SEVENTH FIVE-YEAR REVIEW REPORT FOR LIBBY GROUND WATER CONTAMINATION SUPERFUND SITE LINCOLN COUNTY, MONTANA

Prepared by

U.S. Environmental Protection Agency
Region 8
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LIST OF ABBREVIATIONS AND ACRONYMS

µg/L	microgram(s) per liter
bgs	below ground surface
CAMU	Corrective Action Management Unit
CGA	controlled groundwater area
CH2M	CH2M HILL, Inc.
Champion	Champion International Corporation
COC	contaminant of concern
dioxin TCDD	2,3,78-tetrachlorodibenzo-p-dioxin
DNAPL	dense nonaqueous phase liquid
ELF	Expanded Landfarm
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FFS	focused feasibility study
FYR	five-year review
HQ	hazard quotient
IC	institutional control
IP	International Paper
ISB	in-situ biosparging
LNAPL	light nonaqueous phase liquid
LTU	land treatment unit
MCL	maximum contaminant level
mg/kg	milligram(s) per kilogram
Montana DEQ	Montana Department of Environmental Quality
N/A	not available
NAPL	nonaqueous phase liquid
NL	not listed
O&M	operations and maintenance
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCP	pentachlorophenol
PFAS	per- and polyfluoroalkyl substances
PRP	potentially responsible party
RAO	remedial action objective
ROD	Record of Decision
RSL	regional screening level
SAETS	source area extraction and treatment system
site	Libby Groundwater Contamination Superfund Site
TI	technical impracticability

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 Section 121, consistent with the National Contingency Plan (40 *Code of Federal Regulations* Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the seventh FYR for the Libby Ground Water Contamination Superfund Site (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 greater than levels that allow for unlimited use and unrestricted exposure.

The Site consists of two operable units (OUs), both of which are addressed in this FYR report. OU1 addresses the alternative drinking water supply initiative, and OU2 addresses contaminated soil and groundwater in the upper and lower aquifers.

The protectiveness determination of the Site is currently deferred. More work is needed to determine the current protectiveness of the lower aquifer remedy. Portions of the site in or near the maximum extent of the contaminated groundwater plume do not have controls in place to prevent the drillings of wells for irrigation or human consumption. In addition, the use of PFAS at the Site is currently unknown and should be investigated.

EPA Remedial Project Managers Maggie Ogden and Jason Rappe led this FYR. Participants included Montana Department of Environmental Quality (Montana DEQ) Project Manager Melody Wunderlin, EPA Community Involvement Coordinator (CIC) Beth Archer, and EPA FYR contractor CH2M HILL, Inc. (CH2M). The review began on July 10, 2024.

Site Background

The Site, a former lumber mill and wood-treatment facility, is on the eastern edge of the city of Libby in northwest Montana (Figure 1). The facility treated timbers and poles with creosote and pentachlorophenol (PCP) from 1946 to 1969. Historical releases of wood-treating fluids at the Site resulted in impacts to the underlying soil and groundwater. Soil and groundwater remediation have been ongoing at the Site since the late 1980s under the oversight of the EPA and Montana DEQ (collectively, the Agencies). The Site includes two groundwater plumes (upper and lower aquifers) that extend laterally from a former waste pit area to the north-northwest as well as contaminated soil areas and remedial features underlying the original wood-treating facility (Figures 1, 2, and C-1). The former mill property is also OU5 of the Libby Asbestos Superfund Site, where the only contaminant of concern (COC) being addressed is asbestos. This OU was partially deleted in 2024.

The former mill property is used for light industrial, commercial and recreational purposes. A portion of the former mill property is owned by Lincoln County Port Authority (LCPA). The LCPA has sold some of its property to Noble Investment. Noble Investment is currently developing the area for industrial and commercial uses. Plans include new infrastructure, including new water and sewer services, and roads into the planned development area.

Since 2020 new features within the Site include:

- New concrete plant across from the fire pond with production wells into the upper and lower aquifer.
- Wildcat Custom Homes.
- Studio 1889 Furniture.
- Demolition of the old mill buildings.

- Cabinet Mountain RC raceway by the fish pond.
- Construction of a new swimming pond.

The topographic relief at the Site is relatively flat and dips gently toward the north-northeast. Underlying the Site are two main aquifers separated by a leaky aquitard. The upper aquifer occurs from the water table surface (5 to 30 feet below ground surface (bgs)) to about 70 feet bgs and is unconfined. Three upper aquifer subunits with differing hydrogeologic properties or contaminant impacts have been characterized, including the shallow, middle and deep subunits. The lower aquifer consists of alluvial deposits and occurs from 110 to 190 feet bgs. The upper and lower aquifers are separated by the Intermediate Zone, a leaky aquitard. The groundwater flow direction is north-northwest toward the Kootenai River. PCP and polycyclic aromatic hydrocarbons (PAHs) are the primary contaminants of concern (COCs) at the Site. They exist as both non-aqueous phase liquid (NAPL) and dissolved phase in groundwater.

Local residents historically used the upper aquifer (typically the shallow subunit) groundwater for drinking and irrigation. A city ordinance now prohibits drilling groundwater wells for human consumption or irrigation in the city of Libby. Instead, city residents use public water for human consumption and irrigation.

Onsite surface water features include the fire pond, fishing pond, and Libby Creek, which runs along the eastern side of the Site. The Kootenai River, which flows to the northwest, is north of the Site and is a major river system of regional groundwater discharge used by the public for fishing, boating and other recreational activities.

Appendix A provides a list of the Site-related resources referenced in this FYR report. Appendix B provides the Site's chronology of events.

Figure 1: Site Vicinity Map

FIVE-YEAR REVIEW SUMMARY FORM

Site Name: Libby Ground Water Contamination		
EPA ID: MTD980502736		
Region: 8	**State:** MT	**City/County:** Libby/Lincoln
NPL Status: Final		
Multiple OUs? Yes	**Has the Site achieved construction completion?** Yes	
Lead agency: EPA		
Author name (Federal or State Project Manager): Jason Rappe, Maggie Ogden, with contractor support provided by CH2M		
Author affiliation: EPA Region 8 and Jacobs		
Review period: 7/10/2024 through 7/7/2025		
Date of site inspection: 10/4/2024		
Type of review: Statutory		
Review number: 7		
Triggering action date: 7/16/2020		
Due date *(five years after triggering action date)*: 7/16/2025		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Beginning in 1983, the EPA performed four phases of site investigative work. The results found that wood-treating compounds in the upper aquifer were migrating offsite. Based on 1984 sampling data, in 1985, Champion International Corporation (Champion), successor to the St. Regis Company, offered to pay the owners of contaminated wells to use municipal water. The EPA conducted field investigations in 1985 and 1986, and approval to implement an alternate water supply followed shortly thereafter.

A 1986 baseline human health endangerment assessment prepared as part of the feasibility study and a second baseline endangerment assessment in 1988 identified unacceptable risks to residential populations and industrial and construction workers. Based on these assessments, the EPA determined that residential exposure to groundwater for domestic use would result in unacceptable risks. The primary COCs for groundwater at the Site are PCP and PAHs. Benzene, dioxin/furans, and arsenic are also groundwater COCs based on their association with historical wood-treating practices. However, concentrations of these constituents are not as widespread at this Site. The EPA determined that direct exposure to soils in the waste disposal pit area, the former butt dip area, and the former tank farm would result in unacceptable risk under a residential or industrial land use scenario. Primary COCs for soils include PCP, PAHs and dioxins/furans.

Response Actions

Between 1946 and 1969, J. Neils Lumber Company, followed by St. Regis Company, operated a wood-treatment mill onsite. Its operations contaminated soil and groundwater at several locations. After wood-treating operations ceased in 1969, St. Regis Company continued to own the Site property until 1985, when Champion purchased it. Operations included periodic hauling of sludge from the wood-treating fluid tanks to waste pits. The Montana Department of Health and Environmental Sciences Water Quality Bureau first detected wood-treating compounds in groundwater in 1979 when water from a newly installed residential drinking water well smelled of creosote. In 1980, an initial site investigation by the EPA found creosote, PAHs and PCP in 3 of the 11 residential wells sampled. The EPA identified the wood-treating operations at the former Champion property—notably a tank farm, butt dip area, and waste disposal pits—as the sources of the groundwater contamination and NAPL (Figure 1).

The EPA placed the Site on the Superfund program's National Priorities List in September 1983. The St. Regis Company (the original potentially responsible party (PRP)) entered into an Administrative Order on Consent with the EPA in October 1983 to begin remedial investigations, feasibility studies, and remedial action.

The EPA issued the Site's OU1 Record of Decision (ROD) in September 1986. The remedial action objective (RAO) for OU1 was to significantly reduce or eliminate human exposure to contaminated groundwater as an interim remedy. The 1986 ROD provides for the following:

- An ordinance by the city of Libby preventing the installation of new water wells that would provide water for human consumption or irrigation in the upper and lower aquifers within the limits of the city of Libby[1]
- A Buy Water Plan, in which the PRP offered to plug and abandon domestic wells within the aerial extent of groundwater contaminated by the Site, hook residents up to city water (if not already), and offered financial compensation for the increased cost of using city water for irrigation

The EPA issued the Site's OU2 ROD in December 1988. The remedial action objectives (RAOs) for OU2 were to reduce human exposure to both the soil and groundwater COCs. Two Explanations of Significant Differences (ESDs), the first in 1993 and the second in 1997, modified the remedy selected in the 1988 OU2 ROD. In 2020, the EPA issued an OU2 ROD Amendment.

The major components of the original OU2 remedy (1988 ROD, 1993 and 1997 ESDs) include the following:

- Excavation and consolidation of contaminated soils from identified source areas[2] (Figure C-1 in Appendix C)
- Onsite soil treatment via biodegradation (i.e., landfarming)
- Use of proprietary controls for property within the Site identifying locations of hazardous areas and land use restrictions to limit use to industrial or commercial use
- In situ bioremediation of groundwater beneath the waste pit areas
- NAPL source area extraction, treatment, and reinjection
- Groundwater use restriction through: (1) within Libby city limits, the ordinance preventing the installation of new water wells for human consumption or irrigation in the upper and lower aquifers and (2) in portions of Lincoln County outside of the Libby city limits, other groundwater use restrictions
- Monitoring activities
- Deed restrictions for the portion of the Site with contaminated soils

In the 1993 OU2 ESD, the EPA determined that active remediation in the lower aquifer was technically infeasible via a technical impracticability (TI) waiver and updated the remedy for the lower aquifer (institutional controls

[1] The city ordinance was included in both the OU1 interim remedy and the final OU2 remedy.

[2] Contaminated soil was excavated based on the exceedance of the total carcinogenic PAH cleanup goal. The 1988 ROD selected total carcinogenic PAHs as the indicator cleanup level because PAHs were ubiquitous in the three waste areas and were found to be co-located with other COCs.

(ICs) and monitoring). The 1993 OU2 ESD for the lower aquifer discussed the apparent stability of plumes in both aquifers and, consequently, that migration control was not required. The ESD required long-term monitoring to determine if the contaminant plumes are moving and to ensure protection of human health. The TI waiver concluded that if contaminant plumes are shown to migrate in the future, protectiveness will be reassessed. The PRP submits results of the lower aquifer monitoring program to the Agencies annually. The Agencies assess modifications to the monitoring program at the FYR. The 1993 OU2 ESD also removed soil cleanup goals for several COCs. The 1997 OU2 ESD revised soil and groundwater cleanup goals to address the updated federal and state maximum contaminant levels (MCLs) and risk assessment calculations. Table 1 lists the final soil cleanup goals for the land treatment unit (LTU).

Table 1: Soil Contaminant of Concern Cleanup Goals

Soil COC	ROD Cleanup Goals (mg/kg)[a]
Total carcinogenic PAHs	88[b]
Acenaphthene	166
Anthracene	33
Fluorene	250
Fluoranthene	250
Chrysene	59,400
Benzo(a)anthracene	594
Benzo(b)fluoranthene	594
Benzo(k)fluoranthene	5,940
Benzo(a)pyrene	59
Indeno (1,2,3-c,d)pyrene	594
Dibenzo(a,h)anthracene	59
PCP	36
2,3,7,8-Tetrachlorodibenzo-p-dioxin (dioxin TCDD)	0.0029

Notes:
[a] Cleanup goals were provided in the 1997 OU2 ESD unless otherwise noted.
[b] This cleanup goal was set in the 1988 OU2 ROD, used for contaminated soil excavation.
Soil cleanup goals are site specific and risk based using a construction worker exposure scenario.
mg/kg = milligram(s) per kilogram

Because of ongoing issues with meeting cleanup goals in the NAPL-impacted portions of the upper aquifer, the EPA, in consultation with Montana DEQ, revised the cleanup strategy for the upper aquifer with a focus on areas with remaining impacts (Areas 1, 2, and 3; Figure 2). The EPA issued the OU2 ROD Amendment in April 2020. The updated RAOs include the following:

- Prevent ingestion of upper aquifer groundwater with site-related COCs that exceed revised groundwater cleanup levels.
- Protect human health and the environment by reducing site-related COCs in upper aquifer groundwater to preliminary revised groundwater cleanup levels.

The updated remedy in the 2020 OU2 ROD Amendment consists of the following changes:

- Replace the current source area extraction and treatment system (SAETS) with in-situ biosparging (ISB) in the NAPL source area (Area 1).
- Add ISB to the area downgradient of the NAPL source area (Area 2).
- Continue monitored natural attenuation for the dissolved plume area (Area 3).
- Incorporate updated performance standards for groundwater, based on current state and federal standards.

- Institutional controls and monitoring, including well drilling restrictions, water use restrictions, and deed restrictions, retained from the current OU2 remedy and improved if feasible.
- Continue all other aspects of the 1988 OU2 ROD.

The 2020 OU2 ROD Amendment focuses on the following areas of the Site (Figure 2):

- Area 1 (2.7 acres) includes the former waste pit source area that contains predominantly residual (immobile) NAPL and the highest groundwater contamination concentrations.
- Area 2 (33 acres) includes the former tank farm source area and the residual NAPL that historically migrated away from the former sources.
- Area 3 (98 acres) includes the area containing only dissolved-phased COC contamination in the upper aquifer (beyond the extent of observed NAPL).

Upper aquifer remediation areas were developed on the basis of COC concentrations in groundwater and the interpreted presence of NAPL in the upper aquifer. Selecting remediation areas in this manner allowed for evaluating more rigorous treatment technologies in the areas that pose the greatest risk to human health (i.e., areas of the upper aquifer with the highest COC concentrations) and those areas that serve as a continuous source of groundwater contamination (i.e., areas of the upper aquifer with the greatest NAPL impacts).

Table 2 lists the groundwater cleanup levels from the 1997 OU2 ESD and the groundwater cleanup levels in the 2020 OU2 ROD Amendment for the upper aquifer. Although the COCs in the upper aquifer consist of PCP, PAHs, benzene, and arsenic, the distribution of PCP in groundwater has the largest vertical and horizontal extent. The extent of the contamination of all COCs is within the extent of the PCP plume; therefore, the PCP plume will be referred to more frequently in this document and other site documents.

Table 2: Groundwater Contaminants of Concern and Cleanup Goals for the Upper Aquifer

Groundwater COC	Cleanup Goals 1997 ESD (µg/L)	Cleanup Goals 2020 ROD Amendment (µg/L)
Pentachlorophenol	1	1[a]
Benzene	5	5[a]
Arsenic	50	10
Dioxin (TCDD)	0.00003	0.00003
Chrysene	0.2	50
Benzo(a)anthracene	0.1	0.5
Benzo(b)fluoranthene	0.2	0.5
Benzo(k)fluoranthene	0.2	5
Benzo(a)pyrene	0.2	0.2[a]
Indeno (1,2,3-c,d)pyrene	0.4	0.5
Dibenz(a,h)anthracene	0.3	0.05
Acenaphthene	NL	70
Anthracene	NL	2,100
Fluoranthene	NL	20
Fluorene	NL	50
Naphthalene	NL	100
Pyrene	NL	20

[a] Cleanup level is based on the MCL. All other cleanup levels are based on Montana DEQ-7 groundwater quality standards.
µg/L = microgram(s) per liter
NL = not listed

Status of Implementation

OU1

The OU1 interim remedy consists of an alternate water supply and ICs. The remedy started in 1986. The interim remedy for OU1 includes the following:

- A city ordinance prohibiting the installation of new water supply wells within city limits in the upper and lower aquifers for consumption or irrigation. The ordinance, passed in 1986, is still in effect.
- An offer of an alternate water supply to Libby residents whose domestic wells were either contaminated or potentially contaminated by offsite contaminant migration in the upper aquifer. Residents who agreed to participate in the Buy Water Plan would obtain their water from Libby's public water system. Champion capped and locked domestic wells and provided the residents monetary compensation for costs incurred from using metered public water. The first FYR report stated that 35 residential well owners were part of the Buy Water Plan.
- Champion augmented the Buy Water Plan in 1997 by offering to reimburse affected well owners with $2,000. In return, the well owners allowed Champion to permanently seal and disable their wells according to state well abandonment regulations. The second FYR report stated that Champion abandoned and sealed 44 residential wells. Effective June 20, 2000, Champion became a wholly owned subsidiary of International Paper Company (IP). On December 31, 2000, Champion was merged into IP. IP, the PRP, reported one additional abandoned well (mentioned in the 2020 FYR report).
- Champion also made 12 payments of $30,000 per year to the city of Libby for a fixed amount of irrigation water per household. Payments began in 1986. Champion and the city negotiated a new agreement in 2010, which has since expired. As of the 2020 FYR report, IP was in the process of negotiating a new agreement with the city of Libby.

