DRAFT

LOADING, TRANSPORTATION, AND OFF-SITE DISPOSAL PLAN

WEST LAKE LANDFILL SUPERFUND SITE OPERABLE UNIT 1

Prepared For:

The United States Environmental Protection Agency Region VII

Prepared on Behalf of:

The West Lake Landfill OU-1 Respondents

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DRAFT - MAY 2020

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CERTIFICATION STATEMENT

LOADING, TRANSPORTATION, AND DISPOSAL PLAN
OPERABLE UNIT 1
WEST LAKE LANDFILL SUPERFUND SITE

I, Raymond D'Hollander, certify that I am currently a Missouri State registered professional engineer and that this Loading, Transportation, and Off-Site Disposal Plan was prepared under my direction and supervision in accordance with generally accepted practice. This document was prepared to fulfill the requirements of the Third Amendment to Administrative Settlement Agreement and Consent Order for the West Lake Landfill Superfund Site OU-1.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ _____

Raymond D. D'Hollander, P.E. Date

Missouri Professional Engineer

License No. PE-2019010891

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LIST OF ACRONYMS

ACRONYM	Definition
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirements
ASAOC	Administrative Settlement Agreement and Order of Consent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
Ci	curie
CQAP	Construction Quality Assurance Plan
CQC	Contractor Quality Control
CQCP	Construction Quality Control Plan
DIWP	Design Investigation Work Plan
DOT	U.S. Department of Transportation
ERP	Emergency Response Plan
FFS	Final Feasibility Study
FMCSR	Federal Motor Carrier Safety Regulations
FS	Feasibility Study
FSP	Field Sampling Plan
HASP	Health and Safety Plan
IMP	Incident Management Plan
LandGEM	Landfill Gas Emissions Model
LBSR	leached barium-sulfate residues
LDR	land disposal restriction
LLRW	low-level radioactive waste
LLW	low-level waste
LSA	Low-Specific Activity
LTODP	Loading, Transportation and Disposal Plan
MDNR	Missouri Department of Natural Resources
MLLRW	mixed low-level radioactive waste
MLLW	mixed low-level waste
MSD	Metropolitan St. Louis Sewer District
MSW	Municipal Solid Waste
NCC	Non-Combustible Cover
NORM	Naturally Occurring Radioactive Material
NPL	National Priorities List
NRC	Nuclear Regulatory Agency
OU	Operable Unit
pCi/g	picoCurie/gram
PSHEP	Project Safety, Health, and Environment Plan
QAPP	Quality Assurance Project Plan
Ra	radium
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDWP	Remedial Design Work Plan
RI	Remedial Investigation
RIM	Radiologically Impacted Material
RML	Radioactive Materials License
ROD	Record of Decision
RODA	Record of Decision Amendment
RSMo	Revised Statutes of Missouri
SH&E	Safety, Health and Environment
SOW	Statement of Work
SPCC	Spill Prevention, Control and Countermeasures
TAC	Texas Administrative Code
TENORM	Technically Enhanced NORM
Th	thorium
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage and Disposal Facility
U	uranium
USAEC	U.S. Atomic Energy Commission
USDOE	U.S. Department of Energy
USEPA	U.S. Environmental Protection Agency
USNRC	U.S. Nuclear Regulatory Commission
WAC	Waste Acceptance Criteria
WCS	Waste Control Specialists

1.0 INTRODUCTION

This Loading, Transportation, and Off-Site Disposal Plan (LTODP) has been prepared on behalf of West Lake Landfill OU-1 Respondents Bridgeton Landfill, LLC, Cotter Corporation (N.S.L), and the U.S. Department of Energy (Respondents). The Site is the West Lake Landfill Superfund Site, U.S. Environmental Protection Agency (USEPA) Superfund Site ID # MOD079900932 (Site). A Record of Decision Amendment (RODA) for Operable Unit 1 (OU-1) of the Site was issued on September 27, 2018 (USEPA 2018). The Respondents entered into a Third Amendment to the Administrative Settlement Agreement and Order on Consent (ASAOC) with USEPA (Docket No. VII-93-F-0005) to perform the design of the Amended Remedy selected in the RODA for OU-1 on May 6, 2019 (USEPA 2019a). USEPA is the lead agency for the Site and Missouri Department of Natural Resources (MDNR) is the support agency. This plan addresses the requirements of the ASAOC Statement of Work Section 5.7(i).

1.1 Site Location

The Site is located within the western portion of the St. Louis metropolitan area, east of the Missouri River in northwestern St. Louis County, with a physical address of 13570 St. Charles Rock Road, Bridgeton, Missouri, as indicated on **Figures 1** and **2**. The Site consists of an approximately 200-acre parcel of land that includes six inactive waste disposal areas, or units, as indicated in **Figure 3**. The six units include Radiological Area 1 (Area 1), Radiological Area 2 (Area 2), a closed demolition landfill, an inactive sanitary landfill, the North Quarry, and the South Quarry. The North Quarry and the South Quarry are part of the permitted Bridgeton Landfill, and are former active sanitary landfills. These six identified units were used for solid and industrial waste disposal at the Site from approximately the 1950s through 2004.

The Site is composed of three operating units (OUs). OU-1 contains the radiologically contaminated areas and comprises Area 1, Area 2, the Buffer Zone (a 1.78-acre parcel of land adjacent to Area 2), and Lot 2A2 of the Crossroads Industrial Park. OU-2 contains areas not identified as containing radiological contamination and comprises the closed demolition landfill, the inactive sanitary landfill, the North Quarry and the South Quarry. OU-3 covers the sitewide groundwater. This LTODP addresses OU-1 only.

1.2 Site History

The Site previously received radiologically contaminated materials from the processing of uranium (U) ore for the Manhattan Engineering District and the U.S. Atomic Energy Commission (USAEC), in addition to receiving municipal, demolition, and other waste. Parts of the Site were radiologically contaminated when soil mixed with leached barium-sulfate residues (LBSR) was brought to the landfill and reportedly used as cover for landfilling operations at the Site in 1973. The U.S. Nuclear Regulatory Commission (USNRC), as successor to the USAEC, commissioned a radiological study that ultimately confirmed the presence of two distinct radiological areas at the Site. The USEPA added the Site to the National Priorities List (NPL) in 1990.

On March 3, 1993, the USEPA and the respondents at that time (Laidlaw Waste Systems (Bridgeton), Inc.; Rock Road Industries, Inc.; Cotter Corporation (N.S.L.); and the U.S. Department of Energy (USDOE)) entered into an Administrative Order on Consent (AOC) for performance of a Remedial Investigation/Feasibility Study (RI/FS) for OU-1. Between 1994 and 2006, the OU-1 Respondents performed multiple investigations at the Site, including the collection and analysis of waste and soil samples and the monitoring of surface water, sediments, groundwater, and air quality. The results of these evaluations were summarized in the Remedial Investigation

(EMSI 2000), Baseline Risk Assessment (Auxier 2000), and Feasibility Study (EMSI 2006) reports. Based on these reports, the USEPA issued a proposed plan for OU-1 in June 2006 (USEPA 2006).

In the 2008 Record of Decision (ROD), the USEPA selected a capping remedy for OU-1. As a result of agency and community concerns following the 2008 ROD, the USEPA determined that further evaluation of remedial alternatives was warranted. Other actions have been taken at OU-1 the Site since 2008, which include:

- Preparation of a Supplemental Feasibility Study (EMSI et al. 2011).
- Installation of a non-combustible cover (NCC) over portions of Area 1 and Area 2.
- Development and implementation of an Incident Management Plan (IMP).
- Air monitoring on site and around the perimeter of the Site.
- An investigation of the extent of radiologically impacted material (RIM) in Area 1 (Feezor Engineering 2014 and EMSI et al. 2016).
- An Isolation Barrier Alternatives Analysis (EMSI et al. 2014).
- Additional characterization of Area 1 and Area 2 and preparation of a Remedial Investigation Addendum (EMSI 2018a).
- An updated Baseline Risk Assessment (Auxier 2018).
- A Final Feasibility Study (FFS) (EMSI et al. 2018b) for OU-1.

In September 2018, USEPA amended the remedy for OU-1 in the RODA (USEPA 2018). The selected amended remedy identified in the RODA primarily includes partial excavation and off-site disposal of RIM followed by the installation of a final cover system. The objectives of the amended OU-1 remedy are preventing direct contact or radiation exposure from the contaminated media at the site including the protection of groundwater by limiting infiltration and leaching of contaminants.

2.0 OBJECTIVE AND SCOPE

This LTODP has been developed in accordance with Section 5.7(i) of the Remedial Design Statement of Work (SOW) for Operable Unit 1, West Lake Landfill Superfund Site (USEPA 2019b), and includes plans to ensure compliance with the off-site shipment requirements detailed in Section 3.11 of the SOW and Section 3.4 of the Remedial Design Work Plan (Parsons et al. 2019). Proof that the requirements set forth herein are met will be provided during the RA. The selection of a transportation and disposal subcontractor will be subject to USEPA acceptance.

It is anticipated that final adjustments to this plan may be made in consultation with the RA contractor after the contractor has been selected. Final adjustments will require approval from USEPA, the Respondents, and the Project Engineer.

2.1 Clean-up Standards

The RODA generally requires partial excavation and removal of RIM from the Site, as described below. USEPA has defined RIM at the Site as any material containing combined radium (Ra)-226 plus Ra-228 or combined thorium (Th)-230 plus Th-232 at levels greater than 7.9 pCi/g, or U-238 plus U-235 plus U-234 at levels greater than 54.5 pCi/g.

The RODA defines a requirement for the total radioactivity to be removed in the Selected Remedy to be equivalent to the total radioactivity represented by the combined Ra and Th greater than 52.9 pCi/g down to 16 feet below 2005 ground surface (B2005GS). The RODA Selected Remedy generally requires removal of RIM greater than 52.9 pCi/g to a depth of 12 feet B2005GS, and will include removal of some RIM between 12 and 20 feet B2005GS, as well as allow for isolated pockets of RIM greater than 52.9 pCi/g between 8 feet and 12 feet B2005GS to remain in place.

Removal of RIM greater than 52.9 pCi/g to 12 feet B2005GS would result in the removal of less radioactivity than a similar excavation to 16 feet B2005GS, which is described in Alternative 4 of the RODA. Therefore, the remedial design (RD) excavation design must include additional removal below the 12-foot depth in order to achieve a total radioactivity removal equivalent to Alternative 4 in the RODA. The RODA proposes that this additional radioactivity will be removed by targeting localized deposits of higher radioactivity materials in the 12- to 20-foot zone, particularly materials with radioactivity greater than 1,000 pCi/g. The RD will consider practical aspects to define the excavation boundaries, including performing deeper excavations in areas where overlying materials are already planned for removal, and leaving local isolated RIM in place where extensive additional overburden excavation would be required.

The current calculated estimate of the total activity in RIM delineated to be greater than 52.9 pCi/g in the 0 to 16 feet B2005GS zone is 233 Curie (Ci) in Areas 1 and 2. There is an additional 33 Ci in the 16 to 20 feet B2005GS zone which can be used to offset RIM greater than 52.9 pCi/g that may not be excavated in the 8 to 16 feet B2005GS zone.

The currently computed RIM activities, as presented in the Preliminary Excavation Plan Updated Draft (Parsons et al. 2020a) and discussed in Appendix A.1 of the Draft Preliminary 30% Design (Parsons et al. 2020), are summarized by area in **Table 2-1** below. This table provides the total computed activity of the 0-16 feet B2005GS zone as well as individual layers of 0 to 8, 8 to 12, 12 to 16, and 16 to 20 feet B2005GS to address the decision-making criteria discussed above.

TABLE 2-1 COMPUTED ACTIVITY IN RIM GREATER THAN 52.9 pCi/g AT STATED DEPTH INTERVALS

Zone	Depth Intervals (feet B2005GS)	Area 1 (Ci)	Area 2 (Ci)	Total Area 1 and 2 (Ci)
A	**0 - 16**	**42.1**	**190.4**	**233**
B	0 - 8	16.6	147.1	164
C	8 - 12	12.1	33.1	45
D	12 - 16	13.4	10.2	24
E	16 - 20	2.2	30.4	33

The Amended Remedy selected in the RODA for OU-1 areas adjacent to Area 2, the Buffer Zone and Lot 2A2 of the Crossroads Industrial Park, is to excavate radiologically-impacted soils to sufficiently reduce concentrations of radionuclides to background levels. Radiologically-impacted soils will be transported back to Area 1 or 2 and incorporated into these areas as part of the implementation of the remedy. RIM characterization and a background study will be performed during the design investigation and incorporated into the Final Design.

2.2 Regulatory Compliance Drivers

The codes, standards, laws, and regulations listed below establish the minimum requirements for waste management, transportation, and disposal.

- 29 CFR, Part 1910, Occupational Safety and Health Standards.
- 40 CFR, Chapter 1 – Environmental Protection Agency – Part 192 – Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings.
- 40 CFR, Chapter 1 – Environmental Protection Agency – Parts 260-299 – Resource Conservation and Recovery Act (RCRA). Establishes the standards for hazardous and mixed low-level waste (MLLW) identification, treatment, storage, and disposal of solid and hazardous waste generated by the project OU-1 Remedial Action (RA).
- 40 CFR, Chapter 1 – Environmental Protection Agency – Part 761 – Toxic Substances Control Act (TSCA). Establishes requirements for identifying, storing, transporting, and treating TSCA and TSCA low-level waste (LLW).
- 40 CFR, Chapter 1 – Environmental Protection Agency – Part 330.440 Procedures for Planning and Implementing Off-Site Response Actions.
- 49 CFR, Subchapter C – Hazardous Material Regulations – Parts 40, 100-185, 325, and 355-399.
- 19 CSR 20-10 – Department of Health and Senior Services – Division of Environmental Health and Epidemiology – Chapter 10 – Protection Against Ionizing Radiation.
- 10 CSR 25 – Department of Natural Resources – Hazardous Waste Management Commission.
- 10 CSR 80 – Department of Natural Resources – Solid Waste Management – Chapter 4 – Demolition Landfill.

All waste transportation and disposal will be completed in compliance with the above.

3.0 WASTE GENERATION PLANNING AND CONTROL

3.1 Pollution Prevention/Waste Minimization

RAs will operate in a manner to conserve materials and resources to the greatest extent possible. Consideration will be given to operating rates as well as selection and use of any necessary reagents and consumables to minimize environmental impact.

3.2 Leak and Spill Protection and Prevention

Spill response procedures, the USEPA Spill Line, and the MDNR Spill Line are detailed in the Emergency Response Plan (ERP) for the Site (Parsons et al. 2020b).

