SOIL MANAGEMENT PLAN
City of Albuquerque Rail Yards
Albuquerque, Bernalillo County, New Mexico

Prepared for:

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ACRONYMS AND ABBREVIATIONS

ACBM	asbestos-containing building materials
amsl	above mean sea level
AST	aboveground storage tank
ATSF	Atchison, Topeka and Santa Fe Railway
bgs	below ground surface
BNSF	Burlington Northern Santa Fe Railway
BTEX	benzene, toluene, ethyl benzene, and total xylenes
COA	City of Albuquerque
COPC	contaminant of potential concern
CWE	Central Works Equipment
DBS&A	Daniel B. Stephens and Associates
EDB	ethylene dibromide/1,2-dibromoethane
EPA	Environmental Protection Agency
ERM	Environmental Resources Management, Inc.
ft	feet *or* foot
ft/ft	foot per foot
HAI	Huang & Associates, Inc
HEAL	Hall Environmental Analysis Laboratory
INTERA	INTERA Incorporated
LBP	lead-based paint
MRO	motor oil range organic
MTBE	methyl tertiary butyl ether
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NM-GS	New Mexico Ground Water Standard
NMWQCC	New Mexico Water Quality Control Commission
PAH	polynuclear aromatic hydrocarbon
PCS	petroleum-contaminated soil
PID	photoionization detector
ppm	part per million
RSL	regional screening level

S&A	sampling and analysis
Site	City of Albuquerque Rail Yards, Albuquerque, New Mexico
SMP	Soil Management Plan
SSL	Soil Screening Level
SWB	Solid Waste Bureau
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbon
TPH-DRO	total petroleum hydrocarbon diesel range organics
TPH-GRO	total petroleum hydrocarbon
TPH-MRO	total petroleum hydrocarbon motor oil range organics
VOC	volatile organic compound
XRF	x-Ray Fluorescence

1.0 INTRODUCTION

This Soil Management Plan (SMP) has been prepared by INTERA Incorporated (INTERA) on behalf of the City of Albuquerque (COA) to be used as a guide for future excavation activities at the COA Rail Yards (Site) (VRP Site No. 53161007). This document is intended to assist the COA and/or their subcontractors in field identification and management of potentially contaminated soil that could be encountered during excavation/construction activities at the Site. This SMP includes field procedures for identification, response actions, communication, removal/excavation, temporary stockpiling, characterization, transportation, and disposal of potentially contaminated soil.

2.0 SITE DESCRIPTION

The Site is located between 2nd Street and Commercial Street in downtown Albuquerque, New Mexico and consists of approximately 27 acres located within the former Atchison, Topeka, and Santa Fe (ATSF)/Burlington Northern Santa Fe (BNSF) Central Works Equipment (CWE) Facility Railyard that operated from the 1880s to the early 1990s (**Figure 1**). The Site is located at an elevation of approximately 5,000 feet (ft) above mean sea level (amsl) and is primarily topographically flat, with a slight drop in elevation toward the south. Today, numerous small and large buildings and structures formerly used to support various railroad maintenance activities are located at the Site (**Figure 2**). The Site is bounded to the west by residential property and to the north and south by commercial/industrial property (INTERA, 2015). Residential properties are located to the east of the Site beyond the adjoining railroad tracks. The nearest surface water body is the Rio Grande, located approximately 1,500 ft to the west of the Site.

3.0 PLANNED REDEVELOPMENT

The proposed development of the Site is still being determined; the only known excavation activity to occur in the near future is to excavate two utility trenches within the COA Rail Yards North (**Figure 3**). Potable water, sewer, and natural gas utility lines will be placed in these areas. The main subsurface utility trench will be approximately 300-ft long, 15-ft wide, and 3-ft deep. A smaller trench may also be excavated south of this larger trench to install additional utility lines.

4.0 SITE ENVIRONMENTAL CONDITIONS

4.1 Site History

As a result of historical Site operations, the Site sustained environmental impacts from both petroleum hydrocarbon and metals contamination. Contamination is present in both the Site vadose zone (Site soils and soil vapor) and in the saturated zone (groundwater) and includes metals, volatile organic vapors, and organic and inorganic contaminants in groundwater. In addition, both asbestos-containing building materials (ACBM) and lead-based paint (LBP) were used in many of the Site buildings and are other Site contaminants of concern.

Investigations into the nature and extent of petroleum hydrocarbon and metal contamination at the Site have been ongoing since 1988 and have primarily focused on the extent of the soil contamination and the dissolved-phase groundwater plume (INTERA, 2015). The New Mexico Environment Department (NMED) conducted a limited Site investigation at the Site in 1988. Characterization activities completed during this investigation included the sampling and analysis (S&A) of surface soils and the installation of two off-site monitoring wells. Results of this investigation indicated the presence of polynuclear aromatic hydrocarbons (PAHs) and metal in soils and trace toluene in groundwater (DBS&A, 1996b). These results initiated a series of additional characterization efforts and some remedial action for one or more portions of the Site; however, remedial actions were limited to small excavation areas. A summary of investigation activities completed for the Site since 1988 is provided in **Table 1.** A summary of remedial actions completed for the Site since 1988 is provided in **Table 2.**

