

APPENDIX R

Ecological Checklist for the SLDS ISOU

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Checklist for Ecological Assessment/Sampling

I. SITE DESCRIPTION

- Site Name:** Inaccessible Soil Operable Unit (ISOU) at the St. Louis Downtown Site (SLDS)
U.S. EPA ID Number: MOD980633176
Location: Site is roughly bounded by Dock Street, Ninth Street, Angelica Street, and the Mississippi River.
County: NA **City:** St. Louis **State:** Missouri
- Latitude:** 38-39-44 N **Longitude:** 90-11-21 W
- Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g. site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known and suspected release area, sampling location and any other important features, if available.** See Figures R-1,R-2, and R-3.

II. SITE CHARACTERIZATION

- What is the approximate area of the site?**
Site is approximately 210 acres.
- Is this the first site visit?** ☒ Yes ☐ No
If no, attach trip report of previous site visit(s), if available.
Date(s) of previous site visit(s):
- Are aerial or other site photographs available?** ☒ Yes ☐ No
If yes, please attach any available photo(s) to the site map at the conclusion of this section.
See attached photographs.
- The land use on the site is:**

50 % Heavy Industrial	48 % Light Industrial	% Urban
% Residential	% Rural	% Agricultural^b
2 % Recreational^a	% Undisturbed	% Other^c

^aFor recreational areas, please describe the use of the area (e.g., park, playing field, etc.).
The Riverfront Bike trail extends along the east side of the property. The bike trail is a paved trail that is located on a levee in the northern portion of the site and then drops into the floodplain area located between the levee and the Mississippi River in the southern portion of the site (See Photos 34 and 35).

^bFor agricultural areas, please list the crops and/or livestock which are present.

^cFor areas designated as "other," please describe the use of the area.
- Provide an approximate breakdown of land uses in the areas surrounding the site. Indicate the radius (in miles) of the area described:** 1- mile radius from the approximate center of the Mallinckrodt property.

40 % Heavy Industrial	28 % Light Industrial	% Urban
7 % Residential	% Rural	% Agricultural^b
% Recreational^a	% Undisturbed	25 % Other^c

^aFor recreational areas, please describe the use of the area (e.g., park, playing field, etc.).

^bFor agricultural areas, please list the crops and /or livestock which are present.

^cFor areas designated as "other," please describe the use of the area. Mississippi River

6. **Has any movement of soil taken place at the site?** ☒ Yes ☐ No

If yes, please identify the most likely cause of this disturbance:

☐ Agricultural Use ☐ Heavy Equipment ☐ Mining ☐ Erosion ☐ Natural Events ☒ Other

Please describe: The project site has been continuously occupied since the early 1800s. Construction and land alteration has occurred throughout the history of site as a variety of structures have been built and then demolished. The construction of the levees involved a large addition of fill material to the site. In addition, numerous remediation activities have occurred at the site, removing contaminated soils and replacing those soils with clean fill.

7. **Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site (e.g., federal and state parks, national and state monuments, wetlands, prairie potholes)? Remember, flood plains and wetlands are not always obvious; do not answer "no" without confirming information.** No. The Mississippi River is located adjacent to the site. The river is channelized at this location, and flow is primarily confined to the navigation channel. A small area of the site is located with the 100-year floodplain of the Mississippi River. The majority of the site is protected by a levee along the eastern edge of the site. National Wetland Inventory Maps from the 1980s indicate that a small forested wetland is located along the river just north of the McKinley Bridge. This wetland was not observed during the field reconnaissance. No other wetlands were observed at the site.

Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

8. **What type of facility is located at the site?**

☒ Chemical ☒ Manufacturing ☐ Mixing ☐ Waste disposal

☒ Other (specify): The primary site is the Mallinckrodt property, which began in 1867 with the construction of a chemical plant. Operations have continued at this site since 1867. From 1942 to 1957, Mallinckrodt processed uranium feed materials in support of the nation's early nuclear program.

9. **What are the suspected contaminants of concern (COCs) at the site? If known, what are the maximum concentration levels? Please cite the source of data cited (e.g. RFI, confirmatory sampling, etc.).**

Contaminants of concern include: arsenic, cadmium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, thorium, uranium, vanadium, and zinc. Radiological constituents include Ra-226, Ra-228, Th-230, Th-232, U-234, U-235, U-238, Ac-227, Pb-210, and Pa-231. Additional details for COCs can be found in the Remedial Investigation (RI) Report.

10. **Check any potential routes of off-site migration of contaminants observed at the site:**

☐ Swales ☐ Depressions ☐ Drainage ditches

☐ Runoff ☐ Windblown particulates ☐ Vehicular traffic

☒ Other (specify): There appears to be very little opportunity for off-site migration through surface water. The majority of the site is covered by buildings, parking lots, or other pavement. Storm water at the site is collected by storm sewers and discharges to a sanitary sewer. Because most of the soils at the site are covered windblown contamination is also unlikely.