There are no containers known to be in use within the boundaries of OU-1 with oil storage capacity of 55 gallons or greater. However, an underground former diesel tank with more than 55 gallons of oil storage capacity is believed to be permanently closed and buried within the boundaries of OU-1 in Area 1. In accordance with Title 40 of the Code of Federal Regulations (CFR) 112.19(d)(2)(i) and (5), the requirements of 40 CFR Part 112 are not applicable to OU-1, and a Spill Prevention, Control, and Countermeasures (SPCC) Plan is not required for OU-1.

If oil storage for fuel and lubricants is needed during the performance of RD/RA activities, the ERP (Parsons et al. 2020b) may be revised as necessary to incorporate the required SPCC Plan.

3.3 Potential Spill Sources

Loading and transport of waste materials is detailed in **Section 6** of this plan. Day-to-day site activities that present the potential for spills are detailed below.

3.3.1 Vehicle Storage and Equipment Maintenance

To complete the scope of work outlined in the RDWP, a variety of vehicles and equipment will be used on the Site. During the use and maintenance of on-site vehicles and equipment there is a risk of leaks and spills of motor oil, hydraulic fluids, coolants, and other lubricants. All equipment and vehicles will be stored in a designated area on site. A regular inspection program for equipment will be implemented. Dry cleanup materials such as absorbent materials and drip pads will be kept on site and readily accessible for any spills and leaks.

3.3.2 Fuel Transfer Operations

During the fueling of equipment and vehicles there is a potential for spillage of petroleum products. The following precautions will be taken during all fuel transfer activities.

- All fuel will be carried in suitable containers of the appropriate color and marked with the contents.

- Spill kits and dry powder fire extinguishers will be available in all vehicles.
- Checks will be performed to ensure that there are no leakages, that fuel caps fit correctly, and that the seal is fitted.
- Equipment refueling will use a Type I or Type II safety can as well as a funnel as applicable.
- Fueling will be performed in designated areas.

Any spills or leaks during fuel transfer operations will be contained and cleaned up immediately.

4.0 PROJECT WASTE STREAM

4.1 Radiologically Impacted Material

As discussed in the *Remedial Investigation Addendum* (EMSI 2018a), radionuclides are present in both Areas 1 and 2 of OU-1 at levels above background and are present within a matrix of soil and solid waste materials. These materials, when above the threshold activity level, are defined as radiologically impacted material (RIM). The potential sources of the radionuclides include an estimated 8,700 tons of leached barium sulfate residue mixed with approximately 39,000 tons of surface soils.

The RIM in Areas 1 and 2 appears to be mixed with decomposed municipal solid waste (MSW), debris, and fill materials such that a much larger volume of material is now affected. While no contemporaneous landfill records regarding RIM placement are known to exist, it is likely the RIM-containing materials were used as cover material for landfill operations. Such variable and discontinuous placement of the material, combined with landfill compaction operations and differential settlement over time, would explain why RIM and non-RIM material could be mixed in such a way that they cannot be visibly distinguished, and at the same time are intermixed with solid waste. The solid waste has been decomposing for nearly 50 years and is not expected to contain putrescible waste based upon an analysis of the Landfill Gas Emissions Model (LandGEM), included in Appendix A.2C of the Draft Preliminary 30% Design (Parsons et al. 2020).

A summary of preliminary RIM volumes targeted for excavation, as presented in the Updated PEP and Appendix A.1 of the Draft Preliminary 30% Design (Parsons et al. 2020), is summarized in **Table 4-1** below.

TABLE 4-1 SUMMARY OF PRELIMINARY RIM VOLUMES

Estimated Excavated Materials	Area 1 (cubic yards)	Area 2 (cubic yards)	Total Area 1 and 2 (cubic yards)
RIM > 52.9 pCi/g	10,800	71,800	82,600

These estimated volumes are preliminary, based on current existing site information and interpretation of the current geostatistical model, are neat volumes and do not include fluffing during excavation, processing, and loading into containers. The estimated volumes do not include typical minor over-excavation inherent in the excavation process. These volumes are subject to change based on incorporation of additional data into the geostatistical model in the future.

4.2 Radiological Contaminants of Concern

Within the RIM are radionuclides from the uranium, actinium, and thorium natural decay series. The radionuclides of interest for shipping and disposal within each decay series are as follows:

Uranium Series	Actinium Series	Thorium Series
U-238	U-235	Th-232
Th-234	Th-231	Ra-228
Pa-234	Pa-231	Ac-228
U-234	Ac-227	Th-228
Th-230	Th-227	Ra-224
Ra-226	Ra-223	Pb-212
Pb-214	Pb-211	Bi-212
Bi-214	Bi-211	Tl-208
Pb-210		

The lists of radionuclides above are those that should be evaluated for compliance with disposal site and state and federal Department of Transportation (DOT) requirements. The RODA (USEPA 2018) identified eight radionuclides (U-238, U-235, Th-232 and their associated daughter products, U-234, Th-230, Ra-226, lead-210, and protactium-231) as contaminants of concern. The shipping papers and waste manifests may include only a small subset of these radionuclides after evaluation of the actual container inventories.

4.3 Chemical and Hazardous Waste

For any waste that is shipped off site, an evaluation of the material will be performed to determine if it should be handled as hazardous waste. If RCRA hazardous waste is generated during excavation activities that will be disposed of off-site, it will be managed in accordance with RCRA Subtitle C requirements regarding:

- Identification of hazardous wastes (40 CFR Part 261).
- Packaging, temporary storage, off-site transportation of hazardous wastes (40 CFR Parts 262 and 263).
- Treatment and disposal of hazardous wastes (40 CFR Part 268).

Similarly, the requirements of the Missouri Hazardous Waste Management Law (260.350 – 260.430 Revised Statutes of Missouri (RSMo)) and associated regulations (10 CSR § 25-7) would apply if hazardous wastes are encountered and will be disposed of off-site.

In addition, any regulated asbestos-containing material encountered during the remediation that will be disposed of off-site will be managed and disposed of in compliance with 40 CFR § 61.154(j), 10 CSR § 10-6.241, and St. Louis County Ordinance 612.530, all of which pertain to excavating/disturbing asbestos.

4.4 Liquids

Liquids expected during the RA include leachate embedded within the excavation area waste and stormwater that contacts the excavation area ("contact water"). Samples of free liquid typical of contact water that may require removal from within the proposed excavation extent or areas where contact water is generated from exposed material will be evaluated and characterized during the design investigation. It is anticipated that these liquids will be managed in an on-site pretreatment plant. Preventative measures such as berms and covers will be used to minimize the amount of stormwater coming into contact with the excavation area. Stormwater that does not contact contaminated materials will not require treatment.

To the degree that either type of liquid must be removed from the excavation area or other areas for work to continue, the liquid will be collected and stored in containers (e.g., frac tanks) for processing. Treatment methods such as precipitation and filtration will be used as required to remove radionuclides to prepare the liquid for any necessary additional treatment. Once the liquid has been treated to the levels required for discharge, it will enter storage containers so that the allowable discharge rate can be achieved, if required. Depending on the selected treatment methods and the volume of liquids encountered, treatment may by conducted on either a continuous or batch basis. Potential discharge options include the Metropolitan St. Louis Sewer District (MSD), or surface discharge if treated to required levels. Residual solids, including sediment and precipitated solids, generated from the contact water treatment plant will be placed into Area 1 or Area 2 in the backfill below the final cover.

5.0 CHARACTERIZATION STRATEGY

5.1 General

Samples for disposal characterization are to be collected as part of the upcoming Design Investigation, expected to take place during the Summer of 2020 (conditions permitting), in accordance with the Design Investigation Work Plan (DIWP) and Field Sampling Plan. A subset of samples will be collected and analyzed for standard waste characterization parameters such as toxicity characteristic using the Toxicity Characteristic Leaching Procedure (TCLP), free liquids using the Paint Filter Liquids Test, and others, as well as specific radionuclides necessary to accurately characterize the waste, including waste to be disposed of off-site. Additionally, samples to be collected as part of the design investigation for other purposes (as detailed in the DIWP and Quality Assurance Project Plan [QAPP]) will be analyzed for specific radionuclides of interest. The data generated from this sampling may also be considered by waste disposal facilities for characterization purposes. Additional samples for waste to be disposed of off-site may be collected during the RA, as necessary to meet the needs of disposal facilities. Specifics related to such additional sampling efforts will be described in upcoming submittals.

It is currently anticipated that analyses will be performed by GEL Laboratories, which is fully accredited and certified to perform such analyses, as detailed in the QAPP. Samples collected strictly for waste characterization will not be validated, with a standard Level II data package and electronic data deliverable to be provided by the laboratory. Those samples being collected for other purposes, as discussed above and under separate cover, will be validated in accordance with the information provided in the QAPP.

Data collected as part of the above processes will then be used to develop the appropriate waste profiles, as discussed in **Section 5.3** below.

5.2 Profile Development

The waste profiles for waste to be disposed of off-site will be developed during the implementation of the remedial action by the OU-1 Remedial Action project waste specialist. The waste specialist will ensure the waste to be disposed of off-site is classified and characterized correctly through process knowledge and/or analytical data following the regulatory guidance in 40 CFR §262.11 and the requirements of the selected disposal facility or facilities Waste Acceptance Criteria (WAC). The OU-1 Remedial Action project waste specialist may be an employee of the selected waste disposal contractor.

The first step in the waste acceptance process is the completion of a profile. Waste profile(s) will be completed for each waste stream or appropriate combination of authorized waste streams that are sent off site for disposal. The designated disposal facility's waste profile forms and site-specific WAC will be used to prepare the waste profiles prior to submission to the designated disposal facility for approval.

The following information will be considered for the profile development of the waste.

- Radiological waste status
- Hazardous waste status
- Any processing needed before disposal
- Process that generated the waste
- Waste type
- Waste codes, both RCRA and state as applicable

- Waste description
- Physical and chemical description(s), including but not limited to:
  - Percent, averages and maximum of soil and/or debris
  - Density
  - pH
  - Chelating agents in the waste
  - Flash point
- Radionuclides (averages and maximum)
- Packaging

The completed waste profile and supporting documentation must allow the designated waste facility to demonstrate that the waste is compliant with regulatory requirements along with license and permit conditions. The completed profile form provides an overview of the waste stream and its physical, chemical and radiological characteristics. If there is uncertainty as to what data is needed to populate the profile or which method should be used to collect or report such data, the disposal facility will be consulted. Additional profiles and/or waste streams will be developed based on the data, as necessary.

6.0 WASTE TRANSPORTATION AND DISPOSAL

6.1 Disposal Facilities

The following describe the anticipated disposal facilities that can accept the West Lake Landfill OU-1 waste for disposal. Additional facilities may be identified in the future and will require approval from the regulators, the Respondents and the Project Engineer. Other sites, such as Energy Solutions' Clive Disposal Facility in Grantsville, Utah; Clean Harbor's Deer Trail, Colorado; and US Ecology Washington in Richland, Washington can also accept the waste, but disposal at these sites is complicated by factors that make a detailed discussion of their capabilities moot. For example, Energy Solutions requires that any shipment containing Ra-226 in soil or soil-like material in concentrations ≥1,000 pCi/g must be packaged in non-bulk containers (i.e., drums or boxes) unless written approval is obtained. Shipments to Deer Trail from outside the states of Nevada, Colorado, and New Mexico are subject to the rules of the Rocky Mountain Low-Level Radioactive Waste Compact Board, including their rules for import permits. Disposal at US Ecology Washington is cost prohibitive compared to US Ecology's other facilities. Because of these and other complicating matters, use of any of these other sites is not anticipated. Nonetheless, cost proposals from these and any additional facilities that are identified in the future may be sought as the waste management activity approaches. The use of any facility beyond the facilities described in the sections that follow is contingent upon approval from the regulators and respondents and requires a revision to this LTODP.

6.1.1 Waste Control Specialists

Waste Control Specialists (WCS) operates three adjacent disposal facilities. A processing facility that is part of the Subtitle C landfill at the same location offers treatment to the waste prior to disposal at any of the three landfills. The Treatment, Storage and Disposal Facility (TSDF) processing services are available to meet the WCS disposal waste acceptance criteria of non-conforming waste prior to disposal. All three landfills operate under the same Radioactive Materials License (RML) R04100. All landfills have both highway and rail access directly into the facility.

Two of WCS's disposal facilities could accept this waste. These facilities are described in **Table 6-1** below. The third facility is reserved for federal waste.

TABLE 6-1 WCS DISPOSAL FACILITIES

Name of Disposal Facility	Waste Acceptance and Description Comments	Radiological Waste Limits
Waste Control Specialists, LLC TSD Facility Hauling Route: 1,400.4 miles	9998 W. State Hwy. 176 Andrews, TX 79714 Phone: (432) 525-8500	
RCRA/TSCA (Subtitle C) Landfill EPAID# TXD988088464 (site ID)	The RCRA/TSCA-permitted landfill (Subtitle C) is a part of the TSDF and accepts industrial waste, land disposal restriction (LDR)-compliant hazardous waste, Comprehensive Environmental Response, compensation, and Liability Act (CERCLA) waste, solid PCB waste in unlimited concentration, exempt radioactive waste (NORM and TENORM), and licensed radioactive waste (exempt by License Condition 192). **Comments** ▪ More cost effective than the CWF. ▪ No specific size limitations on waste, just needs to be profiled, so they can manage throughput. ▪ Ability to repackage, store, process and treat liquid low-level waste and other types of wastes. ▪ Facility is rail serviced and can receive various container types.	Maximum (pCi/g): ▪ Ra-226 2,000(1) ▪ Ra-228- 208,000 ▪ Th-230 8,550 ▪ Th-232 4,580
Compact Waste Disposal Facility (CWF)	The CWF accepts commercial low-level radioactive waste (LLRW) that is generated in a host state or party state or LLRW that is not generated in a host state or party state but has been approved for importation to the state by the Texas Compact Commission. The CWF is not permitted to accept TSCA-regulated PCB wastes or hazardous wastes. **Comments** ▪ Waste would require disposal packaging and likely would not be cost effective. ▪ Waste is immediately transferred to the State of Texas under LLW compact laws immediately upon receipt. The shipper and the transporter need to be registered with Texas Department of State Health Services, and the generator needs to go through a review process to be a certified generator to ship to the CWF.	Class A/B/C(2) LLW for: ▪ Ra-226 Ra-228 Th-230 Th-232

Notes:
1. Limits will be increased upon approval of RML R04100 Amendment 34 and RS-5.0.0 Rev. 9
2. Cannot exceed Class C

6.1.2 US Ecology Facilities

US Ecology has multiple disposal facilities that could accept the waste. It is likely that US Ecology would use a combination of these facilities since they each have advantages. These facilities are described in **Table 6-2**, below.

