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DRAFT
TROY ASBESTOS PROPERTY EVALUATION WORK PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN)

FOR THE

TROY ASBESTOS PROPERTY EVALUATION PROJECT

Troy Operable Unit of the Libby Asbestos Superfund Site

January 2006

Prepared for:

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Remediation Division
P.O. Box 200901
Helena, Montana 59620

Contract Number 402014
Contract Task Order Number 41

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CONTENTS

Section **Page**

REVIEWS AND APPROVALS I
DISTRIBUTION LIST II
ACRONYMS AND ABBREVIATIONS VI

1.0 PROJECT DESCRIPTION AND MANAGEMENT 1

1.1 SITE CONCEPTUAL MODEL 2
1.2 SITE BACKGROUND 2
1.3 SCHEDULE 5
1.4 REPORT ORGANIZATION 5

2.0 PROJECT ORGANIZATION 7

2.1 MONTANA DEQ OVERSIGHT 7
2.2 NON-DEQ OBSERVATION OF FIELD ACTIVITIES 7
2.3 SPECIAL TRAINING AND CERTIFICATES 10

3.0 TROY DATA QUALITY OBJECTIVES 12
4.0 FIELD PROCEDURES 20

4.1 HEALTH AND SAFETY PROCEDURES 20
4.2 SITE ACCESS AND LOGISTICS 21

4.2.1 Community Relations and Community Involvement Center 21
4.2.2 Logistics and Schedule 22
4.2.3 Access Agreements and Waivers 25

4.3 VERBAL INTERVIEW 27
4.4 BUILDING INSPECTION, SAMPLE COLLECTION, AND RECORDING PROCEDURES 27

4.4.1 Indoor Inspection 27
4.4.2 Indoor Dust Sampling 30
4.4.3 Outdoor Inspection 32
4.4.4 Outdoor Soil Sampling 34
4.4.5 Photography 36

5.0 FIELD QUALITY CONTROL PROCEDURES 37

5.1 EQUIPMENT DECONTAMINATION 37
5.2 QUALITY ASSURANCE SAMPLES 37
5.3 FIELD DOCUMENTATION 38
5.4 CONTAINMENT AND DISPOSAL OF INVESTIGATIVE-DERIVED WASTE 39
5.5 CHAIN OF CUSTODY 39

CONTENTS (Continued)

Section **Page**

6.0 DATA MANAGEMENT 41

6.1 DATA REQUISITION 41
6.2 DATA REPORTING 41

7.0 QA/QC PROCEDURES 42

7.1 QA/QC OBJECTIVES 42
7.2 INTERNAL QC CHECKS 42
7.3 AUDITS, CORRECTIVE ACTIONS, AND QA REPORTS 43

7.3.1 Field Inspections and Sampling Procedures Audits 43
7.3.2 Corrective Action Procedures 43
7.3.3 Laboratory Audits 44

REFERENCES 45

Appendix

A SITE-SPECIFIC HEALTH AND SAFETY PLAN (Troy Asbestos Property Evaluation)
B STANDARD OPERATING PROCEDURES
C EQUIPMENT/SUPPLIES LIST
D INFORMATION PACKET FOR RESIDENTS
E FIELD FORMS (Troy Asbestos Property Evaluation)

FIGURES

Figure		Page
1-1	DRAFT SITE CONCEPTUAL MODEL – POTENTIAL HUMAN EXPOSURE PATHWAYS TO LIBBY AMPHIBOLE AT THE TROY OPERABLE UNIT	3
1-2	TOPOGRAPHIC VIEW OF THE TROY OPERABLE UNIT SITE	4
3-1	TAPE INPUTS	17
3-2	TAPE OUTDOOR SOIL SAMPLING DESIGN	18
3-3	TAPE INSPECTION AND SAMPLING PROCESS DIAGRAM	19

TABLES

Table		Page
1-1	SCHEDULE FOR THE TAPE INSPECTION AND SAMPLING PROJECT	5
2-1	KEY PERSONNEL	8
3-1	DATA QUALITY OBJECTIVES, INVESTIGATION OF TROY OPERABLE UNIT	13

ACRONYMS AND ABBREVIATIONS

AHERA	Asbestos Hazard Emergency Response Act
amsl	Above mean sea level
ASTM	ASTM International (formerly the American Society for Testing and Materials)
CDM	Camp Dresser & McKee
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
cm^2	Square centimeters
CPR	Cardiopulmonary resuscitation
DEQ	Montana Department of Environmental Quality
DEQ/RD	DEQ/Remediation Division
DPHHS	Montana Department of Public Health and Human Services
DQO	Data quality objective
EPA	U.S. Environmental Protection Agency
FSDS	Field sampling data sheet
GPS	Global positioning system
HASP	Health and safety plan
HAZWOPER	Hazardous waste operations
IFF	Inspection field form
LA	Libby amphibole
Microvac	Microvacuum
mm	Millimeters
OSHA	Occupational Safety and Health Administration
OU	Operable unit
PPE	Personal protective equipment
PLM	Polarized light microscopy
QA	Quality assurance
QC	Quality control
SOP	Standard operating procedure
TAPE	Troy Asbestos Property Evaluation
Tetra Tech	Tetra Tech EM Inc.
µm	Micrometers

