First Five-Year Review

Lee Acres Landfill
Farmington, New Mexico

October 2009

Prepared By

Bureau of Land Management

Farmington Field Office

BLM

Farmington Field Office • Farmington, New Mexico

First Five-Year Review Memorandum

Lee Acres Landfill Superfund Site
EPA ID# NMD980750020
Farmington, San Juan County, New Mexico

This U.S. Environmental Protection Agency (EPA) memorandum documents the performance, determinations and approval of the Lee Acres Landfill Superfund Site First Five-Year Review, including the attached First Five-Year Review Report prepared by the Bureau of Land Management (BLM).

The first Five-Year Review is required by Section 121(c) of the Comprehensive Environmental Response, Compensation & Liability Act (CERCLA), 42 U.S.C. §9621(c), which requires that a periodic review be conducted no less often than every five years after the initiation of remedial action at sites where hazardous substances, pollutants or contaminants will remain onsite above levels that allow for unlimited use and unrestricted exposure. The triggering action for this statutory first five-year review is the initiation of the remedial action on October 25, 2004. BLM led the five-year review effort and completed it in close cooperation with EPA.

Summary of Five-Year Review Findings

The five-year review for this site indicates that the four remedy actions set forth in the Record of Decision (ROD) and the Remedial Action Work Plan (Work Plan) have been implemented as planned:

1. Construction of landfill cover (capillary barrier cover) with lysimeters. Construction of the landfill cover was completed on September 14, 2005 and has been maintained and monitored according to schedule. The February 2009 monitoring report found the cover is in excellent condition, and all flux measurements from lysimeters to date are significantly below the agreed upon alarm level providing confidence the cover system is working very well.

2. Surface water run-on and run-off controls. The realignment of San Juan County Road 350 was incorporated into the remedial action design. The road provides the surface water run-on and run-off controls by channeling up gradient surface water along an impervious road apron downhill to a culvert that discharges the water off the landfill site.

3. Monitored natural attenuation of ground water. The Remedial Action Work Plan identified seven existing wells to be monitored, and required an additional well to be drilled. The additional well was completed in July 2005. These eight wells were selected based on their ability to provide adequate monitoring coverage of possible contamination flow off of the remediation site. The eight monitoring wells are sampled by the U.S. Geologic Survey. The ROD identified seven

contaminants of concern (COC). Six of the COCs have been below cleanup levels established in the ROD and below maximum contaminate levels (MCL) established by the Safe Drinking Water Act (SDWA) in all wells since 2000. Manganese is the seventh COC listed in the ROD. Manganese has sporadically been detected above the established background level (clean up level) in all monitoring wells except well #68.

4. Institutional controls. In January 1997, BLM withdrew 134.6 acres of public land surrounding and including the landfill from settlement, sale, location or entry as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). This withdrawal remains in effect for 50 years (until 2047).

Actions Needed

Based on the data review, site inspection, interviews and technical assessment, it appears the remedy has been implemented as planned and is functioning as intended by the decision document. No issues concerning the remedy implementation were identified.

The monitoring schedule in the Work Plan requires the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. This required five year monitoring period will be completed in the fall of 2010. After the fall of 2010, EPA will evaluate BLM's recommendation for annual monitoring until such time the site is deleted from the National Priority List (NPL).

Currently all contaminants of concern at the site with the exception of manganese is below clean up standards. Manganese levels in six of eight monitoring wells are at or below the clean up standard. Manganese is regulated by EPA at the Site based upon the enforceable limit specified in the ROD. BLM needs to continue to monitor for manganese until they meet the clean up standard. If all contaminants of concern are below clean up standards including manganese the monitoring frequency will increase to quarterly for a period of eight consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D.

Protectiveness Statement

The remedial actions performed at the site are considered to be protective of human health and the environment in the short-term. Long-term protectiveness will be achieved when manganese values begin to decrease and meet the clean up standard established in the ROD. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes, and reduced the potential mobility of contaminant sources that may remain on the site. The eleventh monitoring inspection of the landfill cover was completed on February 20, 2009. The summary paragraph of the Feb. 20, report stated the cover is in excellent condition. Data from 8 ground water monitoring wells around the site indicate that all contaminants of concern listed in the ROD, satisfy the maximum contaminant levels (MCL) set under the SDWA Act. The

data also shows that manganese is the only contaminant of concern listed in the ROD that failed to comply with the enforceable limits established in the ROD.

Determinations

I have determined that the actions performed for the Lee Acres Landfill Superfund Site are protective of human health and the environment.

Approved By: _____ FOR

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

Date: 10-23-9

CONCURRENCES

First Five-Year Review

For the

Lee Acres Landfill Superfund Site

By: _____ Date: 10/6/09
Sairam S. Appaji, Remedial Project Manager
Superfund Remedial Branch

By: _____ Date: 10/13/09
Henry Parr, Chief
LA/OK/NM Remedial Section

By: _____ Date: 10/20/09
Charles Faultry, Associate Director
Superfund Remedial Branch

By: _____ Date: 10/2/09
Donald H. Williams, Deputy Associate Director
Superfund Remedial Branch

By: _____ Date: 10/23/09
George Malone, Assistant Regional Counsel
Superfund Division, Office of Regional Counsel

By: _____ Date: 10/23/09
Mark Peycke, Chief
Superfund Branch, Office of Regional Counsel

By: _____ FOR Date: 10-23-9
Sam Coleman, Director
Superfund Division

Five-Year Review

Lee Acres Landfill
Farmington New Mexico

Prepared By
Farmington BLM

October 2009

First Five-Year Review

Lee Acres Landfill Superfund Site
EPA ID# NMD980750020
Site ID: 0600911
Farmington, NM

This memorandum documents the United States Department of Interior (DOI) performance, determinations, and approval of the first five-year review for the Lee Acres Landfill Superfund Site performed under Section 121(c) of the Comprehensive Environmental Response, Compensation & Liability Act (CERCLA), 42 United States Code (USC) 9621 (c), as described in the attached Five-Year Review Report.

Summary of Five-Year Review Findings

The five-year review for this site indicates that the four remedy actions set forth in the Record of Decision (ROD) and the Remedial Action Work Plan (Work Plan) have been implemented as planned:

1. Construction of landfill cover (capillary barrier cover) with lysimeters. Construction of the landfill cover was completed on September 14, 2005 and has been maintained and monitored according to schedule. The February 2009 monitoring report found the cover is in excellent condition, and all flux measurements from lysimeters to date are significantly below the agreed upon alarm level providing confidence the cover system is working very well.

2. Surface water run-on and run-off controls. The realignment of San Juan County Road 350 was incorporated into the remedial action design. The road provides the surface water run-on and run-off controls by channeling up gradient surface water along an impervious road apron downhill to a culvert that discharges the water off the landfill site.

3. Monitored natural attenuation of ground water. The Remedial Action Work Plan identified seven existing wells to be monitored, and required an additional well to be drilled. The additional well was completed in July 2005. These eight wells were selected based on their ability to provide adequate monitoring coverage of possible contamination flow off of the remediation site. The eight monitoring wells are sampled by the U.S. Geologic Survey. The ROD identified seven contaminants of concern (COC). Six of the COCs have been below cleanup levels established in the ROD and below maximum contaminate levels (MCL) established by the Safe Drinking Water Act (SDWA) in all wells since 2000. Manganese is the seventh COC listed in the ROD. Manganese has sporadically been detected above the established background level (clean up level) in all monitoring wells except well #68.

4. Institutional controls. In January 1997, BLM withdrew 134.6 acres of public land surrounding and including the landfill from settlement, sale, location or entry as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). This withdrawal remains in effect for 50 years (until 2047).

Actions Needed

Based on the data review, site inspection, interviews and technical assessment, it appears the remedy has been implemented as planned and is functioning as intended by the decision documents. No issues concerning the remedy implementation were identified.

The monitoring schedule in the Work Plan requires that the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. This required five year monitoring period will be completed in the fall of 2010. After the fall of 2010, BLM recommends monitoring the cover annually until site deletion from the EPA National Priority List (NPL).

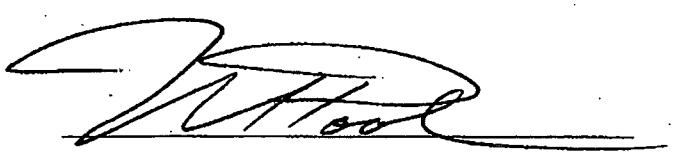
The groundwater monitoring schedule in the Work Plan requires semi-annual monitoring for a period five years after completion of construction. The five year period will be completed in the fall of 2010. The ROD also states that after the contamination levels have dropped below New Mexico State Standards, the monitoring will increase to quarterly for a period of eight consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D. Monitoring will continue as scheduled in the Work Plan. Currently all contaminants of concern except manganese are under established clean up levels. Manganese levels in six of eight monitoring wells are at or below clean up levels. Manganese is regulated by EPA at the Site based upon the enforceable limit specified in the ROD.

Protectiveness Statement

The remedial actions performed at the site are considered to be protective of human health and the environment. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes, and reduced the potential mobility of contaminant sources that may remain on the site. The eleventh monitoring inspection of the landfill cover was completed on February 20, 2009. The summary paragraph of the Feb. 20, report stated the cover is in excellent condition. Data from 8 ground water monitoring wells around the site indicate that all contaminants of concern listed in the ROD, satisfy the maximum contaminant levels (MCL) set under the SDWA Act. The data also shows that manganese is the only contaminant of concern listed in the ROD that failed to comply with the enforceable limits established in the ROD.

Determinations

I have determined that the actions performed for the Lee Acres Landfill Superfund Site are protective of human health and the environment.



10/2/09

Mike Pool
Acting Deputy Director, Bureau of Land Management

Date

Contents

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Acronyms

ARARS.....Applicable or Relevant and Appropriate Requirements
BH.....Borehole
BLM..... .....Bureau of Land Management
BTEX.....Benzene, Toluene, Ethyl benzene, Xylene
CERCLA .....Comprehensive Environmental Response, Compensation, and Liability Act
COC.....Contaminants of Concern
COPC.....Contaminants of Potential Concern
DCE.....Dichloroethene
DOI.....Department of the Interior
EPA..... Environmental Protection Agency
ES.....Executive Summary
FML.....Flexible Membrane Liner
FS .....Feasibility Study
GBR.....Giant Bloomfield Refinery
MCL.....Maximum Contaminant Level
MDL.....Minimum Detection Level
mg/l.....Milligrams per liter (parts per million)
MOU..... Memorandum of Understanding
NCP.....National Contingency Plan
NMED..... New Mexico Environment Department
NMEID.....New Mexico Environmental Improvement Division
NMOCD.....New Mexico Oil Conservation Division
NMWQCC.....New Mexico Water Quality Control Commission
NPL.....National Priorities List
O & M.....Operation and Maintenance
PCE.....Tetrachloroethene
PRG.....Preliminary Remediation Goals
RAO.....Remedial Action Objectives
RI..... Remedial Investigation
RIR.....Remedial Investigation Report
SARA.....Superfund Amendments and Reauthorization Act
SDWA.....Safe Drinking Water Act
TBC ……To Be Considered
TCE …… Trichloroethylene
SVOC .....Semi-volatile Organic Compounds
TMV.....Toxicity, Mobility, and Volume
µg/l.....micrograms per liter (parts per billions)
VOC.....Volatile Organic Compounds

Executive Summary

The first five-year review of the Lee Acres Landfill Superfund Site located in San Juan County, New Mexico, was completed in June of 2009. This site is on the National Priorities List (NPL – EPA ID# NMD980750020). The remedy actions selected in the June 2004, Record of Decision (ROD) included the construction of a landfill cover, water run-on and run-off controls, institutional controls, and monitored natural attenuation of ground water. The remedy actions resulted in landfill contaminants remaining onsite above levels that would allow for unlimited use and unrestricted exposure. The ROD required a statutory review no less often than each five years after the initiation of the remedial action as defined in the Work Plan to ensure that the remedy is, or will be, protective of human health and the environment. The results of this first five-year review indicate that the remedy actions completed at the site are protective of human health and the environment. The initial construction of the landfill cap and follow-up actions performed appear to be functioning as designed. The site has been maintained sufficiently to protect the landfill cover that has been constructed over the remaining waste. No deficiencies were noted that currently impact the protectiveness of the remedial actions.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name Lee Acres Landfill		
EPA ID: NMD980750020		
Region: EPA Region 6	**State:** New Mexico	**City/County:** Farmington/San Juan
SITE STATUS		
NPL status: □ X Final __ Deleted __ Other (specify)		
Remediation status (choose all that apply): __ Under Construction __ Operating. X Complete		
Multiple OUs?* __ YES X NO	**Construction completion date:** 9 / 14 / 2005	
Has site been put into reuse? __ YES X NO		
REVIEW STATUS		
Lead agency: □ _ EPA _ State _ Tribe X Other Federal Agency: Bureau of Land Management (BLM)		
Author name: Barney Wegener		
Author title: Remedial Project Manager	**Author affiliation:** BLM	
Review period: 10 / 25 / 2004 to 10 / 25 / 2009		
Date(s) of site inspection: 2 / 19 / 2009		
Type of review: Statutory		
Review number: □ X 1 (first) __ 2 (second) __ 3 (third) __ Other (specify)		
Triggering action: Actual Remedial Action Start		
Triggering action date: October 25, 2004		
Due date *(five years after triggering action date)*: October 25, 2009		
Issues: Based on the data review, site inspection, interviews and technical assessment, it appears the remedy has been implemented as planned and is functioning as intended by the decision documents. No issues concerning the remedy implementation were identified.		

Recommendations and Follow-Up Actions:

1. The monitoring schedule in the Record of Decision (ROD) and Remedial Action Work Plan requires that the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. This required 5 year monitoring period will be completed in the fall of 2010. BLM recommends that the landfill cover be monitored semi-annually through 2010, and then annually until other monitoring requirements may be established in conjunction with site deletion from NPL.

2. The groundwater monitoring schedule in the Work Plan requires the semi-annual monitoring of eight specified wells for a period five years after completion of construction. This five year monitoring period will be completed in the fall of 2010. BLM recommends continued groundwater monitoring through 2010, and then consulting with EPA to establish monitoring requirements to facilitate removal of the site from the National Priorities List.

3. The Work Plan also states that after the contamination levels have dropped below New Mexico State Standards, the monitoring will increase to quarterly for a period of 8 consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D. BLM recommends that after the contaminant levels attain the enforceable limits set in the ROD, and the ground water monitoring requirements in the ROD are completed in 2010, a review of the NMAC 20.6.2.4103 D regulations will be completed. Upon completion of the review, BLM will either initiate quarterly monitoring, or notify NMED of BLM's review findings and BLM's intent to consult with EPA to establish monitoring requirements to facilitate removal of the site from the National Priorities List.

Protectiveness Statement:

The remedial actions performed at the site are considered to be protective of human health and the environment. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes, and reduced the potential mobility of contaminant sources that may remain on the site. The eleventh monitoring inspection of the landfill cover was completed on February 20, 2009. The summary paragraph of the Feb. 20, report stated the cover is in excellent condition. Data from 8 ground water monitoring wells around the site indicate that all contaminants of concern listed in the ROD, satisfy the maximum contaminant levels (MCL) set under the SDWA Act. The data also shows that manganese is the only contaminant of concern listed in the ROD that failed to comply with the enforceable limits established in the ROD.

* ["OU" refers to operable unit.]

Lee Acres Landfill Superfund Site
Farmington New Mexico
First Five-Year Review Report

Introduction

The Farmington Field Office of the Bureau of Land Management (BLM) has conducted a statutory First Five-Year review of the remedial actions implemented at the Lee Acres Landfill Superfund Site during the period of October 2005 through October 2009. 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 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.

BLM is preparing the Five-Year Review report pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), §121 and the National Contingency Plan (NCP). 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 level 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 remedy selected for Lee Acres Landfill in the ROD resulted in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. The triggering action for this statutory review is the initiation of the remedial action on October 25, 2004.

2.0 Site Chronology

Date	Event
May 1, 1962	Lee Acres officially opened
Apr. 25, 1980	San Juan County Development Plan for landfill includes provisions for combined sludge and dead animal pit.
Nov. 10, 1980	NMEID found refuse pit almost full and not compacted or covered at required frequency. Suggested either additional land for expansion or new location.
Aug. 24, 1981	NMEID submits to EPA Potential Hazardous Waste Site Inspection Report, reporting surface impoundment with liquids, sludge, oily wastes, drilling fluids and drilling muds.

Sept. 9, 1981	NMEID reported noncompliance regarding required 2 feet of final cover over original landfill area.
Apr. 18, 1985	Lagoon breach and vapor release incident occurred. Eleven people treated for hydrogen sulfide poisoning.
May 8, 1985	BLM compliance exam reported sludge pit was fenced and a "No Dumping" sign posted.
Jan. 14, 1986	NMEID inspection reported the liquid waste lagoon was 96 to 97% evaporated
Apr. 24, 1986	NMEID inspection reported the liquid waste lagoon was completely covered with soil.
Apr. 25, 1986	Lee Acres Landfill officially closed by BLM suspending leases, except for a 5 acre transfer station.
Oct. 21, 1986	NMEID Administrative Order issued for BLM to provide water to residents, and prepare plans to investigate, cleanup, and monitor ground water.
Nov. 5, 1986	BLM begins bottled water delivery to 13 identified residents.
Dec. 1986	BLM fenced landfill to prevent direct contact.
Dec. 24, 1986	BLM and Lee Acres Water Users Assoc. enter agreement to permanently hook up Lee Acres residents to the community supply system.
1987	Lee Acres residents hooked up to community water system.
March 1989	BLM conducts preliminary investigation.
Dec. 19, 1989	Clean Water Act Sec. 404 nationwide permit received for arroyo erosion control construction.
Aug. 28, 1990	Lee Acres Landfill placed on the National Priorities List by EPA.
Sept. 13, 1991	CERCLA 107 letters issued by EPA to BLM, San Juan County and Giant Bloomfield Refinery.
Jan. 1993	BLM, EPA and NMED enter into a technical MOU for completion of the Remedial Investigation.
Sept. 1993	Final Remedial Investigation Report.
May 19, 1995	EPA and NMED approve Remedial Investigation.
May 8, 1996	EPA and NMED approve Feasibility Study.
Sept. 1996	EPA and NMED approve Proposed Plan

Nov. 16, 1996	Public review and comment period completed.
July 23, 2004	ROD signed by EPA & DOI
July 23, 2004	Inter Agency Agreement (IAG) between EPA and DOI signed.
Sept. 27, 2004	Remedial Design approval by EPA & NMED
Oct. 21, 2004	Design specification change from 9-inch to 15-inch layers for soil cover lifts approved by EPA & NMED.
October 25, 2004	Site preparation of site roadway and landfill site.
October 26, 2004	Gradation tests for gravel admixture and capillary barrier approved by BLM contract Consultant.
November 1, 2004	Removal of pilot cap and area leveled.
November 17, 2004	County Road 5569 right-of-way work begins
December 8, 2004	Southeast (small) cap work started.
December 15, 2004	Southeast (small) cap work completed.
Dec.20, 2004 – Jan. 25, 2005	Inclement weather delays significant work progress at Lee Acres.
February 2, 2005	Main cap work began with capillary gravel break
February 3, 2005	Lysimeters installed over northern & southern lagoons
February 7, 2005	Site visit by BLM contract consultant.
February 9, 2005	Site visit by EPA.
February 10, 2005	Placement of separator Geotextile started.
February 15, 2005	Site visit by NMED
March 1, 2005	Design specification change from 15-inch to 30-inch layers for soil cover lifts approved by EPA & NMED.
March 10, 2005	30-inch soil cover competed.
March 14, 2005	Rock Armoring of sides slopes begins.
March 23, 2005	Preparation of 30-inch soil lifts for erosion resistant layer.
March 24, 2005	Site visit by BLM contract consultant.
March 28, 2005	Placement of erosion resistant layer (50/50 blend) begins.
April 1, 2005	Erosion resistant layer (50/50 blend) completed.
April 6, 2005	Topsoil application to side slopes of road right-of-way.
April 14, 2005	Culvert drainage work completed.
April 26, 2005	Site visit by EPA
May 2, 2005	County Road 350 ready for road base and paving.
July 21, 2005	Site visit by NMED
August 25, 2005	New Monitoring well drilled and completed
September 1, 2005	CR 350 road completed and open to traffic
September 14, 2005	Lee Acres reseeding completed.

Lee Acres Area Map

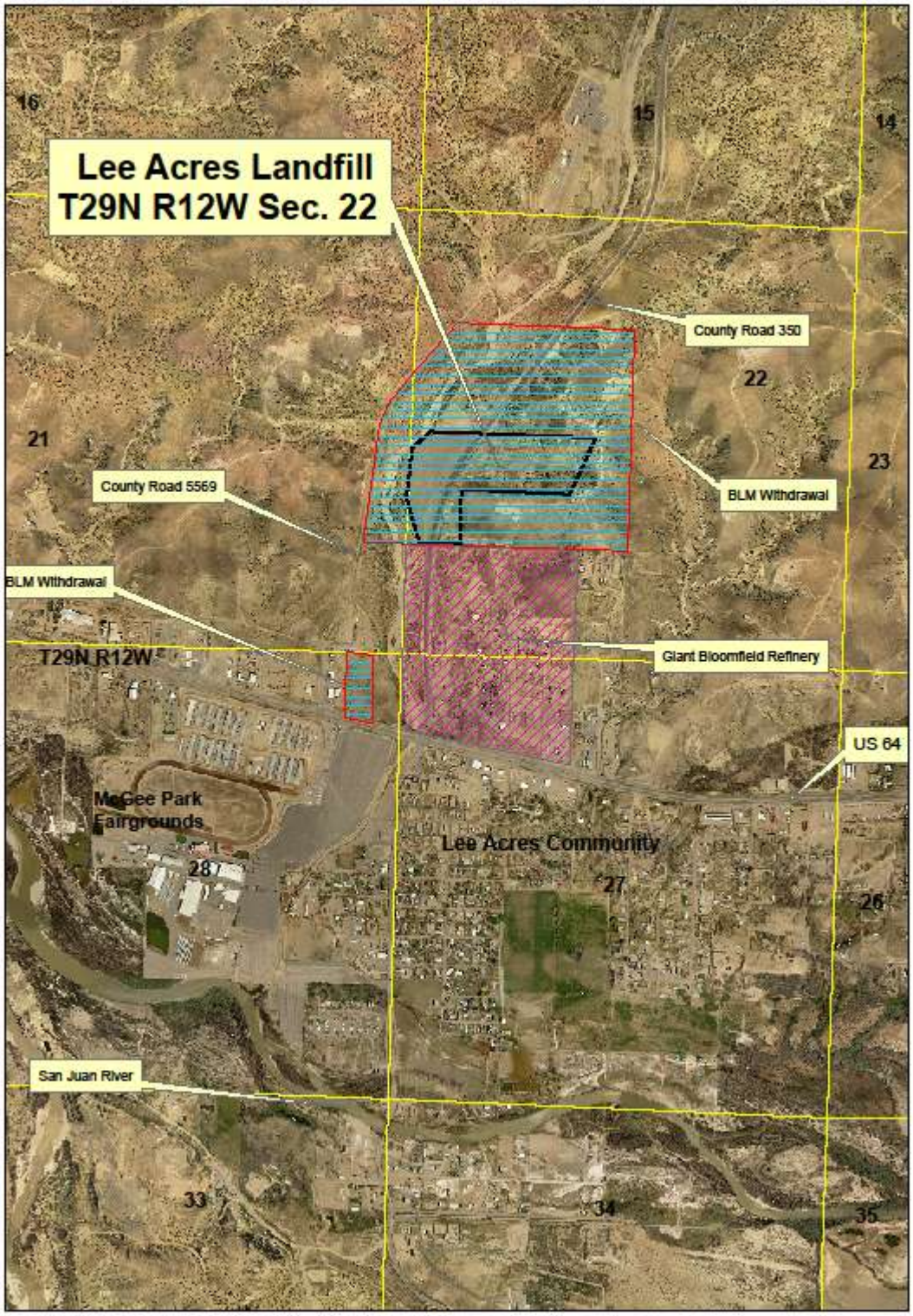


Figure 1

3.0 Background

The Lee Acres Landfill is approximately 4.5 miles east of Farmington, New Mexico, consisting of nearly 60 acres of federal land located in San Juan County. San Juan County is located in the San Juan Basin, an asymmetrical syncline consisting of Quaternary to Cretaceous aged alluvium, sandstone, siltstone, shale, limestone, and coal. The climate of the area is classified as arid continental, characterized by cool, dry winters and warm dry summers. The large distance from any source of oceanic moisture creates a climate of abundant sunshine and large diurnal variations in temperature. The soils are mainly sandy loam and loamy sands derived from sandstone and shale parent materials.

