VOLUNTARY CLEANUP PLAN REMEDIATION PROPOSAL
FOR
EMPIRE BUILDING MATERIALS, INC. PROPERTY
AT THE CMC ASBESTOS BOZEMAN CECRA FACILITY
BOZEMAN, GALLATIN COUNTY, MONTANA

Prepared for:

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Prepared by:

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LIST OF ACRONYMS

%	percent
<	less than
>	greater than
ACW	asbestos-containing waste
APR	air-purifying respirator
ARM	Administrative Rules of Montana
B.S.	Bachelor of Science
BMP	best management practice
BTV	background threshold value
CCR	Construction Completion Report
CECRA	Comprehensive Environmental Cleanup and Responsibility Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMC	Chicago-Milwaukee Corp.
COC	contaminant of concern
DEQ	Montana Department of Environmental Quality
EA	Environmental Assessment
EL	exposure limit
Empire	Empire Building Materials, Inc.
EPA	U.S. Environmental Protection Agency
ERCL	Environmental Requirements, Criteria, or Limitations
ESA	Environmental Site Assessment
f/cc	fiber per cubic centimeter
GIS	Geographic Information System
GPS	global positioning system
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	high-efficiency particulate air
I-90	Interstate 90
IC	institutional control
ISO	International Organization for Standardization
MCA	Montana Code Annotated

LIST OF ACRONYMS (CONTINUED)

MDT	Montana Department of Transportation
NCP	National Contingency Plan
NESHAP	National Emission Standard for Hazardous Air Pollutants
NIOSH	National Institute for Occupational Safety and Health
O&M	operations and maintenance
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PLP	Potentially Liable Person
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
RP	Remediation Proposal
RTI	Resource Technologies, Inc.
RSL	Regional Screening Level
SSL	Soil Screening Level
TEM	Transmission Electron Microscopy
TWA	time-weighted average
VCP	Voluntary Cleanup Plan
VCP-EA	Voluntary Cleanup Plan-Environmental Assessment
VCRA	Voluntary Cleanup and Redevelopment Act
WESTON®	Weston Solutions, Inc.

1. INTRODUCTION

1.1 SCOPE OF WORK AND PURPOSE

This Voluntary Cleanup Plan (VCP) Remediation Proposal (RP) is being submitted to the Montana Department of Environmental Quality (DEQ) on behalf of the City of Bozeman (applicant) for voluntary cleanup on private property owned by Empire Building Materials, Inc. (Empire). This property lies within the boundaries of the Chicago-Milwaukee Corp. (CMC) Asbestos Bozeman Comprehensive Environmental Cleanup and Responsibility Act (CECRA) Facility regulated by the State Superfund Unit of DEQ. The CMC Asbestos Bozeman CECRA Facility (Facility Code 31311) is located in Bozeman, Gallatin County, Montana, and is on DEQ's CECRA Priority List, ranked as a medium priority facility.

This VCP RP was prepared in accordance with § 75-10-734 Montana Code Annotated (MCA) and DEQ's *Voluntary Cleanup and Redevelopment Act Application Guide* (DEQ, 2020) to address asbestos-containing soils to satisfy requirements in § 75-10-734(3), MCA.

Weston Solutions, Inc. (WESTON®) prepared the Second Voluntary Cleanup Plan-Environmental Assessment (VCP-EA) Addendum (WESTON, 2024) for the CMC Asbestos Bozeman CECRA Facility that details previous investigation and remediation work at the CMC Asbestos Bozeman CECRA Facility where asbestos-impacted soils and potential asbestos-impacted soils remain. However, this VCP RP addresses only a portion of the overall CMC Asbestos Bozeman CECRA Facility. This VCP RP is being prepared for proposed voluntary cleanup activities that will address observed and potentially inaccessible asbestos-impacted soils on the Empire property located at 606 and 608 East Main Street in Bozeman, Montana (**Figures 1** and **2**). For the purposes of this report, the Empire-owned properties that are the subject of this VCP RP will herein be identified as the "Empire property."

There are known inaccessible asbestos-containing soils left in place around the perimeter of the foundation and under the foundation of the South Warehouse, as well as the potential asbestos under the North Warehouse and Warehouse 3. The buildings are proposed to be demolished for a future mixed-use development, so this VCP RP is for the remediation that will occur upon removal of the foundations of both structures. The areas of remaining contamination located outside of the Empire property but within the CMC Asbestos Bozeman CECRA Facility are covered (i.e., under concrete or asphalt) and will be remediated when there are activities (e.g., redevelopment, upgrades to city infrastructure) that result in excavations that remove existing cover, thus exposing the asbestos-contaminated soils. Any activities that disturb the existing cover will require a separate VCP RP and are not covered in this report.

There is potential for additional remediation for a portion of the City of Bozeman's right-of-way (ROW) on South Wallace Avenue, between East Main Street and East Olive Street, depending on the extent of development and the City's requirements for replacement of city-owned infrastructure (i.e., utilities, sidewalks, street).

1.2 COMPLETENESS DETERMINATION OF ENVIRONMENTAL ASSESSMENT

WESTON submitted the Second VCP-EA Addendum to DEQ on September 16, 2024, and a revised Environmental Assessment (EA) to address DEQ's comments was submitted on November 1, 2024, with a subsequent revision submitted on December 16, 2024. Section 75-10-736(2), MCA, indicates that once DEQ determines that the EA component of the VCP is complete, the applicant may submit the RP. DEQ determined the Second VCP-EA Addendum complete on December 23, 2024, and the DEQ completeness determination is included in **Appendix A**.

1.3 WRITTEN CONSENT OF OWNERS AND DEQ REIMBURSEMENT

Under a Stipulated Agreement with DEQ signed in 2017, the City of Bozeman agreed to act as the lead potentially liable person (PLP) to conduct remedial actions at the CMC Asbestos Bozeman CECRA Facility. As the lead PLP, the VCP RP applicant is the City of Bozeman:

City of Bozeman
c/o Kellen Gamradt
P.O. Box 1230
Bozeman, MT 59771-1230

The owner of record for the property with the proposed cleanup actions in this VCP RP is Empire:

Empire Building Materials, Inc.
Physical Address: 606 and 608 East Main Street, Bozeman, MT 59715
Owner Address: P.O. Box 220, Bozeman, MT 59771-0220

Section 75-10-733(2)(c), MCA, requires written consent of current owners (Empire) of the property within the CMC Asbestos Bozeman CECRA Facility to allow access by the applicant, its agents, and DEQ for the implementation of the VCP. A copy of the access agreement granting the City of Bozeman, DEQ, WESTON, private developers, and their agents and authorized representatives' access to the Empire property during implementation of voluntary cleanup activities was included in the Second VCP-EA Addendum and is included in **Appendix B**. This will allow the right of reasonable entry and continued access to the Empire property for the purpose of performing voluntary cleanup activities.

The portions of South Wallace Avenue included within this VCP RP are part of the City of Bozeman's right of way (ROW); written consent from the City is included in **Appendix B** to cover any remediation activities that may occur within the City's ROW. If any work is expected to occur in Montana Department of Transportation's (MDT's) ROW on East Main Street, an encroachment permit application is required to be submitted to MDT for access to the MDT roadway. Access and remediation may not occur until MDT has issued the encroachment permit. The encroachment permit application is also included in **Appendix B**.

As required by § 75-10-733(3)(a), MCA, the City of Bozeman agrees to reimburse DEQ for the State's remedial action costs incurred in the review and oversight of the VCP.

1.4 VCP PREPARATION/QUALIFICATIONS

To satisfy the requirements specified in § 75-10-734(1), MCA, WESTON used qualified environmental professional staff trained in preparing environmental studies and assessments. This team included a project manager and technical specialist. Mindy McCarthy was the primary author of this VCP RP. The key staff and their roles and qualifications are described in more detail below, and resumes are provided in **Appendix C**:

- Project Manager – Jenny O'Mara, EIT, has a Bachelor of Science (B.S.) in Environmental Engineering and has nearly 30 years of environmental experience. She has routinely applied Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), CECRA, and other federal and state regulations to cleanup actions and provided project and technical management for the investigation, evaluation, and remediation of hazardous waste sites in Montana.

- Senior Engineering Professional – Mindy McCarthy has a B.S. in Environmental Engineering with 25+ years of experience in the environmental field providing technical expertise for Phase I/II Environmental Site Assessments (ESAs), site investigations, assessments, and remediation.

1.5 VERIFICATION OF EMPIRE PROPERTY CONDITIONS

The portion of the CMC Asbestos Bozeman CECRA Facility under this VCP RP is eligible to be addressed under the Voluntary Cleanup and Redevelopment Act (VCRA) as described in § 75-10-732(1), MCA, because there has been a release of a hazardous substance that may present imminent and substantial endangerment to public health, welfare, and safety and to the environment.

The Empire property conditions have not changed, and no remedial actions have occurred since the submission of the Second VCP-EA Addendum (WESTON, 2024).

There are no fixed start dates for the initiation or implementation of this VCP RP; however, it is anticipated that demolition of the buildings and subsequent remediation will occur no sooner than the spring of 2025, following DEQ's approval of this VCP RP. After approval, the applicant will obtain required permits and initiate cleanup. Initiation of cleanup is expected to occur within 12 months of DEQ approval of the VCP RP, and the cleanup will be completed within 60 months of DEQ approval pursuant to § 75-10-736(6)(b)(i), MCA. The applicant will petition for closure of the remediation of areas within the CMC Asbestos Bozeman CECRA Facility that are covered under this VCP RP.

1.6 REVIEW OF CONTAMINANTS OF CONCERN (COCS)

As described in the Second VCP-EA Addendum (WESTON, 2024), the only known contaminant of concern (COC) at the CMC Asbestos Bozeman CECRA Facility is anthophyllite asbestos in shallow soils (to depths of 4 feet). The extent of potential and confirmed asbestos impacted soil is shown in **Figure 2**. Potential asbestos-impacted areas are those areas where the presence of asbestos has not been confirmed, but where there are reasons to assume asbestos contamination may be present due to proximity to historical asbestos ore operations. Confirmed asbestos-

impacted areas are those areas where visual asbestos was documented during previous investigations and remediation. For this VCP RP, only the Empire property portion of the CMC Asbestos Bozeman CECRA Facility, which contains both potential and observed asbestos-contaminated soils as described below, is being proposed for remediation.

Although all accessible asbestos ore was removed from the Empire property in 2009 as described in the 2010 Construction Completion Report (Tetra Tech, 2010), inaccessible asbestos ore remains beneath the South Warehouse and around its perimeter, beneath the North Warehouse, and beneath South Wallace Avenue (**Figure 2**). As a part of the remediation in 2009, a shotcrete cover was placed over asbestos-contaminated soils around the perimeter of the South Warehouse as excavation and removal of these soils would have compromised the structure's foundation. As a result, recorded land use restrictions called institutional controls (ICs) were placed on two buildings located within the Empire property in the form of a restrictive covenant for the soils under the North and South Warehouses.

Although not previously recognized, Resource Technologies, Inc. (RTI) completed an asbestos inspection of building materials for the warehouses on Empire property in August 2024. They identified in their *Revised Asbestos Sampling Report* (RTI, 2024) that the concrete slabs at Warehouse 3 are suspected to have been poured directly onto asbestos-containing soils based on the estimated construction date of the building occurring after asbestos milling operations, but it is not confirmed.

Since the remaining asbestos contamination at the Empire property is limited to the potential asbestos-impacted area located under the North Warehouse and Warehouse 3, and the observed asbestos-impacted area located under the South Warehouse, those areas are the focus of this VCP RP.

If the demolition and redevelopment activities result in the replacement of city-owned infrastructure (i.e., utilities, sidewalks, street), then the same cleanup activities and requirements as described for the Empire property will occur.

2. CLEANUP LEVELS

As described in **Section 1.6,** previous investigation and cleanup efforts have demonstrated that asbestos in soil is the only COC for the CMC Asbestos Bozeman CECRA Facility. Section 75-10-734(3)(i), MCA, requires identification of cleanup levels for the CMC Asbestos Bozeman CECRA Facility that are protective of public health, welfare, and safety and of the environment based on the current and reasonably anticipated future uses of the CMC Asbestos Bozeman CECRA Facility. Development and application of Facility-specific soil screening levels, comparison with background screening levels, Facility-specific risk-based cleanup levels, or adjustment of established generic screening levels are unnecessary since DEQ's January 5, 2016 completeness letter for the 2015 EA Addendum (Tetra Tech, 2015) specified the cleanup level as 0.25 percent (%) in soil. This cleanup level was developed because it was the lowest possible detection limit achievable by the CARB 435 TEM analytical method. Therefore, any debris or soil with asbestos concentrations at or above 0.25% requires evaluation of remedial options.

Additionally, no Facility-specific leaching to groundwater screening level is necessary because asbestos is insoluble, asbestos-containing soils have been covered with little leaching potential, and asbestos-containing soils are not in direct contact with groundwater.

3. REMEDIAL ALTERNATIVES COMPARISON

Section 75-10-734(3)(b), MCA, requires a comparison of reasonable remedial alternatives based on the remedy selection criteria specified in § 75-10-721, MCA. The following sections present a comparison of the remedial alternatives to the criteria associated with the asbestos in soils at the Empire property that are part of this VCP RP.

Protectiveness: In accordance with § 75-10-721(1), MCA, the voluntary cleanup must "attain a degree of cleanup of the hazardous or deleterious substance and control of a threatened release or further release of that substance that assures protection of public health, safety and welfare and of the environment." An evaluation of the protectiveness of the alternatives in relation to public health, welfare, safety, and the environment is included in **Section 3.3**.

Compliance with Environmental Requirements, Criteria, or Limitations (ERCLs): In accordance with § 75-10-721(2)(a) and (b), MCA, the cleanup must be consistent with applicable state or federal environmental requirements, criteria, or limitations and must consider the substantive state or federal environmental requirements, criteria, or limitations that are relevant to the site conditions. The ERCLs are further described in **Section 3.1**, and an evaluation of whether the alternative complies with all ERCLs is included in **Section 3.3** and **Appendix D**.

Mitigation of Exposure Risk: In accordance with § 75-10-721(2)(c)(i) and § 75-10-734(3)(a)(iv), MCA, the remedial action should demonstrate acceptable mitigation of exposure to risks to the public health, safety, and welfare and to the environment. An evaluation of whether the alternative mitigates exposure risk to public health, welfare, and safety and the environment is included in **Section 3.3**.

Effectiveness and Reliability: In accordance with § 75-10-721(2)(c)(ii), MCA, the remedial action should be effective and reliable in the short term and long term. An evaluation of the short- and long-term effectiveness and reliability of the alternative is included in **Section 3.3**.

Practicable and Implementable: In accordance with § 75-10-721(2)(c)(iii), MCA, the remedial action should be technically practicable and implementable. An evaluation of the ease or difficulty of implementing the alternative and whether it is technically practicable and implementable is included in **Section 3.3**.

Treatment or Resource Recovery Technologies: In accordance with § 75-10-721(2)(c)(iv), MCA, the remedial action should consider the use of treatment technologies or resource recovery technologies if practicable, giving due consideration to engineering controls. An evaluation of whether the alternative implements treatment or recovery strategies is included in **Section 3.3**.

Cost Effectiveness: In accordance with § 75-10-721(2)(c)(v), MCA, the remedial action should consider cost-effectiveness. A comparison of incremental cost with incremental reduction of risk is included in **Section 3.3**.

3.1 APPLICABLE OR RELEVANT STATE AND FEDERAL ENVIRONMENTAL REQUIREMENTS, CRITERIA, OR LIMITATIONS

Section 75-10-721(2)(a) and (b), MCA, provides that approving or implementing remedial actions must comply with applicable or relevant state or federal ERCLs. Applicable requirements apply regardless of whether the proposed remedy is being conducted under VCRA or not. Relevant requirements are those that are not applicable but that address situations or issues sufficiently similar to those at the CMC Asbestos Bozeman CECRA Facility. DEQ considers relevant ERCLs on a case-by-case basis considering facility-specific information. **Appendix D**, which is adapted from the DEQ-approved 2016 VCP RP (Tetra Tech, 2016), provides a list of all applicable and relevant ERCLs that were selected based on the work proposed in this VCP RP. If a different VCP or remedial action were proposed, preferred, chosen, or implemented for the Empire property, the ERCLs contained herein might be substantially different. All relevant requirements identified in the approved VCP RP must be attained. **Appendix D** also includes a statement about how the RP complies with each ERCL.

There are generally three types of ERCLs—action-specific, contaminant-specific, and location-specific—and each type is described in DEQ's *Voluntary Cleanup and Redevelopment Act Application Guide* (DEQ, 2020). Some ERCLs could be categorized as more than one type but are not duplicated within **Appendix D**.

CECRA indicates only state and federal ERCLs apply as cleanup requirements; however, remedial designs, implementation, and operation and maintenance (O&M) must also comply with all other applicable laws (local, state, and federal). Because asbestos is the COC at the CMC Asbestos Bozeman CECRA Facility, applicable laws relating to health and safety and compliance with these laws are the applicant's responsibility. Many of the listed requirements in **Appendix D** are promulgated as identical or nearly identical requirements in both federal and state law, usually pursuant to delegated environmental programs administered by the U.S. Environmental Protection Agency (EPA) and the state (e.g., federal Clean Water Act and the Montana Water Quality Act). The preamble to the National Contingency Plan (NCP) indicates that when such a situation occurs, the state provision should be cited as the appropriate standard, but the provision should be treated as a federal requirement. ERCLs and other laws that are unique to the state are also identified.

3.2 PRESENT AND REASONABLY ANTICIPATED FUTURE USES

As stated in the Second VCP-EA Addendum (WESTON, 2024), the Empire property is currently a commercial property that is used as an office and for building material storage. In the future, the buildings will be demolished, and the long-term goal for the property is for a mixed-use development.

No changes to the current use of South Wallace Avenue are proposed. It will continue to be used as a public ROW with associated curbs, gutters, and sidewalks owned by the City of Bozeman. In the foreseeable future, street maintenance or upgrading would occur to preserve and improve the condition and longevity of this ROW.

The surrounding properties near the Empire property are primarily commercial, intermixed with residential, and a public library and park. Some of the adjacent property areas that are part of the

CMC Asbestos Bozeman CECRA Facility have had remedial cleanup under previously approved VCPs, including Harrington's property to the south of the Empire property and the Bozeman Public Library to the east of the Empire property. No changes to the current use of the Bozeman Public Library property or park land to the east and south of the Empire property are expected. The surrounding properties to the north and west are commercial or residential properties, and any future redevelopment in this area would have to conform to zoning restrictions. Any areas remaining within the CMC Asbestos Bozeman CECRA Facility that have not been remediated would require cleanup under a separate VCP if redevelopment requires disturbance of the asbestos-containing soils.

3.3 REMEDIAL ALTERNATIVES

There are three remedial alternatives identified for the Empire property. These alternatives include the following:

- Alternative 1 – No Action
- Alternative 2 – Excavation and Off-Site Disposal
- Alternative 3 – Limited Area Excavation and Off-Site Disposal

The following provides a discussion of each alternative and an evaluation of the remedial alternatives criteria.

3.3.1 Alternative 1 – No Action

Alternative 1 would leave the Empire property in its present condition with the known and potential asbestos-containing soils in place around the perimeter of the foundation of the South Warehouse, and under the South and North Warehouses and Warehouse 3. The existing IC (restrictive covenant) would remain in place. Due to the existing restrictive covenant on the Empire property, no redevelopment could take place. However, there would be no remediation, monitoring, or additional ICs. **Table 3-1** presents the remedial evaluation for Alternative 1.

Table 3-1. Alternative 1 Remedial Evaluation

Criteria	Alternative Evaluation
Protectiveness	Alternative 1 would be less protective of public health, safety, welfare, and the environment than other alternatives. Asbestos in soil would remain in place at the Empire property and would continue to pose a risk if the soil from the inaccessible areas were disturbed by subsurface work (e.g., utility or infrastructure installation, building remodeling or demolition) in the event where current ICs do not ensure protectiveness.
Compliance with ERCLs	The existing established IC requires removal if the soil from the inaccessible area is disturbed. It remains in place at the Empire property, so Alternative 1 complies with the ERCLs.
Mitigation of Exposure Risk	Alternative 1 does not provide for further mitigation of exposure risks to public health, welfare, and safety or to the environment.
Effective and Reliable	Alternative 1 is not effective and reliable in the short or long term because it would limit redevelopment, which is the proposed future use of the Empire property per the current property owner. This alternative would still require

	compliance with established ICs. The ICs include requirements to address asbestos upon disturbance of the cover material (i.e., concrete and paved surfaces) that currently prevent access to the asbestos-contaminated soils. Alternative 1 would prevent renovation or demolition of existing structures, including concrete, paved surfaces, and upgrades to infrastructure and potential future redevelopment within the Empire property boundary.
Practicable and Implementable	Although Alternative 1 is implementable, it is not practicable, as it would restrict the redevelopment of properties within the Empire property boundary.
Treatment or Resource Recovery Technologies	Alternative 1 does not include use of treatment or resource recovery technologies or engineering controls.
Cost Effectiveness	Alternative 1 is cost-effective because there are no additional costs beyond those associated with monitoring of the ICs that were itemized as part of a previous VCP when that remedy was selected; however, it would restrict the redevelopment of properties within the Empire property boundary.

3.3.2 Alternative 2 – Excavation and Off-Site Disposal

Under Alternative 2, excavation and off-site disposal of all known asbestos-contaminated soil and asbestos-containing waste (ACW) at the Empire property would occur upon demolition and removal of the existing covers at the South and North Warehouses and Warehouse 3 prior to future redevelopment of the property. The ACW includes asphalt pavement, concrete slab foundations, footings, and other concrete portions of the structure installed on the Empire property prior to July 1, 2009. Under the existing IC (i.e., restrictive covenant for the Empire property), the soils must be inspected for asbestos. A Montana Accredited Asbestos Contractor/Supervisor is required to inspect and, if necessary, sample those areas for the presence of asbestos. If the inspection and sampling show the presence of asbestos in any of the soils, a Montana Accredited Asbestos Project Contractor would remove, transport, and dispose of the contaminated soils and ACW in compliance with applicable state and federal requirements. All contaminated materials would be handled using methods consistent with *Asbestos/National Emission Standard for Hazardous Waste Pollutants (NESHAP) Adequately Wet Guidance,* EPA 340/1-90-019 (EPA, 1990), including being wrapped in leak-tight wrapping while wet and prior to transportation.

Soils with greater than (>) 1% asbestos removed under Alternative 2 will be hauled and disposed of in Valleyview Landfill, a Class II landfill located in East Helena, Lewis and Clark County, Montana. If sample results for the soils are less than (<) 1%, the wastes will be hauled and disposed of in Logan Landfill, a Class II landfill located in Manhattan, Gallatin County, Montana. The concrete slabs are considered non-friable ACW and can be disposed of at the Logan Landfill; however, if the soil exceeds 1% asbestos, they will be disposed of with the asbestos-contaminated soils at the Valleyview Landfill.

During excavation, confirmation samples will be collected to demonstrate that the asbestos contamination has been removed from the Empire property and meets the cleanup levels as described in **Section 2**. Confirmation sampling is further described in **Section 4.7**.

Upon excavation, the remediation boundary will be documented using a global positioning system (GPS) survey, and the removal locations, removal and disposal volumes, and confirmation

sampling results will be documented through the City's IC program (e.g., Geographic Information System [GIS], street cut permits).

Once the asbestos-contaminated soils are removed to achieve cleanup levels, the property owner may request DEQ approval to remove the restrictive covenant from the Empire property in accordance with § 75-10-727, MCA, and there would be no further action needed on the Empire property.

Table 3-2 presents the remedial evaluation for Alternative 2. **Table 3-3** presents an estimated cost breakdown for Alternative 2.

Table 3-2. Alternative 2 Remedial Evaluation

Criteria	Alternative Evaluation
Protectiveness	Alternative 2 would include the highest long-term protectiveness of public health, safety, welfare and the environment through removal of all contaminated waste to achieve cleanup levels, thus protecting future users from inhalation risks from soil disturbances.
Compliance with ERCLs	Alternative 2 complies with the ERCLs as described in the ERCLs analysis (**Appendix D**).
Mitigation of Exposure Risk	Alternative 2 would mitigate exposure risks to public health, welfare, and safety and to the environment by removing and disposing asbestos contamination at an approved off-site landfill. During remediation, soil confirmation samples would be collected to ensure cleanup levels are achieved. Controls and best management practices (BMPs) would be implemented during excavation and transport activities to prevent exposure to workers or the public during construction activities. The approved landfill that will receive the asbestos-contaminated soils is controlled and restricted, preventing further exposure. Because all contaminated waste above cleanup levels would be removed from the Empire property, ICs to prevent future exposures to asbestos contamination would no longer be necessary on the Empire property.
Effective and Reliable	Alternative 2 is effective and reliable in the short and long term. In the short term, during the cleanup, containment and BMPs would be applied to protect workers and the public. Air monitoring would also occur as described in **Section 4.6** to verify the effectiveness of the controls and BMPs. In the long term, the contaminated waste would be removed from the Empire property and disposed offsite at a permitted disposal facility, and ICs and O&M would not be required for the Empire property.
Practicable and Implementable	Previous successful removal actions have occurred at the CMC Asbestos Bozeman CECRA Facility under VCRA, and the same work practices spelled out in previous VCP RPs would be applied. Specifically, remediation projects were completed in 2003 and 2009. Known engineering controls exist to excavate, transport, and dispose of asbestos waste (using conventional excavation equipment that is readily available) that prevent public and construction worker exposure to unacceptable levels during cleanup.
Treatment or Resource Recovery Technologies	No treatment or resource recovery technologies would be used in Alternative 2. Long-term engineering controls would not be necessary because contamination would be removed and disposed of at an off-site landfill, though short-term

	engineering controls (fencing, etc.) would be necessary during implementation of the remedy.
Cost Effectiveness	Alternative 2 will cost approximately $972,400 to implement, including remedial construction, engineering, oversight, disposal costs, air monitoring, compliance monitoring, and associated analytical costs. An Alternative 2 cost breakdown is provided in **Table 3-3**. This alternative is cost effective because it mitigates the long-term and short-term risks for the Empire property completely.

The estimated costs identified in **Table 3-3** assumes total removal of the footprint from the South Warehouse, the North Warehouse and Warehouse 3 with expected cost accuracy ranges of -30 to +50 percent. The estimated costs for materials, labor, and equipment are generated on specific assumptions based on experience and by using RS Means and are only for comparison. Some costs to implement Alternative 2 may qualify for Orphan Share reimbursement, subject to DEQ's review and availability of Orphan Share funds.

Table 3-3. Alternative 2 Cost Estimate

Item	QTY	Units	Unit Cost	Item Cost
Design and Work Planning	1	LS	$50,000	$50,000
Fencing and Signage	1	LS	$7,500	$7,500
Security (night and weekend patrol - per month)	1	Month	$2,500	$3,750
Traffic, Air Monitoring, and Dust Control	1	LS	$37,500	$37,500
Site Office and Restrooms	1	LS	$4,500	$4,500
Site Preparation and Setup	1	LS	$7,500	$7,500
Mobilization/Demobilization	1	LS	$30,000	$30,000
Concrete Slab and Soil Removal	1	LS	$173,800	$173,800
Transportation	3,000	Tons	$50	$150,000
Disposal of ACW	2,330	CY	$85	$198,550
Contractor Oversight	1	LS	$37,500	$37,500
Analytical Costs	1	LS	$90,000	$90,000
Project Management/Reporting	1	LS	$55,000	$55,000
Task Subtotal				**$845,600**
Contingency (approximately 15 percent)				$126,800
Toal Estimate				**$972,400**

CY – cubic yard
LS – lump sum
QTY – quantity

3.3.3 Alternative 3 – Limited Area Excavation and Off-Site Disposal

Under Alternative 3, a limited area (North Warehouse and Warehouse 3) containing asbestos-contaminated soils and ACW would be excavated and disposed of with the remaining areas of asbestos soils being left in place under their current cover. Upon demolition and removal of the existing cover material at the North Warehouse and Warehouse 3, the potential asbestos-contaminated soils and ACW would be excavated and disposed of. The ACW includes asphalt pavement, concrete slab foundations, footings, and other concrete portions of the structure installed on the Empire property prior to July 1, 2009. Under the existing IC (i.e., restrictive covenant for the Empire property), the soils must be inspected for asbestos. A Montana Accredited Asbestos

Contractor/Supervisor is required to inspect and, if necessary, sample those areas under the North Warehouse and Warehouse 3 for the presence of asbestos. If the inspection and sampling show the presence of asbestos in any of the soils, a Montana Accredited Asbestos Project Contractor would remove, transport, and dispose of the contaminated soils and ACW in compliance with applicable state and federal requirements. All contaminated materials would be handled using methods consistent with Asbestos/National Emission Standard for Hazardous Waste Pollutants (NESHAP) Adequately Wet Guidance, EPA 340/1-90-019 (EPA, 1990), including being wrapped in leak-tight wrapping while wet and prior to transportation.

Soils with greater than (>) 1% asbestos removed under Alternative 3 will be hauled and disposed of in Valleyview Landfill, a Class II landfill located in East Helena, Lewis and Clark County, Montana. If sample results for the soils are less than (<) 1%, the waste will be hauled and disposed of in Logan Landfill, a Class II landfill located in Manhattan, Gallatin County, Montana. The concrete slabs are considered non-friable ACW and can be disposed of at the Logan Landfill; however, if the soil exceeds 1% asbestos, they will be disposed of with the asbestos-contaminated soils at the Valleyview Landfill.

Following excavation, confirmation samples will be collected to demonstrate that the asbestos contamination has been removed from the Empire property and meets the cleanup levels as described in **Section 2**. Confirmation sampling is further described in **Section 4.7**.

The remediation boundary will be documented using a global positioning system (GPS) survey, and the removal locations, removal and disposal volumes, and confirmation sampling results will be documented through the City's IC program (e.g., Geographic Information System [GIS], street cut permits).

The remaining covered area of contamination at the South Warehouse would remain in its current condition, including a portion of known asbestos-containing soils around the perimeter of the foundation and under the South Warehouse. The existing IC (restrictive covenant) would remain in place. Due to the existing restrictive covenant on the Empire property, no disturbance of the remaining cover could take place without removal and disposal of any underlying contamination.

Table 3-4 presents the remedial evaluation for Alternative 3. **Table 3-5** presents an estimated cost breakdown for Alternative 3.

Table 3-4. Alternative 3 Remedial Evaluation

Criteria	Alternative Evaluation
Protectiveness	Alternative 3 would be less protective of public health, safety, welfare, and the environment than Alternative 2 because asbestos in soil would remain in place at the Empire property in the covered contamination area of the South Warehouse and would continue to pose a risk if the soil from this area is disturbed by subsurface work (e.g., utility or infrastructure installation, building remodeling or demolition). However, the IC would remain in place and the asphalt/concrete cover would be protective so long as they are not disturbed.
Compliance with ERCLs	Alternative 3 complies with the ERCLs as described in the ERCLs analysis (**Appendix D**) since exposed asbestos will be addressed and the IC will remain in

	place for areas with remaining asbestos contamination under asphalt/concrete cover.
Mitigation of Exposure Risk	Alternative 3 mitigates exposure risks to public health, safety, welfare and the environment but leaves asbestos soils in place, although exposure risks are minimized with the cover and existing IC. However, any future disturbances to the cover may result in exposure risks.
Effective and Reliable	Alternative 3 is effective and reliable in the long-term due to the presence of the existing ICs but is less effective and reliable than Alternative 2 since it leaves asbestos soils in place that could be disturbed in the future. The existing ICs include requirements to address asbestos upon disturbance of the cover (i.e., concrete and paved surfaces) that currently prevent access to the asbestos-contaminated soils. However, Alternative 3 would prevent redevelopment of the entire Empire property and demolition of all existing structures, including concrete, paved surfaces, and upgrades to infrastructure. This alternative conflicts with the Empire property owners proposed reasonably anticipated future use.
Practicable and Implementable	Alternative 3 is implementable and practicable, but conflicts with reasonably anticipated future use of the Empire property.
Treatment or Resource Recovery Technologies	Alternative 3 does not include use of treatment or resource recovery technologies, but would utilize engineering controls during implementation of the excavation portion of the remedy (fencing, etc.).
Cost Effectiveness	Alternative 3 will cost approximately $741,800 to implement, including remedial construction, engineering, oversight, disposal costs, air monitoring, compliance monitoring, and associated analytical costs. An Alternative 3 cost breakdown is provided in **Table 3-5**. This alternative would restrict the redevelopment of properties within the Empire property boundary; however, the partial remediation mitigates the long-term and short-term risks for the areas where asbestos containing material is to be removed. In addition, it is likely that remediation costs will significantly increase in the future so it would be a cost-benefit to complete all remediation at once.

Table 3-5. Alternative 3 Cost Estimate

Item	QTY	Units	Unit Cost	Item Cost
Design and Work Planning	1	LS	$50,000	$50,000
Fencing and Signage	1	LS	$5,000	$5,000
Security (night and weekend patrol - per month)	1	Month	$2,500	$2,500
Traffic, Air Monitoring, and Dust Control	1	LS	$25,000	$25,000
Site Office and Restrooms	1	LS	$3,000	$3,000
Site Preparation and Setup	1	LS	$5,000	$5,000
Mobilization/Demobilization	1	LS	$30,000	$30,000
Concrete Slab and Soil Removal	1	LS	$147,300	$147,300
Transportation	2,040	Tons	$50	$102,000
Disposal of ACW	1,590	CY	$85	$135,210
Contractor Oversight	1	LS	$25,000	$25,000
Analytical Costs	1	LS	$60,000	$60,000
Project Management/Reporting	1	LS	$55,000	$55,000
Task Subtotal				**$645,010**
Contingency (approximately 15 percent)				$96,800
Toal Estimate				**$741,800**

CY – cubic yard
LS – lump sum
QTY – quantity

3.3.4 Remedial Alternatives Summary

Potential and observed asbestos covered under this VCP RP is present at the Empire property around the foundation perimeter of the South Warehouse, under the South and North Warehouses and Warehouse 3.

Alternative 1 – A no action alternative is not an acceptable alternative because it is not consistent with the reasonably anticipated future uses of the Empire property over the long term and would limit redevelopment.

Alternative 2 – Complete removal of asbestos contamination is the only alternative that would comply with the existing restrictive covenant on the Empire property. More importantly, this alternative is the most protective in the long term and mitigates the risk to public health, welfare, and safety and to the environment. This alternative has a high cost because it includes complete removal and disposal of remaining currently inaccessible asbestos within the Empire property. Alternative 2 would eliminate the need for continuing the IC specific to the Empire property and would not require any new ICs or O&M since all asbestos-contaminated soils and ACW would be removed.

Alternative 3 – This alternative scored lower than Alternative 2 due to 1) the uncertainties in the effectiveness for contaminant removal due to this being only a partial removal with the potential for future disturbance; 2) the need to continue the IC on the property; and 3) this alternative not being consistent with the proposed future use of the property. This alternative would leave the South Warehouse cover in place. While this alternative has a lower cost than Alternative 2, it

includes limited removal and disposal of remaining inaccessible asbestos within the Empire property, compared to complete removal of asbestos as proposed in Alternative 2.

Complete removal of asbestos contamination is the only alternative that aligns with the future redevelopment plans. This alternative is less protective in the long term compared to Alternative 2, but mitigates the risk to public health, welfare, safety and to the environment for the areas where remediation will occur. Alternative 3 would still require the IC on the Empire property.

Therefore, Alternative 2 is the proposed remedy for the Empire property. A summary comparison table for the proposed alternatives is provided in **Table 3-6**.

Table 3-6. Remedial Alternatives Comparison Summary

Criteria	Alternative 1 – No Action	Alternative 2 – Excavation and Off-Site Disposal	Alternative 3 – Limited Area Excavation and Off-Site Disposal
Protectiveness	Yes	Yes	Yes
Compliance with ERCLs	Yes	Yes	Yes
Mitigation of Exposure Risk	Yes	Yes	Yes
Effective and Reliable	No	Yes	Yes – limits redevelopment
Practicable and Implementable	Yes	Yes	Yes
Technology/Engineering Controls	No	No	No
Cost Effectiveness	Yes - $0	Yes - $972,400	Yes - $741,800

4. PROPOSED CLEANUP PLAN

The preferred remedy for the Empire property is Alternative 2, which involves excavation of asbestos-contaminated soil and removal of ACW, with subsequent disposal at a Class II landfill. This removal will occur when the existing North Warehouse, South Warehouse, and Warehouse 3 structures are demolished and removed in preparation for the redevelopment project and the inaccessible asbestos becomes accessible. The work will be conducted either concurrently or following building demolition.

Although all inaccessible asbestos-contaminated soils (**Figure 2**) and associated ACW will be removed beneath the existing North Warehouse, South Warehouse and Warehouse 3 within the Empire-owned property, additional removal may be needed in the City ROW if potential future development (e.g., infrastructure improvements for water and sewer utilities) impacts existing sidewalk, curbs, or pavement.

For soils with >1% asbestos, ACW removed under Alternative 2 will be hauled and disposed in Valleyview Landfill, a Class II landfill located in East Helena, Lewis and Clark County, Montana. If sample results for the soils are <1%, the wastes will be hauled and disposed in Logan Landfill, a Class II landfill located in Manhattan, Gallatin County, Montana. Once all ACW has been removed and disposed of, although unlikely, any areas that require fill material will be backfilled with clean soil, graded, compacted, and hard-scaped as required.

ICs and O&M will still be required on the remaining properties at the CMC Asbestos Bozeman CECRA Facility; however, once the Empire property remediation is complete, ICs and O&M may no longer be needed in this area and the IC could be repealed on the Empire property pursuant to § 75-10-727(4), MCA.

The following sections provide details related to specific tasks that will be completed during implementation of this VCP RP.

4.1 HEALTH AND SAFETY REQUIREMENTS

All on-site remediation personnel will be required, at a minimum, to complete Occupational Safety and Health Administration (OSHA) 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) and relevant 8-hour refreshers, hold a current HAZWOPER medical clearance certification (i.e., physician letter and respiratory protection training as required by 29 Code of Federal Regulations [CFR] 1910.134), and asbestos awareness training as required by 29 CFR 1910.1001. Applicable health and safety regulations will be met during implementation of the VCP RP.

All applicable health and safety regulations will be met during implementation of the selected remedial action. On-site remediation personnel will be responsible for developing OSHA-compliant, project-specific Health and Safety Plans (HASPs) and must maintain appropriate documentation of training for active field personnel. A generic HASP is included in **Appendix E**; however, the remediation contractors or subcontractors will be responsible for developing their own HASPs but the example in **Appendix E** contains the minimum requirements.

Respiratory protection will be required for all soil disturbance activities within the exclusion zone and contaminant reduction zone (described in **Section 4.8.1**) as described in the associated HASP. All contractors with personnel wearing respirators on-site must maintain their own respiratory protection plan. A map of the planned exclusion and contaminant reduction zones for this project is included in **Figure 3**. The Montana Accredited Asbestos Contractor/Supervisor and construction oversight personnel may refine the map based on site conditions prior to remediation activities. Respiratory protection shall reduce the airborne concentration of asbestos fibers below the permissible exposure limit (PEL) and exposure limit (EL). The airborne concentration of asbestos cannot exceed 0.1 fiber per cubic centimeter (f/cc) of air as an 8-hour time-weighted average (TWA) or exceed 1.01 f/cc averaged over a 30-minute sampling period. A National Institute for Occupational Safey and Health (NIOSH)-approved, half-face, negative-pressure air-purifying respirator (APR) equipped with P-100 high-efficiency particulate air (HEPA)-rated particulate filter will be used by personnel engaged in disturbance and/or handling of asbestos-contaminated soils and ACW. All personnel entering the remediation area must wear the same level of respiratory protection and protective clothing as personnel handling ACW, even if they are not engaged in disturbing or handling ACW.

All persons conducting remedial actions for this VCP RP must meet accreditation requirements established in Administrative Rules of Montana (ARM) 17.74.362. The owner or operator will obtain an asbestos project permit as required by ARM 17.74.355.

The Project Site Safety and Health Officer (SSHO) will be responsible for implementation of the HASP, daily tailgate meetings, recordkeeping of safety and health activities, and air monitoring. The SSHO will be on-site to ensure that the protocols and procedures required by the HASP are properly being implemented. The SSHO, DEQ-personnel and remediation workers will have the authority to stop work if workers or the public's health and safety are compromised. However, DEQ will be notified if conditions that may affect the risk to public health, welfare, and safety of the environment occur during VCP-RP implementation.

To protect on-site and off-site workers nearby residents, business workers, and area visitors, air monitoring will be performed during excavation and hauling of asbestos-contaminated soils and ACW. The types of air monitoring that will be performed and their objectives are defined below in **Section 4.6**.

4.2 ACCESS

Access to regulated areas will be limited to authorized persons and to persons authorized by 29 CFR 1926.1101(e)(3).

4.3 PERMITS

Prior to remediation, appropriate permits will be obtained. A list of potential permits required to complete the asbestos remediation work is provided below.

- National Emission Standard for Hazardous Air Pollutants (NESHAP) Notification – DEQ's Asbestos Control Program
- Asbestos Project Permit – DEQ's Asbestos Control Program
- Street Cut Permit - City of Bozeman

To meet the City of Bozeman's requirements for remediation activities that would extend into the South Wallace ROW, a Street Cut Permit is required. This permit application is included on the City of Bozeman's Project Dox Portal, located on the City's webpage at: https://www.bozeman.net/services/development-center. Relevant permit information is included in **Appendix F**. The City of Bozeman requires a Montana Accredited Asbestos Contractor/Supervisor to inspect the project area for the presence of asbestos-containing material during excavation and to complete the *Potential Asbestos Along Wallace Avenue* form that would be submitted to the City and DEQ. Copies of all permits will be provided to DEQ in the Construction Completion Report.

4.4 SITE PREPARATION AND SECURITY

Work layouts and work plans will be developed prior to implementation of the remedial activities and will be based on the portion of the Empire property being addressed.

Structural features that are not in direct contact with asbestos-contaminated soils will be demolished at the Empire property prior to soil removal for work activities that are not included in this VCP RP. Once the foundations of the North and South Warehouses and Warehouse 3 are

removed, the work zone will be established for the removal of the ACW and the excavation and removal of asbestos-contaminated soils.

In the work layouts and plans, work zones will be delineated to include an exclusion zone where excavation and confirmation sampling will be conducted; a contaminant reduction zone adjacent to the excavation area where loading will occur, and personnel and equipment leaving the exclusion zone will be decontaminated; and a support zone for equipment staging and personnel not actively engaged in remedial activities outside of contaminated areas. Only excavation equipment will be in the exclusion zone, while loading trucks will be staged in the contamination reduction zone. The work zones are further discussed in **Section 4.8.1**.

The work zone will be enclosed with a temporary, 6-foot-high chain link fenced area around the perimeter to deter access from the general public. The only access to the work zone will be through gates, which will be locked when construction operations have ceased each day.

To further deter and protect the general public, asbestos warning signs will be posted at the construction entrances and at intervals of 100 meters (328 feet) or less in accordance with 40 CFR 61.151(b)(1). The warning signs will conform to the requirements for a 51-centimeter by 36-centimeter (20-inch by 14-inch) upright sign and will be posted in such a manner and location that a person can easily read the legend. The warning signs will display a legend in the specific size, font, and spacing outlined in 40 CFR 61.151(b)(1) and will contain the following:

- Asbestos Waste Disposal Site
- Do Not Create Dust
- Breathing Asbestos is Hazardous to Your Health

A contracted security service will provide patrols of the perimeter of the Empire property during remedial activities, after construction work has ceased for the day and on non-working days. The security staff will be provided asbestos awareness training. If there are suspected trespasser(s), the City of Bozeman's Police Department and the Project Safety Coordinator will be notified immediately. The emergency contact information will be included in the project-specific HASP.

4.5 DUST CONTROL

Dust control practices will be implemented for cleanup work activities to ensure ambient air quality standards (e.g., fugitive dust/opacity) will not be exceeded during the proposed action. Control measures will adhere to good engineering practices that include, but may not be limited to, the following:

- Mitigate dust by spraying water or wetting agents (surfactants) onto contaminated surfaces within the work area.

- Use water to presoak areas where work will occur.

4.6 AIR MONITORING PLAN

All persons entering a regulated area will be required to wear a respirator in accordance with 29 CFR 1926.1101(h)(1) and (2) and 29 CFR 1910.134. Regulated areas shall be demarcated from the rest of the workplace to minimize the number of people who will be exposed to asbestos. Both

stationary air monitoring and personal air monitoring will be performed during excavation and hauling of ACW and asbestos-contaminated soils to protect on-site and off-site workers, nearby residents, business workers, and area visitors. A potential work layout configuration and stationary air monitoring locations are shown in **Figure 3**. The types of air monitoring to be collected by the Montana Accredited Asbestos Contractor/Supervisor will include baseline air monitoring, personal air monitoring, and stationary air monitoring.

Baseline air sampling will be performed prior to any cleanup activities to verify the baseline conditions and will provide a basis of comparison for results of monitoring during cleanup activities. Prior to remediation activities, one baseline stationary air sample will be collected at two separate locations upwind from the Empire property. One baseline sample will be collected upwind at the Empire property boundary and another baseline sample will be collected outside of the Empire property boundary at a location to be determined. The samples will be collected during workday hours (8am to 5pm) when it is dry conditions, with no precipitation.

Personal and stationary air monitoring activities will be completed during cleanup work that involves disturbance or movement of contaminated soils to determine exposure and are described below. The analytical methods for air monitoring are included in **Table 4-1**.

Table 4-1. Air Monitoring Analytical Methods

Sample Type	Analytical Method	PEL	EPA	Required Reporting Limit
Personal	TEM NIOSH Method 7402	0.1 f/cc (8-hour TWA)	NA	0.002 f/cc
Stationary	ISO Method 10312:1995(E)	NA	6.0E-0.5 f/cc[1]	6.0E-0.5 f/cc

[1]EPA's Residential Default Exposure Parameter
EPA – Environmental Protection Agency
f/cc – fibers per cubic centimeter
ISO - International Organization for Standardization
NA – Not Applicable
NIOSH - National Institute for Occupational Safety and Health
PEL – permissible exposure limit
TEM – Transmission Electron Microscopy
TWA – time-weighted average

4.6.1 Stationary Air Monitoring

Ambient air samples will be collected in real time during the construction activity at strategic stationary locations to quantify air quality at a single location that is representative of an area expected to have worst-case exposure (downwind). Wind direction will be evaluated prior to sampling. Upwind and downwind stations will be included, and monitoring may need to occur outside the perimeter of the area where remediation activities will occur based on several site factors such as wind direction, proximity to roadways, or building interference. Potential stationary air monitoring locations are shown on the Work Layout in **Figure 3**. Two baseline air monitoring samples will be collected prior to cleanup activities to provide a comparison of results during remediation monitoring.

