTP is calculated by using the daily meter readings reported in the BNSF Clovis Waste Water Treatment Facility Report.

TABLE 1. MONTHLY DISCHARGE DATA
BNSF SANTA FE LAKE SITE AND CITY OF CLOVIS WWTP
CLOVIS, NEW MEXICO
JANUARY -DECEMBER 2011

Month	Discharged to the Santa Fe Lake	Days of Discharge to Lake	Beginning Counter Number	Ending Counter Number	Total Fluids Discharged to Lake (gallons)
January	Yes	31	0	3,331,801	3,331,801
February	Yes	19	0	2,058,048	2,058,048
March	Yes	31	0	3,047,534	3,047,534
April	Yes	30	0	3,588,225	3,588,225
May	Yes	31	0	3,451,355	3,451,355
June	Yes	20	0	2,296,076	2,296,076
July	Yes	25	0	3,168,125	3,168,125
August	Yes	31	0	3,871,762	3,871,762
September	Yes	19	0	1,842,135	1,842,135
October	Yes	31	0	3,153,608	3,153,608
November	Yes	30	0	3,071,035	3,071,035
December	Yes	24	0	2,630,553	2,630,553
Totals		**322**			**35,510,257**

TABLE 1. MONTHLY DISCHARGE DATA
BNSF SANTA FE LAKE SITE
CLOVIS, NEW MEXICO
JANUARY -DECEMBER 2012

Month	Discharged to the Santa Fe Lake	Days of Discharge to Lake	Beginning Counter Number	Ending Counter Number	Total Fluids Discharged to Lake (gallons)
January	Yes	26	0	2,294,126	2,294,126
February	Yes	24	0	2,272,487	2,272,487
March	Yes	14	0	1,402,874	1,402,874
April	Yes	4	0	132,177	132,177
May	Yes	6	0	306,020	306,020
June	Yes	2	0	96,137	96,137
July	Yes	10	0	457,778	457,778
August	Yes	7	0	196,826	196,826
September	Yes	5	0	267,449	267,449
October	Yes	3	0	67,493	67,493
November	Yes	2	0	218,191	218,191
December	Yes	5	0	299,732	299,732
Totals		**108**			**8,011,290**

Attachment 9 – Site Inspection Checklist

Attachment 9 - Site Inspection Checklist

Site Inspection Checklist

I. SITE INFORMATION	
Site name: AT&SF (Clovis)	**Date of inspection: January 17, 2013**
Location and Region: Clovis, NM, Region 6	**EPA ID: NMD043158591**
Agency, office, or company leading the five-year review: New Mexico Environment Department	**Weather/temperature: Sunny, cool, 35 to 45 degrees**

Remedy Includes: (Check all that apply)

X Landfill cover/containment
X Access controls
X Institutional controls
Groundwater pump and treatment
Surface water collection and treatment
X Other - Vegetative cover, remnant of ring dike to keep playa lake dewatered

Monitored natural attenuation
Groundwater containment
Vertical barrier walls

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Tim Wippold (Name) BNSF Contractor Representative (Title) January 2013 (Date)
Interviewed at site at office by phone Phone no. _____ **X** by e-mail
Problems, suggestions; **None X** Report attached See Attachment 11

2. **O&M staff** Michael Flen (Name) BNSF Subcontractor Representative (Title) January 2013 (Date)
Interviewed at site at office by phone Phone no. _____ **X** by e-mail
Problems, suggestions; **None X** Report attached See Attachment 11

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 Curry County
Contact Lance Pyle (Name) Curry County Manager (Title) January 2013 (Date) 575-763-6016 (Phone no.)
Problems; suggestions; **None** **X** Report attached See Attachment 11

Agency _____
Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone no.)
Problems; suggestions; Report attached _____

Agency _____
Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone no.)
Problems; suggestions; Report attached _____

Agency _____
Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone no.)
Problems; suggestions; Report attached _____