The landfill originally consisted of 20 leased acres issued in 1962 for the operation of a municipal solid waste landfill by San Juan County. An additional 40 acres was leased in 1980 expanding the land fill to it present size of 60 acres (Figure 1).

After acquiring the additional acreage, San Juan County, with the knowledge of the New Mexico Environmental Improvement Division (NMEID) and Bureau of Land Management (BLM), expanded the use of the landfill to allow the disposal of liquid waste. Containment berms were built and lagoons were established and referred to as the northern and southern lagoons.

In 1985, during routine maintenance activities the berm of the northern lagoon was breached, causing a release of the liquid contents and hydrogen sulfide gas. A resident along with responding emergency personnel were overcome by the hydrogen sulfide gas and subsequently hospitalized, and later, released. The lagoon was aerated and treated chemically to neutralize the hydrogen sulfide and stabilize other chemicals by the New Mexico Environmental Improvement Division (NMEID), the predecessor to the NMED. The landfill was immediately closed to liquid waste disposal and later closed to solid waste disposal in 1986. The site was stabilized and covered with clean soil up to a depth of 4 to 15 feet. The BLM conducted a Preliminary Investigation in 1988. In 1990, the Environmental Protection Agency (EPA) placed the Lee Acres Landfill on the National Priorities List (NPL) as EPA ID# NMD980750020.

3.1 Physical Characterisitics

The Lee Acres Landfill is in the eastern portion of San Juan County, a dissected high plateau within the Navajo Section of the Colorado Plateau physiographic province. This high plateau is dissected by the San Juan and Animas Rivers that originate in the San Juan Mountains of southern Colorado, coalesce near Farmington, and flow west to the Colorado River. The landfill is located in the southern drainage basin of the interfluvial ridge between the two rivers. The intermittent surficial waters from the area drain through an unnamed arroyo system that joins the San Juan River south of the Lee Acres subdivision.

The 60-acre landfill can be divided into two portions. The eastern 40 acres is sublain by tertiary Nacimiento Formation claystone/siltstone facies interfingered with Nacimiento sandstone facies that forms the low permeable barrier to bedrock aquifers. This portion of the landfill was generally used for solid waste disposal and dead animal pits. The western 20 acres of the landfill is underlain by quaternary alluvium classified as unconsolidated silty sand to sandy gravel. The

thickness of the alluvium, from ground surface to bedrock, is up to 60 feet near the center of the channel and the depth to water is 34 to 47 feet. Alluvial ground water is present beneath approximately 8 acres along the western edge of the landfill, but not the eastern portion of the landfill.

3.2 Hydrology

Quaternary alluvium forms an unconfined aquifer. It is poorly to moderately sorted, fine-grained to coarse-grained sands, with some gravels and cobbles. Unconsolidated silt and clay lenses are common south of U.S. 64 , where the unnamed arroyo channel alluvium mixes with San Juan River deposits. The unconfined aquifer was defined during the RI because it is bounded on the east by bedrock and the saturated zone ends with no confining feature on the west or above the ground water. This type of configuration is, by geologic definition, an unconfined aquifer. There are no known beneficial uses of this aquifer; however, it is a potential drinking water source. Pursuant to Section 7.28 of the Rules and Regulations Governing Drilling of Wells and Appropriation and Use of Ground Water in New Mexico, the unconfined alluvial aquifer is part of the San Juan Underground Water Basin. The New Mexico Water Quality Control Commission Regulations 3101 (A) classify all ground water with an existing total dissolved solids concentration less than 10,000 milligrams per liter as protected.

The western edge of the landfill is underlain by an unconfined alluvial aquifer. The aquifer is bound on both sides by the margins of an incised bedrock channel which is approximately 600 feet wide in the area near the landfill. Ground water in the alluvial aquifer moves southward at a rate of approximately 0.17 feet per day (62 feet/year), based on the hydraulic data collected in 1993. Farther south, the saturated alluvium interfingers with the San Juan River deposits and is not bound by the bedrock channel. The alluvium is comprised of poor to moderately sorted, fine to medium sands with some gravel and cobbles. Unconsolidated silt and clay lenses are common. The underlying regional bedrock aquifer is unaffected by the contamination from the Lee Acres Landfill site.

Ground water in the unnamed arroyo alluvial aquifer flows from north to south toward the San Juan River within a paleochannel in the bedrock. South of U.S. 64, ground water is no longer contained within the incised unnamed arroyo bedrock channel where the alluvium interfingers with San Juan River terrace and flood plain deposits. In this area, ground water from the unnamed arroyo alluvium discharges and mixes with the ground water of the San Juan River Valley. Most of the domestic, municipal, and agricultural water in the San Juan Basin comes from wells completed in the Quaternary surficial valley deposits or underlying sandstones. Recharge is derived from upstream alluvial aquifer flow and infiltration from meteoric precipitation. Infiltration from the fire water storage ponds southeast of the landfill and the landfill liquid waste lagoons contributed to alluvial aquifer recharge in the past. These sources were later drained, and no longer impact the alluvial aquifer.

Horizontal gradients in the alluvial aquifer range from 0.004 feet per foot (feet/ft) to 0.014 feet/ft. The gradients are steeper in the northern portion of the study area and generally decrease toward the south, the direction of the ground water movement as shown in Figure 2.

Saturated Alluvium Extent and Potentiometric Surface Map

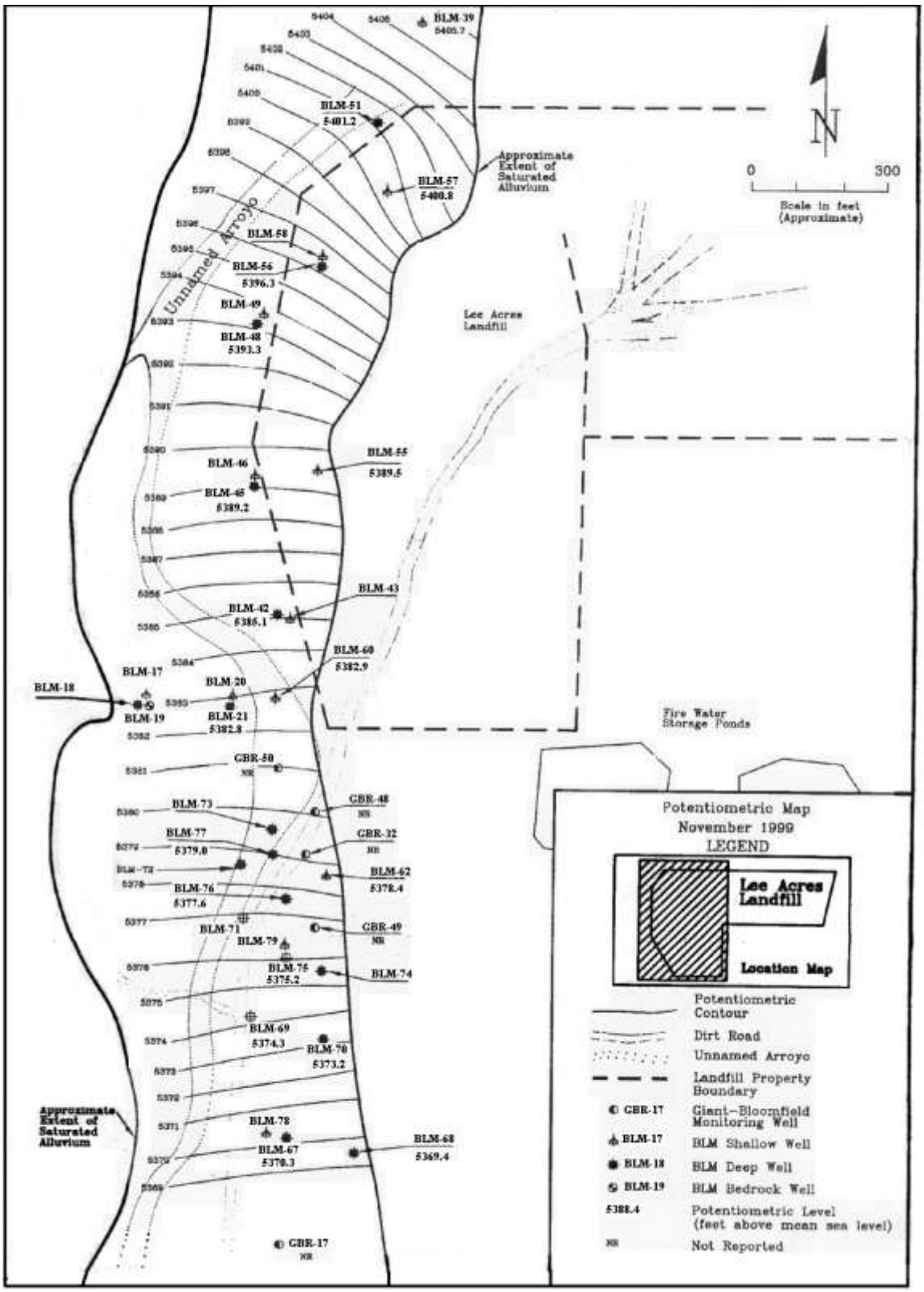


Figure 2

3.3 Land and Resource Use

In this part of San Juan County, much of the land is publicly owned, open rangeland. Several governmental agencies, industries, developers, and private citizens own or lease land within the original study area for the site. The original study area (circa 1986) was significantly larger than the site is now. It was re-defined in 1993 for the RI. No Indian reservations, tribal lands, or railroad land grants are within the study area. Residential, commercial, and industrial developments are concentrated in the incorporated municipalities of Aztec, Bloomfield, and Farmington, and adjacent to the transportation corridors between these towns. The major vehicular transportation route in the vicinity of the former landfill is U.S. Highway 64, also known as the Bloomfield Highway. The highway is located approximately ½ mile south of the landfill boundary.

The land in the region of the study area is used predominantly as open rangeland for livestock and wildlife. It is also used for: 1) industrial purposes by the Giant-Bloomfield Refinery (GBR), and by the El Paso Natural Gas Substation, which is north of the study area; 2) residential purposes south of the study area and north of the San Juan River; and 3) public recreational purposes at the San Juan County Fairgrounds southwest of the study area.

The rangeland vegetation in the area is not well suited to supporting large numbers of livestock; approximately 12 acres are required to feed one mature cow and calf for one month (one animal-unit-month). Oil and natural gas wells are present near the landfill. A north to south trending natural gas pipeline is located approximately 500 feet west of the landfill site. No public schools, prisons, or hospitals are within three miles of the site. The nearest educational facility is a private school operated by the Mennonite community approximately one mile north of the landfill. Future use of this area is expected to remain much the same as it is now, with the exception of a possible county road expansion.

The landfill is surrounded on the north, east and west by undeveloped property. GBR is located south of the landfill, and the GBR property is bounded on the south by Highway 64. South of Highway 64, there is a residential area, the Lee Acres Subdivision, which extends to the San Juan River. The San Juan River is about one mile south of the Lee Acres Landfill.

3.4 History of Contamination

Based on historical records and field sampling, soil investigations at the landfill identified four major areas that are either known or potential contaminant source areas that pose a threat to ground water. The former northern and southern liquid waste lagoons have been identified as known contaminant source areas. Two other potential contaminate sources were identified in the southern portion of the landfill, and may have been solid waste disposal areas.

Soil samples were collected from both the vadose and saturated zones during the initial stage of the RI. Details of the soil sampling programs are found in the RI. The landfill is estimated to contain approximately 800,000 cubic yards of contaminated soil and waste. Waste types encountered within the landfill consist of common household waste and various types of construction debris. Typical types of household and industrial wastes that contain many of the

chemicals listed below include paint thinners, grease and oil strippers and cleaners, pesticides, general cleaning chemicals, dry cleaning chemicals, carburetor cleaners, used oil from automotive and heavy equipment, kitchen and restaurant cleaners and grease, oil field wastes, spent copier and toner cartridges, and many other types of materials. It is probable that many of these products or their containers were placed in both lagoons, as well as other parts of the landfill during the period from 1974 through 1986.

The following methods for soil testing at the Lee Acres Landfill were used during the RI in 1993 and earlier. Samples were collected during borehole installation and from well installation. Soil samples from boreholes BH 01 through BH 39 and wells BLM 39 through BLM 66 were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/PCBs and metals using EPA methods 8010, 8020, 8270, 8080 and TCLP. Soil samples from boreholes BH 40 through BH 53 and well bores BLM 67 through BLM 79 were analyzed for VOCs, metals, chloride, and sulfate.

Soil samples collected for the RI in 1990 identified chlorinated and non-chlorinated VOCs, SVOCs, and pesticides in the subsurface above the method detection limits (MDLs). Chlorinated VOCs, common in solvents, were found in soil samples including 1,2-*trans*-dichloroethene (1,2-*trans*-DCE), tetrachloroethane (PCE), trichloroethene (TCE), trichloromethane, dichloromethane, and other constituents in very low concentrations. During the 1990 sampling event, 1,2-*trans*-DCE was detected in one soil sample collected in the landfill and in two samples collected off-site. Other VOC contaminants detected in vadose zone soils on and south of the landfill included TCE, PCE, and petroleum, gasoline, and oil field wastes such as benzene, toluene, ethylene and xylene (BTEX) compounds. On the site, the highest concentrations of BTEX were found in the region of the former northern liquid waste lagoon and east of the northern lagoon. The majority of the VOC compounds are indicative of solvent and stripper well wastes, while the BTEX compounds are related to petroleum hydrocarbon wastes. Chlorinated VOCs were found in relatively low concentrations less than 10 micrograms per kilogram (µg/kg) in the landfill. The highest concentration (252,600µg/kg) was found in the northern lagoon. Areas outside the lagoon, but adjacent to it ranged in concentration from 30 to 51 µg/kg.

Pesticide concentrations ranged from 5.7 µg/kg to 405 µg/kg. These sites were very localized in the borehole grid, predominantly in the southwestern portion of the landfill. SVOCs, predominantly *bis*(2-ethylhexyl)phthalate and dichlorobenzene were detected in landfill soils in concentrations at or near the minimum detection level (MDLs). The highest concentrations of SVOCs in the soils were found just inside the south landfill entrance, near the former southern liquid waste lagoon, and in the eastern 40-acre portion of the landfill. The highest concentrations of pesticides were at or near MDLs. They were located in soil samples from the eastern and southern portions of the landfill.

3.5 Initial Response

On April 18, 1985, the Farmington field office of the NMEID received information that a disposal pit at the Lee Acres Landfill had breached. The incident extended from April 18 to May 3, 1985. The NMEID incident report is not specific as to which lagoon breached, but the

description suggests that it was the north lagoon. The area was sealed off, the breach was repaired, and sampling activities were performed. Eleven people were treated and released for symptoms of hydrogen sulfide poisoning. The NMEID Emergency Response staff from the NMEID Hazardous Waste section responded to the incident: coordinated the onsite activities with assistance from the NMEID Farmington field office. Additional agencies also responded to the incident. The Occupational Health and Safety Bureau provided monitoring support; the Office of Epidemiology evaluated health effects; the Scientific Laboratories Division performed laboratory analyses; and the San Juan County Road and Fire Departments assisted with security, sampling, and heavy equipment.

The lagoon was aerated and treated chemically to neutralize the hydrogen sulfide and stabilize other chemicals by the New Mexico Environmental Improvement Division. The landfill was immediately closed to liquid waste disposal and later closed to solid waste disposal in 1986 and the site was covered with clean soil up to a depth of 4 to15 feet.

3.6 Basis for Taking Action

In 1986, volatile organic compounds (VOCs) were found at concentrations greater than the associated maximum contaminant levels (MCLs) in samples collected from three domestic water supply wells in the Lee Acres subdivision located down-gradient from the landfill and the Giant Bloomfield Refinery. Even though the source of the contamination was not linked to the Lee Acres Landfill, and BLM did not assume responsibility for the contaminants, the BLM agreed to connect 13 residents in the subdivision, who were using private drinking water wells, to a municipal water supply. During the construction of the connections, BLM provided those residents with at least 8,700 gallons of bottled water. The hookups were completed in 1987.

In January 1993, BLM developed a technical working group to complete the Remedial Investigation (RI), the Feasibility Study (FS), and the Proposed Plan (PP). The RI was approved by EPA in May 1995, and the FS was approved in May 1996. Subsequently, the PP was approved by the EPA in September 1996. The public review and response period was completed in November 1996 with no comments received. Information from the RI was used to identify seven contaminants of concern (COC) within the ROD (Table 1). The basis for taking remedial action is to prevent further contamination of ground water from leaching of contaminants that may exist in the landfill soils, and to eliminate all possibility of human and ecological exposure to contaminated soils and ground water.

4.0 Remedial Actions

The Record of Decision identified four components of selected remedy:

- Landfill cover (capillary barrier cover) with lysimeters
- Surface water run-on and run-off controls
- Monitored natural attenuation of ground water
- Institutional controls, in the form of withdrawal of site by BLM

4.1 Landfill Cover and Surface Water Controls

The 1996 Proposed Plan required the development of a pilot project to test the effectiveness of the proposed capillary barrier cap (landfill cover). If the test was successful the landfill cover was to be the selected remediation for the Lee Acres Landfill. The pilot study began in August 1997 and was completed in March 1999. After more than three years of monitoring and evaluation, the landfill cover was declared to be a success. Based on the successful test, the landfill cover was a selected remedy for the site.

The landfill cover is designed to prevent future leaching of contaminants by minimizing percolation of surface moisture into the ground water through the contaminated trash layers and the lagoon sediments that are still in place in the landfill.

The landfill cover construction consisted of two inter-related actions:

1) Closure and capping of landfill soils to prevent leachate using a capillary barrier design provided by the Department of Energy's Sandia National Laboratory and,
2). Realignment of County Road 5569 to create County Road CR 350, which incorporated surface water run-on and run-off controls to prevent storm water run-on from reaching the landfill cover (figure 3).

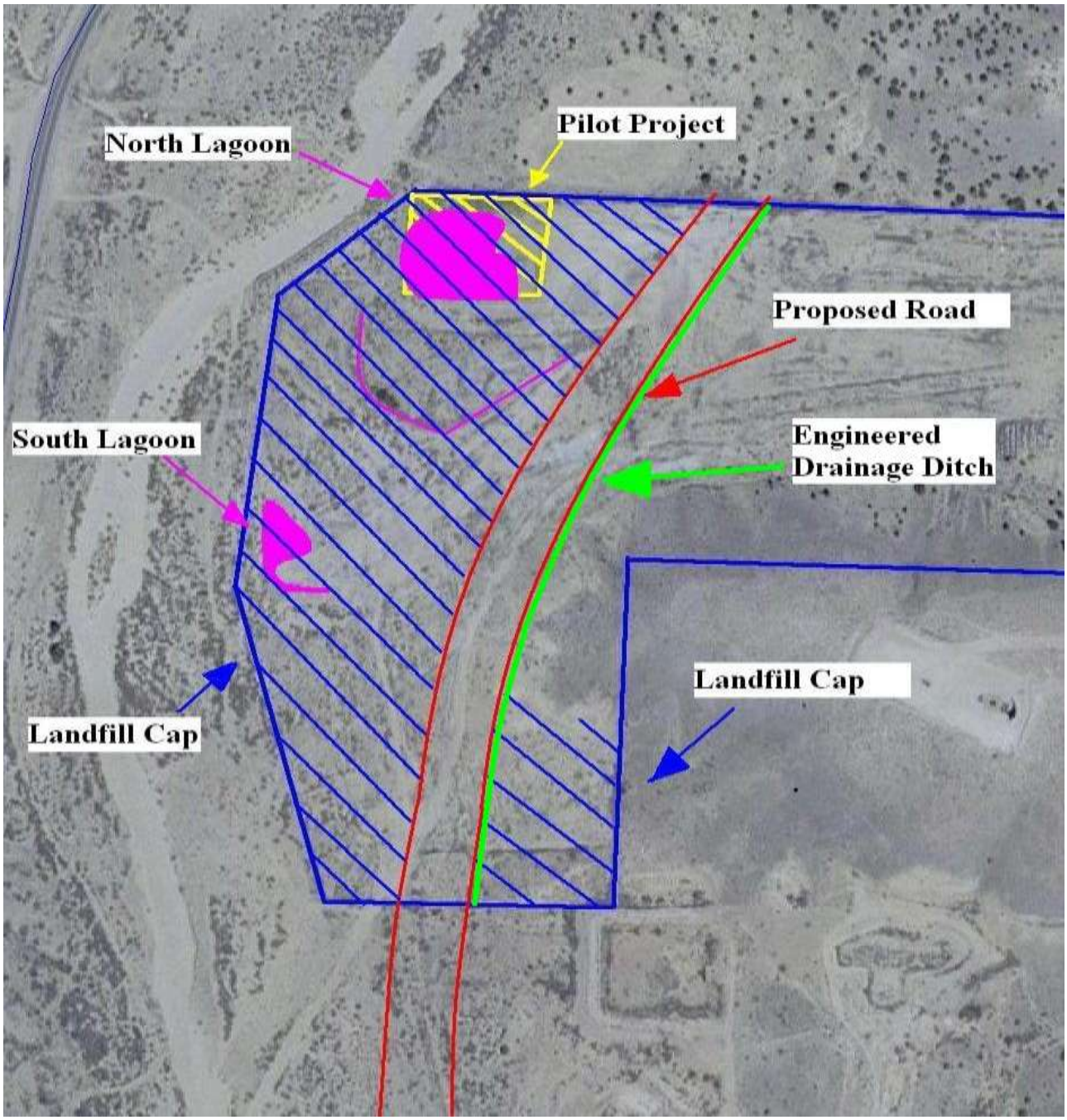
4.1.1 Construction

Construction of the Capillary Barrier began with general site construction requirements performed by the San Juan County Public Works Department (SJC). These consisted of temporary environmental controls for erosion and sediment control, dust abatement, and spill prevention. Site clearing followed next with the grubbing trees, brush and herbaceous vegetation from the area.

