SECOND FIVE-YEAR REVIEW REPORT FOR JACKSONVILLE ASH SUPERFUND ALTERNATIVE APPROACH SITE DUVAL COUNTY, FL

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Prepared by

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Table of Contents

Tables

Figures

LIST OF ABBREVIATIONS AND ACRONYMS

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
BLL	Blood Lead Level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
COJ	City of Jacksonville
COPEC	Contaminant of Potential Ecological Concern
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbon
EPA	United States Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FS	Feasibility Study
FYR	Five-Year Review
GCTL	Groundwater Cleanup Target Level
GIS	Geographic Information System
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IC	Institutional Control
ICP	Institutional Control Plan
MCL	Maximum Contaminant Level
µg/dL	Micrograms per Deciliter
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
NA	Not Applicable
NCP	National Contingency Plan
NPL	National Priorities List
NS	Not Sampled
O&M	Operation and Maintenance
OU	Operable Unit
PCB	Polychlorinated Biphenyl
PRP	Potentially Responsible Party
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RBA	Relative Bioavailability
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SAA	Superfund Alternative Approach
SAP	Sampling and Analysis Plan
SCTL	Soil Cleanup Target Level
TCLP	Toxicity Characteristic Leaching Procedure

2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TEQ	Toxic Equivalency
USACE	United States Army Corps of Engineers
UU/UE	Unlimited Use/Unlimited Exposure
XRF	X-Ray Fluorescence

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the second FYR for the Jacksonville Ash Superfund Alternative Approach (SAA) site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

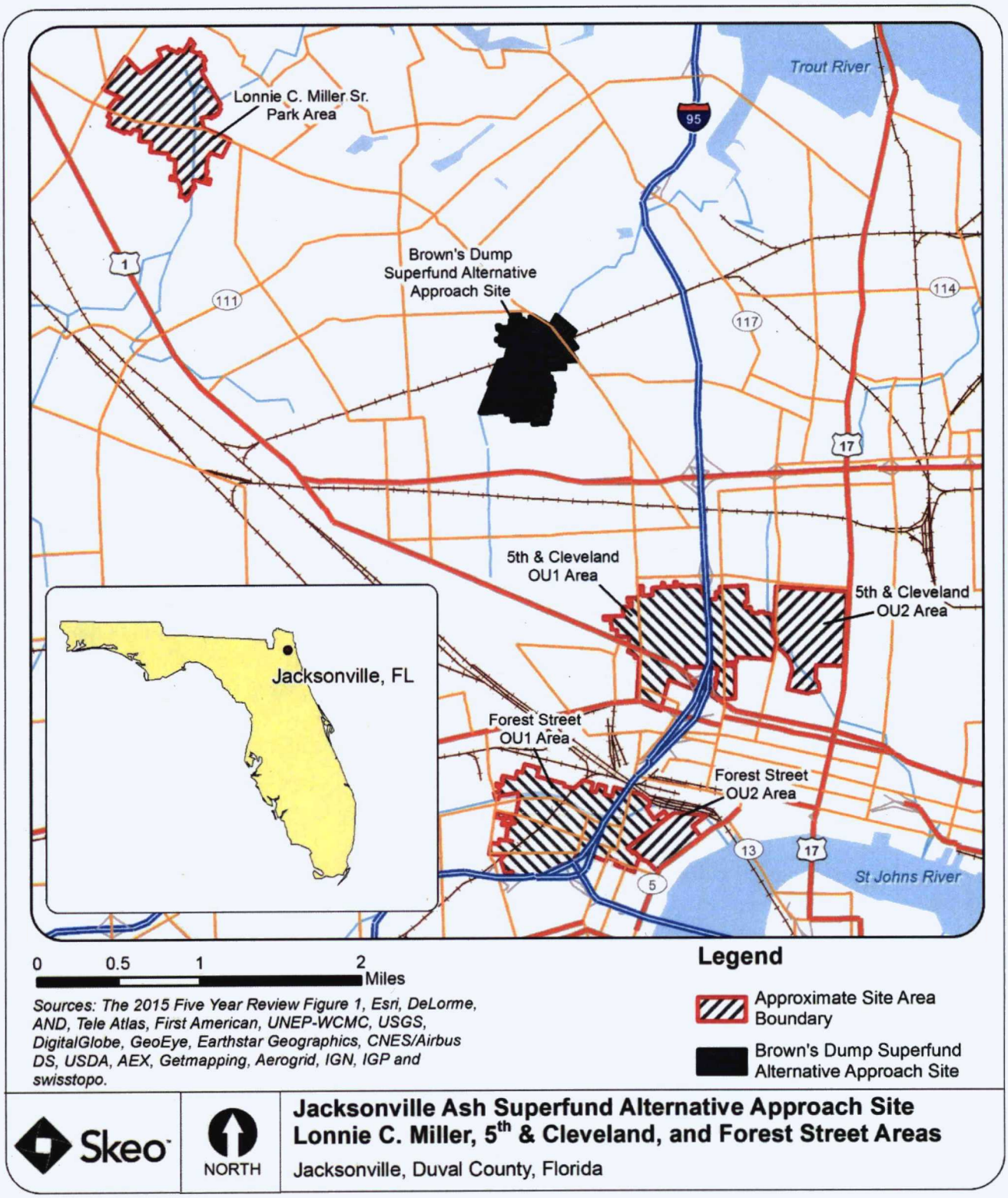
The Site consists of two operable units (OUs). This FYR addresses both OUs. OU1 addresses the soil remedy at the Forest Street Incinerator, 5th & Cleveland Incinerator and Lonnie C. Miller Sr. Park areas of the Site. OU2 addresses the remedy for contaminated soils located east of Hogan's Creek and east of Chelsea Street, and for the 5th & Cleveland and Forest Street areas, respectively.

The EPA remedial project manager (RPM) Joe Alfano led the FYR. Participants included the EPA community involvement coordinator L'Tonya Spencer; the Florida Department of Environmental Protection (FDEP) representatives Brian Durden and Tim Freeman; the City of Jacksonville (COJ) representative Jeff Foster; and Johnny-Zimmerman Ward and Claire Marcussen from Skeo (the EPA FYR support contractor). The review began on 10/16/2018. Documents used to prepare this FYR are listed in Appendix A. Appendix B provides site status information. Appendix C provides a detailed site chronology.

Site Background

The 1,140-acre Site is located in the northwest portion of Jacksonville, Duval County, Florida. The Site includes two former municipal solid waste incinerator areas (Forest Street Incinerator and 5th & Cleveland Incinerator) including parcels where ash residues and soil were used as fill material at nearby residential and commercial properties and downwind parcels impacted by windblown ash. The Site also includes a third area, the Lonnie C. Miller Sr. Park (Figure 1), where incinerator ash was deposited before the area became a park. The COJ operated the two incinerators from 1910 to the 1960s. A former city landfill known as Brown's Dump also received waste ash; the EPA is addressing the Brown's Dump site in a separate FYR. The ash residues and soil were contaminated with metals, primarily lead and arsenic, other metals and several organic contaminants such as dioxin and carcinogenic polycyclic aromatic hydrocarbons (cPAHs). Most residents within a 4-mile radius of the three site locations obtain drinking water from COJ's municipal water supply system. The water comes from the Floridan Aquifer, which is not affected by site contamination. Several private wells in the surficial aquifer are located within 4 miles of the three site areas; long-term monitoring of this aquifer demonstrates that it is not contaminated by the ash contamination. A description of the three parts of the Site is provided below.

Figure 1: Site Vicinity



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Forest Street Incinerator

The Forest Street Incinerator part of the Site covers about 370 acres in a mixed residential/commercial area (Figure D-1). The 10.5-acre incinerator area includes the former location of the incinerator facility, portions of Forest Street Park, and Forest Park Head Start School, which has been closed and demolished. The OU2 portion includes the remaining acreage, and includes contaminated soils located east of Chelsea Street. The northern part of the Forest Street Incinerator area lies within the 100-year flood zone of the St. John's River drainage system. Surface drainage generally flows northward over land into drainage ways along streets, stormwater collection systems and swales into McCoy's Creek, which is located 100 to 150 feet north of the Site. McCoy's Creek acts as the discharge zone for groundwater.

5th & Cleveland Incinerator

The 5th & Cleveland Incinerator part of the Site covers about 520 acres next to U.S. Interstate 95 in a primarily residential area (Figure D-2). The OU2 portion of this area is contaminated soils located east of Hogan's Creek. Land uses in this area include single-family homes, multi-family apartments and four schools. A 9-acre portion of the area also includes the Emmet Reed Community Center, Emmet Reed Park and a new tennis facility. Groundwater flows in a northeasterly direction in this location. Surface drainage generally flows northeast to a channelized subsurface unnamed creek. The unnamed creek flows east and discharges into Hogan's Creek about a half-mile downstream.

Lonnie C. Miller Sr. Park

The Lonnie C. Miller Sr. Park part of the Site covers about 250 acres in a residential area. The park is less than a quarter-mile northeast of U.S. Highway 1 (Figure D-3). Land uses include single-family homes to the north, south and east, and commercial businesses to the west. The Ribault River is located just east of the park. Groundwater beneath the park flows toward the river in an east-to-northeasterly direction. Surface drainage is collected in an on-site drainage ditch system, which joins with an off-site drainage ditch from the north and continues toward the southeast to an unnamed tributary and into the Ribault River.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Jacksonville Ash Site		
EPA ID: FLSFN0407002		
Region: 4	**State:** Florida	**City/County:** Jacksonville/Duval
SITE STATUS		
NPL Status: Non-NPL		
Multiple OUs? Yes	**Has the Site achieved construction completion?** No	
REVIEW STATUS		
Lead agency: EPA		
Author name: Joe Alfano (EPA)		
Author affiliation: EPA with support from Skeo		
Review period: 10/16/2018 – 10/28/2019		
Date of site inspection: 12/12/2018		
Type of review: Statutory		
Review number: 2		
Triggering action date: 1/22/2015		
Due date *(five years after triggering action date)*: 1/22/2020		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The Site has been investigated as three separate areas. The EPA completed human health risk assessments (HHRAs) for the three areas between 2002 and 2003. The EPA concluded that contaminated soil was a health concern at the areas. Sediment, surface water and groundwater were not contaminated above levels of concern. Primary contaminants of concern (COCs) in soil were arsenic and lead. Other COCs identified included other metals, cPAHs, polychlorinated biphenyls (PCBs), and 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) (dioxin) (Table 1).

The EPA completed ecological risk assessments for the areas in 2003. The EPA concluded that concentrations of contaminants of potential ecological concern (COPECs) in surface soil presented a risk to terrestrial communities. In addition, the ecological risk assessment indicated that sediment at all three areas could present a risk to aquatic communities. Surface water was not a media of concern. The primary COPECs were metals, cPAHs, pesticides and PCBs.

Table 1: Soil COCs, by Area

COC	Forest Street Incinerator (OU1 and OU2)	5th & Cleveland Incinerator (OU1 and OU2)	Lonnie C. Miller Sr. Park
Metals			
Antimony	X	X	X
Arsenic	X	X	X
Barium	X	X	-
Cadmium	X	X	X
Copper	X	X	X
Lead	X	X	X
Manganese	X	X	X
Nickel	-	-	X
Thallium	-	-	X
Vanadium	X	-	-
Zinc	-	-	X
Organics Chemicals			
Dioxin as represented by 2,3,7,8-TCDD*	X	X	X
cPAHs	X	X	X
Aroclor-1260[a]	-	X	-
Aroclor-1254[a]	-	-	X

Notes:

a. This is a PCB mixture.

* = Calculated using toxicity equivalents (TEQ), which are used to report the toxicity-weighted masses of mixtures of dioxins. Each dioxin compound is assigned a toxic equivalency factor that denotes a given dioxin compound's toxicity relative to 2,3,7,8-TCDD.

X = COC

\- = not a COC for the area

Response Actions

Following a February 1996 FDEP site visit at the 5th & Cleveland Incinerator location, FDEP requested that COJ implement interim measures to cover exposed areas of ash and ash-contaminated soil with gravel, compost or sod. COJ installed an interim cover at the 5th & Cleveland area in October 1996.

In September 1999, COJ entered into an Administrative Order on Consent (AOC) to conduct a remedial investigation/feasibility study (RI/FS) at the Site. The EPA did not list the Site on the Superfund program's National Priorities List (NPL) but considers it an NPL-caliber site and refers to the Site as an SAA site. Pursuant to the 1999 AOC, the required investigation and cleanup activities at the Site follow the NCP. The EPA, the state of Florida and COJ, the Site's primary potentially responsible party (PRP), have investigated site conditions and have taken steps to clean up the Site to protect human health and the environment.

The EPA selected the Site's remedy in an August 2006 Record of Decision (ROD) to address contaminated soil and sediment at the three areas: Forest Street Incinerator area (OU1) and (OU2); 5th and Cleveland Incinerator area (OU1) and (OU2) and the Lonnie C. Miller Sr. Park. Table 2 summarizes the remedial action objectives (RAOs) and the major remedy components defined in the 2006 ROD.

Table 2: 2006 ROD RAOs and Remedy Components

Environmental Medium	RAO	Remedy Components
Soil	• Prevent human exposure to COCs through contact, ingestion or inhalation of soil contaminated with incinerator ash or other wastes disposed of at the Site with a carcinogenic risk greater than 1 x 10^{-6}, a noncarcinogenic hazard index greater than 1, or lead concentrations above 400 milligrams per kilogram (mg/kg); • Prevent impacts to terrestrial biota from exposure to surface soils contaminated with incinerator ash disposed of at the Site and containing COPECs at concentrations above preliminary ecological remedial goals and soil background concentrations; • Control erosion and transport of soils containing visible ash, lead above 400 mg/kg, or COPECs above preliminary ecological remedial goals along the banks of rivers and creeks to prevent possible unacceptable risks to human health or ecological impacts; and • Prevent direct contact with the soil in open crawlspaces with exceedances of human health remedial goals.	• Excavation of contaminated surface soil above remedial goals as needed to allow for installation of a 2-foot-thick soil cover; • Temporary relocation for eligible residents upon their request; • Site restoration (e.g., backfilling with clean soil, replacement of flower beds, trees, shrubs, grass); • Stabilization of the banks of McCoy's Creek, Ribault River and Hogan's Creek (e.g., clear banks, excavate soil to achieve acceptable side slopes, dispose of excavated soil/material properly, install erosion controls to prevent erosion of ash/contamination into creek); • Placement of geotextile (or other membrane) topped with gravel under houses that have open crawlspaces with soil concentrations above human health remedial goals; • Solidification/stabilization of excavated soil exceeding Toxicity Characteristic Leaching Procedure (TCLP) limits prior to off-site disposal; and • Institutional controls to control exposure to remaining soil contamination (e.g., soil contamination under the soil cover and under buildings, roads, driveways, sidewalks, asphalt or concrete).
Sediment	• Prevent impacts to aquatic communities and viable insectivore (insect eating) and piscivore (fish eating) communities from exposure to sediment contaminated with incinerator ash and containing COPECs at concentrations above ecological preliminary remediation goals and sediment background concentrations.	• No active sediment remediation required.[a]
Groundwater	• Verify the "no action" decision for groundwater.	• Groundwater monitoring.

Notes:

a. Detected exceedances of ecological sediment preliminary remediation goals in stream sediments were determined to be similar to sediment background concentrations upstream of the site locations. Therefore, the ROD did not require active remediation of the stream sediment. The drainage ditches at the 5th & Cleveland site and Lonnie C. Miller Sr. Park are not significant aquatic habitats due to the lack of water for most of the year. The ROD required remediation to human health soil cleanup concentrations for the ditches.

Table 3 presents a summary of soil remedial goals established in the ROD for residential and industrial/commercial parcels. The ROD stated that cleanup to satisfy the human health remedial goals in soil will also provide adequate protection to ecological receptors because the residential remedial goals are equal to or more stringent than the ecological remedial goals. Therefore, separate actions to address ecological risk in soil were not needed.

Table 3: 2006 ROD Human Health Soil COC Remedial Goals

Soil COC	Residential Remedial Goal (mg/kg)	Industrial/Commercial Remedial Goal (mg/kg)
Metals		
Antimony	27	370
Arsenic	2.1	12
Barium	4,166	130,000
Cadmium	82	1,700
Copper	2,810	89,000
Lead	400	1,400
Manganese	3,500	43,000
Nickel	1,433	35,000
Thallium	6.1	150
Vanadium	491	10,000
Zinc	26,000	630,000
Organic Chemicals		
TEQ of 2,3,7,8-TCDD (dioxin)*	0.00000882[a]	0.00003
cPAHs	0.1	0.7
Aroclor-1260	0.5	2.6
Aroclor-1254	0.5	2.6

Notes:
a. Background concentration was selected in the 2006 ROD.
* TEQ = toxicity equivalents, which are used to report the toxicity-weighted masses of mixtures of dioxins. Each dioxin compound is assigned a toxicity equivalency factor that denotes a given dioxin compound's toxicity relative to 2,3,7,8-TCDD.
Source: 2006 ROD Tables 51 for residential and Table 52 for industrial cleanup goals.
mg/kg = milligrams per kilogram

Status of Implementation

The EPA and COJ voluntarily entered into a consent decree in July 2008, which provides for construction of the remedy stipulated in the ROD. COJ completed the remedial design in 2009; it identified lead as the main driver for remediation, followed by arsenic, cPAHs and dioxins. According to the Remedial Design Report, an association of lead with ash was recognized in the RI, and ash is a visible indicator of contamination. During remedial design, the EPA determined that excavating a subset of chemicals from the original COC list would also result in the remediation of other COCs that were less prevalent at the Site. Thus, the EPA refined the COC list to lead, arsenic, cPAHs and dioxin as the main remedial goal drivers.