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

Gloria Wicker, nearby resident, interviewed in person on January 16, 2013. See Attachment 11.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	X O&M manual	**X** Readily available	**X** Up to date	N/A
	X As-built drawings	**X** Readily available	**X** Up to date	N/A
	X Maintenance logs	**X** Readily available	**X** Up to date	N/A
	Remarks_____			
2.	**Site-Specific Health and Safety Plan**	**X** Readily available	**X** Up to date	N/A
	X Contingency plan/emergency response plan	**X** Readily available	**X** Up to date	N/A
	Remarks_____			
3.	**O&M and OSHA Training Records**	Readily available	**X** Up to date	N/A
	Remarks_____			
4.	**Permits and Service Agreements**			
	Air discharge permit	Readily available	Up to date	**X** N/A
	Effluent discharge	Readily available	Up to date	**X** N/A
	Waste disposal, POTW	Readily available	Up to date	**X** N/A
	Other permits_____	Readily available	Up to date	**X** N/A
	Remarks_____			
5.	**Gas Generation Records**	Readily available	Up to date	**X** N/A
	Remarks_____			
6.	**Settlement Monument Records**	Readily available	Up to date	**X** N/A
	Remarks_____			
7.	**Groundwater Monitoring Records**	Readily available	**X** Up to date	N/A
	Remarks_____			
8.	**Leachate Extraction Records**	Readily available	Up to date	**X** N/A
	Remarks_____			
9.	**Discharge Compliance Records**			
	Air	Readily available	Up to date	**X** N/A
	Water (effluent)	Readily available	Up to date	**X** N/A
	Remarks_____			
10.	**Daily Access/Security Logs**	**X** Readily available	**X** Up to date	N/A
	Remarks_____			

IV. O&M COSTS

1. **O&M Organization**

State in-house Contractor for State
PRP in-house **X** Contractor for PRP
Federal Facility in-house Contractor for Federal Facility
Other_____
_____

2. **O&M Cost Records**

Readily available Up to date **X** Not Available
Funding mechanism/agreement in place
Original O&M cost estimate_____ Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ Breakdown attached
Date Date Total cost
From_____ To_____ _____ Breakdown attached
Date Date Total cost
From_____ To_____ _____ Breakdown attached
Date Date Total cost
From_____ To_____ _____ Breakdown attached
Date Date Total cost
From_____ To_____ _____ 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 **X** Applicable N/A

A. Fencing

1. **Fencing damaged** **X** Location shown on site map **X** Gates secured N/A

Remarks The tree branches observed growing through fence in 2008 site inspection have been cut back and fence is in good condition.

B. Other Access Restrictions

1. **Signs and other security measures** **X** Location shown on site map N/A

Remarks At entry gate, information is current.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented — Yes **X** No N/A

Site conditions imply ICs not being fully enforced — Yes **X** No N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Site Visits

Frequency Weekly

Responsible party/agency BNSF

Contact Tim Wippold (Arcadis subcontracts GMC Env.) Project Mgr. 1/17/13 713-953-4889
Name Title Date Phone no.

Reporting is up-to-date — **X** Yes No N/A

Reports are verified by the lead agency — **X** Yes No N/A

Specific requirements in deed or decision documents have been met — **X** Yes No N/A

Violations have been reported — Yes No **X** N/A

Other problems or suggestions: Report attached

_____

_____

_____

_____

2. **Adequacy** **X** ICs are adequate ICs are inadequate N/A

Remarks_____

_____

_____

D. General

1. **Vandalism/trespassing** Location shown on site map **X** No vandalism evident

Remarks_____

_____

2. **Land use changes on site** **X** N/A

Remarks_____

_____

3. **Land use changes off site** **X** N/A

Remarks_____

_____

VI. GENERAL SITE CONDITIONS

A. Roads **X** Applicable N/A

1. **Roads damaged** Location shown on site map **X** Roads adequate N/A

Remarks_____

_____

B. Other Site Conditions

Remarks _____
_____
_____
_____
_____
_____

VII. LANDFILL COVERS **X** Applicable N/A

A. Landfill Surface

1. **Settlement** (Low spots) Location shown on site map **X** Settlement not evident
Areal extent_____ Depth_____
Remarks_____
_____

2. **Cracks** Location shown on site map **X** Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks_____
_____

3. **Erosion** Location shown on site map **X** Erosion not evident
Areal extent_____ Depth_____
Remarks_____
_____

4. **Holes** Location shown on site map **X** Holes not evident
Areal extent_____ Depth_____
Remarks_____
_____

5. **Vegetative Cover** **X** Grass **X** Cover properly established **X** No signs of stress
Trees/Shrubs (indicate size and locations on a diagram)
Remarks Reseeded annually where needed and watered as needed.

6. **Alternative Cover (armored rock, concrete, etc.)** N/A
Remarks Some ballast observed on west and north outlet areas.