Asbestos air sampling and analysis will be performed in accordance with EPA's *Framework for Investigating Asbestos-Contaminated Superfund Sites,* OSWER Directive #9200.0-68 (EPA, 2008) and collected following the International Organization for Standardization (ISO) Method 10312:2019 Ambient Air – Determination of Asbestos Fibers – Direct Transfer Transmission Electron Microscopy Method, for sampling Superfund Sites. Samples will be collected with portable air pumps fitted with mixed cellulose ester filters using flexible tubing and adjustable flow rate. The filter cartridge would typically be placed at breathing zone height (approximately 3 to 5 feet above ground). The pumps will be calibrated at least once daily. The Standard Operating Procedure (SOPs) for stationary air monitoring that include pump calibration, equipment setup, and sample collection are included in **Appendix G**.

Table 4-2 presents the locations and sample frequency of air monitoring.

4.6.2 Personal Air Monitoring

Air samples will be collected for on-site workers to determine the average contaminant concentration the worker would be exposed to without respiratory protection. This will be performed by using small personal pumps that draw air through a sample cartridge. Personal samples will be analyzed in accordance with NIOSH Method 7400, Asbestos and Other Fibers by PCM, Issue 3 (June 2019). Follow-up analysis of the samples by NIOSH Method 7402, Asbestos by TEM, Issue 3 (August 2022) will be performed if phase contract microscopy (PCM) fiber counts are greater than 0.01 f/cc. The SOPs for personal air monitoring that include pump calibration, equipment setup, and sample collection are included in **Appendix G**.

Table 4-2 presents the locations and sample frequency of air monitoring.

Table 4-2. Sample Locations and Frequency

Sample Type	Location*	Number	Frequency
Baseline	Upwind – one at Empire property boundary and one outside Empire property boundary	2 locations	1
Stationary	Upwind at Empire property boundary	1 location	1/day
Stationary	Downwind (surrounding Empire property boundary)	3 locations	1/day
Stationary	Transportation route (between Empire property and where trucks enter Interstate -90)	1 location	1/day
Personal	Identify highest exposure potential for remediation contractor workers; pumps on person	25% of remediation contractor workers and 25% of oversight contractor workers	1/day

*Actual locations will be determined prior to remediation based on the prevailing wind direction and the most current site conditions (e.g., remaining structures, exclusion zone demarcated areas, truck entry point, etc.).

4.7 CONFIRMATION SAMPLING

To ensure cleanup goals have been achieved, confirmation soil samples will be collected from the floor and sidewalls of the excavation area during the soil removal phase of the cleanup action in accordance with the Confirmation Sampling Plan included in **Appendix H**. The confirmation soil samples will document that all soils with visible or detected asbestos have been removed from the excavation floor and sidewalls to concentrations below 0.25%. Subsequent soil excavation and confirmation soil sampling will continue until asbestos in soil is confirmed to be below 0.25%. Confirmation sampling grids are shown in **Figure 4**.

For an area that is excavated to a maximum depth of 6 feet, the final confirmation soil sample will be collected and analyzed for informational purposes only. Samples for areas that cannot be excavated due to limitations (e.g., adjacent to trees, foundations, sidewalks) will also be collected for documentation purposes.

Prior to collecting samples, the excavated areas will be visually inspected for the presence of asbestos ore using grid-sampling techniques. The visual inspection will consist of establishing 3-foot-wide parallel transects that cover the entire excavation area and walking each transect to observe visual asbestos. Any visual asbestos identified on the surface will be collected and the location noted in the field logbook and field maps. Asbestos ore collected during visual inspection will be deposited with ACW for transport and disposal.

Once a grid cell has been determined free of visible asbestos ore, a five-point composite sample will be collected in grid cells measuring 25 feet by 25 feet (625 square feet total) from the excavation floors and will be collected every 50 linear feet from sidewalls of each excavation area. Separate samples will be collected from the surface and subsurface of sidewalls, and each sidewall will be composited separately.

The lateral and vertical dimensions of each excavation will be documented in the field notebook and on field maps and will be updated on the City's GIS map. Each soil subsample location of the five-point composite will be documented on the field maps and in the field notebook.

The Confirmation Sampling Plan (**Appendix H**) includes the following:

- Number, location, and types of samples to be collected;
- Collection and analytical methods;
- Cleanup levels; and
- Quality assurance/quality control requirements.

4.8 WASTE MANAGEMENT

Prior investigations and remedial actions performed at the CMC Asbestos Bozeman CECRA Facility have indicated that asbestos is the only known COC present in soils. Prior to disposal, coordination with the landfill facilities will occur to ensure that all waste management requirements are met.

4.8.1 Contaminated Demolition Debris, Soil Handling, and Waste Loading Procedures

The demolition of the concrete foundations that are considered ACW and subsequent contaminated soils will be handled in accordance with the NESHAP Adequately Wet Guidance (EPA, 1990) to control emissions of particulate asbestos in outside air. The NESHAP standards for asbestos are presented in 40 CFR 61, Subpart M and require no visible emission of asbestos and specify emission control requirements, including adequate wetting. According to 40 CFR 61.141, adequately wet is described as sufficiently mixed or penetrated with liquid to prevent the release of particulates.

Water or wetting agents (e.g., surfactants) will be brought on-site by the excavation contractor. Water may be obtained from a potable source or reused as treated water from decontamination (Section 4.8.3). Adequate wetting will be accomplished by repeatedly spraying the ACW and soils with water or a wetting agent. Water or wetting agents may be applied with garden hoses/sprayers through a system of pipes and hoses or as a misting unit to create a saturated environment. Water trucks may also be used. If visible emissions are observed during demolition, then the material has not been adequately wetted. In addition, air emissions exceeding 6.0E-05 f/cc outside the exclusion zone during stationary air monitoring indicate that water alone is not sufficiently controlling emissions. Surfactants and other wetting agents will be required. Alternative methods will be used if freezing conditions prohibit the use of water methods.

The Montana Accredited Asbestos Contractor/Supervisor and construction oversight personnel will be responsible for ensuring the materials are adequately wet. Any materials stockpiled prior to loading will be maintained adequately wet. If the materials are not disposed of as soon as practicable, they will be stored in a secure holding area that is accessible only to Montana Accredited Asbestos Project Contractor or Asbestos Contractor/Supervisors.

The work area will be divided into an exclusion zone (demolition and excavation area), a contaminant reduction zone, and a support zone. Excavation equipment will be in the exclusion zone. The contaminant reduction zone is where haul trucks will be loaded and where decontamination of equipment, vehicles, and personnel will occur to eliminate contamination leaving the Empire property.

Before leaving the exclusion zone, the ACW and contaminated soils must be adequately wet—but not saturated—before being loaded into haul trucks stationed in the loading area immediately adjacent to the exclusion zone. Empty trucks will enter a loading/staging area through a controlled entrance, and 6-mil polyethylene sheeting will be placed on the ground to contain any waste spilled during loading. The empty trucks will be lined with 6-mil polyethylene sheeting so the poly sheeting extends over the sides of the truck and the waste can be tightly wrapped around from underneath. Haul trucks will be loaded with the adequately wet waste from the exclusion zone. The poly sheeting will be wrapped around the soils, so they are leak tight (burrito wrapped). Asbestos waste warning labels, as specified in 40 CFR 61.150(a)(iv), 49 CFR 171 and 172, and ARM 17.74.369, will include the name of the waste generator and the location of generation and must be placed inside or fixed to the wrapping. Spray adhesive shall be used to seal the liner. The wrap must be leak tight to prevent the release of asbestos.

In the contamination reduction zone, each liner will be inspected to ensure that it is properly sealed. Any ACW or soil not contained within the sealed liner shall be removed from the truck bed. A fitted tarp will be placed over each truck bed and secured to protect the liner during transport. While the loading process is ongoing, the driver will remain in the truck with the windows up and the ventilation system off or will have exited the cab and contaminant reduction zone prior to loading. When loading has been completed, the driver can exit the truck or re-enter the contamination reduction zone to inspect the truck and perform decontamination, as necessary. The plastic sheeting on the ground and any waste on the sheeting will also be included as ACW and disposed of at the Valleyview Landfill.

4.8.2 Stormwater Management

Approximately 0.25 acres will be disturbed for the asbestos soil remediation, which would not require a Montana Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity; however, a construction stormwater permit from the City of Bozeman will need to be obtained. Because the project involves removing contaminated soils and there are storm drains adjacent to the Empire property, stormwater BMPs will be required to control stormwater runoff from the remediation construction area. The construction contractor will develop a construction site map that details the selected BMPs for the City's approval.

4.8.3 Wastewater Management

The wastewater from decontamination of equipment will be contained, treated, and disposed of. The wastewater will be collected in a sump or tank, which allows for solids to settle. Water from the settling tank can be filtered, and the treated water will be stored in tanks for potential reuse as decontamination water or for dust control. The filter and tank solids will be disposed of at the landfill in the same manner as the asbestos-contaminated soils. Any remaining treated wastewater in the tanks will be sampled and analyzed for the suite of analyses needed by the City of Bozeman wastewater treatment plant supervisor for approval to discharge to the City of Bozeman's sanitary sewer.

4.8.4 Waste Transportation and Shipment Records

The non-friable ACW (i.e., concrete debris) will be disposed of at the Valleyview Landfill with the contaminated soil. ACW and soils will be disposed at Logan Landfill if they are <1% asbestos. All trucks transporting waste to the landfills will follow the routes detailed in Section 4.8.4.1.

4.8.4.1 Haul Route

The proposed haul route to the Logan Landfill located at 10585 Two Dog Road in Manhattan, Montana, is as follows:

- Exit the Empire property and proceed north on South Wallace Avenue.
- Turn right onto East Main Street.
- Proceed to the East Main Street Interstate 90 (I-90) interchange and turn left onto I-90 westbound on-ramp.

- Proceed west on I-90 for approximately 26 miles to Exit 283 (ramp for Buffalo Jump Road).
- Turn left on Buffalo Jump Road and then take a sharp left onto Two Dog Road.
- Head east on Two Dog Road for 1.7 miles and arrive at Logan Landfill on the left.

The proposed haul route to the Valleyview Landfill located at 17 Powertrain Road in East Helena, Montana, is as follows:

- Exit the Empire property and proceed north on South Wallace Avenue.
- Turn right onto East Main Street.
- Proceed to the East Main Street I-90 interchange and turn left onto I-90 westbound on-ramp.
- Proceed west on I-90 for approximately 34 miles to Exit 274 (ramp for US-287 N).
- Turn right onto US-287 N and drive north for 58 miles.
- Turn left onto Highway 518 and travel south for 1.5 miles.
- Turn left onto Powertrain Road and continue until you arrive at the Valleyview Landfill on the right.

In accordance with ARM 17.74.369, a person may not transport ACW generated at a facility unless accredited by the department as a Montana Accredited Asbestos Project Contractor or Montana Accredited Asbestos Contractor/Supervisor or escorted and supervised by a person who is accredited. Truck drivers shall abide by all speed limits and traffic laws. Every truck driver must have completed the OSHA 40-hour HAZWOPER training and annual updates and must have a minimum of 32 hours of asbestos training or be escorted by a Montana Accredited Asbestos Project Contractor or Montana Accredited Asbestos Contractor/Supervisor. Prior to transporting or disposing of ACW or soils from the project area, the transporter shall possess a valid Montana Asbestos Project Permit from DEQ pursuant to ARM 17.74.355.

The person who transports the ACW or asbestos-contaminated soils from the project area shall:

a) Maintain proof of accreditation and the asbestos project permit and make it available, upon request, to the department during ACW handling activities.

b) Prior to waste pick up:

   i. Obtain assurance from the Montana Accredited Asbestos Contractor/Supervisor that the waste is adequately wet;

   ii. Confirm the waste is properly packaged in leak-tight containers or wrappings, except as provided in 40 CFR 61.150(a)(3);

iii. Confirm the contained or wrapped waste is labeled with the name of the waste generator and the location at which the waste was generated;

iv. Ensure that any vehicle used to transport ACW during the loading and unloading of the waste is marked with signs conforming to the requirements of 40 CFR 61, Subpart M;

v. Ensure that the waste shipment record form contains all information required by 40 CFR 61, Subpart M, and record the asbestos project permit number on the form;

vi. Deposit ACW at a licensed Class II landfill; and

vii. Retain responsibility for ACW until the waste is accepted by the licensed Class II landfill.

Each load leaving the Empire property should have a waste shipment record completed by the Montana Accredited Asbestos Contractor/Supervisor in accordance with the NESHAP regulation in 40 CFR 61.150(d)(1). The waste shipment record will contain the following:

- Name, address, and telephone number of the generator;
- Name and address of the DEQ Asbestos Control Program contact;
- Approximate quantity in cubic yards;
- Name and telephone number of the disposal facility operator;
- Name and physical facility location of the disposal facility;
- Date transported;
- Name, address, and telephone number of the transporter; and
- Certification that the contents of this consignment are fully and accurately described by proper shipping name; are classified, packed, marked, and labeled; and are in all respects in proper condition for transport by highway according to applicable international and government regulations.

Three copies of the waste shipment record are required. The Montana Accredited Asbestos Contractor/Supervisor will retain one copy on-site during the duration of the project. When the haul truck driver checks in at the landfill, one copy of the waste shipment record will be provided to the landfill attendant. Per 40 CFR 61.154(e)(2), the owner/operator of the waste disposal facility is to send copies of the signed waste shipment records back to the generator (City of Bozeman) as soon as possible, but no longer than 30 days after receipt of the waste. The City of Bozeman will provide copies to the Empire property owner. Both the generator and the landfill operator shall maintain their copies of the waste shipment records for 2 years. Copies of all waste shipment records, including the records showing that the landfill operator accepted the ACW, must be provided with the Construction Completion Report (CCR).

4.8.5 Materials Handling at Landfill

Logan Landfill, operated by Gallatin County, is licensed as a Class II landfill that accepts non-friable asbestos waste that is <1% asbestos. Valleyview Landfill, operated by Tri County Disposal, is licensed as a Class II landfill that accepts both friable and non-friable asbestos waste. Prior to

implementation of any remediation work at the Empire property, the Montana Accredited Asbestos Contractor/Supervisor will contact the landfills and obtain pre-approval for the volume of waste that is expected to be removed and hauled to the landfill for disposal. Standards for active waste disposal facilities accepting asbestos waste are presented in the NESHAP regulations, 40 CFR 61.154. The standard includes requirements for emissions, warning signs, fencing, cover, and records.

Asbestos was determined to be the only COC from previous investigations, and the alternative will not generate a listed or characteristic hazardous waste. No asbestos characterization of asbestos-contaminated soils will be performed because asbestos >1% can be disposed of in the Valleyview Landfill. The asbestos analytical results of the soil waste will be included on the waste shipping form. The ACW (i.e., concrete slabs) do not require analysis prior to disposal at the Logan Landfill. If required by the landfill, waste characterization of the soils, including hydrocarbons and total metals, will be completed.

4.9 RESTORATION/REVEGETATION

The Empire property is being redeveloped and construction on the entire property footprint will commence immediately upon demolition and soil removal. The developer plans to pour foundation for a commercial structure once the excavation is complete. Cover soils and re-vegetation are not anticipated since the entire footprint is expected to be developed into a commercial structure, with no landscaping. Any areas that are not part of the actual commercial building footprint, will be hardscaped to include walkways, driveways, patios, etc.

4.10 BACKFILL

It is not expected that any backfill will be needed since a commercial building will be constructed on the entire footprint of the Empire property. If backfill is needed, the source of clean backfill and associated information will be provided, and a backfill approval request letter will be submitted to DEQ for approval. The letter will include detailed source location information and an evaluation of whether the source is within or adjacent to a known contaminated site. In addition, the backfill source will be adequately characterized, and a summary of the analytical results and a comparison of the results to appropriate DEQ regulatory levels will be provided.

To characterize the backfill source, one 5-point composite will be collected for every 400 cubic yards of backfill material and will be analyzed for asbestos, the Resource Conservation Recovery Act (RCRA) 8 metals, and for COCs of the contaminated backfill source site (if applicable). The characterized material will be compared to appropriate screening levels identified by DEQ. Asbestos concentrations will be required to be non-detect. Metals concentrations, except arsenic, will be compared to the direct contact and leaching-to-groundwater-based soil screening levels contained in the most recent EPA Regional Screening Levels (RSLs) for "Chemical Contaminants at Superfund Sites" guidance document. Arsenic concentrations will be below the background threshold value (BTV) for inorganics in Montana surface soils. **Table 4-2** provides the analytical method, screening level, and required reporting limit for asbestos and the RCRA 8 metals. If other COCs are to be analyzed, the appropriate screening levels as determined by DEQ will be applied.

Table 4-3. Backfill Soil Characterization

Analytical Parameter	Analytical Method	BTV (mg/kg)	EPA Residential Soil RSL (mg/kg)[1]	Protection of Groundwater screening levels (mg/kg)[2]	Required Reporting Limit*
Asbestos	CARB 435 (PLM)	None	Non-detect (%)	NS	0.25%
Arsenic	SW-846 6010/6020	22.5	0.68	0.29	0.710 mg/kg
Barium	SW-846 6010/6020	429	1,500	421	0.366 mg/kg
Cadmium	SW-846 6010/6020	0.7	0.71	3.8	0.366 mg/kg
Chromium	SW-846 6010/6020	41.7	12,000	1,800,000	0.122 mg/kg
Lead	SW-846 6010/6020	29.8	200**	90	0.555 mg/kg
Mercury	SW-846 6010/6020	NS	0.71	1	0.010 mg/kg
Selenium	SW-846 6010/6020	0.7	39	2.6	0.111 mg/kg
Silver	SW-846 6010/6020	0.3	39	8.5	0.022 mg/kg

[1]RSLs for non-carcinogenic compounds are divided by 10 for screening purposes based on DEQ's Soil Screening Flowchart.

[2]As outlined in DEQ's Soil Screening Flowchart Part 2, the EPA MCL-based SSL (from RSL table) multiplied by a dilution attenuation factor (DAF) of 10 is used for arsenic, cadmium, chromium, lead, mercury and selenium. For barium and silver, the DEQ-7 standard differs from the MCL, so the value listed is the adjusted risk-based soil screening level based on the DEQ-7 standard using the approach outlined in DEQ's Soil Screening Flowchart, Part 2. For lead, the MCL-based SSL was used despite it differing from the DEQ-7 standard for lead per DEQ direction to use the updated MCL.

*Based on low-level analytical method detection limits

**Based on DEQ's Soil Screening Flowchart for residential soil use calculated from a 5 µg/dL blood level endpoint for the IEUBK model

BTV – Background Threshold Value
mg/kg – milligrams per kilogram
NS – no standard
PLM – Polarized Light Microscopy
RSL – Regional Screening Level
SSL – Soil Screening Level

4.11 OPERATIONS AND MAINTENANCE

Because all contaminated asbestos waste will be removed from the Empire property, no long-term O&M will be required. However, there is still long-term O&M needed at other properties within the CMC Asbestos Bozeman CECRA Facility boundary under the City of Bozeman's O&M Plan (Tetra Tech, 2010).

4.12 GPS SURVEY

Upon excavation, the remediation boundary will be documented using GPS survey, and the removal locations, removal and disposal volumes, and confirmation sampling results will be documented through the City's IC program (e.g., GIS, street cut permits).

5. VCP SCHEDULE

VCRA requires that remediation be completed within 60 months of approval of the VCP. There are no fixed start dates for the initiation or implementation of this RP. The schedule for the redevelopment project is dependent upon the developer implementing the project; however, it is desired to be completed as soon as possible after DEQ's completeness determination of this document.

From submittal of the VCP RP, below is the expected timeline and task duration for the proposed voluntary cleanup. The timeline is contingent upon the VCP RP submittal date and DEQ's completeness determination.

1. Submit VCP RP to DEQ.
2. DEQ VCP RP review – 30-day duration.
3. Address VCP RP comments and finalize – 14-day duration.
4. DEQ approval/public notice of VCP RP – 45-day duration.
5. DEQ VCP RP completeness determination – 60-day duration.
6. Obtain remediation contractor, develop required plans, and obtain required permits – 60-day duration.
7. Empire property remediation – 30-day duration.
8. Prepare and submit CCR for DEQ – 30-day duration (must be completed within 60 days of completion of VCP RP work).
9. DEQ Closure petition review – 60-day duration (to be submitted with the CCR).
10. DEQ CCR review – 30-day duration.
11. Address DEQ's CCR comments and finalize – 7-day duration.
12. Submit reimbursement request to DEQ.
13. DEQ review of reimbursement request and authorization for reimbursement

6. REFERENCES

Bozeman. 2024. City of Bozeman Infrastructure Viewer web map. Accessed September 2024. https://gisweb.bozeman.net/Html5Viewer/?viewer=infrastructure

DEQ (Montana Department of Environmental Quality). 2020. *Voluntary Cleanup and Redevelopment Act Application Guide*. January.

EPA (U.S. Environmental Protection Agency). 1990. *Asbestos/National Emission Standard for Hazardous Waste Pollutants (NESHAP) Adequately Wet Guidance* (EPA 340/1-90-019). December.

EPA. 2008. *Framework for Investigating Asbestos-Contaminated Superfund Sites* (EPA OSWER Directive #9200.0-68). September.

ISO. 2019. *Ambient Air – Determination of Asbestos Fibers – Direct Transfer Transmission Microscopy Method,* International Standard, ISO 10312:2019. October.

NIOSH. 2019. *Asbestos and Other Fibers by PCM, Issue 3.* June.

NIOSH. 2022. *Asbestos by TEM: Method 7402, Issue 3*. August 1.

RTI. 2024. *Asbestos Sampling Report; Empire Building Materials 608 East Main Street Bozeman, MT*. September 13.

Tetra Tech. 2010. *CMC East Main Depot Facility Asbestos Management Program Final Operations and Maintenance Plan*. February.

Tetra Tech. 2010. *Final East Main Depot Facility Final Construction Completion Report*. February 8.

Tetra Tech. 2015. *Addendum to the 2013 Environmental Assessment Component of a Voluntary Cleanup Plan for the CNC East Main Depot CECRA Facility, Bozeman, MT*. September 23.

Tetra Tech. 2016. *Final Voluntary Cleanup Plan Proposal for the CMC Bozeman Asbestos CECRA, Bozeman, MT*. November 3.

WESTON. 2024. *Second VCP-EA Addendum, CMC Asbestos Bozeman CECRA Facility, Bozeman, Gallatin County, Montana*. September 16.

FIGURES

Legend

Empire Building Materials Property

0 4,000 8,000

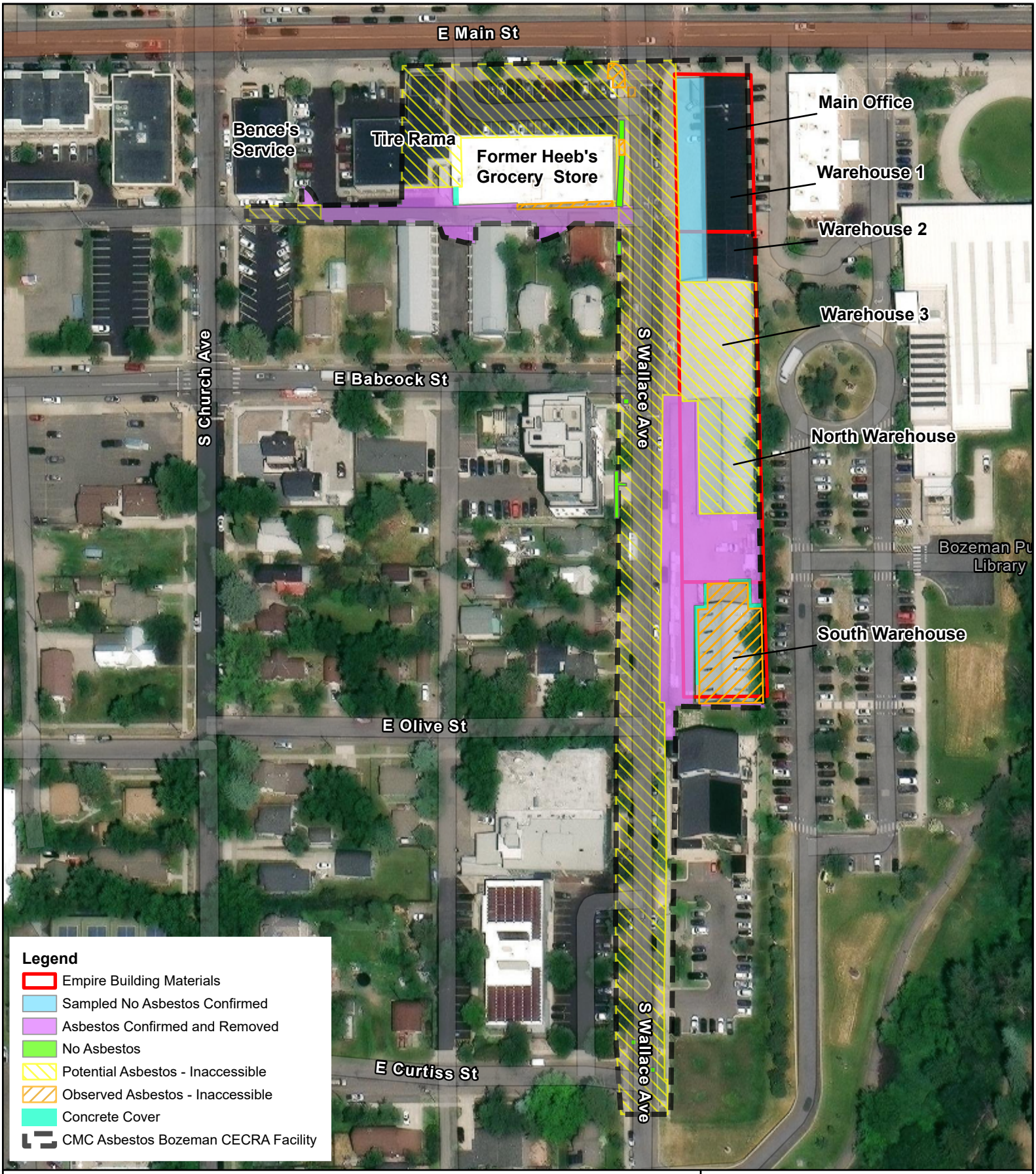
Feet

World Street Map: Bozeman GIS, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, NGA, USGS

N

Figure 1- Site Location
Empire Property VCP RP
CMC Asbestos Bozeman CECRA Facility
Bozeman, Gallatin County, Montana

WESTON SOLUTIONS



0 100 200

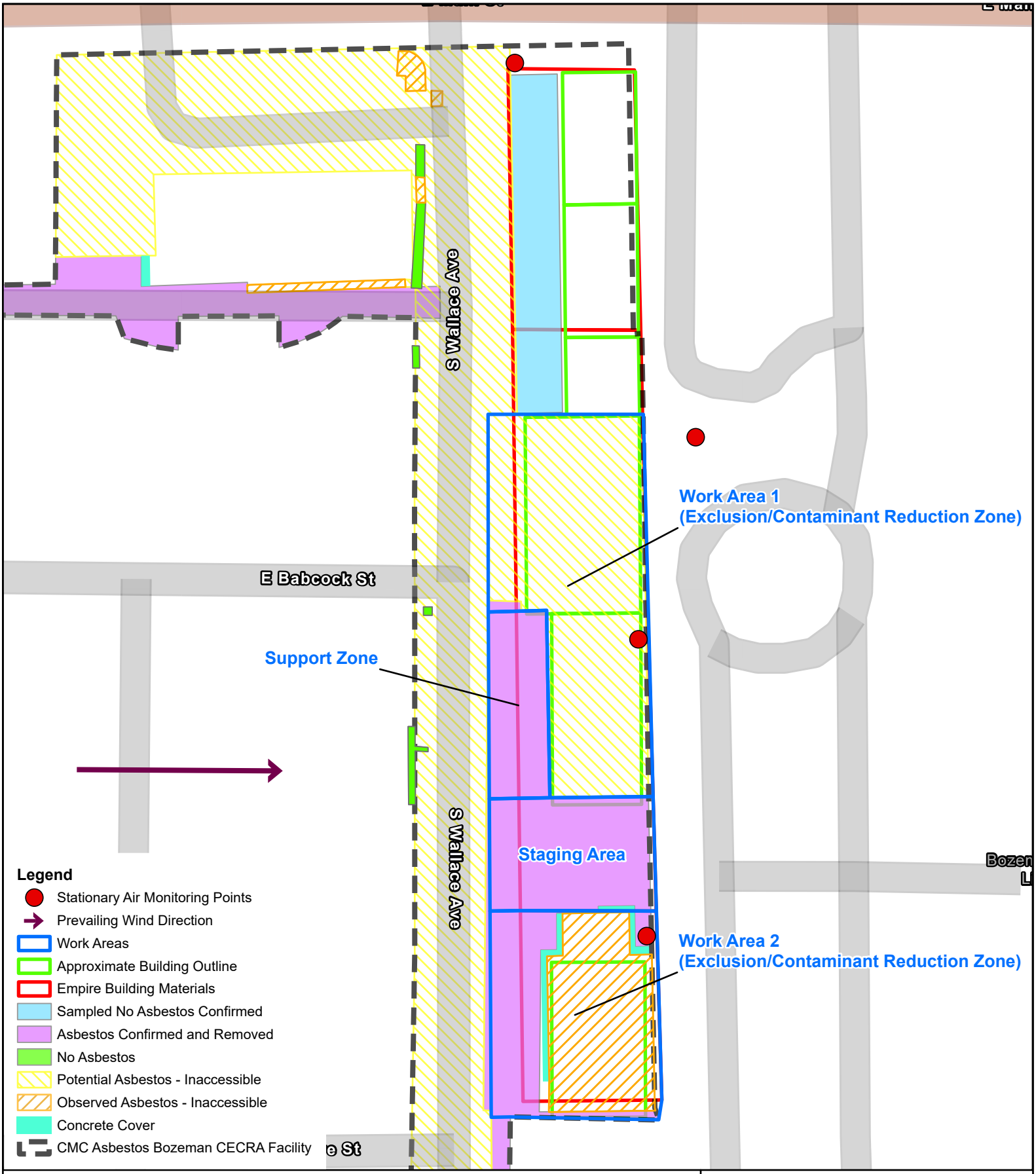
Feet

World Imagery: Maxar, Microsoft
Hybrid Reference Layer: Esri Community Maps Contributors, Montana State University, Bozeman GIS, Montana State Library, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS

N

Figure 2 - Site Vicinity Map
Empire Property VCP RP
CMC Asbestos Bozeman CECRA Facility
Bozeman, Gallatin County, Montana

WESTON SOLUTIONS



Note:
An additional stationary air monitoring station will be placed along the Transportation Route between the Facility and where the trucks enter Interstate 90.

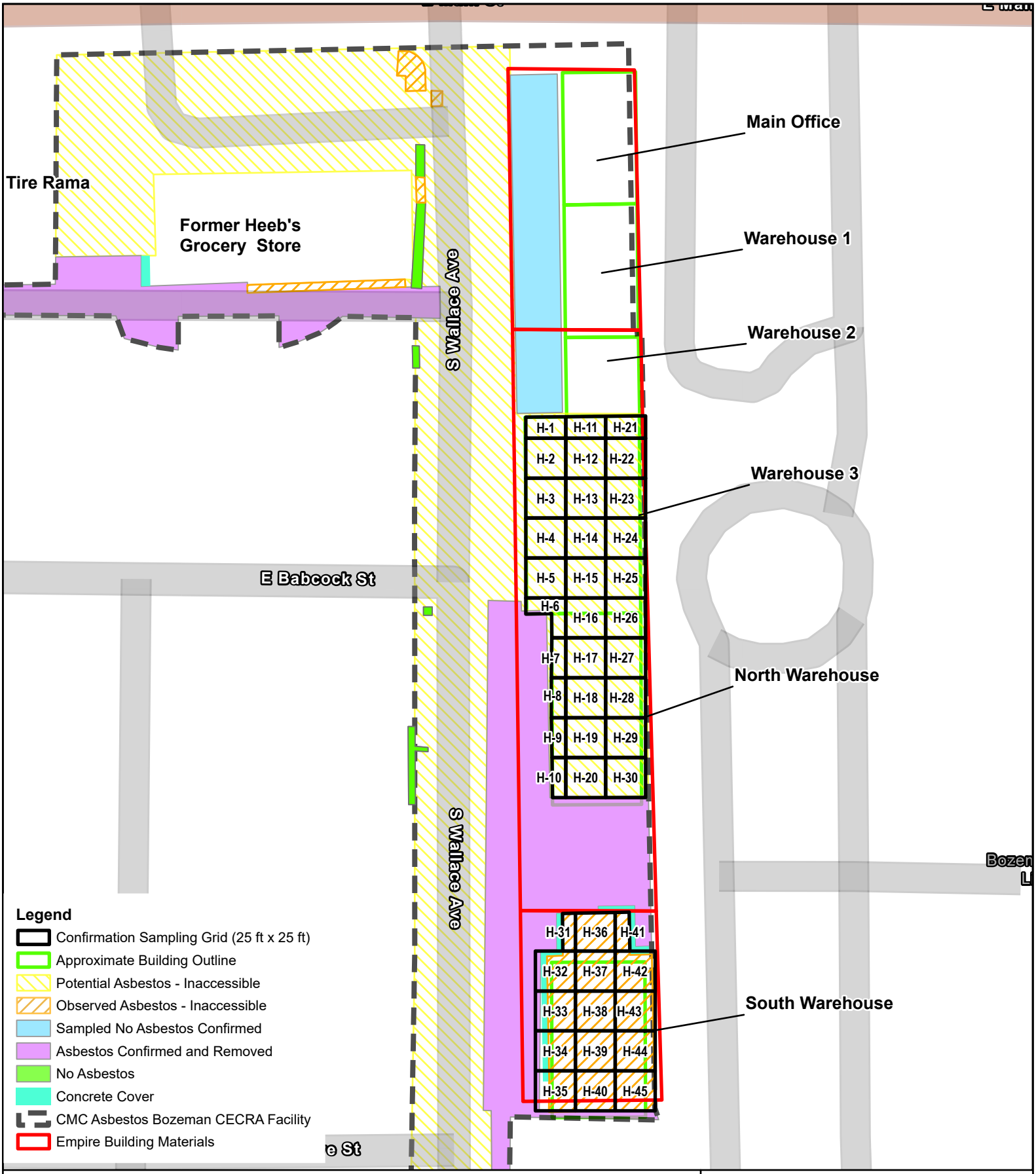
0 80 160
Feet

N

Hybrid Reference Layer: Esri Community Maps Contributors, Montana State University, Bozeman GIS, Montana State Library, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS

Figure 3 - Work Layout
Empire Property VCP RP
CMC Asbestos Bozeman CECRA Facility
Bozeman, Gallatin County, Montana

WESTON SOLUTIONS



Hybrid Reference Layer: Esri Community Maps Contributors, Montana State University, Bozeman GIS, Montana State Library, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS

Figure 4 - Confirmation Sampling Grid
Empire Property VCP RP
CMC Asbestos Bozeman CECRA Facility
Bozeman, Gallatin County, Montana

WESTON SOLUTIONS

APPENDIX A

SECOND VCP-EA ADDENDUM DEQ COMPLETENESS DETERMINATION

DEQ
Montana Department
of Environmental Quality

December 23, 2024

Sent via Email Only

Kellen Gamradt
City of Bozeman
P.O. Box 1230
Bozeman, MT 59771-1230

RE: Second Addendum to the 2013 Voluntary Cleanup Plan – Environmental Assessment (VCP-EA) for the CMC Asbestos Bozeman CECRA Facility in Bozeman, MT

Dear Kellen:

Montana Department of Environmental Quality (DEQ) personnel have conducted a completeness evaluation of the December 16, 2024, revision of the above-referenced Voluntary Cleanup Plan Environmental Assessment (VCP-EA) pursuant to § 75-10-736(1), Montana Code Annotated (MCA). As provided in this statute, this evaluation includes not only a determination of whether the VCP-EA meets the requirements of the Voluntary Cleanup and Redevelopment Act (VCRA), but also evaluating the VCP-EA's adequacy and accuracy pursuant to § 75-10-734, MCA.

DEQ has determined that the VCP-EA has incorporated all DEQ's comments on previous drafts of the document. The VCP-EA is considered complete and DEQ is providing notice to you pursuant to § 75-10-736(1), MCA.

DEQ looks forward to receipt of the next component of the Voluntary Cleanup Plan for the CMC Asbestos Bozeman, the Remediation Proposal (VCP-RP). If you have any questions or comments, please feel free to call me via email at Abigail.nathlich@mt.gov or phone: 406-444-6773.

Sincerely,

Abby Nathlich
Environmental Project Officer
State Superfund Unit

cc: Travis Horton, Gallatin City-County Health Department
Jenny O'Mara, Weston
Moriah Bucy, VCRA Coordinator
Sarah Christopherson, DEQ Legal

APPENDIX B

WRITTEN CONSENT FOR VOLUNTARY PROPERTY ACCESS

PROPERTY OWNER WRITTEN CONSENT
FOR VOLUNTARY PROPERTY ACCESS TO:

City Right-of-Way
South Wallace Avenue

Sections 75-10-730 through 738 Montana Code Annotated (MCA) require the written consent of current property owners to be included as part of a voluntary cleanup plan. Section 75-10-733(2)(c) MCA requires that voluntary cleanup plans include "the written consent of current owners of the facility or property to allow access to the facility by the applicant, and its agents and the department; and implementation of the voluntary cleanup plan."

As part of the process for the cleanup efforts of the CMC East Main Depot Facility, the Montana Department of Environmental Quality (DEQ) has identified additional areas to be included in part with the voluntary cleanup plan efforts. Specifically, the 60-foot-wide right-of-way on South Wallace Avenue from Main Street to East Curtis Street. This section of right-of-way falls within the limits of the CMC Asbestos Facility and is owned by the City of Bozeman.

As a representative of the City of Bozeman, owner of the South Wallace Avenue right-of-way, I Kellen Gamradt, on behalf of the City of Bozeman consent to the implementation of the *Voluntary Cleanup Plan Remediation Proposal for the Empire Building Materials, Inc. Property at the CMC-East Main Depot CECRA Facility* (VCP-RP) proposed for the facility as approved by DEQ. I grant Weston Solutions, it's agents, and the Montana DEQ access to the South Wallace right-of-way located within the facility.

City of Bozeman
PO Box 1230
20 E Olive Street
Bozeman, MT 59771

Signature: Kellen Gamradt Digitally signed by Kellen Gamradt DN: cn=Kellen Gamradt, o, ou, email=kgamradt@gmail.com, c=US Date: 2025.04.02 12:54:59 -06'00'

Name/Title: Kellen Gamradt, City Project Engineer

Date: 4/2/2025

WRITTEN CONSENT OF PROPERTY OWNERS FOR VOLUNTARY CLEANUP IMPLEMENTATION AND PROPERTY ACCESS

CMC East Main Depot Facility located in Bozeman, Montana

Applicant:
City of Bozeman

Property Owner:

Empire Building Materials, Inc.
PO Box 220
Bozeman, MT 59771-0220

Property Addresses:

606 and 608 E. Main Street
Bozeman, MT 59715

Property Geocodes/Legal Descriptions:
06-0799-07-1-03-25-0000
ROUSE 1ST ADD, S07, T02 S, R06 E, ACRES 0.53, AMND LOT 1A-1 PLAT C-5-B

06-0799-07-1-03-35-0000
S07, T02 S, R06 E, ACRES 0.727, PT OF BLK C ROUSES 1ST BOZ & PT OF BLK B ROUSES 2ND BOZ PLUS POR VAC ALLEY & BABCOCK ST

06-0799-07-4-56-20-0000
ROUSE 2ND ADD, S07, T02 S, R06 E, BLOCK B, TR BEING COS 361

A Voluntary Cleanup Plan (VCP) is being prepared by City of Bozeman for the Empire-owned portion of the CMC East Main Depot Facility located in Bozeman, Montana, for submittal to the Montana Department of Environmental Quality (DEQ) in accordance with the Voluntary Cleanup and Redevelopment Act. Section 75-10-733(2)(c) of the Montana Code Annotated (MCA) requires that the VCP must include "the written consent of current owners of the facility or property to allow: (i) access to the facility by the applicant and its agents and the department; and (ii) implementation of the voluntary cleanup plan when a remediation proposal includes the information required in 75-10-734 MCA and meets the requirements of 75-10-721 MCA." The following agreement has been developed to satisfy the statutory requirement for owner consent to both the implementation of the voluntary cleanup plan and access to the facility by the applicant and its agents and the department.

Empire Building Materials, Inc. is the owner of 606 and 608 E. Main Street properties as described above, which are located within the City of Bozeman's CMC East Main Depot Facility. Empire Building Materials, Inc. provides consent for the implementation of the *Voluntary Cleanup Plan Remediation Proposal for Empire Building Materials, Inc. Property At The CMC-East Main Depot CECRA Facility* (VCP-RP) proposed for the facility as approved by DEQ. Empire Building Materials, Inc. further grants the City of Bozeman, DEQ, Weston Solutions, Bozeman Hotel MM, LLC, and their agents and authorized representatives access to the facility

during voluntary cleanup activities under the DEQ-approved VCP-RP. If other properties not owned by Empire Building Materials, Inc. are identified during the course of the environmental assessment of the facility, owner consents will be provided in accordance with 75-10-733(2)(c) MCA.

Anthony Tangaro

Signature(s)

Anthony Tangaro

Name/Title (please print)

11/1/24

Date

MDT-MAI-007 07/14

Montana Department of Transportation
Encroachment Application

2701 Prospect Avenue
PO Box 5895
Helena, MT 59604-5895
Phone: (406) 444-7220
Fax (406) 444-7684
TTY: (406) 444-7696
www.mdt.mt.gov

To be filled in by Department of Transportation Personnel

Print Form

Agreement Number: | **Project Number:** | **Project Name:** | **ID Number:** | **County:**

Maintenance Section: | **Corridor:** | **Sign Route:** | **Milepost:** | **Roadbed:**

Montana Department of Transportation | **Title** | **Signature** | **Date**

Subject to the terms and conditions shown on Page 2 hereof; this permit is hereby approved and granted. The "Permittee" agrees to the terms of this permit.

APPLICANT (PROPERTY OWNER)

NATURE OF PERMIT APPLICATION:
(Give sufficient detail to permit thorough understanding and submit blueprints or sketches in triplicate.)
*If work involves Environmental-Related cleanup or monitoring, also complete Section 7.

Township | **Section** | **Range** / **Corridor** | **Sign Route** | **Mile Post**

Name | **Phone\Fax Number**

Address | **E-mail**

City | **State** (MT) | **Zip Code**

If a Corporation, give State of Incorporation and names of President and Secretary

Highway survey stations, milepost, distances to centerline, and distance from right-of-way line near which installations or structures will be installed:

For how long a period is the permit desired?:

Are there environmental actions involving hazardous waste sites? (Superfund, Spills, Underground Storage Tanks, Old Mines, etc.) If Yes you will need to fill out additional environment questions.

- ◯ **Yes (Complete Page 3)**
- ◯ **No**

An environmental checklist must be filled out, signed and attached in order for this application to be considered complete.

Link to Environmental Checklist

Company or Corporation | **Title** | **Signature** | **Date**

Montana Department of Transportation
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(INSTRUCTIONS CONCERNING USE OF THIS FORM)

Applicant will complete this form along with plans, sketches and an environmental checklist and send to the appropriate District Maintenance Chief for review and approval.

If the proposed installation will result in significant, permanent or long term impacts to the transportation network in terms of substantial increase traffic volumes, weight or delays to traffic on state roadways, such as major mines greater than five acres, a railroad at -grade crossing, railroad under or overpass, or strip mines, or if the proposed action has permanent impacts to other forms of transportation (rail, transit, or air movement), the encroachment permit must be submitted to the transportation planning division for review prior to issuance of this permit.

Subject to the following terms and conditions, the permit applied for upon the reverse side hereof, is hereby granted:

1. TERM. This permit shall be in full force and effect from the date hereof until revoked as herein provided.
2. REVOCATION. This permit may be revoked by State upon giving **45** days notice to Permittee by ordinary mail, sent to the address shown herein. However, the State may revoke this permit without notice if Permittee violates any of its conditions or terms.
3. COMMENCEMENT OF WORK. No work shall be commenced until Permittee notifies the Maintenance Chief shown in application the date the Permittee proposes to commence work.
4. CHANGES IN HIGHWAY. If State highway changes necessitate changes in structures or installations installed under this permit, Permittee will make necessary changes without expense to State.
5. STATE SAVED HARMLESS FROM CLAIMS. As a consideration of being issued this permit, the Permittee, its successors or assigns, agrees to protect the State and save it harmless from all claims, actions or damage of every kind and description which may accrue to, or be suffered by, any person or persons, corporations or property by reason of the performance of any such work, character of materials used, or manner of installations, maintenance and operation, or by the improper occupancy of said highway right-of-way, and in case any suit or action is brought against the State and arising out of, or by reason of, any of the above causes, the Permittee, its successors or assigns, will, upon notice to them of the commencement of such action, defend the same at its sole cost and expense and satisfy any judgment which may be rendered against the State in any such suit or action.
6. PROTECTION OF TRAFFIC. The Permittee shall protect the work area with traffic control devices that comply with the Manual of Uniform Traffic Control Devices. The Permittee may be required to submit a traffic control plan to the Maintenance Chief for approval prior to starting work. During work, the Maintenance Chief or designee may require the Permittee to use additional traffic control devices to protect traffic or the work area. No road closure shall occur without prior approval from the District Engineer.
7. HIGHWAY AND DRAINAGE. If the work done under this permit interferes in any way with the drainage of the State highway affected. Permittee shall, at the Permittee's expense, make such provisions as the State may direct to remedy the interference.
8. RUBBISH AND DEBRIS. Upon completion of work contemplated under this permit, all rubbish and debris shall be immediately removed and the roadway and roadside left in a neat and presentable condition satisfactory to the State.
9. INSPECTION. The installation authorized by this permit shall be in compliance with the attached plan and the conditions of this permit. The Permittee may be required to remove or revise the installation, at sole expense of Permittee, if the installation does not conform with the requirements of this permit or the attached plan.
10. STATE'S RIGHT NOT TO BE INTERFERED WITH. All changes, reconstruction or relocation shall be done by Permittee so as to cause the least interference with any of the State's work, and the State shall not be liable for any damage to the Permittee by reason of any such work by the State, its agents, contractors or representatives, or by the exercise of any rights by the State upon the highways by the installations or structures placed under this permit.
11. REMOVAL OF INSTALLATIONS OR STRUCTURES. Unless waived by the State, upon termination of this permit, the Permittee shall remove the installations or structures installed under this permit at no cost to the State and restore the premises to the prior existing condition, reasonable and ordinary wear and tear and damage by the elements, or by circumstances over which the Permittee has no control, excepted.
12. MAINTENANCE AT EXPENSE OF PERMITTEE. Permittee shall maintain, at its sole expense, the installations and structures for which this permit is granted, in a condition satisfactory to the State.
13. STATE NOT LIABLE FOR DAMAGE TO INSTALLATIONS. In accepting this permit, the Permittee agrees that any damage or injury done to said installations or structures by a contractor working for the State, or by any State employee engaged in construction, alteration, repair, maintenance or improvement of the State highway, shall be at the sole expense of the Permittee.
14. STATE TO BE REIMBURSED FOR REPAIRING ROADWAY. Upon being billed, therefore, Permittee agrees to promptly reimburse State for any expense incurred in repairing surface of roadway due to settlement at installation, or for any other damage to roadway as a result of the work performed under this permit.
15. The Permittee shall not discharge or cause discharge of any hazardous or solid waste by the installation or operation of the facility of a State Right-of-Way.
16. The Permittee will control noxious weeds within the disturbed installation area for two (2) years.
17. In accordance with Mont. Code Ann. § 76-3-403(2), Permittee shall, at Permittee's expense, employ the services of a Montana Licensed Professional Land Surveyor to re-establish all existing survey monuments disturbed by work contemplated under this permit.
18. The use of explosives is prohibited for the installation.
19. Any condition of this permit shall not be waived without written approval of the appropriate District Administrator.

