

# **Second Five-Year Review**

**Lee Acres Landfill  
Farmington, New Mexico  
October 2014**



**Prepared By**  
**Bureau of Land Management**  
Farmington District Office

**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 Second 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 second 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 have been implemented as planned:

1. Construction of landfill 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 July 2, 2014 Lee Acres CERCLA Cover System – Post Construction Monitoring Report found the cover is in excellent condition. Since the landfill cover was completed, all measurements to date have been significantly below the agreed upon alarm level except for two measurements in the north lysimeter during 2010. The rolling annual flux rate for the north lysimeter in 2010 was 10.73 mm/year, and was attributed to an exceptionally cold and wet winter. Since August of 2010, all measurements have been significantly below the alarm level providing confidence the cover system is working very well to minimize flux.
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 the Maximum Contaminant Levels (MCL) established by the Safe Drinking Water Act (SDWA) in all wells since 2000. Manganese is the seventh COC listed in the ROD. Over the years, groundwater monitoring results for manganese have been erratic. The manganese levels appear to be influenced by upgradient background levels that are unrelated to the site. BLM plans to submit documentation to the EPA and NMED to consider amending the cleanup standard established in the ROD.

4. Institutional controls. In January 1997, the Bureau of Land Management (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. Over the years, groundwater monitoring results for manganese have been erratic. The manganese levels appear to be influenced by upgradient background levels that are unrelated to the site. BLM plans to submit documentation to the EPA and NMED to consider amending the cleanup standard established in the ROD.

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 was completed in the fall of 2010. BLM has monitored the cover semi-annually since the fall of 2010. BLM recommends the monitoring of the landfill cover to be continued semi-annually through completion of an existing contract that expires in 2015, and then annually.

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 was completed in the fall of 2010 and BLM continues to monitor semi-annually. 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 New Mexico Administrative Code (NMAC) 20.6.2.4103 D. All six contaminants of concern regulated by the SDWA have been below the cleanup levels established in the ROD since 2000. Manganese is the seventh contaminate of concern identified in the ROD. The New Mexico Water Quality Control Commission (NMWQCC) established a domestic water supply standard of manganese, and the ROD established a cleanup level for manganese. Over the years, groundwater monitoring results for manganese have been erratic. The manganese levels appear to be influenced by upgradient background levels and unrelated to the site. BLM plans to submit documentation to the EPA and NMED to consider amending the cleanup standard established in the ROD.

Due to the documentation that all six contaminants of concern regulated by the SDWA have been below cleanup levels since 2000 and attainment of the manganese cleanup level is not likely, BLM recommends that quarterly monitoring for a total of eight quarters be initiated in 2015. After completion of quarterly monitoring, BLM will consult EPA and the NMED GWQB to determine if continued monitoring of the six contaminants of concern regulated by the SDWA is warranted. Manganese may not achieve cleanup level in all monitoring wells during the quarterly monitoring. BLM will consult the Environmental Protection Agency (EPA) and NMED GWQB to determine if an appropriate regulatory process should be pursued to amend the manganese cleanup level (Appendix #5)

## **Protectiveness Statement**

The remedial actions performed at the site are considered to be protective of human health and the environment. Institutional controls are in place on 134.68 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 23<sup>rd</sup> monitoring inspection of the landfill cover was completed on July 2, 2014. The summary paragraph of the July, 2 report stated the cover is in excellent condition. Data from 8 ground water monitoring wells around the site indicate that all COCs listed in the ROD, satisfy the MCLs set under the SDWA. 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.

\_/s/ Edwin L. Roberson \_\_\_\_\_  
Edwin L. Roberson  
Assistant Director Resources and Planning  
Bureau of Land Management

\_\_9-19-14\_\_  
Date

# **Second Five-Year Review**

**Lee Acres Landfill  
Farmington New Mexico**

**Prepared By  
Farmington BLM**

**October 2014**

**Second Five-Year Review**

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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
FFO.....	Farmington Field Office
FLPMA.....	Federal Land Policy and Management Act
MCL.....	Maximum Contaminant Level
MDL.....	Minimum Detection Level
mg/l.....	Milligrams per liter (parts per million)
MOU.....	Memorandum of Understanding
NCP.....	National Contingency Plan
NMAC.....	New Mexico Administrative Code
NMED.....	New Mexico Environment Department
NMED GWQB.....	New Mexico Environment Department Ground Water Quality Bureau
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.....	Perchloroethylene (Tetrachloroethylene)
PRG.....	Preliminary Remediation Goals
RAO.....	Remedial Action Objectives
RI.....	Remedial Investigation
RIR.....	Remedial Investigation Report
RMP.....	Resource Management Plan
RSL.....	Regional Screening Level
SARA.....	Superfund Amendments and Reauthorization Act
SDWA.....	Safe Drinking Water Act
SJC.....	San Juan County
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 second five-year review of the Lee Acres Landfill Superfund Site located in San Juan County, New Mexico, was completed in October 2014. 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. CERCLA requires a statutory review no later than five years following the signature date of the previous Five-Year Review report. The results of this second 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		
<b>Site name</b> Lee Acres Landfill		
<b>EPA ID:</b> NMD980750020		
<b>Region:</b> EPA Region 6	<b>State:</b> New Mexico	<b>City/County:</b> Farmington/San Juan
SITE STATUS		
<b>NPL status:</b> <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
<b>Remediation status</b> (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
<b>Multiple OUs?*</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<b>Construction completion date:</b> <u>9 / 14 / 2005</u>	
<b>Has site been put into reuse?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
<b>Lead agency:</b> <input type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input checked="" type="checkbox"/> Other Federal Agency: Bureau of Land Management (BLM)		
<b>Author name:</b> Barney Wegener		
<b>Author title:</b> President Wegener Services LLC	<b>Author affiliation:</b> Contractor	
<b>Review period:</b> <u>10 / 25 / 2009</u> to <u>10 / 25 / 2014</u>		
<b>Date(s) of site inspection:</b> <u>2 / 19 / 2014</u>		
<b>Type of review:</b> Statutory		
<b>Review number:</b> <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)		
<b>Triggering action:</b> Actual Remedial Action Start		
<b>Triggering action date:</b> October 25, 2004		
<b>Due date (five years after triggering action date):</b> October 25, 2014		
<b>Issues:</b> 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 for all COCs except manganese.		

### **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 was completed in the fall of 2010. BLM recommends that the landfill cover continues be monitored semi-annually through completion of the existing monitoring contract in 2015, and then annually.
  
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 was completed in the fall of 2010. BLM has continued to monitor ground water semi-annually.
  
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. All six contaminants of concern regulated by the Safe Drinking Water Act (SDWA) have been below the cleanup levels established in the ROD since 2000. Manganese is the seventh contaminate of concern identified in the ROD. The New Mexico Water Quality Control Commission established a domestic water supply standard of manganese, and the ROD established a cleanup level for manganese. Over the years, groundwater monitoring results for manganese have been erratic. The manganese levels appear to be influenced by upgradient background levels and unrelated to the site. BLM plans to submit documentation to the EPS and NMED to consider amending the cleanup standard established in the ROD.  

Due to the documentation that all six contaminants of concern regulated by the SDWA have been below cleanup levels since 2000 and attainment of the manganese cleanup level is not likely, BLM recommends that quarterly monitoring for a total of eight quarters be initiated in 2015. After completion of quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if continued monitoring of the six contaminants of concern regulated by the SDWA is warranted.
  
4. After completion of groundwater quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if an appropriate regulatory process for amending the manganese cleanup level for the site should be pursued (Appendix #5).

**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 23<sup>rd</sup> monitoring inspection of the landfill cover was completed on July 2, 2014. The summary paragraph of the July 2 report stated the cover is in excellent condition. Data from 8 ground water monitoring wells around the site indicate that all contaminants of concern regulated by SDWA 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 Second Five-Year Review Report

## Introduction

The Farmington Field Office (FFO) of the Bureau of Land Management (BLM) has conducted a statutory Second Five-Year review of the remedial actions implemented at the Lee Acres Landfill Superfund Site during the period of October 2009 through October 2014. 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 has prepared the Second 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 Record of Decision (ROD) resulted in hazardous substances, pollutants, or contaminants remaining on-site above levels that would not allow for unlimited use and unrestricted exposure. The triggering action for this statutory review is the signature date of the first Five – Year Review on October 23, 2009.

## 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 completed.
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.
February 19, 2009	Initiate First Five-Year Review
October 23, 2009	Complete First-Five Year Review
February 19, 2014	Initiate Second Five-Year Review

# Lee Acres Area Map

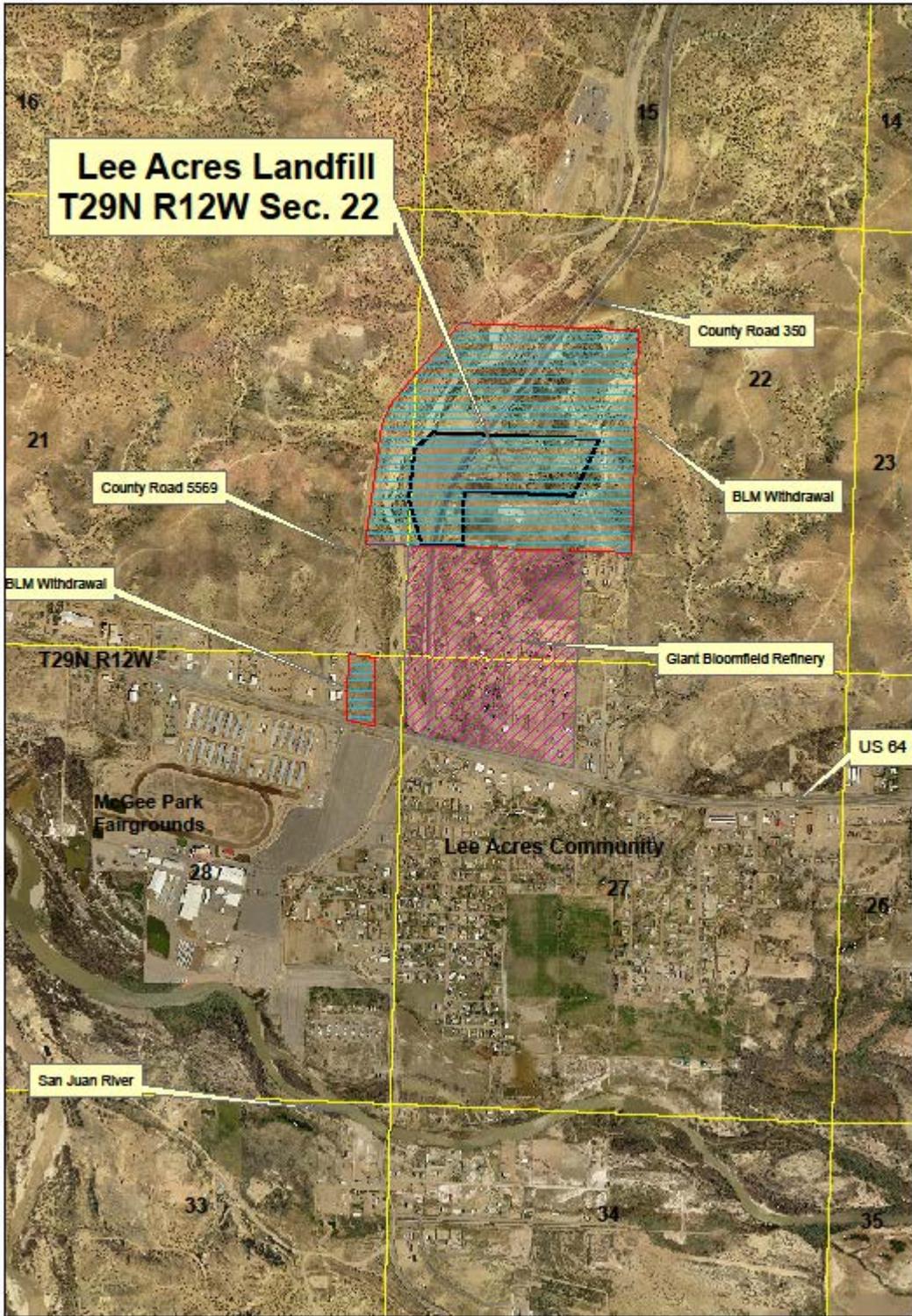


Figure 1

### **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 its 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 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 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 Characteristics**

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 overlain by tertiary Nacimiento Formation claystone/siltstone facies interfingering 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

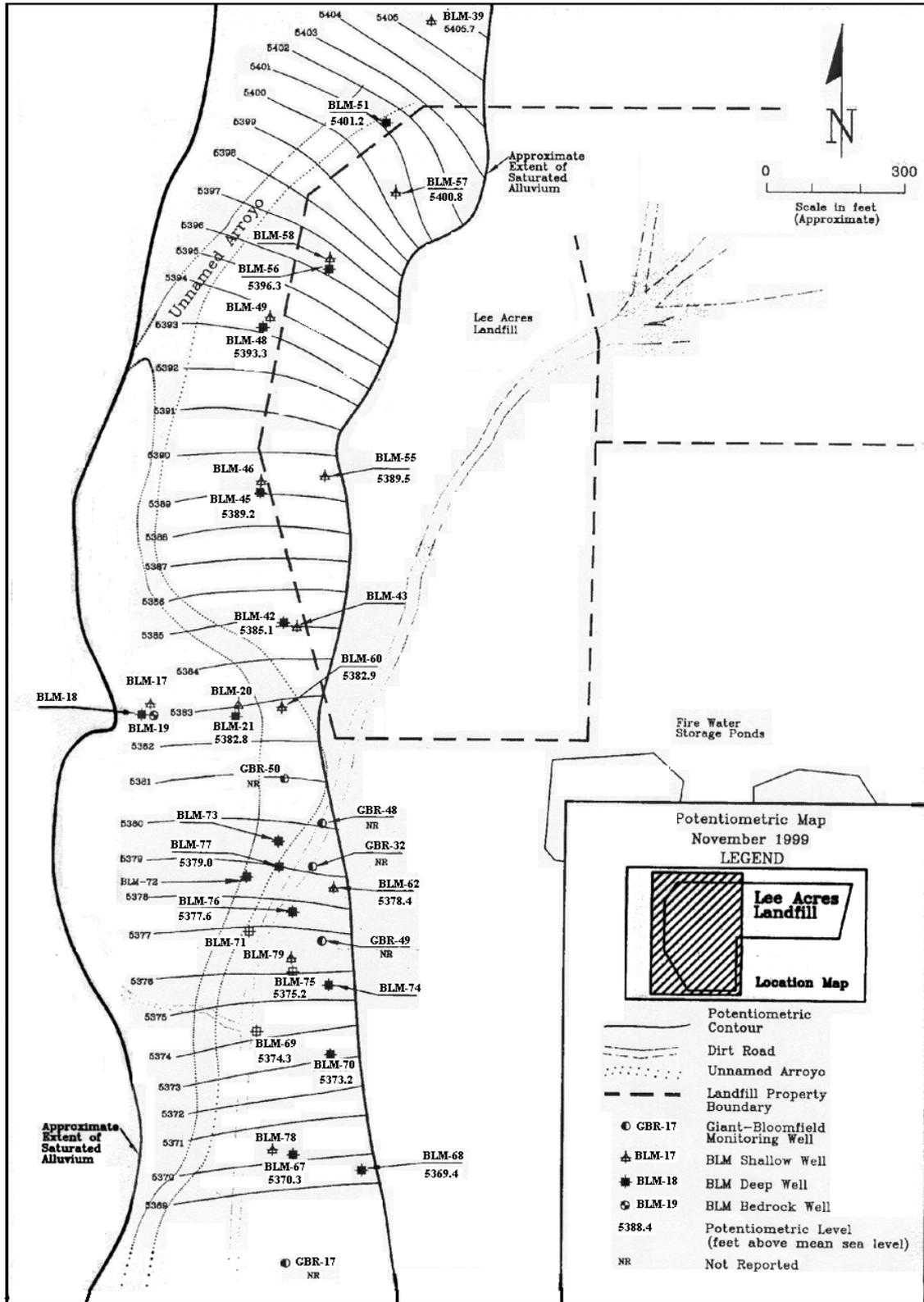


Figure 2

### **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), tetrachloroethene (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 ( $\mu\text{g}/\text{kg}$ ) in the landfill. The highest concentration ( $252,600\mu\text{g}/\text{kg}$ ) was found in the northern lagoon. Areas outside the lagoon, but adjacent to it ranged in concentration from 30 to  $51\ \mu\text{g}/\text{kg}$ .

Pesticide concentrations ranged from  $5.7\ \mu\text{g}/\text{kg}$  to  $405\ \mu\text{g}/\text{kg}$ . 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 to 15 feet.

### **3.6 Basis for Taking Action**

In 1986, VOCs were found at concentrations greater than the associated 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 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 remedy 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).