Table 1. Characterization and Investigation Activities

Date	Consultant	Location	Investigation Activity
December 1995	DBS&A	CWE Shops	Phase II Environmental Site Assessment – collected soil and groundwater samples
June 1996	DBS&A	ATSF Railway Company CWE Facility	Water well inventory, soil sampling, groundwater sampling, and aquifer test
July 1996	DBS&A	ATSF Railway Company CWE Facility	Quarterly groundwater monitoring – Stage I Abatement Plan
September 1996	DBS&A	ATSF Railway Company CWE Facility	Plugging and abandonment of on-site water supply wells
December 1996	DBS&A	ATSF Railway Company CWE Facility	Quarterly groundwater monitoring – Stage I Abatement Plan
March 1997	DBS&A	Former ATSF Railway Company CWE Facility	Quarterly groundwater monitoring – Stage I Abatement Plan
January 2000	DBS&A	Former ATSF Railway Company CWE Facility	Groundwater monitoring event
May 2000	Dames & Moore Inc.	Former ATSF Railway Company CWE Facility	Limited Site Investigation – collected soil and groundwater samples, installed wells
September 2000	ERM	CWE Shop Area, Transformer Vandalism Site	Investigated transformer oil leak from 13 vandalized electrical transformers
October 2005	Terracon	Albuquerque Locomotive Shops Area B, Area C, and Tract A	Site characterization and remediation excavation activities
June 2010	HAI	Albuquerque Locomotive Shops Area A	Phase II Environmental Site Assessment – collected soil and groundwater samples
January 2011	Innovar	Albuquerque Locomotive Shops Area B, Area C, and Tract A	Phase II Environmental Site Assessment – focused on nine areas of concern
July 2012	INTERA	Albuquerque Locomotive Shops Area B, Area C, and Tract A	Soil and groundwater sample collection to aid in the delineation of metal and petroleum hydrocarbon contamination
September 2015	INTERA	Conceptual Site Model, COA Rail Yards	Consolidate all previous Site data
February 2017	INTERA	Parcel 1 Additional Characterization Report	Soil, Soil Vapor, ACBM, LBP, and groundwater sampling
February 2017	INTERA	Parcel 2 Additional Characterization Report	Soil, Soil Vapor, ACBM, LBP, and groundwater sampling
February 2017	INTERA	Parcel 3 Additional Characterization Report	Soil Vapor, ACBM, and LBP sampling
February 2017	INTERA	Parcel 4 Additional Characterization Report	Soil, Soil Vapor, ACBM, LBP, and groundwater sampling
February 2017	INTERA	Parcel 5 Additional Characterization Report	Soil Vapor, ACBM and LBP sampling
February 2017	INTERA	Parcel 7 Additional Characterization Report	Soil Vapor, ACBM, and LBP sampling
February 2017	INTERA	Parcel 8 Additional Characterization Report	Soil Vapor, ACBM, and LBP sampling
February 2017	INTERA	Parcel 9 Additional Characterization Report	Soil, Soil Vapor, ACBM, and LBP sampling
February 2017	INTERA	Parcel 10 Additional Characterization Report	Soil, Soil Vapor, ACBM, LBP, and groundwater sampling
February 2017	INTERA	Additional Groundwater Characterization Report	Groundwater sampling
2018	COA Environmental Health Dept.	COA Rail Yards North and South	Groundwater and soil vapor sampling
May 2019	COA EHD	COA Rail Yards North	Additional Soil Investigation and Impacted Soil Removal

Notes:

COA EHD = City of Albuquerque Environmental Health Department

DBS&A = Daniel B. Stephens & Associates, Inc.

ERM = Environmental Resources Management, Inc.

HAI = Huang & Associates, Inc.

Table 2. Excavation Activities.

Date	Consultant	Location	Soil Removal Quantity (cubic yards)	Action Driver
2005	Terracon	Roundhouse excavation area	40	Lead
2005	Terracon	Former oil cellar/AST excavation area (reported to be backfilled with same soil, [HAI, 2010])	330	Petroleum
2005	Terracon	Former battery storage excavation area	280	Lead
2005	Terracon	Former sand blasting excavation area	140	Lead
2019	COA EHD	Former battery storage excavation area and former sand blasting excavation area	900	Lead

Notes:
AST= above-ground storage tank
COA EHD = City of Albuquerque Environmental Health Department
HAI = Huang & Associates, Inc.

4.2 Site Soil Conditions

Site surface and near-surface soils consist of sandy fill and debris and contain classic fining-upward sequences typical of a fluvial depositional environment (INTERA, 2012; Innovar, 2011). Fine-grained sediments (sediments containing silts and clay) predominate in the shallow subsurface up to 10 to 15 ft below ground surface (bgs). Below these sediments, coarser-grained units consisting of fine- to coarse-grained sand extend to depths of at least 47 ft bgs. The contact between the fine and coarse units is gradational.

The following constituents are identified as Site soil contaminants of potential concern (COPCs) (INTERA, 2015):

- Metals: antimony, arsenic, chromium, iron, lead, manganese, and thallium;
- PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene; dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene; and,
- Total petroleum hydrocarbon (TPH) diesel range organic (TPH-DRO) and TPH motor oil range organic (TPH-MRO) (the sum of TPH-DRO and TPH-MRO).

