

**FINAL CLOSE OUT REPORT FOR
FORMER MCKIN COMPANY SUPERFUND SITE
CUMBERLAND COUNTY, MAINE**



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Prepared by

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Date

TABLE OF CONTENTS

FINAL CLOSE OUT REPORT FORMER MCKIN COMPANY SUPERFUND SITE GRAY, CUMBERLAND COUNTY, MAINE

I.	Introduction.....	1
II.	Summary of Site Conditions.....	1
	a. Site Background and Description.....	1
	b. Past response actions Actions.....	3
	c. Selected Remedy and RAOs.....	3
	d. Institutional Controls.....	7
	e. Final Inspection.....	10
III.	Monitoring Results.....	11
IV.	Attainment of Groundwater Restoration Cleanup Levels.....	14
V.	Summary of Operation and Maintenance.....	14
VI.	Demonstration of Cleanup QA/QC.....	14
VII.	Five-Year Review.....	15
VIII.	Site Completion Criteria.....	15
IX.	Bibliography.....	16

FIGURES/ATTACHMENTS

1. Site Location
2. Institutional Control Zone
3. Town of Gray (Tax Map)
4. Monitoring Well Locations

APPENDIX

- A: Site Inspection Photos

I. Introduction

This Final Close Out Report (FCOR) documents that all response actions for the McKin Company Superfund Site (Site) have been successfully completed in accordance with *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-22, May 2011). This FCOR documents all decision documents have been completed and the selected remedy is implemented and consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP), and the United States Environmental Protection Agency (EPA) policy and guidance documents.

II. Summary of Site Conditions

a. Background and Description

The Site is located in Gray, Maine, about 15 miles north of Portland, Maine (Figure 1). The Site property comprises an area of approximately 7 acres located on the west side of Mayall Road. Additionally, the Site is composed of areas impacted by contamination that was released on the McKin property. Based on observed groundwater contaminant distribution, the Site extends north of Collyer Brook at its confluence with Royal River, and east to the Royal River. In total, it is estimated that the Site consists of about 660 acres of residential, farm and wooded properties.

The topography of the Site has been modified by past excavations; the fenced enclosure was formerly a gravel pit with steep slopes on the west, south, and north sides. At-grade access to the property is from Mayall Road. The topography at the Site ranges from 300 feet above mean sea level (MSL) at the McKin property to less than 140 feet MSL at the floodplain of the Royal River, a horizontal distance of about 3,700 feet (three-quarters of a mile). Wetland areas are interspersed in the floodplain in eroded channels and depressions. The land surface is dissected by several small unnamed streams and associated gullies. The topography west of the McKin property, in the Depot Road vicinity is relatively flat.

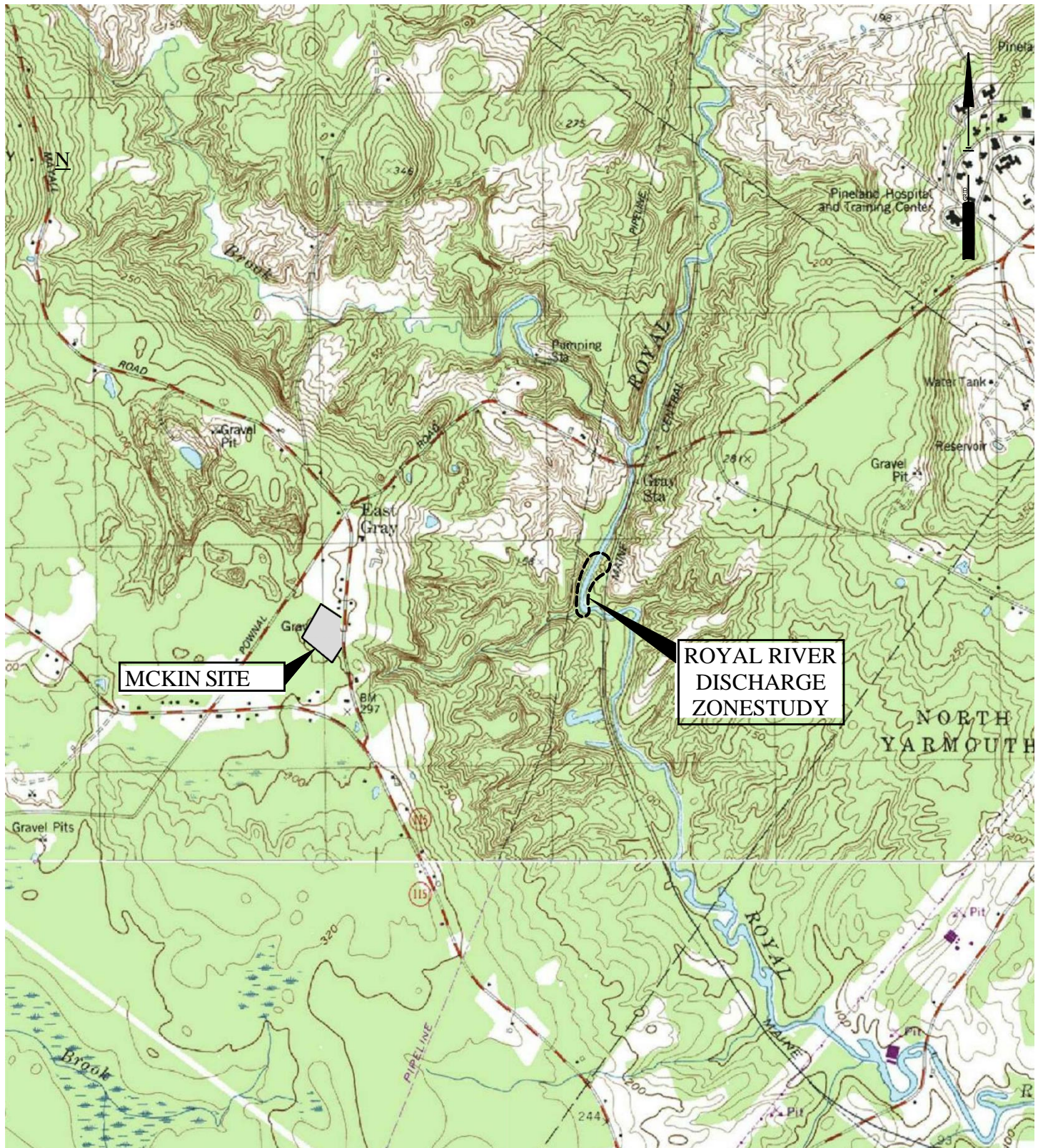
Groundwater that moves beneath the Site flows east and north toward the Royal River and Collyer Brook, respectively. The Royal River is a Class B surface water from its confluence with Collyer Brook to tidewater; Collyer Brook is a Class A surface water from Route 202 to its confluence with Royal River.