OU2

The OU2 remedial design began in March 1989. Remedial action began in October 1989.

Soils and Source Area NAPL Extraction

The 1988 OU2 ROD identified three source areas – the tank farm, butt dip area, and waste disposal pits. These source areas were removed because they were potential sources of groundwater contamination. The selected remedy was to excavate soils in these source areas, with onsite treatment via landfarming. Once the treated soils met the cleanup goals (Table 1), they would be stored in an LTU. Excavation limits were defined as the depth to groundwater or until remaining soils did not exceed the 88 mg/kg PAHs cleanup goal.[3] Excavated areas were backfilled with clean fill.

The LTU consists of two, 1-acre, lined impoundments. In 1998, to accelerate completion of the soil remedy, the PRP constructed an additional 10-acre land treatment area called the Expanded Landfarm (ELF) (Figure 2). The ELF has been operating since 1998 with periodic cultivation and irrigation. The ELF system has been effective at degrading PAHs and PCP; however, it has not been as effective at degrading dioxin/furan compounds.

Before the 2020 FYR, soils remained in the ELF because dioxins in the soils exceeded the cleanup level. The PRP submitted a technical memorandum to the Agencies on July 9, 2018, which proposed a land treatment closure approach based on the soil sample results. In 2020, the Agencies reclassified the LTU as a Corrective Action Management Unit (CAMU) (EPA 2020a). CAMUs are special units created under Resource Conservation and Recovery Act (RCRA) to facilitate treatment, storage, and disposal of hazardous wastes which allows for an in-place closure that meets applicable or relevant and appropriate requirements (ARARs). The OU2 ROD discusses in general terms the need for a protective cap with post-closure care after soil treatment is complete; however, it did not select a specific method to close the LTU that would be consistent with the RCRA ARARs. The CAMU

[3] Contaminated soil was excavated based on the exceedance of the total carcinogenic PAH cleanup goal. The 1988 ROD selected total carcinogenic PAHs as the indicator cleanup level because PAHs were ubiquitous in the three waste areas and were found to be co-located with other COCs.

provisions in RCRA were not added until 1993, therefore, it was not possible in 1988 when EPA selected the OU2 remedy for EPA to select the CAMU as the closure approach. The ARARs were clarified in the 2020 "Minor Modification to the Operable Unit 2 Remedy" memorandum, finalizing the closure approach. No other technical changes to the LTU were required.

The SAETS, constructed in 1991, recovers both NAPL and contaminated groundwater from the upper aquifer contaminated by the waste pit area. The SAETS consists of two different treatment systems; a fixed film bioreactor system for treating contaminated groundwater, and a coalescing oil/water separator system for free product removal.

The fixed film bioreactor system treats water pumped from well 9006 by passing the contaminated water through a 10,000 gallon oil/water separator, then two 10,000 gallon fixed film bioreactors (in series). Free product from the oil/water separator is pumped to a free product accumulation tank. Treated water is injected back into the ground through an infiltration ditch. The fixed-film bioreactors have degraded more than 38,000 pounds of total PAHs and 7,500 pounds of PCP since 1991. The bioreactor system will continue to be operated until the 2020 amended remedy infrastructure is in place, which is anticipated winter 2025. At that time, the fixed film bioreactor will be shut down and decommissioned, so it does not interfere with the amended remedy.

The coalescing separator system treated the contaminated water pumped from wells 9008 and 9009 by sending it through a coalescing oil/water separator. Free product recovered from the coalescing separator was pumped to an accumulation tank for proper disposal. Water separated from this system was pumped to the infiltration gallery. This system was operated until August 15, 2023, when it was shut down as part of a planned phased decommissioning plan when the ISB systems required in the 2020 ROD Amendment became operational. The coalescing tank will be used in 2025 to clarify development water from the Area 1 deep sparge well installed in 2025.

A total of 37,816 gallons of free product had been shipped offsite from both the bioreactor and coalescing oil/water separators as of 2023. Approximately 31 gallons was measured in the free production accumulation tank as of the writing of the 2024 SAETS report (March 2025).

In the mid-1990s, a NAPL recovery program, separate from the SAETS, was implemented in the vicinity of the former tank farm area to monitor and remove NAPL, if practical, from groundwater contaminated by the former tank farm area. The NAPL monitoring program is ongoing and consists of 29 wells. Between 1993 and 2023, over 70 gallons of light NAPL (LNAPL) was recovered from two wells (3031.1 and 3039.1). However, recovery of LNAPL from these wells was not included in the updated 2023 Groundwater Monitoring Plan and NAPL recovery has been discontinued. NAPL gauging of the wells still occurs, but monitoring is now done under the Remedial Action Operations and Performance Monitoring Plan. The plan monitors the NAPL source mass and solubility of COCs from NAPL to assess the remedy effectiveness.

Groundwater

The remedy for the upper aquifer originally consisted of two in situ bioremediation systems:

- An intermediate injection system in the former tank farm area (Figure C-1) that operated from 1987 to 1997. This system is separate from the SAETS that is treating water from the former waste pit area.
- The boundary injection system, about 1,000 feet downgradient of the intermediate system, that operated from 1993 to 2003.

The EPA approved the discontinuation of both systems because, with the presence of trapped NAPL in the upper aquifer, they were no more effective than natural attenuation in reducing dissolved-phase PCP and PAHs to cleanup levels. Following the shutdown of these two systems in 2003, the remedy transitioned into the existing long-term groundwater monitoring program, with ongoing adjustments to support monitoring optimization.

A comprehensive groundwater monitoring program began in fall 1991 to evaluate the overall distribution of contamination in the upper aquifer. Data collected from the groundwater monitoring program indicate that the dissolved-phase plume in the upper aquifer likely extends roughly 1.25 miles, starting at the north edge of the

LTU and continuing northwest to below the Highway 37 bridge. PCP, the most widespread groundwater COC, defines the dissolved-phase plume.

NAPL is distributed throughout the upper aquifer in a complex manner and is most frequently observed near the base of the upper aquifer near the former waste pit where the source area extraction wells are screened. The estimated area of upper aquifer impacted is about 120 acres.

Based on the recommendations in the 2010 FYR report, additional groundwater characterization work for the upper aquifer was undertaken to better delineate the extent of the dissolved-phase plume, understand the nature and extent of NAPL in the upper aquifer, evaluate newer remedial technologies, and develop a numerical groundwater flow and transport model.

The PRP completed the following additional studies and activities between 2011 and 2016 under oversight by the Agencies:

- Conducted a vapor intrusion investigation from 2011 to 2013 to assess vapor intrusion as a potential exposure pathway. Results indicated no evidence of any vapor intrusion
- Re-evaluated groundwater cleanup levels based on current federal and state standards, resulting in the 2020 ROD Amendment with revised RAOs and cleanup levels incorporated
- Conducted laboratory treatability studies to evaluate hot water/steam-enhanced extraction and ISB technologies for removing NAPL and reducing dissolved-phase COCs in groundwater
- Led a field pilot study for ISB to determine specific parameters related to how well it may work at the Site
- Collected additional NAPL and groundwater samples needed to support conceptual design and development of remedial alternatives

All this information was compiled in a 2018 Focused Feasibility Study (FFS) report to support the 2020 OU2 ROD Amendment.

The PRP completed the following additional studies and activities between 2020 and 2024 under oversight by the Agencies:

- Completed work plans for the upper aquifer remedial design, Area 2 in-situ biosparging pilot test, remedial action work for the upper aquifer, and the LTU closure design
- Completed yearly groundwater monitoring activities
- Developed a Materials Management Plan for OU2
- Provided reports for the in situ pilot test, landfarm operations, remedial action operations, and performance monitoring plan

Remedy construction for the Area 2 ISB activity was completed in 2024. The Area 1 ISB system is currently in progress and planned to be constructed in phases through at least 2025, with plans to be operational in spring 2026.

Construction for the Area 2 ISB includes:

- New metal building for the treatment system
- Installation of 29 new in-situ biosparging barrier wells, including the air piping routed to the wells
- Installation of Air System for the in-situ biosparging wells, including:
    - New air compressor
    - Demister and wet receiver tanks
    - Air dryer systems
    - Air injection well manifold system

- 30 air injection lines, plus two spare lines

Construction for the Area 1 ISB includes:

- Demolition and discontinuation of the coalescing oil/water separator system
- Installation of 17 air transfer wells (ATW) for Phase I. Per the remedial design, a total of 62 wells are planned to be installed. However, the PRP requested a phased approached of well installation. In the review of observations of the performance of the Area 2 ISB, modifications were made to the air transfer well construction. A phased installation will allow the performance of the ATWs using the modified design to be evaluated while operating and providing protection against pressure accumulation in the deep subunit of the upper aquifer.

Institutional Controls Review

As required in the 1988 OU2 ROD, a deed restriction is in place on the former mill property area of the Site identifying the locations of the waste disposal pit area, former butt dip area, and former tank farm area and restricting the future land use of these source areas. The deed restriction is meant to alert the owner to the presence of a Superfund site and prohibits actions that would interfere with the remedy. The soil cleanup goals for the Site are based on commercial and industrial land use. Although current property zoning is commercial and industrial, and expected to remain so, no mechanism is in place to ensure future land use at all areas within the Site does not change. According to LTU Remedial Design Workplan, deed restrictions will be placed on the property encompassing the LTU after the LTU is closed and capped per the design. These restrictions are meant to prohibit activities that would comprise the integrity of the final capped LTU. The ELF is planned to be planted with native vegetation after the final lift is removed and sampling indicates no risk.

The EPA's 1986 ROD relied on a local ordinance, passed by the city, that prohibits well drilling for human consumption and irrigation. Additionally, the Buy Water Plan was initiated as an interim remedy to provide residents with monetary compensation for using city water in lieu of their existing wells. The PRP and the city also signed an incentive agreement to compensate water users to incentivize compliance with the new groundwater ordinance by paying the city directly. The most recent incentive agreement was signed in June of 2025. There are some wells within the city limits that existed before the ordinance. These wells are used for irrigation and are not for household use. The EPA is attempting to strengthen public awareness of groundwater contamination, particularly for owners of existing wells and new property owners in the newly developed areas. This will be done through notices, fact sheets, and additional community meetings.

Currently, there are no restrictions on the installation of wells or groundwater use outside the city limits within the county. Outside of the city ordinance boundaries, there are areas with current groundwater contamination, and areas where groundwater contamination could migrate or where human activity (pumping groundwater wells) could cause the contaminated groundwater to spread. The EPA and MDEQ identified a controlled groundwater area (CGA) as the most effective institutional control for the Site to prevent the installation of new wells. A CGA is a rulemaking process under Montana law, which Montana describes as the "authority to designate a controlled ground water area to prevent new appropriations or limit certain types of water appropriations due to water availability or water quality problems." MCA 85-2-501 *et. seq*. The CGA rulemaking process requires a petitioner who is a state or local public health agency, municipality, county agency, or conservation district, etc. Discussions for a proposed controlled groundwater area (CGA) between the EPA, MDEQ, the city of Libby, and Lincoln County are ongoing to identify a petitioner for the CGA.

The EPA initiated a notification process with the local Montana 811 whereby the PRP's contractor, Arrowhead Engineering, provides the locations where remedial action is taking place when a call for a utility locate is received. The EPA and MDEQ are updated quarterly of activities from Arrowhead and the PRP. All Site remedial action infrastructure is identified through mapping, and site knowledge, of potential conflicts due to planned work or excavation activities into the plume. This system started in July 2024, with 132 responses and reports that had been disseminated as of May 2025.

Montana 811 is a Montana utility locate service. Montana state law (Montana Code Annotated Section 69-4-503) requires that all parties planning to excavate, drill or perform other subsurface activities notify the designated

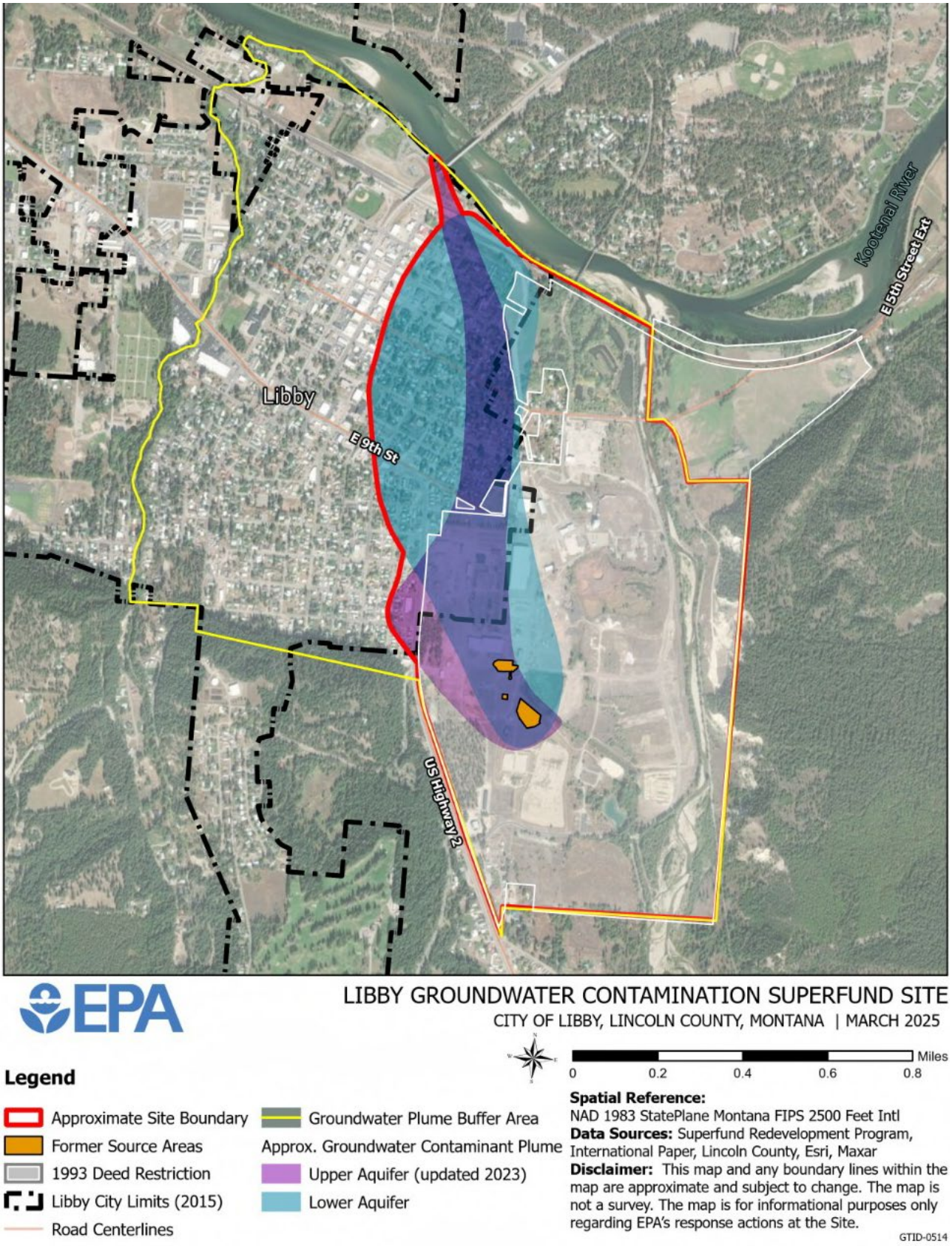
Montana 811 (one-call) notification center prior to starting these activities. A person provides Montana 811 the location and type of work being performed. Then the Montana 811 call center coordinates with all known utilities within the location provided by the caller. This system is similar to the system established for the ground-disturbing activities and asbestos containing material in the Libby area. In addition to protecting remedial action-related infrastructure, this system provides an update on any new well installations in the buffer area.

Table 3 summarizes the planned and implemented controls for the Site.

Table 2*:* Summary of Planned and/or Implemented ICs

Media, Engineered Controls, and Areas That Do Not Support Unlimited Use and Unrestricted Exposure Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented or Planned and Date
Groundwater	Yes	Yes	City of Libby	Prohibit installation and use of groundwater wells used for human consumption or irrigation	City ordinance for properties within city of Libby corporate limits 1986
Groundwater	Yes	Yes	Impacted parcels outside the city of Libby in Lincoln County	Discontinue the use of groundwater wells for human consumption or irrigation	Buy Water Plan 1986 (Inactive)
Soil in source areas	Yes	Yes	Source areas: waste disposal pit area, former butt dip area, and former tank farm, and other Site property	Prohibit activities that could disturb the source areas and treatment areas and restrict land use in these areas	Restrictive covenant attached to deed 1993

Figure 2. Institutional Control Map



Systems Operations, Operations and Maintenance

Soils

The Annual Landfarm Operations Reports describe operations and maintenance (O&M) and long-term monitoring activities performed at the LTUs. Operations include periodic cultivation and irrigation of the soils in the ELF. Once the soils in the ELF meet cleanup levels, soils are transferred to the LTU. Leachate collected in the LTU sumps undergoes quarterly sampling. All water collected from the sumps is directly discharged into the onsite infiltration trench. Three basic monitoring activities occur at the landfarm:

1. Soils sampling in the treatment zone to evaluate contaminant degradation, soil moisture and compliance with cleanup levels
2. Sampling of leachate from the collection sumps
3. Berm integrity inspections

In 2018, confirmation soil samples were collected from the ELF to assess PCP, PAH and dioxin degradation. Sampling indicates PAHs and PCP were less than their respective remediation goals. However, dioxin concentrations remain greater than the remediation goal. In general, samples are close to the dioxin cleanup goals, with the exception of a single congener that ranges from one to three orders of magnitude greater than its cleanup goals.