These COPCs were derived from evaluating historical Site analytical data with the applicable New Mexico state regulatory standards, including NMED soil screening level (SSLs) (NMED, 2019). Petroleum-contaminated soil (PCS) was present in both the finer-grained and coarser-grained soil units. **Figure 4a** through **Figure 4c** illustrate where exceedances of metals, PAHs, and TPH exist on the Site.

In addition, volatile organic compounds (VOCs) including trichloroethene (TCE), were identified as Site soil vapor COPCs (COA, 2018), and ACBM and LBP in Site buildings and structures were identified as other Site COPCs for Site redevelopment activities. **Figure 5a** through **Figure 5d** illustrate where exceedances of soil vapor CPOCs exist on the Site.

Transite pipe (pipe made from an asbestos-cement material) was identified in the subsurface near transformers located south of the Babbitt Shop (**Figure 2**). Samples of the Transite pipe contained 25% to 30% asbestos (Terracon, 2005). The pipe appeared to be the remnant of piping used for hot/cold water used throughout the main buildings. It is unclear whether any Transite pipe has been removed from the COA Rail Yards and therefore any future excavation activities must proceed with caution and be aware that this material may be encountered. Photograph examples of Transite pipe are included in **Appendix A.**

4.3 Site Groundwater Conditions

Groundwater elevation contours constructed from groundwater elevation data obtained from Site wells (1996, 1999, 2010, and 2017) indicate that local groundwater flow is predominately to the east. Hydraulic gradients calculated for horizontal groundwater flow beneath the Site ranged from 0.0042 foot per foot (ft/ft) (November 2016) to 0.006 ft/ft (April 1996 and December 1999) (INTERA, 2015).

Data collected during the mid-1990s from on-Site groundwater monitoring wells indicate the depth to groundwater beneath the Site was between 30 and 40 ft bgs (DBS&A, 1996a). More recent well data indicate that groundwater levels at the Site have increased approximately 5 to 10 ft above this range (INTERA, 2017). Groundwater levels were measured at the Site in April 2020 and ranged from 17.50 ft below top of casing (btoc) at monitoring well RAILMW02 to 25.72 ft btoc at monitoring well RAILMW06. This rise in the local water table in the downtown COA area is likely a direct result of recently reduced groundwater pumping from the regional aquifer as the sole source for the area’s water supply. Additionally, as the water levels rise, contaminated vadose zone soils previously not saturated may become saturated.

It is important to note that any excavation activities exceeding a depth of 15 feet bgs may encounter saturated soils and excavations of this depth or greater should be avoided. If an excavation of a depth greater than 15 feet bgs is required, the COA should amend this plan to include language to handle saturated soils and/or to prescribe how to conduct dewatering activities if necessary.

The following constituents are identified as Site groundwater COPCs (INTERA, 2015):

- PAHs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.
- VOCs including benzene, toluene, ethyl benzene, and total xylenes (BTEX), total naphthalenes, and ethylene dibromide (EDB).
- TPH-DRO and TPH-MRO.

- Metals: mercury, arsenic, barium, cadmium, chromium, lead, selenium and silver.

These COPCs were derived from evaluating historical Site analytical data with the applicable New Mexico state regulatory standards including the New Mexico Water Quality Control Commission (NMWQCC) Human Health Standards defined in New Mexico Administrative Code (NMAC) 20.6.2.3.3103 (New Mexico Ground Water Standards [NM-GS]) (NMED, 2018). Results from the April 2020 groundwater monitoring event are presented on **Figure 6** and indicate that total naphthalene was detected above the New Mexico Water Quality Control Commission Standard in monitoring wells RAILMW01 (formerly MW-01) and RAILMW03 (formerly MW-03).

5.0 SOIL MANAGEMENT PLAN

This section provides field/construction staff methodology for identifying and/or field screening potentially contaminated soil and protocols for communication, temporary storage or stockpiling, transportation, and disposal of potentially contaminated soil. Based on historical Site characterization, it is anticipated that VOCs are unlikely to be encountered in the proposed trenching excavation areas. Though metals are the primary concern in these areas, the soil will be screened for both.

5.1 Identification of Contaminated Soil

Soil characterization must be performed prior and/or during excavation activities. The designated person must observe soil for visual evidence of contamination. The three primary physical indicators of petroleum-related contamination in soil include staining, sheen, and petroleum-like odor, as described below:

Staining: Generally, soil that is impacted with petroleum hydrocarbons displays gray or black staining, although other contaminants and natural conditions may also contain staining.

Sheen: Sheen is another indication of petroleum contamination. Soil with a sheen may appear shiny and iridescent.

Odor: Soil impacted with petroleum products, volatile organics, and other types of contamination may release vapors when exposed to the atmosphere. These vapors can be interpreted as an odor and will have a gasoline-like odor.