11. **If known, what is the approximate depth to the water table?**

7-32' below ground surface (bgs)

12. **Indicate the direction of ground-water flow.**

Ground-water flow is generally to the east.

13. Is the direction of surface runoff apparent from site observations? ☒ Yes ☐ No
If yes, to which of the following does the surface runoff discharge? Indicate all that apply.
- ☐ Surface water ☐ Ground water ☒ Sewer ☐ Collection impoundment
- Storm water on the site is collected in a series of swales and curb and drop inlets and then conveyed offsite to waste water treatment facilities.
14. Is there a navigable water body or tributary to a navigable water body? ☒ Yes ☐ No
The Mississippi River is located adjacent to the site.
15. Is there a water body on or in the vicinity of the site? If yes, also complete Section III.B.1: Aquatic Habitat Checklist -- Non-Flowing Systems and/or Section III.B.2: Aquatic Habitat Checklist -- Flowing Systems.
- ☐ Yes ☒ No
16. Is there evidence of flooding? ☐ Yes ☒ No
Wetlands and flood plains are not always obvious; do not answer "no" without confirming information. If yes, complete Section V: Wetland Habitat Checklist. No visible evidence of flooding or wetlands was observed at the site. The eastern portion of the site is located within the 100-year floodplain of the Mississippi River; however, it does not appear that floodwaters have reached the site in some time. The lack of potential wetlands and floodplains was confirmed by an SAIC wetland scientist during the site visit.
17. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. (Use a blank sheet if additional space is needed for text.) Not applicable
18. Are any threatened and/or endangered species (plant or animal) known to inhabit the area of the site?
☐ Yes ☒ No
If yes, you are required to verify this information with the U.S. Fish and Wildlife Service (USFWS). If species' identities are known, please list them next.
19. Record weather conditions at the time this checklist was prepared:
- Date: 09/10/2010
- Temperature: 80° F Normal daily high temperature: 83° F
- Wind (direction/speed): None Precipitation (rain, snow): <0.1 inches
- Cloud cover: Overcast, occasional light rain
20. Describe reasonable and likely future land and/or water use(s) at the site.
The project site is located within a highly industrialized portion of the City of St. Louis. There are no known plans to discontinue the use of the Mallinckrodt facility. Therefore, the site is anticipated to remain as industrial land use.
- No surface water is located at the site. As noted in the 1998 ROD (USACE 1998a), the Mississippi Alluvial Aquifer (HU-B) qualifies as a potential source of drinking water under the "Guidelines for Groundwater Classification under the USEPA Groundwater Protection Strategy" (USEPA 1988). However, the City of St. Louis explicitly forbids the installation of wells into the subsurface for the purposes of using the ground water as a potable water supply (Ordinance 66777, City of St. Louis 2005).
21. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).
Detailed information concerning site history may be found in the Remedial Investigation Report.
22. Identify the media (e.g., soil [surface or subsurface], surface water, air, ground water) that are known or suspected to contain COCs.
Contamination is suspected in inaccessible soil and sediments associated with buildings and sewers, roadways, and RRs.

IIA. SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

The site visit began at approximately 0930 on 09/10/2010 with overcast skies and a temperature of 80° F. Observations were made within the boundaries of the SLDS property. Areas adjacent to the SLDS were observed from the public roadways.

The SLDS is predominantly an industrialized area, and the only habitat present at the site consists of small wooded areas and barren/field habitats. The wooded areas are located at three main areas (DT-2, DT-5, and DT-9) as shown in Figure R-2. Open field areas are located along the levee (DT-9), at DT-1, and the Terminal Railroad Spoil Area. The largest vegetated area on the site is the area adjacent to the Mississippi River along the levee. The majority of this area is maintained as mowed turfgrass. A highly disturbed, linear forested area is located immediately adjacent to the Mississippi River. This approximately 4.5-acre fragmented woodland is dominated by disturbance-tolerant species such as mulberry (*Morus* sp.), eastern cottonwood (*Populus deltoides*), Amur honeysuckle (*Lonicera maackii*), and Japanese honeysuckle (*Lonicera japonica*). A few American sycamore (*Platanus occidentalis*) and silver maple (*Acer saccharinum*) trees are also present. There is almost no understory present in the woodland.

Other large, vegetated areas at the site include a small wooded area adjacent to the Terminal railroad tracks, a wooded area adjacent to the Ameren UE electrical station (DT-5), and a former building site (DT-1). All of these areas are characterized by disturbance-tolerant species such as tree of heaven (*Ailanthus altissima*), Amur honeysuckle, Johnson grass (*Sorghum halepense*), and ragweed (*Ambrosia artemisiifolia*, *A. trifida*). These areas are described in more detail in Sections IIIA1 and IIIA3.

Wildlife observations during the site visit included several bird species (swallow, sparrow, robin, cardinal, mourning dove, and mockingbird), as well as a groundhog den, raccoon tracks, and beaver cuttings.