Site cleanup was scheduled to begin in December 2009. However, at a special meeting held in April 2008, COJ requested that the EPA approve the "fast-track" remediation of two schools at the 5th & Cleveland Incinerator location, the Veterans Administration outpatient clinic, and a church property. An Animal Care and Control Facility and apartment complex were fast-tracked at the Forest Street Incinerator location. Table 4 provides a summary of the fast-tracked remediation completion dates.

Table 4: Remediation Completion Dates for Fast-Track Areas

Site Location	Fast-Track Area	Dates of Remediation
5th & Cleveland Incinerator (OU1)	Emmett C. Reed Park – Malivai Tennis Center	5/2006 – 3/2010
	Darnell-Cookman Middle School John E. Ford Elementary School	6/2008 – 8/2008
	St. Stephen Church Property	5/2009 – 7/2009
	Department of Veterans Administration Medical Clinic	3/2010 – 12/2011
Forest Street Incinerator (OU1)	Animal Care and Control Facility	8/2008 – 1/2009
	Hollybrook Apartments	4/2010 – 9/2010

Table 5 provides a summary of the ash remediation completed as of March 2019 at the three OU1 areas and the two OU2 areas. About 1,549 properties (mostly residential) have been remediated. As shown in Table 5, the overall remedial action is over 95 percent complete for most locations in OU1 and OU2. Only the 5th & Cleveland Incinerator OU1 location is less complete, with remediation at 87.8 percent complete. However, COJ issued a notice to proceed to a contractor for the next phase of remediation at this location that began in July 2018. COJ is continuing to pursue outstanding access agreements for the OU1 and OU2 areas and will include these parcels in future remediation as access becomes available.

In September 2018, the COJ requested that the EPA conduct a risk assessment using recreational exposure of the "Restricted Area" within the Lonnie C. Miller Sr. Park site and is awaiting the results in support of improving the park. As of March 2019, the COJ has completed engineering plans for the first phase of civil site improvements at the Lonnie C. Miller Sr. Park (including remediation) and 90 percent design plans for the proposed recreational facilities. The COJ plans to put out a Request for Proposal to complete the design and conduct the construction and remediation in the last quarter of 2019. The Parks and Recreation Department and the COJ ash remediation team plan to work together to develop the park in conjunction with the remediation effort to eliminate double handling of materials, maximize funds, and optimize ash removal. The COJ is completing the engineering plans for Phase 2 of additional civil site improvements (including remediation). Currently, the COJ plans to conduct the site improvements during 2022 and 2023. The design plans for the proposed recreational facilities will be prepared prior to that time.

Table 5: Overall Summary of Ash Remediation (as of June 2019)

Total Parcels	Remediated Parcels	No Remediation		Completed Parcels		Soil Removed (Tons)	Need Remediation Parcels		Need Sampling Parcels	
		Not Required	IC Only*	Total	Percent		With Access	No Access	With Access	No Access
5th & Cleveland Incinerator (OU1)										
933	651	126	42	819	**87.8**	301,844	76[a]	38	0	0
Forest Street Incinerator (OU1)										
770	477	139	117	733	**95.2**	144,495	16[b]	21	0	0
Lonnie C. Miller Sr. Park (OU1)										
279	75	194	7	276	**98.9**	32,781	3[c]	0	0	0
5th & Cleveland Incinerator (OU2)										
539	272	229	35	536	**99.4**	34,792	1[d]	0	0	2
Forest Street Incinerator (OU2)										
164	74	63	25	162	**98.8**	26,494	1	0	0	1

Total Parcels	Remediated Parcels	No Remediation		Completed Parcels		Soil Removed (Tons)	Need Remediation Parcels		Need Sampling Parcels	
		Not Required	IC Only*	Total	Percent		With Access	No Access	With Access	No Access

Notes:

* Parcels that do not require sampling or remediation due to existing impervious surfaces or other engineering controls.

a. Includes 55 Florida Department of Transportation (FDOT) parcels, three commercial parcels and 7 industrial parcels.
b. Includes the staging area/park, the former school parcels and nine parcels to be included in the McCoys Creek Restoration project.
c. Includes Lonnie C. Miller Sr. Park and the Mission Parcel as well as a parcel with an access agreement that refuses remediation.
d. Includes a parcel that the owner has elected to not remediate due to new landscape materials.

Maps showing the parcel remediation status for OU1 and OU2 are included in Appendix D. Note that parcels identified as "no remediation required" are those parcels that have been sampled and do not require remediation. However, the status of these parcels could change because they are next to parcels that have either not been sampled or require remediation. The parcels identified as "no remediation – EPA approved" do not require remediation, as approved by the EPA. As COJ receives access agreements, it will remediate additional parcels. As of March 2019, the COJ is in the process of selecting a contractor for the restoration of McCoy's Creek to reduce flooding of infrastructure and private properties, provide a robust creek-side recreational trail to connect adjacent neighborhoods to downtown and increasing economic value and redevelopment opportunities, and utilize a variety of multi-disciplinary goals and resources to achieve a model project. The project includes channel improvement/restoration, bulkhead restoration, boulevard closures, greenway creation, creek remediation/restoration and parcel remediation.

As buildings with institutional controls are demolished in the future, the area under the building footprints will be sampled. For parcels at which remediation has not yet occurred, institutional controls are already in place to prevent or minimize exposure as these properties are located within the Soil Delineation Zone; these controls are discussed in the next section of this FYR Report. A summary of the construction completion reports approved and pending approval by the EPA since the previous FYR are included in Appendix C.

Remediation of soil/ash at residential and industrial/commercial parcels involves excavating the upper 2 feet of soil and installation of a certified clean soil cover. The areas are then re-graded followed by placement of sod and then a post-excavation survey is completed. For houses with crawl spaces greater than 8 inches with soil above cleanup goals, a synthetic cover topped with gravel is installed. To prevent human exposure to subsurface soil below 2 feet, a 2-foot-thick soil cover and institutional controls are required. Where practical, excavation occurs below 2 feet to reduce or eliminate the need for institutional controls. In addition, visible boundary markers are placed as an engineering control to indicate known contamination for properties with building slabs, driveways, parking lots and sidewalks right next to the excavation limits where cleanup goals are exceeded at the bottom of the 2-foot excavations.

Confirmation sampling occurs at each excavation, including collection of soil samples along excavation walls at 20-foot intervals, screening for visible ash, and evaluating lead concentrations using a field x-ray fluorescence (XRF) analyzer. In addition, the bottom of each excavation is screened for visible ash and lead using the XRF device. Samples with an XRF lead reading between 200 mg/kg and 400 mg/kg

in residential areas are either excavated or samples saved for further laboratory analyses. The confirmation sample locations and associated laboratory analyses are included in the corresponding parcel completion reports.

COJ sends the EPA a Certification of Completion for properties at which remediation has been completed. COJ maintains a database that tracks remediation progress at every parcel in the soil/ash delineation zone. Any remediation subsequent to completion would be subject to the Ash Management Plan. The Ash Management Plan details the minimum procedures necessary for handling encountered ash material, including procedures for identifying ash; notifying COJ and regulatory officials; handling, storing, and characterizing the ash for proper disposal; and transporting the ash to an approved facility for disposal.

Excavated soils are staged for Toxicity Characteristic Leaching Procedure (TCLP) sampling and if classified as hazardous, the stockpiled soil is first treated with a stabilizing reagent prior to shipment to the Trail Ridge Landfill. In addition, due to the age of some of the buildings, if asbestos is identified at a parcel, a licensed asbestos abatement contractor remediates parcels and the co-mingled ash- and asbestos-contaminated soil is disposed of in accordance with asbestos regulations by bagging and burial at Trail Ridge Landfill. Finally, institutional controls prevent potential human exposure to contaminated soil under existing buildings, asphalt or concrete roadways, driveways and sidewalks. Additional detail on the institutional controls is provided in the next section.

Institutional Control (IC) Review

The Institutional Control Plan (ICP) is dated November 2017. The purpose of the ICP is to define, help implement, and maintain institutional controls for properties within the Site. Institutional controls are used to help minimize the potential for human exposure to ash-related contamination remaining on properties above the remedial goals, to protect the integrity of the remedy, or both. Residual ash-related contamination may be present after remediation underneath buildings, sidewalks, driveways, trees, shrubs or other structures on the property. Residual ash-related contamination may also be present at depths greater than two feet. The ICP is administered by the COJ's Ash Management Program, which is an activity of the Solid Waste Division within the Public Works Department.

The ICP uses a combination of proprietary controls (easements and restrictive covenants), government controls, enforcement and permit tools, and informational tools, in accordance with the Consent Decree and summarized below. A summary of the sitewide ICP components and a copy of the relevant ordinances referenced in the ICP are included in Appendix F of this FYR.

Table 6 lists the institutional control instruments that the COJ has implemented that pertain to and limit activities within the Ash Site locations.

Table 6: Summary of Planned and/or Implemented Institutional Controls

Media That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented[a]
Soil	Yes	Yes	Multiple parcels within the site boundary	Prevent and/or manage potential human exposure to subsurface soil contamination remaining above remedial goals (e.g., under buildings, asphalt or concrete roadways, driveways and sidewalks) or at depths greater than 2 feet in yards. Keep properties remediated to industrial remedial goals from reverting to another use designation (e.g., residential) without proper remediation to meet the proposed non-industrial use.	Section 320.403 (Ordinance Code) requires that all building permits issued within the Soil Delineation Zone comply with the Ash Management Plan. Section 654.118 (Ordinance Code) requires compliance of all land development within the Soil Delineation Zone with the Ash Management Plan. Section 366.302 (Ordinance Code) requires that all water wells constructed within the Soil Delineation Zone meet minimum construction standards and that all cuttings from the construction are containerized and properly disposed of. The 2017 ICP requires a combination of proprietary controls, government controls, enforcement and permit tools, and informational tools, in accordance with the Consent Decree (see Table 5 above).

Notes:

a. City of Jacksonville Code of Ordinances. Version January 31, 2019. https://library.municode.com/fl/jacksonville/codes/code_of_ordinances?nodeId=12174 (accessed 2/22/2019).

Systems Operations/Operation and Maintenance (O&M)

Site remediation is ongoing, so O&M activities have only been initiated by the COJ at remediated parcels. The COJ revised the Site's O&M Plan in January 2018. The O&M Plan describes the inspections, sampling, monitoring, analysis, maintenance and reporting that the COJ will conduct to maintain the approved remedy on properties that have been remediated or otherwise closed via an institutional control (Table 7).

Table 7: O&M Activities (summarized from 2018 O&M Plan)

O&M Activity	Description
Inspections	Annual inspections of 10 percent of the parcels with institutional controls within the site locations on a rotating basis such that each parcel with institutional controls will be inspected at least once every 10 years. Inspections will include a visual inspection to review site conditions, including vegetation (grass, trees, shrubs), drainage and erosion, crawl-space barriers (geofabric/gravel or geofoam), and the integrity of structures, fences and any other features that may affect the parcel remedy. The COJ

O&M Activity	Description
	will use the inspections to determine where maintenance is necessary and document the status of the remedy.
Groundwater Monitoring	Annual groundwater monitoring took place from 2012 to 2016, in accordance with the 2011 Groundwater Monitoring Sampling and Analysis Plan and Quality Assurance Project Plan (2011 SAP/QAPP). Monitoring confirmed the RI's conclusion that the ash does not leach into the groundwater above groundwater drinking water standards and verified the groundwater "no action" decision in the ROD. Groundwater monitoring is no longer necessary, as agreed upon by FDEP and the EPA in 2018.
Maintenance	Ongoing proper care and maintenance of soil cover and vegetation installed as part of the remedy on the COJ-owned parcels. In addition, proper care and maintenance of soil cover and vegetation on privately-owned parcels within the site locations. The COJ will host annual information workshops that address the proper care and maintenance of soil caps and lawns for parcels that have been remediated.
Institutional Controls	The COJ has established institutional controls on parcels to protect human health and the environment from exposure to ash-contaminated materials that remain on the parcels. Once a parcel is remediated and confirmation sampling is conducted, an ICP is prepared for the parcel that indicates where known ash-related contamination remains on the parcel and establishes the controls to limit future exposure. The maintenance of these institutional controls is explained in the previous section.
Soil Cover O&M	A 2-foot clean soil cover and underlying barrier marker will be or has been installed at the two public areas, Lonnie C. Miller Sr. Park and the former Mary McLeod Bethune school property because of the large ash-impacted areas involved. These soil covers will be inspected on an annual basis and any repairs made to ensure the integrity of the caps.
Creek Bank Stabilization and Erosion Control	Creek bank stabilization and erosion control measures, as necessary consistent with published RODs, will be constructed along the ash-impacted banks of Moncrief Creek, McCoy's Creek, the Ribault River and Hogan Creek. Such measures prevent ash and ash-contaminated soil along the banks of the affected creek and river segments from eroding into the creek and river beds, especially during significant storm events. The stabilized areas will be inspected annually and repaired as necessary.
Source: 2018 Ash Remediation O&M Plan. Prepared by ETM. January 2018.	

The annual O&M costs estimated in the 2018 O&M Plan are $725,289.60, which includes an estimated remediation of 10 parcels per year and encompasses both the Brown's Dump SAA Site and the Jacksonville Ash SAA Site.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR Report as well as the recommendations from the previous FYR Report and the status of those recommendations.

Table 8: Protectiveness Determinations/Statements from the 2014 FYR Report

OU #	Protectiveness Determination	Protectiveness Statement
1	Will be Protective	The remedy for OU1 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks.
2	Will be Protective	The remedy for OU2 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks.

The previous FYR Report did not identify any issues at the Site.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was made available by a public notice published in the *Florida Times Union* newspaper on 8/9/2019 (Appendix E). It stated that the FYR was underway and invited the public to submit any comments to the EPA. The results of the review and the report will be made available at the Site's two information repositories – Jacksonville Urban League, located at 903 West Union Street in Jacksonville, Florida, and Bradham Brooks Public Library, located at 1755 West Edgewood Avenue in Jacksonville.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. The interviews are summarized below and copies of the interview forms are included in Appendix G.

Jeff Foster: Mr. Foster is with COJ. He indicated that the remediation efforts have been completed in accordance with design plans and specifications and meet the required level to be protective of human health and the environment. Mr. Foster stated that, overall, the community's perception has been positive regarding the site cleanup with only a small number of property owners that have not been satisfied with the work completed on their parcels. These complaints usually involve claims that COJ did not adequately replace items or features or that COJ did not do enough remediation on a parcel.

Rafael Felix: Mr. Felix works for the U.S. Army Corps of Engineers (USACE) providing remedial oversight on behalf of the EPA. Mr. Felix stated that the cleanup contractor is removing the contamination according to all the established processes in the project with no complaints so far. In addition, the project has caused a positive effect around the remediated areas by giving peace of mind and improving residents' quality of life. Mr. Felix is not aware of any major complaints or inquiries regarding the site cleanup activities and is comfortable with the status of the institutional controls at the Site. Mr. Felix recommends that parcel remediation should be scheduled in a manner that can be more time efficient when moving heavy equipment from one neighborhood to another. He also recommended placing a copy of the parcel layout on a construction sign to help representatives identify plans without having to stop contractor work.

FDEP Representatives: The FDEP project representatives indicated that the cleanup appears to meet the requirements established by the 2006 ROD, and imposes engineering and institutional controls, where necessary, to protect human health and the environment. They indicated that FDEP staff have received periodic complaints and inquiries regarding concerns over lead contaminated dust and dirt leaving the remediation site. They also indicated that FDEP staff have received calls regarding the significance of the barrier marker placed under the 2-foot clean soil layer may not always be effective in discouraging residents and/or contractors from digging up the area to install or fix an appurtenance located on an affected property.

The Hester Group: The Hester Group works with affected property owners and keeps people updated with annual mailings. Hester Group representatives stated that, overall, the site cleanup has been very successful. Over time the property owners have become informed and understand the cleanup program. The Hester Group indicated that in the past, concerns had been less with the cleanup itself but more with the lack of investment from COJ to bring services to the community. Some residents were concerned

that signing any documentation meant that they could lose their property or have to address liens or back taxes, and some residents had landscaped yards that they did not want changed.