TABLE 6-2 US ECOLOGY DISPOSAL FACILITIES

Name of Disposal Facility	Waste Acceptance and Description Comments	Radiological Waste Limits	
US Ecology Idaho EPAID# IDD073114654 (site ID) Hauling Route: 556.9 miles	20400 Lemley Road Grand View, ID 83624 Phone: (800) 274-1516		
RCRA/TSCA (Subtitle C) Landfill	The Grand View, Idaho facility provides RCRA and TSCA treatment and disposal services. They are also permitted to manage Naturally Occurring Radioactive Material (NORM/NARM) and Technologically Enhanced NORM (TENORM) waste, including other waste exempted from Federal Regulation by the Nuclear Regulatory Commission (USNRC). The Subtitle C, RCRA/TSCA treatment plant and landfill can accept a variety of container sizes and bulk loads. It is also rail served via Union Pacific and a company-owned rail transfer facility. Comments ▪ No specific size limitations on waste, just needs to be profiled so they can manage throughput.	Ra-226, Ra-228	500 pCi/g bulk(1), 1,500 pCi/g (IP-1)
		Th-230, no progeny	0.1 ppm/ <2,000 pCi/g
		Pb-210	1,500 pCi/g
		K-40	818 pCi/g(4)
		Other TENORM	Ra-228 1,500 pCi/g
		Uranium/ Thorium	<500 ppm + Exempt Items
		Byproduct Material	Exempt Items, <3,000 pCi/g
		Special Nuclear Material	<3,000 pCi/g(3)
US Ecology Michigan (There are two Part B permitted facilities for RCRA, TSCA, NORM/TENORM waste at this location) Hauling Route: 1,580.0 Miles	49350 North I-94 Service Drive Belleville, MI 48111 Phone: (800) 592-5489		
RCRA/TSCA (Subtitle C) Landfill (Wayne Disposal, Inc.) EPAID# MID 000 724 831 Michigan Disposal	This Part B permitted treatment facility and Subtitle C, RCRA/TSCA landfill are located off of the I-94 freeway in the Detroit metro area. They can accept waste in containers or bulk and also have ability to accept material by rail. Note: There are two Part B permitted facilities for RCRA, TSCA, NORM/TENORM waste at this location. The Michigan Disposal Waste Treatment Plant operates the RCRA treatment facility and Wayne Disposal, Inc. operates the landfill. Both are owned by US Ecology.	Ra-226,Ra-228	50 pCi/g
		Th-230, no progeny	0.1 ppm/ <2,000 pCi/g
		Pb-210	260 pCi/g
		K-40	818 pCi/g (4)
		Other TENORM	Downblending (2)

Name of Disposal Facility	Waste Acceptance and Description Comments	Radiological Waste Limits	
Waste Treatment Plant EPAID# MID 048 090 633	**Comments** ▪ This facility is the closest to the West Lake Landfill Site. ▪ In general, dimensions of waste should be less than 3 ft in any dimension. ▪ The permit allows higher-concentration radiological material to be blended with other customer waste to meet radiological disposal concentration limits.	Uranium/ Thorium	<500 ppm and exempt items
		Byproduct Material	Exempt Items

Notes:
1) Limit is for Ra-226 + Ra-228. Current application submitted to increase the Ra-226 + Ra-228 container concentration limit to 10,000 pCi/g.
2) Capabilities vary depending on activity and volumes.
3) Requires USNRC exemption.
4) Natural amount of K-40 in elemental potassium.
5) Specified radiological waste limit for "Th-230, no progeny" applies to Th-230 only and does not include contributions from any progeny (such as Ra-226) for which separate limits apply.

6.2 Non-USNRC Licensed Facility Exception

When radioactive waste from the Site is anticipated to be disposed in a non-NRC licensed disposal facility, Section 5.7(i)(2) of the SOW requires the LTODP to define the process and requirements to ensure that the facility is designed and operated to accept the waste while protecting human health and the environment and that the community surrounding the disposal facility is informed and provided the opportunity to comment. This is accomplished by verifying that such facilities possess state-issued permits showing that they are authorized to receive the waste from the West Lake Landfill and that the permitting process included an opportunity for public comment. The individual waste sites will verify that such wastes are acceptable via their respective exemption processes which are described for potential facilities in the sections that follow.

6.2.1 Waste Control Specialists Exemption Process

WCS has an Agreement State Radioactive Material License (TCEQ License #R04100). Since this waste is radioactive, WCS will receive the waste using an NRC form 540/541 and an approved waste profile associated with the waste stream. Upon arrival, WCS will use its Exemption Process of License Condition LC192 of R04100 and Procedure RS-5.0.0, *Exemption Process for the RCRA Landfill*, to exempt the waste after receipt. Procedure 5.0.0 allows WCS to accept, exempt, and dispose of the waste in the site RCRA landfill.

The following are general notes for the WCS exemption process:

- WCS is permitted to receive LLRW, mixed low-level radioactive waste (MLLRW), NORM, Oil & Gas NORM, and 11e.(2) byproduct materials under LC192 and WCS procedure RS-5.0.0 for exemption via Procedure RS 5.0.0.
- The material is initially accepted as licensed waste and then exempted under the WCS Radioactive Material License R04100 LC192 (EXEMPT BY LC192).
- WCS Radioactive Materials License R04100 License Condition 192 (LC192) is an alternative method for obtaining a radioactive waste exemption as stipulated through 30 Texas Administrative Code (TAC)

§336.5(a) (relating to exemptions from the application of radioactive waste rules in 30 TAC §336) and 30 TAC §90.

- LC192 allows for a broader range of isotopes, isotopic concentrations and waste forms to be exempted than the "exempt by rule" categories. Packages contaminated with isotopes within the limits of procedure RS-5.0.0, Attachment 2, Table 1 can be exempted as per RS-5.0.0.

6.2.2 US Ecology Exemption Process

The US Ecology facilities are permitted to accept waste for disposal containing radium and source material less than 0.05% by weight (the "Unimportant Quantity of Source Material" limit found in 10 CFR 40.13(a)) that are not regulated by the USNRC or Agreement State for disposal. US Ecology's Michigan and Idaho facilities' radioactive waste acceptance criteria are set by the States of Michigan and Idaho, respectively, at limits that are below the levels that would require a radioactive material license from the USNRC or Agreement State. Since this type of material is not regulated by the USNRC or Agreement State, West Lake Landfill does not have (or require) a license to possess it and therefore, US Ecology does not need a license, or an exemption to licensing to receive and dispose of it at either their Belleville, Michigan, facility or their Grand View, Idaho, facility.

6.3 Loading

Loading processes, including covering requirements and weather restrictions, will be detailed in the remedial design. These processes will be continually evaluated during the remedial construction so that project requirements are met. Pending the selection of a specific transportation method and disposal facility, it is anticipated that RIM may be loaded into a variety of container types for shipment to one of the offsite disposal facilities, as discussed below. Regardless of the container type, each container will be loaded carefully to avoid spillage and contamination of container exterior. Once filling of the container is complete, it will be sealed prior to leaving the loading location. The container will then either be transported to an on-site storage area where it will await transportation to the disposal facility, or be loaded for immediate transport to the facility. On-site staging and storage are discussed in more detail in **Section 8** – Container Management. It is important to note that after a truck or container is loaded with waste and sealed, it will be scanned and "free-released" prior to leaving the loading area to ensure other areas of the Site do not become contaminated and that the outside of the vehicle or container is free of any radioactive material prior to offsite shipment.

During the loading process dust generation will be managed and mitigated so that potential impacts to work or the surrounding communities are minimized. Additionally, it is important to avoid the introduction of excess liquids (e.g., rainwater) to the excavated waste material. Profile-approved absorbents will be added as necessary during loading to minimize the probability of containers having free liquids upon receipt.

6.3.1 Direct Loading of Waste Materials into a Dump-Bed Truck

DOT allows for certain Low Specific Activity (LSA) materials to be transported unpackaged when the average specific activity does not exceed 30 times the values for activity concentration specified in 49 CFR173.436, or the material otherwise meets the definition of LSA-I from 49 CFR 173.403. It is possible that site-derived wastes will qualify as LSA-I and therefore such materials may be directly loaded into the transport vehicle (e.g., dump-bed truck). These very low activity materials may be transported unpackaged with the transport vehicle serving to prevent the material from being released to the environment during transportation. The full requirements for this transportation are described below, as summarized from 49 CFR 173.427(c).

(c) LSA-I material… may be transported unpackaged under the following conditions:

1. All unpackaged material… must be transported in such a manner that under routine conditions of transport there will be no escape of the radioactive contents from the conveyance nor will there be any loss of shielding;

2. Each conveyance must be under exclusive use, except when only transporting SCO-I on which the contamination on the accessible and the inaccessible surfaces is not greater than 4.0 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters and 0.4 Bq/cm^2 for all other alpha emitters;

3. For SCO-I… measures shall be taken to ensure that the radioactive material is not released into the conveyance or to the environment; and

4. The highway or rail conveyance must be placarded in accordance with [49 CFR 172 (f)]

Dump-bed trucks can range in size between 14 cubic yards (smaller. straight truck dump) and 50 cubic yards (tractor-trailer dump). In addition, the truck/dump bed may be either lined or unlined before placement of the waste materials into the truck. A simple plastic liner is often used to allow the material to slide easily from the truck when it arrives at the disposal facility as well as reduce potential for residual material to adhere to the truck bed. In addition, material should not be transported off-site in a condition that may generate free-liquid during transportation.

6.3.2 Intermodal Containers

While the 30-cubic-yard intermodal container is described below, other sizes are available and may be used based on the material densities after removal from the landfill.

The 30-cubic-yard containers are approximately 8 feet wide, 6 feet tall, and 20 feet long. Waste loaded into these containers would be top loaded into each container. These containers include a lid that is sealed upon completion of filling the container such that the waste material is completely contained within the individual containers. The containers would then be shipped via flatbed truck to a rail transloading facility where the sealed containers would be transferred to a rail car Multiple intermodal containers would be loaded onto a single rail car to minimize the cost of transportation.

6.3.3 Soft-Sided Containers

The West Lake Landfill waste may be packaged in soft-sided containers (e.g., super-sacks) meeting US DOT Industrial Package Type I standards (e.g., "TYPE IP-1"). These soft-sided containers are available in multiple sizes from 1 cubic yard (2,500-pound capacity) up to 8 cubic yards (24,000-pound capacity). These containers work well for loading, storage, and unloading both at the Site and the disposal facilities.

These containers are sealable in order to eliminate the potential for dispersal of the waste materials during transport. The containers would then shipped via flatbed truck to a rail transloading facility where the sealed containers would be transferred to a rail car. Multiple IP-1 containers would be loaded onto a single rail car or gondola to minimize the cost of transportation.

6.4 Transportation Routes

Three scenarios for waste transportation under consideration include:

1. Construction of a rail spur to provide direct rail access to the Site, and then rail transportation directly to the disposal facility.

2. Trucking waste containers to a local rail yard or transloading facility for transfer of the sealed containers (without opening the containers or otherwise exposing the contents) to rail car, and then transportation directly to the disposal facility.
3. Trucking waste containers directly from the Site to the waste facility.

6.4.1 Rail Spur Feasibility

Two rail spur alignments were considered to assess the feasibility of providing direct rail access to the Site. These two alignments would connect to the existing industrial rail spur network across St. Charles Rock Road at their nearest points. By connecting a rail spur to the Site, trucking of waste containers would be reduced as this could allow for rail transportation directly from the site to the disposal site's off-loading facility. Note that for some disposal facilities a short truck haul may still be required to transport containers from the facility's off-loading area to final disposal location.

The results of the on-site rail spur construction feasibility assessment are presented in a technical memorandum included as **Attachment A** to this document. This memo does not recommend construction of a rail spur to the Site for due to a variety of safety and technical concerns.

6.4.2 Transloading Facilities

This method of waste disposal transportation consists of using trucks to haul waste containers to local rail yards/transloading facilities where they are transferred to a rail car and then transported to the disposal facility. Using a local transloading facility is generally safer, more environmentally sustainable, and less expensive than hauling waste in trucks to disposal facilities directly, given the long-haul distances.

Selection of the transloading facility is dependent on the logistics of the waste transportation contractor. Factors to be considered by the contractor selecting the transloading facility include the following:

- Proximity to the Site.
- Whether the rail line serviced there goes to the selected disposal facility.
- Volume the transloading location can ship.
- Volume the transloading location can store.
- Transload facility's acceptance of waste containers.

Given the factors required for consideration when selecting a transloading facility, the actual location cannot be determined at this time. Potentially viable transloading facilities and local rail yards in the St Louis area are shown on **Figure 4**. This map includes commercial facilities that were identified through internet research, and it is likely that there are other public and privately owned transloading locations nearby. Potential impacts to the community at a proposed transload facility or facilities will be evaluated during final selection. Of the 20 facilities identified in the map on **Figure 4**, **Table 6-3** below presents their proximity to West Lake Landfill.

TABLE 6-3. NUMBER OF LOCAL RAIL YARDS AND TRANSLOADING LOCATIONS WITHIN SITE VICINITY

Distance from Site	Number of Transloading Facilities
Less than 5 miles	0
5 – 10 miles	1
10 – 15 miles	7
15 – 20 miles	5
Greater than 20 miles	7

Railway access at each disposal facility is serviced by specific rail service providers. An analysis of rail service providers will be performed as necessary once transloading and disposal facilities are selected.

6.4.3 Direct Haul to Disposal Facilities

The direct haul method of waste disposal transportation uses trucks to haul the waste directly from the Site to the disposal facility. Haul routes were chosen to minimize impact to the public, make use of appropriate roadways, and maximize route safety to the extent practicable.

Interstate routes have been designed for safe travel, minimum vertical clearance for overpasses, and roads designed to handle truck loads. On this basis, interstate routes have been preferentially selected and their use has been maximized for each potential truck route. If no interstate routes were available, US highways were chosen as substitutes, with state highways being used where no US highways were available. Non-interstate routes were verified by visual analysis using Google Earth.

Haul routes were also selected to mitigate impact to local communities. Left-hand turns were minimized whenever possible to reduce conflict points during turning movements. Bypass interstate routes will be used to avoid downtown areas, urban centers, and dense populations where possible.

Trucking routes to the waste disposal facilities identified in **Section 6.1** are presented below.