20. OTHER CONDIDTIONS AND/OR REMARKS:

21. ☐ See attached addendum

Montana Department of Transportation
Encroachment Application

2701 Prospect Avenue
PO Box 5895
Helena, MT 59604-5895
Phone: (406) 444-7220
Fax (406) 444-7684
TTY: (406) 444-7696
www.mdt.mt.gov

Additional Environmental Questions Pertaining to Environmental actions involving hazardous waste sites (Superfund, Spills, Underground Storage Tanks, Old Mines, etc.)

Name of Facility:

Facility ID:

Address: **City** **State** **Zip Code**

MT

Check Boxes that are applicable below and provide subsequent details

☐ **Leaking underground storage tank site?** **MDEQ identification number** ☐ **Petro Fund Eligible?**

☐ **Remediation Response Sites (State Superfund Site)?** **identification number and/or site name**

☐ **Federal Superfund Site?** **identification number and/or site name**

☐ **Is Mine Active or Abandoned?** **Mine Site ID#** **Mine Description or Name**

☐ **Spill?** **Spill Site** **Spill Description**

Other Environmental Action

Traffic Control Plan Attached? ◯ **Yes** ◯ **No**

For each well installed in MDT R/W, provide GPS coordinates in state plane coordinates (preferred) or well survey information in another format (continue on another sheet if necessary).

NOTE: Each well request needs to be submitted on a separate application form.

Add Well	Well Designation	Easting	Northing
X			
X			
X			

APPENDIX C

QUALIFIED ENVIRONMENTAL PROFESSIONAL RESUMES

JENNY O'MARA, E.I.T., HELENA, MT — PROJECT MANAGER

Education: BS, Environmental Engineering – Montana Tech of the University of Montana
Credentials/Certifications: E.I.T., MT, No. PEL-EI-LIC-30458; 40-hour Occupational Safety and Health Act Hazardous Waste and Emergency Response (HAZWOPER)Training (Current Annual Recertification)

Key Qualifications: Jenny O'Mara has more than 25 years of professional experience of project/program management and experience managing and conducting US Environmental Protection Agency (EPA) Targeted Brownfields Assessments (Phase I and IIs) at sites throughout Montana. Provides oversight and technical review of project work including compliance with local, state, and federal requirements; site characterization; and technical reporting. Experience providing project and technical management for the investigation, evaluation, and remediation of hazardous waste sites in Montana under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Coordinates with other consultants and stakeholders to assist in development of preliminary remedial action objectives, process options, points of compliance, alternative development, and screening criteria. Evaluates cleanup alternatives relative to applicable and relevant environmental cleanup laws, provide technical review of legal agreements such as administrative orders and position papers, and conduct engineering cost estimates. Has extensive permitting and compliance experience with water, wastewater, and air.

Phase I and Phase II Environmental Site Assessments (ESAs), Multiple Montana Locations, Headwaters, Project Manager. Managed a team of staff scientists and engineers to conduct Phase I and Phase II ESAs and provided oversight on sampling investigation activities under project-specific Sampling and Analysis Plans (SAPs). Provided final quality assurance review on final reports and final conclusions in the Phase I and II reports.

Libby Asbestos Superfund Site (Operable Unit 3), Libby, MT, Montana Department of Environmental Quality (DEQ), Project Manager. Manages a team of engineers who provide technical expertise and support services to DEQ to aid in reviewing all documents related to CERCLA actions at the site. Assists DEQ by providing technical support for review and of the OU3 Remedial Investigation (RI)/Feasibility Study (FS), including human health risk assessment, ecological risk assessment, risk management strategy, geotechnical evaluation, monitoring reports, treatability studies, etc. Coordinates with other consultants and stakeholders to assist in development of preliminary remedial action objectives, process options, points of compliance, alternative development, and screening criteria. Evaluates cleanup alternatives relative to applicable and relevant environmental cleanup laws, provide technical review of legal agreements such as administrative orders and position papers, and conduct engineering cost estimates.

Libby Asbestos Superfund Site (Sitewide), Libby and Troy, MT, DEQ, Project Manager. Manages a team of scientists and engineers to support DEQ for development and administration of the Sitewide Operation and Maintenance (O&M) program. Performed technical review of Remedial Action Completion Report, O&M Plan, Best Management Practices Manual, Institutional Control Implementation and Assurance Plan (ICIAP). Prepared sitewide O&M cost estimate and participated in joint site inspection at the end of remedial activities. Assisted in development of reimbursement program for post-remediation abatement projects within Superfund boundary, including creation of flow-charts to determine funding eligibility. Participated in workgroups with representatives from U.S. Environmental Protection Agency, DEQ, and Lincoln County. Drafted sections of O&M Manual for use by State and County personnel post-remediation. Performed quality control review of the state's O&M Sampling Guidance. Specific challenges included the development of O&M programs and institutional controls to ensure continued protection of the remedy and acceptance by the impacted community.

Phase I and Phase II ESAs, Multiple Montana Locations, EPA START Program, Senior Project Leader. Provide initial project management and team strategy. Research and review all historical documents and conduct investigations at various locations throughout Montana. Developed final report, findings and conclusions, prepared SAPs, HASPs and Phase II ESA.

West Bank Project, Great Falls, MT, Great Falls Development Authority (GDFA), Project Manager. Managed a team of staff scientists and engineers to conduct a due diligence investigation and to review 30 years of historical data collected for the site. The scope of work focused on groundwater and soil contamination across this CECRA-listed site. The site contained commingled plumes in both groundwater and soils; Contaminants of concern were petroleum fuel products, arsenic, dioxin/furans, RCRA metals, and pentachlorophenol (PCP). The project team developed an SAP and completed a Phase II ESA with cleanup recommendations. Provide technical expertise to all stakeholders, including private parties, nongovernmental organizations, and state, local and federal agencies.

MINDY MCCARTHY, HELENA, MT SENIOR ENGINEERING PROFESSIONAL/QUALIFIED ENVIRONMENTAL PROFESSIONAL

Education: BS, Environmental Engineering – Montana Tech of the University of Montana
Credentials: 40-hour HAZWOPER Training (Current Annual Recertification)

Key Qualifications: Mindy McCarthy has over 25 years of project/program management experience, involving wastewater and environmental compliance, various environmental projects, and environmental laboratory analysis. Extensive experience in Phase I and II Environmental Site Assessments in accordance with ASTM requirements. Performed site investigations to identify sources and delineate the nature and magnitude of contamination by collecting environmental samples of various media. Extensive experience in preparation and analysis of project and program quality planning documents, including Quality Management Plans (QMPs), QAPPs, SAPs, Work Plans, and other technical documents and performing data analysis and data validations.

Idaho Pole Superfund Site, Bozeman, MT, Scout-DAC, LLC, Senior Environmental Professional. Completed Phase I ESA for the potential redevelopment of the Idaho Pole Superfund Site. Developed SAP/QAPP for soil characterization at the Idaho Pole Superfund Site that was approved by the EPA and DEQ. The sampling effort is to further characterize post-remediation contamination levels of PCP, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (dioxins and furans) at the Site in order to support the proposed redevelopment use and evaluate potential human health exposure risks to ensure protection of human health and the environment. Collected composite surface soil samples in accordance with sampling requirements for screening in development of the data quality objectives and sampling design. Performed verification and validation on all laboratory analytical data per EPA requirements, EPA QA/G-8 (EPA, 2002) and EPA's National Functional Guidelines for Organic Superfund Methods Data Review (EPA, 2020).

Phase I and II ESAs, various locations, Headwaters Resource Conservation and Development Inc., Qualified Environmental Professional. Project manager and field team lead for various Phase I and II ESAs in southwest Montana responsible for developing site-specific SAPs and performing sampling investigations to include building materials and surface and subsurface soils. Evaluated data and provided summary of results and recommendations.

Non-Level A Response, Jefferson County, MT, Elkhorn Mining District, EPA, Senior Engineering Professional. Field team lead conducting sampling specific to the Site Inspection at selected abandoned mines in the Elkhorn Mining District. Collected in-situ XRF screening readings, in-situ surface water quality field parameters, surface water/sediment samples, and surface soil samples.

Libby Asbestos Superfund Site, Libby, MT, DEQ, Technical Support. Provided technical review of various reports related to the Libby Superfund Site, including the draft final Remediation Action Completion Report, BMP Manual, etc. Developed reimbursement program and prepared Operation and Maintenance (O&M) Manual. and sitewide O&M cost estimate. Reviewed technical documents related to Operable Unit 3 Feasibility Study, including SAP/QAPPs, water quality, soil, and sediment monitoring data, treatability studies, etc. Conducts the annual Sitewide O&M Inspection at the Libby Asbestos Superfund Site for DEQ to confirm that institutional controls remain in place and provide protection as intended and provide a report of the findings. The annual inspection consists of record reviews and non-intrusive visual site inspections.

Bozeman Trax Partners, LLC, North Park/North Loop Development, Bozeman, MT, Senior Engineering Professional. Completed a Phase I ESA for a 173-acre fee-owned and state-leased property for future industrial and commercial development. Completed a waterbody and wetland assessment and delineation to evaluate baseline conditions and the potential effects on aquatic resources. Further, for planned work activities in wetland and stream crossing areas, prepared a Clean Water Act 404 permit application for the US Army Corps of Engineering, and a 310 stream permit application for the Gallatin County Conservation District for work in Mandeville Creek.

Rails to Trails Conservancy, Yellowstone Heritage Trail along Historic Elk River, Park County, MT, Senior Engineering Professional. Completed an Environmental Scan for a Feasibility Study for a 49-mile trail corridor located in the Paradise Valley. The document identified the resources present, potential impacts, and proposed avoidance or mitigation measures. This scan included physical, biological, social, and cultural resource elements, as well as a summary of permits and clearances that may be required.

ANDY WANTA, HELENA, MT PROJECT GEOSCIENTIST/QUALIFIED ENVIRONMENTAL PROFESSIONAL

Education: BS, Geology – University of Wisconsin Oshkosh; MS, Geology – University of Wisconsin Milwaukee
Credentials: 40-hour Occupational Safety, First Aid, CPR, AED certified

Key Qualifications: Andy Wanta has over 7 years of experience involving environmental sampling, contaminate delineation, and subsurface exploration. Project experience includes Phase I and Phase II Environmental Site Assessments in accordance with ASTM requirements. Performed site investigations to identify sources and delineate the nature and magnitude of contamination by collecting environmental samples of various media. Extensive experience in implementing project and program quality planning documents, including QAPPs, SAPs, Work Plans, and other technical documents.

MT Great Outdoors Conservation Easement, Lincoln and Sanders County, MT, Montana Fish, Wildlife & Parks, Project Geologist. Prepared a Phase I ESA for MFWP of an approximately 113,000-acre area comprised of numerous forested parcels located in the vicinity of US Highway 2, east and southeast of Libby, Montana. MFWP proposed to acquire a conservation easement for the property and met the requirements, and the Phase I satisfied the requirements to obtain federal funding from the U.S. Forest Service under the Forestry Legacy Program. Evaluated existing and historic uses and reviewed mining documents (e.g., opencut mining, hard rock mining) to determine whether environmental conditions were present that may result in environmental conditions associated with the subject property.

Idaho Pole Superfund Site, Bozeman, MT, Scout-DAC, LLC, Project Geologist. Conducted soil sampling and implemented SAP/QAPP for soil characterization at the Idaho Pole Superfund Site. The sampling effort is to further characterize post-remediation contamination levels of PCP, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (dioxins and furans) at the Site to support the proposed redevelopment use and evaluate potential human health exposure risks to ensure protection of human health and the environment. Collected composite surface soil samples in accordance with sampling requirements for screening in development of data quality objectives and sampling design.

Phase II Environmental Site Assessment (ESA), Johnson Property, Dillon, MT, Headwaters Resource Conservation and Development Inc., Qualified Environmental Professional. Field team lead for various Phase II ESA at a property in Dillon, Montana to evaluate suspected contaminants that may be present in the soils at the site including, polychlorinated biphenyls (PCB) and metals, PAHs, and petroleum contaminates. Responsible for developing site-specific SAPs and performing sampling of surface and subsurface soils. Evaluated data and provided summary of results and recommendations.

Orphan Well Program, Sterling CO, Colorado Oil and Gas Conservation Commission, Field Team Lead. Conducted soil sampling and inventoried site conditions at former oil and gas infrastructure locations. Soil sampling was conducted to determine if contaminates were present at these sites and, if they were, to characterize and delineate the contamination. Developed and implemented site-specific SAP/QAPP for soil sampling. Coordinated with local landowners to gain access to sites that were on private property. Performed data analysis, reported on site-specific conditions, and provided recommendations for future remediation and clean up activities.

Drift River Site Assessment, Cook Inlet, AK, Alaska Department of Environmental Quality (ADEQ), Project Geologist. Conducted soil and water sampling at a recently closed oil and gas facility to delineate petroleum related contaminates. The site was at a remote facility off the road system so significant logistical challenges were encountered and overcome. Sampling was targeted at delineating contamination at documented historic spill locations. Responsible for implementing site-specific SAPs and adhering to site-specific health and safety plan (HASP). Evaluated data and wrote a report providing a summary of results and recommendations.

Rails to Trails Conservancy, Yellowstone Heritage Trail along Historic Elk River, Park County, MT, Project Scientist. Performed information requests and evaluations to support a feasibility study for a trail corridor in Paradise Valley, MT for the Rails-to-Trails Conservancy in Partnership with Park County. Conducted an environmental scan, biological resource scan, and physical environment scan.

West Railroad Street-Laurel, Laurel, MT, Sanderson Stewart, Project Scientist. Performed site assessment and wetland delineation, and report writing for a transportation project. Field work consisted of wetland delineation, biological resource assessment, water resource survey in the project area and capturing GPS coordinates.

APPENDIX D

ERCLS

ENVIRONMENTAL REQUIREMENTS, CRITERIA OR LIMITATIONS ANALYSIS

Remedial action undertaken pursuant to the Comprehensive Environmental Cleanup and Responsibility Act (CECRA), § 75-10-701, *et seq.*, MCA, must "attain a degree of cleanup of the hazardous or deleterious substance and control of a threatened release or further release of that substance that assures protection of public health, safety and welfare and of the environment." Section 75-10-721(1), MCA. Additionally, the Montana Department of Environmental Quality (DEQ) "shall require cleanup consistent with applicable state or federal environmental requirements, criteria, or limitations" and "may consider substantive state or federal environmental requirements, criteria or limitation that are relevant to the facility conditions." Sections 75-10-721(2)(a) and (b), MCA.

There is a distinction between "applicable" requirements and those that are "relevant." "Applicable" requirements are those requirements that would legally apply at the facility regardless of the CECRA action. "Relevant" requirements are those requirements that are not applicable, but address situations or problems sufficiently similar to those at the facility and, therefore, are relevant for use at the facility. Attainment of "applicable" requirements is mandatory under CECRA. "Relevant" requirements may be considered by DEQ in approving remedial actions under CECRA. All relevant requirements identified in the approved VCP must be attained.

ERCLs are generally of three types: action-specific, contaminant-specific, and location-specific. Action-specific requirements are those that are triggered by the performance of a certain activity as part of a particular remedy. They do not in themselves determine the remedy but rather indicate the manner in which the remedy must be implemented. Contaminant-specific requirements are those that establish an allowable level or concentration of a hazardous or deleterious substance in the environment or which prescribe a level or method of treatment for a hazardous or deleterious substance. Location-specific requirements are those that serve as restrictions on the concentration of a hazardous or deleterious substance or the conduct of activities solely because the facility is in a specific location or the action affects specified types of areas. Some ERCLs could be categorized in more than one way; in this case, they are generally not duplicated within the document.

CECRA defines as cleanup requirements only state and federal ERCLs. Remedial designs, implementation, operation, and maintenance must, nevertheless, comply with all other applicable laws, both state and federal. Many such laws, while not strictly environmental, have environmental impacts. Identification of all applicable laws, including health and safety laws and local regulations that must be complied with during implementation of the voluntary cleanup plan, remains the VCRA applicant's responsibility.

Many requirements listed here are promulgated as identical or nearly identical requirements in both federal and state law, usually pursuant to delegated environmental programs administered by the Environmental Protection Agency (EPA) and the states, such as the requirements of the federal Clean Water Act and the Montana Water Quality Act. The preamble to the National Contingency Plan states that such a situation results in citation to the state provision as the

appropriate standard, but treatment of the provision as a federal requirement. ERCLs and other laws that are unique to state law are also identified.

Identified within this document are applicable or relevant state and federal ERCLs for the proposed VCP for the Empire-property that is included in the CMC Asbestos Bozeman CECRA Facility. The ERCLs contained in this document are tailored to the proposed VCP submitted and are intended to apply exclusively to this VCP dated November 25, 2024. If a different VCP or remedial action were proposed, preferred, chosen, or implemented for this Facility, the ERCLs contained herein might be substantially different.

1.0 ACTION-SPECIFIC ERCLs

1.1 Air Standards

These standards, promulgated pursuant to section 109 of the Clean Air Act, 42 U.S.C. §§ 7401, *et seq.*, (applicable) are applicable to releases into the air from any cleanup activities.

Sections 75-2-101, *et seq.*, MCA, (applicable) provide that state emission standards are enforceable under the Montana Clean Air Act.

Administrative Rules of Montana (ARM) 17.8.802 (applicable) incorporates by reference the air regulations in certain parts of CFR Title 40 regarding quality assurance requirements for prevention of significant deterioration air monitoring; standards of performance for new stationary sources; emission standards for hazardous air pollutants, and other standards and requirements.

ARM 17.8.805 (applicable) provides ambient air ceilings, and states that no concentrations of a pollutant shall exceed concentrations permitted under with the applicable secondary or the primary national ambient air quality standard, whichever concentration is lowest for the pollutant for a period of exposure.

ARM 17.8.204 (applicable) provides for ambient air monitoring and provides that, generally, all ambient air monitoring, sampling and data collection, recording, analysis and transmittal must be in compliance with a project-specific, DEQ approved Quality Assurance Project Plan (QAPP).

ARM 17.8.220 (applicable) prohibits causing or contributing to concentrations of particulate matter in the ambient air such that the mass of settle particulate matter exceeds a 30-day average: 10 gm/m^2, 30-day average, not to be exceeded. A measurement method is also provided.

ARM 17.8.221 (applicable) prohibits causing or contributing to concentrations of particulate matter such that the scattering coefficient of particulate matter in the ambient air exceeds an annual average: 3×10^{-5} per meter, annual average, not to be exceeded.

ARM 17.8.223, 75-2-101, *et seq*, MCA, 40 CFR Part 50.6 (applicable) Dust control regulations are promulgated at ARM 17.8.223 as part of a federally approved State Implementation Plan (SIP), pursuant to the Clean Air Act of Montana, §§ 75-2-101 et seq., MCA. Corresponding

federal regulations are found at 40 CFR Part 50.6. Per ARM 17.8.223, no person may cause or contribute to concentrations of particulate matter that is 10 microns in diameter or smaller (PM-10) in the ambient air which exceed 150 $\mu g/m^3$ of air, 24-hour average, no more than one expected exceedance per calendar year and 50 $\mu g/m^3$ of air, annual average.

ARM 17.8.304 (applicable) provides that no person may cause or authorize emissions into be discharged into the outdoor atmosphere that "exhibit an opacity of 20 percent or greater average over six consecutive minutes."

ARM 17.8.308 (applicable) provides that no person may cause or authorize the production, handling, transportation or storage of any material; or cause or authorize the use of any street, road, or parking lot; or operate a construction facility or demolition project, unless reasonable precautions to control emissions of airborne particulate matter are taken. Such emissions of airborne particulate matter must be controlled so that they do not "exhibit an opacity of 20 percent or greater average over six consecutive minutes."

ARM 17.8.308 (applicable) states that no person may operate a construction site or demolition project unless reasonable precautions are taken to control emissions of airborne particulate matter. Such emissions of airborne particulate matter from any stationary source shall not exhibit an opacity of 20% or greater averaged over six consecutive minutes.

ARM 17.8.324 (applicable) contains certain standards regarding hydrocarbon emissions and the treatment, storage, and handling of petroleum products.

ARM 17.8.604 (applicable) lists certain wastes that may not be disposed of by open burning, including oil or petroleum products, RCRA hazardous wastes, chemicals and wood and wood byproducts that have been coated, painted, stained, treated or contaminated by foreign material. Any waste which is moved from the premises where it was generated and any trade waste (material resulting from construction or operation of any business, trade, industry or demolition project) may be open burned only in accordance with the substantive requirements of ARM 17.8.611 or 612.

ARM 17.24.761 (relevant) specifies a range of measures for controlling fugitive dust emissions during mining and reclamation activities. Some of the measures could be considered relevant to control fugitive dust emissions in connection with excavation, earth moving and transportation activities conducted as part of the remedy at the Facility. Such measures include, for example, paving, watering, chemically stabilizing, or frequently compacting and scraping roads, promptly removing rock, soil or other dust-forming debris from roads, restricting vehicle speeds, revegetating, mulching, or otherwise stabilizing the surface of areas adjoining roads, restricting unauthorized vehicle travel, minimizing the area of disturbed land, and promptly revegetating regraded lands.

VCP Compliance: The proposed remedy involves handling asbestos-contaminated soil that may result in dust emissions. However, remedial actions at the Empire property will include wetting and other best management practices related to fugitive dust control. Dust control measures will ensure that air standards will not be exceeded during the proposed remedial

action. Air monitoring will be a component of the proposed remedial action conducted by the oversight personnel and the air-monitoring plan would verify the effectiveness of work practices, engineering controls, and barriers. In addition, there are no unpaved roads in the Facility area, so dust generated from hauling activities are not expected. Remedial actions will be halted if significant dust is generated and will not resume until adequate dust control measures are in place. The proposed remedy will not result in emissions of the specific compounds included in these regulations. The proposed remedy does not involve the treatment, storage or handling of petroleum products other than basic refueling of construction equipment. Therefore, the proposed remedy meets the requirements of these ERCLs.

1.2 Water Quality Requirements

1.2.1 Clean Water Act, Point Source Discharges Requirements, 33 USC § ' 1342 (applicable, substantive provisions only):

Section 402 of the Clean Water Act, 33 USC § ' 1342, *et seq.*, authorizes the issuance of permits for the discharge of any pollutant. This includes storm water discharges associated with industrial activity. *See*, 40 Code of Federal Regulations (CFR) 122.26(b)14). Industrial activity includes inactive mining operations that discharge storm water contaminated by contact with or that has come into contact with any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations, *see*, 40 CFR 122.26(b)(14)(iii); landfills, land application sites, and open dumps that receive or have received any industrial wastes including those subject to regulation under Resource Conservation and Recovery Act (RCRA) subtitle D, *see*, 40 CFR 122.26(b)(14)(v); and construction activity including clearing, grading, and excavation activities, *see*, 40 CFR 122.26(b)(14)(x). Because the State of Montana is delegated the authority to implement the Clean Water Act, these requirements are enforced in Montana through the Montana Pollutant Discharge Elimination System (MPDES). The MPDES requirements are set forth below.

ARM 17.30.1201 *et seq.*, (standards) and ARM 17.30.1301 *et seq.* (permits) (applicable): If point sources of water contamination are retained or created by any remediation activity, applicable Clean Water Act standards would apply to those discharges. The State of Montana established state standards and permit requirements in conformity with the Clean Water Act, and these standards and requirements apply to point source discharges. *See* ARM 17.30.1201.

ARM 17.30.1342-1344 (applicable): The State of Montana has been delegated the authority to implement the Clean Water Act and these requirements are enforced in Montana through the MPDES. These regulations set forth the substantive requirements applicable to all MPDES and National Pollutant Discharge Elimination System permits. The substantive requirements, including the requirement to properly operate and maintain all facilities and systems of treatment and control, are applicable requirements.

VCP Compliance: The appropriate MPDES stormwater permit will be obtained prior to initiation of cleanup activities and the conditions of the permit will be met throughout the remediation. Therefore, the proposed remedy meets the requirements of this ERCL.

1.2.2 Montana Water Quality Act, §§ 75-5-101, *et.seq.*, MCA:

Section 75-5-303, MCA (applicable), states that existing uses of state waters and the level of water quality necessary to protect the uses must be maintained and protected. Section 75-5-317, MCA, provides an exemption from non-degradation requirements which allows changes of existing water quality resulting from an emergency action or reclamation that is designed to protect the public health or the environment and that is approved, authorized, or required by the department. Degradation meeting these requirements may be considered nonsignificant.

Section 75-5-605, MCA (applicable), prohibits causing pollution of any state waters. Pollution is defined as contamination or other alteration of physical, chemical, or biological properties of state waters which exceeds that permitted by the water quality standards or the discharge, seepage, or drainage of any substances into state water that will likely create a nuisance or render the water harmful, detrimental or injurious to public health, recreation, safety, or welfare, or to livestock or wild animals. Also, it is unlawful to place or cause to be placed any wastes where they will cause pollution of any state waters.

ARM 17.30.637 (applicable), prohibits discharges containing substances that will: (a) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines; (b) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials; (c) produce odors, colors or other conditions which create a nuisance or render undesirable tastes to fish flesh or make fish inedible; (d) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; or (e) create conditions which produce undesirable aquatic life.

ARM 17.30.705 (applicable), provides that for all state waters, existing and anticipated uses and the water quality necessary to protect these uses must be maintained and protected unless degradation is allowed under the non-degradation rules at ARM 17.30.708.

ARM 17.30.1011 (applicable), provides that any groundwater whose existing quality is higher than the standard for its classification must be maintained at that high quality unless degradation may be allowed under the principles established in § 75-5-303, MCA and the non- degradation rules at ARM 17.30.701, *et seq.*

1.2.3 Stormwater Runoff Control Requirements

ARM 17.24.633 (applicable), provides all surface drainage from a disturbed area must be treated by the best technology currently available (BTCA).

ARM 17.30.1105 (applicable): requires coverage under an MPDES general permit for any person who discharges or proposes to discharge storm water from a point source for discharges associated with construction activity, industrial activity, mining oil and gas activity, small municipal sperate storm sewer systems that are identified in ARM 17.30.1102 or designated pursuant to ARM 17.30.1107, for which DEQ determines that storm water controls are needed based on wasteload allocations that are part of TMDLs that address the pollutants of concern,

and that DEQ determines are contributing to a violation of a water quality standard or are significant contributors of pollutants to surface waters.

ARM 17.30.1115 (applicable) requires submittal of a Notice of Intent for any person who discharges or proposes to discharge storm water associated with construction activity.

ARM 17.30.1341 to 1344 (applicable) requires a storm water permit for storm water point sources. Generally, the permits require the permittee to implement best management practices (BMPs) and to take all reasonable steps to minimize or prevent any discharge which has a reasonable likelihood of adversely affecting human health or the environment. However, if there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with the activity, an individual MPDES permit or alternative general permit may be required.

VCP Compliance: The appropriate MPDES stormwater permit will be obtained prior to initiation of cleanup activities and the conditions of the permit will be met throughout the remediation. Therefore, the proposed remedy meets the requirements of this ERCL.

1.3 Water Well Requirements

No water wells will be drilled, utilized, or otherwise impacted by implementation of the proposed remedy. Therefore, VCP compliance with water well regulations is not relevant to this project.

1.4 Solid Waste Management Requirements

40 CFR Part 257 (applicable) establishes standards with which solid waste disposal must comply to avoid possible adverse effects on health or the environment. These criteria apply to any remedial alternatives that require any type of on-site solid waste disposal. The criteria do not apply to hazardous waste disposal that is subject to regulation under subtitle C of the Resource Conservation and Recovery Act (RCRA). Part 257.3-2 provides for the protection of threatened or endangered species. Part 257.3-3 provides that a facility shall not cause the discharge of pollutants into waters of the United Sates. Part 257.3-4 states that a facility or practice shall not contaminate underground drinking water. Part 257.3- states that a facility or practice shall not engage in open burning of solid waste. Part 257.3-8 states the explosive limits or other specifics regarding safety.

Montana Solid Waste Management Act and regulations, §§ 75-10-201, *et seq.*, MCA, ARM 17.50.101 *et seq.* (applicable) - Regulations promulgated under the Solid Waste Management Act, § 75-10-201, *et seq.*, MCA, and pursuant to the federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901 *et seq.* (RCRA Subtitle D) specify requirements that apply to the to the transportation of solid wastes and the operation, closure and post-closure care of solid waste facilities.

Section 75-10-206, MCA (applicable) allows variances to be granted from solid waste regulations if failure to comply with the rules does not result in a danger to public health or safety or compliance with specific rules would produce hardship without producing benefits to the health and safety of the public that outweigh the hardship.

Section 75-10-212 MCA (applicable) prohibits dumping or leaving any debris or refuse upon or within 200 yards of any highway, road, street, or alley of the State or other public property, or on privately owned property where hunting, fishing, or other recreation is permitted. However, the restriction relating to privately owned property does not apply to the owner, his agents, or those disposing of debris or refuse with the owner's consent.

ARM 17.50.501 through 503 (applicable) provides standards for the storage, handling, treatment, recycling, recovery, and disposal of non- hazardous solid waste.

ARM 17.50.523 (applicable) specifies that solid waste must be transported in such a manner as to prevent its discharge, dumping, spilling or leaking from the transport vehicle.

ARM 17.50.525 (applicable) specifies DEQ may inspect solid waste facilities at reasonable hours upon presentation of proper credentials.

ARM 17.50.1004 (applicable) addresses Class II landfills in floodplains.

ARM 17.50.1005 (applicable) prohibits placement of a Class II landfill in a wetland unless special conditions are met.

ARM 17.50.1006 (applicable) prohibits placement of a Class II landfill within 200 feet of a fault which has had displacement in Holocene time unless special conditions are met.

ARM 17.50.1007 (applicable) prohibits placement of a Class II landfill in a seismic impact zone (as defined in ARM 17.50.1002(35)) unless special conditions are met.

ARM 17.50.1008 (applicable) prohibits placement of a Class II landfill in an unstable area, which are defined in ARM 17.50.1002(40) as including locations that are susceptible to events or forces that are capable of impairing the integrity of the landfill structural components responsible for preventing releases from the landfill.

ARM 17.50.1009 (applicable) provides that a solid waste management facility must be located where a sufficient acreage of suitable land is available for solid waste management, including adequate separation of wastes from underlying groundwater and adjacent surface water. The facility may not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife or result in the destruction or adverse modification of critical habitat for those species. Also, the facility must manage solid waste, gas, and leachate.

ARM 17.50.1009 (applicable) requires that Class II landfills be designed, constructed, and maintained with a run-on and run-off control system to address 25-year storm events.

ARM 17.50.1108 (applicable) requires that the owner or operator of a solid waste facility use barriers to control public access.

ARM 17.50.1109(1)(c) (applicable) requires that solid waste facilities not discharge pollutants in excess of state standards. A solid waste facility must contain a leachate collection system unless

there is no potential for migration of a constituent in Appendix I or II to 40 CFR 258.

ARM 17.50.1110 (applicable) prohibits a Class II landfill from causing a discharge of a pollutant into state waters, including wetlands.

ARM 17.50.1111 (applicable) prohibits placement of bulk or non-characterized waste into a solid waste facility, unless the waste is household waste other than septic liquid waste or leachate derived from and placed back into a facility with a composite liner and leachate collection and removal system.

ARM 17.50.1115 (applicable) provides requirements for managing special waste including asbestos-contaminated material.

ARM 17.50.1116(2)(f) (applicable) requires that a solid waste management facility be designed, constructed, and operated in a manner to prevent harm to human health and the environment.

ARM 17.50.1204(1)(b) (applicable) requires that a Class II landfill be constructed utilizing a composite liner and leachate collection and removal system that is designed and constructed to maintain less than a 30-centimeter depth of leachate over the liner.

ARM 17.50.1205(3) (applicable) requires that the leachate system provide for accurate monitoring of the leachate level and provide a minimum slop at the base of the overlying leachate collection layer equal to at least two percent.

ARM 17.50.1303 (applicable) identifies requirements for groundwater monitoring.

ARM 17.50.1312 (applicable) identifies requirements for monitoring well abandonment.

ARM 17.50.1403 (applicable) sets forth the closure requirements for Class II landfills. This includes the requirement that the cover be a minimum of 24 inches thick and other criteria, as follows:

1. install a cover that is designed to minimize infiltration and erosion;
2. design and construct the final cover system to minimize infiltration through the closed unit by the use of an infiltration layer that contains a minimum 18 inches of earthen material and has a permeability less than or equal to the permeability of any bottom liner, barrier layer, or natural subsoils or a permeability no greater than 1×10^{-5} centimeters per second (cm/sec), whichever is less; and
3. minimize erosion of the final cover by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant.

ARM 17.50.1404 (applicable) sets forth post closure care requirements for Class II landfills. Post closure care requires maintenance of the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the cover and comply with the groundwater monitoring requirements found at ARM Title 17, chapter 50, subchapter 13.

VCP Compliance: Non-hazardous waste from this Facility will be transported and disposed of at the Logan Landfill or Valley View Landfill, licensed solid waste management facilities, in accordance with these ERCLs. No hazardous waste will be taken to the landfill. Transport vehicles will be tarped and tied down to avoid any leaking of waste during transport. The impacted soil remaining onsite will not adversely affect human health or the environment as it will be located below the ground surface and it is not leaching contaminants to groundwater. The landfill is operated and will be closed in accordance with the applicable regulations. The cleanup goals have been selected such that the soil remaining on-site will not adversely affect human health or the environment and will not leach contaminants to groundwater. Therefore, the proposed remedy meets the requirements of these ERCLs.

1.5 Hazardous Waste Management Requirements

1.5.1 RCRA, 42 U.S.C. §§ 6901 *et seq.*, (applicable, as incorporated by the Montana Hazardous Waste Act) and the Montana Hazardous Waste Act, §§ 75-10-401 *et seq.*, MCA, (applicable) and regulations under these acts establish a regulatory structure for the generation, transportation, treatment, storage and disposal of hazardous wastes. These requirements are applicable to substances and actions at the facility which involve the active management of hazardous wastes.

Wastes may be designated as hazardous by either of two methods: listing or demonstration of a hazardous characteristic. Listed wastes are the specific types of wastes determined by EPA to be hazardous as identified in 40 CFR Part 261, Subpart D (40 CFR 261.30 - 261.35) (applicable, as incorporated by the Montana Hazardous Waste Act). Listed wastes are designated hazardous by virtue of their origin or source, and must be managed as hazardous wastes regardless of the concentration of hazardous constituents. Characteristic wastes are those that by virtue of concentrations of hazardous constituents demonstrate the characteristic of ignitability, corrosivity, reactivity or toxicity, as described at 40 CFR Part 261, Subpart C (applicable, as incorporated by the Montana Hazardous Waste Act).

The RCRA regulations at 40 CFR Part 262 (applicable, as incorporated by the Montana Hazardous Waste Act) establish standards that apply to generators of hazardous waste. These standards include requirements for obtaining an EPA identification number and maintaining certain records and filing certain reports. These standards are applicable for any waste which will transported offsite.

1.5.2 The Montana Hazardous Waste Act, §§ 75-10-401 *et seq.*, MCA (applicable) and regulations.

This Act establishes a regulatory structure for the generation, transportation, treatment, storage and disposal of hazardous wastes. These requirements are applicable to substances and actions at the facility which involve listed and characteristic hazardous wastes.

ARM 17.53.501-502 (applicable) adopts the equivalent of RCRA regulations at 40 CFR Part 261, establishing standards for the identification and listing of hazardous wastes, including standards for recyclable materials and standards for empty containers, with certain State

exceptions and additions.

ARM 17.53.601-604 (applicable) adopts the equivalent to RCRA regulations at 40 CFR Part 262, establishing standards that apply to generators of hazardous waste, including standards pertaining to the accumulation of hazardous wastes, with certain State exceptions and additions.

ARM 17.53.701-708 (applicable) adopts the equivalent to RCRA regulations at 40 CFR Part 263, establishing standards that apply to transporters of hazardous waste, with certain State exceptions and additions.

ARM 17.53.801-803 (applicable) adopts the equivalent to RCRA regulations at 40 CFR Part 264, establishing standards that apply to hazardous waste treatment, storage and disposal facilities, with certain State exceptions and additions.

ARM 17.53.1101-1102 (applicable) adopts the equivalent to RCRA regulations at 40 CFR Part 268, establishing land disposal restrictions, with certain State exceptions and additions.

Section 75-10-422 MCA (applicable) prohibits the unlawful disposal of hazardous wastes.

ARM 17.53.1201-1202 (applicable) adopts the equivalent to RCRA regulations at 40 CFR Part 270 and 124, which establish standards for permitted facilities, with certain State exceptions and additions.

ARM 17.53.1401 (applicable) adopts the equivalent of RCRA regulations at 40 CFR Part 279 that set forth the standards for the management of used oil.

VCP Compliance: Soils to be removed under this VCP have been fully characterized during previous investigations. No hazardous waste will be generated, stored, transported, or disposed as part of this VCP. Therefore, the proposed remedy complies with the requirements of these ERCLs.

1.6 Technology-Based Treatment

ARM 17.30.1203 (Applicable): Provisions of 40 CFR Part 125 for criteria and standards for the imposition of technology-based treatment requirements are adopted and incorporated in DEQ permits. For toxic and nonconventional pollutants treatment must apply the best available technology economically achievable (BAT); for conventional pollutants, application of the best conventional pollutant control technology (BCT) is required. Where effluent limitations are not specified for the particular industry or industrial category at issue, BCT/BAT technology-based treatment requirements are determined on a case by case basis using best professional judgment (BPJ).

VCP Compliance: The VCP applicant will obtain the required permit which may impose a technology-based treatment requirement. The applicant will comply with all permit requirements. Therefore, the proposed remedy meets the requirements of these ERCLs.

1.7 Underground Injection Control Program

The Underground Injection Control Program provided in 40 CFR Parts 144 and 146 (Applicable) sets forth the standards and criteria for the injection of substances into aquifers. Wells are classified as Class I through V, depending on the location and the type of substance injected. For all classes, no owner may construct, operate or maintain an injection well in a manner that results in the contamination of an underground source of drinking water at levels that violate maximum contaminant levels (MCLs) or otherwise adversely affect the health of persons. Each classification may also contain further specific standards, depending on the classification.

VCP Compliance: No injection of substances will occur as part of the proposed remedy. Therefore, the proposed remedy meets the requirements of these ERCLs.

1.8 Underground Storage Tank Requirements

40 CFR Part 280, Subpart F (applicable**)** sets forth requirements for Release Response and Corrective Action for underground storage tank (UST) Systems Containing Petroleum or Hazardous Substances. These include initial response, initial abatement measures, facility characterization, free product removal, and investigations for soil and groundwater cleanup.

40 CFR 280.64 (applicable) provides that where investigations in connection with leaking underground storage tanks reveal the presence of free product, owners and operators must remove free product to the maximum extent practicable as determined by the implementing agency. This regulation also requires that the free product removal be conducted in a manner that minimizes the spread of contamination into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the facility, and that properly treats, discharges or disposes of recovery byproducts in compliance with applicable local, state and federal regulations.

40 CFR 280.64 (applicable) provides that abatement of free product migration is a minimum objective for the design of the free product removal system provides that any flammable products must be handled in a safe and competent manner to prevent fires or explosions.

40 CFR Part 280, Subpart D (applicable) sets forth requirements for release detection.

40 CFR 280.43 (relevant) specifies groundwater monitoring requirements for underground storage tanks and requires continuous monitoring devices or manual methods used to detect the presence of at least 1/8 of an inch of free product on top of the groundwater in the monitoring wells.

The Montana regulations regarding underground storage tanks include similar requirements.

ARM Title 17, Chapter 56, Sub-Chapter 4 (applicable) specifies release detection.

ARM 17.56.407 (applicable) specifies groundwater monitoring requirements for underground storage tanks and requires continuous monitoring devices or manual methods used to detect the

presence of at least 1/8 of an inch of free product on top of the groundwater in the monitoring wells.

ARM Title 17, Chapter 56, Sub-Chapter 6 (applicable) specifies release response and corrective action for tanks containing petroleum or hazardous substances.

ARM 17.56.602 through 605 (applicable) requires certain mitigation measures including removal of as much of the regulated substance from the system as is necessary to prevent further release into the environment and prevention of further migration of the released substance into surrounding soil and groundwater. In particular, ARM 17.56.602(1)(c) (applicable requires that after a release from an underground storage tank system is identified in any manner, owners and operators must investigate to determine the possible presence of free product, begin free product removal as soon as practicable, conduct free product removal in a manner that minimizes the spread of contamination into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site, and that properly treats, discharges or disposes of recovery byproducts in compliance with applicable local, state and federal regulations. This regulation also provides that abatement of free product migration is a minimum objective for the design of the free product removal system and provides that any flammable products must be handled in a safe and competent manner to prevent fires or explosions.

ARM 17.56.607 (relevant) specifies that all free product must be removed to the maximum extent practicable before a release may be considered resolved.

ARM 17.56.702 (applicable) requires that all tanks and connecting piping which are taken out of service permanently must be removed from the ground. This applies if any remaining underground piping is encountered during remedial activities.

VCP Compliance: No USTs are known to be associated with the Facility. If any USTs are encountered during Facility remediation, investigation and closure will be pursued in accordance with these regulations. Therefore, the proposed remedy meets the requirements of these ERCLs.

1.9 Reclamation and Revegetation Requirements

Certain portions of the Montana Strip and Underground Mining Reclamation Act and Montana Metal Mining Act as well as the Mine and Smelter Waste Remediation provisions as outlined below are relevant requirements for activities at the Facility. While no mining activities are occurring at the Facility, these requirements are relevant for the management and reclamation of areas disturbed by excavation, grading, or similar actions.

ARM 17.24.501 (relevant) gives general backfilling and final grading requirements.

ARM 17.24.631(1), (2), (3)(a) and (b) (relevant): Disturbances to the prevailing hydrologic balance will be minimized. Changes in water quality and quantity, in the depth to groundwater and in the location of surface water drainage channels will be minimized, to the extent consistent with the selected remedial action. Other pollution minimization devices must be used

if appropriate, including stabilizing disturbed areas through land shaping, diverting runoff, planting quickly germinating and growing stands of temporary vegetation, regulating channel velocity of water, lining drainage channels with rock or vegetation, mulching, and control of acid-forming, and toxic-forming waste materials.

ARM 17.24.633 (relevant) states that all surface drainage from a disturbed area must be treated by the best technology currently available (BTCA). Treatment must continue until the area is stabilized.

ARM 17.24.635 through 17.24.637 (relevant) set forth requirements for temporary and permanent diversions.

ARM 17.24.638 (relevant) specifies sediment control measures to be implemented during operations.

ARM 17.24.640 (relevant) provides that discharge from diversions must be controlled to reduce erosion and minimize disturbance of the hydrologic balance.

ARM 17.24.641(relevant) indicates that practices to prevent drainage from acid or toxic forming spoil material into groundwater and surface water will be employed.

ARM 17.24.643 through 17.24.646 (relevant) provide provisions for groundwater protection, groundwater recharge protection, and groundwater and surface water monitoring.

ARM 17.24.701 and 702 (relevant) provide requirements for redistributing and stockpiling of soil for reclamation. Also outline practices to prevent compaction, slippage, erosion, and deterioration of biological properties of soil.

ARM 17.24.703 (relevant) require that when using materials other than, or along with, soil for final surfacing in reclamation, the operator must demonstrate that the material (1) is at least as capable as the soil of supporting the approved vegetation and subsequent land use, and (2) the medium must be the best available in the area to support vegetation. Such substitutes must be used in a manner consistent with the requirements for redistribution of soil in ARM 17.24.701 and 702.

ARM 17.24.711 (relevant) requires that a diverse, effective and permanent vegetative cover of the same seasonal variety and utility as the vegetation native to the area of land to be affected must be established. This provision would not be relevant and appropriate in certain instances, for example, where there is dedicated development.

ARM 17.24.713 (relevant) provides that seeding and planting of disturbed areas must be conducted during the first appropriate period for favorable planting after final seedbed preparation, but may not be more than ninety days after soil has been replaced.

ARM 17.24.714 (relevant) requires use of a mulch or cover crop or both until an adequate permanent cover can be established. Use of mulching and temporary cover may be suspended

under certain conditions.

ARM 17.24.716 (relevant) establishes the required method of revegetation.

ARM 17.24.717 (relevant) relates to the planting of trees and other woody species if necessary, as provided in § 82-4-233, MCA, to establish a diverse, effective, and permanent vegetative cover.

ARM 17.24.718 (relevant) requires soil amendments if necessary to establish a permanent vegetative cover.

