Fourth Five-Year Review Report
for
Florida Steel Corporation
FLD050432251

Indiantown
Martin County, Florida

September 2016

United States Environmental Protection Agency
Region 4
Atlanta, Georgia

Approved by:

Franklin E. Hill
Director, Superfund Division

Date:

8/16/16

Fourth Five-Year Review Report
for
Florida Steel Corporation
18300 SW Warfield Boulevard
Indiantown
Martin County, Florida

Tables

Figures

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Contaminant of Concern
EC	Emission Control
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FS	Feasibility Study
FSC	Florida Steel Corporation
FYR	Five-Year Review
IC	Institutional Control
MCL	Maximum Contaminant Level
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MOA	Memorandum of Agreement
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
pCi/g	Picocuries per Gram
pCi/L	Picocuries per Liter
PCB	Polychlorinated Biphenyl
PCOR	Preliminary Close-Out Report
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SFWMD	South Florida Water Management District
TBC	To-Be-Considered
TSCA	Toxic Substances Control Act

Executive Summary

The 151.6-acre Florida Steel Corporation Superfund Site (the Site) is located in a rural area in Indiantown, Martin County, Florida. The Florida Steel Corporation (FSC), now known as Gerdau Ameristeel, acquired the Site in 1969. FSC operated a steel mill from November 1970 until February 1982. The mill produced three byproducts: mill scale, slag and emission control (EC) dust. The mill crushed and graded the slag and sold it as aggregate and fill material. Site operations and discharge contaminated site soil, groundwater and a neighboring wetland area. The EPA added the Site to the Superfund program's National Priorities List (NPL) in December 1982.

The U.S. Environmental Protection Agency designated two operable units (OUs) at the Site. OU1 addresses source materials, incinerator ash, soil and on-site wetland sediment. OU2 addresses the Southwest Wetlands and contaminated groundwater. The EPA issued a Record of Decision (ROD) for OU1 in June 1992. The selected remedy included: excavation and off-site disposal of contaminated soils; on-site solidification in a lined and capped landfill, and treatment as necessary of EC dust, soil and ash; excavation restrictions; control of surface water runoff during remediation; and periodic monitoring of surface water and groundwater quality. The EPA issued a ROD for OU2 in March 1994 that included: groundwater extraction and blending with clean water to achieve maximum contaminant levels (MCLs); spray field discharge of the blended groundwater; clearing of some vegetation from the Southwest Wetland; sediment excavation, solidification and stockpiling in OU1 landfill as needed; backfilling, restoring and monitoring the excavated area for at least five years. The 2013 Explanation of Significant Differences (ESD) modified the OU1 and OU2 ROD to document the selection and inclusion of institutional controls as part of the remedy for the Site.

The Site's potentially responsible party (PRP), Gerdau Ameristeel (formerly FSC), conducted the remedial actions. The Site reached construction completion on September 11, 1999. The Site is currently undergoing regular groundwater monitoring. The triggering action for this five-year review (FYR) was the signing of the previous FYR on September 27, 2011.

The remedy for OU1 currently protects human health and the environment because groundwater monitoring continues, contaminated source material and soil contamination have been excavated, stabilized and contained in the on-site landfill and there are no current exposures to contamination. In order for the OU1 remedy to be protective in the long term, animal burrows in the landfill cap must be repaired, relocating any sensitive species per state or local law.

The remedy for OU2 currently protects human health and the environment because, although the groundwater remediation system is not operating as designed, there are no current exposures to contamination. In order to be protective in the long term, the appropriate course of action for addressing lingering contamination must be determined.

Because the remedial actions at all OUs are protective in the short term, the Site's remedy is protective of human health and the environment in the short term. In order for the remedy to be protective in the long term, issues identified in the OU1 and OU2 protectiveness statements should be addressed.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Florida Steel Corporation		
EPA ID: FLD050432251		
Region: 4	**State:** FL	**City/County:** Indiantown/Martin
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Peter Thorpe (EPA), Kristin Sprinkle (Skeo Solutions) and Sarah Alfano (Skeo Solutions)		
Author affiliation: EPA and Skeo Solutions		
Review period: November 2015 – September 2016		
Date of site inspection: 01/06/2016		
Type of review: Statutory		
Review number: 4		
Triggering action date: 09/01/2011		
Due date *(five years after triggering action date)*: 09/01/2016		

Five-Year Review Summary Form (continued)

Issues/Recommendations

Issues and Recommendations Identified in the Five-Year Review:

OU1	Issue Category: Operations and Maintenance			
	Issue: There are animal burrows in the capped area.			
	Recommendation: Address animal burrows in cap and relocate sensitive species per state or local law.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	1/01/2017

OU2	Issue Category: Remedy Performance			
	Issue: The OU2 remedy has been offline since 2009 and it may not be practical to restart it, although several shallow and deep wells continue to exceed cleanup standards and there is some evidence of deep aquifer migration.			
	Recommendation: Consider targeted remedial actions to address lingering exceedances and migration. Update site decision and operation and maintenance (O&M) documents as needed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	1/01/2017

Protectiveness Statements

Operable Unit: 1	*Protectiveness Determination:* Short-Term Protective
Protectiveness Statement: The remedy for OU1 currently protects human health and the environment because groundwater monitoring continues, contaminated source material and soil contamination have been excavated, stabilized and contained in the on-site landfill and there are no current exposures to contamination. In order for the OU1 remedy to be protective in the long term, animal burrows in the landfill cap must be repaired, relocating any sensitive species per state or local law.	
Operable Unit: 2	*Protectiveness Determination:* Short-Term Protective
Protectiveness Statement: The remedy for OU2 currently protects human health and the environment because, although the groundwater remediation system is not operating as designed, there are no current	

exposures to contamination. In order to be protective in long term, the appropriate course of action for addressing lingering contamination must be determined.

Sitewide Protectiveness Statement
Protectiveness Determination: Short-Term Protective
Protectiveness Statement: Because the remedial actions at all OUs are protective in the short term, the Site's remedy is protective of human health and the environment in the short term. In order for the remedy to be protective in the long term, issues identified in the OU1 and OU2 protectiveness statements should be addressed.

Five-Year Review Summary Form (continued)

Environmental Indicators
- Current human exposures at the Site are under control. *- Current groundwater migration is under control.*

Are Necessary Institutional Controls in Place?
☒ All ☐ Some ☐ None

Has EPA Designated the Site as Sitewide Ready for Anticipated Use?
☒ Yes ☐ No

Has the Site Been Put into Reuse?
☐ Yes ☒ No

Fourth Five-Year Review Report
for
Florida Steel Corporation Superfund Site

1.0 Introduction

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

The U.S. Environmental Protection Agency prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Skeo Solutions, an EPA Region 4 contractor, conducted the FYR and prepared this report regarding the remedy implemented at the Florida Steel Corporation Superfund site (the Site) in Indiantown, Martin County, Florida. The EPA's contractor conducted this FYR from November 2015 to September 2016. The EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site. The Florida Department of Environmental Protection (FDEP), as the support agency representing the State of Florida, has reviewed all supporting documentation and provided input to the EPA during the FYR process.

This is the fourth FYR for the Site. The triggering action for this statutory review is the date of the third FYR report. The FYR is required due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of two operable units (OUs). This FYR report addresses both site OUs.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
Florida Steel Corporation (FSC) operated a steel mill at the Site	November 1970 to February 1982
Florida Department of Environmental Regulation (FDER, now FDEP) conducted a Resource Conservation and Recovery Act (RCRA) compliance inspection and identified piles of emission control (EC) dust as possible RCRA violations	1981
The EPA proposed the Site for listing on the Superfund program's National Priorities List (NPL)	December 30, 1982
FDER discovered some site soils were contaminated with polychlorinated biphenyls (PCBs)	March 1983
The EPA placed the Site on the NPL	September 8, 1983
FSC completed the PCB remedial action plan	August 25, 1985
FSC and FDER entered into a Consent Agreement	September 4, 1985
FSC initiated PCB-contaminated soil excavation efforts	February 15, 1986
FSC initiated a periodic groundwater monitoring program	1986
FSC completed PCB-contaminated soil excavation and placed soils in on-site vault	May 8, 1986
FSC completed a feasibility study (FS) for treatment options of PCB-contaminated soil in vault	October 2, 1986
FSC and EPA entered into Administrative Order on Consent for treatment of PCB-contaminated soils	September 21, 1987
FSC and FDER entered into Administrative Order on Consent for a remedial investigation (RI)/FS	May 30, 1988
FSC initiated and completed incineration of PCB-contaminated soil in on-site vault	October 1987 to May 1988
FSC completed Phase 1 of the RI	September 30, 1988
FSC submitted a revised RI/FS work plan	December 29, 1988
FSC completed Phase 2 of the RI	October 17, 1989
FSC filed a Restrictive Covenant	August 22, 1990
The EPA issued Wetland Impact Study Report (OU1)	May 1991
The EPA issued OU1 Record of Decision (ROD)	June 30, 1992
FSC initiated remedial design for OU1	February 10, 1993
The EPA and FSC signed a Consent Decree for OU1	February 19, 1993
The EPA issued OU2 ROD	March 30, 1994
FSC completed remedial action work plan for OU1	1994
FSC completed the remedial design for OU1	September 21, 1994
FSC initiated the remedial design for OU2	October 3, 1994
The EPA and FSC signed a Consent Decree for OU2	January 24, 1995
FSC's contractors excavated and restored northern portion of Southwest Wetland	July 1995 to December 1995
FSC completed remedial design for OU2	June 12, 1995
The EPA received completed OU2 remedial design; the EPA received OU2 Performance Standards Verification Plan	February 15, 1996
The EPA and FDEP performed inspection for soil and wetlands and determined the remedy construction was appropriate and complete	April 23, 1996
The EPA and FDEP performed inspection for the groundwater remediation system and determined the remedy construction was appropriate and complete	February 18, 1997
FSC activated groundwater remediation system	April 24, 1997
The EPA issued Preliminary Close-Out Report (PCOR)	September 11, 1997
PRP contractor completed Operation and Maintenance (O&M) Manual	November 16, 1997

Event	Date
The EPA issued first FYR report	January 16, 2001
The EPA issued second FYR report	April 18, 2006
The EPA issued third FYR report	September 27, 2011
The EPA issued an Explanation of Significant Differences (ESD) for OUs 1 and 2 to document the need for institutional controls at the Site	June 25, 2013
Gerdau Ameristeel filed a Restrictive Covenant	April 14, 2015
The EPA designated the Site as Sitewide Ready for Anticipated Use	April 30, 2015

3.0 Background

3.1 Physical Characteristics

The 151.6-acre Site is located in a rural area of Martin County, southwest of State Road 710 (Warfield Boulevard). The Site's street address is 18300 Southwest Warfield Boulevard, and it is about 2 miles northwest of the unincorporated community of Indiantown (Figure 1) in Florida.

A main line rail track and State Road 710 abut and parallel the Site's northern boundary. The area north of the main line rail track and State Road 710 is zoned for agricultural land uses. This area includes several wetland areas. A 230-kilovolt transmission line runs parallel to the southern boundary of the Site at a distance of about 200 feet and then extends along the Site's eastern boundary, where it connects to a Florida Power & Light electrical substation located on Site. A 500-kilovolt transmission line extends across the western portion of the Site.

Past steel mill operations shaped current Site features. On-site water bodies include small man-made borrow pits, stormwater retention ponds and drainage ditches. Previously removed structures include the former mill building, and a concrete recirculating reservoir. Existing site components include a landfill; storage tank; treatment plant; recovery, injection, production and monitoring wells; and spray fields.

Runoff from the Site flows southwesterly through wetlands toward Canal C-44, which flows into the St. Lucie River and on into the Indian River Lagoon Drainage Basin. There are two major aquifers in Martin County: the surficial (non-artesian) aquifer system with both shallow and deep zones, located about 5 to 130 feet below the land surface, and the Floridan aquifer system, which occurs from 600 to 1,500 feet below sea level. A thick section of sand and clay of low permeability separates the two aquifers. The surficial aquifer system is the principal source of fresh water supplies in Martin County. The direction of groundwater flow at the Site is to the south. The Site is located 2 miles northeast of the St. Lucie Canal (Canal C-44) and water in the shallow zone surficial aquifer flows towards the canal from both the north and south.

3.2 Land and Resource Use

The Florida Steel Corporation (FSC), now known as Gerdau Ameristeel, acquired the Site in 1969. Prior to 1969, the Site consisted mostly of brushland with some swampy areas. The site property and extensive areas to the southeast, southwest and northwest are zoned for industrial uses. The industrially zoned lands to the south and east of the Site include several wetland areas. The Floridian Natural Gas Storage Company, LLC secured an option to purchase the property in 2010 and negotiations continue. The company plans to build a natural gas storage facility on the Site. The EPA determined the Site met the Sitewide Ready for Anticipated Use performance measure in April 2015.

A 2013 potable well survey confirmed an irrigation well located 2,800 feet south of the Site. However, there are no nearby potable wells located downgradient of the Site. The Indiantown Company, the local water company, provides potable water supplies to areas around the Site. Water is drawn from eight surficial aquifer wells located in Indiantown, about 2 miles southeast from the Site.

3.3 History of Contamination

FSC operated a steel mill from November 1970 until February 1982. The mill produced three byproducts: mill scale, slag and emission control (EC) dust. Mill scale is the oxidized iron that sloughs off hot steel as it is cooled. Lime formed the slag, which was introduced as a flux into electric furnaces to remove impurities such as soil and sand from the molten steel. Primary metals present in the slag included barium, chromium and lead. The mill crushed and graded the slag and sold it as aggregate and fill material. EC dust is the fine particulate material generated as high temperatures in electric arc furnaces drive off and oxidize iron and other volatile metals contained in the scrap. The major constituents of EC dust were iron oxide, zinc oxide and lead oxide.

