FOURTH FIVE-YEAR REVIEW REPORT FOR SACO MUNICIPAL LANDFILL SUPERFUND SITE YORK COUNTY, MAINE

SEPTEMBER 8, 2020

Prepared by

U.S. Environmental Protection Agency
Region 1
Boston, Massachusetts

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Date

SEMS Doc ID 100014665

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LIST OF ABBREVIATIONS & ACRONYMS

ALM	Adult Lead Methodology
ARAR	Applicable or Relevant and Appropriate Requirement
BLL	Blood Lead Level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Environmental Risk Assessment
FYR	Five-Year Review
HA	Health Advisory
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
IC	Institutional Control
ICL	Interim Cleanup Level
IEUBK	Integrated Exposure Uptake Biokinetic Model
Maine DEP	Maine Department of Environmental Protection
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MEG	Maximum Exposure Guideline
mg/kg	Milligrams per Kilogram
µg/dL	Micrograms per Deciliter
µg/L	Micrograms per Liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ng/L	Nanogram per Liter
NPL	National Priorities List
NTCRA	Non-Time-Critical Removal Action
O&M	Operation and Maintenance
OLEM	Office of Land and Emergency Management
OU	Operable Unit
PFAS	Per- and polyfluoroalkyl substances
PFBS	Perfluorobutanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
ppm	Part Per Million
ppt	Part Per Trillion
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RfD	Reference Dose
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SSPS	Site-Specific Performance Standard
TBC	To-Be-Considered
UCL	Upper Confidence Limit
UU/UE	Unlimited Use/Unrestricted Exposure
VISL	Vapor Intrusion Screening Level

I. INTRODUCTION

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

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

This is the fourth FYR for the Saco Municipal Landfill Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE). The Site consists of a single sitewide operable unit (OU). The sitewide OU addresses all contaminated media.

EPA remedial project manager (RPM) John Bryant led the FYR. Participants included EPA community involvement coordinator (CIC) Darriel Swatts, EPA attorney Sarah Meeks and EPA risk assessor Courtney Carroll, Iver McLeod from the Maine Department of Environmental Protection (Maine DEP), and Kirby Webster from EPA FYR support contractor Skeo. The potentially responsible parties (PRPs) were notified of the initiation of the FYR. The review began on December 19, 2019.

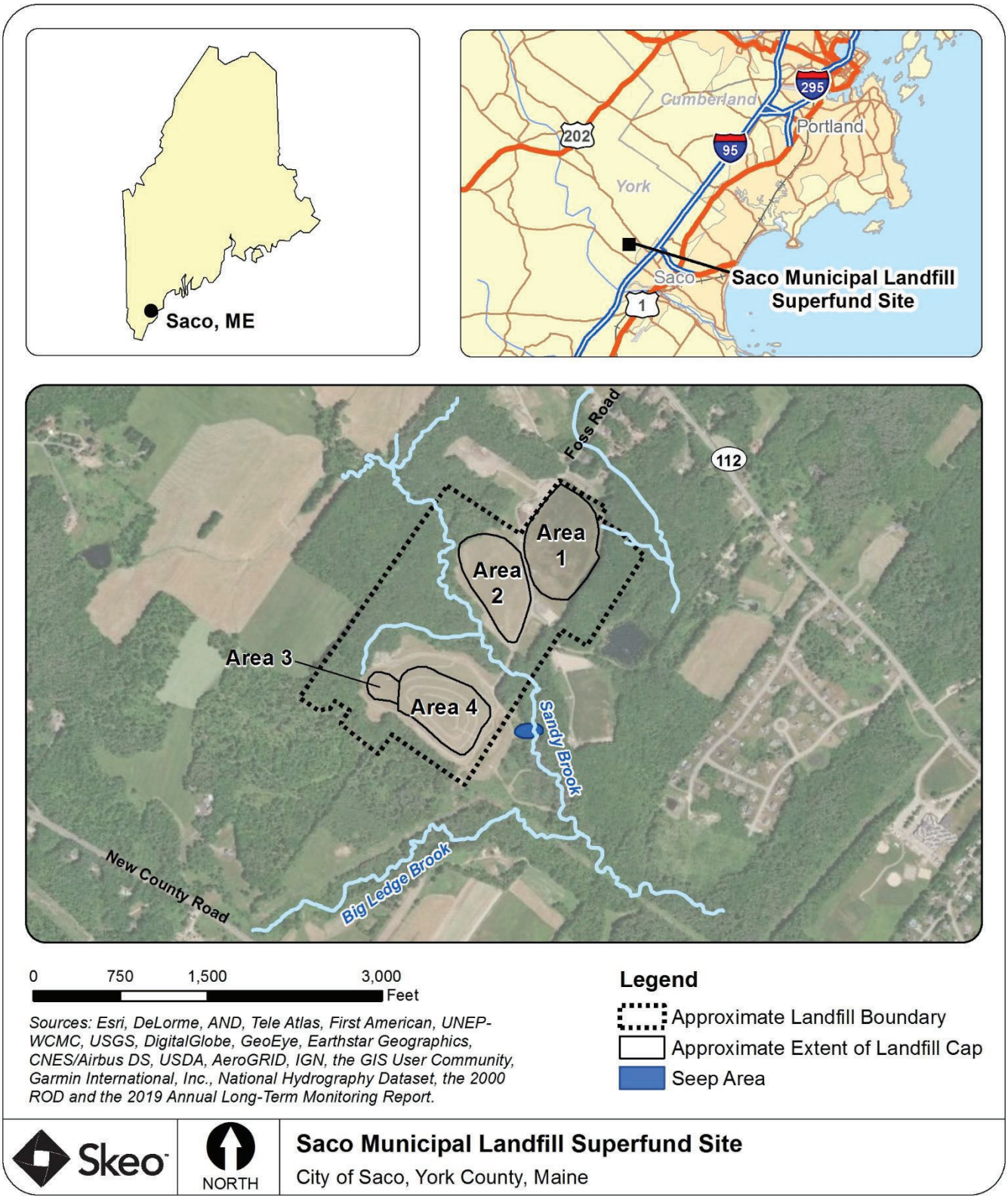
Site Background

The Site is located on Foss Road in the City of Saco, York County, Maine. It includes four separate landfill areas (Landfill Areas 1, 2, 3 and 4) that cover approximately 30 acres (Figure 1). From 1963 to 1989, the city of Saco (City) owned and operated the various landfills. Wastes disposed of in the landfills included municipal, industrial and construction waste, and sludge from a nearby former tannery wastewater treatment system. The City currently owns the parcels associated with the Site and is the performing PRP. Disposal activities and past landfill practices resulted in the release of landfill leachate that contaminated shallow groundwater, surface water (Sandy Brook) and a seep at the Site.

The Saco River is located about 2.3 miles southwest of the Site. Sandy Brook, a small perennial tributary to the Saco River, flows through the Site. Landfill Areas 1 and 2 are located on the east side of Sandy Brook and Landfill Areas 3 and 4 are located on the west side of the brook. The Site is mostly bounded by wooded areas in all directions. Landfill Areas 1 and 2 have been converted to athletic fields. The nearest homes are located about a third of a mile north and east of Landfill Area 4.

Groundwater at the Site is encountered in the overburden and the bedrock aquifers. Overburden groundwater flow from Landfill Areas 1 and 2 is generally west/southwest toward Sandy Brook. Bedrock groundwater flow is not known for Landfill Areas 1 and 2 because there are no bedrock wells to measure groundwater elevation. From Landfill Areas 3 and 4, overburden and bedrock flow are generally east/southeast toward Sandy Brook. A groundwater seep area (referred to as the primary or wetland seep area) is located east of Landfill Area 4 and discharges to Sandy Brook. Due to suspected contamination in nearby shallow wells, the municipal water supply was extended to residents along Buxton Road in 1975. No groundwater is known to be used near the Site. Appendix A provides a list of references used in preparation of this FYR Report. Appendix B provides a chronology of site events.

Figure 1: Site Vicinity 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 EPA's response actions at the Site.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Saco Municipal Landfill		
EPA ID: MED980504393		
Region: 1	**State:** ME	**City/County:** Saco/York
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	**Has the Site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: John Bryant		
Author affiliation: EPA Region 1		
Review period: 12/19/2019 - 9/1/2020		
Date of site inspection: 6/30/2020		
Type of review: Statutory		
Review number: 4		
Triggering action date: 9/8/2015		
Due date *(five years after triggering action date)*: 9/8/2020		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Investigations at the Site started in 1973. Investigations in the late 1970s and early 1980s identified groundwater and surface water quality problems associated with the release of landfill leachate. In 1980, EPA and Maine DEP performed a preliminary site assessment. In 1981, Maine DEP initiated landfill closure at the Site. EPA placed the Site on the National Priorities List (NPL) in February 1990.

In 1995, the City conducted Phase 1A of the Site's remedial investigation and feasibility study (RI/FS). The results indicated that dissolved organic carbon from the leachate in Landfill Areas 3 and 4 was causing reducing conditions that mobilized the naturally-occurring arsenic and manganese into the groundwater beneath the Site, resulting in the discharge of these contaminants to a wetland seep area and into surface water and sediments of Sandy Brook. The final Phase 1A RI Report was completed in 1998 and included a human health risk assessment (HHRA). An ecological risk assessment (ERA) was completed in 2000. The final FS Report, which included a supplemental RI, was completed in July 2000.

The HHRA identified a potential threat to future residents based on the use of site groundwater as drinking water. Additionally, the ERA identified an ecological risk to benthic organisms, limited to a small portion of Sandy Brook downstream of the wetland seep area. The ecological risk was determined to be minimal and would be addressed by the remedial alternatives for groundwater. Groundwater contaminants of concern (COCs) include arsenic, benzene and manganese.

Response Actions

In 1975, the municipal water supply was extended to residents along Buxton Road (Route 112). In 1976, the City completed the closure of Landfill Area 1. In 1985, the clay cap on Landfill Area 1 was repaired and the City completed the closure of Landfill Area 2 under state oversight.

EPA signed an Action Memorandum in 1996 to initiate a non-time-critical removal action (NTCRA) to consolidate and cap contaminated soils and wastes within Landfill Areas 3 and 4. EPA developed the following NTCRA objectives to be used in evaluating source control options:

- Prevent, to the extent practicable, direct contact with and ingestion of soil/debris within the landfill and beneath the landfill.
- Prevent, to the extent practicable, the potential for water to infiltrate through the landfill debris mass.
- Control, to the extent practicable, surface water run-off to minimize erosion.
- Control landfill gas so that methane does not present a fire or explosion hazard.
- Prevent, to the extent practicable, the release of landfill gas containing hazardous substances, pollutants or contaminants at levels that would represent an unacceptable human health exposure to a site worker or trespasser.
- Prevent, to the extent practicable, the migration of groundwater with contaminant concentrations above state or federal drinking water standards, or in their absence a level equal to a hazard quotient of 1 or an excess carcinogenic risk of 1×10^{-6} beyond the edge of the landfill.
- Prevent, to the extent practicable, continued ecological impacts to Sandy Brook or Big Ledge Brook.
- Remove sediments and soils at levels that could result in an unacceptable ecological impact.
- Prevent, to the extent practicable, the migration of landfill-impacted groundwater into Sandy Brook.

The NTCRA consisted of:

- Grading of the landfill.
- Excavating contaminated sediments from a seep area and consolidating them with the waste material in Landfill Area 4.
- Design and construction of a multi-layer, low hydraulic conductivity cap with surface drainage controls.
- Maintenance of the cap.
- Long-term monitoring of surface water, sediments and groundwater.
- Post-removal site control of the cap. The control shall ensure the long-term, continued effectiveness of each component of the NTCRA.
- Institutional controls, including implementation of deed restrictions and/or other controls to prohibit the future use of the Site in any manner that would compromise the integrity of the cap and its associated systems.

EPA selected the remedy for the Site in a 2000 Record of Decision (ROD).