Additionally, soil samples will be field screened using a photoionization detector (PID) to screen for VOCs and an x-ray fluorescence (XRF) analyzer for metals. Please refer to **Appendix C** for XRF measurement specifications. If detected, the extent of impacted soil will be delineated implementing the heated head space method using a hand-held PID unit. Excavated soil resulting in PID readings greater than 100 parts per million (ppm) or above the NMED's residential and/or industrial land use SSLs for metals shall be segregated from other excavated soil until further analysis can be performed to characterize the soil for regulatory appropriate disposal. See **Section 5.2** and **Section 5.3** for more information on stockpile management and composite sampling, respectively.

Observations and results of the field screening will need to be documented either on a soil field screening log or in a field logbook. The log will identify the location of the screened material and summarize the individual field screening results.

5.2 Stockpile Management

If potentially contaminated soil is encountered during construction activities, soil should be segregated from "clean" soil and temporarily stockpiled on-site. Additionally, if excavated soil results in PID readings >100 ppm, the soil should be segregated from other excavated soil until further analysis can be performed to determine final disposition.

Soil that is placed in a temporary stockpile must be well maintained at all times. All stockpiled soil must be placed on impermeable plastic sheeting (minimum of 6-mil thickness) with a berm around the stockpile. The plastic sheeting and berm will prevent runoff of soil and potential contaminants to surrounding areas. The berms can be constructed with haybales, lumber, or other equivalent methods. The bottom plastic sheeting should be wrapped over the berm and the stockpiled soil should be covered with plastic sheeting to prevent exposure to precipitation and wind. The plastic sheeting that covers the soil stockpile should be secured using sandbags or equivalent. Daily inspections should be performed to observe and document the stockpile is secured and protected from inclement weather.

5.3 Composite Soil Sampling

Analysis of segregated soil shall be conducted in compliance with NMED Solid Waste Bureau (SWB) regulations as follows: One representative soil sample shall be collected per 100 cubic yards of potentially impacted soil material excavated. Upon collection, all representative samples shall be submitted to the contract laboratory, Hall Environmental Analysis Laboratory (HEAL), for analysis of the following:

- Metals antimony, arsenic, chromium, iron, lead, manganese, and thallium via United States Environmental Protection Agency (EPA) Method 6010/6020/7040;
- Metals antimony, arsenic, chromium, iron, lead, manganese, and thallium using the Toxicity Characteristic Leaching Procedure (TCLP) via EPA Method 1311/6010/7470;
- VOCs and methyl tertiary butyl ether (MTBE) via EPA Method 8260B;
- TPH gasoline range organics (TPH-GRO), TPH-DRO, and TPH-MRO via EPA Method 8015 modified;
- PAHs via EPA Method 8310; and,
- EDB via EPA Method 504.1.

Analytical results obtained from these samples will be further evaluated against applicable NMED SSLs and EPA regional screening levels (RSLs) to establish the presence or absence of contamination or specialty waste. Soil sample results for lead will also be compared to the Site-specific soil lead residential level of 550 mg/Kg (these are for soil samples collected for the purposes of confirmation of soil removal and are not to be used for purposes of a disposal profile). A copy of the NMED approval letter of the Site-specific soil lead residential level is included in **Appendix B.**

If the presence of impacted soil is confirmed, the COA will remove the soil from the Site for disposal at an approved facility. The COA has identified both the COA Cerro Colorado Landfill in Albuquerque and the Waste Management Landfill Facility in Valencia County as local facilities currently approved to accept impacted soil. Once a disposal facility is selected based on volume of impacted soil and corresponding analytical concentrations, the impacted soil will be transported from the Site.

5.4 Solid Waste

It is not anticipated that buried solid waste or debris will be encountered at the Site during construction activities; however, should it be encountered, this material should be observed for the presence of contaminated material and segregated from excavated soil as practicable. Asbestos containing Transite pipe was historically identified in the southern portion of the Site, just south of the Babbitt Shop (**Figure 2**). During all excavation activities, but especially in the area to the south of the Babbitt Shop, be cautious that encountering buried Transite pipe is possible. If any buried piping is encountered, it should be handled with care to prevent as much damage as possible and segregated from excavated soil. The COA will then evaluate the removed piping for the presence of asbestos, either by sampling or visual observation, and then coordinate for appropriate disposal. Please see **Appendix A** that includes example photographs of Transite pipe.

Visual inspection of any excavated material will be completed by the COA and/or their subcontracted environmental professionals and will include an assessment for such items as treated wood, potential asbestos-containing material (e.g. pipe, roofing, flooring, insulation, etc.), or other similar materials that have the potential to contain hazardous substances. Visual inspections will be recorded on daily work logs or in a logbook and all excavation activities will be documented with photographs.

Any hazardous materials encountered during excavation will require special handling. If any suspicious hazardous materials are identified, the COA will be notified and they will be segregated for further inspection and sampling. Sampling will be based on the material characteristics and professional judgement. Pending analytical results, all suspect material should be placed on plastic and covered. Smaller materials can be placed in plastic bags.