The McKin facility operated from 1965 to 1977 as a collection and transfer station and disposal facility for waste oil and industrial process waste. In 1972, the facility was expanded with the addition of an asphalt-lined lagoon and incinerator to process a large volume of oily waste from an oil spill in Hussey Sound (a shipping channel leading into Portland harbor). The incinerator operated under a permit from MEDEP until operations ceased in about 1973. Most of the oily wastes were stored in the on-site lagoon. This lagoon reportedly leaked and discharged portions of its contents to the subsurface. The facility reportedly handled an estimated 100,000 to 200,000 gallons of waste annually between 1972 and 1977.

At the time of the facility's operation, the surrounding residential properties were serviced by individual (i.e., private) water supply wells. During 1973 and 1974, residents reported chemical odors in their well water and discoloration of their laundry. Investigations subsequently found solvents in Site soils and groundwater. Volatile organic compounds (VOCs) from the facility contaminated local residential wells through migrating groundwater. In 1977, the solvents were identified as trichloroethene (TCE) and 1,1,1-trichloroethane (TCA), and the Town of Gray ordered the McKin Company to cease operations.

Additional information on the Site background can be found in the 1985 Record of Decision (ROD), 2001 Amended Record of Decision (AROD), and previous Five-Year Review (FYR) reports.

Figure 1
Site Location



b. Past Response Actions

In November 1977 Fred C. Hart Associates, a contractor to EPA, conducted a hydrogeologic assessment of the area, which indicated contaminants from the Site had reached many local private wells. In December 1977, the Town of Gray issued a cleanup order regarding the McKin property. Also, in December 1977, sixteen private water supply wells were capped, and emergency water supplies were brought in by truck to service nearby residents. In August 1978 affected homes were connected to a public water supply in an action funded by a \$300,000 "Imminent Threat Grant" from the U.S. Department of Housing and Urban Development (HUD) and matching funds from the Town of Gray.

The Maine Attorney General's Office filed a suit against the McKin Company in 1978. A separate class action initiated by a Gray Citizens Group was settled out of court. During the summer of 1979, Maine Department Environmental Protection (MEDEP) supervised the removal of pumpable liquid wastes from the above-ground tanks, drums and lagoons. This amounted to approximately 33,500 gallons of oil and chemical waste. Additional MEDEP actions taken in 1979 and 1980 included moving empty 55-gallon drums into the fenced area, performing a magnetometer survey, installing and sampling monitoring wells around the Site and collecting and analyzing soil and groundwater samples.

In November 1982 a hydrogeologic study prepared by Robert G. Gerber (Gerber) and funded by MEDEP. Gerber simulated groundwater movement in the Site area and concluded that local groundwater contamination in the surficial and bedrock aquifer resulted from waste disposal practices at the Site.

In April 1982, MEDEP contracted Jetline Services to rinse and crush a number of on-site barrels and containers and provide cost estimates to clean and dispose of all remaining above-ground tanks.

Air quality at the Site was monitored by EPA, and residual materials in the above-ground tanks were sampled and analyzed by MEDEP in March 1983.

A Remedial Action Master Plan (RAMP) for the Site was prepared in April 1983 by Camp, Dresser and McKee (CDM) under contract with EPA. The RAMP recommended collecting the necessary data, developing the required Site area remedial action program and implementing certain Initial Remedial Measures (IRMs) to remedy potential hazards. MEDEP entered into a cooperative agreement with EPA in June 1983 to implement the IRMs and the Remedial Investigation and Feasibility Study (RI/FS) as recommended in the RAMP. The IRM work conducted by Jetline Services included the cleaning and removal of all remaining above-ground tanks from the Site. This work was completed in September 1983 and represents the most recent Removal Action to take place on the Site.

c. Selected Remedy and Remedial Action Objectives

The Site was listed as final on the National Priority List (NPL) on September 8, 1983 (48 FR 40658).

In January of 1984, CDM was awarded a contract by MEDEP to undertake the RI/FS. The RI was completed in February 1985 and the FS in March 1985. The following remedial action objectives (RAOs) were used to evaluate alternatives in the FS:

- Maintain adequate safe drinking water for the public potentially impacted by groundwater contamination;
- Prevent exposure of the public to harmful airborne contaminants;
- Prevent contact by the public with contaminated soils by dermal or ingestion routes;
- Prevent subsurface discharge of contaminated groundwater from the McKin property to off-site aquifers;
- Restore, within a reasonable time and practical limits, the off-site aquifer contaminated by McKin operations to levels acceptable for drinking water supply and protective of the environment; and
- Protect Royal River state-designated uses and aquatic life.