6.4.3.1 Waste Control Specialists - Andrews, Texas

The transportation route from the site to the WCS disposal facility is detailed in **Figure 5**. Truck traffic via this route will proceed as follows:

- Turn right onto St. Charles Rock Road
- Turn right to merge onto I-270 S (14.3 miles)
- Take exit 5B for I-44 W toward US-50 W/Tulsa (363 miles)
- Use the right 2 lanes to take exit 34 to merge onto I-44 W/US-412 W toward OK-66/Tulsa (5.1 miles)
- Keep left at the fork to continue on I-44 (14.3 miles)
- Merge onto I-44 (1 mile)
- Keep right to stay on I-44 (86.1 miles)
- Continue onto Turner Turnpike (446 feet)
- Take exit onto I-40 toward Amarillo (245 miles)
- Use the right two lanes to take exit 70 to merge onto I-27 S/US-60 W/US-87 toward Canyon/Lubbock

- Continue to follow I-27 S for 120 miles
- Take exit 4 toward US-82/US-87 BUS/Crosbyton/Brownfield
- Merge onto I-27 Frontage
- Turn right onto US-82 Frontage Road
- Use the left lane to take the ramp onto US-82 W (40.4 miles)
- Continue onto South 1st Street
- Continue onto US-385 S/Seagraves Road (41 miles)
- Turn right onto FM 181 S/ SW Ave G
- Slight left to stay on FM 181 S (21 miles)
- Keep right to continue onto NW 7001 (7.3 miles)
- Turn right onto Frankel City Highway
- Turn right onto TX-176 W (13.4 miles)
- Turn right onto NW 9701
- Turn left (0.5 miles)
- Arrive at disposal facility

6.4.3.2 US Ecology - Belleville, Michigan

The transportation route from the site to the US Ecology Midland, Michigan, disposal facility is shown in **Figure 6**. Truck traffic via this route will proceed as follows:

- Turn right onto St. Charles Rock Road
- Turn left onto I-270 N (29.6 miles)
- I-270 N turns slightly left and becomes I-70 E (82.6 miles)
- Keep right at the fork to stay on I-70 E (68.2 miles)
- Keep left to stay on I-70 E (58.6 miles)
- Use the right 2 lanes to take exit 69 for I-465 S/I-74 E (2.2 miles)
- Keep right at the fork, follow signs for I-74 E/I-465 S and merge onto I-465 S (26.4 miles)
- Use the right to lanes to take exit 37 for I-69 N/IN-37 N toward Fort Wayne (97.5 miles)
- Take exit 296A for US-24 E/US-33 S/I-469 (0.4 miles)
- Merge onto I-469 E/US-33 S (30.3 miles)
- Take exit 31A to merge onto I-69 N toward US-27 N/Lansing (80.7 miles)
- Take exit 38 to merge onto I-94 E, follow signs for Detroit (62.8 miles)
- Keep right at the fork to stay on I-94 E, follow signs for Detroit (16.1 miles)
- Take exit 187 for Rawsonville Road (0.3 miles)
- Turn left onto Rawsonville Road
- Turn right onto N Interstate 94 Service Drive (1.2 miles)
- Arrive at disposal facility

6.4.3.3 US Ecology – Grand View, Idaho

The transportation route from the site to the US Ecology Grandview, Idaho, disposal facility is shown in **Figure 7**. Truck traffic via this route will proceed as follows:

- Turn right onto St. Charles Rock Road
- Turn right to merge onto I-70 W (13.6 miles)
- Keep left to stay on I-70 W (210 miles)
- Use the right 2 lanes to take exit 8B to merge onto I-435 N toward Des Moines (10.3 miles)
- Keep left to stay on I-435 N (20.8 miles)
- Continue onto I-29 N (117 miles)

- Take exit 10 for IA-2 toward Sidney/Nebr City
- Turn left onto IA-2 W (3 miles)
- Continue onto NE-2 W (50.1 miles)
- Keep left to stay on NE-2 W, follow signs for W Van Dorn St/US-77/I-80 (1.3 miles)
- Use the right lane to merge onto US-77 N/Homestead Expy via the ramp to I-80 (2.5 miles)
- Keep left at the fork, follow signs for I-80 W and merge onto I-80 West (294 miles)
- Keep right at the fork to stay on I-80 W (533 miles)
- Take exit 168 for I-84 W toward Ogden
- Continue onto I-84 W (77.2 miles)
- Keep left at the fork to stay on I-84 W, follow signs for Boise (96.8 miles)
- Merge onto I-84 W (107 miles)
- Take exit 114 for Cold Springs Road toward Hammett/Interstate 84 Business/ID-78 (0.3 miles)
- Turn left onto Cold Springs Road
- Turn right onto Old US-30 W (1.9 miles)
- Turn left onto ID-78 W (15.9 miles)
- Turn left onto ID-51 S/ID-78 W (signs for Bruneau Elko Nevada) (6.7 miles)
- Slight right onto ID-78 W (25 miles)
- Turn right onto Lemly Road (1.6 miles)
- Arrive at disposal facility

6.5 Department of Transportation Radiation Dose and Contamination Limits

All outgoing shipments will have a pre-shipment survey of each conveyance. The conveyance surveys shall consist of both radiation and contamination surveys. The following tables provide the survey limits prior to release of the shipments.

TABLE 6-4 US DOT RADIATION LIMITS (49 CFR 173.441)

Dose Rates	Non-Exclusive Use Limits (mrem/hr)	Exclusive Use Limits (mrem/hr)
At any external surface of a package	200	200
At 2 meters from external surface of a package	10	N/A
At any point on outer surface of vehicle (including top and underside)	N/A	200
At any point 2 meters from outer surfaces of a vehicle	N/A	10
Normally occupied space (i.e., cab)	N/A	2

Note: mrem/hr = millirem per hour

TABLE 6-5 US DOT CONTAMINATION LIMITS (49 CFR 173.443 AND FACILITY WAC)

Type	DOT Limit (dpm/cm²)	Removable Contamination Site Administrative Limit(1) (dpm/100 cm²)
Beta Contamination	240	1,000
Alpha Contamination	24	20

Notes:
(1) Site administrative limits are ALARA
dpm – disintegrations per minute

6.6 Applicable Transportation Regulations

- FMCSR-Federal Motor Carrier Safety Regulations
- Title 29 CFR 1910-Occupational Safety and Health Standards
- Title 40 CFR 61, 262-263 and 700-789
- Title 49 CFR, 100-185, 325 and 355-399

7.0 COMMUNITY IMPACTS

During the loading and transportation of waste containers from the Site to the disposal facility, there is the potential for impacts to the surrounding communities. Selection of final transportation routes will include an assessment of any potential impacts to both the local community and any communities located along the anticipated transportation routes that may be impacted along with methods to reduce/mitigate potential impacts. Potentially impacted local communities and the steps taken to minimize these impacts are detailed in the following sections.

7.1 Potentially Impacted Local Communities

The Bridgeton, Missouri community may be impacted by the increase in traffic and personnel entering and exiting the Site location. These hazards include personal vehicles, delivery trucks, on-site vehicles, subcontractor vehicles, waste transportation vehicles, and heavy equipment. This area is already subject to commercial truck traffic and personnel traffic associated with the operation of the existing transfer station and closed Bridgeton Landfill.

Vehicles carrying waste containers for disposal will make a right-hand turn to exit out of the Site and travel southeast down St. Charles Rock Road to Interstate 70/270. From here they would remain on interstates or highways to the extent possible until reaching the designated transloading and/or disposal facility.

Navigating from the West Lake Landfill to Interstate 70/270 requires 1.1 miles of travel on St. Charles Rock Road, where the surrounding area is comprised of primarily commercial and vacant land. Properties adjacent to St. Charles Rock Road may be impacted by traffic leaving the Site and are listed below, based on location along the west or east sides.

Potentially-impacted party receptors along the west side of St. Charles Rock Road include:

- Collision Centers of St. Louis
- Allied Services, LLC
- Helena Chemical
- Ceiling Center
- CRAFCO Inc. (Paving Maintenance Supply Inc.)
- 12904 St. Charles Rock Road (single family residential)
- Laidlaw Waste Systems Inc.
- Car Credit City LLC
- QuikTrip Corporation

Potentially-impacted parties receptors along the east side of St. Charles Rock Road include:

- Terrisan Commons (Mobile home park)
- Virbac (PM Resources Inc.)
- Hussman Corporation
- Midwest Block and Brick Inc.
- Commercial Lot (Khurshid Investments LLC)
- Phillipp Law Firm
- Rock Road Trailer and RV

- 6 Bing Boulevard (Multi-Family Residential)
- Super 8 Motel
- Waffle House

Precautions taken to minimize impacts to the surrounding community are detailed in **Section 7.2**.

7.2 Minimization of Impacts to Local Communities

Traffic routes from the Site to the various transloading locations or disposal facilities that limit the number of left-hand turns and impact to existing traffic are detailed in **Section 6.4.3** of this report. Traffic leaving the Site will take St. Charles Rock Road directly to Interstate 70/270 to minimize impacts to the local Bridgeton community. Drivers are required to follow all traffic laws and regulations and take caution when entering and exiting off the main road. Signs, cones, barriers, etc. will be implemented to limit and direct traffic in and out of the Site if and as necessary. In order to minimize noise pollution, engine breaks will not be used by transport vehicles while on local roads. All vehicles will be visually inspected and, if necessary, broom-cleaned prior to leaving the Site to mitigate tracking mud from the Site onto St. Charles Rock Road. Any trucks that have been in Area 1 or Area 2 or that are hauling site waste will require frisking prior to leaving the Site.

7.3 Potentially Impacted Communities Along the Transportation Routes and Mitigation Measures

Transportation routes outside the St Louis area for either truck traffic or railway hauling will also be assessed to minimize impacts to the community. Railways are designed for hauling long distances and with standard operations, the operations discussed here would have little impact on railway systems. Truck traffic will be maximized on interstate and federal highways to the extent practical, as these roadways roads are generally designed for high volumes of traffic and long hauls with minimum impacts to the community.

When hauls routes are being evaluated, they will be assessed for safety and community impacts from West Lake landfill to the final disposal locations.

8.0 CONTAINER MANAGEMENT

8.1 Container Management and Tracking

The physical integrity of shipping containers will be inspected by the waste specialist before they are used, and operators and packagers will take care to maintain such integrity during filling. The waste specialist performs a final integrity inspection as filled containers are loaded onto conveyances for shipment to the disposal facility. Deficiencies will be appropriately repaired, or the container will be rejected. If material is to be shipped unpackaged (i.e., direct loading into a highway dump truck/tractor trailer), the integrity inspection is performed on the trailer of the conveyance prior to and following the filling activity.

Immediately upon its filling, and prior to its movement, each container is assigned a unique identification number that is recorded with other information to track it while it is relocated, stored, loaded, shipped and disposed. Such tracking information includes:

- Container ID number
- Date packaged
- Manifest document number/shipment ID number
- Waste type
- Waste codes
- Waste description
- Waste location (point of generation/storage location)
- Radionuclides
- Appropriate profile identification

A facility receiving containers will acknowledge receipt of packages in an acceptable condition by signing and returning a copy of the shipping paperwork at which time the waste specialist's responsibility for tracking the containers will cease. If the container is not received in a proper condition, the receiving site will notify the waste specialist who will, in turn, notify the OU-1 Remedial Action project manager so that appropriate corrective action(s) can be accomplished. The waste specialist will investigate any occurrence where confirmation of receipt is not obtained within 30 days of the container being placed into transit.

8.2 Accumulation, Staging, and Storage

8.2.1 Temporary Stockpile Areas

As material is excavated at an active location, each discrete unit (e.g., bucket load) will be designated either for disposal off-site or as overburden. The contractor may choose to temporarily stockpile each type of material near the excavation for operational efficiency or may choose to directly load the waste for off-site disposal. If temporary stockpiles are used, the following requirements must be met:

- Stockpiles for the two types of waste should be adequately separated (minimum of 10 feet to allow for housekeeping or use of physical barriers, such as berms or Jersey barriers, to keep the material separated).
- Either separate equipment or broom-cleaned equipment should be used for stockpiling and loading different material-types.
- Measures must be taken to prevent wind-blown material from leaving a stockpile.
- Stockpiles shall be sized for a single day's use (see below).

- Tarping will be used to prevent rain and snow infiltration from contacting the stockpiled material.
- Exceptions to these requirements may be granted on a case by case basis with approval by the engineer and USEPA on-site representative.

The remedial action contractor shall make certain that the material excavated each day is transported to its designated staging area by the end of the workday. Waste designated for off-site disposal shall be transported to a staging area for loading, and overburden material shall be transported to a stockpile or to a backfill location. The remedial action contractor will take care to avoid excavating more waste for off-site disposal than can be accepted by the staging area. In unusual circumstances when this is not possible, excavation will be halted, and daily cover shall be applied as protection until the operation can resume. In extreme circumstances (for example, a sudden weather event), a quickly deployed means of cover shall be used, such as tarps or other means designated in the final design and/or approved by the Project Engineer.

Daily cover shall be applied to the working face of each open excavation and each overburden stockpile, as described in the Final Design documents.

In some phases of the OU-1 Remedial Action overburden material may need to be stockpiled for longer durations.

8.2.2 Staging Area

Depending on the selected method of transportation of waste to the disposal facility, multiple options exist for staging the waste containers temporarily on site. It is expected that the waste container staging area will be able to store enough containers to support about three weeks of ongoing disposal. This will help maintain schedule in case there are periods where excavation or transportation/processes are temporarily delayed or slowed.

If the selected disposal facility has flexibility within its WAC to accept all waste as-excavated, a direct-load method may be used. For example, shipping containers such as U.S. DOT Industrial Packaging 1 containers ("IP-1 bags") may be filled at the excavation area, and then transported to a designated staging area for loading onto on-road vehicles. The waste transporter's representative shall verify that each container meets the requirements of the disposal site and shall oversee the operation of loading the containers onto on-road vehicles. The waste transporter shall take responsibility for each container of waste when it is loaded. Tracking information for each container shall be logged at this time.

8.2.3 Inspections

The remedial action contractor (or a representative) shall conduct periodic inspections of the staging and loading area(s) to verify that operations are proceeding according to this Plan. The results of each inspection shall be reported to the Project Engineer within 24 hours, but significant deficiencies shall be reported immediately.

Inspections shall verify, at a minimum:

- Areas meet designated safety requirements.
- Container staging area conditions are orderly.
- Covers, when required, are in place.
- Container staging area is within pre-established maximum sizes.
- Loose material is being cleaned up on a regular basis.
- Separation between site vehicles and road vehicles is adequate.

The waste specialists (including the transporter's representative) shall also conduct periodic inspections to verify that the operation complies with the disposal site's requirements. Deficiencies shall be reported to the project engineer within 24 hours, but significant deficiencies shall be reported immediately.

The area(s) will also be available for inspection by USEPA and MDNR.