There are no complete significant exposure pathways to ISOU media being evaluated in the ISOU RI Report (inaccessible soil, storm-sewer sediment, and structural surfaces) at the site. There is no natural ecological habitat at the site. Few terrestrial receptors are likely to inhabit the site, because the patchiness of the vegetation, lack of cover and water, and high level of disturbance are unattractive to wildlife. The only receptors likely to use the site would be urban-adapted species. Finally, there is currently no evidence of significant contaminant transport via ground water to more sensitive aquatic habitats offsite. However, further evaluation of potential risks to the environment from site ground water will be conducted as part of the Ground-water Remedial Action Alternative Assessment initiated under the 1998 ROD.

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Affiliation: SAIC

Date: 09/10/2010

III. HABITAT EVALUATION

IIIA. Terrestrial Habitat Checklist

IIIA1. WOODED

1. Are there any wooded areas at the site? ☒ Yes ☐ No
If no, go to Section IIB: Shrub/Scrub.

Wooded Area Questions

- ☒ Onsite ☐ Offsite

Name or Designation: Wooded Area 1 (DT-2); Figure R-2, Photographs 1-4

1. Estimate the approximate size of the wooded area. 4.5 acres
Please identify what information was used to determine the wooded area of the site (e.g., direct observation, photos, etc.). Aerial photography and direct observation
2. Indicate the dominant type of vegetation in the wooded area. Provide photographs, if available.

- ☐ Evergreen
☒ Deciduous
☐ Mixed

Dominant plant species, if known: Species underlined were dominant

Tree and Shrub Layer: Mulberry, cottonwood, Amur honeysuckle, sumac, (*Rhus* sp.), silver maple, black willow (*Salix nigra*), black locust (*Robinia pseudoacacia*), Siberian elm (*Ulmus pumila*).

3. Estimate the vegetation density of the wooded area.

- ☒ Dense (i.e., greater than 75% vegetation)
☐ Moderate (i.e., 25% to 75% vegetation)
☐ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at breast height.

- ☐ 0-6 inches
☒ 6-12 inches
☐ >12 inches
☐ No single size range is predominant

5. Specify type of understory present, if known. Provide a photograph, if available.

Honeysuckle was the only understory species present. The following species were present in the unmowed areas adjacent to the woods: Johnson grass, foxtail (*Setaria glauca*), goldenrod (*Solidago* sp.), late-flowering thoroughwort (*Eupatorium serotinum*), elderberry (*Sambucus canadensis*).

Name or Designation: Wooded Area 2 (DT-5); Figure R-2, Photographs 4-8

Estimate the approximate size of the wooded area. 0.5 acres

Please identify what information was used to determine the wooded area of the site (e.g., direct observation, photos, etc.). Aerial photography and direct observation

1. Indicate the dominant type of vegetation in the wooded area. Provide photographs, if available.

- ☐ Evergreen
☒ Deciduous
☐ Mixed

Dominant plant species are underlined: cottonwood, tree of heaven, sycamore, black locust, Catalpa (*Catalpa speciosa*)

2. Estimate the vegetation density of the wooded area.

- ☒ Dense (i.e., greater than 75% vegetation)
☐ Moderate (i.e., 25% to 75% vegetation)
☐ Sparse (i.e., less than 25% vegetation)

3. Indicate the predominant size of the trees at the site. Use diameter at breast height.

- ☒ 0-6 inches
☐ 6-12 inches
☐ >12 inches
☐ No single size range is predominant

4. Specify type of understory present, if known. Provide a photograph, if available.

Understory was limited to Amur honeysuckle with some horseweed (*Conyza canadensis*), ragweed, and late-flowering thoroughwort along the edges of the woods.

Name or Designation: Wooded Area 3 (DT-9); Figure R-3, Photographs 9-12

1. Estimate the approximate size of the wooded area. 1.0 acres

Please identify what information was used to determine the wooded area of the site (e.g., direct observation, photos, etc.). Aerial photography and direct observation

2. Indicate the dominant type of vegetation in the wooded area. Provide photographs, if available.

- ☐ Evergreen
☒ Deciduous
☐ Mixed

Dominant plant species are underlined: Mulberry, Siberian elm, tree of heaven, sycamore, wild grape, cottonwood, hackberry

3. Estimate the vegetation density of the wooded area.

- ☒ Dense (i.e., greater than 75% vegetation)
☐ Moderate (i.e., 25% to 75% vegetation)
☐ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at breast height.

- ☒ 0-6 inches
☐ 6-12 inches
☐ >12 inches
☐ No single size range is predominant

5. **Specify type of understory present, if known. Provide a photograph, if available.**

The understory was limited to Amur honeysuckle. Some scattered camphorweed (*Heterotheca subaxillaris*) and annual sunflower (*Helianthus annuus*), as well as a few large clusters of Johnson grass, were present in the gravel area adjacent to the woods.

IIIA2. SHRUB/SCRUB

1. **Is shrub/scrub vegetation present at the site?** ☐ Yes ☒ No

If no, go to Section IIC: Open Field.