The July 22, 1985 ROD included an on-site component for treatment of contaminated soil (Source Control, Operable Unit 1 (OU1)) and an off-site groundwater treatment component (Groundwater Migration, Operable Unit 2 (OU2)). The remedy selected in the 1985 ROD included:

- On-site soil aeration of soils from identified areas on the property;
- Off-site disposal of approximately 16 drums;
- Soil testing in the petroleum contaminated areas;
- Construction of the GETS [Groundwater Extraction and Treatment System] and operation of this system for a period of five years to achieve groundwater performance standards of 92 Parts Per Billion (ppb) TCA and 28 ppb TCE;
- Re-evaluation of the groundwater performance standards if the standards were not met within five years;
- Initiation of an off-site groundwater and surface water monitoring program; and
- Building demolition, clearing debris, removing drums and other materials, and other site closure activities.

The remedy selected in the 1985 ROD has since been modified three times: by an Explanation of Significant Differences (ESD) in 1990, the Amended ROD (AROD) in 2001, and a second ESD in 2014. The September 12, 1990 ESD changed the treated water discharge from surface water to on-site reinjection. The March 30, 2001 AROD included establishing a TI Zone Waiver for groundwater with ICs to prevent groundwater use within the specified TI area. The AROD changed the off-site groundwater remedy, replacing the two groundwater RAOs in the 1985 ROD (fourth and fifth RAO bullets above with the following four activities:

1. Develop institutional controls to prevent exposure to contaminated groundwater;
2. Monitor groundwater to show that the contaminant plume does not expand and that contaminant concentrations continue to decline due to natural processes;
3. Monitor surface water to show decreases in TCE concentrations in the Royal River resulting from decreases in groundwater concentrations. A contingency response approach would be implemented if TCE exceeds the state performance standard at a specified location and date; and
4. Evaluate the remedy to assess that it is protective of human health and the environment at least every five years and report findings in Five-Year Review reports.

A Consent Decree with EPA, the State of Maine and the Settling Parties was entered in (Civil Action # 88-0101B) on November 30, 1988. An Amended Consent Decree with EPA, the State of Maine and Settling Parties was entered in (Civil Action # 01-382B) on December 6, 2001. The 2001, Amended Consent Decree and Remedial Action Work Plan (RAWP) defined the remedial actions (below) to be undertaken at the Site.

The remedial actions described below include elements which have been completed pursuant to the 1988 Consent Decree (elements 1 - 4); elements which are carried forward from the 1988 Work Plan (elements 5 - 6); and those remedial actions that the Settling Parties to a Consent Decree with EPA (the "Settling Parties") have completed pursuant to the 2001 Amended Consent Decree (elements 7-8).

1. Final Solvent Soil Aeration Report and Final Petroleum Soil Aeration Report (Element 1 of the 1988 RAWP).

This remedial action was fulfilled with the submittal of the Soil Remediation and Site Closure Report in July 1987 and the Addendum Report in October 1987.

The pilot-scale soil remediation study at the site, which utilized low temperature thermal aeration in an enclosed environment, was conducted by Canonie Engineering. Results of the pilot study was published in an April 1986 Report. Full scale aeration of the VOC contaminated soil began on July 8, 1986 and completed on February 3, 1987. A "Petroleum Area

Soils Characterization and Remediation Analysis" was submitted to EPA and Maine DEP in January 1987. The agencies approved a plan to treat petroleum contaminated soil and this was accomplished between March 13, 1987 and April 17, 1987.

Site demobilization and final closure was completed on June 23, 1987, followed by the issuance of a report in July 1987 entitled "Soil Remediation and Site Closure, McKin Superfund Site". A total of 11,456 cubic yards of contaminated soil were excavated, treated, verified analytically to ensure a mean residual concentration not exceeding 0.10 mg/kg TCE, and backfilled.

2. Design and Construction of Groundwater Extraction and Treatment System (GETS) (Element 2 of the 1988 RAWP).

This remedial action was fulfilled with the submittal of Groundwater Extraction and Treatment System Design Report in December 1989, the Revised Interim Groundwater Extraction and Treatment System Report in October 1992 and the Technical Analysis of the Ability of Groundwater Extraction & Treatment System to Restore the Aquifer in Areas East of Mayall Road revised in March 1996.

3. Operation of Groundwater Extraction and Treatment System (Element 3 of the 1988 RAWP).

This remedial action was fulfilled with the operation of the GETS from April 1991 to October 1995. EPA and Maine DEP agreed in October 1995 to suspend operation of the GETS pending a request for a Technical Impracticability ("TI") waiver and an evaluation of contaminant rebound. With the change in remedy for the off-site operable unit as described in the March 2001 ROD Amendment and as set forth in the Amendment to Consent Decree, EPA and Maine DEP have agreed to a permanent termination of the GETS.

4. Site Characterization of Well DEP-8 Area (Element 6 of the 1988 RAWP).

This remedial action was fulfilled with the approval of the December 1989 hydrogeologic Investigation. DEP- 8 Study Area Remediation and Pilot-Scale Treatability Study and the submission of the August 20, 1990 DEP-8 Soil Confirmation Project summary letter.

5. Groundwater and Surface Water Monitoring (Element 4 of the 1988 RAWP).

Under the LTMP, groundwater and surface water monitoring will continue until the groundwater reaches EPA and MEDEP drinking water standards.

6. Operation, Maintenance, Final Closure, and Future Site Use (Element 5 of the 1988 RAWP).

Operation, Maintenance, Final Closure, and Future Site Use will be continued until the Site reaches final closure and groundwater has reached EPA and MEDEP drinking water standards.

7. Installation of a series of groundwater monitoring wells, called the 900-series wells, in overburden and bedrock along Collyer Brook, the Royal River, and the southern side of the eastern flowing contaminant plume (Element 7 of the 2001 Amended Consent Decree).