ARM 17.24.721 (relevant) specifies that rills and gullies must be stabilized and the area reseeded and replanted if the rills and gullies are disrupting the reestablishment of the vegetative cover.

ARM 17.24.723 (relevant) requires periodic monitoring of vegetation, soils, water, and wildlife.

ARM 17.24.724 (relevant) specifies how revegetation success is measured.

ARM 17.24.726 (relevant) sets the required methods for measuring vegetative success.

ARM 17.24.731 (relevant) provides if toxicity to plants or animals is suspected, comparative chemical analyses may be required.

ARM 17.24.751 (relevant) provides that measures to prevent degradation of fish, wildlife, and habitat will be employed.

ARM 17.24.761 (relevant) provides that fugitive dust control measures will be employed during excavation and construction activities to minimize the emission of fugitive dust.

Section 75-10-1404, MCA (relevant) provides that lands where waste has been removed must be revegetated using plant species native to the area and must achieve a vegetative cover equal to 85 percent of the vegetative cover of adjacent lands that were not previously disturbed within three years of the initial seeding.

VCP Compliance: Surface water controls for run-on and runoff will be implemented during construction to prevent runoff from contaminated soil. Dust control measures will be used during excavation and backfilling activities.

Under the proposed alternative, the entire remediation area is to be covered by a commercial building and surface and subsurface soils will be removed to accommodate a building foundation. Although it is expected that the entire surface area will be covered by a future development (foundation). If development plans change soils left in-place within 2 feet of the ground surface after regrading must meet surface soil cleanup standards and any backfilling . and temporary or permanent revegetation is required, soil quality (for promotion of plant growth) will be evaluated. Compost or other amendments may be added to ensure sufficient organic matter. Seeding and planting of disturbed areas will be conducted within ninety days

after the soil has been replaced. Appropriate BMPs will remain in place until vegetation or adequate cover is established. The disturbed areas will be revegetated consistent with these requirements.

Therefore, the proposed remedy meets the requirements of these ERCLs.

1.10 Noxious Weed Requirements

Sections 7-22-2101 *et seq*., MCA (Applicable) establishes and authorizes weed control at the local level. Section 7-22-2101(8)(a), MCA defines "noxious weeds." Designated noxious weeds are listed in ARM 4.5.201 and 4.5.206 through 4.5.209 and must be managed consistent with weed management criteria developed under § 7-22-2109(2)(b), MCA and in compliance with § 7-22-2152, MCA (Applicable). In addition, ARM 4.5.210 identifies regulated plants that may not be used for revegetation.

VCP Compliance: Under the proposed alternative, the entire remediation area is to be covered by a commercial building and surface and subsurface soils will be removed to accommodate a building foundation. Revegetation is not anticipated due to the nature of redevelopment on the entire footprint of the property. If development plans change, a Revegetation Plan meeting the requirements specified in the RP of the VCP, will be submitted to the County Weed Board at least 15 days prior to initiation of the cleanup. A copy of the Revegetation Plan and approval letter will be provided to DEQ when available. Therefore, the proposed remedy meets the requirements of these ERCLs.

2.0 CONTAMINANT-SPECIFIC ERCLs

2.1 Groundwater Standards

2.1.1 Safe Drinking Water Act – 42 U.S.C. § 300f *et seq*. and the National Primary Drinking Water Regulations (40 CFR Part 141) (applicable) establishes MCLs and maximum contaminant level goals (MCLGs) for contaminants in drinking water distributed in public water systems. ERCLs analysis in conjunction with the groundwater classification standards promulgated by the State of Montana. Because the aquifer affected by the Facility is currently and has been used as a drinking water source, so MCLs are identified because the groundwater at the Facility is a potential source of drinking water.

EPA's guidance on Remedial Action for Contaminated Groundwater at Superfund Sites states that MCLs developed under the Safe Drinking Water Act generally are Applicable or Relevant and Appropriate Requirements [ARARs; the federal equivalent of ERCLs] for current or potential drinking water sources. EPA has also established MCLGs for contaminants in drinking water distributed in public water systems. MCLGs that are above zero are relevant under the same conditions (55 Fed.Reg. 8750-8752, March 8, 1990). See also, State of Ohio v. EPA, 997 F.2d 1520 (D.C. Cir. 1993), which upholds EPA's application of MCLs and non-zero MCLGs as ARARs for groundwater which is a potential drinking water source.

MCLS for the primary contaminants of concern in groundwater are listed below. However, compliance with all MCLs is required and remedial actions must meet the MCLs for the COC at

the Facility, including any breakdown products generated during remedial actions.

Chemical	MCL
Asbestos	7 x 10^6 fibers longer than 10 microns in length/liter

In addition, the Secondary Maximum Contaminant Levels (SMCLS) specified in 40 CFR Part 143.3 are relevant requirements which are ultimately to be attained by the remedy for the facility. This regulation contains standards for iron, manganese, sulfate, color, odor, and corrosivity that are relevant to the remedial actions.

2.1.2 The Montana Water Quality Act, §§ 75-5-101, *et seq.,* MCA (applicable) and regulations.

The Montana Water Quality Act, § 75-5-605, MCA (applicable) provides that it is unlawful to cause pollution of any state waters and § 75-6-112, MCA (applicable) provides that is unlawful to violate the Montana Water Quality Act. Section 75-5-605, MCA (applicable) also states that it is unlawful to place or cause to be placed any wastes where they will cause pollution of any state waters. Section 75-5-303, MCA (applicable) states that existing uses of state waters and the level of water quality necessary to protect the uses must be maintained and protected.

ARM 17.30.1006 (Applicable) classifies groundwater into Classes I through IV based upon its specific conductance and establishes the groundwater quality standards applicable with respect to each groundwater classification. Class I is the highest quality class; Class IV the lowest. Concentrations of substances in groundwater within Class 1 may not exceed the human health standards for groundwater listed in Circular DEQ-7, Montana Numeric Water Quality Standards, (DEQ-7) (applicable). In addition, no increase of a parameter may violate the non-degradation policy found in § 75-5-303, MCA (applicable).

For concentrations of parameters for which human health standards are not listed in DEQ-7, ARM 17.30.1006 allows no increase of a parameter to a level that renders the waters harmful, detrimental or injurious to the beneficial uses listed for that class of water.

DEQ-7 human health standards for the primary contaminants of concern in groundwater are listed below. Compliance with all DEQ-7 standards is required and remedial actions must meet the DEQ-7 standards for all contaminants at the facility, including any breakdown products generated during remedial actions.

Chemical	DEQ-7 Standard for Groundwater
Asbestos	7 x 10^6 fibers longer than 10 microns in length/liter

ARM 17.30.1011 (applicable) provides that any ground water whose existing quality is higher than the standard for its classification must be maintained at that high quality unless degradation may be allowed under the principles established in § 75-5-303, MCA, and the non-degradation rules at ARM 17.30.701 *et seq.*

VCP Compliance: Groundwater at the facility would be classified as Class I based on specific

conductivity less than 1,000 µS/cm. Groundwater at the facility does not exceed the standards listed in DEQ-7 or the MCLs and no public drinking water supply sources are located near the Facility.

Impacted soil is not leaching COCs to the groundwater at concentrations above human health standards or risk-based screening levels. The proposed remedy will not create additional groundwater degradation. Therefore, the proposed remedy meets the requirements of these ERCLs.

2.2 Surface Water Quality Standards

The Montana Water Quality Act, §§ 75-5-101 *et seq.*, MCA, (applicable) establishes requirements for restoring and maintaining the quality of surface and ground waters and the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, establishes requirements for restoring and maintaining the quality of surface waters. Under these Acts the state has authority to adopt water quality standards designed to protect beneficial uses of each water body and to designate uses for each water body. Montana's regulations classify state waters according to quality, place restrictions on the discharge of pollutants to state waters and prohibit the degradation of state waters.

ARM 17.30.610 ((applicable) provides that the waters of the East Gallatin River from to the Springhill Road crossing at approximately latitude 45.7256, longitude -111.0666, are classified "B-1" for water use.

The "B-1" classification standards are contained in ARM 17.30.623 (applicable) of the Montana water quality regulations. This section provides the beneficial uses for the B-1 classification, and provides that concentrations of toxic, carcinogenic, or harmful parameters in the waters may not exceed DEQ-7 standards. The section also provides the specific water quality standards for water classified as B-1.

For the primary contaminants of concern, the DEQ-7 levels are listed below. DEQ-7 provides that "whenever both Aquatic Life Standards and Human Health Standards exist for the same analyte, the more restrictive of these values will be used as the numeric Surface Water Quality Standard."

Chemical	DEQ-7 Standard for Surface Water
Asbestos	7 x 106 fibers longer than 10 microns in length/liter

ARM 17.30.623provides that concentrations of carcinogenic, bioconcentrating, toxic or harmful parameters which would remain in the water after conventional water treatment may not exceed the applicable standards set forth in DEQ-7.

The B-1 classification standards at ARM 17.30.625 also include the following criteria:
(1) Water quality criteria for Escherichia coli are expressed in colony forming units per 100 milliliters of water or as most probable number, which is a statistical representation of the number of organisms in a sample, as incorporated by reference in 40 CFR 136.3(b). The water

quality standard for Escherichia coli bacteria (E-coli) varies according to season, as follows:

(a) from April 1 through October 31, the geometric mean number of E-coli may not exceed 126 colony forming units per 100 milliliters and 10 percent of the total samples may not exceed 252 colony forming units per 100 milliliters during any 30-day period; and

(b) from November 1 through March 31, the geometric mean number of E-coli may not exceed 630 colony forming units per 100 milliliters and 10 percent of the samples may not exceed 1,260 colony forming units per 100 milliliters during any 30-day period.

(2) Dissolved oxygen concentration must not be reduced below the levels given in department circular DEQ-7.

(3) Induced variation of hydrogen ion concentration (pH) must be maintained within the range of 6.5 to 8.5 must be less than 0.5 pH unit. Natural pH outside this range must be maintained without change. Natural pH above 7.0 must be maintained above 7.0.

(4) The maximum allowable increase above naturally occurring turbidity is 5 nephelometric turbidity units except as permitted in § 75-5-318, MCA.

(5) A 1ºF maximum increase above naturally occurring water temperature is allowed within the range of 32ºF to 66ºF; within the naturally occurring range of 66ºF to 66.5ºF, no discharge is allowed which will cause the water temperature to exceed 67ºF; and where the naturally occurring water temperature is 66.5ºF or greater, the maximum allowable increase in water temperature is 0.5ºF. A 2ºF per-hour maximum decrease below naturally occurring water temperature is allowed when the water temperature is above 55ºF. A 2ºF maximum decrease below naturally occurring water temperature is allowed within the range of 55ºF to 32ºF. This applies to all waters in the state classified B-1 except for Prickly Pear Creek from McClellan Creek to the Montana Highway No. 433 crossing where a 2ºF maximum increase above naturally occurring water temperature is allowed within the range of 32ºF to 65ºF; within the naturally occurring range of 65ºF to 66.5ºF, no discharge is allowed which will cause the water temperature to exceed 67ºF; and where the naturally occurring water temperature is 66.5ºF or greater, the maximum allowable increase in water temperature is 0.5ºF.

(6) No increase are allowed above naturally occurring concentrations of sediment, settleable solids, oils, floating solids, which will or is likely to create a nuisance or render the waters harmful, detrimental, or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish or other wildlife; and 6) true color must be kept within specified limits.

(7) True color must not be increased more than five color units above naturally occurring color.

(8) Concentrations of carcinogenic, bioconcentrating, toxic, radioactive, nutrient, or harmful parameters may not exceed the applicable standards set forth in Department Circular DEQ-7 and, unless a nutrient standards variance has been granted, Department Circular DEQ-12A.

(9) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in Department Circular DEQ-7 and, unless a nutrient standards variance has been granted, Department Circular DEQ-12A when stream flows equal or exceed the design flows specified in ARM 17.30.635(2).

(10) If site-specific criteria for aquatic life are adopted using the procedures given in § 75-5-310, MCA, the criteria shall be used as water quality standards for the affected waters and as the basis for permit limits instead of the applicable standards in Department Circular DEQ-7.

(12) In accordance with § 75-5-306(1), MCA, it is not necessary that wastes be treated to a purer condition than the natural condition of the receiving water as long as the minimum treatment

requirements, adopted pursuant to § 75-5-305, MCA, are met.

ARM 17.30.637 (applicable) prohibits discharges containing substances that will: (a) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines; (b) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter (mg/L)) or globules of grease or other floating materials; (c) produce odors, colors or other conditions which create a nuisance or render undesirable tastes to fish flesh or make fish inedible; (d) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; (e) create conditions which produce undesirable aquatic life.

ARM 17.30.637 (Applicable) also provides that leaching pads, tailing ponds, or water, waste or product holding facilities must be located, constructed, operated and maintained to prevent any discharge, seepage, drainage, infiltration, or flow which may result in pollution of state waters, and a monitoring system may be required to ensure such compliance. No pollutants may be discharged and no activities may be conducted which, either alone or in combination with other wastes or activities, result in the total dissolved gas pressure relative to the water surface exceeding 110 percent of saturation.

ARM 17.30.705 (Applicable) provides that for any surface water, existing and anticipated uses and the water quality necessary to protect these uses must be maintained and protected unless degradation is allowed under the non-degradation rules at ARM 17.30.708.

VCP Compliance: Remedial actions at the facility include the removal of contaminated soils, which will provide long-term protection of surface water from runoff of contaminated soils. In addition, the remedial actions will be conducted in accordance with applicable permits and applicable BMPs will be used to minimize the discharge of any material to surface water at the Facility. Following the remediation, surface water at the facility will not exceed the standards listed in DEQ-7. Therefore, the VCP meets the requirements of these ERCLs.

2.3 Stormwater Runoff Control Requirements

Clean Water Act, Point Source Discharges Requirements, 33 USC §'1342: Section 402 of the Clean Water Act, 33 USC §' 1342, et seq., authorizes the issuance of permits for the discharge of any pollutant. This includes stormwater discharges associated with industrial activity. Industrial activity includes inactive mining operations that discharge storm water contaminated by contact with or that has come into contact with any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the Facility of such operations, see, 40 CFR 122.26(b)(14)(iii); landfills, land application sites, and open dumps that receive or have received any industrial wastes including those subject to regulation under RCRA subtitle D, see, 40 CFR 122.26(b)(14)(v); and construction activity including clearing, grading, and excavation activities, see, 40 CFR 122.26(b)(14)(x). Because the State of Montana has been delegated the authority to implement the Clean Water Act, these requirements are enforced in Montana through the Montana Pollutant Discharge Elimination System (MPDES).

ARM 17.30.1201 *et seq.* and ARM 17.30.1301 *et seq* (applicable): If point sources of water

contamination are retained or created by any remediation activity, applicable Clean Water Act standards would apply to those discharges. The State of Montana established state standards and permit requirements in conformity with the Clean Water Act, and these standards and requirements apply to point source discharges. See ARM 17.30.1201.

ARM 17.30.1342-1344 (applicable): The State of Montana has been delegated the authority to implement the Clean Water Act and these requirements are enforced in Montana through the MPDES. These regulations set forth the substantive requirements applicable to all MPDES and National Pollutant Discharge Elimination System permits. The substantive requirements, including the requirement to properly operate and maintain all facilities and systems of treatment and control, are applicable requirements.

ARM 17.24.633 (applicable), provides all surface drainage from a disturbed area must be treated by the best technology currently available (BTCA).

ARM 17.30.1341 (applicable), provides the issuance of stormwater permits for certain activities. Generally, the permits require the permittee to implement best management practices (BMPs) and to take all reasonable steps to minimize or prevent any discharge which has a reasonable likelihood of adversely affecting human health or the environment. However, if there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with the activity, an individual MPDES permit or alternative general permit may be required.

VCP Compliance: The remedial actions will be conducted in accordance with applicable permits and implement stormwater management controls to minimize the discharge of any material from the Facility to surface water. Following the remediation, surface water near the Facility will not exceed the standards listed in DEQ-7. Therefore, the VCP meets the requirements of these ERCLs.

2.4 Air Standards

The Clean Air Act (42 U.S.C. §§ 7401 *et seq.*) (applicable) provides limitations on air emissions resulting from cleanup activities or emissions resulting from wind erosion of exposed hazardous substances. Some of these ERCLs, identified as action-specific requirements could also be identified here as contaminant specific requirements but will not be repeated.

The National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61 (applicable) establishes emission standards for specific air pollutants.

40 CFR Part 61, Subpart M (applicable) establishes requirements for emissions of asbestos. Requirements for managing asbestos containing material including notification requirements, procedures for controlling emissions, standards for transportation and disposal, record keeping requirements, and disposal Facility closure requirements are addressed.

Clean Air Act, 40 CFR 61.145(c) (relevant) establishes detailed standards and specification for demolition and renovation. The regulation provides detailed procedures for controlling asbestos release during demolition of a building containing regulated- asbestos containing material (RACM). The dust control portions of the regulations are relevant for soil disturbance activities.

Clean Air Act, 40 CFR 61.149 (relevant) establishes detailed procedures and specifications for handling and disposal of asbestos containing waste material (ACM) generated by an asbestos mill. The provision allows an alternative emission control and treatment method.

Clean Air Act, 40 CFR 61.150 (relevant) provides detailed procedures for processing, handling, and transporting asbestos material generated during building demolition and renovation (among other sources). Relevant for soil disturbance activities.

Clean Air Act, 40 CFR 61.151 (relevant) provides the standard for inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations. Provides requirements for covering, revegetation, and signage at facilities where RACM will be left in place. The provision allows an alternative control method.

Clean Air Act, 40 CFR 61.152 (relevant) establishes detailed specifications for air cleaning used as part of a system to control asbestos emissions control system.

Sections 75-2-101, *et seq.*, MCA, (applicable) provides that state emission standards are enforceable under the Montana Clean Air Act.

ARM 17.74 Subchapter 3 (applicable) addresses requirements related to persons or entities engaged in asbestos related occupations, in charge of asbestos projects, or engaged in facility demolition or renovation activities. Training requirements for persons engaged in asbestos-type occupations are specified.

ARM 17.74.369 (applicable) Addresses transportation and disposal of asbestos- containing waste. This focuses on the accreditation requirements for transporters of asbestos waste, permitting requirements, record retention responsibilities, and transportation requirements (i.e., the asbestos must be adequately wet, contained in leak-tight packaging, and both the asbestos waste and the vehicle transporting it must comply with labeling requirements). This ERCL specifies that the asbestos-containing waste must be deposited at a licensed Class II or Class IV landfill facility as soon as practical, or, if asbestos-containing waste is not disposed of as soon as practical, store any asbestos-containing waste in a secure holding facility or location accessible only to asbestos project workers or asbestos project contractor/supervisors accredited by DEQ. This provision also requires that the entity responsible for transport and disposal retains responsibility for the asbestos until the waste is accepted by a licensed Class II or IV landfill. This requirement is applicable to the handling of asbestos-containing waste as defined in ARM 17.74.352(4). The regulations are also relevant for the transportation and disposal of all other ACW, even if the ACW does not meet the definition of asbestos-containing waste.
The Asbestos Control Act (§§ 75-2-501 *et seq.*, MCA) (applicable) establishes requirements for asbestos projects including permitting and inspection requirements. Section 75-2-502, MCA, defines an asbestos project to exclude a project that involves less than ten square feet in surface area or three linear feet of pipe.

ARM 17.8.220 (applicable) provides that no person shall cause or contribute to concentrations of particulate matter in the ambient air such that the mass of settled particulate matter exceeds a 30-

day average of 10 grams per square meter (gm/m^2). A measurement method is also provided.

ARM 17.8.221 (applicable) provides concentrations of particulate matter in ambient air shall not exceed annual average scattering coeffient of 3×10^{-5} per meter.

40 CFR 50.12 and ARM 17.8.222 (applicable) provides ambient air quality standards for lead. Lead concentrations in air shall not exceed the following 90-day average: 1.5 micrograms per cubic meter ($\mu g/m^3$) of air.

ARM 17.8.223 (applicable) provides PM-10 concentrations in ambient air shall not exceed a 24-hour average of 150 $\mu g/m^3$ of air and an annual average of 50 $\mu g/m^3$ of air.

Ambient air standards under section 109 of the Clean Air Act are also promulgated for carbon monoxide, hydrogen sulfide, nitrogen dioxide, sulfur dioxide, and ozone. If emissions of these compounds were to occur at the facility in connection with any cleanup action, these standards would also be applicable. *See* ARM 17.8.210, 17.8.211, 17.8.212, 17.8.213, and 17.8.214.

VCP Compliance: The proposed remedy involves handling impacted soil and preventing the release of dust, including asbestos fibers. All persons conducting remedial actions will be accredited by DEQ as provided for in ARM 17.74.362, the applicant will obtain an asbestos project permit as required by ARM 17.74.355, and all the sampling required by ARM 17.74.357 will be conducted. Remedial actions at the facility will include wetting and other dust control measures. The air monitoring program plan details the air monitoring program and procedures. Asbestos will be used as an indicator of fugitive dust control. Remedial actions will be halted if significant dust is generated and will not resume until adequate dust control measures are in place.

Warning signs will be posted at all entrances and at intervals of 100 meters (328 feet) or less along the property line of the remediation area. The warning signs will be posted in such a manner and location that a person can easily read the legend and state: "Asbestos Waste Disposal Site, Do Not Create Dust, Breathing Asbestos is Hazardous to Your Health" in the specific size, font, and spacing outlined in 40 CFR § 61.151(b)(1). The perimeter of the remediation area will be fenced in a manner adequate to deter access by the general public.

All asbestos-containing waste (ACW) will be transported by a DEQ-accredited asbestos project worker or asbestos project contractor/supervisor or the truck will be escorted and supervised by a person who is a DEQ- accredited asbestos project worker or asbestos project contractor/supervisor. All ACW will be adequately wet; packaged in leak-tight containers or leak-tight wrapping; labeled with the name of the waste generator and the location at which the waste was generated; and any vehicle used to transport asbestos-containing waste during the loading and unloading of the waste will be marked with signs conforming to the requirements of 40 CFR 61, subpart M.

All ACW will be deposited at the Valley View Landfill, a Class II landfill, as soon as is practical. If the ACW is not disposed of as soon as practical, it will be stored in a secure holding facility or location accessible only to asbestos project workers or asbestos project contractor/supervisors accredited by DEQ.

Therefore, the VCP meets the requirements of these ERCLs.

2.5 Natural Streambed and Land Preservation Act

Section 75-7-111, MCA, (applicable) provides that a person planning to engage in any activity that will physically alter or modify the bed or banks of a stream must give written notice to the Board of Supervisors of a Conservation District, the Directors of a Grass Conservation District, or the Board of County Commissioners if the proposed project is not within a district, and must submit a "310 Permit" application to one of those entities.

ARM 36.2.404 (applicable) establishes minimum standards which would be applicable if a remedial action alters or affects a streambed, including any channel change, new diversion, riprap or other streambank protection project, jetty, new dam or reservoir or other commercial, industrial or residential development. No such project may be approved unless reasonable efforts will be made consistent with the purpose of the project to minimize the amount of stream channel alteration, insure that the project will be as permanent a solution as possible and will create a reasonably permanent and stable situation, insure that the project will pass anticipated water flows without creating harmful erosion upstream or downstream, minimize turbidity, effects on fish and aquatic habitat, and adverse effects on the natural beauty of the area and insure that streambed gravels will not be used in the project unless there is no reasonable alternative. Soils erosion and sedimentation must be kept to a minimum. Such projects must also protect the use of water for any useful or beneficial purpose. See § 75-7-102, MCA.

ARM 36.2.408 *et seq.* requires persons planning to engage in a project that will impact a stream to receive written consent from DNRC and sets forth standards and guidelines for applications.

VCP Compliance: The proposed remedy does not involve altering or otherwise affecting any stream channel or bank. Therefore, the VCP meets the requirements of these ERCLs.

3.0 LOCATION-SPECIFIC ERCLS

3.1 Endangered Species

3.1.1. The Endangered Species Act (relevant). This statute and implementing regulations (16 U.S.C. § 1531 *et seq.*, 50 CFR Part 402, 40 CFR 6.302(h), and 40 CFR 257.3-2) require that any federal activity or federally authorized activity may not jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify a critical habitat. Compliance with this requirement involves consultation with the U.S. Fish and Wildlife Service (USFWS) and a determination of whether there are listed or proposed species or critical habitats present at the facility, and, if so, whether any proposed activities will impact such wildlife or habitat.

3.1.2 Montana Nongame and Endangered Species Act, §§ 87-5-101 *et seq.* (applicable): Endangered species should be protected in order to maintain and to the extent possible enhance their numbers. These sections list endangered species, prohibited acts and penalties. *See also*, §

87-5-201, MCA, (applicable) concerning protection of wild birds, nests and eggs; and ARM 12.5.201 (applicable) prohibiting certain activities with respect to specified endangered species.

VCP Compliance: Based on information obtained from the Montana Natural Heritage Program, endangered species or species of concern have not been identified at the Facility or surrounding area, especially since it is in a heavy urbanized area. The remedy will not have an impact on endangered species or species of concern. Thus, the proposed remedy meets the requirements of this ERCL.

3.2 Migratory Bird Treaty Act

This requirement (16 USC §§ 703 *et seq*.) (relevant) establishes a federal responsibility for the protection of the international migratory bird resource and requires continued consultation with the appropriate program within the USFWS during remedial design and remedial construction to ensure that the cleanup of the facility does not unnecessarily impact migratory birds.

VCP Compliance: Migratory birds are present near the Facility. However, given that the Facility is located in an urban area, it does not provide the majority of habitat for these species relative to the surrounding area. There are no features of the Facility that are particularly attractive to these species. Therefore, remedial actions at the Facility are not expected to impact migratory birds. Thus, the proposed remedy meets the requirements of this ERCL.

3.3 Bald Eagle Protection Act

This requirement (16 USC §§ 668 *et seq.*) (relevant) establishes a federal responsibility for protection of bald and golden eagles, and requires continued consultation with the appropriate program within the USFWS during remedial design and remedial construction to ensure that any cleanup of the facility does not unnecessarily adversely affect the bald and golden eagle.

VCP Compliance: Bald and golden eagles have not been observed at the Facility. In addition, given the urban area where the Facility is located, the Facility does not provide the majority of habitat for these species relative to the surrounding area. There are no features of the Facility that are particularly attractive to these species. Therefore, remedial actions at the Facility are not expected to impact these species. Thus, the proposed remedy meets the requirements of this ERCL.

3.4 Historic Sites, Buildings, Objects and Antiquities Act

These requirements, found at 16 USC 461 *et seq.*, (relevant) provide that, in conducting an environmental review of a proposed action, the responsible official shall consider the existence and location of natural landmarks using information provided by the National Park Service pursuant to 36 CFR § 62.6(d) to avoid undesirable impacts upon such landmarks.

VCP Compliance: Current data indicate that no landmarks are present on the facility. Thus, the proposed remedy meets the requirements of this ERCL.

3.5 Montana Greater Sage-Grouse Stewardship Act

The Montana Greater Sage-Grouse Stewardship Act, §§ 2-15-243 and 76-22-101, *et seq*., MCA, and related Executive Orders 10-2014, 12-2015, and 21-2015 (applicable, substantive provisions only) establishes a map of sage-grouse Core Areas, Connectivity Areas, and General Habitat (Executive Order 21-2015 at https://sagegrouse.mt.gov/images/exec_order_map.jpg), a Montana sage-grouse oversight team, and a Sage Grouse Habitat Conservation program. If a remedial action will occur within one of the designated areas on the map, consultation is required with the Sage Grouse Habitat Conservation program, which is housed within the Department of Natural Resources and Conservation (https://sagegrouse.mt.gov/). Certain activities are prohibited or limited within the designated areas on the map. See the Core Area Stipulations, General Habitat Stipulations, and Connectivity Habitat Stipulations in Attachment D of Executive Order 10-2014, as amended by Executive Order 12-2015, including requirements/restrictions on surface disturbance; surface occupancy; seasonal use limitations; transportation limitations; pipelines; overhead power lines and communications towers; noise; vegetation removal; sagebrush eradication; wildfire and prescribed burns; monitoring; reclamation; conifer expansion; and rangelands. The industry-specific stipulations (for oil and gas, mining, coal mining, and wind energy industries) within Core Areas in Attachment D may be relevant, depending upon the type of facility and activities required for remedial action. A waiver of the various requirements is allowed through creation of a Special Management Area where a planned land use or activities associated with "valid rights" cannot be implemented. "Valid rights" are defined as "legal 'rights' or interest that are associated with land or mineral estate and that cannot be divested from the estate until that interest expires, is relinquished, or acquired." (Executive Order 10-2014, Attachment H). The procedures for Special Management Areas are outlined in Attachment E to Executive Order 10-2014, as amended by Executive Order 12-2015. Certain activities outlined in Attachment F of Executive Order 10-2014, as amended by Executive Order 12-2015, are exempt from these requirements.

VCP Compliance: The facility is not with a sage grouse core area, connectivity area, or general habitat. Thus, the proposed remedy meets the requirements of this ERCL.

3.6 Resource Conservation and Recovery Act

40 CFR 264.18 (relevant) provides location requirements for owners and operators of hazardous waste management units. Portions of new management units must not be located within 200 feet of a fault which has had displacement in Holocene time and management units in or near a 100-year floodplain must be designed, constructed, operated, and maintained to avoid washout.

VCP Compliance: All hazardous waste will be removed from the facility and no management units will be created. Thus, the proposed remedy meets the requirements of this ERCL.

3.7 Fish and Wildlife Coordination Act

These standards are found at 16 USC § 661 *et seq.* and 40 CFR 6.302(g) (relevant) and require that federally funded or authorized projects ensure that any modification of any stream or other water body affected by a funded or authorized action provide for adequate protection of fish and

wildlife resources.

VCP Compliance: The proposed remedy does not involve modification of any stream or other waterbody. Therefore, the proposed remedy meets the requirements of these ERCLs.

3.8 Floodplain Management Order

Executive Order 11988 (relevant) requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Implementing regulations for this executive order are found at 40 CFR 6. The executive order and regulations are relevant because a portion of the facility is in a floodplain; however, no federal action is anticipated at the facility. In addition, application of the Montana floodplain requirements (see below) addresses protection of the floodplain.

VCP Compliance: The proposed remedy will not involve excavation of contaminated soils from within the 100-year floodplain; therefore, the proposed remedy will not result in adverse impacts to the floodplain and will meet the requirements of this ERCL

3.9 Protection of Wetlands Order

This requirement (40 CFR Part 6, Appendix A, Executive Order No. 11,990) (relevant) mandates that federal agencies and potentially responsible parties avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practicable alternative exists.

Section 404(b)(1), 33 U.S.C. § 1344(b)(1) (relevant) also prohibits the discharge of dredged or fill material into waters of the United States. Together, these requirements create a "no net loss" of wetlands standard.

VCP Compliance: No designated wetlands are present at the Facility. Therefore, the proposed remedy will meet the requirements of this ERCL.

3.10 Solid Waste Management Requirements

Regulations promulgated under the Solid Waste Management Act, §§ 75-10-201 *et seq.*, MCA, (applicable) specify requirements that apply to the location of any solid waste management facility.

ARM 17.50.1004 (applicable) specifies a solid waste facility located within the 100-year floodplain may not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste that poses a hazard to human health or the environment. *See also* ARM 17.50.1009(1)(h) (applicable).

ARM 17.50.1005 (applicable) specifies a solid waste facility may not be located in a wetland, unless there is no demonstrable practicable alternative.

ARM 17.50.1006 (applicable) specifies a solid waste facility cannot be located within 200 feet (60 meters) of a fault that has had displacement in Holocene time without demonstration that an alternative setback will prevent damage to the structural integrity of the solid waste facility and will be protective of human health and the environment.

ARM 17.50.1007 (applicable) specifies a solid waste facility may not be located in a seismic impact zone without demonstration, by a Montana licensed engineer, that the solid waste structure is designed to resist the maximum horizontal acceleration in lithified earth material for the site.

ARM 17.50.1008 (applicable) specifies a solid waste facility may not be located in an unstable area (determined by consideration of local soil conditions, local geographic or geomorphologic features, and local artificial features or events, both surface and subsurface) without demonstration, by a Montana licensed engineer, that the solid waste facility is designed to ensure that the integrity of the structural components will not be disrupted.

ARM 17.50.1009 (applicable) requires that Class II landfills be designed, constructed, and maintained with a run-on and run-off control system to address 25-year storm events.

ARM 17.50.1110 (applicable) prohibits a Class II landfill from causing a discharge of a pollutant into state waters, including wetlands.

ARM 17.50.1116 (applicable) requires that a solid waste management facility be designed, constructed, and operated in a manner to prevent harm to human health and the environment.

ARM 17.50.1204(1)(b) (applicable) requires that a Class II landfill be constructed utilizing a composite liner and leachate collection and removal system that is designed and constructed to maintain less than a 30-centimeter depth of leachate over the liner.

ARM 17.50.1205(3) (applicable) requires that the leachate system provide for accurate monitoring of the leachate level and provide a minimum slop at the base of the overlying leachate collection layer equal to at least two percent.

ARM 17.50.1303 (applicable) identifies requirements for groundwater monitoring.

ARM 17.50.1312 (applicable) identifies requirements for monitoring well abandonment.

ARM 17.50.1403 (applicable) sets forth the closure requirements for Class II landfills. This includes the requirement that the cover be a minimum of 24 inches thick and other criteria, as follows:

1. install a cover that is designed to minimize infiltration and erosion;
2. design and construct the final cover system to minimize infiltration through the closed unit by the use of an infiltration layer that contains a minimum 18 inches of earthen material and has a permeability less than or equal to the permeability of

any bottom liner, barrier layer, or natural subsoils or a permeability no greater than $1x10^{-5}$ cm/sec, whichever is less; and

3. minimize erosion of the final cover by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant.

ARM 17.50.1404 (applicable) sets forth post closure care requirements for Class II landfills. Post closure care requires maintenance of the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the cover and comply with the groundwater monitoring requirements found at ARM Title 17, chapter 50, subchapter 13.

Section 75-10-212, MCA (applicable) prohibits dumping or leaving any debris or refuse upon or within 200 yards of any highway, road, street, or alley of the State or other public property, or on privately owned property where hunting, fishing, or other recreation is permitted. However, the restriction relating to privately owned property does not apply to the owner, his agents, or those disposing of debris or refuse with the owner's consent.

VCP Compliance: All solid waste at the facility will be removed, transported, and properly disposed of at either the Logan Landfill or Valley View Landfill, both appropriately permitted disposal facilities. Therefore, the proposed remedy meets the requirements of these ERCLs.

3.11 Floodplain and Floodway Management Act and Requirements

The following standards are included here to indicate the restrictions on any related activities that might occur in or affect the floodway or floodplain.

Section 76-5-401, MCA and ARM 36.15.601 (applicable) provide that residential, certain agricultural, industrial-commercial, recreational and other uses are permissible within the designated floodway, provided they do not require structures other than portable structures, fill or permanent storage of materials or equipment.

Section 76-5-402, MCA and ARM 36.15.701 (applicable) provide that in the flood fringe (i.e., within the floodplain but outside the floodway), residential, commercial, industrial, and other structures may be permitted subject to certain conditions relating to placement of fill, roads, and floodproofing.

ARM 36.15.602(6) (applicable) provides that domestic water supply wells may be permitted, even within the floodway, provided the well casing and well meets certain conditions.

ARM 36.15.602(5), 36.15.605, and 36.15.703 (applicable) provide that solid and hazardous waste disposal and storage of toxic, flammable, hazardous, or explosive materials are prohibited anywhere in floodways or floodplains.

Section 76-5-402, MCA (applicable) states that the following are prohibited in a floodway: buildings for living purposes or place of assembly or permanent use by human beings; any

structure or excavation that will cause water to be diverted from the established floodway, cause erosion, obstruct the natural flow of water, or reduce the carrying capacity of the floodway; and the construction or permanent storage of an object subject to flotation or movement during flood level periods.

Section 76-5-406, MCA and ARM 36.15.216 (applicable) contain substantive factors that address obstruction or use within the floodway or floodplain.

ARM 36.15.604 (increase in upstream elevation or significantly increase flood velocities), ARM 36.15.602(1) (excavation of material from pits or pools), and ARM 36.15.603 (water diversions or changes in place of diversion) (applicable) provide further conditions or restrictions that generally apply to specific activities within the floodway or floodplain.

ARM 36.15.701(3)(c) (applicable) requires that roads, streets, highways and rail lines must be designed to minimize increases in flood heights.

ARM 36.15.701(3)(d) (applicable) provides that structures and facilities for liquid or solid waste treatment and disposal must be floodproofed to ensure that no pollutants enter flood waters and may be allowed and approved only in accordance with DEQ regulations, which include certain additional prohibitions on such disposal.

ARM 36.15.702(2) (applicable) provides the standards applied to residential, commercial or industrial structures.

ARM 36.15.606 (applicable) provides that flood control works comply with safety standards for levees, floodwalls, and riprap.

ARM 36.15.901 (applicable) requires electrical systems to be flood-proofed.

VCP Compliance: The proposed remedy does not involve modification of any stream of other water body. The proposed remedy will involve excavation of contaminated soils from within the 100-year floodplain. Removal of these soils will not adversely impact the ability of the floodplain to convey floodwater. Therefore, the proposed remedy meets the requirements of these ERCLs.

APPENDIX E

GENERIC HEALTH AND SAFETY PLAN

PROJECT HEALTH AND SAFETY PLAN

Voluntary Cleanup for Asbestos-Contaminated Soil
At Empire Property
CMC Asbestos Bozeman CECRA Facility
Bozeman, Montana

Date

Prepared For:

[Client]

Prepared by:

[Contractor]

Prepared By:

Name Date
Title

Reviewed By:

Name Date
Title

Name Date
Title

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1.0 INTRODUCTION

This document serves as the Program Health and Safety Plan (HASP) for [Contractor] personnel performing Asbestos-Contaminated Soil Remediation on the project presented in **Table 1**. All [Contractor] staff are required to review this HASP and sign the Health and Safety Review Form in **Attachment A** to acknowledge that they understand the health and safety requirements. Note: Contractors performing the asbestos remediation should work under their own HASP. This HASP is required per 29 CFR 1910.120.

Table 1: Project Information

Client Name:	City of Bozeman		
Site Name:	Empire Property within the CMC Bozeman Asbestos CECRA Facility		
Prepared By:		**Date Prepared:**	
Date Revised:			
Project Start Date:		**Project End Date:**	

1.1 Site History

This Voluntary Cleanup Plan (VCP) Remediation Proposal (RP) was submitted to the Montana Department of Environmental Quality (DEQ) on behalf of the City of Bozeman (applicant) for voluntary cleanup on private property owned by Empire Building Materials, Inc. (Empire). This property lies within the boundaries of the Chicago-Milwaukee Corp. (CMC) Asbestos Bozeman Comprehensive Environmental Cleanup and Responsibility Act (CECRA) Facility regulated by the State Superfund Section Unit of DEQ. The CMC Asbestos Bozeman CECRA Facility (Facility Code 31311) is located in Bozeman, Gallatin County, Montana, and is on DEQ's CECRA Priority List, ranked as a medium priority facility.

The Empire property and adjacent properties were purchased in the early 1900s by the Chicago, Milwaukee, St. Paul & Pacific Railway, later known as CMC (Weston, 2023). At that time, a freight office/warehouse, a freight platform, and railroad spurs were constructed by CMC. Starting in 1955, Empire leased several different parcels over various timeframes from CMC, including portions of the freight office for the storage of building materials and offices (ERM, 1992). Interstate Manufacturing Asbestos Products leased a portion of the Empire property along the south and east sides for asbestos storage and milling. Stockpiles of asbestos ore are reported to have been stored where the South Warehouse is currently located.

There are known inaccessible asbestos-containing soils left in place around the perimeter of the foundation and under the foundation of the South Warehouse, as well as the potential asbestos under the North Warehouse and Warehouse 3. The buildings are proposed to be demolished for a future mixed-use development, so this VCP RP is for the remediation that will occur upon removal of the foundations of both structures. The areas of remaining contamination located outside of the Empire property but within the CMC Asbestos Bozeman CECRA Facility are covered (i.e., under concrete or asphalt) and will be remediated when there are activities (e.g., redevelopment, upgrades to city infrastructure) that result in excavations that remove existing cover, thus exposing the asbestos-contaminated soils. Any activities that disturb the existing cover will require a separate VCP RP and are not covered in this report.

1.2 Project Description

This project involves excavation of asbestos-contaminated soil and removal of ACW, with subsequent disposal at a Class II landfill. This removal will occur when the existing North Warehouse, South Warehouse, and Warehouse 3 structures are demolished and removed in preparation for the redevelopment project and

the inaccessible asbestos becomes accessible. The work will be conducted either concurrently or following building demolition.

1.3 Scope of Work

During fieldwork, [Oversight Contractor] will conduct visual inspections and grid sampling will be performed throughout the Potential Asbestos areas identified in the VCP-RP. This task may include the contractor creating test pits and exposing the subgrade for the purposes of visual analysis and collection of soil samples. If the inspection and sampling show the presence of asbestos in any of the soils, [Remediation Contractor] would remove, transport, and dispose of the contaminated soils and ACW in compliance with applicable state and federal requirements. All contaminated materials would be handled using methods consistent with Asbestos/National Emission Standard for Hazardous Waste Pollutants (NESHAP) Adequately Wet Guidance, EPA 340/1-90-019 (EPA, 1990).

For soils with >1% asbestos, ACW removed under Alternative 2 will be hauled and disposed in Valleyview Landfill, a Class II landfill located in East Helena, Lewis and Clark County, Montana. If sample results for the soils are <1%, the wastes will be hauled and disposed in Logan Landfill, a Class II landfill located in Manhattan, Gallatin County, Montana. Once all ACW has been removed and disposed of, any areas that require fill material will be backfilled with clean soil, graded, compacted, and paved with asphalt as required.

General site conditions and hazards present include: asbestos dust, driving hazards associated with operating a motor vehicle, vehicle traffic, heat stress, inclement weather, domestic animals, biological hazards, heavy equipment, and slips, trips, and falls.

Applicable Activity Hazard Analyses (AHAs) for all Tasks are listed below and provided in **Attachment B**.

- **Task 1 – Visual and Grid Sample Investigation**
  - AHA 1.1: Visual and Grid Sample Investigation
- **Task 2 – Asbestos Remediation**
  - AHA 2.1: Asbestos Remediation

1.4 Project Representatives

The Project Representatives and contact information is presented in **Table 2**. Emergency response contact information is presented in **Table 3**.

Table 2: Project Delivery Team Contact Information

[Contractor] Project Representatives				
Name	**Organization**	**Responsibility**	**Phone**	
		Site Safety and Health Officer (SSHO)	Mobile:	
		Project Manager	Mobile	
			Mobile:	
Client Representatives				
Name/ Organization	**Organization**	**Responsibility**	**Phone**	
Kellen Gamradt	City of Bozeman			

Table 3: Project-Specific Emergency Contacts

Emergency Organization/Agency	Emergency Telephone Number	Non-Emergency Telephone Number
Police or Fire Department	911	406-582-2000/ 406-582-2350
Ambulance Service ***(EMT will determine appropriate hospital for treatment)***		NA
Local Medical Facility for minor injuries: A map and directions for the local medical facility are included in Attachment C.		**406-414-5000 (Bozeman Health)**
Pollution Emergency	800-292-4706	
National Response Center	800-424-8802	
Spill Response	800-255-3924	
Poison Control Center	800-222-1222	

1.5 Personal Protective Equipment

Personal protective equipment (PPE), identified in the AHA for the task, will be used to protect workers from physical and chemical hazards at the site. At a minimum, PPE includes a reflective safety vest, steel-toe leather boots, long pants, hard hat, safety glasses, Tyvek suits, air-purifying half-faced respirator (HEPA filtered), and gloves. Required PPE for all [Contractor] tasks are listed in **Table 4** of this document and in the Activity Hazard Analysis (AHA) for each activity per the scope of work for this effort. **Table 4** summarizes the PPE required for [Contractor] tasks:

- AHA 1.1: Visual and Grid Sample Investigation
- AHA 2.1: Asbestos Remediation (Soil Removal and Disposal)

Table 4:Task-Specific PPE Requirements

PPE Ensemble Items	Asbestos Remediation
Hard Hat	✓
High-Visibility Safety Vests (Class 2 or 3)	✓
Protective-Toe Safety Boots	✓
ANSI Z87 Safety Glasses	✓
Surgical Nitrile Gloves	*✓
Work Gloves – ANSI A3 or Leather (can be worn beneath nitrile gloves)	*✓
Tight-Fitting APR (full/half-face)*	*✓
Tyvek Coveralls	*✓

Notes:
✓ - Required PPE
*✓ - Conditional PPE
** - Respirator cartridges selected based on an exposure hazard assessment and cartridge life calculations or estimate.
Respirator, nitrile gloves, and Tyvek coveralls are required for asbestos sampling/confirmation sampling and remediation oversight when within the Exclusion and Contamination Reduction Zone. If there is heavy equipment (ex. Forklifts) actively in use in the work area, high-visibility vests and hard hats will be required. Leather work gloves are required for general use of hands tools and equipment.

1.6 Emergency Muster Point

The escape route from each site and an emergency muster point will be determined and provided to all workers daily during the pre-entry briefing/initial site safety meeting. The chosen muster point will be identified by [Contractor] and documented by the SSHO at the start of each day.

1.7 Underground Utilities

Notification should be no less than two -- but no more than 10 -- working days before commencing excavation. The markings are valid for 15 working days from the date of the call to the notification center. Providing the correct spelling of the street name, pavement type, nearest cross-street and the area to be marked will assist the locators in marking the location of underground facilities within the required 48-hour time period.

811 Know what's below. Call before you dig.

1.8 Subcontractors

[Contractor] will procure subcontractors as needed to complete all work activities. To ensure that hazards associated with the performance of the work activities are recognized and properly controlled each subcontractor procured by [Contractor] will conduct their job duties in accordance with this HASP as well as their own unique safety policies and procedures. Copies of all required health and safety documentation for each subcontractor's work activities shall be provided to [Contractor] for review prior to the start of onsite activities. [Contractor] will communicate and coordinate planned activities and work areas/zones with other subcontractors to afford a safe work environment for all staff.