7. **Bulges** Location shown on site map **X** Bulges not evident
Areal extent_____ Height_____
Remarks_____
_____

8.	**Wet Areas/Water Damage**	**X** 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 **X** No evidence of slope instability
	Areal extent_____		
	Remarks_____		
	_____		
B. Benches		Applicable **X** 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**	Location shown on site map	N/A or okay
	Remarks_____		
	_____		
2.	**Bench Breached**	Location shown on site map	N/A or okay
	Remarks_____		
	_____		
3.	**Bench Overtopped**	Location shown on site map	N/A or okay
	Remarks_____		
	_____		
C. Letdown Channels		Applicable **X** 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**	Location shown on site map	No evidence of settlement
	Areal extent_____	Depth_____	
	Remarks_____		
	_____		
2.	**Material Degradation**	Location shown on site map	No evidence of degradation
	Material type_____	Areal extent_____	
	Remarks_____		
	_____		
3.	**Erosion**	Location shown on site map	No evidence of erosion
	Areal extent_____	Depth_____	
	Remarks_____		
	_____		

4. **Undercutting** Location shown on site map No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____
_____

5. **Obstructions** Type_____ No obstructions
Location shown on site map Areal extent_____
Size_____
Remarks_____
_____

6. **Excessive Vegetative Growth** Type_____
No evidence of excessive growth
Vegetation in channels does not obstruct flow
Location shown on site map Areal extent_____
Remarks_____
_____

D. Cover Penetrations Applicable **X** N/A

1. **Gas Vents** Active Passive
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance
N/A
Remarks_____
_____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks_____
_____

3. **Monitoring Wells** (within surface area of landfill)
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks_____
_____

4. **Leachate Extraction Wells**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance N/A
Remarks_____
_____

5. **Settlement Monuments** Located Routinely surveyed N/A
Remarks_____
_____

E. Gas Collection and Treatment Applicable **X** N/A

1. **Gas Treatment Facilities**
   Flaring Thermal destruction Collection for reuse
   Good condition Needs Maintenance
   Remarks_____
   _____

2. **Gas Collection Wells, Manifolds and Piping**
   Good condition Needs Maintenance
   Remarks_____
   _____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   Good condition Needs Maintenance N/A
   Remarks_____
   _____

F. Cover Drainage Layer **X** Applicable N/A

1. **Outlet Pipes Inspected** Functioning **X** N/A
   Remarks_____
   _____

2. **Outlet Rock Inspected** **X** Functioning N/A
   Remarks_____
   _____

G. Detention/Sedimentation Ponds Applicable **X** N/A

1. **Siltation** Areal extent_____ Depth_____ N/A
   Siltation not evident
   Remarks_____
   _____

2. **Erosion** Areal extent_____ Depth_____
   Erosion not evident
   Remarks_____
   _____

3. **Outlet Works** Functioning N/A
   Remarks_____
   _____

4. **Dam** Functioning N/A
   Remarks_____
   _____

H. Retaining Walls Applicable **X** N/A

1. **Deformations** Location shown on site map Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____
   _____

2. **Degradation** Location shown on site map Degradation not evident
   Remarks_____
   _____

I. Perimeter Ditches/Off-Site Discharge Applicable **X** N/A

1. **Siltation** Location shown on site map Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Vegetative Growth** Location shown on site map N/A
   Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____
   _____

3. **Erosion** Location shown on site map Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Discharge Structure** Functioning N/A
   Remarks_____
   _____

VIII. VERTICAL BARRIER WALLS Applicable **X** N/A

1. **Settlement** Location shown on site map Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Performance Monitoring** Type of monitoring_____
   Performance not monitored
   Frequency_____ Evidence of breaching
   Head differential_____
   Remarks_____
   _____

IX. GROUNDWATER/SURFACE WATER REMEDIES Applicable **X** N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines Applicable N/A
1. **Pumps, Wellhead Plumbing, and Electrical** Good condition All required wells properly operating Needs Maintenance N/A Remarks_____
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks_____
3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks_____
B. Surface Water Collection Structures, Pumps, and Pipelines Applicable **X** N/A
1. **Collection Structures, Pumps, and Electrical** Good condition Needs Maintenance Remarks_____
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** Good condition Needs Maintenance Remarks_____
3. **Spare Parts and Equipment** Readily available Good condition Requires upgrade Needs to be provided Remarks_____
C. Treatment System Applicable **X** N/A