The 2000 ROD established the following remedial action objectives (RAOs):

- Prevent the ingestion of groundwater containing contaminants that exceed federal or state maximum contaminant levels (MCLs), non-zero maximum contaminant level goals (MCLGs), or state maximum

enforcement guidelines (MEGs) or, in their absence, an excess cancer risk of 1 x 10^{-6} (one in a million) or a hazard quotient (HQ) of 1.
- Restore groundwater to meet federal or state MCLs, MCLGs or MEGs or, in their absence, an excess cancer risk of 1 x 10^{-6} (one in a million) or an HQ of 1.
- Perform long-term monitoring of surface water, sediments and groundwater to verify that the cleanup programs at the Site are protective of human health and the environment.

Having capped Landfill Areas 3 and 4 as part of the NTCRA, the major components of the remedy selected in the ROD included monitoring groundwater, surface water and sediments to demonstrate natural attenuation, establishing an evaluation program to measure progress of natural attenuation, and institutional controls to restrict current and future land and groundwater use. The estimated duration that would be required to meet groundwater cleanup goals (via natural attenuation) was 60 to 100 years. The 2000 ROD selected Interim Groundwater Cleanup Levels (ICLs) based on chemical-specific applicable or relevant and appropriate requirements (ARARs) which were MCLs for arsenic and benzene and the Maine MEG for manganese (Table 1). The 2000 ROD also identified the cleanup levels for surface water as Federal and State water quality criteria. At the time when ICLs have been achieved, EPA will evaluate residual groundwater contamination to determine whether the remedial action is protective.

Table 1: Interim Groundwater COC Cleanup Levels

Groundwater COC	ROD Cleanup Goal (µg/L)	Basis
Arsenic	50	MCL
Benzene	5	MCL
Manganese	200	MEG
Source: Table 18 of the 2000 ROD.		

Status of Implementation

In 1999, the City (under the supervision of EPA and Maine DEP) completed the NTCRA described in EPA's 1996 Action Memorandum. The purpose of this early cleanup action was to remove the source component of contamination and prevent direct exposure to contaminated soils. The completed NTCRA consisted of:

- Excavation of soils/sediments from several groundwater seeps that contained elevated levels of arsenic and placement of these materials beneath the cap for Landfill Areas 3 and 4.
- Excavation of several pockets of solid waste (about 5,000 cubic yards) outside the footprint of the existing landfills and consolidation of this solid waste into Landfill Areas 3 and 4.
- Design and construction of a multi-barrier landfill cap over Landfill Areas 3 and 4.
- Development of land use restrictions that will restrict future use of the Site.
- Creation of a new on-site wetlands area southeast of Landfill Area 4 to compensate for the wetlands affected by cap construction.

NTCRA construction activities began in 1996 and finished in 1998. EPA signed a Preliminary Close-Out Report in September 2000 after installation of the cap. The report confirmed that no additional remedial construction activities were necessary.

The 2001 Long-Term Monitoring Plan, revised in 2017, was prepared to monitor and evaluate long-term conditions in groundwater, surface water and sediment and to assess the effectiveness and progress of the remedy. Long-term monitoring also will verify that natural attenuation processes are occurring and specifically that arsenic and manganese concentrations are decreasing to meet their respective ICLs in groundwater. The monitoring program has been developed to:

- Demonstrate that natural attenuation is occurring as expected.
- Detect changes in environmental conditions (e.g., hydrogeologic, geochemical, microbial or other changes) that may reduce the ability of natural attenuation processes to meet the RAOs.
- Verify management of migration (e.g., that the plume boundaries are not expanding).
- Detect new releases of contaminants to the environment that could impact the effect of the natural attenuation processes.
- Verify that concentrations of contaminants in Sandy Brook sediment do not increase to levels likely to constitute a significant risk to the ecology of the brook.

In addition to the ICLs, a site-specific performance standard (SSPS) of 3 µg/L was selected for arsenic in the surface waters of Sandy Brook. This level was selected based on the reporting limit for arsenic.

Although no cleanup levels were established for sediments in Sandy Brook, the ERA suggested that a moderate reduction in growth and reproduction to benthic organisms may occur in sediments with arsenic concentrations exceeding 106 milligrams per kilogram (mg/kg). The ROD states that EPA will reevaluate the potential environmental impacts of site contamination if arsenic concentrations above 200 mg/kg are detected in isolated locations, or if concentrations above 100 mg/kg are detected over broader areas.

Institutional Control (IC) Review

Institutional controls for the Site were required by 1996 Action Memorandum and the 2000 ROD and were completed before issuance of the 2000 ROD as part of the NTCRA (Table 2). Land and groundwater use have been restricted by a "Grant of Environmental Restrictions and Right of Access" agreed to by the City, EPA and Maine DEP. The City ensures that institutional controls continue to be effective. The 2000 Grant of Environmental Restrictions specifically references two parcels, Lot 6 and Lot 2 (097006000000 and 097002000000), but restricted areas described in the 2000 Grant of Environmental Restrictions document include a neighboring third parcel, Lot 9 (097009000000), that was not identified in the Grant of Environmental Restrictions. Figure 2 shows the current institutional controls and current property parcels.[1] Additional institutional controls are likely needed on at least a portion of the additional property parcel, Lot 9 (097009000000).

The following uses are restricted at the following locations described in the 2000 Grant of Environmental Restrictions and Right of Access:

- **Land Use Restriction Parcel.** Use that disturbs the integrity of any layers of the cap, or any other structures for maintaining the effectiveness of the removal action, whether in place now or put in place in the future. The Land Use Restriction Parcel includes the section of land which constitutes the capped areas of Lot 6 (097006000000) as identified in Exhibit A, located in the 2000 Grant of Environmental Restrictions.
- **Groundwater Restriction Parcel No. 1**. Groundwater and surface water use, including, but not limited to, use as a drinking water supply. Groundwater Restriction Parcel No. 1 refers to approximately 86 acres of Lot 6 (097006000000) and approximately 48 acres of Lot 2 (097002000000) and separated from Groundwater Restriction Parcel No. 2 by a line defined by Exhibit B, located in the 2000 Grant of Environmental Restrictions.
- **Groundwater Restriction Parcel No. 2.** Groundwater shall be used at a rate no greater than 1 to 2 gallons per minute. No groundwater wells shall be installed within the restricted area except for purposes of groundwater monitoring pursuant to a plan approved by the Grantee and EPA or as provided in the 2000 Grant of Environmental Restrictions. Groundwater Restriction Parcel No. 2 refers to approximately 23 acres of Lot 2 (097002000000) and approximately 5 acres of Lot 6 (097006000000), but not including Groundwater Restriction Parcel No. 1.

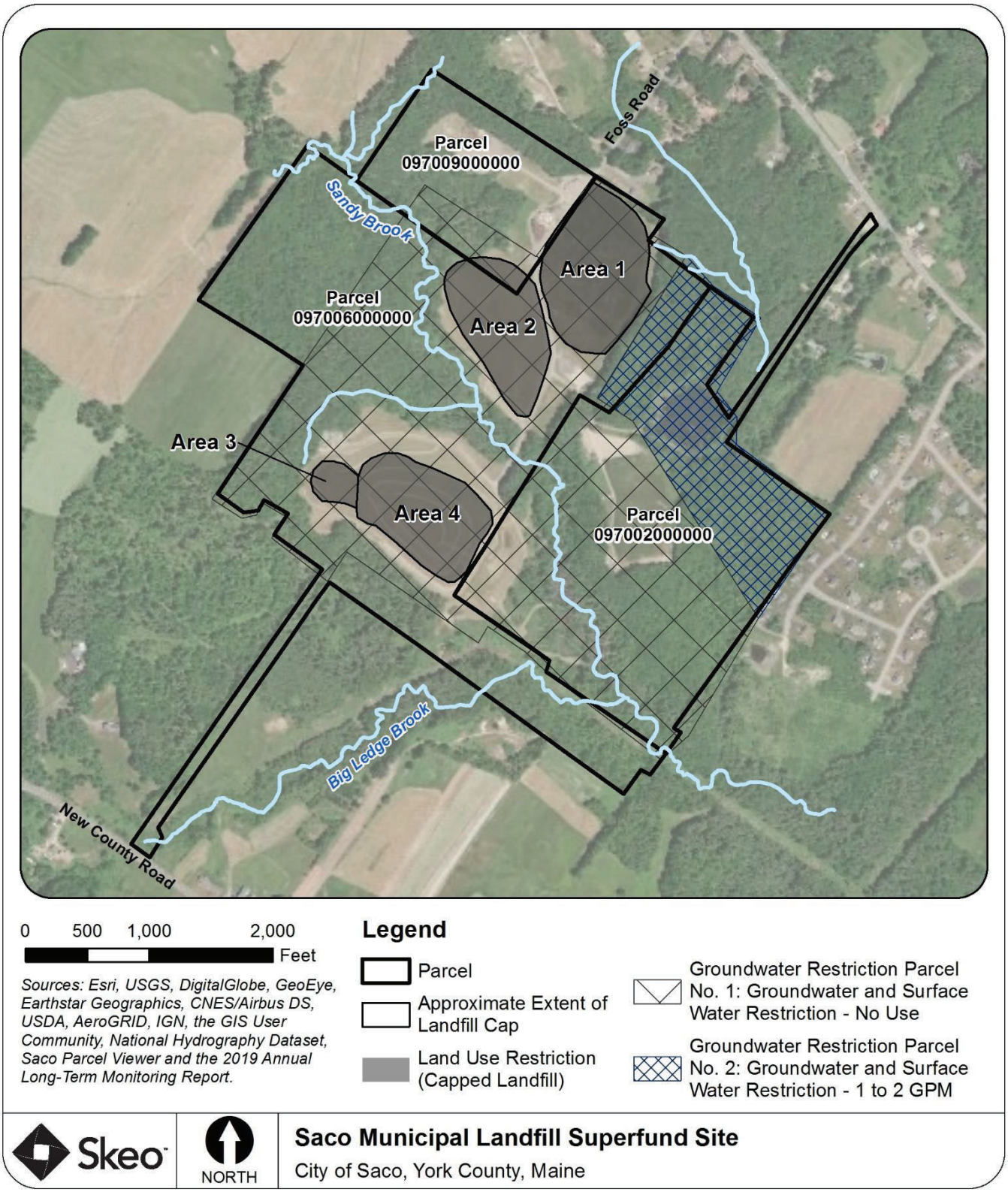
[1] Identified from: https://webapps2.cgis-solutions.com/saco/parcels/

- **The Land Use Restriction Parcel and the Groundwater Restriction Parcels.** Residential development and any activity or use at the Site that adversely impacts the NTCRA, whether now or in the future, including, without limitation: (1) systems and areas to collect and/or contain groundwater, surface water runoff, or leachate; (2) systems or containment areas to excavate, dewater, store, treat, and/or dispose of soils and sediments; and (3) systems and studies to provide long-term environmental monitoring of groundwater, surface waters and sediment, and to ensure the long-term effectiveness of the removal action and its protectiveness of human health and the environment.

Table 2: Summary of Planned and/or Implemented Institutional Controls (ICs)

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	097009000000	Restrict current and future groundwater use.	None in place
			097006000000 097002000000		Grant of Environmental Restrictions and Right of Access (2000) County of York Book 10129, Page 332
Surface Water	Yes	No	097006000000 097002000000	Restrict current and future use of surface water.	Grant of Environmental Restrictions and Right of Access (2000) County of York Book 10129, Page 332
Capped Landfill Areas	Yes	Yes	097009000000	Restrict current and future land use.	None in place
			097006000000 097002000000		Grant of Environmental Restrictions and Right of Access (2000) County of York Book 10129, Page 332

Figure 2: Institutional Control Map



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Systems Operations/Operation and Maintenance (O&M)

The 1999 Post Removal Site Control Plan defines the O&M activities necessary to maintain the landfill cap and associated drainage systems. It includes:

- Normal landscaping care including grass mowing, drainage system cleaning, and related maintenance.
- Site inspections.
- Assessment of passive gas venting system.
- Progress reports:
    - Three times per year for the first two years following approval of the plan.
    - Two times per year for the next eight years.
    - Thereafter, annually, submitted in November.

The City conducts O&M on landfill areas as required under Maine DEP's Solid Waste Management Rules: Chapter 401, Landfill Siting, Design and Operation.

There have been no major O&M issues reported during this FYR period.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determination and statement from the previous FYR Report as well as the recommendation from the previous FYR Report and the status of that recommendation.