The original Pilot Cap was removed and the area leveled and compacted with a smooth roller compactor. Removal of the Pilot Cap was deemed necessary over concerns that area where the Pilot Cap and new cap join could have the potential to create pathways for moisture to infiltrate downward. Removing the Pilot Cap and constructing a new capillary barrier over the entire western portion of the landfill would create a smooth, continuous and homogenous barrier over the entire area. At the completion of this phase, the region received record precipitation amounts that resulted in many construction delays due to unexpected wet conditions. This put construction of the cap behind schedule.

The southeast corner of the landfill was identified as a potential contaminant source area. Based on analytical results, it was believed this area may have been used as a lagoon area or solid waste disposal site. Initially, construction of the capillary barrier was to be completed on the western and southeastern portion of the landfill in one continuous operation. However, the region continued to experience repeated precipitation events delaying the work schedule. During a break in the weather, SJC began and completed construction of the southeastern capillary barrier in the course of a few days. The capillary barrier over the larger western portion of the landfill was constructed from February 2005 through April 2005.

The capillary barrier was constructed in phases. The first phase consisted of the installation of an uncompacted 6 inch gravel bottom layer. The capillary barrier is formed by the contrast in unsaturated hydraulic properties between the course gravel layer and the overlying fine soil layer and is referred to as the capillary break.



Map of Construction of the Landfill Cover and County Road 350

Figure 3

Soil Fraction	Sieve Size	Specification
Fines	<0.075 mm (#200)	<2%
Sand	<0.425 mm (#4), >0.075 mm	<15%
Gravel	>4.75 (#4), <19 mm (3/4)	>85%
Max Size	<50mm	100%

The gradation tests for the course gravel were reviewed and deemed acceptable by Mr. Steve Dwyer, who designed the capillary barrier and served as the BLM contract Consultant.

The Remedial Action Work Plan & Remedial Design called for installation of two lysimeters to monitor the performance of the cap. One lysimeter was installed directly above the northern lagoon with the second installed above the southern lagoon. The placement of these lysimeters was based on the assumption the lagoons were presumed to be the direct cause of contaminant increases in the groundwater and the areas of most concern with regard to preventing further infiltration into the existing plumes. At this time there is no accepted performance standard for landfills but an annual influx of 1.3 mm/year has been chosen as an initial alert level for determining the effectiveness of the landfill cap. The 1.3 mm/year value was chosen based on this value being used at the Rocky Mountain Arsenal Superfund site in Denver.

The lysimeters used for this project consisted of double wall, double bottom carbon steel tanks (10 feet in diameter and 2 feet high). The tanks have a single 2-inch outlet in the bottom of the tank adjacent to the sidewall for draining purposes. The tanks were placed on bed material

consisting of fine washed sand. The tank and pipe fittings were inspected and tested for water tightness. Following the inspection and site test, the top of the tanks were left open and filled with clean capillary gravel to avoid passing fines into the PVC drain line. The top of the tanks filled with gravel matches the top of the adjacent capillary barrier coarse layer to ensure a continuous capillary break was formed. A gate valve and value box was installed adjacent to the tanks to open and close the 2-inch drain lines. The end of the drain lines are equipped with caps to prevent dirt, debris and foreign materials from entering and plugging the drain lines. The lysimeter drain line caps are removed and the valves opened to allow for the collection of any water collected in the lysimeters during post-construction completion monitoring activities.

The next phase of work involved the installation of a geotextile filter fabric over the completed gravel layer. The fabric was designed to separate the overlying fine soil from the underlying gravel. This fabric also serves as an additional capillary barrier break. The geotextile was supplied in 12.5 foot wide rolls approximately 360 feet long with a thickness of 50 mm. The material was rolled out using a work release prison crew. Each roll covered approximately 500 square feet. To prevent tearing or puncturing, no vehicle traffic was allowed on the material. The material was overlapped approximately one foot to ensure an adequate overlap. SJC covered the material with soil within five days to prevent long term exposure to UV radiation from sunlight and ambient exposure.

The next phase consisted of placement of the fine soil layer designed to store infiltrated water. SJC hauled in the soil from a nearby borrow site. Initially, the construction plan called for 9-inch lifts compacted to 100 to 112 lbs/ft^3. The total thickness of the soil cover was to be 30 inches. However, SJC still experienced over compaction using the 15-inch lifts approved in the October 2004 design specification change. The soil was still becoming over compacted from the weight of equipment necessary to spread the soil. Geomat Inc. on behalf of SJC requested a specification design change to use a single 30-inch layer instead of two 15-inch lifts. The compaction and moisture content of the soil in the bottom 15 inches were checked by a nuclear density meter. The proposed modification was reviewed and approved by both Remedial Project Managers with the Environmental Protection Agency (EPA) and New Mexico Environmental Department (NMED).

The next phase after completion of the 30-inch fine soil layer involved placement of a 6-inch thick erosion layer. The erosion layer was a blend of the native soil used in the 30-inch soil cover and gravel. This application is also referred to as the 50/50 blend. The intent of this layer

was to minimize erosion of the cover. The gradation test for the gravel was reviewed by Mr. Steve Dwyer and was found to be marginally acceptable for this task. Before this stage could be started the design specification called for the soil cover to be scarified. Scarification is essential to insure a good bond between the soil cover and the erosion barrier. The mixture was spread evenly in one lift to a thickness of 6-inches.

Coble (four to five inches in diameter) was placed around the northern, western and southern perimeter of the capillary barrier to serve as a rip rap armament layer to protect against erosion.

The rip rap was placed on outer slopes of the cap at a slope not to exceed a 6:1 ratio. Each rip rap installation was underlain by a geotextile separation material. At the eastern edge of the cap a v-drainage ditch was constructed where the cap adjoins the slope base of County Road 350. The drainage ditch captures runoff from the road slope and diverts it offsite.

The final phase of the cover construction included seeding with a native vegetation seed mix. .

In January 1997, the BLM withdrew 134.68 acres of public land (see fig.1) surrounding and including the landfill from settlement, sale, location and entry as described in Public Land Order No. 7234 (62 Fed. Reg. 2177, January 15, 1997). The withdrawal does not prohibit all activities on the withdrawn land and at BLM's discretion; BLM may choose to authorize activities that will not disturb the integrity of the containment system. The BLM has determined that realignment of County Road 350 and placement of fence barriers isolating the road from the Lee Acres landfill and capillary barrier would not jeopardize the integrity of the remedial design.

The realignment of County Road 350 was being designed so the location of the road would not adversely affect the capillary barrier cap.

The placement of the road actually serves to intercept runoff from the east and divert it around and away from the landfill via ditches and two 24-inch culverts located beneath the roadway at the north and south ends of the landfill site.

The ongoing road construction was slightly behind schedule due to unforeseen delays in weather and site conditions. The road was completed on September 1, 2005. Reseeding was completed on September 14, 2005.

The eastern edge road drainage channel construction plans described using an 80 mil geomembrane over laid with 4-inch pea gravel. This design is illustrated in the Remedial Design construction drawing Sheet 5 of 7, Detail B. SJC requested a change in design which was discussed at the Lee Acres Landfill site on March 24, 2005 with Mr. Steve Dwyer, Geomat Inc., representing SJC, and BLM. However, another job site visit was held on July 21, 2005 involving SJC, Geomat, BLM and Mr. Steve Dwyer, to discuss the difficulty the SJC would encounter to safely and efficiently operate the necessary equipment to complete the March 30, 2005 design change. As a result a new design change was prepared consisting of the drainage channel be under laid with geotextile, followed by 2½-inches of asphalt and seal oil. This design is based on runoff calculation conducted by Cheney-Walters-Echols, Inc. This design will handle and divert runoff around and away from the landfill. However, any erosion will be handled by SJC as part of its ongoing operation and maintenance for the site. Persistent erosion problems will require a re-design and construction appropriate to correct the issue. The Remedial Action Work Plan & Remedial Design required the placement of barrier fencing isolating the Lee Acres Landfill from the road. The barrier fence was installed on the eastern side of the landfill in September 2004. During a site visit by BLM and NMED personnel, in December 2004, it was determined that a portion of the eastern fence required realignment. Old aerial photograph reveals trenching and other landfill activities took place in an area currently not protected from public entry by the barrier fence. NMED requested that the barrier fence be realigned to protect this area from public entry. The fence correction was completed in late August, 2005, before the roadway was open to public traffic.

4.1.2 Landfill Cover Monitoring

The Remedial Action Work Plan established the monitoring requirements for the landfill cover. The monitoring was to be performed quarterly for the first two years after installation, and then semi-annually for three more years. After the five-year monitoring period has been completed in the fall of 2010, the BLM may request that EPA, in its discretion, negotiate a reduction in the type and frequency of monitoring.

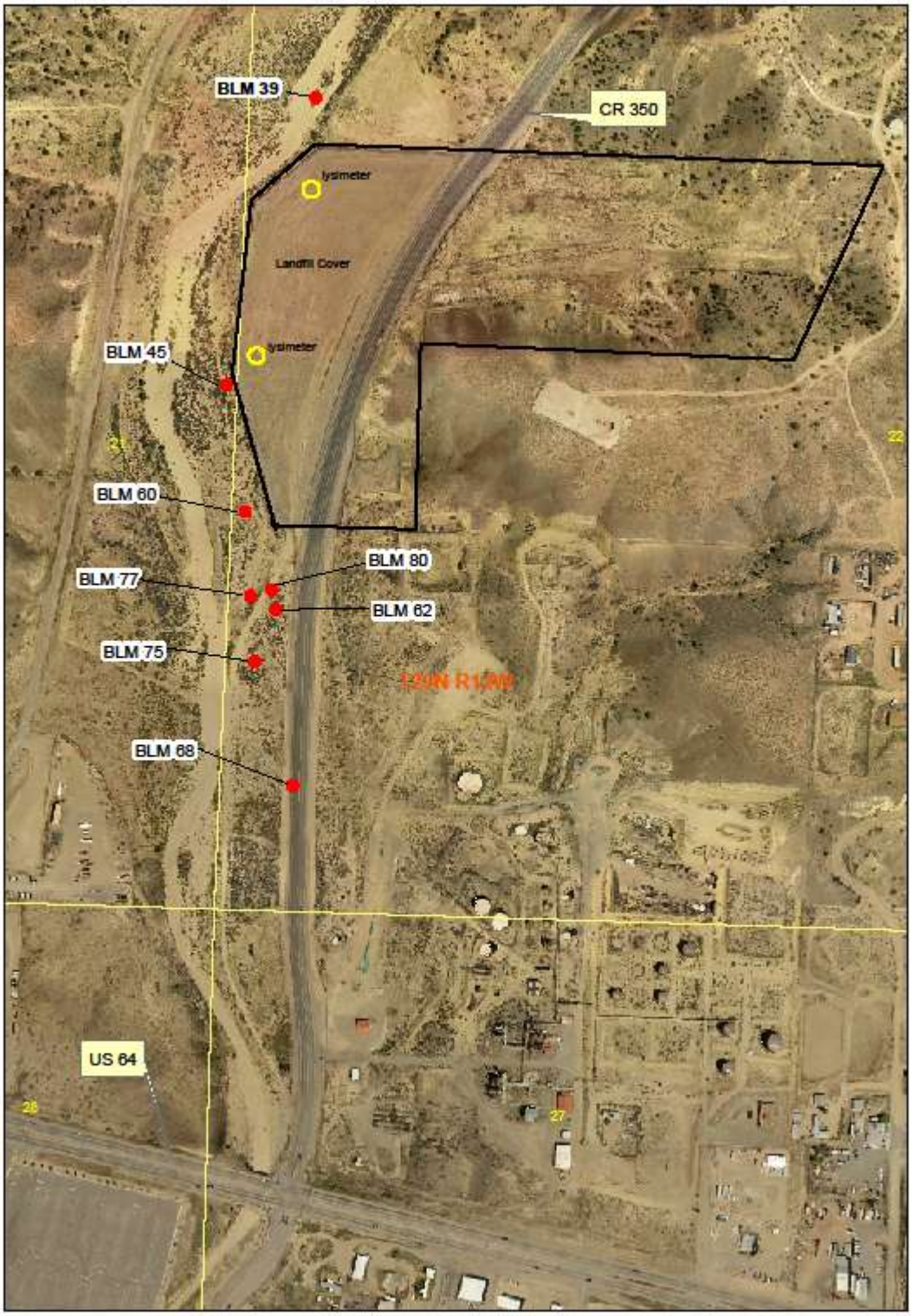
An important feature of the landfill cover monitoring was the inclusion of lysimeters installed under the cover profile. There were two lysimeters installed. One was installed directly above the northern lagoon while the second above the southern lagoon. The lagoons are presumed to be the direct cause of contaminant increases in the groundwater and consequently are the points of most concern with regard to preventing further surface water infiltration into the existing plumes. Initially, an annual flux of 1.3 mm/year within each lysimeter was used as the initial alert level for determining the effectiveness of the cover system. There was no universally accepted performance standard for landfills at the time the Work Plan was approved. Studies at the Rocky Mountain Arsenal Superfund site in Denver, Colorado were using 1.3 mm/year as an acceptable flux for the cover systems installed there, and the same standard was adopted for Lee Acres.

Personnel responsible for performing monitoring and maintenance duties on a CERCLA site generally must have extensive experience and expertise in the area of concern. It was recommended that personnel performing monitoring on the landfill cover system and lysimeters have a minimum of 10 years of landfill cover experience and be a registered professional engineer. Dr. Stephen Dwyer was retained to monitor the Lee Acres landfill cover.

Dr. Dwyer completed the eleventh monitoring inspection on February 20, 2009. The summary of the February 20, 2009, report stated the cover is in excellent condition. The cover soils, embankments, and drainage trenches were all in good condition and performing as designed. The vegetation at the site continues to mature and improve. The vegetation now appears to be approaching a climax community similar to the surrounding vegetation in undisturbed areas. Erosion at the site is minimal. Percolation measurements were made with no flux measured in the north or south lysimeter. Since the landfill cover was completed, all measurements to date are significantly below the agreed upon alarm level providing confidence the cover system is working very well to minimize flux. The complete February 20, 2009, monitoring report can be found in Attachment A.

4.2 Monitored Natural Attenuation of Ground Water.

The ROD identified seven chemicals of concern (COC) and established Cleanup Levels (Table 1). The Remedial Action Work Plan established requirements for groundwater monitoring. The Work plan identified seven existing groundwater wells (BLM#s 39, 45, 60, 62, 68, 77, and 75) to monitor, and required that a new well (BLM # 80) be constructed in the area of highest contaminations levels (Figure 4). The new well BLM 80 was completed in



Map of BLM Monitoring Wells, Landfill Cover, and Lysimeters

Figure 4

2005 and was first monitored on December 20, 2005. The Work Plan states: BLM wells 39, 45, 60, 62, 68, 75, 77, and 80 were selected based on their ability to provide adequate monitoring coverage of possible contamination flow off the remediation site. The selected wells are scheduled to be monitored semi-annually for the first five years after completion of the landfill cover. The first five year monitoring period will be completed in the fall of 2010. If at the end of the five-year post-construction period the contamination levels have dropped below New Mexico State Standards, the Work Plan states that the monitoring will increase to quarterly for a period of eight consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D.

4.3 Institutional Controls

An area of 135.6 acres of public land, which includes the Lee Aces Landfill site and a buffer area around the site, was withdrawn by BLM from settlement, sale, location, or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234) to protect public health, welfare and the environment from hazardous materials that may remain onsite. At the end of the 50 year period of the withdrawal, if hazardous substances remain at the Lee Acres Landfill above levels that prevent unlimited use and unrestricted exposure, the withdrawal will be extended, or other controls will be implemented. The institutional controls component of the selected remedy will not be modified unless it has been reviewed and approved by EPA.

The area withdrawn is described as follows (Figure 1):

New Mexico Principal Meridian
T. 29N. , R. 12W., Sec. 21 lots 6 and 7 (everything southeast of County Road No. 5569);
Sec. 22, lot 5 (everything southeast of County Road No. 5569);
lot 6 W\1/2\, lot 11 W\1/2\, and lot 12;
Sec. 28 lot 2.

The effect of the withdrawal is to prohibit all potential uses of this public land that BLM is unable to prohibit on a discretionary basis due to statutory requirements. The withdrawal does not prohibit all activities on the withdrawn land. The activities not prohibited by the withdrawal, however, are at BLM's discretion, and BLM may choose whether or not to authorize these activities and may dictate the circumstances under which they may occur. BLM will exercise its discretion to prohibit any activities that could disturb the integrity of the landfill cover, and to prohibit the drilling of ground-water wells for any purpose other than monitoring connected with the remedial action at the Lee Acres Landfill site.

Discretionary restrictions on the use of the land at the Lee Acres Landfill Site that are in compliance with the current withdrawal will be implemented in accordance with BLM's current Resource Management Plan (RMP). The RMP enable BLM to manage public lands and resources in a balanced manner, as directed by the Federal Land Policy and Management Act (FLPMA) of 1976. The RMP also allows BLM to analyze impacts to public lands, as prescribed under the National Environmental Policy Act (NEPA) of 1969.

All future proposals for Lee Acres Landfill Site will have to be in accordance with the current

withdrawal as well as the current resource management plan. Any person or entity proposing an activity within the Lee Acres Landfill site would do so through an application to the Farmington Field Office. This application would be reviewed for conformance with the withdrawal and the current resource management plan. Only those applications that are in conformance with the provisions of these documents will be subject to further NEPA review and analysis. Final determination on any future proposed actions at the Lee Acres Landfill Site will be made by the Farmington Field Office, following a proposal-specific NEPA analysis that will include consultation with the appropriate governmental entities.

BLM is responsible for implementing, maintaining, and monitoring of the surface and institutional controls for the duration of the remedies selected in the ROD and for as long as hazardous substances remain on site above levels that prevent unlimited use and unrestricted exposure. BLM will submit to EPA a monitoring report on the status of the surface and institutional controls at least annually. The report, at a minimum, will contain an evaluation of whether all of the surface and institutional controls requirements of the ROD are being met, including the results of a visual field inspection of all areas subject to surface and institutional controls, and a description of any deficiencies in the surface and institutional controls and measures that have been or will be taken to correct the deficiencies. BLM will notify EPA in writing within 72 hours of discovery of any activity that is inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least 45 days in advance of any proposals for major land use changes inconsistent with the surface or institutional control objectives or use restrictions, exposure assumptions, or any action that may disrupt the effectiveness of the remedial action. BLM will notify EPA in writing at least six months prior to any transfer, sale, or lease of any property subject to surface or institutional controls and consult with EPA on specific wording for property transfer or lease documents. BLM will notify EPA of any activities that violate the restrictions in the land use plan described above, the effect of the activities on the protectiveness of the remedy, and any proposed actions to address the violation of the restrictions. BLM also will consult with EPA prior to proposing any changes in the restrictions in the land use plan described above.

4.4 Operations and Maintenance

San Juan County constructed the landfill cover, a chain link fence, and realigned County Road (CR) 5569 through the landfill site to complete CR 350 (Figure 4). The County is responsible to maintain these improvements. Maintenance activities performed by the County to date include re-seeding the landfill cover, repairing damage to the fence along CR 350 caused by a minor traffic accident, and removing loose trash and tumble weeds from the landfill cover and fence line (Table 2). Per the ROD, BLM as the lead Agency responsible for implementation of the selected remedy is responsible for ensuring that all operations and maintenance activities are properly conducted under the selected remedy. BLM is responsible to maintain the monitoring wells; no maintenance has been required on monitoring wells since the completion of the landfill cap.

Maintenance Performed by San Juan County

Year	Labor $	Vehicle $	Material $	Total $	Description of Work
2006	220.00	42.60	2,167.39	2,429.99	Re-seed Landfill Cover
2007	2,520.00	162.30	24	2,706.30	Re-seed Landfill Cover, Remove Weeds, Fence Maintenance
2008	120.00	94.00	0	214.00	Clean Landfill Cover and Fence Line
2009	160.00	84.00	0	244.00	Clean Landfill Cover and Fence Line
Total	3,020.00	382.90	2,191.39	**5,594.29**	

Table 2

5.0 Progress Since the Last Five Year Review

This is the first five-year review for this site.

6.0 Five-Year Review Process

This five-year review for the Lee Acres Landfill has been conducted in accordance with EPA's Comprehensive Five-Year Review Guidance dated June 2001. Interviews were conducted with relevant parties, a site inspection was conducted, and applicable data and documentation covering the period of the review were evaluated. The activities conducted as part of this review are described in the following sections.

6.1 Administrative Components

The five-year review for this site was initiated by BLM. The review team was led by the BLM Remedial Project Manager (RPM) for this site, Barney Wegener/BLM Farmington Field Office, and included members from San Juan County NM, the BLM National Operations Center staff with expertise in hydrology and risk assessment, and NMED. The components of the review include community involvement, document review, data review, a site inspection, and interviews, and development of this Five-Year Review Report.

6.2 Community Involvement

A public notice announcing the initiation of the five-year review was published in the Farmington, New Mexico **The Daily Times** on February 11, March 7, and March 14, 2009. Beth Utley, Public Relations Manager for San Juan County, served as the community involvement coordinator and received no comments from the public during the five-year review process. Upon signature, the five-year review report will be placed in the information repositories for the site, including the Farmington BLM public room, the Farmington Public Library, and the EPA Region 6 office in Dallas, Texas. A public notice will be published in The Daily Times to summarize the findings of the review and announce the availability of the report at the information repositories. Copies of the public notices are provided in Attachment 2 to this report.

6.3 Document Review

The five-year review for the Lee Acres Landfill included a review of relevant documents including the Record of Decision, the Remedial Action Work Plan, the Remedial Investigation, Landfill Cover Monitoring reports, and Ground Water Monitoring reports.