1.9 [Contractor] Safety Policy

[Contractor] is committed to providing our employees with a safe and healthy work environment. It is not only our obligation to each other, but also a sound business practice to do so. Work related injuries and illnesses cause needless pain and suffering, cost money, and adversely affect our reputation with our clients. It is our firm belief that all work-related injuries and illnesses are preventable, and it is therefore our goal to have a workplace that is free from occupational injuries and illnesses. Every attempt shall be made to eliminate the possibility of injuries and illnesses. No aspect of the company's activities, including expediency and cost, shall take precedence over the health and safety of our employees.

The provisions of this HASP are mandatory for all [Contractor] personnel engaged in fieldwork associated with the environmental services being conducted at this site. A copy of this HASP and applicable Safety Standard Operating Procedures (SOPs) will be maintained on-site.

In the event of a conflict between this HASP, the Safety SOPs, and federal, state, and local regulations, workers shall follow the most stringent/protective requirements.

1.9.1 Health and Safety Expectations

Commitment to safety, health, and environmental excellence requires all work to proceed only after it is safe and environmentally sound to do so. The responsibility for ensuring this takes place rests with every worker present at this property. Effectively meeting these responsibilities depends upon open communication between individuals and their supervisors prior to work beginning, and – in certain cases – after safety, health and/or environmental issues are identified.

The safety and health of on-site personnel will take precedence over cost and schedule considerations for all project work. All [Contractor] personnel covered by this HASP have the authority to STOP WORK if they see a potential or actual hazard that may threaten the safety of people or the environment. Upon stopping work, the SSHO must be immediately notified and provided with information regarding the nature of the safety, health or environmental concern. The SSHO should meet with the worker with the intent of resolving the worker's concerns. Once the concerns are resolved to the satisfaction of the worker, work can proceed.

If the concerns are not resolved to the satisfaction of the worker and/or the SSHO, work will be paused to resolve the issue. Using his/her expertise, safety, health, and environmental rules, regulations, and procedures, the [Contractor] Safety Professional will attempt to resolve the matter with all parties involved. Work will not resume until this criterion is met.

1.9.2 Tailgate Meetings

Prior to the commencement of project activities, a pre-work briefing will be conducted by [Contractor] and the SSHO will document and agree to the specific requirements of this HASP and all on-site staff will have to acknowledge attendance and acceptance of the provisions herein in **Attachment D** of this document. All documentation should be maintained in the project file.

1.9.3 Maximum Duration of the Workday for Field Activities

An employee may not work a shift that exceeds 12 hours in duration. For the purpose of this policy, the work shift includes time spent at lunch and on break. Personnel driving trucks in support of the project may not drive more than 10 hours in any 24-hour period. Site mobilizations for projects with 7-day workweeks may not exceed 21 days without 48 hours of time off. For unanticipated or emergency conditions, personnel may work no more than 14 hours per day for no more than two consecutive days.

1.10 Training

All [Contractor] personnel performing activities at the site will be trained in accordance with Occupational Safety and Health (OSHA) 29 CFR Part 1910 (General Industry) and OSHA 29 CFR Part 1926 (Construction Industry), when applicable. The specific OSHA standards that are applicable to the work under this HASP are: 29 CFR 1910.132, 19 CFR 1910.134, and 29.CFR 1926.11. All personnel are required to remain current in all their required training and evaluate their need for additional training when there is a change in work.

Client, subcontractor, and visiting personnel who do not need to meet the training, medical surveillance, and personal protective equipment requirements of this HASP will not be exposed to hazards on the site and must be escorted at all times by a fully trained and qualified person with knowledge of all hazards on the site. Such unqualified people can include surveyors, utility locators, government personnel, [Contractor] and Client representatives, and others with business reasons to be at the site.

1.10.1 HAZWOPER Qualifications

Personnel performing work at the job site must be qualified as HAZWOPER workers (unless otherwise noted in specific AHAs or by the SSHO) and must meet the medical monitoring and training requirements specified in the [Contractor]'s Standard Operating Procedures.

If site monitoring procedures indicate that a possible exposure has occurred above the OSHA permissible exposure limit (PEL), employees may be required to receive supplemental medical testing to document any symptoms that may be specific to the materials present.

1.10.2 Site-Specific Safety Training

In addition to the general health and safety training programs, personnel will be required to complete any supplemental task specific training for the tasks to be performed. Administration and compliance with the requirements for additional task-specific training will be the responsibility of the project or lead manager or their delegate. Any additional required training that is completed will be documented and tracked in the project files.

1.10.3 Competent Person Training Requirements

Competent Persons (CP, OSHA conformance) are required to effectively complete the planned scope of work. Each CP must be designated by their employer as such for the site hazards they will oversee. Th CP will perform

the required daily on-site inspections of operations and/or equipment. The competent person may be a [Contractor] (if responsible for supervising that activity) or the subcontractor's employee.

1.11 Organization/Responsibility

The implementation of health and safety at this project location will be the shared responsibility of the [Contractor] Project Manager (PM), the [Contractor] Project SSHO, and all other [Contractor] personnel and [Contractor's] subcontractors implementing the proposed scope of work. The Program HASP Organizational Information is presented in **Table 2**. Safety certifications for key [Contractor] personnel are presented in **Table 5**.

1.11.1 [Contractor] Project Manager

The [Contractor] PM is the individual who has the primary responsibility for ensuring the overall health and safety of this project. As such, the PM is responsible for ensuring that the requirements of this HASP are implemented. Some of the PM's specific responsibilities include:

A. Assuring that all personnel to whom this HASP applies, including [Contractor] subcontractors, have received a copy for review;

B. Providing adequate authority and resources to the on-site SSHO to allow for the successful implementation of all necessary safety procedures;

C. Supporting the decisions made by the SSHO;

D. Maintaining regular communications with the SSHO;

E. Coordinating the activities of all [Contractor] subcontractors and ensuring that they are aware of the pertinent health and safety requirements for this project, and

F. Conducting periodic project safety audits.

1.11.2 [Contractor] Site Safety and Health Officer

All [Contractor] personnel are responsible for implementing the safety requirements specified in this HASP. An SSHO will be assigned by the PM to ensure implementation of the HASP. The SSHO must be on-site during all activities covered by this HASP. The SSHO is responsible for enforcing the requirements of this HASP once work begins. The SSHO has the authority to immediately correct all situations where noncompliance with this HASP is noted and to immediately stop work in cases where an immediate danger is perceived. Some of the SSHO 's specific responsibilities include:

A. Assuring that all personnel to whom this HASP applies, including all subcontractors, have reviewed and signed this HASP and all AHAs relevant to their work;

B. Assuring that all personnel to whom this HASP applies have attended a pre-entry briefing and daily tailgate meetings;

C. Maintaining a high level of health and safety consciousness among employees implementing the site work;

D. Securing Work Permits. The SSHO must determine what, if any, work permits must be secured from the facility prior to the commencement of activities. If required, the SSHO must determine how long the work permit is good for and verify that all the provisions of the work permit can be met by [Contractor] and its subcontractors;

E. Procuring the air monitoring instrumentation required and performing air monitoring for investigative activities;

F. Procuring and distributing the PPE and safety equipment needed for this project for [Contractor] employees;

G. Managing work with FEMA Incident Command System, SSHO must be trained accordingly (100, 200, 300, 400, 700, 800 courses);

H. Verifying that all PPE and health and safety equipment used by [Contractor] is in good working order;

I. Verifying that [Contractor] subcontractors are prepared with the PPE, respiratory protection and safety equipment required for this program;

J. Preparing and submitting an initial AHA prior to mobilization and revising the AHA onsite to reflect actual site conditions. All AHA revisions must briefed to all staff, reviewed daily, and updated as needed (**Attachment B**). The that will be reviewed daily by all workers and updated as needed;

K. Notifying the PM of all noncompliance situations and stopping work if an immediate danger situation is perceived;

L. Monitoring and controlling the safety performance of all personnel within the established restricted areas to ensure that required safety and health procedures are being followed;

M. Conducting/assisting with incident investigations and preparing incident investigation reports;

N. Conducting the pre-entry briefing for all personnel prior to beginning work;

O. Conducting a 360° walkaround of the jobsite daily, evaluating uncontrolled hazards. Provide updates to all staff at daily tailgate meeting; and

P. Initiating emergency response procedures in accordance with the Program HASP.

1.11.3 [Contractor] Field Personnel

All [Contractor] field personnel covered by this HASP are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

A. Assess each task prior to beginning work on that task for hazards and necessary controls;

B. Assess the work area for changing conditions and new hazards;

C. Participate in the development of effective controls;

D. Stop work and initiate corrective actions if work site risks are discovered or if personnel are uncertain of how to proceed;

E. Reading this HASP and all relevant AHAs prior to beginning work on the site;

F. Submitting a completed HASP Review and acceptance form (**Attachment A**) to the [Contractor] SSHO prior to the start of work;

G. Attending the required pre-entry briefing prior to beginning on-site work and any subsequent safety meetings that are conducted during the implementation of the program;

H. Bringing forth any questions or concerns regarding the content of the HASP to the PM or the SSHO prior to the start of work;

I. Reporting all Incidents, injuries and illnesses, regardless of their severity, to the [Contractor] SSHO; and,

J. Complying with the requirements of this HASP and the requests of the SSHO.

1.11.4 Subcontractors

Each [Contractor] subcontractor and other personnel completing work at the project site on behalf of the developer are responsible for directing the means and methods for their work. Each subcontractor's management will provide qualified employees and allocate enough time, materials, and equipment to safely complete assigned tasks. Each subcontractor is responsible for equipping its personnel with all required PPE and training.

[Contractor] considers each subcontractor to be an expert in all aspects of the work operations for which they are tasked to provide, and each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services. Each subcontractor is expected to perform its operations in accordance with its own unique safety policies and procedures, in order to ensure that hazards associated with the performance of the

work activities are properly controlled. Copies of any required safety documentation for a subcontractor's work activities will be provided to [Contractor] for review prior to the start of onsite activities.

Hazards not listed in this HASP but known to any subcontractor, or known to be associated with a subcontractor's services, must be identified and addressed to the [Contractor] PM or the Site Supervisor, or the SSHO, prior to beginning work operations. The Site Supervisor and SSHO has the authority to halt any subcontractor operations, and to remove any subcontractor or subcontractor employee from the site for failure to comply with established health and safety procedures or for operating in an unsafe manner.

Additionally, contractors hired by [Contractor] are responsible for:

A. Providing in advance, a copy of a written safety plan, including task hazard assessments, and policies pertaining to their work;

B. Reading the HASP in its entirety prior to the start of on-site work;

C. Attending the required pre-entry briefing prior to beginning on-site work and any subsequent safety meetings that are conducted during the implementation of the program;

D. Ensuring that their equipment is in good working order via daily inspections;

E. Operating their equipment in a safe manner;

F. Appointing an on-site safety coordinator to interface with the [Contractor] SSHO;

G. Providing [Contractor] with copies of safety data sheets (SDS) for all hazardous materials brought on-site;

H. Providing [Contractor] with current copies of required training certifications for all personnel operating on-site; and,

I. Providing required PPE and safety supplies to their employees.

Table 5: Key Personnel Safety Certifications

Personnel Name	Position	Medical Clearance (expires)	40-Hour HAZWOPER	8-Hour HAZWOPER Refresher (expires)	First Aid/CPR (expires)	Asbestos Awareness	BBP Refresher (expires)	Respirator Fit Test

Notes:
BBP – Bloodborne Pathogens
**Applicable certifications will be update prior to field work*
TBD – To Be Determined

All individuals involved in activities conducted on site will have Occupational Safety and Health Administration (OSHA) 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and current 8-hour HAZWOPER refresher training, and respiratory protection training as required by 29 Code of Federal Regulations (CFR) 1910.134. Individuals must also have asbestos awareness training, as required by 29 CFR 1910.1001, as well as training in use of required personal protective equipment (PPE).

1.12 HASP Modification

Should significant information become available regarding potential on-site hazards, it will be necessary to modify this HASP. All proposed modifications to this HASP must be reviewed and approved by the [Contractor] Regional EHS Manager before the new work is implemented. Any significant modifications must be incorporated into the written document as addenda and the HASP must be reissued. The [Contractor] PM will ensure that all personnel covered by this HASP receive copies of all issued addenda. Sign-off forms will accompany each addendum and must be signed by all personnel covered by the addendum. Sign-off forms will be submitted to the [Contractor] PM. The HASP addenda should be distributed during the daily safety meeting so that they can be reviewed and discussed. Attendance forms will be collected during the meeting.

2.0 MITIGATING EXPOSURES TO HAZARDS

The first line of defense is to identify and eliminate hazards. When eliminating a hazard (inclusive of substitution of tools, chemicals, etc.) is not feasible, workers should implement best work practices and engineering controls to mitigate exposures. Effective administrative and PPE controls are secondary choices when hazards cannot be eliminated or controlled by engineering controls. The hazard control hierarchy below is the general approach to mitigating both physical and chemical hazards in the workplace.

2.1 Engineering Controls

- Only enter excavations greater than 4 feet deep with proper shoring and/or sloping (1:1)

2.2 Administrative Controls

- The use of water spray to control dust emissions to control potential releases or contact with contaminated material.
- Staying out of the active excavation zone when heavy equipment is in operation. Use caution while near heavy equipment, maintain eye contact with operators, do not enter or conduct field activities within the equipment operation zone (Total reach of any moving parts of equipment) without eye contact with operator
- Ensure construction equipment has backup alarms and are operated by qualified operations.
- Use of OSHA/NIOSH Heat app and work rest schedules to prevent heat stress.
- Ensure underground utilities have been surface-marked prior to excavation.
- Be mindful of traffic and use traffic control (e.g. signage, cones/candles, barricades) as appropriate.
- Use proper lifting techniques (e.g. legs, not back, no twisting).
- Use caution to avoid slips/trips/falls, wear proper clothing for weather conditions.
- Properly decontaminate reusable equipment and supplies. Discard disposable equipment and supplies.

2.3 Personal Protective Equipment

- Use of high visibility clothing and hard hats around heavy equipment.
- Use of work gloves if using any hand tools or nitrile gloves if handling any chemicals or contaminated materials
- Tyvek suits when in the exclusion and contamination reduction zones.
- Half-mask air-purifying respirator (HEPA filtered)
- Use of sunscreen to avoid UV exposure.
- Use of weather appropriate clothing to reduce heat stress.

3.0 CHEMICAL HAZARD ASSESSMENT AND CONTROL

3.1 Chemical Contaminants of Concern

The known anticipated Chemical Contaminant of Concern (COC) is asbestos based on the results of numerous previous investigations that have been completed at the project site and is presented in **Table 6**. The AHA included as **Attachment B** describes hazard mitigation.

3.2 Hazardous Substances Brought On-Site

A safety data sheet (SDS) must be available for each hazardous substance that [Contractor] or its subcontractors bring on the property. This includes solutions/chemicals that will be used to preserve environmental samples, decontaminate sampling equipment, gases needed to calibrate air monitoring equipment, materials used for drilling and installing monitoring wells, and products to service equipment. Small quantities (<10 gal) of gasoline and diesel fuel may also be maintained at the site. All containers of hazardous materials must be labeled in accordance with OSHA's Hazard Communication Standard.

A list of hazardous chemicals used by [Contractor] personnel will be maintained at the jobsite and is presented in **Table 7** and is placed in a centrally identified location with the SDSs. Further information on each chemical may be obtained by reviewing the appropriate SDS. The list will be arranged to enable cross-reference with the SDS file and the label on the container. The FSO or Location Manager is responsible for ensuring the chemical listing remains up to date.

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Table 6: Chemicals Anticipated for Use and Known COCs Present at Project Site

Contaminants of Concern	Site Presence	Exposure Limits ACGIH TLVs, OSHA PELs, NIOSH IDLH	Methods	Routes of Exposure	Symptoms and Effects of Exposure(1)
Asbestos	Soil	TLV: 0.1 f/cc TWA PEL: 0.1 f/cc TWA Excursion: 1 f/cc (30 min) IDLH: NA	PCM – NIOSH Method 7400 TEM – NIOSH Method 7402 (if air concentrations are greater than ½ the OSHA PEL)	Inh, Ing	Asbestosis (chronic exposure): dyspnea (breathing difficulty), interstitial fibrosis, restricted pulmonary function, finger clubbing; irritation eyes; [potential occupational carcinogen]

Abs: Absorption (skin and mucous membranes)
Con: skin and/or eye contact
Inh: Inhalation
mg/m^3: milligrams per cubic meter
NIOSH: National Institute for Occupational Safety and Health
STEL: 15-minute short-term exposure limit (ACGIH)
(R) Respirable Particulate Matter (ACGIH)
EXC: Highest 30-minute average concentration

ACGIH: American Conference of Governmental Industrial Hygienists
IDLH: immediately dangerous to life and health (NIOSH)
Ing: Ingestion
NA: not available
ppm: parts per million by volume
TWA: 8-hr time-weighted average (unless other time period specified)
f/cc: fibers per cubic centimeter

Note: (1) See NIOSH Pocket Guide to Chemical Hazards, Table 5 (9/2007)

Table 7: Chemical Products Planned for Use at Project Site

Chemical/Hazardous Materials In Use Check Box if Present - Add Additional Chemicals To List **Attach SDSs in Attachment E**		Quantity Anticipated	Storage Requirements	Special PPE Requirement?
Chemicals Products Planned for Use at the Project Site	☐ Hydrochloric Acid (HCl, preservative)	~ 2 mL / bottle	Sample Container	Nitrile Gloves / Safety Glasses
	☐ Nitric Acid (HNO_3, preservative)	~ 2 mL / bottle	Sample Container	Nitrile Gloves / Safety Glasses
	☐ Sulfuric Acid (H_2SO_4, preservative)	~ 2 mL / bottle	Sample Container	Nitrile Gloves / Safety Glasses
	☐ Sodium Bisulfate (preservative)	~ 2 mL/ bottle	Sample Container	Nitrile Gloves / Safety Glasses
	☐ Sodium Hydroxide (preservative)	~ 2 mL/bottle	Sample Container	Nitrile Gloves / Safety Glasses
	☐ Isobutylene and zero air	~ 0.6 ft^3/ bottle	Compressed Gas Cylinder	Nitrile Gloves / Safety Glasses
	☐ Four Gas Calibration Gas	~ 0.6 ft^3/ bottle	Compressed Gas Cylinder	Nitrile Gloves / Safety Glasses
	☐ Gasoline Fuel	N/A	Fuel Safety Can	Nitrile Gloves / Safety Glasses
	☐ Diesel Fuel	N/A	Fuel Safety Can	Nitrile Gloves / Safety Glasses
	☐ Silica Sand	~ 45 - 90 lb. bags	Bags	½ or FFAPR/P100
	☐ Portland Cement (or Similar)	~ 45 - 90 lb. bags	Bags	½ or FFAPR/P100
	☐ Bentonite	~ 45 - 90 lb. bags	Bags	Dusk Mask/APR
	☐ Alconox/Liquinox	< 5 lb	Liquid Conc. or powder	Nitrile Gloves / Safety Glasses
	☐ Other (specify)			

Figure 1: Hazard Communication (HAZCOM) Program Compliance Field Form

Location Specific HAZCOM Program/Checklist

To ensure an understanding of and compliance with the Hazard Communication Standard, [Contractor] will use this checklist/document (or similar document) in conjunction with the [Contractor]. Written Hazard Communication Program as a means of meeting site or location-specific requirements as per 29CFR1910.1200 to include the provisions of the Global Harmonization System (GHS).

While the primary responsibility for implementing the site specific HAZCOM program is assigned to the [Contractor] Field Safety Officer, it is the responsibility of all personnel to effect compliance. Responsibilities under various conditions can be found within the [Contractor] Written Hazard Communication Program.

To ensure that information about the dangers of all hazardous chemicals used by [Contractor] is known by all affected employees, subcontractors and client personnel, the following site-specific Hazard Communication Program has been established. All affected personnel will participate in this Hazard Communication Program.

☐	Site or other location name/address:	*Empire Property: 606 & 608 E Main St. Bozeman, MT*			
☐	Site/Project/Location Manager:				
☐	Site/Location Safety Officer:				
☐	List of chemicals compiled, format:	☒ HASP	☐ Other:		
☐	Location of SDS files:	☐ HASP			
☐	Training conducted by (Name):			Date:	
☐	Indicate format of training documentation:	☒ Field Log:	☐ Other:		
☐	Client briefing conducted regarding hazard communication:	☒ Yes ☐ No			
☐	If multi-employer site (client, subcontractor, agency, etc.), indicate name of affected companies: Resource Technologies, Inc. and Empire Building Materials, Inc.				
☐	Other employer(s) notified of chemicals, labeling, and SDS information:	☐ Yes ☐ No			
☐	Has [Contractor] been notified of other employer's or client's hazard communication program(s), as necessary? ☐ Yes ☐ No x**N/A**				

Employee Training and Information

The SSL is responsible for the [Contractor] site-specific personnel training program. The SSL will ensure that all program elements specified below are supplied to all affected employees.

At the time of initial assignment for employees to the work site, or whenever a new hazard is introduced into the work area, employees will attend a health and safety meeting or briefing that includes the information indicated below.

- Hazardous chemicals present at the work site.
- Physical and health risks of the hazardous chemicals.
- The signs and symptoms of overexposure.
- Routes of Exposure
- Procedures to follow if employees are overexposed to hazardous chemicals.
- Location of the SDS file and Written Hazard Communication Program.
- How to determine the presence or release of hazardous chemicals in the employee's work area.
- How to read labels and review SDSs to obtain hazard information.
- Steps [Contractor] has taken to reduce or prevent exposure to hazardous chemicals.
- How to reduce or prevent exposure to hazardous chemicals using controls procedures, work practices, and personal protective equipment.
- Hazardous, non-routine tasks to be performed (if any).
- Chemicals within unlabeled piping (if any).

Hazardous Non-Routine Tasks

When employees are required to perform hazardous non-routine tasks, the affected employee(s) will be given information by the SSL about the hazardous chemicals he or she may use during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps [Contractor] is using to reduce the hazards. These steps include, but are not limited to, ventilation, respirators, presence of another employee, and emergency procedures.

Chemicals in Unlabeled Pipes

Work activities may be performed by employees in areas where chemicals are transferred through unlabeled pipes. Prior to starting work in these areas, the employee will contact the SSL, at which time information as to the chemical(s) in the pipes, potential hazards of the chemicals or the process involved, and the safety precautions that should be taken will be determined and presented.

Multi-Employer Work Sites

It is the responsibility of the SSL to provide other employers with information about hazardous chemicals imported by [Contractor] to which their employees may be exposed, along with suggested safety precautions. It is also the responsibility of all site employees and the Site Manager to obtain information about hazardous chemicals used by other employers to which [Contractor] employees may be exposed. [Contractor]'s chemical listing will be made available to other employers, as appropriate. SDSs will be available for viewing to all employees and subcontractors maintained in a central location.

The location, format, and/or procedures for accessing SDS information must be relayed to affected employees.

4.0 PHYSICAL HAZARDS AND CONTROLS

4.1 Mobile or Heavy Equipment

No employee or subcontractor personnel shall operate heavy equipment unless they have documented qualifications. Prior to operations, [Contractor] project manager must receive and verify that the equipment is maintained and is in safe, working order. The following procedures will be followed:

- Excavation area should be designated and controlled using cones, signs, and safety tape.
- Only authorized employees are permitted to enter the excavation area.
- The Operator should always know the number of people in the excavation area, and the authorized employees shall always be aware of the work scope/plan and location of equipment.
- Effective communication must be maintained at all times with the project site lead, the operator, and the employees in excavation area. Preferably 2-way radios should be used but if not applicable, designated hand signals should be used for communication.
- Maintain eye contact with operator if practicable, always approach the equipment from the front, never from behind or other blind spots.
- When equipment is in motion, operator should be able to see all areas that will be traversed, if this cannot be followed, then a “spotter” should be designated to guide the operator around blind turns and congested areas. Equipment should be equipped with a backup alarm to alert surroundings.
- When equipment is not in use, the equipment should be stopped on level ground if possible, the machine placed in manufactures designated “park” gear, the emergency brake engaged, and any hydraulic arms lowered to the ground.

4.2 Utility Hazards

4.2.1 Underground Utilities

[Contractor] employees must review and comply with FLD34 Utilities, Underground. Each "person" as defined in the Underground Utility Damage Prevention Act must provide their own notice of excavation to request a mark-out of natural gas, electric, telephone, cable television, water, and sewer lines in the proposed drilling locations. The [Contractor] team should “white-line” the proposed drilling locations prior to the completion of utility locate activities. [Contractor] or its subcontractors will utilize a private utility locating company to identify and mark utilities that are not in the right-of-way that are covered by the public locate(s).

Allow required time for marking; Work may begin only when all notified utilities have either marked their lines or reported that they have no facilities in the area of excavation.

Respect the marks - Protect and preserve the markings from the time work begins until the work is completed. Call the utility services and request the utility to be re-located if the marks become illegible due to time, weather, construction, or any other cause.

Excavate carefully - If the excavation is within 2 feet of a marked utility line, expose the utility line by hand digging and keep all mechanized equipment at least 2 feet away from the extremities of the utility. Work will not begin until the required utility clearances have been completed.

4.2.2 Overhead Utilities

[Contractor] employees must review and comply with FLD56 Drilling Safety which addresses overhead utilities. All overhead lines will be considered “energized” unless properly de-energized, grounded and tested by the utility company before working within the clearance distance as defined below. The [Contractor] SSHO must observe de-energizing process and reconfirm that the lines are de-energized daily.

Any vehicle or mechanical equipment that can have part of its structure elevated near energized overhead lines shall be operated so that a minimum clearance of 10 feet is maintained at all times. This 10-foot distance shall

be increased a minimum of 0.4 inches for each 1 kV over 50 kV. **If the voltage of the overhead line is unknown, maintain a clearance distance of 35 feet from ground projection of the nearest power line to the vehicle.** Any work within the clearance distance must be approved by the Regional Health and Regional EHS Manager and the utility company.

Table 8: Line Voltage Minimum Safe Working Distance

Voltage (Kilovolts)	Distance (Feet)
0-50	10
>50-200	15
>200-350	20
>350-500	25
>500-750	35
>750-1000	45

Precautions must be taken when handling lengths of pipe or tubing that can approach overhead power and utility lines. When working with pipe or tubing, maintain a distance equal to the length of pipe plus the clearance distance defined in **Table 8**.

4.3 Slips, Trips, Falls, and Protruding Objects

A variety of conditions may exist that can result in injury from slips, trips, falls, and protruding objects. Slips and trips may occur as a result of wet, slippery, or uneven walking surfaces. To prevent injuries from slips and trips, always keep work areas clean; keep walkways free of objects and debris; and report/clean up liquid spills. Serious injuries may occur as a result of falls from elevated heights. If fall hazards exist in the scope of work, a fall hazard assessment and a site-specific Fall Protection Plan must be completed by a CP. AHAs for tasks with fall hazards must provide hazard controls consistent with the site-specific plan.

Protruding objects are any object that extends into the path of travel or working area that may cause injury when contacted by personnel. The daily 360° walkaround of the site should include identification of housekeeping and material storage hazards, corrective actions, and steps to eliminate the hazard. Always be aware of protruding objects and when feasible remove or label the protruding object with an appropriate warning. When picking up and carrying equipment, identify a path that is clear of any obstructions. The ground surface might not be visible or unreliable due to settling. Surface debris might be present and wet or swampy areas can exist. **Always utilize roads, pathways, or other designated routes or travel. Do not take shortcuts**.

Employees should walk around, not over, obstacles. It might be necessary to remove obstacles to create a smooth, unobstructed access point to the work areas on site.

During winter months, snow shovels and salt crystals or calcium chloride should be kept on site to keep work areas free of accumulated snow and ice. Furthermore, use sand or other aggregate material to help keep work surfaces from being slippery, especially where salt/calcium chloride cannot be used. In addition, make sure work boots have soles that provide good traction. When walking on ice is necessary crampons or Yaktrax® devices (or equivalent) should be used.

Maintaining a work environment that is free from accumulated debris is the key to preventing slip, trip and fall hazards at construction sites. Essential elements of good housekeeping include

- Orderly placement of materials, tools and equipment;
- Placing trash receptacles at appropriate locations for the disposal of miscellaneous rubbish;
- Prompt removal and secure storage of items that are not needed to perform the immediate task at hand; and,
- Awareness on the part of all employees to walk around, not over or on, equipment that might have been stored in the work area.

4.4 Housekeeping

During site activities, work areas will be routinely inspected for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. Tools, hoses, and other supplies will be kept orderly and out of the way for potential trip hazards. At no time will debris or trash be intermingled with waste PPE or contaminated materials. Additional information on the requirements of housekeeping can be found in FLD37 Housekeeping, Worksite.

4.5 Noise Exposure

[Contractor] employees must review and comply with FLD01 Occupational Noise and Hearing Conservation. The use of heavy equipment or noise producing tools can expose the field team to noise levels that exceed the ACGIH TLV of 85 dB for an 8-hour day. Exposure to noise can result in the following:

- Temporary hearing losses where normal hearing returns after a rest period;
- Interference with speech communication and the perception of auditory signals;
- Interference with the performance of complicated tasks; and,
- Permanent hearing loss due to repeated exposure resulting in nerve destruction in the hearing organ.

Since personal noise monitoring will not be conducted during the proposed activities, employees must follow this general rule of thumb: If the noise levels are such that you must shout at someone 5 feet away from you or you are within 25 ft of operating heavy equipment, you need to be wearing hearing protection. Employees can wear either disposable earplugs or earmuffs, but all hearing protection must have a minimum noise reduction rating (NRR) of 28 dB. Additional requirements are outlined in FLD01 - Noise and Hearing Conservation.

4.6 Airborne Particulates

Site operations may increase airborne dust concentrations, which include dust contaminated with asbestos. Due to the nature of asbestos, the controls are more stringent than “particulates not otherwise classified” (PNOC). Section 5.0 and the VCP-RP discuss real-time air monitoring strategies and controls for site-generated dust. Dust generated during site activities can be hazardous to the respiratory system, eyes, and can contribute to overall exposure if materials are absorbed through the skin. The ACGIH has established an eight-hour exposure limit for respirable dust, not otherwise classified, of 3 mg/m^3. Controls for dust exposures should include water on site roads, site speed limits, and specific engineering controls on pieces of equipment that generate dust (screening equipment, mixers, grinding, etc.).

4.7 Drums & IDW

4.7.1 Drum Handling

Accidents may occur during handling of drums and other containers. Hazards include physical injury resulting from moving heavy containers by hand and working around stacked drums, and deteriorated drums. When working around or with drums:

- Have a dry chemical fire extinguisher on hand to control small fires (minimum 20B:C).
- Inspect drums at least weekly: check for labels, markings, etc., and note conditions of containers. Are the drums bulging, deteriorated, or leaking? If labels are not legible, replace them. If the drums are deteriorated or leaking, initiate emergency response and cleanup efforts.
- Before moving any drum or container, plan the best sequence in which the various containers should be moved, the destination, and a clear route to the destination.
- Do not move drums that are not intact or tightly sealed.
- Pressurized drums are extremely hazardous. If possible, do not move drums that may be under internal pressure as evidenced by bulging or swelling.

- Have over pack equipment ready before any attempt is made to move drums containing hazardous wastes or chemicals.
- If the drum contents or origin are not known, do not open or move the drum. Notify the project manager and Regional EHS Manager for additional support and planning prior to handling unknowns.
- Never stand on drum tops.

4.7.2 Spill Prevention

Work involving drums or other containers can create potential sources for spills. Secondary containment and proper staging areas for drums and containers are essential planning tools for spill prevention. During this contract, recovery of spilled product(s), contaminated soils, and soil cuttings and water from drilling operations will be generated. Under this scope of work, it is anticipated that some soil cuttings from sampling and/or drilling activities may be generated as Investigation Derived Waste (IDW). Details on spill prevention are included is Section 8.5 of this document.

4.8 Hand Safety

4.8.1 Glove Selection

Gloves should be selected to afford protection from a variety of hazards to protect onsite workers from hand injuries, the following gloves will be used for when performing a specific duty:

- ANSI A3 or equivalent leather or mechanic's gloves for general protection, cushioning, or abrasion/laceration protection. Select protective level of gloves from a hazard assessment of the task.
- Nitrile gloves for dermal protection from general chemical hazards
- Insulated gloves for work in cold weather
- Certified, tested Insulating gloves when working w/ electrical hazards
- Vibration dampening gloves when utilizing vibrating/gyrating saws, hammers, or other equipment
- Specialty gloves as required: Rubber/Chemical Specific, Waterproof, added grip, filet gloves, etc.

Specify gloves based on a hazard assessment of the task. Ensure that multiple sizes are available to fit all personnel. Remove jewelry prior to work to avoid catching on equipment or creating pinch points. Pinch points are found between a moving object and a stationary object, or between two continuously moving objects. Yellow hand stickers will be placed on equipment to remind workers of pinch points. Additional requirements are outlined in FLD58 - Drum Handling Operations.

4.8.2 Hand Tools

Rules for the safe use of hand tools:

- Select the right size tool for the job.
- All hand tools must be inspected prior to use and removed from service if they are defective.
- Handles must be sound, straight and tight-fitting.
- Always keep the cutting edges sharp and never test a cutting edge with your finger.
- Always carry your tools securely and never put sharp or pointed tools in your pocket.
- When carrying hand tools, always point the cutting edge to the ground.
- Always keep your tools in a dry place to prevent rust.

4.9 Traffic Safety

BASIC PROCEDURES

Evaluate the traffic conditions, speed limit, and sight distances at the site entrance and secure the services of a traffic control planner to develop a plan for warning motorists of the site traffic.

Personnel exposed to traffic hazards should wear orange or yellow ANSI Class II or III safety vests. Work area should be delineated with traffic cones, or other suitable warning barriers, to prevent motorists from inadvertently driving through. Where it is not feasible to implement such procedures, a standby observer should be assigned to warn the work crew of any impending traffic hazards.

4.10 Driving Safety

[Contractor] employees must review and comply with FLD57 Motor Vehicle Safety. Drivers must be licensed to drive the class of vehicle they are operating and trained in defensive driving. Only [Contractor] personnel may drive [Contractor] vehicles or vehicles rented for [Contractor] business; client, subcontractor, or other work-related personnel may ride. Drivers and passengers must comply with all traffic laws and posted signs and will not operate a vehicle if under the influence of impairing medication, alcohol, or any other substance.

PLANNING / PREPARATION

- Prior to departure, check traffic reports, weather conditions, road construction, and road closures. If necessary, develop an alternative route and new, approved JMP (Journey Management Plan).
- Prior to entering the vehicle, inspect the vehicle.
- Leave early to allow for contingencies.

DISTRACTIONS

[Contractor] employees must make every attempt NOT to operate a vehicle while talking on your cell phone, regardless of “hands free” or not. If you receive a call; attempt to pull over to answer it or pull over and return the call. Although “hands free” is allowed, it is not encouraged. Do NOT allow other distractions to interfere with your safe operation of the vehicle. Under NO CIRCUMSTANCES is driving and talking without a “hands free” device acceptable while operating a motor vehicle on company business.

4.11 Environmental Hazards – Biological Hazards Assessment

For a more detailed level of protection from poisonous plants and insects, [Contractor] employees must review and comply with FLD43 Biological Hazards. Additional preparation and planning, to include clearing and grubbing of pathways, is recommended for work conducted within the remote areas. Contact with animals, insects, and plants can cause injury and illness to personnel. Biological hazards, which can be found throughout the project site, include bees and other stinging insects, mosquitos, ticks, hazardous plants, and snakes. Project team awareness and adherence to the safe work practices outlined in this HASP should reduce the risks associated with these hazards.

4.12 Weather

The Site Safety Officer will check the weather forecast for the project area each morning prior to mobilization. Predicted weather conditions will be included in the discussion during the daily tailgate safety meeting. Weather changes should initiate a review and update of the work schedule as necessary. Severe weather can occur with little warning. The employee must be aware of the potential for lightning, flash flooding and high wind events.

BE PREPARED, KNOW WHAT IS COMING YOUR WAY

- Utilize a weather app on a mobile device to track storm risks. Monitor National Weather Service (NWS) watch and warning alerts for inclement weather.
- Check the Storm Prediction Center's web page for alerts and warnings. http://www.spc.noaa.gov/products/wwa/
- Monitor wind conditions whenever work is underway that can be impacted by high winds.
- When in the field, be aware of the route you must take to get to shelter.
- When working in low areas be aware of the potential for flash flooding and the route to higher ground.

4.12.1 Cold and Heat Stress

Detailed procedures on mitigating heat and cold stress are outlined in SOP #07 – Cold Stress and SOP #03 – Heat Stress. Staff should take the time to acclimate to these work conditions prior to conducting long duration work and plan to take breaks accordingly. Access to potable water and electrolyte replacements is a requirement.

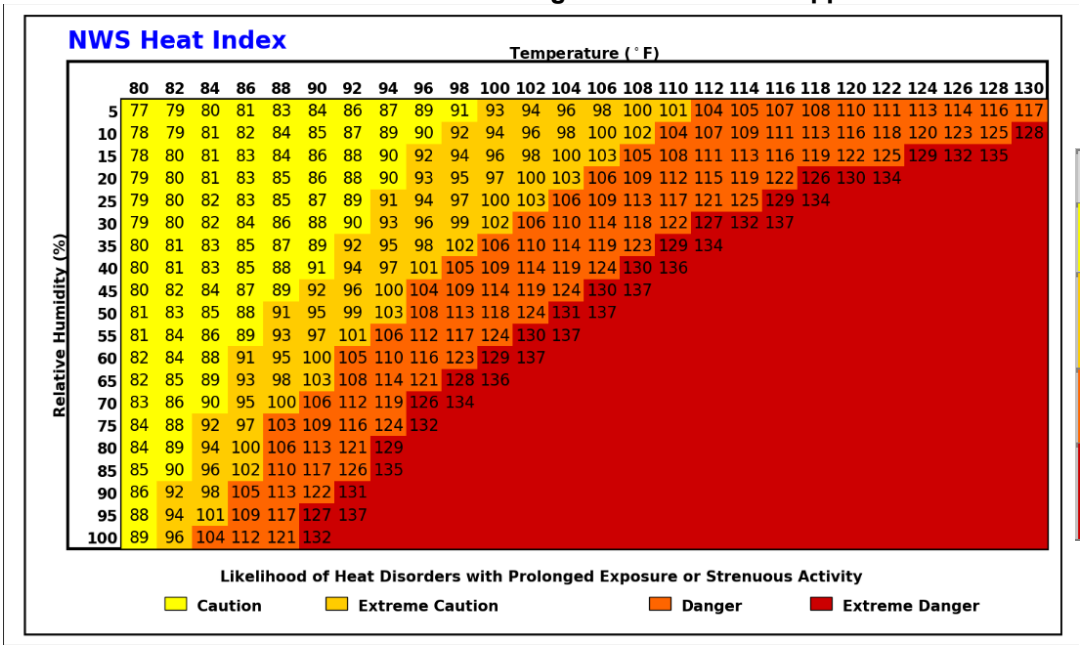
MEASURES TO AVOID HEAT STRESS

The following guidelines should be adhered to when working in hot environments:

- Monitor the heat index. OSHA offers a free mobile application to monitor the location of the user and includes the ability to predict the heat index across the workday. Follow guidance in the app and in accompanying OSHA standards for work-rest cycles and other controls. The NOAA heat index table, utilized by the OSHA Heat app (**Figure 2**).
- Alternately, utilize real-time monitoring of the Wet Bulb Globe Temperature (WBGT) and follow ACGIH guidance for work/rest cycles.
- Identify a shaded, cool rest area.
- Rotate personnel, alternative job functions.
- Water intake should exceed sweat produced. Most workers exposed to hot conditions drink less fluids than needed because of an insufficient thirst. DO NOT DEPEND ON THIRST TO SIGNAL WHEN AND HOW MUCH TO DRINK. Consume enough liquid to force urination every two hours. In humid climates ice water or ice should be consumed to help maintain normal body temperature since evaporation does not provide an efficient mechanism for heat removal.
- Eat light meals before and during work shifts. Avoid highly salted foods.
- Drink sports drinks such as Gatorade® diluted 1:1 with water or alternately, utilize low-sugar electrolyte tablets/powders that can be added to bottled water periodically during the workday.
- Save most strenuous tasks for non-peak heat hours such as the early morning or the evening.
- Avoid alcohol during prolonged periods of heat. Alcohol may cause additional dehydration.
- Avoid double shifts and/or overtime.

The implementation and enforcement of the above-mentioned measures will be the joint responsibility of the Project Manager and health and the Site Safety Officer. Potable water and fruit juices should be made available each day for the field team.

Figure 2: OSHA Heat Application



Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91°F to 103°F	Moderate	Implement precautions and heighten awareness
103°F to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures

5.0 AIR MONITORING

Air monitoring is the act of collecting air samples to determine air quality at specific locations of concern and quantify exposure. All persons entering a regulated area will be required to wear a respirator in accordance with 29 CFR 1926.1101(h)(1) and (2) and 29 CFR 1910.134. Regulated areas shall be demarcated from the rest of the workplace to minimize the number of people who will be exposed to asbestos. Both stationary air monitoring and personal air monitoring will be performed during excavation and hauling of ACW and asbestos-contaminated soils. Baseline air sampling will be performed prior to any cleanup activities to verify the baseline conditions. Air monitoring activities will be completed during cleanup work to determine exposure in accordance with the Project VCP-RP prior to implementation.

Background air monitoring is used to quantify the air quality at specific locations of concern due to other sources in the absence of cleanup activity. Background air monitoring results provide a basis of comparison for results of monitoring during cleanup activities. Stationary and/or mobile background monitoring may be performed.

Personal air monitoring is performed to determine the average concentration of a contaminant an individual is or would be exposed to without respiratory protection. Personal air monitoring is performed using small air sampling pumps typically attached at the waist that draw air through a sample cartridge located within 12 inches of the nose and mouth and will be utilized on both onsite and off-site workers.

Stationary air monitoring is the act of collecting air samples at a stationary location to quantify air quality at a single location. The location is generally chosen to be representative of an area of concern and is selected to represent worst-case exposure when practical. Determination of wind direction is critical during stationary air monitoring. Portable air pumps with adjustable flow rates are typically used. The filter cartridge is typically placed at a height of 3 to 5 feet above ground to be representative of breathing zones.

Both stationary air monitoring and personal air monitoring will be performed during excavation and hauling of ACW and asbestos-contaminated soils. Background air sampling will be performed prior to any cleanup activities to verify the baseline conditions. Air monitoring activities will be completed during cleanup work to determine exposure.

The analytical methods for air monitoring are included in **Table 9** below. The sample locations and frequencies are included in **Table 10**.

Table 9: Air Monitoring Analytical Methods

Sample Type	Sample Frequency	Analytical Method	PEL	EPA	Required Reporting Limit
Personal	1/day	TEM NIOSH Method 7402	0.1 f/cc (8-hour TWA)	NA	0.002 f/cc
Stationary	1/day per worker	ISO Method 10312:1995(E)	NA	6.0E-0.5 f/cc[1]	6.0E-0.5 f/cc

[1]EPA's Residential Default Exposure Parameter
EPA – Environmental Protection Agency
f/cc – fibers per cubic centimeter
ISO - International Organization for Standardization
NA – Not Applicable
NIOSH - National Institute for Occupational Safety and Health
PEL – permissible exposure limit
TEM – Transmission Electron Microscopy

TWA – time-weighted average

The following is a discussion of hazards potentially presented to worker personnel during this project asbestos, known or suspected to be present on site.

5.1 Monitoring Equipment

5.2 Personal Air Sampling

Air samples will be collected for on-site workers to determine the average contaminant concentration the worker would be exposed to using small personal pumps that draw air through a sample cartridge. Personal samples will be analyzed in accordance with NIOSH Method 7400, Asbestos and Other Fibers by PCM, Issue 3 (June 2019). Follow-up analysis of the samples by NIOSH Method 7402, Asbestos by TEM, Issue 3 (August 2022) will be performed if phase contract microscopy (PCM) fiber counts are greater than 0.01 f/cc. Stationary Air Monitoring

Ambient air samples will be collected in real time during the construction activity at strategic stationary locations to quantify air quality at a single location that is representative of an area expected to have worst-case exposure (downwind). Wind direction will be evaluated prior to sampling. Upwind and downwind stations will be included, and monitoring may need to occur outside the perimeter of the area where remediation activities will occur based on several site factors such as wind direction, proximity to roadways, or building interference. Prior to beginning cleanup activities, two background air monitoring samples will be collected prior to cleanup activities to provide a comparison of results during remediation monitoring. The samples will be collected at each location between the hours of 8 a.m. and 5 p.m. on a dry, no-precipitation workday. The background samples will be used to provide a baseline concentration of asbestos fibers in the air at the facility so comparisons can be made between the baseline condition and the conditions during the cleanup activities.

Asbestos air sampling and analysis will be performed in accordance with EPA's Framework for Investigating Asbestos-Contaminated Superfund Sites, OSWER Directive #9200.0-68 (EPA, 2008) and collected following the International Organization for Standardization (ISO) Method 10312:2019 Ambient Air – Determination of Asbestos Fibers – Direct Transfer Transmission Electron Microscopy Method, for sampling Superfund Sites. Samples will be collected with portable air pumps fitted with mixed cellulose ester filters using flexible tubing and adjustable flow rate. The filter cartridge would typically be placed at breathing zone height (approximately 3 to 5 feet above ground). The pumps will be calibrated at least once daily.

Table 10: Sample Locations and Frequency

Sample Type	Location*	Number	Frequency
Baseline	Upwind – one at Empire property boundary and one outside Empire property boundary	2 locations	1
Stationary	Upwind at Empire property boundary	1 location	1/day
Stationary	Downwind (surrounding Empire property boundary)	3 locations	1/day
Stationary	Transportation route (between Empire property and where trucks enter Interstate -90)	1 location	1/day
Personal	Identify highest exposure potential for remediation contractor workers; pumps on person	25% of remediation contractor workers and 25% of oversight contractor workers	1/day

*Actual locations will be determined prior to remediation based on the prevailing wind direction and the most current site conditions (e.g., remaining structures, exclusion zone demarcated areas, truck entry point, etc.).

5.2.1 Airborne Particulates

Airborne particulates will be monitored near and downwind of the active excavation area(s) to assess potential exposures and potential offsite transport of contaminated dust. One or more pDR 1500 or equivalent monitors will be deployed at the site. Health and Safety Action Levels for real-time air monitoring measurements are presented in **Table 11**.

5.3 Calibration and Recordkeeping

Equipment used by [Contractor] will be calibrated in accordance with [Contractor] 's standard operating procedures. A log of the calibrations and daily data collection documentation will be kept in the field notebook. Data from the monitoring equipment will be downloaded each day and made part of the project record.