ACRONYMS AND ABBREVIATIONS
(continued)

VCI	Vermiculite-containing insulation
Volpe Center	John A. Volpe National Transportation Systems Center
WP	Work plan

1.0 PROJECT DESCRIPTION AND MANAGEMENT

include that the site is a fund lead site - managed by EPA MDEQ will be the lead for the troy operable unit

Tetra Tech EM Inc. (Tetra Tech) received Task Order No. 41 from the Montana Department of Environmental Quality, Remediation Division (DEQ/RD), under DEQ Contract No. 402014. The purpose of this task order is to complete a Troy Asbestos Property Evaluation (TAPE) work plan for the Troy Operable Unit (OU) of the Libby Asbestos Superfund Site. The work plan describes the field and property inspections and sample collection necessary to identify the nature and extent of asbestos-containing vermiculite and the Troy OU property locations that will require remediation.

This work plan document is a combined field sampling plan and quality assurance project plan and is referred to as the TAPE work plan. The TAPE site-specific health and safety plan (HASP) is provided as Appendix A.

Troy, Montana, is located 18 miles northwest of Libby, Montana. From the 1920s until 1990, an active vermiculite mine and associated processing operations was located at Libby. While it was in operation, the vermiculite mine in Libby may have produced 80 percent of the world's supply of vermiculite (EPA 2005). Vermiculite is used primarily for insulation in buildings and as a soil amendment. The vermiculite deposit is contaminated with a form of amphibole asbestos (Libby amphibole [LA]) that is considered a virulent carcinogen. Asbestos is a known carcinogen and is associated with a multitude of respiratory health effects, including asbestosis, lung cancer, and mesothelioma. For decades, vermiculite ore and waste materials were ubiquitous in the Libby community while the mine operated and after its closure.

Some vermiculite mine workers lived in Troy, Montana, and commuted to the mine to work each day. The mine workers were exposed to asbestos-contaminated materials at the mine and processing facilities, and they transported asbestos-contaminated dust to their homes on clothes and equipment. In addition, the asbestos-contaminated vermiculite ore and waste materials in varying forms may have been used for amending soils (as fill or as a conditioner), as construction fill materials, and for insulating buildings in and around Troy.

In 1999, EPA Region 8 dispatched an emergency response team to investigate in response to media reports that described a high rate of asbestos-related deaths in Libby. Originally believed to be a problem limited to the mine workers, the scope has increased. Subsequent environmental investigations have found many areas in and around Libby contaminated with LA. EPA began Comprehensive Environmental Response Compensation and Liability Act (CERCLA, also known as Superfund) ~~emergency response~~ removal actions in Libby in 2000 that continue today. Properties in Troy are being

time critical

investigated to evaluate whether LA-contaminated vermiculite has been transported to these properties and whether the concentrations would pose health risks to the occupants.

Tables and figures in this document follow the first reference in the text. Appendix A contains the site-specific HASP, Appendix B contains copies of project-applicable standard operating procedures (SOPs), Appendix C is a list of equipment and supplies required for the project, Appendix D is an information packet for residents, and Appendix E contains example TAPE project field forms.