Prior to 1975, the steel mill used a system of hydraulic shears in its billet casting operation. The hydraulic fluid used in the hydraulic shears contained polychlorinated biphenyl (PCBs). Hydraulic fluid from the billet cutting shears entered the plant's recirculating contact cooling water system. The hydraulic fluid then mixed with lube oil, mill scale and other sediments, which accumulated in the concrete recirculating reservoir. Radium, a naturally occurring element in groundwater, can become concentrated within the ion exchange resin of the water softener and then discharged via periodic back flushing of the resin. Sodium chloride in groundwater can also cause naturally occurring radium to leach from the soil. Uncontained waste piles also contributed to site contamination. In August 1980, the EPA found elevated levels of contaminants in EC dust, the shallow surficial aquifer and soil.

3.4 Initial Response

During mill operations, a system of baghouses collected EC dust. Prior to 1980, FSC deposited the EC dust captured in the baghouses in two on-site disposal areas. In 1980, the Resource Conservation and Recovery Act (RCRA) listed EC dust as a hazardous waste. In 1981, the Florida Department of Environmental Regulation (FDER, now FDEP), conducted a RCRA compliance inspection of the facility. During the inspection, they obtained samples of EC dust from uncontained waste piles on site.

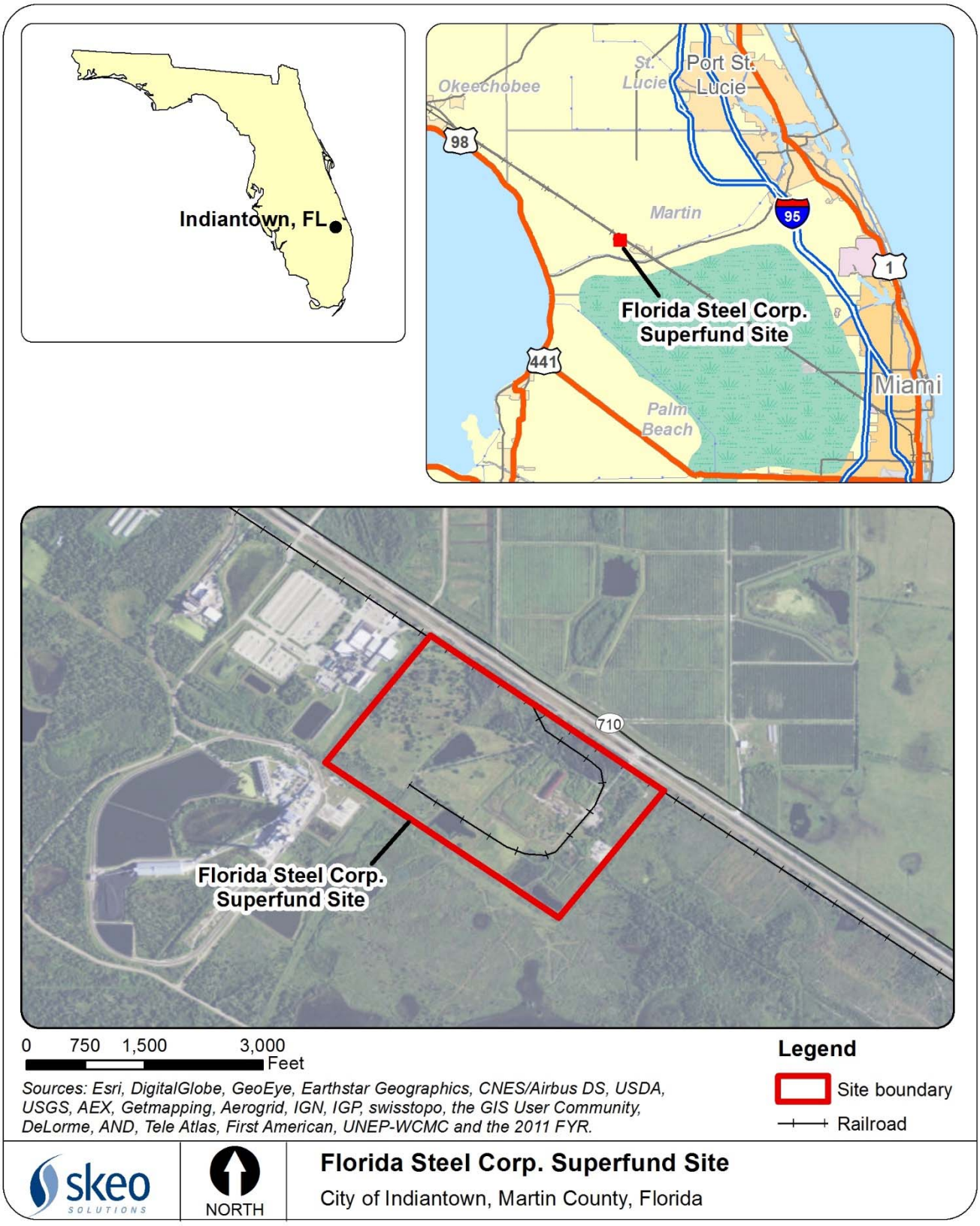
In September 1983, the EPA placed the Site on the Superfund program’s National Priorities List (NPL). The EPA based the listing on the potential threat to the environment from heavy metals present in both the EC dust and the shallow surficial aquifer. Early in 1983, FSC, with FDEP oversight, began a remedial investigation (RI) focused on the EC dust disposal areas. In March 1983, FDER discovered some of the EC dust was contaminated with PCBs. During 1985, FSC removed about 8,000 tons of EC dust from disposal areas and shipped it to a metal recycling facility for zinc recovery. FSC also removed some EC dust as part of the PCB cleanup.

From February to May, 1986, in compliance with the 1985 Consent Agreement between FSC and FDEP, FSC excavated about 11,200 tons of soil, sediment and EC dust containing PCBs at concentrations of 50 milligrams per kilogram (mg/kg) and above from the Site. They temporarily placed soil, sediment and EC dust in a specially constructed secure on-site storage vault. FSC then backfilled the excavations with clean fill material. Also in 1986, FSC began a periodic groundwater monitoring program at the Site.

In October 1986, FSC developed a separate feasibility study (FS) that described options for the treatment of the PCB-contaminated soil in the vault. In 1987, based on the FS, the EPA directed FSC to incinerate the PCB-contaminated soil. In compliance with a 1987 Administrative Order of Consent between FSC and the EPA, FSC began incineration of the material in the vault in October 1987 and completed it in May 1988. Because of the presence of heavy metals, FSC consolidated ash from the incineration within a specially designated ash retention building pending remedial design. Final disposition of the ash is addressed in the site remedy.

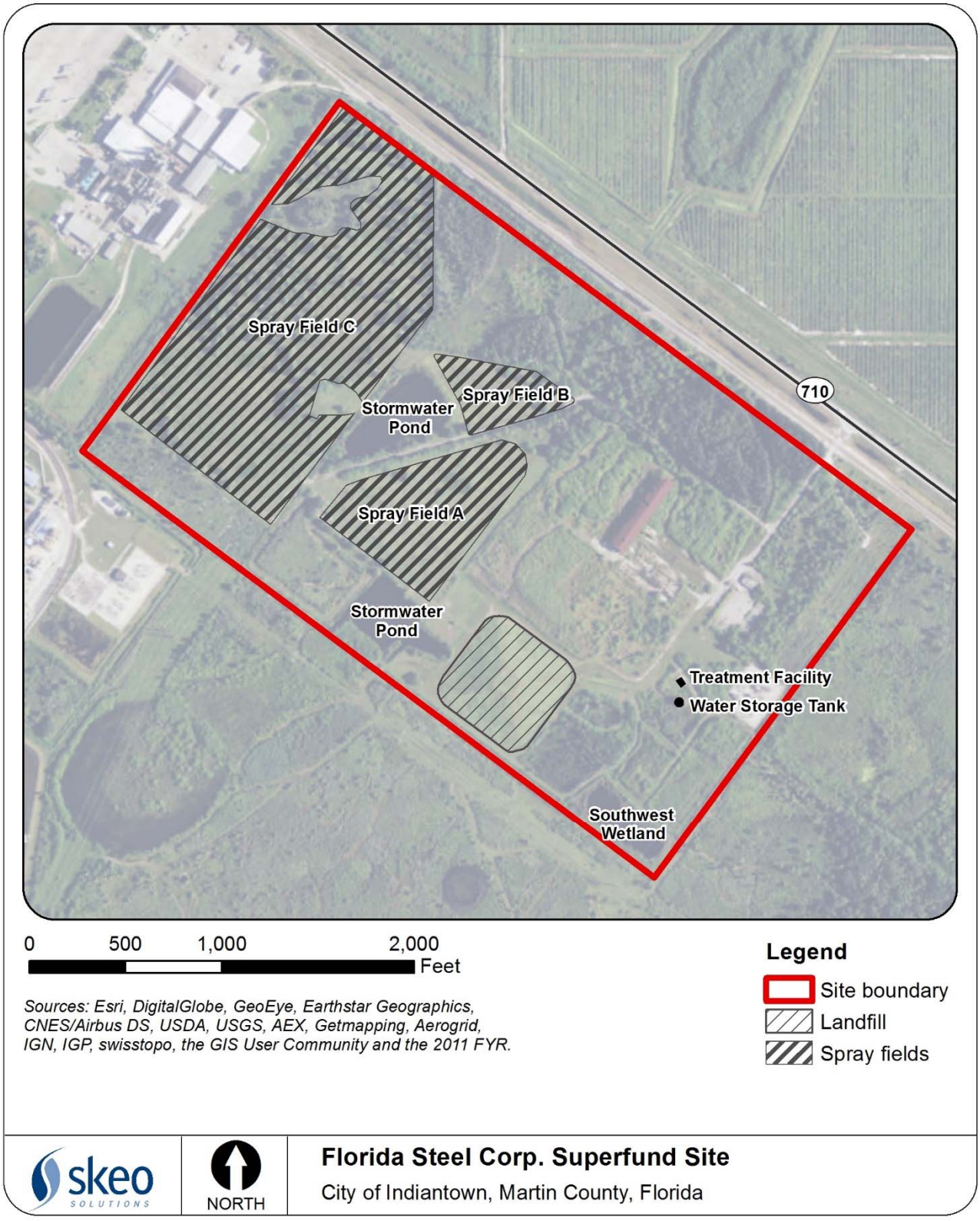
During the RI, FSC and FDEP discovered site soils contaminated with PCBs in limited areas outside areas previously addressed and in a small area west of the slag disposal area.

Figure 1: Site Location Map



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 2: Detailed Site Map



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.

3.5 Basis for Taking Action

FSC, under oversight from FDEP, conducted Phase I and II RIs at the Site in 1988 and 1989, respectively.

Records of Decision (RODs) for OU1 and OU2 identify the following contaminants of concern (COCs): cadmium, chromium, lead, zinc and PCBs in soil and sodium, radium-226 and radium-228, and gross alpha in groundwater.

FSC derived cleanup levels for those scenarios which, based on the quantitative risk assessment, could adversely impact the health of exposed individuals. The exposure pathways that were evaluated and determined to pose either potential carcinogenic or non-carcinogenic risks are:

- Dermal contact and ingestion of contaminated soil by industrial workers under current and future use conditions at the Site.
- Ingestion of contaminated water at nearby off-site locations in the future, if contaminated groundwater was not treated.

Investigations found that lead was the toxic metal present in the highest concentrations on site. The quantitative risk assessment found that the highest potential risk was associated with ingestion of contaminated groundwater though there were no current users.

In May 1991, the Wetland Impact Study indicated that although the Southwest Wetland was a highly functional wetland, metals such as lead and zinc were present in sediments above screening values, particularly in sediment in the northern or northern portion of the Southwest Wetland.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

OU1

The EPA issued a ROD for OU1 in June 1992. Although the selected remedy for OU1 did not specify remedial action objectives (RAOs), the remedy was designed to address remaining sources, incinerator ash, soil and sediment contamination at the Site and implementation of groundwater monitoring. The selected remedy in the 1992 OU1 ROD included:

- Excavation and off-site disposal of about 600 cubic yards of soil contaminated with PCBs at concentrations equal to or greater than 50 mg/kg in areas that had previously been remediated.
- Excavation and on-site solidification of about 37,000 cubic yards of the following:
    - EC dust and metals-contaminated soil and ash. All EC dust and ash would be excavated and treated; soil containing lead above 600 mg/kg would be excavated and treated.
    - Soil containing PCB levels between 25 and 50 mg/kg.
- Restrictions on any excavation below the water table unless the water treatment system anticipated for the second OU is operational. However, at the time of the ROD, it was not anticipated that excavation below the water table would be required.
- Control of surface water runoff from the Site during remediation of on-site soils to include analysis of surface water samples for lead and zinc may continue for at least two years after all on-site construction was completed.
- Compliance with RCRA Land Disposal Restriction Treatment Standards for EC dust, which is a listed RCRA waste, by meeting levels specified in the treatability variance for contaminated soil and debris.
- Disposal of all solidified material in an on-site, double-lined RCRA landfill with a RCRA cap. The landfill would meet the provisions of 40 CFR Subpart N landfill requirements and would be built above the water table.
- Periodic monitoring of surface water and groundwater quality. The quality of surface water runoff should be consistent with possible future criteria developed for the Site's wetlands (OU2). Groundwater quality would be monitored for up to 30 years.