6.4 Data Review

Groundwater monitoring has been conducted by USGS at the Lee Acres Landfill site since 1993. In addition, the property south of, and adjacent to the Lee Acres Landfill was owned and operated by Giant Bloomfield Refinery (GBR). Groundwater monitoring wells were installed and sampled by GBR and are included in this data review.

6.4.1 Lee Acres Landfill Groundwater Monitoring Data Review

The U.S. Geological Survey (USGS), Water Resources Division, entered into an agreement with BLM to perform ground water sampling and analysis at and around the Lee Acres Landfill site. USGS submits semiannual reports to BLM that includes: Summary of Concentrations of Analytes, Analytical Results, and Laboratory Quality Assurance/ Quality Control Results. Charts of contaminants of concern show the cumulative results of ground water monitoring (Charts 1 – 9). All of the COC regulated by the Safe Drinking Water Act (SDWA) have been below Maximum Contaminate Levels (MCL) since 2000 and nickel has been below the clean up level established in the ROD since 1993.

Manganese is not regulated by the SWDA, but the New Mexico Water Quality Control Commission (NMWQCC) has established a human health standard of 200 parts per billion (ppb) for manganese in domestic water supply. The method for determining the background manganese concentrations at the Lee Acres Landfill site was developed and agreed upon by EPA, NMED, and BLM. A background concentration of 346 ppb was determined by averaging data collected during the Remedial Investigation from three wells (BLM 14, 15, 39) that were located up-gradient of the landfill and were determined to be unaffected by activities at the landfill. The NMWQCC regulations section 4101 (B) state that if background

levels exceed state standards, then the cleanup level shall be the background concentration. The enforceable cleanup level for manganese provided in the ROD is 346 ppb.

All contaminants of concern listed in the ROD are enforceable by EPA according to the limits set in the ROD. All contaminants of concern listed in the ROD are below MCLs established under the SDWA. Manganese is classified as a secondary maximum contaminant level (SMCL) under the SDWA which is not enforced by EPA. Note however, EPA can and has set risk-based concentration limits and/or state-based limits for manganese, which have been included in RODs. In this case, the ROD includes an enforceable limit (i.e., 346 ppb) for manganese based upon the NMWQCC regulation (Part 3-101.2) requiring cleanups to attain the background concentration level. Ground water sampling for manganese shows that manganese has not attained the cleanup levels required under the ROD. Of the three upgradient wells used in establishing the average background level for manganese (346 ppb), well 39 was identified in the Work Plan as the only upgradient well to continue to be monitored. Manganese has averaged 717 ppb in well 39 since 1993 (Chart 1). The RI states that the reason for the increase in manganese in well 39 is unknown.

In the ROD, manganese in the ground water downgradient from the landfill is attributed to either past disposal of liquid in the former liquid waste lagoons, or the interaction between the native soils and reducing agents in the former lagoons. Also, where petroleum hydrocarbons undergo natural biodegradation in contact with groundwater, dissolved manganese may be found at relatively high concentrations in groundwater (Deutsch, 1997); however, oxidizing conditions reverse this reaction and cause manganese to precipitate back to the aquifer sediments (Klinchuch and Delfino 2000). This process may be occurring at the Lee Acres Landfill site. Well 68 is the most down-gradient monitoring well and is considered to be the point of compliance. All COC levels at well 68, including manganese, have been below cleanup levels since 2000; indicating that contaminants of concern are not migrating off site at concentrations above cleanup levels.

Table 1

Constituent	Site Historic Maximum Concentration (µg/L)	Risk-Based Preliminary Remediation Goal (µg/L)	SDWA MCL (µg/L)	NMWQCC Standards (µg/L)	Site Background Mean[a] (µg/L)	Cleanup Levels (µg/L)
Manganese	6,335	176	50[b]	200[c]	346	346[d]
Nickel	578[e]	NA	NA	200[f]	7.75	200
1,2-*cis*-Dichloroethene	77	NA	70	per part 101z.z[g]	NA	70
1,2-*trans*-Dichloroethene	120	NA	100	per part 101z.z[g]	NA	100
Tetrachloroethylene (PCE)	10	NA	5	20	NA	5
Trichloroethylene (TCE)	11	NA	5	100	NA	5
Vinyl Chloride	3.1	NA	2	1	NA	1

a Mean concentration value of upgradient area located north of the former Lee Acres Landfill
b Secondary Maximum Contaminant Level (SMCL)
c Standard for domestic supply.
d NMWQCC regulation Part 3-101.2 does not require cleanup level below site background level.
e Highest value of 12,500 µg/L occurred during the May 1993 sampling period and was determined to be a statistical anomaly for the purposes of this table, the next highest value is specified.
f Standard for irrigation use.
g No NMWQCC specific to 1,2-DCE exists, therefore Part 101.z.z. is referenced for State ARAR
NA - not applicable.
NOTE: Dichloromethene was detected once in 95 samples at a concentration level of 27 µg/L; however, this concentration was considered a statistical anomaly and is not presented

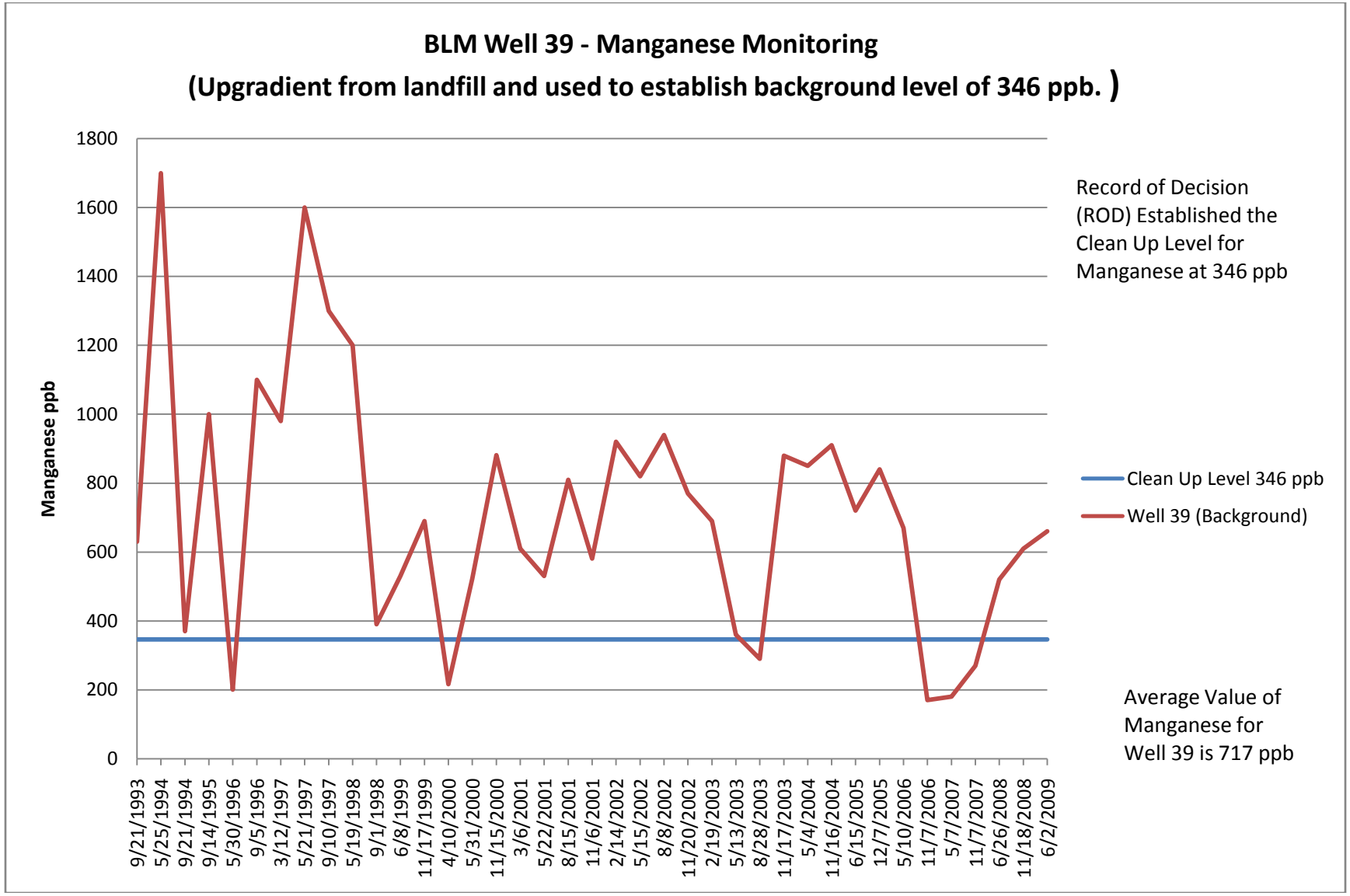

BLM Well 39 - Manganese Monitoring
(Upgradient from landfill and used to establish background level of 346 ppb.)
Manganese ppb
1800
1600
1400
1200
1000
800
600
400
200
0
9/21/1993
5/25/1994
9/21/1994
9/14/1995
5/30/1996
9/5/1996
3/12/1997
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
4/10/2000
5/31/2000
11/15/2000
3/6/2001
5/22/2001
8/15/2001
11/6/2001
2/14/2002
5/15/2002
8/8/2002
11/20/2002
2/19/2003
5/13/2003
8/28/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
Record of Decision (ROD) Established the Clean Up Level for Manganese at 346 ppb
Clean Up Level 346 ppb
Well 39 (Background)
Average Value of Manganese for Well 39 is 717 ppb

Chart 1

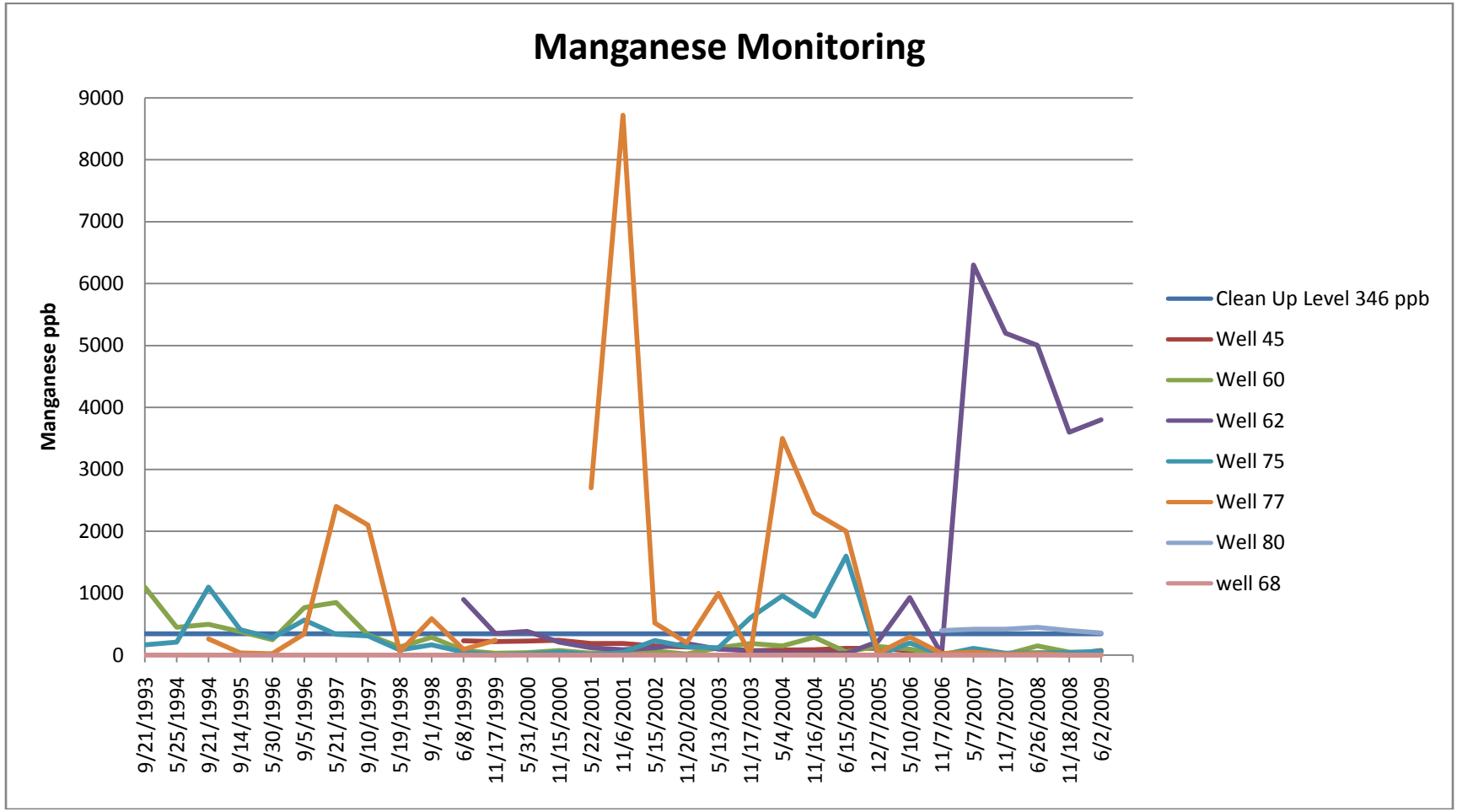

Manganese Monitoring
Manganese ppb
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
9/21/1993
5/25/1994
9/21/1994
9/14/1995
5/30/1996
9/5/1996
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
Clean Up Level 346 ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
well 68

Chart 2

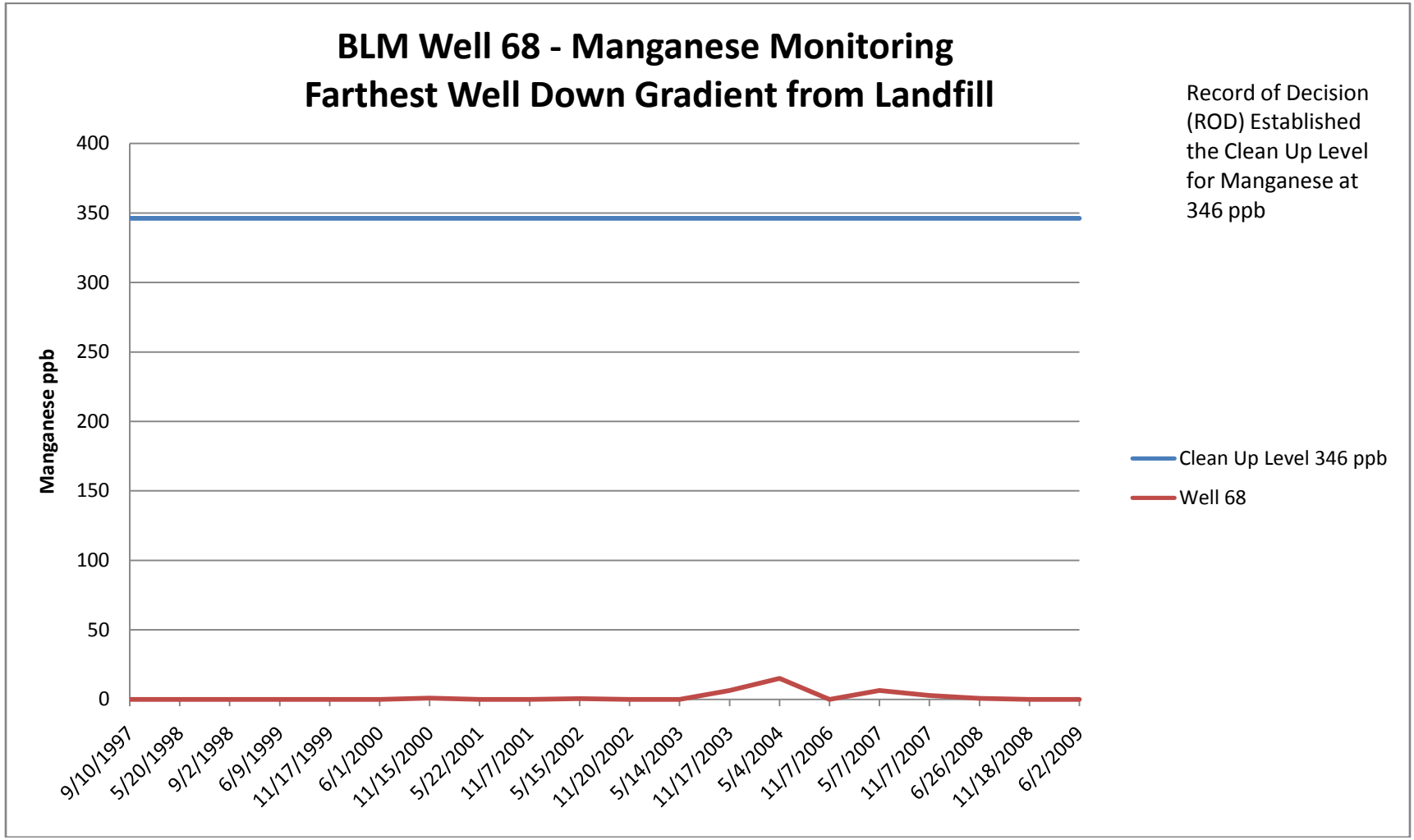

BLM Well 68 - Manganese Monitoring
Farthest Well Down Gradient from Landfill
Manganese ppb
400
350
300
250
200
150
100
50
0
9/10/1997
5/20/1998
9/2/1998
6/9/1999
11/17/1999
6/1/2000
11/15/2000
5/22/2001
11/7/2001
5/15/2002
11/20/2002
5/14/2003
11/17/2003
5/4/2004
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
Record of Decision (ROD) Established the Clean Up Level for Manganese at 346 ppb
Clean Up Level 346 ppb
Well 68

Chart 3

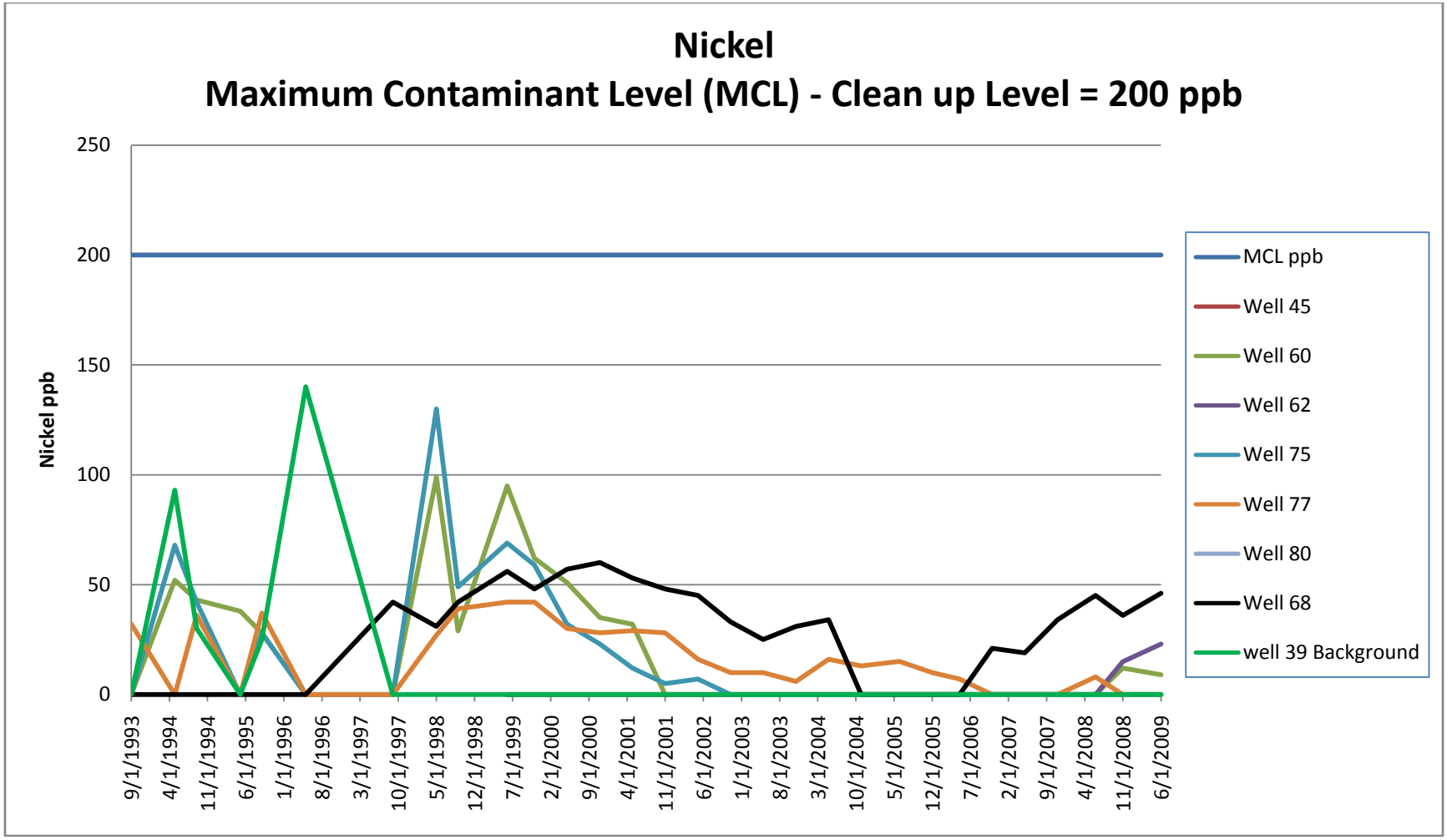

Nickel
Maximum Contaminant Level (MCL) - Clean up Level = 200 ppb
Nickel ppb
250
200
150
100
50
0
9/1/1993
4/1/1994
11/1/1994
6/1/1995
1/1/1996
8/1/1996
3/1/1997
10/1/1997
5/1/1998
12/1/1998
7/1/1999
2/1/2000
9/1/2000
4/1/2001
11/1/2001
6/1/2002
1/1/2003
8/1/2003
3/1/2004
10/1/2004
5/1/2005
12/1/2005
7/1/2006
2/1/2007
9/1/2007
4/1/2008
11/1/2008
6/1/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 68
well 39 Background