Table 3: Protectiveness Determinations/Statements from the 2015 FYR Report

OU #	Protectiveness Determination	Protectiveness Statement
Sitewide	Short-term Protective	The remedy is considered protective of human health and the environment in the short-term. There are no current exposures of Site-related waste to humans or the environment at concentrations that would represent a health concern. The landfill cover system prevents exposure to waste material and contamination within the landfill. The ICs and the municipal water line that was installed have eliminated groundwater use in areas impacted by the Site. The ICs prevent any land use that would result in exposures to Site-related contaminants. The MCL for arsenic has changed since the signing of the ROD from 50 µg/L to 10 µg/L. EPA will adjust the cleanup level for arsenic prior to certifying that cleanup levels have been achieved. Routine inspections and maintenance will continue to be performed at the landfill to ensure the cover system remains protective. Long-term groundwater, surface water and sediment sampling will continue to be performed to evaluate the overall progress of the remedy toward achieving cleanup goals and long-term protectiveness.

Table 4: Status of Recommendations from the 2015 FYR Report

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
Sitewide	The ROD does not reflect the current MCL for arsenic.	Revise the groundwater cleanup level for arsenic in a future decision document to the current MCL of 10 µg/L, the concentration to be used to evaluate the long-term cleanup of groundwater.	Ongoing	EPA will adjust the cleanup level for arsenic prior to certifying that cleanup levels have been achieved.	Ongoing

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was made available by press release, on 3/12/2020 (Appendix C) announcing the start of the FYR. The results of the review and the report will be made available at the Site's webpage: www.epa.gov/superfund/sacolandfill and at the EPA Records Center in Boston, MA.

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

Patrick Fox, with Saco Public Works, feels that the remedial controls were well designed and constructed and therefore require low maintenance. He is not aware of any major effects on the surrounding area, which is generally a fairly rural section of the community. He does not recall any complaints or inquiries regarding environmental issues at the landfill Superfund Site. He feels informed on relevant site activities and does not have any comments, suggestions or recommendations regarding environmental issues at the Site.

David Dinsmore, with the PRP's contractor Woodard & Curran, said that the area has been transformed from a former municipal dump into a recreational area that is being reused by residents for recreational activities. Based on recent results from analyses of surface water and sediment samples, there does not appear to be any change in conclusions from previous FYRs; there is no unacceptable human health risk from exposure to contaminants. The monitoring data for key contaminants indicate concentrations in groundwater are relatively stable. Concentrations of arsenic, iron and manganese detected in surface water and sediment samples collected from Sandy Brook are within historical ranges established for each of the nine monitoring locations. There have been no unexpected difficulties that have resulted in additional effort and unanticipated costs within the past five years for the landfill area. For the surface water and sediment sampling program, beavers have constructed dams in Sandy Brook that have resulted in flooding at some of the sampling locations, making access more difficult. The dams have been removed to restore the brook to its original condition. The sampling program has been modified in recent years to focus on perimeter sampling points at the Site. Consistent with the documented stability of site conditions, reductions in sampling frequency or other optimizations may be warranted in the future to reduce cost while still monitoring the effectiveness of the remedy.

Iver McLeod, Maine DEP project manager, said that the project is going well. The remedy is preventing contact with waste and minimizing leachate but unfortunately is probably creating conditions that mobilize arsenic. He said that there appear to be no significant issues related to monitoring, O&M, or reuse activities. Current proposed legislation for addressing per- and polyfluoroalkyl substances (PFAS) could impact aspects of the cleanup if the

legislation is passed and if PFAS is found to be present in landfill leachate. He is not aware of any changes in projected land use and is comfortable with the status of the institutional controls.

Data Review

Data collected during this FYR period include groundwater, surface water and sediment data. Long-term monitoring has been performed at the Site since June 2001 in accordance with the Long-Term Monitoring Plan (updated in 2017).

The long-term monitoring network includes 24 groundwater monitoring wells and nine surface water and sediment locations (Figure 3). Groundwater samples are collected semi-annually (typically May/June and October/November) and the results are discussed in annual long-term monitoring reports. Surface water and sediment samples are collected annually, except in FYR years when surface water samples are collected semi-annually. Mann Kendall Trend Test look for trends according to data. Mann Kendall's are used to analyze data collected over time for consistently increasing or decreasing trends. As part of the FYR process, data trends were calculated using Mann-Kendall Test for the site COCs for each long-term monitoring well location from 2010 through 2019. A summary of the data collected during this FYR period as well as a discussion of its historical context are provided below, by media. Figure H-1 in Appendix H provides groundwater sampling location and 2019 data. Figure H-2 in Appendix H provides surface water and sediment sampling locations and 2019 data. Figure H-3 and H-4 shows groundwater elevations in the shallow overburden and bedrock.

Groundwater

Benzene concentrations are below the MCL at all wells included in the sampling program and concentrations are stable or decreasing in the Mann-Kendall analyses. Arsenic concentrations exceeded cleanup goals in 11 (of 24) wells during this review period. Manganese concentrations exceeded cleanup goals in 18 wells during this review period. Arsenic and manganese do not exceed cleanup goals in the furthest upgradient wells (MW-93-1, MW-93-7, MW-95-9S and MW-97-17R). Given that EPA signed the ROD in 2000 and specified that groundwater natural attenuation processes would take from 60 to 100 years to meet acceptable levels, this is expected. Overall, groundwater COC concentrations are highest in Landfill Areas 3 and 4.

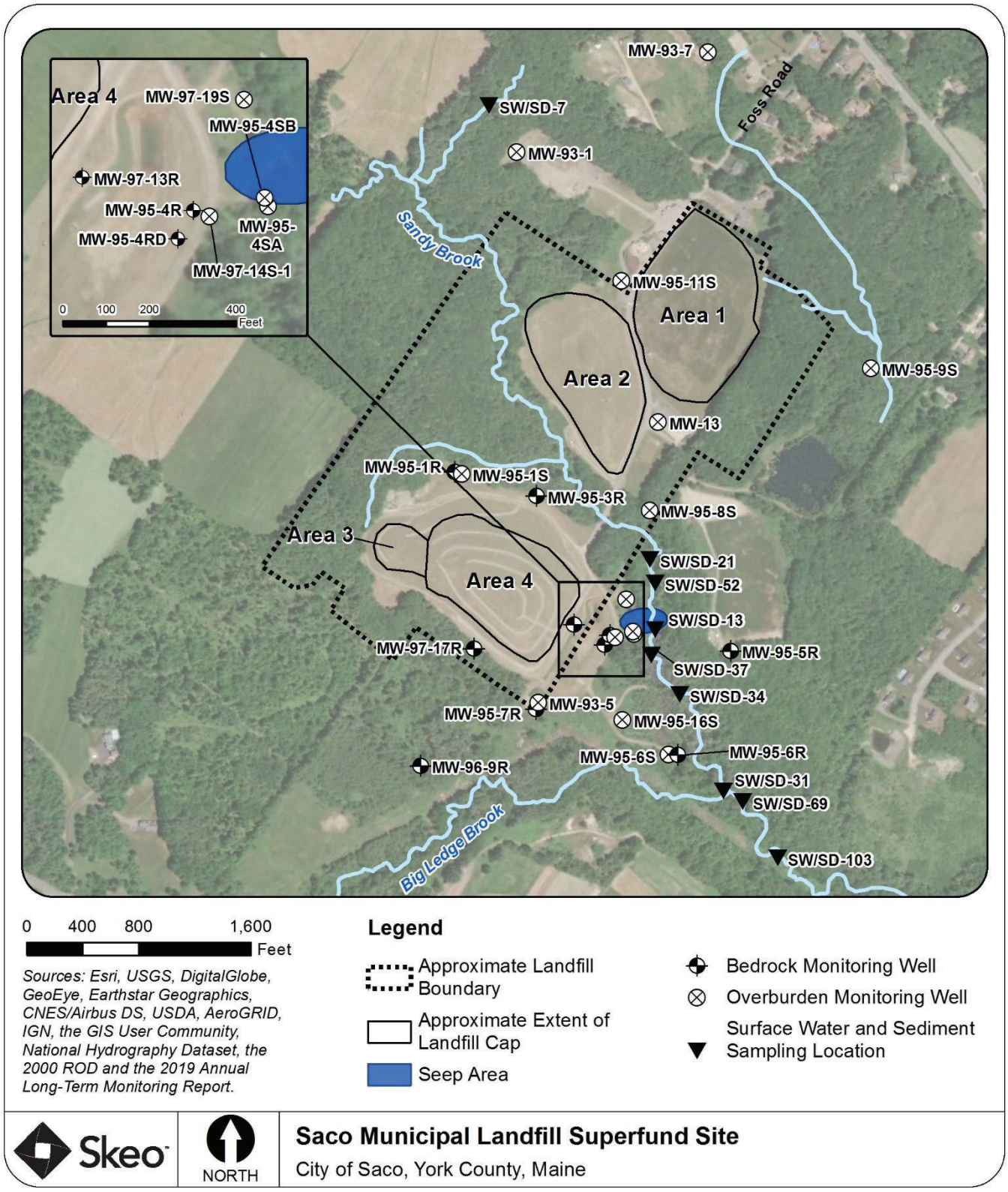
As documented in the trend analysis, several wells exhibited an increasing trend in manganese and arsenic concentrations. The highest arsenic concentration observed sitewide during this FYR period was observed in overburden well MW-95-1S in 2018 (1,460 µg/L), the highest concentration ever recorded at this location. Concentrations decreased in a subsequent sampling event. However, this data was not validated at the time of this Five-Year Report and therefore was not included. This well is located in the northern portion of Landfill Areas 3 and 4.

Data collected during this FYR have been consistent with historical trends. The 2018 Annual Report states that "dissolved organic carbon in the landfill leachate plume is creating reducing conditions in the aquifer, which continue to promote reductive dissolution and the release of naturally occurring arsenic into the groundwater." However, given the increasing trends in some wells, it is unclear whether cleanup goals will be able to be achieved in the ROD-described timeframe.

Upgradient

Upgradient of the landfill areas, concentrations of arsenic exceed the current MCL of 10 µg/L at well MW-93-1, with a maximum concentration of 28.6 µg/L (November 2016) during this FYR period with the current concentration slightly lower (22.3 µg/L) in November 2019. Manganese exceeds the ICL of 200 µg/L at MW-93-7, with a maximum detected concentration of 292 µg/L (June 2017) during this FYR period; the current concentration is lower (122 µg/L) in November 2019. However, per the trend analysis, manganese concentrations are increasing at MW-93-7 (Figure H-5).

Figure 3: Detailed Site Map



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Landfill Areas 1 and 2
Downgradient of Landfill Areas 1 and 2, arsenic concentrations exceed the current MCL at two of the four monitoring wells. Manganese concentrations exceed the ICL at three of the four monitoring wells.

Landfill Areas 3 and 4
During this FYR period, 13 out of 18 wells exceeded the current arsenic MCL. One of these wells (MW-96-9R) exhibited increasing concentrations per the trend analysis (Figures H-6). The maximum arsenic concentration was detected in Northern Boundary well MW-95-1S at 1,460J µg/L in June 2018.

During this FYR period, 13 out of 18 wells exceeded the manganese ICL of 200 µg/L. The maximum manganese concentration was detected in Northern Boundary well MW-95-1R at 8,320 µg/L in 2014. Manganese concentrations in this well have been steadily decreasing. The most recent concentration was 6,370 µg/L in 2019. Two wells (MW-95-7R and MW-97-14S-1) exhibited increasing concentrations per the trend analysis (Figures H-7 and H-8).

Surface Water and Sediment
The long-term monitoring network consists of nine surface water and sediment sampling locations on Sandy Brook (Figure 3). These locations are sampled annually in June. The most recent surface water and sediment sampling data were from the November 2019 event. Surface water quality in Sandy Brook is influenced by seeps, which is apparent as concentrations increase from upstream/background location SW-7 to SW-37. Concentrations generally decrease from SW-37 to SW-103. The remediated seep area is located near SW-13.