In 2020, the EPA reclassified the LTU to a CAMU allowing for the disposal of hazardous material. This change allowed for an update to the dioxin remediation goal, raising the allowable concentration that can be transferred to the LTU, while still meeting ARAR requirements. Since that time, soils in the ELF have met cleanup levels and have been transferred to the LTU per the LTU workplan and sample parameters. The volume of soil transferred from the last five years is summarized below:

- 2021 – 5,558 bank cubic yards transferred to the LTU. Approximately, the upper 0.4 feet of the ELF.
- 2022 – No soil transferred to the LTU.
- 2023 – 1,446 bank cubic yards transferred to the LTU. Approximately, the upper 0.4 feet of the ELF.
- 2024 – 5,169 bank cubic yards transferred to the LTU. Approximately, the upper 0.4 feet from five of the seven ELF plots.
- 2025 – No soil transferred to LTU.

Soil is placed in one-foot lifts and then compacted in the LTU. Before and after surveys are performed on the LTU and ELF for final volume calculations and soil tracking.

As of 2025, no contaminated soil remains in Plots 1 and 7. In April of 2025, the final soil lift on Plots 2 through 6 was transferred to the LTU. The ELF was confirmed free of contamination and will be seeded in June and in fall 2025 following the ELF closure plans of the 2022 LTU workplan. The LTU will remain open until the end of 2025 to allow for the disposal of any contaminated soil that meets the acceptance criteria of the 2024 Materials Management Plan during the development of the former mill property.

Source Area Extraction Treatment System (SAETS)

The SAETS Annual Operations Reports for each operational year describe O&M and long-term monitoring activities associated with the SAETS and performed at the Site. O&M activities at the Site have evolved as conditions have changed, but current O&M of the SAETS is adequate to ensure consistent system operation. The SAETS treated approximately 5.55 million gallons of oil-contaminated groundwater from the upper aquifer in 2024. In 2024, the bioreactor treatment system averaged nearly 90 percent removal for total PAHs and 93 percent removal for PCP while operating in the series mode.

As part of the 2023 Remedial Action Work Plan, the SAETS will be decommissioned following the installation of the Area 1 and Area 2 remedial action infrastructure including injection and air transfer wells and ISB equipment. The coalescing oil/water separator part of the SAETS was decommissioned in August 2023. The fixed film

bioreactor system part of the SAETS is planned to continue operation until the end of 2025 in accordance with the Final Source Area Extraction Treatment System Decommissioning Plan.

In-situ Biosparging System
The Area 2 ISB system began operation in September 2024 following the startup and monitoring listed in the upper aquifer Remedial Action Operations and Performance Monitoring Plan. Area 1 ISB is planned to begin operation in 2026.

The performance monitoring plan for the ISB includes four operations goals for both the ISB areas; these are:

- Maintain aerobic conditions in the target treatment zones.
- Maintain groundwater flow direction within acceptable limits.
- Enhance contaminate bio oxidation.
- Reduce mass discharge of COCs to Area 3.

Each of these operational goals have a specific sampling and assessment approach. Groundwater elevations and dissolved oxygen and oxidation/reduction potential of select wells were collected weekly for the first month after Area 2 ISB start-up and then quarterly for next two years. Microbial and COC concentrations will be sampled in selected wells annually. Results from all monitoring and data will be used to evaluate system effectiveness and optimization needs.

Groundwater Monitoring
Long-term groundwater monitoring at the Site occurs annually and includes collection of groundwater samples for chemical analysis and water levels from the monitoring well network. Upper and lower aquifer monitoring is conducted in accordance with the updated 2023 Groundwater Monitoring Plan. This new plan states that:

"*The objective of this Plan is to describe the collection of groundwater data in both the upper and lower aquifers to monitor: 1) perimeter monitoring wells to confirm the extent of the plume; 2) wells in the interior of the plume to track changes in contaminant concentrations; 3) field parameters to assess the potential for natural attenuation to maintain plume stability; 4) water level behavior (including groundwater gradients and direction); and 5) NAPL distribution."*

The lower aquifer monitoring program is designed to collect groundwater data at appropriate locations and frequencies to monitor the location of the contaminant plume and any changes in contaminant concentrations resulting from the remedial actions in the upper aquifer. The plan divides the lower aquifer wells into two networks: Group 1L – Perimeter Monitoring Wells and Group 2L – Interior Monitoring Wells. Group 1L wells are sampled every two years, and Group 2L wells are sampled every year and analyzed for COCs.

The 2023 Groundwater Monitoring Plan was designed to collect groundwater data at appropriate locations and frequencies to monitor the location of the contaminant plume and monitor any changes in contaminant concentrations resulting from remedial actions. The 2023 plan divides both the upper and lower aquifer wells into two groups; A and B. Group A wells are sampled every year and are located within or near the plume. Group B wells are sampled every other year to confirm the aerial extent of contamination in the groundwater. All wells are measured for water level and LNAPL/DNAPL every year.

The upper aquifer Remedial Action Operations and Performance Monitoring Plan for monitoring ISB-related wells is used in conjunction with the wells in the 2023 Groundwater Monitoring Plan, but the two monitoring plans are separate from each other. Monitoring activities described in the upper aquifer Remedial Action Operations and Performance Monitoring Plan began when the Area 2 ISB startup occurred in September 2024. After ISB startup, wells for this system were also monitored for dissolved oxygen weekly for the first month, monthly for the first year, quarterly for the second year. After the second year, the monitoring frequency will be evaluated for appropriate monitoring needed based on data needs and trends.

Groundwater monitoring activities in the upper and lower aquifer are described in the data review section of this FYR report. The Site's monitoring program is examined annually to determine if the program can eliminate any wells or analyses.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR (Table 4) as well as the recommendations from the last FYR and the current status of those recommendations (Table 5).

Table 3: Protectiveness Determinations and Statements from the 2020 Five-Year Review

OU #	Protectiveness Determination	Protectiveness Statement
1	Short-term Protective	The OU1 remedy currently protects human health and the environment. However, for the remedy to be protective in the long term, the proposed CGA should be implemented for areas in Lincoln County.
2	Short-term Protective	The OU2 remedy currently protects human health and the environment. However, for the remedy to be protective in the long term, the following actions need to be taken: review the soil remedy for the LTU and determine if modifications are needed; review the soil remedy to ensure it is protective based on updated dioxin toxicity; implement the proposed CGA for areas in Lincoln County; and implement additional soil ICs for land use controls and restrictions on remaining waste areas including the waste pit area, ELF and LTU as needed.
Sitewide	Short-term Protective	The sitewide remedy currently protects human health and the environment. However, for the remedy to be protective in the long term, the following actions need to be taken: review the soil remedy for the LTU and determine if modifications are needed; review the soil remedy to ensure it is protective based on updated dioxin toxicity; implement the proposed CGA for areas in Lincoln County; and implement additional soil ICs for land use controls and restrictions on remaining waste areas including the waste pit area, ELF and LTU as needed.

Table 4: Status of Recommendations from the 2020 FYR

OU	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
2	Soil dioxin concentrations have remained elevated in the ELF so that removal to the LTU has not occurred. It is unclear if the soil remedy will attain cleanup goals. Also, dioxin toxicity has changed, and the cleanup goal may no longer be valid.	Review the soil remedy and determine if modifications are needed or if onsite disposal of treated soils can occur. Record any soil modified cleanup goals in a decision document as the EPA determines appropriate.	Completed	Updated in 2020 by the EPA. Minor modification to the OU2 remedy incorporates CAMU.	12/17/2020
1, 2	ICs are in place to prohibit groundwater use and the installation of new groundwater wells in the City of Libby, but no restrictions are in place to prohibit groundwater use and the installation of new groundwater wells in Lincoln County. Additionally, there are some wells within the city limits that existed before the ordinance and that may still be used for irrigation.	Implement the proposed CGA for areas previously identified in Lincoln County.	Under Discussion	The CGA was proposed but a petitioner has not been identified at this time. An 811-notification system has been put in place by the local 811 that will notify PRP, EPA, and Montana DEQ regarding utility locate calls in the area. This will help the agencies and PRP understand underground work in the OU.	Not applicable
2	ICs are in place to prohibit activities that could disturb waste left in place beneath clean fill. Industrial land use forms the basis for soil cleanup levels. Although current property zoning is for commercial and industrial uses, and is expected to remain so, no mechanism is in place to ensure future land use at all areas within the Site does not change.	Review the soil ICs and implement additional restrictions as needed for the ELF and LTU, and for the remainder of the Site in general if necessary.	Under Discussion	Deed restrictions for the ELF and LTU are planned to be implemented after closure.	Not applicable

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement, and Site Interviews

The EPA provided public notice by newspaper posting in *The Western News* on September 1, 2024, *The Kootenai Valley Record* on September 11, 2024, and in *The Montanian* on September 11, 2024 (Appendix D). The notice stated that the FYR was underway and invited the public to submit any comments to the EPA.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. The results of these interviews are summarized as follows:

- David Cosgriff, O&M contractor, provided an overview of the O&M activities at the Site, indicating maintenance is going well and there will be fewer maintenance activities when the ISB systems are operating.
- Kathi Hooper, Lincoln County Board of Health, has the impression that the Site has had a lot of work performed, but not much to show for it based on the complicated nature of the Site. Lately, she is receiving more calls of concern regarding reports that the developer is installing new groundwater wells in the area.
- Chris Noble and Tina Oliphant, local developers, have the impression that the remedy has not shown any progress in groundwater quality. Additionally, they have had difficulty coordinating and communicating with the PRP.
- Sam Sikes, the City Administrator, believes it is going to be difficult to clean up the aquifers and is concerned the PRP is becoming less involved, especially financially, because the funding support for water projects has stopped.
- Brent Teske, Lincoln County Commissioner and former Mayor, does not know if the remedy is working with the limited data he has seen. He thinks the biggest concern and impact are that the community cannot use the groundwater.
- Peggy Williams, Mayor of Libby, is concerned that the Site has not been cleaned up after 40 years and the PRP is not being held accountable. She thinks the EPA needs to do more to keep the community informed and involved.

Data Review

During this FYR period, the EPA collected the following soil and groundwater data to support evaluation of the OU2 remedy performance:

- Groundwater monitoring data for the upper and lower aquifers (annual reports from 2020, 2021, 2022 and 2023)
- Geophysical Work Plan and Logging Report (2022)
- SAETS operational data (annual reports from 2022 and 2023)
- ELF and LTU soil operations data (2021 and 2023)
- LTU Design and Work Plans (2020)
- Remedial Action Work Plan, including upper aquifer Remedial Action Operations and Performance Monitoring Plan (2023)

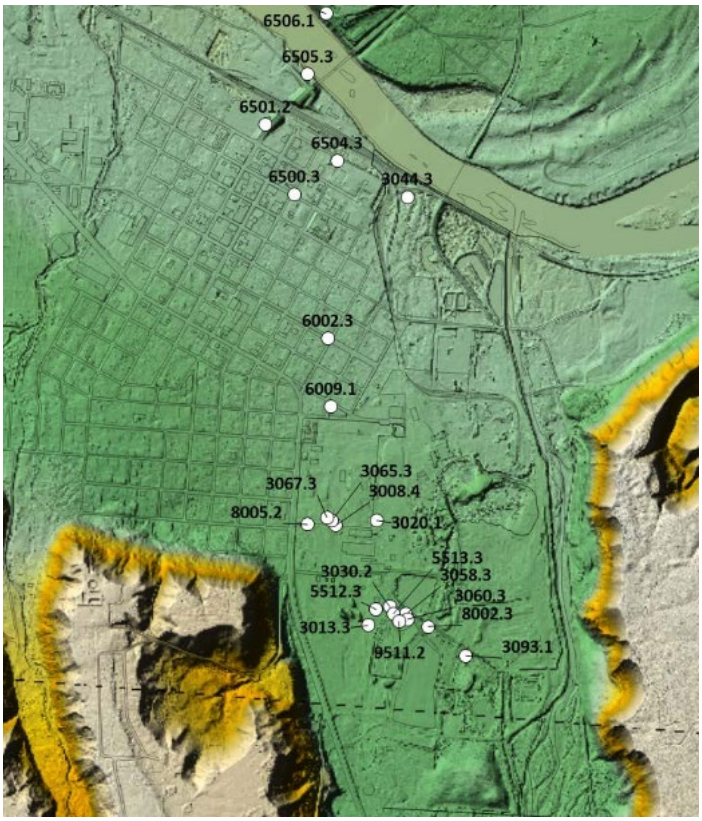
The LTU, SAETS, and remedial action operational data are discussed in the O&M section under Section II of this report. This data review will discuss groundwater monitoring conducted at the Site since 2020 to provide a current understanding of the extent of the contaminant plume and any changes in contaminant concentrations.

In August 2022, a geophysical study was performed using a natural gamma down-hole geophysical logging tool to evaluate the subsurface aquifers and geology that could influence groundwater flow. The study used 22 existing monitoring wells shown in Figure 3 below. The investigation clarified the upper aquifer's three subunits; a shallow, medium and deep. The investigation clarified the intermediate zone that separates the upper and lower aquifer. It appears that the vertical gradient between the lower and upper aquifers reverses as the distance to the

river decreases. Farther away from the river the groundwater flows from upper to lower, and closer to the river groundwater flows from the lower to the upper. However, the rate of flow between the upper and lower are much smaller than the horizontal flow of groundwater toward the river (Figure H-5)

The PRP performed plume analytics to evaluate the behavior of the primary COCs (PCP and naphthalene). Based on this analysis, the PRP identified the need for seven additional wells. These wells were installed in July 2023 (3011.4, 3069.1, 3071.1, 3072.1, 3073.1, 3074.1, 6020.4) all screened in the upper deep aquifer unit.

Figure 3. Downhole Geophysical Investigation Wells (reference the Figure 1 from AECOM Downhole Geophyiscal and Water-level Monitoring Plan June 2, 2022)



Upper Aquifer

The seven additional groundwater monitoring wells installed in July of 2023 were all installed in the upper aquifer to assist with performance monitoring. NAPL was confirmed at wells 3072.1, and 3074.1; these two wells were placed inside the estimated plume. Well 3069.1 was placed just outside the estimated NAPL plume and was found to contain NAPL in the well. The estimated NAPL plume was slightly adjusted to accommodate the presence of NAPL in this well. Additionally, LNAPL was found in 8 of the 140 upper aquifer wells during the 2023 groundwater level monitoring event; an additional 14 wells were found to contain dense nonaqueous phase liquid (DNAPL); and 5 additional wells were found to contain LNAPL during the 2023 DNAPL monitoring event.

Upper Aquifer Conclusions

PCP concentrations in the upper aquifer exceeded Site cleanup levels during this review period in a number of monitoring wells (20 wells in 2023).

Both the PCP and NAPL plume maps have been updated based on the data collected in 2023. The new PCP plume map connected the two previously separated plumes: the small plume near the Kootenai River and the large plume for the source area. The PCP plume was also contracted from west to east to make an overall thinner, longer plume that extends from the source area to Kootenai River (Figures H-2 and H-3). The NAPL plume slightly extends west to incorporate well 3069.1 results; otherwise, there were no noticeable changes (AECOM 2022f).

Based on the geophysical study, a sunken fluvial channel was observed within the plume area. It is thought that this is a paleochannel from an ancient path of the Kootenai River. Well 6020.4 (Figure H-3) was specifically drilled in this area to further define the channel and confirm the conceptual model. Based on results of the drill log and PCP in the well, the plume maps were refined to show this paleochannel as a pathway for contaminants in the deep subunit of the upper aquifer (Figure H-4).

The 2020 FYR suggested the PRP thought that increased PCP in the upper aquifer could be explained from an upward flow from the lower to the upper. Based on the geophysical study, while there is an upward flow closer toward the river, the rates are minimal compared to the horizontal flows so any concentration increases from the lower to the upper would be minimal.

Based on data from wells on the north side of the river, the plume does not extend across the river. Drilling has not occurred in the river to further define the leading edge of the plume. Sampling the Kootenai River for COCs may result in difficult to interpret results as the volume of the river will significantly dilute any concentrations.

During the fourth quarter 2024 Site team conference call, sampling macroinvertebrates was discussed with the PRP as an approach to identify contaminant discharge into the river. The PRP provided a presentation that indicated PCP degrades in a river system due to photolysis, sediment adsorption, biota uptake, and microbial degradation (within days to months). Additionally, any bioaccumulation from macroinvertebrates to fish to larger mammals is small. Studies indicate that fish accumulate PCP through direct water uptake versus ingestion. The concentration of PCP in the groundwater would be significantly reduced in the river.

Lower Aquifer
The EPA is still reviewing the lower aquifer groundwater data focusing on PCP concentrations and NAPL presence through the date of record.

Site Inspection
The FYR Site inspection took place on October 4, 2024. In attendance were David Cosgriff, from IP's consultant Arrowhead Engineering, and the EPA contractor Jesse Woodward, Project Manager from CH2M. The purpose of the inspection was to assess the protectiveness of the remedy. Appendices F and G provide the Site inspection checklist and photos. This inspection occurred during the ISB startup oversight.