Chart 4

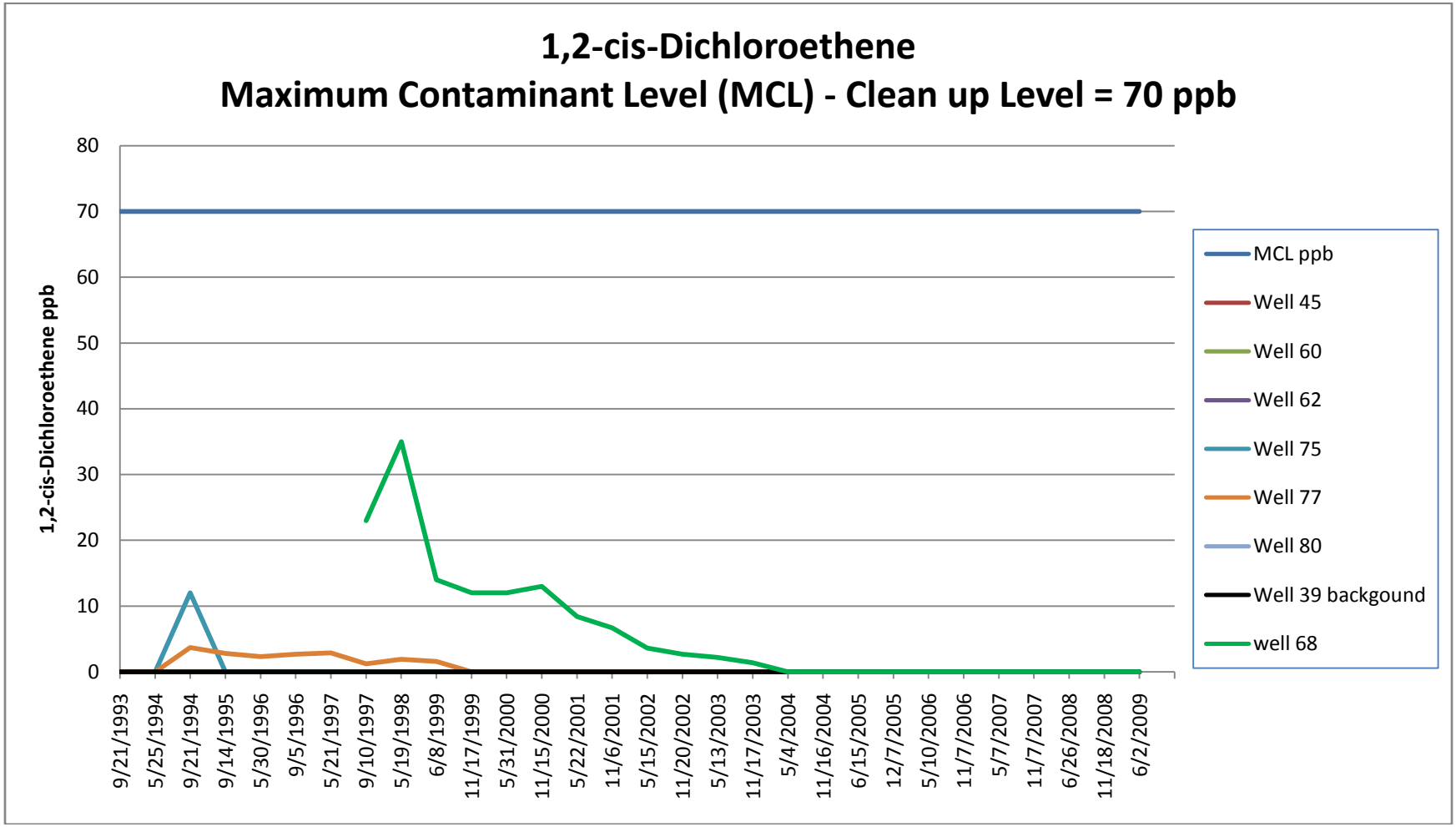

1,2-cis-Dichloroethene
Maximum Contaminant Level (MCL) - Clean up Level = 70 ppb
1,2-cis-Dichloroethene ppb
80
70
60
50
40
30
20
10
0
9/21/1993
5/25/1994
9/21/1994
9/14/1995
5/30/1996
9/5/1996
5/21/1997
9/10/1997
5/19/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 5

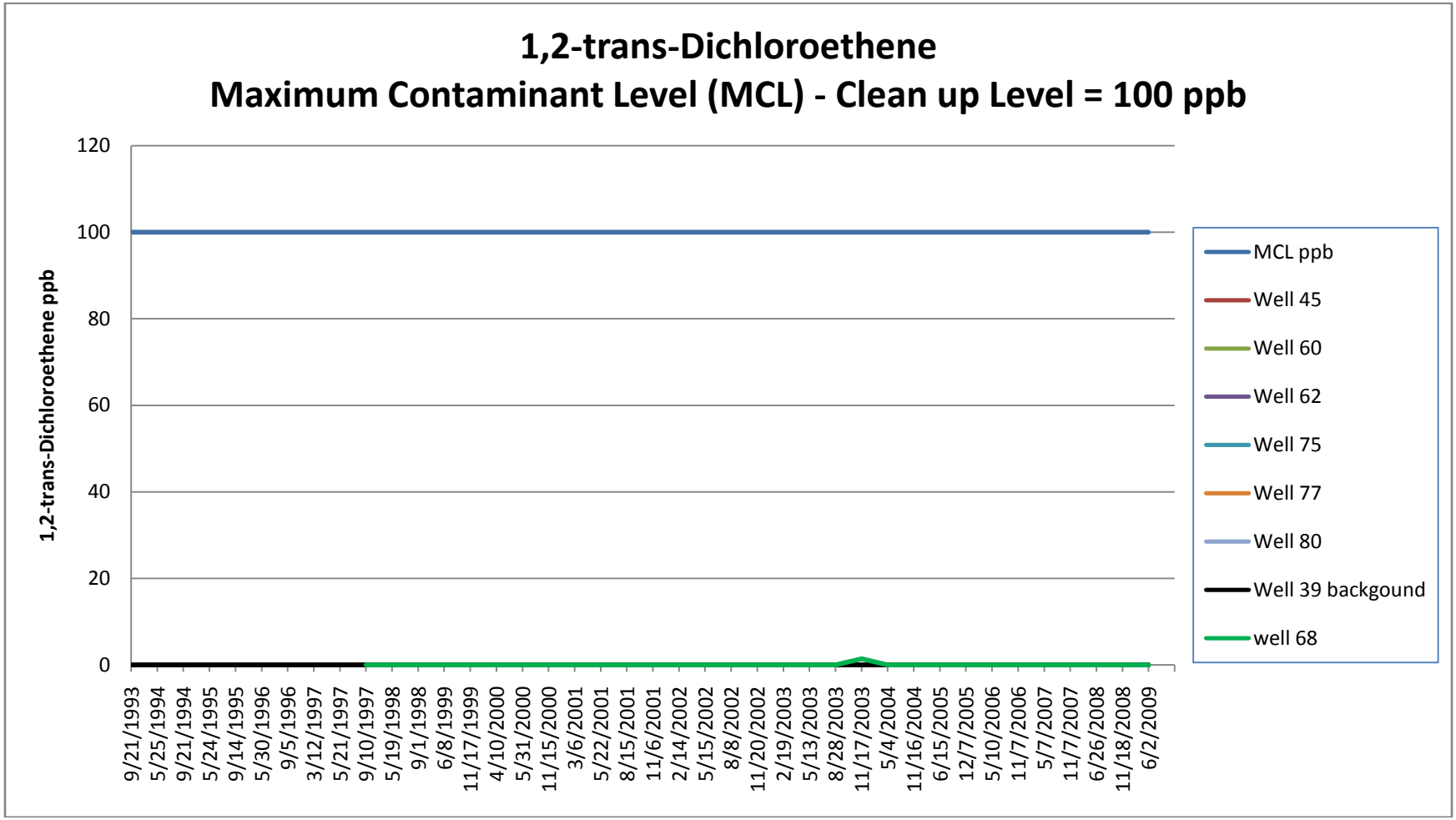

1,2-trans-Dichloroethene
Maximum Contaminant Level (MCL) - Clean up Level = 100 ppb
1,2-trans-Dichloroethene ppb
120
100
80
60
40
20
0
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/5/1996
3/12/1997
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
4/10/2000
5/31/2000
11/15/2000
3/6/2001
5/22/2001
8/15/2001
11/6/2001
2/14/2002
5/15/2002
8/8/2002
11/20/2002
2/19/2003
5/13/2003
8/28/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 6

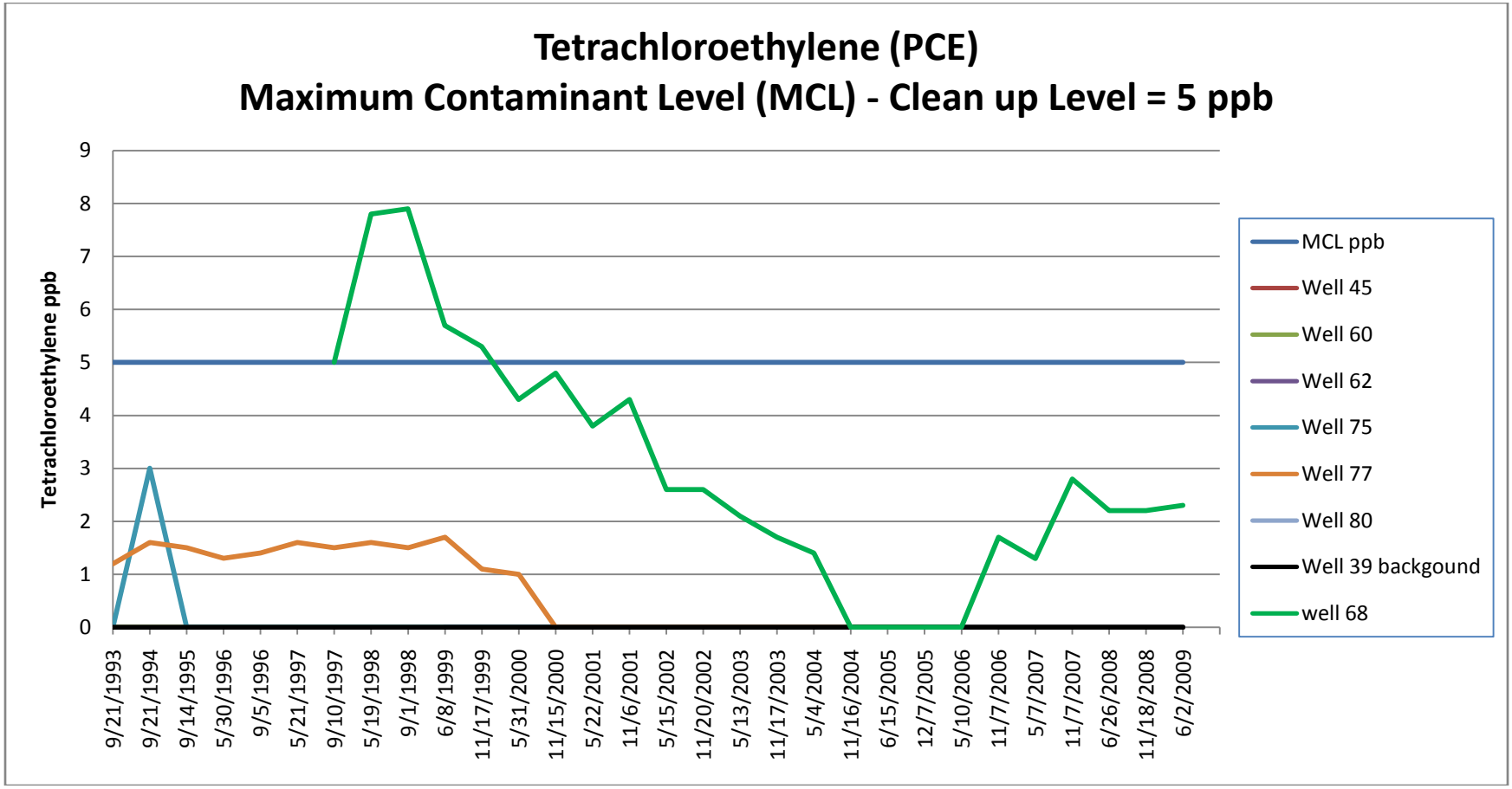

Tetrachloroethylene (PCE)
Maximum Contaminant Level (MCL) - Clean up Level = 5 ppb
Tetrachloroethylene ppb
0
1
2
3
4
5
6
7
8
9
9/21/1993
9/21/1994
9/14/1995
5/30/1996
9/5/1996
5/21/1997
9/10/1997
5/19/1998
9/1/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 7

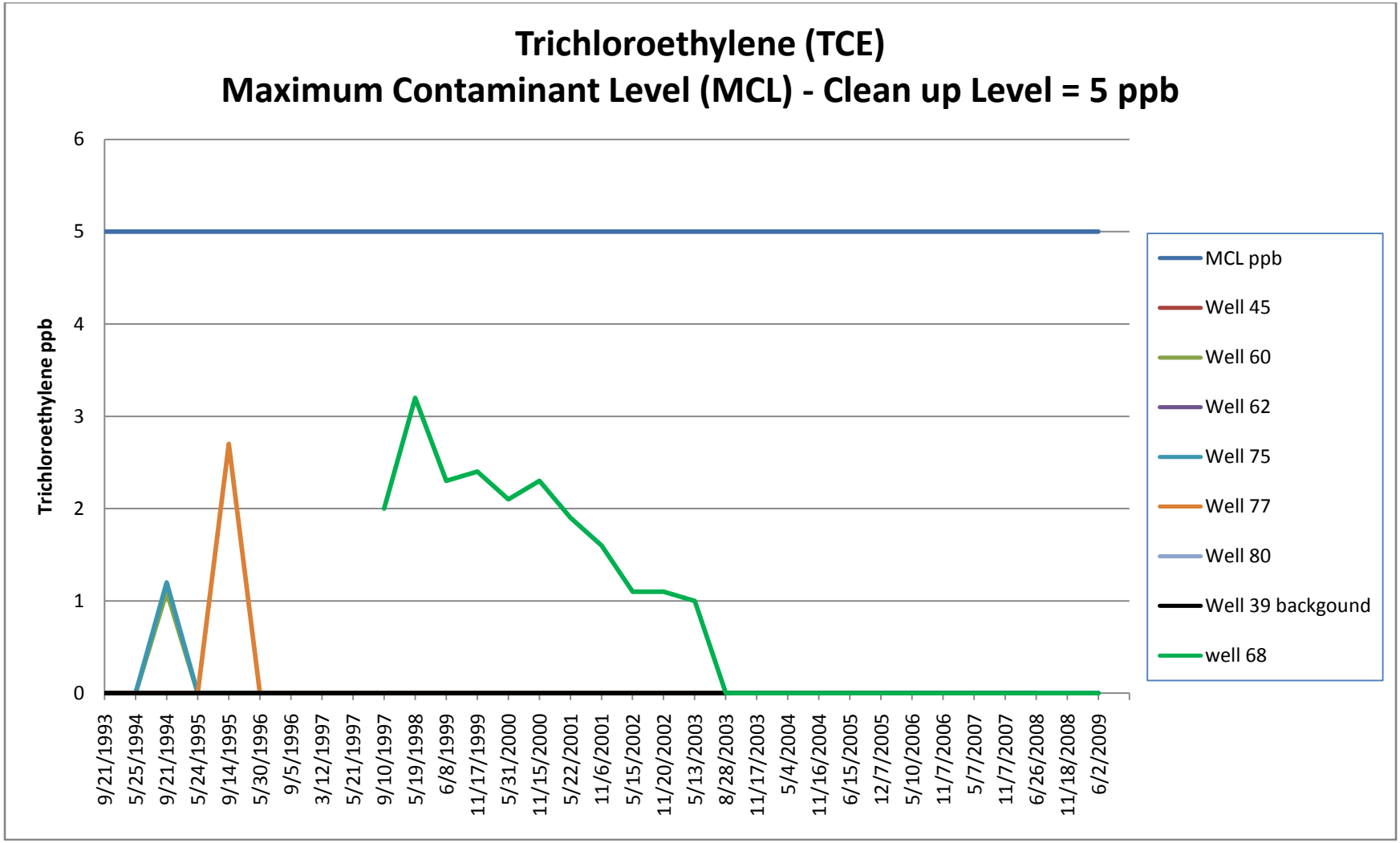

Trichloroethylene (TCE)
Maximum Contaminant Level (MCL) - Clean up Level = 5 ppb
Trichloroethylene ppb
0
1
2
3
4
5
6
9/21/1993
5/25/1994
9/21/1994
5/24/1995
9/14/1995
5/30/1996
9/5/1996
3/12/1997
5/21/1997
9/10/1997
5/19/1998
6/8/1999
11/17/1999
5/31/2000
11/15/2000
5/22/2001
11/6/2001
5/15/2002
11/20/2002
5/13/2003
8/28/2003
11/17/2003
5/4/2004
11/16/2004
6/15/2005
12/7/2005
5/10/2006
11/7/2006
5/7/2007
11/7/2007
6/26/2008
11/18/2008
6/2/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 8

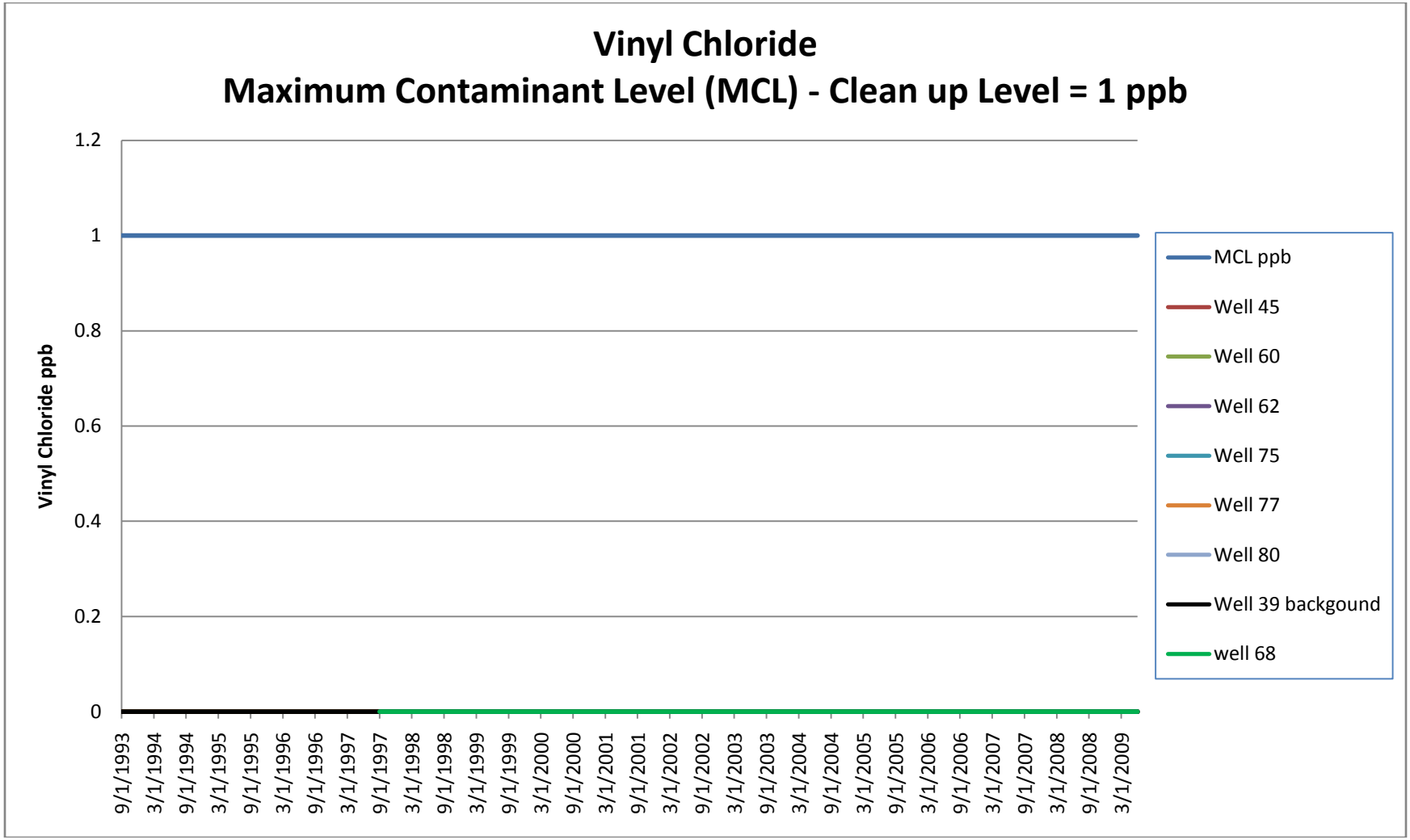

Vinyl Chloride
Maximum Contaminant Level (MCL) - Clean up Level = 1 ppb
Vinyl Chloride ppb
1.2
1
0.8
0.6
0.4
0.2
0
9/1/1993
3/1/1994
9/1/1994
3/1/1995
9/1/1995
3/1/1996
9/1/1996
3/1/1997
9/1/1997
3/1/1998
9/1/1998
3/1/1999
9/1/1999
3/1/2000
9/1/2000
3/1/2001
9/1/2001
3/1/2002
9/1/2002
3/1/2003
9/1/2003
3/1/2004
9/1/2004
3/1/2005
9/1/2005
3/1/2006
9/1/2006
3/1/2007
9/1/2007
3/1/2008
9/1/2008
3/1/2009
MCL ppb
Well 45
Well 60
Well 62
Well 75
Well 77
Well 80
Well 39 backgound
well 68

Chart 9

6.4.2 Giant Bloomfield Refinery Ground Water Monitoring

During the period of operation of the landfill, the Giant-Bloomfield Refinery (GBR), located immediately south of the landfill, was also in full operation, refining mainly diesel and unleaded gasoline. It was discovered that the refinery lost approximately 45,000 barrels of refined product into the soils and ground water from about 1975 to 1984. In their efforts to recover the product and remediate the contaminated ground water, GBR installed numerous groundwater monitoring wells downgradient of the Lee Acres Landfill. The GRB cleanup effort and groundwater monitoring are conducted under the regulatory authority of New Mexico Oil and Gas Division (NMOCD). Not all of the GBR wells are relevant to the five-year review; however, GBR well 17 (immediately downgradient of BLM 68) and eight wells within the Lee Acres community are reviewed to present additional evidence that EPA regulated contaminants of concern have not migrated since Lee Acres Landfill ROD was signed in 2004 (See Map Figure 5).

GBR well 17 was monitored by USGS from 1993 to 2003 for the contaminants of concern listed in the Lee Acres Landfill ROD. From 1993 to 1996, manganese ranged from 29 to 110 ppb; below the established cleanup level. From 1997 to 2003, manganese was below the reporting limit of 10 ppb. Nickel was recorded above the clean up level of 200 ppb from 1993 to 1996, but dropped below the reporting limit of 40 ppb from 1997 to 2003. USGS discontinued monitoring GBR well 17 after 2003. The well was not monitored in 2004. Giant Bloomfield Refinery started monitoring GBR well 17 in 2005 and continues to the present. Analytes monitored by GBR included four COC listed in the Lee Acres ROD: 1,2-*trans*-Dichloroethene, Tetrachloroethylene (PCE), Trichloroethylene (TCE), and Vinyl Chloride. Since 2005, all results for these analytes have been non-detect (ND). A typical analytical report for well 17 is presented in Figure 6 and 6A to illustrate the scope of the GBR monitoring for this well.