The last modification occurred with the July 3, 2014 ESD and addressed the 900-series wells. The 2001 AROD required a new series of wells (designated in the AROD as the 900-series wells), to provide assurance regarding the lateral extent of bedrock contamination and vertical gradient between bedrock and overburden. Following several attempts to gain access for

installation of the 900-series wells, EPA, MEDEP, and Settling Parties representatives met in 2009 to discuss these wells. The Agencies ultimately concluded that the 900-series wells were not necessary.

Data suggested that the northern portion of the overburden plume was approaching drinking water standards, and the updated regression analysis indicated that the eastern portion of the overburden plume might attain these standards more quickly than originally calculated. Moreover, hydrological and water quality data indicated that the Royal River system functions as the discharge zone for the overburden and bedrock plumes. Accordingly, because the plumes are contained by the Royal River system, the Agencies concluded that the 900-series wells were not needed to delineate the lateral extent of the bedrock plume or the vertical gradient. In addition, because OU2 covers more than 600 acres the Agencies concurred that data from the proposed eight 900-series wells (roughly one bedrock well per 75 acres) would not provide the high level of confidence necessary to remove restrictive covenants from individual properties or to recommend to the Town of Gray to adjust the Institutional Control Zone. The 2014 ESD memorialized this change in the remedy.

8. Abandonment of residential wells impacted by contaminants from the McKin facility (Element 8 of the 2001 Amended Consent Decree).

This remedial action was fulfilled with the submittal of the 2021 Documentation Report Residential Well Abandonments dated December 15, 2021. The abandonment of residential drinking water wells was the final element of the 2001 RAWP to the amended Consent Decree for the Site. The report serves as documentation of the work performed by the Settling Parties, and the EPA to identify and abandon the residential wells. The Report documents that the work performed was in accordance with the procedures outlined in the Residential Well Abandonment Plan, included in Volume I of the Project Operations Plan.

In sum, the RAOs set forth in the 1985 ROD as subsequently modified in the March 2001 ROD Amendment have been achieved. All institutional controls (ICs) have been implemented and monitored for compliance. Long-term groundwater monitoring indicates contaminant concentrations are decreasing throughout the plume, and surface water standards have been achieved since 2009. In addition, following awareness of a potential vapor intrusion pathway, that pathway has been investigated first in 2007, again in 2009, and it has been determined that it does not pose an unacceptable risk.

Status of Implementation

Site Soil and Groundwater

Between July 1986 and April 1987, approximately 12,000 cubic yards of soils containing solvents and petroleum were excavated and treated by soil aeration. Of that amount, approximately 9,500 cubic yards of VOC-contaminated soils were treated and met the 1985 ROD 0.1 mg/kg TCE treatment performance standard. The VOC-contaminated soils were excavated outward from the identified source areas until TCE concentrations were below 1 mg/kg, the soil excavation performance standard. During the same time, approximately 2,500 cubic yards of petroleum-contaminated soils were excavated to a 1 mg/kg polynuclear aromatic hydrocarbon (PAH) and total extractable hydrocarbons performance standard and treated in the same manner. The treated soil was then stabilized using cement and replaced in the excavation. The entire property was sloped, graded, loamed, and hydroseeded.

In 1990, EPA and MEDEP agreed to a phased approach to groundwater remediation beginning with four extraction wells and a central treatment system to address the contamination in the eastern and northern plumes (the GETS system). Two extraction wells were located approximately 1,000 feet north of the Site on the western side of Mayall Road (prior to the intersection with Depot Road), one west of Depot Road

and the fourth off of Mayall Road approximately 500 feet west of the Depot Road intersection. Two infiltration galleries were located in the central and northern areas of the Site to reinject treated groundwater. Following an evaluation of the effectiveness of the first phase, a decision to expand the system (e.g., the next phase) to the east side of Mayall Road would be made.

One of the four extraction wells, placed in the eastern plume, (EW-503), was designed with a projected flow of 20 gallons per minute (gpm). The well was installed in soils with a limited saturated overburden thickness that yielded only 1-2 gpm. As a result, the system was not effective in extracting VOCs migrating in the eastern plume to the Royal River. In addition, the expected flushing of VOCs through the use of infiltration galleries did not appear to affect the water quality in the northern TCE plume thereby limiting the effectiveness of that action. This observation of the northern plume suggested that the pumping of the residential wells in the 1970s, historical lagoon operations, and TCE transport through bedrock fractures contributed to the movement of contaminated groundwater and the extent of the northern plume.

In July 1993, the Settling Parties evaluated an expansion of the GETS east of Mayall Road (second phase) and concluded that groundwater restoration was not technically practicable because of the presence of contamination in the deep bedrock. Computer modeling of multiple extraction system arrangements (wells placed perpendicular to groundwater flow, wells placed parallel to flow, multiple rows of wells, etc.) all indicated a timeframe of over 200 years before cleanup levels would be attained.

In late 1995, the agencies agreed to allow the Settling Parties to submit a Technical Impracticability Evaluation Report in place of the 56-month report required under the Consent Decree. Groundwater data indicated the likely presence of dense non-aqueous phase liquids (DNAPL) in bedrock and overburden aquifers. The presence of residual DNAPL in low permeable strata may act as a continuing source of VOCs that may desorb, dissolve in the groundwater, and be carried to more permeable units. EPA and MEDEP approved a temporary shutdown of the system in October 1995 so the parties could evaluate the effectiveness of the system and other clean-up alternatives. This evaluation included an assessment of the feasibility and cost of groundwater restoration, containment, mitigation, and institutional controls. During the period of operation, from April 1991 to October 1995, the GETS removed approximately 26 gallons of TCE.

Additional information on implementation of the soil treatment and groundwater extraction and treatment can be found in the previous FYR Reports and the 2001 AROD.

d. Institutional Controls

The 2001 AROD identified four overlapping institutional controls (Table 1) that were to be used in conjunction with long-term monitoring to assure protectiveness of the remedy.