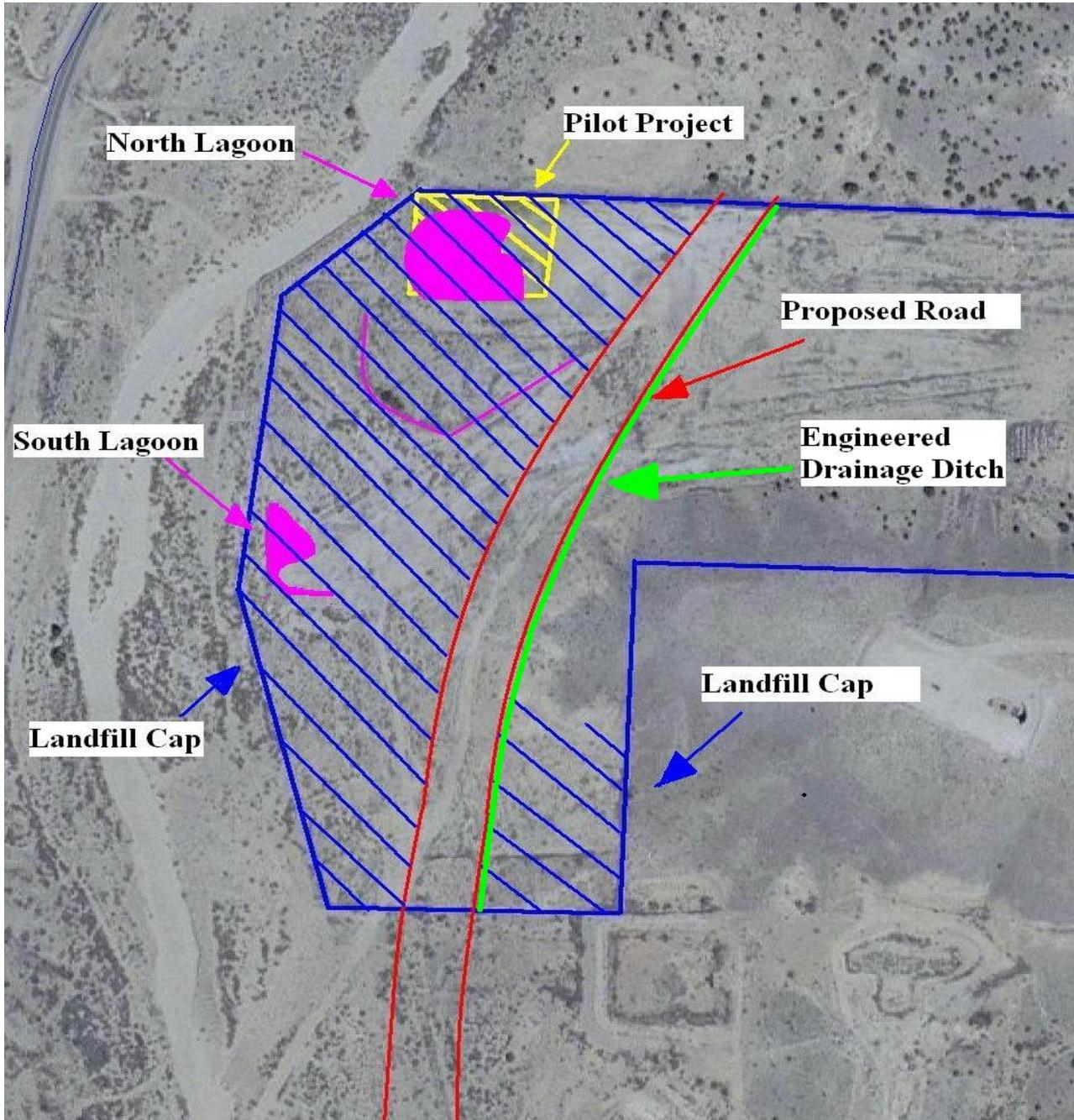
### **4.1.1 Construction**

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 coarse 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 valve 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<sup>3</sup>. 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. BLM continues to monitor the cover semi-annually.

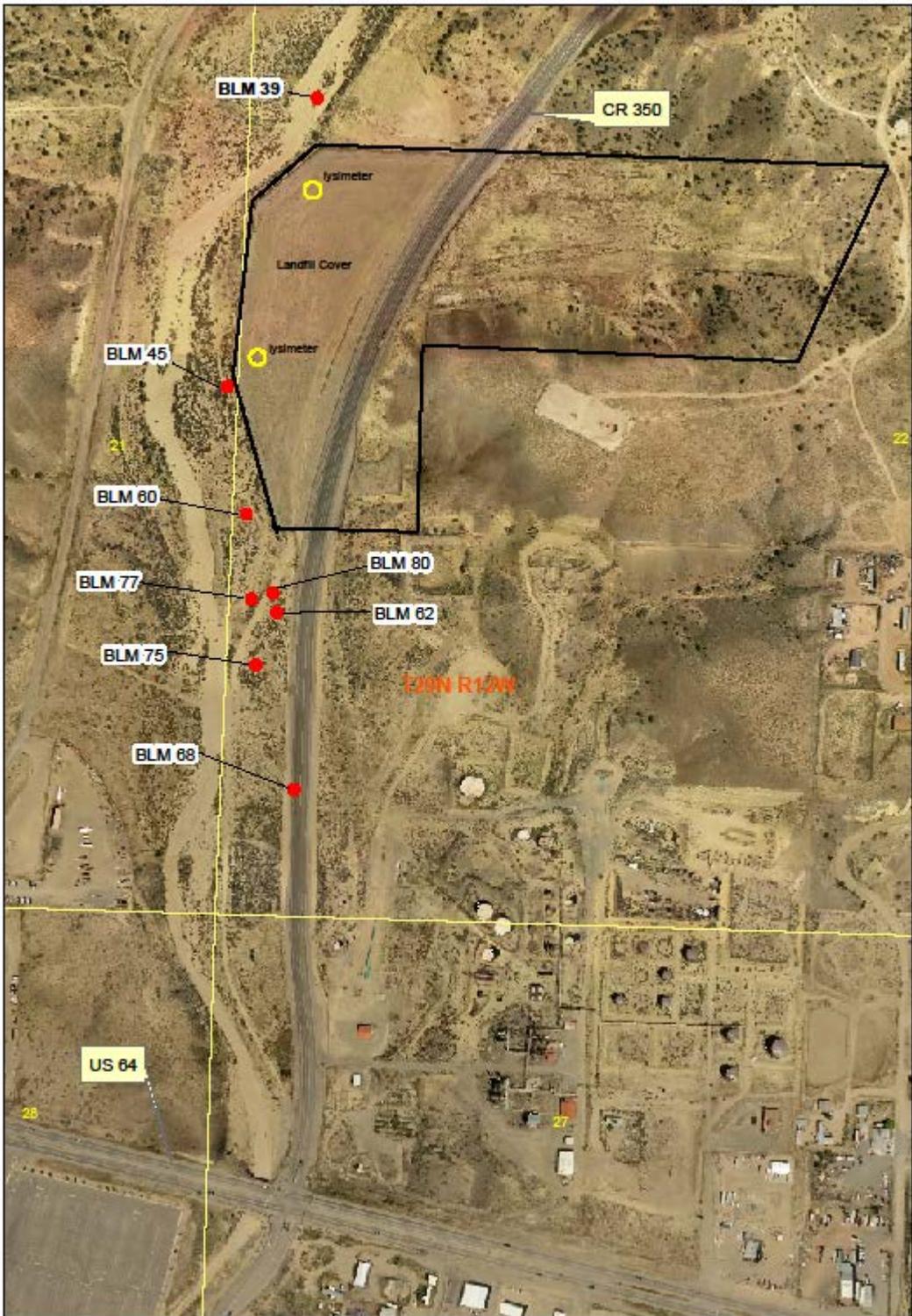
An important feature of the landfill cover monitoring was the inclusion of lysimeters installed under the cover profile. There were two lysimeters installed. One was installed directly above the northern lagoon while the second above the southern lagoon. The lagoons are presumed to be the direct cause 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.

Mr. Dwyer completed the 23<sup>rd</sup> monitoring inspection on July 2, 2014. The summary of the July 2, 2014, 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 have been significantly below the agreed upon alarm level except for two measurements in the north lysimeter during 2010. The rolling annual flux rate for the north lysimeter in 2010 was 10.73 mm/year, and was attributed to an exceptionally cold and wet winter. Since August of 2010, all measurements have been significantly below the alarm level providing confidence the cover system is working very well to minimize flux. The complete July 2, 2014, monitoring report can be found in Attachment 1.

#### **4.2 Monitored Natural Attenuation of Ground Water.**

The ROD identified seven contaminants 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. BLM continues to monitor the wells semi-annually.

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. All six contaminants of concern regulated by the SDWA have been below the cleanup levels established in the ROD since 2000. Manganese is the seventh contaminate of concern identified in the ROD. The New Mexico Water Quality Control Commission established a domestic water supply standard of manganese, and the ROD established a cleanup level for manganese. Over the years, groundwater monitoring results for manganese have been erratic. The manganese levels appear to be influenced by upgradient background levels and unrelated to the site. BLM plans to submit documentation to the EPA and NMED to consider amending the cleanup standard established in the ROD.

Due to the documentation that all six contaminants of concern regulated by the SDWA have been below cleanup levels since 2000 and attainment of the manganese cleanup level is not likely, BLM recommends that quarterly monitoring for a total of eight quarters be initiated in 2015. After completion of quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if continued monitoring of the six COCs regulated by the SDWA is warranted, and if an appropriate regulatory process should be pursued to amend the manganese cleanup level (Appendix #5)

#### **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 FFO. 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 FFO, 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, and maintain gabion basket flood prevention structures (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 the monitoring wells since the completion of the landfill cap.

Table #2: Maintenance Performed by San Juan County

Year	Labor Materials Vehicles \$	Description of Work
2006	2,429.99	Re-seed landfill cover
2007	2,706.30	Re-seed landfill cover, remove weeds, fence maintenance
2008	214.00	Clean landfill cover and fence line
2009	629.00	Clean landfill cover and fence line
2010	260.00	Treat weeds, clean landfill cover and fence line
2011	235.00	Treat weeds, clean landfill cover and fence line
2012	310.00	Treat weeds, clean landfill cover and fence line, inspect after storms
2013	415.00	Treat weeds, clean landfill cover and fence line, inspect after storms
2014	1,740.00	Treat weeds, clean landfill cover and fence line, inspect after storms, maintain gabion baskets
Total	\$8,939.29	

Table 2

## **5.0 Progress Since the Last Five Year Review**

The site continues to be maintained and monitored. All contaminants of concern regulated by the SDWA remain under cleanup levels. Manganese continues to be erratic in the site as well as the in the background well located up gradient of the site.

## **6.0 Five-Year Review Process**

This second 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 second 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, Dale Wirth/BLM Farmington Field Office with Barney Wegner from Wegener Services LLC, and included members from San Juan County NM, the BLM National Operations Center staff with expertise in hydrology and risk assessment, USGS, Mr. Stephan Dwyer (consultant), and NMED. The components of the review include community involvement, document review, data review, a site inspection, and interviews, and development of this Second 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 **Daily Times** on February 16, February 19, and March 17, 2014. Joni Kelsey, Public Relations Manager for San Juan County, served as the community involvement coordinator until she was replaced by T.J. Richards due to an ailment. An article appeared in the **Daily Times** on Sunday, March 2 that outlined the Lee Acres second five-year process. No comments were received 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 data collected by the USGS at the Lee Acres Landfill site since 1993 was reviewed. Cover monitoring data submitted by Dr. Stephen Dwyer since 2005 was reviewed.

### **6.4.1 Lee Acres Landfill Groundwater Monitoring Data Review**

The 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 SDWA have been below MCLs since 2000..

Manganese is not regulated by the SDWA, 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 established 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 up gradient wells used in establishing the average background level for manganese (346 ppb), well 39 was identified in the Work Plan as the only up gradient (background) well to continue to be monitored. Manganese has averaged 609 ppb in well 39 and has been erratic with no observable trend since 1993 (Chart 1). The RI states that the reason for the increase in manganese in well 39 is unknown (RI page 5-75).

Manganese in the ground water down gradient 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 (ROD page 31). 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.

Table 1  
Groundwater Cleanup Levels for Chemicals of Concern at Lee Acres Superfund Site

Contaminants of Concern (COC)	Site Historic Maximum Concentration (ug/l)	EPA 2014 Regional Screening Levels (ug/l)	SDWA MCL (ug/l)	NMWQC Human Health Standards (ug/l)	ROD Site Background Mean <sup>a</sup>	Cleanup Levels (ug/l)
Manganese	29,000	430	50 <sup>b</sup>	200 <sup>c</sup>	346	346 <sup>d</sup>
Nickel	578 <sup>e</sup>	NA	NA	200 <sup>f</sup>	7.75	200
1,2-cis-Dichloroethene	77	36	70	NA	NA	70
1,2-trans-Dichloroethene	120	360	100	NA	NA	100
Perchloroethylene (Tetrachloroethylene) (PCE)	10	11	5	20	NA	5
Trichloroethylene (TCE)	11	0.49	5	100	NA	5
Vinyl Chloride	3.1	0.019	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) based on discoloration, staining, and taste issues.
- c Standard for domestic supply.
- d NMWQCC Regulation Part 3-101.2 does not require cleanup below site background level.
- e Highest value of 12,500 ug/l occurred during May 1993 and was determined to be a statistical anomaly; the next highest value is specified.
- f Standard for irrigation use.

Table 1

**Well 39 Manganese Monitoring**  
**Background - Up Gradient from Lee Acres Landfill**  
**\*4/16/2014 Only Metals Were Sampled**

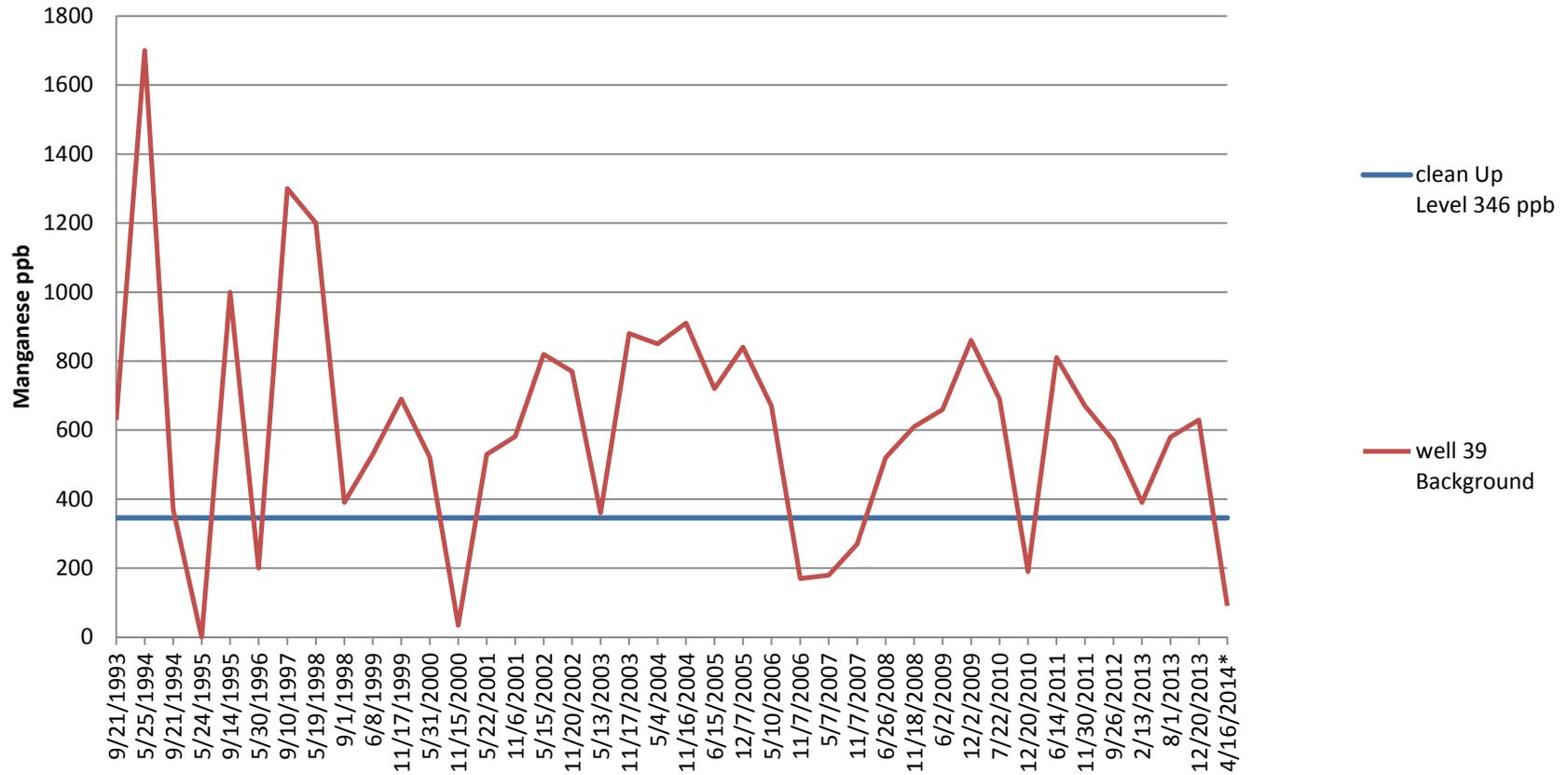


Chart #1

Manganese Monitoring Clean Up Level 346 ppb  
 \*4/16/2014 Only Metals Were Sampled