Giant Bloomfield Refinery established eight monitoring wells (SHS 4, 6, 10, 12, 13, 15, 16, and 17) under the direction and authority of the NMOCD. GBR started monitoring these wells in 1995, and analytes monitored included four COC listed in the Lee Acres ROD: 1,2-*trans*-Dichloroethene, Tetrachloroethylene (PCE), Trichloroethylene (TCE), and Vinyl Chloride. Since the Lee Acres Landfill ROD was signed in 2004, all eight wells have been ND for the four COC listed in the Lee Acres ROD. A typical analytical report for SHS wells (SHS 4) is presented in Figure 7 and 7A to illustrate the scope of the GBR monitoring for the SHS wells in the Lee Acres community. Giant Bloomfield Refinery submitted a revised sample schedule to NMOCD in discharge Plan GW040 in 2005 to remove the eight SHS wells listed above from the sampling matrix based on the number of previous clean reporting periods (8 quarters). These wells have not been sampled since October of 2006.

Refinery Map of the reviewed GBR and SHS wells monitored by Bloomfield Giant

Figure 5

	JAN 2007	APR 2007	JUL 2007	OCT 2007	NOV 2007	DEC 2006
1,2-Dichlorobenzene	nd					
1,3-Dichlorobenzene	nd					
1,4-Dichlorobenzene	nd					
Ethylbenzene	nd					
Methyl-t-Butyl Ether	nd					
Toluene	nd					
Total Xylenes	nd					
PAH						
1-Methylnapthalene	nd					
2-Methylnapthalene	nd					
Benzo(a)pyrene	nd					
Napthalene	nd					
GBR-17						
Lab pH						7.0
Lab Conductivity@25C						2500
Total Dissolved Solids (Calc)						2000
Total Alkalinity as CaCO3						164
Total Hardness as CaCO3						696
Bicarbonate as HCO3						163
Carbonate as CO3						nd
Hydroxide						nd
Chloride						48
Sulfate						1400
Calcium						273
Magnesium						22.6
Potassium						7.27
Sodium						222
HALOCARBONS						
Bromodichloromethane						nd
Bromoform						nd
Bromomethane						nd
Carbon Tetrachloride						nd
Chloroethane						nd
Chloroform						nd
Chloromethane						nd
Dibromochloromethane						nd
1,2-Dibromomethane (EDB)						nd
1,2-Dichlorobenzene						nd

Figure 6

	JAN 2007	APR 2007	JUL 2007	OCT 2007	NOV 2007	DEC 2006
1,3-Dichlorobenzene						nd
1,4-Dichlorobenzene						nd
1,1-Dichloroethane						nd
1,2-Dichloroethane (EDC)						nd
1,1-Dichoroethene						nd
trans-1,2-Dichloroethene						nd
1,2-Dichloropropane						nd
cis-1,-Dichloropropene						nd
trans-1,2-Dichloropropene						nd
Methylene Chloride						nd
1,1,2,2-Tetrachloroethane						nd
Tetrachloroethane						nd
1,1,1-Trichloroethane						nd
1,1,2-Trichloroethane						nd
Trichloroethene						nd
Trichlorofluoromethane						nd
Vinyl Chloride						nd
AROMATICS						
Benzene						nd
Chlorobenzene						nd
1,2-Dichlorobenzene						nd
1,3-Dichlorobenzene						nd
1,4-Dichlorobenzene						nd
Ethylbenzene						nd
Methyl-t-Butyl Ether						nd
Toluene						nd
Total Xylenes						nd
GBR-24D						
Lab pH	8					
Lab Conductivity@25C	4500					
Total Dissolved Solids (Calc)	3490					
Total Alkalinity as CaCO3	213					
Total Hardness as CaCO3	1220					
Bicarbonate as HCO3	213					
Carbonate as CO3	nd					
Hydroxide	nd					
Chloride	190					
Sulfate	2000					
Calcium	421					

Figure 6A

TABLE 2.1 GIANT INDUSTRIES, INC. ONSITE REMEDIATION PROJECT 2005 ANNUAL ANALYTICAL DATA SUMMARY					
	JAN	APR	JUL	OCT	DEC
1,2-Dichlorobenzene	nd				
1,3-Dichlorobenzene	nd				
1,4-Dichlorobenzene	nd				
Ethylbenzene	nd				
Methyl-t-Butyl Ether	nd				
Toluene	nd				
Total Xylenes	nd				
SHS-4					
Lab pH	7.3				
Lab Conductivity@25C	3200				
Total Dissolved Solids (Calc)	2700				
Total Alkalinity as CaCO3	210				
Total Hardness as CaCO3	1400				
Bicarbonate as HCO3	210				
Carbonate as CO3	1.0				
Hydroxide	nd				
Chloride	63				
Sulfate	1600				
Calcium	490				
Magnesium	39				
Potassium	5.1				
Sodium	320				
HALOCARBONS					
Bromodichloromethane	nd				
Bromoform	nd				
Bromomethane	nd				
Carbon Tetrachloride	nd				
Chloroethane	nd				
Chloroform	nd				
Chloromethane	nd				
Dibromochloromethane	nd				
1,2-Dibromomethane (EDB)	nd				
1,2-Dichlorobenzene	nd				
1,3-Dichlorobenzene	nd				
1,4-Dichlorobenzene	nd				
1,1-Dichloroethane	nd				
1,2-Dichloroethane (EDC)	nd				
1,1-Dichoroethene	nd				
trans-1,2-Dichloroethene	nd				
1,2-Dichloropropane	nd				
cis-1,-Dichloropropene	nd				
trans-1,2-Dichloropropene	nd				
Methylene Chloride	nd				
1,1,2,2-Tetrachloroethane	nd				

Figure 7

TABLE 2.1
GIANT INDUSTRIES, INC.
ONSITE REMEDIATION PROJECT
2005 ANNUAL ANALYTICAL DATA SUMMARY

	JAN	APR	JUL	OCT	DEC
Tetrachloroethane	nd				
1,1,1-Trichloroethane	nd				
1,1,2-Trichloroethane	nd				
Trichloroethene	nd				
Trichlorofluoromethane	nd				
Vinyl Chloride	nd				
AROMATICS					
Benzene	nd				
Chlorobenzene	nd				
1,2-Dichlorobenzene	nd				
1,3-Dichlorobenzene	nd				
1,4-Dichlorobenzene	nd				
Ethylbenzene	nd				
Methyl-t-Butyl Ether	nd				
Toluene	nd				
Total Xylenes	nd				
SHS-6					
Lab pH	7.2				
Lab Conductivity@25C	2900				
Total Dissolved Solids (Calc)	2300				
Total Alkalinity as CaCO3	230				
Total Hardness as CaCO3	1100				
Bicarbonate as HCO3	230				
Carbonate as CO3	nd				
Hydroxide	nd				
Chloride	61				
Sulfate	1300				
Calcium	390				
Magnesium	32				
Potassium	3.1				
Sodium	300				
HALOCARBONS					
Bromodichloromethane	nd				
Bromoform	nd				
Bromomethane	nd				
Carbon Tetrachloride	nd				
Chloroethane	nd				
Chloroform	nd				
Chloromethane	nd				
Dibromochloromethane	nd				
1,2-Dibromomethane (EDB)	nd				
1,2-Dichlorobenzene	nd				
1,3-Dichlorobenzene	nd				

Figure 7A

6.5 Interviews

Interviews were conducted with Beth Utley/San Juan County Public Relations Manager; Bruce Cauthen/Western Refining (GBR) Environmental Engineer: Dave Keck/San Juan County Public Works Administrator; Fredrick Gebhardt/USGS Water Science Center Hydrologic Technician; Phyllis Bustamante/Geoscientist - New Mexico Environmental Department – Superfund Over Site; Stephen Dwyer/Contract Engineer; and T.J. Richards/San Juan County Compliance Specialist. Copies of the Interview Record Forms are provided in Attachment 3.

Ms. Beth Utley participated in the interview as the Community Involvement Coordinator for the five-year review. She is employed by San Juan County Public and holds the title of Public Relations Manager. Ms. Utley explained that she posted 3 Public Notices in the Farmington Daily Times on Feb. 11, March 7, and March 14 (Attachment 2), but did not receive any responses from the public. Since 2004 when she took over the position of Public Relations Manager, she has not received any negative responses from the public concerning Lee Acres. San Juan County received an award from the National Association of Counties for cooperating with federal agencies and the State of New Mexico to develop remedial actions for the Lee Acres site and the construction of the cap (capillary barrier cover, or landfill cover) and Road 350. The Farmington Daily Times reported on the award, and she did receive some positive comments from the public in response the report in the paper.

Mr. Bruce Cauthen participated in the interview as an environmental engineer for Western Refining who now owns the Giant Bloomfield Refining site. He was familiar with the Lee Acres Landfill site and worked for Bloomfield Giant Refinery in 1981 as part of the shut down crew. He is in charge of analyzing groundwater monitoring reports and coordinating with NMOCD on the GBR and SHS monitoring wells. He was not aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site, and that after looking through his ground water monitoring charts, he said “it looks like the contaminants of concern are below cleanup levels and that is good for the community”.

Mr. Dave Keck participated in the interview as the Public Works Administrator for San Juan County. He stated: “As Public Works Administrator, I was responsible for initial construction of the test cap, the main cap, and I am responsible for maintenance and oversight for the entire site including the cap, County Road 350, and the road apron utilized for water run on and run off control. I initiated the idea of building a road (County Road 350) through the site to improve traffic in the county, and to use the road construction to control water run-off and run-on to protect the cap. I was the administrative advisor of the cap construction and attended coordination meetings and site inspections”. Mr. Keck said that he had received no calls and no questions from the community concerning the landfill site, and that he felt the landfill cover has performed very well. There are very few issues other than reseeding the cover after the initial seeding effort failed. He was very pleased with the remediation project.

Mr. Fredrick Gebhardt participated in the interview as a hydrologic technician for the USGS Water Science Center. He began sampling the ground water at Lee Acres in 1993, and became the Lee Acres Sampling Project Manager in 2000. He is responsible for the USGS sampling program at Lee Acres. He was not aware of any community concerns and believes the BLM and EPA remediation plan is moving in the right direction. He said "I think they are on track to start the closure process".

Ms. Phyllis Bustamante participated in the interview as a geoscientist for the New Mexico Environmental Department – Ground Water Quality Bureau – Superfund Oversight Section. She has been assigned to Lee Acres for 2 years. The Superfund Oversight Section (SOS) assists the U.S. Environmental Protection Agency (EPA) in characterization of inactive hazardous waste sites, and provides management assistance to EPA at Superfund sites listed on the National Priorities List. She reviews the Lee Acres site and associated documents for consistency under the Superfund rules so that actions initiated at Lee Acres are consistent with State of New Mexico rules to ensure protection of human health and the environment. Her impression was that BLM has met commitments outlined in the Record of Decision (ROD) by constructing the landfill cover and monitoring ground water. She thought the monitoring information indicates that things are going well. Early indications of the cap monitoring show the cap may be preventing migration of contaminants to, or through the ground water. She said "In terms of reviewing the documents, I have concerns and I am hoping that we are not missing any contamination movement or migration. Analytical results do not clearly show that PCE has gone through the degradation process. I am not seeing all secondary by products that should be produced during the breakdown of PCE to TCE to DCE to VC. I wonder; could some of the contamination migrated without being detected with the current monitoring system? Analytical review and down gradient wells monitoring does not indicate that much migration is taking place, but no monitoring system is perfect. I wonder if a path of migration may not have been detected"?

Mr. Steven Dwyer participated in the interview as a contract engineer. He helped to conceptualize the use of an engineered capillary barrier (cap) as a remedy to the Lee Acres Landfill, and participated in cap research and development at Sandia National Laboratories. He attended meetings with the EPA, BLM, and NMED to discuss the appropriateness of the cap, and how it would promote natural attenuation of contaminants that were present within the land fill. He designed the small test cap and had oversight in its construction and monitored the test cap after construction. He assisted the firm of Cheney-Walters-Echols INC to engineer the main cap, reviewed the final plan, and provided construction oversight as construction engineer as the cap was being built. He has been monitoring the cap for the 4 years after the cap was completed, and thinks the cap looks very good. He said "The cover is working very well. Any issues that have arisen have been taken care of between BLM and San Juan County. Data is showing the cap is working and is allowing natural attenuation to do its thing. There is generally a window of time between 3 to 7 years after construction that if there is going to be a problem with a cap, it will show up within this window. We have reduced the monitoring of the cap from quarterly to semiannual. I would recommend continuing the monitoring

semiannually until we get out of the 3 to 7 year window. If no problems arise after that time, monitoring may be reduced to annually".

Ms. T.J. Richards participated in the interview as the Compliance Specialist for San Juan County. She has been involved with San Juan County administration since 1993, and moved to engineering technician in 1999. She worked with BLM staff and the Engineering Firm of Cheney - Walters – Echols INC to develop the remedial design work plan for the cap and Road 350. Since the cap has been completed, she is responsible for the project compliance and maintenance. She thought the effects to the community have been minimal. The only issue she has noticed is a temporary traffic impediment while USGS (Fred Gebhardt) is monitoring BLM well 68 along the side of County Road 350. USGS monitors the well semi-annually, and sets traffic cones to close the west lane of traffic while a water sample is taken. She drives by the site about 8 to 10 times per month to look at the fence lines, check to see if the erosion controls are working, and look for trash. The only incident that she was aware of was when a citizen crashed his vehicle through the fence along County Road 350. The San Juan County Sheriff's Office responded to the accident; no injuries were reported and the fence was repaired by the County the next day. She knew of no other incidents.

6.6 Site Inspection

BLM coordinated a site inspection of the Lee Acres Landfill on February 19, 2009. The site inspection was attended by representatives from EPA Region 6, NMED, San Juan County, USGS, BLM, and a private contractor. Attendees walked the perimeter of the landfill cover and along the water drainage channels constructed down the sides of County Road 350. The purpose of the site inspection was to assess the condition of the landfill cover, the fence surrounding the site, and the water run-on and run-off controls that were engineered into the design of County Road 350. The landfill cover was found to be in excellent condition. The cover soils, embankments, and drainage channels were all in good condition and performing as designed. The vegetation at the site appeared to be sparse, but was similar to the surrounding vegetation in undisturbed areas adjacent to the landfill. No excessive erosion was found during the inspection. Biointrusion activity by native animals and insects was found to be minimal. Burrowing animal intrusion was limited to just a couple of small rodent holes, and there were some ant hills noticed. The fence surrounding the site was in good condition and the gate was locked. The groundwater monitoring wells around the perimeter of the landfill cover were in good condition and the well casings were covered and locked. There was no evidence of the site being vandalized or disturbed by the public. No issues concerning the condition of the landfill cover, water run-on and run-off controls, County Road 350, or the fence were identified. Institutional controls consisting of BLM withdrawal of the Lee Acres Landfill site and buffer area around the site from settlement, sale, location, or entry remains in force, and is effective until 2047. The Site Inspection Check List is presented in Attachment 4.

7.0 Technical Assessment

The five-year review must determine whether the remedy at the site is protective of human health and the environment. The EPA guidance describes three questions used to provide a framework for organizing and evaluating data and information and to ensure all relevant issues are considered when determining the protectiveness of a remedy. These questions are assessed for the Lee Acres Landfill site in the following paragraphs. A conclusion of the technical assessment is presented at the end of the section.

Question A: Is the remedy functioning as intended by the decision documents?
Groundwater monitoring has shown that concentrations of the ROD listed contaminants of concern (COC) regulated by EPA have declined and all maximum contaminant levels (MCLs) are being met in the ROD selected groundwater monitoring well network. Concentrations have declined, especially at the most downgradient monitoring well (BLM-68), and all wells are meeting MCLs. Manganese is classified as a secondary maximum contaminant level (SMCL) under the SDWA which is not enforced by EPA. Note however, EPA can and has set risk-based concentration limits and/or state-based limits for manganese, which have been included in RODs. In this case, the ROD includes an enforceable limit (i.e., 346 ppb) for manganese based upon the NMWQCC regulation (Part 3-101.2) requiring cleanups to attain the background concentration level. Ground water sampling for manganese shows that manganese has not attained the cleanup levels required under the ROD. Manganese levels have been erratic in some monitoring wells; including well 39 which is upgradient of the landfill. However, manganese levels in well 68 have been below the cleanup level since 1997 indicating that manganese is not migrating off site.

San Juan County constructed the landfill cover, a chain link fence, and realigned County Road (CR) 5569 through the landfill site to complete County Road 350 (Figure 4). The County is responsible to maintain these improvements. Maintenance activities performed by the County to date include re-seeding the landfill cover, repairing damage to the fence along CR 350 caused by a minor traffic accident, and removing loose trash and tumble weeds from the landfill cover and fence line (Table 2). Per the ROD, BLM as the lead Agency responsible for implementation of the selected remedy is responsible for ensuring that all operations and maintenance activities are properly conducted under the selected remedy. BLM and San Juan County have closely cooperated during all aspects of operation and maintenance activities since the completion of construction. The average cost of operations and maintenance since construction completion has been approximately $1,400 per year. Future costs for operations and maintenance are expected to be within a range of $200 to $3,000 per year. BLM is responsible to maintain the monitoring wells; no maintenance has been required on monitoring wells since the completion of the landfill cap.

A review of the semi-annual cap inspections, including the most recent inspection on February 19, 2009, show that the cap is functioning as designed. The answer to this question is yes.

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

Land Use and Exposure Assessment:
1. Has land use or expected land use on or near the site changed (*e.g.*, industrial to residential, commercial to residential)? A County road (CR 350) has been constructed across the cap of the Landfill, however this change does not alter the exposure scenarios used in assessing the protectiveness of the remedy. Because the site is capped with 5 feet of soil, there are no contaminants of concern on the ground surface. The site is fenced and the cap is inspected semi-annually and is in good operating condition.

2. Have any human health or ecological routes of exposure or receptors changed or been newly identified (*e.g.*, dermal contact where none previously existed, new populations or species identified on site or near the site)? The exposure pathways presented in the 1995 Remedial Investigation (RI), Chapter 8, Human Baseline Risk Assessment included: ingestion of groundwater, inhalation of volatile chemicals while showering, inhalation of volatile chemicals associated with groundwater within the house, dermal absorption of chemicals while showering, and inhalation of chemicals in outdoor air. In the risk assessment, the future resident was assumed to reside in a downgradient area directly adjacent to the former landfill and that the resident's water supply comes from either the bedrock aquifer or the shallow/deep alluvial aquifer (RI page 8-30). These exposure pathways are still considered possible; however, BLM has withdrawn the Lee Acres Landfill site from settlement, sale, location, or entry (Fed. Reg. Jan 15, 1997), effective until 2047. Groundwater monitoring documents that all COC are below their respective MCLs and limits specified in the ROD except for manganese. There is no MCL for manganese, but the ROD sets the limit at 346 ppb consistent with NMQCC regulation (part 3-101.2). Because of the five feet of cover soil and improving groundwater conditions by natural attenuation, risk to future onsite trespasser or offsite receptors is deemed insignificant.

3. Are there newly identified contaminants or contaminant sources? There are no newly identified sources at the site. Nor would the land downgradient of the site and north of the highway likely be developed as this is land owned by Giant Bloomfield Refinery and has had groundwater contamination associated with the Refinery. GBR is currently undergoing post-remediation groundwater monitoring with the State of New Mexico Oil Conservation Division.

4. Are there unanticipated toxic byproducts of the remedy not previously addressed by the decision documents (*e.g.*, byproducts not evaluated at the time of remedy selection)? No.

ARARs, Toxicity and Cleanup Levels
The Five-Year Guidance contains the following questions:

1. Are there changes in the standards identified as ARARs in the ROD that bear on the protectiveness of the remedy? Table 3 shows the important chemical specific ARARs for the site as published in the ROD and currently in 2009. Are there newly promulgated standards that might apply or be relevant and appropriate to the site and that bear on the protectiveness of the remedy? ARARs were reviewed and there are no changes in ARARs that would increase risk, in fact, the toxicity factor for manganese has been adjusted upward, indicating less toxicity.

2. Are there changes in to-be-considered standards (TBCs) identified in the ROD that bear on the protectiveness of the remedy? No TBCs were identified in the ROD. The basis for each cleanup level identified in the ROD is shown in Table 1. Have there been changes to the basis of the cleanup levels? None. The selected remedy is protective of human health and the environment. The selected remedy for the soil pathway attains State and Federal ARARs. The statutory determination in the ROD states the goal that the selected remedy for the ground-water pathway will attain ARARs within a reasonable time frame not to exceed the ground-water monitoring period of 30 years. In fact, the remedy has attained all ARARs (except manganese in some wells) since the ROD was signed in 2004.

3. Have physical site conditions changed such that protectiveness may be affected (*e.g.*, changes in anticipated direction or rate of groundwater flow)? Has understanding of physical site conditions changed (*e.g.*, identification of a new groundwater divide)? No new information has come to light on the direction of groundwater flow.

4. Have toxicity factors for contaminants of concern at the site changed? Some slight changes have occurred. Table 1 presents the ROD cleanup levels, ARARs and toxicity factors from EPA's Integrated Risk Information System (IRIS). These changes indicate either less toxicity or the toxicity factor in IRIS was withdrawn pending further study by EPA.

5. Have other contaminant characteristics changed? No.

6. Have ecological toxicity reference values and/or ecological "no observed adverse effect levels/lowest observed adverse effect" (NOAELs/LOAELs) levels changed? There are no standardized ecological toxicity factors. Because the site has been capped and converted into a County road, ecological receptors are considered minimal to nonexistent. Recent inspection does not show any animals larger than insects, small lizards, or small rodents burrowing into the cap. The cap has a gravel cover that was designed to discourage animal burrowing.

The EPA Guidance Appendix G-2 shows a decision flow sheet for any changes in standards. However, the changes are minimal and do not increase risk nor do they have lower (more restrictive) standards compared to the ROD.

For these reasons, it is therefore unnecessary to revise or expand the previous risk assessment as part of the five-year review.

Remedial Action Objectives (RAOs):
As part of the five-year review, the EPA Guidance requires an evaluation of the RAOs stated in the ROD to determine whether the remedy is meeting RAOs. The RAOs for the potential soil pathway are:

- Reduce or eliminate the potential for future leaching of contaminants from the landfill to ground water by preventing moisture infiltration.
- Reduce or eliminate the potential for future direct exposure to contaminated soil and waste.
- Reduce or eliminate the potential for future migration of contaminants through storm water run-off or erosion.

The RAOs for ground water are:

- Elimination or significant reduction of the risk posed by elevated manganese levels in ground water by eliminating access to the ground water.
- Reduction of levels of manganese, nickel, 1,2-DCE, PCE, TCE, and VC to comply with ARARs.