The Town of Gray established a groundwater ordinance for the Site on January 22, 2002. The objective of this ordinance is to prevent exposure to contaminated groundwater until federal and state drinking water standards are reached. The ordinance prohibits the extraction and use of groundwater for any purpose, with the exception of groundwater monitoring. This ordinance delineates an area known as the Institutional Control Zone (ICZ) where these restrictions will apply (Figure 2). This zone was established based on the horizontal area of the Technical Impracticability Zone, extending vertically to deep bedrock. The 894-acre ICZ boundaries include areas where groundwater is known or suspected to exceed federal Maximum Contaminant Levels (MCLs) and Maine Maximum Exposure Guidelines (MEGs) and areas where contaminated groundwater could migrate in the future. The ordinance includes provisions for Town enforcement and stipulates penalties for any breaches of the ordinance.

The second IC included restrictive covenants for nineteen sub-dividable properties. The restrictive covenants were included to prevent the use of groundwater on these properties and alleviate the concern that future development and installation of wells could possibly alter the boundaries of the contaminant

plume. These restrictive covenants were signed by MEDEP's Commissioner on May 2, 2001 and were recorded in the Cumberland County Registry of Deeds.

The third IC included the establishment of two conservation easements to protect areas of open space with frontage along Collyer Brook and the Royal River. These were recorded in the Cumberland County Registry of Deeds on January 11, 2002 and January 16, 2002.

Finally, the Settling Parties were also required to make a good faith effort to procure a restrictive covenant for the former McKin parcel. This was achieved with a Declaration of Environmental Covenant that was recorded in the Cumberland County Registry of Deeds on September 27, 2013. The Site property is designated on the Town of Gray's Tax Map 45, Lot 38-20 (Figure 3).

In addition to these ICs, two separate agreements were reached between the Settling Parties and the Town of Gray and the Gray Water District. The Settling Parties agreed to provide funds to the Gray Water District for development of a new water supply well and for water mains to connect the new well to the existing municipal distribution system. Per a Memorandum of Understanding signed by the Settling Parties, EPA, MEDEP, Gray Water District, and the Town of Gray, payment by the Settling Parties for these controls and agreements were made on or around January 1, 2002.

Table 1
Summary of Institutional Controls

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
On-Site Soil and Groundwater	Yes	Yes	Gray Tax Map 45, Lot 38-20	Prohibits use of groundwater, and activities that would interfere with the remedy	Declaration of Environmental Covenant, September 27, 2013
Off-Site Groundwater	Yes	Yes	Surrounding properties (Figure 4 above)	Prohibit the removal and use of groundwater from land located within Institutional Control Zone	Town of Gray Groundwater Ordinance, January 22, 2002
Off-Site Groundwater	Yes	Yes	19 parcels	Prohibit the use of groundwater of sub-dividable parcels	19 Declaration of Restrictive Covenants
Off-Site Groundwater	Yes	Yes	Gray Tax Map 29, Lots 39-3, 39-31, and Map 37, Lot 39-203	Protect and enhance water quality in Collyer Brook and Royal River	2 Conservation Easements, January 11, 2002 and January 16, 2002