1.	**Treatment Train** (Check components that apply) Metals removal Oil/water separation Bioremediation Air stripping Carbon adsorbers Filters_____ Additive (*e.g.*, chelation agent, flocculent)_____ Others_____ Good condition Needs Maintenance Sampling ports properly marked and functional Sampling/maintenance lo displayed and up to date Equipment properly identified Quantity of groundwater treated annually_____ Quantity of surface water treated annually_____ Remarks_____ _____
2.	**Electrical Enclosures and Panels** (properly rated and functional) N/A Good condition Needs Maintenance Remarks_____ _____
3.	**Tanks, Vaults, Storage Vessels** N/A Good condition Proper secondary containment Needs Maintenance Remarks_____ _____
4.	**Discharge Structure and Appurtenances** N/A Good condition Needs Maintenance 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) Properly secured/locked Functioning Routinely sampled Good condition All required wells located Needs Maintenance N/A Remarks_____ _____
D. Monitoring Data	
o	1. Monitoring Data **X** Is routinely submitted on time **X** Is of acceptable quality
o	2. Monitoring data suggests: Groundwater plume is effectively contained Contaminant concentrations are declining
D. Monitored Natural Attenuation	

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

Properly secured/locked | Functioning | Routinely sampled | Good condition

All required wells located | Needs Maintenance | N/A

Remarks_____

_____

X. OTHER REMEDIES

If there are remedies applied at the site which are 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

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The playa basin is well-vegetated and isolated from surface runoff/wastewater treatment plant discharge and by the ring dike berm which is in good condition. The OSF cap is well vegetated and in good condition – the animal burrows noted in the previous five year review were not evident during this site inspection. Monitoring wells are intact, secured, and routinely sampled.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M appears to be adequate to ensure vegetative cover, erosion control, and dewatering of playa basin.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

There do not appear to be any physical indicators of potential remedy failure. Ground water monitoring detections of TRPH and phenolics are notable because they are Site parameters of concern. They do not currently exhibit specific trends nor has a determination been made regarding their origin. _____

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.
Per the ROD, the need for continued ground water monitoring is to be evaluated in 2013. Based on the TRPH and phenolics detections, some form of ground water monitoring should be maintained. As mentioned in the previous five year review, an exit strategy, potentially including modified analytes, should be developed to guide eventual termination of the ground water monitoring program.

Attachment 10 – Site Inspection Photographs

Attachment 10 – Site Inspection Photographs

Photograph Number: 1 Photographer: Sabino Rivera
Location: ATSF-Clovis Superfund Site
Subject: View of vegetation On-Site Storage Facility
City: Clovis State: New Mexico
Date: January 17, 2013

Photograph Number: 2 Photographer: Sabino Rivera
Location: ATSF-Clovis Superfund Site
Subject: View of sprinkler irrigation system
City: Clovis__ State: New Mexico
Date: January 17, 2013

Photograph Number: 3 Photographer: Sabino Rivera
Location: ATSF-Clovis Superfund Site
Subject: View of Monitor Well F
City: Clovis__ State: New Mexico
Date: January 17, 2013

Photograph Number: 4 Photographer: Sabino Rivera
Location: ATSF-Clovis Superfund Site
Subject: View of Monitor Well E
City: Clovis State: New Mexico
Date: January 17, 2013

Photograph Number: 5 Photographer: Sabino Rivera
Location: ATSF-Clovis Superfund Site
Subject: View of Monitor Well D
City: Clovis State: New Mexico
Date: January 17, 2013

Photograph Number: 6 Photographer: Sabino Rivera
Location: ATSF-Clovis Superfund Site
Subject: View of Monitor Well C
City: Clovis State: New Mexico
Date: January 17, 2013

Photograph Number: 7 Photographer: Sabino Rivera
Location: ATSF-Clovis Superfund Site
Subject: View of Monitor Well B
City: Clovis State: New Mexico
Date: January 17, 2013

Photograph Number: 8 Photographer: Sabino Rivera
Location: ATSF-Clovis Superfund Site
Subject: View of Monitor Well G
City: Clovis State: New Mexico
Date: January 17, 2013

Photograph Number: 9 Photographer: Sabino Rivera
Location: ATSF-Clovis Superfund Site
Subject: View of Monitor Well A
City: Clovis State: New Mexico
Date: January 17, 2013