OU2

Although the selected remedy for OU2 did not specify RAOs, the remedy was designed to address groundwater and the Southwest Wetland. The selected groundwater remedy in the March 1994 OU2 ROD included:

- Extraction of contaminated groundwater through a system of shallow and deep recovery wells.
- Blending contaminated groundwater from the plumes with clean water from deep production wells located on upgradient portions of the Site to achieve compliance with state and federal maximum contaminant levels (MCLs).
- Spray field discharge of the blended groundwater. The blended water must meet drinking water standards (MCLs) before being discharged to the on-site spray fields.

The ROD notes that if groundwater contaminant levels cease to decline and remain at levels higher than the extraction standards, the EPA may re-evaluate the system's performance.

Remediation in the Southwest Wetland addresses metal-contaminated sediment within the northern portion of the Southwest Wetland. The selected wetland remedy in the 1994 OU2 ROD included:

- Clearing vegetation from northern 3.8-acre portion of the Southwest Wetland. Excavating the upper 6 inches of metals-contaminated sediment within the cleanup boundary.
- Excavating and stockpiling of the remaining sediment. Excavated wetland sediment that contains lead at concentrations above 600 mg/kg to be solidified and disposed of in the on-site containment to be constructed as part of OUl. Solidification standards are the same as specified in the ROD for OUl.
- Backfilling the excavated area with clean sand and previously-excavated sediment that contains lead and zinc below their respective screening values. The upper portion of the backfill layer should consist of at least 6 inches of clean sediment. The area should be backfilled so that the resulting ground elevation is about 12 inches lower than the original ground elevations.
- Revegetating the disturbed areas with native wetland vegetation in accordance with plans approved by the EPA, FDEP and Martin County.
- Monitoring and maintaining the revegetated areas to promote regrowth and to remove exotic or nuisance species. This maintenance period was to last at least five years.

The 2013 Explanation of Significant Differences (ESD) modified the OU1 and OU2 ROD to document the selection and inclusion of institutional controls as part of the remedy for the Site. Institutional controls cited in the ESD include: limiting future uses of the property to industrial or commercial, restricting any future use of the landfill area, which can impact the integrity of the landfill, and restricting the use of contaminated groundwater until cleanup levels and remedial action objectives have been achieved.

The groundwater extraction and discharge standards for remediation of the groundwater plumes, as stated in the OU2 ROD, are referenced in Table 2.

Table 2: Groundwater Primary COC Cleanup Goals

COC	Cleanup Standards
Sodium (mg/L)	160[1]
Radium-226 + radium-228 (pCi/L)	5[2]
Gross Alpha (pCi/L)	15[2]
Notes: mg/L - milligrams per liter pCi/L - picocuries per liter 1- State standard only, there is no federal MCL for sodium 2- Federal and state standards are the same	

4.2 Remedy Implementation

OU1 Soil

The EPA and FSC signed a Consent Decree for the OU1 remedy in February 1993. FSC initiated the remedial design for OU1 in February 1993 and completed the remedial design in September 1994. Excavation activities associated with the OU1 remediation began in January 1995 and continued through November 1995. The PRP's contractor removed about 43,500 cubic yards of EC dust, soil, sediment and

debris from these areas. FSC performed verification sampling to confirm that all soil, slag and sediment exceeding cleanup criteria had been removed from the grid.

The on-site landfill covers about 6 acres of the Site. A PRP contractor, OHM Corporation, constructed the bottom liner and leachate control systems between June 1995 and October 1995.

FSC began full-scale treatment of contaminated soil, sediment and slag on October 26, 1995, and completed it on December 15, 1995. The combined wet weight of lead- and PCB-contaminated material treated was about 81,200 tons.

FSC placed all treated materials in specific areas within the above-grade on-site landfill. After all materials were disposed of in the containment, FSC constructed the top liner system between February 1996 and April 1996. FSC installed a security fence around the base of the on-site landfill.

As part of the remedial action, FSC controlled and routed all surface water runoff to the on-site stormwater retention ponds. FSC collected and analyzed surface water samples for lead and zinc, The OU1 ROD states that surface water runoff and analysis of surface water samples may continue for at least two years after all on-site construction was completed. Surface water sampling for lead and zinc was discontinued after 2006 as the results for these two metals were below the State of Florida Class III water quality criteria. Surface water sampling for sodium, radium and gross alpha was discontinued after October 2011 as sample results were below the groundwater cleanup goals as specified in the OU1 ROD.

OU2

The EPA and FSC signed a Consent Decree for the OU2 remedy in January 1995. FSC began the remedial design for OU2 in October 1994 and completed the remedial design in June 1995. FSC installed the groundwater remediation system between April 1996 and January 1997. The remediation phase, which began in April 1997, involved extraction, treatment and disposal of groundwater from the plume.

The groundwater remediation system installed at the Site consists of recovery and injection wells in the shallow and deep surficial aquifer, upgradient production wells, a treatment facility; an above ground 300,000-gallon storage tank; a 40-acre spray field separated into three areas, and monitoring wells within the spray field areas and downgradient of the property boundary.

Due to a wildfire in the project area in April 2009, which destroyed most of the spray heads and some of the electrical services, the spray irrigation system is currently not functioning.

FSC began restoring the Southwest Wetland in July 1995 and completed it in December 1995. The wetlands cleanup for the northern portion of the Southwest Wetland included clearing existing vegetation, removal of contaminated sediment and revegetation. FSC solidified and disposed of sediments with lead levels above 600 mg/kg in the on-site landfill. For excavated upland areas on the Site, as a soil additive, FSC used excavated sediment containing lead at concentrations lower than 600 mg/kg but above 160 mg/kg. The EPA and FDEP performed formal inspections of the Southwest Wetland on May 15, 1996, December 6, 1996, March 19, 1997, and October 22, 1997.

Ardaman & Associates, Inc. and OHM Corporation, as the PRP's contractors, conducted the principal remedial activities. EPA Region 4 provided oversight of the Site's cleanup. FDEP provided technical review and approval of wetlands restoration.

The PRP implemented sitewide institutional controls, as required by the ESD, in the form of two restrictive covenants filed with Martin County's Clerk of the Circuit Court; see section 6.3 for more information.

4.3 Operation and Maintenance (O&M)

OU1

O&M activities in the 1996 OU1 O&M plan include:

- Routine quarterly inspections and routine maintenance (e.g., mowing, weeding).
- Routine sampling of surface water for lead, zinc, pH, conductivity and hardness whenever significant discharge occurs from the Site to the Southwest Wetland.
- Checking and removing leachate as necessary in the leachate collection and leak detection sumps.
- Annual sampling and analyses of three existing wells (M-71, RW-4 and RW-5) for PCBs, lead, cadmium, chromium and nickel. Well M-71 is no longer being monitored.

The sampling of surface water for lead, zinc, pH, conductivity and hardness has been discontinued and determined unnecessary as results were below the State of Florida Class III surface water criteria. In addition, the sampling and analyses of PCBs, lead, cadmium, chromium and nickel in three OU1 wells (M-71, RW-4 and RW-5) is no longer required and has been discontinued since these analytes were consistently below detection or below criteria. The OU1 O&M plan should be updated by the PRP to reflect these changes.

OU2

O&M activities in the 1997 OU2 O&M plan include:

- Install and operate a groundwater remediation and spray irrigation system.
- Implement a sampling and testing program for the groundwater remediation system, as well as a maintenance program.

The groundwater remediation system has not operated since April 2009. Since then, Gerdau Ameristeel's contractor, with the EPA's approval, has monitored the groundwater quality in the shallow and deep zones of the shallow aquifer monitored semi-annually to determine whether the system needs to be restarted or whether additional remedial action should be taken. Contractors have been sampling selected monitoring and remediation wells since April 2009, including newly installed monitoring wells in 2012 and 2014.

On September 8, 1998, FSC submitted a request to the EPA for termination of the monitoring program for the Southwest Wetland. The revegetation contractor performed site inspections for a period of five years after revegetation of the Southwest Wetland. During the first year, the contractor performed inspections monthly for the first three months following planting, and quarterly inspections thereafter.

The contractor made annual inspections after the first year for a total inspection and monitoring period of at least five years. The revegetation contractor recommended maintenance actions including replacement plantings, erosion control, water level adjustments and removal or herbicidal applications for nuisance or exotic species.

O&M Costs

Projected O&M costs per year from the RODs were:

- $18,200 for up to 30 years for the OU1 inspection, maintenance and sampling.
- $83,000 for 10 years for the OU2 groundwater remediation system O&M.
- $7,500 for five years for the OU2 Southwest Wetland restoration.

The five-year O&M period for the Southwest Wetland has been completed. Increases in costs for 2012 and 2013 are attributable to the design and installation of additional deep aquifer wells.

Table 3: Annual O&M Costs

Year	Total Cost *(rounded to the nearest $1,000)*
2011	$76,000
2012	$180,000
2013	$104,000
2014	$90,000
2015	$69,000

These costs include all necessary groundwater monitoring, vegetation management to allow for sitewide well monitoring and landfill vegetative cover mowing and weeding, and burrow reparation work.

5.0 Progress Since the Last Five-Year Review

The protectiveness statement from the 2011 FYR for the Site stated the following:

The remedy at OU1 is protective of human health and the environment in the short term. In order to be protective in the long term, the restrictive covenants need to be modified to require prohibitions on activities that may impact the integrity of the landfill.

The remedy at OU2 is protective of human health and the environment in the short term. The wetlands excavation criterion for lead has been met in the excavated part of the Southwest Wetland and the Site is located within a Florida Ground Water Delineated Area, which restricts the installation of any new potable wells. The Site is also covered by a Memorandum of Agreement (MOA) between EPA and the South Florida Water Management District (SFWMD) which further restricts the issuance of water use and well construction permits in the area. In order for the remedy to be protective in the long term, evaluation of the current ground water remedy and monitoring for potential expansion or migration of the existing ground water contamination plume must be completed.

Because the remedial actions (RAs) at both OUs are protective in the short term, the Site's remedy is protective of human health and the environment in the short term. In order for the Site's remedy to be protective in the long term, additional ground water contaminant plume monitoring and an evaluation of the current ground water remedy must be completed. Additionally, the restrictive covenants must be modified to reflect the current parceling of the land and include restrictions on the landfill property to prohibit activities that may impact the integrity of the landfill.

The 2011 FYR included three issues and recommendations. This report summarizes each recommendation and its current status below.

Table 4: Progress on Recommendations from the 2011 FYR

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Continue evaluation of the groundwater remedy as described in the 2009 Recommendations for Assessment of Groundwater Remediation Program for Operable Unit 2 report and reach a decision on the continued operation of the groundwater remedy.	EPA	02/01/2012	Ongoing. The EPA continues to review groundwater data and is considering alternatives.	Ongoing
Develop a plan to properly abandon unused wells, as needed.	PRP	05/18/2016	The PRP generated Abandonment of Unused Monitor Wells for Gerdau Indiantown Mill Site report.	09/08/2012
Issue an ESD to specifically require institutional controls. Institutional controls should include those already in place plus a restriction on uses which would impact the integrity of the landfill and reference the existing SFWMD groundwater MOA.	EPA	02/01/2012	The EPA finalized an ESD requiring institutional controls implemented that limit future uses of the property to commercial and/or industrial purposes, restrict any future use of the landfill area that can impact the integrity of the landfill and restrict the use of groundwater until cleanup levels and RAOs have been achieved. The ESD references the SFWMD groundwater MOA.	6/25/2013

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 4 initiated the FYR in October 2015 and scheduled its completion for September 2016. The EPA remedial project manager (RPM) Peter Thorpe led the EPA site review team, the EPA community involvement coordinator (CIC) L'Tonya Spencer, and contractor support provided to the EPA by Skeo. In October 2015, the EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification
- Document review

- Data collection and review
- Site inspection
- Local interviews
- FYR Report development and review

6.2 Community Involvement

In February 2016, the EPA published a public notice in the Treasure Coast News newspaper announcing the commencement of the FYR process for the Site, providing contact information for Peter Thorpe, RPM and L'Tonya Spencer, CIC and inviting community participation. The press notice is available in Appendix B. The EPA received no comments as a result of the advertisement.

The EPA will make the final FYR Report available to the public. Upon completion of the FYR, the EPA will place copies of the document in the designated Site repository: Indiantown Branch Library, located at 15200 SW Adams Avenue, Indiantown, Florida.

6.3 Document Review

This FYR included a review of relevant Site-related documents, including the ROD, ESD, the previous FYR and recent monitoring data. Appendix A provides a complete list of the documents reviewed.

ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substances, 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, as described below:

- Applicable requirements are those cleanup standards, standards of control and other substantive requirements, criteria or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, remedial action, location or other circumstance found at a CERCLA site.

- Relevant and appropriate requirements are those standards that, while not "applicable," address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards more stringent than federal requirements may be applicable or relevant and appropriate.

- To-Be-Considered (TBC) criteria are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary remedial action. For example, TBC criteria may be particularly useful in determining health-based levels where no ARARs exist or in developing the appropriate method for conducting a remedial action.

Chemical-specific ARARs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish an acceptable amount or concentration of a chemical that may remain in, or be discharged to,

the ambient environment. Examples of chemical-specific ARARs include MCLs under the federal Safe Drinking Water Act and ambient water quality criteria enumerated under the federal Clean Water Act.

Action-specific ARARs are technology- or activity-based requirements or limits on actions taken with respect to a particular hazardous substance. These requirements are triggered by a particular remedial activity, such as discharge of contaminated groundwater or in-situ remediation.