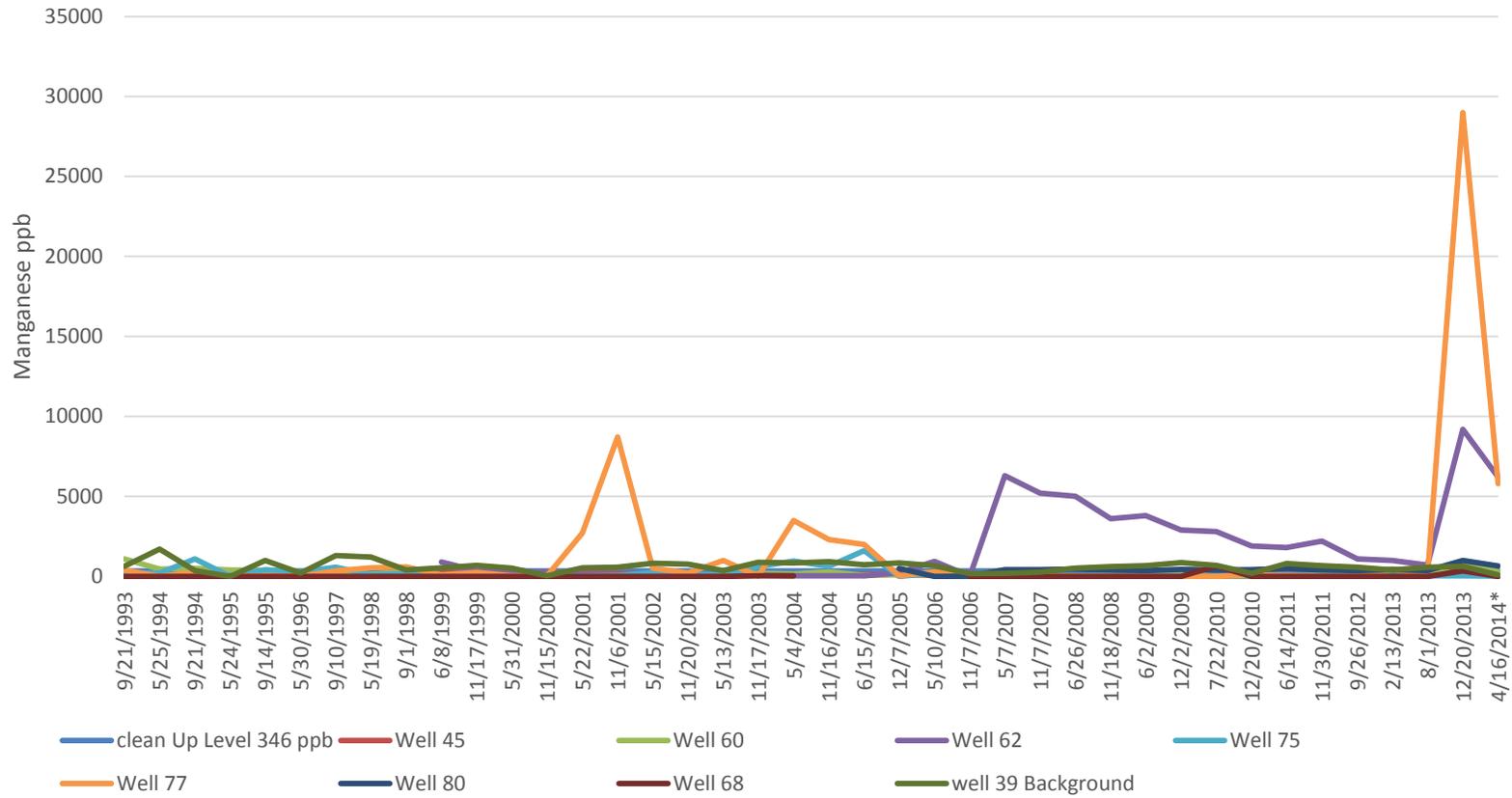


Chart #2

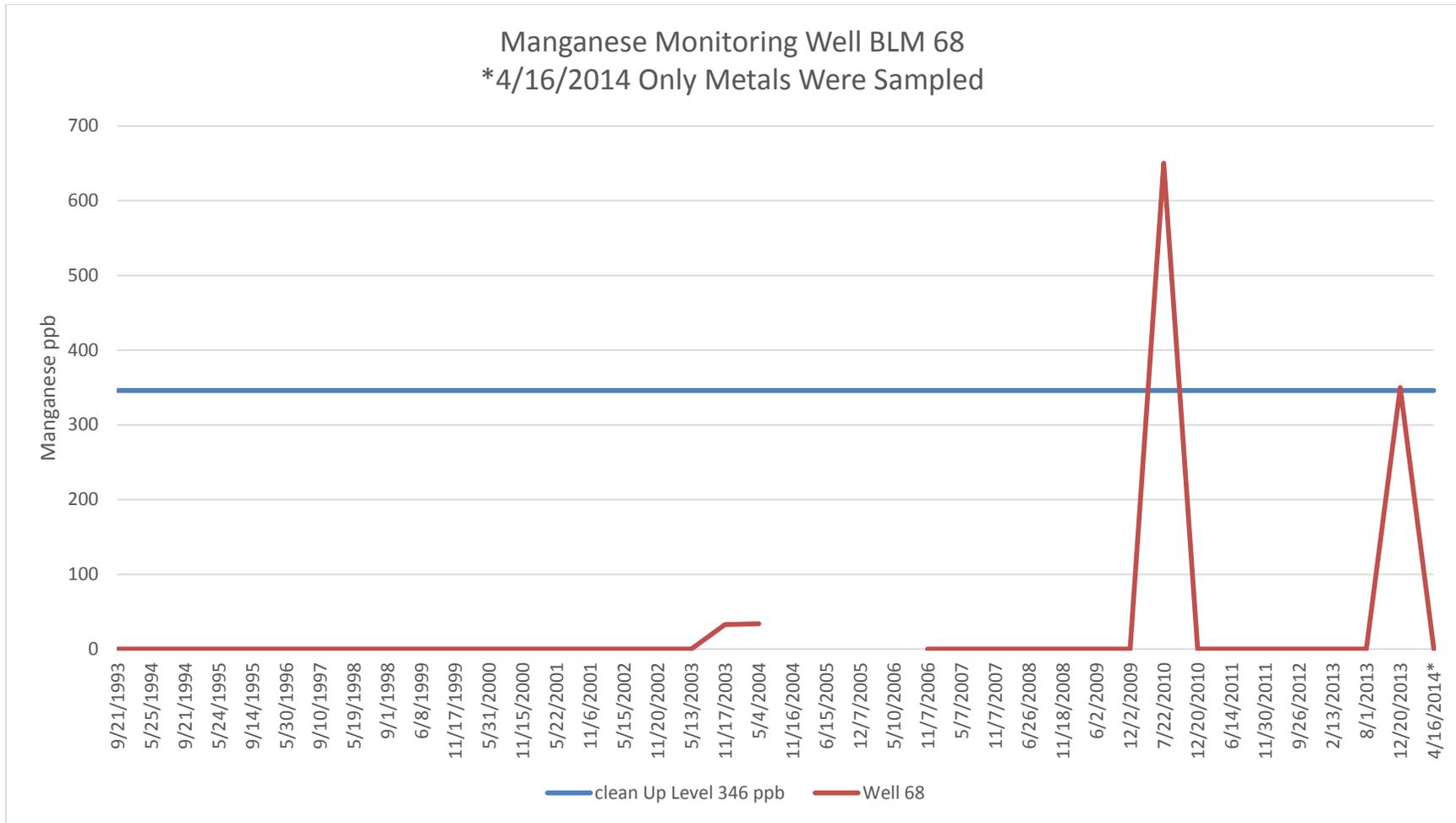


Chart #3

Nickel  
 Maximum Contaminat Level (MCL) - Clean up Level = 200 ppb  
 \*4/16/2014 Only Metals Were Sampled

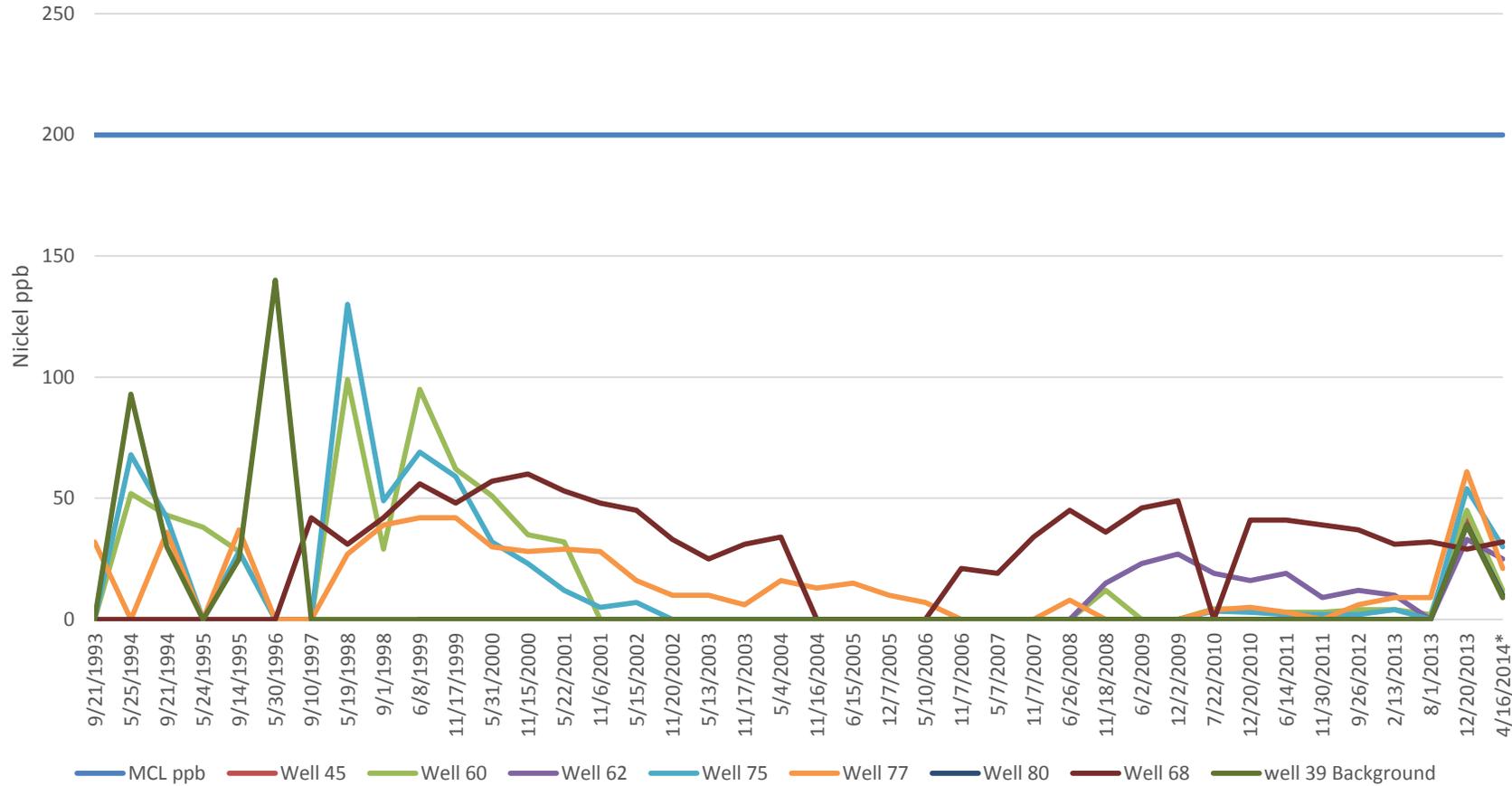


Chart #4

1,2-cis-Dichloroethene  
 Maximum Contaminat Level (MCL) - Clean up Level = 70 ppb

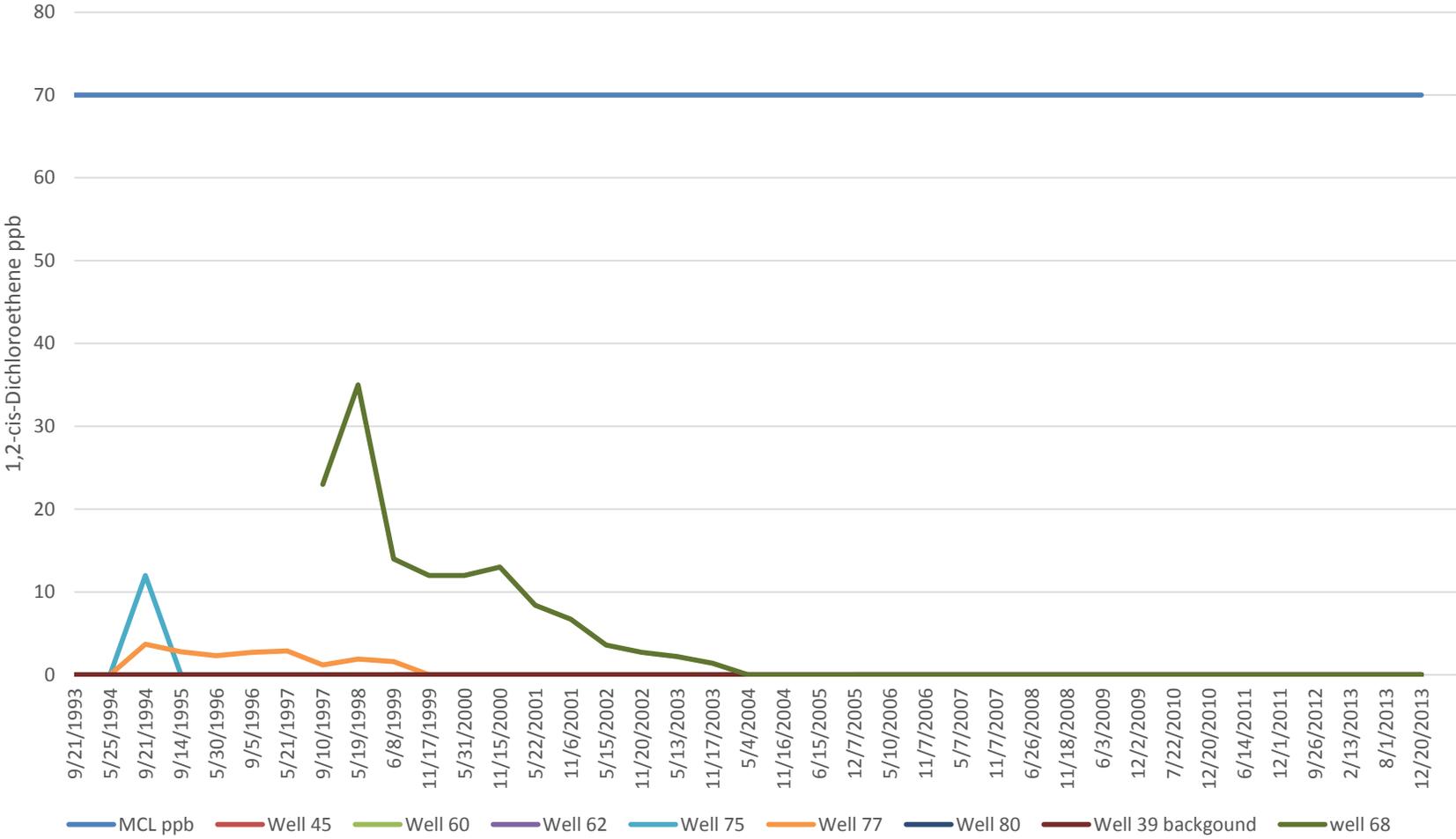


Chart #5

1,2-trans-Dichloroethene  
 Maximum Contaminat Level (MCL) - Clean up Level = 100 ppb