Attachment 11 – Interview Responses

Attachment 11 – Interview Responses

INTERVIEW RECORD

Site Name: ATSF Clovis Superfund Site		**EPA ID No.:NMD043158591**
Subject: Fourth Five Year Review		**Time:** **Date:**
Type: ☐ Telephone ☐ Visit ☐ Other **Location of Visit:**		☐ Incoming ☐ Outgoing
Contact Made By:		
Name: Mark Garman	**Title:** Project Manager	**Organization:** NMED
Individual Contacted:		
Name: Lance A. Pyle	**Title:** County Manager	**Organization:** Curry County
Telephone No: 575-763-6016 **Fax No: No:** 575-763-3656 **E-Mail Address:** lpyle@currycounty.org	**Street Address:** 700 North Main, Ste. 10 **City, State, Zip:** Clovis, NM 88101	

Summary Of Conversation

1. What is your overall impression of the project? (general sentiment)
   Don't know much about it.

2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results. None

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses. I have been County Manager since December 2007 and have received none.

4. Do you feel well informed about the site's activities and progress? no

5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? No – don't know enough about it to comment.

Page 1 of _____

INTERVIEW RECORD

Site Name: ATSF Clovis Superfund Site		**EPA ID No.:NMD043158591**
Subject: Fourth Five Year Review		**Time:** **Date:**
Type: ☐ Telephone ☐ Visit ☐ Other **Location of Visit:**		☐ Incoming ☐ Outgoing
Contact Made By:		
Name: Mark Garman	**Title:** Project Manager	**Organization:** NMED
Individual Contacted:		
Name: Gloria Wicker	**Title:** Nearby Resident	**Organization:**
Telephone No: 575-762-0029 **Fax No:** **E-Mail Address:**		**Street Address:** 500 Kimberly Lane **City, State, Zip:** Clovis, NM 88101-8520

Summary Of Conversation

1. What is your overall impression of the project? (general sentiment)

She remembered there was a lot of activity at the Site during the remedial action. She thinks the Site property needs to be grazed to improve the health and appearance of vegetation.

2. What effects have site operations had on the surrounding community?

She believes the Site is a bit of an eyesore in its current condition.

3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

Just its appearance (eyesore) and tendency for tumbleweeds to accumulate along the fence.

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

No.

5. Do you feel well informed about the site's activities and progress?

She didn't feel this was an applicable question since there isn't much activity at the Site.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Control tumbleweed accumulation. Vegetation maintenance through grazing, tree planting could control fugitive dust and improve appearance. Good grazing practices could stimulate native vegetation.

Page 1 of 1

INTERVIEW RECORD

Site Name: ATSF Clovis Superfund Site		**EPA ID No.:NMD043158591**
Subject: Fourth Five Year Review Report		**Time:** **Date:**
Type: ☐ Telephone ☐ Visit ☐ Other **Location of Visit:**		☐ Incoming ☐ Outgoing
Contact Made By:		
Name: Mark Garman	**Title:** Project Manager	**Organization:** NMED
Individual Contacted:		
Name: Mike Flen	**Title:** Subcontractor	**Organization:** GMC Environmental (Subcontractor to ARCADIS)
Telephone No: 575-356-4871 **Fax No:** **E-Mail Address:** m_flen@yahoo.com		**Street Address: 1621 S Prince** **City, State, Zip:** Clovis, NM 88101

Summary Of Conversation

1. What is your overall impression of the project? (general sentiment) Since the beginning of the project in the late 80's, I believe that we have made great strides in cleaning up the site.

2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results. Yes. Site visits, inspections, and recording of site activities are done on a minimum of twice weekly. More often if needed.

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses. No.

4. Do you feel well informed about the site's activities and progress? Yes.

5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? No.