Surface Water
In 2019, arsenic concentrations in SW-7 and SW-21 were detected below the SSPS of 3 µg/L. Downstream of SW-21, all arsenic concentrations exceeded the SSPS. The highest concentration, 8.59 µg/L, was detected at SW-13. The 2019 results are generally consistent or slightly lower than historical surface water sampling results (Table 5). These values are all below the current federal freshwater national recommended aquatic acute and chronic criteria for arsenic (340 µg/L and 150 µg/L).[2] Institutional controls are in place restricting use of Sandy Brook.

Table 5: Maximum Detected Arsenic Concentrations in Surface Water, 2014 and 2019

Monitoring Location (Upstream to Downstream)	June 2014 Concentration (µg/L)	November 2019 Concentration (µg/L)
SW-7	<1.0	<1.0
SW-21	2.3	1.3
SW-52	**16.9**	**8.27**
SW-13	**16.8**	**8.59**
SW-37	**18.6 (dup)**	**7.41**
SW-34	**18.5**	**7.1**
SW-31	**15.8**	**6.34**
SW-69	**11.8**	**4.92**
SW-103	**11.1**	**4.74**

Notes:
Source: Table A-2 in 2019 Annual Long-Term Monitoring Report.
Dup = duplicate sample result.
Bold = exceeds the SSPS of 3 µg/L.

[2] Located at https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table.

Sediment

Sediment sample location SD-7 is the furthest upstream sediment sample location. In the long-term monitoring report, results from this location were used as background values against which to compare concentrations from other locations. Arsenic was detected at an estimated concentration of 4.13 mg/kg at SD-7 during the 2019 November sampling event. Arsenic concentrations were above this background concentration at all downstream sediment sampling locations. The maximum concentration of arsenic observed in November 2019 was 40.8 mg/kg at SD-13. None of the arsenic concentrations exceeded the ecological benchmark of 106 mg/kg in 2019.

Site Inspection

The site inspection took place on June 30, 2020. Participants included: John Bryant from EPA, Patrick Fox from the city of Saco, Jedd Steinglass from Woodard & Curran, and Kirby Webster from EPA contractor Skeo. The purpose of the inspection was to assess the protectiveness of the remedy. The site inspection checklist is included in Appendix E. Site inspection photos are included in Appendix F.

Site inspection participants met at the parking lot associated with soccer fields at the end of Foss Road. Participants made visual observations of landfill surfaces and general site conditions. The Site is well kept, and the City mows the Site frequently. Roads throughout the Site are in good condition. Participants noted that trespassing has not been a concern; sometimes a person walking a dog goes through the Site, but there has been no damage or vandalism.

The soccer field on Landfill Area 1 is well kept, and site inspection participants noted that it is used appropriately and regularly. The vegetative cover is well-established. Site inspection participants noted a leveled off area next to Landfill Area 2 that is used as an ice-skating pond in the winter. Participants observed Area 2 and the collection tank and drainage system associated with Landfill Area 2. The City is monitoring and maintaining the collection tank. The tank discharges to the retention basin. City representatives noted that there have been no recent issues with the collection tank and drainage system.

Landfill Area 4 benches and channels seem to be in good condition. The gabion-lined let down channels did not have any signs of erosion, settlement or obstructions. The retention basin was not holding any water, except near the outlet structure. Wet areas could be observed where mowing was attempted but not completed. Cover penetrations (passive gas vent structures) generally appeared to be in good condition. Many vent riser pipes are leaning at various degrees of tilt, as has been historically observed. Well MW-97-13R was observed to be damaged. Site inspection participants suspected the damage occurred during routine mowing. The City indicated its willingness to make necessary repairs.

Sandy Brook was flowing freely. Participants noted that with the recent precipitation, the water was high. While beavers have been an issue in the past in Sandy Brook, site inspection participants noted that there has not been any recent beaver activity. Sandy Brook is not easy to access, and site inspection participants reported that there have not been any instances of fishing or children playing in Sandy Brook.

V. TECHNICAL ASSESSMENT

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

Question A Summary:

Yes, the remedy is generally functioning as intended by the decision documents. The NTCRA landfill cap prevents contact with wastes contained within the landfills and is in good condition. The groundwater contaminant plume appears to be stable, although Mann-Kendall trend analyses indicate arsenic concentrations are increasing in one well (MW-96-9R) and manganese concentrations are increasing in three wells (MW-93-7, MW-95-7R and MW-97-14S-1). Surface water and sediment concentrations have remained fairly consistent with

historical results. Most of the required institutional controls restricting groundwater, surface water and land use are in place for the Site.

Remedial Action Performance
It is unclear whether the current groundwater remedy of natural attenuation will be successful in remediating groundwater contamination in the ROD-specified timeframe. EPA and the performing PRP, with input from the MEDEP are evaluating next steps to determine if remedial action goals can be attained or if alternative options need to be evaluated.

System Operations/O&M
Current O&M activities appear to be adequate in maintaining the cap and monitoring groundwater, surface water and sediment.

Implementation of Institutional Controls and Other Measures
Institutional controls for the Site were required by the 1996 Action Memorandum and the 2000 ROD. Institutional controls are required to protect the remedy by prohibiting any use that disturbs the integrity of the cap, preventing groundwater use, and prohibiting residential development. Site conditions indicate the institutional controls are working as intended. The current institutional control, a Grant of Environmental Restrictions and Right of Access, references two specific parcels, but restrictions described in the document include three property parcels. This third parcel may also require an institutional control. All three parcels are owned by the City of Saco. Surface water restrictions are in place but are not required by decision documents.

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

Question B Summary:
No. There have been changes in toxicity values, exposure assumptions, exposure pathways and methods of evaluating risk, potential standards and To-Be-Considered (TBC) criteria since the 2000 ROD was issued as discussed below. The changes as described below are not expected to alter the protectiveness of the remedy because ICs are in place preventing exposure to Site-contaminated media.

Changes in Standards and TBCs
New standards should be considered during the FYR process as part of the protectiveness determination. Under the NCP, if a new requirement is promulgated after the ROD is signed, and the requirement is determined to be an ARAR, the new requirement must be attained only if necessary, to ensure that the remedy is protective of human health and the environment.

EPA guidance states:

> "Subsequent to the initiation of the remedial action new standards based on new scientific information or awareness may be developed and these standards may differ from the cleanup standards on which the remedy was based. These new … [standards] should be considered as part of the review conducted at least every five years under CERCLA §121(c) for sites where hazardous substances remain on-site. The review requires EPA to assure that human health and the environment are being protected by the remedial action. Therefore, the remedy should be examined in light of any new standards that would be applicable or relevant and appropriate to the circumstances at the site or pertinent new [standards], in order to ensure that the remedy is still protective. In certain situations, new standards or the information on which they are based may indicate that the site presents a significant threat to health or environment. If such information comes to light at times other than at the five-year reviews, the necessity of acting to modify the remedy should be considered at such times." (See CERCLA Compliance with Other Laws Manual: Interim Final (Part 1) EPA/540/G-89/006 August 1988, p. 1-56.)

Appendix G compares 1990 ROD cleanup goals to current standards. Since the signing of the ROD, the MCL for arsenic has become more stringent (decreasing from 50 µg/L to 10 µg/L) and the Maine MEG for manganese has become less stringent (increasing from 200 µg/L to 300 µg/L). There are currently no completed exposure pathways to contaminated groundwater and most institutional controls are in place restricting the use of groundwater.

In May 2016, EPA issued final lifetime drinking water health advisories (HAs) for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). The EPA HA for PFOA and PFOS is 70 nanograms per liter (ng/l) (parts per trillion (ppt)) individually or combined. See also EPA's *Interim Recommendations to Address Groundwater Contaminated with Perfluorooctanoic Acid and Perfluorooctanesulfonate* [OSWER DIRECTIVE 9283.1-47, Dec. 19, 2019].

Maine has not promulgated drinking water or groundwater standards for PFAS. The State Department of Health and Human Services has issued a fact sheet adopting EPA's health advisory of 70 ng/L (ppt) for PFOA and PFOS, individually or combined, in drinking water. According to Maine Remedial Action Guidelines for Sites Contaminated with Hazardous Substances Rules,[3] Maine DEP recommends that the EPA health advisory level be applied at sites where groundwater is currently being used, or may be used in the future, for human consumption.

Changes in Toxicity and Other Contaminant Characteristics

- ***2016 PFOA/PFOS non-cancer toxicity values***

In May 2016, EPA issued final lifetime drinking water health advisories for PFOA and PFOS, which identified a chronic oral reference dose (RfD) of 2E-05 mg/kg-day for PFOA and PFOS (USEPA, 2016a and USEPA, 2016b). These RfD values should be used when evaluating potential risks from ingestion of contaminated groundwater at Superfund sites where PFOA and PFOS might be present based on-site history. Potential estimated health risks from PFOA and PFOS, if identified, would likely increase total site risks due to groundwater exposure. Further evaluation of potential risks from exposure to PFOA and PFOS in other media at the Site might be needed based on site conditions and may also affect total site risks.

- ***2014 Perfluorobutanesulfonic Acid (PFBS) non-cancer toxicity value***

PFBS has a chronic oral RfD of 2E-02 mg/kg-day based on an EPA Provisional Peer Reviewed Toxicity Value (PPRTV) (USEPA, 2014a). This RfD value should be used when evaluating potential risks from ingestion of contaminated groundwater at Superfund sites where PFBS might be present based onsite history. Potential estimated health risks from PFBS, if identified, would likely increase total site risks due to groundwater exposure. Further evaluation of potential risks from exposure to PFBS in other media at the Site might be needed based on Site conditions and can also affect total site risks.

PFAS compounds, including PFOA, PFOS and PFBS, have been used in a variety of industrial applications and can be associated with Sites such as landfills. Given the history of contaminants disposed of in the landfill, sampling for the PFAS compounds is planned at the Site. Given that most institutional controls are in place to prevent the use of groundwater and this FYR identified no current use of groundwater at the Site, it is unlikely that the presence of PFAS would affect current protectiveness.

[3] Maine Remedial Action Guidelines for Sites Contaminated with Hazardous Substances Rules, effective October 19, 2018. https://www.maine.gov/dep/spills/publications/guidance/rags/ME-Remedial-Action-Guidelines-10-19-18cc.pdf.

- ***Lead in Soil Cleanups***

Updated scientific information indicates that adverse health effects are associated with blood lead levels (BLLs) at less than 10 µg/dL. Several studies have observed "clear evidence of cognitive function decrements in young children with mean or group BLLs between 2 and 8 µg/dL." Soil screening, action or cleanup level developed based on the previous target BLL of 10 µg/dL may not be protective.

EPA's approach to evaluate potential lead risks is to limit exposure to residential and commercial soil lead levels such that a typical (or hypothetical) child or group of similarly exposed children would have an estimated risk of no more than 5% of the population exceeding a 5 µg/dL blood lead level (BLL). This is based on evidence indicating cognitive impacts at BLLs below 10 µg/dL. Additionally, this approach aligns with the Lead Technical Review Workgroup's current support for using a BLL of 5 µg/dL as the level of concern in the Integrated Exposure Uptake Biokinetic Model (IEUBK) and Adult Lead Methodology (ALM). A target BLL of 5 µg/dL reflects current scientific literature on lead toxicology and epidemiology that provides evidence that the adverse health effects of lead exposure do not have a threshold.[4]

EPA's 2017 OLEM memorandum "Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters" (OLEM Directive 9285.6-56) provides updates on the default baseline blood lead concentration and default geometric standard deviation input parameters for the Adult Lead Methodology. These updates are based on the analysis of the NHANES 2009-2014 data, with recommended updated values for baseline blood lead concentration being 0.6 µg/dL and geometric standard deviation being 1.8.

Using updated default IEUBK and ALM parameters at a target BLL of 5 µg/dL, site-specific lead soil screening levels (SLs) of 200 ppm and 1,000 ppm are developed for residential and commercial/industrial exposures, respectively.

Table 4-1 of 1998 remedial investigation summarizes lead detected in soil. The average concentration of lead detected prior to remediation was 68 mg/kg which is below the residential SL of 200 mg/kg. Therefore, this change in lead policy does not impact the protectiveness of the remedy.