Location-specific ARARs are restrictions on hazardous substances or the conduct of the response activities solely based on their location in a special geographic area. Examples include restrictions on activities in wetlands, sensitive habitats and historic places.

Remedial actions are required to comply with the chemical-specific ARARs identified in the ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Soil and Sediment Cleanup Goals

According to the 1992 OU1 ROD, the lead cleanup level of 600 mg/kg in soil and sediment was based on the leachability of lead from soil into the underlying groundwater and is a level calculated to be protective of groundwater. The EPA's 1992 recommended cleanup level for lead in groundwater, 15 micrograms per liter (µg/L), was used as the basis for the derivation of this lead soil cleanup level. The EPA's current action level for lead in drinking water remains 15 µg/L.

The cleanup level of 25 mg/kg for PCB-contaminated soil was based on the Toxic Substances Control Act (TSCA) Spill Cleanup Policy for areas with restricted access. The current TSCA Spill Cleanup Policy from 2007 (40 CFR 761) indicates the cleanup level for bulk PCB remediation waste in low occupancy areas is less than or equal to 25 mg/kg.

Groundwater

According to the 1994 ROD for OU2, groundwater ARARs include the federal MCLs and Florida Primary Drinking Water Standards. Groundwater COCs include sodium, combined radium-226 + radium-228, and gross alpha concentrations. ARARs from the 1994 ROD were compared to current federal and state standards (Table 5). As shown in Table 5, groundwater MCLs have not changed for any constituent since the signing of the ROD.

Table 5: Previous and 2015 ARARs for Groundwater COCs

COC (Units)	1994 ROD Performance Standard [a]	2016 Performance Standard [b]	ARAR Change
Sodium (mg/L)	160	160	No change
Radium-226 + radium-228 combined (pCi/L)	5	5	No change
Gross alpha concentrations (pCi/L)	15	15	No change

Notes:
a. 1994 ROD, Table 8.
b. Lower of the federal and state primary MCLs. Federal MCLs are available at http://water.epa.gov/drink/contaminants/index.cfm (accessed 2/23/2016). FDEP MCLs are available at http://www.dep.state.fl.us/water/drinkingwater/standard.htm (accessed 2/23/2016).

COC (Units)	1994 ROD Performance Standard [a]	2016 Performance Standard [b]	ARAR Change
mg/L – milligram per liter pCi/L – picocuries per liter			

Institutional Control Review

On January 6, 2016, Skeo staff conducted research at the Martin County Property Assessors and Martin County Clerk of the Circuit Court Recorder's offices and found the deed information pertaining to the Site listed in Table 6; these documents are also available online. Institutional controls in the form of restrictive covenants (1990 and 2015) are in place to limit groundwater use and land uses, including swimming, hunting, fishing, camping, recreational activities, growing crops for humans or animals, residential land uses, day care facilities, playgrounds and schools (see Table 6). Skeo staff also visited the Martin County Property Appraiser's Office to conduct parcel research and found that parcel boundaries have remained consistent with Figure 3.

Table 6: Deed Documents from Martin County Public Records Office

Date	Type of Document	Description	Book #	Page #
4/21/1970	Deed	Property transferred to FSC	0324	2207
4/21/1970	Deed	Property transferred to FSC	0324	2220
8/27/1990	Restrictive Covenant	Land use restrictions for 26-39-38-000-000-00021-8 and 35-39-38-000-000-00011-1	873	1016
4/14/2015	Restrictive Covenant	Land and groundwater restrictions, property access agreements. Covenant redefines site areas, although legal parcel IDs in Martin County Property Assessors office remain the same.	2779	407

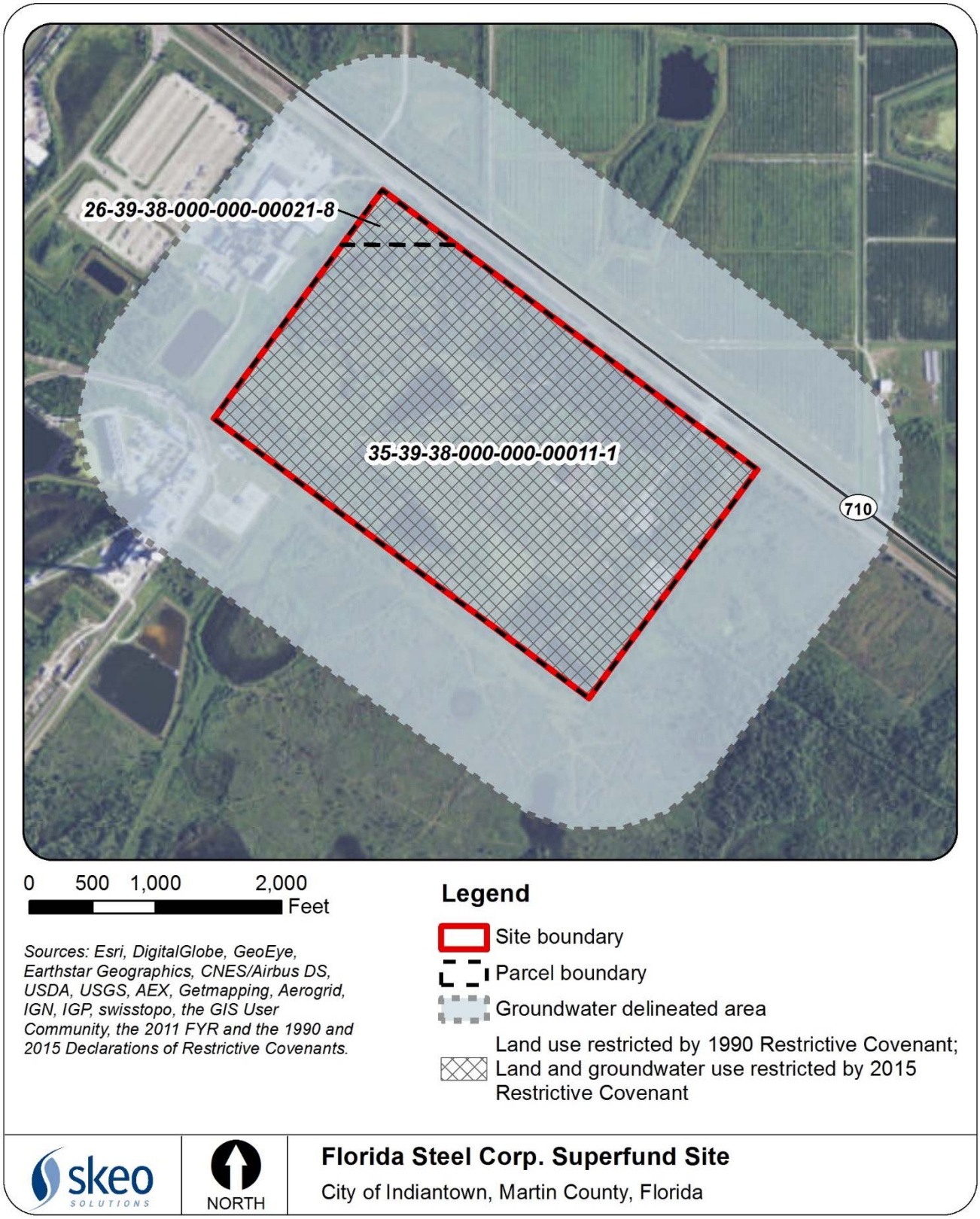
Tables 7 lists the institutional controls associated with areas of interest at the Site.

Table 7: Sitewide Institutional Control (IC) Summary Table

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Instrument in Place
Groundwater	Yes	Yes	26-39-38-000-000-00021-8 35-39-38-000-000-00011-1	Restrict the use of groundwater until cleanup levels and RAOs have been achieved.	The Site lies within a Florida Delineated Groundwater Area, which restricts well placement within the delineated area (see Figure 3, includes off-site perimeter where contaminated groundwater remains).[1] The 2015 Restrictive Covenant also restricts the use of groundwater until cleanup levels have been achieved.

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Instrument in Place
Soil	Yes	Yes	26-39-38-000-000-00021-8 35-39-38-000-000-00011-1	Limit future uses of the property and future use of the landfill area.	The 1990 Restrictive Covenant limits specific activities, including swimming, hunting, fishing, camping, recreational activities, growing crops for humans or animals, residential land uses, day care facilities, playgrounds and schools. The 2015 Restrictive Covenant includes land use restrictions which limit future uses of the Site to commercial and/or industrial purposes; it includes land use restrictions to limit any future use of the landfill area which would impact the integrity of the landfill; and restricts the use of groundwater until cleanup levels have been achieved.
1. Florida's groundwater delineation information is available online at: http://www.dep.state.fl.us/water/groundwater/delineate.htm.					

Figure 3: Site Institutional Controls



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.

6.4 Data Review

OU1

Data associated with the periodic monitoring of OU1 surface water and groundwater quality was not available for this FYR and is no longer required. Gerdau Ameristeel contractors do not regularly check the leachate sump for leachate as the sumps ceased to produce leachate years ago, following remedial construction completion. However, Gerdau Ameristeel plans to check the leachate sumps in 2016. If there is leachate, they will remove and properly dispose of it as needed.

OU2

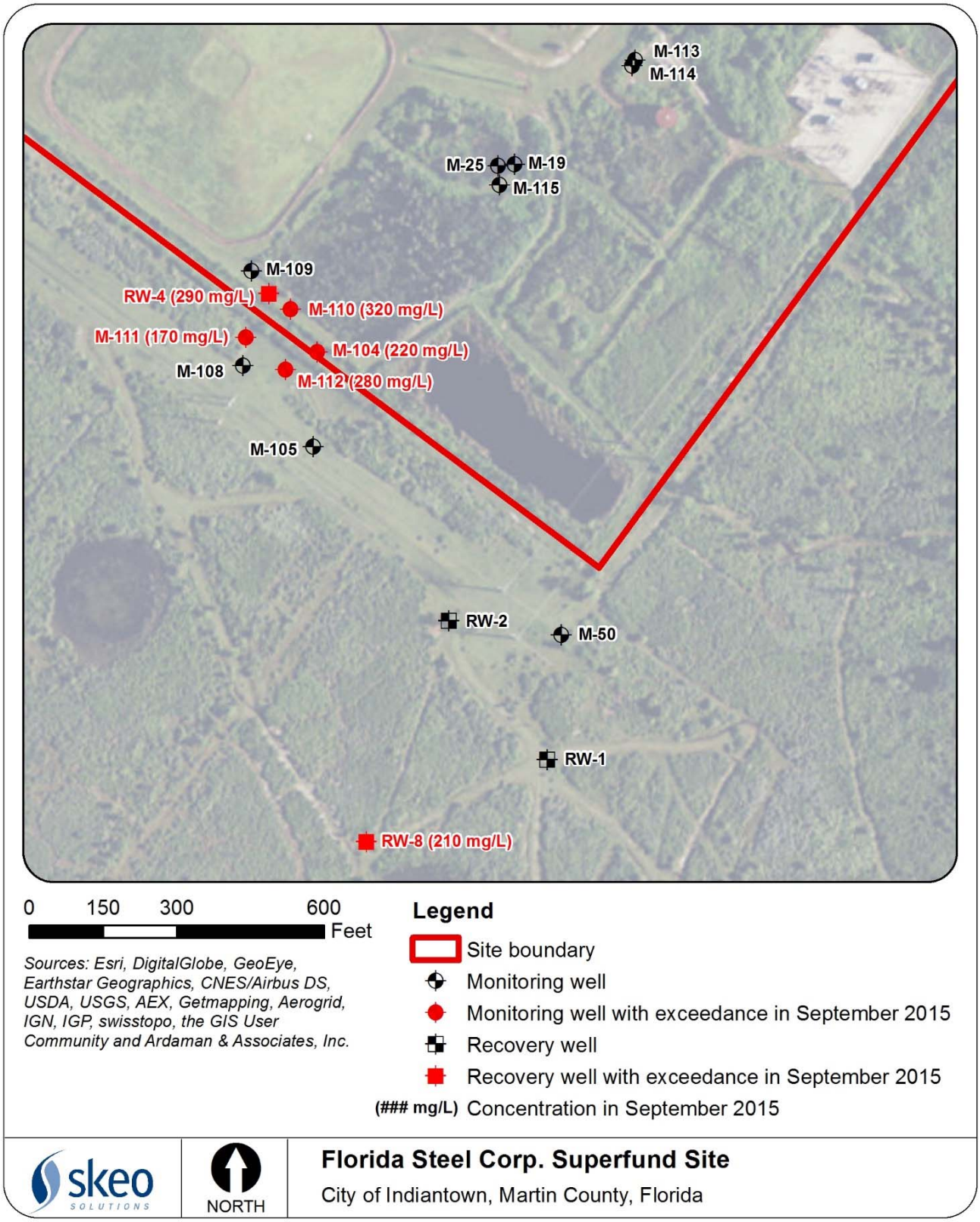
Current OU2 groundwater monitoring at the Site is focused on the two contaminated groundwater plumes, one located within the shallow surficial aquifer and one located within the deep surficial aquifer. The original groundwater remediation system for OU2 consisted of shallow and deep recovery wells, injection wells, production wells, monitoring wells, a treatment facility and 300,000 gallon above-ground storage tank (Figure 2). Since the suspension of the groundwater remediation system in April 2009, monitoring occurs semi-annually for both the shallow and deep groundwater plumes. There have been ten sampling events since the previous FYR. Since the last FYR, eight monitoring wells were installed at the Site (M-108 through M-115) to better define the extent of the shallow surficial aquifer plume in the vicinity of existing shallow surficial aquifer recovery well RW-4 and monitoring well M-104, in which the extraction standard for sodium has consistently been exceeded.