9.0 RESPONSIBILITIES

9.1 Project Manager

The project manager is responsible for all OU-1 Remedial Action project activities including the quality of contract deliverables. The project manager will also function as the primary client contact and ensure that all OU-1 Remedial Action and Respondent requirements are met. The project manager will ensure that all activities related to loading, transportation, and off-site disposal are completed in accordance with this plan. The project manager discussed here will be both one from the remedial action contractor team and from the construction oversight engineer's team. Coordination between these two project managers will be important to achieve implementation success.

9.2 Project Engineer

The project engineer is responsible for managing design issues during construction, including the review of submittals for compliance with the design, approving all changes to the design, and periodically making Site inspections to assess compliance of construction with the design. The Project Engineer discussed here will be from the construction oversight engineer's team.

9.2 Superintendent/On-Site QC Representative

The site superintendent/on-site quality control representative will be on site at all times. He/she will be responsible for supervising activities in real time and serve as the point of contact for waste characterization and management. The superintendent will be responsible for day-to-day activities on the site. As the on-site point of contact, the superintendent will be responsible for directing waste container deliveries and shipments, ensuring that proper containers are being used for each waste stream, maintaining records of waste containers, shipment documentation, and container inspections, as well as making sure that all waste manifests and shipping documentation have been properly prepared and signed for transportation and disposal. The superintendent/on-site quality control representative discussed here will be from the remedial action contractor's team.

9.3 Waste Transporter

The selected waste transporter will work directly with the site superintendent and waste specialist to ensure that all storage and transportation containers meet applicable and appropriate requirements for transport of the waste and in accordance with waste type and the requirements specified in the final design. The waste transporter will also be responsible for checking that all wastes are properly labeled and loaded per disposal facility requirements.

9.4 Site Health and Safety Officer

The site health and safety officer will ensure that the health and safety plan (HASP) is properly implemented and that all personnel are trained on the site-specific OU-1 Remedial Action health and safety requirements. The site health and safety officer will ensure that all loading and transportation activities are performed in accordance with the Project Safety, Health, and Environment Plan (PSHEP), including the Radiation Safety Plan, as well as the Final Design. The site health and safety officer discussed here will be from the construction oversight engineer's team.

9.5 Analytical Quality Assurance Manager

The analytical quality assurance manager will oversee any on-site analytical analyses, coordinate with/track data from off-site labs, review and evaluate analytical data, prepare data usability and data validation reports and site-specific quality assurance project plans, and provide technical support for data quality assessment and interpretation. The analytical quality assurance manager will perform the functions listed below:

- Provide quality assurance technical assistance to the OU-1 Remedial Action staff.
- Monitor the preparation and review of quality assurance plans for analytical work, as required.
- Review and validate analytical data in accordance with approved quality assurance plans.
- Assess compliance with Region VII data validation protocols.

The analytical quality assurance manager discussed here will be from the construction oversight engineer's team.

9.6 Contractor Quality Control (CQC) System Manager

The CQC system manager will work directly with the site superintendent to ensure that all requirements of the Construction Quality Assurance/Quality Control Plan (CQAP/CQCP) are met. The CQC system manager discussed here will be from the remedial action contractor's team.

9.7 Waste Specialist

The waste specialist(s) will be responsible for the development of waste profiles for the site. The waste specialist will ensure the waste is classified and characterized correctly through process knowledge and/or analytical data following the regulatory guidance in 40 CFR §262.11. The waste specialist may be from the selected waste disposal company.

The waste specialist(s) will perform the functions below:

- Prepares waste profiles for the anticipated disposal facilities.
- Provides waste characterization and disposal technical assistance to the OU-1 Remedial Action staff.
- Monitor the preparation of shipping papers for Department of Transportation and Disposal Facility Compliance, as required.
- Perform inspections of the waste containers and staging and loading areas (see **Sections 8.1** and **8.2.3**)
- Investigate occurrence where confirmation of receipt by the disposal facility is not obtained within 30 days. of the container being placed into transit.

- Review and apply analytical data to shipping containers prior to shipment, Tracking and verifying all waste manifests and shipment documentation.

10.0 HAZARD IDENTIFICATION AND CORRECTIVE ACTIONS

10.1 Emergency Response and Notifications

An *Emergency Response Plan* (ERP) (Parsons et al. 2020b) has been prepared for the Site. This plan details the procedures that will be used in the event of an accident or emergency at the Site during the implementation of the RD/RA. The ERP is applicable to OU-1; the remainder of the Site is addressed in the *Incident Management Plan* (IMP) (Bridgeton Landfill 2019).

10.2 Spill Contingency

In accordance with Title 40 of the CFR 112.19(d)(2)(i) and (5), the requirements of 40 CFR Part 112 are not applicable to OU-1, and a SPCC Plan is not required for OU-1. Spill kits will be kept on site to address any spills or leakage from on-site equipment and vehicles. Should a spill take place, call lines and procedures are detailed in the ERP (Parsons et al. 2020b).

10.3 Tracking and Corrective Actions

An incident that would trigger incident reporting, investigation, and management process includes the following:

- An injury of any significance is sustained by anyone working at the Site.
- An illness of any significance is sustained by anyone and manifests its signs or symptoms at the Site (specifics related to COVID-19).
- An injury or illness of any significance is sustained by anyone at the Site, and is related to Site work activities.
- An unplanned release of a hazardous substance or other environmentally significant substance occurs anywhere and affects work activities related to the Site.
- An unplanned security or law enforcement event of any significance occurs on the Site.
- An unplanned event involving property damage occurs on the Site.
- A motor vehicle-related event of any significance occurs, involving vehicle or facility damage on Site, or related to Site activities.
- An unplanned event occurs on Site that could have caused an injury, an illness, environmental damage, or property damage, but did not because of the intervention of random or fortunate circumstances and conditions. These incidents are also called near misses, near hits, and close calls.

When a person detects an incident, the person shall immediately implement the incident reporting process detailed in the PSHEP.

The project manager shall ensure that significant incidents (including significant near misses) are formally investigated. Incident investigations seek facts, not fault. The result of a properly conducted incident investigation is thoughtful identification of root causes of the incident and effective corrective actions and recommendations to prevent similar incidents from recurring.

The investigation process starts as soon as the initial report of the investigation is submitted. The project manager (or delegate) shall lead the investigation and shall seek assistance from the project safety, health and environment (SH&E) representative. A formal incident investigation report with corrective actions and accountability assignments shall be distributed to the appropriate members of the OU-1 Remedial Action team.

After the investigation report is submitted, the project manager shall ensure that the OU-1 Remedial Action team is aware of any findings, lessons learned, and the status of the corrective actions identified in the incident investigation report.

10.4 Stop Work Authority and Emergency Response

Each employee is a critical leader for preventing injuries, illnesses, and adverse environmental impacts. Therefore, each employee is authorized to stop work immediately if a safety, health, or environmental concern exists or if the work is not going according to plan. Once work is stopped, each employee is expected to communicate the work stoppage to the other affected parties and further evaluate the condition and adjust the work plan to resolve the safety, health, or environmental concern before restarting the work.

- Stop the task you are doing or intervene with a co-worker if applicable.
- Take immediate measures to notify any others affected. If there is no imminent danger, notify the appropriate line supervisors and site leaders.
- Offer correction or get help if needed. Affected parties shall discuss and gain agreement on the resolution of the stop work issue.
- Prepare to resume once the concern has been resolved. If necessary, suspend the task until the adjusted work plan can be reviewed and revised, when needed. When opinions differ regarding the validity of the stop work issue or adequacy of the resolution, the Superintendent or Site Health and Safety Officer shall make the final determination, giving full weight to all opinions and views.

There is no circumstance where retribution or retaliation may be directed toward an employee who conscientiously exercised their stop work authority.

The West Lake Landfill OU-1 Remedial Action ERP details the processes that will be followed in the event of an accident or emergency during the implementation of the RD/RA, including the following:

- Emergency response roles and responsibilities.
- Emergency assessment and response strategy.
- Emergency notifications.
- Emergency response infrastructure and equipment.
- Radiation safety during emergencies.
- Post-response reporting.
- Emergency response training.

A full discussion of procedures and processes related to Stop Work Authority and Emergency Response can be found in the PSHEP.

11.0 ANNUAL WASTE REPORTING

An annual waste report will be completed for the Site summarizing all waste transported to off-site disposal facilities. Included in this report will be all shipping documents generated during waste transportation as well as certificates of disposal received from disposal facilities.

11.1 Shipping Documents

All shipping documents for waste transported to off-site disposal facilities will be included in the Annual Waste Report. Shipping documents may include but are not limited to:

- Waste manifests
- Bills of lading
- Weight tickets

11.2 Certificate of Disposal

Upon receipt of waste material, the disposal facilities will issue a Certificate of Disposal. While a certificate of disposal is not necessarily required for RIM, facilities will still be required to supply one for each manifest for waste tracking purposes. All waste transported from the Site will be tracked from cradle to grave to ensure proper disposal.

SECTION 12 REFERENCES

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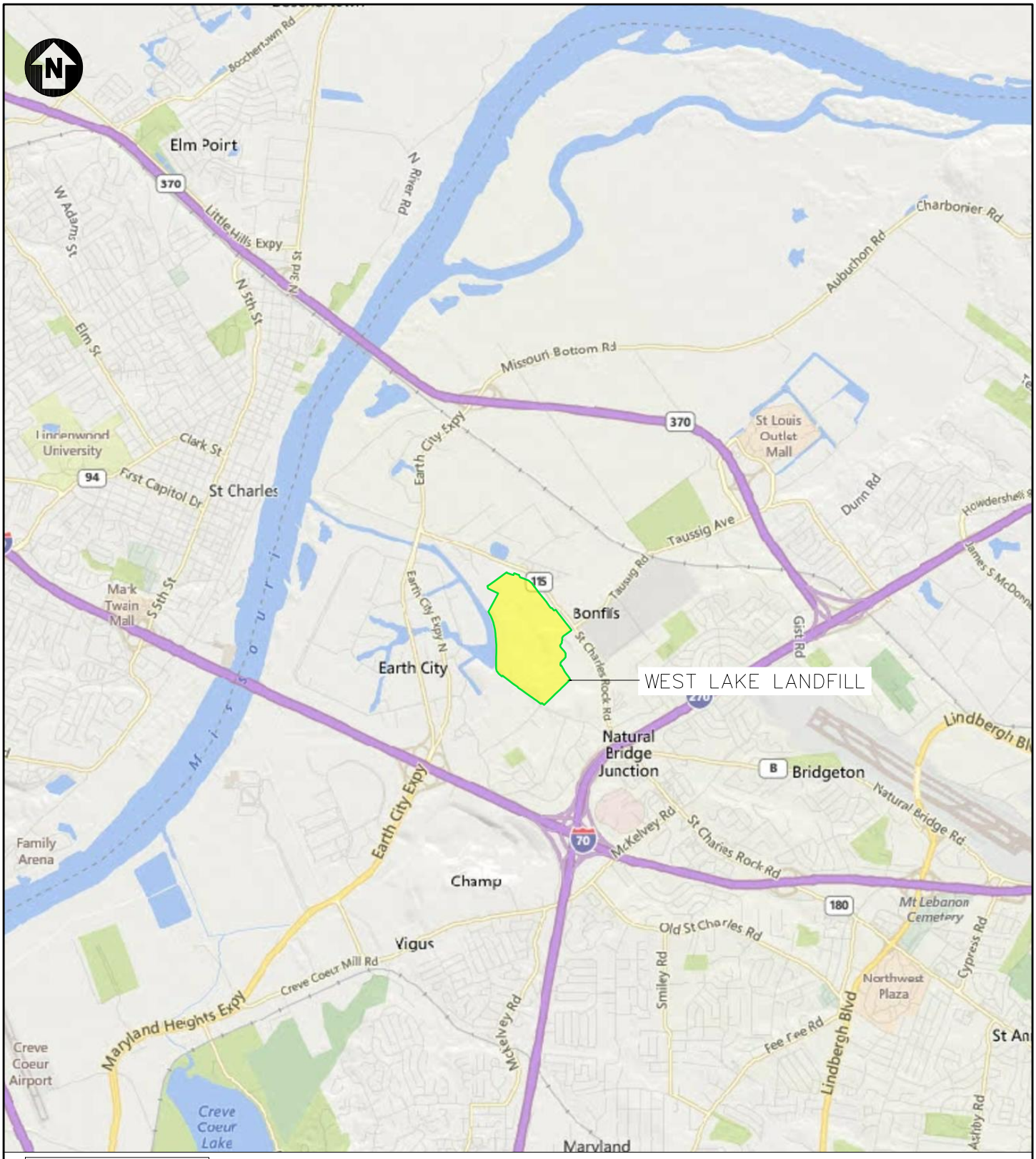
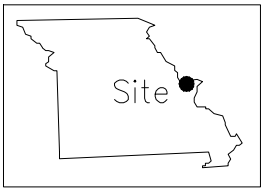
FIGURES





Missouri Quadrangle

5000 2500 0

SCALE: 1"=5000'

FIGURE 1
SITE LOCATION MAP

West Lake Landfill OU-1 Respondents

WEST LAKE LANDFILL OU-1

PARSONS
301 PLAINFIELD ROAD * SUITE 350 * SYRACUSE, NY 13212 * 315-451-9560

PROJECT #	DATE:	DRWN:	CHKD:	FIGURE #
451662.02300	7/19/19	JR	AG	1

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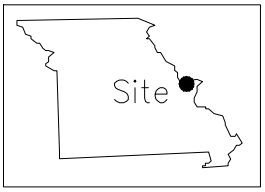

Missouri Quadrangle

5000 2500 0

SCALE: 1"=5000'