Based on the favorable groundwater monitoring results and cap inspections, the remedy is meeting all RAOs stated in the ROD, is within EPA's acceptable risk range, and the remedy is considered protective.

In summary, the answer to question B, are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid? The answer to this question is yes, these components are still valid.

Table 3. Lee Acres Landfill ARARs and Toxicity Factors

	ROD Cleanup		ROD	2009	2004	2009	1995- RI Tox Factor		2009 IRIS Tox Factor	
	Levels	Basis	MCL	MCL	NMWQCC[b]	NMWQCC[b]	RfD	SFO	RfD	SFO
Manganese	346	Background	50[a]	50[a]	200	200	5.00E-03	NA	1.40E-01	NA
Nickel	200	NMWQCC	NA	NA	200	200	2.00E-02	NA	2.00E-02	NA
1,2-cis-Dichloroethene	70	MCL	70	70	part 101z	700	1.00E-02	NA	withdrawn	NA
1,2-trans-Dichloroethene	100	MCL	100	100	part 101z	25	2.00E-02	NA	withdrawn	NA
Tetrachloroethene	5	MCL	5	5	20	6.9	1.00E-01	5.20E-02	1.00E-02	withdrawn
Trichloroethene	5	MCL	5	5	100	25	1.00E-02	1.10E-02	withdrawn	withdrawn
Vinyl Chloride	1	NMWQCC	2	2	1	20	not listed	not listed	3.00E-03	1.00E-01

a - Secondary Maximum Contaminant Level (MCL) – not based on health
b - Standard for domestic supply NM 20.6.4.900. NM MCLs are same as EPA

Question C: Other information and protectiveness of the remedy:
The Guidance requires consideration of any other information that comes to light that could call into question the protectiveness of the remedy, such as ecological risks, flood boundaries and land use changes that are being considered by local officials. No information of this type has come to light.

Conclusion:
Based on the responses to Questions A, B and C, there have been no changes to exposure pathways, toxicity factors, ARARs, chemicals of concern, land use, RAOs that require a new risk assessment. Inspections of the cap and the groundwater monitoring show the remedy is protective and is working. The remedy is considered protective in the short-term because institutional controls are in place, and therefore, there is no current or potential exposure. Follow-up actions are necessary to address long-term protectiveness to ensure RAOs continue to be met. Because the remedial actions at the Lee Acres Landfill are protective, the site is protective of human health and the environment. At this point in time, there is no apparent reason to think the remedy is incapable of achieving long-term protection of human health and the environment.

8.0 Issues

No issues concerning the construction, maintenance, monitoring, or protectiveness of remedies completed as required in the Lee Acres Landfill Record of Decision were identified.

9.0 Recommendations and Follow-Up Actions

1. The monitoring schedule in the Record of Decision (ROD) and Remedial Action Work Plan requires that the landfill cover to be monitored quarterly for the first two years after installation, and then semi-annually for three more years. This required 5 year monitoring period will be completed in the fall of 2010. BLM recommends that the landfill cover be monitored semi-annually through 2010, and then annually until other monitoring requirements may be established in conjunction with site deletion from NPL.

2. The groundwater monitoring schedule in the Work Plan requires the semi-annual monitoring of eight specified wells for a period five years after completion of construction. This five year monitoring period will be completed in the fall of 2010. BLM recommends continued groundwater monitoring semi-annually through 2010, and then consulting with EPA to establish monitoring requirements to facilitate removal of the site from the National Priorities List.

3. The Work Plan also states that after the contamination levels have dropped below New Mexico State Standards, the monitoring will increase to quarterly for a period of 8 consecutive quarters in order to comply with regulations found at NMAC 20.6.2.4103 D. After the groundwater monitoring requirements in the ROD are complete in 2010, BLM will review the NMAC regulations and coordinate with NMED to discuss future monitoring regimen for the site.

4. BLM recommends the Lee Acres Landfill be placed on the EPA Superfund Post Construction Completion list.

10.0 Protectiveness Statement

The remedial actions performed at the site are considered to be protective of human health and the environment. BLM withdrew 134.6 acres of public land, which includes the Lee Acres Landfill and a buffer area around it from settlement, sale, location or entry for a period of 50 years (62 FR 2177, Public Land Order No. 7234). The construction of the landfill cover eliminated any exposure to landfill wastes, and reduced the potential mobility of contaminant sources that may remain on the site. The eleventh monitoring inspection of the cover was completed on February 20, 2009. The summary of the Feb. 20, report stated the cover is in excellent condition. Groundwater data collected from eight monitoring wells indicate that all COCs are below their respective MCLs and limits specified in the ROD except for manganese. There is no MCL for manganese, but the ROD sets the limit at 346 ppb consistent with MNQCC regulation (part 3-101.2).

11.0 Next Review

A second five-year review will be completed in October 2014 if the contamination at the Site remains above levels that prevent unlimited use and unrestricted exposure as specified in 40 C.F.R. § 300.430(f)(4)(ii).

12.0 References

Deutsch, W. J. (1997). *Groundwater geochemistry – Fundamentals and applications to contamination.* New York: Lewis Publishers.

Klinchuch, Leslie A. and Delfino, Thomas A. (2000). "Reductive Dissolution and Precipitation of Manganese Associated with Biodegradation of Petroleum Hydrocarbons." Environmental Geosciences, Volume 7, Number 2, (2000): 69-79.

ATTACHMENT 1

Landfill Cover Monitoring Report Feb 20, 2009

Lee Acres Landfill

Post-Construction Monitoring

Inspection date: **February 20, 2009**

Submitted to:

Mr. Barney Wegener US Department of Interior Bureau of Land Management, Farmington Field Office 1235 La Plata Highway Farmington, NM 87401

Submitted by:

DWYER ENGINEERING, LLC
Stephen F Dwyer, PhD, PE
1813 Stagecoach Rd. SE
Albuquerque, NM 87123

Summary:

This report summarizes the eleventh monitoring inspection performed of the Lee Acres Superfund Closure cover system (EPA ID# NMD980750020). This is the third monitoring inspection performed on a semi-annual interval. The Work Plan identified the first 2 post-construction years required quarterly monitoring on the progress of the cover system, while the final 3 years of the initial 5-year monitoring period required monitoring on a semi-annual basis.

The cover is in excellent condition. The cover soils, embankments, and drainage trenches were all in good condition and performing as designed (Picture 1). The vegetation at the site continues to mature and improve. The vegetation now appears to be approaching a climax community similar to the surrounding vegetation in undisturbed areas. Erosion at the site is minimal. Percolation measurements were made with no flux measured in the north or south lysimeter.

The Lee Acres Landfill Remedial Action Work Plan and Remedial Design prepared by the Department of Interior, Bureau of Land Management stated in appendix E that the alarm level for the measurement of flux via the installed lysimeters is 1.3 mm/year. All measurements to date are significantly below the agreed upon alarm level providing confidence the cover system is working very well to minimize flux.

Site Name: Lee Acres Landfill	**Date of Inspection: February 20, 2009**
City: Farmington	**Weather: Sunny and warm.**
State: New Mexico	**Temperature: high 50s**
EPA Region: 6	**Site Map: Figure 1**
Inspector: Stephen F Dwyer, PhD, PE	**ID#: NMD9870750020**
Prior Monitoring Performed: Initial Monitoring Report (7-21-05); 1st Quarter Monitoring Report (10-27-05); 2nd Quarter Monitoring (2-11-06); 3rd Quarter (5-20-06); 4th Quarter (8-9-06); 5th Quarter (11-17-06); 6th Quarter (2-16-07); 7th Quarter (5-3-07); 8th Quarter (8-16-07); 9th Semi-Annual (2-29-08); 10th Semi-Annual (9-12-08).	
ITEM	**REMARKS**
COVER SYSTEM (Capillary Barrier)	
1. SETTLEMENT (LOW SPOTS) Yes ( ) No (**X**) Areal Extent: none Depth: none	No settlement or evidence of ponding noted.
2. CRACKS Yes ( ) No (**X**) Length: none Width: none Depth: none	No significant surface cracking seen on cover.
3. EROSION Yes (X) No ( ) Areal Extent: minimal Depth: minimal	There is no significant erosion noted on the site (Picture 1). Desert pavement has reached equilibrium on the main cover surface allowing no significant visible erosion. The gravel admixture surface layer was designed for this purpose – to allow for minimal erosion of the uppermost fine material leaving behind the gravel, thus forming a surface armorment referred to as a 'desert pavement' (Picture 2). The steeper side slopes along the roadway now produce minimal erosion (Picture 3).
4. BIOINTRUSION Yes (X) No ( )	There is minimal biointrusion activity

Areal Extent: minimal Depth: shallow Suspected Cause (Rodent or Other): rodent and ant	(isolated insect / mammal holes and ant piles) found on the cover (Pictures 4) The burrowing animal intrusion had decreased to only a couple of holes on the entire site. The number of ant hills had decreased from the last visit. These were inactive at the time of the site visit – winter hibernation.
5. VEGETATIVE COVER Yes ( ) No (**X**) Grass: Yes (X) No ( ) Shrubs Yes (X) No ( ) Weeds: Yes (**X**) No ( ) – minimal Other: Yes (X) No ( ) - wildflowers Condition: vegetation was in excellent condition. Size: Approaching mature state.	The cover's vegetation has continued to improve (Picture 1). Native shrubs and forbs are expanding their surface coverage (Picture 5). More native grasses are visible on the site. Minimal invasive species were noted other than some dried up tumbleweeds.
6. GRAVEL/SOIL ADMIXTURE COVER SURFACE Yes (**X**) No ( ) Material Type: soil mixed with gravel Condition: Excellent	The gravel/soil surface admixture is in good shape and performing as designed with evidence of a 'desert pavement' formation (Pictures 2 and 3).
7. WET AREAS Yes ( ) No (**X**) Ponding: Yes ( ) No (**X**) Areal Extent: none Estimated Flow Rate: none Soft Subgrade: Yes ( ) No (**X**) Areal Extent: none	None noted during this visit.
9. SLOPE INSTABILITY Yes ( ) No (**X**) Slides: Yes ( ) No (**X**) Areal Extent: none Probable Slide Interface: none Suspected Cause: NA Exposed Cover Components: none	Slopes along the roadway appear in good shape with no signs of instability (Picture 3). These slopes were compacted to high densities for strength in road construction. The slopes have produced minimal silt erosion while the desert pavement has approached equilibrium.
10. GEOTEXTILE EXPOSED Yes ( ) No (**X**) Type: geotextile filter fabric Areal Extent: none	none
11. SOUTHEAST CLOSURE SECTION – EAST OF ROAD Condition: Excellent	This cover section is in excellent condition (Picture 6).
FLUX MEASURMENTS FROM LYSIMETERS	
1. LYSIMETER FUNCITONING PROPERLY Yes (**X**) No ( )	Neither lysimeter produced any flux (Figure 1, Pictures 7 and 8). Both lysimeters appeared to be functioning

Description of problem: none	properly. Both valves were in good shape.
1a. NORTH LYSIMETER Yes (**X**) No ( ) Description of problem: none	
1b. SOUTH LYSIMETER Yes (**X**) No ( ) Description of problem: none	
DRAINAGE CHANNELS	
1. SETTLEMENT Yes ( ) No (**X**) Areal Extent: none Depth: none	All drainage channels are in good shape. Acceptable levels of silt are found in the interior drainage trenches (Pictures 9 and 10).
2. MATERIAL DEGRADATION Yes ( ) No (**X**) Material Type: Areal Extent: none Degree of Degradation: none	
3. EROSION Yes ( ) No (**X**) Areal Extent: minimal Depth: minimal	
4. UNDERCUTTING Yes ( ) No (**X**) Areal Extent: none Depth: none	
5. OBSTRUCTIONS Yes ( ) No (**X**) Type: none Areal Extent: none Size:	
6. SLOPE INSTABILITY Yes ( ) No (**X**) Type: none Areal Extent: none	
COVER PENETRATIONS	
1. LYSIMETER ACCESS VALVE Yes (**X**) No ( ) Functioning: Yes (**X**) No ( ) Condition: Good	There are 2 valve access ports that penetrate the cover profile; one for each lysimeter (Picture 7). These ports allow access to the cutoff valves for the 2 lysimeters installed to monitor the flux through the cover. They are made of PVC pipe and are in excellent condition at this time. These cover penetrations are in good shape and do not appear to be allowing preferential flow through the cover.

PERIMETER DITCHES/OFF-SITE DISCHARGE	
1. SILTATION Yes ( ) No (**X**) Areal Extent: minimal Depth: minimal	The perimeter ditches and off-site drainage appear to be working properly. (Picture 9 and 10).
2. VEGETATION GROWTH Yes (**X**) No ( ) Areal Extent: full coverage Type: Shrub, grasses and forbs with some weeds.	Vegetation continues to improve. The surface vegetation appears to be a success at this time (Pictures 1, 5, and 6).
3. EROSION Yes ( ) No (**X**) Areal Extent: minimal Depth: minimal	No new erosion noted on site.
4. DISCHARGE STRUCTURE Yes (X) No ( ) Functioning: Yes (X) No ( ) Condition: Good	The culverts located in cross drainage trenches above and below the Lee Acres cover site appeared to be working properly (Picture 11).
5. CULVERT Yes (**X**) No ( ) Material Type: Corrugated metal culverts direct drainage from the east side of the road to the arroyo located west of the landfill site. There are two culverts: one located north of the site and one located south of the site.	The culverts located in cross drainage trenches above and below the Lee Acres cover site appeared to be working properly (Picture 11).
FENCING	
1. FENCING DAMAGE Yes ( ) No (**X**) Description of damage: none	The chain link fence around the perimeter of the site is in excellent condition (Picture 12).
ROADS	
1. ROAD DAMAGE Yes ( ) No (**X**) Location: Bisects landfill (figure 1) Description of damage: none Impact to Closure: Yes ( ) No (**X**) Description of Impact: Helps by redirecting up-gradient surface runoff away from landfill source locations.	The road (County Highway 350) is still in new condition.
SITE ACCESS	
1. ACCESS RESTRICTIONS Yes (**X**) No ( ) Description: Chain link fence and locked gate.	The site is currently secured with chain link fencing. Access is limited by a locked gate. All are in excellent condition (Picture 12).

GENERAL	
1. VANDALISM Yes ( ) No (**X**) Description of damage: none	none
2. CHANGED SITE CONDITION Yes ( ) No (**X**)	No degradation noted. Vegetation has improved.
3. LAND USE CHANGE Yes ( ) No (**X**) Description: none	none
INTERVIEWS	
1. INTERVIEW ON-SITE WORKERS Yes ( ) No (**X**) Problems: none Suggestions: none Attach report: NA	none
2. INTERVIEW NEIGHBORS Yes ( ) No (**X**) Problems: none Suggestions: none Attach report: none	none
3. INTERVIEW LOCAL OFFICIALS Yes (X) No ( ) Problems: none Suggestions: none Attach report: none	None. 5-year CERCLA review was held the prior day that included a site visit by all attendees.

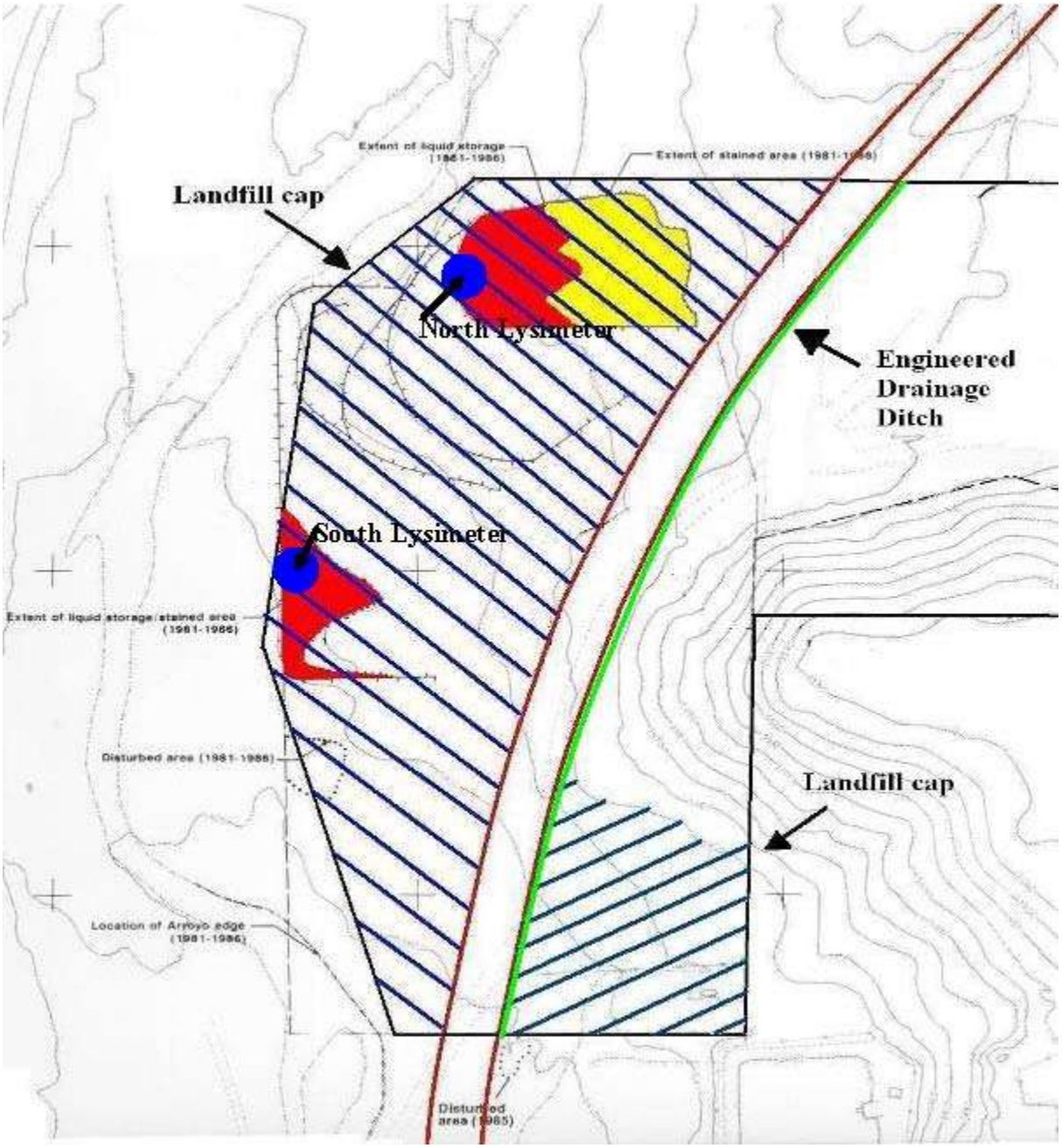


Figure 1. Lee Acres Landfill Site with Lysimeter Locations

Picture 1. Lee Acres Cover, dated 2-20-09

Picture 2. Desert Pavement on Cover Surface

Picture 3. Roadway Western Slope

Picture 4. Ant Hill on Cover – Inactive due to Winter Hibernation

Picture 5. Vegetation Present on Cover

Picture 6. Southeast Cover System

Picture 7. North Lysimeter Valve Access

Picture 8. North Lysimeter Collection Point

Picture 9. Exterior Drainage Ditch East of Roadway

Picture 10. Drainage Ditch on East Side of Cover Adjacent to Roadway

Picture 11. Culvert South of Site

Picture 12. Site Gate

ATTACHMENT 2

Public Notices

PUBLIC NOTICE

BLM AND EPA BEGINS FIVE-YEAR REVIEW of the SUPERFUND CLEAN UP at the LEE ACRES LANDFILL SITE

The Bureau of Land Management (BLM) and the U.S. Environmental Protection Agency (EPA) is in the process of completing a **Five-Year Review** of the **Lee Acres Landfill Superfund Site**, located approximately 3/8 mile north of the intersection of U.S. Highway 64 and San Juan County road 5500 near McGee Park. BLM welcomes comments and/or questions prior to and following the review's expected completion date of November 2009.

What is a Five-Year Review?
It is a review required by law or policy to make sure that the BLM – EPA cleanup is protective of human health and the environment. The review includes inspecting the site and cleanup technologies and examining monitoring data, operating data, and maintenance records. This entire process is repeated every five years.

Why is a Five-Year Review being done for this site?
The Five-Year Review will evaluate the effectiveness of the Lee Acres Landfill Remedial Action Work Plan components:

- Closure and capping of landfill soils to prevent leachate using a capillary barrier design provided by the Department of Energy's Sandia National Laboratory.
- Realignment of County Road 350, including storm water run-on and run-off controls constructed to divert run-on, and maximize run-off.
- Monitor natural attenuation of ground water contaminants.

To Review Five-Year Report:
When complete, the Five-Year Review will be available on the internet at the New Mexico BLM external website, and at the BLM public room at 1235 La Plata Highway, Farmington NM.

PLEASE NOTE: For more information or to report concerns about the Site which may be helpful to the Five-Year Review process, contact:

Beth Utley
San Juan County
100 South Oliver Drive
Aztec NM 87410
505-334-4581

Barney Wegener
Farmington BLM
1235 La Plata Highway
Farmington NM 87401
505-599-6346

Confirmed Publication in Farmington Daily Times: Feb. 11, March 7, and March 14, 2009.

PUBLIC NOTICE

BLM AND EPA COMPLETES FIVE-YEAR REVIEW of the SUPERFUND CLEAN UP at the LEE ACRES LANDFILL SITE

The Bureau of Land Management (BLM) and the U.S. Environmental Protection Agency (EPA) has completed a **Five-Year Review** of the **Lee Acres Landfill Superfund Site**, located approximately 3/8 mile north of the intersection of U.S. Highway 64 and San Juan County road 5500 near McGee Park.

What is a Five-Year Review?
It is a review required by law or policy to make sure that the BLM – EPA cleanup is protective of human health and the environment. The review includes inspecting the site and cleanup technologies and examining monitoring data, operating data, and maintenance records. This entire process is repeated every five years.

Why was a Five-Year Review being done for this site?
The Five-Year Review will evaluate the effectiveness of the Lee Acres Landfill Remedial Action Work Plan components:

- Closure and capping of landfill soils to prevent leachate using a capillary barrier design provided by the Department of Energy's Sandia National Laboratory.
- Realignment of County Road 350, including storm water run-on and run-off controls constructed to divert run-on, and maximize run-off.
- Monitor natural attenuation of ground water contaminants.

Results of the Five-Year Review:
The results of the Five-Year Review indicate that the remedy is protective of human health and the environment. The results of the Five-Year Review are available on the internet at the New Mexico BLM external website, the Farmington Public Library, and at the BLM public room at 1235 La Plata Highway, Farmington NM.