Page 1 of _____

INTERVIEW RECORD

Site Name: ATSF Clovis Superfund Site		**EPA ID No.:NMD043158591**
Subject: Fourth Five Year Review Report		**Time:** **Date:**
Type: ☐ Telephone ☐ Visit ☐ Other **Location of Visit:**		☐ Incoming ☐ Outgoing
Contact Made By:		
Name: Mark Garman	**Title:** Project Manager	**Organization:** NMED
Individual Contacted:		
Name: Tim Wippold	**Title:** Project Manager	**Organization:** Arcadis U.S., Inc.
Telephone No: 713-953-4800 **Fax No:** 713-977-4620 **E-Mail Address:** Tim.Wippold@arcadis-us.com		**Street Address:** 2929 Briarpark Drive, Ste 300 **City, State, Zip:** Houston, TX 77042

Summary Of Conversation

1. What is your overall impression of the project? (general sentiment) *I have been managing the project since 1988. I take a lot of personal pride in my work. As a result, my overall impression of the project is that it was executed very well.*

2 Is the remedy functioning as expected? How well is the remedy performing? *I believe that the remedy is functioning as expected.*

3 What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Within the lake bed, the cleanup goals were met. *Groundwater monitoring shows that it was never impacted by the site; however, possibly impacted by the up-gradient site.*

4. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities. *After delisting in March 2003, there has been a site inspection twice per week by ARCADIS' local contractor, GMC Environmental. There has been inspection by ARCADIS at least on a quarterly basis.*

5. Have there been any significant changes in the 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. *There have been no changes since site delisting in March 2003.*

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 give details. *There have been no unexpected O&M difficulties.*

7. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. *For this five year review, BNSF will be requesting reduced groundwater monitoring.*

8. Do you have any comments, suggestions, or recommendations regarding the project? *Yes. The site has been monitored for ten years since delisting. The monitoring data has consistently shown the remedy has been effective. As a result, the frequency of monitoring should be reduced.*

9. Some of the 2007 TRPH detections have been disregarded because TRPH was also detected in the field blank. Do you have any theories how your sampling methodology could have introduced TRPH into the field blank and some ground water samples during the 2007 event? *Concerning this issue, the 2007 report attributed the presence of detections in the field blanks as possibly resulting from the switch to 40 ml vials during that sampling event.*

10. Many TRPH detections from 2007 through 2010 cannot be disregarded because of field blank contamination. Most are approximated because they are below the reporting limit which ranges from 3.0 to 5.0 mg/L in the 2007 through 2011 sampling events. However, many of the approximated (J) detections are greater than the NMED risk-based screening level of 0.4 mg/L for TPH-diesel range. In addition, one detection in 2007 was as high as 23.5 mg/L. Assuming the adjacent Koch pipeline property is not a source of TPH in ground water, do you have any theories regarding the detections? *The highest TRPH detection at the site was in well MW-E in 2007 (23.5 mg/l). MW-E is the BNSF site's upgradient well (which is downgradient from the Koch property), I do not*

think it would be a likely assumption that the Koch property is not the source.

11. There have been occasional Total Phenolics detections over the years. The highest detection was 1.02 mg/L but they are generally less than 1 mg/L. However, the NMWQCC domestic water supply standard for *Phenols* is 0.005 mg/L. Do you have any theories regarding the occasional Total Phenolics detections over the years? *The 1.02 mg/l phenolics was detected in well MW-F in 2007. Since then, the highest value detected at the site is 0.745 mg/l in MW-E in 2008. Again, I think it is significant that the highest value detected since 2008 is from BNSF site's upgradient well (which is downgradient from the Koch property).*

ATTACHMENT 12 - DP-10 Effluent Monitoring Results January 2008 through July 2012

Attachment 12- DP-10 Effluent Monitoring Results January 2008 through July 2012

TABLE 2
2009 DP-10 EFFLUENT MONITORING RESULTS
BNSF RAILYARD, CLOVIS, NEW MEXICO

Parameter	Effluent Limitation	January 2009		February 2009		March 12, 2009 DP10-031209		April 8, 2009 DP10-040809		May 13, 2009 DP10-051309		June 17, 2009 DP10-061709		July 14, 2009 DP10-071409		August 12, 2009 DP10-081209		September 15, 2009 DP10-091509		October 20, 2009 DP10-102009		November 10, 2009 DP10-111009		December 2009	
		Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit
Monthly Sampling		No Discharge		No Discharge																				No Discharge	
Benzene (ug/L)	100					7.7	1.0	3.2	1.0	1.9	1.0	ND	1.0	2.5	1.0	ND	1.0	2.8	1.0	2.1	1.0	2.2	1.0		
Toluene (ug/L)	750					11	1.0	5.2	1.0	2	1.0	ND	1.0	4.3	1.0	ND	1.0	3.1	1.0	3	1.0	2.7	1.0		
Ethylbenzene (ug/L)	750					14	1.0	4.5	1.0	1.3	1.0	ND	1.0	3.0	1.0	ND	1.0	0.88J	1.0	1.4	1.0	1.1	1.0		
Total xylenes (ug/L)	620					100	1.0	45.0	1.0	ND	1.0	1.6	1.0	26.0	1.0	ND	1.0	31.0	1.0	25.0	1.0	19.0	1.0		
1-Methylnaphthalene (ug/L)	1000					ND	80	43.0	10.0	4.0	2.0	ND	2.0	6.2	2.0	ND	2.0	17.0	2.0	45.0	9.5	17.0	2.0		
2-Methylnaphthalene (ug/L)						ND	60	ND	1.5	ND	1.5	ND	1.5	0.34J	1.5	ND	1.5	4.2	1.5	17	7.1	5.1	1.5		
Naphthalene (ug/L)						ND	80	ND	2.0	ND	2.0	ND	2.0	ND	2.0	ND	2.0	ND	2.0	3.0JB	9.5	ND	2.0		
Lead (mg/L)	0.100					ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010		