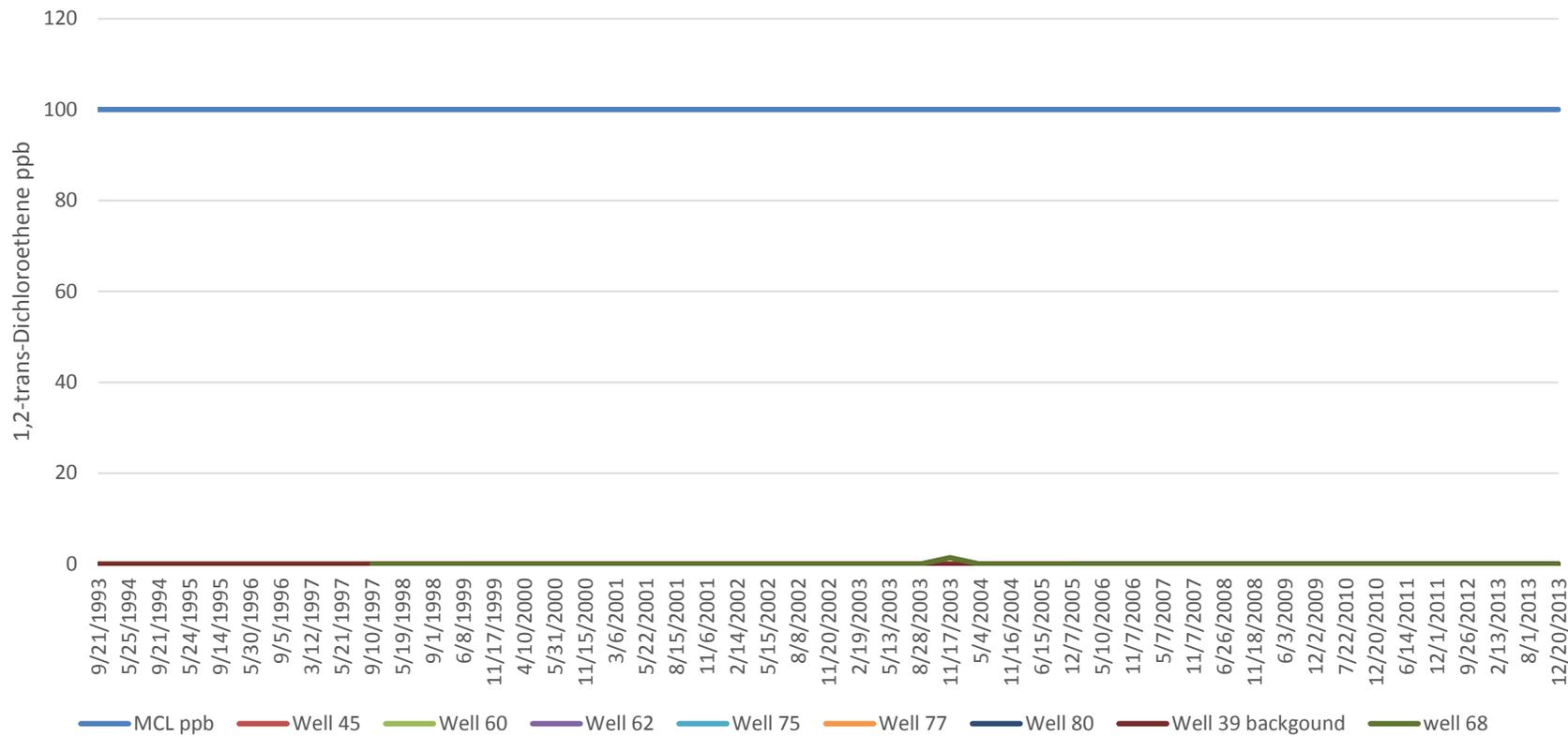


Chart #6

Tetrachloroethylene (PCE)  
 Maximum Contaminat Level (MCL) - Clean up Level = 5 ppb

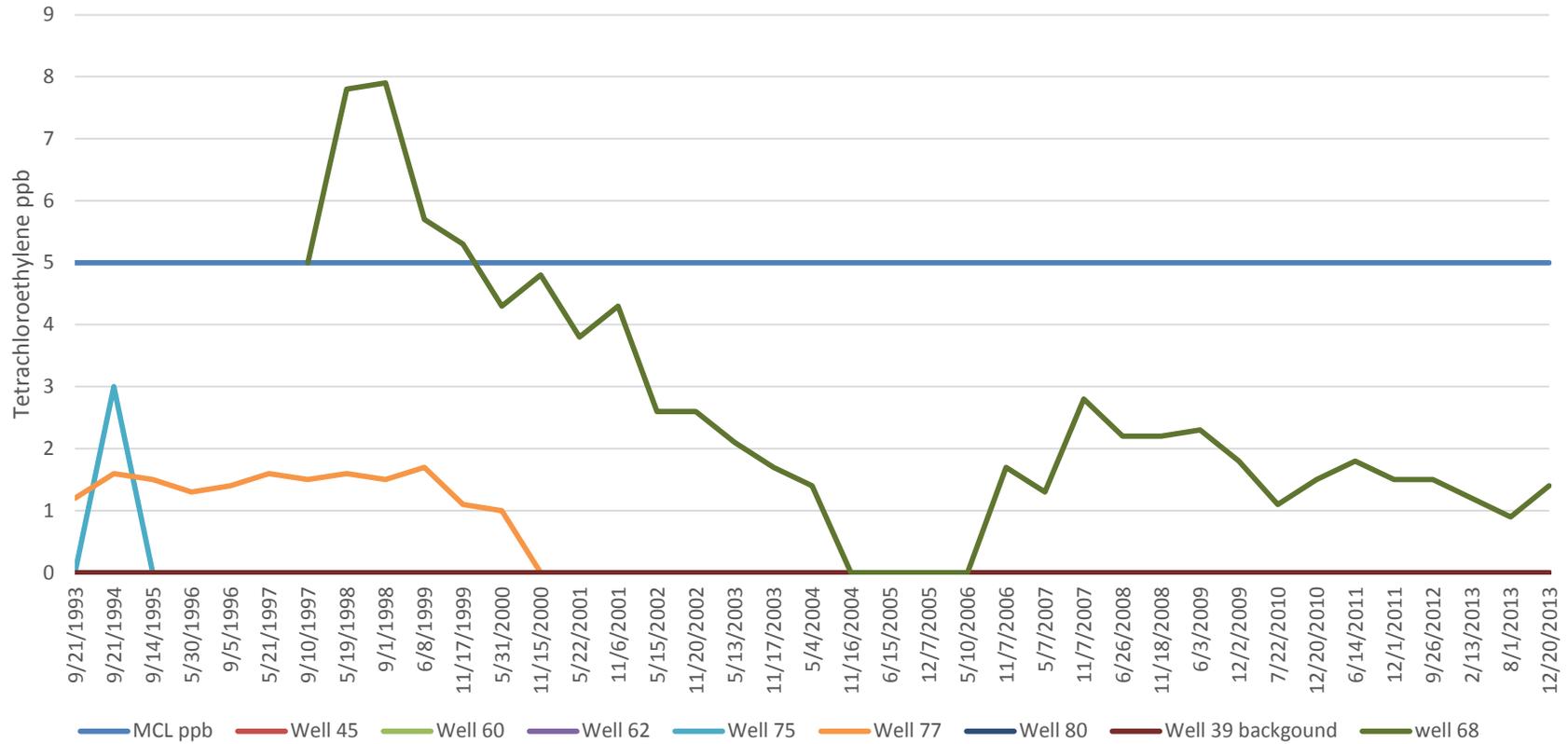


Chart #7

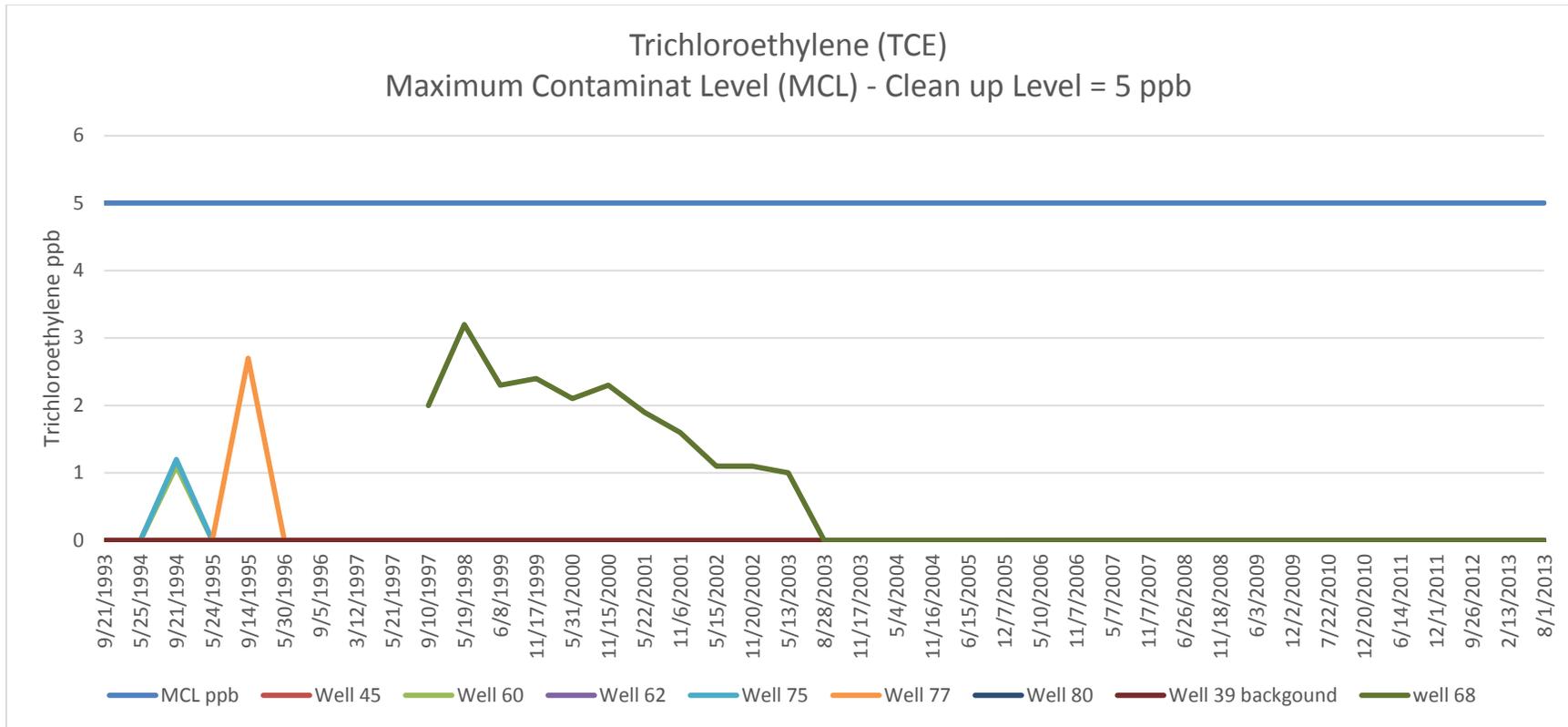


Chart #8

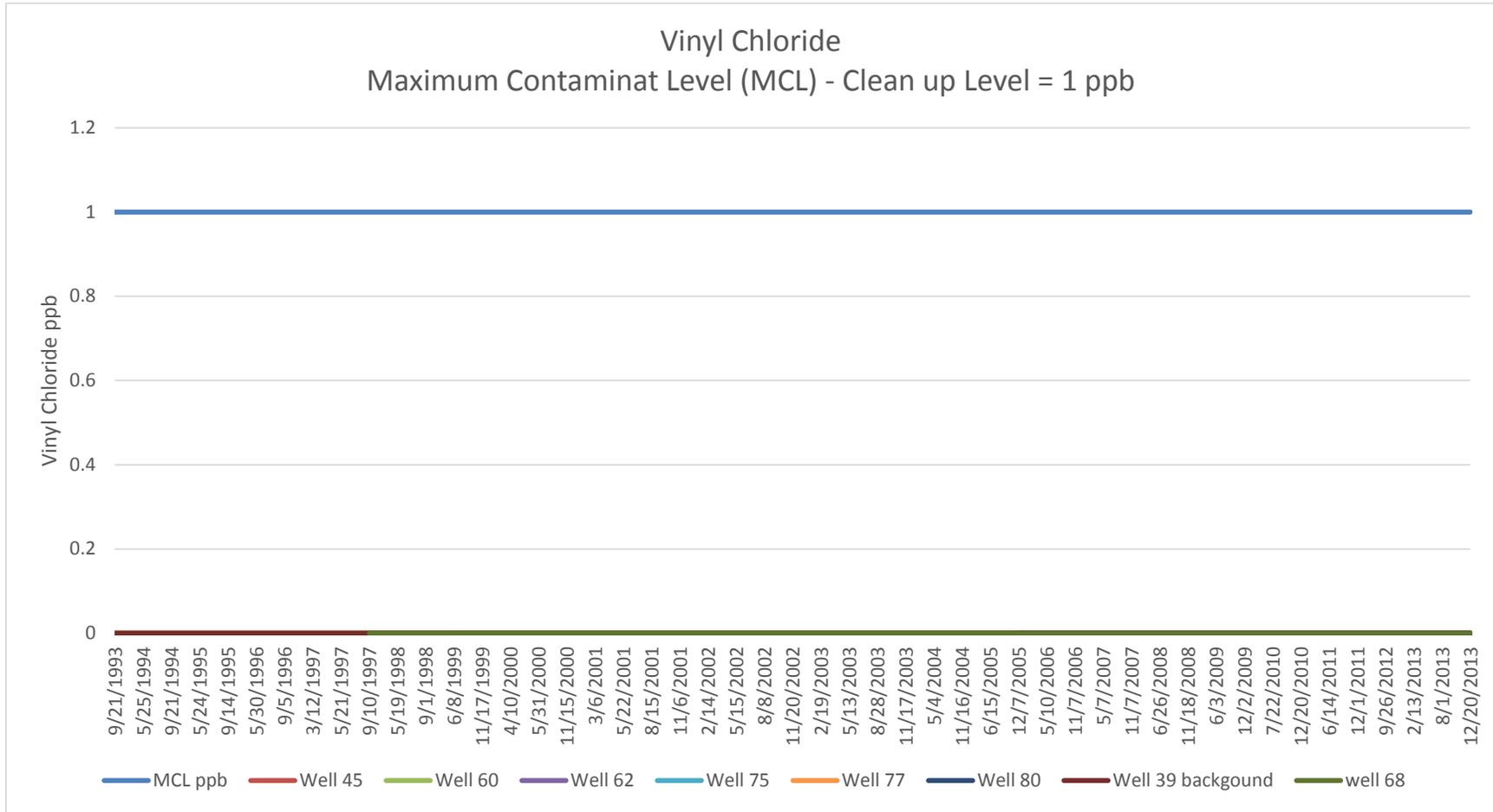


Chart #9

## 6.5 Interviews

Interviews were conducted with: Dave Keck/San Juan County Public Works Administrator, Fredrick Gebhardt/USGS Water Science Center Hydrologic Technician, Allan Pasteris/Geoscientist - New Mexico Environmental Department – Superfund Oversight, Stephen Dwyer/Contract Engineer, T.J. Richards/San Juan County Compliance Specialist and Public Involvement Coordinator, and Kelly Robinson/Western Refining (GBR) Environmental Engineer with Randy Schmaltz and Allen Hains. Copies of the Interview Record Forms are provided in Attachment 3.

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. Mr. Keck thought the project has been highly successful and was proud to have been a part of it.

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. Mr. Gebhardt said that he thought capillary barrier and the other remedial actions completed at the site have been successful. He also noted that a September 2013 thunder storm event resulted in an increase in groundwater elevation at the site of about two feet, and it appeared that the elevated groundwater may have caused some spikes in manganese levels, but did not result in any other contaminants of concern exceeding cleanup levels. He thought the results of the long term groundwater sampling that he has conducted indicates that the site is ready for closure.

Mr. Allan Pasteris participated in the interview as a geoscientist for the New Mexico Environmental Department – Ground Water Quality Bureau – Superfund Oversight Section. He has been assigned to Lee Acres for 6 months. 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. He 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.

Mr. Pasteris’s major impression was that BLM has continued to fulfill its commitments as established in the ROD, and the actions at the site have made great strides toward achieving the cleanup goals. He was impressed at the level of cooperation between BLM and San Juan County

as they have worked together to insure the betterment of the project. He also thought the implementation of the cap has produced good results in respect to groundwater quality.

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 has 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 9 years after the cap was completed.

Mr. Dwyer thought the capillary barrier worked well and has met everyone's expectations, and the desert pavement (gravel and soil composite) has done a good job of stabilizing the surface of the cap. He also stated that the planted native vegetation has grown well on the desert pavement and is now more robust on the cap than on the surrounding areas. He noted that the amount of flux (water flow) through the cap has been lower than the alarm level identified in the ROD and said the cap is working well

Ms. T.J. Richards participated in the interview as the Compliance Specialist and Community Involvement Coordinator 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. She is responsible for scheduling any maintenance that may be needed. In the past year, she has scheduled crews to clean up trash and maintain gabion baskets.

T.J. Richards also participated in the interview as the Community Involvement Coordinator. Ms. Richards was assigned the duties of the Community Involvement Coordinator after the original coordinator (Joni Kelsey) came down with a medical emergency. T.J. explained that Joni placed two public notices in the Farmington Daily Times and she placed the third notice after she was assigned Community Involvement Coordinator duties. No public comments were received by Joni Kelsey or T.J. during the Second Five-Year Review process.

Ms. Kelly Robinson participated in the interview as an environmental engineer for Western Refining who now owns the Giant Bloomfield Refining site, and Randy Schmaltz (Health, Safety, Environment and Regulatory Director) and Allen Hains (Manager Remediation Projects) also participated. Robinson, Schmaltz, and Hains are the management team responsible to conduct the remediation program at the closed Giant Bloomfield Refinery which

is located along the southern boundary of the Lee Acres Landfill site. They thought that the Lee Acres site had been well maintained and the capillary barrier and the realignment of County Highway 350 have had a positive impact on the community. They stated that Western Refining has cooperated with the BLM, USGS, NMED Water Quality Bureau, and San Juan County to facilitate the required monitoring activities on the Lee Acres site, and they want to continue to cooperate.