FIGURE 2

SITE LOCATION MAP ON AERIAL PHOTO

West Lake Landfill OU-1 Respondents

WEST LAKE LANDFILL OU-1

PARSONS
301 PLAINFIELD ROAD * SUITE 350 * SYRACUSE, NY 13212 * 315-451-9560

PROJECT #	DATE:	DRWN:	CHKD:	FIGURE #
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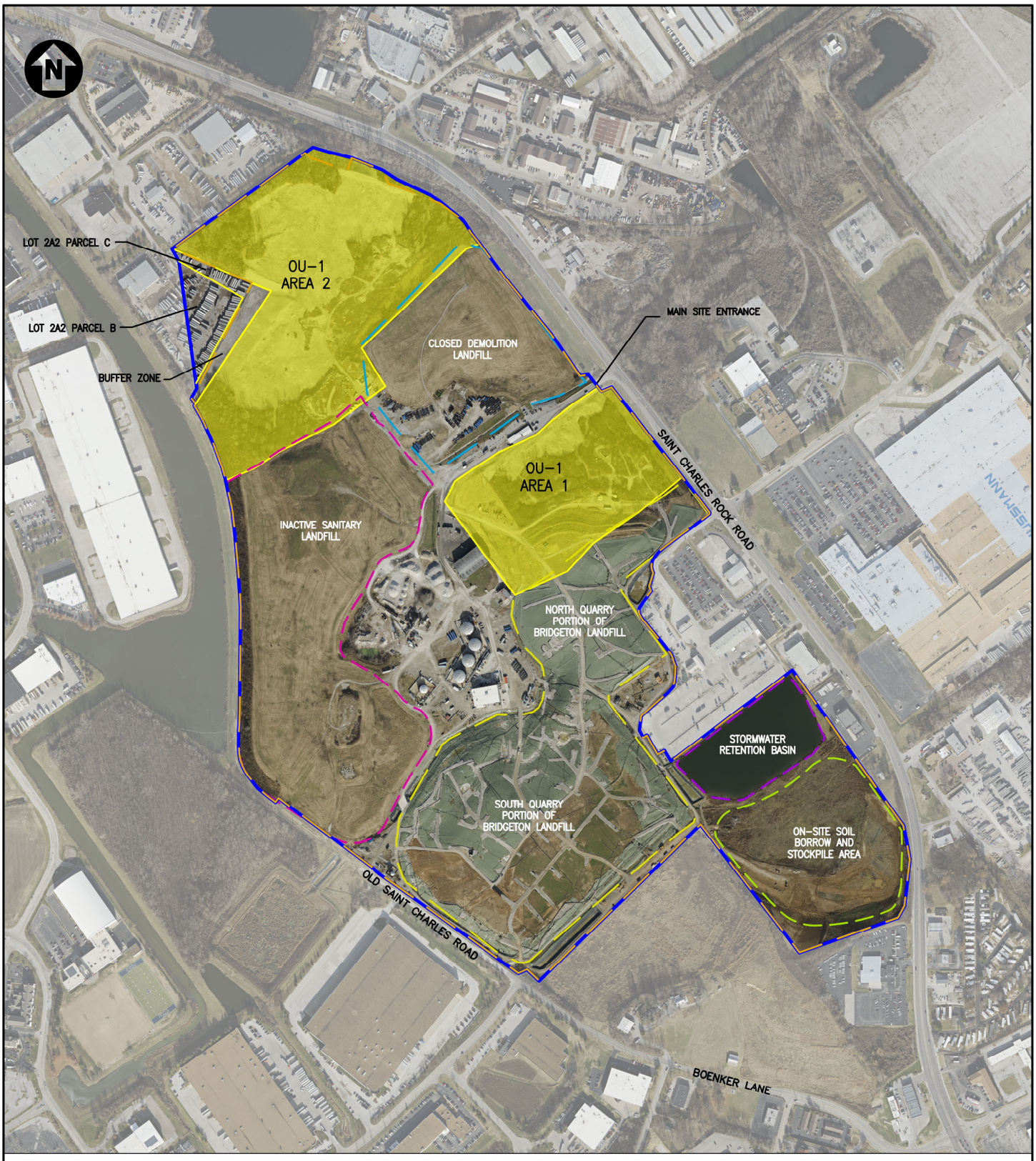

LEGEND:

- SUPERFUND SITE
- LANDFILL BOUNDARY
- BRIDGETON LANDFILL
- INACTIVE SANITARY LANDFILL
- CLOSED DEMOLITION LANDFILL
- STORMWATER RETENTION POND
- SOIL BORROW/STOCKPILE AREA

800 400 0

SCALE: 1"=800'

FIGURE 3
SITE AREAS

West Lake Landfill OU-1 Respondents

WEST LAKE LANDFILL OU-1

PARSONS
301 PLAINFIELD ROAD * SUITE 350 * SYRACUSE, NY 13212 * 315-451-9560

PROJECT #	DATE:	DRWN:	CHKD:	FIGURE #
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FILE NAME: P:\WEST LAKE\10.0 TECHNICAL CATEGORIES\10.1 CAD\FIGURES\RDWP\RDWP-FIG-3.DWG

West Lake Landfill

TBT NS Thoroughbred Bulk Transfer Terminal

Affton Terminal Services/
Loup Network Partner (51721)

Mid-Coast Terminal

Luther Yard

St. Louis Intermodal Yard

Midwest Systems, MWS Intermodal Services, LLC

Loup Network Partner (27224)

CMR Carload Connection/
Loup Network Partner (34001)

Loup Network Partner (42061)

Rose Lake Yard

Ee-Jay Motor Transport/
Loup Network Partner (47082)

Watco Terminal & Port Services/
Loup Network Partner (23921)

Loup Network Partner (24781)

Material Resources

BNSF- St. Louis (Lindenwood)

FGM Logistics, LLC

Loup Network Partner (24881)

ContainerPort Group- CPG

Burlington Junction Transloading

UP- Dupo

Local Rail Yards and Transloading Facilities

Site Location

5 Miles

10 Miles

15 Miles

20 Miles

0 2.5 5 Miles N

Note: Facilities identified on this map are based on publicly available information. Individual facilities have not been contacted to assess interest or feasability of use for transloading of West Lake disposal materials.

FIGURE 4

Local Rail Yards and Transloading Locations
Distance from Site

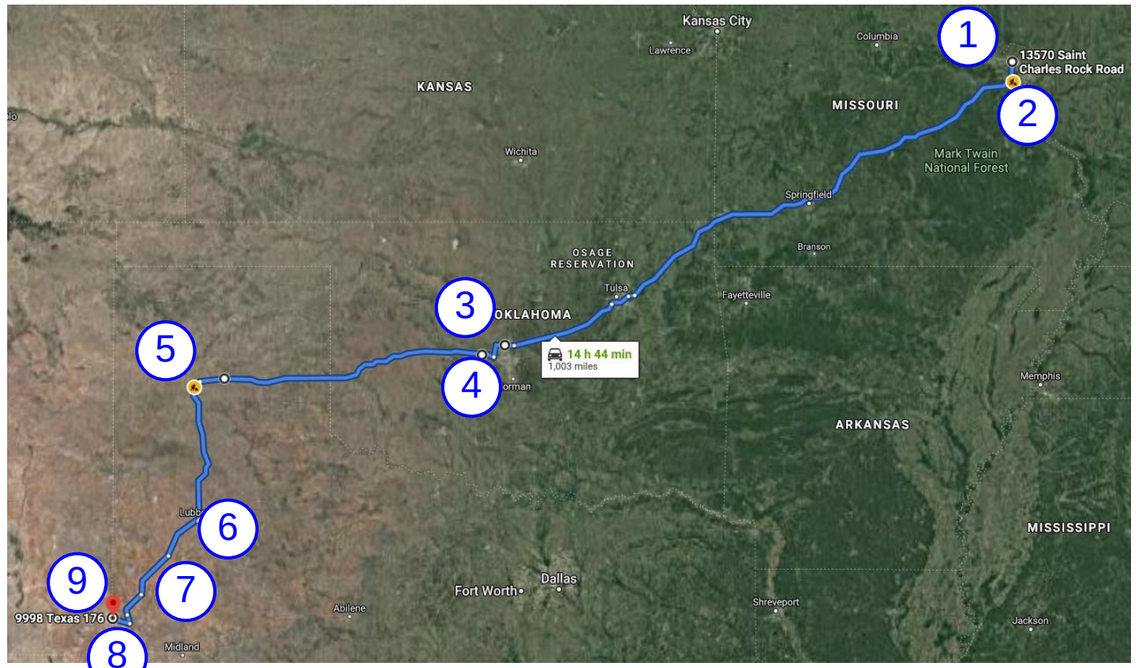
LTODP

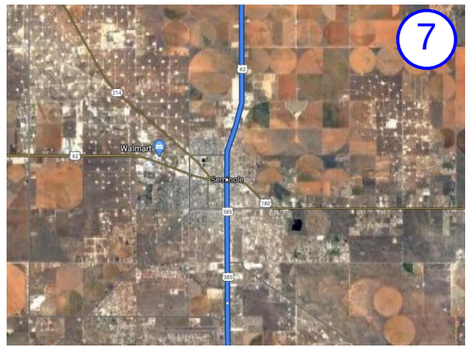
PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

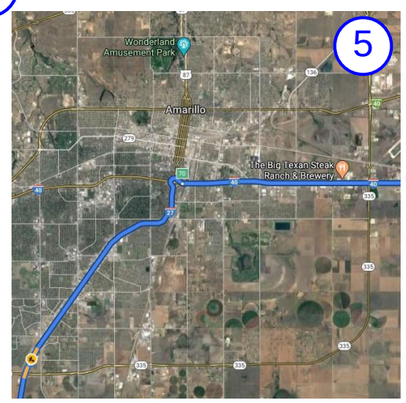
Plotted By: CS

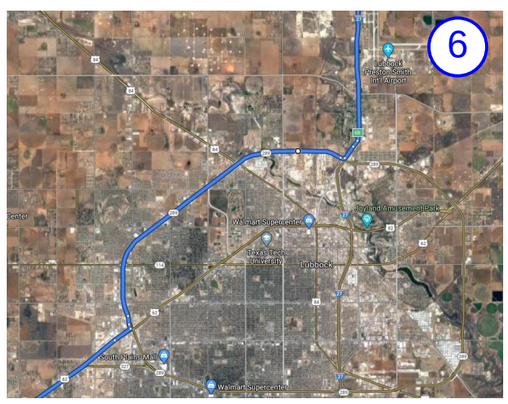
Plot Date: 3/11/2020

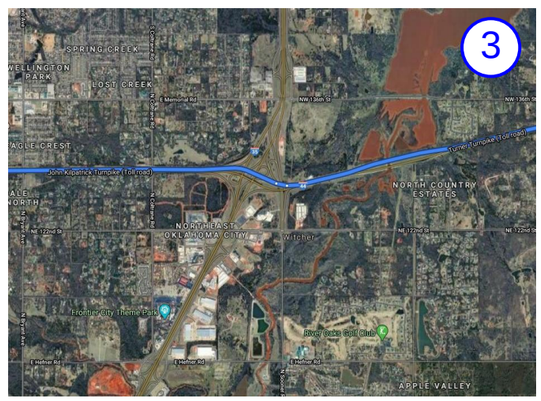
Document Path: Q:\GIS\West Lake\Rail Transportation\Rail Distance Buffers.mxd

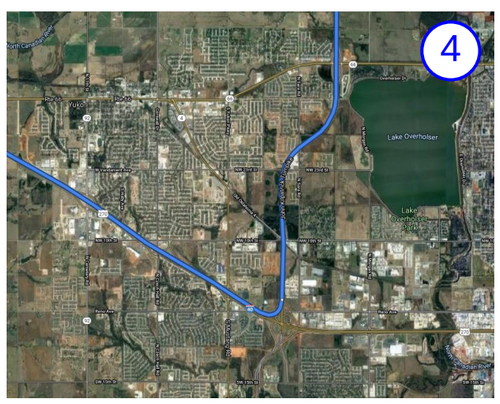


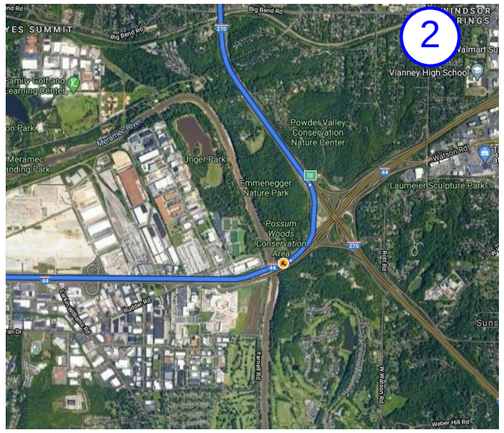












Map #	Action	Location
1	**Start**	**13570 St Charles Rock Road Bridgeton, MO 63044**
1	Head northeast toward St Charles Rock Rd	Bridgeton, MO
1	Turn right onto St Charles Rock Rd	Bridgeton, MO
1	Turn right to merge onto I-270 S	Bridgeton, MO
2	Merge onto I-44 W	Sunset Hills, MO
3	Merge onto John Kilpatrick Turnpike	Oklahoma City, OK
4	Merge onto I-40 W	Oklahoma City, OK
5	Merge onto I-27 S	Amarillo, TX
6	Exit onto TX-289 W	Lubbock, TX
6	Turn right onto US-62 W	Lubbock, TX
7	Turns into US 385-S	Seminole, TX
8	Turn right onto TX-176 W	Andrews, TX
9	**Arrive**	**9998 W. State Hwy. 176 Andrews, TX 79714**