5.5 Loading and Hauling

Soil that has been characterized and requires off-site disposal can be loaded directly into truck for transport to the appropriate disposal facility once the appropriate testing and profiling has been completed. The COA and/or the subcontractor must exercise care during the loading of impacted soil to help minimize spillage and dust and will load trucks only to their rated capacity or regulatory limits. All trucks leaving the Site will be free of loose soil on the exterior of the trucks and the trucks beds with loaded soil will be covered. Impacted soil loaded into trucks will be covered during transportation to the disposal facility. The COA and/or the subcontractor must use care not to track soil onto public roads and must construct a gravel egress from the Site for trucks to drive over as necessary. Street sweepers or wheel wash stations may be deemed necessary and should be utilized as conditions warrant. Trucks should not be allowed to leave the Site if liquids are draining from the load. The COA and/or the subcontractor is also responsible for providing all labor and materials necessary to remedy situations involving spills or accidents involving vehicles in transit.

6.0 UNFORESEEN CONDITIONS

In the event that undocumented contamination or other potentially hazardous conditions are encountered that are not addressed in this SMP, the COA and/or the subcontractor shall cease work and notify the COA and the COA should notify NMED. The subcontractor should barricade or isolate the area of question and wait until the COA and NMED have determined the appropriate course of action to assess any unforeseen potentially hazardous condition.

7.0 REFERENCES

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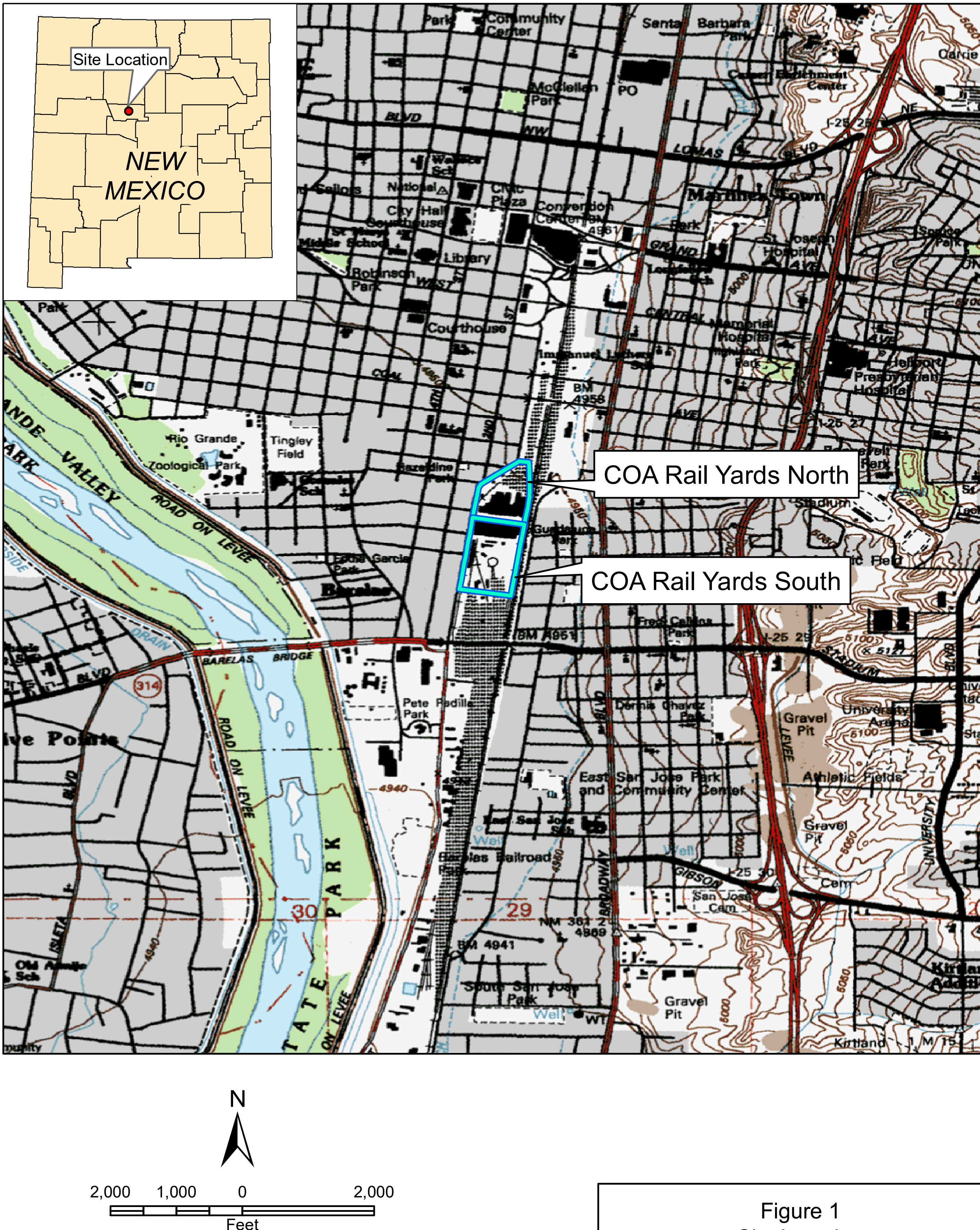
FIGURES



Source(s): USGS, Albuquerque West Quadrangle, 1996

Figure 1
Site Location
Soil Management Plan
Albuquerque Rail Yards,
Albuquerque, New Mexico

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Active Monitoring Well

Destroyed/Damaged Monitoring Well

Site Feature

Demolished

Property Boundary

N

160 80 0 160

Feet

Note:
RAILMW01 is damaged and currently being evaluated for possible repair.