## **6.6 Site Inspection**

BLM coordinated a site inspection of the Lee Acres Landfill on February 19, 2014. The site inspection was attended by representatives from EPA Region 6, NMED, San Juan County, USGS, BLM, Western Refining, and Dr. Stephan Dwyer - 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 has matured since the First Five-Year review completed in 2009. The quality of the vegetation on the cover is now as good as, or better than the surrounding undisturbed vegetation. There were severe thunderstorms near the site during September 2013. Storm water runoff in the adjacent arroyo had deposited debris around some of the monitoring wells and along the gabion baskets that protect the cover. None of the monitoring wells were damaged and San Juan County maintained the gabion baskets. No excessive erosion was found on the cover 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 is intended to evaluate whether the remedy at the site is still 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?**

Review of recent groundwater monitoring data, site access restrictions, and cap integrity indicate

that the remedy is functioning as intended. Groundwater monitoring has shown that concentrations of the COC identified in the ROD have remained below all MCLs in the groundwater monitoring well network. Manganese, a COC at this site, does not have a primary health-based MCL but instead has a non-enforceable aesthetic-based secondary maximum contaminant level (SMCL; 50 ppb) under the SDWA. The EPA has developed a risk-based concentration for manganese of 430 ppb (Table 1), which has been included in other RODs as a health-based remedial goal. The Lee Acres 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 in all monitoring wells. Manganese levels have been erratic in some monitoring wells; including background well 39 which is upgradient of the landfill. Manganese has averaged 609 ppb in well 39 since 1993, and monitoring results for manganese in well 39 have been erratic with no observable trend. The remedy intended by the decision document is functioning for all contaminants except manganese. Manganese levels appear to be influenced by non-site related sources. BLM will consult with EPA and NMED to determine if an appropriate regulatory process should be pursued to amend the manganese cleanup level (Appendix #5).

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 for maintaining 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, removing loose trash and tumble weeds from the landfill cover and fence line, and maintain erosion control gabion baskets located along wash (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. 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 \$993.25 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 for maintaining 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 July 2, 2014 show that the cap is functioning as designed. *The answer to Question A is yes – the remedy is functioning as intended.*

**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)? Land use at the Site remains the same as projected in the ROD and the previous Five Year Review. There is no routine human activity at the site other than occasional site monitoring and cap inspection; access restrictions remain in place. The Site is fenced and the cap is inspected semi-annually and is in good operating condition. The Site was

capped with 5 feet of soil as part of the original remedy, leaving no contaminants of concern on the ground surface. County road (CR 350) was constructed adjacent to the cap of the Landfill, however there is no access from the road to the cap due to fencing. The addition of CR 350 does not alter the exposure scenarios used in assessing the protectiveness of the remedy.

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)? There has been no change in the exposure status for human or ecological receptors at the site. The exposure pathways for current and hypothetical receptors presented in the 1995 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, a 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 (although unlikely); BLM has withdrawn the Lee Acres Landfill site from settlement, sale, location, or entry (Fed. Reg. Jan 15, 1997), effective until 2047. Because of the five feet of soil cover and improving groundwater conditions due to natural attenuation, risk to future onsite trespassers or offsite receptors is deemed insignificant.

3. Are there newly identified contaminants or contaminant sources? There are no newly identified contaminants or sources at the site. The land downgradient of the site and north of U.S. Highway 64 is owned by Giant Bloomfield Refinery and has had groundwater contamination associated with releases from the Refinery. GBR is currently undergoing post-remediation groundwater monitoring under the direction of 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 unanticipated toxic byproducts of the remedy have been identified.

### **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, the 2009 Five-Year Review, and the current Five-Year Review. 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? The ARARs were reviewed and no newly promulgated standards were identified as ARARs.

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. The EPA has replaced the risk-based preliminary remediation goals (PRGs) shown in Table 1 with risk-based regional screening

levels (RSLs; EPA, 2014). The RSLs for most of the COCs have changed (some higher, some lower) since the original ROD and the previous Five Year Review, as shown in Table 1.

Have there been changes to the basis of the cleanup levels? There have been no changes to site groundwater cleanup levels.. The Site cleanup levels (Table 1) are a combination of NMWQCC Standards, EPA Primary MCLs, and the background concentration of manganese. The selected remedy remains protective of human health and the environment. The statutory determination in the ROD states the goal that the selected remedy for the groundwater pathway will attain ARARs within a reasonable time frame not to exceed the groundwater 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 physical site conditions or the direction of groundwater flow. There are no anticipated impacts to the effectiveness of the Site remedy based on changes in physical conditions or groundwater flow.

4. Have toxicity factors for contaminants of concern at the site changed? Yes; EPA has updated the toxicity values for a number of COCs since the ROD and the previous Five Year Review were published. Updated chemical-specific toxicity values are presented in Table 4. However, the changes in toxicity factors and their corresponding RSLs (Table 1) have not impacted the risk assessment conclusions, since all groundwater exposure pathways are incomplete. There have been no changes to the cleanup levels presented in the ROD.

5. Have other contaminant characteristics changed? No changes have been identified.

6. Have ecological toxicity reference values and/or ecological “no observed adverse effect levels/lowest observed adverse effect” (NOAELs/LOAELs) levels changed? The exposure potential for most ecological receptors is considered minimal to nonexistent. The site has been capped with coarse material to discourage burrowing; native vegetation has been planted on the surface to help maintain the cap integrity. Recent inspection does not show any animals larger than insects, small lizards, or small rodents burrowing into the cap. The cap is fenced to minimize large animal activity. Because ecological receptors have no direct exposure to any site groundwater COCs, there are no ecological toxicity or exposure values that need to be updated.

For Lee Acres, the changes in toxicity criteria and EPA’s risk-based screening levels do not constitute a change in any of the formal standards, site risks, or cleanup levels. None of the MCLs, New Mexico water quality standards, or project cleanup levels has changed since the last Five Year Review.

This Five Year Review confirms that the basis for selection of exposure and toxicity for site COCs has not changed appreciably since the ROD and the remedy remains protective for human health and ecological receptors. With the exception of the updated RSLs in Table 1 and toxicity values in Table 4, there are no changes in the risk assessment for the site.

**Remedial Action Objectives (RAOs):**

As part of the five-year review, the EPA Guidance (2001) 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 groundwater monitoring results and landfill cap inspections, the remedy is meeting the RAOs for all COCs with the exception of manganese.

Question B asked whether the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection are still valid. ***Since the manganese levels have not attained the cleanup level of 346ppb established in the ROD, and due to the level of manganese in the upgradient background well #39 has averaged 609ppb since 1993, the cleanup levels determined in the ROD for manganese does not appear to be valid. The answer to Question B is no. All other exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection remain valid.***

**Table 3: Primary ARARs for Groundwater at Lee Acres**

Contaminant	ROD Cleanup Level (µg/L) and Basis	Source	EPA MCL <sup>a</sup> (µg/L)	NMWQCC <sup>b</sup> (µg/L)
Manganese <sup>a</sup>	346 (background)	ROD	50	200
		2009 5YR	50	200
		<b>2014 5YR</b>	<b>50</b>	<b>200</b>
Nickel <sup>a</sup>	200 (NMWQCC)	ROD	NA	200
		2009 5YR	NA	200
		<b>2014 5YR</b>	<b>NA</b>	<b>200</b>
1,2 -cis-Dichloroethene	70 (MCL)	ROD	70	part 101z
		2009 5YR	70	700
		<b>2014 5YR</b>	<b>70</b>	<b>NA</b>
1,2-trans-Dichloroethene	100 (MCL)	ROD	100	part 101z
		2009 5YR	100	25
		<b>2014 5YR</b>	<b>100</b>	<b>NA</b>
Tetrachloroethene	5 (MCL)	ROD	5	20
		2009 5YR	5	6.9
		<b>2014 5YR</b>	<b>5</b>	<b>20</b>
Trichloroethene	5 (MCL)	ROD	5	100
		2009 5YR	5	25
		<b>2014 5YR</b>	<b>5</b>	<b>100</b>
Vinyl Chloride	1 (NMWQCC)	ROD	2	1
		2009 5YR	2	20
		<b>2014 5YR</b>	<b>2</b>	<b>1</b>

NA: not available

<sup>a</sup>EPA 2014: Regional Screening Levels (RSL) Table; May.

[http://www.epa.gov/reg3hwmd/risk/human/rb-concentration\\_table/Generic\\_Tables/docs/master\\_sl\\_table\\_run\\_MAY2014.pdf](http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/docs/master_sl_table_run_MAY2014.pdf)

<sup>b</sup>New Mexico Water Quality Control Criteria, Human Health Standards 2014: June.

<http://www.nmcpr.state.nm.us/nmac/parts/title20/20.006.0002.htm>

<sup>c</sup>Secondary MCL, based on aesthetics, not health protection

Table #3

**Table 4: Changes in Chemical-Specific Toxicity Standards**

Contaminant	ROD Cleanup Level (µg/L) and Basis	Source	Noncancer Reference Dose (RfD), mg/kg-day	Oral Cancer Slope Factor, CSFo, (mg/kg-day) <sup>-1</sup>	Citation
Manganese	346 (background)	ROD	5.0E-03	NA	2009 5YR
		2009 5YR	1.4E-01	NA	2009 5YR
		<b>2014 5YR</b>	<b>1.4E-01</b>	<b>NA</b>	EPA 2014
Nickel <sup>a</sup>	200 (NMWQCC)	ROD	2.0E-02	NA	2009 5YR
		2009 5YR	2.0E-02	NA	2009 5YR
		<b>2014 5YR</b>	<b>2.0E-02</b>	<b>NA</b>	EPA 2014
1,2 -cis- Dichloroethene	70 (MCL)	ROD	1.0E-02	NA	2009 5YR
		2009 5YR	withdrawn	NA	2009 5YR
		<b>2014 5YR</b>	<b>2.0E-03</b>	<b>NA</b>	EPA 2014
1,2-trans- Dichloroethene	100 (MCL)	ROD	2.0E-02	NA	2009 5YR
		2009 5YR	withdrawn	NA	2009 5YR
		<b>2014 5YR</b>	<b>2.0E-02</b>	<b>NA</b>	EPA 2014
Tetrachloroethene	5 (MCL)	ROD	1.0E-01	5.2E-02	2009 5YR
		2009 5YR	1.0E-02	withdrawn	2009 5YR
		<b>2014 5YR</b>	<b>6.0E-03</b>	<b>2.1E-03</b>	EPA 2014
Trichloroethene	5 (MCL)	ROD	1.0E-02	1.1E-02	2009 5YR
		2009 5YR	withdrawn	withdrawn	2009 5YR
		<b>2014 5YR</b>	<b>5.0E-04</b>	<b>4.6E-02</b>	EPA 2014
Vinyl Chloride	1 (NMWQCC)	ROD	not listed	not listed	2009 5YR
		2009 5YR	3.0E-03	1.0E-01	2009 5YR
		<b>2014 5YR</b>	<b>3.0E-03</b>	<b>7.2E-01</b>	EPA 2014

NA: not applicable, not a carcinogen by the oral exposure route

<sup>a</sup>Evaluated as nickel soluble salts; value not available for elemental nickel

EPA 2014: Regional Screening Levels (RSL) Table; May.

[http://www.epa.gov/reg3hwm/risk/human/rb-concentration\\_table/Generic\\_Tables/docs/master\\_sl\\_table\\_run\\_MAY2014.pdf](http://www.epa.gov/reg3hwm/risk/human/rb-concentration_table/Generic_Tables/docs/master_sl_table_run_MAY2014.pdf)

Table #4

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

EPA's Five-Year Review Guidance (2001) 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 been identified.

**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. The remedy is working as intended and is effective at providing long-term protectiveness for human health and the environment.

**8.0 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 for all COCs except manganese.

**9.0 Recommendations and Follow-Up Actions**

1. The monitoring schedule in the 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. The first required five year monitoring period was completed in the fall of 2010. BLM has continued semi-annual monitoring since the completion of the First Five-Year Review. BLM recommends that the landfill cover continues be monitored semi-annually through completion of an existing monitoring contract in 2015, 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 of five years after completion of construction. This five year monitoring period was completed in the fall of 2010. BLM continues to monitor groundwater semi-annually. BLM recommends that quarterly monitoring for a total of eight quarters be initiated in 2015 to comply with regulations found at NMAC 20.6.2.4103 D. After completion of quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if continued monitoring of the six contaminants of concern regulated by the SDWA is warranted. Over the years, groundwater monitoring results for manganese have been erratic. The Manganese levels appear to be influenced by upgradient background levels and unrelated to the site. After completion of quarterly monitoring, BLM will consult EPA and NMED GWQB to determine if

an appropriate regulatory process should be pursued to amend the manganese cleanup level (Appendix #5).

## **10.0 Protectiveness Statement**

The remedial actions performed at the site were evaluated for this Five-Year Review and 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 23<sup>rd</sup> monitoring inspection of the cover was completed on July 2, 2014. The summary of the July 2, 2014 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.

## **11.0 Next Review**

A third five-year review will be completed in October 2019 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**

Bureau of Land Management (BLM). 2009. Five-Year Review, Lee Acres Landfill, Farmington, New Mexico. October.

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.

U.S. Environmental Protection Agency (EPA). 2001. Comprehensive Five-Year Review Basis. June. EPA 540-R-01-007

U.S. Environmental Protection Agency (EPA). 2004. Record of Decision for the Lee Acres Landfill Superfund Site, Farmington, New Mexico. May.

U.S. Environmental Protection Agency (EPA). 2014: Regional Screening Levels (RSL) Table; May.  
[http://www.epa.gov/reg3hwmd/risk/human/rb-concentration\\_table/Generic\\_Tables/docs/master\\_sl\\_table\\_run\\_MAY2014.pdf](http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/docs/master_sl_table_run_MAY2014.pdf)

# **ATTACHMENT 1**

**Landfill Cover Monitoring Report July 2, 2014**

# Lee Acres CERCLA Cover System, Farmington, NM

## Post-Construction Monitoring Report

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*Inspection date: July 2, 2014*

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Submitted to: Dale Wirth

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

Submitted by: Stephen F Dwyer, PhD, PE

Dwyer Engineering, LLC  
1813 Stagecoach Rd. SE  
Albuquerque, NM 87123

## Summary:

This report summarizes the monitoring inspection performed on July 2, 2014 of the Lee Acres Superfund Closure cover system (EPA ID# NMD980750020). The surface of the cover is in excellent condition. The cover soils, embankments, and drainage trenches were all in good condition. The vegetation at the site was in excellent condition nearing a mature state.

The flux measured during this inspection for both the north and south lysimeters was zero. The rolling annual flux rate for both lysimeters is zero. Refer to Table 1 for details of percolation measurements obtained to date. 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.