Table 11: Action Levels and Monitoring Procedures

Hazard	Instrument	Action Level	Action
Particulates Not Otherwise Classified (PNOC), Respirable Fraction	Personal DataRAM (pDR), or equivalent	< 1.5 mg/m^3	Level D PPE. Use dust suppression as appropriate to maintain dust levels below action level.
		$\geq$ 1.5 mg/m^3	Implement dust control measures and re-monitor exclusion zone; continue particulate monitoring. If particulates remain > 1.5 mg/m^3, upgrade to Level C PPE.

Notes:
(1) The selection of appropriate lamp should be made by a safety professional with consideration of the mix of contaminants and ionization potential of the key contaminants. The 10.6 ev lamp is the standard configuration of most PID instruments.

CGI – Combustible Gas Indicator
LEL – Lower Explosive Limit
O_2 – Oxygen
eV – Electron volt
< - Less than
> - Greater than
≥ - Greater than or equal to
PNOC – Particulates Not Otherwise Classified
% - percent
PID – Photoionization Detector
pDR – Personal DataRAM
SCBA – Self-Contained Breathing Apparatus

6.0 PERSONAL PROTECTIVE EQUIPMENT

PPE will be utilized during all site activities to control physical, biological, and chemical exposure hazards. Effective engineering and administrative controls should be evaluated and specified, and PPE should be utilized for remaining hazards that are not well controlled. **Table 4** describes the PPE and chemical protective clothing to be worn for general site activities and for certain specific tasks.

6.1 Other Safety Equipment

The following additional safety items will be available at the site:

- First aid kit
- Fire extinguisher
- Portable phones, jobsite radios

7.0 SITE CONTROL

Site Control: [Contractor] personnel will ensure that all work activities are known, and all workers understand their specific work zones (including pathways in and out of their work area).

7.1 Designation of Zones

[Contractor] designates work areas or zones as suggested in the "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," NIOSH/OSHA/USCG/EPA, November 1985. They recommend that the areas surrounding each of the work areas to be divided into three zones:

- Exclusion or "Hot" Zone
- Contamination Reduction Zone
- Support Zone

7.1.1 Exclusion Zone

An exclusion zone will be established around the project site. If the project site is accessible to the public or other workers not covered by this HASP, the perimeter of the exclusion zone will be marked with caution tape or indicated by traffic cones so that employees, visitors, and client or host employer personnel are aware of the work being conducted.

All [Contractor] and contractor personnel entering these work areas must wear the prescribed level of protective equipment.

7.1.2 Contamination Reduction Zone

A decontamination zone will be established adjacent to each work area. Personnel will remove contaminated gloves and other disposable items in this area and place them in a plastic bag until they can be properly disposed of. Equipment leaving the exclusion zone will be decontaminated in the CRZ prior to leaving the work area.

7.1.3 Support Zone

The support zone will include the area outside of the exclusion zone and CRZ.

7.1.4 Site Access Control

The public will be restricted from the project site by fences, barricade tape, traffic cones, and/or signs.

7.1.5 Parking and Staging Areas

Parking will be restricted to designated parking areas on the side of the road. The [Contractor] employee will not park in any active drive lanes of the roadway.

7.2 General Site Safety Practices

The following measures are designed to augment the specific health and safety guidelines provided in this plan.

- Smoking is prohibited in all work areas. Matches and lighters are not allowed in these areas.
- Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking or any other activities.
- The use of alcohol or illicit drugs is prohibited during the conduct of field operations.

•

8.0 DECONTAMINATION

8.1 General Decontamination Plan

All personnel will use inside out techniques when removing spent PPE. Hands and face will be wet wiped prior to any hand to mouth contact.	
Decontamination Waste Disposition	
Consistent with the levels of protection required, provide step-by-step procedures for personnel decontamination:	
☐	Disposable equipment will be used where possible and will be disposed of in plastic trash bags.
☐	Driller will be responsible for placing waste generated during work in drums and staged a predetermined location.
☐	Drums will be properly labeled and logged in the field log book.
Heavy Equipment Decontamination	
A procedure for decontamination steps required for non-sampling equipment and heavy machinery follows:	
☐	[Remediation contractor] will be responsible for decontamination of heavy machinery
☐	Decontamination will generally be performed as directed.
☐	Soil & debris will be knocked off equipment and transferred to drums. The equipment will be rinsed with clean water.
☐	Decontamination water will be transferred from the pad to drums for subsequent disposal.
Sampling Equipment Decontamination	
Sampling equipment will be decontaminated in accordance with the following procedure:	
☐	Non-disposable equipment will be decontaminated using a non-phosphate detergent and rinsed clean with water. Decontamination water will be disposed in accordance with other potentially contaminated water by transferring to drums for subsequent disposal.
IDW Disposal Plan	
Describe procedure to dispose of IDW to include who is responsible for IDW disposal.	
☐	[Contractor] will be responsible for the proper disposal of IDW.

8.2 Personal Decontamination

Proper decontamination is required of all personnel before leaving the site. Decontamination will occur within the contamination reduction zone. Employees will self-decontaminate through the use of Hudson sprayers water will be disposed in test pit excavations. Regardless of the type of decontamination system required, a container of potable water and liquid soap should be made available so employees can wash their hands and face before leaving the site for lunch or at the end of the day. Additional provisions for decontamination can be found in FLD59 Decontamination Guidelines – Personnel & Equipment.

8.2.1 PPE Decontamination

Disposable PPE, such as Tyvek coveralls, gloves, etc. will be removed in the decontamination zone and placed in garbage bags. Final disposal of contaminated PPE will be in accordance with the work plan.

If worn, respirators will be cleaned after each use with respirator wipe pads and will be stored upright in plastic bags. Refer to the cleaning instructions provided with the respirator or specified by Appendix B-2 to the OSHA regulations at 29 CFR 1910.134. Respirator cartridges are disposable and will not be decontaminated or re-used.

8.3 Equipment Decontamination

Equipment will be decontaminated prior to being moved to other locations. Decontamination procedures will be specified by the SSHO, Project Manager and [Remediation Contractor] representatives (site Lead).

8.4 IDW Management

IDW includes spent PPE, spent groundwater, decontamination fluids, etc. IDW will be managed as impacted materials. A secured IDW staging area is located on-site.

8.5 Spill Prevention & Response

Work activities may involve the use of hazardous materials (i.e. fuels, solvents) or work involving drums or other containers. Potential sources for spills under this scope of services include; contractor fueling containers, dewatering fluids, and decontamination fluids.

Secondary containment and proper staging areas for drums and containers are essential planning tools for spill prevention. The following procedures will be used to prevent or contain spills:

- All hazardous material will be stored in appropriate containers
- Tops/lids will be placed back on containers after use.
- Containers of hazardous materials will be stored appropriately away from moving equipment.
- Secondary containment will be implemented in staging areas as appropriate

At least one spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up materials shall be available at each work site (more as needed).

- All hazardous commodities in use (i.e. fuels) shall be properly labeled.
- Containers shall only be lifted using equipment specifically manufactured for that purpose.

In the event of a spill or release, ensure safety, assess situation, and perform containment and control measures, as appropriate & mobilize per Site Spill Response Plan.

a. Cleanup per SDSs if small; or sound alarm, call for assistance, notify Emergency Coordinator.
b. Evacuate to pre-determined safe place.
c. Account for personnel.
d. Determine if team can respond safely.

9.0 EMERGENCY RESPONSE

OSHA defines emergency response as any "response effort by employees from outside the immediate release area or by other designated responders (e.g., mutual-aid groups, local fire departments, etc.) to an occurrence that results, or is likely to result in an uncontrolled release of a hazardous substance." According to [Contractor] policy, [Contractor] personnel shall not participate in any emergency response where there are potential safety or health hazards (e.g., fire, explosion, or chemical exposure). [Contractor] response actions will be limited to evacuation and medical/first aid as described within the following sections. As such this section is written to comply with the requirements of 29 CFR 1910.38 (a).

The basic elements of an emergency evacuation plan include:

- Employee training;
- Alarm systems;
- Escape routes;
- Escape procedures;
- Critical operations or equipment;
- Rescue and medical duty assignments;
- Designation of responsible parties;
- Emergency reporting procedures; and,
- Methods to account for all employees after evacuation.

9.1 Employee Training

Employees must be instructed in the site-specific aspects of emergency evacuation. On-site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed.

9.2 Alarm System/Emergency Signals

An emergency communication system must be in effect at all sites. The simplest and most effective emergency communication system in many situations will be direct verbal communications. Each site must be assessed at the time of initial site activity and periodically as the work progresses. Verbal communications must be supplemented anytime voices cannot be clearly perceived above ambient noise levels (e.g., noise from heavy equipment; drilling rigs, backhoes, etc.) and anytime a clear line-of-sight cannot be easily maintained amongst all [Contractor] personnel because of distance, terrain or other obstructions.

Verbal communications will be adequate to warn employees of hazards associated with the immediate work area. [Contractor] will bring a portable phone to the site to ensure that communications with local emergency responders is maintained, when necessary.

In the event of a fire or explosion, ensure personal safety, assess situation, and perform containment and control measures, as appropriate:

a. Sound alarm and call for assistance, notify Emergency Coordinator and SSHO.
b. Evacuate to predetermined safe place.
c. Account for personnel.
d. Use fire extinguisher only if safe and trained in its use.
e. Stand by to inform emergency responders of materials and conditions

9.3 Escape Routes and Procedures

The escape route from the site and an emergency muster point will be provided to all workers during the project mobilization. Prior to mobilizing to a new project area, the SSHO or his designee will confirm that the escape routes are clear and lead to a safe area.

9.4 Employee Accounting Method

The SSHO is responsible for identifying all [Contractor] personnel on-site at all times. [Contractor] and its subcontract employees will notify the SSHO when they enter and leave the site. The SSHO will account for all [Contractor]] and its subcontract employees following an evacuation. **All injuries must be reported to direct supervisor/site supervisor and Site Safety Officer.**

9.4.1 First Aid

Provide first aid, if trained; assess and determine need for further medical assistance. If a clinic visit is warranted, transport or arrange for transport to the medical facility identified in this HASP. Minor injuries will be treated on site using supplies from the first aid kit or other local sources. All cuts and abrasions will be cleaned with potable water and a clean dressing applied. The injured employee will be evaluated at the end of the workday and the following day when the employee arrives at the project site to determine whether the wound has started the healing process. The wound will be protected from contamination during the project activities.

9.4.2 Professional Treatment

In the event an injury or illness requires more than first aid treatment, the SSHO will accompany the injured person to the medical facility and will remain with the person until release or admittance is determined. The escort will relay all appropriate medical information to the on-site project manager.

If the injured employee can be moved from the accident area, he or she will be brought to the CRZ where their PPE will be removed. If the person is suffering from a back or neck injury the person will not be moved and the requirements for decontamination do not apply. The SSHO must familiarize the responding emergency personnel about the nature of the site and the injury. If the responder feels that the PPE can be cut away from the injured person's body, this will be done on-site. If this not feasible, decontamination will be performed after the injured person has been stabilized.

A map and directions to the selected local medical facility is included in **Attachment C**.

9.5 Designation of Responsible Parties

The Site Manager or SSO are responsible for initiating an emergency response. In the event neither can fulfill that duty, any qualified First Aid/CPR trained person will assume the lead role.

9.6 Incident Reporting and Investigation

Any incident resulting in injury, illness, or property damage is required to be reported. Any serious incident resulting in injury, illness, or property damage requires an Incident investigation. The investigation should be conducted as soon as emergency conditions are under control. The purpose of the investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided.

Attachment A– Health and Safety Plan Review Form

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Personnel Acknowledgement

By signing below, the undersigned acknowledges that he/she has read and reviewed the [Contractor] Health and Safety Plan for Environmental Services at the Site. The undersigned also acknowledges that he/she has been instructed in the contents of this document and understands the information pertaining to the specified work, and will comply with the provisions contained therein.

PRINT NAME	SIGNATURE	ORGANIZATION	DATE

Attachment B – Activity Hazard Analysis

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ACTIVITY HAZARD ANALYSIS

Activity/Work Task:	**AHA 1.1 – Asbestos Remediation**	Overall Risk Assessment Code (RAC) *(Use highest code from below):*	**M**
Client:	City of Bozeman		
Project Location:	Empire Property: 606 and 608 E Main St. Bozeman, MT		
Work Order No.:	16009.001.002.0020		
Date Prepared: **Date Revised:**	2/25/25		
Prepared by (Name/Title): **Revised by:**			

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Reviewed by SSO (Printed Name/Signature):	Date:
Reviewed by Site Mgr. (Printed Name/Signature):	Date:
Reviewed by (Other): (Printed Name/Signature):	Date:
Reviewed by Sub. Foreman (Printed Name/Signature):	Date:

Step 1: Review each "**Hazard**" with identified safety "**Controls**" and determine RAC (See above).

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "**Hazard**" on AHA. Annotate the overall highest RAC at the top of the AHA.

"**Probability**" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"**Severity**" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible.

NOTES:

Risk Assessment Codes (RAC)

E = Extremely High Risk	**H = High Risk**
M = Moderate Risk	**L = Low Risk**

Job Steps	Hazards	Hazard Controls	RAC
Visual and Grid Sampling • *Gather visual observations of site conditions, conducting 360-degree observations and collecting samples*	Struck-by vehicles or equipment.	• All work will be conducted from the shoulder of the road, out of the driving lanes. • Maintain awareness of personnel on foot and other vehicles. • Maintain awareness of warehouse equipment in operation (ex. Forklifts); being visible and making eye-contact when equipment is being operated nearby	**M**

Job Steps	Hazards	Hazard Controls	RAC
	Motor Vehicle Operations	• Drivers will conduct daily inspections during use, utilizing a checklist form that will be turned in each day or weekly. • Drivers shall hold a license and/or appropriate training for the type and class of vehicle they are operating. • Seat belt use is required for all equipment/vehicles. • Cell phone use if prohibited when operating motorized vehicles • Do not exceed more than 14 total hours of combined driving and work. Each worker is required to have 10 hours of rest each day. • Follow established and/or posted speed limits. Reduce speeds during poor conditions. • If ground hazards exist, utilize backup cameras for all backing.	**M**
	Slip/Trip/Fall Hazards	• Exercise good housekeeping. Remove items from pathways that could pose a trip hazard. • Wear boots that include a safety toe and puncture-resistant soles • Avoid muddy or wet areas in rainy conditions. • Ensure non-slip pads are present on stairs or ramps especially in rainy conditions. • Work will be completed in adequate natural light. • Be careful of areas in the warehouses with items on the ground.	**M**

Job Steps	Hazards	Hazard Controls	RAC
	Heat stress	• The SSHO will monitor the weather conditions both real and predicted for times across the workday using the OSHA/NIOSH Heat app. • Field staff will review and implement the [Contractor] Heat Stress SOP #3 • Take breaks in a cool vehicle throughout the day • Work/rest periods will be established according to the American Conference of Governmental Industrial Hygienists (ACGIH) and the National Institute for Occupational Safety and Health (NIOSH) guidelines based on the heat levels noted on the OSHA/NIOSH Heat app. • Water and electrolyte/fluids replacement will be available to workers at convenient locations in site personnel's vehicles. • Dress in light-weight clothing that protects from sun exposure • Persons taking medications should consult with their personal physician prior to working in high-temperature environments. • Work will be completed in the cooler, early morning hours before peak temperatures are reached.	**L**
	Asbestos containing materials	• Avoid disturbing any material in a way that would create dust • Stand away from and up wind from the inspector while they are collecting sampling in case any dust is generated • If friable material is encountered, don additional PPE described in Table 4.	**M**
Soil Removal and Replacement and Resurfacing • *Excavating small excavations to repair utilities or remove and replace known asbestos contaminated soil.*	Struck-by vehicles or equipment.	• All work will be conducted from the shoulder of the road, out of the driving lanes. • Maintain awareness of personnel on foot and other vehicles. • Maintain awareness of warehouse equipment in operation (ex. Forklifts); being visible and making eye-contact when equipment is being operated nearby	**M**

Job Steps	Hazards	Hazard Controls	RAC
Replacement of removed surfacing per a VCP	Motor Vehicle Operations	• Drivers will conduct daily inspections during use, utilizing a checklist form that will be turned in each day or weekly. • Drivers shall hold a license and/or appropriate training for the type and class of vehicle they are operating. • Seat belt use is required for all equipment/vehicles. • Cell phone use if prohibited when operating motorized vehicles • Do not exceed more than 14 total hours of combined driving and work. Each worker is required to have 10 hours of rest each day. • Follow established and/or posted speed limits. Reduce speeds during poor conditions. • If ground hazards exist, utilize backup cameras for all backing.	**M**
	Heavy Equipment Operation	• Operator shall hold a license and/or appropriate training for the type and class of vehicle they are operating. • Cell phone use if prohibited when operating equipment • Do not exceed more than 14 total hours of combined driving and work. Each worker is required to have 10 hours of rest each day. • Ensure underground utilities have been surface-marked prior to excavation,	**M**
	Slip/Trip/Fall Hazards	• Exercise good housekeeping. Remove items from pathways that could pose a trip hazard. • Wear boots that include a safety toe and puncture-resistant soles • Avoid muddy or wet areas in rainy conditions. • Ensure non-slip pads are present on stairs or ramps especially in rainy conditions. • Work will be completed in adequate natural light. • Be careful of areas in the warehouses with items on the ground.	**M**

Job Steps	Hazards	Hazard Controls	RAC
	Heat stress	• The SSHO will monitor the weather conditions both real and predicted for times across the workday using the OSHA/NIOSH Heat app. • Field staff will review and implement the [Contractor] Heat Stress SOP #3 • Take breaks in a cool vehicle throughout the day • Work/rest periods will be established according to the American Conference of Governmental Industrial Hygienists (ACGIH) and the National Institute for Occupational Safety and Health (NIOSH) guidelines based on the heat levels noted on the OSHA/NIOSH Heat app. • Water and electrolyte/fluids replacement will be available to workers at convenient locations in site personnel's vehicles. • Dress in light-weight clothing that protects from sun exposure • Persons taking medications should consult with their personal physician prior to working in high-temperature environments. • Work will be completed in the cooler, early morning hours before peak temperatures are reached.	**L**
	Asbestos containing materials	• Avoid disturbing any material in a way that would create dust • Stand away from and up wind from the inspector while they are collecting sampling in case any dust is generated • If friable material is encountered, don additional PPE described in Table 4.	**M**

Equipment	PPE	Inspection	Training
• Motor Vehicles • Heavy Equipment • Fire Extinguishers • First Aid Kits	• Safety-toe boots with ankle supports (ASTM F2413 compliant) • Safety vests (Class 2 or 3 Reflective Vest) • Long pants and sleeved shirts. Pants, shirts and socks treated with permethrins where ticks are present. • Leather or mechanics type gloves when working with trowels and shovels. • Tyvek suit • NIOSH approved air-purifying respirator with HEPA filter as needed.	• Initial inspection of all equipment to be used. • Daily inspection of equipment prior to use. • PPE inspections prior to each use.	• First aid/CPR • BBP • PPE Training • Initial site safety briefing • Daily tailgate safety briefings • Vehicle training

AHA 1.1 – Asbestos Remediation

In accordance with [Contractor] policies and regulatory requirements "Work will not begin until the AHA for the work activity has been reviewed and briefed to all site personnel. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations or change of competent/qualified persons.

By signing below, I understand, agree to, and will conform to the site rules set forth in this AHA, my respective company's EHS Planning Documents (including amendments and attachments), and those controls agreed upon during any site-specific health and safety briefing(s).

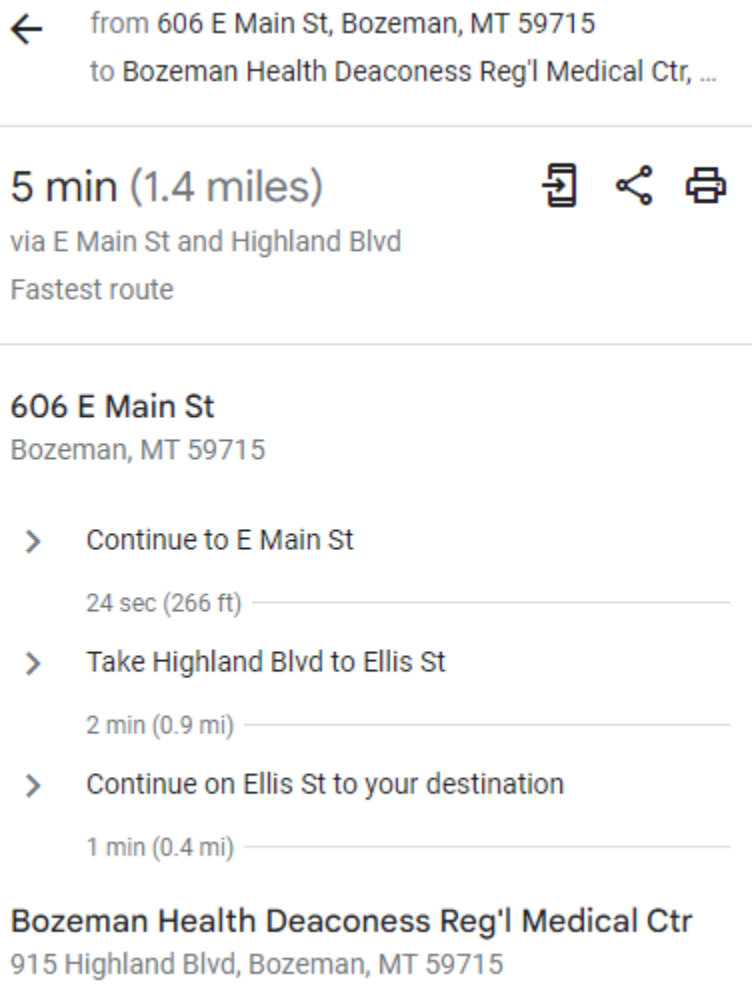
Name	Signature	Date	Company
Andy Wanta			[CONTRACTOR]

Attachment C – Local Medical Facility Map and Directions

Local Medical Facility:

Bozeman Health
915 Highland Blvd, Bozeman, MT 59715

Driving Directions:




Search along the route
Gas
EV charging
Hotels
Western Cafe
U.S. Highway 191
Residence Inn Bozeman Downtown
E Main St
606 East Main Street
Bozeman Public Library
Cypress St
E Babcock St
Auto Stop
Lindley Park Center
The Lindley House
Top rated
E Olive St
Highland Blvd
Bozeman Sculpture Park
Fisher's Technology
Aloha Hale Cleaning
E Cutliss St
Lindley Rd
Bogert Pk
S Church Ave
22 min
0.9 miles
Frontage Rd
Bogert Pl
Sunset Hills Cemetery
5 min
1.4 miles
Haggerty Ln
E Story St
Peets Hill/ Burke Park
Sunset Hills Nordic Trails
Gallagator Trail
Farve Jennifer L
Mulder
Memorial Wall
Ellis St
Bridger Ear, Nose & Throat
APRS Physical Therapy
High Country Care
Genoa Healthcare
Hacot Pk
Bozeman Health Deaconess Regional...
Bozeman Health
Karath John F
Ice Pond Rd
15 min
every 60 min

Attachment D – Pre-Entry Briefing and Daily Tailgate Form

Tailgate Safety Meeting Log*

This sign-in log documents the topics of the tailgate safety briefing and individual attendance at the briefing. Personnel who perform work operations onsite are required to attend each safety briefing and acknowledge their ability to ask questions and receipt of such briefings daily. Please provide a brief narrative of the following topics as applicable to the Project.

Meeting Leader:	**Signature:**
Date /Time / Weather:	**Project Name:**

Topic	***Circle***	***Discussion / Notes***
Daily 360º Walkaround Discussion	Yes / NA	
Operational Plan of the Day - Changes	Yes / NA	
Reviewed Procedures, AHA Changes	Yes / NA	
PPE Selected via Hazard Assessment	Yes / NA	
Fit For Duty – all staff	Yes / NA	
Emergency Action Plan & Procedures	Yes / NA	
PPE Requirements – Glove Selection	Yes / NA	
Required Monitoring / Action Levels	Yes / NA	
Site Control / Work Zones / Security	Yes / NA	
Access / Egress / Slips, Trips, & Falls	Yes / NA	
Smoking, Eating, & Drinking	Yes / NA	
Heat/Cold Stress	Yes / NA	
Exclusion Areas Barricades / Cones	Yes / NA	
Required Permits, Passes, Keys, etc.	Yes / NA	
Decon Procedures / IDW Mgmt.	Yes / NA	
Equipment Inspections / Checklists	Yes / NA	

Communications Protocol	Yes / NA	
Comments/Observations:		
Questions for Success –Take two minutes to think through and answer these questions: 1. What are we about to do? 2. What equipment are we going to use? 3. Have I/we been trained to use this equipment? 4. Have I/we been trained to do this job? 5. How can I/we be hurt? 6. Do I/we understand the hazard controls established to prevent an incident?		
Incidents Added to Deficiency Log:		
Reportable Incidents: Supervisor, MISHAPS Line / EHS Mgr. Y / N		
End of Day Sign-off: Site Safety Officer Signature:		

Date: **Weather:** **By:**

Tailgate Meeting Attendees		
Printed Name	**Signature**	**Company**

Attachment C– Applicable EHS FLDs

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FLD CHECKLIST (Check all that apply)		
	[CONTRACTOR] FLD TITLE	**DESCRIPTION**
☐	FLD01 – Noise and Hearing Conservation	Occupational Noise and Hearing Conservation
☒	FLD02 – Inclement Weather	Rain/humidity/cold/ice/snow/lightning
☐	FLD03 – Hot Process – Steam	Burns/displaced oxygen/wet working surfaces
☒	SOP 03 – Heat Stress Prevention/Monitoring	Heat rash/cramps/exhaustion/heat stroke
☐	FLD06 – Cold Stress	Hypothermia/frostbite
☐	FLD08 – Confined Space Entry	Falls/burns/drowning/engulfment/electrocution
☒	FLD09 – Fork Lifts	Fork Lift Truck Safety
☐	FLD10 – Manual Lifting/Handling Heavy Objects	Back strain/abdomen/arm/leg muscle/joint injury
☐	FLD11 – Rough Terrain	Vehicle accidents/slips/trips/falls
☐	FLD12 – Housekeeping	Slips/trips/falls/punctures/cuts/fires
☐	FLD13 – Structural Integrity	Crushing/overhead hazards/compromised floors
☐	FLD14 – Site Security, Violence Free Workplace	Bodily injury
☐	FLD16 – Pressure Systems – Compressed Gases	Mechanical injury/fire/explosion/suffocation
☐	FLD17 – Diving	Poor visibility/entanglement/drowning/cold stress
☐	FLD18 – Operation and Use of Boats	Drowning/heat/cold stress/hypothermia/falls
☐	FLD19 – Working Over Water	Drowning/frostbite/hypothermia/falls/electrocution
☒	FLD20 – Traffic	Struck by vehicle/collision
☐	FLD21 – Explosives	Explosion/fire/thermal burns
☒	FLD22 – Heavy Equipment Operation	Crushing/pinch points/overhead hazards/electrocution
☐	FLD23 – Cranes, Riggings, and Slings	Overhead hazards/electrocution
☐	FLD23A – Crane Operations – [Contractor] Responsibilities	Crane Operations – [Contractor] Responsibilities
☐	FLD23B – Cranes and Hoisting Devices – Procedures/Use	Cranes and Hoisting Devices – Procedures for Use
☐	FLD23C – Crane Rigging and Slings	Crane Rigging and Slings
☐	FLD23D – Cranes, Derricks, Rigging and Slings: Checklist	Cranes, Derricks, Rigging and Slings: Checklists
☐	FLD24 – Aerial Lifts	Overhead hazards/falls/electrocution
☐	FLD25 – Elevation and Fall Protection	Overhead hazards/falls/electrocution

FLD CHECKLIST (Check all that apply)		
	[CONTRACTOR] FLD TITLE	**DESCRIPTION**
☐	FLD26 – Ladders	Overhead hazards/falls/electrocution/slips
☐	FLD27 – Scaffolding	Slips/trips/falls/overhead hazards
☒	FLD28 – Excavating/Trenching	Crushing/falling/overhead hazards/suffocation
☐	FLD30 – Hazardous Materials	Explosions/fires from oxidizing, flam./corr. Material
☐	FLD31 – Fire Prevention and Protection Planning	Fire and explosion
☐	FLD32 – Fire Extinguishers Required	Fire
☐	FLD33 – Demolition	Overhead/electrocution/slips/trips/falls/fire
☒	FLD34 – Utilities	Electrocution/shock/thermal burns
☐	FLD35 – Electrical Safety	Electrocution/shock/thermal burns
☐	FLD36 – Welding/Cutting/Burning	Heat stress/fires/burns
☐	FLD37 – High Pressure Washers	Thermal burns/high pressure impaction/heat stress
☐	FLD38 – Hand and Power Tools	Smashing body parts/pinching/cuts/electrocution
☒	FLD43A – Animals	Biological Hazards at site
☒	FLD43B – Stinging and Biting Insects	Biological Hazards at site
☐	FLD43C – Molds and Fungi	Biological Hazards at site
☒	FLD43D – Hazardous Plants	Biological Hazards at site
☐	FLD43E – Etiologic Agents	Biological Hazards at site
☒	FLD44 – Biological Hazards – Bloodborne Pathogens Exposure Control Plan – First Aid Providers	Biological Hazards/BBP at site/First Aid Providers
☐	FLD45 – Biological Hazards – Bloodborne Pathogens Exposure Control Plan – Work With Infectious Waste	Infectious Waste at site/BBP/ at site/Infectious Waste
☐	FLD46 – Control of Exposure to Lead	Lead poisoning
☐	FLD47 – Clearing, Grubbing and Logging Operations	Cuts/ dismemberment/gouges
☐	FLD48 – Federal, State, Local Regulatory Agency Inspections	Not applicable
☐	FLD49 – Safe Storage of Samples	Exposure to hazardous materials/waste
☐	FLD50 – Cadmium Exposure Control Plan	Exposure Control
☐	FLD51 – Process Safety Procedure	Safety Procedure

FLD CHECKLIST (Check all that apply)		
	[CONTRACTOR] FLD TITLE	**DESCRIPTION**
☒	FLD52 – Asbestos Exposure Control Plan	Asbestos Exposure
☐	FLD53 – Hexavalent Chromium Exposure Control Plan	Exposure Control Plan
☐	FLD54 – Benzene Exposure Control Plan	Exposure Control Plan
☐	FLD55 – Working with Hydrofluoric Acid	Hydrofluoric Exposure
☐	FLD56 – Drilling Safety	Electrocution/overhead hazards/pinch points
☒	FLD57 – Motor Vehicle Safety	Driving Safely when performing [CONTRACTOR] activities
☐	FLD58 – Drum Handling Operations	Improper Handling of Hazardous Drums
☒	FLD59 – Decontamination	Minimize Employee Contact with Hazardous Substances
☐	FLD60 – Employee Duty Schedule/Basic Fatigue Management Plan	Basic Fatigue Management Plan
☐	FLD61 – Gasoline Contaminant Exposure	Gasoline Contaminant Exposure
☐	FLD62 – Automatic External Defibrillator (AED) Guidelines	AED Program Guidelines
☐	FLD63 – Handheld X-Ray Fluorescence (XRF) Analyzers	XRF Analyzer Guidelines
☐	FLD64 – Employees Working Alone	Isolated Working Conditions
☒	FLD65 – Respiratory Protection	APR, SCBA, Air-line Program Guidelines

Attachment E – SDS for Chemical Products at the Jobsite

IF APPLICABLE

APPENDIX F

CITY OF BOZEMAN STREET CUT PERMIT GUIDANCE DOCUMENT

BOZEMAN MT

Street Cut Permit Guidance Document

The following document is for guidance purposes only. The applicant shall read and understand the relevant references listed below.

Below is a description of the permit review process, followed by applicant and City actions needed to move the process forward. This document also includes relevant references.

For this guidance document, the Applicant and the Permittee are the same party.

Description

A Street Cut Permit is required for all situations where a contractor will be cutting through an existing street or alley surface within City of Bozeman. For information regarding this permit please visit the City's webpage https://www.bozeman.net/services/development-center. Make sure to have all relevant permit information available before you proceed to fill out permit.

General Information

- Pedestrian ramps required at all street corners.
- Before excavating, call 1-800-424-5555 (or 811) for utility locates.
- Inspections are to be scheduled Monday through Friday only, during regular business hours. Call the City of Bozeman Engineering Department at (406) 582-2280 to schedule. Allow a minimum of twenty-four (24) hours prior to time inspection is needed for scheduling.
- All construction work and materials used shall comply with the City of Bozeman Design and Construction Standards.
- This permit application may necessitate the provision for supplementary information.

Permit Conditions

1. Term: The permit shall be in full force and effect from the date hereof until revoked as herein provided.
2. Permit Fee: The permit may be issued only after all approval signatures are obtained and any applicable permit fees, as established by City Commission resolution, are paid by the Permittee.
3. Revocation: The permit may be revoked by the City upon giving thirty (30) days' notice to the Permittee by ordinary mail, directed to the address shown in the application hereto attached; however, the City reserves the right to revoke this permit without giving said notice in the event Permittee fails to comply with any of the conditions or terms set forth herein.
4. Work Standards: All work shall be done in accordance with the Montana Public Works Standard Specifications (MPWSS), 6th Edition, April 2010, as modified by the City of Bozeman. City modifications to the MPWSS can be obtained at the office of the City Engineer, 20 East Olive Street, Bozeman, Montana, or on the City's website, www.bozeman.net.
5. Commencement of Work: Upon approval of the Permit, the Permittee shall notify the Street Superintendent 48 hours in advance of any work.

6. Pavement Degradation Fees: Permits for excavations in paved streets or alleys shall be subject to a pavement degradation fee. Newly constructed streets, reconstructed streets, or streets that have been repaved shall be considered protected streets for a period of five (5) years following construction and shall be subject to an additional pavement degradation fee surcharge. Pavement degradation fees or surcharges shall not be required for the following: emergency utility repair work, installation of new fire sprinkler service lines required by the Fire Marshall, if no alternate connection point is available, or infrastructure improvement work being done under the City's Capital Improvement Program.
7. Lane Mitigation Fees: Closures for lane closure of any travel-way, sidewalk or shared use path, bike lane, parking lane, driving lane, or alley shall be subject to a lane mitigation fee as established by City Commission resolution. Fees will be calculated on number of days agreed on in the permit. Days beyond that, without prior approval, will be subject to overage fees.
8. City Held Harmless from Claims: In accepting this permit, the Permittee, or Permittee's successors or assignees, agrees to indemnify the City and hold it harmless from all claims, actions, liability, and damage of every kind and description which may accrue to, or be suffered by, any person or persons, corporations or property by reason of the performance of any such work, character of materials used, or manner of installations, maintenance and operation, or by the improper occupancy of said roadway right-of-way, and in case any suit or action is brought against the City and arising out of or by reason of any of the above causes, the Permittee or Permittee's successors or assignees will upon notice of the commencement of such action, defend the same at Permittee's cost and expense and satisfy any judgement which may be rendered against the City in any such suit or action. City includes its officers, employees, agents, and assigns. The Permittee shall obtain the necessary insurance coverage for the proposed excavation work as specified in Exhibit "Insurance Requirements." Permittee herby waives any rights of subrogation with regards to workers compensation coverage it may have, or may require in the future, regarding the work performed by Permittee and their subcontractors. In the event Permittee uses subcontractors to perform any portion of the work, the Permittee will obtain a "Waiver of Subrogation" regarding workers compensation from the subcontractor.
9. Street Opening Bonds: For each street cut permit, street opening bonds submitted on approved bond forms (see Exhibit "Bond Form" or bond preparer's form) shall be provided in the amount of $5000 or 100 percent of the cost of the work, whichever is greater, as surety for satisfactory completion of the work contemplated and maintenance of the completed work. The bond shall be valid for a period of at least one year following acceptance of the restoration by the City.
10. Protection of Traffic: Insofar as the interests of the City and the traveling public are concerned, all work performed under this permit shall be done in accordance with the MPWSS, 6th Edition, April 2010, as modified by the City of Bozeman. All construction zones shall be signed in accordance with the Manual of Uniform Traffic Control Devices (MUTCD).
11. Street Closures: If a street closure is approved to complete the proposed work, the following shall apply:
    a. The approved Traffic Control Plan shall be always adhered to by the Permittee, and all signs, barricades, and other traffic control devices shall be maintained in place prior to initiation of any work and until the work is completed.
    b. At least 24 hours prior to closing the street, the Permittee shall notify the Police and Fire Departments, ambulance services, property owners residing within the portion to be closed,

and if applicable, school bus operators of the intended street closure, and shall promptly notify them once the street has been reopened.

c. For closures of collector or arterial streets, the Permittee shall, in addition to "b" above, send a press release to the Bozeman Daily Chronicle newspaper and local radio stations detailing the intended street closure at least two days in advance of any work.
d. Lane Mitigation Fees will be paid before work commences per City Commission Resolution.

12. Existing Underground Utilities:
    a. It shall be the responsibility of the Permittee to contact all pertinent utility companies by calling the Utilities Underground Location Center (One Call) at 1-800-424-5555 at least two business days prior to starting any excavation.
    b. Any underground utility which is damaged by the Permittee shall be repaired at the Permittee's expense in the manner and means prescribed by the authorized representative of the utility owner.
    c. The costs incurred by the City to repair any damaged utility shall be paid by the Permittee.
13. Street and paved alley restoration:
    a. Trenches shall be compacted to 95 percent density in accordance with AASHTO T-99 (or T-180 as appropriate). When the street cut is to be made in a collector or arterial street, an area of poor subgrade materials, or any other area requiring immediate closure and resurfacing of the street, non-shrink backfill shall be used. The asphalt patch over non-shrink backfill shall be four (4) inches in depth placed in two lifts. Imported structural backfill may be substituted for non-shrink backfill only upon written approval by the City Engineer.
    b. Concrete curb, gutter and sidewalks shall be repaired according to the *City of Bozeman Design and Construction Standards*.
    c. All asphalt patches shall be made with hot mix asphalt within forty-eight hours of trench backfilling. The thickness of the asphalt patch shall be equal to or exceed that of the existing roadway but shall be no less than three (3) inches. If hot mix asphalt is not available, M-3000 concrete may be used but shall be removed and replaced with hot mix asphalt as soon as the local asphalt supplier company starts up the following construction season. The temporary patch shall be made within forty-eight hours off trench backfilling.
    d. Before the street cut patch is made, the existing asphalt shall be cut back as distance of one (1) foot on each side of the existing trench opening. The edge of the existing asphalt shall be tacked with SS-I or equal prior to placing the new hot mix asphalt.
    e. All street cuts shall be covered by a one (1) year warranty period commencing upon final inspection and acceptance by the City and said warranty shall extend to the City.
    f. In the event the Applicant fails to restore the street in a timely manner, the City reserves the right to have the work completed at the Applicant's expense. If defects in the patch occur within the warranty period, the City reserves the right to repair the patch at the Applicant's expense if applicant fails to make the necessary repairs within five (5) days of being notified.
14. Gravel Alley Restoration: Gravel alleys require 12 inches of compacted road mix at surface.
15. Rubbish and Debris: Upon completion of work allowed under this permit, all rubbish and debris shall be immediately removed from the right-of-way and roadway restored and left in a neat and presentable condition satisfactory to the City.
16. Inspection: The City shall have the right to inspect all work covered under the scope of this permit. All work contemplated under this permit shall be done to the satisfaction of the

authorized representative of the City, and the City hereby reserves the right to order the change of location or installation authorized by this permit at any time, said changes to be made at the sole expense of the Permittee.

17. City to be reimbursed for repairing roadway: Upon being billed therefore, Permittee agrees to promptly reimburse the City for any expense incurred in repairing surface of roadway due to settlement after installation, or for any other damage to roadway, curb, gutter, or sidewalk because of the work performed under this permit.
18. Other Conditions and/or Remarks:
    a. This permit is valid for a period of six months after the date of approval, unless otherwise extended in writing by the Director of Transportation & Engineering or their designee.
    b. One (1) lane of traffic shall be always kept open unless a Street Closure and Traffic Control Plan has been approved and uploaded indicating otherwise.
19. Potential Asbestos Along Wallace Avenue:
    a. In the event the proposed work is located on or immediately adjacent to Wallace Avenue south of Main Street (reference Exhibit "Potential Asbestos Along Wallace Avenue Notice"), the Applicant shall fill out the attached Potential Asbestos Along Wallace Avenue form and hire a Montana Accredited Asbestos Contractor/Supervisor to inspect the excavation for the presence of asbestos-containing material. It shall be the Applicant's responsibility to contact the City Engineer's office to ascertain whether such services are required and to hire an inspector with the appropriate credentials. It shall be a violation of the terms of the permit to fail to hire a Montana Accredited Asbestos Contractor/Supervisor if the Applicant is excavating within the area delineated on the map (Exhibit "Memo Re Updated GIS Map Showing Potential Asbestos Ore").
    b. The Montana Accredited Asbestos Contractor/Supervisor must be present for the first day of excavation and each additional day that a new area is excavated. Whether or not asbestos contaminated soil is encountered during the proposed work, the applicant shall fill out the attached Potential Asbestos Along Wallace Avenue form, submit this form to the City of Bozeman Street Department and the Montana Department of Environmental Quality within five days of completion of the inspection and/or asbestos removal activities.
    c. If any asbestos containing material is identified, a Montana Accredited Asbestos Abatement Contractor/Supervisor or Worker must immediately remove, transport, and dispose of the asbestos in compliance with all applicable state and federal environmental requirements, criteria, and limitations, including OSHA regulations.
    d. Any contractor intending to conduct any work in the Wallace Avenue area delineated on the map (Exhibit "Memo Re Updated GIS Map Showing Potential Asbestos Ore) must include a contingency for the discovery of asbestos within its work plan.

Applicant Actions

- Provide applicant information as requested on permit application form.
- Provide contractor information as requested on permit application form.
- Provide comprehensive project information as requested on permit application form.
- Provide certifications and signatures as requested on permit application form.
- Upload and submit required documents including:
    - 1.) Insurance certificate naming City of Bozeman as additional insured,

- 2.) Bond,
- 3.) MUTCD Compliant Traffic Control Plan,
- 4.) Notification Letter that you received after submitting your permit application,
- 5.) Screenshot or snip of the completed Street Cut fee Calculator worksheet showing the cut dimensions and indicating whether your cut is 2-, 3- or 4-sided and what the anticipated fees will be, and
- 6.) Screenshot or snip of the completed Lane Mitigation Fees worksheet indicating anticipated lane closure lengths.
- 7.) Map or picture of your work area.

City Actions

- Engineering Department staff will review the submittal for conformance with the permit submittal checklist to ensure the applicant has provided a complete package and uploaded all required files.
- After a successful completion of the pre-screen, if corrections are required or documents missing, the submittal will be returned to the applicant to resolve the issues and re-submit.
- Permit application will be distributed to appropriate City staff for review. If questions or issues arise, the permit will be sent back to the applicant for resolution.
- Once all issues have been resolved, Engineering staff will notify applicant that fees are due.
- Once fees are paid through the Engineering Permit Payments portal, Engineering staff will post a decision letter in the "Decision" folder in ProjectDox. The Applicant will receive an email stating the letter is available in the decisions folder in ProjectDox.

Relevant References

The following references are provided on the City website under the permit type heading, and should be consulted for requirements associated with this permit. Note that some of these references may change from time to time.

- *City of Bozeman Design and Construction Standards*
- Street Cut Fee Schedule
- Insurance Requirements
- Bond Form
- Potential Asbestos Along Wallace Avenue Notice
- Memorandum Re: Updated GIS Map Showing Potential Asbestos Ore," most recent dated memorandum.

Filing and Naming Criteria

The software has underlying features that do not work if these requirements are not fulfilled. Projects not complying with this section will not proceed beyond prescreen and will be returned to the applicant to correct.

Documents Folder

- Upload all documents and any additional supporting documents in the Documents Folder
- Documents may be any size

- Documents may be scans if they are legible.
- File names shall meet the following criteria:
  - The software won't accept file names exceeding 30 characters.
  - The file name shall start with a 3-digit number beginning with "001"
  - The name shall also include a brief description of the content of the file.

  Example of file naming standards:

Sheet Description	**ProjectDox File Name**
Signed Notification Letter	001 Notification Letter
MUTCD Compliant Traffic Control Plan	002 Traffic Control Plan
Street Opening Bond	003 Street Opening Bond
General Liability Insurance	004 General Liability Insurance
Automobile Liability Insurance	005 Automobile Liability Insurance
Worker's Compensation Insurance	006 Worker's Compensation Insurance
Map of Work Area	007 Map of Work Area
Snip or Screenshot of Street Cut Fee Calculator	008 Street Cut Fees Calculator
Snip or Screenshot of the Lane Mitigation Fees	009 Lane Mitigation Fees Calculator

Revisions / Resubmittals

New versions of previously submitted files must use the exact same name as the original file. The software will indicate that there is a new version.

Contact Information

For questions or changes to your permit, please call 406-582-2280.

APPENDIX G

ASBESTOS AIR MONITORING STANDARD OPERATING PROCEDURES

ASBESTOS SAMPLING

SOP#: 2015
DATE: 11/17/94
REV. #: 0.0

1.0 SCOPE AND APPLICATION

Asbestos has been used in many commercial products including building materials such as flooring tiles and sheet goods, paints and coatings, insulation, and roofing asphalts. These products and others may be found at hazardous waste sites hanging on overhead pipes, contained in drums, abandoned in piles, or as part of a structure. Asbestos tailing piles from mining operations can also be a source of ambient asbestos fibers. Asbestos is a known carcinogen and requires air sampling to assess airborne exposure to human health. This Standard Operating Procedure (SOP) provides procedures for asbestos air sampling by drawing a known volume of air through a mixed cellulose ester (MCE) filter. The filter is then sent to a laboratory for analysis. The U.S. Environmental Protection Agency/Environmental Response Team (U.S. EPA/ERT) uses one of four analytical methods for determining asbestos in air. These include: U.S. EPA's Environmental Asbestos Assessment Manual, Superfund Method for the Determination of Asbestos in Ambient Air for Transmission Electron Microscopy (TEM)[1]; U.S. EPA's Modified Yamate Method for TEM[2]; National Institute for Occupational Safety and Health (NIOSH) Method 7402 (direct method only) for TEM; and NIOSH Method 7400 for Phase Contrast Microscopy (PCM)[3]. Each method has specific sampling and analytical requirements (i.e., sample volume and flow rate) for determining asbestos in air.