Site inspection participants met at the Site field office and lab at 231 Port Boulevard to conduct the Site inspection and observe remedy components. After discussing current Site status, participants walked the Site to observe the waste pit treatment area, bioreactor building, monitoring wells, injection wells, LTUs and ISB. The O&M contractor communicated future development plans and potential conflicts with monitoring wells. The newly installed Area 2 ISB system was inspected during startup and appeared to be working as designed.

V. TECHNICAL ASSESSMENT

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

OU1
The interim remedy for OU1 is functioning as intended. The remedy for OU1 involved providing an alternate water supply source for Libby residents through the Buy Water Plan and adoption of a city ordinance prohibiting the installation of groundwater wells for human consumption. To support the remedy, the city of Libby and the PRP may need to reach an agreement for the continuation of the city ordinance. In order to protect areas outside of city limits, additional ICs are needed to provide similar protections. Additional ICs are becoming more essential as a developer is actively installing new wells outside city limits, but within the Site boundaries.

OU2 – Groundwater
The current remedy for OU2 is not functioning as intended because of the inability to meet RAOs in the intended timeframe. The coalescing oil/water system was discontinued in 2023 to prepare for the installation of the Area 1

in-situ biosparging system. The Area 1 ISB is scheduled to be operational by the end of 2026. The Area 1 ISB system startup and operation is planned to use a phased approach, so that 17 of the planned 62 wells will be installed (anticipated to be installed by the end of 2025) and operating in 2026. Based on data from the first phase of operation, additional wells would be installed in later years, if needed.

The Area 2 Biosparging System Transect became operational in September 2024. An evaluation of this system should be performed to assure the complete treatment of the upper aquifer. The evaluation should include the following questions:

1. Does the operation show an increase in dissolved oxygen at depth between injection wells?
2. Does the operation show shallow water receiving less dissolved oxygen than expected?
3. Is there any indication that upgradient groundwater is migrating around the biosparged zone?

The PRP installed additional wells in 2023 in response to an increase in PCP in downgradient wells and to help improve the conceptual site model of the Site for the upper aquifer.

A review of the lower aquifer is currently underway.

Institutional controls are in place to prohibit installation of new groundwater wells in the city of Libby. Institutional controls need to be expanded to portions of the Site not covered by the city ordinance. The EPA continues to strengthen public awareness of groundwater contamination, particularly for new property owners outside of the city limits, through local tabling, community meetings, and fact sheets. Further protections are necessary to prevent exposures to groundwater contamination and to prevent plume migration as a result of pumping from groundwater wells.

OU2 – Soil

Components of the soil remedy are functioning as intended. Previously excavated contaminated soils have been treated biologically in the ELF and transferred to the LTU. The RAOs and cleanup levels for soil dioxins were updated, as discussed previously, so that the LTU was reclassified as a CAMU and allowed for soils to be transferred from the ELF. The final lift from the ELF is expected to be transferred to the CAMU in 2025, and then the final cover system will be constructed on the LTU per the design submitted in 2022.

The PRP developed a material management plan to provide directions for development activities in the area. Contaminated soil encountered during development of the former mill property that meets the acceptance criteria can be disposed of in the LTU until closure, which is anticipated at the end of 2025. The complete extent of development is unknown at this time, but future contaminated soil handling and treatment is not currently identified.

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

OU1

The exposure assumptions and RAOs for OU1 remain valid. The RAO specified in the 1986 ROD was to significantly reduce or eliminate human exposure to contaminated groundwater. The Buy Water Plan and the city ordinance are still in place and the RAO has been met within the city of Libby.

OU2 – Groundwater

The exposure assumptions and RAOs for the OU2 remedy for the upper aquifer remain valid. The new ISB remedy for the upper aquifer is expected to be functioning in the Spring of 2026. A review of the lower aquifer data is currently underway.

Emerging contaminants were not addressed in the ROD, and historical activities align with areas where per- and polyfluoroalkyl substances (PFAS) are potentially found. On April 19, 2024, and April 25, 2024, the EPA finalized a rule that designated two types of PFAS chemicals as CERCLA hazardous substances and six types of PFAS chemicals with National Primary Drinking Water Regulation Maximum Contaminant Levels (MCLs),

respectively. PFAS are a group of man-made chemicals that have been used in various industrial applications due to their desirable properties, such as resistance to water, oil and stains.

While PFAS are not traditionally associated with wood preservatives like creosote or pentachlorophenol, they might be used in other ways within these operations. PFAS-containing wood lacquers and sealers are used for their unique chemical properties to enhance performance and durability. Additionally, PFAS have historically been used in fire suppression foams, particularly in aqueous film-forming foams.

The 1985 Phase III Field Investigation noted that the waste pits were burned for fire practice and to reduce the liquid levels once a month for the first three years, then once or twice a year thereafter. PFAS sampling has not been completed at the Site but there is a potential for PFAS to have been used in the wood treatment and at the waste pits.

OU2 – Soil

The exposure assumptions and RAOs for the OU2 remedy for soil remain valid. The excavation soil cleanup goals for total carcinogenic PAHs remain valid. The soil cleanup goals for the LTU were updated when the LTU changed to a CAMU.

A 2013 evaluation determined that vapor intrusion does not pose a risk under current site conditions. Conditions are expected to change with planned development of the former mill property. As conditions change, the EPA will ensure reassessment of the potential risk from vapor intrusion.

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 Five-Year Review:
None

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 2	**Issue Category: Remedy Performance**			
	Issue: The review for the lower aquifer is still underway and has not been completed.			
	Recommendation: Complete the lower aquifer review and determine if additional work is needed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
Yes	Yes	EPA	EPA/State	7/31/2027

OU(s): 1, 2	Issue Category: Changed Site Conditions			
	Issue: Fire suppression activities have occurred on the Site and the presence of PFAS is unknown.			
	Recommendation: On-site sampling is recommended to determine if there are any PFAS impacts from historical activities.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
Yes	Yes	PRP	EPA/State	7/31/2027

OU(s): 1, 2	Issue Category: Changed Site Conditions			
	Issue: ICs are in place to prohibit groundwater use and the installation of new groundwater wells in the City of Libby, but no restrictions are in place to prohibit groundwater use and the installation of new groundwater wells in Lincoln County. Current Deed Restriction does not adequately reflect current and future site conditions and does not restrict groundwater well drilling. Additionally, there is ongoing development in the county that may impact groundwater and soil excavation exposures.			
	Recommendation: Update property ICs to reflect current and future site conditions, implement a well ban outside the City of Libby limits within the county in areas impacted by contaminant plumes, and update the materials management plan for excavated contaminated soils handling and disposal.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	7/31/2027

OTHER FINDINGS

The following are recommendations that were identified during the FYR that may improve performance of the remedy, reduce costs, improve management of O&M, accelerate site closeout, conserve energy, and promote sustainability but do not affect current or future protectiveness:

- Conduct quarterly monitoring of select upper and lower aquifer wells near the downgradient extent of the PCP.
- Conduct more community engagement efforts to provide updates on project activities.
- Assist stakeholders on communications with the PRP as reasonable.
- Update the material management plan as needed.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
Operable Unit: 1	*Protectiveness Determination:* Short-term Protective	Click here to enter a date
The OU1 remedy currently protects human health and the environment. There are no currently known exposures related to the remaining existing wells across the Site. For the remedy to be protective in the long term, an IC should be implemented for areas in Lincoln County outside the city limits.		

Protectiveness Statement(s)		
Operable Unit: 2	*Protectiveness Determination:* Protectiveness Deferred	12/31/2027
For the remedy to be protective, the following actions need to be taken: Continue the evaluation of the lower aquifer remedy, determine if PFAS is impacting the Site, implement an IC for areas impacted by contaminant plumes in Lincoln County; implement additional soil ICs for land use controls and restrictions on remaining waste areas including the waste pit area, ELF and CAMU as needed.		

Sitewide Protectiveness Statement	
Protectiveness Determination: Protectiveness Deferred	12/31/2027
Protectiveness Statement: More work is needed to determine the current protectiveness of the lower aquifer remedy. On-site sampling is recommended to determine if there are any PFAS impacts from historical activities. Institutional controls do not adequately cover areas outside of the city limits, and so ICs should be implemented to prohibit well drilling across the Site.	

VIII. NEXT REVIEW

The next FYR report for the Site is required 5 years from the completion date of this review.

APPENDIX A – REFERENCE LIST

1986. *Record of Decision Libby Ground Water Superfund Site Lincoln County, Montana*. EPA Region 8. Updated December 1988.

1993. *Explanation of Significant Differences Libby Ground Water Contamination*. EPA Region 8. September.

1995. *Five-Year Review for Libby Ground Water Superfund Site Lincoln County, Montana*. EPA Region 8. January.

1997. *Explanation of Significant Differences Libby Ground Water Contamination*. EPA Region 8. January.

2000. *Second Five-Year Review Report for Libby Ground Water Site Libby, Lincoln County, Montana*. EPA Region 8. March.

2005. *Third Five-Year Review Report for Libby Ground Water Site Libby, Lincoln County, Montana*. EPA Region 8. March.

2010. *Fourth Five-Year Review Report for Libby Ground Water Site Libby, Lincoln County, Montana*. EPA Region 8. March.

2015. *Fifth Five-Year Review Report for Libby Ground Water Site Libby, Lincoln County, Montana*. EPA Region 8. September.

2019. *Proposed Plan for Record of Decision Amendment, Upper Aquifer Component of Operable Unit 2 for Libby Groundwater Contamination Superfund Site, Libby, Montana*. EPA Region 8. August.

2020a. *Minor Modification to the Operable Unit 2 Remedy, Libby Groundwater Contamination Superfund Site, Libby, Montana*. EPA Region 8. December.

2020b. *Record of Decision Amendment, Upper Aquifer Component of Operable Unit 2 for Libby Groundwater Contamination Superfund Site, Libby, Montana*. EPA Region 8. March.

2020c. *Sixth Five-Year Review Report Libby Ground Water Site Libby, Lincoln County, Montana*. EPA Region 8. September.

AECOM. 2017. *Technical Memorandum: NAPL Characterization Study for the Upper Aquifer for Libby Groundwater Site, Libby, Montana*. April.

AECOM. 2018. *Focused Feasibility Study for the Upper Aquifer for Libby Groundwater Site, Libby, Montana*. Revision 2. April.

AECOM. 2019. *Technical Memorandum: Lower Aquifer Well Cluster 6504 Drilling and Sampling Results for Libby Groundwater Site, Libby, Montana*. March.

AECOM. 2020a. *Controlled Groundwater Area Petition Supporting Information, Libby Groundwater Site, Libby, Montana*. May.

AECOM. 2020b. *Proposal to Manage the LTU Consistent with CAMU ARARs, Libby Groundwater Site, Libby, Montana*. July.

AECOM. 2020c. *Draft Upper Aquifer Remedial Design Work Plan, Libby Groundwater Site, Libby, Montana*. September.

AECOM. 2020d. *Work Plan: Pre-Design Investigation for the Land Treatment Unit Closure, Libby Groundwater Site, Liby, Montana*. October.

AECOM. 2021a. *Final Work Plan for Area 2 In-situ biosparging Pilot Test, Libby Groundwater Site, Libby, Montana*. Revision 1. March.

AECOM. 2021b. *Preliminary (30%) Remedial Design Report Area 1 of the Upper Aquifer, Libby Groundwater Site, Libby, Montana*. June.

AECOM. 2021c. *Remedial Design Work Plan Land Treatment Unit Closure Cover Design Modification, Libby, Montana*. Revision 1. July.

AECOM. 2021d. *Area 2 In-Situ Biosparging Pilot Test Work Plan Addendum, Libby Groundwater Site, Libby Montana*. August.

AECOM. 2021e. *Intermediate (60%) Remedial Design Report Area 1 of the Upper Aquifer, Libby Groundwater Site, Libby, Montana*. November.

AECOM. 2022a. *Pre-Final (95%) Remedial Design Report Land Treatment Unit Closure, Libby, Montana*. February.

AECOM. 2022b. *Preliminary (30%) Remedial Design Report Area 2 of the Upper Aquifer, Libby Groundwater Site, Libby, Montana*. March.

AECOM. 2022c. *Area 2 In-Situ Biosparging Pilot Study Report, Libby Groundwater Site, Libby, Montana*. April.

AECOM. 2022d. *Final (100%) Remedial Design Report Land Treatment Unit Closure, Libby, Montana*. May.

AECOM. 2022e. *Pre-Final (95%) Remedial Design Report Area 1 of the Upper Aquifer, Libby Groundwater Site, Libby, Montana*. June.

AECOM. 2022f. *Work Plan, Downhole Geophysical Logging and Water-Level Monitoring, Libby Groundwater Site, Libby, Montana*. June.

AECOM. 2023a. *Remedial Action Work Plan for the Upper Aquifer, Libby Groundwater Site, Libby, Montana*. June.

AECOM. 2023b. *Upper Aquifer Remedial Action Operations and Performance Monitoring Plan, Libby Groundwater Site, Libby, Montana*. August.

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Arrowhead Engineering, Inc. 2017. *Annual Groundwater Monitoring Report for the Upper and Lower Aquifer for Libby Groundwater Site, Libby, Montana*. May.

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Arrowhead Engineering, Inc. 2018b. *Third Quarter Progress Report - 2018, Libby Groundwater Site, Libby, Montana*. October.

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Arrowhead Engineering, Inc. 2019c. *Lower Aquifer Monitoring Well Installations - 2019 for Libby Groundwater Site, Libby, Montana*. July.

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Arrowhead Engineering, Inc. 2020b. *Final Monitoring Wells Installed During 2019 - Investigation Field Activity and Data Summary Report, Libby Groundwater Site, Libby, Montana*. April.

Arrowhead Engineering, Inc. 2021. *2020 Annual Groundwater Monitoring Report for the Upper and Lower Aquifer for Libby Groundwater Site, Libby, Montana*. March.

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Aquifer for Libby Groundwater Site, Libby, Montana. March.

Arrowhead Engineering, Inc. 2022b. *2021 Annual Operations Report, Source Area Extraction and Treatment System for Libby Groundwater Site, Libby, Montana*. March.

Arrowhead Engineering, Inc. 2022c. *2021 Annual Landfarm Operations Report for Libby Groundwater Site, Libby, Montana*. April.

Arrowhead Engineering, Inc. 2023a. *2022 Annual Groundwater Monitoring Report for the Upper and Lower Aquifer for Libby Groundwater Site, Libby, Montana*. March.

Arrowhead Engineering, Inc. 2023b. *Annual Landfarm Operations Report for Libby Groundwater Site, Libby, Montana*. April.

Arrowhead Engineering, Inc. 2023c. *Draft Libby Groundwater Site Ground Water Monitoring Plan, Libby, Montana. Revision 1*. July.

Arrowhead Engineering, Inc. 2024. *2023 Annual Operations Report, Source Area Extraction and Treatment System for Libby Groundwater Site, Libby, Montana*. May.

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URS. 2016. *Conceptual and Numerical Groundwater Flow and Transport Model for Libby Groundwater Site, Libby, Montana*. October.