INTERA

Source(s): Aerial – BERNCO GIS website, dated 2018.

Figure 2
Site Plan
Soil Management Plan
Albuquerque Rail Yards,
Albuquerque, New Mexico

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Active Monitoring Well

Destroyed/Damaged Monitoring Well

Site Feature

Demolished

Property Boundary

Proposed Utility Trench

N

160 80 0 160

Feet

Note:
RAILMW01 is damaged and currently being evaluated for possible repair.

INTERA

Source(s): Aerial – BERNCO GIS website, dated 2018.

Figure 3
Proposed Utility Trench
Soil Management Plan
Albuquerque Rail Yards,
Albuquerque, New Mexico

Document Path: S:\ABQ\COALB.C008.RYVP\Graphics\MapDocs\2020_SMP\03_SMP_utilitytrench.mxd 7/7/2020

Legend

SSL Exceedance
- Soil Boring
- Surface Soil
- Test Pit

- Removed Soil Area, 2019
- Site Feature
- Demolished
- Property Boundary

N

160 80 0 160

Feet

Note: Some sample depths include a portion greater than 10 ft bgs (i.e., sample interval = 8 - 12 ft bgs).
SSL: Soil Screening Levels (NMED, 2019)

INTERA

Figure 4a
Residential SSL Exceedances (0-10 ft bgs), TPH DRO+MRO
Soil Management Plan,
Albuquerque Rail Yards,
Albuquerque, New Mexico

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Legend

SSL Exceedance
- Soil Boring
- Surface Soil
- Confirmation Sample

- Removed Soil Area, 2019
- Site Feature
- Demolished
- Property Boundary

N

160 80 0 160

Feet

Notes:
Some sample depths include a portion greater than 10 ft bgs (i.e., sample interval = 8 - 12 ft bgs).
SSL: Soil Screening Levels (NMED, 2019).
Lead is compared to its Site Specific SSL of 550 ppm.
Antimony, Arsenic, and Thallium are compared to their respective SSLs.

INTERA

Figure 4b
Residential and Site Specific Exceedances (0-10 ft bgs) for Antimony, Arsenic, Lead and/or Thallium
Soil Management Plan,
Albuquerque Rail Yards,
Albuquerque, New Mexico

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Legend

SSL Exceedance
- Soil Boring
- Surface Soil

- Removed Soil Area, 2019
- Site Feature
- Demolished
- Property Boundary

N

160 80 0 160

Feet

Notes:
Some sample depths include a portion greater than 10 ft bgs (i.e., sample interval = 8 - 12 ft bgs).
SSL: Soil Screening Levels (NMED, 2019).
VOCs: Volatile organic compounds
VOC exceedances include: Benzo (a) anthracene, benzo (a) pyrene, benzo (b) fluoranthene, dibenzo (a, h) anthracene , and/or indeno (123, cd) pyrene.

INTERA

Figure 4c
Residential SSL Exceedances
(0-10 ft bgs), VOCs
Soil Management Plan,
Albuquerque Rail Yards,
Albuquerque, New Mexico

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Figure 5a
Naphthalene Soil Gas and Sub-Slab
Soil Vapor Residential VISL Exceedance, 2016
Soil Management Plan,
Albuquerque Rail Yards,
Albuquerque, New Mexico

INTERA

Note: Some sample depths include a portion greater than 10 ft bgs (i.e., sample interval = 8 - 12 ft bgs).
VISL: Vapor Instrusion Screening Levels (NMED, 2019)

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Legend

Detect Below VISL
Sub-slab Soil Vapor Sample

Non-Detect
Sub-slab Soil Vapor Sample

Site Feature
Demolished
Property Boundary

N

160 80 0 160
Feet

Note: Some sample depths include a portion greater than 10 ft bgs
(i.e., sample interval = 8 - 12 ft bgs).
VISL: Vapor Instrusion Screening Levels (NMED, 2019)

INTERA

Figure 5b
Naphthalene Soil Gas and Sub-Slab
Soil Vapor Residential VISL Exceedance, 2018
Soil Management Plan,
Albuquerque Rail Yards,
Albuquerque, New Mexico

FILE: S:\ABQ\COALB.C008.RYVP\Graphics\MapDocs\2020_SMP\05b_SMP_ResVISLNaph2018.mxd 7/7/2020

Legend

Non-Detect

- Soil Gas Sample
- Sub-slab Soil Vapor Sample

- Site Feature
- Demolished
- Property Boundary

N

160 80 0 160

Feet

Figure 5c
Trichloroethene Soil Gas and Sub-Slab
Soil Vapor Residential VISL Exceedance, 2016
Soil Management Plan,
Albuquerque Rail Yards,
Albuquerque, New Mexico

Note: Some sample depths include a portion greater than 10 ft bgs
(i.e., sample interval = 8 - 12 ft bgs).
VISL: Vapor Instrusion Screening Levels (NMED, 2019)

INTERA

FILE: S:\ABQ\COALB.C008.RYVP\Graphics\MapDocs\2020_SMP\05c_SMP_ResVISLTrichloroethene2016.mxd 7/7/2020