The remainder of Section IIIA2 is not applicable

IIIA3. OPEN FIELD

1. **Are there open (bare, barren) field areas present at the site?** ☒ Yes ☐ No

If yes, please answer the questions below:

Open Field Area Questions

☒ Onsite ☐ Offsite

Name or Designation: Field 1 (Plant 7E, DT-1); Photographs 13-20

1. **Estimate the approximate size of the open field area.** 7.0 acres

Please identify what information was used to determine the open field area of the site. Aerial photography and direct observation.

2. **List the vegetation: (dominant vegetation is underlined).**

Field 1A: Johnson grass, common ragweed, common sunflower, evening primrose (*Oenothera biennis*), purple top (*Tridens flavus*), foxtail, partridge pea (*Chamaecrista fasciculata*), common mullein (*Verbascum thapsus*), cottonwood

Field 1B: Johnson grass, foxtail, common ragweed, late-flowering thoroughwort, cottonwood, common sunflower, spotted spurge (*Euphorbia maculate*), goldenrod, common mullein, horseweed

3. **Estimate the vegetation density of the area.**

☐ Dense (i.e., greater than 75% vegetation)

☒ Moderate (i.e., 25% to 75% vegetation)

☐ Sparse (i.e., less than 25% vegetation)

4. **Indicate the approximate average height of the dominant plant:** Cottonwoods on the edge of the Field 1A were approximately 8-10 ft tall, several cottonwoods were that tall in Field 1B, and a single tree near the center of the site was approximately 25 ft tall. Sunflowers in the interior of both sites were approximately 3 ft tall.

Name or Designation: Field 2 (DT-9); Photographs 21-24

1. **Estimate the approximate size of the open field area.** 13 acres

Please identify what information was used to determine the open field area of the site. Aerial photographs and site observation.

2. **List the vegetation: (dominant vegetation is underlined).**

Common ragweed, foxtail, Johnson grass, wormwood (*Artemisia* sp.), spiny amaranth (*Amaranthus spinosus*), chicory (*Cichorium intybus*), red clover (*Trifolium pretense*)

3. Estimate the vegetation density of the area.

- ☐ Dense (i.e., greater than 75% vegetation)
☒ Moderate (i.e., 25% to 75% vegetation)
☐ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant: 5-6 feet

Name or Designation: Field 3 (Terminal Railroad Spoil Area); Photographs 25-27

1. Estimate the approximate size of the open field area. 5.75 acres

Please identify what information was used to determine the open field area of the site.

2. List the vegetation: (dominant vegetation is underlined).

Common sunflower, late-flowering thoroughwort, camphorweed, Johnson grass, horseweed, mulberry, common mullein, goldenrod, Chinese lespedeza, (*Lespedeza cuneata*), Queen Anne's lace (*Daucus carota*), common ragweed.

3. Estimate the vegetation density of the area.

- ☐ Dense (i.e., greater than 75% vegetation)
☒ Moderate (i.e., 25% to 75% vegetation)
☐ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant. 3-4 ft

IIIA4. MISCELLANEOUS

1. Are other types of terrestrial habitats present at the site, other than woods, scrub/shrub, and open field?

☒ Yes ☐ No

If yes, identify and describe them below.

2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map.

Areas of vegetation less than 0.1 acre in size are scattered throughout the SLDS along fence lines and in the corners of unused lots. In total, it is estimated that these sites total less than 1.5 acres of additional habitat. Vegetation in these areas is characterized by noxious and invasive species, such as Johnson grass, ragweed, mulberry, Amur honeysuckle, and tree of heaven. A few sites contained cottonwoods and sumac. See photographs 32-33.

3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

Several species of birds were observed at the site, including swallow, mourning dove, mockingbird, robin, cardinal, American goldfinch, and sparrows. Raccoon tracks were observed along the Mississippi River, and a ground hog den was observed in Wooded Area 2. Evidence of beaver cuts on trees was also observed in the wooded area adjacent to the river. An eastern cottontail rabbit was observed in Field 3.

4. Review the questions in Section I to determine if any additional habitat checklists should be completed for this site.

No other habitat type is applicable.

III.B AQUATIC HABITAT

III.B1 NON-FLOWING SYSTEMS

1. What type of open-water, non-flowing system is present at the site? None

The remainder of Section IIIB1 is not applicable.

III.B2 FLOWING SYSTEMS

1. What type(s) of flowing water system(s) is (are) present at the site? The Mississippi River is located adjacent to the site.

Flowing Aquatic Systems Questions

☐ Onsite ☒ Offsite

Name or Designation: Mississippi River – The river is not considered part of the site, although it is possible that during a 100-year flood event, portions of the site east of the levee (DT-2, DT-9, DT-15) would be flooded. See Photographs 28-31.

Indicate the type of flowing aquatic feature present. River

1. For natural systems, are there any indicators of physical alteration (e.g., channeling, debris, etc.)?

☐ Yes ☒ No

If yes, please describe the indicators observed.

The river has been extensively modified through the use of dams, dredging, levees, wing dams, and rip-rap. Most of the river bank adjacent to the site has at least some remaining rip-rap structure.