Figure 2
Institutional Control Zone

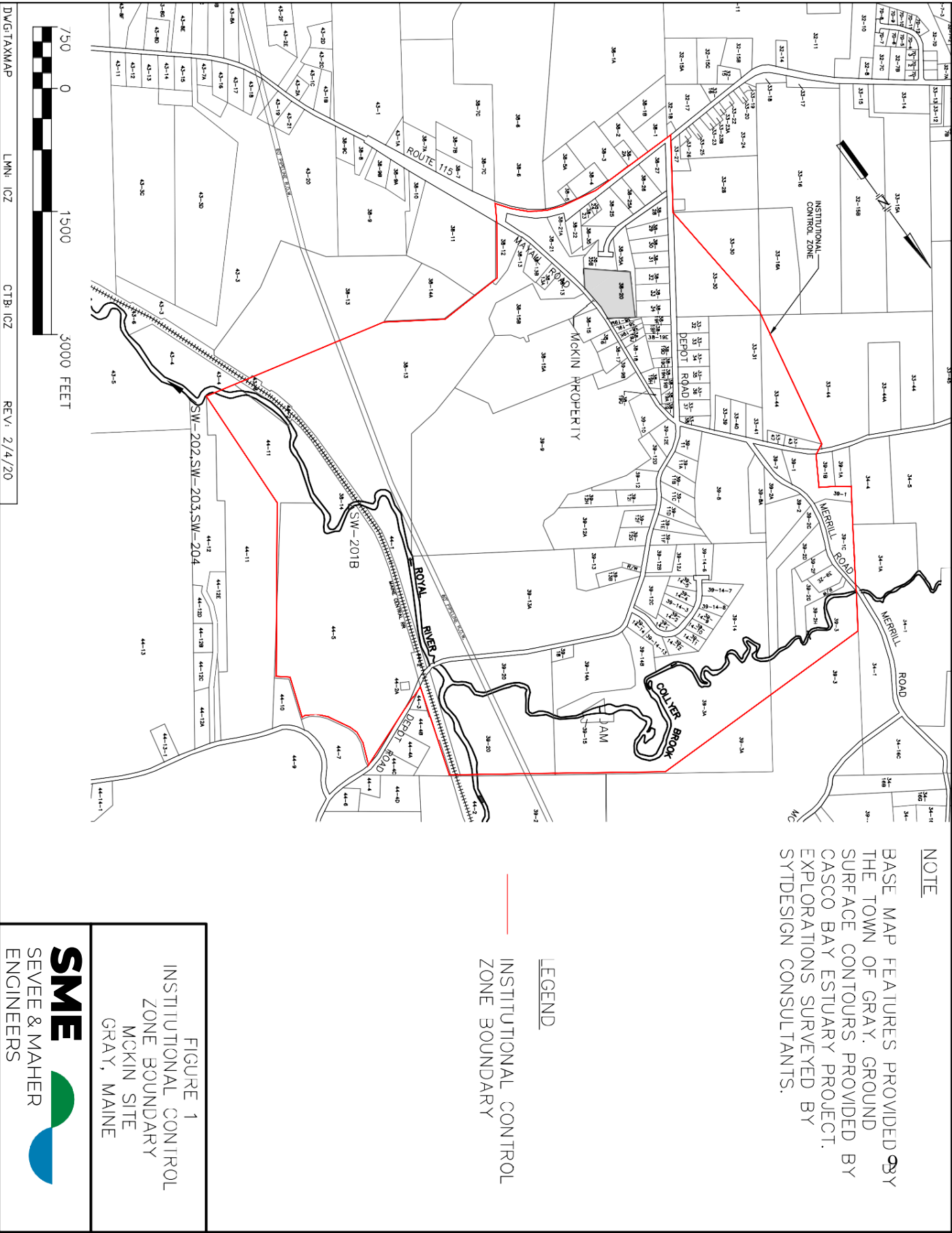


Figure 3
Town of Gray (Tax Map)



e. Final Inspection Activities

On December 6, 2021, an inspection was conducted with representatives from EPA, MEDEP, and the Settling Parties' Contractor (Sevee & Maher Engineers, Inc.). The inspection included checking the remaining fence line, and observations of the vegetated cover and monitoring wells.

Currently, the Site is a vacant parcel with intermittent trees and areas of soil mounding from the historical gravel operations. The Site remains secured with a chain link fence and posted signage surrounding the property. All remedial components have been removed.

Inspection of the infiltration system can be observed in the northwest and central areas of the property. The surface of the infiltration beds, and unused areas of the property, show no signs of excessive erosion.

Photos from the final inspection are attached in Appendix A.

III. Monitoring Results

The Settling Parties conduct routine groundwater and surface water monitoring in accordance with the Long-Term Monitoring Plan (LTMP). The LTMP, approved by the Agencies in 2001 (Revised March 2022), is attached to the Remedial Action Work Plan, Appendix A to the 2001 Consent Decree Amendment. The Revised March 2022 LTMP is a standalone document that was approved by MEDEP and EPA in March of 2022. The LTMP set forth a monitoring approach that included criteria for modifying the sampling frequency based on TCE concentrations and statistical analysis of the data. Monitoring under the LTMP commenced in January 2002 and initially included three categories of locations (active, intermittent, and inactive) and four sampling frequencies (quarterly, semi-annually, annually, and every three years). For more details on the criteria and the sampling locations in each category, see the 2001 LTMP and Revised March 2022 LTMP.

At the height of the groundwater monitoring, 46 monitoring wells and four springs/seeps were sampled. Between 1998, three years after the GWETS shutdown, and 2002, before the LTMP was approved, sampling was reduced to 27 monitoring wells and one spring. By the time of the 2008 FYR, sampling had been reduced to 18 monitoring wells. By the time of the 2013 FYR, sampling had been further reduced to fifteen wells. Groundwater springs and seeps had achieved drinking water standards and were no longer monitored. By Spring 2021, the last sampling event reviewed, sampling has now been reduced (with EPA and ME DEP approval) under the Revised March 2022 LTMP to eight wells. This reduction in sampling locations and frequency demonstrates the continuing improvement of the groundwater.

At the time of the 2008 FYR, six VOCs were consistently detected in the groundwater: tetrachloroethene (PCE), trichloroethene (TCE), trichloroethane (TCA), cis-1,2-dichloroethene (cis-DCE), 1,1-dichloroethene (1,1-DCE), and 1,1-dichloroethane (1,1-DCA). Of these six, TCE and 1,1-DCE exceeded federal MCLs and Maine MEGs with TCE overwhelmingly being the most widespread and having the highest concentrations. By the 2013 FYR, five VOCs were detected and only TCE exceeded its MCL and MEG. From Fall 2013 through Spring 2021, four VOCs were detected in monitoring well MW-206A. Of these compounds, only TCE was detected at MW-206A above its MCL and MEG.

Over the last five years, TCE concentrations in the three wells remaining in the active category appear to show three different patterns. TCE concentrations at B-1A, located off Depot Road, northwest of the Site, have fluctuated and apparently stabilized in the 50-60 ppb range. TCE concentrations at MW-206A, located off Mayall Road, north of the Site, have continued to decline, approximately by half during the last five years. And TCE concentrations at B-103B, located just west of the Royal River, decreased by an order of magnitude since the 2013 FYR.

Evaluation of these data suggests different flow paths for groundwater (and contaminants) originating from the Site. B-1A is located on the outermost western edge of the plume near the McKin facility and the flow path in that location was likely influenced first by residential wells in use prior to the expansion of the municipal water supply and then by the groundwater extraction system. With municipal water supply provided throughout the area and the groundwater extraction system decommissioned, it appears that the flow of groundwater moving through the area has decreased and the release of TCE from the aquifer (probably from back diffusion) matches the rate of flow through the system. As documented in the 1999 Site Conceptual Model, TCE concentrations at B-1A were as high as 29,000 ppb in the early investigations, potentially indicating DNAPL and thereby a residual source for the back diffusion.

MW-206A represents the centerline of the plume prior to the bifurcation of the overburden plume into the northern and eastern plumes and the decreasing TCE concentration continues the historical trend observed at this location.

With regards to B-103B, over the duration of the long-term monitoring program, this well has had cyclical periods of increases and then decreases of TCE, suggesting either the passage of slugs of TCE-contaminated groundwater or occasional deviations in the flow paths in this area. The notable increase in TCE concentration in the Fall 2017 sample (i.e., 44 ppb) after seven sampling events below 10 ppb, may coincide with the increase from non-detect in Fall 2014 to 12 ppb TCE in Spring 2016 sampling event at B4A, located midway between MW-206A and B-103B4.