OU2 Shallow and Deep Surficial Aquifers

Based on the analytical results from this FYR period, presented in Tables F-1 through F-4 in Appendix F, the remaining groundwater contamination in the shallow surficial aquifer is located in the vicinity of wells RW-4, M-104, M-110, M-11 and M-112 and the area around RW-8 (Figure F-1 in Appendix F). Sodium and radium-226 + radium-228 concentrations in RW-4 have not decreased since the remediation system shut down in 2009. Gross alpha concentrations in RW-4 increased in 2014 but have been decreasing in 2015.

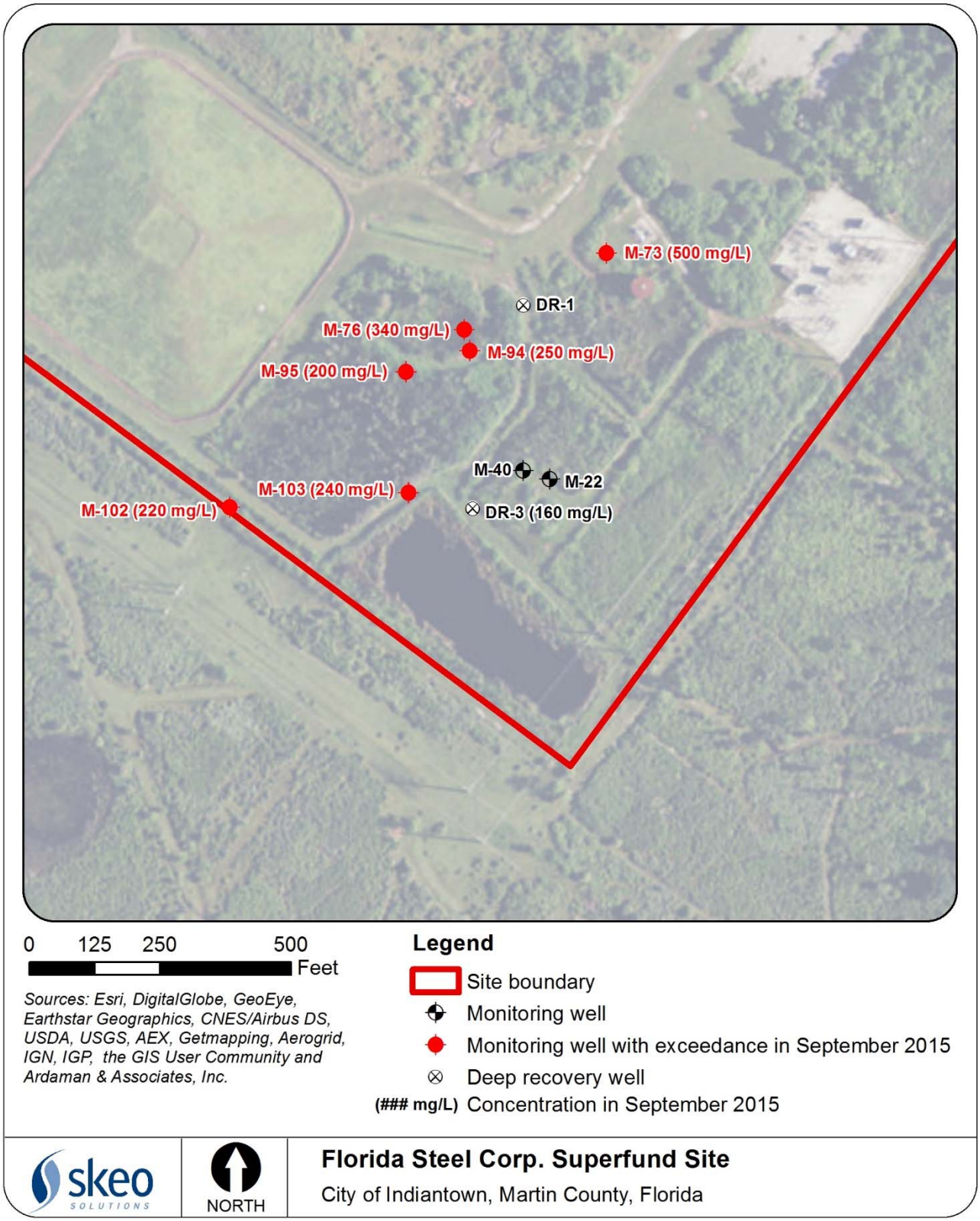
Based on the analytical results and maps presented in Tables F-1 through F-4 in Appendix F, the remaining groundwater plume in the deep surficial aquifer is located in the vicinity of well M-73 and the area around M-94, M-95 and M-76 (Figure F-2 in Appendix F). The sodium plume in the deep surficial aquifer extends south to newly installed wells M-102 and M-103. Sodium and radium-226 + radium-228 concentrations in M-73 have decreased since July 2013. Gross alpha concentrations in M-73 have generally remained stable during this FYR period. Sodium concentrations in M-102 have increased since February 2011 from 110 mg/L to 220 mg/L (in September 2015). Sodium concentration in M-103 have remained stable. Neither M-102 nor M-103 exceeded the radium or gross alpha standard.

Figure 4: Sodium Exceedance in Shallow Surficial Aquifer (September 2015)



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 5: Sodium Exceedances in Deep Surficial Aquifer (September 2015)



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.

Confining Layer

Two wells, M-114 and M-115, were installed in August 2014 to monitoring groundwater quality in the confining layer between the shallow and deep surficial aquifers near M-73 and M-76, respectively. Sodium concentrations were below the extraction standard in both wells in 2015. The radium-226 + radium-228 and gross alpha concentrations in both wells exceeded the respective standards and the radionuclide concentrations in the nearby deep wells in 2015. The radium-226 + radium-228 concentrations in M-114 and M-115 have decreased since the September 2014 sampling event, while the gross alpha concentrations have increased.

Relationship between Sodium and Radionuclide Concentrations

There are five wells (RW-2, M-25, M-50, M-114 and M-115) that meet the sodium performance standard but not the radium-226 + radium-228 standard, and four wells (M-25, M-50, M-114 and M-115) that meet the sodium standard but not the gross alpha standard. Sodium chloride in groundwater can cause naturally occurring radium to leach from the soil. As sodium levels decrease, it is expected that radium levels will naturally decrease over time.

6.5 Site Inspection

The Site inspection was performed on January 6, 2016. In attendance were: Bill Denman and Peter Thorpe from EPA Region 4, Kelsey Helton and Sam Hankinson from FDEP, Francis Cheung from Ardaman and Associates, Inc., Luis Nieves from Gerdau Ameristeel; and Sarah Alfano and Kristin Sprinkle from Skeo Solutions. Participants toured the property and visited the on-site landfill, the groundwater recovery manifold and storage tank. The Site inspection began at the Site entrance, near the footprint of the Site's formerly demolished administrative building. The completed Site Inspection Checklist is in Appendix D. Photographs taken to record Site conditions are available in Appendix E.

The Site is currently undergoing regular groundwater monitoring. The groundwater remediation system has not been operational since 2009, when it was destroyed by a fire. The groundwater recovery manifold remains fenced on site, but many components appear rusted and the system is not operational. Site inspection participants observed that the tank appeared rusted but is not holding Site water as the system is not in operation.

The on-site landfill is surrounded by a chain-link fence and gate, which are secured and in good condition. The fence has warning signs posted along the perimeter. The landfill appeared to be well vegetated; however there appeared to be animal burrows at the top of the landfill that require maintenance. The Site contractor mentioned that leachate collection and leachate detection sump pumps have been dry in the past couple of years and are not actively operating.

Site inspection participants noted that several monitoring wells were found to be unlocked and in need of re-labeling. Because sitewide perimeter fencing is discontinuous and damaged, it is necessary to secure all wells. The nearby site O&M operator passed away and oversight is now based out of an office further away from the Site. As a result, physical site inspections occur less frequently and less consistently than in years past. However, the Site inspection participants noted that trespassing is no longer a problem since the on-site buildings were demolished in 2015. These demolitions were made to

help prepare the Site for reuse by an energy company that has been working with the Site's owner to store natural gas on the Site.

On January 6, 2016, Skeo staff visited the designated site repository: Indiantown Public Library, located at 15200 SW Adams Avenue, Indiantown, Florida. Library staff were not able to locate the Site's administrative record.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the current landowners and regulatory agencies involved in Site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. All of the interviews took place by email. The interviews are summarized below. Appendix C provides the complete interviews.

Peter Thorpe: Mr. Thorpe represents the EPA as the recently-appointed RPM for the Site. He commented that cleanup of the contamination is nearly complete and that the Site will soon support a Natural Gas Holding facility, tapping into the natural gas pipeline nearby. He is not aware of any complaints by nearby residents or any effects on the nearby community. He mentioned that the remediation equipment has not been operating since the spray field equipment was damaged in the 2009 wildfire. However, sodium levels have stabilized and are very close to the remediation goals for the Site.

Local Real Estate Expert: This expert represents Indiantown Realty and is aware of the former environmental issues at the Site. His overall impression of the Site is positive in terms of getting it ready for reuse. He commented that the closing of the steel mill had a negative economic effect on the community. The steel mill was a large employer and generated tax revenues for the area; however he believes that most people look to the Site with optimism and believe the economic aspects can be replaced. He commented that he thinks the best way to for the EPA to keep community members informed of the Site is to have all Site information readily available online. Overall, he believes it has been a positive experience, but that it did take a while for Site remediation to be complete.

Francis Cheung: Mr. Cheung is a contractor with Ardaman & Associates, the O&M contractor for the Site. His overall impression of cleanup, maintenance and reuse activities of the Site is good, due to continued effectiveness of the OU1 remediation and containment of contaminated wetland sediments under OU2. He commented that remediation of groundwater under OU2 has made substantial progress, but had to be suspended in April 2009 due to wildfires. He mentioned that groundwater sampling and analyses indicate that, except for these two wells, all monitoring wells display a stable or decreasing trend in groundwater contamination and plumes have not expanded. Currently, Gerdau Ameristeel is exploring alternatives with the EPA and FDEP to bring OU2 to closure, as it is under contract to be sold for redevelopment into a natural gas storage facility. Site visits and mowing are completed periodically and groundwater sampling occurs semi-annually.

Gerdau Ameristeel Attorney: This attorney represents Gerdau Ameristeel and requested the following statement be recorded as a site interview. *In 2015, Gerdau recorded a Declaration of Restrictive Covenants ("DRC") with the FDEP encumbering the property. The DRC restricts future use of the property to commercial and/or industrial purposes, restricts use of groundwater under a portion of the property, prohibits use of the landfill vault constructed on-site, and acknowledges the future planned reuse of the property for construction and operation of a natural gas storage facility as approved by the*

Federal Energy Regulatory Commission. In addition, Gerdau Ameristeel provided both the EPA and FDEP with information regarding existing institutional controls (including recorded encumbrances on property downgradient) that provide additional assurance that the remedy as implemented is protective of human health and the environment.

7.0 Technical Assessment

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

The review of site documents, ARARs and the site inspection indicate that the remedy for OU1 is functioning as intended by the ROD. However, since the remediation system was shut down, the remedy for OU2 is not functioning as intended except for semi-annual monitoring. The EPA currently approves of this approach.

The 2013 ESD requires institutional controls protect the remedy and to ensure protectiveness; the necessary institutional controls are in place for both OU1 and OU2. The 1990 Restrictive Covenant limits land use and Florida's groundwater delineation (see Figure 3) serves to restrict contaminated groundwater use. In addition, Gerdau Ameristeel added property information and detailed land and groundwater use restrictions in a restrictive covenant in 2015 (see section 6.3) to prepare the property for future purchase or leasing.

OU1

The OU1 remedy is functioning as intended by the decision documents for the Site. Contaminated soils were excavated, consolidated, stabilized/solidified and placed under a vegetated soil cover in the on-site landfill. Access to the landfill is restricted by a security fence and signs are in place around the perimeter of the landfill. The vegetative cover is in good condition; however there were animal burrows noted at the top of the landfill during the site inspection. Sampling for OU1 COCs in groundwater and surface water monitoring is no longer required. The O&M plan will need to be updated to reflect the current EPA-approved sampling schedule.

OU2

The OU2 groundwater remediation system was shut down in 2009 after a wildfire destroyed parts of the system. The system is now in a dilapidated state. Since 2009, the site groundwater is monitored semi-annually for natural attenuation. Concentrations of the site COCs have generally remained stable since the shutdown of the remediation system. Concentration of site COCs have decreased in RW-1 and M-112 (radium), RW-4 and M-105 (gross alpha) and concentrations have also decreased slightly in shallow well M-19 (sodium). The concentrations of COCs have decreased in recent years in deep wells DR-3 and M-95 (sodium), M-22 (all COCs), and DR-1 (radium). Exceedances of the performance standards remain in the vicinity of shallow aquifer wells RW-4, M-104, M-110, M-11 and M-112 and the area around RW-8 (Figure F-1). Exceedances of performance standards remain in the area near deep aquifer wells M-76/95/94 and M-73. Exceedances were also observed in wells M-102 and M-103, which are outside the original plume area, indicating contaminants are migrating in the deep surficial aquifer. There were no exceedances observed downgradient of well M-102 and M-103. There is no exposure pathway because the Site lies within a Florida Delineated Groundwater Area, which restricts well placement. In addition, a 2013 potable well survey confirmed there are no nearby potable wells located downgradient of the Site. Because there is evidence the plume is migrating in the deep aquifer and there

are some exceedances in both the shallow and deep aquifers, the EPA may wish to consider a more targeted approach to address remaining contamination.