Site Name: <b>Lee Acres Landfill</b>	Date of Inspection: <b>July 2, 2014</b>
City: <b>Farmington</b>	Weather: <b>Warm, sunny</b>
State: <b>New Mexico</b>	Temperature: <b>90s</b>
EPA Region: <b>6</b>	Site Map: <b>Figure 1</b>
Inspector: <b>Stephen F Dwyer, PhD, PE</b>	ID#: <b>NMD9870750020</b>
Prior Monitoring Performed: See Table 1 @ end of report	

ITEM	REMARKS
<b>COVER SYSTEM (Capillary Barrier)</b>	
<b>1. SETTLEMENT (LOW SPOTS)</b> Yes ( ) No (X) Areal Extent: none Depth: none	No settlement or evidence of ponding in cover noted.
<b>2. CRACKS</b> Yes ( ) No (X) Length: none Width: none Depth: none	No significant surface cracking seen on cover.
<b>3. EROSION</b> Yes (...) No (X) Areal Extent: no new erosion noted Depth: NA	There is no new significant erosion noted on the site. The gravel admixture surface layer of the cover was designed for this purpose – to allow for minimal erosion of the uppermost fine material leaving behind the gravel on the surface, thus forming a surface armor referred to as a ‘desert pavement’ (Picture 2). The steeper side slope along the eastern perimeter of the cover adjacent to Highway 350 had some silt erosion that was deposited in the drainage trench (Picture 9) at its base (Picture 10). The silt deposits are within tolerable limits

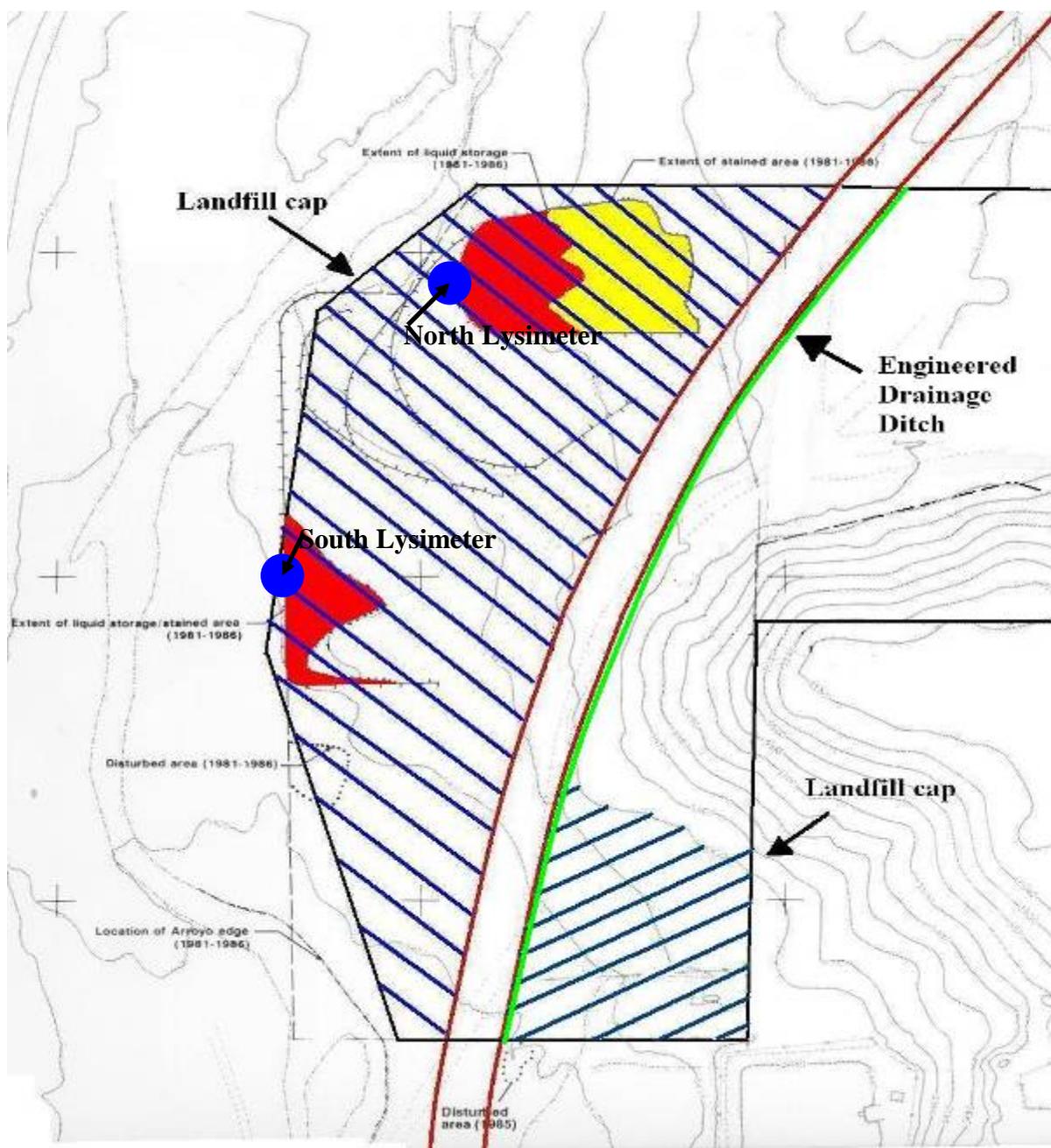
ITEM	REMARKS
<p><b>4. BIOINTRUSION</b> Yes (X) No ( )  Areal Extent: minimal  Depth: shallow  Suspected Cause: Small Animal and Insect</p>	<p>There is minimal biointrusion activity (ants and small animals) found on the cover. There were minimal burrow holes found during this inspection by small mammals (Picture 8).</p>
<p><b>5. VEGETATIVE COVER</b> Yes (X) No ( )  Grass: Yes (X) No ( )  Shrubs Yes (X) No ( )  Weeds: Yes (X) No ( ) – some tumbleweeds  Other: Yes (X) No ( ) – wildflowers, yucca and cacti  Condition: excellent  Size: Approaching mature state.</p>	<p>The cover's vegetation appears mature (Pictures 1, 3, 5, 6, 7, and 13). The seeded vegetation is in excellent condition. Non-seeded local native vegetation is beginning to establish on the site such as cacti.</p>
<p><b>6. GRAVEL/SOIL ADMIXTURE COVER SURFACE</b> Yes (X) No ( )  Material Type: soil mixed with gravel  Condition: Excellent</p>	<p>The gravel/soil surface admixture is in good shape and performing as designed with evidence of a stable 'desert pavement' formation (Picture 2).</p>
<p><b>7. WET AREAS</b> Yes ( ) No (X)  Ponding: Yes ( ) No (X)  Areal Extent: NA  Estimated Flow Rate: none  Soft Subgrade: Yes ( ) No (X)  Areal Extent: none</p>	<p>The cover surface soil was very dry. No evidence of ponding was seen on the cover surface.</p>
<p><b>9. SLOPE INSTABILITY</b> Yes ( ) No (X)  Slides: Yes ( ) No (X)  Areal Extent: none  Probable Slide Interface: none  Suspected Cause: NA  Exposed Cover Components: none</p>	<p>Slopes along the roadway appear in good shape with no signs of instability (Picture 10). These slopes were compacted to high densities for strength in road construction. Gentler slopes along the perimeter of the cover system are in good shape (Picture 4). These slopes were covered with a gravel mulch to minimize erosion along the perimeter of the cover.</p>
<p><b>10. GEOTEXTILE EXPOSED</b>  Yes ( ) No (X)  Type: geotextile filter fabric  Areal Extent: none</p>	<p>none</p>

ITEM	REMARKS
<b>11. SOUTHEAST CLOSURE SECTION – EAST OF ROAD</b> Condition: Excellent	This cover is surrounded by a fence with locked gate. This cover section is in excellent condition (Picture 13). Vegetation is well established with no signs of significant erosion, excessive biointrusion or stability issues.
<b><i>FLUX MEASUREMENTS FROM LYSIMETERS</i></b>	
<b>1. LYSIMETER FUNCTIONING PROPERLY</b> Yes (X) No ( ) Description of problem: none	There was no percolation produced from either lysimeter during this inspection.  There was no visual evidence of damage to either lysimeter. Both lysimeter drainage valves worked properly.
<b>1a. NORTH LYSIMETER</b> Yes (X) No ( ) Description of problem: none	
<b>1b. SOUTH LYSIMETER</b> Yes (X) No ( ) Description of problem: none	
<b><i>DRAINAGE CHANNELS</i></b>	
<b>1. SETTLEMENT</b> 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 (Picture 9).
<b>2. MATERIAL DEGRADATION</b> Yes ( ) No (X) Material Type: Areal Extent: none Degree of Degradation: none	
<b>3. EROSION</b> Yes ( ) No (X) Areal Extent: minimal, no new erosion noted Depth: minimal	
<b>4. UNDERCUTTING</b> Yes ( ) No (X) Areal Extent: none Depth: none	
<b>5. OBSTRUCTIONS</b> Yes ( ) No (X) Type: none Areal Extent: none Size:	
<b>6. SLOPE INSTABILITY</b> Yes ( ) No (X) Type: none Areal Extent: none	

ITEM	REMARKS
<b>COVER PENETRATIONS</b>	
<b>1. LYSIMETER ACCESS VALVE</b> Yes (X) No ( ) Functioning: Yes (X) No ( ) Condition: Good	There are 2 valve access ports that penetrate the cover profile; one for each lysimeter. 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.
<b>PERIMETER DITCHES/OFF-SITE DISCHARGE</b>	
<b>1. SILTATION</b> Yes ( ) No (X) Areal Extent: minimal, <i>no new</i> siltation noted Depth: minimal	The perimeter ditches and off-site drainage trenches appear to be working properly. There was some silt remaining in the perimeter ditch along the eastern edge of the cover (Picture 9).
<b>2. VEGETATION GROWTH</b> Yes (X) No ( ) Areal Extent: full coverage Type: Shrub, grasses and forbs with minimal weeds.	Vegetation has matured. The surface vegetation appears to be a success at this time.
<b>3. EROSION</b> Yes ( ) No (X) Areal Extent: minimal, <i>no new</i> erosion noted Depth: minimal	No significant erosion noted on site.
<b>4. DISCHARGE STRUCTURE</b> 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.
<b>5. CULVERT</b> 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.
<b>FENCING</b>	

ITEM	REMARKS
<b>1. FENCING DAMAGE</b> Yes ( ) No ( <b>X</b> ) Description of damage: none	The chain link fence around the perimeter of the site is in excellent condition (Pictures 11, 12 and 13).
<b>ROADS</b>	
<b>1. ROAD DAMAGE</b> Yes ( ) No ( <b>X</b> ) Location: Bisects landfill (figure 1) Description of damage: none Impact to Closure: Yes ( ) No ( <b>X</b> ) Description of Impact: Helps by redirecting up-gradient surface runoff away from landfill source locations.	The road (County Highway 350) is generally in good condition (Pictures 11 and 14). There is evidence of settlement noted in the roadway that corresponds with buried debris the road was constructed over (Picture 14). This settlement appears to create a low spot in the roadway. The San Juan County Manager verbally informed me at the site closure's 5-year CERCLA review in April 2014 the roadway will be repaired to eliminate the low spot.
<b>SITE ACCESS</b>	
<b>1. ACCESS RESTRICTIONS</b> Yes ( <b>X</b> ) No ( ) Description: Chain link fence and locked gate.	The site is currently secured with chain link fencing (Picture 11, 12, and 13). Access is limited by a locked gate. All are in excellent condition.
<b>GENERAL</b>	
<b>1. VANDALISM</b> Yes ( ) No ( <b>X</b> ) Description of damage: none	none
<b>2. CHANGED SITE CONDITION</b> Yes ( ) No ( <b>X</b> )	No degradation noted. Vegetation has improved.
<b>3. LAND USE CHANGE</b> Yes ( ) No ( <b>X</b> ) Description: none	none
<b>3. Other</b> Yes ( ) No ( <b>X</b> ) Description:	.
<b>INTERVIEWS</b>	
<b>1. INTERVIEW ON-SITE WORKERS</b> Yes ( ) No ( <b>X</b> ) Problems: none Suggestions: none Attach report: NA	none

ITEM	REMARKS
<b>2. INTERVIEW NEIGHBORS</b> Yes ( ) No (X) Problems: none Suggestions: none Attach report: none	none
<b>3. INTERVIEW LOCAL OFFICIALS</b> Yes ( ) No (X) Problems: none Suggestions: none Attach report: none	NA.



**Figure 1. Lee Acres Landfill Site with Lysimeter Locations**



**Picture 1. Lee Acres Cover, South View**



**Picture 2. 'Desert Pavement' on Cover Surface**



**Picture 3. Cover, East View**



**Picture 4. Cover Perimeter with Rock Erosion Protection**



**Picture 5. Cover, North View**



**Picture 6. Cover, West View**



**Picture 7. Cover, North View**



**Picture 8. Small Animal Burrow Hole on Cover**



**Picture 9. Sediment in Drainage Channel @ Base of Eastern Slope**



**Picture 10. Highway Slope East of Cover**



**Picture 11. Perimeter Fence and Adjacent Highway**



**Picture 12. Locked Fence around Site**



**Picture 13. Smaller Cover East of Roadway**



**Picture 14. Settlement in Roadway**

Monitoring Period Date	calendar days	Lysimeters			Lysimeters		Lysimeters		Lysimeters	
		North	South		North	South	North Lysime	South Lysime	North	South
		ml	ml		Flux Rate cm/sec	Flux Rate cm/sec	Flux mm	Flux mm	Annualized Flux mm/yr	Annualized Flux mm/yr
7/21/2005	start	initial	initial		0	0	-	-	0	0
10/27/2005	98	5600	5100		9.1E-09	8.3E-09	0.8	0.7	2.9	2.6
2/10/2006	106	910	790		1.4E-09	1.2E-09	0.1	0.1	0.4	0.4
5/18/2006	97	221	0		3.6E-10	0.0E+00	0.0	0.0	0.1	0.0
8/9/2006	83	6740	0		1.3E-08	0.0E+00	0.9	0.0	4.1	0.0
11/17/2006	100	850	0		1.3E-09	0.0E+00	0.1	0.0	0.4	0.0
2/16/2007	91	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
5/3/2007	76	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
8/16/2007	105	3608	0		5.5E-09	0.0E+00	0.5	0.0	1.7	0.0
2/29/2008	197	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
9/12/2008	196	650	0		5.3E-10	0.0E+00	0.1	0.0	0.2	0.0
2/20/2009	161	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
9/30/2009	222	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
3/19/2010	170	16277	0		1.5E-08	0.0E+00	2.2	0.0	4.8	0.0
8/27/2010	161	61981	0		6.1E-08	0.0E+00	8.5	0.0	19.3	0.0
3/2/2011	187	340	0		2.9E-10	0.0E+00	0.0	0.0	0.1	0.0
9/29/2011	211	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
4/24/2012	208	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
10/12/2012	171	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
4/24/2013	194	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
10/21/2013	180	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
7/2/2014	254	0	0		0.0E+00	0.0E+00	0.0	0.0	0.0	0.0
<b>TOTAL</b>	<b>3268</b>	<b>97177</b>	<b>5890</b>	<b>AVERAGE</b>	<b>4.9E-09</b>	<b>4.3E-10</b>	<b>6.3E-01</b>	<b>3.8E-02</b>	<b>1.5</b>	<b>0.1</b>

**Table 1. Percolation Results**

*Note: Rolling annual flux refers to the cumulative flux for the prior year (i.e. the prior 2 semi-annual measurements or the prior 4 quarterly measurements)*

# **ATTACHMENT 2**

Public Notices

## PUBLIC NOTICE

### BLM AND EPA BEGINS SECOND 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 **Second 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 2014.

#### **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. The First Five-Year Review was completed in October 2009.

#### **Why is a Second 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 Second Five-Year Report:**

When complete, the Second Five-Year Review will be available on the internet at the New Mexico BLM external website, the Farmington Public Library, and at the BLM public room at 6251 College Blvd., Farmington NM.

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

T.J. Ricahards  
San Juan County  
305 South Oliver Drive  
Aztec NM 87410  
505-334-4574

Barney Wegener  
Farmington BLM  
6251 College Blvd. Suite A.  
Farmington NM 87402  
505-564-7695

Sample of Public Notice Published in Farmington Daily Times on 2/16/2014, 2/19/2014, and 3/17/2014

**AFFIDAVIT OF PUBLICATION**

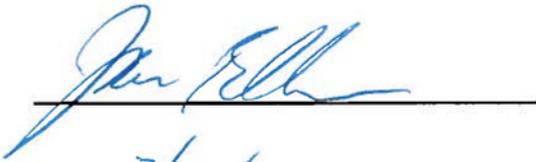
**Ad No. 70050**

**STATE OF NEW MEXICO  
County of San Juan:**

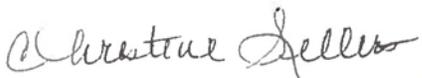
JOHN ELCHERT, being duly sworn says:  
That HE is the PUBLISHER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Monday, March 17, 2014

And the cost of the publication is \$112.55



ON 3/17/14 JOHN ELCHERT appeared before me, whom I know personally to be the person who signed the above document.





**COPY OF PUBLICATION**

**PUBLIC NOTICE**  
BLM AND EPA BEGINS SECOND 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 Agency (EPA) is in the process of completing a Second Five-Year Review of the Lee Acres Landfill Superfund Site, located approximately 3/8 mile north of the intersection of U.S. Highway 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 2014.

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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. The entire process is repeated every five years. The First Five-Year Review was completed in October 2009.

**Why is a Second 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 Second Five-Year Report:**

When complete, the Second Five-Year Review will be available on the internet at the New Mexico BLM external website, the Farmington Public Library, and at the BLM public room at 6251 College Blvd., Farmington NM.

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

T.J. Richards  
San Juan County  
305 South Oliver Drive  
Aztec, NM 87410  
Office: 505-334-4574

Barney Wegener  
Farmington BLM  
6251 College Blvd. Suite A.  
Farmington NM 87402  
505-564-7695

Legal No. 70050 published in The Daily Times on March 17, 2014.

**For Publication in the Farmington Daily Times upon Completion of the Lee Acres  
Second Five-Year Review:**

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

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- 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 Second Five-Year Report:**

The results of the Second Five-Year Review indicate that the remedy is protective of human health and the environment. The results of the Second Five-Year Review will be available on the internet at the New Mexico BLM external website, the Farmington Public Library, and at the BLM public room at 6251 College Blvd., Farmington NM.