Bolded concentrations denote an excursion to the effluent limitations.
ND - Analyte not detected.
J - Estimated value, concentration is between the method detection limit and the reporting limit

TABLE 3
2010 DP-10 EFFLUENT MONITORING RESULTS
BNSF RAILYARD, CLOVIS, NEW MEXICO

Parameter	Effluent Limitation	January 19, 2010 DP10-011910		February 16, 2010 DP10-021610		March 10, 2010 DP10-031110		April 13, 2010 DP10-041310		May 6, 2010 DP10-050610		June 16, 2010 DP10-061610		July 7, 2010 DP10-070710		August 9, 2010 DP10-080910		September 1, 2010 DP10-090110		October 1, 2010 DP10-100110		November 15, 2010 DP10-111510		December 14, 2010 DP10-121410	
		Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit
Monthly Sampling																									
Benzene (ug/L)	100	1.7	1.0	2.3	1.0	2.6	1.0	2.9	1.0	4.2	1.0	0.85J	1.0	1.1	1.0	1.9	1.0	9.1	1.0	2.9	1.0	1.9	1.0	4.5	1.0
Toluene (ug/L)	750	2.0	1.0	3.3	1.0	3.6	1.0	4.2	1.0	7.9	1.0	1.0	1.0	1.2	1.0	2.1	1.0	12	1.0	2.6	1.0	2.7	1.0	7.3	1.0
Ethylbenzene (ug/L)	750	1.5	1.0	2.3	1.0	2.9	1.0	2.0	1.0	4.3	1.0	ND	1.0	ND	1.0	ND	1.0	2.9	1.0	0.46J	1.0	1.1	1.0	3.9	1.0
Total xylenes (ug/L)	620	27	1.0	32	1.0	29	1.0	37	1.0	56	1.0	7.6	1.0	5.5	1.0	13	1.0	73	1.0	16	1.0	21	1.0	53	1.0
1-Methylnaphthalene (ug/L)	1000	150	20	82	10	61	9.9	57	10	110	19	ND	1.9	ND	2.0	5.4	2.0	65	20.0	ND	9.5	25	2.0	44	9.9
2-Methylnaphthalene (ug/L)		65	15	60	8	38	7.4	24	1.5	74	14	ND	1.4	ND	1.5	ND	1.5	25	1.5	ND	7.1	4.3	1.0	26	7.4
Naphthalene (ug/L)		5.7	2.0	10	2.0	18	1.0	13	1.0	23	1.0	ND	1.9	ND	2.0	ND	2.0	ND	1.0	ND	9.5	4.4	1.0	11	2.0
Lead (mg/L)	0.100	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	0.0035J	0.010	ND	0.010	ND	0.010

Bolded concentrations denote an excursion to the effluent limitations.

ND - Analyte not detected.