APPENDIX B – CHRONOLOGY

Table B-1: Site Chronology

Event	Date
J. Neils Lumber Company began lumberyard and wood-treating operations at the Site	1946
Then-owner St. Regis Company discontinued wood-treating operations at the Site	1969
EPA discovered contamination in nearby residential drinking water well	July 1, 1979
EPA conducted a preliminary assessment of the Site	January 1, 1980
EPA conducted a site inspection	August 1, 1981
EPA listed the Site on the National Priorities List	September 8, 1983
St. Regis entered into an Administrative Order on Consent	October 1983
The PRP started the remedial investigation/feasibility study for OU1 and OU2	March 9, 1985
The PRP completed the remedial investigation/feasibility study for OU1 EPA signed the OU1 ROD	September 26, 1986
The PRP completed the remedial design for OU1	October 1, 1986
The PRP completed the remedial action for OU1	November 1, 1986
The PRP (Champion, successor to St. Regis) completed the remedial investigation/feasibility study for OU2; EPA signed the OU2 ROD	December 30, 1988
The PRP began remedial design activities for OU2; the court approved a consent decree for the Site	March 27, 1989
The PRP began remedial action for OU2	October 18, 1989
The PRP completed the remedial design for OU2	September 26, 1991
The EPA issued an ESD for OU2 to modify cleanup levels and implement a technical impracticality waiver for the lower aquifer contamination	September 14, 1993
The EPA prepared a preliminary closeout report for OU2 The EPA filed a construction complete notice for the Site	September 20, 1993
Champion (PRP) sold mill property to Stimson Lumber Company	
Restrictions added to property deed	November 2, 1993
The EPA signed the Site's first FYR report	January 24, 1995
The EPA issued an ESD for OU2	January 22, 1997
The EPA expanded the land treatment unit	1998
The EPA shut down the intermediate injection system based on information from the then-current site review	1999
Champion submitted a TI evaluation report for the upper aquifer to the EPA	January 11, 1999
EPA signed the Site's second FYR report	March 30, 2000
IP merged with Champion and assumed responsibility for Site liability, including O&M of remedial systems	June 20, 2000
Stimson Lumber Company sold mill property to the Lincoln County Port Authority	2003

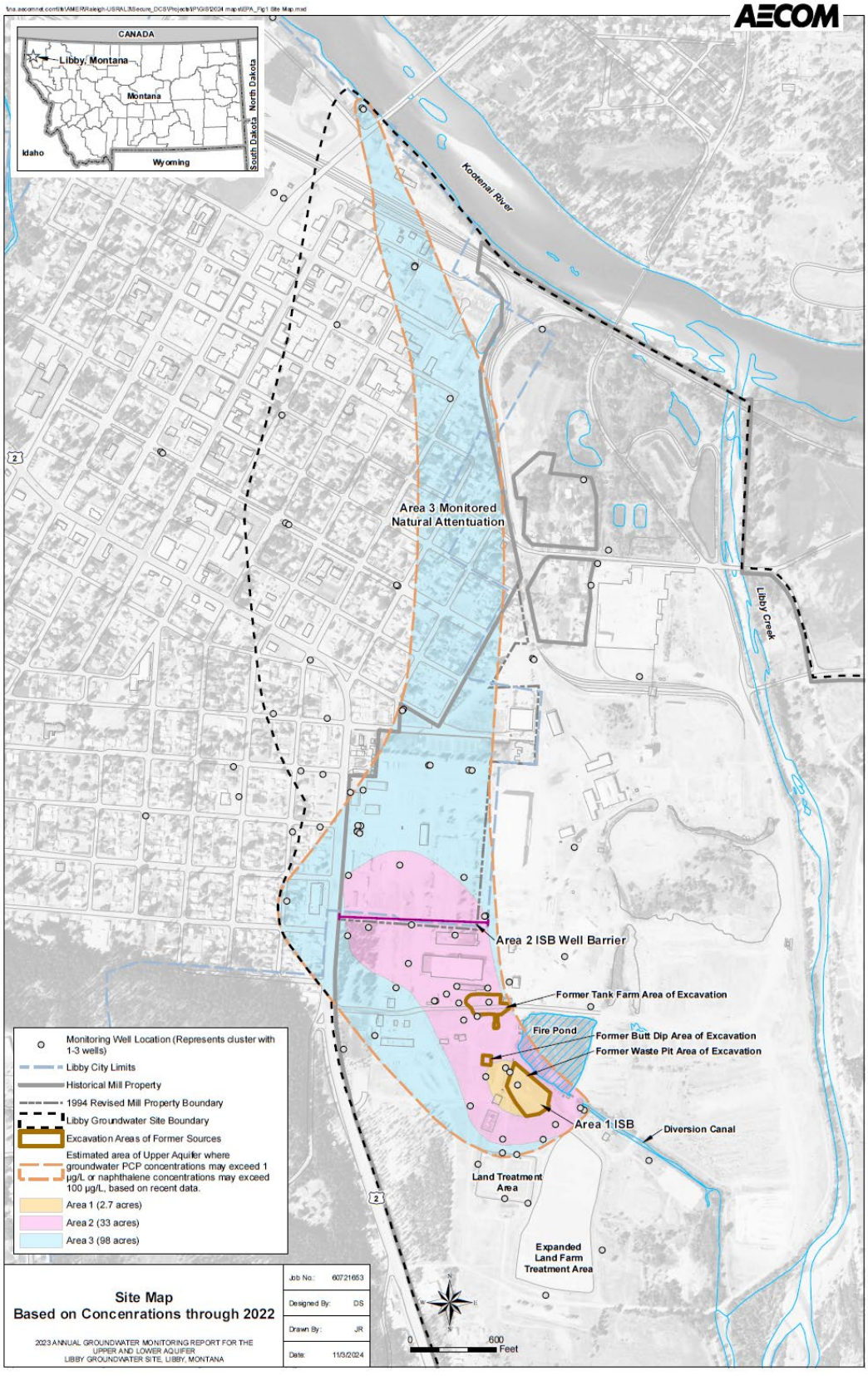
Event	Date
EPA signed the Site's third FYR report	March 31, 2005
EPA denied a TI waiver of applicable or relevant and appropriate requirement groundwater standards for the upper aquifer	May 2009
PRPs completed a plume stability analysis	October 1, 2009
EPA began a focused remedial investigation and feasibility study for OU2 to address compliance with RAOs, pursuant to an amendment to the existing consent decree	January 27, 2010
EPA signed the Site's fourth FYR report	March 29, 2010
PRPs completed investigation of upper aquifer dissolved plume	February 17, 2011
PRPs completed source area characterization	May 14, 2012
PRPs initiated the preparation of an FFS to evaluate alternatives to remediate contaminants in the upper aquifer	March 13, 2013
PRPs completed bench-scale test of steam-enhanced groundwater extraction	August 29, 2013
PRPs completed vapor intrusion assessment	October 14, 2013
PRPs submitted updated conceptual Site model	January 13, 2014
PRPs submitted technical memorandum of remedial alternatives for the upper aquifer	January 21, 2014
PRPs completed bench-scale test of in-situ biosparging	March 14, 2014
EPA signed the Site's fifth FYR Report	September 25, 2015
PRPs completed the FFS report for the upper aquifer	April 25, 2018
EPA released the proposed plan for OU2	August 2019
EPA signed the OU2 ROD Amendment	April 6, 2020
EPA signed the Site's sixth FYR Report	July 16, 2020
Memo to file regarding Minor Modification to Operable Unit 2 Remedy and transmits attached Dec. 9, 2020 Technical Memo Final Revision 2 Proposal to Manage LTU Consistent with CAMU Applicable or Relevant and Appropriate Requirements Libby Groundwater Site Libby, Montana	December 17, 2020
PRPs completed the remedial design work plan for the Upper Aquifer	December 22, 2020
PRPs completed the work plan for the Area 2 pilot test	March 4, 2021
PRPs completed the remedial design work plan for the land treatment unit cover design modification	July 22, 2021
PRPs completed the 2020 annual groundwater monitoring report.	August 10, 2021
PRPs completed the 2020 source area extraction and treatment system report	August 10, 2021
PRPs completed the 2020 landfarm operations report	August 10, 2021
PRPs completed the addendum to the Area 2 pilot test work plan	August 23, 2021
EPA completed the community involvement plan	February 14, 2022
PRPs completed the 2022 annual groundwater monitoring report.	April 13, 2022

Event	Date
PRPs completed the Area 2 ISB pilot study report	April 19, 2022
PRPs completed the remedial design report for the LTU/CAMU closure	June 21, 2022
PRPs completed the 2021 annual groundwater monitoring report.	July 21, 2022
PRPs completed the 2021 source area extraction and treatment system report	July 25, 2022
Consent Decree Modification, Notice of Non Material Modification to Consent Decree, Unites States v. International Paper Company, Case CV-89-127-M-CCL; signed and filed	September 28, 2022
PRPs completed the remedial design report for Area 1	October 13, 2022
PowerPoint presentation given to County Commissioners, October 26, 2022 Site update and notice of plan to offer expanded Buy Well Program	October 26, 2022
PRPs completed the 2022 annual groundwater monitoring report.	June 12, 2023
PRPs completed the remedial action work plan for the upper aquifer	June 28, 2023
PRPs completed the OU2 materials management plan	July 25, 2023
PRPs completed the upper aquifer remedial action operations and performance monitoring plan	August 2, 2023
EPA completed Fact sheet: Digging Safely at Libby Groundwater Superfund Site, spring 2024	April 8, 2024
PRPs completed the 2023 source area extraction and treatment system report	May 25, 2024
PRPs completed the 2023 annual groundwater monitoring report.	June 21, 2024
Libby Groundwater Site map, August 2024	August 12, 2024
PRPs completed a second revision of the OU2 materials management plan	August 16, 2024
EPA Newsletter: Libby Groundwater Superfund Site, November 2024	November 6, 2024

EPA = U.S. Environmental Protection Agency
ESD = Explanation of Significant Differences
FFS = focused feasibility study
FYR = five-year review
O&M = operations and maintenance
OU = operable unit
PRP = potentially responsible party
RAO = Remedial Action Objective
ROD = Record of Decision
Site = Libby Groundwater Contamination Superfund Site
TI = technical impracticability

APPENDIX C – REMEDIAL FEATURES

Figure C-1: Remedial Features



APPENDIX D – PUBLIC NOTICE

The Western News

EPA United States Environmental Protection Agency

EPA Region 8 Announces the Seventh Five-Year Review for the Libby Groundwater Superfund Site

EPA, with the state of Montana, is conducting the seventh five-year review of the Libby Ground Water Contamination Superfund site (called the Libby Groundwater site or site) in Lincoln County, Montana. This review will ask if the remedies continue to protect human health and the environment and will come out in 2025. The previous 2020 five-year review is available on the site webpage.

A lumber and plywood mill operated just outside of Libby in the late 40s through the late 60s. This resulted in contaminated soil and groundwater at the site. EPA divided the site into two sections called Operable Units.

The Operable Unit 1 remedy includes components to reduce or eliminate human exposure to contaminated groundwater as an interim remedy. The last review showed the remedy for this area was short-term protective. However, to be protective long term, the review recommended additional controls to stop groundwater use outside city limits.

The Operable Unit 2 remedy includes treatment of contaminated soil and groundwater and components to reduce human exposure to. The last review rated this area as short-term protective. To be protective long term, the review recommended additional remedial action and controls to make sure that people don't eat, inhale, or touch contaminated soil or drink contaminated water.

We want to hear from you!

Community members can share important information that helps EPA evaluate the remedies. If you have questions or would like to participate in an interview, please contact EPA by **January 1, 2025**:

Beth Archer
EPA Community Involvement Coordinator
Phone: 720-512-1917
Email: archer.elizabeth@epa.gov

More information is available online:
www.epa.gov/superfund/libby-groundwater

APPENDIX E – INTERVIEW FORMS

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Beth Archer, Jason Rappe EPA

Melody Wunderlin DEQ

Subject and affiliation: David Cosgriff Arrowhead Engineering, Inc.

Subject contact information: david@aelibby.com

Date: 9/18/24 **Time:** 10:30a **Location:** Port Authority

Interview Format: ☒In Person ☐Phone ☐Mail ☐Other

Interview Category: Potentially Responsible Party's contractor

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

   Cleanup – I'm actually pretty pleased with where we're headed with the in-situ biosparging systems. I think it's going to have a beneficial impact and make the Site cleaner than it was, not sure it will be a pristine groundwater plume anytime soon but it will be vastly improved.
   Maintenance – This is going well, will be less maintenance now with the in-situ biosparging systems operating (compressors and air dryers).
   Reuse – we don't have as much with reuse recycling on this project; we used to reuse non-aqueous phase liquid from this system. We are recycling the steel from the decommissioning of the source area extraction and treatment system. It would be great to get some redevelopment on the former mill property; it's sat vacant for decades now. It's expensive for the county to maintain and keep up with weed control

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   The biggest concerns over the years are groundwater being impacted and unavailable for use. That's the ongoing concern that comes up in public meetings. Libby has a surface water source (Flower Creek provides water); city water costs have always seemed to be an issue

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

   I think the remedy will be improved with these new systems and will be more cost effective than the existing remedy, especially the old bioreactor system. In-situ biosparging is expected to do significantly more cleanup in a lot less time for a lot less money.
   Land farm is finally approaching closure, switching that to a corrective action management unit allowed us to not meet the dioxin cleanup level for the land farm. Landfarming doesn't treat dioxins very well

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- One robbery (diesel pump stolen a few years ago), a few break-ins on the former mill property, but no break-ins on the Libby Groundwater Site, some arson situations at the mill property. Scale shack. Surprisingly, no break-ins at the Libby Groundwater Site office property. The diesel pump was located outside the Libby Groundwater Site fence when it was stolen. The replacement pump was installed within the Site fence.

5. **How do you learn about what's happening at the Site now?**

Just from our meetings and interactions with agencies and other consulting company.

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- Yes, they have. Fact sheets are great; it's something the public can have and walk away with. I like the links to the EPA website so you can share information. Public meetings are not as useful; allows some people to grandstand, but I think it's still important to do public meetings.

7. **Do you have any comments, suggestions or recommendations regarding any aspects of the project?**

   I think we're in a pretty good place on where we're headed; I have the opportunity to bring comments up if I think things can be improved. Good relationship with International Paper.

8. **Do you consent to have your name along with your responses to this questionnaire in the FYR report?**

   Yes

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Jason Rappe EPA RPM

Subject and affiliation: Jerry Bennett Lincoln County Port Authority

Subject contact information:

Date: 11/12/24 **Time:** 4:00pm **Location:** LCPA

Interview Format: ☒In Person ☐Phone ☐Mail ☐Other

Interview Category: Local Government

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

   Overall, it has been handled. The structure that we are left with working with multiple entities in the last two years have slowed down development. The Lincoln County Port Authority is willing to support the controlled groundwater area, but the parties need to come to the table.

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   No. There have been people that do what they shouldn't, and that has not caused a problem, and there are others that ask permission for activities at the port.

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

   It's been fine; I have not seen any issues. The only issue is there was a well outside of the port in the past that had some creosote. It was rectified by IP quickly.

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- Not as much now. There were a few years that had issues, but fences were place around port property.

5. **How do you learn about what's happening at the Site now?**

   From the website.

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- Information is readily available. Most of the contamination is contained in the port. Unless there were construction activities in the port, there is not much of a need to access information. Now that there is more development occuring, there might be interest in supplementing the EPA website with something related to the port.

7. **Do you have any comments, suggestions or recommendations regarding any aspects of the project?**

   When anyone new comes on there is a big learning curve getting everyone up to speed. It just bogs down the project. It would be helpful to have RPMs stay on for a longer duration.

8. **Do you consent to have your name along with your responses to this questionnaire in the FYR report?**

   Yes.

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Beth Archer, Jason Rappe EPA

Subject and affiliation: Kathi Hooper Health Department

Subject contact information:

Date: 9/16/24 **Time:** 10:00a **Location:** Lincoln County Health Department

Interview Format: ☒In Person ☐Phone ☐Mail ☐Other

Interview Category: Local Government

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

   My impression is it's been going on for many years with very little change/progress. A lot of work and not much to show for it. It is a complicated Site.

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   Yes, we have had calls from people concerned about water quality. Especially outside of the city but in that affected area. We deal with people who are upset about not being able to put a well in in the city. Lately we're getting concerns about the new development out there and all the wells being installed. We've gotten calls from concerned individuals (residents and Board of Health) about the wells being installed in a groundwater Superfund site.

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

   Although there hasn't been a lot of progress, my understanding is the actions that were taken have prevented the expansion of the plume. Although they weren't terribly effective at reducing the contamination, the plume has not spread or grown too much.
   My understanding was that the lower aquifer couldn't be treated or addressed.

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- Gates with codes, there has been some trespassing on the port area. Some vandalism of at least one of the buildings out there (near Stimson with broken windows).
- Calls from people who are concerned about the dust that's being created at the new development.

5. **How do you learn about what's happening at the Site now?**

   Call EPA, updates from the Board of Health.

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- I feel less informed on the groundwater Site than the asbestos site, which makes sense. The county works more closely with the asbestos than the groundwater. I think EPA has provided opportunities to get information on the Site that the public doesn't necessarily take advantage of. After the BOH talked about the Controlled Groundwater Area, that's the only time it's ever really come up at the Board of Health.
- The Board of Health would be interested in more regular updates on the groundwater Site.

7. **Do you have any comments, suggestions or recommendations regarding any aspects of the project?**

I do think that giving regular updates to the Board of Health and County Commissioners keep us more involved. I appreciate the in-person visits to Libby. That is one of the differences, the asbestos site has always had the Asbestos Resource Program and communication with EPA directly as the Health Department. EPA having more of a presence in Libby.

8. **Do you consent to have your name along with your responses to this questionnaire in the FYR report?**

   Sure.

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Beth Archer EPA

Subject and affiliation: Click or tap here to enter text. Resident

Subject contact information:

Date: 11/20/24 **Time:** 3:00pm **Location:** Phone

Interview Format: ☐In Person ☒Phone ☐Mail ☐Other

Interview Category: Resident

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

   I don't know a ton about the groundwater Site, just what I see when I go to Libby.

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   Yes. I'm concerned about how much contamination is still in the groundwater. I would like to see them drill a test well at my property to see if I could pull water without contamination.
   There's a stream right above me (Flower Creek) – used to run through Pioneer Park and may have eventually gone over to where the Site is. This should be above where the contamination is; it's higher elevation. I don't think contaminated groundwater went uphill to reach my property.

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

   I don't know much about it; I'm sure it's great. Any improvements are an improvement.

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- Not that I'm aware of.

5. **How do you learn about what's happening at the Site now?**

   Basically through the newspapers, not living full time in Libby that's pretty much the best method. When I was in town, seeing people do things and neighbors give me some information.

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- Not myself particularly, no. For me, not living in Libby, a newsletter or something would be helpful. Request for hard copy mailing of newsletter.

7. **Do you have any comments, suggestions or recommendations regarding any aspects of the project?**

   The only thing I would like is to know if the water underneath my property is contaminated and to know if I could drill a well if it's not contaminated. I'd like to be able to use the well for irrigation. Growing up in Libby, my dad was always curious if the city shut off the access to water without knowing the full extent of contamination in the groundwater.

8. **Do you consent to have your name along with your responses to this questionnaire in the FYR report?**

   Yes.