2. Indicate the general composition of the bottom substrate.

<input type="checkbox"/> Bedrock	<input type="checkbox"/> Sand (course)	<input type="checkbox"/> Concrete
<input type="checkbox"/> Boulder (>10 inches)	<input checked="" type="checkbox"/> Silt (fine)	<input checked="" type="checkbox"/> Debris
<input type="checkbox"/> Cobble (2.5 - 10 inches)	<input type="checkbox"/> Clay (slick)	<input checked="" type="checkbox"/> Detritus
<input type="checkbox"/> Gravel (0.1 - 2.5 inches)	<input checked="" type="checkbox"/> Muck (fine/black)	<input type="checkbox"/> Marl (Shells)
<input type="checkbox"/> Other (please specify): _____		

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover).

The bank is generally steep and at the time of the survey extended approximately 15-20 ft above the water level of the river. The bank was un-vegetated and consisted of a mix of rip-rap and silt.

4. Is the system influenced by tides? ☐ Yes ☒ No
What information was used to make this determination?

5. Is the flow intermittent? ☐ Yes ☒ No
If yes, please note the information used to make this determination.

6. Is there a discharge from the site to the water body? ☐ Yes ☒ No
If yes, describe the origin of each discharge and its migration path.

7. Indicate the discharge point of the water body. Specify name of the discharge, if known.

8. **Identify any field measurements and observations of water quality that were made. Provide the measurement and the units of measure in the appropriate space below:**
No water quality measurements were made.
9. **Describe observed color and area of coloration.**
No color observations were made.
10. **Is any aquatic vegetation present?** ☐ Yes ☒ No
If yes, please identify the type of vegetation present, if known.

☐ Emergent ☐ Submergent ☐ Floating
11. **Mark the flowing water system on the attached site map.**
See attached Figures R-1 and R-2.
12. **What observations were made at the water body regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc?** Evidence of birds (swallow, mourning dove), beaver, and raccoon were observed at the site.

IIIC. WETLAND HABITAT CHECKLIST

1. Are any wetland¹ areas such as marshes or swamps on or adjacent to the site?
☐ Yes ☒ No

Identify the sources of the observations and information (e.g., National Wetland Inventory, federal or state agency, U.S. Geological Survey [USGS] topographic maps) used to make the determination whether or not wetland areas are present.

The lack of wetlands on site determination was made after a review of National Wetland Inventory maps, aerial photographs, and an on-site visit by an SAIC wetland scientist.

If no wetland areas are present, proceed to Section III.D: Sensitive Environments and Receptors.

III.D Sensitive Environments and Receptors

1. **Do any other potentially sensitive environmental areas² exist adjacent to or within one-half mile of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. Do not answer “no” without confirmation from the USFWS and other appropriate agencies. See Table 1 for a list of contacts.**
No. The project is located within an industrial urban area with no potential for sensitive environmental areas. The Missouri Department of Conservation’s Natural Heritage database indicated that no threatened or endangered species are known to occur in the City of St. Louis.
2. **Are any areas on or near (i.e., within one-half mile) the site owned or used by local tribes? If yes, describe.**
No

¹Wetlands are defined in 40 *CFR* §232.2 as “ Areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Examples of typical wetlands plants include: cattails, cordgrass, willows, and cypress trees. National wetland inventory maps may be available at <http://nwi.fws.gov>. Additional information on wetland delineation criteria is also available from the USACE.

² Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to Table 2 at the end of this document for examples of sensitive environments.

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. This information should be obtained from the USFWS and other appropriate agencies. See Table 1 for a list of contacts.
No suitable habitat is present on site.
4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.
The site could provide limited habitat to urban-adapted migratory bird species such as robins or killdeer.
5. Is the site used by any ecologically³, recreationally, or commercially important species? If yes, explain.
No, the limited habitat quality and quantity on the site would only be suitable for species adapted to urban habitat.

IV. EXPOSURE PATHWAY EVALUATION

Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

Yes
No

Uncertain

1. Please provide an explanation for your answer. Numerous studies have been conducted on site, including the 1977 radiological survey, the 1987 to 1990 Phase 1 and Phase 2 site characterization, an RI addendum in 1992 and 1993, the 1998 background soil survey, and the ongoing pre-design investigations (PDIs) and final status survey evaluations (FSSEs). Details of these investigations are included in the *Remedial Investigation Work Plan for the Inaccessible Soil Operable Unit at the St. Louis Downtown Site*.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in off-site affected areas?

Yes

No

Uncertain

No offsite contamination

Please provide an explanation for your answer: Observation of site conditions, including ground-water flow and the impervious nature of the majority of the site surface, limit potential for offsite contamination.

3. Do existing data address potential migration pathways of contaminants at the site?

Yes
No

Uncertain

Please provide an explanation for your answer. The majority of potential site contaminants occur within accessible soils at the site that are under remediation. Migration of contaminants from inaccessible soil is limited, because most of these soils are covered by buildings, pavement, or other impervious materials.