The U.S. EPA/ERT typically follows procedures outlined in the TEM methods for determining mineralogical types of asbestos in air and for distinguishing asbestos from non-asbestos minerals. The Phase Contrast Microscopy (PCM) method is used by U.S. EPA/ERT as a screening tool since it is less costly than TEM. PCM cannot distinguish asbestos from non-asbestos fibers, therefore the TEM method may be necessary to confirm analytical results. For example, if an action level for the presence of fibers has been set and PCM analysis indicates that the action level has been exceeded, then TEM analysis can be used to quantify and identify asbestos structures through examination of their morphology crystal structures (through electron diffraction), and elemental composition (through energy dispersive X-ray analysis). In this instance samples should be collected for both analyses in side by side sampling trains (some laboratories are able to perform PCM and TEM analysis from the same filter). The Superfund method is designed specifically to provide results suitable for supporting risk assessments at Superfund sites, it is applicable to a wide range of ambient air situations at hazardous waste sites. U.S. EPA's Modified Yamate Method for TEM is also used for ambient air sampling due to high volume requirements. The PCM and TEM NIOSH analytical methods require lower sample volumes and are typically used indoors; however, ERT will increase the volume requirement for outdoor application.

Other Regulations pertaining to asbestos have been promulgated by U.S. EPA and OSHA. U.S. EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) regulates asbestos-containin g waste materials. NESHAP establishes management practices and standards for the handling of asbestos and emissions from waste disposal operations (40 CFR Part 61, Subparts A and M). U.S. EPA's 40 CFR 763 (July 1, 1987)[4] and its addendum 40 CFR 763 (October 30, 1987)[4] provide comprehensive rules for the asbestos abatement industry. State and local regulations on these issues vary and may be more stringent than federal requirements. The OSHA regulations in 29 CFR 1910.1001 and 29 CFR 1926.58 specify work practices and safety equipment such as respiratory protection and protective clothing when handling asbestos. The OSHA standard for an 8-hour, time-weighted average (TWA) is 0.2 fibers/cubic centimeters of air. This standard pertains to fibers with a length-to-width ratio of 3 to 1 with a fiber length >5 μm[5,6]. An action level of 0.1 fiber/cc (one-half the OSHA standard) is the level U.S. EPA has established in which employers must initiate such activities as air monitoring, employee training, and

medical surveillance[5,6].

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute U.S. EPA endorsement or recommendation for use.

2.0 METHOD SUMMARY

Prior to sampling, the site should be characterized by identifying on-site as well as off-site sources of airborne asbestos. The array of sampling locations and the schedule for sample collection, is critical to the success of an investigation. Generally, sampling strategies to characterize a single point source are fairly straightforward, while multiple point sources and area sources increase the complexity of the sampling strategy. It is not within the scope of this SOP to provide a generic asbestos air sampling plan. Experience, objectives, and site characteristics will dictate the sampling strategy.

During a site investigation, sampling stations should be arranged to distinguish spatial trends in airborne asbestos concentrations. Sampling schedules should be fashioned to establish temporal trends. The sampling strategy typically requires that the concentration of asbestos at the source (worst case) or area of concern (downwind), crosswind, as well as background (upwind) contributions be quantified. See Table 1 (Appendix A) for U.S. EPA/ERT recommended sampling set up for ambient air. Indoor asbestos sampling requires a different type of strategy which is identified in Table 2 (Appendix A). It is important to establish background levels of contaminants in order to develop a reference point from which to evaluate the source data. Field blanks and lot blanks can be utilized to determine other sources.

Much information can be derived from each analytical method previously mentioned. Each analytical method has specific sampling requirements and produce results which may or may not be applicable to a specific sampling effort. The site sampling objectives should be carefully identified so as to select the most appropriate analytical method. Additionally, some preparation (i.e., lot blanks results) prior to site sampling may be required, these requirements are specified in the analytical methods.

3.1 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

3.2 Sample Preservation

No preservation is required for asbestos samples.

3.3 Sample Handling, Container and Storage Procedures

1. Place a sample label on the cassette indicating a unique sampling number. Do not put sampling cassettes in shirt or coat pockets as the filter can pick up fibers. The original cassette box is used to hold the samples.

2. Wrap the cassette individually in a plastic sample bag. Each bag should be marked indicating sample identification number, total volume, and date.

3. The wrapped sampling cassettes should be placed upright in a rigid container so that the cassette cap is on top and cassette base is on bottom. Use enough packing material to prevent jostling or damage. Do not use vermiculite as packing material for samples. If possible, hand carry to lab.

4. Provide appropriate documentation with samples (i.e., chain of custody and requested analytical methodology).

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

Flow rates exceeding 16 liters/minute (L/min) which could result in filter destruction due to (a) failure of its physical support under force from the increased pressure drop; (b) leakage of air around the filter mount so that the filter is bypassed, or (c) damage to the asbestos structures due to increased impact velocities.

4.1 U.S. EPA's Superfund Method

4.1.1 Direct-transfer TEM Specimen Preparation Methods

Direct-Transfer TEM specimen preparation methods have the following significant interferences:

- The achievable detection limit is restricted by the particulate density on the filter, which in turn is controlled by the sampled air volume and the total suspended particulate concentration in the atmosphere being sampled.

- The precision of the result is dependent on the uniformity of the deposit of asbestos structures on the sample collection filter.

- Air samples must be collected so that they have particulate and fiber loadings within narrow ranges. If too high a particulate loading occurs on the filter, it is not possible to prepare satisfactory TEM specimens by a direct-transfer method. If too high a fiber loading occurs on the filter, even if satisfactory TEM specimens can be prepared, accurate fiber counting will not be possible.

4.1.2 Indirect TEM Specimen Preparation Methods

Indirect TEM specimen preparation methods have the following interferences:

- The size distribution of asbestos structures is modified.

- There is increased opportunity for fiber loss or introduction of extraneous contamination.

- When sample collection filters are ashed, any fiber contamination in the filter medium is concentrated on the TEM specimen grid.

It can be argued that direct methods yield an under-estimate of the asbestos structure concentration because many of the asbestos fibers present are concealed by other particulate material with which they are associated. Conversely, indirect methods can be considered to yield an over-estimate because some types of complex asbestos structures disintegrate during the preparation, resulting in an increase in the numbers of structures counted.

4.2 U.S. EPA's Modified Yamate Method for TEM

High concentrations of background dust interfere with fiber identification.

4.3 NIOSH Method for TEM

Other amphibole particles that have aspect ratios greater than 3:1 and elemental compositions similar to the asbestos minerals may interfere in the TEM analysis. Some non-amphibole minerals may give electron diffraction patterns similar to amphiboles. High concentrations of background dust interfere with fiber identification.

4.4 NIOSH Method for PCM

PCM cannot distinguish asbestos from non-asbestos fibers; therefore, all particles meeting the counting criteria are counted as total asbestos fibers. Fiber less than 0.25 um in length will not be detected by this method. High levels of non-fibrous dust particles may obscure fibers in the field of view and increase the detection limit.

5.1 EQUIPMENT/MATERIALS

5.2 Sampling Pump

The constant flow or critical orifice controlled sampling pump should be capable of a flow-rate and pumping time sufficient to achieve the desired volume of air sampled.

The lower flow personal sampling pumps generally provide a flow rate of 20 cubic centimeters/minute (cc/min) to 4 L/min. These pumps are usually battery powered. High flow pumps are utilized when flow rates between 2 L/min to 20 L/min are required. High flow pumps are used for short sampling periods so as to obtain the desired sample volume. High flow pumps usually run on AC power and can be plugged into a nearby outlet. If an outlet is not available then a generator should be obtained. The generator should be positioned downwind from the sampling pump. Additional voltage may be required if more than one pump is plugged into the same generator. Several

electrical extension cords may be required if sampling locations are remote.

The recommended volume for the Superfund method (Phase I) requires approximately 20 hours to collect. Such pumps typically draw 6 amps at full power so that 2 lead/acid batteries should provide sufficient power to collect a full sample. The use of line voltage, where available, eliminates the difficulties associated with transporting stored electrical energy.

A stand should be used to hold the filter cassette at the desired height for sampling and the filter cassette shall be isolated from the vibrations of the pump.

5.3 Filter Cassette

The cassettes are purchased with the required filters in position, or can be assembled in a laminar flow hood or clean area. When the filters are in position, a shrink cellulose band or adhesive tape should be applied to cassette joints to prevent air leakage.

5.2.1 TEM Cassette Requirements

Commercially available field monitors, comprising 25 mm diameter three-piece cassettes, with conductive extension cowls shall be used for sample collection. The cassette must be new and not previously used. The cassette shall be loaded with an MCE filter of pore size 0.45 µm, and supplied from a lot number which has been qualified as low background for asbestos determination. The cowls should be constructed of electrically conducting material to minimize electrostatic effects. The filter shall be backed by a 5 µm pore size MCE filter (Figure 1, Appendix B).

5.2.2 PCM Cassette Requirements

NIOSH Method 7400, PCM involves using a 0.8 to 1.2 µm mixed cellulose ester membrane, 25 mm diameter, 50 mm conductive cowl on cassette (Figure 2, Appendix B). Some labs are able to perform PCM and TEM analysis on the same filter; however, this should be discussed with the laboratory prior to sampling.

5.3 Other Equipment

- Inert tubing with glass cyclone and hose barb
- Whirlbags (plastic bags) for cassettes
- Tools - small screw drivers
- Container - to keep samples upright
- Generator or electrical outlet (may not be required)
- Extension cords (may not be required)
- Multiple plug outlet
- Sample labels
- Air data sheets
- Chain of Custody records

6.0 REAGENTS

Reagents are not required for the preservation of asbestos samples.

7.1 PROCEDURES

7.2 Air Volumes and Flow Rates

Sampling volumes are determined on the basis of how many fibers need to be collected for reliable measurements. Therefore, one must estimate how many airborne fibers may be in the sampling location.

Since the concentration of airborne aerosol contaminants will have some effect on the sample, the following is a suggested criteria to assist in selecting a flow rate based on real-time aerosol monitor (RAM) readings in milligrams/cubicmeter (mg/m^3).

	Concentration	Flow Rate
C Low RAM readings:	<6.0 mg/m^3	11-15. L/min
C Medium RAM readings:	>6.0 mg/m_3	7.5 L/min
C High RAM readings:	>10. mg/m^3	2.5 L/min

In practice, pumps that are available for environmental sampling at remote locations operate under a maximum load of approximately 12 L/min.

7.1.1 U.S. EPA's Superfund Method

The Superfund Method incorporates an indirect preparation procedure to provide flexibility in the amount of deposit that be can be tolerated on the sample filter and to allow for the selective concentration of asbestos prior to analysis. To minimize contributions to background contamination from asbestos present in the plastic matrices of membrane filters while allowing for sufficient quantities of asbestos to be collected, this method also requires the collection of a larger volume of air per unit area of filter than has traditionally been collected

for asbestos analysis. Due to the need to collect large volumes of air, higher sampling flow rates are recommended in this method than have generally been employed for asbestos sampling in the past. As an alternative, samples may be collected over longer time intervals. However, this restricts the flexibility required to allow samples to be collected while uniform meteorological conditions prevail.

The sampling rate and the period of sampling should be selected to yield as high a sampled volume as possible, which will minimize the influence of filter contamination. Wherever possible, a volume of 15 cubic meters (15,000 L) shall be sampled for those samples intended for analysis only by the indirect TEM preparation method (Phase 1 samples). For those samples to be prepared by both the indirect and the direct specimen preparation methods (Phase 2 samples), the volumes must be adjusted so as to provide a suitably-loaded filter for the direct TEM preparation method. One option is to collect filters at several loadings to bracket the estimated optimum loading for a particular site. Such filters can be screened in the laboratory so that only those filters closest to optimal loading are analyzed. It has been found that the volume cannot normally exceed 5 cubic meters (5000 L) in an urban or agricultural area, and 10 cubic meters (10,000 L) in a rural area for samples collected on a 25 mm filter and prepared by a direct-transfer technique.

An upper limit to the range of acceptable flow rates for this method is 15 L/min. At many locations, wind patterns exhibit strong diurnal variations. Therefore, intermittent sampling (sampling over a fixed time interval repeated over several days) may be necessary to accumulate 20 hours of sampling time over constant wind conditions. Other sampling objectives also may necessitate intermittent sampling. The objective is to design a sampling schedule so that samples are collected under uniform conditions throughout the sampling interval. This method provides for such options. Air volumes collected on Phase I samples are maximized (<16 L/min). Air volumes collected on Phase 2 samples are limited to provide optimum loading for filters to be prepared by a direct-transfer procedure.

7.1.2 U.S. EPA's Modified Yamate Method for TEM

U.S. EPA's TEM method requires a minimum volume of 560 L and a maximum volume of 3,800 L in order to obtain an analytical sensitivity of 0.005 structures/cc. The optimal volume for TEM is 1200 L to 1800 L. These volumes are determined using a 200 mesh EM grid opening with a 25-mm filter cassette. Changes in volume would be necessary if a 37-mm filter cassette is used since the effective area of a 25 mm (385 sq mm) and 37 mm (855 sq m) differ.

7.1.3 NIOSH Method for TEM and PCM

The minimum recommended volume for TEM and PCM is 400 L at 0.1 fiber/cc. Sampling time is adjusted to obtain optimum fiber loading on the filter. A sampling rate of 1 to 4 L/min for eight hours (700 to 2800 L) is appropriate in non-dusty atmospheres containing 0.1 fiber/cc. Dusty atmospheres i.e., areas with high levels of asbestos, require smaller sample volumes (<400 L) to obtain countable samples.

In such cases, take short, consecutive samples and average the results over the total collection time. For documenting episodic exposures, use high flow rates (7 to 16 L/min) over shorter sampling times. In relatively clean atmospheres where targeted fiber concentrations are much less than 0.1 fiber/cc, use larger sample volumes (3,000 to 10,000 L) to achieve quantifiable loadings. Take care, however, not to overload the filter with background dust. If > 50% of the filter surface is covered with particles, the filter may be too overloaded to count and will bias the measured fiber concentration. Do not exceed 0.5 mg total dust loading on the filter.

7.2 Calibration Procedures

In order to determine if a sampling pump is measuring the flow rate or volume of air correctly, it is necessary to calibrate the instrument. Sampling pumps should be calibrated immediately before and after each use. Preliminary calibration should be conducted using a primary calibrator such as a soap bubble type calibrator, (e.g., a Buck Calibrator, Gilibrator, or equivalent primary calibrator) with a representative filter cassette installed between the pump and the calibrator. The representative sampling cassette can be reused for calibrating other pumps that will be used for asbestos sampling. The same cassette lot used for sampling should also be used for the calibration. A sticker should be affixed to the outside of the extension cowl marked "Calibration Cassette."

A rotameter can be used provided it has been recently precalibrated with a primary calibrator. Three separate constant flow calibration readings should be obtained both before sampling and after sampling. Should the flow rate change by more than 5% during the sampling period, the average of the pre- and post-calibration rates will be used to calculate the total sample volume. The sampling pump used shall provide a non-fluctuating air-flow through the filter, and shall maintain the initial volume flow-rate to within ± 10% throughout the sampling period. The mean value of these flow-rate measurements shall be used to calculate the total air volume sampled. A constant flow or critical orifice controlled pump meets these requirements. If at any time the measurement indicates that the flow-rate has decreased by more than 30%, the sampling shall be terminated. Flexible tubing is used to connect the filter cassette to the sampling pump.Sampling pumps can be calibrated prior to coming on-site so that time is saved when performing on-site calibration.

7.2.1 Calibrating a Personal Sampling Pump with an Electronic Calibrator

1. See Manufacturer's manual for operational instructions.

2. Set up the calibration train as shown in (Figure 3, Appendix B) using a sampling pump, electronic calibrator, and a representative filter cassette. The same lot sampling cassette used for sampling should also be used for calibrating.

3. To set up the calibration train, attach one end of the PVC tubing (approx. 2 foot) to the cassette base; attach the other end of the tubing to the inlet plug on the pump. Another piece of tubing is attached from the cassette cap to the electronic calibrator.

4. Turn the electronic calibrator and sampling pump on. Create a bubble at the bottom of the flow chamber by pressing the bubble initiate button. The bubble should rise to the top of the flow chamber. After the bubble runs its course, the flow rate is shown on the LED display.

5. Turn the flow adjust screw or knob on the pump until the desired flow rate is attained.

6. Perform the calibration three times until the desired flow rate of ± 5% is attained.

7.2.2 Calibrating a Rotameter with an Electronic Calibrator

1. See manufacturer's manual for operational instructions.

2. Set up the calibration train as shown in (Figure 4, Appendix B) using a sampling pump, rotameter, and electronic calibrator.

3. Assemble the base of the flow meter with the screw provided and tighten in place. The flow meter should be mounted within 6^{o} vertical.

4. Turn the electronic calibrator and sampling pump on.

5. Create a bubble at the bottom of the flow chamber by pressing the bubble initiate button. The bubble should rise to the top of the flow chamber. After the bubble runs its course, the flow rate is shown on the LED display.

6. Turn the flow adjust screw or knob on the pump until the desired flow rate is attained.

7. Record the electronic calibrator flow rate reading and the corresponding rotameter reading. Indicate these values on the rotameter (sticker). The rotameter should be able to work within the desired flow range. Readings can also be calibrated for 10 cm^3 increments for Low Flow rotameters, 500 cm^3 increments for medium flow rotameters and 1 liter increments for high flow rotameters.

8. Perform the calibration three times until the desired flow rate of ± 5% is attained. Once on site, a secondary calibrator, i.e., rotameter may be used to calibrate sampling pumps.

7.2.3 Calibrating a Personal Sampling Pump with a Rotameter

1. See manufacturer's manual for Rotameter's Operational Instructions.

2. Set up the calibration train as shown in (Figure 5, Appendix B) using a rotameter, sampling pump, and a representative sampling cassette.

3. To set up the calibration train, attach one end of the PVC tubing (approx. 2 ft) to the cassette base; attach the other end of the tubing to the inlet plug on the pump. Another piece of tubing is attached from the cassette cap to the rotameter.

4. Assemble the base of the flow meter with the screw provided and tighten in place. The flow meter should be mounted within 6° vertical.

5. Turn the sampling pump on.

6. Turn the flow adjust screw (or knob) on the personal sampling pump until the float ball on the rotameter is lined up with the precalibrated flow rate value. A sticker on the rotameter should indicate this value.

7. A verification of calibration is generally performed on-site in the clean zone immediately prior to the sampling.

7.3. Meteorology

It is recommended that a meteorological station be established. If possible, sample after two to three days of dry weather and when the wind conditions are at 10 mph or greater. Record wind speed, wind direction, temperature, and pressure in a field logbook. Wind direction is particularly important when monitoring for asbestos downwind from a fixed source.

7.4 Ambient Sampling Procedures

7.4.1 Pre-site Sampling Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies needed.

2. Obtain necessary sampling equipment and ensure it is in working order and fully charged (if necessary).

3. Perform a general site survey prior to site entry in accordance with the site specific Health and Safety plan.

4. Once on-site the calibration is performed in the clean zone. The calibration procedures are listed in Section 7.2.

5. After calibrating the sampling pump, mobilize to the sampling location.

7.4.2 Site Sampling

1. To set up the sampling train, attach the air intake hose to the cassette base. Remove the cassette cap (Figure 6 and 7, Appendix B). The cassette should be positioned downward, perpendicular to the wind

2. If AC or DC electricity is required then turn it on. If used, the generator should be placed 10 ft. downwind from the sampling pump.

3. Record the following in a field logbook: date, time, location, sample identification number, pump number, flow rate, and cumulative time.

4. Turn the pump on. Should intermittent sampling be required, sampling filters must be covered between active periods of sampling. To cover the sample filter: turn the cassette to face upward, place the cassette cap on the cassette, remove the inlet plug from the cassette cap, attach a rotameter to the inlet opening of the cassette cap to measure the flow rate, turn off the sampling pump, place the inlet plug into the inlet opening on the cassette cap. To resume sampling: remove the inlet plug, turn on the sampling pump, attach a rotameter to measure the flow rate, remove the cassette cap, replace the inlet plug in the cassette cap and invert the cassette, face downward and perpendicular to the wind.

5. Check the pump at sampling midpoint if sampling is longer than 4 hours. The generators may need to be regased depending on tank size. If a filter darkens in appearance or if loose dust is seen in the filter, a second sample should be started.

6. At the end of the sampling period, orient the cassette up, turn the pump off.

7. Check the flow rate as shown in Section 7.2.3. When sampling open-faced, the sampling cap should be replaced before post calibrating. Use the same cassette used for sampling for post calibration (increase dust/fiber loading may have altered the flow rate.

8. Record the post flow rate.

9. Record the cumulative time or run.

10. Remove the tubing from the sampling cassette. Still holding the cassette upright, replace the inlet plug on the cassette cap and the outlet plug on the cassette base.

7.4.3. Post Site Sampling

1. Follow handling procedures in Section 3.2, steps 1-4.

2. Obtain an electronic or hard copy of meteorological data which occurred during the sampling event. Record weather: wind speed, ambient temperature, wind direction, and precipitation. Obtaining weather data several days prior to the sampling event can also be useful.

7.5 Indoor Sampling Procedures

PCM analysis is used for indoor air samples. When analysis shows total fiber count above the OSHA action level 0.1 f/cc then TEM (U.S. EPA's Modified Yamate Method) is used to identify asbestos from non-asbestos fibers.

Sampling pumps should be placed four to five feet above ground level away from obstructions that may influence air flow. The pump can be placed on a table or counter. Refer to Table 2 (Appendix A) for a summary of indoor sampling locations and rationale for selection.

Indoor sampling utilizes high flow rates to increased sample volumes (2000 L for PCM and 2800 to 4200 L for TEM) in order to obtain lower detection limits below the standard, (i.e., 0.01 f/cc or lower [PCM] and 0.005 structures/cc or lower [TEM]).

7.5.1 Aggressive Sampling Procedures

Sampling equipment at fixed locations may fail to detect the presence of asbestos fibers. Due to limited air movement, many fibers may settle out of the air onto the floor and other surfaces and may not be captured on the filter. In the past, an 8-hour sampling period was recommended to cover various air circulation conditions. A quicker and more effective way to capture asbestos fibers is to circulate the air artificially so that the fibers remain airborne during sampling. The results from this sampling option typifies worst case condition. This is referred to as aggressive air sampling for asbestos. Refer to Table 2 for sample station locations.

1. Before starting the sampling pumps, direct forced air (such as a 1-horsepower leaf blower or large fan) against walls, ceilings, floors, ledges, and other surfaces in the room to initially dislodge fibers from surfaces. This should take at least 5 minutes per 1000 sq. ft. of floor.

2. Place a 20-inch fan in the center of the room. (Use one fan per 10,000 cubic feet of room space.) Place the fan on slow speed and point it toward the ceiling.

3. Follow procedures in Section 7.4.1 and 7.4.2 (Turn off the pump and then the fan(s) when sampling is complete.).

4. Follow handling procedures in Section 3.2, steps 1-4.

8.0 CALCULATIONS

The sample volume is calculated from the average flow rate of the pump multiplied by the number of minutes the pump was running (volume = flow rate X time in minutes). The sample volume should be submitted to the laboratory and identified on the chain of custody for each sample (zero for lot, field and trip blanks).

The concentration result is calculated using the sample volume and the numbers of asbestos structures reported after the application of the cluster and matrix counting criteria.

9.1 QUALITY ASSURANCE/ QUALITY CONTROL

Follow all QA/QC requirements from the laboratories as well as the analytical methods.

9.2 TEM Requirements

1. Examine lot blanks to determine the background asbestos structure concentration.

2. Examine field blanks to determine whether there is contamination by extraneous asbestos structures during specimen preparation.

3. Examine of laboratory blanks to determine if contamination is being introduced during critical phases of the laboratory program.

4. To determine if the laboratory can satisfactorily analyze samples of known asbestos structure concentrations, reference filters shall be examined. Reference filters should be maintained as part of the laboratory's Quality Assurance program.

5. To minimize subjective effects, some specimens should be recounted by a different microscopist.

6. Asbestos laboratories shall be accredited by the National Voluntary Laboratory Accreditation Program.

7. At this time, performance evaluation samples for asbestos in air are not available for Removal Program Activities.

9.3 PCM Requirements

1. Examine reference slides of known concentration to determine the analyst's ability to satisfactorily count fibers. Reference slides should be maintained as part of the laboratory's quality assurance program.

2. Examine field blanks to determine if there is contamination by extraneous structures during sample handling.

3. Some samples should be relabeled then submitted for counting by the same analyst to determine possible bias by the analyst.

4. Participation in a proficiency testing program such as the AIHA-NIOSH proficiency analytical testing (PAT) program.

10.0 DATA VALIDATION

Results of quality control samples will be evaluated for contamination. This information will be utilized to qualify the environmental sample results accordingly with the project's data quality objectives.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA, and corporate health and safety procedures. More specifically, when entering an unknown situation involving asbestos, a powered air purifying respirator (PAPR) (full face-piece) is necessary in conjunction with HEPA filter cartridges. See applicable regulations for action level, PEL, TLV, etc. If previous sampling indicates asbestos concentrations are below personal health and safety levels, then Level D personal protection is adequate.

12.1 REFERENCES

(1) Environmental Asbestos Assessment Manual, Superfund Method for the Determination of Asbestos in Ambient Air, Part 1: Method, EPA/540/2-90/005a, May 1990, and Part 2: Technical Background Document, EPA/540/2-90/005b, May 1990.

(2) Methodology for the Measurement of Airborne Asbestos by Electron Microscopy, EPA's Report No. 68-02-3266, 1984, G. Yamate, S.C. Agarwal, and R. D. Gibbons.

(3) National Institute for Occupational Safety and Health. NIOSH Manual of Analytical Method. Third Edition. 1987.

(4) U.S. Environmental Protection Agency. Code of Federal Regulations 40 CFR 763. July 1, 1987. Code of Federal Regulations 40 CFR 763 Addendum. October 30, 1987.

(5) U.S. Environmental Protection Agency. Asbestos-Containing Materials in Schools; Final Rule and Notice. 52 FR 41826.

(6) Occupational Safety and Health Administration. Code of Federal Regulations 29 CFR 1910.1001. Washington, D.C. 1987.

APPENDIX A

Tables

TABLE 1.

SAMPLE STATIONS FOR OUTDOOR SAMPLING

Sample Station Location	Sample Numbers	Rationale
Upwind/Background[1]	Collect a minimum of two simultaneous upwind/background samples 30° apart from the prevailing windlines.	Establishes background fiber levels.
Downwind	Deploy a minimum of 3 sampling stations in a 180 degree arc downwind from the source.	Indicates if asbestos is leaving the site.
Site Representative and/or Worst Case	Obtain one site representative sample which shows average condition on-site or obtain worst case sample (optional).	Verify and continually confirm and document selection of proper levels of worker protection.

[1] More than one background station may be required if the asbestos originates from different sources.

APPENDIX A (Cont'd)

Tables

TABLE 2

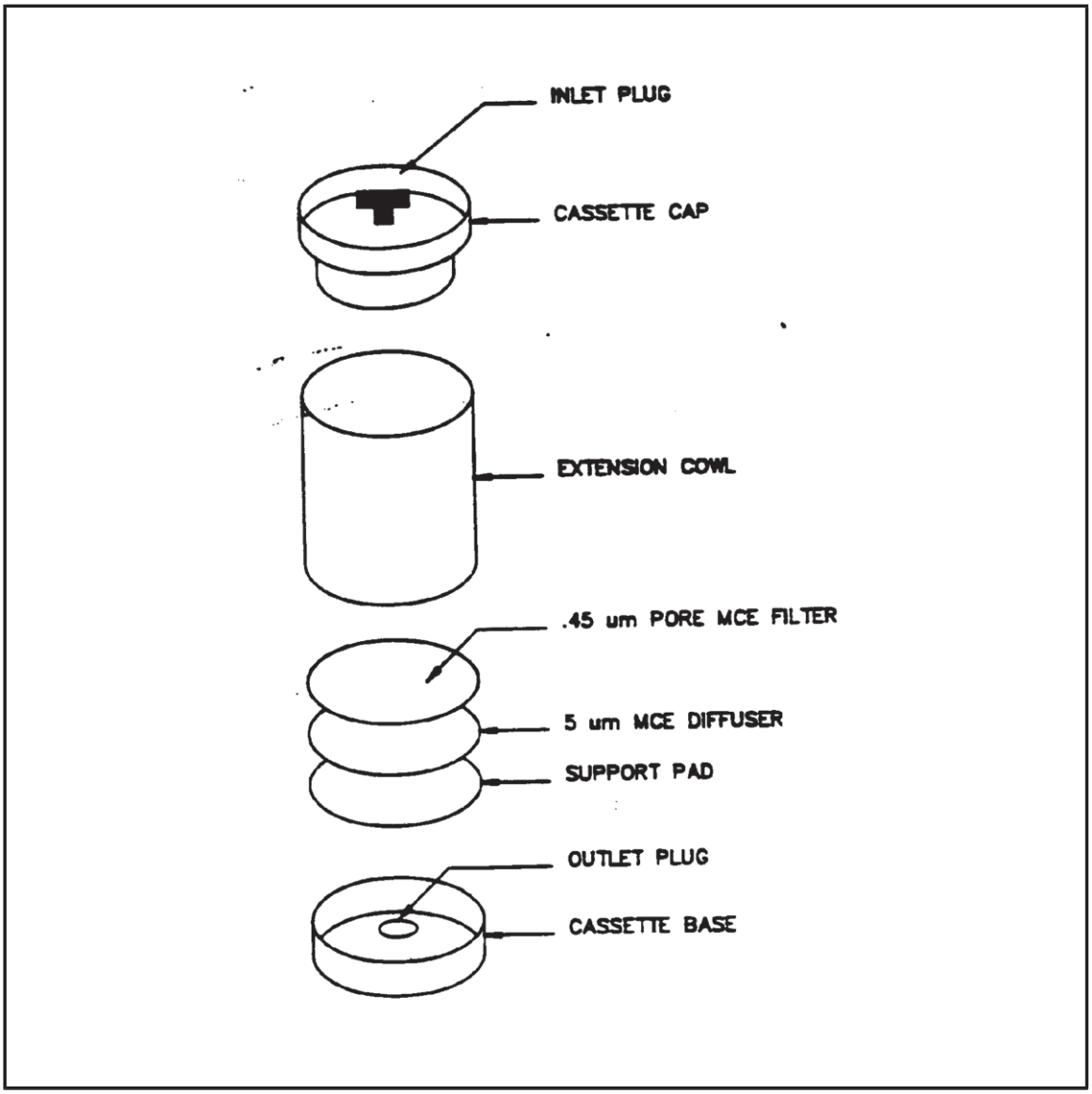
SAMPLE STATIONS FOR INDOOR SAMPLING

Sample Station Location	Sample Numbers	Rationale
Indoor Sampling	If a work site is a single room, disperse 5 samplers throughout the room. If the work site contains up to 5 rooms, place at least one sampler in each room. If the work site contains more than 5 rooms, select a representative sample of the rooms.	Establishes representative samples from a homogeneous area.
Upwind/Background	If outside sources are suspected, deploy a minimum of two simultaneous upwind/background samples 30° apart from the prevailing windlines.	Establish whether indoor asbestos concentrations are coming from an outside source.
Worst Case	Obtain one worst case sample, i.e., aggressive sampling (optional).	Verify and continually confirm and document selection of proper levels of worker protection.

APPENDIX B

Figures

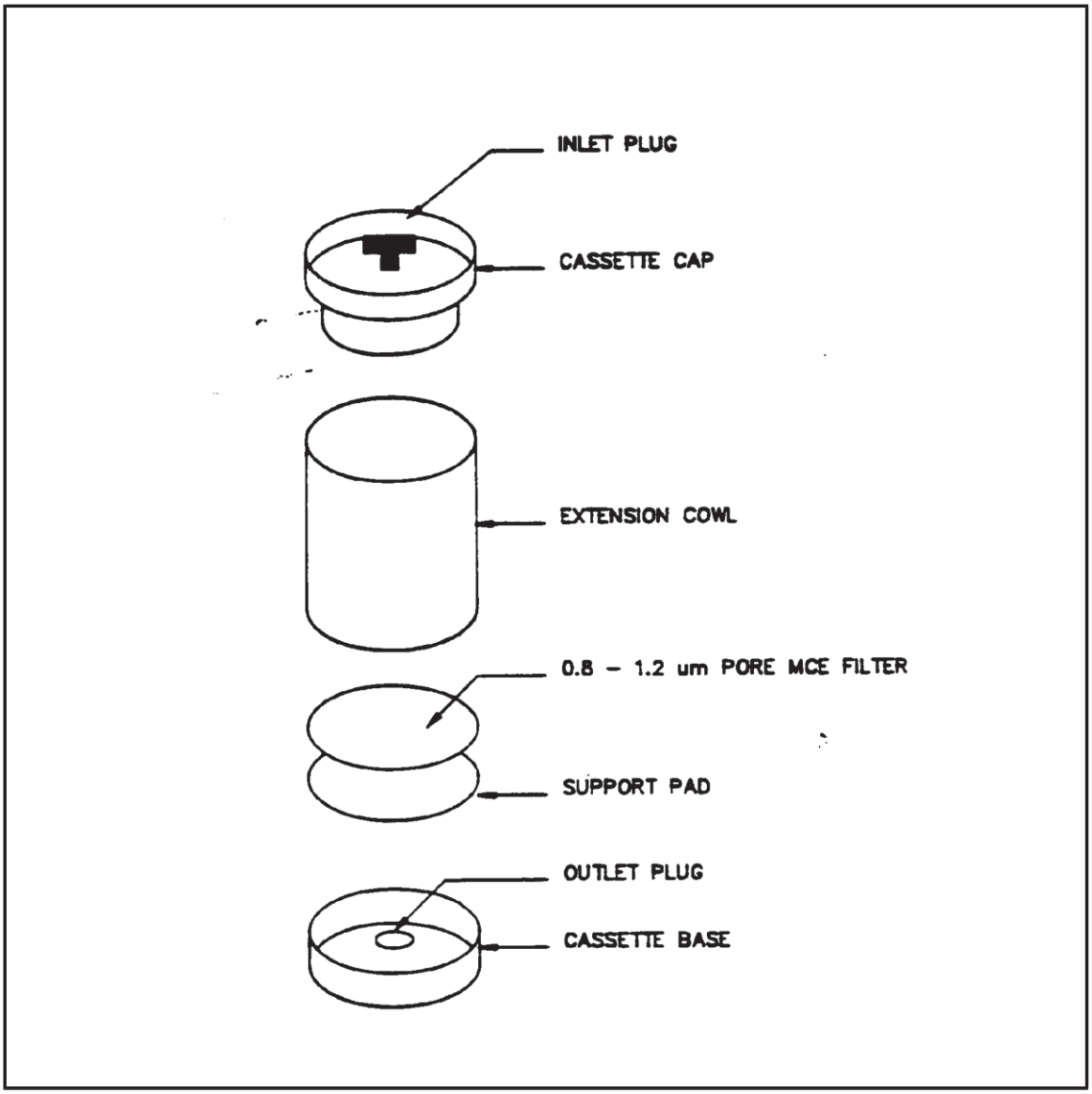
FIGURE 1. Transmission Electron Microscopy Filter Cassette



APPENDIX B (Cont'd)

Figures

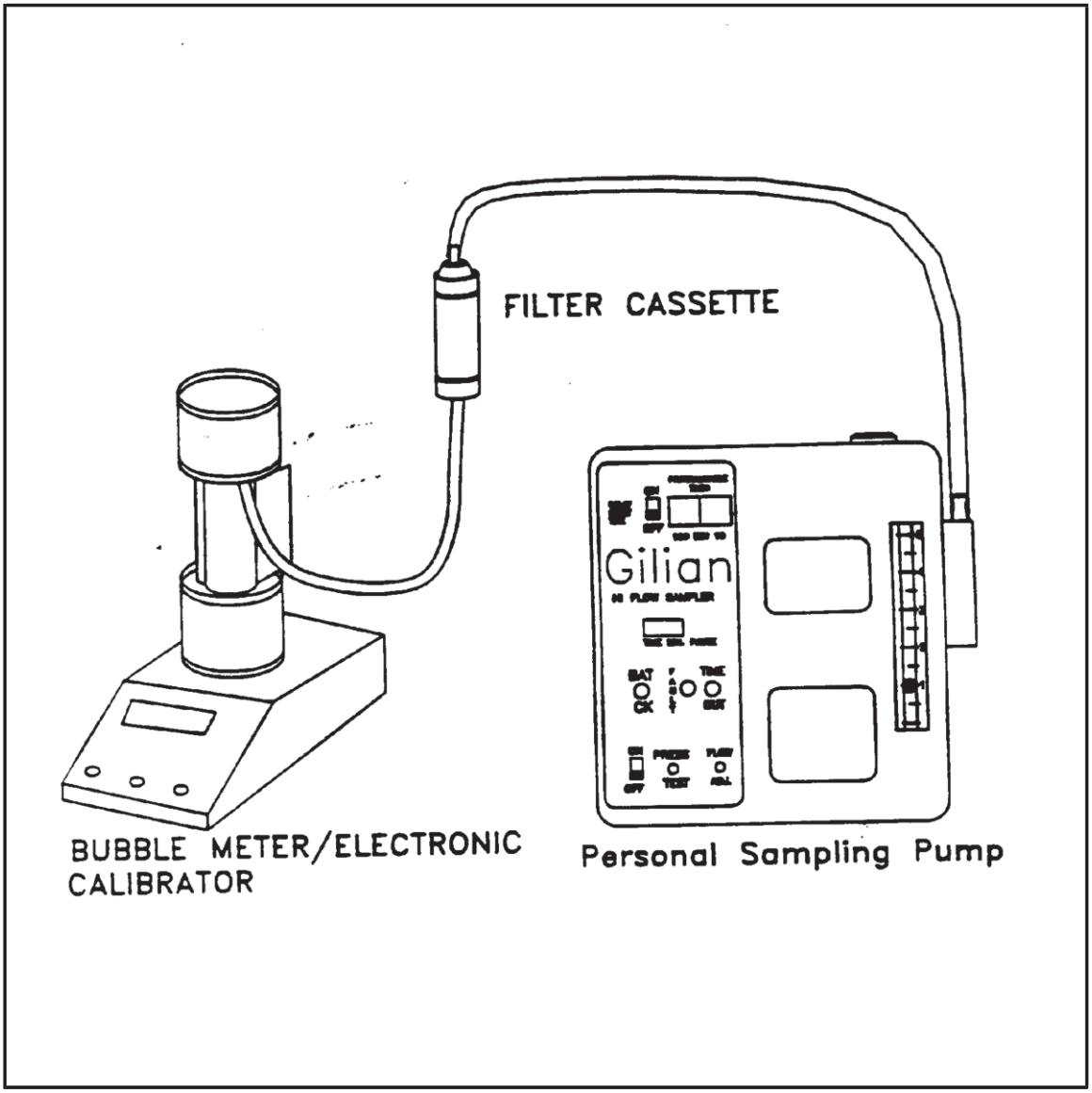
FIGURE 2. Phase Contrast Microscopy Filter Cassette



APPENDIX B (Cont'd)

Figures

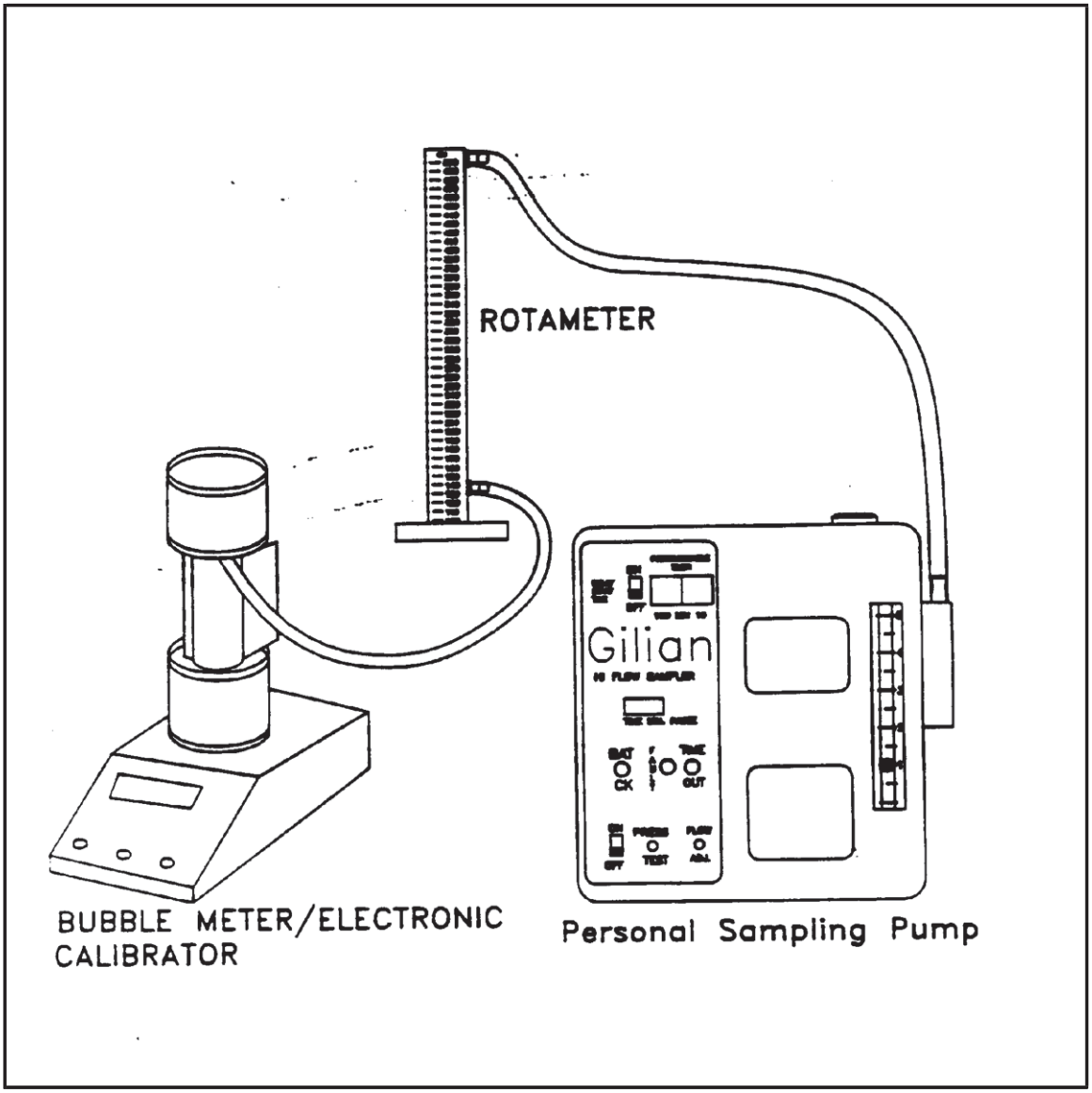
FIGURE 3. Calibrating a Personal Sampling Pump with a Bubble Meter



APPENDIX B (Cont'd)

Figures

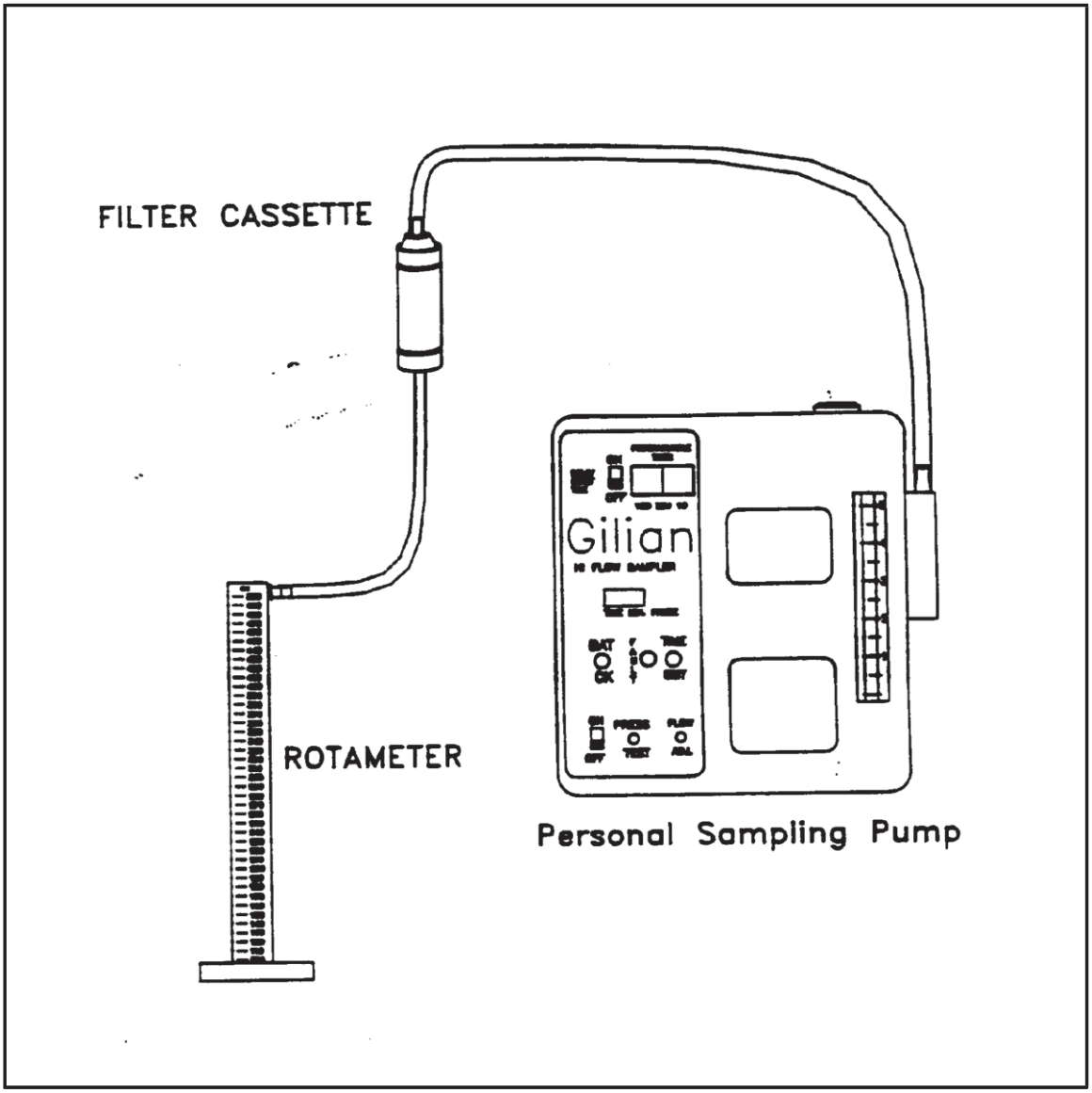
FIGURE 4. Calibrating a Rotameter with a Bubble Meter