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Beth Archer, Maggie Ogden EPA

Melody Wunderlin DEQ

Subject and affiliation: Chris Noble, Tina Oliphant Noble Investment Properties

Subject contact information:

Date: 8/13/24 **Time:** 3:15pm **Location:** Noble's Office

Interview Format: ☒In Person ☐Phone ☐Mail ☐Other

Interview Category: Developer

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

   See Question 3 for more responses.
   Reuse Activities: Cooperation and communication with the RP have been stymied. EPA has consistently directed Noble Investment Properties (NIP) to directly communicate with the RP. NIP has diligently attempted to do so. The RP has not been willing to communicate and ignored our outreach for discussion. It seems the RP will only communicate based upon their needs, which NIP responds to promptly. This lack of cooperation now includes the RP's onsite contractor, Arrowhead (AE), who now requires us to communicate with the RP's attorney despite the simplicity of questions. Most recently NIP has attempted to communicate with AE requesting information for the use of the land farm per the approved Materials Management Plan (MMP), with no response.
   The EPA has not attempted to mediate the situation. Essentially the property owner has been shut out of any discussion with the RP and finds themselves in a triangle with the RP and EPA.

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   The escalating cost of development and slow responsiveness is causing hesitation from potential businesses and citizens for development based upon the costs and the capacity of city water services. This will only hinder long-term growth. The restrictions of water wells within city limits, and beyond the active plume, is hampering economic development. The RP's strategy of cessation of outreach and responsiveness to project developers and the city of Libby has increased hesitation and uncertainty. The remedy to the RP's destruction of a natural resource was concluded with no alternatives for the community and developers' financial burden.

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

   The remedy has not shown any progress in the groundwater quality. The tank farm has been cleaned to unknown standards. There is no available data regarding the boundaries of Schedule X nor the effort to clean (dispose of) or status of soils remaining in place. It is not clear what effort or result was in place to clean these soils, if any.

   There was great effort by EPA and the RP to establish a Materials Management Plan (MMP). This includes the use of the land farm for contaminated soil. We now believe the MMP's stated use of the land farm for disposal will not be available to NIP or anyone. In fact the land farm is scheduled to be shut down within several months. If the use of the land farm was the basis of the MMP, then the validity and value of the document comes into question.

There also seems to be a lack of data collection to include potential modeling of the plume movement and impacts of activities that could influence the plume. This includes complete lack of communication on the maintenance of the "Fire Pond" and the urgent need to remove sediment to maintain flow into and out of the pond. There are also conflicting comments on the cleanup of sediment within the Fire Pond. This will force NIP to channel their water rights and divert water resources upstream to meet their needs, which will allow the Fire Pond to continue to degrade. On multiple occasions NIP has requested assistance from the EPA to address the problem, find a common solution for all parties' best interests. The only response is a request from EPA and the RP to not maintain the Fire Pond.

There seems to be a resistance to mutually discussing the issues and solutions meeting the needs of all parties and landowners affected.

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- None known.

5. **How do you learn about what's happening at the Site now?**

The EPA provides correspondence of activity on the Site to NIP, but it would be more functional for EPA to standardize schedules and methods for updates. We have been surprised to randomly stumble on updates on the EPA's website on important disclosures of the Site as documents are posted to the EPA-managed web page for the Superfund Site without any notification. As more property owners become involved, there will need to be a firm standard on how documents affecting the Superfund Site are communicated to those owners.
Also see Response to Question 7 and 6.

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- We suggest direct emails to the property owners. This is also critical for any changes/updates to the CERCLA documents, i.e. intentions to modify the consent decree. Property owners should be aware of and have input into any changes affecting the Superfund Site and land use requirements.

7. **Do you have any comments, suggestions or recommendations regarding any aspects of the project?**

We would encourage EPA to require their RP to meet with the landowners to seek solutions to the issues addressed above. It is very confusing to hear EPA indicate this property is ready for redevelopment but does not support the fundamental needs of developing infrastructure. Many properties directly above the contaminated aquifer and bordering NIP property, have been developed in the past and have been required to meet different or no standards from the current experience of NIP.

We would also like answers to our written questions. For instance, we have asked what the intention of EPA was when the most recent modification to the Consent Decree eliminated the language that the RP must use best effort and why the community does not deserve best efforts. There is no response. The Consent Decree also requires parties to not unreasonably interfere with the landowner's operations. We believe there is no oversight by EPA on this requirement. It is not clear what EPA's effective function is on this Site.

We have asked for a legal determination of the legal boundary of Schedule X since it has a significant planning and financial impact to property owners. It is also unclear what cleanup activities were conducted within Schedule X, the extent of contaminated soil removed, and what materials were used to backfill any soil removed, if any. If this information is not available or non-existent, then we request the RP sample soils to a pre-determined elevation and provide data to all current and future landowners affected by Schedule X.

Past EPA and RP attempts at a Controlled Groundwater Area have been met with unsatisfactory results from the community (City, County, Port Authority). A contracted Environmental Consultant's request for additional information was completely disregarded by the RP's contractor (AE), removing any credibility in the process from the local community. NIP also questions the lack of restitution that accompanies the request for a CGA or the loss of this natural resource.

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

Yes, consent given. Chris Noble, Noble Investment Properties

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Jason Rappe, Beth Archer EPA

Subject and affiliation: DC Orr Resident

Subject contact information:

Date: 1/8/25 **Time:** 10:30a **Location:** Online

Interview Format: ☐In Person ☐Phone ☐Mail ☒Other

Interview Category: Resident

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

   The contractors were doing some cutting edge work initially but the remediation work being done now is not impressive. EPA does not inform the public of what's going on. I do not feel that these interviews are helpful and only include people that the company recommends. It doesn't inspire confidence that EPA is really protecting human health, I have concerns that EPA is protecting IP's pocketbook. There was a paper that should have been released (technical impracticability waiver), lower aquifer was not going to get cleaned up, TI waiver was never released to the public. I personally have a well under my house and no one has told me to close the well. It feels like progress has stalled out and we're never going to have clean aquifers again.

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   There has been no public involvement in Libby so community can't really respond or have a lot of concerns since they're not informed of the issues. EPA officials having secret meetings and not answering questions truthfully sends people away and does not promote trust. I feel there is continued regulatory failure on this issue.

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

   I feel concerned that contamination is entering the Kootenai River; fishing on the Kootenai River is a mainstay of local economy. I don't see any mitigation efforts for people eating those fish, that is regulatory failure in my mind.

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- No not that I'm aware of. For the most part the public doesn't have access to the Site.

5. **How do you learn about what's happening at the Site now?**

   I don't. There is no way/mechanism to find out what's going on at the Site. The website doesn't give any information either. No public involvement. Anyone who answers differently than "I don't" has either a direct line to the company or EPA.

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- I do not think the EPA has done a good job of keeping people informed. Especially affects people because water rates are sky high. City of Libby gets paid as an "injured" party, I do not feel the city is an injured party in the Site. The people who actually own property are injured parties. I feel that individual owners should be

paid rather than the city. The health board should be involved, and they are not communicating with residents.

- To improve Site related information sharing have someone show up in Libby, advertise there is going to be a public meeting, allow for questions and answers publicly. Act like you actually care what happens to the people of Libby. Come to Libby and share what you can do for us.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

From what I know about the practicability of cleaning the aquifer, we are living with this forever. EPA naming the city as the only "injured" party was not fair/equitable. The city of Libby has taken all the money they have gotten from International Paper and wasted that money. That money hasn't hit the ground in any way to make things actually easier for people affected by the pollution. Community members still don't know if they can use their wells; a lot of people still do use their wells. There are a lot of wells in Libby still being used. No one will tell the state or EPA that they have a well because they will be blocked and will lose access to them. Residents don't even know what health effects to look for from using that water. The number one mandate of EPA is to protect human health and you are failing at this.

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

Absolutely.

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Beth Archer, Maggie Ogden EPA

Melody Wunderlin DEQ

Subject and affiliation: Sam Sikes City Admin

Subject contact information:

Date: 8/14/24 **Time:** 10:00a **Location:** City Court

Interview Format: ☒In Person ☐Phone ☐Mail ☐Other

Interview Category: Local Government

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

   Reuse - Right now reuse of the Site is none because everyone is terrified to make a move. People are terrified to take on liability, reuse is just starting.
   Cleanup – still well ban in place. Can't pump water out. I don't see how cleanup is actually happening; it's going to be difficult to clean up two aquifers.
   Protecting the remedy – This is going well, there are protections in place to protect against exposure now. I don't know if we have enough data to say how the plume under the city will affect folks with the well ban in place. The city is providing 8,000 gallons of water in the summer for free – once that goes out people are going to be really upset. People are already screaming, "Why isn't IP involved, why isn't IP doing this?" The impression is that IP would be here forever until the problem was solved. The impression was that the city would get that $270,000 forever for water projects only. Now that that funding has stopped and when funding runs out that will be difficult

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   The biggest thing is that the community can't have wells. IP did it and now IP has stepped away. I'm hearing this from family members, they're asking what's going on with it. You know the inside scoop. IP stepped away from the table.
   There's frustration, it was a mill. One gave us asbestos and one gave us contaminated groundwater and so many jobs. Now what's left after everything shut down? Retirement funds come in, other than that what's left? The biggest employers are the hospital and the government; that's where the money's at right now. We need people like Chris Noble to bring in the jobs, but then when more jobs come in and rent increases folks on income can't afford to live here.

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

   There is no remedy, the groundwater is still down there. They're trying to contain it with the sparging wells but they haven't actually fixed it.

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- There was a fire over in that area 5 or 6 years ago on the Port's property

5. **How do you learn about what's happening at the Site now?**

   Sitting in on meetings, Chris Noble (developers)

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- EPA has had meetings which a lot of time people don't show up to; newspaper ads for EPA stuff. I like how you're going down to the farmers market. Nobody will really care until that IP money runs out and they don't get that 8,000 gallons.

7. **Do you have any comments, suggestions or recommendations regarding any aspects of the project?**

   The biggest thing is why is IP absent? Everybody is so fired up mad about why are we going to fix it, why is IP not talking to us? Transparency is really important. We have a budget of $535,000 – going through about $65,000 a year. Used to get 8,000 gallons for everyone within city limits, but not everyone was using it. Sewer rates are based off of water rates. We used to use this fund for water main replacements or other water projects, but now we're just using it for rates. Lower reservoir is getting washed away; water mains need to get replaced. We've already increased the rates for multiuse areas, if we don't get the IP money the base rate for single family home will go up too.

8. **Do you consent to have your name along with your responses to this questionnaire in the FYR report?**

   Yes.

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Beth Archer, Jason Rappe EPA

Melody Wunderlin DEQ

Subject and affiliation: Brent Teske County Commissioner

Subject contact information: bteske@libby.org

Date: 9/17/24 **Time:** 1:30p **Location:** County Courthouse

Interview Format: ☒In Person ☐Phone ☐Mail ☐Other

Interview Category: Local Government

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

   It's tough because it's an underground site; there's not a lot of visible exposure. The footprint out there that IP occupies, they seem to manage pretty well. There's no public exposure to the Site, it's all fenced off and private. It's a pretty small/compact site; not a lot of exposure or access.
   Cleanup – test wells, injection site, new site they're developing now. Good working relationship with the folks on the ground (David Cosgriff). Little to no impact to the citizens or the city as compared to the actual groundwater contamination.
   Cleanup is happening under our feet, no real reuse of anything out there. It would be nice if we could reuse the water, the fact that we can't utilize that resource is becoming cumbersome. Libby, like everywhere else in the world, is bound by water

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   The biggest community impact is the fact that they can't use groundwater. The agreement struck with IP has been in a no-go negotiation phase for a number of years. City has been able to carry the 8000 gallons a month for 4 months for several years. However, this will probably go away soon and will be impactful to people with rate increases. It's bad enough that people aren't watering their lawns anyway with price increases. The people that do water will feel that effect.
   Lack of being able to expand water resources in the valley is a concern. We don't have the footprint or the resources. Flower creek is dry right now; Libby creek is still flowing. It's happening (drought), it will affect people, as long as people can get water they're happy. This will be a problem. Last year the reservoir was really low in September. Lack of resource (water) is going to be troublesome in the future.

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

   We don't have enough data to see if the in situ remedy is working. I really don't know right now. We're able to limit exposure at some of the wells that we discovered were contaminated. It was prompt, not a lot of political/bureaucratic red tape. IP stepped up on that. The rest of the remedy; Noble punched a well. That area is outside the ordinance so the institutional control in place is limited. Is anyone else outside of plume area punching holes? That's the problem with the city limit ordinance IC. It's going to get contested when that 8,000 gallons goes away and people will start punching holes. From what I understand right now, it (the remedy) seems to be somewhat successful keeping it (the contamination) at bay, but we will see when we have more data.
   What's going to happen with the lower aquifer, will it be capped off? It's different not being able to see it and deal with it like the asbestos.

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- No, I haven't heard anything at their facilities. Being 90 feet underground or better.

5. **How do you learn about what's happening at the Site now?**

   Most if it is from EPA, updates, briefs for county commissioners. IP hasn't provided updates since I left the city officially. City of Libby also provides updates.

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- I think they have; the public has so much going on that they don't care. Public meetings are not well attended, the same couple people come. It's hard to engage the public. You increase water rates, restrict water use, start having issues with the allotment going away – you'll have public involvement then. Right now the information you're putting out is sufficient, I haven't had any questions I can't answer.
- Facebook, specifically the health department's page, might be a good way to put out information. Getting out there for as much as the public is willing to absorb right now. Public doesn't care now but that could change.

7. **Do you have any comments, suggestions or recommendations regarding any aspects of the project?**

   The biggest thing is walking the fine line to make IP adhere to what the remedy/standard/agreement was and to make them more responsible and accountable. IP felt they fulfilled their obligation, Andrew tried to mediate but it gave the appearance of speaking on IP's behalf. An independent moderator should come in. Getting IP to be responsible, no one is asking for a billion-dollar handout. Be responsible for it, take care of it.
   Natural Resource Damage settlement for WR Grace made me think about what happens if IP goes bankrupt and goes away? Somebody should probably ask that question and look for some kind of assurance or security.
   Not sure if people are drilling in city limits because of the expense of the water.
   Something EPA should address with the city: change in the consent decree that they feel they weren't consulted. Removed obligation for IP to use "best efforts" language. How did that get struck/changed from the consent decree without the city signing off? Who spearheaded that? Might be something somebody wants to address, different time different place different attitude.
   Controlled Groundwater Area – nobody knew for a long time that IP was behind the Controlled Groundwater Area effort. Then there was the perception that IP was trying to use that to get out of their responsibilities

8. **Do you consent to have your name along with your responses to this questionnaire in the FYR report?**

   Yes.

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Beth Archer, Maggie Ogden EPA

Melody Wunderlin DEQ

Subject and affiliation: Peggy Williams Mayor of Libby

Subject contact information: mayor@cityoflibby.com

Date: 8/14/24 **Time:** 9:00am **Location:** City Court

Interview Format: ☒In Person ☐Phone ☐Mail ☐Other

Interview Category: Local Government

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

   The cleanup is incomplete and since you're still trying to do something, is it actually maintenance? Reuse – there's a big concern in my mind about how the cleanup, Site in general, and how contamination affects economic development. It hasn't been cleaned up in 40 years, there are still a lot of questions. How will this affect the economic development of the city and county? This area is viewed a big economic driver.

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   Yes. The groundwater is unusable, the water rates are high which affects the community and limits potential (development/expansion). IP is not being held accountable and actually seems to be driving the bus rather than being held accountable to what they should be doing.

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

   It is a failure when you've spent 40 years and truly haven't made any progress. The city's feeling is that our concerns have never been heard, costs to city and residents have not been heard and considered, and IP is not in compliance with its obligations laid out in the original documents

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- Not to my knowledge, the Site is very quiet.

5. **How do you learn about what's happening at the Site now?**

   What EPA tells me, gossip. There's almost an aura of secrecy (groundwater Site and what's happening)

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- No, EPA has not kept the community involved and informed. EPA is trying to figure out ways to better share information. EPA has to be involved in going out into where people are, you cannot depend on people coming to you. EPA public meetings can be a tool but should not be the only way you share information.

7. **Do you have any comments, suggestions or recommendations regarding any aspects of the project?**

   You should revisit the technical impracticability waiver and your entire remedy for the Site and reevaluate your approach for the Site. You should really consider its impact and cost to the community, especially the city of Libby where the cost is being borne

8. **Do you consent to have your name along with your responses to this questionnaire in the FYR report?**

   Sure.

Libby Groundwater Superfund Site Five Year Review Interview Form

Site: Libby Groundwater **EPA ID No.** MTD980502736

Interviewer and affiliation: Beth Archer EPA

Subject and affiliation: Melody Wunderlin Montana DEQ

Subject contact information:

Date: 2/4/25 **Time:** 3:30pm **Location:** Virtual

Interview Format: ☐In Person ☐Phone ☐Mail ☒Other

Interview Category: State Government

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

   Cleanup – soils are on a good trajectory. For groundwater we have quite a way to go. I'd be interested to see what some of our first data coming out of area 2 biosparging looks like (upper aquifer)
   Maintenance – soils are in a good spot. The groundwater institutional controls are pretty unprotective at this point and the agencies need to address this concern. It could be useful to update the conceptual Site model based on current risks and Site conditions.
   Reuse – This is nuanced. The area has the potential for productive reuse however there are complicating factors with current contamination on the Site. The current trajectory on reuse isn't moving as quickly towards resolving concerns as the state would like to see. This isn't entirely the fault of the current PRP or EPA, but the state would like to a renewed interest in EPA and the PRP communications with developers and landowners to improve the ability to productively reuse the Superfund Site. Work is needed to ensure redevelopment can move forward in a protective way. Some of that work might involve updating deeds, better defining what reuse looks like at this Site etc.