³ Ecologically important species include populations of species, which provide a critical (i.e., not replaceable) food resource for higher organisms. These species' functions would not be replaced by more tolerant species or perform a critical ecological function (such as organic matter decomposition) and will not be replaced by other species. Ecologically important species include pests and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc).

4. Do existing data address potential migration pathways of contaminants in off-site affected areas?

Yes

No

Uncertain

No offsite contamination

Please provide an explanation for your answer. See response to question 2 above.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within one-half mile) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available. No
6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 1 ft bgs. If yes, explain.
Contamination may be present within the inaccessible soil at the site. The potential that receptors could come in contact with this soil is unlikely due to the presence of buildings, roadways, etc. acting as cover material. Additionally, the presence of potential receptors is limited by the quality and quantity of available habitat on site.
7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment, or surface water? If yes, explain.
Chemicals present on site are limited to the inaccessible soil.
8. Could chemicals reach receptors via ground water? Can chemicals leach or dissolve to ground water? Are chemicals mobile in ground water? Does ground water discharge into receptor habitats? If yes, explain.
No. While it is possible that chemicals found on the site could leach or dissolve into the ground water, there is no open pathway for ecological receptors due to the depth to ground water and the general lack of sensitive receptors.
9. Could chemicals reach receptors through runoff or erosion? Unlikely. The majority of the site is covered by impervious surfaces such as parking lots, buildings, and walkways. The portions of the site not covered by impervious surfaces are protected by landscape plants, mulch, and turf grass.

Answer the following questions.

What is the approximate distance from the contaminated area to the nearest watercourse?

0 feet (i.e., contamination has reached a watercourse)

1-10 ft

11-20 ft

21-50 ft

51-100 ft

101-200 ft

> 200 ft

> 500 ft

> 1000 ft

What is the slope of the ground in the contaminated area?

0-10%

10-30%

> 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

< 25%

25-75%

> 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

Yes

☒ No

Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

Yes

☒ No

Do not know

10. **Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.**

No

11. **Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating toward receptors or habitats? Could NAPL discharge contact receptors or their habitat? No**

Conclusion

Given the environmental setting/nature of the potential contamination in the inaccessible soils at the SLDS, the results of this Ecological Risk Checklist concur with the findings of the 1993 ecological evaluation that the ISOU evaluations should focus on the protection of human health for the following reasons: (1) the SLDS is a heavily urbanized area not suitable for habitation of sensitive and threatened and endangered (T&E) species, (2) it is highly unlikely that potential ecological impacts from the ISOU are greater than those from accessible media, (3) the potential for direct exposures to ISOU media is greater for humans than for terrestrial or aquatic species, and (4) the potential for subsurface migration beneath structures to sensitive terrestrial or aquatic habitats (although none are likely to exist) is unlikely. Also, given that some remediation at the SLDS has since been conducted, potential impacts to ecological resources from the ISOU contaminated media are likely to be even less significant than those determined during the 1993 BRA. Therefore, no comprehensive ecological risk assessment will be performed as part of the ISOU RI.

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FIGURES

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LEGEND

Property Boundary

Uranium-Ore Processing Areas as Defined by the 1998 ROD

SLDS Boundary

Building or Tank

River/Stream

Fence

Railroad

Elevations (ft asl)

	397-404
	404-412
	412-420
	420-428
	428 - 436
	436-444
	444-452
	452-460
	460-468

MO-East State Plane
(NAD 83, Feet)