FSC completed remediation of the Southwest Wetland in December 1995 and the maintenance and monitoring period following the remedial action continued for five years, as required.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Yes, although the selected remedies for OU1 and OU2 did not specify RAOs, the remedy designated cleanup levels and was designed to address remaining sources, incinerator ash, soil and sediment contamination at the Site, groundwater and the Southwest Wetland. Cleanup levels remain valid, no one uses the groundwater and the expected future use remains industrial.

The Site included some levels of PCB soil contamination. On-site soils contaminated with PCBs greater than 50 mg/kg were cleaned up to industrial-based level of 25 mg/kg and either disposed of off site (e.g, > 50 mg/kg) or solidified and contained in the on-site landfill (> 25 mg/kg <50 mg/kg). Institutional controls prohibit excavating in the landfill area and limit the potential for exposure to these contaminated materials.

7.3 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.

7.4 Technical Assessment Summary

The remedy at OU1 is functioning as intended. The groundwater remedy at OU2 is not functioning as intended in the decision documents since the groundwater remediation system is inoperable due to fire damage. Semi-annual monitoring at the Site indicates that COC concentrations, while mostly stable, are decreasing in some wells and increasing in others, with increases occurring in wells outside the original plume boundaries. The EPA may wish to consider targeted remedial actions to address lingering exceedances and migration.

8.0 Issues, Recommendations and Follow-up Actions

Table 9: Issues and Recommendations Identified in the Five-Year Review

OU1	**Issue Category: Operations and Maintenance**			
	Issue: There are animal burrows in the capped area.			
	Recommendation: Address animal burrows in cap and relocate sensitive species per state or local law.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	1/01/2017

OU2	Issue Category: Remedy Performance			
	Issue: The OU2 remedy has been offline since 2009 and it may not be practical to restart it, although several shallow and deep wells continue to exceed cleanup standards and there is some evidence of deep aquifer migration.			
	Recommendation: Consider targeted remedial actions to address lingering exceedances and migration. Update site decision and O&M documents as needed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	1/01/2017

The following additional items, though not expected to affect protectiveness, warrant additional follow-up:

- The EPA recommends that Gerdau Ameristeel lock, label and secure all site remedial wells by the close of calendar year 2016.
- The EPA recommends that the Site's full administrative record, including decision documents and the last three FYRs, be sent to the site repository.
- The landfill letdown channels that could not be found during site inspection. The EPA recommends locating channels and removing vegetation overgrowth and obstructions as needed.
- The EPA recommends that Gerdau Ameristeel submit an updated O&M plan to the EPA to document the discontinuation of surface water sampling and OU1 COCs in groundwater.

9.0 Protectiveness Statements

Table 10: Protectiveness Statements

Protectiveness Statements

*Operable Unit:*1	*Protectiveness Determination:* Short-Term Protective
Protectiveness Statement: The remedy for OU1 currently protects human health and the environment because groundwater monitoring continues, contaminated source material and soil contamination have been excavated, stabilized and contained in the on-site landfill and there are no current exposures to contamination. In order for the OU1 remedy to be protective in the long term, animal burrows in the landfill cap must be repaired, relocating any sensitive species per state or local law.	
Operable Unit: 2	*Protectiveness Determination:* Short-Term Protective
Protectiveness Statement: The remedy for OU2 currently protects human health and the environment because, although the groundwater remediation system is not operating as designed, there are no current	

exposures to contamination. In order to be protective in long term, the appropriate course of action for addressing lingering contamination must be determined.

Sitewide Protectiveness Statement
Protectiveness Determination: Short-Term Protective
Protectiveness Statement: Because the remedial actions at all OUs are protective in the short term, the Site's remedy is protective of human health and the environment in the short term. In order for the remedy to be protective in the long term, issues identified in the OU1 and OU2 protectiveness statements should be addressed.

10.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

Abandonment of Unused Monitor Wells at Gerdau Ameristeel Indiantown Mill, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, dated March, 2012.

Declaration of Covenants, Conditions and Restrictions, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, dated August, 1990.

Declaration of Restrictive Covenants, Gerdau Ameristeel, Indiantown Mill, Martin County, Florida, dated April, 2015.

Feasibility Study Report, Operable Unit 2, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, Revision No. 1, Ardaman & Associates, Inc., November 23, 1993.

Groundwater Sampling Event for Operable Unit 2, Gerdau Ameristeel Indiantown Mill, Martin County, Florida, dated June, 2011.

Groundwater Sampling Event for Operable Unit 2, Gerdau Ameristeel Indiantown Mill, Martin County, Florida, dated October, 2011.

Groundwater Sampling Event for Operable Unit 2, Gerdau Ameristeel Indiantown Mill, Martin County, Florida, dated March, 2012.

Groundwater Sampling Event for Operable Unit 2, Gerdau Ameristeel Indiantown Mill, Martin County, Florida, dated July, 2013.

Groundwater Sampling Event for Operable Unit 2, Gerdau Ameristeel Indiantown Mill, Martin County, Florida, dated July, 2014.

Groundwater Sampling Event for Operable Unit 2, Gerdau Ameristeel Indiantown Mill, Martin County, Florida, dated March, 2014.

Groundwater Sampling Event for Operable Unit 2, Gerdau Ameristeel Indiantown Mill, Martin County, Florida, dated September, 2015.

Operation and Maintenance Manual Groundwater Remediation and Spray Irrigation System for Operable Unit 2, Gerdau AmeriSteel Indiantown Mill, Martin County, Florida, dated November 1997.

Operation & Maintenance Plan and Performance Standards Verification Plan, Operable Unit 1, AmeriSteel Indiantown Mill, Martin County, Florida, dated August 1996.

Remedial Investigation Report - Phase I, Florida Steel Corporation, Indiantown Mill Site, Martin County, Florida, Volume 1, Ardaman & Associates, Inc., September 30, 1988.

Remedial Investigation Report - Phase II, Florida Steel Corporation, Indiantown Mill Site, Martin County, Florida, Volume 1, Ardaman & Associates, Inc., October 17, 1989.

Remedial Design Work Plan, Operable Unit 1, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, Revision No. 1, Ardaman & Associates, Inc., May 10, 1993.

Reinedial Design Report, Operable Unit 1, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, Volume I, Project History and Remedial Design, Revision No. 0, Ardaman & Associates, Inc., September 9, 1994.

Remedial Design Report, Operable Unit 1, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, Volume 11, Treatability Study, Revision No. 0, Ardaman & Associates, Inc., September 9, 1994.

Remedial Design Report, Operable Unit 1, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, Volume III, Technical Specifications, Revision No. 0, Ardaman & Associates, Inc., September 9, 1994.

Remedial Design Work Plan, Operable Unit 2, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, Revision No. I, Ardaman & Associates, Inc., January 16, 1995.

Remedial Design and Remedial Action Work Plan, Remediation of Southwest Wetland, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, Revision No. 1, May 10, 1995.

Remedial Action Work Plan, Remediation of Groundwater Plume, Operable Unit 2, Florida Steel Corporation, Indiantown Mill, Martin County, Florida, Revision No. 1, Ardaman & Associates, Inc., February 15, 1996.

Second Five-Year Review Report for Gerdau Ameristeel Indiantown Mill Formerly known as Florida Steel Corporation Indiantown Martin County, Florida. Ardaman & Associates, Inc., April 2006.

Seventh Report on Groundwater Remediation Program for Operable Unit 2, Gerdau Ameristeel Indiantown Mill, Martin County, Florida, dated April 13, 2009.

Sixth Report on Groundwater Remediation Program for Operable Unit 2, Gerdau Ameristeel Indiantown Mill, Martin County, Florida, dated June 6, 2008.

United States Environmental Protection Agency, Record of Decision (ROD). The Declaration for Operable Unit One, Florida Steel Corporation, June 30, 1992.

United States Environmental Protection Agency, Record of Decision (ROD), the Declaration for Operable Unit Two, Florida Steel Corporation, March 30, 1994.

Appendix B: Press Notice

The U. S. Environmental Protection Agency, Region 4
Announces the Fourth Five-Year Review for
the Florida Steel Corporation Superfund Site,
Indiantown, Martin County, Florida

Purpose/Objective: The U.S. Environmental Protection Agency (EPA) is conducting the fourth Five-Year Review of the remedy for the Florida Steel Corporation Superfund site (the Site) in Indiantown, 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: Florida Steel Corporation (FSC), now Gerdau Ameristeel, acquired the site property in 1969 and built a steel mill for recycling scrap steel into new steel products, including concrete reinforcing steel and wrought iron. The mill operated from November 1970 to February 1982. It produced mill scale, slag and emission control (EC) dust as byproducts. EC dust was collected by a system of baghouses and, until November 1980, deposited in two disposal areas on site. In 1981, the Florida Department of Environmental Regulation conducted a Resource Conservation and Recovery Act (RCRA) compliance inspection of the facility. Samples of EC dust were obtained from uncontained waste piles. Based on sampling findings, EPA listed the 151-acre Site on the National Priorities List (NPL) in December 1982. Contaminants of concern included lead, zinc and polychlorinated biphenyls (PCBs) in site soils and sodium, radium and gross alpha in site groundwater.

Cleanup Actions: To manage the cleanup, EPA divided the Site into two operable units (OUs): OU1 (soil cleanup) and OU2 (southwest wetland and groundwater remediation). EPA selected the final remedy for OU1 in the Site's 1992 Record of Decision (ROD). It included excavation and off-site disposal of 600 cubic yards of PCB-contaminated soil; excavation and on-site solidification of 37,000 cubic yards of EC dust and metals-contaminated soil and ash, control of surface water runoff during soil cleanup; disposal of all solidified material in an on-site RCRA landfill with a RCRA cap; and periodic monitoring of surface water and groundwater for up to 30 years.

EPA issued the ROD for OU2 in 1994. The final remedy included groundwater extraction, blending of the water with clean water to meet federal and state requirements, and upgradient disposal of the blended water; wetlands cleanup; and excavation and on-site solidification and disposal of lead-contaminated wetland sediment in the on-site landfill.

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 Site above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human

health and the environment. The fourth Five-Year Review for the Site is scheduled for completion by July 2016.

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

Peter Thorpe,
EPA Remedial Project Manager
Phone: 404-562-9688
(Toll-Free)
Email: thorpe.peter@epa.gov

L'Tonya Spencer,
EPA Community Involvement Coordinator
Phone: 404-562-8463 / 1-800-435-9234

Email: spencer.latonya@epa.gov

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

Additional site information is available at the Site's local document repository, located at Indiantown Public Library,
1502 S.W. Adams Avenue, Indiantown, FL 34956, and online at:
http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400657&msspp=med.

Appendix C: Interview Forms

Florida Steel Corp. Superfund Site		**Five-Year Review Interview Form**	
Site Name:	**Florida Steel Corp.**	**EPA ID No.:**	**FLD050432251**
Interviewer Name:	**Sarah Alfano**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Peter Thorpe**	**Affiliation:**	**EPA**
Subject Contact Information:	**Thorpe.pete@epa.gov**		
Time:	**3:47PM**	**Date:**	**3/3/2016**

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: EPA Remedial Project Manager

1. What is your overall impression of the project; including cleanup, maintenance, and reuse activities (as appropriate)?
   I'm the new RPM on this site. The cleanup of the contamination is nearly complete. The Site is about to be reused as a Natural Gas Holding facility that will tap into the natural gas pipeline nearby.

2. What have been the effects of this Site on the surrounding community, if any?
   There is very little community surrounding this Site.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities since the implementation of the cleanup?
   None.

4. What is your assessment of the current performance of the remedy in place at the Site?
   The spray field equipment was damaged in wildfire onsite. The remediation has not operated since then. The sodium levels have stabilized and are very close to the remediation goals for the site.

5. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?
   The institutional control are in place.

6. Are you aware of any community concerns regarding the Site or the operation and management of its remedy? If so, please provide details.
   None.

7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

   None.

Florida Steel Corp. Superfund Site		**Five-Year Review Interview Form**	
Site Name:	**Florida Steel Corp.**	**EPA ID No.:**	**FLD050432251**
Interviewer Name:	**Sarah Alfano**	**Affiliation:**	**Skeo Solutions**
Subject Name:		**Affiliation:**	**Indiantown Realty**
Subject Contact Information:			
Time:	**2:30**	**Date:**	**1/14/16**

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.

2. What is your overall impression of the project; including cleanup, maintenance, and reuse activities (as appropriate)?
   Overall impression is positive in terms of getting the site ready to be reemployed and be a productive member of the community.

3. What have been the effects of this Site on the surrounding community, if any?
   When it was an operating business it was one of the employers of taxpayers in the community and when that went away the economic aspect did too. The steel mill was a large employer in town, when they left, that aspect of the community moved on too. Most folks look to that property with open optimism that the economic element can be replaced.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?
   No, I haven't seen or heard of any. It has all been fine.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?
   I think if anyone has ever had a comment question or concern, they have been accessible. Having a simple web presence there, that is where people will look for information. That is about the extent, I don't think they need to do outreach really just having the info available online.

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?
   I am located two miles from the site and we do have a well.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?
   No, I think it has been a positive experience. In terms of clear communication and the focus on the site remediation and getting the site turned around, that is good. It may have taken awhile but those things often do.

Florida Steel Corp. Superfund Site — Five-Year Review Interview Form

Site Name: Florida Steel Corp. **EPA ID No.:** FLD050432251
Interviewer Name: Sarah Alfano **Affiliation:** Skeo Solutions
Subject Name: Frances Cheung **Affiliation:** Ardaman & Associates
Subject Contact Information: 407-855-3860; fcheung@ardaman.com
Time: 8:39AM **Date:** 02/19/2016
Interview Location: Florida Steel Superfund Site

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: O&M Contractor

1. What is your overall impression of the project; including cleanup, maintenance, and reuse activities (as appropriate)?