**PLEASE NOTE: For more information or to report concerns about the site contact:**

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505-564-7695

# ATTACHMENT 3

## Interviews

## INTERVIEW RECORD

<b>Site Name: Lee Acres Landfill</b>		<b>EPA ID No.: NMD980750020</b>	
<b>Subject: Second Five-Year Review</b>		<b>Time: 1300</b>	<b>Date: 4-21-2014</b>
<b>Type:</b> Visit		Incoming	Outgoing
<b>Location of Visit: San Juan County Public Works Office</b>		1300	1400
<b>Contact Made By:</b>			
<b>Name: Barney Wegener</b>	<b>Title: Consultant</b>	<b>Organization: Wegener Services LLC</b>	
<b>Individual Contacted:</b>			
<b>Name: Dave Keck</b>	<b>Title: San Juan County Public Works Administrator</b>	<b>Organization: San Juan County</b>	
<b>Telephone No: 505-334-4520</b>		<b>Street Address: 305 South Oliver Dr.</b>	
<b>Fax No: 505-334-3645</b>		<b>City, State, Zip: Aztec NM 87410</b>	
<b>E-Mail Address: dkeck@sjcounty.net</b>			
<b>Purpose of the Five-Year Review</b>			
<p><b>The Purpose of the second 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.</b></p>			
<p><b>QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?</b></p> <p><b>I am the Public Works Administrator for San Juan County. As the Public Works Administrator, I was directly involved with the construction of the following selected remedies: the capillary barrier, the water run-on and run-off controls and the construction of Highway 350, and the construction of the institutional controls consisting of the fencing around the site. I supervised all San Juan County crews involved with the construction of the remedies. I also supervise T.J. Richards who is the San Juan County operations and maintenance officer for the Lee Acres site.</b></p>			

## Interview Questions

**QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009?**

**I am pleased with the outcome of the remedial action remedies that San Juan County constructed. Highway 350 has improved the traffic flow within the county. It is my opinion that San Juan County is very pleased with the project as a whole.**

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

**I think the capillary barrier and the remedy actions as a whole have given the citizens of the area peace of mind that there is no longer a threat of water contamination.**

**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 supervise T.J. Richards who has been assigned as the operations and maintenance officer for San Juan County. T.J. is responsible for site monitoring and maintenance.**

## INTERVIEW RECORD

**QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?**

No

### Summary Of Conversation

I think the entire project has been highly successful and I am proud to have been a part of it.

<b>Site Name: Lee Acres Landfill</b>		<b>EPA ID No.: NMD980750020</b>	
<b>Subject: Second Five-Year Review</b>		<b>Time: 0930</b>	<b>Date: 4-22-2014</b>
<b>Type:</b> Telephone		Incoming	Outgoing
<b>Location of Visit:</b>		0930	1015
<b>Contact Made By:</b>			
<b>Name: Barney Wegener</b>	<b>Title: Consultant</b>	<b>Organization: Wegener Services LLC</b>	
<b>Individual Contacted:</b>			
<b>Name: Stephen Dwyer PhD, PE</b>	<b>Title: Contract Engineer</b>	<b>Organization: Dwyer Engineering LLC</b>	
<b>Telephone No: 505-844-0595</b>		<b>Street Address: 1813 Stagecoach Rd. SE</b>	
<b>Fax No: 505-271-0741</b>		<b>City, State, Zip: Albuquerque, nm 87123</b>	
<b>E-Mail Address: dwyerengineering@yahoo.com</b>			
<b>Purpose of the Five-Year Review</b>			
<p>The Purpose of the second 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.</p>			
<p><b>QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?</b></p> <p>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 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 capillary barrier since it was completed in 2005.</p>			
<b>Interview Questions</b>			

**QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009?**

**In my opinion, the capillary barrier worked well and has met everyone's expectations. The desert pavement (gravel and soil composite) has done a good job of stabilizing the surface of the cap and has prevented erosion. The planted native vegetation has grown well on the desert pavement, and now the plant community has matured and is more robust on the cap than on the surrounding areas. The amount of flux (water flow) through the cap has been lower than the alarm level identified in the Record of Decision of 1.3 mm/year. The cap is working well.**

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

**I think the cap and the other remedies have had a major positive impact for the area. San Juan County was able to straighten Highway 350 through the site, and that resulted in a much safer road. The cap has stopped recharge of water into the old landfill and that has enhanced the natural attenuation of contaminants that were in the landfill. The remedies has resulted in an effective cleanup of the site.**

**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 have monitored the cap since it was completed in 2005. I monitor the amount of flux that is captured in the lysimeters and I evaluate the surface of the cap for vegetation development, bio intrusions, and erosion. When I have discovered bio intrusions, usually due to rodents, I have notified BLM and the problems have been resolved in a timely manner. I also recommended vegetation reseeding shortly after the cap was completed, but now the vegetation community has reached climax.**

## **INTERVIEW RECORD**

**QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?**

No

### **Summary Of Conversation**

**In my opinion, the cap and the other remedial actions have been successful. The remedies included the unique situation of allowing a highway to be constructed through the site that not only provided a much safer road for the area, but also complemented the design of the cap and controls the amount of storm water runoff that can reach the cap. The capillary barrier works well and the desert pavement is effective at controlling erosion and limiting rodent intrusions.**

<b>Site Name: Lee Acres Landfill</b>		<b>EPA ID No.: NMD980750020</b>					
<b>Subject: Second Five-Year Review</b>		<b>Time: 0800</b>	<b>Date: 4-16-2014</b>				
<b>Type: Visit</b>	<table border="1"> <tr> <td>Incoming</td> <td>Outgoing</td> </tr> <tr> <td>0800</td> <td>0900</td> </tr> </table>			Incoming	Outgoing	0800	0900
Incoming	Outgoing						
0800	0900						
<b>Location of Visit: San Juan County Public Works Office</b>							
<b>Contact Made By:</b>							
<b>Name: Barney Wegener</b>		<b>Title: Consultant</b>	<b>Organization: Wegener Services LLC</b>				
<b>Individual Contacted:</b>							
<b>Name: T.J. Richards</b>		<b>Title: Compliance Specialist &amp; Community Involvement Coordinator</b>	<b>Organization: San Juan County</b>				
<b>Telephone No: 505-334-4574</b> <b>Fax No: 505-334-3645</b> <b>E-Mail Address: tjrichards@sjcounty.net</b>		<b>Street Address: 305 South Oliver Dr.</b> <b>City, State, Zip: Aztec NM 87410</b>					
<b>Purpose of the Five-Year Review</b>							
<p><b>The Purpose of the second 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.</b></p>							
<p><b>QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?</b></p> <p><b>I have two assigned duties connected to the Lee Acres Landfill site as an employee of San Juan County. I am the operations manager for the site and have been since the construction of the Capillary Barrier. I was also assigned the duties of Community Involvement Coordinator after the original coordinator (Joni Kelsey) came down with a medical emergency.</b></p>							
<b>Interview Questions</b>							

**QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review completed in October 2009?**

The site has been well maintained. There have been minimal incidents due to weather events and those incidents have been corrected in a timely manner. There have been no complaints from the public concerning the Lee Acres site.

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

I do not think there has been any impact to the community in the past 5 years. I have not received any comments from the community or from the public concerning Lee Acres.

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

No. Joni Kelsey was the Community Involvement Coordinator and she placed two legal notices in the Farmington Daily Times in February to announce the start of the Second Five-Year Review Process, and I placed a 3<sup>rd</sup> legal notice in the Farmington Daily Times on March 17<sup>th</sup>. No public comments were received after the public notices were published. I have not received any comments from anyone, nor did Joni Kelsey receive any comments before her medical emergency.

**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 inspections and monitor the site, including the fenced capillary barrier and other areas east of Highway 350. I inspect quarterly and also after weather events. I go out even on weekends after weather events to insure any damage to the site is identified and quickly as possible. When maintenance is needed, I notify the proper San Juan County crew to perform the maintenance. After the maintenance work is completed, I inspect the work. I keep a copy of the Daily Reports to track maintenance costs.

## 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 my opinion, I do not think the Lee Acres Landfill site should be considered a Super Fund Site anymore. The capillary barrier has performed as designed and I do not think Lee Acres poses any threat to the downstream community or the groundwater.

<b>Site Name: Lee Acres Landfill</b>		<b>EPA ID No.: NMD980750020</b>	
<b>Subject: Second Five-Year Review</b>		<b>Time: 0800</b>	<b>Date: 5-7-2014</b>
<b>Type: Visit</b>		Incoming	Outgoing
<b>Location of Visit: Western Refining Bloomfield NM Office</b>		0800	1200
<b>Contact Made By:</b>			
<b>Name: Barney Wegener</b>	<b>Title: Consultant</b>	<b>Organization: Wegener Services LLC</b>	
<b>Individuals Contacted:</b>			
<b>Name: Kelly Robinson</b>	<b>Title: Environmental Supervisor</b>	<b>Organization: Western Refining</b>	
<b>Randy Schmaltz</b>	<b>Health, Safety, Environment and Regulatory Director</b>		
<b>Allen Hains</b>	<b>Manager Remediation Projects</b>		
<b>Telephone No: (Kelly Robinson) 505-632-4166</b>		<b>Street Address: 111 County Road 4990</b>	
<b>Fax No: 505-632-4021</b>		<b>City, State, Zip: Bloomfield NM 87413</b>	
<b>E-Mail Address: kelly.robinson@wnr.com</b>			
<b>Purpose of the Five-Year Review</b>			
<p><b>The Purpose of the second 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.</b></p>			
<p><b>QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?</b></p> <p><b>We (Kelly Robinson, Randy Schmaltz, and Allen Hains) are the management team responsible to conduct the remediation program at the closed Giant Bloomfield Refinery which is located along the southern boundary of the Lee Acres Landfill site. Western Refining acquired the Giant Bloomfield Refinery and is responsible to remediate the Giant Bloomfield Refinery site as regulated by the New Mexico Oil Conservation Division (OCD).</b></p>			

## Interview Questions

**QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009.**

**It appears to us that the Lee Acres site has been well maintained.**

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

**We think the capillary barrier (CAP) and the realignment of County Highway 350 have had a positive impact on 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.**

**We do not monitor the Lee Acres Site.**

**QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?**

**No**

**Summary of Conversation**

## INTERVIEW RECORD

**We have cooperated with the BLM, USGS, NMED Water Quality Bureau, and San Juan County to facilitate the required monitoring activities on the Lee Acres site, and we want to continue to cooperate.**

<b>Site Name: Lee Acres Landfill</b>		<b>EPA ID No.: NMD980750020</b>	
<b>Subject: Second Five-Year Review</b>		<b>Time: 0930</b>	<b>Date: 6-12-2014</b>
<b>Type:</b> Visit		Incoming	Outgoing
<b>Location of Visit:</b> Harold Runnels Bldg. Santa Fe (NMED office)		0930	1115
<b>Contact Made By:</b>			
<b>Name:</b> Barney Wegener	<b>Title:</b> Consultant	<b>Organization:</b> Wegener Services LLC	
<b>Individual Contacted:</b>			
<b>Name:</b> Allan Pasteris	<b>Title:</b> Geoscientist	<b>Organization:</b> New Mexico Environment Department, Ground Water Quality Bureau	
<b>Telephone No:</b> 505 872-0039 <b>Fax No:</b> 505-827-2965 <b>E-Mail Address:</b> allan.pasteris@state.nm.us		<b>Street Address:</b> 1190 St. Francis Dr. P.O. Box 5469 <b>City, State, Zip:</b> Santa Fe, NM 87502-5469	
<b>Purpose of the Five-Year Review</b>			
<p><b>The Purpose of the second 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.</b></p>			
<p><b>QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?</b></p> <p><b>I am a staff member of the New Mexico Environment Department – Ground Water Quality Bureau – Superfund Oversight Section. I have been assigned to Lee Acres for 6 months. 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 EPS 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.</b></p>			
<b>Interview Questions</b>			

**QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009?**

**My major impression is that BLM continues to fulfill its commitments as established in the ROD. The actions at the site have made great strides toward achieving the cleanup goals. I am impressed at the level of cooperation between BLM and San Juan County as they have worked together to insure the betterment of the project.**

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

**The reclamation of the landfill has enhanced the landscape of 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 was at the site in 2009 and I attended the BLM coordination meeting that initiated the Second Five-Year review on February 19<sup>th</sup>, 2014. I also assisted Phyllis Bustamante in 2009 to sample ground water in the Lee Acres Community. No human health issues were identified as a result of the 2009 Lee Acres community groundwater sampling.**

## **INTERVIEW RECORD**

**QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?**

**No. The fence and the site were in good shape during the February 19<sup>th</sup> 2014 site inspection.**

### **Summary Of Conversation**

**I am impressed with the condition of the cap and the quality of the vegetation. It appears that the implementation of the cap has produced good results in respect to groundwater quality.**

<b>Site Name: Lee Acres Landfill</b>		<b>EPA ID No.: NMD980750020</b>	
<b>Subject: Second Five-Year Review</b>		<b>Time: 1015</b>	<b>Date: 6-2-2014</b>
<b>Type: Telephone</b>	Incoming		Outgoing
<b>Location of Visit:</b>	1015	1115	
<b>Contact Made By:</b>			
<b>Name: Barney Wegener</b>	<b>Title: Consultant</b>	<b>Organization: Wegener Services LLC</b>	
<b>Individual Contacted:</b>			
<b>Name: Fredrick Gebhardt</b>	<b>Title: Hydrologic Technician</b>	<b>Organization: USGS Water Science Center</b>	
<b>Telephone No: 505-830-7978</b>		<b>Street Address: 5338 Montgomery Blvd. NE Suite 400</b>	
<b>Fax No: 505-830-7998</b>		<b>City, State, Zip: Albuquerque NM 87109</b>	
<b>E-Mail Address: gebhardt@usgs.gov</b>			
<b>Purpose of the Five-Year Review</b>			
<p><b>The Purpose of the second 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.</b></p>			
<p><b>QUESTION #1: What is your connection to, or involvement with the Lee Acres Landfill?</b></p> <p><b>I am with the USGS Water Science Center in Albuquerque. I am the project manager for the groundwater sampling contract between BLM and USGS. I have conducted groundwater sampling at the Lee Acres site for many years and I am responsible for collecting samples, maintaining quality control, and sending the samples to a qualified laboratory. I also analyze data results from the laboratory and prepare sampling reports that are submitted to BLM as outlined in the contract.</b></p>			
<b>Interview Questions</b>			

**QUESTION #2: What is your overall impression of the activities performed at the site since the completion of the First Five-Year Review in October 2009?**

**It appears to me that the capillary barrier and the other remedial actions completed at the site have been successful.**

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

**The completion of the capillary barrier and the realignment of San Juan County road 350 ten years ago resulted in the site blending into the local topography and I do not think anyone notices that the site exists. I think the remedial actions completed at the site have been beneficial to the area.**

**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.**

**As I noted in question #1, I routinely sample the groundwater monitoring wells at the site per the groundwater monitoring contract between USGS and BLM.**

**QUESTION #6: Are you aware of any incidents of vandalism, trespassing, or other activities at the site since the completion of the First Five-Year Review in October 2009 that required emergency response from local authorities?**

**No**

**Summary Of Conversation**

**Last September there were some storm events in the Lee Acres area, and some high water runoff passed down through the arroyo that is adjacent to the capillary barrier. The storm events resulted in an increase of the groundwater elevation at the site of about 2 feet. The elevated groundwater may have caused some spikes in manganese levels, but did not result in any other contaminants of concern that I am contracted to sample exceeding cleanup levels. Manganese has always been erratic and has not been well understood in the system. I think the results of the long term groundwater sampling that I have conducted indicates that the site is ready for closure.**

# ATTACHMENT 4

Site Inspection Check List and Photos

## Site Inspection Checklist

I. SITE INFORMATION			
<b>Site name:</b> Lee Acres Landfill	<b>Date of inspection:</b> 2-19-2014		
<b>Location and Region:</b> Farmington NM Region 6	<b>EPA ID:</b> NMD980750020		
<b>Agency, office, or company leading the five-year review:</b> Farmington BLM (DOI)	<b>Weather/temperature:</b> Sunny and 50 degrees F.		
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Landfill cover/containment  <input checked="" type="checkbox"/> Access controls  <input checked="" type="checkbox"/> Institutional controls  <input type="checkbox"/> Groundwater pump and treatment  <input type="checkbox"/> Surface water collection and treatment  <input type="checkbox"/> Other _____            _____         </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Monitored natural attenuation  <input type="checkbox"/> Groundwater containment  <input type="checkbox"/> Vertical barrier walls         </td> </tr> </table>		<input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____ _____	<input checked="" type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls
<input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____ _____	<input checked="" type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls		
<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached <input checked="" type="checkbox"/> Site map attached			
II. INTERVIEWS (Check all that apply)			
1. <b>O&amp;M site manager</b> <u>Dave Keck</u> _____ <u>Public Works Administrator</u> <u>4-21-2013</u> <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. <u>505-334-4520</u> Problems, suggestions; <input checked="" type="checkbox"/> Report attached _____ _____			
2. <b>O&amp;M staff</b> <u>T. J. Richards</u> _____ <u>Compliance Specialist</u> <u>4-16-2013</u> <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input type="checkbox"/> at site <input checked="" type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. <u>505-334-4574</u> Problems, suggestions; <input checked="" type="checkbox"/> Report attached _____ _____			



<b>III. ON-SITE DOCUMENTS &amp; RECORDS VERIFIED</b> (Check all that apply)				
1.	<b>O&amp;M Documents</b> <input type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks _____	X Readily available <input type="checkbox"/> Readily available X Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input type="checkbox"/> N/A X N/A <input type="checkbox"/> N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	X Readily available X Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks <u>Tail Gate Meetings</u>	X Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks <u>No Permits Required</u>	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	X N/A X N/A X N/A X N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	X N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	X N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	X Readily available	X Up to date	<input type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	X N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	X N/A X N/A
10.	<b>Daily Access/Security Logs</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	X N/A