0

160

320

640

Feet

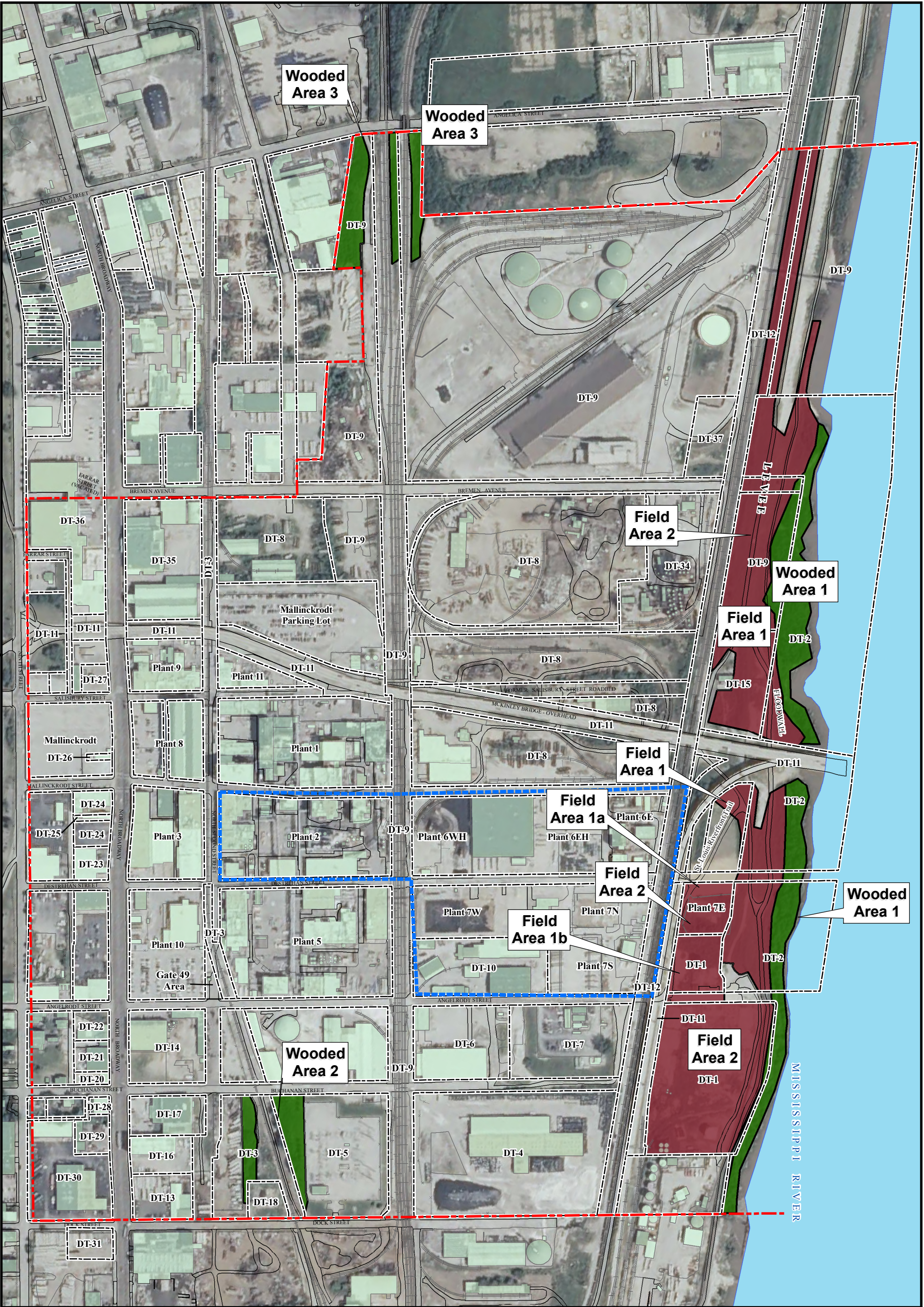
St. Louis Downtown Site (SLDS)
St. Louis, Missouri