Legend

Detect Above VISL
Sub-slab Soil Vapor Sample

Detect Below VISL
Sub-slab Soil Vapor Sample

Non-Detect
Sub-slab Soil Vapor Sample

Site Feature
Demolished
Property Boundary

N

160 80 0 160
Feet

Note: Some sample depths include a portion greater than 10 ft bgs
(i.e., sample interval = 8 - 12 ft bgs).
VISL: Vapor Instrusion Screening Levels (NMED, 2019)

INTERA

Figure 5d
Trichloroethene Soil Gas and Sub-Slab
Soil Vapor Residential VISL Exceedance, 2018
Soil Management Plan,
Albuquerque Rail Yards,
Albuquerque, New Mexico

FILE: S:\ABQ\COALB.C008.RYVP\Graphics\MapDocs\2020_SMP\05d_SMP_ResVISLTrichloroethene2018.mxd 7/7/2020

Active Monitoring Well

Destroyed/Damaged Monitoring Well

Site Feature

Demolished

Property Boundary

N

160 80 0 160

Feet

B= Benzene
EDB = 1,2-dibromoethane
Σ Naph = Naphthalene + 1,Methylnaphthalene + 2, Methylnaphthalene

Well ID
Analyte: Results in µg/L (micrograms per liter), ***Red/Bold/Italic*** indicates value or laboratory reporting limit in excess of the NMWQCC Standards.

Note:
All results from April 2020 sampling event except RAILMW01 which is damaged and currently being evaluated for possible repair.

Figure 6
Distribution of Dissolved-Phase Contaminants, April 2020
Soil Management Plan
Albuquerque Rail Yards,
Albuquerque, New Mexico

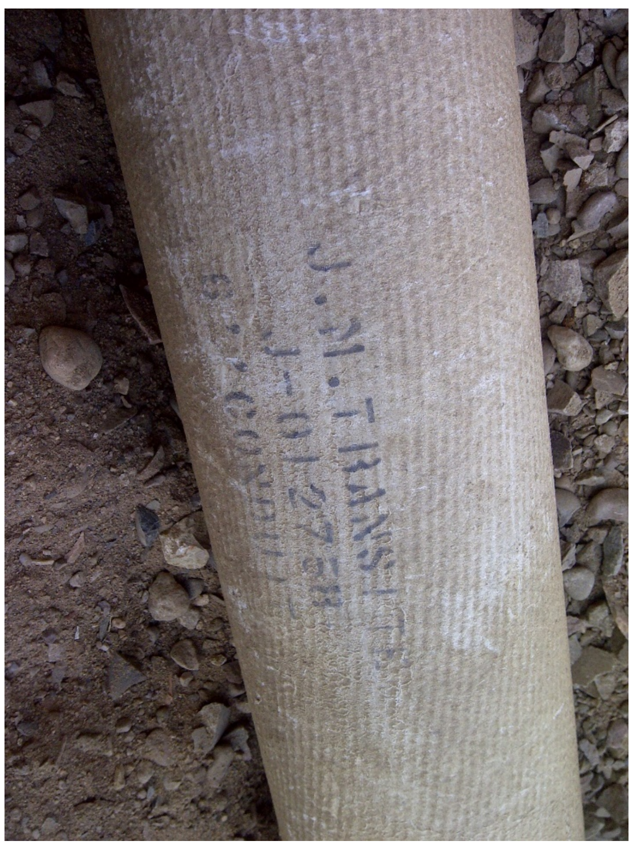
INTERA

Source(s): Aerial – BERNCO GIS website, dated 2018.

Document Path: S:\ABQ\COALB.C008.RYVP\Graphics\MapDocs\2020_SMP\06_SMP_GWresults.mxd 7/7/2020

APPENDIX A

No. 1 – Example of transite pipe.
Source: https://inspectapedia.com/hazmat/Asbestos_Water_Pipes.php



No. 2 – Example of transite pipe.
Source: https://azenvsp.com/asbestos-test/sample-pictures-asbestos/

APPENDIX B

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 St. Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469
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Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

May 6, 2020

Ms. Carina Munoz-Dyer
Acting Environmental Health Manager
City of Albuquerque
1 Civic Plaza NW
Albuquerque, NM 87102

RE: Approval of IEUBK Model Outputs the for the Albuquerque Rail Yards Site in Albuquerque, New Mexico, VRP Site No. 53161007

Dear Ms. Munoz-Dyer:

The New Mexico Environment Department (NMED) received the revised Integrated Exposure Uptake Biokinetic (IEUBK) Model Outputs on December 5, 2019 prepared by the City of Albuquerque Environmental Health Department for the above referenced site.

The NMED Risk Assessment Guidance for Investigations and Remediation, Volume 1, February 2019, Rev. 2 (June 19, 2019) allows for the Alternative Evaluation for Lead in soils using the IEUBK Model in Section 2.3.3. The IEUBK Model relates measured lead concentrations in environmental media with an estimated blood-lead level for assessing risks to residential receptors.

NMED hereby approves the site-specific soil lead residential level of 550 parts per million (ppm) for the Albuquerque Rail Yards based on the results from the bioavailability sampling and modeling.