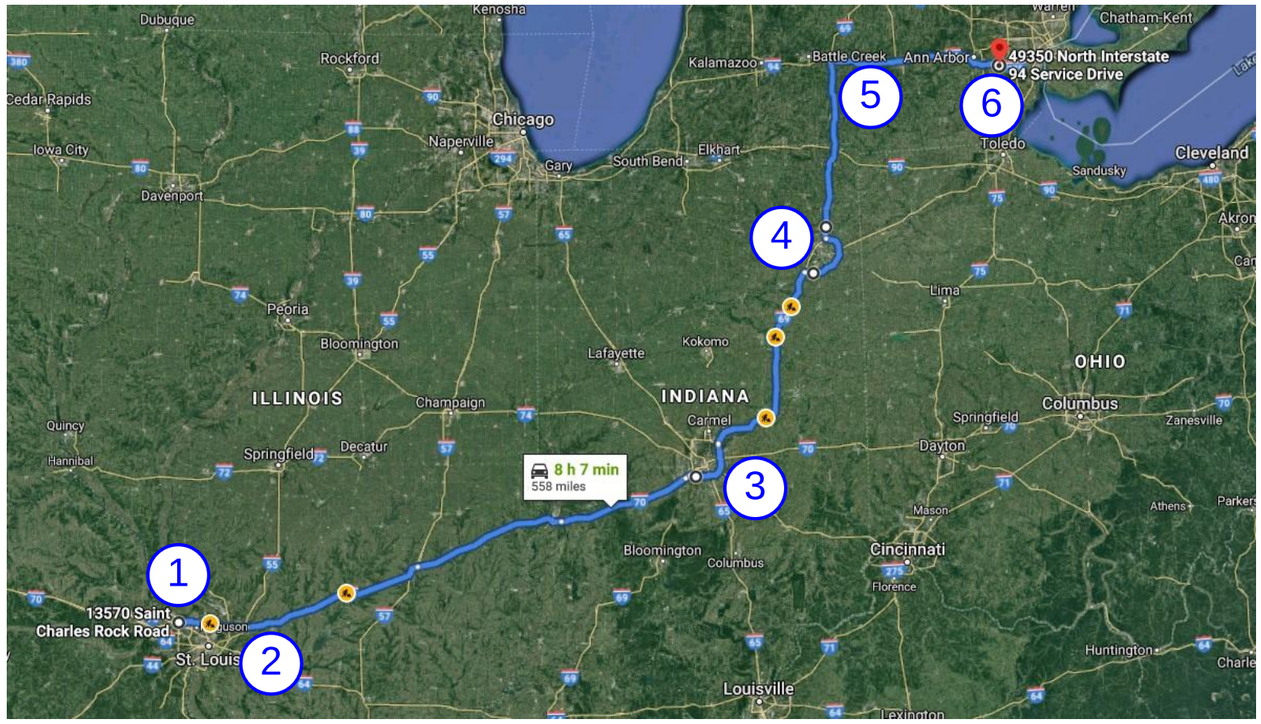
FIGURE 5
LONG DISTANCE TRUCK ROUTE

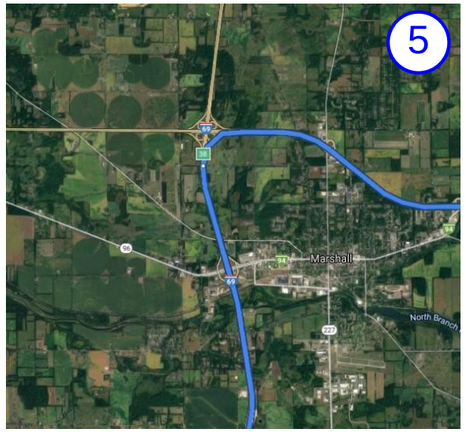
ROUTE: WEST LAKE TO WASTE CONTROL SPECIALISTS SITE

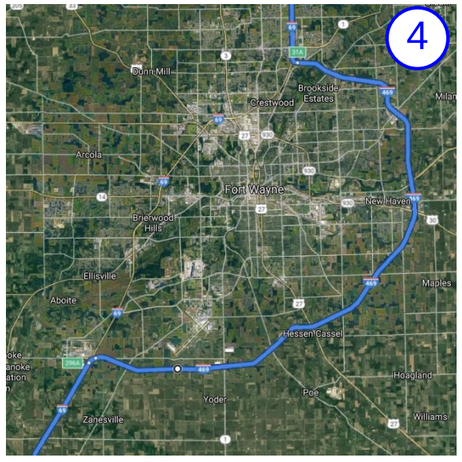
WEST LAKE LANDFILL SUPERFUND SITE OPERABLE UNIT 1

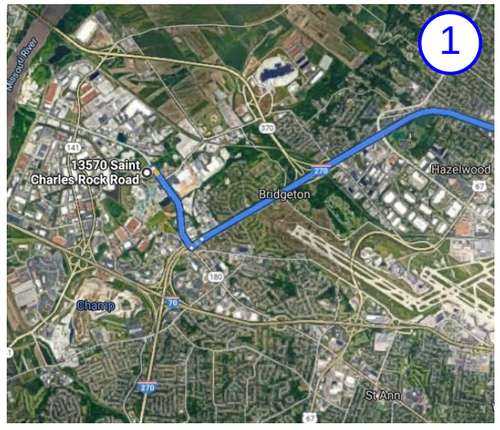
PARSONS
ST. MARY'S HALE CENTRE DRIVE, SUITE 400
SAINT LOUIS, MISSOURI 63141-5743 (314) 432-2600

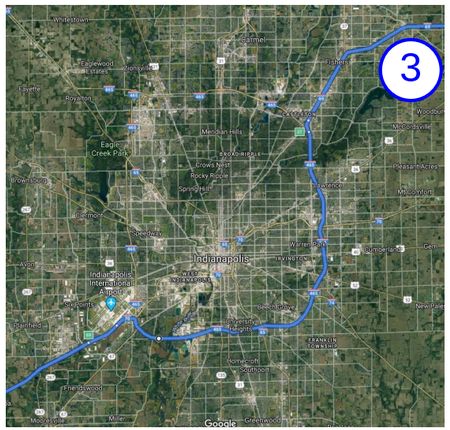
MO STATE CERTIFICATE OF AUTHORITY #000479 ENGINEERING











Map #	Action	Location
1	**Start**	**13570 St Charles Rock Road Bridgeton, MO 63044**
1	Head northeast toward St Charles Rock Rd	Bridgeton, MO
1	Turn right onto St Charles Rock Rd	Bridgeton, MO
1	Turn left to merge onto I-270 N	Bridgeton, MO
2	Merge onto I-70 E	Troy, IL
3	Merge onto I-465 E	Indianapolis, IN
3	Merge onto I-69 N	Indianapolis, IN
4	Merge onto I-469 N	Ft. Wayne, IN
4	Merge onto I-69 N	Ft. Wayne, IN
5	Merge onto I-94 E	Marshall, MI
6	Exit onto Rawsonville Road, turn left	Rawsonville, MI
6	Turn right onto N. I-94 Service Drive	Rawsonville, MI
6	**Arrive**	**49350 North I-94 Service Drive Belleville, MI 48111**

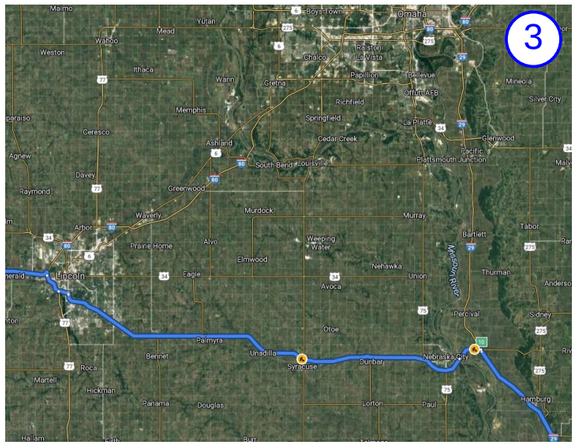
FIGURE 6
LONG DISTANCE TRUCK ROUTE

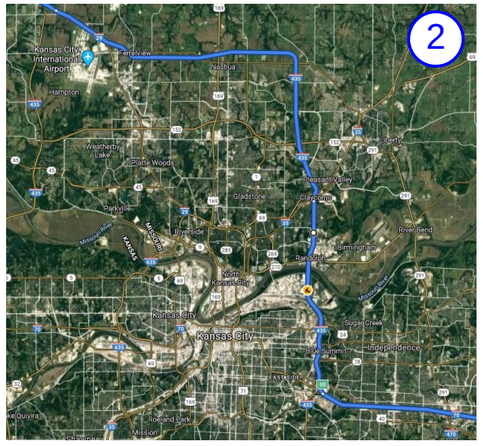
ROUTE: WEST LAKE TO US ECOLOGY – MICHIGAN SITE

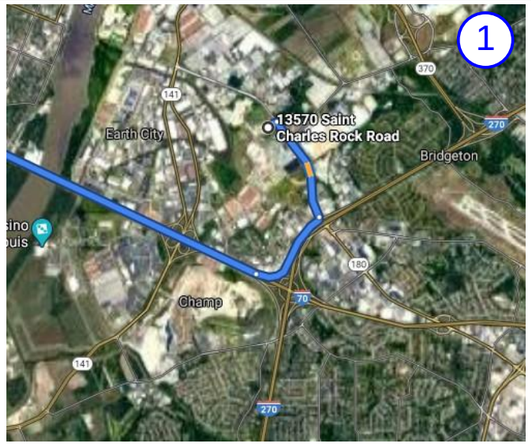
WEST LAKE LANDFILL SUPERFUND SITE OPERABLE UNIT 1

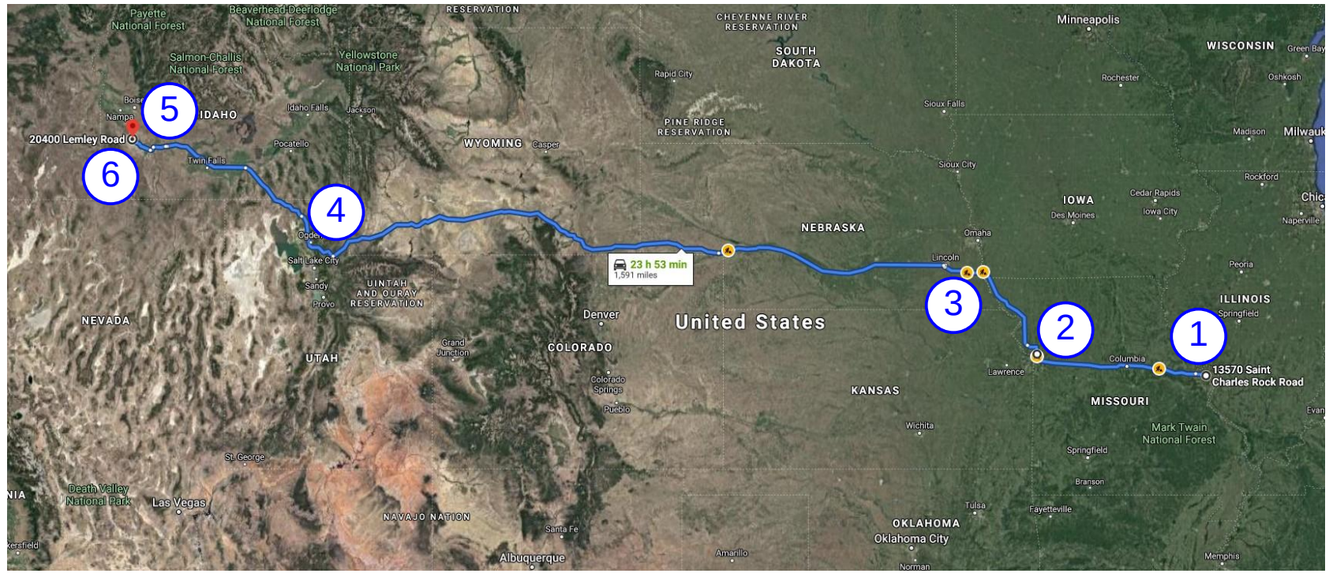
PARSONS
1700 MARKET STREET, SUITE 1000
ST. LOUIS, MISSOURI 63103-4141 314.436.4900

MO STATE CERTIFICATE OF AUTHORITY #000479 ENGINEERING

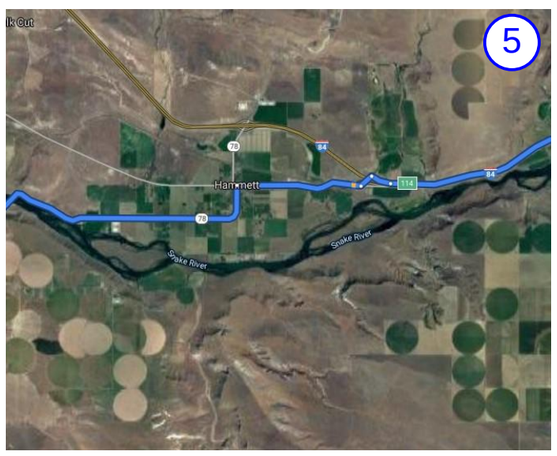








Map #	Action	Location
1	**Start**	**13570 St Charles Rock Road Bridgeton, MO 63044**
1	Head northeast toward St Charles Rock Rd	Bridgeton, MO
1	Turn right onto St Charles Rock Rd	Bridgeton, MO
1	Turn right to merge onto I-270 S	Bridgeton, MO
1	Merge onto I-70 W	Earth City, MO
2	Merge onto I-435 N	Blue Springs, MO
2	Merge onto I-29 N	Ferrelview, KS
3	Exit onto State Hwy 2 W, Turn left	Percival, IA
3	Merge onto US Hwy 77 N	Lincoln, NE
3	Merge onto I-80 W	Lincoln, NE
4	Merge onto I-84 W	Echo, UT
5	Exit onto State Hwy 78 W	Hammett, ID
6	Turn right onto Lemley Road N	Grand View, ID
6	**Arrive**	**20400 Lemley Road Grand View, ID 83624**



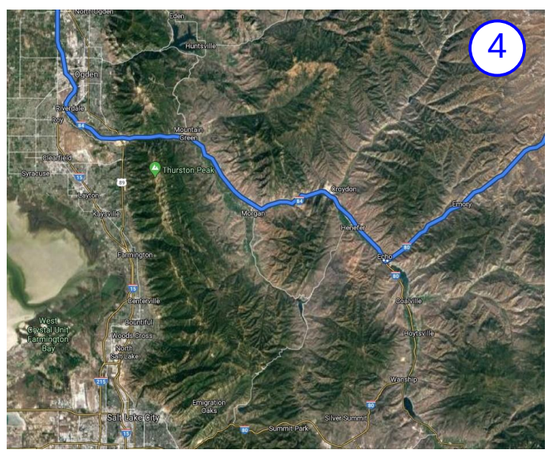


FIGURE 7
LONG DISTANCE TRUCK ROUTE

ROUTE: WEST LAKE TO US ECOLOGY – IDAHO SITE

WEST LAKE LANDFILL SUPERFUND SITE OPERABLE UNIT 1

PARSONS
1700 MARKET STREET, SUITE 1000
ST. LOUIS, MISSOURI 63103-4435 314.436.4900

MO STATE CERTIFICATE OF AUTHORITY #000479 ENGINEERING

ATTACHMENT A INDUSTRIAL RAIL SPUR CONNECTION FEASIBIILTY ASSESSMENT

MEMORANDUM

May 12, 2020

To: West Lake OU-1 Design Team

From: Parsons Railway Engineering Team

Subject: West Lake Landfill Superfund Site OU-1, Industrial Rail Spur Connection Feasibility Assessment

As stated in the Record of Decision Amendment for the West Lake Landfill OU-1, the feasibility of constructing a rail-spur on site is to be evaluated during the Remedial Design process. An on-site rail spur would allow for direct loading of waste shipping containers for transport and disposal, while reducing the impacts of increased truck traffic to and from the Site, as well as limiting the potential for the incidental release of materials or any contamination in the event of a traffic accident during trucking to an offsite rail transloading facility.

The purpose of this technical memorandum is to document a feasibility assessment of extending two nearby existing rail spurs to the West Lake Landfill Superfund Site (Site). This memorandum outlines significant feasibility challenges and safety concerns related to the rail spur extension concept. Ultimately, based on this assessment, this memorandum finds that the extension of the rail spur for use on site is not feasible.

Background

The feasibility of rail access to the West Lake Landfill Superfund Site was assessed, focusing on the viability of two different potential spur alignments (**Figure 1**). These two alignments were selected based on Site proximity and feasibility potential. Both alignment options would connect to the existing industrial rail spur network across St. Charles Rock Road. The following two alignments were considered:

- **Alignment 1**: Alignment to the center of the Site, at the current site entrance between Areas 1 and 2. This would be the ideal location since it would be adjacent to the source of the material to be removed.
- **Alignment 2**: Alignment to the south of the Site. This track alignment would not provide optimal access to the location where most of the waste will be generated.