Changes in Risk Assessment Methods

- ***2014 OSWER Directive Determining Groundwater Exposure Point Concentrations, Supplemental Guidance***

In 2014, EPA finalized a Directive to determine groundwater exposure point concentrations (EPCs).[5]

This Directive provides recommendations to develop groundwater EPCs. The recommendations to calculate the 95% Upper Confidence Limit (UCL) of the arithmetic mean concentration for each contaminant from wells within the core/center of the plume, using the statistical software ProUCL, could result in lower groundwater EPCs than the maximum concentrations routinely used for EPCs as past practice in risk assessment, leading to changes in groundwater risk screening and evaluation. In general, this approach could result in slightly lower risk or higher screening levels.

[4] In 2015, the Maine Legislature adopted 5 micrograms of lead per deciliter of blood (µg Pb/dL) as the definition of lead poisoning. 22 M.R.S, §1315 §§ 5-C, states: "Lead poisoning. "Lead poisoning" means a confirmed elevated level of lead in blood that is equal to or exceeds 5 micrograms per deciliter." http://legislature.maine.gov/statutes/22/title22sec1315.html

[5] USEPA. 2014. Determining Groundwater Exposure Point Concentrations. OSWER Directive 9283.1-42. February 2014. https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=236917

Changes in Exposure Pathways

- ***2014 OSWER Directive on the Update of Standard Default Exposure Factors***

In 2014, EPA finalized a Directive to update standard default exposure factors and frequently asked questions associated with these updates[6]. Many of these exposure factors differ from those used in the risk assessment(s) supporting the ROD(s). These changes in general would result in a slight decrease of the risk estimates for most chemicals, therefore this directive would not alter remedy protectiveness.

- ***2018 EPA VISL Calculator***

In February 2018, EPA launched an online Vapor Intrusion Screening Level (VISL) calculator that can be used to obtain risk-based screening level concentrations for groundwater, sub-slab soil gas and indoor air. The VISL calculator uses the same database as the regional screening levels (RSLs) for toxicity values and physiochemical parameters and is automatically updated during the semi-annual RSL updates. Please see the User's Guide for further details on how to use the VISL calculator[7]. Because there are no buildings overlying the contaminant plume, this pathway is not a concern at the Site under current conditions. If any future redevelopment activities are planned for the Site, the vapor intrusion pathway would need to be considered in the redevelopment plans and future evaluation of this potential future pathway may be necessary to ensure protectiveness.

Expected Progress Toward Meeting RAOs
The remedy has been successful in preventing ingestion of groundwater containing contaminants that exceed federal or state MCLs, non-zero MCLGs and MEGs, or, in their absence, an excess cancer risk of 1 x 10^{-6} or an HQ of 1. The Mann-Kendall trend analyses indicate increases in arsenic and manganese in some wells. Particularly because of the change in the MCL for arsenic, it is unclear if the RAO of restoring groundwater to meet federal or state MCLs, MCLGs or MEGs, or, in their absence, an excess cancer risk of 1 x 10^{-6} or an HQ of 1, can be met in the timeframe (60 to 100 years) outlined in the ROD. O&M procedures are in place to meet the RAO of performing long-term monitoring of surface water, sediments and groundwater to verify that the cleanup programs at the Site are protective of human health and the environment.

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

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

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
None.

[6] USEPA. 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. February 6, 2014. https://www.epa.gov/sites/production/files/2015-11/documents/oswer_directive_9200.1-120_exposurefactors_corrected2.pdf.
[7] https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator

Issues and Recommendations Identified in the FYR:

OU(s): 1	Issue Category: Institutional Controls			
	Issue: Institutional controls are in place on only two of the three parcels identified in the use restriction area.			
	Recommendation: Implement institutional controls on the additional property parcel, Lot 9 (Parcel ID: 097009000000).			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	9/30/2023

OU(s): 1	Issue Category: Other			
	Issue: ROD does not reflect current MCL for arsenic.			
	Recommendation: Revise the groundwater cleanup level for arsenic through a decision document revision and evaluate the timeframe to achieve cleanup goals for groundwater. An evaluation of arsenic background conditions should be performed prior to adopting the revised arsenic MCL given the concentration of arsenic in an upgradient/background well.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	8/1/2024

OTHER FINDINGS

Several additional recommendations were identified during the FYR. These recommendations do not affect current and/or future protectiveness.

- Include PFAS in a future groundwater monitoring event.
- Ensure that monitoring well MW-97-13R is repaired.
- Revise ROD cleanup goal for manganese to reflect current Maine MEG (i.e., 300 µg/L).

VII. PROTECTIVENESS STATEMENT

Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: The remedy currently protects human health and the environment because there are no completed exposure pathways. The landfill cover system prevents exposure to waste material and contamination within the landfill. Institutional controls and the municipal water line that was installed have eliminated groundwater use in areas impacted by the Site. Institutional controls prevent any land use that would result in exposures to site-related contaminants. However, in order for the remedy to be protective in the long term, the following actions need to be taken: determine if RAOs can be met in the ROD-specified timeframe; and implement institutional controls on the additional property parcel to ensure protectiveness. Additionally, the MCL for arsenic has changed since the signing of the ROD from 50 µg/L to 10 µg/L. EPA will adjust the arsenic cleanup level through a decision document revision pending a background study for arsenic.

VIII. NEXT REVIEW

The next FYR Report for the Saco Municipal Landfill Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

2014 Annual Long-Term Monitoring and Third Five-Year Review Report. Saco Municipal Landfill Superfund Site. Saco, Maine. Woodard & Curran. City of Saco. March 31, 2015.

2015 Annual Long-Term Monitoring Report. Saco Municipal Landfill Superfund Site. Saco, Maine. Woodard & Curran. City of Saco. March 31, 2016.

2018 Annual Long-Term Monitoring Report. Saco Municipal Landfill Superfund Site. Saco, Maine. Woodard & Curran. City of Saco. June 28, 2019.

Draft 2019 Annual Long-Term Monitoring Report. Saco Municipal Landfill Superfund Site. Saco, Maine. Woodard & Curran. City of Saco. May 8, 2020.

Action Memorandum – Request for a Non-Time Critical Removal Action at the Saco Municipal Landfill Superfund Site, Saco, Maine. U.S. Environmental Protection Agency Region I. September 23, 1996.

Final Phase 1A Remedial Investigation Report. Saco Municipal Landfill Superfund Site, Saco, Maine. Woodard & Curran. October 1998

Five-Year Review Report for Saco Municipal Landfill Superfund Site, Saco, Maine. Prepared by: United States Environmental Protection Agency, EPA New England, Boston, Massachusetts. September 2005.

Grant of Environmental Restrictions and Right of Access. June 21, 2000.

Long-Term Monitoring Plan. Saco Municipal Landfill Superfund Site. Saco, Maine. Woodard & Curran. October 24, 2001.

Long-Term Monitoring Plan, Revision 1. Saco Municipal Landfill Superfund Site. Saco, Maine. Woodard & Curran. June 2017.

Post-Removal Site Control Plan. Saco Municipal Landfill. Woodard & Curran. March 1999.

Record of Decision Summary. Saco Municipal Landfill. Saco, Maine. September 2000.

Second Five-Year Review Report for Saco Municipal Landfill Superfund Site, Saco, Maine. Prepared by: United States Environmental Protection Agency, EPA New England, Boston, Massachusetts. September 2010.

Superfund Site Preliminary Close-Out Report (Non-Time-Critical Removal Action and Final Site Action). Saco Municipal Landfill Superfund Site, Saco, Maine. September 2000.

Third Five-Year Review Report for Saco Municipal Landfill Superfund Site, Saco, Maine. Prepared by U.S. Environmental Protection Agency, Region 1, Boston, Massachusetts. September 2015.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
The Saco Municipal Landfill operated as a municipal solid waste and industrial waste landfill	1963 – 1989
Municipal water supply line was installed to serve adjacent residences	1975
The City closed Landfill Area 1 and a clay cap was installed	1976
The City closed Landfill Area 2 with a clay cap and installed a leachate recirculation system	1985
Landfill Area 3 and Landfill Area 4 stopped receiving waste	1989
EPA placed the Site on the NPL	February 1990
EPA entered into an Administrative Order of Consent with the City to conduct the Site's RI/FS	September 26, 1995
EPA signed an Action Memorandum to initiate a NTCRA to construct the cap over Landfill Areas 3 and 4	1996
Construction of landfill cap for Landfill Area 3 and Landfill Area 4	1997 – 1999
PRP completed the combined RI/FS EPA signed the Site's ROD selecting monitored natural attenuation as the long-term remedial action EPA determined that construction of the Site's remedy was complete	September 29, 2000
EPA completed first FYR Report	September 15, 2005
EPA completed second FYR Report	September 9, 2010
EPA determined site achieved Sitewide Ready for Anticipated Use performance measure	December 21, 2010
EPA completed third FYR Report	September 8, 2015

APPENDIX C – PRESS NOTICE

United States Environmental Protection Agency

News Releases from Region 01

EPA Begins Reviews of Five Maine Superfund Site Cleanups This Year

03/12/2020

Contact Information:
David Deegan (deegan.dave@epa.gov)
617-918-1017

BOSTON – The U.S. Environmental Protection Agency (EPA) will conduct comprehensive reviews of previously-completed cleanup work at five National Priorities List (NPL) Superfund sites in Maine this year. The sites, including two federal facilities that are also listed as NPL Superfund sites, will undergo a legally-required Five-Year Review to ensure that previous remediation efforts at the site continue to protect public health and the environment.

"It is a major EPA priority to make continued progress cleaning up Superfund sites across New England. Once cleanup work at all or a portion of a site is completed, EPA conducts regular periodic reviews of our previous work to ensure that it is continuing to protect human health and the environment," **said EPA New England Regional Administrator Dennis Deziel.**

"Maine DEP continues to work closely with EPA to ensure protection of public health and the environment. Assistance from EPA at our Superfund sites is vital to this effort, and these Five-Year Reviews are a critical component towards ensuring that the remediation strategies are working as intended," **said Maine DEP Commissioner Gerald Reid.**

Background

The Superfund program, a federal program established by Congress in 1980, investigates and cleans up the most complex, uncontrolled or abandoned hazardous waste sites in the country and works to facilitate activities to return

them to productive use. Under the Trump Administration, the Superfund program has reemerged as a priority to fulfill EPA's core mission of protecting human health and the environment.

EPA is actively involved in Superfund studies and cleanups at 16 sites in Maine, including three federal facilities. There are many phases of the Superfund cleanup process including considering future use and redevelopment and conducting post-cleanup monitoring of sites. EPA must ensure completed remedies continue to be protective of public health and the environment. The NPL Superfund sites where EPA will begin work on Five-Year Reviews in 2020 are listed below, and the web links provide detailed information on site status and past assessment and cleanup activity. Once the Five-Year Review is complete, its findings will be posted to the website in a final report.

Five-Year Reviews of Superfund sites in Maine to be completed in 2020

Eastland Woolen Mill, Corinna, Maine www.epa.gov/superfund/eastland
Pinette's Salvage yard, Washburn, Maine www.epa.gov/superfund/pinette
Saco Municipal Landfill, Saco, Maine www.epa.gov/superfund/sacolandfill

Federal Facilities
Brunswick Naval Air Station, Brunswick, Maine
www.epa.gov/superfund/brunswick
Loring Air Force Base, Limestone, Maine www.epa.gov/superfund/loring

More information on Superfund and other cleanup sites in New England:
https://www.epa.gov/cleanups/cleaning-new-england

LAST UPDATED ON MARCH 13, 2020

APPENDIX D – INTERVIEW FORMS

SACO MUNICIPAL LANDFILL SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Saco Municipal Landfill	
EPA ID: MED980504393	
Subject name: Patrick Fox	**Subject affiliation: Saco Public Works**
Subject contact information: Saco Public Works (207)284-6641	
Interview date: 6/16/20	**Interview time:**
Interview location:	
Interview format (circle one): In Person Phone Mail **Email** Other:	
Interview category: Potentially Responsible Party (PRP)	

1. What is your overall impression of the remedial activities at the Site?
   I feel the remedial controls were well designed and constructed, therefore require low maintenance. The remedial activities seem effective.