Juanitta Clem and JoAnne Snelson: Ms. Clem and Ms. Snelson are with England, Thims & Miller, Inc., COJ's remedial action contractors. They stated that remediation is currently 86 percent complete and contaminant levels within the top 2 feet of ground surface have been effectively eliminated, with 68 of the remaining parcels scheduled for remediation in 2019. Residual soil contamination has been identified in all remaining parcels (except the three parcels that have not been sampled). Furthermore, the source (incinerator ash) has been eliminated and therefore the contaminant levels are not increasing. Ms. Clem and Ms. Snelson stated that COJ is fully aware of the requirement to maintain the 2-foot cap over the Site in perpetuity and as such has already put into place permitting review requirements to preclude disturbing the remedy. Since the overall program is nearing completion of construction, COJ has shifted the focus of its efforts to O&M activities and institutionalizing government controls.

Data Review

For each remediated parcel, the soil confirmation sample locations and remediation has achieved the ROD soil cleanup goals. The ROD requires groundwater monitoring to verify the "no action" decision for this medium. COJ began groundwater monitoring in October 2012 and annual sampling was completed in 2014, 2015 and 2016. Relatively minor and sporadic exceedances of drinking water standards or health-based levels for arsenic, lead and manganese were noted in several wells, with all results below these levels in 2016 (Appendix J). Based on the results of groundwater sampling events, groundwater has not been adversely affected by the incinerator ash. Based on the results, the EPA and FDEP approved discontinuation of groundwater monitoring in October and December 2018, respectively.

Site Inspection

The site inspection took place on 12/12/2018. Participants included Joe Alfano (EPA), L'Tonya Spencer (EPA), Brian Durden and Tim Freeman (FDEP), Jeff Foster (COJ), Juanitta Clem (England, Thims and Miller), and Johnny Zimmerman-Ward, Claire Marcussen and Madeline Reinsel (the EPA FYR support contractor Skeo). Appendix H provides a completed site inspection checklist. Appendix I provides photographs of the Site taken during the site inspection.

The inspection began at Lonnie C. Miller Sr. Park. An open gate that led to an area that has not been remediated was observed. In addition, there were no signs on the fenced-and-gated area to notify the public of the area's contamination. During the inspection the EPA instructed the O&M contractor to ensure the fenced area is secured and signs be installed to warn the general public not to enter. Reese Park is located less than a half-mile east of the Lonnie C. Miller Sr. Park location. Remediation has been completed at Reese Park and residential areas next to this park. Residential lots were observed to have sod in place where excavations had occurred. Site inspection participants observed an example of a remediated crawlspace area, which included matting and gravel.

The second area visited was the 5th & Cleveland site location. Participants observed reuse of remediated residential areas and the Emmett C. Reed sports complex that includes tennis and basketball courts and landscaped areas. Site participants also observed two ongoing residential remediations in the residential area located near 5th Street and North Laura Street and 5th Street and Eaverson street. Warning tape and temporary fencing was observed to prevent exposure from residents while remediation was taking place.

Contractors were present to ensure the work area was safe from any interference from traffic or the general public while contaminated soil was being removed and covered.

At the third ash location, the Forest Street Incinerator, several areas were observed that had been fast-tracked for remediation, including the Animal Care Control Facility and Darnell-Cookman Middle School. The staging area for the Forest Street Incinerator location was observed, including the former Forest Park Head Start School, which is vacant, fenced, contains a large slab, and is ready to be developed into a park. Participants also observed a part of McCoy's Creek, located downgradient of the excavated soil staging area, and saw that a reinforced wall was present along the south side of the creek.

Skeo staff visited the designated site repository, Bradham and Brooks Branch Library, located at 1755 West Edgewood Avenue in Jacksonville. The repository included several documents, including the 2008 and 2009 remedial designs, work plans, and the Sample and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP). All site-related materials are dated 2009 or older. The EPA is working with the library to determine if staff prefer compact discs or hard copies.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

Yes. The remedy is functioning as intended for residential and commercial/industrial parcels where remediation has been completed. During remediation, soil/ash is excavated from the upper 2 feet at residential and commercial parcels, followed by installation of a soil cover. Human exposure to subsurface soil is prevented by installation of a 2-foot-thick soil cover and institutional controls. Where practical, excavation occurs below 2 feet to reduce or eliminate the need for institutional controls. A cover is installed in residential crawlspaces to further prevent direct contact with contaminated soil. Finally, potential human exposure to the contaminated soil footprint under existing buildings, asphalt or concrete roadways, driveways and sidewalks is prevented by institutional controls. Institutional controls are in place to prevent direct exposure to soils at parcels that have not been remediated.

As of March 2019, COJ's remediation of the Site is over 90 percent complete for most of the areas in OU1 and OU2. Only the 5th & Cleveland Incinerator OU1 site location is less complete, with remediation at 83 percent complete. However, COJ issued a notice to proceed to a contractor for the next phase of remediation at this location that began in July 2018. COJ is continuing to pursue outstanding access agreements for the site locations and will include these parcels in future remediation as access becomes available.

The EPA selected a "no action" remedy for groundwater and has completed four rounds of groundwater sampling (2012, 2014, 2015 and 2016) and the results indicate groundwater has not been affected by the incinerator ash deposited at any of the site locations evaluated during the groundwater sampling events (Appendix J). Based on the results, the EPA and FDEP approved discontinuation of groundwater monitoring in October and December 2018, respectively.

Institutional controls in the form of proprietary controls, government controls, enforcement and permit tools, and informational tools are in place to prevent or minimize exposure to contamination left in

place. The ICP is dated November 2017. COJ has updated the Jacksonville ordinance codes to require that all building permits and land development in the Soil Delineation Zone comply with the Ash Management Plan and to require that all water wells installed in the Soil Delineation Zone meet minimum construction standards and that all cuttings from the construction shall be containerized and properly disposed of. Multiple layers of controls are in place that require COJ approvals if land use changes or a parcel is redeveloped. In addition, for parcels at which remediation has not yet occurred, institutional controls are already in place to prevent or minimize exposure since these parcels are located within the Soil Delineation Zone.

During the site inspection, several monitoring wells were not secured. However, COJ is requiring a contractor to address all unsecured wells.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Question B Summary:

Yes. The exposure assumptions, toxicity data, cleanup levels and RAOs remain valid. The 2006 soil cleanup goals were established based on residential and industrial land uses. Since 2006, the EPA has revised some of the default exposure factors associated with residential and industrial exposure; in addition, toxicity values have changed for some of the soil COCs. The 2006 ROD selected the state soil cleanup target levels (SCTLs) as cleanup goals for some of the soil COCs. The SCTLs have not changed since the previous FYR (Appendix K). The ROD soil cleanup goals were also compared to the EPA's November 2018 regional screening levels (RSLs) for soils to evaluate whether any changes in toxicity and exposure values since the ROD could impact current remediation levels (Appendix L). The evaluation demonstrated that ROD soil cleanup goals remain valid. In addition, the EPA conducted a lead bioavailability study in June 2019 using the soil samples collected in December 2018. The results demonstrated that the absolute bioavailability of lead in site soils is 30% which is the same as the default value used in the lead exposure model. Using a lower blood lead level target in conjunction with updated default inputs and the site specific bioavailability in the lead exposure model, the EPA calculated a residential soil lead level of 400 mg/kg. Therefore, the cleanup goal for lead established in the 2006 ROD remains valid.

Remediation has not yet occurred next to McCoy's Creek, Hogan's Creek and the Ribault River because most of the creek and river banks currently have adequate stability and erosion protection (e.g., vegetated and portions with retaining walls), which reduces exposure to ash that may have deposited in creek and river sediments. Once funding becomes available, the need for stabilization of the northern bank of McCoy's Creek will be evaluated. In addition, the EPA has evaluated risk from children's intermittent exposures to contaminated creek and river bank soil/sediments and issued new guidance in 2013. The concentrations of lead in creek and river sediments at the Site do not pose unacceptable risks to children in a recreational use scenario based on the new guidance.

According to the ROD, cleanup to human-health cleanup goals will also provide adequate protection to ecological receptors.

QUESTION C: Has any other information come to light that could call into question the protectiveness

of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

This FYR did not identify any issues at the Site.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement	
Operable Unit: OU1	*Protectiveness Determination:* Will be Protective
Protectiveness Statement: The remedy is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks.	

Protectiveness Statement	
Operable Unit: OU2	*Protectiveness Determination:* Will be Protective
Protectiveness Statement: The remedy is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks.	

VIII. NEXT REVIEW

The next FYR Report for the Jacksonville Ash SAA Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Ash Management Plan. Prepared by the City of Jacksonville, Florida. April 2015.

Ash Remediation Institutional Control Plan, Revision 3. Prepared by the City of Jacksonville. November 2017.

Ash Remediation Operations and Maintenance Plan, Revision 3. Prepared by the City of Jacksonville. January 2018.

Calculation of Soil Lead Bioavailability. Memorandum from Kevin Koporec EPA Toxicologist to Joe Alfano, EPA Remedial Project Manager. June 7, 2019.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System (CERCLIS) Site Information Accessed at http://www.epa.gov/region4/superfund/sites/npl/florida/jaxashfl.html.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Site (Part 4), Revision 4.0. Prepared by England-Thims & Miller, Inc. (ETM). November 3, 2017.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Site (Part 4), Revision 4.1. Prepared by ETM. July 28, 2017.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Site (Part 4), Revision 4.2. Prepared by ETM. July 28, 2017.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Site (Part 4), Revision 4.3. Prepared by ETM. May 24, 2018.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Site (Part 5), Revision 5.0. Prepared by ETM. November 3, 2017.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Site, Operable Unit 2, Revision 3.0. Prepared by ETM. July 28, 2017.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Site, Operable Unit 2, Revision 3.1. Prepared by ETM. August 8,2018.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Site (Part 5), Gate Property. Revision 6.0. Prepared by ETM. November 3, 2017.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Operable Unit 2 Site. Revision 0.1. Prepared by ETM. August 3, 2017.

Construction Completion Report for Parcel Remediation for Forest Street Incinerator Operable Unit 2 Site (Part 3). Revision 2.0. Prepared by ETM. September 7, 2017.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Site, Revision 0.1. Prepared by ETM. November 7, 2017.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Site, Revision 2.0 Prepared by ETM. June 30, 2017.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Site, Revision 3.0 Prepared by ETM. November 3, 2017.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Site, Revision 4.0 Prepared by ETM. April 6, 2018.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Operable Unit 2 Site, Revision 0.0 Prepared by ETM. April 10, 2017.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Operable Unit 2 Site, Revision 0.1 Prepared by ETM. April 10, 2017.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Operable Unit 2 Site, Revision 0.2 Prepared by ETM. September 6, 2017.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Operable Unit 2 Site, Revision 1.0. Prepared by ETM. September 14, 2015.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Operable Unit 2 Site, Revision 1.1. Prepared by ETM. September 14, 2015.

Construction Completion Report for Ash Remediation for 5th & Cleveland Incinerator Operable Unit 2 Site, Revision 3.0. Prepared by ETM. September 6, 2017.

Construction Completion Report for Remediation of the Lonnie C. Miller Sr. Park Ash Site, Revision 0.4 Prepared by ETM. July 28, 2017.

Construction Completion Report for Remediation of the Lonnie C. Miller Sr. Park Ash Site, Part 2. Revision 2.0. Prepared by ETM. September 14, 2015.

Construction Completion Report for Remediation of the Lonnie C. Miller Sr. Park Ash Site, Part 3. Revision 3.0. Prepared by ETM. September 7, 2017.

EPA Record of Decision: Jacksonville Ash Site. EPA ID: FLSFN0407002. Jacksonville, Florida. August 24, 2006.

Five-Year Review - Jacksonville Ash Superfund Alternative Approach Site. Prepared January 2015.

Health Consultation: 5th & Cleveland Incinerator Site, Jacksonville, Duval County, Florida. Prepared by the Agency for Toxic Substances and Disease Registry. November 12, 2003. Accessed at http://www.floridahealth.gov/environmental-health/hazardous-waste-sites/_documents/f/fifthandcleveland111203.pdf.

Institutional Control Plan, Revision 3. City of Jacksonville, Ash Remediation. Prepared by ETM. November 2017.

Intermittent exposure to creek sediment. Memorandum from Kevin Koporec, EPA Toxicologist to Joe Alfano, EPA Remedial Project Manager. July 1, 2013.

Jacksonville Ash Groundwater Monitoring Report, 5th & Cleveland Incinerator Site, Brown's Dump Site, Forest Street Incinerator Site and Lonnie C. Miller Sr. Park Site, Jacksonville, Duval County, Florida. Prepared by Aerostar SES LLC. July 22, 2016.

Progress Report No. 44 – Ash Remediation. Brown's Dump and Jacksonville Ash Site Consent Decree. Prepared by England-Thims & Miller, Inc. (ETM). December 2018.

Progress Report No. 45 – Ash Remediation. Brown's Dump and Jacksonville Ash Site Consent Decree. Prepared by England-Thims & Miller, Inc. (ETM). March 2019.

Remedial Design Work Plan for Jacksonville Ash and Brown's Dump Sites, Revision 1. Prepared by England-Thims and Miller, Inc. for the City of Jacksonville. August 29, 2008.

Remedial Design/Remedial Action Consent Decree for Jacksonville Ash and Brown's Dump Sites Administered under CERCLA. July 17, 2008. https://www.epa.gov/sites/production/files/2014-03/documents/browns_dump_125.pdf.

Remedial Design Report. Final. Prepared by England-Thims and Miller, Inc. for the City of Jacksonville. September 17, 2009.

Update of Scientific Considerations for Lead in Soil Cleanups. Memorandum from Mathy Stanislaus, Assistant Administrator to EPA Regional Managers , Regions I through X. Office of Land and Emergency Management. December 22, 2016.

APPENDIX B – CURRENT SITE STATUS

Environmental Indicators

- Current human exposures at the Site are not under control.[1]
- Current groundwater migration is under control.

Are Necessary Institutional Controls in Place?

☒ All ☐ Some ☐ None

The remedy is ongoing. For parcels at which remediation has not yet occurred, institutional controls are already in place to prevent or minimize exposure as these properties are located within the Soil Delineation Zone. COJ plans to implement additional institutional controls once these parcels are remediated. The anticipated institutional controls include a combination of proprietary controls, government controls, enforcement and permit tools, and informational tools.

Has the EPA Designated the Site as Sitewide Ready for Anticipated Use?

☐ Yes ☒ No

Has the Site Been Put into Reuse?

☒ Yes ☐ No

The Site is in continued residential and commercial/industrial use.

[1] As reported on the EPA's site web page www.epa.gov/superfund/jacksonville-ash (accessed 12/3/2018), ash from COJ's municipal solid waste incinerators has contaminated soil in residential areas with lead, arsenic, cPAHs and dioxin above remedial goals. COJ is continuing to pursue outstanding access agreements for the OU1 and OU2 areas and will include these parcels in future remediation as access becomes available. Some temporary engineering controls have been put in place. These controls include fencing, signs, grass cover and placing of clean soil over contaminated soil. The human exposure indicator will continue to be "not under control" until the remaining parcels with access for remediation and parcels without access for remediation are addressed. The EPA has prepared a Community Involvement Plan and provides updates and other information about the Site through regular meetings.