DRAWN BY:
DLL

REV:
B

DATE:
10/24/11

R-1. Topographic Map



St. Louis Downtown Site (SLDS)
St. Louis, Missouri

FUSRAP

DRAWN BY:	REV:	DATE:
DLL	2	10/24/11

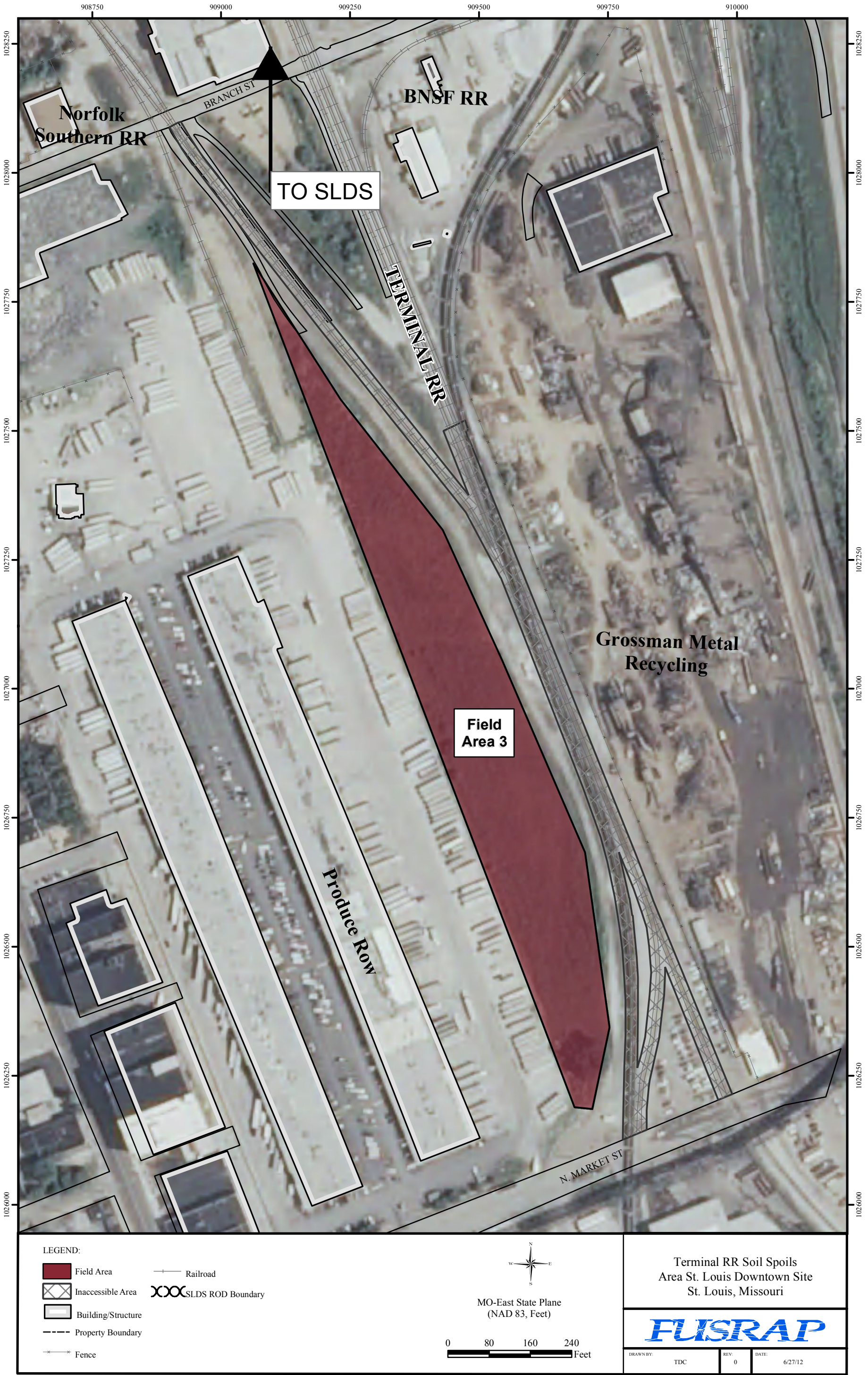


Figure R-3. Terminal RR Soil Spoils Area

PHOTOGRAPHS

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Wooded Area 1 (DT-2)



Photo 1. View looking south at the northern edge of the wooded area. McKinley Bridge is visible in the background.



Photo 2. View facing east from the top of the levee at wooded area 1 and field area 1.



Photo 3. View of wooded area facing southeast.



Photo 4. View of understory within the wooded area.

Wooded Area 2 (DT-5)



Photo 5. View facing southeast at the edge of the Ameren UE substation. Bradford pears are located to the left with the wooded area to the right. Ragweed and late-flowering thoroughwort are visible in the foreground.



Photo 6. View of wooded area from the railroad tracks. Tree of heaven and late-flowering thoroughwort are the most visible species. Goldenrod and honeysuckle are also present at this location.



Photo 7. View southeast along the southwest edge of Wooded Area 2.



Photo 8. Groundhog den within Wooded Area 2.

Wooded Area 3 (DT-9)



Photo 9. View from the intersection of Angelica railroad crossing. View is facing southwest at woodland on the southwest edge of the railroad tracks.



Photo 10. View facing south.



Photo 11. View facing southeast with both strips of woods visible at the edge of the photographs.



Photo 12. View of honeysuckle understory.

Field Area 1a (Plant 7E)



Photo 13. View of DT-1 facing south.



Photo 14. View of DT-1 inside the fenceline facing southeast.



Photo 15. View of DT-1 facing south.



Photo 16. Additional view of DT-1 facing south.

Field Area 1b (DT-1)



Photo 17. View of DT-1 facing east.



Photo 18. View facing east southeast.



Photo 19. View facing east northeast.



Photo 20. View facing north northeast.

Field Area 2 (DT-9)



Photo 21. View looking south along the levee. Photograph was taken near the northern boundary of the site. McKinley Bridge is visible in the background.



Photo 22. View facing north at the toe of the levee. Photograph shows Johnson grass to the right with several cottonwoods visible in the background.



Photo 23. View facing north from the top of the levee. Johnson grass, ragweed, wormwood species are visible along the top and toe of the levee.



Photo 24. Mowed portion of the levee near McKinley Bridge.

Field Area 3 (Railroad Spoil Area)



Photo 25. View facing southeast of railroad spoil area.



Photo 26. View facing northwest.



Photo 27. View facing southwest into vegetation portion of site. Eastern cottontail rabbit is highlighted within the red circle.

Mississippi River



Photo 28. View north along the bank of the river near the northern boundary of SLDS.



Photo 29. View facing south along the riverbank.



Photo 30. View of the riverbank in the vicinity of McKinley Bridge.



Photo 31. View facing east across the river.

Miscellaneous Photographs



Photo 32. View facing southwest along rail line. Gunther Salt (DT-4) is visible to the right. Note the vegetation along the fence line and underneath the elevated walkway.



Photo 33. View facing southwest along Buchanan Street at the fenceline next to DT-4 and at the mowed turfgrass adjacent to the USACE trailers.



Photo 34. View facing north at the Riverfront Trail. This photograph was taken near the north end of SLDS across from DT-9.



Photo 35. Entrance to the Riverfront Trail at the end of Branch Street just south of the SLDS boundary.

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APPENDIX S

Derivation of Building Surface Preliminary Remediation Goals

(On the DVD on the Back Cover of this Report)

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