APPENDIX B (Cont'd)

Figures

FIGURE 5. Calibrating a Sampling Pump with a Rotameter



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Figures

FIGURE 6. Personal Sampling Train for Asbestos

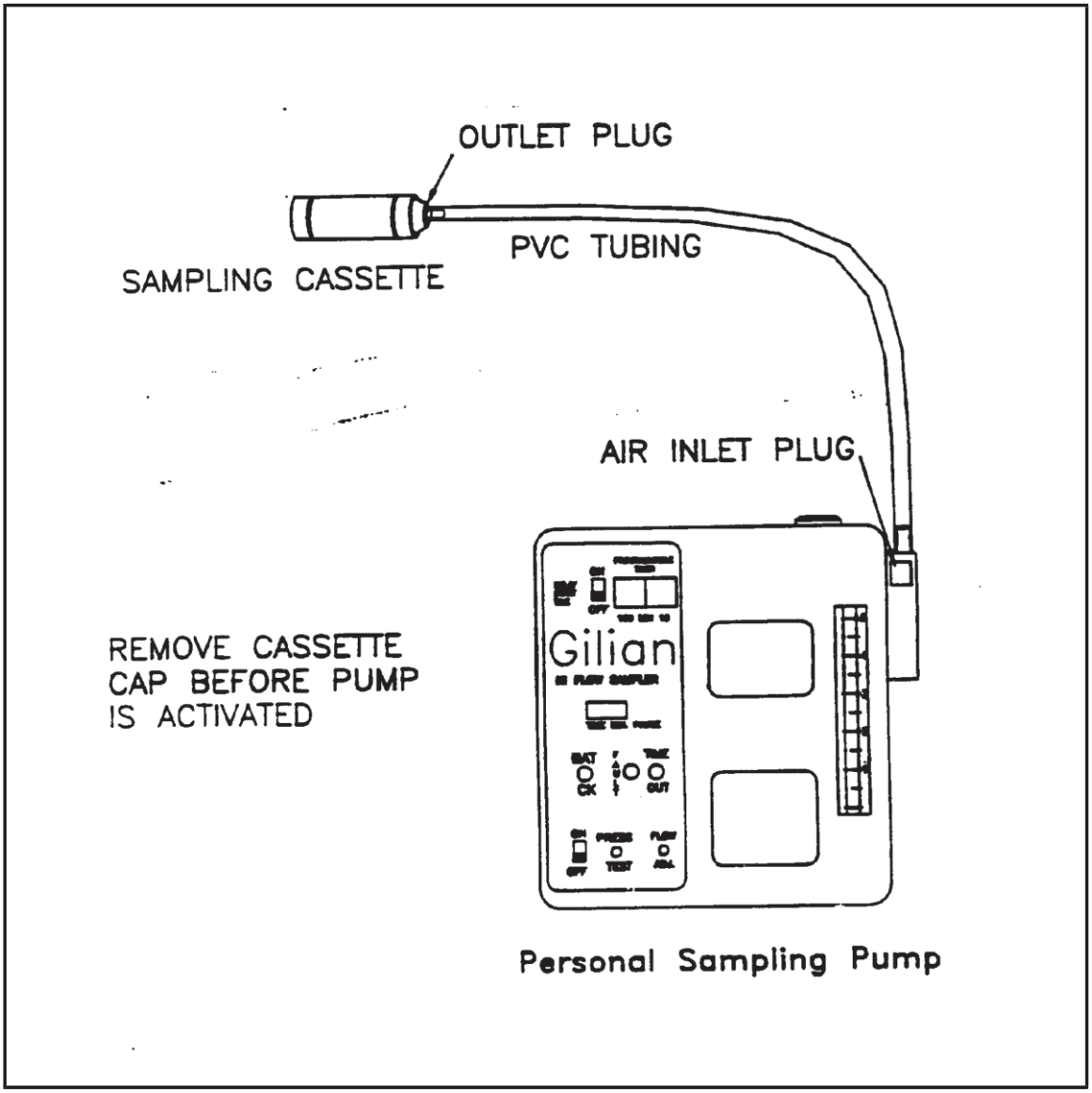

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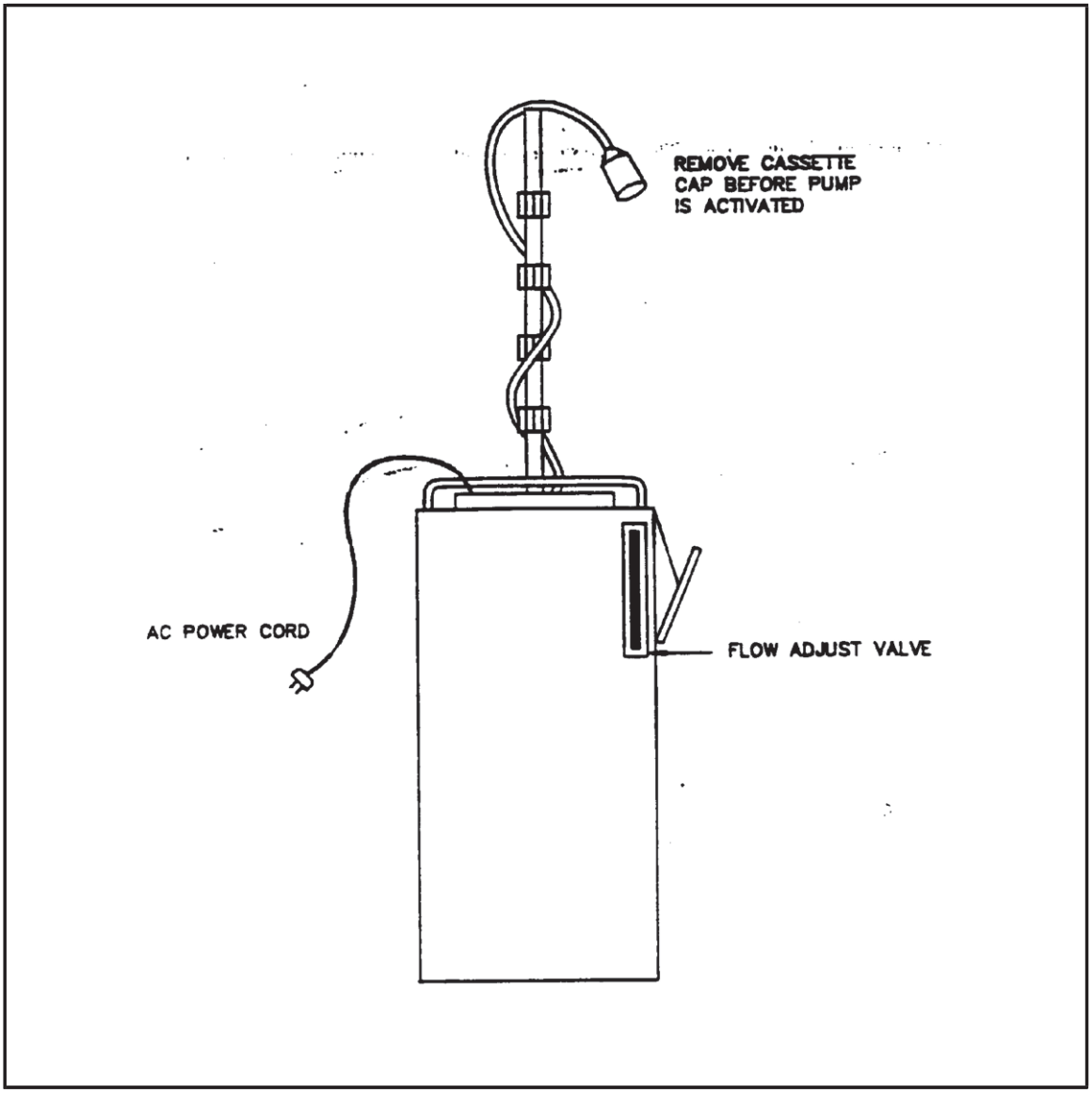
FIGURE 7. High Flow Sampling Train for Asbestos



NIOSH METHOD 7402 TEM AIR

ASBESTOS by TEM 7402

FORMULA: Various MW: Various CAS: Various RTECS: Various

METHOD: 7402 **EVALUATION: PARTIAL** **Issue 1: 15 May 1989**
Issue 2: 15 August 1994

OSHA : 0.1 asbestos fibers (>5 µm long)/cc; 1 f/cc/30 min excursion; carcinogen
MSHA: 2 asbestos fibers/cc
NIOSH: 0.1 f/cc (fibers > 5 µm long)/400 L; carcinogen
ACGIH: 0.2 crocidolite; 0.5 amosite; 2 chrysotile and other asbestos, fibers/cc; carcinogen

PROPERTIES: solid, fibrous, crystalline, anistropic

SYNONYMS [CAS#]: actinolite [77536-66-4] or ferroactinolite [15669-07-5]; amosite [12172-73-5]; anthophyllite [77536-67-5]; chrysotile [12001-29-5]; serpentine [18786-24-8]; crocidolite [12001-28-4]; tremolite [77536-68-6]; amphibole asbestos [1332-21-4].

SAMPLING

SAMPLER: FILTER (0.45- to 1.2-µm cellulose ester membrane, 25-mm diameter; conductive cassette)

FLOW RATE: 0.5 to 16 L/min

VOL-MIN*: 400 L @ 0.1 fiber/cc
-MAX*: (step 4, sampling)
*Adjust for 100 to 1300 fibers/mm^2

SHIPMENT: routine (pack to reduce shock)

SAMPLE STABILITY: stable

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: 80 to 100 fibers counted

BIAS: not determined

OVERALL PRECISION ($\hat{S}_{rT}$): see EVALUATION OF METHOD

ACCURACY: not determined

MEASUREMENT

TECHNIQUE: MICROSCOPY, TRANSMISSION ELECTRON (TEM)

ANALYTE: asbestos fibers

SAMPLE PREPARATION: modified Jaffe wick

EQUIPMENT: transmission electron microscope; energy dispersive X-ray system (EDX) analyzer

CALIBRATION: qualitative electron diffraction; calibration of TEM magnification and EDX system

RANGE: 100 to 1300 fibers/mm^2 filter area [1]

ESTIMATED LOD: 1 confirmed asbestos fiber above 95% of expected mean blank value

PRECISION ($\hat{S}_r$): 0.28 when 65% of fibers are asbestos; 0.20 when adjusted fiber count is applied to PCM count [2].

APPLICABILITY: The quantitative working range is 0.04 to 0.5 fiber/cc for a 1000-L air sample. The LOD depends on sample volume and quantity of interfering dust, and is <0.01 fiber/cc for atmospheres free of interferences. This method is use d to determine asbestos fibers in the optically visible range and is intended to complement the results obtained by phase con trast microscopy (Method 7400).

INTERFERENCES: Other amphibole particles that have aspect ratios greater than 3:1 and elemental compositions similar to the asbestos minerals may interfere in the TEM analysis. Some non-amphibole minerals may give electron diffraction patterns similar to amphiboles. High concentrations of background dust interfere with fiber identification. Some non-asbestos amphibole m inerals may give electron diffraction patterns similar to asbestos amphiboles.

OTHER METHODS: This method is designed for use with Method 7400 (phase contrast microscopy).

REAGENTS:

1. Acetone. (See SPECIAL PRECAUTIONS.)

EQUIPMENT:

1. Sampler: field monitor, 25-mm, three-piece cassette with ca. 50-mm electrically-conductive extension cowl, cellulose ester membrane filter, 0.45- to 1.2-µm pore size, and backup pad.
   NOTE 1: Analyze representative filters for fiber background before use. Discard the filter lot if mean count is >5 fibers/100 fields. These are defined as laboratory blanks.
   NOTE 2: Use an electrically-conductive extension cowl to reduce electrostatic effects on fiber sampling and during sample shipment. Ground the cowl when possible during sampling.
   NOTE 3: 0.8-µm pore size filters are recommended for personal sampling. 0.45-µm filters are recommended for sampling when performing TEM analysis on the samples because the particles deposit closer to the filter surface. However, the higher pressure drop through these filters normally preclude their use with personal sampling pumps.
2. Personal sampling pump, 0.5 to 16 L/min, with flexible connecting tubing.
3. Microscope, transmission electron, operated at ca. 100 kV, with electron diffraction and energy-dispersive X-ray capabilities, and having a fluorescent screen with inscribed or overlaid calibrated scale (Step 15).
   NOTE: The scale is most efficient if it consists of a series of lines inscribed on the screen or partial circles every 2 cm distant from the center.
4. Diffraction grating replica with known number of lines/mm.
5. Slides, glass, pre-cleaned, 25- x 75-mm.
6. Knife, surgical steel, curved-blade.
7. Tweezers.
8. Grids, 200-mesh TEM copper, (optional: carbon-coated).
9. Petri dishes, 15-mm depth. The top and bottom of the petri dish must fit snugly together. To assure a tight fit, grind the top and bottom pieces together with an abrasive such as carborundum to produce a ground-glass contact surface.
10. Foam, clean polyurethane, spongy, 12-mm thick.
11. Filters, Whatman No. 1 qualitative paper or equivalent, or lens paper.
12. Vacuum evaporator.
13. Cork borer, (about 8-mm).
14. Pen, waterproof, marking.
15. Reinforcement, page, gummed.
16. Asbestos standard bulk materials for reference; e.g. SRM #1866, available from the National Institute of Standards and Technology.
17. Carbon rods, sharpened to 1 mm x 8 mm.
18. Microscope, light, phase contrast (PCM), with Walton-Beckett graticule (see method 7400).
19. Grounding wire, 22-gauge, multi-strand.
20. Tape, shrink- or adhesive-.

SPECIAL PRECAUTIONS: Acetone is extremely flammable (flash point = 0 °F). Take precautions not to ignite it. Heating of acetone must be done in a fume hood using a flameless, spark-free heat source. Asbestos is a confirmed human carcinogen. Handle only in a well-ventilated fume hood.

SAMPLING:

1. Calibrate each personal sampling pump with a representative sampler in line.
2. For personal sampling, fasten sampler to worker's lapel near worker's mouth. Remove the top cover from cowl extension ("open-face") and orient sampler face down. Wrap joint between extender and monitor body with tape to help hold the cassette together and provide a marking surface to identify the cassette. Where possible, especially at low %RH, attach sampler to electrical ground to reduce electrostatic effects during sampling.
3. Submit at least two field blanks (or 10% of the total samples, whichever is greater) for each set of samples. Remove top covers from the field blank cassettes and store top covers and cassettes in a clean area (e.g., closed bag or box) during sampling. Replace top covers when sampling is completed.
4. Sample at 0.5 to 16 L/min [3]. Adjust sampling rate, Q (L/min), and time, t (min), to produce fiber density, E, of 100 to 1300 fibers/mm ^{2} [$3.85 \cdot 10^4$ to $5 \cdot 10^5$ fibers per 25-mm filter with effective collection area (A_c = 385 mm^2)] for optimum accuracy. Do not exceed ca. 0.5 mg total dust loading on the filter. These variables are related to the action level (one-half the current standard), L (fibers/cc), of the fibrous aerosol being sampled by:

$$t = \frac{A_c \cdot E}{Q \cdot L \cdot 10^3}, \text{ min.}$$

   NOTE: The purpose of adjusting sampling times is to obtain optimum fiber loading on the filter. A sampling rate of 1 to 4 L/min for 8 h (700 to 2800 L) is appropriate in atmospheres containing ca. 0.1 fiber/cc in the absence of significant amounts of non-asbestos dust. Dusty atmospheres require smaller sample volumes ($\leq$400 L) to obtain countable samples. In such cases take short, consecutive samples and average the results over the total collection time. For documenting episodic exposures, use high rates (7 to 16 L/min) over shorter sampling times. In relatively clean atmospheres, where targeted fiber concentrations are much less than 0.1 fiber/cc, use larger sample volumes (3000 to 10000 L) to achieve quantifiable loadings. Take care, however, not to overload the filter with background dust [3].
5. At the end of sampling, replace top cover and small end caps.
6. Ship samples upright with conductive cowl attached in a rigid container with packing material to prevent jostling or damage.
   NOTE: Do not use untreated polystyrene foam in the shipping container because electrostatic forces may cause fiber loss from sample filter.

SAMPLE PREPARATION:

7. Remove circular sections from any of three quadrants of each sample and blank filter using a cork borer [4]. The use of three grid preparations reduces the effect of local variations in dust deposit on the filter.
8. Affix the circular filter sections to a clean glass slide with a gummed page reinforcement. Label the slide with a waterproof marking pen.
   NOTE: Up to eight filter sections may be attached to the same slide.
9. Place the slide in a petri dish which contains several paper filters soaked with 2 to 3 mL acetone. Cover the dish. Wait 2 to 4 min for the sample filter(s) to fuse and clear.
   NOTE: The "hot block" clearing technique [5] of Method 7400 or the DMF clearing technique [6] may be used instead of steps 8 and 9.
10. Transfer the slide to a rotating stage inside the bell jar of a vacuum evaporator. Evaporate a 1-by 5-mm section of a graphite rod onto the cleared filter(s). Remove the slide to a clean, dry, covered petri dish [4].
11. Prepare a second petri dish as a Jaffe wick washer with the wicking substrate prepared from filter or lens paper placed on top of a 12-mm thick disk of clean, spongy polyurethane foam [7].

Cut a V-notch on the edge of the foam and filter paper. Use the V-notch as a reservoir for adding solvent.

NOTE: The wicking substrate should be thin enough to fit into the petri dish without touching the lid.

12. Place the TEM grid on the filter or lens paper. Label the grids by marking with a pencil on the filter paper or by putting registration marks on the petri dish halves and marking with a waterproof marker on the dish lid. In a fume hood, fill the dish with acetone until the wicking substrate is saturated.

NOTE: The level of acetone should be just high enough to saturate the filter paper without creating puddles.

13. Remove about a quarter section of the carbon-coated filter from the glass slide using a surgical knife and tweezers. Carefully place the excised filter, carbon side down, on the appropriately-labeled grid in the acetone-saturated petri dish. When all filter sections have been transferred, slowly add more solvent to the wedge-shaped trough to raise the acetone level as high as possible without disturbing the sample preparations. Cover the petri dish. Elevate one side of the petri dish by placing a slide under it (allowing drops of condensed acetone to form near the edge rather than in the center where they would drip onto the grid preparation).

CALIBRATION AND QUALITY CONTROL:

14. Determine the TEM magnification on the fluorescent screen:
    a. Define a field of view on the fluorescent screen either by markings or physical boundaries.
       NOTE: The field of view must be measurable or previously inscribed with a scale or concentric circles (all scales should be metric) [7].
    b. Insert a diffraction grating replica into the specimen holder and place into the microscope. Orient the replica so that the grating lines fall perpendicular to the scale on the TEM fluorescent screen. Ensure that goniometer stage tilt is zero.
    c. Adjust microscope magnification to 10,000X. Measure the distance (mm) between the same relative positions (e.g., between left edges) of two widely-separated lines on the grating replica. Count the number of spaces between the lines.
       NOTE: On most microscopes the magnification is substantially constant only within the central 8- to 10-cm diameter region of the fluorescent screen.
    d. Calculate the true magnification (M) on the fluorescent screen:

$$m = \frac{X \cdot G}{Y}$$

       where: X = total distance (mm) between the two grating lines;
              G = calibration constant of the grating replica (lines/mm);
              Y = number of grating replica spaces counted
    e. After calibration, note the apparent sizes of 0.25 and 5.0 µm on the fluorescent screen. (These dimensions are the boundary limits for counting asbestos fibers by phase contrast microscopy.)
15. Measure 20 grid openings at random on a 200-mesh copper grid by placing a grid on a glass slide and examining it under the PCM. Use the Walton-Beckett graticule to measure the grid opening dimensions. Calculate an average graticule field dimension from the data and use this number to calculate the graticule field area for an average grid opening.
    NOTE: A grid opening is considered as one graticule field.
16. Obtain reference selected area electron diffraction (SAED) or microdiffraction patterns from standard asbestos materials prepared for TEM analysis.
    NOTE: This is a visual reference technique. No quantitative SAED analysis is required [7]. Microdiffraction may produce clearer patterns on very small fibers or fibers partially obscured by other material.
    a. Set the specimen holder at zero tilt.

b. Center a fiber, focus, and center the smallest field-limiting aperture on the fiber. Obtain a diffraction pattern. Photograph each distinctive pattern and keep the photo for comparison to unknowns.

NOTE: Not all fibers will present diffraction patterns. The objective lens current may need adjustment to give optimum pattern visibility. There are many more amphiboles which give diffraction patterns similar to the analytes named on p. 7402-1. Some, but not all, of these can be eliminated by chemical separations. Also, some non-amphiboles (e.g., pyroxenes, some talc fibers) may interfere.

17. Acquire energy-dispersive X-ray (EDX) spectra on approximately 5 fibers having diameters between 0.25 and 0.5 µm of each asbestos variety obtained from standard reference materials [7].

NOTE: The sample may require tilting to obtain adequate signal. Use same tilt angle for all spectra.

a. Prepare TEM grids of all asbestos varieties.

b. Use acquisition times (at least 100 sec) sufficient to show a silicon peak at least 75% of the monitor screen height at a vertical scale of $\geq$500 counts per channel.

c. Estimate the elemental peak heights visually as follows:

(1) Normalize all peaks to silicon (assigned an arbitrary value of 10).

(2) Visually interpret all other peaks present and assign values relative to the silicon peak.

(3) Determine an elemental profile for the fiber using the elements Na, Mg, Si, Ca, and Fe. Example: 0-4-10-3-<1 [7].

NOTE: In fibers other than asbestos, determination of Al, K, Ti, S, P, and F may also be required for fiber characterization.

(4) Determine a typical range of profiles for each asbestos variety and record the profiles for comparison to unknowns.

MEASUREMENT :

18. Perform a diffraction pattern inspection on all sample fibers counted under the TEM, using the procedures given in step 17. Assign the diffraction pattern to one of the following structures:

a. chrysotile;

b. amphibole;

c. ambiguous;

d. none.

NOTE: There are some crystalline substances which exhibit diffraction patterns similar to those of asbestos fibers. Many of these, (brucite, halloysite, etc.) can be eliminated from consideration by chemistry. There are, however, several minerals (e.g., pyroxenes, massive amphiboles, and talc fibers) which are chemically similar to asbestos and can be considered interferences. The presence of these substances may warrant the use of more powerful diffraction pattern analysis before positive identification can be made. If interferences are suspected, morphology can play an important role in making positive identification.

19. Obtain EDX spectra in either the TEM or STEM modes from fibers on field samples using the procedure of step 18. Using the diffraction pattern and EDX spectrum, classify the fiber:

a. For a chrysotile structure, obtain EDX spectra on the first five fibers and one out of ten thereafter. Label the range profiles from 0-5-10-0-0 to 0-10-10-0-0 as "chrysotile."

b. For an amphibole structure, obtain EDX spectra on the first 10 fibers and one out of ten thereafter. Label profiles ca. 0-2-10-0-7 as "possible amosite"; profiles ca. 1-1-10-0-6 as "possible crocidolite"; profiles ca. 0-4-10-3-<1 as "possible tremolite"; and profiles ca. 0-3-10-0-1 as "possible anthophyllite."

NOTE: The range of profiles for the amphiboles will vary up to ± 1 unit for each of the elements present according to the relative detector efficiency of the spectrometer.

c. For an ambiguous structure, obtain EDX spectra on all fibers. Label profiles similar to the chrysotile profile as "possible chrysotile." Label profiles similar to the various amphiboles as "possible amphiboles." Label all others as "unknown" or "non-asbestos."

20. Counting and Sizing:
    a. Insert the sample grid into the specimen grid holder and scan the grid at zero tilt at low magnification (ca. 300 to 500X). Ensure that the carbon film is intact and unbroken over ca. 75% of the grid openings.
    b. In order to determine how the grids should be sampled, estimate the number of fibers per grid opening during a low-magnification scan (500 to 1000X). This will allow the analyst to cover most of the area of the grids during the fiber count and analysis. Use the following rules when picking grid openings to count [7,8]:
        (1) Light loading (<5 fibers per grid opening): count total of 40 grid openings.
        (2) Moderate loading (5 to 25 fibers per grid opening): count minimum of 40 grid openings or 100 fibers.
        (3) Heavy loading (>25 fibers per opening): count a minimum of 100 fibers and at least 6 grid openings.

        Note that these grid openings should be selected approximately equally among the three grid preparations and as randomly as possible from each grid.
    c. Count only grid openings that have the carbon film intact. At 500 to 1000X magnification, begin counting at one end of the grid and systematically traverse the grid by rows, reversing direction at row ends. Select the number of fields per traverse based on the loading indicated in the initial scan. Count at least 2 field blanks per sample set to document possible contamination of the samples. Count fibers using the following rules:
        (1) Count all particles with diameter greater than 0.25 µm that meet the definition of a fiber (aspect ratio $\geq$3:1, longer than 5 µm). Use the guideline of counting all fibers that would have been counted under phase contrast light microscopy (Method 7400). Use higher magnification (10000X) to determine fiber dimensions and countability under the acceptance criteria. Analyze a minimum of 10% of the fibers, and at least 3 asbestos fibers, by EDX and SAED to confirm the presence of asbestos. Fibers of similar morphology under high magnification can be identified as asbestos without SAED. Particles which are of questionable morphology should be analyzed by SAED and EDX to aid in identification.
        (2) Count fibers which are partially obscured by the grid as half fibers.
            NOTE: If a fiber is partially obscured by the grid bar at the edge of the field of view, count it as a half fiber only if more than 2.5 µm of fiber is visible.
        (3) Size each fiber as it is counted and record the diameter and length:
            (a) Move the fiber to the center of the screen. Read the length of the fiber directly from the scale on the screen.
                NOTE 1: Data can be recorded directly off the screen in µm and later converted to µm by computer.
                NOTE 2: For fibers which extend beyond the field of view, the fiber must be moved and superimposed upon the scale until its entire length has been measured.
            (b) When a fiber has been sized, return to the lower magnification and continue the traverse of the grid area to the next fiber.
    d. Record the following fiber counts:
        (1) f_s, f_b = number of asbestos fibers in the grid openings analyzed on the sample filter and corresponding field blank, respectively.
        (2) F_s, F_b = number of fibers, regardless of identification, in the grid openings analyzed on the sample filter and corresponding field blank, respectively.

CALCULATIONS:

21. Calculate and report the fraction of optically visible asbestos fibers on the filter, $(f_s - f_b)/(F_s - F_b)$. Apply this fraction to fiber counts obtained by PCM on the same filter or on other filters for which the TEM sample is representative. The final result is an asbestos fiber count. The type of asbestos present should also be reported.
22. As an integral part of the report, give the model and manufacturer of the TEM as well as the model and manufacturer of the EDX system.

EVALUATION OF METHOD:

The TEM method, using the direct count of asbestos fibers, has been shown to have a precision of 0.275 (s_r) in an evaluation of mixed amosite and wollastonite fibers. The estimate of the asbestos fraction, however, had a precision of 0.11 (s_r). When this fraction was applied to the PCM count, the overall precision of the combined analysis was 0.20 [2].

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METHOD REVISED BY:

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NIOSH METHOD 9002 PLM BULK

APPENDIX H

CONFIRMATION SAMPLING PLAN

SOIL CONFIRMATION SAMPLING & ANALYSIS PLAN

VOLUNTARY CLEANUP PLAN REMEDIATION PROPOSAL
CMC ASBESTOS BOZEMAN CECRA FACILITY

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May 2025

TABLE OF CONTENTS

LIST OF ACRONYMS

AHERA	Asbestos Hazard Emergency Response Act
ACW	Asbestos Contaminated Waste
CFR	Code of Federal Regulations
COC	chain-of-custody
DEQ	Department of Environmental Quality
DI	detailed investigation
DQO	Data Quality Objectives
EDS	energy dispersive spectroscopy
EPA	U.S. Environmental Protection Agency
ft^2	square feet
Grace	W.R. Grace Company
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	High Efficiency Particulate Air
ID	Identifier
NIOSH	National Institute of Occupational Safety and Health
NIST	National Institute of Standards and Technology
NVLAP	National Voluntary Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PC	Percent Complete
PLM	Polarized Light Microscopy
PLM-VE	PLM Visual Area Estimation Method
PLM-GRAV	PLM Gravimetric Method
PPE	personal protective equipment
QA	quality assurance
QC	quality control
SAP	Sampling and Analysis Plan
Site	Empire-owned property
SOP	Standard Operating Procedure
VCP-RP	Voluntary Cleanup Plan-Remediation Proposal
>	greater than
≤	less than or equal to
<	less than

1.0 INTRODUCTION

The purpose of this site-specific Soil Confirmation Sampling and Analysis Plan (SAP) is to describe the procedures to be followed when collecting data in support of the Voluntary Cleanup Plan-Remediation Proposal (VCP-RP) for the CMC Asbestos Bozeman CECRA Facility (Facility) located in Bozeman, Montana. The cleanup will be performed under the approved VCP-RP for the Empire-owned-property portion of the Facility that has been identified as having observed or potential asbestos (Site). The primary goal of this Soil Confirmation SAP is to provide data for purposes of ensuring the cleanup goals are achieved and determining if additional actions are warranted during remediation of asbestos-contaminated soils.

1.1 Data Quality Objectives

The Data Quality Objectives for collecting and analyzing soil confirmation samples are:

- The confirmation soil samples will document that all soils with visible or detected asbestos have been removed from the excavation floor and sidewalls to concentrations below at least 0.25%.
- Characterize soils that will be disposed of as solid wastes.

1.1.1 Soil Data Quality Levels

Screening analysis with confirmation laboratory will be used for waste characterization and cleanup confirmation. Each sampling grid will be visually inspected for the presence of asbestos ore and then analyzed by Polarized Light Microscopy (PLM) Method 9002.

All confirmation samples that exhibit an "asbestos not present" result will be further analyzed by the California Air Resources Board (CARB) Method 435 TEM Level B that achieves a detection limit of 0.1%. Confirmation samples that exhibit a positive result for asbestos by PLM will not be analyzed by the CARB Method 435 since a positive result indicates that cleanup levels have not been met for a particular grid or sidewall. In this case, additional soil will be excavated from the grid and the confirmation sampling procedure will be repeated.

1.2 Performance Criteria

In order to support decisions, the performance criteria for the data quality indicators (i.e., precision, bias, and sensitivity) have been defined and described below.

1.2.1 Precision

Precision is the degree of variability among individual measurements of the same sample under similar conditions.

Individual composite points for the soil duplicate samples will be collected from different locations within the same use area as the original field sample. Field duplicates will be collected at a rate of one per 20 field samples collected. Analysis of these field duplicates will provide a measure of the precision of the sampling and analysis process. For field duplicate samples, the target Relative Percent Difference is 35% for soil.

Laboratory quality control (QC) analyses will provide information on analysis reproducibility and precision. Laboratory QC analyses consist of laboratory duplicates, and analysis of standard reference materials for Polarized Light Microscopy (PLM) analysis.

1.2.2 Bias/Accuracy

Accuracy is a measure of the closeness of a reported concentration to the true value. Accuracy of analysis is ensured by certification of laboratory analysts under the National Voluntary Laboratory Accreditation Program. Participation in this national program includes quarterly samples for analytical asbestos detection. These prepared samples include a known concentration of asbestos; when the laboratory performs analysis of the samples their analysts must fall within the allowable standard deviation for the specific sample analyzed. Participation in this program ensures both precision and accuracy of both the equipment used in the analysis and the analyst's competence.

1.2.3 Representativeness

To the extent feasible, samples will be collected and analyzed in accordance with the procedures set forth in this SAP. The contractor's field QA efforts will focus on assuring that samples are representative of the conditions in the various environmental media at the time of sampling.

Laboratory QA efforts will be aimed primarily at assuring that analytical procedures provide sufficient accuracy and precision to reliably quantify contaminant levels in environmental samples. The contract laboratory also will ensure that analyzed portions are representative of each sample, and that the results obtained from analysis of each sample are comparable to those obtained from analysis of other similar samples.

This will ensure that results are representative and appropriate for ensuring that the remediation has achieved cleanup levels.

1.2.4 Comparability

The data generated under this SAP will be obtained using sample collection, preparation, and analysis methods used previously at the Site. The use of consistent methods will yield data that are comparable to previous data, allowing for comparison to other historic and future data collected at the Site.

1.2.5 Completeness

Completeness is defined as the percentage of laboratory measurements judged to be valid on a method-by-method basis. Valid data are defined as all data and/or qualified data considered to meet the DQOs for this project. The data completeness goal for soil confirmation samples is 90 percent and the goal for meeting analytical holding times is 100 percent. At the end of each sampling event, the completeness of the data will be assessed. If any data omissions are apparent, the parameter in question will be resampled and/or reanalyzed, if feasible. The laboratory results will be monitored as they become available to assess laboratory performance and its effect on data completeness requirements. Where appropriate, additional samples will be collected to ensure that laboratory performance meets completeness requirements.

2.0 SPECIAL TRAINING/CERTIFICATIONS

2.1 Field

Due to the hazardous nature of asbestos, all individuals involved in the collection, packaging, and shipment of samples must ensure that sampling is conducted in accordance with their developed health and safety guidance document(s) and must maintain appropriate documentation of training by active field personnel. Appropriate personal protective equipment (PPE) must always be worn during sampling and handling.

Weston personnel will be required, at a minimum, to complete OSHA 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) and relevant 8-hour refreshers, hold current HAZWOPER medical clearance certification (i.e. physician letter and respiratory protection training as required by 29 Code of Federal Regulations [CFR] 1910.134), and asbestos awareness training as required by 29 CFR 1910.1001.

2.2 Laboratory

All analytical laboratories participating in the analysis of asbestos samples are subject to national, local, and Site-specific certifications and requirements. To comply with those requirements, a laboratory may be accredited by the National Institute of Standards and Technology (NIST) and National Voluntary Laboratory Accreditation Program (NVLAP) for the analysis of asbestos by PLM. This includes the analysis of NIST/NVLAP standard reference materials, or other verified quantitative standards, and successful participation in at least two proficiency rounds per year.

It is the responsibility of the laboratory to follow their health and safety policies and regulations. All sample handling and preparation activities must be performed in an area fitted with a negative pressure, ventilated hood with an operating High Efficiency Particulate Air (HEPA) filtration system. Appropriate PPE must always be worn during handling.

3.0 DOCUMENTS AND RECORDS

3.1 Field Documentation

Documentation of field activities under the VCP will include sample maps, photos, and field logbooks as needed. This information and collected field information collected during oversight activities will be provided electronically.

3.1.1 Sample Location Maps

Sample maps will be created to show the locations of excavation and sample areas [in square feet (ft^2)] of soil samples. The excavation boundaries will be surveyed with a sub-meter accuracy GPS to provide accurate GIS data of the to the City of Bozeman to update Facility maps.

3.1.2 Sample Photos

Photos are taken to document site conditions at the time of the excavation and confirmation sampling.

3.1.3 Field Logbook

A field logbook should be used to document field conditions, log of the photos taken, sample location, sample IDs, sample appearance (i.e., visible asbestos), date and time of sampling, and any other relevant information about field sampling activities.

4.0 SOIL CONFIRMATION SAMPLING STUDY DESIGN

Confirmation sampling will be conducted within the Site following excavation and abatement of asbestos contaminated soils that may have visible asbestos or asbestos concentrations above cleanup levels. The primary goal of confirmation sampling is to confirm that abatement actions have met clearance criteria to concentrations below at least 0.25%.

4.1 Sampling Locations and Variables

Confirmation samples are collected in conjunction with soil excavation activities. A five-point composite confirmation sample will be collected from each cell of a 25x25 ft or 625ft^2 grid from the excavation floor as well as along all sidewalls. Separate samples should be collected from surface and subsurface soil for sidewalls, and samples from separate sidewalls should generally not be composited. If sampling along a narrow corridor, a 5-point composite sample should be collected over an area of 625 square feet. A total of 45 sampling grids (excluding field duplicates) have been identified, however, the required number of grids and sample locations will be dependent on the area excavated.

Alternate sampling strategies are considered on a Site-specific basis. For example, it may be appropriate to collect samples along radial lines extending from a known source of airborne contamination. Factors like heterogeneity of contamination must be considered in determining grid size.

5.0 SAMPLING METHODS

This section summarizes field activities that will be performed by Weston in support of confirmation sampling.

5.1 Confirmation Sampling Process

Confirmation sampling of soils left in place will be performed in all areas where asbestos-contaminated soils are removed. Confirmation sampling will be performed as excavation proceeds.

If an area is excavated to a maximum depth of six feet, the final confirmation soil sample will be collected and analyzed for informational purposes only since the excavation will not extend deeper than six feet. Samples for areas that can't be excavated due to limitations (e.g., adjacent to trees, foundations, sidewalks, etc.) are also collected for documentation purposes.

Prior to confirmation sampling, the excavation areas will be visually inspected for the presence of asbestos ore using grid-sampling techniques. The visual inspection will consist of establishing three-foot-wide parallel transects that cover the entire excavation area and walking each transect to observe visual asbestos. Any visual asbestos identified on the surface will be collected and the

location noted in the field logbook and field maps. Ore collected during visual inspection will be deposited with asbestos-containing waste (ACW) for transport and disposal.

Once a grid cell has been determined free of visible asbestos ore, a 5-point composite sample will be collected in grid cells measuring 25-feet by 25-feet (625 square feet total) from the floors and be collected every 50 linear feet from sidewalls of each excavation area. Separate samples will be collected from the surface and subsurface of sidewalls and each sidewall will be composited separately.

The lateral and vertical dimensions of each excavation will be documented in the field notebook and on field maps and will be updated on the City of Bozeman's GIS map. Each soil subsample location of the 5-point composite will be documented on the field maps and in the field notebook.

5.1.1 Sample Labeling

A unique sample ID will identify each sample collected during confirmation sampling events. This provides a tracking record to allow retrieval of information about a particular sample and to ensure that each sample is uniquely identified. Sample IDs are defined and documented on the chain-of-custody (COC) to control the samples collected, to prevent duplication in assigning sample IDs, and to prevent transcription errors in the documentation process. The labels will be affixed to the sample bag or jar for samples.

The sample label will be firmly attached to the jar and the following information will be legibly and indelibly written on the label:

- Project name;
- Unique sample ID;
- Sample media;
- Sample location (depth and grid #)
- Sampling date and time;
- Analysis requested; and
- Sample collector's initials.

For cleanup confirmation soil samples, the profile or confirmation cell identifiers shall be used, in addition to identifying whether the sample is a sidewall or excavation floor sample, as indicated by either SW or FLR. For example, a composite confirmation sample collected from cell H-9 on the excavation floor shall be labeled "H-9-Conf-FLR", while a composite confirmation sample collected from cell H-9 on sidewall shall be labeled "H-9-Conf-SW". Additionally, sidewall samples will include a depth interval for the confirmation sample identifier, which will be added after the SW. For example, a sample collected at 4-inches below the surface at cell H-9 will be labeled as "H-9-Conf-SW-4." Duplicate confirmation samples will be assigned a fictitious sample cell identifier that is higher than H-44 (the highest actual grid number).

The laboratory will add any necessary chemical preservatives prior to shipping the containers to the Facility. Samples will be properly prepared for transportation to the laboratory by placing the

samples in an adequately padded container (i.e., cooler) to maintain temperature of four (4) degrees centigrade (°C), if needed.

5.1.2 Sample Handling and Custody

Following collection, store samples in a safe location where they are protected from tampering, damage, contamination, or loss prior to shipping to the analytical laboratory. There is no hold time for samples for PLM analysis and there is no temperature requirement, but it is prudent to ship samples soon after collection.

The COC form provided by the lab contains the appropriate analysis, sample information (e.g., sample ID, analytical methods, etc.), and billing information. The COC will contain the following information:

- Unique sample ID;
- Date and time of collection;
- Location of sample collection;
- Sample Matrix;
- Analyses requested; and
- Sample collector's printed name and signature and date relinquished (bottom of COC)

If there are any deviations, please note those on the COC. When ready to ship, complete the sample collection date and time, then sign and date that you are relinquishing the samples and include the COC in a plastic zipper-top bag in the shipping container. The Chain-of-Custody documentation will be placed inside the shipping container so that it will be immediately apparent to the laboratory personnel receiving the container but will not be damaged or lost during transport. The shipping container will be sealed so that it will be obvious if the seal has been tampered with or broken.

Place samples in a sturdy shipping container, such as a cardboard box or standard beverage cooler. Containers should be just slightly larger than the volume of the samples to prevent jostling and should not be over-packed, which can compromise the container and seals. If a small amount of packing materials is needed to secure samples in the container, use bubble wrap. Seal the container closed with packing tape. A good practice is to add a custody seal to the outside and make several full passes around the container with the tape to ensure if dropped, the container and samples will remain intact. Samples will be shipped using the approved shipping provider.

After the samples are sealed and labeled, they will be packaged for transport to an approved analytical laboratory. Samples will be shipped overnight.

5.2 Field Decontamination

All items that come into contact with potentially contaminated media shall be decontaminated before use, between sampling locations and after use. However, decontamination is not required to be performed between aliquots of the 5-point composite sample. Potable water and Liquinox should be used to thoroughly rinse off soil sampling equipment (shovel, trowel) after each composite soil sample has been collected to minimize the potential for cross contamination

during soil sample collection. Decontamination water will not be captured rather it will be discharged to the ground in the vicinity of the sample area.

6.0 LABORATORY ANALYSIS

Soil sample analyses will include asbestos and **Table 1** below presents the analytical methods required for the waste soil characterization and cleanup confirmation sampling.

Table 1. Analytical Methods for Soil Confirmation Samples

Analyte	Analytical Method	Project Required Reporting Limit	Proposed Cleanup Goal
Asbestos (soil)	PLM Method 9002	0.25%	<0.25%
Asbestos (soil)	CARB 435 (TEM) Level B	0.1%	<0.1%

All containers and shipping requirements will be consistent with the laboratory protocol.

Laboratory personnel will specify any additional QC samples required.

7.0 QUALITY ASSURANCE/QUALITY CONTROL

7.1 Field Quality Assurance/Quality Control (QA/QC)

Field QA/QC activities include all processes and procedures that have been designed in this SAP to ensure that field samples are collected and documented properly, and that issues/deficiencies associated with field data collection or sample processing are quickly identified and rectified. Any sort of field issues will be communicated to DEQ to determine a resolution.

7.1.1 Field Duplicate

A field duplicate is a sample collected independently at the same sampling location during a single act of sampling. Individual composite points for the soil duplicate samples will be collected from different locations within the same use area as the original field sample. Field duplicates will be collected at a rate of one per 20 field samples collected. Analysis of these field duplicates will provide a measure of the precision of the sampling and analysis process. Field duplicates will be indistinguishable from other samples by the laboratory.

7.2 Laboratory QA/QC

Each laboratory operates under a QA program. It is the responsibility of the laboratory to maintain a documented QA program manual, or equivalent, that details the laboratory's QA program. The overall laboratory QA program consists of laboratory certifications, training, quality documents, laboratory audits, and external performance evaluation programs. Laboratories that analyze field samples must maintain required certifications and must satisfactorily complete internal training requirements to ensure that proper QA/QC practices are conducted during sample analysis.

Samples collected under this guidance will be analyzed in accordance with nationally recognized analytical procedures (i.e., Good Laboratory Practices) in order to provide analytical data of known quality and consistency. The lab must meet established criteria for accuracy, sensitivity,

bias, and precision and that they comply with specified data quality needs or requirements according to the methods.

The laboratory will notify the contractor if there are non-conformances associated with the analysis methods that may impact the data quality. Other nonconformance issues, such as those found during performance evaluations or audits, will be addressed on a case-by-case basis.

8.0 ASSESSMENT AND OVERSIGHT

The DEQ or designee may conduct field surveillance for sampling activities detailed in this SAP to assess the overall quality assurance/quality control (QA/QC) program. During the surveillance, they will examine activities and documentation to assess whether activities are conducted in conformance with the procedures and QA/QC requirements stated in this SAP/, and any other relevant governing documents. During the surveillance, the following field activities will be assessed: visual vermiculite inspections; sample collection, handling, shipping; and field documentation.

9.0 DATA REVIEW, VERIFICATION, AND VALIDATION

Key components to assessing the data collected as part of this guidance are data review, data verification, and data validation. This section outlines the general processes involved with each component.

9.1 Data Review

Data review of field sample activities will be conducted and will include ensuring proper labeling and sample handling and cross-checking that the sample IDs and sample dates have been reported correctly on the COC, noting any deviations. Field notes with any deviations will be noted and provided in a final report.

9.2 Data Verification

Data verification includes cross-checking that sample IDs and sample dates have been reported correctly, and that analytical methods and required analytical sensitivities align with the sampling requirements identified in guidance, and SOPs. The goal of data verification is to identify and correct data reporting errors. Performing regular data verification reviews will ensure that any potential data reporting issues are quickly identified and rectified to limit any impact on overall data quality. If discrepancies are found, the contractor will then notify the appropriate entity (field or laboratory) in order to correct the issue.

9.3 Data Validation

Unlike data verification, where the goal is to identify and correct data reporting errors, the goal of data validation is to evaluate overall data quality and to assign data qualifiers, as appropriate, to alert data users to potential data quality issues. The person validating the data will review the laboratory results, including the QC report, the sample receipt checklist, to identify any QA/QC issues noted in the data review. An asbestos-specific data validation checklist will be completed

by the contractor. The contractor may assess other information associated with sampling and analysis efforts to identify potential data issues and evaluate the data quality.

9.4 Data Usability

It is the responsibility of the contractor to evaluate data to ensure that the data objectives and criteria have been met, and reported results are adequate and appropriate for their intended use based on the results of the data verification and data validation efforts.

The data usability assessment should evaluate results against data quality indicators, including precision, accuracy/bias, representativeness, comparability, and whether specified analytic requirements (e.g., sensitivity) were achieved. Non-attainment of project requirements may result in additional sample collection or field observations (if possible) or additional analysis in order to achieve project needs.

10.0 REFERENCES

American Society for Testing and Materials (ASTM) 1987, American Society for Testing and Materials Methods.

EPA, 2008. OSWER Directive #9200.0-68. *Framework for Investigating Asbestos-Contaminated Superfund Sites.*