APPENDIX C – SITE CHRONOLOGY

Table C-1: Site Chronology

Event	Date
PRP completed a preliminary contamination assessment report for the Forest Street Incinerator site location	November 3, 1994
PRP completed a contamination assessment report for the Forest Street Incinerator site location	November 20, 1995
PRP completed interim remedial measures and a preliminary assessment report on the 5th & Cleveland Incinerator site location	October 31, 1996
PRP completed preliminary assessment report on the Forest Street Incinerator site location	November 26, 1996
The EPA discovered the Lonnie C. Miller Sr. Park site location	December 18, 1996
PRP completed a preliminary assessment for the Lonnie C. Miller Sr. Park site location	December 24, 1996
The EPA completed a site inspection at the Forest Street Incinerator and 5th & Cleveland Incinerator locations	December 1, 1997
The EPA completed a site inspection at the Lonnie C. Miller Sr. Park location	December 31, 1997
The EPA identified COJ as the PRP	May 27, 1999
Administrative AOC signed and PRP initiated the Site's RI/FS	September 1, 1999
The EPA completed the HHRA for the 5th & Cleveland Incinerator site location	September 27, 2002
The EPA completed the human health risk assessment for the Forest Street Incinerator and the Lonnie C. Miller Sr. Park locations	March 1, 2003
The EPA completed the ecological risk assessment for the 5th & Cleveland Incinerator and Forest Street Incinerator locations	March 31, 2003
The EPA completed the ecological risk assessment for the Lonnie C. Miller Sr. Park location	September 12, 2003
PRP completed an Engineering Evaluation/Cost Analysis and Action Memorandum	August 9, 2004
PRP began the removal action at the 5th & Cleveland Incinerator site location to construct a tennis facility at Emmett C. Reed Park	May 5, 2006
PRP completed the RI/FS and the EPA issued the Site's ROD	August 24, 2006
PRP initiated the remedial design	December 21, 2007
COJ began a fast-track remedial action at two school properties at the 5th & Cleveland Incinerator site location	June 20, 2008
The EPA and the PRP entered into a Consent Decree	July 17, 2008
PRP began a fast-track remedial action at the site of the Animal Care and Control Facility property within the Forest Street Incinerator location	August 11, 2008
PRP completed a fast-track remediation of two school properties at the 5th & Cleveland Incinerator site location	August 13, 2008
PRP completed a fast-track remediation of the proposed Animal Care and Control Facility at the Forest Street Incinerator site location	January 28, 2009
PRP completed a removal action at the Forest Street Incinerator site location to construct the Animal Care and Control Facility	March 18, 2009
PRP began a fast-track remediation of the St. Stephen Church property at the 5th & Cleveland Incinerator site location	May 6, 2009
PRP completed a fast-track remediation of the St. Stephen Church property within the 5th & Cleveland Incinerator site location	July 24, 2009
PRP completed the remedial design and initiated the remedial action	September 29, 2009
PRP began remedial action at OU1 5th & Cleveland Incinerator location	March 8, 2010
PRP completed the removal action at the 5th & Cleveland Incinerator site location to construct a tennis facility at Emmett C. Reed Park	March 25, 2010

Event	Date
PRP began remedial action at the OU1 Forest Street Incinerator location	May 7, 2010
PRP began remedial action at Lonnie C. Miller Sr. Park	June 21, 2010
PRP began remedial action at the OU2 5th & Cleveland Incinerator and Forest Street Incinerator site locations	September 10, 2012
PRP completed remedial action at the OU2 5th & Cleveland Incinerator and Forest Street Incinerator site locations	February 22, 2013
The EPA issued the first FYR	January 22, 2015
The EPA and FDEP acknowledged that "no further action" is required for groundwater monitoring	September 8, 2016

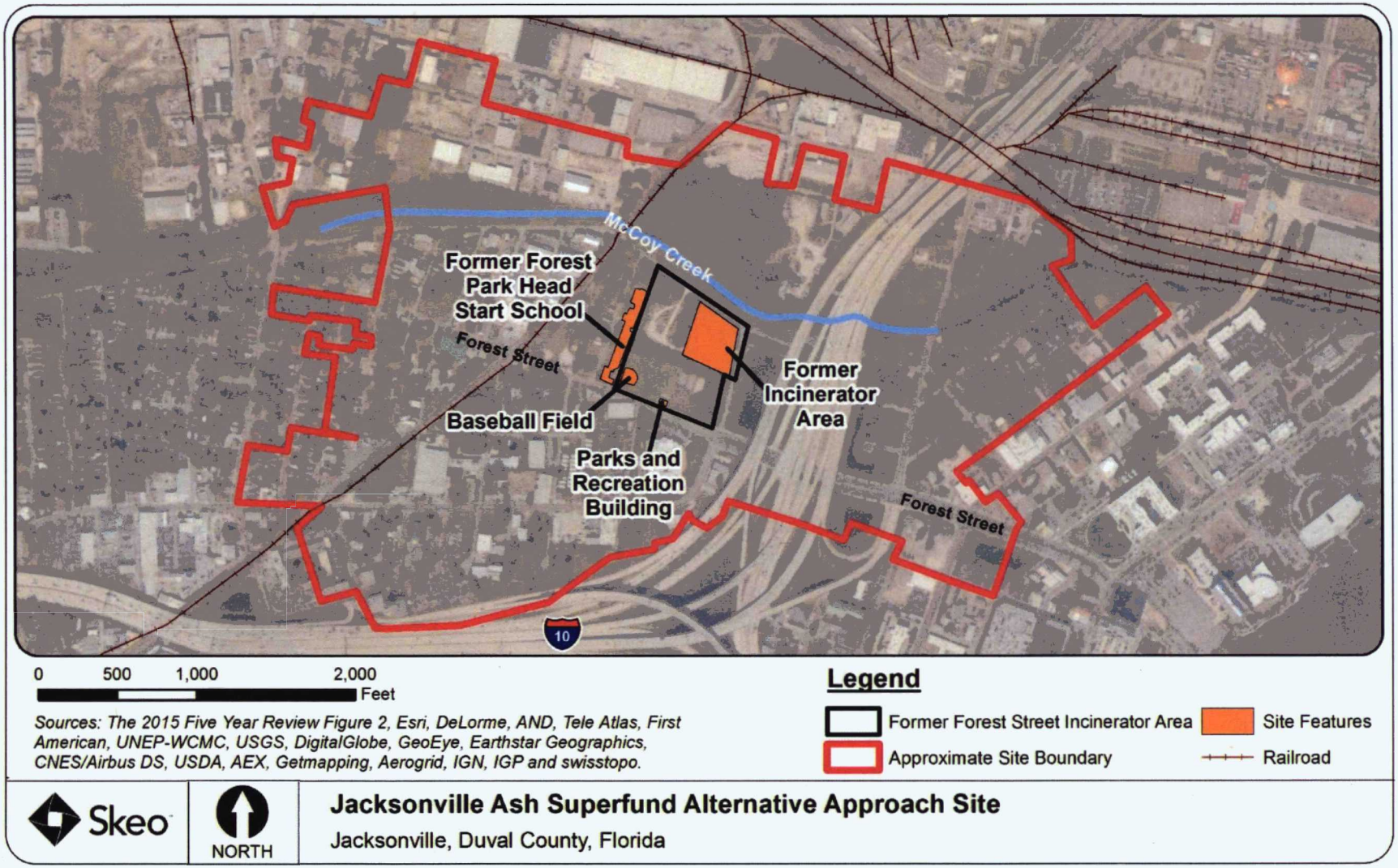
Table C-2: Summary of Construction Completion Reports, 2014 to 2018

Site and Part/Phase	Submittal Revision Number	Completion Report Submitted to Agencies	Completion Report Approved by the EPA
No Remediation Required ("Green Parcels") Submittals			
5th & Cleveland Incinerator	0.1	7/6/2017	11/7/2017
5th & Cleveland Incinerator OU2 (FCOU2)	0.0	6/4/2014	4/10/2017
5th & Cleveland Incinerator OU2 (FCOU2)	0.1	1/16/2015	4/10/2017
5th & Cleveland Incinerator OU2 (FCOU2)	0.2	2/20/2017	9/6/2017
Forest Street Incinerator	0.2	11/2/2017	pending
Forest Street Incinerator Operable Unit 2 (FSOU2)	0.1	9/28/2016	8/3/2017
Lonnie C. Miller Sr. Park	0.3	10/28/2013	2/18/2014
Lonnie C. Miller, Sr. Park	0.4	1/13/2017	7/28/2017
Construction Completion Report Submittals (Remediation Complete)			
5th & Cleveland Incinerator Part 1	Rev. 1.3	10/28/2013	2/18/2014
5th & Cleveland Incinerator Part 2	Rev. 2.0	6/30/2014	4/10/2017 6/30/2017 (three parcels)
5th & Cleveland Incinerator Parts 3 and 4	Rev. 3.0	7/8/2015	11/3/2017
5th & Cleveland Incinerator Parts 5 and 6	Rev. 4.0	5/30/2017	4/6/2018
5th & Cleveland Incinerator Operable Unit 2 (FCOU2), Parts 1, 2 and 2A	Rev. 1.0	6/4/2014	9/14/2015
5th & Cleveland Incinerator Operable Unit 2 (FCOU2), Parts 1, 2 and 2A	Rev. 1.1	1/20/2015	9/14/2015
5th & Cleveland Incinerator Operable Unit 2 (FCOU2), Part 3	Rev. 2.0	2/20/2017	9/6/2017
Forest Street Incinerator Part 4	Rev. 4.0	7/9/2015	11/3/2017
Forest Street Incinerator Part 4	Rev. 4.1	7/23/2015	7/28/2017
Forest Street Incinerator Part 4	Rev. 4.2	8/31/2015	7/28/2017
Forest Street Incinerator Part 4	Rev. 4.3	4/25/2018	5/24/2018
Forest Street Incinerator Part 5	Rev. 5.0	8/7/2017	11/3/2017
Forest Street Incinerator - Gate Property	Rev. 6.0	8/7/2017	11/3/2017

Site and Part/Phase	Submittal Revision Number	Completion Report Submitted to Agencies	Completion Report Approved by the EPA
Forest Street Incinerator - Gate Property	Rev. 6.1	1/5/2018	2/12/18 – approved by FDEP
Forest Street Incinerator Operable Unit 2 (FSOU2), Part 3	2.0	9/14/2016	9/7/2017
Lonnie C. Miller Sr. Park Part 2	Rev. 2.0	5/31/2014	9/14/2015
Lonnie C. Miller Sr. Park Part 3	Rev. 3.0	1/10/2017	9/7/2017
Institutional Control-Only Completion Report Submittals			
5th & Cleveland Incinerator	Rev. 5.0	10/17/2018	pending
5th & Cleveland Incinerator Operable Unit 2 (FCOU2)	Rev. 3.0	4/12/2017	9/6/2017
Forest Street Incinerator	Rev. 7.0	12/5/2018	pending
Forest Street Incinerator Operable Unit 2 (FSOU2)	Rev. 3.0	10/28/2016	7/28/2017
Forest Street Incinerator Operable Unit 2 (FSOU2)	Rev. 3.1	4/18/2017	8/8/2017
Lonnie C. Miller Sr. Park	Rev. 4.0	2/23/2017	pending
Source: Provided by ETM in March 2019.			

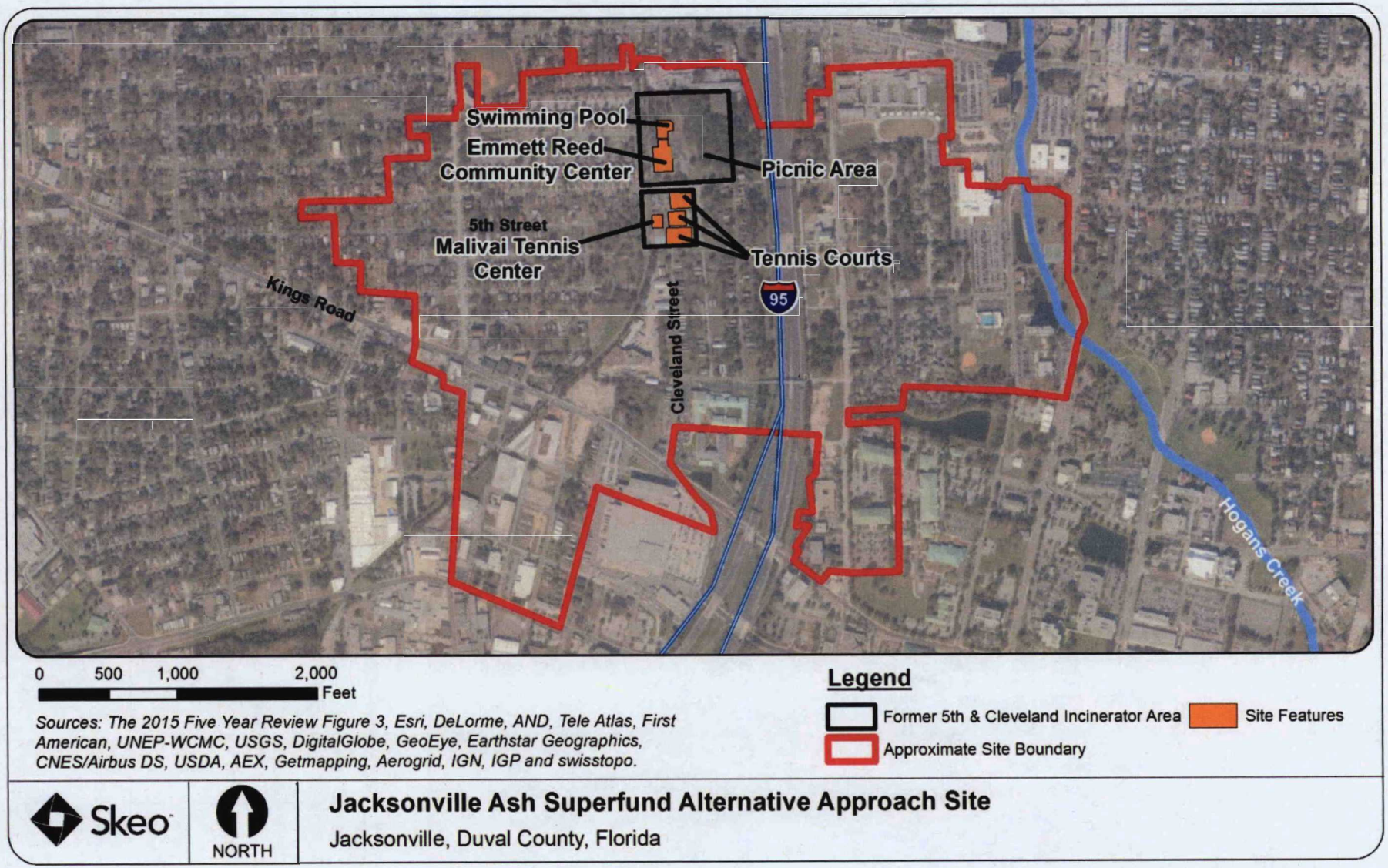
APPENDIX D – SITE MAPS

Figure D-1: Features of the Forest Street Incinerator Site Location



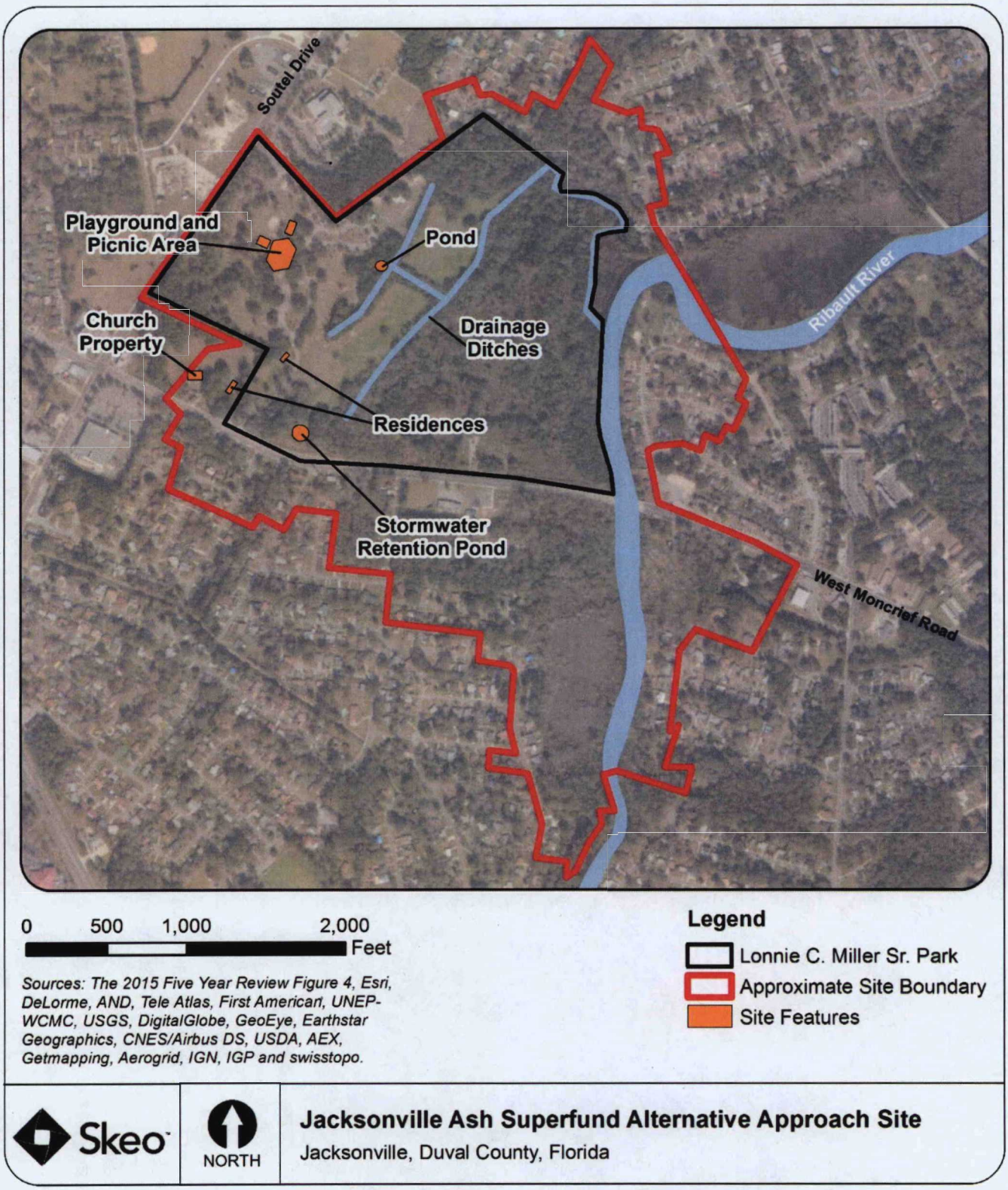
Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Figure D-2: Features of the 5th & Cleveland Incinerator Site Location



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Figure D-3: Lonnie C. Miller Sr. Park Site Location



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding the EPA's response actions at the Site.