J - Estimated value, concentration is between the method detection limit and the reporting limit

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TABLE 4
2011 DP-10 EFFLUENT MONITORING RESULTS
BNSF RAILYARD, CLOVIS, NEW MEXICO

Parameter	Effluent Limitation	January 12, 2011 DP10-011211		February 15, 2011 DP10-021511		March 8, 2011 DP10-030811		April 11, 2011 DP10-041111		May 11, 2011 DP10-051111		June 8, 2011 DP10-060811		July 13, 2011 DP10-071311		August 9, 2011 DP10-080911		September 7, 2011 DP10-090711		October 11, 2011 DP10-101111		November 10, 2011 DP10-111010		December 7, 2011 DP10-120711	
		Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit
Monthly Sampling																									
Benzene (ug/L)	100	3.3	1.0	4.6	1.0	4.1	1.0	0.33J	1.0	0.31J	1.0	0.16J	1.0	0.20J	1.0	1.3	1.0	1.2	1.0	3.3	1.0	4.3	1.0	2.3	1.0
Toluene (ug/L)	750	4.2	1.0	15	1.0	6.4	1.0	0.37J	1.0	0.39J	1.0	0.26J	1.0	0.28J	1.0	1.9	1.0	1.4	1.0	5.2	1.0	8.6	1.0	3	1.0
Ethylbenzene (ug/L)	750	2.1	1.0	12	1.0	3.5	1.0	0.17J	1.0	0.19J	1.0	0.38J	1.0	ND	1.0	0.57J	1.0	0.40J	1.0	2.3	1.0	4.0	1.0	2.0	1.0
Total xylenes (ug/L)	620	33	1.0	93	1.0	55	1.0	3	1.0	7	1.0	10	1.0	3.1	1.0	22	1.0	18	1.0	56	1.0	61	1.0	34	1.0
1-Methylnaphthalene (ug/L)	1000	20	4.0	130	15	59	20.0	ND	40	4	2.0	7.3J	7.9	<90	2000	16	2.0	10	2.0	49	20	73	20	31	9.9
2-Methylnaphthalene (ug/L)		4.5	3.0	130	20	22	1.5	ND	30	ND	1.5	ND	5.9	<70	1500	1.6	1.5	1.3J	1.5	21	1.5	66	15	19	1.5
Naphthalene (ug/L)		2.7	1.0	24	20	6.0B	1.0	ND	40	1.2	1.0	ND	7.9	<80	2000	ND	2.0	1.9B	2.0	8.1B	1.0	9.9	2.0	5.0B	1.0
Lead (mg/L)	0.100	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	ND	0.010	0.0032J	0.010	ND	0.010	ND	0.010	0.0035J	0.010	ND	0.010	ND	0.010

Bolded concentrations denote an excursion to the effluent limitations.

ND - Analyte not detected.

J - Estimated value, concentration is between the method detection limit and the reporting limit

TABLE 5
2012 DP-10 EFFLUENT MONITORING RESULTS
BNSF RAILYARD, CLOVIS, NEW MEXICO

Parameter	Effluent Limitation	January 5, 2012 DP-10-010512		February 8, 2012 DP-10-020812		March 12, 2012 DP-10-031212		April 12, 2012 DP-10-041212		May 8, 2012 DP-10-050812		June 12, 2012 DP-10-061212		July 16, 2012 DP-10-07162012	
		Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit
Monthly Sampling															
Benzene (ug/L)	100	ND	1.0	0.52J	1.0	0.31J	1.0	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Toluene (ug/L)	750	ND	5.0	0.61J	5.0	0.45J	5.0	ND	5.0	0.75J	5.0	ND	5.0	ND	5.0
Ethylbenzene (ug/L)	750	1.1	1.0	0.55J	1.0	0.43J	1.0	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Total xylenes (ug/L)	620	10	3.0	5.2	3.0	7.7	3.0	ND	3.0	ND	3.0	ND	3.0	1.4J	3.0
1-Methylnaphthalene (ug/L)	1000	5	0.25	0	0.25	12	0.25	0.064J	0.25	0.059J	0.25	0.11J	0.25	0.11J	0.25
2-Methylnaphthalene (ug/L)		0.44	0.25	0.047J	0.25	1.4	0.25	0.022J	0.25	0.031J	0.25	0.062J	0.25	0.062J	0.25
Naphthalene (ug/L)		0.5	0.25	0.46	0.25	0.68	0.25	0.19J	0.25	0.087J	0.25	0.088J	0.25	0.11J	0.25
Lead (mg/L)	0.100	ND	0.005	0.0056	0.005	ND	0.005	ND	0.005	0.011	0.005	0.0063	0.005	ND	0.025

Bolded concentrations denote an excursion to the effluent limitations.

ND - Analyte not detected.

J - Estimated value below the lowest calibration point. Confidence correlates with concentration.

Attachment 13 – Applicable or Relevant and Appropriate Requirements

Attachment 13 – Applicable or Relevant and Appropriate Requirements

RADIAN CORPORATION

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).

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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.