2. What have been the effects of this Site on the surrounding community, if any?
   I am not aware of any major effects on the surrounding area, which is generally a fairly rural section of the community.

3. What is your assessment of the current performance of the remedy in place at the Site?
   The site seems stable and the controls seem effective and relatively straight forward to maintain.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?
   In the last 5 years I cannot recall any complaints or inquiries regarding environmental issues at the landfill superfund site.

5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?
   Between correspondence with our consultant, Maine DEP, and EPA, I feel informed on relevant site activities.

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
   No.
7. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?
   Yes.

SACO MUNICIPAL LANDFILL SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Saco Municipal Landfill	
EPA ID: MED980504393	
Interviewer name: Kirby Webster	**Interviewer affiliation: Skeo**
Subject name: David Dinsmore	**Subject affiliation: Woodard & Curran**
Subject contact information: ddinsmore@woodardcurran.com	
Interview date: 6/11/2020	**Interview time: 1400**
Interview location: Interview form filled out in home office on date indicated above.	
Interview format (circle one): In Person Phone Mail (Email) Other:	
Interview category: O&M Contractor	

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   As part of the site cleanup, waste at the Saco Landfill was consolidated in each of the cells prior to installation of the landfill caps. The landfill caps are kept clean and are well maintained by the City of Saco. Trash and other waste have not been disposed of at the Site for many years. Exposure risk to the public is under control based on the environmental covenants and routine maintenance that is conducted by the City. The area has been transformed from a former municipal dump into a recreational area that is being reused by residents for recreational activities.

2. What is your assessment of the current performance of the remedy in place at the Site?
   The landfill caps of the four former cells remain in good condition and continue to perform as they were designed to do by reducing the amount of leachate generated from precipitation events and limiting contact to the underlying waste. Based on recent results from analyses of surface water and sediment samples there does not appear to be any change in conclusions from previous Five Year Reviews; that there is no unacceptable human health risk from exposure to site contaminants.

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?
   The monitoring data for key contaminants such as benzene, arsenic, iron and manganese indicate that concentrations in groundwater are relatively stable. Detections of benzene remain below federal and state drinking water standards. Arsenic concentrations exceed the interim clean up goal of 50 µg/L in groundwater at some locations; however increasing trends in concentrations are generally not indicated. Groundwater concentrations of iron and manganese are neither increasing nor decreasing at the majority of monitoring locations as indicated from the Mann Kendall statistical analysis. Concentrations of arsenic, iron and manganese detected in surface water and sediment samples collected from Sandy Brook are within historical ranges established for each of the nine monitoring locations.

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.
   O&M activities associated with on-going routine maintenance of the landfill caps and associated features such as vents and riprap channels are completed on an as-needed basis by City of Saco Public Works staff. Inspections are conducted on an annual schedule by an EPA contractor to identify any other conditions that may need additional attention.

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?
   To my knowledge there have no significant changes in O&M requirements or schedules. Sampling continues at the same monitoring wells and sediment and surface water locations as those established in the latest revision of the long-term monitoring plan in 2017. The current O&M and sampling schedules are adequate to maintain and monitor conditions at the landfill to ensure that the remedy remains protective in limiting exposure to visitors and residents living near the Site.

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.
   For the landfill area, there have been no unexpected difficulties that have resulted in additional effort and unanticipated costs within the past five years. For the surface water and sediment sampling program, beavers have constructed dams in Sandy Brook that have resulted in flooding at some of the sampling locations, making access more difficult. The dams have been removed to restore the brook to its original condition.

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.
   The sampling program has been modified in recent years to focus on perimeter sampling points at the Site. Consistent with the documented stability of Site conditions, reductions in sampling frequency or other optimizations may be warranted in the future to reduce cost while still monitoring the effectiveness of the remedy.

8. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?
   The current O&M activities appear to be sufficient in allowing the site remedy to perform as it was intended to do. No specific changes are recommended at this time.

9. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?
   Yes. I give my consent for my name to be used in the Five Year Report.

SACO MUNICIPAL LANDFILL SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Saco Municipal Landfill	
EPA ID: MED980504393	
Interviewer name: Kirby Webster	**Interviewer affiliation: Skeo**
Subject name: Iver McLeod	**Subject affiliation: MEDEP Project Manager**
Subject contact information: iver.j.mcleod@maine.gov**, 207-592-2981**	
Interview date: 6/23/2020	**Interview time:**
Interview format (underline one): In Person Phone Mail Email Other:	
Interview category: State Agency	

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   Overall, project is going well. There appear to be no significant issues related to monitoring, O&M, or reuse activities.

2. What is your assessment of the current performance of the remedy in place at the Site?
   Remedy is preventing contact with waste and minimizing leachate but unfortunately is probably creating conditions that mobilize arsenic.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?
   No

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.
   MEDEP has reviewed annual reports and communicated with EPA and Saco consultants regarding results of sampling and upcoming 5YR.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?
   No, although there is proposed legislation that if passed would give MEDEP authority to designate sites, require cleanups, and seek cost recovery for addressing PFAS contamination. This could impact aspects of the Saco MLF cleanup if PFAS is found to be present in landfill leachate.

6. Are you comfortable with the status of the institutional controls at the Site?
   Yes

   If not, what are the associated outstanding issues?

7. Are you aware of any changes in projected land use(s) at the Site?
   No

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
   No

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

APPENDIX E – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Saco Municipal Landfill	**Date of Inspection:** 06/30/2020
Location and Region: Saco, ME 1	**EPA ID: MED980504393**
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** 70 degrees fahrenheit, light rain

2000 ROD Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: _____
- ☒ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** — David Dinsmore (Name) | Woodard & Curran (Title) | 06/11/2020 (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 City of Saco				
Contact	Patrick Fox (Name)	Saco Public Works (Title)	06/16/2020 (Date)	207-284-6641 (Phone No.)
Problems/suggestions ☐ Report attached: _____				
Agency State of Maine				
Contact	Iver McLeod (Name)	Project Manager (Title)	06/23/2020 (Date)	207-592-2981 (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: _____

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

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ N/A
   ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

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. **Groundwater Monitoring Records** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: _____

8. **Leachate Extraction Records** ☒ Readily available ☐ Up to date ☐ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air	☐ Readily available	☐ Up to date	☒ N/A
☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

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: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

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

Describe costs and reasons: _____

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

A. Fencing

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

Remarks: _____

B. Other Access Restrictions

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

Remarks: _____

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): _____

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: Institutional controls need to be reviewed to ensure the restrictions are associated with the correct parcels.

D. General

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

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: _____

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

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

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

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

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

Area 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
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☐ Bulges not evident
	Area extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Area extent: _____
	☐ Ponding	☐ Location shown on site map	Area extent: _____
	☐ Seeps	☐ Location shown on site map	Area extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Area extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☐ No evidence of slope instability		
	Area 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
   Area extent: _____ Depth: _____
   Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type:_____ Area extent: _____
   Remarks: _____

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

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

5. **Obstructions** Type: _____ ☐ No obstructions
   ☐ Location shown on site map Area extent: _____
   Size: _____
   Remarks: _____

6. **Excessive Vegetative Growth** Type: _____
   ☐ No evidence of excessive growth
   ☐ Vegetation in channels does not obstruct flow
   ☐ Location shown on site map Area extent: _____
   Remarks: _____

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: _____

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

A. Groundwater 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: _____

2. **Extraction 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: _____

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 groundwater treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

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

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

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

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

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

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

☐ Chemicals and equipment properly stored

Remarks: _____

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

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

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

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

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

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

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

Remarks: _____

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).

Remedy was designed to prevent ingestion of contaminated groundwater, restore groundwater to drinking water standards, and verify cleanup programs at the Site are protective of human health and the environment. Monitoring data suggest that contaminants may not be able to reach cleanup goals in the ROD-described timeframe.

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.

No issues were identified with current O&M.

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.

There are no early indicators of a potential remedy problem other than those already described.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

No opportunities were identified for optimizing the remedy.

Site Inspection Participants

John Bryant, EPA RPM
Patrick Fox, City of Saco
Jedd Steinglass, Woodard & Curran
Kirby Webster, Skeo

APPENDIX F – SITE INSPECTION PHOTOS

Landfill Area 1 – current soccer fields

Landfill Area 2

Collection tank at Landfill Area 2

Signage on road next to Landfill Area 2 looking toward Landfill Area 3

Area used as ice-skating pond in the winter

Landfill Area 3

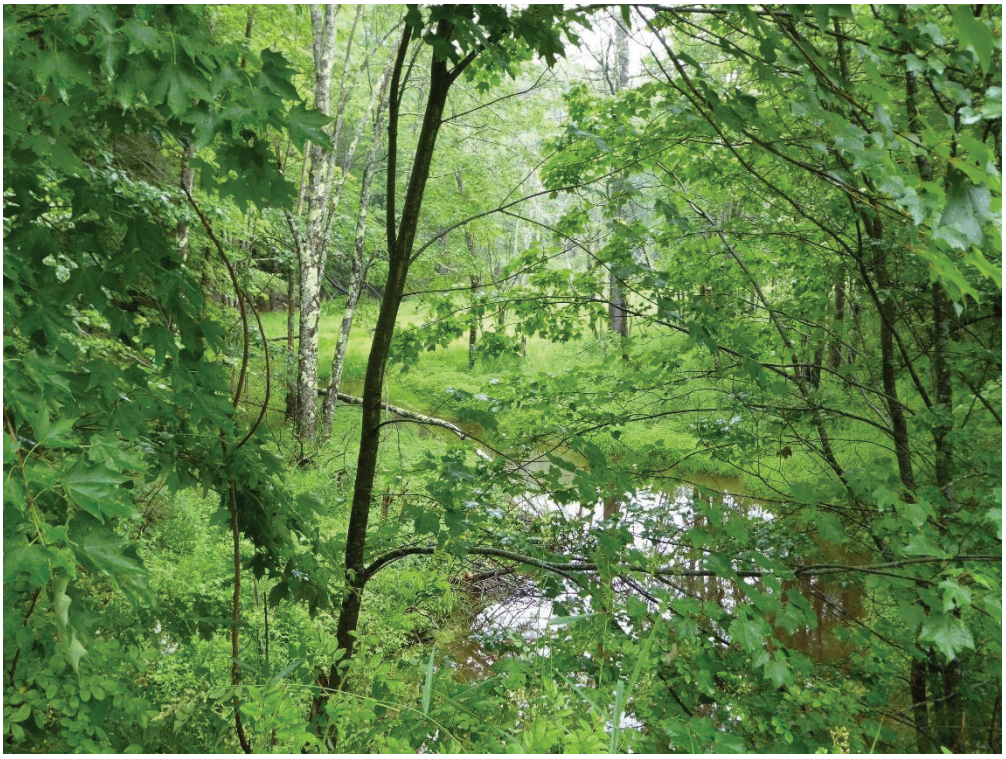
Gabion-lined letdown channel and retaining structure on Landfill Area 3

Outlet pipe on Landfill Area 3

Retention basin

Outlet structure into the retention basin

Rock pile storage area near Landfill Area 3



Sandy Brook from the road

Sandy Brook next to Landfill Area 2

Groundwater monitoring wells

APPENDIX G – DETAILED ARARS REVIEW TABLE

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

Groundwater
The 2000 ROD identified ICLs based on the ARARs (e.g., MCLs and more stringent state groundwater remediation standards) as available, or other suitable criteria described below. Because the aquifer under the Site is a potential drinking water source, MCLs, non-zero MCLGs established under the Safe Drinking Water Act, and state MEGs are ARARs. Where a promulgated state standard is more stringent than values established under the Safe Drinking Water Act, the state standard was used as the ICL. In the absence of an MCLG, an MCL, a proposed MCLG, a proposed MCL, a more stringent state standard or other suitable criteria to be considered (e.g., health advisory, state guideline), an interim cleanup level was derived for each COC having carcinogenic potential (Class A, B and C compounds) based on a 10^{-6} excess cancer risk level per compound considering the current or future ingestion of groundwater from domestic water usage. In the absence of the above standards and criteria, ICLs for all other COCs (Classes D and E) were established based on a level that represents an acceptable exposure level to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime, incorporating an adequate margin of safety (HQ = 1) considering the current or future ingestion of groundwater from domestic water usage.