Two studies estimated contaminant travel time from the Site to the Royal River. In 1982, an initial evaluation prepared by a MEDEP consultant estimated an overall five-year travel time noting the heterogeneity of the overburden soil. This estimate was generally corroborated in the 1999 Site Conceptual Model submitted by the Settling Parties. The Site Conceptual Model also provided lines of evidence supporting the flux through the bedrock to the Royal River and the associated uncertainties with travel time through the bedrock. The cyclical periods noted in B-103B fall within these estimates.

Fall 2021 Groundwater Snapshot

The monitoring wells sampled during the Fall 2021 monitoring event are listed on Table 2 and shown of Figure 4 below. These monitoring wells include B-103B, B-1A, and MW-206A. Four VOCs were detected in groundwater above the laboratory Practical Quantitation Limit (PQL) during the sampling event: TCE, TCA, 1,1-DCE, and 1,2-DCE. Of the four detected VOCs listed above, TCE exceeded its MCL of 5 µg/L and its Maine Remedial Action Guidelines (RAGs) of 2.8 µg/L, at two of the three locations listed above in the sampling event. These locations included B-1A, and MW-206A. None of the above listed compounds exceeded the laboratory reporting limits at monitoring well B-103B during the event. Table 2 lists TCE concentrations measured at the three monitoring wells sampled during the monitoring event and last reported concentration at the other four intermittently sampled wells.

Wells sampled intermittently (MW-803C, B-4A, MW-803A, MW-803B) are sampled every three years. Monitoring well B-4A, also on an intermittent status, was sampled semiannually over the last 2 years as necessary to confirm a downward TCE concentration trend and a concentration below 5 µg/L. TCE has not been detected above the 1 µg/L laboratory reporting limit for three consecutive events beginning in the Spring of 2019 through the fall of 2020 at B-4A. TCE concentrations measured at monitoring wells B-1A and MW-206A in April 2021 are consistent with historical measurements, which indicate a gradual steady decline since 2008. Monitoring well B-103B, the TCE concentration did not exceed the MCL of 5 µg/L but was equal to the Maine RAG of 2.8 µg/L.

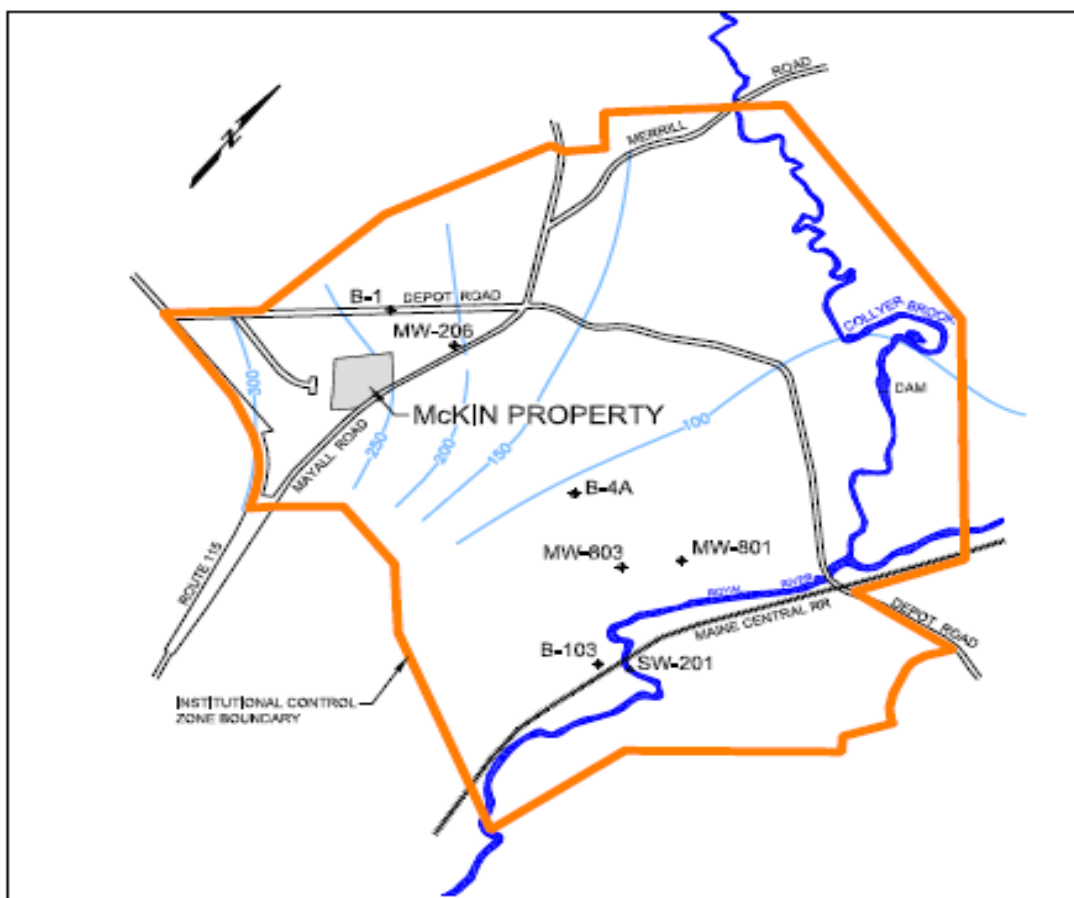
Table 2
Groundwater and Surface Water Sampling Summary

Wells Included	Current Sampling Frequency	Last TCE Result (µg/L)	Last Sampled	Next Sampling (1)
B-1A	Semi-annual (active)	51	September 2021	April 2022
B-4A	Every three years (intermittent)	<1	September 2020	April 2022
B-103B	Semi-annual (active)	2.8	September 2021	April 2022
MW-206A	Semi-annual (active)	130(sample duplicate concentration was 180)	September 2021	April 2022
MW-803A	Every three years (intermittent)	12	September 2020	April 2022
MW-803B	Every three years (intermittent)	7.5	September 2020	April 2022
MW-803C	Every three years (intermittent)	8.8	April 2019	April 2022
SW-201B (2)	Every five years	<1	September 2019	April 2022

Note:

- Next sampling schedule is based on the monitoring frequency established in current draft of the updated LTMP.
- SW-201B is a surface water sample location.