If you have any further questions, please contact Savannah Richards, VRP Project Manager for this site, at (505) 827- 3253 or savannah.richards@state.nm.us, or Rebecca Cook, Voluntary Remediation Program and Brownfields Team Leader, at (505) 827-7101.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

cc: Rebecca Cook, VRP/Brownfields Team Leader
Ken R. Ziegler, Senior Environmental Health Scientist, City of Albuquerque, krziegler@cabq.gov
ROS Reading File

APPENDIX C

Measurement Specifications for Field Portable X-Ray Fluorescence Spectrometry for Lead at the Albuquerque Railyards

Based on EPA Method 6200 Revision 0 February 2007

Sample Preparation

In situ samples

In situ sampling is only to be used for quick assessments and must be confirmed with bagged sample. Results from in situ sampling must be clearly marked so they can be separated for reporting.

Sample area should be compacted, dry or only slightly moist and not wet, and smoothed with a trowel or metal tool.

Bagged Samples

Bagged samples are the preferred method.

- Collection

Sample shall be collected in a volume of approximately a 4” by 4” area 1” deep. __________________

Record location, color, description and estimated moisture content. Sample to be soil and not debris.

- Sample treatment

Wet samples, greater than 20% moisture, must be dried (only ambient or toaster oven NOT microwave).

Samples shall be sieved through a #60 sieve. ___________________

If 90% of sample cannot be sieved, the sample must be ground or noted in record.

- Bagging

Sample to be placed in new zip lock bag and mixed so that sample is as uniform as possible. Intent is to get mixture of sample grain sizes mixed and not segregated.

Bag should be full so that it is greater than 0.5” thick for X-ray.

Label bag with sample ID, approximate depth, and grid location.

Splitting Sample for Laboratory Analysis

Sample for laboratory analysis will be taken from ziplock bag used for XRF testing.

Samples must not be dried using microwave oven as this has caused differences in XRF and laboratory results.

XRF Setup and Testing

XRF Initialization

Follow XRF INNOV-X Systems Alpha Series X-Ray Fluorescence Spectrometer August 2005 Version 2.1 Instruction Manual.

Turn on XRF at least 15 to 30 minutes prior to first sample. Record all power on and power off times in log book.

XRF will run energy calibration on startup.

XRF to be used on clean table with no dirt or materials nearby.

Additional Measurements to be Taken

- Instrument Blank

Instrument blank must be run 1 per day, but also throughout day to check on contamination or possible reading shifts. Temperature changes greater than 10 degree F can cause signal drift.

May be run 1 per 20 samples as check on readings.

Trouble shoot if not 0 and clean.

Record instrument blanks in log book and on Quick Guide sheet.

- Calibration Verification (NIST Standard)

Calibration check is to be run at beginning, middle, and end of day. NMED uses every 4 hour frequency.

Reading must be within 20% of standard.

Record in log book and Quick Guide sheet.

- Duplicate, Precision Check

1 duplicate a day, but it consists of 1 sample tested 7 times. Testing does not need to be done back to back, but can be done throughout the day.

Record and check if precision is adequate. Use Quick Guide sheet as well.

Measurements

- Time of Reading

Measurements should be 120 seconds unless duplicates show similar results at shorter times.________

In situ measurements can be shorter as these results will be reported separately.

- Sample and XRF placement

Sample should fill bag consistently. Sample thickness must be greater than 0.5" under the XRF. Sample should be flat against XRF as best reading will be from a uniform contact between sample and XRF.

Area under sample should be clean.

Record time, technician, temperature, reading, soil description, approximate depth, grid location, and other relevant information.

Quick Guide

Frequency or Timing	What	Requirement
15 to 30 minutes before 1st Sample,	Turn XRF on	Red light turns on and is solid
1/day	Energy Calibration of XRF	Performed by XRF when turned on
1/day or 20 samples or concerned temperature change has been great	Instrument Blank Test Blank	Must read 0 or clean everything and restart XRF
Beginning, middle and end of day	Calibration Verification Test Standard	Test standard and must ready within 20% of sample
None	Gain Check	XRF doesn't require it but can explain reading shifts such as calibration or blank readings
1/day	Duplicate, run 1 sample 7 times	Doesn't have to be run back to back, but as time allows during day, must meet requirement shown below

Tracking Sample Checks

XRF On Time _______________ First Sample 15 to 30 minutes later Time ____________

*Note in log book all times XRF turned off and on _________/___________ , _________/___________ ,

_________/___________ ,_________/___________ , _________/___________ , _________/___________

Instrument Blank Time ________________ Result ________________

Calibration Verification Start of Day Time ___________ Result _____________ Is within 20% _________

Middle of Day Time ___________ Result _____________ Is within 20% _________

End of Day Time ___________ Result _____________ Is within 20% _________

Duplicate Check

Sample ID ________________ Date _______________

Reading 1 ____________ Time ______________ Reading 2 ____________ Time ______________

Reading 3 ____________ Time ______________ Reading 4 ____________ Time ______________

Reading 5 ____________ Time ______________ Reading 6 ____________ Time ______________

Reading 7 ____________ Time ______________

Standard Deviation ______________ Mean Reading _____________

RSD = 100 x (Standard Deviation / Mean Reading) = ____________________ must be 20% or less