Figure D-4: Forest Street Incinerator OU1 Parcel Status (as of February 2019)

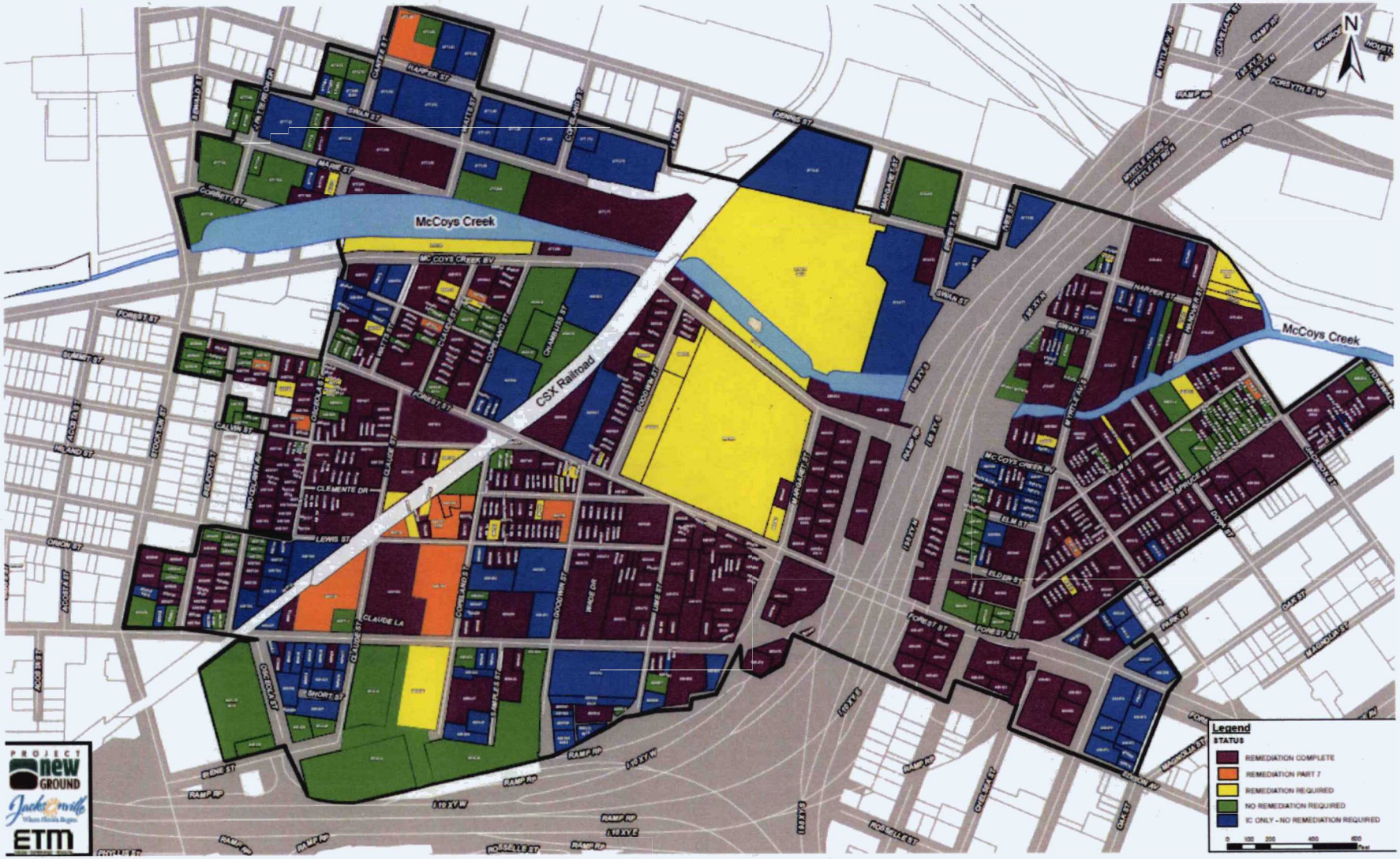


Figure D-5: Forest Street Incinerator OU2 Parcel Status (as of February 2019)

Figure D-6: 5th & Cleveland OU1 Parcel Status (as of February 2019)

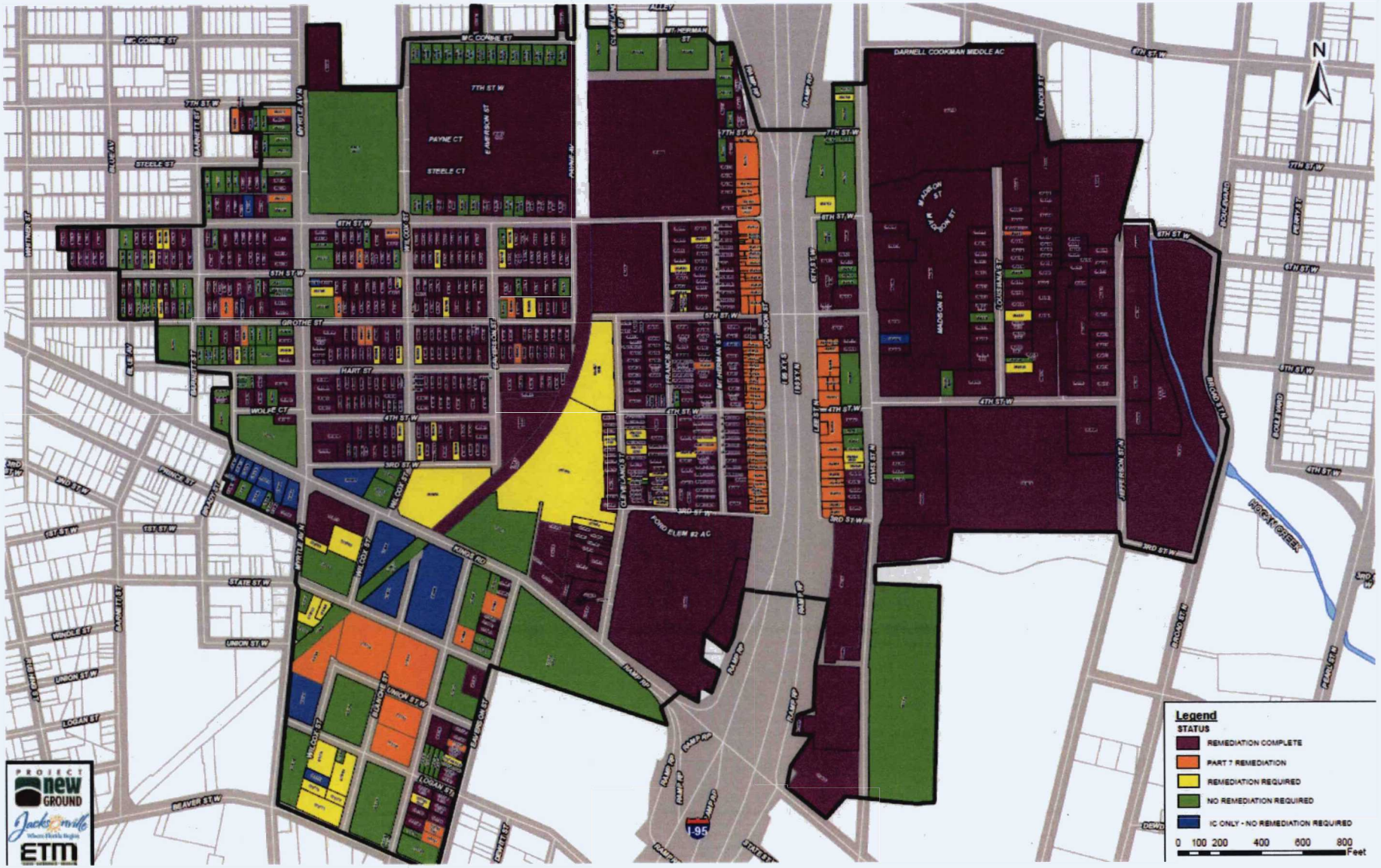
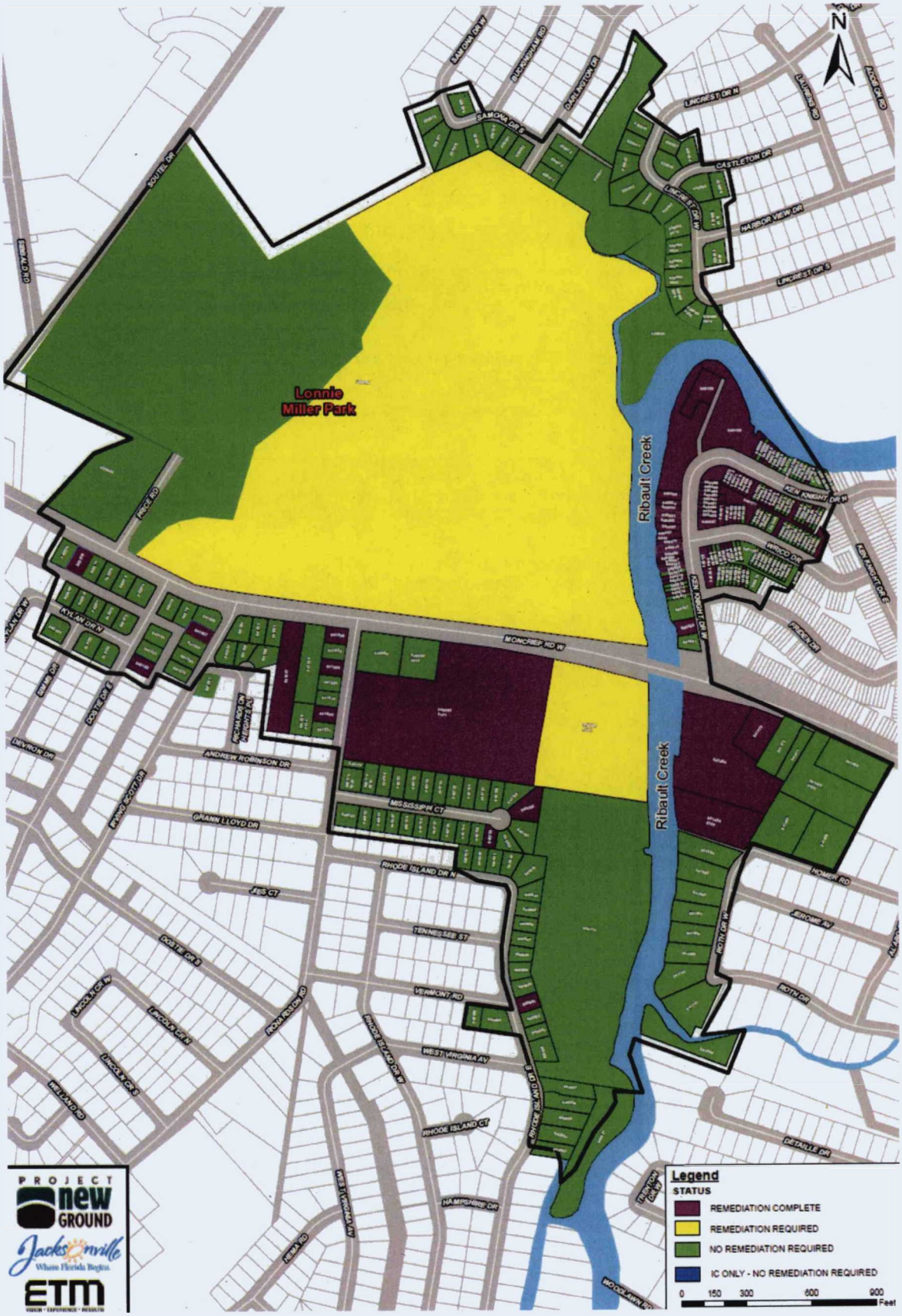


Figure D-7: 5th & Cleveland OU2 Parcel Status (as of February 2019)

Figure D-8: Lonnie C. Miller Sr. Park Parcel Status (as of February 2019)



APPENDIX E – PRESS NOTICE

The U.S. Environmental Protection Agency, Region 4 Announces the Second Five-Year Reviews for the Brown's Dump and Jacksonville Ash Superfund Alternative Sites Jacksonville, Duval County, Florida

Purpose/Objective: The EPA is conducting Five-Year Reviews of the remedies for the Brown's Dump Superfund Alternative site(Brown's site) and the Jacksonville Ash Superfund Alternative site (Ash site) in Jacksonville, Florida. The purpose of the Five-Year Review is to make sure the selected cleanup actions effectively protect human health and the environment.

Site Background: The Brown's site is located in a residential and industrial area north of Jacksonville in Duval County. From late 1949 to 1953, site owners operated a landfill that received ash from Jacksonville's municipal incinerators. The Brown's site consists of three former ash deposit areas: the Mary McLeod Bethune Elementary School property, which is fenced and vacant, a Jacksonville Electric Authority electrical substation, and surrounding homes.

The Ash site includes three separate areas in northwest Jacksonville: the Forest Street Incinerator, the 5th & Cleveland Incinerator and Lonnie C. Miller, Sr. Park. The Forest Street Incinerator and the 5th & Cleveland Incinerator were Jacksonville's municipal solid waste incinerators from 1910 until the 1960s. The city disposed of combustion ash and ash residues on each of the properties. Disposal also took place on the area that later became Lonnie C. Miller, Sr. Park.

The EPA, the Florida Department of Environmental Protection (FDEP) and the city of Jacksonville have investigated the Brown's site and the Ash site and identified lead, arsenic, polycyclic aromatic hydrocarbons (PAHs) and dioxin as the primary contaminants in the ash and soil. The EPA did not list the sites on the Superfund program's National Priorities List (NPL). The EPA considers both sites to be NPL-caliber sites and is addressing them through the Superfund Alternative Approach.

Cleanup Actions: The EPA designated the Brown's site as a single area, or operable unit (OU), to address on-site soil and off-site soil contamination. The EPA designated two OUs at the Ash site. OU1 addresses soils at the Forest Street Incinerator, 5th & Cleveland Incinerator and Lonnie C. Miller, Sr. Park properties. OU2 includes the soils downwind of the Forest Street Incinerator and the 5th & Cleveland Incinerator. The EPA selected final remedies for the sites in the sites' August 2006 Records of Decision (RODs). The remedies for both sites included excavating and disposing of contaminated soil off site, filling in excavated areas with clean soil, using soil and gravel covers where needed to address potential human exposure, temporarily relocating residents, stabilizing creek banks and installing erosion controls, monitoring site groundwater, and putting institutional controls in place.

Five-Year Review Schedule: The National Contingency Plan requires review of remedial actions that result in any hazardous substances, pollutants or contaminants remaining at the sites above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human health and the environment. The second of the Five-Year Reviews for the Brown's site and the Ash site will be completed by July 2019.

The EPA Invites Community Participation in the Five-Year Review Process: The EPA is conducting these Five-Year Reviews to evaluate the effectiveness of the sites' remedies and to ensure that the remedies remain protective of human health and the environment. As part of the Five-Year Review process, EPA staff is available to answer any questions about the sites. Community members who have questions about the sites or the Five-Year Review process, or who would like to participate in a community interview, are asked to contact:

Joe Alfano, EPA Remedial Project Manage
Phone: (404) 562-8933
Email: alfano.joe@epa.gov

L'Tonya Spencer, EPA Community Involvement Coordinator
Phone: (404) 562-8463 I (877) 718-3752 (toll-free)
Email: spencer.latonya@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, GA 30303-8960

Additional information is also available at the sites' local document repository, Bradham Brooks Public Library, located at 1755 West Edgewood Avenue, Jacksonville, Florida 32208, and online at https://www.epa.gov/superfund/brown (Brown's site) and https://www.epa.gov/superfund/jacksonville-ash (Ash site).