The feasibility of each proposed alignment is discussed below. For both alignment alternatives, the following items were considered for a successful rail connection:

- Railway geometry requirements
- Railroad coordination
- Property ownership, rights-of-way, and easements
- St. Charles Rock Road crossing challenges
- Utilities and drainage considerations
- Proximity to loading zone
- Potential wetland and riparian impacts
- Floodplain risks
- Cost estimates
- Scheduling considerations

Railway Geometry Requirements

Alignment 1

Connecting this location to the existing railroad spur network presents various design issues relating to railway geometry requirements. A major concern with this alignment is at the connection to the existing spur network across St. Charles Rock Road. A very tight radius of about 310 feet, with a degree of curvature of 17.5 degrees, would be needed to avoid adjacent industrial development. This is well beyond the industry track design maximum degree of curvature of 12 degrees (radius of 478.34 feet) per the Norfolk Southern Railway Company Specifications for Design and Construction of Privately Owned Industry Tracks (April 2019). For the purposes of transporting hazardous materials, it is unlikely that design exceptions would be granted by Norfolk Southern Railway for a tight radius since it increases the chances of a derailment. Norfolk Southern guidelines would govern as the proposed rail extension would connect to the Norfolk Southern Railway. Also, looking at the existing spur before its connection to the main rail line, there is another curve that does not meet the industry track design maximum degree of curvature. Both curves of concern in this alignment are shown on **Figure 1**.

Vertical alignment issues would also need to be further studied during the design process for this alignment, if selected. Railroad tracks require flat grades, with a 3% maximum grade allowed on a spur track and 0% for rail car storage areas, as described in the Norfolk Southern Railway Company Specifications for Design and Construction of Privately Owned Industry Tracks (April 2019). Site topography (**Figure 2)** shows that there is considerable relief near the entrance of the Site. Steep grades within the alignment and rail car storage areas would require cutting into solid waste materials and/or building retaining walls. Site regrading necessary to facilitate a spur and railyard for car storage would be significant and would likely require solid waste re-location on the Site. Furthermore, this contradicts the goal on minimizing disturbance to solid waste. **Figure 2** shows the topography at the entrance of the Site. Immediately to the north of the Site entrance, there is about 10 feet of vertical relief that would require grading modifications, while to the south of the alignment is a remediation area. The significant grading modifications required would create considerable disruption to the current operations of this area, interfering with truck traffic going to and from the transfer station, the weigh station, and the inactive Bridgeton Landfill.

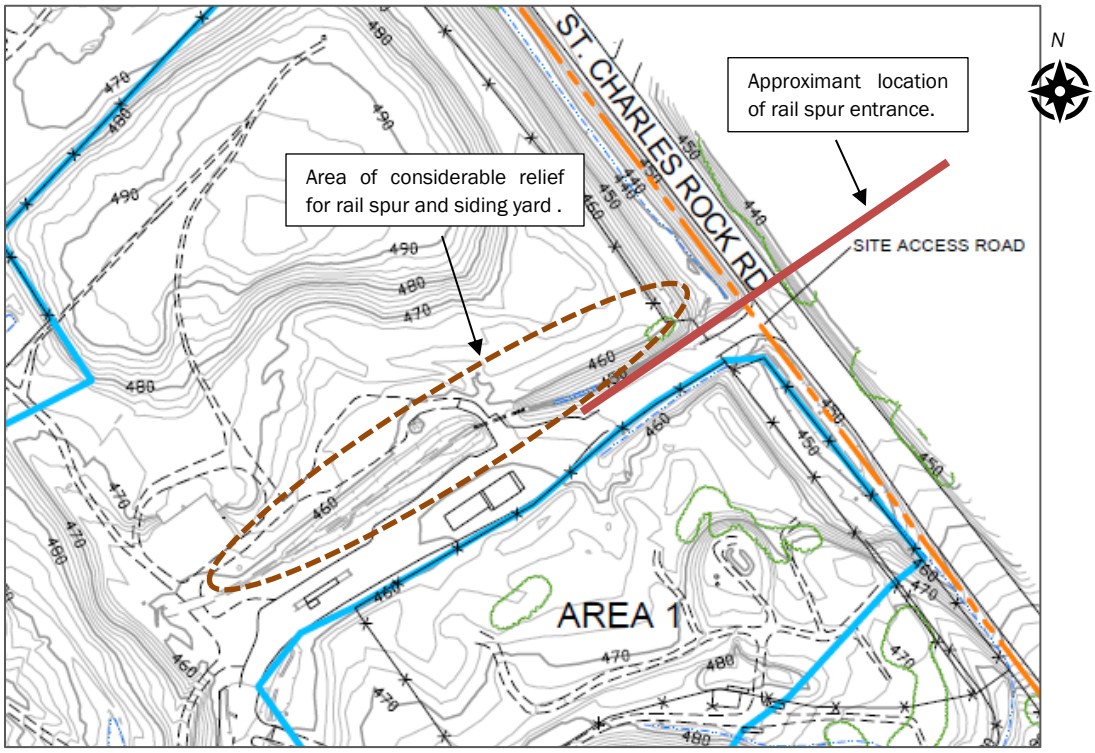


FIGURE 2 STEEP TOPOGRAPHY AT THE ENTRANCE OF THE SITE WOULD REQUIRE SIGNIFICANT GRADING MODIFICATIONS TO ACCOMMODATE A RAIL SPUR

Alignment 2

While the vertical geometry requirements appear to be feasible for Alignment 2, the existing spur contains two curves that do not meet the industry track design maximum degree of curvature before connecting to the main rail line. Both curves of concern are shown on **Figure 1**.

Furthermore, the geometry requirements to the northeast of St. Charles Rock Road appear to be too narrow between the existing buildings for safe train traffic. This area would include the spur alignment adjacent to the property identified as P3 on **Figure 1**. Impacts of the vertical geometry requirements for this alignment would require further evaluation.

Railroad Coordination

An industrial track spur from the Site would connect to the Norfolk Southern Railway (Railway). Standard coordination with the Railway would be needed for any spur connection. Coordination with the Railway would determine the scheduling of track access on the existing spur. The Railway may limit track access on the existing spur below what is necessary to dispose of waste in a timely manner (i.e., access is only allowed for one to two trains per week). This would result in an increase in the amount of space needed to accommodate parking more loaded rail cars on site to wait for the next track access opportunity.

Review and approval of the design plans by the Railway would take place once the 100% plans are complete, to ensure compliance with railroad engineering and safety standards. Although the Railway does not provide an estimated timeframe for its approval process, we anticipate that the review process for this project, given the hazardous materials involved, may take up to 12 months.

Property Ownership, Rights-of-Way, and Easements

Both alignment alternatives discussed above will require the use of private industrial and/or residential properties, as well as utilizing a public right-of-way. Additional research would be needed to determine the need, cost, and schedule implications for acquiring property or land-use easements. The level of effort required to negotiate these agreements in uncertain and could be a very lengthy process.

Properties requiring access agreements are shown as tax parcels on **Figure 1**. The Alignment 1 option would require at least two access agreements, while the Alignment 2 option would require approximately nine access agreements.

St. Charles Rock Road Crossing Challenges

Alignment 1

Rail spur crossing of the public right-of-way, across the four lanes of St. Charles Rock Road, would require a grade crossing. The overall feasibility of a grade crossing is dictated by local regulations, traffic counts, and site distances, including whether crossing gates or a warning signal will be required. Grade changes along the roadside would be required to develop the at-grade rail spur crossing. This introduces safety concerns related to adding a railway grade crossing on this road, as well as concerns about the potential impact to the community and associated travel delays when the rail spur crossing is in operation.

Alignment 2

The road crossing for the Alignment 2 option poses even more risk than the Alignment 1 option, as the crossing for Alignment 2 would be placed on a curve of St. Charles Rock Road. This reduces the line of sight for traffic approaching the rail crossing and further increases community safety concerns.

Utilities and Drainage Considerations

Both alignments would have major impacts on open drainage patterns across the area east of St. Charles Rock Road. This would require a drainage study to quantify the impacts and develop mitigation measures.

The west side of St. Charles Rock Road is a corridor for multiple overhead utilities. As per the Norfolk Southern Railway specifications for Clearances of Tracks located on Industry Property, railroad tracks require a minimum vertical clearance of 27 feet from top of rail to overhead wire. It appears that a 10- to 15-foot raise of these overhead utilities would be needed to allow the spur to cross underneath. The options for addressing this clearance problem would either require four pole replacements to raise the utilities higher or transition the utilities to an underground system.

The poles carry four arms of electrical lines along with several other communications lines; therefore, further identification of multiple line owners would be required to include them in the process.

To relocate these lines, whether raising them higher or moving them underground, would require a certain amount of downtime of the utilities, for the movement and lengthening of the lines. Impacts of this downtime could range from a minor inconvenience to major concerns for some companies for their operations, such as banks, hospitals and other commercial and industrial companies. Residents may also be affected by the downtime.

Figure 3 is an image of the existing utilities along St. Charles Rock Road.

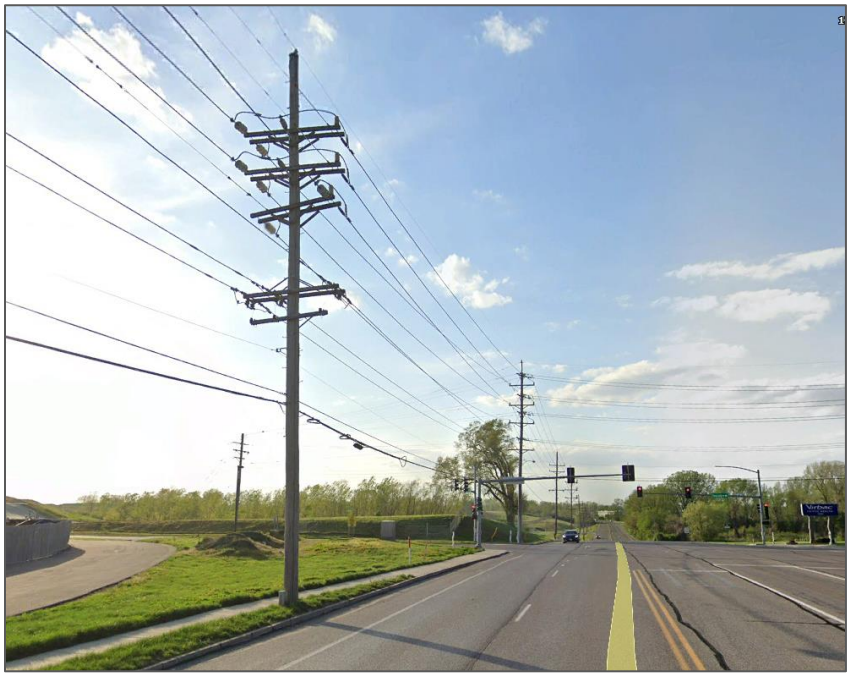


FIGURE 3 IMAGE OF UTILITIES ALONG THE WEST SIDE OF ST. CHARLES ROCK ROAD. THE EXISTING SITE ENTRANCE IS AT THE TRAFFIC LIGHT IN THE LOWER RIGHT QUADRANT OF THE IMAGE

Proximity to Loading Zone

The Alignment 1 option, in the center of the Site, would place the rail cars next to the material to be removed, which simplifies the loading of waste containers onto the rail cars.

Alignment 2, located to the south of the Site, is nearly a straight mile from the location where most of the waste will be generated. This would require additional on-site transportation through the Bridgeton Landfill to move the material from where it is removed to loading on the rail car. There are several issues with implementing this on-site transportation plan:

- The Bridgeton Landfill has a complex gas collection system in place that cannot be disturbed.
- On-site road improvements would be needed, as well as stormwater drainage changes.
- Coordination with many other on-site operations would be required, including ongoing operations of an existing transfer station.

If the waste is not hauled on-site to the Alignment 2 option, a short haul of material on St. Charles Road to the rail yard would be necessary.

Potential Wetlands and Riparian Impacts

Alignment 1 would affect wetlands and riparian habitat east of St. Charles Rock Road, as shown in **Figure 4** from the U.S. Fish and Wildlife Service National Wetlands Inventory. A wetlands impact study would be required and documentation of potential impacts to water resources will require submittal to state and federal agencies. Mitigation for unavoidable impacts would need to be developed in coordination with these agencies during the permitting process and incorporated into final design for both temporary and permanent impacts. Permanent impacts to wetlands and streams from construction activities could require compensatory mitigation.

Figure 4 Screen shot of the U.S. Fish and Wildlife Service National Wetlands Inventory

Floodplain Risks

Alignment 1 is in an area with a reduced flood risk, but Alignment 2 lies in a Federal Emergency Management Agency (FEMA) regulatory floodway (**Figure 1**). Implementation of Alignment 2 would require a Floodplain Encroachment Analysis. If a hydraulic analysis determines that the Base Flood Elevation would rise, a request to revise the regulatory floodway would be submitted first to local officials for approval and then submitted to FEMA for final approval.

Cost Estimates

Preliminary estimates for the design and construction of the physical railway would range from $3 million to $5 million. This estimate does not include costs for environmental assessments and impacts, permitting, acquisition of rights-of-way/easements, at-grade crossing on St. Charles Rock Road, on-site rail yard development, stormwater re-design of affected areas, and utility relocations, all of which could pose significant additional cost.

Scheduling Considerations

It is difficult to predict the duration of time to implement the suggested rail spur extensions. Access agreements, environment permits, Department of Transportation permits, and railway requirements all require review and approval from local, state and federal agencies before construction can begin. This process is expected to be lengthy and it would only take one agency's disapproval to end the rail spur extension project.

Conclusion

While a rail connection to the West Lake Landfill Superfund Site is technically possible, there are enough concerns raised in this feasibility assessment to see that a significant effort would be needed to further quantify the full impacts of a railroad spur connection. Further feasibility studies, at significant costs and time, would be required to fully evaluate the track profile, property acquisition/easement needs, utility relocations, wetland impacts, and floodplain encroachment. Potential impacts to the community would also have to be fully assessed. Each of these items, along with expected design challenges, are significant components that may ultimately terminate the implementation of the rail spur project.

In addition to the safety, cost and project schedule issues cited in this technical memorandum, more concerns are likely to be identified in the course of a detailed feasibility study. Alternative methods of transferring material, which are further detailed in the Loading, Transportation, and Off-Site Disposal Plan, to which this evaluation is attached, provide safer, less disruptive, and more workable options for the Site. Therefore, a rail spur connection is not recommended as a method for waste transport and disposal for the West Lake Landfill Superfund Site.