2. **Are you aware of any community concerns regarding the Site, the remedial action or the operations and maintenance program since the cleanup was implemented?**

   Yes. I have heard concerns from the city, the developers, and other community members. The concerns focus on access to usable water, potential institutional controls, and concerns about clear communications from the PRP and agencies.

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

   I think the performance of remedy will be determined as we have more data. The state has concerns about remedy effectiveness due to potential interactions between the upper and lower aquifer and would like more data on this area. The state would also like more data on the interactions between the groundwater contamination and the Kootenai River before a determination is made about remedy protectiveness at the upper aquifer.

4. **Have there been any problems with unusual or unexpected activities at the Site? (e.g., vandalism, trespassing or emergency responses from local authorities)**

- Wells being drilled at the Site was an unexpected change to Site condition. I am not aware of any other unexpected activities.

5. **How do you learn about what's happening at the Site now?**

   I am kept up to date by team meetings, Site visits, and communications with locals.

6. **Has the EPA kept involved parties and the community informed of activities on the Site? How can the EPA best provide Site-related information in the future?**

- I've seen an improvement in EPA's communications since I first came on the Site in late 2023. When I initially joined the Site team there was a lull in communications. I think this is improving, and we're on a good trajectory.
- On improving Site-related communications, I think the newsletters and regular meetings with the city are both positive. One place we could improve communications is with current property owners and developers at the Site and interested property owners/developers. I think having a newsletter or communication specifically designed for that audience would help them get tailored information they need to develop/use the Site while avoiding contamination. I anticipate the number of property owners at the Site will increase over the coming years and want the Site team to be set up for success as that happens.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

I feel hopeful with the direction we are going right now. The State is feeling a lot of urgency around additional groundwater controls (controlled groundwater area or an ordinance) due to increased pathways for exposure on the Site. The state would like to see action from EPA on preventing contamination exposure and potential contaminated plume migration.
I appreciate EPA's efforts to improve communications between the PRP and the community; the state agrees that this is a priority although unsure how to best move this forward.

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

Yes.

APPENDIX F – SITE INSPECTION CHECKLISTS

I. SITE INFORMATION	
Site name: Libby Groundwater Contamination Superfund Site	**Date of inspection:** 10/4/2024
Location and Region: Libby, Montana Region 8	**EPA ID:** MTD980502736
Agency, office, or company leading the five-year review: EPA Region 8	**Weather/temperature:** Clear 50 degrees Fahrenheit

Remedy Includes: (Check all that apply)

- x Landfill cover/containment
- x Access controls
- x Institutional controls
- x 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 Cosgriff (Name) Site Manager (Title) 10/4/2024 (Date)
   Interviewed x at site ☐ at office ☐ by phone Phone no. 406-293-1011
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   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, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____
_____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - x O&M manual — x Readily available — ☐ Up to date — ☐ N/A
   - x As-built drawings — x Readily available — ☐ Up to date — ☐ N/A
   - x Maintenance logs — x Readily available — ☐ Up to date — ☐ N/A

   Remarks_____

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

   Remarks_____

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

   Remarks_____

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — X N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — X N/A
   - ☐ Waste disposal, POTW — ☐ Readily available — ☐ Up to date — X N/A
   - ☐ Other permits_____ — ☐ Readily available — ☐ Up to date — X N/A

   Remarks_____

5. **Gas Generation Records** — ☐ Readily available — ☐ Up to date — x N/A

   Remarks_____

6. **Settlement Monument Records** — ☐ Readily available — ☐ Up to date — X N/A

   Remarks_____

7. **Groundwater Monitoring Records** — X Readily available — X Up to date — ☐ N/A

   Remarks_____

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

   Remarks_____

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — x N/A
   - ☐ Water (effluent) — ☐ Readily available — ☐ Up to date — x N/A

   Remarks_____

10. **Daily Access/Security Logs** — ☐ Readily available — ☐ Up to date — x N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☐ PRP in-house x Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other_____
_____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
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 X Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map X Gates secured x N/A

Remarks_____
_____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map x N/A

Remarks_____
_____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes x No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes x No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) _____
Frequency _____
Responsible party/agency: PRP and City of Libby
Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No x N/A
Reports are verified by the lead agency ☐ Yes ☐ No x N/A

Specific requirements in deed or decision documents have been met x Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes x No ☐ N/A
Other problems or suggestions: ☐ Report attached

_____
_____
_____
_____

2. **Adequacy** ☐ ICs are adequate x ICs are inadequate ☐ N/A
Remarks: Additional institutional controls planned, including a CGA that would apply to some parts of the Lincoln County, have not been agreed to by all stakeholders.

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map x No vandalism evident
Remarks_____
_____

2. **Land use changes on site** ☐ N/A
Remarks: The Port Authority has sold property within the Site boundaries to a developer. The developer is actively constructing new infrastructure and selling property to new land owners.

3. **Land use changes off site** x N/A
Remarks_____
_____

VI. GENERAL SITE CONDITIONS

A. Roads x Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map x Roads adequate ☐ N/A
Remarks_____
_____

B. Other Site Conditions

Remarks Overall, the site is well maintained and has a consistent presence.

VII. LANDFILL COVERS x Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map x Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Cracks** ☐ Location shown on site map x Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____
   _____

3. **Erosion** ☐ Location shown on site map x Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Holes** ☐ Location shown on site map x Holes not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

5. **Vegetative Cover** x Grass ☐ Cover properly established x No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____
   _____

6. **Alternative Cover (armored rock, concrete, etc.)** x N/A
   Remarks_____
   _____

7. **Bulges** ☐ Location shown on site map x Bulges not evident
   Areal extent_____ Height_____
   Remarks_____
   _____

8. **Wet Areas/Water Damage** x Wet areas/water damage not evident
   ☐ Wet areas ☐ Location shown on site map Areal extent_____
   ☐ Ponding ☐ Location shown on site map Areal extent_____
   ☐ Seeps ☐ Location shown on site map Areal extent_____
   ☐ Soft subgrade ☐ Location shown on site map Areal extent_____
   Remarks_____
   _____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map x No evidence of slope instability
   Areal extent_____
   Remarks_____
   _____

B. Benches ☐ Applicable x 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 x 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** ☐ Location shown on site map ☐ No evidence of settlement Areal extent_____ Depth_____ Remarks_____ _____	
2.	**Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation Material type_____ Areal extent_____ Remarks_____ _____	
3.	**Erosion** ☐ Location shown on site map ☐ No evidence of erosion Areal extent_____ Depth_____ Remarks_____ _____	

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____
_____

5. **Obstructions** Type_____ ☐ No obstructions
☐ Location shown on site map Areal 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 Areal extent_____
Remarks_____
_____

D. Cover Penetrations ☐ Applicable x 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. **Leachate Extraction Wells**
☐ 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 x 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 x N/A

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

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

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

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident
   Remarks_____
   _____

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks_____
   _____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks_____
   _____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks_____
   _____

H. Retaining Walls ☐ Applicable x 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 x N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☐ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____
   _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Discharge Structure** ☐ Functioning ☐ N/A
   Remarks_____
   _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable x N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Performance Monitoring** Type of monitoring_____
   ☐ Performance not monitored
   Frequency_____☐ Evidence of breaching
   Head differential_____
   Remarks_____
   _____

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

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

1. **Pumps, Wellhead Plumbing, and Electrical**
   x Good condition x All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks_____
   _____
   _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   x Good condition☐ Needs Maintenance
   Remarks_____
   _____

3. **Spare Parts and Equipment**
   x Readily available ☐ Good condition☐ Requires upgrade ☐ Needs to be provided
   Remarks_____
   _____

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

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal x Oil/water separation ☐ Bioremediation
   ☐ Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   x Good condition ☐ Needs Maintenance
   x Sampling ports properly marked and functional
   x Sampling/maintenance log displayed and up to date
   x Equipment properly identified
   x Quantity of groundwater treated annually 6.15 million gallons
   ☐ Quantity of surface water treated annually_____
   Remarks_____
   _____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A x Good condition ☐ Needs Maintenance
   Remarks_____
   _____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A x Good condition x Proper secondary containment ☐ Needs Maintenance
   Remarks_____
   _____

4. **Discharge Structure and Appurtenances**
   ☐ N/A x Good condition ☐ Needs Maintenance
   Remarks_____
   _____

5. **Treatment Building(s)**
   ☐ N/A x Good condition (esp. roof and doorways) ☐ Needs repair
   x Chemicals and equipment properly stored
   Remarks_____
   _____

6. **Monitoring Wells** (pump and treatment remedy)
   ☐ Properly secured/locked x Functioning x Routinely sampled ☐ Good condition
   ☐ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks_____
   _____

D. Monitoring Data

1. Monitoring Data
   x Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
   ☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance x N/A
Remarks_____
_____

X. OTHER REMEDIES

If there are remedies applied at the site which are 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 to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
Additional investigation is being conducted to fully delineate the contaminant plume for the lower aquifer. The Area 2 biosparging system has begun operation, additional monitoring is being conducted per the workplan for system effectiveness.

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.

_____
_____
_____
_____
_____
_____
_____
_____
_____

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.

Groundwater monitoring data for the lower aquifer indicates the lower aquifer plume needs additional monitoring points.

D. Opportunities for Optimization

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

_____
_____
_____
_____
_____
_____
_____
_____
_____

APPENDIX G – SITE INSPECTION PHOTOS

Photograph 11: **Land Treatment Unit (LTU)**

Photograph 12: **LTU and ditch**

Photograph 13: **LTU (piping (on right) and Expanded Landfarm (ELF) on the left**

Photograph 14: **ELF**

Photograph 15: **ELF**

Photograph 16: **Area 1 ISB area in background**

Photograph 17: **Area 1 ISB associated well**

Photograph 18: **Area 1 ISB area with Stakes showing new ISB wells to be installed.**

Photograph 19: **Area 1 ISB – pilot scale manifold. To be used for the for Remedial Action system**

Photograph 20: **Source Area Extraction Treatment System (SAETS). Blue coalescing tank taken offline and re-purposed to treat well development water.**

Photograph 21: **SAETS bioreactors. These will be removed when Area 1 ISB is running.**

Photograph 12: **Looking North from IP field office and laboratory. Stinger building on the left, new concrete facility on the right.**

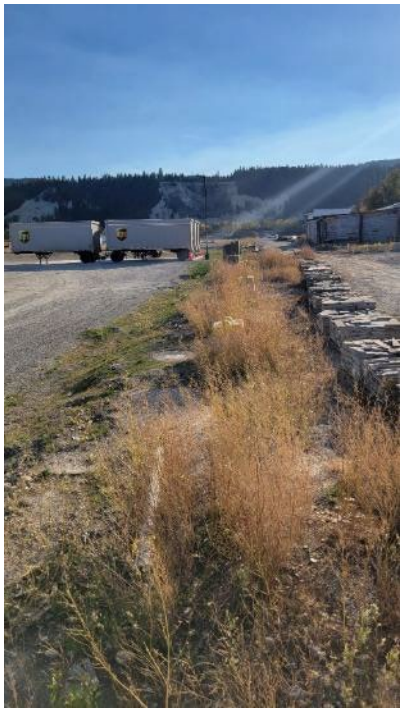
Photograph 13: **North side of fire pond looking east. .**

Photograph 14: **Outlet of fire pond. Note that water level is below outlet elevation.**

Photograph 15: **Southeast corner of fire pond, looking north. Note east bank is graded and de-vegetated.**

Photograph 16: **Southeast corner of fire pond. Looking northeast at planned development area.**

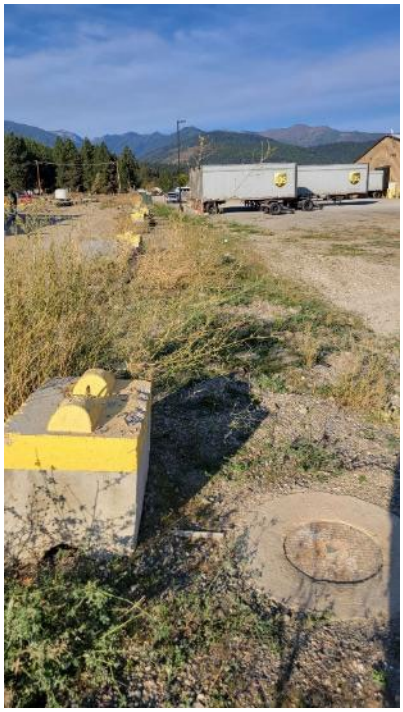
Photograph 17: **Area 2 ISB line of biosparging wells, looking east.**



Photograph 18: **Area 2 ISB utility marker installed for future development changes to planned new road.**

Photograph 19: **Area 2 ISB bollard for buried airlines.**

Photograph 20: **Area 2 ISB biosparging well curtain line, looking west.**



Photograph 21: **Area 2 ISB building.**

Photograph 22: **Area 2 ISB compressed air system..**

Photograph 23: **Area 2 ISB nested monitoring wells.**

Photograph 24: **Area 2 ISB monitoring well with air vent attachment.**

Photograph 25: **Area 2 ISB well curtains from Highway 2 looking east.**

Photograph 26: **Area 2 ISB area looking at new planned road alignment. Looking west.at Cedar Street. .**