1.1 SITE CONCEPTUAL MODEL

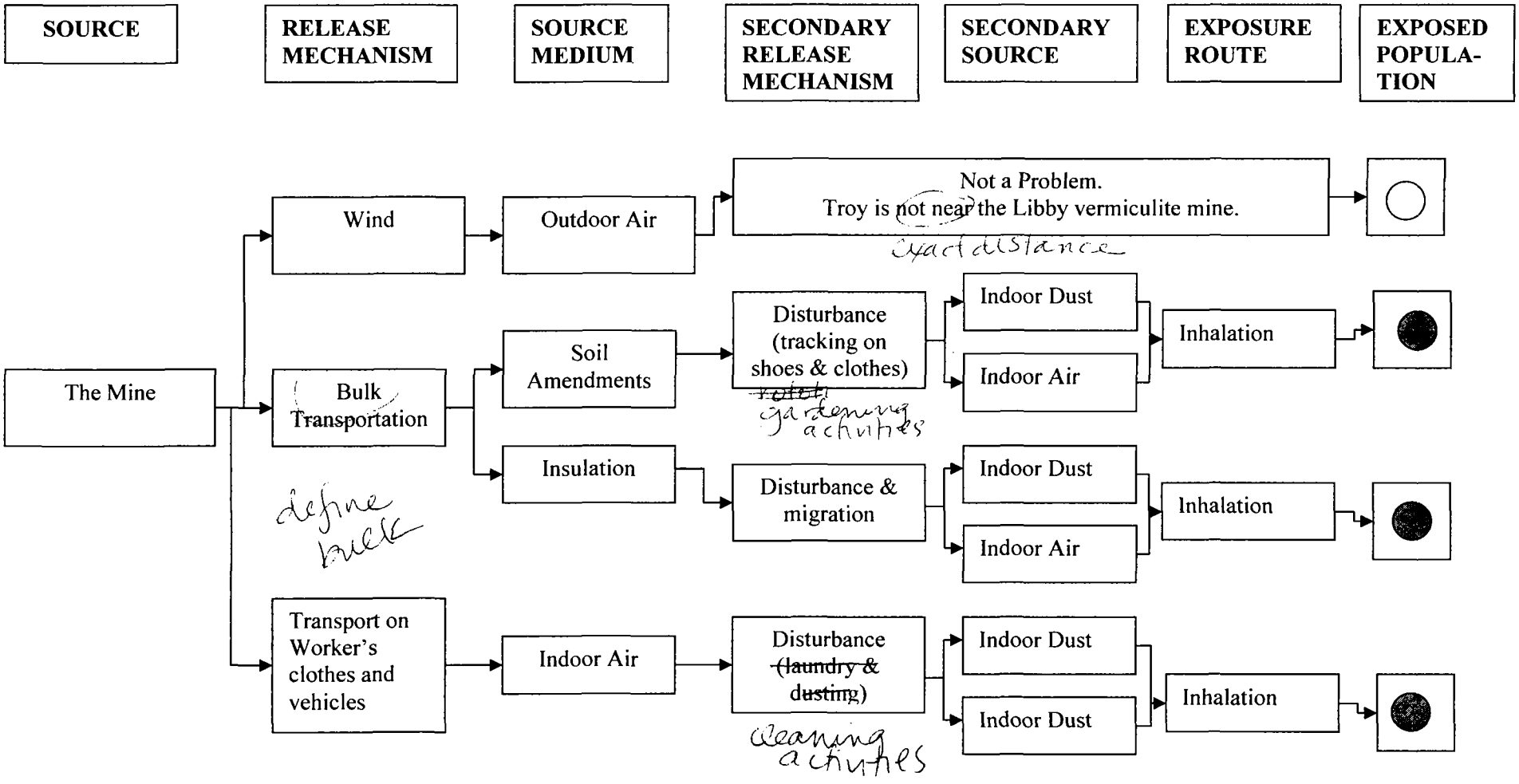
Asbestos exposure is a potential human health concern because chronic inhalation of excessive levels of asbestos fibers suspended in air can result in lung diseases such as asbestosis and mesothelioma. The relationship between asbestos exposure and mesothelioma has been documented, and at least 70 percent of people with mesothelioma report that they have been exposed to asbestos (National Cancer Institute 2005). Figure 1-1 presents a draft Site Conceptual Model for Troy, which identifies exposure pathways by which asbestos fibers from the Libby mine might be inhaled or ingested by humans. The draft site conceptual model will be refined as additional data are acquired and the understanding of actual transport and exposure pathways for Troy is improved. EPA, CDM, and the Montana Department of Public Health and Human Services (Montana DPHHS) have provided additional related background information for the Libby asbestos project and on mesothelioma in Montana (CDM 2003; Montana DPHHS 2005).

1.2 SITE BACKGROUND

Properties in Troy are being investigated to evaluate whether LA-contaminated vermiculite has been transported to these properties and at concentrations that would pose health risks to the occupants.

The Troy OU site is located along the Kootenai River valley at an elevation ranging from 1,850 feet above mean sea level (amsl) at the northern end of the OU to 2,500 feet amsl on the mountain slopes surrounding the valley. The Troy OU site is approximately 8 miles long and up to 1.8 miles wide. Topography of the site consists of relatively flat river valley terraces on both sides of a gently graded Kootenai River. Several tributaries flow into the Kootenai River along the 8-mile stretch contained within the Troy OU site. Figure 1-2 provides a topographic view of the Troy OU site along with the boundary of the study area.

Site B-
WP



Pathway is complete and could be significant, quantitative evaluation required.

Pathway is complete, but minor, qualitative evaluation required.

Figure 1-1: Draft Conceptual Site Model – Potential Human Exposure Pathways to Asbestos at the Troy Operable Unit

Figure 1-2: Topographic View of the Troy OU Site

ED MADEJ IS WORKING ON A REVISED BOUNDARY AREA.