APPENDIX F – SUMMARY OF INSTITUTIONAL CONTROLS AND COPIES OF JACKSONVILLE APPLICABLE CODE OF ORDINANCES

Table F-1: Summary of the Sitewide ICP Components

ICP Component	Description of ICP Component Requirements
Annotate Property Record Cards	Requires the Duval County Property Appraiser to annotate the property record cards or its equivalent of all properties within the site boundaries (as defined by the Consent Decree) that there are or may be hazardous substances on the property.
Establish geographic information system (GIS)	The GIS data management system shows all parcels that are located within the Ash Sites http://maps.coj.net/DuvalProperty/# and includes all pertinent parcel information to include Parcel Completion Reports with remediation as-built drawings. The system is maintained and updated on a regular basis and can readily supply parcel information to other COJ Departments as well as the public as an invaluable aid to the COJ in issuing building permits, changing zoning, and other controls within the sites.
Building Permit Review Program	Requires the COJ Building Inspection Division to submit all building permit applications within the sites to the Solid Waste Division for review. Upon review of the applications, COJ will issue requirements and restrictions regarding excavation, as needed. All permits for parcels located within the sites will require that the work be conducted in accordance with the EPA-approved Ash Management Plan. If the contractor identifies ash-related contamination, the contractor must stop work immediately and notify COJ. All excavated soil must be characterized and taken to the City's Trail Ridge Landfill or other landfill approved by COJ for disposal, as required. The COJ allows ash disposal at Trail Ridge Landfill for no fee.
Ash Management Plan	Requires that the Ash Management Plan be incorporated into the COJ's land development regulations for construction within the site areas (Jacksonville Ordinance Code Sections 654.118 and 320.403). The Ash Management Plan must be provided with the building permits and enforced by COJ's the Solid Waste Division.
Amend County Well Drilling Ordinance	Ordinance was revised to require permits with specific conditions for any well drilled within the Site locations (Jacksonville Ordinance Code Section 366.302).
Annual Notifications	COJ mails letters to all current property owners and residents within all remediated and non-remediated properties within the sites informing them of residual ash-related contamination or potential ash-related contamination. The COJ reviews and may update the annual notice language if necessary. The notices include: • Remediated properties: states that the property is part of an incinerator ash remediation area: contact the COJ at 904.630.2489 prior to digging; and • Non-remediated properties: states that at a minimum the soil on the property is potentially contaminated with incinerator ash, which the COJ will remediate upon request by contacting the COJ at 904.630.2489 for additional information.
Restrictive covenant language	COJ's Office of General Counsel will, upon request, assist individual property owners with the development of a Declaration of Restrictive Covenant for their property at no charge to the property owner. The language limits or authorizes a specific use of the property and/or prohibits certain uses.
Notices to Successors in Title	Provides the required notice to successors in title for all COJ-owned properties within the Sites.
Zoning Change Review Program	Requires COJ's Planning Department to submit all zoning change applications within the Sites to the Solid Waste Division for review. Upon review of the applications, the COJ issues requirements and restrictions regarding the zoning changes as needed. The COJ Planning Department has ready access to the GIS ash overlays to determine when parcels are located within the Sites and require review.
Individual Institutional Control Plans	Requires individual ICPs for all parcels with residual ash-related contamination, including both remediated and non-remediated parcels: • Remediated parcels: delineates all known residual ash-related contamination on the parcel following remediation. The COJ uses these ICPs to determine if any proposed property changes (via a building permit) will be affected by residual ash-related contamination; • Parcels with engineering control/cap in place (asphalt, concrete, building, etc.) and have not be sampled and/or remediated: provides a form of notice to the COJ when a property change

ICP Component	Description of ICP Component Requirements
	is proposed on these parcels. Before a building permit (which includes a demolition permit) can be issued on these parcels, the parcel will typically need to be sampled and/or remediated; • Non-residential parcels with remaining residential remedial goal exceedances: provides a form of notice to the COJ when a zoning change is proposed for these parcels. Before a zoning change is approved, the COJ will determine if sampling or remediation is required on the parcel to accommodate the zoning change; and • Parcels that do not require remediation but have an exceedance(s) below two feet: delineates all known residual ash-related contamination and will be utilized by the COJ to determine if any proposed property changes (via a building permit) will be affected by residual ash-related contamination.
Annual Institutional Control Report	COJ provides the EPA and FDEP with an annual summary of the institutional controls in place and the parcels to which they apply.

Table F-2: City of Jacksonville Applicable Code of Ordinances[2]

Sec. 320.403. - Approval of other authorities.	In addition to verifying compliance with this building code, the Building Official shall require that the laws, rules and regulations of any other regulatory authority having jurisdiction, where the laws, rules and regulations are applicable and are known to him, shall be satisfied before a permit is issued. He shall require such evidence as in his opinion is reasonable to show the other approvals. The Building Official shall not thereby be held responsible for enforcement of the other regulations he is not specifically authorized to enforce. Following are some, but not necessarily all, of the other agencies having jurisdiction: (a) The Public Works Department and Sheriff's Office for the moving of buildings, structures and heavy equipment over, temporary construction over, storage of material on, construction operations over, or temporary blocking of streets or other public spaces. (b) The Fire Operations Division for the burning of construction or demolition waste or the use or storage of explosives. (c) The Public Works Department for the discharge of rainwater or other water runoff on streets or into storm sewers, for compliance with subdivision regulations and for other regulations as may be established from time to time. (d) The Neighborhoods Department for: (1) The adequacy of waste treatment plants receiving waste from a building or premises where the waste discharges through a privately-owned sewerage system; (2) Waste treatment and disposal systems, including septic tanks; (3) Places where food or drink is prepared or served to the public; (4) Private water supply and supply or disposal wells; (5) Commercial swimming pools; (6) Air pollution; (7) Trailer parks; (8) Chemical toilets; and (9) The ash management review program for compliance with the Ash Management Plan prepared by the Regulatory Compliance Department and approved by the U.S. Environmental Protection Agency ("EPA") for those properties located within those areas assigned EPA Site Identification Numbers FLD980847016 (Brown's Dump) and FLSFN0407002 (Jacksonville Ash Sites, i.e., Forest Street Incinerator Site, 5th & Cleveland Streets Incinerator Site, and Lonnie C. Miller, Sr. Park) (the "Brown's Dump" and "Jacksonville Ash Sites"). (e) The State Division of Hotels and Restaurants for the construction, alteration or addition to multiple-residential rental units or places where food or drink is prepared or served to the public.

[2] COJ Code of Ordinances. Version January 31, 2019. https://library.municode.com/fl/jacksonville/codes/code_of_ordinances?nodeId=12174.

	(f) Federal regulations limiting construction during periods of national emergency. (g) The Public Works Department, Corps of Engineers and the state for bulkheads, docks, similar construction or fill along waterfront property. The Building Official is responsible to permit all structures above the waterline not covered by a Corps of Engineers permit. (h) The Planning and Development Department or Planning Commission for those projects required by the Zoning Code to contain their approval. (i) No permit for a hospital or nursing home project that involves the addition of beds by new construction, expansion or conversion to new uses of existing facilities, which addition will increase bed capacity of the facility by five percent or more, shall be issued until a certificate of need has been issued approving the issuance of the permit. (j) The Public Works Department for the purpose of floodplain regulation permitted under Chapter 652. (Ord. 2001-1160-E, § 1; Ord. 2008-513-E, § 1; Ord. 2011-230-E, § 1; Ord. 2011-732-E; Ord. 2013-209-E, § 40; Ord. 2016-140-E, § 16)
Sec. 366.302. - Required permits and permitting standards and procedures.	(a) No water well shall be constructed, repaired and/or abandoned without a permit from the Environmental Quality Division or the SJRWMD. However, an individual permit from the Environmental Quality Division is required before constructing any well within the Brown's Dump and Jacksonville Ash Sites areas. (b) The well permits herein required, except for those permits issued pursuant to a delegation of authority from SJRWMD are independent of all other permits required. (c) The Board shall, by rule, establish construction standards and procedures for processing permit applications for the construction, repair or abandonment of a water well not located within a F.A.C. Chapter 62-524, delineated area. (d) Copies of applications, permits, drillers' logs, water well completion logs and certifications may be required to be submitted to the Department pursuant to the rules of the Board, and Section 366.306 herein. (e) Permits shall be issued or denied within the timeframes allowed by F.S. Ch. 120. The Department shall request additional information within 30 days after receipt of a permit application. (f) A permit for well construction shall be valid one year from the date of issuance. (g) A permit for the construction of a shallow well shall not be required from the Environmental Quality Division where an Urban Services District has established and administers a local shallow well construction program. All other Urban Services Districts shallow well permitting programs, established after the effective date of this act, must: (1) Be approved by the Environmental Quality Division as adequate to meet the requirements of this act and any applicable rules and regulations pursuant thereto; (2) Provide by ordinance, regulation, or local law for requirements compatible with, or stricter or more extensive than those imposed by this ordinance and regulations issued thereunder; (3) Provide for the enforcement of such requirements by appropriate administrative and judicial process; and (4) Provide for administrative organization, staff, financial and other resources necessary to effectively and efficiently carry out its program. (Ord. 2008-346-E, § 2)
Sec. 654.118. - Design Standards: Ash Management Plan for Brown's Dump and Jacksonville Ash Sites.	All lands located within those areas assigned U.S. Environmental Protection Agency ("EPA") Site Identification Numbers FLD980847016 (Brown's Dump) and FLSFN0407002 (Jacksonville Ash sites, i.e., Forest Street Incinerator Site, 5th & Cleveland Streets Incinerator Site, and Lonnie C. Miller, Sr. Park) ("Brown's Dump" and "Jacksonville Ash sites") shall be developed in compliance with the Ash Management Plan prepared by the Neighborhoods Department and approved by the EPA and set forth in the Land Development Procedures Manual. Additionally, all construction that occurs within Brown's Dump and the Jacksonville Ash sites shall be subject to review as set forth in Section 320.403. (Ord. 2011-230-E, § 2; Ord. 2011-732-E; Ord. 2013-209-E, § 40; Ord. 2016-140-E, § 16) **Editor's note:** Ord. 2011-230-E, § 2, amended the Code by repealing former § 654.118, and adding a new § 654.118. Former § 654.118 pertained to bikeways requirements, and derived from Ord. 91-58-147, § 1. Similar provisions can now be found in § 654.133.

APPENDIX G – INTERVIEW FORMS

Jacksonville Ash Site		**Five-Year Review Interview Form**	
Site Name:	**Jacksonville Ash Site**	**EPA ID No.:**	**FLSFN0407002**
Subject Name:	**Jeff Foster**	**Affiliation:**	**City of Jacksonville Solid Waste Division**
Subject Contact Information:	**904.381.8205, jsfoster@coj.net**		
Time:	**12:00 p.m.**	**Date:**	**01/30/2019**
Interview Format (circle one):	**In Person**	**Phone**	**Mail** **Other: Email**

Interview Category: Potentially Responsible Parties (PRPs)

1. What is your overall impression of the remedial activities at the Site? *Remediation efforts have been completed in accordance with design plans and specification and meet the required level to be protective of human health and the environment.*

2. What have been the effects of the Site on the surrounding community, if any? *Overall, the perception has been positive when the residents see what the finished product looks like. There is still some lingering levels of discontent with a small number of individuals in the community.*

3. What is your assessment of the current performance of the remedy in place at the Site? *The remedy provides the required level of protection to human health and the environment.*

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup? *Yes, there are a small number of individuals who are dissatisfied with the work done on their parcels. These usually involve claims that COJ did not replace items or features the way they were or that COJ did not do enough remediation on their parcels or that they do not understand the reason for the remediation that is being required and they will not sign access agreements.*

5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might the EPA convey site-related information in the future? *Yes, I am very involved in the completion of the project and developing the long term O&M requirements that COJ will need to implement for site closure.*

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? *None.*

7. Do you consent to have your name included along with your responses to this questionnaire in the FYR Report? *Yes.*

Jacksonville Ash Site		**Five-Year Review Interview Form**	
Site Name: Jacksonville Ash Site		**EPA ID No.:** FLSFN0407002	
Subject Name: Rafael Felix		**Affiliation:** USACE	
Subject Contact Information: rafael.e.felix@usace.army.mil			
Time:		**Date:** 01/15/2019	
Interview Format (circle one):	**In Person**	**Phone**	**Mail** **Other: Email**

Interview Category: EPA Remedial Oversight

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? *So far, the contractor has performed as planned. Cleanup, maintenance and reuse activities have been in compliance with project documents. Weekly meetings are done every Tuesday, where the project engineer and the quality control manager are always in constant communication.*

2. What have been the effects of the Site on the surrounding community, if any? *The project has caused a positive effect around the remediated areas improving the quality of life of residents.*

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities since the implementation of the cleanup? *As far as I been involved in the project, there has been only minor complaints discussed during weekly meetings or reports. Most of the complaints are about the access to the parcel during the remediation process.*

4. What is your assessment of the current performance of the remedy in place at the Site? *Ash remediation is going as planned. Remediation crews operate and execute smoothly.*

5. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues? *Yes, I am comfortable with the status of the institutional controls at the Site that help minimize the potential human exposure to contamination and protection of the integrity of remedy.*

6. Are you aware of any community concerns regarding the Site or the operation and management of its remedy? If so, please provide details. *Residents always like to be kept up to date with the latest work schedule, especially if they are expecting any remediation around their property. We have seen residents asking this around the contractor's trailer.*

7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? *I would recommend to schedule parcel remediation in such way that can be more time efficient when moving heavy equipment from one neighborhood to another. Also, I would suggest rescheduling weekly meetings to Mondays and Fridays to develop better coordination and communication between contractor administrators and remediation crews. This can be effective for those long holiday weekends since most of the contractor and sub-contractor workers travel out of town. A copy of the parcel layout should be placed on a construction sign to help representatives identify plans without having to stop contractor work.*

8. Do you consent to have your name included along with your responses to this questionnaire in the FYR Report? *Yes, I consent to have my name included along with my responses to this questionnaire.*

Jacksonville Ash Site Site	**Five-Year Review Interview Form**
Site Name: Jacksonville Ash Site [a]	**EPA ID No.:** FLSFN0407002
Subject Name: FDEP Representatives	**Affiliation:** FDEP
Subject Contact Information:	
Time: 11:30 a.m.	**Date:** 06/21/2019
Interview Format (circle one): In Person	**Phone** **Mail** **Other:** Email

Interview Category: State Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? *The Project appears to meet the requirements established by the 2006, EPA ROD, and imposes engineering and institutional controls, where necessary, to protect human health and the environment.*

2. What is your assessment of the current performance of the remedy in place at the Site? *The human health contaminants of concern, remedial action objective appears to be met for the Site, through the established RAO's.*

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? *Department staff have received periodic complaints and inquiries regarding concerns over lead contaminated dust and dirt leaving the remediation site.*

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities. *No additional site related activities were conducted in the past five-year period, nor has the Department received any communications, outside of those pertaining to remediation of the site.*

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? *Department staff are unaware of any changes to State Laws that would affect this project.*

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues? *For the most part, intuitional controls established by the established 2017 ICP, appears to adequately minimize human exposure to ash-related contamination that remain on properties. However, Department staff have received calls regarding the significance of the barrier marker placed under the 2-foot clean soil layer. This control appears to not be effective in all cases in discouraging residents and/or contractors from digging up the area to install or fix an appurtenance located on an affected property. Department staff also have concerns regarding the proposed practice of allowing for the installation of unlined stormwater ponds on top of areas where lead contaminated soil has not been completely removed.*

7. Are you aware of any changes in projected land use(s) at the Site? *Other than those stated, Department is aware of no projected land use changes.*

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? *Department staff are concerned about the proposal to allow the construction and operation of a private school at a site (former Forest Street area) with where lead contaminated soil still exists on the property below the 2-foot clean soil protective layer.*

9. Do you consent to have your name included along with your responses to this questionnaire in the FYR report? *No.*

   a. This interview form also applies to the Brown's Dump SAA Site.

Jacksonville Ash Site Superfund Site		**Five-Year Review Interview Form**	
Site Name:	**Jacksonville Ash Site**	**EPA ID No.:**	**FLSFN0407002**
Interviewer Name:	**Johnny Zimmerman-Ward**	**Affiliation:**	**Skeo**
Subject Name:	**Roslyn Phillips and Bill Hollman**	**Affiliation:**	**Hester Group**
Subject Contact Information:	**904.739.2338**		
Time:	**3:00 p.m.**	**Date:**	**12/12/2018**
Interview Location:	**Hester Group Offices**		
Interview Format (circle one):	**In Person**	**Phone**	**Mail** **Other:**

Interview Category: Residents

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? *Yes. We work with the impacted property owners to coordinate cleanups on private properties and keep people updated with annual mailings.*

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? *It has been very successful. It was good once we got off the ground. We have a few holdouts, but people are working well after they learned about the program. In the beginning, it was more difficult as there was confusion between sampling versus remediation. Most residents saw the need to get the remediation done. Concerns in the past have been less with the cleanup itself but more with the lack of investment from COJ to bring services to the community. Some residents were concerned that signing any documentation meant that they could lose their property or have to address liens or back taxes, and some residents had landscaped yards that they did not want changed.*

3. What have been the effects of the Site on the surrounding community, if any? *Overall, it has improved the community since contamination has been removed.*

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing? *No.*

5. Has the EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can the EPA best provide site-related information in the future? *Yes.*

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used? *NA.*

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project? *No, not as far as the cleanup goes. The only complaint is concern that COJ needs to make more investments (jobs, businesses) in the community, especially since the contamination has had a long-term affect on the area.*

Jacksonville Ash Site		**Five-Year Review Interview Form**	
Site Name: Jacksonville Ash Site		**EPA ID No.:** FLSFN0407002	
Subject Name: Juanitta Bader Clem and JoAnne Snelson		**Affiliation:** England, Thims & Miller, Inc.	
Subject Contact Information: 904.265.3181 / clemj@etminc.com			
Time: 11:30 a.m.		**Date:** 02/07/2019	
Interview Format (circle one): In Person	Phone	Mail	Other: Email

Interview Category: **Remedial Action Contractor**

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? *COJ has done a tremendous job of completing the Jacksonville Ash Site project over 90 percent within 10 years. As the cleanup effort winds down, COJ will move more practically into the maintenance mode. COJ has done a commendable job of reusing the contaminated soil as daily cover at its landfill, Trail Ridge Landfill. There have been several projects that COJ has either developed or assisted in the redevelopment of, including the Animal Care and Control Facility (FS), Emmett C. Reed Park and the VA Clinic (FC), and the Brooklyn redevelopment (FS OU2).*

2. What is your assessment of the current performance of the remedy in place at the Site? *The remedy is more than adequate and is fully protective of human health and the environment.*

3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site? *Soil contaminant levels within the top 2 feet of ground surface have been effectively eliminated; 1,478 of the 1,720 parcels (86 percent) requiring remediation have been remediated to date and 68 of the remaining parcels are scheduled for remediation in 2019. Residual soil contamination within the top 2 feet has been identified in all remaining parcels (except the three parcels that have not been sampled). Furthermore, the source (incinerator ash) has been eliminated and therefore, the contaminant levels are not increasing.*

   Although not considered a risk, groundwater was monitored to confirm the presence of ash in soil was not contributing to groundwater contaminant concentrations. Monitoring data indicates concentrations of contaminants have been decreasing in samples collected from monitoring wells installed on site to evaluate/confirm this premise. Furthermore, approximately 90 percent of the surface area of the Site has been remediated such that continued groundwater monitoring has been deemed unnecessary.