<b>C. Institutional Controls (ICs)</b>			
1.	<b>Implementation and enforcement</b>		
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Type of monitoring (e.g., self-reporting, drive by) <u>Drive By</u>		
	Frequency <u>8 – 10 times per month</u>		
	Responsible party/agency <u>San Juan County</u>		
	Contact <u>T. J. Richards</u>	<u>Compliance Specialist</u>	<u>505-334-4574</u>
	Name	Title	Date Phone no.
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Violations have been reported	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
	Other problems or suggestions: <input type="checkbox"/> Report attached		
	_____		
	_____		
	_____		
2.	<b>Adequacy</b>	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A
	Remarks <u>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).</u>		
	_____		
	_____		
<b>D. General</b>			
1.	<b>Vandalism/trespassing</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident
	Remarks <u>None</u>		
	_____		
2.	<b>Land use changes on site</b>	<input type="checkbox"/> N/A	
	Remarks <u>None</u>		
	_____		
3.	<b>Land use changes off site</b>	<input type="checkbox"/> N/A	
	Remarks <u>None</u>		
	_____		
<b>VI. GENERAL SITE CONDITIONS</b>			
<b>A. Roads</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Roads damaged</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A
	Remarks <u>None</u>		
	_____		

<b>B. Other Site Conditions</b>		
Remarks <u>Site is in good condition</u>		
_____		
_____		
_____		
_____		
<b>VII. LANDFILL COVERS</b> X Applicable ■ N/A		
<b>A. Landfill Surface</b>		
1.	<b>Settlement</b> (Low spots) Areal extent _____ Depth _____ Remarks <u>No Settlement</u>	■ Location shown on site map X Settlement not evident
2.	<b>Cracks</b> Lengths _____ Widths _____ Depths _____ Remarks <u>No Cracks</u>	■ Location shown on site map X Cracking not evident
3.	<b>Erosion</b> Areal extent _____ Depth _____ Remarks <u>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.</u>	■ Location shown on site map ■ Erosion not evident
4.	<b>Holes</b> Areal extent _____ Depth _____ Remarks <u>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.</u>	■ Location shown on site map X Holes not evident
5.	<b>Vegetative Cover</b> ■ Grass ■ Trees/Shrubs (indicate size and locations on a diagram) Remarks <u>The grass and shrub community established by two seedings is similar to the undisturbed vegetation surrounding the site, but is not yet mature.</u>	X Cover properly established ■ No signs of stress
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> Remarks <u>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.</u>	■ N/A
7.	<b>Bulges</b> Areal extent _____ Height _____ Remarks <u>None</u>	■ Location shown on site map X Bulges not evident

8.	<b>Wet Areas/Water Damage</b> <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____	<input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Location shown on site map	Areal extent _____ Areal extent _____ Areal extent _____ Areal extent _____
9.	<b>Slope Instability</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of slope instability
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b> Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
2.	<b>Bench Breached</b> Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
3.	<b>Bench Overtopped</b> Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> No evidence of settlement
2.	<b>Material Degradation</b> Material type _____ Remarks _____	<input type="checkbox"/> Location shown on site map Areal extent _____	<input type="checkbox"/> No evidence of degradation
3.	<b>Erosion</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> No evidence of erosion

4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
<hr/>			
5.	<b>Obstructions</b>	Type _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
<hr/>			
6.	<b>Excessive Vegetative Growth</b>	Type _____	
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
<hr/>			
<b>D. Cover Penetrations</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<hr/>			
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active <input type="checkbox"/> Passive	
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance
	<input type="checkbox"/> N/A		
	Remarks _____		
<hr/>			
2.	<b>Gas Monitoring Probes</b>	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
3.	<b>Monitoring Wells</b> (within surface area of landfill)		
	<input type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks <u>There are two lysimeters within the surface of the landfill site. The lysimeters are in good condition, and monitored regularly.</u>		
<hr/>			
4.	<b>Leachate Extraction Wells</b>	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____		
<hr/>			
5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks _____		
<hr/>			

<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3.	<b>Gas Monitoring Facilities</b> ( <i>e.g.</i> , gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____		
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____		
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____		
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Siltation</b> Areal extent _____      Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____ _____		
2.	<b>Erosion</b> Areal extent _____      Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____		
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____		
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____ _____		

<b>H. Retaining Walls</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement_____		Vertical displacement_____
	Rotational displacement_____		
	Remarks_____		
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks_____		
<b>I. Perimeter Ditches/Off-Site Discharge</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Siltation not evident
	Areal extent_____		Depth_____
	Remarks_____		
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input checked="" type="checkbox"/> Vegetation does not impede flow		
	Areal extent_____		Type_____
	Remarks_____		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident
	Areal extent_____		Depth_____
	Remarks_____		No erosion in trenches.
4.	<b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks_____		
<b>VIII. VERTICAL BARRIER WALLS</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent_____		Depth_____
	Remarks_____		
2.	<b>Performance Monitoring</b>	Type of monitoring_____	
	<input type="checkbox"/> Performance not monitored		
	Frequency_____		<input type="checkbox"/> Evidence of breaching
	Head differential_____		
	Remarks_____		

<b>C. Treatment System</b>		■ Applicable	X N/A
1.	<b>Treatment Train</b> (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.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) ■ N/A                      ■ Good condition                      ■ Needs Maintenance Remarks _____ _____		
3.	<b>Tanks, Vaults, Storage Vessels</b> ■ N/A                      ■ Good condition                      ■ Proper secondary containment                      ■ Needs Maintenance Remarks _____ _____		
4.	<b>Discharge Structure and Appurtenances</b> ■ N/A                      ■ Good condition                      ■ Needs Maintenance Remarks _____ _____		
5.	<b>Treatment Building(s)</b> ■ N/A                      ■ Good condition (esp. roof and doorways)                      ■ Needs repair ■ Chemicals and equipment properly stored Remarks _____ _____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy) ■ Properly secured/locked                      ■ Functioning                      ■ Routinely sampled                      ■ Good condition ■ All required wells located                      ■ Needs Maintenance                      ■ N/A Remarks _____ _____		
<b>D. Monitoring Data</b>			
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

<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)		
	X Properly secured/locked	X Functioning	X Routinely sampled
	X All required wells located	■ Needs Maintenance	X Good condition
	Remarks <u>Wells monitored by USGS</u>		
<b>X. OTHER REMEDIES</b>			
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.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
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.).			
<u>Remedy is functioning as designed.</u>			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
<b>B. Adequacy of O&amp;M</b>			
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.			
<u>The landfill cover is properly maintained and all facilities are in good condition.</u>			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			

**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

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**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

No issues

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**Lee Acres Landfill Site Inspection February 19, 2014**

**View is from the north portion of the landfill cover  
looking east.**



**Lee Acres Landfill Site Inspection February 19,  
2014**

**View is from the center of the cover looking south**



**Lee Acres Landfill Site Inspection February 19,  
2014**

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



## **Lee Acres Landfill Site Inspection February 19, 2014**

**View is from the southern portion of the cover looking at the stability of the cover surface and vegetation.**



**Lee Acres Landfill Site Inspection February 19,  
2014**

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

# Appendix #5

## Potential Regulations to amend the manganese cleanup level

**EPA 540-R-98-031 July 1999: A Guide to Preparing Superfund Proposed Plans Records of Decision, and Other Remedy Selection Decision Documents: Section 7: Documenting Post-ROD Changes: Minor Changes, Explanations of Significant Differences, and ROD Amendments.**

EPA Technical Impracticability Waiver  
OSWER Directive 9200.4-14, January 19, 1995

New Mexico Administrative Code (NMAC) Title 20, Chapter 6, Part 2, December 1, 1995:  
**Environmental Water Quality Ground and 'surface Water Protection:**

20.6.2.1.4101(B) NMAC

20.6.2.3101(A) NMAC

20.6.2.4130 NMAC

# Attachment #6

November 26, 2014

Environmental Protection Agency

Non-Concurrence Letter



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS TX 75202-2733

NOV 26 2014

NOV 26 2014

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Edwin L. Roberson  
Assistant Director, Resources and Planning  
Bureau of Land Management  
Washington, D.C. 20240

Re: Final Five-Year Review Report  
Second Five-Year Review  
Lee Acres Landfill, Bloomington, New Mexico (EPA ID# NMD980750020)

Dear Mr. Roberson:

Thank you for submitting the Final Second Five-Year Review for the U.S. Environmental Protection Agency's (EPA) concurrence. This letter documents that EPA does not fully concur on the protectiveness determinations as stated in the *Final Second Five-Year Review Report for the Lee Acres Landfill Site, Farmington, New Mexico*, dated September 19, 2014. Based on the findings of the Five-Year Review, the EPA is issuing its own independent determination of protectiveness that the site is protective of human health and the environment in the short-term and is not protective in the long-term. The remedy is not considered protective of human health and the environment in the long-term because manganese levels are not decreasing and meeting the cleanup goal established in the Record of Decision.

This is the second Five-Year Review for the Lee Acres Landfill Site, which was triggered due to the implementation of remedial action in 2004 and the completion of the first Five-Year Review in 2009. This Five-Year Review Report was submitted as draft by BLM in July 2014, reviewed and commented on by the State of New Mexico and EPA in August 2014, and was submitted as final by the BLM in September 2014. The final second Five-Year Review report did not incorporate EPA's finding that the remedy is not protective in the long-term. The final report did incorporate recommendations that EPA and New Mexico Environment Department (NMED) submitted.

The Five-Year Review is required by Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9621(c), and by Section 300.430 (f) (4) (ii) of the National Oil and Hazardous Substance Contingency Plan (NCP), which require 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. BLM, as lead agency for Lee Acres Landfill, conducted this review. According to EPA's Comprehensive Five-Year Review Guidance (OSWER No. 9355.7-03B-P, June 2001), EPA's role as the final remedy selection authority at a National Priority List (NPL) site under the jurisdiction of another Federal agency or department requires that EPA retain final authority to make protectiveness determinations in connection with the site. Accordingly, EPA Regions review Federal facility NPL Five-Year Review reports and protectiveness determinations for

consistency with EPA's Comprehensive Five-Year Review Guidance and the adequacy of the supporting basis. The EPA also participates throughout the Five-Year Review process and, as appropriate, EPA either concurs with any protectiveness determinations to ensure protectiveness of human health and the environment or EPA may provide independent findings. In this case, BLM provided EPA with the final Five-Year Review Report which does not address previous EPA comment regarding the protectiveness determination. BLM has stated that it will work with EPA and NMED to follow the appropriate process to evaluate what needs to be done to make a determination that the remedy for the site is protective in the long-term.

The EPA looks forward to working with BLM to address the long-term protectiveness at the site after the completion of eight quarters of groundwater monitoring is complete in 2016. If there are any questions regarding this matter, please feel free to contact Mr. John Meyer of my staff at (214) 665-6742.

Sincerely yours,



Carl Edlund, P.E.  
Director  
Superfund Division

cc: Charlotte Bertrand, Acting Director  
EPA Federal Facilities Restoration and Reuse Office

Phyllis Bustamante, NMED

# Attachment #7

June 1, 2015

Bureau of Land Management

Addendum



# United States Department of the Interior



## BUREAU OF LAND MANAGEMENT

New Mexico State Office  
301 Dinosaur Trail  
P.O. Box 27115  
Santa Fe, New Mexico 87502-0115  
www.blm.gov/nm

In Reply Refer To:  
8600 (9300)

RECEIVED

JUL 06 2015

June 1, 2015

Farmington Field Office  
Bureau of Land Management

### Memorandum

To: Acting, Assistant Director, Renewable Resources and Planning  
Attention: Amy Lueders

Through: Acting, Division Chief, Environmental Quality and Protection  
Attention: McKinley Ben Miller

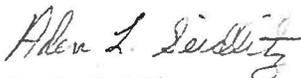
From: Acting State Director, NM

Subject: Second Five-Year Review of Lee Acres Superfund Site Remedial Actions

This memorandum transmits the addendum to the Second five-year review for the Lee Acres Landfill Superfund Site dated September 19, 2014.

On October 23, 2014, the Environmental Protection Agency (EPA) did not fully concur on the long term protectiveness determination as stated in the *Final Second Five-Year Review Report for the Lee Acres Landfill Site, Farmington, New Mexico* (Report). The BLM and EPA coordinated and agreed to revise the long term protectiveness statement through an addendum (Attachment 1).

After review and signature, please forward signed documents to the EPA for final review and concurrence.

  
Aden L. Seidlitz  
Acting State Director

1 Attachment

cc:  
NMF000, Victoria Barr

RECEIVED

JUN 09 2015

BLM-R&P-W0200

UNITED STATES DEPARTMENT OF INTERIOR  
BUREAU OF LAND MANAGEMENT  
1849 C Street, NW #5665, Washington, D.C. 20240

**Addendum to Lee Acres Landfill Superfund Site EPA ID# NMD980750020, Site ID: 0600911  
Five Year Review Report,  
dated September 19, 2014**

On October 23, 2014 the U.S. Environmental Protection Agency (EPA) did not fully concur on the protectiveness determinations as stated in the *Final Second Five-Year Review Report for the Lee Acres Landfill Site, Farmington, New Mexico*, dated September 19, 2014. Based on the findings of the Five-Year Review, the EPA issued its own independent determination of protectiveness that the site is protective of human health and the environment in the short-term and is not protective in the long-term. The remedy is not considered protective of human health and the environment in the long-term because manganese levels are not decreasing and meeting the cleanup goal established in the Record of Decision.

The Five-Year Review report (Report) for the Lee Acres Landfill Superfund Site in Farmington, New Mexico, was signed by Edwin L. Roberson, Assistant Director, Resources and Planning on September 19, 2014. The protectiveness statement outlined in the Report was as follows:

*The remedial actions performed at the site are considered to be protective of human health and the environment. Institutional controls are in place on 134.68 acres of public land, which includes the Lee Acres Landfill and a buffer area around it, precluding 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 23<sup>rd</sup> monitoring inspection of the landfill cover was completed on July 2, 2014. The summary paragraph of the report stated the cover is in excellent condition. Data from eight ground water monitoring wells around the site indicate that all contaminants of concern listed in the Record of Decision (ROD) satisfy the maximum contaminant levels set under the Safe Drinking Water 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.*

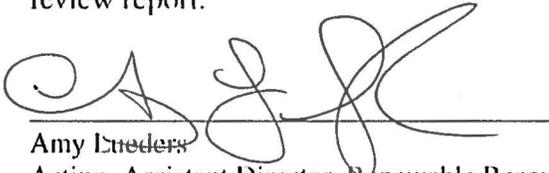
**Protectiveness Statement**

Bureau of Land Management after further review is amending the protectiveness determination to state:

*The remedial actions performed at the site are considered to be protective of human health and the environment in the short term. Because current manganese levels are not decreasing, the long-term protectiveness of human health and the environment will be achieved when manganese levels decrease, and satisfy the cleanup level established in the ROD. Institutional controls are in place on 134.68 acres of public land, which includes the Lee Acres Landfill and a buffer area around it, precluding 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 23<sup>rd</sup> monitoring inspection of the landfill cover was completed on July 2, 2014. The summary paragraph of the report stated the cover is in excellent condition. Data from eight ground water monitoring wells around the site indicate that all contaminants of concern listed in the Record of Decision (ROD) satisfy the maximum contaminant levels set under the Safe Drinking Water 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.*

**Next Five-Year Review**

The next five-year review will be completed on October 2019, five years after the signature of the last five-year review report.



Date 6/24/15

Amy Euders  
Acting, Assistant Director, Renewable Resources and Planning

# Attachment #8

August 14, 2015

Environmental Protection Agency

Concurrence Letter



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS TX 75202-2733

AUG 14 2015

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Ms. Amy Lueders  
Acting, Assistant Director, Renewable Resources and Planning  
United States Department of Interior  
Bureau of Land Management  
1849 C Street, NW #5665  
Washington, D.C. 20240

Re: Addendum to Second Five-Year Review Report dated September 19, 2014  
Lee Acres Landfill, Bloomington, New Mexico (EPA ID# NMD980750020)

Dear Ms. Lueders:

Thank you for submitting the Addendum to the Second Five-Year Review ("Addendum") dated June 24, 2015, for the U.S. Environmental Protection Agency's (EPA) concurrence. This letter documents that EPA concurs with this revised protectiveness determination.

The Addendum incorporates EPA's finding that the remedy is considered protective in the short-term but not protective in the long-term due to increasing manganese levels. The second Five-Year Review Report was submitted to EPA as final by BLM in September 2014. The final report submitted by BLM stated that the remedial actions at the site are considered protective of human health and the environment. However, EPA made an independent protectiveness determination that stated "[t]he remedial actions performed at the site are considered to be protective of human health and the environment in the short term. Because manganese levels are not decreasing, the long-term protectiveness of human health and the environment will be achieved when manganese levels decrease, and satisfy the cleanup level established in the ROD." The Addendum fully incorporates EPA's protectiveness determination as stated above.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Carl E. Edlund".

Carl E. Edlund, R.E.  
Director  
Superfund Division

cc: Charlotte Bertrand, Acting Director  
EPA Federal Facilities Restoration and Reuse Office

Phyllis Bustamante, NMED