Photograph 27: **Old well building converted to record storage.**

Photograph 28: **Record storage area for the Libby Groundwater site.**

APPENDIX H – DATA REVIEW FIGURES

Figure H-1: 2022 Upper Aquifer Plume Map

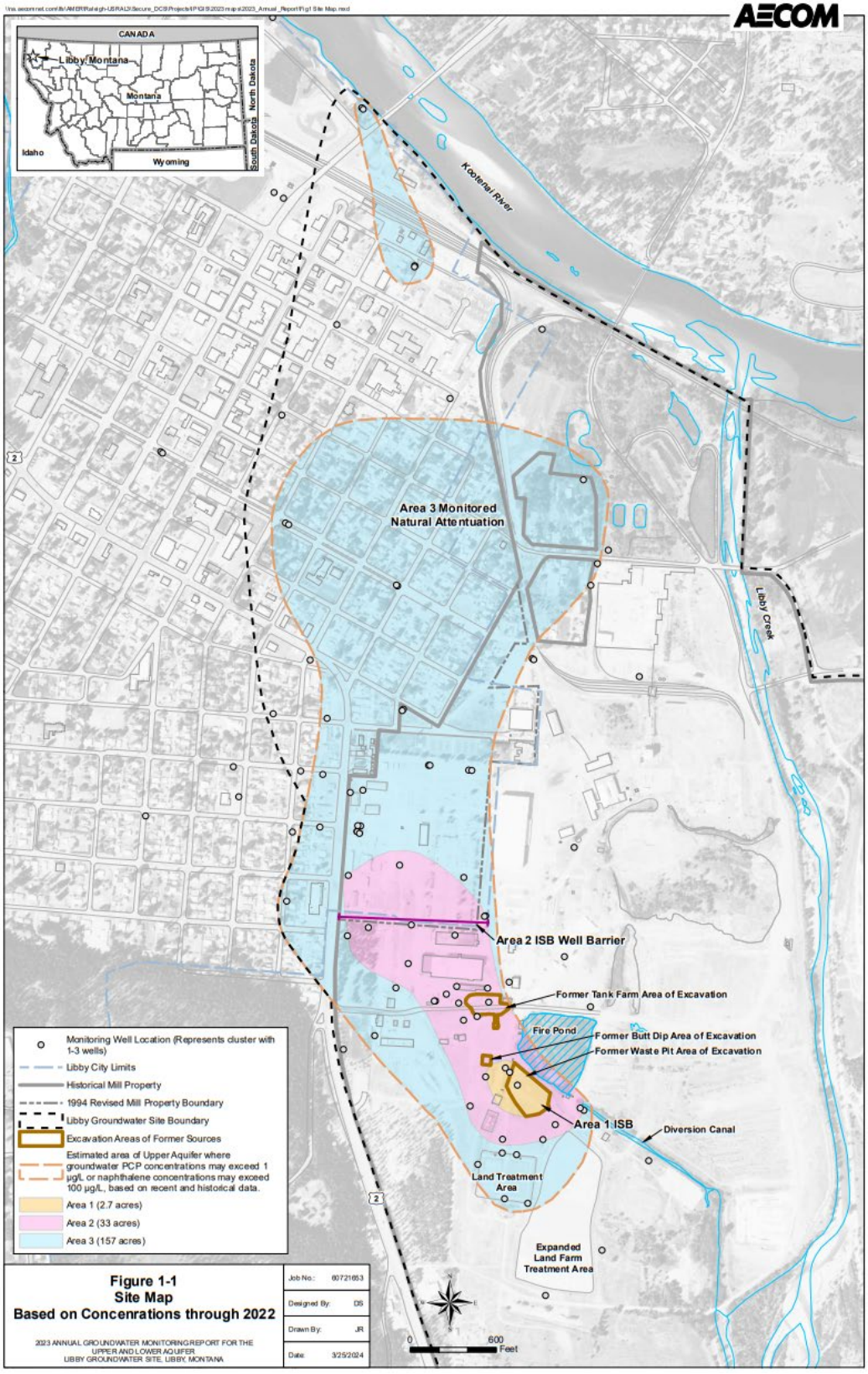


Figure H-2: 2023 Updated Upper Aquifer Shallow Subunit Plume Map

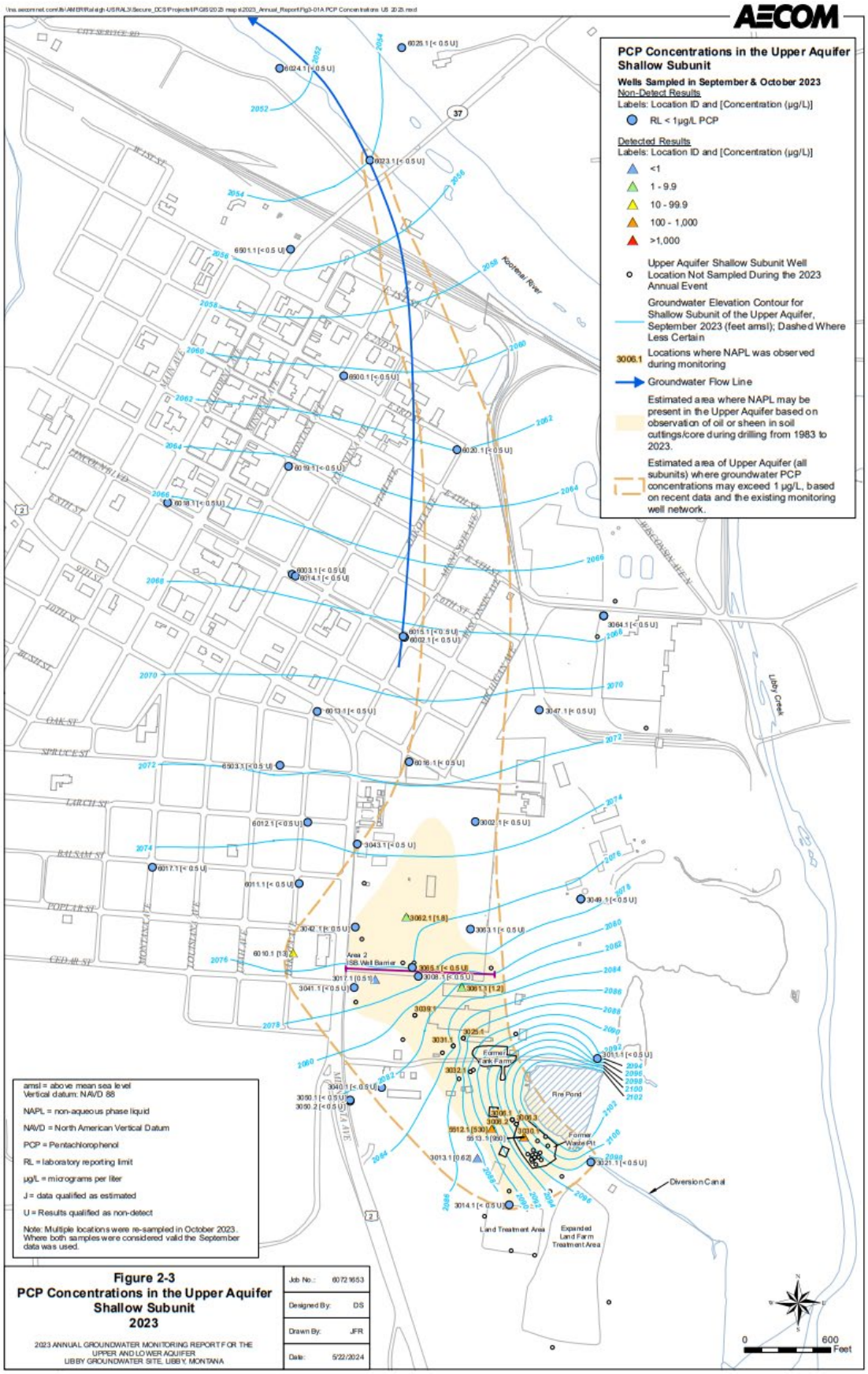


Figure H-3: Updated Upper Aquifer Middle/Deep Subunit Plume Map

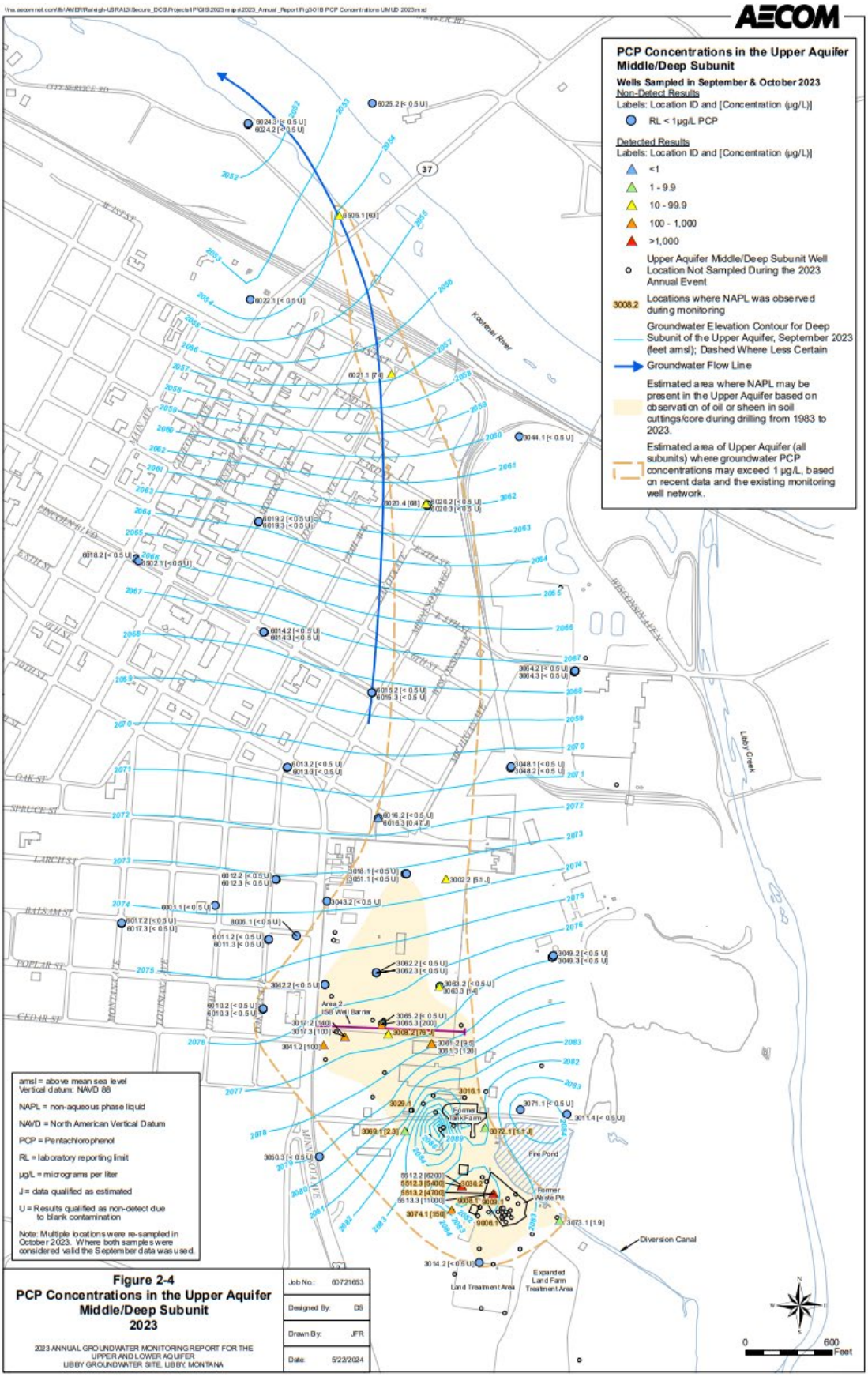


Figure H-4: Top of Intermediate Zone

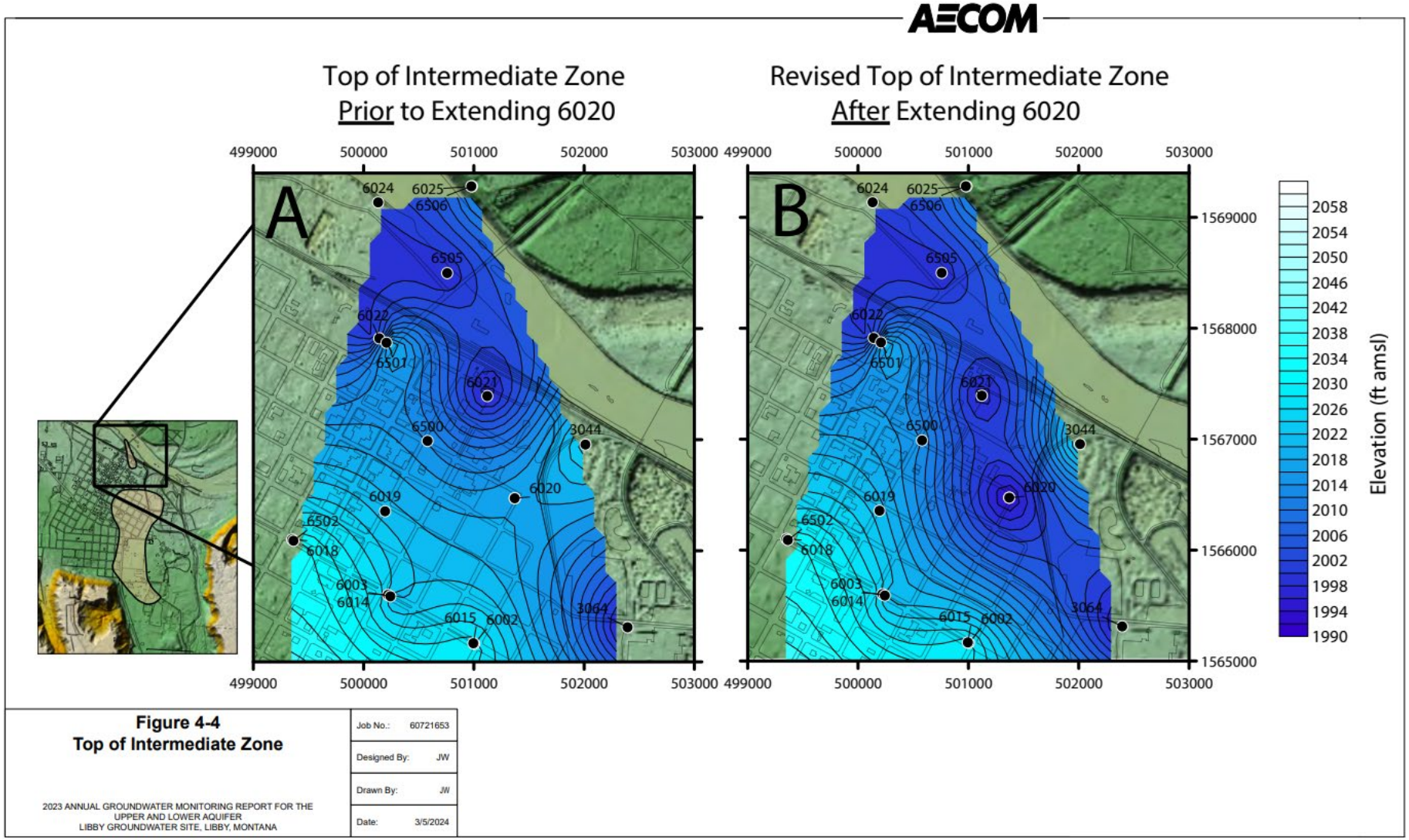
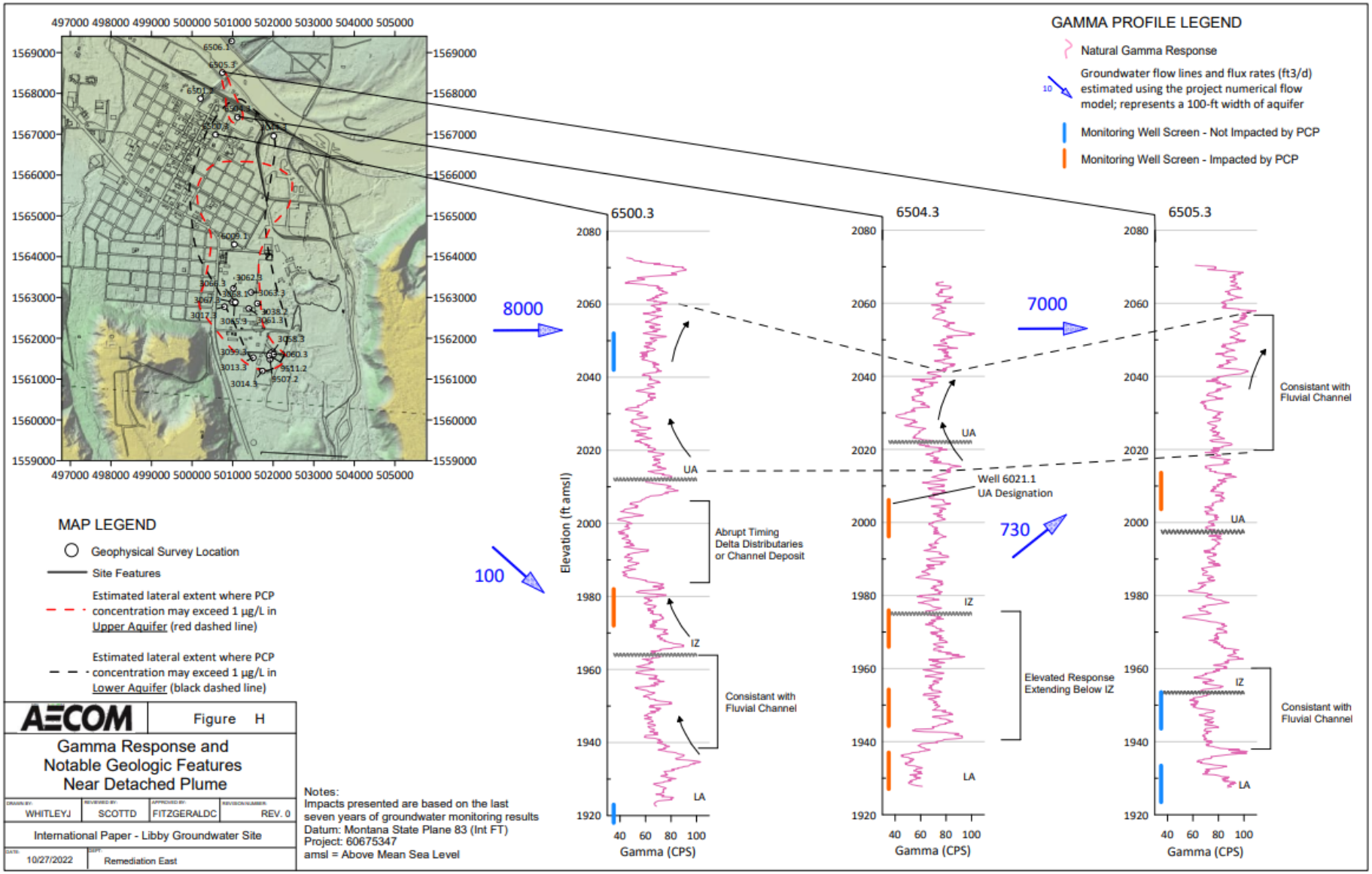


Figure H-5: Gamma Response



APPENDIX I – SCREENING-LEVEL RISK REVIEW

Table I-1: Screening Level Risk Review

Soil COC	Cleanup Goals (mg/kg)	Industrial RSL[a] for Soil (mg/kg)		Risk Calculated Based on Industrial RSL	
		10^{-6} Risk	HQ = 1.0	Risk[b]	HQ[c]
Total carcinogenic PAHs[d]	88[b]	2.1	0.00072	4×10^{-4}	0.4
Acenaphthene	166	NA	45,000	NA	0.004
Anthracene	33	NA	230,000	NA	0.0001
Fluorene	250	NA	30,000	NA	0.008
Fluoranthene	250	NA	30,000	NA	0.008
Chrysene	59,400	2,100	NA	3×10^{-5}	NA
Benzo(a)anthracene	594	21	NA	3×10^{-5}	NA
Benzo(b)fluoranthene	594	21	NA	3×10^{-5}	NA
Benzo(k)fluoranthene	5,940	210	NA	3×10^{-5}	NA
Benzo(a)pyrene	59	2.1	220	3×10^{-5}	0.3
Indeno (1,2,3-c,d)pyrene	594	21	NA	3×10^{-5}	NA
Dibenzo(a,h)anthracene	59	2.1	NA	3×10^{-5}	NA
PCP	36	4	2,800	9×10^{-6}	0.01
2,3,7,8-Tetrachlorodibenzo-p-dioxin (dioxin TCDD)	0.0029	0.000022	0.00072	1×10^{-4}	**4**

Notes:
RSL = Regional Screening Level
HQ = Hazard Quotient
Bold = Exceeds the EPA's Target cancer risk range 1×10^{-6} to 1×10^{-4} or the non-cancer HQ of 1
[a] The EPA soil RSLs, dated November 2025, are available at https://www.epa.gov/risk/regional-screening-levels-rslsgeneric-tables (accessed May 30, 2025).
[b] Risk calculated using the following equation, based on the fact that RSLs are derived based on 1×10^{-6} risk: risk = (cleanup goal / cancer-based RSL) x 10^{-6}
[c] Noncancer HQ calculated using the following equation: HQ = cleanup goal / noncancer-based RSL.
[d] Based on the benzo(a)pyrene equivalence.