4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence. *COJ has staff that periodically reconnoiter the Site and look for activities that may be impacting the remedy. As the cleanup effort winds down, COJ will implement an approved monitoring and periodic inspection program.*

5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts. *While O&M requirements and maintenance schedules have been performed with no significant change over the last five years, COJ has completed the sampling of all but three parcels (exclusive of completely impervious parcels) and has shifted focus to monitoring the Site. Regarding the sampling efforts, COJ has sampled all parcels that can be sampled via their inspection warrant process. The only parcels that were not*

sampled are three parcels that are owner-occupied (the inspection warrant is not allowed by state statute on owner-occupied parcels) and the parcels that are covered with impervious surfaces (whereby the impervious surfaces provide a protective cover). Completing the sampling efforts allowed COJ to follow up with cleanup efforts and bring the Site to 86 percent completion at this time.

6. Have there been unexpected O&M difficulties or costs at the Site since start-up or in the last five years? If so, please provide details. *Not to my knowledge.*

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies. *As discussed in Question No. 5 above, COJ utilized the inspection warrant process to complete the sampling of site parcels (not inclusive of completely impervious parcels). This provided final cleanup results for parcels and allowed COJ the opportunity to complete the cleanup process on most of the parcels. In addition, through COJ's permitting process, COJ reviews plans prior to construction as well as during construction to ensure the proper procedures are followed and the remedy is maintained.*

8. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site? *COJ is fully aware of the requirement to maintain the 2-foot cap over the Site in perpetuity and as such has already put into place permitting review requirements to preclude unwitting removal of the same. Since the overall program is nearing completion of construction, COJ has shifted the focus its efforts to O&M activities and institutionalizing government controls.*

9. Do you consent to have your name included along with your responses to this questionnaire in the FYR Report? *Yes.*

APPENDIX H – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Jacksonville Ash Site	**Date of Inspection:** 12/12/18
Location and Region: Jacksonville, FL, Region 4	**EPA ID:** FLSFN0407002
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** Sunny, 60°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other: Soil excavation and creek bank restoration.
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** Juanitta Clem (Name) | O&M Manager (Title) | 02/07/2019 (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone : _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ (Name) | _____ (Title) | mm/dd/yyyy (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency COJ
   Contact Jeff Foster (Name) | COJ oversight (Title) | 1/30/2019 (Date) | _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency FDEP
   Several Representatives (Name) | _____ (Title) | 06/21/2019 (Date)
   Problems/suggestions ☐ Report attached: Interview from several representatives in Appendix G

   Agency _____
   Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

4. **Other Interviews** (optional) ☒ Report attached: See Section 4 of the current FYR Report.

Community leaders, remediation subcontractor.

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1.	**O&M Documents**				
	☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A	
	☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
4.	**Permits and Service Agreements**				
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A	
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
9.	**Discharge Compliance Records**				
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A	
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A	

IV. O&M COSTS

1.	**O&M Organization**		
	☐ State in-house	☐ Contractor for state	
	☐ PRP in-house	☐ Contractor for PRP	
	☐ Federal facility in-house	☐ Contractor for Federal facility	
	☒ COJ will be overseeing O&M activities once the remedial action is completed.		

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☒ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: mm/dd/yyyy	To: mm/dd/yyyy	_____	☐ Breakdown attached
Date	Date	Total cost	
From: mm/dd/yyyy	To: mm/dd/yyyy	_____	☐ Breakdown attached
Date	Date	Total cost	
From: mm/dd/yyyy	To: mm/dd/yyyy	_____	☐ Breakdown attached
Date	Date	Total cost	
From: mm/dd/yyyy	To: mm/dd/yyyy	_____	☐ Breakdown attached
Date	Date	Total cost	

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☐ Gates secured ☐ N/A

Remarks: Gates unsecured at Lonnie C. Miller Sr. Park. Contractor is in the process of securing the gates.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: Signage at staging area "Project New Ground" with contact information.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Institutional Control Plan is in draft and COJ has notified property owners annually.

Frequency: Annual notification and whenever an area is to be redeveloped or excavated.

Responsible party/agency: COJ

Contact	Jeff Foster	Project Manager	_____	_____
	Name	Title	Date	Phone no.

Reporting is up to date	☒ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☒ Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	☒ Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☒ No	☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: In 2017, the EPA and COJ finalized an Institutional Control Plan that includes multiple layers of institutional controls to ensure the protection of human health for remediation parcels with contamination left in place, parcels which have yet to be remediated, and parcels without site access.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks:

2. **Land Use Changes On Site** ☒ N/A

Remarks:

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☐ Applicable ☒ N/A

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

C. Treatment System ☐ Applicable ☒ N/A

D. Monitoring Data ☒ Applicable* ☐ N/A

* The EPA agreed in 2016 that groundwater monitoring is no longer required.

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation ☐ Applicable ☒ N/A

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

Remedial action is ongoing at parcels within the three site locations. Creek stabilization has not yet been conducted because the creek banks are in good condition. As of the site inspection, the remedial action is 90 percent complete.

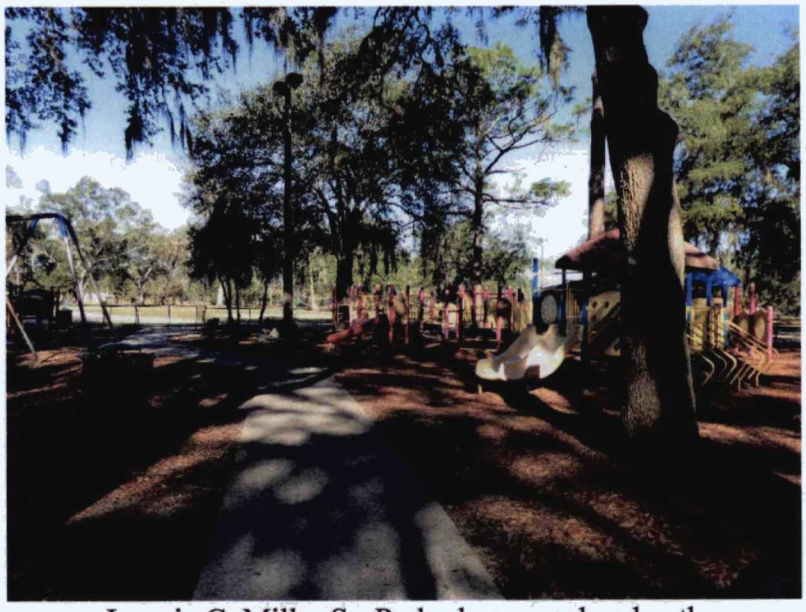
B. Adequacy of O&M

	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. Site remediation is ongoing, so O&M activities have only been initiated by COJ at remediated parcels. COJ revised the O&M Plan in January 2018. The O&M Plan describes the inspections, sampling, monitoring, analysis, maintenance and reporting that will be conducted by COJ to maintain the approved remedy on properties that have been remediated or otherwise closed via an institutional control.
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. No indicators of potential remedy problems were observed.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. No opportunities for optimization were observed.

APPENDIX I – SITE INSPECTION PHOTOS

Lonnie C. Miller Sr. Park area to be remediated, future potential sports complex location

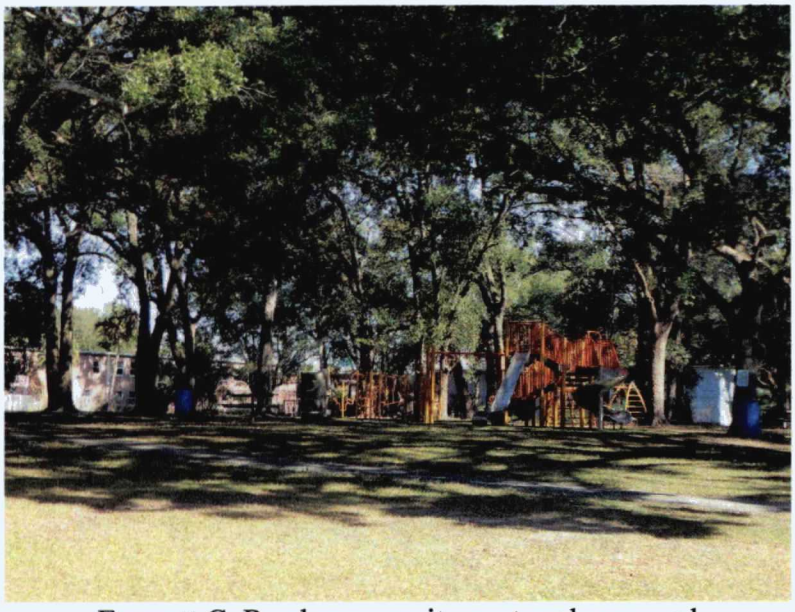
Lonnie C. Miller Sr. Park picnic shelter



Lonnie C. Miller Sr. Park playground and path

Active residential property remediation in OU2

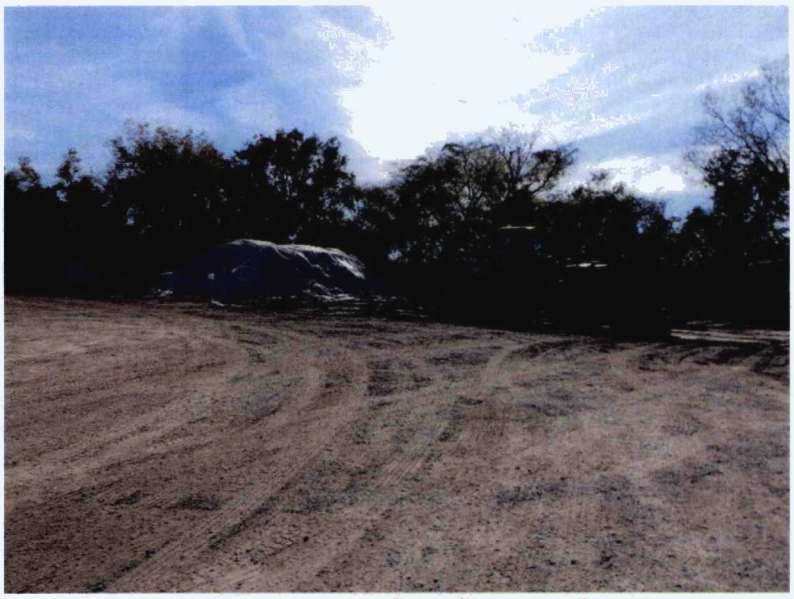
Emmett C. Reed park sign



Emmett C. Reed community center playground

Emmett C. Reed Park tennis courts

Active remediation in a neighborhood on site



COJ staging area for soil excavations

Animal Care and Control Facility building on site

APPENDIX J – DETAILED DATA ANALYSIS

The ROD requires groundwater monitoring to verify the "no action" decision for this medium. COJ began groundwater monitoring in October 2012 and annual sampling was completed in 2014, 2015 and 2016. Wells included in the monitoring events are summarized in Table J-1. Based on the results of groundwater sampling events, groundwater does not appear to have been adversely affected by the incinerator ash. The EPA and FDEP approved discontinuation of groundwater monitoring in October and December 2018, respectively. A summary of the groundwater data collected at the three ash disposal areas is provided below.

Table J-1: Wells included for Annual Monitoring at the Site

Site Location	Monitoring Well
Forest Street Incinerator	BKFSMW002
	FSMW001
	FSMW002
	FSMW003
	FSMW004
	FSMW006
	FSMW011
	FSMW013
	FSMW014
	FSMW015
5th & Cleveland Incinerator	BKFCMW001
	BKFCMW002
	FCMW003
Lonnie C. Miller Sr. Park	BKLMMW002
	LMMW002
	LMMW003
	LMMW004
	LMMW007
Source: Jacksonville Ash Groundwater Monitoring Report. Prepared by Aerostar. July 2016	

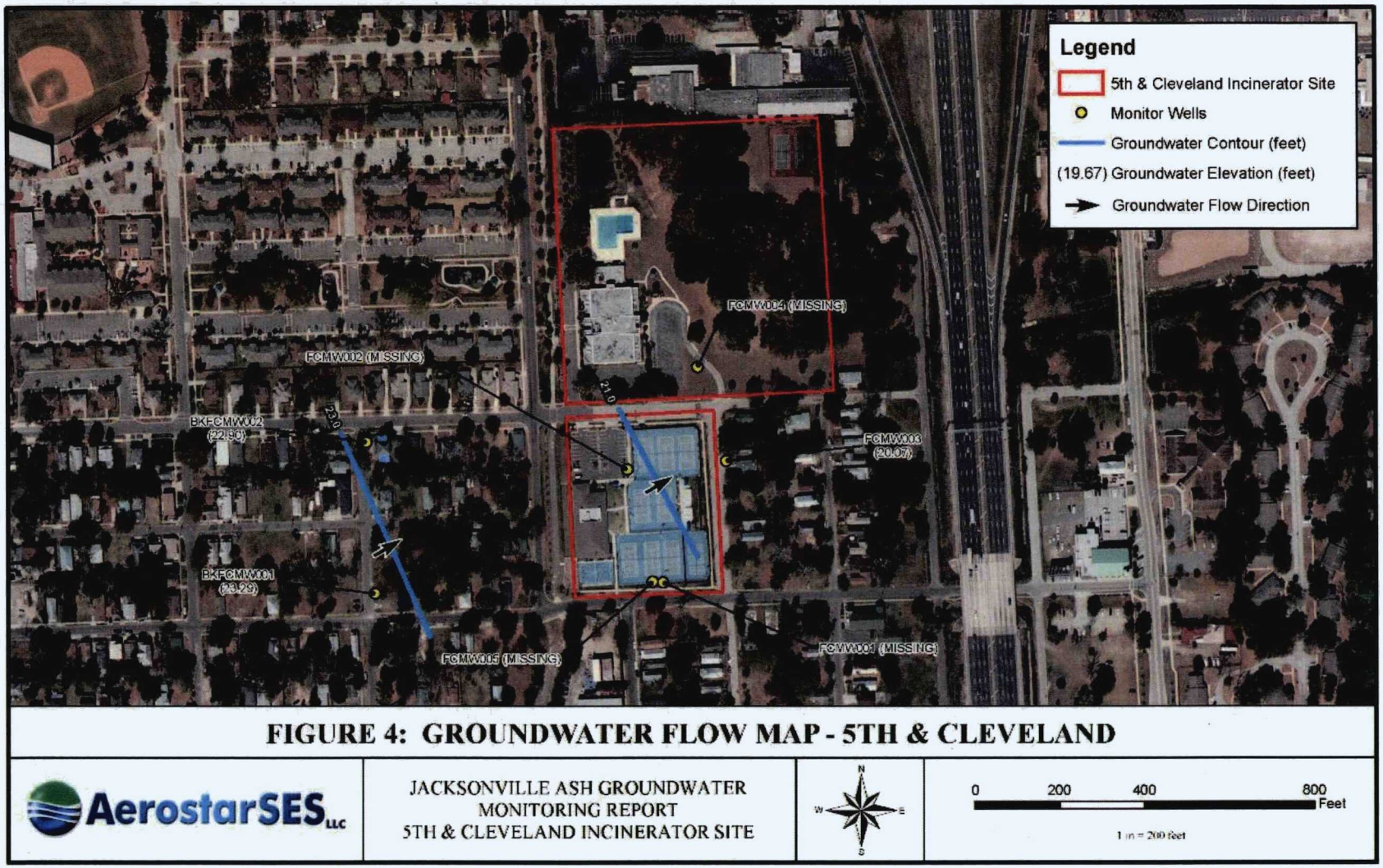
Sampling was conducted concurrently with sampling for the Brown's Dump SAA site.