PLEASE NOTE: For more information or to report concerns about the Site, contact:

Beth Utley
San Juan County
100 South Oliver Drive
Aztec NM 87410
505-334-4581

Barney Wegener
Farmington BLM
1235 La Plata Highway
Farmington NM 87401
505-599-6346

For Publication in Farmington Daily Times for publication upon completion of Five-Year Review

ATTACHMENT 3

Interviews

INTERVIEW RECORD

Site Name: Lee Acres Landfill	**EPA ID No.: NMD980750020**	
Subject: Five-Year Review	**Time: 0830**	**Date: 3-25-2009**
Type: Telephone **Visit** Other **Location of Visit: San Juan County Administration Building**	Incoming 0830	Outgoing 0900

Contact Made By:

Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**

Individual Contacted:

Name: Beth Utley	**Title: San Juan County Public Relations Manager**	**Organization: San Juan County**
Telephone No: 505-334-4581 **Fax No: 505-334-4226** **E-Mail Address: bethutley@sjcounty.net**	**Street Address: 100 South Oliver Drive** **City, State, Zip: Aztec NM 87410**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I have worked for San Juan County since 2000, and have been the County Public Relations Manager since 2004. I am also serving as the Community Involvement Coordinator for the Lee Acres five-year review process.

Interview Questions
QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004? I feel that proper procedures have been in place to insure the safety of the public, and to make sure the cap maintains its integrity.
QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community? No effects at all on the surrounding community. Most people do not know the landfill site is there.
QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site? No.
QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results. I do not conduct site visits or inspection. Other County employees do visit the site, and then I get their reports.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

The only incident that I am aware of is the vehicle accident that required fence repair.

Summary Of Conversation

I asked Beth to summarize her thoughts about Lee Acres and she responded with the following:

The San Juan County Legal Department posted 3 Public Notices in the Farmington Daily Times. The notices ran in the paper at 3 different times: February 11, March 7, and March 14. The notice explained the five-year review process and directed the public to notify me of any questions or concerns. I did not receive any responses. Since 2004 when I took over the position of Public Relations Manager, I have not received any negative responses from the public concerning Lee Acres. San Juan County received an award from the National Association of Counties for cooperating with federal agencies and the State of New Mexico to develop remedial actions for the Lee Acres site and the construction of the cap and Road 350. The Farmington Daily Times reported on the award, and I did receive some positive comments from the public in response the report in the paper.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**
Subject: Five-Year Review		**Time: 1330** **Date: 3-26-09**
Type: Telephone **Visit** Other **Location of Visit: Western Refining Office - Bloomfield**		Incoming 1330 Outgoing 1520
Contact Made By:		
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**
Individual Contacted:		
Name: Bruce Cauthen	**Title: Environmental Engineer**	**Organization: Western Refining**
Telephone No: 505-632-8006 **Fax No: 505-632-4021** **E-Mail Address: bruce.cauthen@wnr.com**		**Street Address: 111 County road 4990** **City, State, Zip: Bloomfield, NM 87413**

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

Western Refining owns property south of the Landfill, and I have been an environmental engineer for Western Refining for about a year. I am familiar with the site. I worked at Giant Bloomfield Refinery in 1981 and was part of the shut down crew. I am now in charge of analyzing groundwater monitoring reports and coordinating with OCD on Giant Bloomfield Refinery monitoring wells. Some of these ground water monitoring wells are located on BLM surface just south of the landfill.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

I was aware of the earth moving project on the site that you call the cap. But I was not working for Western Refining at that time. From an environmental stand point; the overall clean up and project seems to be moving the right direction.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

After looking through the ground water monitoring charts, it looks like the contaminants of concern are below cleanup levels and that is good for the community.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I do not monitor the old landfill site. The monitoring that I am involved with concerns Western Refining in cooperation with the New Mexico Oil Conservation District.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

No.

Summary Of Conversation

Bruce asked me how the cap was constructed and how it works. I replied that I would send him a copy of the Interim Remedial Action Report for the Lee Acres Landfill from September 2005. This report includes details about the cap.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**
Subject: Five-Year Review		**Time: 1000** **Date: 3-18-2009**
Type: Telephone **Visit** Other **Location of Visit:San Juan County Public Works Office**		Incoming 1000 Outgoing 1200
Contact Made By:		
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**
Individual Contacted:		
Name: Dave Keck	**Title: Public Works Administrator**	**Organization: San Juan County**
Telephone No: 505-334-4520 **Fax No: 505-334-3645** **E-Mail Address: dkeck@sjcounty.net**	**Street Address: 305 South Oliver Dr.** **City, State, Zip: Aztec NM 87410**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

As Public Works Administrator, I was responsible for initial construction of the test cap, the main cap, and I am responsible for maintenance and oversight for the entire site including the cap, County Road 350, and the road apron utilized for water run on and run off control. I initiated the idea of building a road (County Road 350) through the site to improve traffic in the county, and to use the road construction to control water run off and run on to protect the cap. I was the administrative advisor of the cap construction and attended coordination meetings and site inspections.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

The cap has performed very well. There are very few issues other than reseeding the cap after the initial seeding effort failed. I am very pleased with the cap project.

QUESTION #3 From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

None; people do not realize they are driving over the old landfill.

QUESTION #4 Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No; I have had no calls and no questions from the community.

Question #5 Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I have done visual drive through inspections, and I have coordinated with BLM. I look at the asphalt lined drainage swale that controls water run on and run off from the cap. The asphalt drainage along the east side of 350 was sealed and is working fine other than a few low places that hold a puddle of water for a short time after a rain.

INTERVIEW RECORD

Question #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

A citizen crashed his vehicle through the fence near the small cap in 2005. The San Juan County Sheriff's Office responded to the accident and determined the driver was impaired by alcohol. No injuries were reported and the fence was repaired by the County the next day. I know of no other incidences.

Summary Of Conversation

Dave's summary was: the cap and remediation project in cooperation with EPA and BLM has been a huge success.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**	
Subject: Five-Year Review		**Time: 0900**	**Date: 3-30-09**
Type: **Telephone** Visit Other **Location of Visit:**		Incoming 0900 Outgoing 1000	
Contact Made By:			
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**	
Individual Contacted:			
Name: Fredrick Gebhardt	**Title: Hydrologic Technician**	**Organization: USGS Water Science Center**	
Telephone No: 505-830-7978 **Fax No: 505-830-7998** **E-Mail Address: gebhardt@usgs.gov**		**Street Address: 5338 Montgomery Blvd. NE Suite 400** **City, State, Zip: Albuquerque NM 87109**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I began sampling the ground water at Lee Acres in 1993, and became the Lee Acres Sampling Project Manager in 2000. I am responsible for the USGS sampling program at Lee Acres.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

I believe the BLM and EPA remediation plan is moving in the right direction. I think they are on track to start the closure process.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

From the prospective of the ground water monitoring program, there is no indication of any effects to the down gradient residences of the Lee Acres community.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No.

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I am contracted by BLM to monitor the ground water monitoring wells twice a year. I am in constant communication with BLM regarding the monitoring results. I think the next phase in this project is closure.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

No.

Summary Of Conversation

I truly feel the project is moving in the right way, and will benefit BLM and the community by closing out the site.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**
Subject: Five-Year Review		**Time: 1000** **Date: 4-16-2009**
Type: Telephone **Visit** Other **Location of Visit:**		Incoming 1000 Outgoing 1200
Contact Made By:		
Name: Barney Wegener **Dale Wirth**	**Title: Natural Resource Specialist** **Branch Chief – Rng & Mult Resources**	**Organization: Bureau of Land Management (BLM)**
Individual Contacted:		
Name: Phyllis Bustamante	**Title: Geoscientist – New Mexico Environmental Department (NMED) Superfund Over Site**	**Organization: NMED**
Telephone No: 505-827-2434 **Fax No: 505-827-2965** **E-Mail Address: phyllis.bustamante@state.nm.us**	**Street Address: Harold Runnels Building Rm. N2250** **1190 St. Francis Drive P.O. Box 5469** **City, State, Zip: Santa Fe, NM 87502-5469**	

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I am a staff member of the New Mexico Environmental Department – Ground Water Quality Bureau – Superfund Oversight Section. I have been assigned to Lee Acres for 2 years. The Superfund Oversight Section (SOS) assists the U.S. Environmental Protection Agency (EPA) in characterization of inactive hazardous waste sites, and provides management assistance to EPA at Superfund sites listed on the National Priorities List. I review the Lee Acres site and associated documents for consistency under the Superfund rules so that actions initiated at Lee Acres are consistent with State of New Mexico rules to ensure protection of human health and the environment.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

My impression is that BLM has met commitments outlined in the Record of Decision (ROD) by constructing the cap and monitoring ground water. The monitoring information indicates that things are going well.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

The cap has eliminated any odors and blowing trash that may have come from the landfill. Early indications of the cap monitoring show the cap may be preventing migration of contaminants to, or through the ground water.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No. I have not heard any community concerns.

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I did a site visit on August 16, 2007 and was introduced to the site by Dale Wirth and Steve Dwyer. I attended the 5 year coordination meeting and follow up site visit on February 19, 2009. On March 24 and April 7, NMED staff members including myself, hand delivered post cards to the Lee Acres subdivision residents with a questionnaire to identify private wells, and the current use of the wells. NMED wants to sample these wells in May 2009, if given permission by the land owner. NMED is initiating this study to see if there are any new targets or contaminants in the ground water under the Lee Acres community. NMED will split samples at the Lee Acres landfill site during the next sampling event conducted by USGS.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

No.

Summary Of Conversation

In terms of reviewing the documents, I have concerns and I am hoping that we are not missing any contamination movement or migration. Analytical results do not clearly show that PCE has gone through the degradation process. I am not seeing all secondary by products that should be produced during the breakdown of PCE to TCE to DCE to VC. I wonder; could some of the contamination migrated without being detected with the current monitoring system? Analytical review and down gradient wells monitoring does not indicate that much migration is taking place, but no monitoring system is perfect. I Wonder if a path of migration may not have been detected?

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**
Subject: Five-Year Review		**Time: 1020** **Date: 3-27-2009**
Type: **Telephone** Visit Other **Location of Visit:**		Incoming Outgoing
Contact Made By:		
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**
Individual Contacted:		
Name: Stephen Dwyer PhD, PE	**Title: Contract Engineer**	**Organization: Dwyer Engineering, LLC**
Telephone No: 505-844-0595 **Fax No: 505-271-0741** **E-Mail Address: dwyerengineering@yahoo.com**		**Street Address: 1813 Stagecoach Rd. SE** **City, State, Zip: Albuquerque, NM 87123**

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I helped to conceptualize the use of an engineered capillary barrier (cap) as a remedy to the Lee Acres Landfill. I participated in cap research and development at Sandia National Laboratories. I attended meetings with the EPA, BLM, and NMED to discuss the appropriateness of the cap, and how it would promote natural attenuation of contaminants that were present within the land fill. I designed the small test cap and had oversight in its construction and monitored the test cap after construction. I assisted the firm of Cheney-Walters-Echols INC to engineer the main cap, and I reviewed the final plan. I provided construction oversight as construction engineer as the cap was being built. I have been monitoring the cap for the 4 years after the cap was completed. The cap looks very good.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

Very favorable. The cover is working very well. Any issues that have arisen have been taken care of between BLM and San Juan County. Data is showing he cap is working and is allowing natural attenuation to do its thing. There is generally a window of time between 3 to 7 years after construction that if there is going to be a problem with a cap, it will show up within this window. We have reduced the monitoring of the cap from quarterly to semiannual. I would recommend continuing the monitoring semiannually until we get out of the 3 to 7 year window. If no problems arise after that time, monitoring may be reduced to annually. Monitoring ground water and the cap go hand in hand.

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

I think they are positive. San Juan County pushed the remediation to include the realignment of Road 350. The road eliminated the need for a stop light on Highway 64, and straightened the alignment of 350; eliminating dangerous curves. The community benefits from the safer alignment of road 350. The cover has also stopped water from pounding on the site, reducing surface water issues.

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No.

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

Yes. I am responsible for monitoring the cap. I am currently monitoring semiannually, and submit my reports to BLM. The cap is performing as designed and you can review my reports in your office.

INTERVIEW RECORD

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

No. Nothing other than a car accident that damaged a fence. The fence was repaired right away. I have found no vandalism during my monitoring visits.

Summary Of Conversation

I am very positive; this is an excellent closure.

Site Name: Lee Acres Landfill		**EPA ID No.: NMD980750020**
Subject: Five-Year Review		**Time:1000** **Date: 3-18-2009**
Type: Telephone **Visit** Other **Location of Visit:**		Incoming 1000 Outgoing 1200
Contact Made By:		
Name: Barney Wegener	**Title: Natural Resource Specialist**	**Organization: Bureau of Land Management (BLM)**
Individual Contacted:		
Name: T.J. Richards	**Title: Compliance Specialist**	**Organization: San Juan County**
Telephone No: 505-334-4574 **Fax No: 505-334-3645** **E-Mail Address: tjrichards@sjcounty.net**		**Street Address: 305 South Oliver Dr.** **City, State, Zip: Aztec NM 87410**

Purpose of the Five-Year Review

The Purpose of the five-year review is to evaluate the implementation and performance of the remedy actions approved in the Lee Acres Landfill Record of Decision (ROD), and to confirm that human health and the environment are protected by the actions performed. Remedy actions include: landfill cover (cap), surface water run-on and run-off controls, monitored natural attenuation of ground water, and institutional controls.

QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?

I have been involved with San Juan County administration since 1993. I moved to engineering technician in 1999. I worked with BLM staff and the Engineering Firm of Cheney - Walters – Echols INC to develop the remedial design work plan for the cap and Road 350. Since the cap has been completed, I am responsible for the project compliance and maintenance.

Interview Questions

QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the landfill cap in October 2004?

The cap has performed very well. I am very pleased with the cap project. I visually inspect the project area every time she passes by – about 8 to 10 times per month

QUESTION #3: From your perspective, what effects have the landfill cap and monitoring activities had on the surrounding community?

The effects have been minimal. The only community issue I have noticed is a temporary traffic impediment while USGS (Fred Gephardt) is monitoring well #68 along the side of the highway (County Road 350).

(USGS monitors well 68 biannually, and sets cones to close the west lane of traffic while he takes a water sample).

QUESTION #4: Are you aware of any ongoing community concerns regarding the remedial actions completed at the Lee Acres Landfill site?

No

QUESTION #5: Have there been routine communications or activities (site visits, inspections, reporting activities, sampling, etc.) conducted by you, or your office regarding the site? Please describe purpose and results.

I drive by the site about 8 to 10 times per month and look at the fence lines, check to see if the erosion controls are working, and look for trash.

QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since October 2004 that required emergency response from local authorities?

The only incident that I am aware of is the traffic accident that Dave Keck mentioned. The fence was damaged by the accident, but the County repaired the fence the next day.

Summary Of Conversation

T.J. said that different government agencies including local, federal, and state cooperated to develop and construct the remedy (cap and Road 350). I think it was a great showing of government agencies working together.

ATTACHMENT 4

Site Inspection Check List and Photos

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Lee Acres Landfill	**Date of inspection: 2-19-2009**
Location and Region: Farmington NM Region 6	**EPA ID: NMD980750020**
Agency, office, or company leading the five-year review: Farmington BLM (DOI)	**Weather/temperature: Sunny and 50 degrees F.**

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
■ Other_____
_____

X Monitored natural attenuation
■ Groundwater containment
■ Vertical barrier walls

Attachments: **X** Inspection team roster attached **X** Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** __Dave Keck_____ ___ Public Works Administrator ___2-19-2009
   Name Title Date
   Interviewed **X** at site ■ at office ■ by phone Phone no. _**505-334-4520**_____
   Problems, suggestions; **X** Report attached _____
   _____

2. **O&M staff** __T. J. Richards_____ ___ Compliance Specialist ___ _3-18-2009_____
   Name Title Date
   Interviewed ■ at site **X** at office ■ by phone Phone no. ___505-334-4574_____
   Problems, suggestions; **X** Report attached _____
   _____

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 San Juan County
Contact Beth Utley Community Involvement Coordinator 3-25-2009 505-334-4581
Name Title Date Phone no.
Problems; suggestions; **X** Report attached _____

Agency USGS
Contact Fredrick Gebhardt Hydrologic Technician 3-30-09 505-830-7978
Name Title Date Phone no.
Problems; suggestions; **X** Report attached _____

Agency New Mexico Environmental Department (NMED)
Contact Phyllis Bustamante NMED Superfund Oversite 4-16-2009 505-827-2434
Name Title Date Phone no.
Problems; suggestions; **X** Report attached _____

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

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

Stephen Dwyer PhD, PE Dwyer Engineering, LLC Landfill Cover Monitoring 505-844-0595

Bruce Cauthen Environmental Engineer Western Refining (Giant Bloomfield Refinery) 505-632-8006

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

1. **O&M Documents**
   - ■ O&M manual — X Readily available — ■ Up to date — ■ N/A
   - ■ As-built drawings — ■ Readily available — ■ Up to date — X N/A
   - ■ Maintenance logs — X Readily available — ■ Up to date — ■ N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — X Readily available — ■ Up to date — ■ N/A
   - ■ Contingency plan/emergency response plan — X Readily available — ■ Up to date — ■ N/A

   Remarks_____

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

   Remarks Tail Gate Meetings

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 _____No Permits Required___

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** — **X** 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** — ■ Readily available — ■ Up to date — X N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**
   - ■ State in-house ■ Contractor for State
   - ■ PRP in-house ■ Contractor for PRP
   - ■ Federal Facility in-house ■ Contractor for Federal Facility
   - X Other ____San Juan County In-House__

2. **O&M Cost Records**
   - X Readily available X Up to date
   - ■ Funding mechanism/agreement in place
   - Original O&M cost estimate $1,109,299.03__ ■ Breakdown attached

   Total annual cost by year for review period if available

From__ Oct 2004_	To _Jan. 2006_	$711,925.34____	■ Breakdown attached
Date	Date	Total cost	
From__ Jan. 2006_	To _Jan. 2007_	$2,429.99_____	■ Breakdown attached
Date	Date	Total cost	
From__ Jan. 2007	To_ Jan 2008 -	$2,706.30_____	■ Breakdown attached
Date	Date	Total cost	
From__ Jan. 2008_	To_ Jan 2009_	$214.00_____	■ Breakdown attached
Date	Date	Total cost	
From___ Jan. 09__	To Present __	$244.00_____	■ Breakdown attached
Date	Date	Total cost	

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons:
   None

V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable ■ N/A

A. Fencing

1. **Fencing damaged** ■ Location shown on site map ■ Gates secured ■ N/A
   Remarks_ A citizen crashed his vehicle through the fence near the small cap in 2005. The San Juan County Sheriff's Office responded to the accident and determined the driver was impaired by alcohol. No injuries were reported and the fence was repaired by the County the next day.

B. Other Access Restrictions

1. **Signs and other security measures** ■ Location shown on site map ■ N/A
   Remarks___ All gates are locked and checked regularly by the County

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) Drive By
Frequency 8 – 10 times per month
Responsible party/agency San Juan County
Contact T. J. Richards (Name) Compliance Specialist (Title) _____ (Date) 505-334-4574 (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 BLM has withdrawn 134.68 acres of public land, within which the landfill is located, from settlement, sale, location, and entry, as described in Public Land Order No., 7234 (62 Fed. Reg. 2177, January 15, 1997).

D. General

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

Remarks None

2. **Land use changes on site** ■ N/A

Remarks None

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

Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ■ Applicable ■ N/A

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

Remarks None

B. Other Site Conditions

Remarks Site is in good condition

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 No Settlement

2. **Cracks** ■ Location shown on site map X Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks No Cracks

3. **Erosion** ■ Location shown on site map ■ Erosion not evident
Areal extent_____ Depth_____
Remarks Steve Dwyer noted that there was minor silt deposits seen in the gravel in storm water run-off trenches, but the silt was minimal and within tolerances. No action needed.

4. **Holes** ■ Location shown on site map X Holes not evident
Areal extent_____ Depth_____
Remarks Steve Dwyer noted that there are some scattered ant hills and evidence of some burrowing animals (probably lizards), but nothing significant and no penetrations. One gopher was found on site in 2006, but was removed immediately.

5. **Vegetative Cover** ■ Grass X Cover properly established ■ No signs of stress
■ Trees/Shrubs (indicate size and locations on a diagram)
Remarks The grass and shrub community established by two seedings is similar to the undisturbed vegetation surrounding the site, but is not yet mature.

6. **Alternative Cover (armored rock, concrete, etc.)** ■ N/A
Remarks There is rock armor 12 feet wide around the perimeter of the cover. All of the rock armor is in good condition and side slopes and drainage trenches are in good shape.

7. **Bulges** ■ Location shown on site map X Bulges not evident
Areal extent_____ Height_____
Remarks_____None

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_____None_____

9. **Slope Instability** ■ Slides ■ Location shown on site map X No evidence of slope instability
Areal extent_____
Remarks_____None_____

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 X N/A or okay
Remarks_____

2. **Bench Breached** ■ Location shown on site map X N/A or okay
Remarks_____

3. **Bench Overtopped** ■ Location shown on site map X 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 X Applicable ■ 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 X Functioning X Routinely sampled X Good condition
■ Evidence of leakage at penetration ■ Needs Maintenance ■ N/A
Remarks There are two lysimeters within the surface of the landfill site. The lysimeters are in good condition, and monitored regularly.____
_____

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 ■ Applicable X N/A

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

2. **Outlet Rock Inspected** ■ 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 X Applicable ■ N/A

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

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

3. **Erosion** ■ Location shown on site map X Erosion not evident
   Areal extent_____ Depth_____
   Remarks ___No erosion in trenches._____
   _____

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_____
   _____

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 log 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

1. Monitoring Data
   X Is routinely submitted on time X Is of acceptable quality

2. Monitoring data suggests:
   X Groundwater plume is effectively contained X Contaminant concentrations are declining

D. Monitored Natural Attenuation

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

X Properly secured/locked X Functioning X Routinely sampled X Good condition
X All required wells located ■ Needs Maintenance ■ N/A
Remarks Wells monitored by USGS

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.).

Remedy is functioning as designed.

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.

The landfill cover is properly maintained and all facilities are in good condition.

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. No issues

D.	Opportunities for Optimization
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. No issues

Lee Acres Landfill Site Inspection February 19, 2009

View is from the north portion of the landfill cover looking south.

Lee Acres Landfill Site Inspection February 19, 2009

View is from the southwest portion of the landfill cover looking to the northeast; note truck on County Road 350.

Lee Acres Landfill Site Inspection February 19, 2009

View is from the northwest corner of cover and cone marks the location of the north lysimeter.

Lee Acres Landfill Site Inspection February 19, 2009

View is from the southern portion of the cover looking south; note County Road 350 on the left, water drain channel in the center, and the southern portion of the cover on the right.

Lee Acres Landfill Site Inspection February 19, 2009

View looking south along storm water run-off channel that was constructed along County Road 350.