Table G-1 provides a comparison of interim groundwater cleanup levels and current standards. As previously discussed, the MCL for arsenic is more stringent than at the time of the signing of the ROD. The current Maine MEG is less stringent than at the time of the signing of the ROD.

Table G-1: Review of Interim Groundwater Cleanup Levels

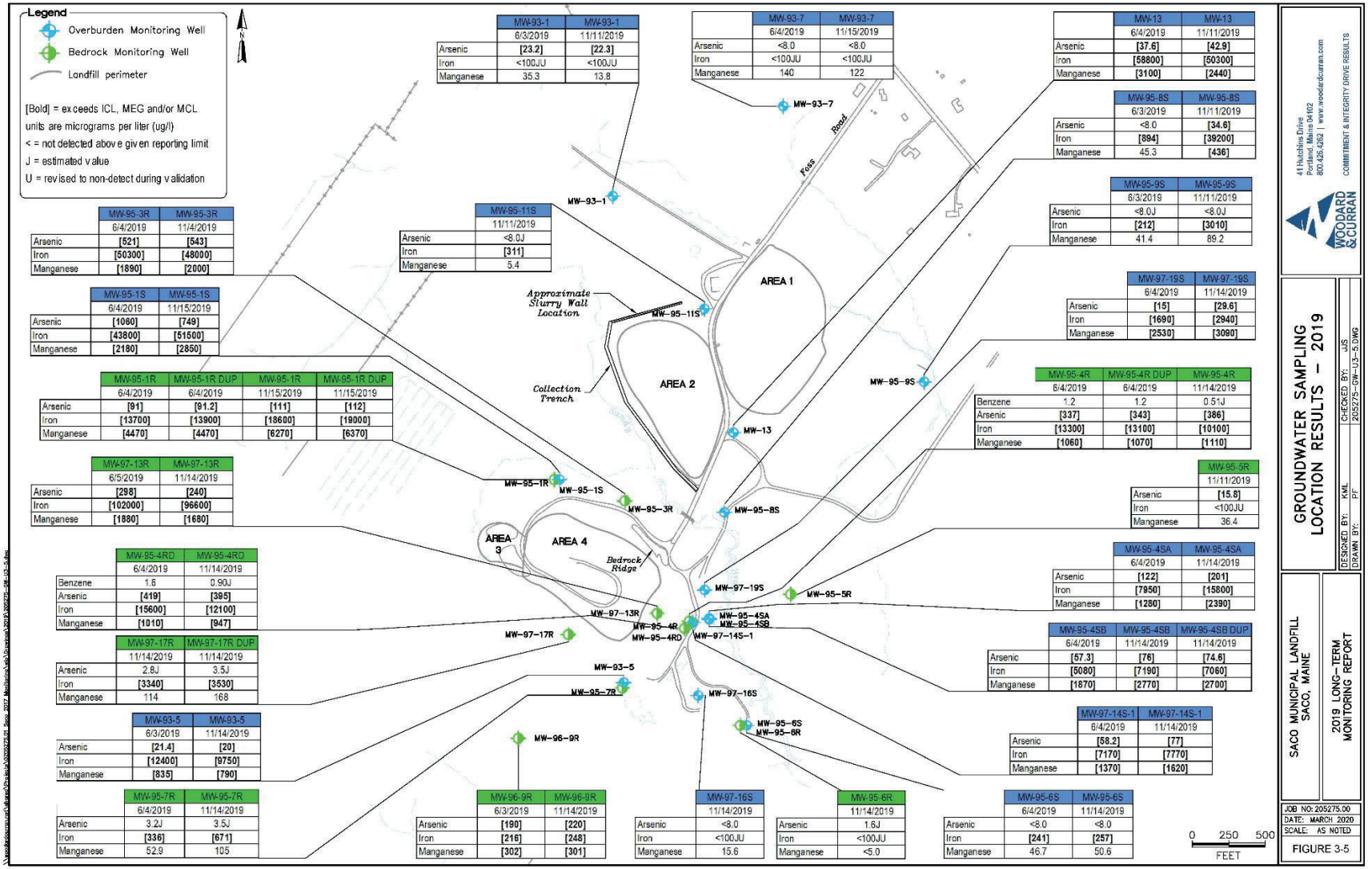
COC	2000 ROD (µg/L)	Current Standards[a] (µg/L)	Change
Arsenic	50	10	More stringent
Benzene	5	5	No change
Manganese	200	300[b]	Less stringent

Notes:
Source: Table 18 of the 2000 ROD.
a. National Primary Drinking Water Regulations located at: https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations (accessed 4/28/2020).
b. Maine MEGs for drinking water located at: https://www.maine.gov/dhhs/mecdc/environmental-health/eohp/wells/documents/megtable2016.pdf (accessed 4/28/2020).

Surface Water and Sediment
The 2000 ROD indicated the cleanup levels for surface water shall be federal and state water quality criteria. Groundwater contamination was identified as the primary aspect of the Site that must be addressed by the selected remedy. No cleanup levels were selected for sediment; however, monitoring of the sediments was required by the ROD to ensure the natural attenuation remedy was protective. The expected decrease in contaminant concentrations in groundwater will result in further reduction in contaminant concentrations in surface water and sediments.

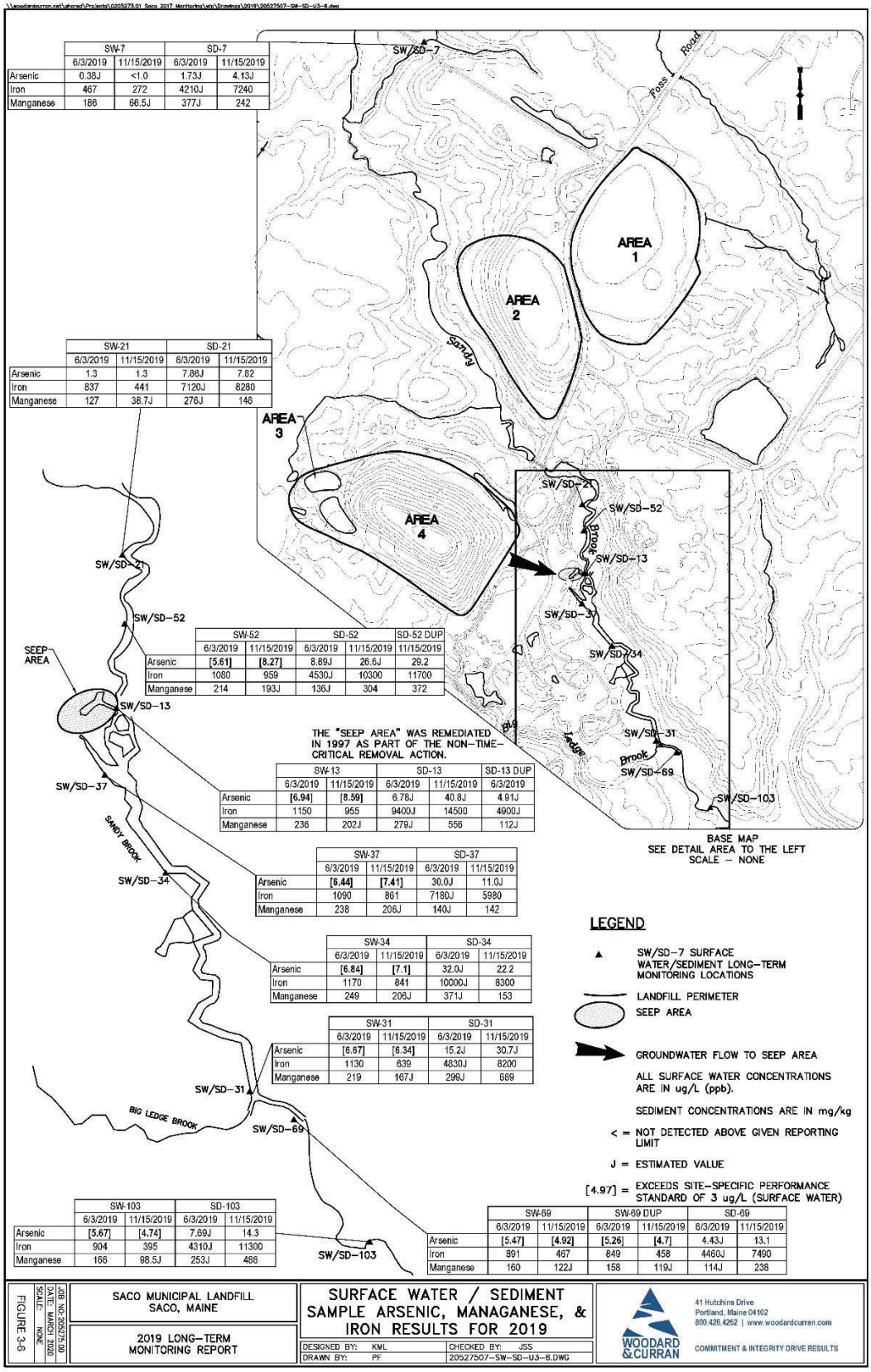
APPENDIX H – DATA FIGURES AND ANALYSES

Figure H-1: Groundwater Sampling Locations and Analysis Results[8]



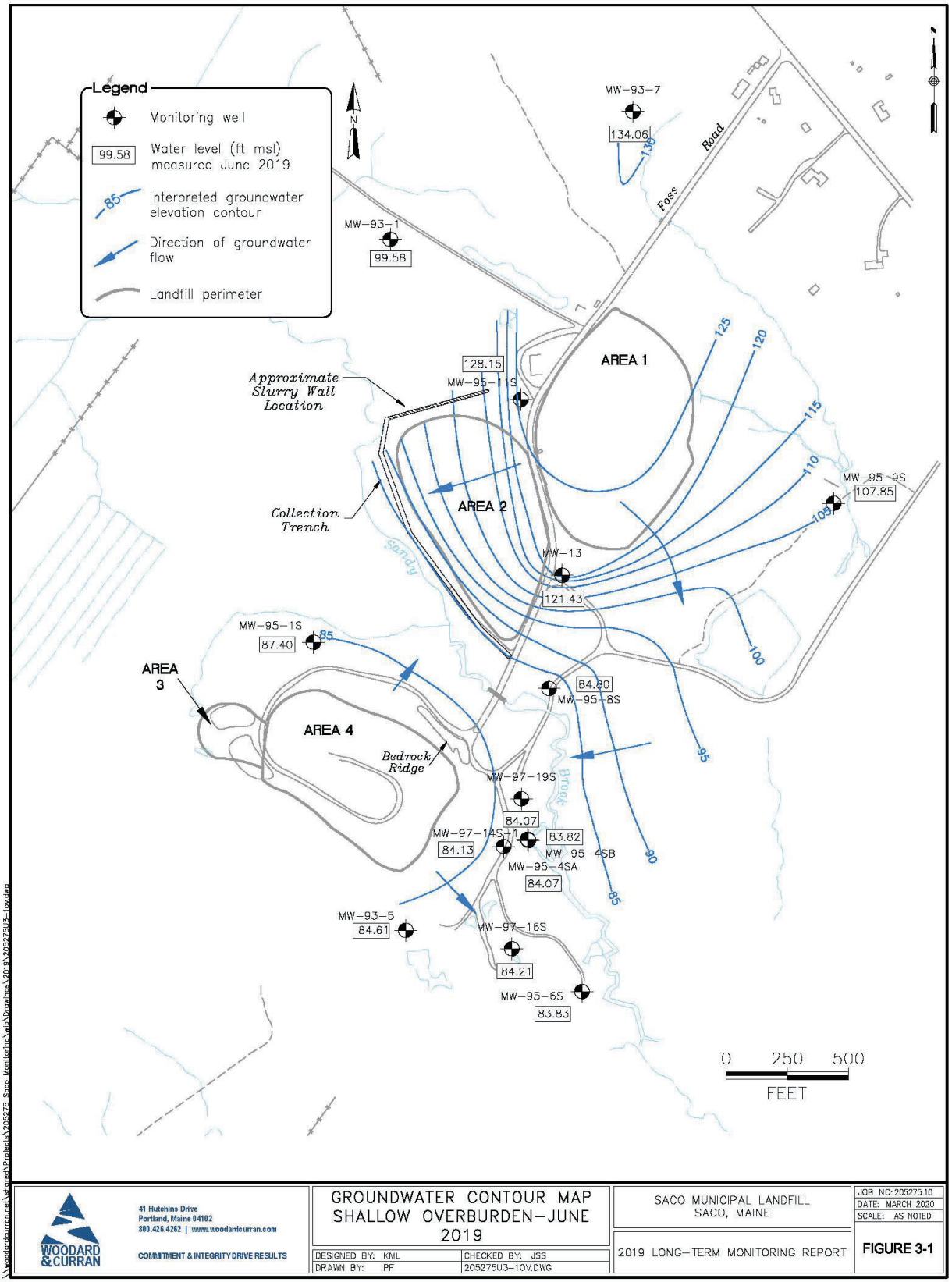
[8] Draft 2019 Annual Long-Term Monitoring Report, Figure 3.5