Figure 4
Monitoring Well Locations



Annual groundwater levels are measured each fall to help establish background groundwater levels going forward as a means of monitoring the groundwater conditions at the Site. Historically, levels at all locations remain generally consistent from year to year.

Surface water location SW-201B, positioned along the Royal River downstream of the former Boiling Springs was last sampled during the September 2019 monitoring event. Because the TCE loading rate into the Royal River has been less than the ROD required river criterion since January 2009, and TCE has not been detected above the laboratory detection limits since September 2011, MEDEP and EPA have agreed to reduce the sampling frequency to one sample every five years to coincide with the Fall sampling event prior to the Five-Year Reviews.

IV. Attainment of Groundwater Restoration Cleanup Levels

Attainment of Groundwater Restoration Cleanup Levels is not a RAO at the Site. EPA and MEDEP agreed that remediation of the groundwater is technically impracticable, and EPA, with the concurrence of MEDEP, issued a Finding of Technical Impracticability for the Site in January 2001 and on March 30, 2001 issued the AROD which modifies the remedy for remediation of the groundwater that was selected in the Record of Decision issued in 1985.

V. Summary of Operation & Maintenance

The 1985 ROD lists mowing as the only O&M activity for the on-site source control remedy. In 2013, in discussions with the property owner regarding the proposed institutional control, the Settling Parties offered to remove the fence or to repair it one time. The owner decided to keep the fence. The Settling Parties removed trees that had fallen on the fence and made repairs as needed. Thus, after the 2013 repairs by the Settling Parties, maintenance of the fence is the owner's responsibility. No other source control maintenance is being performed.

Off-site, the Settling Parties inspect the monitoring wells during sampling events. Verification of the Site ICs (also considered an O&M activity) is ongoing and documented in the FYRs for the Site. No other regular off-site maintenance is being performed.

VI. Demonstration of Cleanup QA/QC

All activities throughout the remedial actions at the Site were performed consistent with the 1985 ROD, as modified by the 1990 ESD, 2001 AROD and 2014 ROD Amendment, and all work plans. Specifically, the construction activities associated with the SVE and groundwater extraction and treatment systems were conducted in compliance with the approved Remedial Design which was consistent with EPA Quality Assurance and Quality Control (QA/QC) procedures. Detailed work plans for all activities including sampling and analyses were reviewed and approved by EPA prior to initiation of field work. Only EPA-approved sampling and analytical methods were utilized for these studies. All analytical data were reviewed and validated according to EPA data validation procedures.

All procedures and protocol utilized during the development and implementation of response actions are described in the work plans and summary reports submitted for each activity. These documents are available for review at the EPA Region I Record Center and the MEDEP office in Augusta, Maine.

The QA/QC program utilized throughout the Remedial Action was sufficiently rigorous and was complied with to enable EPA and MEDEP to determine that analytical results reported were accurate to the degree needed to assure satisfactory execution of the RA, consistent with the decision documents, Remedial Design plans and specifications

VII. Five-Year Review

Hazardous substances will remain at the Site above levels that allow unlimited use and unrestricted exposure after the completion of the action. Pursuant to CERCLA §121(c) and as provided in the current guidance on Five-Year Reviews (OSWER Directive 9355.7-03BP, June 2001), EPA must conduct statutorily required FYRs. FYRs were completed for the Site in 1992, 1998, 2003, 2008 (addendum report 2009), 2013 and 2018.

The remedy at OU1 is protective of human health and the environment because source remediation was completed, OU1 is located within the Town of Gray groundwater ordinance zone that prohibits any use of groundwater, and an environmental covenant for the McKin property has been recorded.

The remedy at OU2 is currently protective of human health and the environment because OU2 is located within the Town of Gray ICZ that prohibits any use of groundwater. In addition, the water rights of sub-dividable properties within OU2 have been purchased by the Settling Parties adding another layer of institutional controls. Element 8 of the Amended Consent Decree requiring abandonment of residential wells located in the ICZ has been completed and properties within OU2 will be notified every five years of the groundwater ordinance established by the Town of Gray as addressed in the Revised February 2022 LTMP.

VIII. Site Completion Criteria

This Site meets all the site completion requirements as specified in OSWER Directive 9320.2-22, *Close-out Procedures for National Priorities List Sites* (dated May 2011). All remedial activities at the Site are complete and the Site poses no unacceptable risk to human health or the environment. The only remaining CERCLA activities to be performed at the Site are Long-Term Monitoring for remedy effectiveness, O&M, and Five-Year Reviews. Therefore, EPA has determined that no further response action is necessary at the Former McKin Company Superfund Site.

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APPENDIX A
DECEMBER 6, 2021 SITE INSPECTION PHOTOS



Entrance to the Former McKin Company Superfund Site. Picture was taken on December 6, 2021 during the FCOR Site visit.



Former McKin Company Superfund Site looking Northwest towards an infiltration gallery. Picture was taken on December 6, 2021 during the FCOR Site visit.



View of the Former McKin Company Superfund Site looking North from inside the entrance of the property. Picture was taken on December 6, 2021 during the FCOR Site visit.



View of Monitoring Wells MW-401A & MW-401C located at the Northeast corner of the Site. Picture was taken on December 6, 2021 during the FCOR Site visit.