   Overall impression is good. Remediation of the contaminated materials under OU-1 and the contaminated wetland sediments under OU-2 was successfully completed in 1996 and remains effective. Remediation of groundwater under OU-2 had made substantial progress, but had to be suspended in April 2009 when a wildfire damaged some key components of the remediation system. Remaining impacts are minimal and isolated. Gerdau is exploring alternatives with EPA and FDEP to bring OU-2 to closure. The facility is under contract to be sold for re-development into a natural gas storage facility.

2. What is your assessment of the current performance of the remedy in place at the Site?

   The remedy for OU-1 remains effective. Although approximately 57 million gallons of impacted groundwater have been withdrawn from the surficial aquifer system prior to April 2009, groundwater sampling and analyses indicated that a small number of monitor wells have not met the extraction standards. Among these wells, only two deep surficial aquifer monitor wells display an increasing trend for sodium. These two monitor wells, however, have consistently met the extraction standards for radionuclides.

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?

   As noted above, impacted groundwater remains above the extraction standards in several small areas. Trend analyses indicated that except for two deep surficial aquifer monitor wells, all other monitor wells display a stable or decreasing trend. There has been little change in groundwater quality and monitoring data indicate that the plumes have not expanded.

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.

   The site is vacant with no improvements, and is located in a relatively remote area. There are no on-site personnel. Site visits and mowing are performed periodically on an as-needed basis. Groundwater sampling and analyses are performed semi-annually.

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.

   There has been no significant change in O&M requirements, maintenance schedules, or sampling routines in the last five years.

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.

   As noted above, the site is located in a relatively remote area. The only O&M difficulty at the site was the passing of the caretaker in 2011, who was a Gerdau employee and lived in Indiantown. The sprayfield for disposal of the blended water from the recovery and production wells has been difficult to maintain, and is frequently subject to damages from wild hogs.

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.

   There have been no opportunities to optimize O&M activities or sampling efforts in the last five years.

8. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?

   The frequency of groundwater monitoring can probably be reduced from semi-annual to annual because there has been no significant change in groundwater quality.

Florida Steel Corp. Superfund Site Five-Year Review Interview Form

Site Name:	**Florida Steel Corp.**	**EPA ID No.:**	**FLD050432251**
Interviewer Name:	**Sarah Alfano**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Attorney**	**Affiliation:**	**Gerdau Ameristeel**
Subject Contact Information:	**4221 W. Boy Scout Blvd., Ste. 1000** **llockett@carltonfields.com**		
Time:	**1:05PM**	**Date:**	**2/25/2016**

Interview Format (circle one): **In Person** **Phone** **Mail** **Other: Email**

Interview Category: **PRP**

1. What is your overall impression of the project; including cleanup, maintenance, and reuse activities (as appropriate)?

   In 2015, Gerdau recorded a Declaration of Restrictive Covenants ("DRC") with the FDEP encumbering the property. The DRC restricts future use of the property to commercial and/or industrial purposes, restricts use of groundwater under a portion of the property, prohibits use of the landfill vault constructed on-site, and acknowledges the future planned reuse of the property for construction and operation of a natural gas storage facility as approved by the Federal Energy Regulatory Commission. In addition, Gerdau provided both the EPA and FDEP with information regarding existing institutional controls (including recorded encumbrances on property downgradient) that provide additional assurance that the remedy as implemented is protective of human health and the environment.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Florida Steel Corp.	**Date of Inspection:** 01/06/2016
Location and Region: Indiantown, FL Region 4	**EPA ID:** FLD05432251
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** 70 and cloudy with light intermittent rain

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☒ Ground water pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: Spray fields - have not worked since 2009
- ☐ Monitored natural attenuation
- ☐ Ground water containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** Francis Cheung (Name) Principal Engineer (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ (Name) _____ (Title) _____ (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 _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

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

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

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

   Agency _____

	Contact Name	Title	Date	Phone No.	
	Problems/suggestions ☐ Report attached:_____				
4.	**Other Interviews** (optional) ☒ Report attached: See Appendix X				
	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: All documents removed from Site, reports available electronically				
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: All documents removed from Site, reports available electronically				
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	
	Remarks: _____				
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.	**Ground Water Monitoring Records**	☐ Readily available	☒ Up to date	☐ N/A	
	Remarks: All documents removed from Site, reports available electronically				
8.	**Leachate Extraction Records**	☐ Readily available	☒ Up to date	☐ N/A	
	Remarks: All documents removed from Site, reports available electronically				
9.	**Discharge Compliance Records**				
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: Spray fields out of operation since 2009				
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A	

Remarks: _____

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

☐ _____

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: 1/1/11 (Date)	To: 12/31/11 (Date)	$76,069.85 (Total cost)	☐ Breakdown attached
From: 1/1/12 (Date)	To: 12/31/12 (Date)	$180,032.69 (Total cost)	☐ Breakdown attached
From: 1/1/13 (Date)	To: 12/31/13 (Date)	$103,852.57 (Total cost)	☐ Breakdown attached
From: 1/1/14 (Date)	To: 12/31/14 (Date)	$89,644.59 (Total cost)	☐ Breakdown attached
From: 1/1/15 (Date)	To: 12/31/15 (Date)	$69,025.41 (Total cost)	☐ Breakdown attached

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

Describe costs and reasons: Increases in costs for 2012 and 2013 are attributable to the design and installation of additional deep aquifer wells.

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

A. Fencing

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

Remarks: Fence around property less secure, fence around landfill new and secure

B. Other Access Restrictions

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

Remarks: Signs visible on fence around landfill

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): Periodic on-site maintenance and inspection during monitoring efforts

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ _____ _____

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: The delineated area covers off-property migration

D. General

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

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: Future use likely to include a natural gas storage facility. All parties aware and supportive.

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

Remarks: Commercial/industrial park being built to the left of entrance.

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

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☒ Settlement not evident

Arial extent: _____ Depth: _____

Remarks: _____

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident

Lengths: _____ Widths: _____ Depths: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident

Arial extent: _____ Depth: _____

Remarks: _____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident

Arial extent: Several animal burrowing holes evident on top of landfill. Depth: Undetermined

Remarks: Holes may be due to gopher turtles, which will need to be relocated in accordance with local regulations.

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established

☒ No signs of stress ☐ Trees/shrubs (indicate size and locations on a diagram)

Remarks: Area recently mowed, some mowing-associated wear observed.

6. **Alternative Cover** (e.g., armored rock, concrete) ☒ N/A

Remarks: _____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident

Arial extent: _____ Height: _____

Remarks: _____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident

☐ Wet areas ☐ Location shown on site map Arial extent: _____

☐ Ponding ☐ Location shown on site map Arial extent: _____

☐ Seeps ☐ Location shown on site map Arial extent: _____

☐ Soft subgrade ☐ Location shown on site map Arial extent: _____

Remarks: _____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map

☒ No evidence of slope instability

Arial extent: _____

Remarks: _____

B. Benches ☐ Applicable ☒ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

C. Letdown Channels ☒ Applicable ☐ N/A

(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ No evidence of settlement
   Arial extent: _____ Depth: _____
   Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type:_____ Arial extent: _____
   Remarks: Letdown channels constructed, but not observed, possibly due to vegetation overgrowth.

3. **Erosion** ☐ Location shown on site map ☒ No evidence of erosion
   Arial extent: _____ Depth: _____
   Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting
   Arial extent: _____ Depth: _____
   Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions
   ☐ Location shown on site map Arial extent: _____
   Size: _____
   Remarks: Overgrown vegetation may be obstructing channels that could not be found. Find channels, remove obstructions as needed.

6. **Excessive Vegetative Growth** Type: Grass
   ☐ No evidence of excessive growth
   ☒ Vegetation in channels does not obstruct flow
   ☐ Location shown on site map Arial extent: _____
   Remarks: While letdown channels could not be found, there was no evidence of water damage or erosion on the cap.

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A
   Remarks: _____

2. **Gas Monitoring Probes**
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A
   Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)

☐ Properly secured/locked ☐ Functioning ☒ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
Remarks: Most wells were not locked. Many wells observed could benefit from relabeling.

4. **Extraction Wells Leachate**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A
Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A
Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs maintenance
Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs maintenance
Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs maintenance ☐ N/A
Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A
☐ Siltation not evident
Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____
☐ Erosion not evident
Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A
Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

   Horizontal displacement: _____ Vertical displacement: _____

   Rotational displacement: _____

   Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

   Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☒ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident

   Area extent: _____ Depth: _____

   Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

   ☒ Vegetation does not impede flow

   Area extent: _____ Type: _____

   Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident

   Area extent: _____ Depth: _____

   Remarks: _____

4. **Discharge Structure** ☒ Functioning ☐ N/A

   Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

   Area extent: _____ Depth: _____

   Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

   ☐ Performance not monitored

   Frequency: _____ ☐ Evidence of breaching

   Head differential: _____

   Remarks: _____

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

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

1. **Pumps, Wellhead Plumbing and Electrical**

   ☐ Good condition ☐ All required wells properly operating ☒ Needs maintenance ☐ N/A

   Remarks: Groundwater remediation system, including spray fields, has been out of operation since 2009. The EPA will work with parties to determine next steps.

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☒ Needs maintenance

Remarks: See above.

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: None present on site.

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

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☒ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☒ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of ground water treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: Groundwater remediation system, including spray fields, has been out of operation since 2009. The EPA will work with parties to determine next steps.

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☒ Needs maintenance

Remarks: System not in operation. Machinery rusting and labels falling off.

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☒ Needs maintenance

Remarks: Groundwater not currently stored in on-site tank. Tank considerably rusted, may need maintenance if put back into operation.

4. **Discharge Structure and Appurtenances**

☒ N/A ☐ Good condition ☐ Needs maintenance

Remarks: No discharge since 2009

5. **Treatment Building(s)**

☒ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: No buildings presently on site.

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☒ Routinely sampled ☐ Good condition

☐ All required wells located ☒ Needs maintenance ☐ N/A

Remarks: All wells should be locked and clearly labeled.

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Ground water plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☒ 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).
The remedy is not currently operating as designed since the groundwater treatment system and spray fields have not been in operation since 2009. Groundwater plumes of sodium appear relatively stable, but certain wells have not met cleanup goals.

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.
O&M activities related to the groundwater treatment system are not occurring. Wells are sampled regularly and the property is well maintained.

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.
See above.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Discuss possible changes to remedy if treatment system is not put back into operation, including monitored natural attenuation or a more targeted treatment of remaining groundwater contamination.

Appendix E: Photographs from Site Inspection Visit

View near site entrance, showing neighboring facility and landfill

Groundwater treatment facility and water holding tank

Landfill perimeter fencing and signage


Leachate collection sump

Southern stormwater retention pond, as viewed from the landfill

View of the Southwest Wetland from the landfill

Animal burrow on the top of the landfill

View of the old facility foundations and demolition debris from the landfill

Unlocked monitoring well, M-103

Appendix F: Data Review

OU2 Shallow Surficial Aquifer

Sodium concentrations in the shallow recovery wells exceeded the cleanup standard of 160 mg/L in RW-4 and RW-8. Concentrations in these wells have remained relatively stable since the remediation system was shut down in 2009. Sodium concentrations in RW-4 were the same in June 2011 and September 2015 (290 mg/L). Sodium concentrations in RW-8 decreased from 320 mg/L to 210 mg/L during the same period (Table F-1). Sodium concentrations in the shallow surficial aquifer exceeded the cleanup standard in M-19 and M-104. Concentrations in M-19 decreased from a maximum of 420 mg/L in June 2011 to below the standard in 2012 and remained low through the most recent sampling event in September 2015 (55 mg/L). Concentrations in M-104 have remained stable since 2011 at about 220 mg/L.

Recovery wells RW-1, RW-2 and RW-4 as well as monitoring wells MW-25, MW-50, M-104, M-105, M-110 and M-112 exceeded the performance standards for radium-226 + radium-228 during this review period. The radium-226 + radium-228 concentrations in RW-1 exceeded the standard once in June 2011 and concentrations in M-110 and M-112 have decreased over the last three sampling events. Recovery well RW-2 has been below 2 pCi/L, but in the most recent event the concentration increased to 5.5 pCi/L. The gross alpha concentrations exceeded the performance standard in MW-25, MW-50, M-104, M-105, M-110 and RW-4. Concentrations in well RW-4 decreased to below the standard in 2015. In M-104, gross alpha concentrations fluctuated above and below the standard throughout the review period.

Table F-1: COC Exceedances in Shallow Recovery Wells 2011-2015

Date	Sodium Concentration (mg/L)		Radium-226 + Radium-228 Concentrations (pCi/L)			Gross Alpha Concentration (pCi/L)
	Performance standard = 160		Performance standard = 5			Performance standard = 15
	RW-4	RW-8	RW-1	RW-2	RW-4	RW-4
06/15/2011	**290**	**320**	**6.2** ± 1.4	–	**15.6** ± 1.9	**15.8** ± 1.3
10/20/2011	**220**	**290**	4.3 ± 1.3	–	**16.2** ± 2.1	**16.1** ± 1.2
02/22/2012	**260**	**270**	4.9 ± 1.3	2.0 ± 1.1	**16.7** ± 2.2	**28** ± 4
12/17/2012	**320**	**240**	2.7 ± 1.4	1.0 ± 1.3	**14.0** ± 2.0	13.4 ± 4.5
07/17/2013	**270**	**270**	1.8 ± 0.9	1.9 ± 0.9*	**16.1** ± 2.0	**15.5** ± 1.2
03/01/2014	**310**	**180**	3.3 ± 1.3	1.0 ± 1.2	**17.0** ± 2.1	**23** ± 3
07/25/2014	**360**	**230**	1.0 ± 1.0	0.8 ± 1.0	**28.2** ± 2.4	**52** ± 4.7
09/05/2014	–	–	–	–	–	–
03/10/2015	**260**	**170**	3.2 ± 0.5	0.7 ± 0.3	**8.4** ± 0.9	12.3 ± 1.1
09/16/2015	**290**	**210**	1.8 ± 0.6	**5.5** ± 0.7	**19.6** ± 1.1	3.1 ± 2.0

Concentrations exceeding the extraction and discharge standards are shaded and **bolded**.
* Dissolved concentration.