Figure H-2: Surface Water and Sediment Sampling Locations and Analysis Results[9]



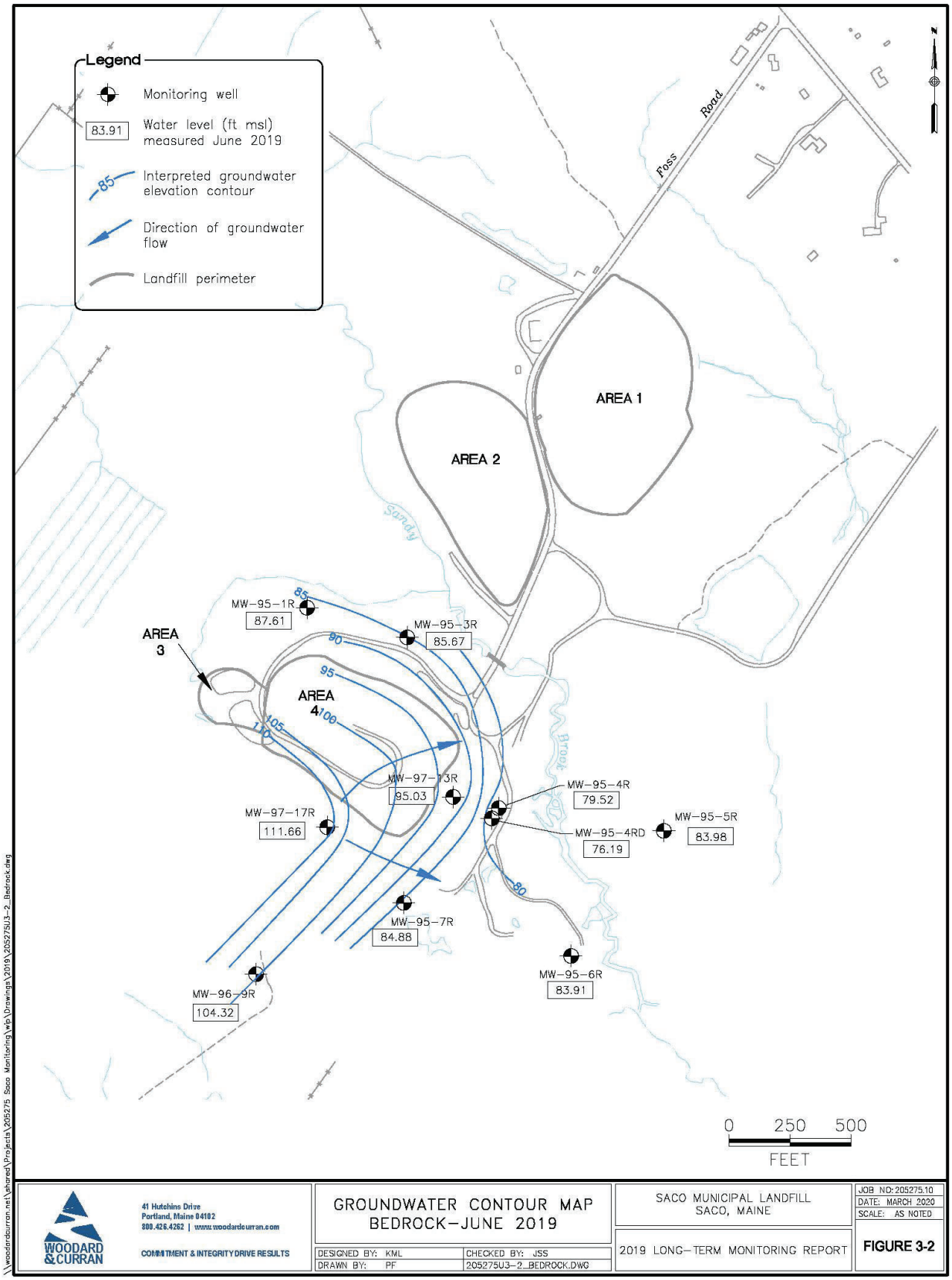
[9] Draft 2019 Annual Long-Term Monitoring Report, Figure 3-6

Figure H-3: Groundwater Contour Map, Shallow Overburden – June 2019[10]



[10] Draft 2019 Annual Long-Term Monitoring Report, Figure 3-1

Figure H-4: Groundwater Contour Map, Bedrock – June 2019[11]



[11] Draft 2019 Annual Long-Term Monitoring Report, Figure 3-2.

Figure H-5: Mann-Kendall Analysis of Manganese in MW-93-7 (Upgradient)

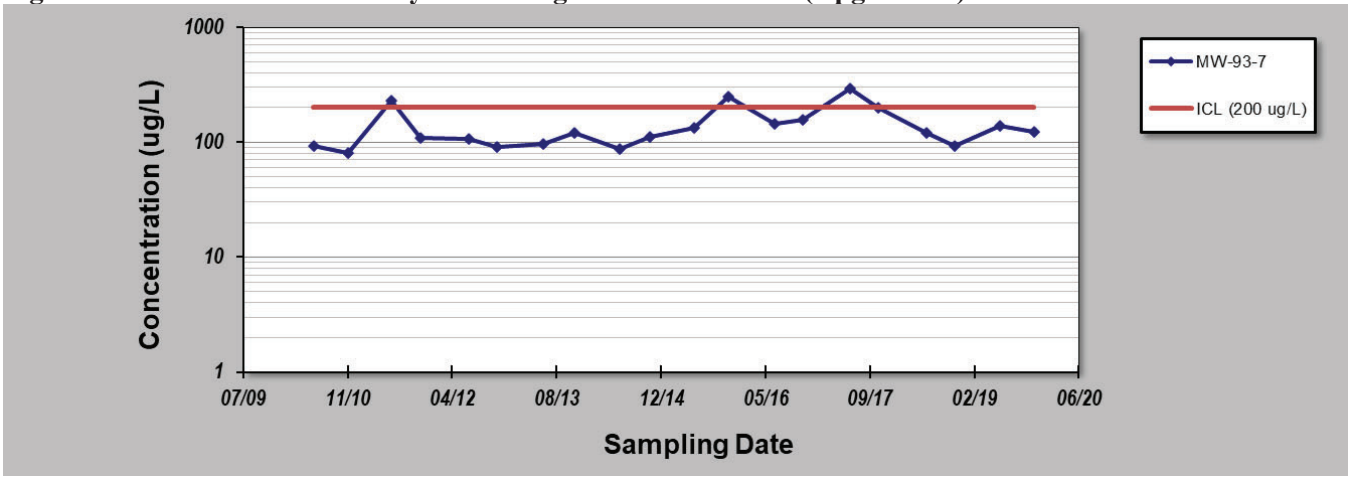


Figure H-6: Mann-Kendall Analysis of Arsenic in MW-96-9R (Areas 3 and 4)

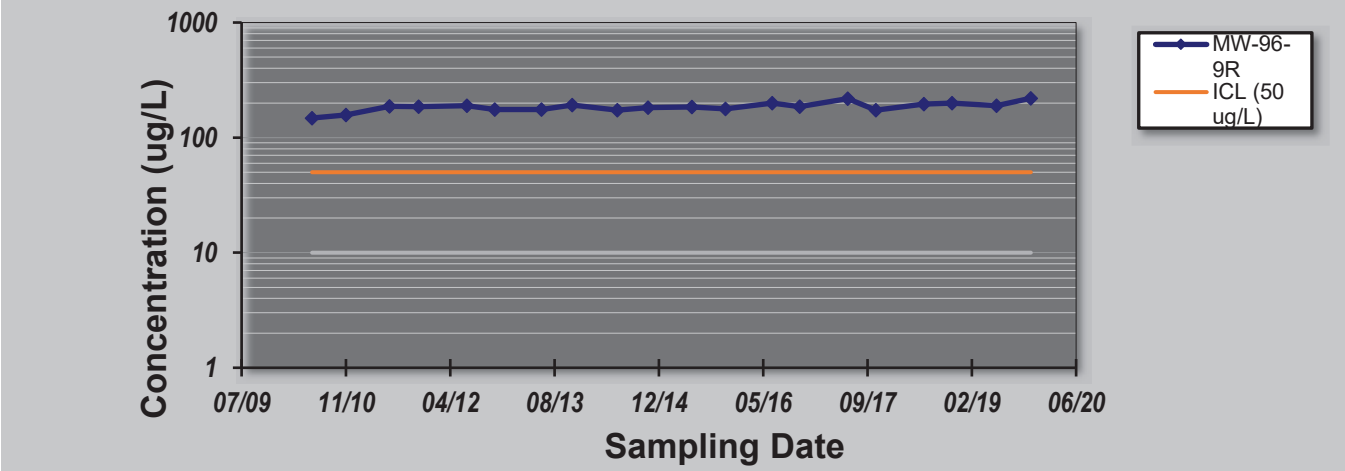


Figure H-7: Mann-Kendall Analysis of Manganese in MW-95-7R (Areas 3 and 4)

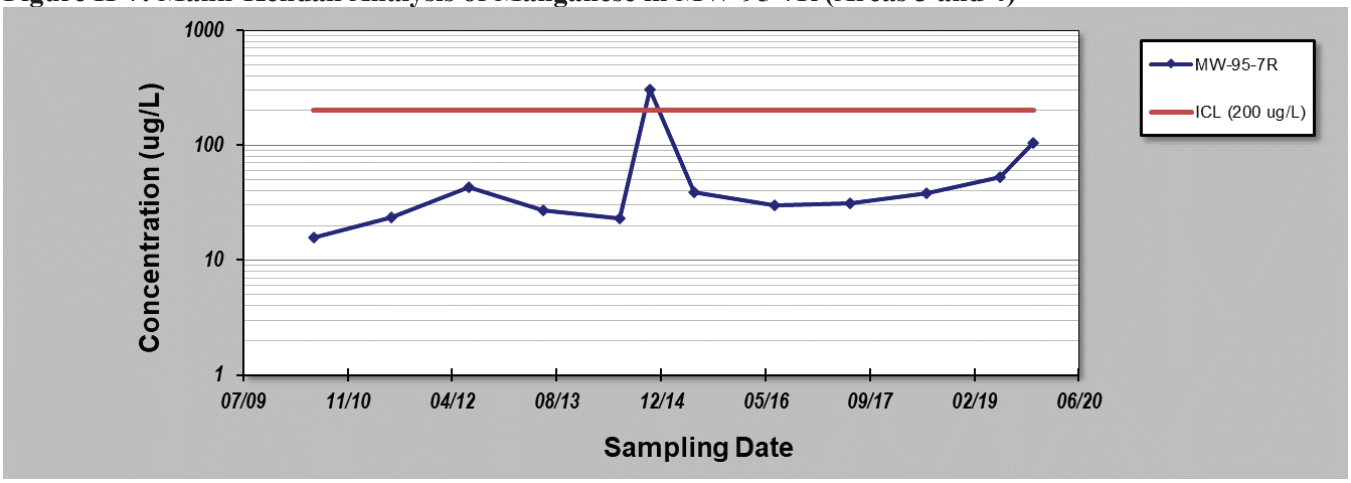


Figure H-8: Mann-Kendall Analysis of Manganese in MW-97-14S-1 (Areas 3 and 4)