Samples were analyzed for select metals (arsenic, lead, barium, cadmium, copper, manganese, zinc, antimony, nickel, thallium and vanadium), with some samples also analyzed for cPAHs, dioxins/furans and PCBs. Groundwater sampling was conducted in accordance with the guidelines established in the March 31, 2011 Groundwater Monitoring SAP/QAPP (2011 SAP/QAPP). Results were compared to screening levels established in the 2011 SAP/QAPP to include drinking water standards and health-based standards. The drinking water standards included the federal maximum contaminant levels (MCLs) and FDEP's groundwater cleanup target levels (GCTLs) established by Florida Administrative Code (FAC) Chapter 62-777. In the absence of an MCL or GCTL, the EPA's RSLs for tap water were used.

5th & Cleveland Incinerator Area

Analytical results from the 2012, 2014, 2015 and 2016 sampling showed no detections above the 2011 SAP/QAPP screening levels for manganese and zinc. Groundwater flow direction was estimated to be to the east-northeast (Figure J-1)

Figure J-1: Monitoring Well Locations at the 5th & Cleveland Incinerator Area



Source: Jacksonville Ash Groundwater Monitoring Report. Prepared by Aerostar. July 2016.

Forest Street Incinerator Area

Laboratory analytical results from 2012 to 2016 show sporadic detections above the 2011 SAP/QAPP screening levels for arsenic, lead and manganese. The most exceedances were observed for manganese. However, there is no trend observed. No other parameters were detected above screening levels during the 2016 sampling event (Table J-2). The monitoring well locations and groundwater flow direction are presented in Figure J-2.

Table J-2: Summary of Detected COCs in Groundwater - Forest Street Incinerator Site (mg/L)

	FSMW004		FSMW006	FSMW011	FSMW015	FSMW015
Sample Date	**Manganese**	**Lead**	**Manganese**	**Manganese**	**Manganese**	**Arsenic**
10/2012	0.37	0.00049	0.2	0.26	0.026	0.0090
2/2014	**1.10**	0.00036	0.75	0.014	0.480	**0.012**
4/2014	**1.10**	NS	NS	NS	NS	NS
2/2015	0.33	0.0009	0.54	**0.89**	0.33	0.007
2/2016	0.31	**0.017**	0.33	**1.3**	0.31	0.0065
6/2016	0.36	0.002	NS	0.28	NS	NS

Notes:
NS = not sampled
Bold result = concentration exceeds remedial goal (arsenic = 0.01 milligrams per liter [mg/L], manganese = 0.88 mg/L, lead = 0.015 mg/L)
mg/L = milligrams per liter
Source: Jacksonville Ash Groundwater Monitoring Report. Prepared by Aerostar. July 2016

Lonnie C. Miller Sr. Park

Analytical results from the 2012, 2014, 2015 and 2016 sampling showed no detections above screening levels. Groundwater flow direction was estimated to be to the east-northeast. The monitoring well locations and groundwater flow direction are presented in Figure J-3.

Figure J-2: Monitoring Well Locations at the Forest Street Area

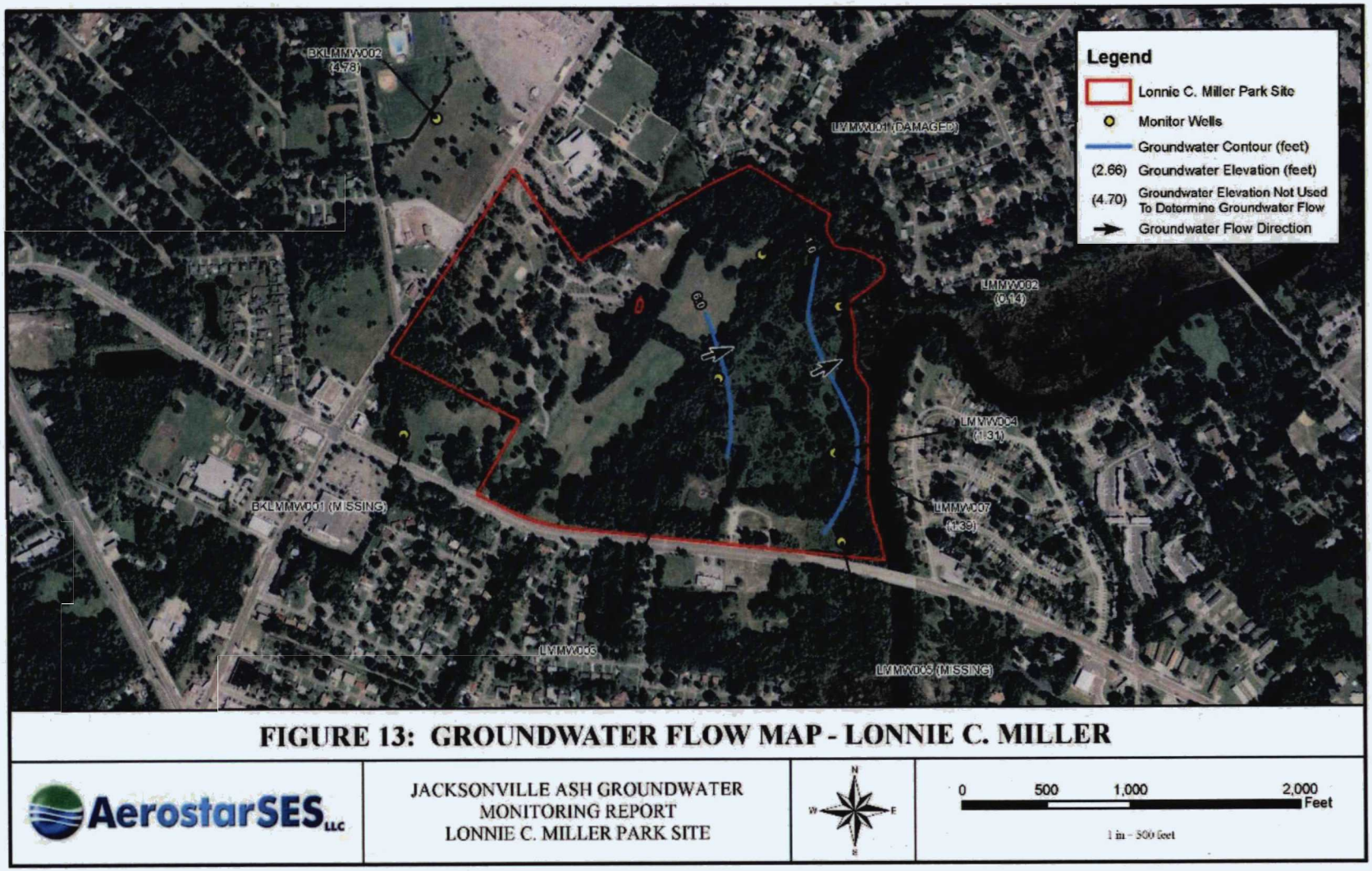
FIGURE 10: GROUNDWATER FLOW MAP - FOREST STREET

AerostarSES LLC

JACKSONVILLE ASH GROUNDWATER
MONITORING REPORT
FOREST STREET INCINERATOR SITE

Source: Jacksonville Ash Groundwater Monitoring Report. Prepared by Aerostar. July 2016

Figure J-3: Monitoring Well Locations at the Lonnie C. Miller Sr. Park



Source: Jacksonville Ash Groundwater Monitoring Report. Prepared by Aerostar. July 2016

APPENDIX K – DETAILED ARARS REVIEW

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. In performing the FYR for compliance with Applicable or Relevant and Appropriate Requirement (ARARs), only those ARARs that address the protectiveness of the remedy are reviewed.

Groundwater ARARs

Groundwater did not require remediation based on the results of the Baseline HHRA and refinement of the COC list. Therefore, chemical-specific ARARs were not identified for groundwater.

Soil ARARs

Except for PCBs, federal ARARs have not been established for the soil COCs. However, state ARARs have been established for the soil COCs in 2005 under FAC Chapter 62-777 based on residential and industrial exposure and are referred to as FDEP's health-based SCTLs. The SCTLs are the risk levels of 10^{-6} for carcinogens and a noncancer hazard index (HI) of 1.0 based on the sum of individual hazard quotients (HQs) as stipulated in FAC Chapter 62-780. The SCTLs have not changed since the previous FYR. In instances where background exceeds the SCTL, the final cleanup goal was the background concentration. In addition, the EPA derived residential based soil cleanup goals for copper, barium, nickel and vanadium based on site-specific risk assessment rather than default to the SCTL for these four metals. The soil cleanup goals were further evaluated in Appendix L to determine if toxicity value changes affect the protectiveness of the cleanup goals.

APPENDIX L – SCREENING-LEVEL RISK REVIEW

The soil cleanup goals were based on residential and industrial land uses; the values were either health-based values developed during the HHRA or the SCTLs established by FDEP under FAC 62-777. Cleanup goals for soil were also developed for ecological receptors. However, according to the ROD, cleanup to the human-health cleanup goals will provide adequate protection of ecological receptors. To evaluate whether any exposure factor and toxicity value changes since the ROD could affect remediation levels, the ROD residential cleanup levels were compared to the EPA's RSLs because the residential levels are more stringent.

As demonstrated in Table L-1, the ROD cleanup goals represent cancer risks that are within the EPA's risk management range of 1×10^{-6} to 1×10^{-4}. The remedial goals for manganese and thallium are equivalent to HQs above the EPA's threshold of 1. The noncarcinogenic RSLs are based on the conservative assumption of child-only exposure, which is not generally used in human health risk assessments. The current RSL for thallium is based on conservative provisional peer-reviewed toxicity values. Region 4 of the EPA determined that the remedial goal is within the acceptable range of values the region developed using EPA Risk Assessment Guidance for Superfund.[3] In addition, according to the 2008 Remedial Action Plan, lead serves as the indicator of other contaminants. The remedial action plan determined that the organic and metal COCs were strongly associated with lead, such that lead served as an indicator of other contaminants during remediation. COCs identified in the remedial action plan and remedial design include lead as well as arsenic, cPAHs and dioxin because these compounds have been correlated with ash contamination. Because the residential-based remedial goals remain valid, the industrial levels would also remain valid because both scenarios use the same toxicity values.

Table L-1: Screening-Level Risk Evaluation of 2006 Soil Remedial Goals

COC	ROD Residential Remedial Goal (mg/kg)	Residential RSL[a] (mg/kg)		Cancer Risk[b]	Noncancer HQ[c]
		1×10^{-6} Risk	HQ=1.0		
Antimony	27	NA	31	--	0.9
Arsenic	2.1	0.68	35	3×10^{-6}	0.06
Barium	4,166	NA	15,000	--	0.3
Cadmium	82	2,100	71	4×10^{-8}	1
Copper	2,810	NA	3,100	--	0.9
Lead	400	400[e]		No change	
Manganese	3,500	NA	1,800	--	2[d]
Nickel	1,433	15,000	1,500	1×10^{-7}	1
Thallium	6.1	NA	0.78	--	8[f]
Vanadium	491	NA	390	--	1
Zinc	26,000	NA	23,000	--	1
Aroclor 1254	0.5	0.24	1.2	2×10^{-6}	0.4
Aroclor 1260	0.5	0.24	NA	2×10^{-6}	--
cPAHs	0.1	0.11	18	9×10^{-7}	0.006
2,3;7,8-TCDD (dioxin)	8.82×10^{-6}	4.8×10^{-6}	5.1×10^{-5}	2×10^{-6}	0.2

[3] The current RSL is based on conservative provisional peer-reviewed toxicity values. Using EPA Risk Assessment Guidance for Superfund, Part B, age-adjusted RSLs of 3 mg/kg and 20 mg/kg were derived by EPA Region 4 based on the provisional value screening toxicity value of 1×10^{-5} mg/kg-day and a value of 8×10^{-5} mg/kg-day, the lower end of the range of values published in the EPA's Integrated Risk Information System summary for thallium soluble salts.

COC	ROD Residential Remedial Goal (mg/kg)	Residential RSL[a] (mg/kg)		Cancer Risk[b]	Noncancer HQ[c]
		1 x 10^{-6} Risk	HQ=1.0		

Notes:

a. Current EPA RSLs, dated November 2018, are available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables (accessed 12/5/2018).
b. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk: cancer risk = (cleanup level ÷ cancer-based RSL) × 10^{-6}.
c. The noncancer HQ was calculated using the following equation: HQ = cleanup level ÷ noncancer-based RSL.
d. Based on current EPA toxicity values and default exposure residential assumptions for an adult and child, EPA Region 4 determined that 3,500 mg/kg remains protective.
e. The EPA has no consensus on carcinogenic or noncarcinogenic toxicity values for inorganic lead, so it is not possible to calculate RSLs. Therefore, the EPA evaluates lead exposure by using blood-lead modeling and established a default residential level of 400 mg/kg. If this value is exceeded, use of site-specific information is recommended in the blood-lead model.

mg/kg = milligrams per kilogram
NA = not applicable; noncancer toxicity criteria not established
Bold = cleanup goal equivalent to noncancer HQ above target of 1.0

Remediation has not yet occurred next to McCoy's Creek, Hogan's Creek and the Ribault River because most of the creek and river banks have adequate stability and erosion protection (e.g., they are vegetated and portions have retaining walls), which reduces exposure to ash that may have deposited in creek and river sediments. Once funding becomes available, the need for stabilization of the northern bank of McCoy's Creek will be evaluated. In 2013 the EPA evaluated intermittent exposures to contaminated creek and river bank soil/sediments and determined that a lead concentration of 3,900 mg/kg is health protective for children in a recreational use scenario exposed to these sediments. The maximum lead concentration detected in sediment (760 mg/kg) is below the health protective level.

The EPA's Office of Land and Emergency Management determined in 2016 that there is sufficient evidence that adverse health effects are associated with blood lead levels (BLLs) at less than 10 µg/dL. Since the cleanup goal of 400 mg/kg is based on a BLL of 10 µg/dL, the EPA conducted a lead bioavailability study in June 2019 using the EPA's In Vitro Bioaccessibility Assay on soil samples collected in December 2018. The results demonstrated that the absolute bioavailability of lead in site soils is 30% which is the same as the default value used in the lead exposure model. Using a lower blood lead level target in conjunction with updated default inputs and the site specific bioavailability in the lead exposure model, the EPA calculated a residential soil lead level of 400 mg/kg. Therefore, the cleanup goal for lead established in the 2006 ROD remains valid.

The EPA selected a "no action" remedy for groundwater. The groundwater screening levels in the 2011 SAP/QAPP for most of the COCs were based on MCLs, which have not changed. A screening-level health evaluation was conducted for the health-based groundwater levels for COCs without established MCLs to determine if the screening levels to support the no action determination remain valid. Table L-2 shows that the health-based screening levels established in 2011 are less stringent for manganese and zinc based on a comparison to the EPA RSLs. However, the screening levels remain valid for manganese and zinc because the levels are based on current toxicity values and are associated with acceptable noncancer risks as calculated in the baseline risk assessment. The health-based levels for the six cPAHs without an established MCL are equivalent to cancer risks that fall within the EPA's risk management range of 1 x 10^{-6} to 1 x 10^{-4}, which supports the finding that the comparison levels used in the 2011 SAP/QAPP remain valid.

Table L-2: Screening-Level Risk Evaluation of 2011 SAP/QAPP Groundwater Screening Levels

COC	Health-based Comparison Levels Listed in the 2011 SAP/QAPP (µg/L)[a]	EPA Tap Water RSL[b] (µg/L)		Future Groundwater Use	
		1 x 10^{-6} Risk	HQ=1.0	Risk[c]	Noncancer HQ[d]
Manganese	880	NA	430	-	**2**
Nickel	100	NA	390	-	0.3
Vanadium	49	NA	86	-	0.6
Zinc	11,000	NA	6,000	-	**2**
Carbazole	3.36	NA	NA	-	-
Carbon disulfide	100	NA	810	-	0.1
Alpha-endosulfan	21.9	NA	100	-	0.2
cPAHs					
Benzo(a)anthracene	0.05	0.03	NA	2 x 10^{-6}	-
Benzo(b)fluoranthene	0.05	0.25	NA	2 x 10^{-7}	-
Benzo(k)fluoranthene	0.5	2.5	NA	2 x 10^{-7}	-
Chrysene	4.8	25	NA	2 x 10^{-7}	-
Dibenzo(a,h)anthracene	0.005	0.025	NA	2 x 10^{-7}	-
Indeno(1,2,3-cd)pyrene	0.05	0.25	NA	2 x 10^{-7}	-

Notes:

a. Comparison levels listed in the March 2011 Groundwater Monitoring SAP/QAPP.
b. Current EPA RSLs, dated November 2018, are available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables (accessed 12/5/2018).
c. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk: cancer risk = (remedial goal ÷ cancer-based RSL) × 10^{-6}.
d. The noncancer HQ was calculated using the following equation: HQ = remedial goal ÷ noncancer-based RSL.

µg/L = micrograms per liter
Bold = cancer risk exceeds 1 x 10^{-4} or noncancer HQ of 1.0

According to the ROD, cleanup to the human-health cleanup goals will also provide adequate protection to ecological receptors.