Table F-2: COC Exceedances in Shallow Aquifer Monitoring Wells 2011-2015

Well	Jun 2011	Oct 2011	Feb 2012	Dec 2012	Jul 2013	Feb-Mar 2014	Jul 2014	Mar 2015	Sep 2015
Sodium Concentration (mg/L) Performance Standard = 160									
M-19	**420**	**180**	**230**	100	NS	50	49	72	55
M-104	**220**	**220**	**250**	**270**	**250**	**220**	**210**	**190**	**220**
M-110	–	–	–	–	–	–	**330****	**350**	**320**
M-111	–	–	–	–	–	–	**170****	160	**170**
M-112	–	–	–	–	–	–	**290****	**240**	**280**
Radium-226 + radium-228 Concentrations (pCi/L) Performance Standard = 5									
M-25	**20** ± 2.1	**25.9** ± 2.2	**12.6** ± 1.8	**22** ± 3.2	NS	**13.6** ± 2.0	**25** ± 2.6	**20.1** ± 1.5	**28.0** ± 1.6
M-50	**11.5** ± 1.8	**11.5** ± 1.7	**12.2** ± 1.8	**9.8** ± 1.8	**6.1** ± 1.3*	5.0 ± 1.2	**11.2** ± 1.7	**8.4** ± 1.1	**13.0** ± 1.0
M-104	**14.9** ± 2.1	**13.5** ± 1.8	**14.1** ± 1.9	**14.1** ± 1.9	**12.0** ± 1.7	**10.4** ± 2.2	**10.8** ± 1.6	**13.5** ± 1.2	**15.0** ± 1.1
M-105	–	**13.4** ± 1.8	**6.0** ± 1.4	3.5 ± 1.1	1.8 ± 0.9*	1.5 ± 1.1*	2.6 ± 1.2	4.0 ± 0.8	3.7 ± 0.7
M-110	–	–	–	–	–	–	**33** ± 2**	**31.6** ± 1.7	**31.5** ± 1.3
M-112	–	–	–	–	–	–	**15.9** ± 1.3**	**10.1** ± 1.1	**8.3** ± 0.8
Gross Alpha Concentration (pCi/L) Performance Standard = 15									
M-25	**31** ± 3	**26** ± 2	**18.3** ± 2.0	**39** ± 3	NS	**29** ± 2	**49** ± 3.1	**60** ± 2.9	**65** ± 5.7
M-50	**26** ± 3	**22** ± 2	**22** ± 2	**22** ± 2	**33** ± 3	**43** ± 2*	**21** ± 2.0	**19** ± 2.1	**23** ± 3.3
M-104	10.7 ± 1.0	**26 ± 5**	11.1 ± 1.1	**16.5** ± 4.5	13.8 ± 1.1	**29** ± 4	**22** ± 3.0	12.6 ± 1.2	**15.7** ± 2.1
M-105	–	**15.5** ± 1.9	8.2 ± 1.8	4.2 ± 1.2	3.4 ± 1.0*	2.6 ± 0.9*	2.4 ± 0.9	11.9 ± 1.8	2.3 ± 1.1
M-110	–	–	–	–	–	–	**21.7** ± 2.1**	**26** ± 1.5	**28** ± 2,8

Concentrations exceeding the extraction and discharge standards are shaded and **bolded**.

* Dissolved concentration.

Figure F-1: September 2015 Sodium Concentrations in Shallow Aquifer Wells

OU2 Deep Surficial Aquifer

Sodium concentrations were above the performance standard in recovery well DR-3 twice during this FYR period. Concentrations in 2014 and 2015 ranged from 88 to 160 mg/L. Recovery well DR-1 had concentrations above the radium-226 + radium-228 and gross alpha performance standards during this review period; however concentrations since 2014 have been below the respective performance standards (Table F-3).

Table F-3: COC Exceedances in Deep Recovery Wells 2011-2015

Date	Sodium Concentration (mg/L)	Radium-226 + radium-228 Concentrations (pCi/L)	Gross Alpha Concentration (pCi/L)
	Performance standard = 160	Performance standard = 5	Performance standard = 15
	DR-3	DR-1	DR-1
06/15/2011	–	**9.2** ± 1.2	12.7 ± 1.9
10/20/2011	–	**5.2** ± 1.4	6.4 ± 1.3
02/22/2012	–	**12.2** ± 1.8	**20** ± 2
12/17/2012	**210**	**9.1** ± 1.9	8.1 ± 1.4
07/17/2013	**180***	4.5 ± 1.2	4.7 ± 1.0
03/01/2014	88	**5.4** ± 1.4	8.7 ± 1.3
07/25/2014	160	4.5 ± 1.2	3.8 ± 1.0
09/05/2014	–	–	–
03/10/2015	130	4.8 ± 0.7	12.9 ± 1.8
09/16/2015	160	3.6 ± 0.6	6.1 ± 1.3

Concentrations exceeding the extraction and discharge standards are shaded and **bolded**.
* Dissolved concentration.

Sodium concentrations in the deep surficial aquifer wells were above the extraction standard in the following wells: M-22, M-73, M-76, M-94, M-95, M-102 and M-103 (Table F-4). Concentrations have remained stable in wells M-73, M-94 and M-103. Concentrations have decreased in wells M-22, M-95 and M-101. Concentrations have increased in wells M-76 and M-102. The highest sodium concentration recorded during this FYR period occurred in the deep surficial aquifer at M-73 (500 mg/L). Wells M-73, M-76, M-94 and M-95 are located within the original deep plume boundary and wells M-102 and M-103 are located outside and south of the original deep plume area (Figure F-2). Concentrations at M-22, M-73 and M-94 exceeded the performance standard for radium-226 + radium-228 during this FYR period. Since 2012, M-73 was the only deep well that exceeded the gross alpha performance standard.

Table F-4: COC Exceedances in Deep Surficial Aquifer Monitoring Wells 2011-2015

Well	Jun 2011	Oct 2011	Feb 2012	Dec 2012	Jul 2013	Feb-Mar 2014	Jul 2014	Mar 2015	Sep 2015
Sodium Concentration (mg/L) Performance Standard = 160									
M-22	**170**	**180**	**170**	**170**	**170***	160	160	160	NS
M-73	**720**	**740**	**710**	**730**	**670**	**380**	**340**	**490**	**500**
M-76	–	–	**170**	**210**	NS	**260**	**310**	**330**	**340**

M-94	**240**	**230**	**250**	**280**	NS	**260**	**270**	**270**	**250**
M-95	**340**	**310**	**300**	**280**	NS	**220**	**220**	**210**	**200**
M-102	120	110	110	**170**	**190***	**190**	**190**	**190**	**220**
M-103	**250**	**290**	**220**	**270**	**170**	**250**	**240**	**260**	**240**
Radium-226 + radium-228 Concentrations (pCi/L) Performance Standard = 5									
M-22	**9.4** ± 1.6	**11.1** ± 1.8	**7.3** ± 1.6	**7.0** ± 1.6	**12.9** ± 1.9*	**8.4** ± 2.0	**9.7** ± 1.7	**6.2** ± 0.8	NS
M-73	**16.6** ± 2.1	**16.6** ± 1.9	**15.4** ± 2.1	**16.3** ± 2.1	**12.6** ± 1.9	**7.4** ± 1.6	**8.2** ± 1.5	**11.5** ± 0.9	**10.8** ± 0.9
M-94	**7.2** ± 1.5	**7.7** ± 1.5	**7.9** ± 1.6	**10.1** ± 1.9	NS	**7.7** ± 1.5	**8.0** ± 1.5	**8.0** ± 1.0	**7.2** ± 1.0
Gross Alpha Concentration (pCi/L) Performance Standard = 15									
M-22	**21** ± 4	**19.7** ± 3.5	8.3 ± 2.2	8.6 ± 2.2	11.0 ± 2.3	9.0 ± 1.6	12.3 ± 2.6	11.6 ± 1.8	NS
M-40	3.7 ± 1.8	**22** ± 1	0.8 ± 0.9	2.0 ± 1.0	1.6 ± 1.2*	3.1 ± 1.2	0.0 ± 0.8	1.0 ± 0.6	1.6 ± 1.1
M-73	**29** ± 2	**21** ± 1	14.1 ± 1.1	**42** ± 2	**24** ± 2	**28** ± 3	**24** ± 2.9	**29** ± 2.5	**18.4** ± 2.1

Concentrations exceeding the extraction and discharge standards are shaded and **bolded**.

* Dissolved concentration.

Figure F-2: September 2015 Sodium Concentrations in Deep Aquifer Wells

Relationship between Sodium and Radionuclide Concentrations

The 2015 Monitoring Report provided plots that depict the relationships between the sodium and radium-226 + radium-228 as well as the sodium and gross alpha concentrations in September 2015. Figures F-3 and F-4 show these plots.

Figure F-3: Sodium-Radium-226 + Radium-228 Relationship for September 2015

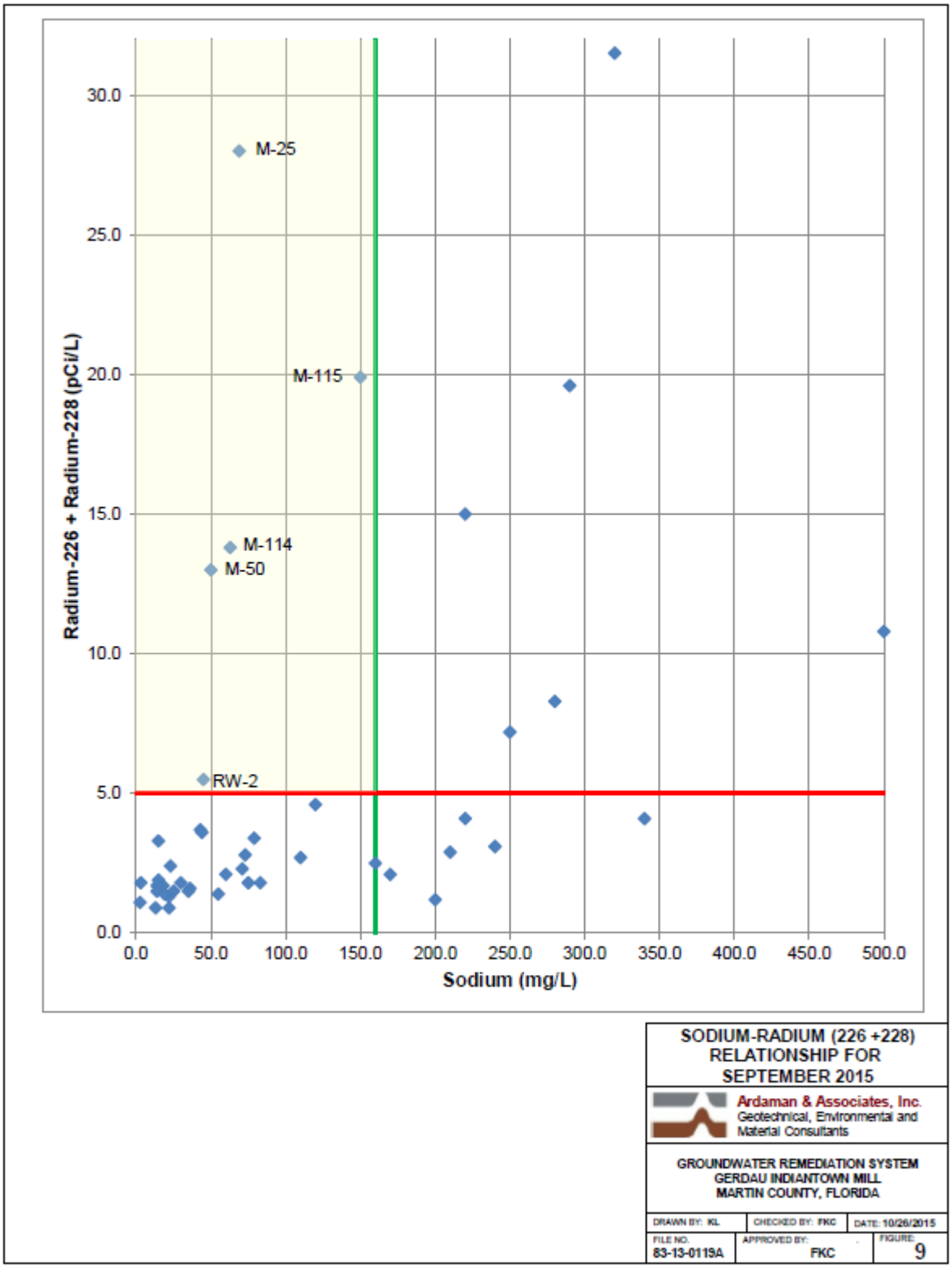


Figure F-4: Sodium-Gross Alpha Relationship for September 2015