1.3 SCHEDULE

Table 1-1 provides the dates for the completion of the draft and final TAPE WP document. The schedule for the TAPE inspection and sampling field work is pending additional funding. The TAPE field work may begin in the summer 2006 and would require approximately 75 full work-days to complete (15 weeks). The soil and dust samples collected from the TAPE field work will be prepared for analysis by CDM and analyzed for asbestos concentrations by an EPA contract laboratory. Tetra Tech should receive all laboratory analytical results within 60 days of submittal to CDM. The draft TAPE project report would be submitted to the DEQ/RD and others approximately 60 days after receiving the analytical data.

TABLE 1-1

SCHEDULE FOR THE TAPE INSPECTION AND SAMPLING PROJECT

Task	Start Date	End Date	Duration[a]
Draft TAPE WP	October 1, 2005	January 31, 2006	120
Consider comments on Draft TAPE WP	TBD	TBD	TBD
Draft Final TAPE WP	TBD February 2006	TBD March 2006	30
Consider comments on Draft Final TAPE WP	TBD	TBD	TBD
Final TAPE WP	TBD April 2006	TBD May 2006	30
Conduct TAPE inspection and sampling – (Begin only at DEQ/RD's request)	TBD Summer 2006	TBD 15 weeks	120

Notes:

[a] Duration in calendar days
TAPE Troy Asbestos Property Evaluation
WP Work plan
TBD To be determined
Shaded dates are estimates

1.4 REPORT ORGANIZATION

This TAPE work plan is organized into eight sections. Section 1.0 is this introduction. The contents of Sections 2.0 through 8.0 are briefly described below.

- Section 2.0 Project Organization. This section identifies key project personnel and project responsibilities and provides an organizational chart and a table of participants with contact information.

- Section 3.0 Work Plan Rationale. This section describes the data quality objective (DQOs) steps used to establish the quantity and the quality of data to support decision making.

- Section 4.0 Field Procedures. This section describes the activities that will take place during the property evaluations. The SOPs for each activity and the HASP are referenced and detailed.

- Section 5.0 Field Quality Control Procedures: This section discusses the field quality assurance and quality control (QA/QC) procedures, including equipment decontamination, QA samples, field documentation, and chain of custody. Also discussed in this section are QA procedures used at the Libby Asbestos Superfund Site (EPA 2003c).

- Section 6.0 Data Management. This section describes how the data will be handled after they have been received from the Libby V2 database.

- Section 7.0 QA/QC Procedures. This section will describe the procedures that will be taken to ensure the quality and integrity of the TAPE data.

Finally, references used in preparing this document are presented in Section 8.0.

2.0 PROJECT ORGANIZATION

Table 2-1 presents the responsibilities and contact information for key personnel involved in the TAPE inspection and sampling project. In some cases, more than one responsibility has been assigned to a person. Tetra Tech does not plan to use any subcontractors for the TAPE project.

The John A. Volpe National Transportation Systems Center (Volpe Center) is providing support to EPA Region VIII, including management of the Libby V2 database which is used to track sampling and other pertinent data from the Libby Asbestos Superfund Site. Tetra Tech will transfer Troy data to and obtain data from Volpe via EPA or via Volpe's subcontractor, CDM. Tetra Tech will transfer custody of all soil and dust samples to CDM or EPA after the samples have been recorded and organized. CDM will then be responsible for custody and quality assurance of the samples until delivery to an EPA contract laboratory for analysis.

2.1 MONTANA DEQ/RD OVERSIGHT

The DEQ/RD Project Officer, or her designee, will provide oversight of all field activities associated with this TAPE project. The DEQ/RD Project Officer, or her designee, will have the ability to inspect all field and sampling activities, determine the appropriateness of the recorded data, and ensure that all activities comply with standard practices that meet the project objectives. Before any oversight is conducted, the Tetra Tech on-site health and safety coordinator will brief the DEQ oversight personnel to ensure safe practices are maintained throughout the TAPE field effort.

2.2 NON-DEQ/RD OBSERVATION OF FIELD ACTIVITIES

Non-DEQ/RD personnel will be allowed the opportunity to observe field activities associated with this project. The request for non-DEQ/RD observation of field activities must first be coordinated with and approved by the DEQ/RD Project Officer. When inspection and sampling are being conducted on a Troy property and the owners are present, the property owners will have the opportunity to (1) observe Tetra Tech field inspection and sampling, and (2) obtain copies of the field forms and property sketches completed for the property. The Tetra Tech field team will brief property owners about the types of sampling and methods for completing the TAPE inspection and sampling; however, the Tetra Tech field team will not interpret results or conclusions from the inspection and sampling for the property owner.

TABLE 2-1

KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
Catherine LeCours	DEQ/RD	Project Officer	• Monitors performance of the contractor • Reviews and approves QA measures • Consults with the EPA and Volpe • Reviews and approves all work plans (FSP/QAPP) • Provides coordination with EPA, Volpe, and CDM • Provides primary interface with the Troy community and disseminate project information to the public	Montana Department of Environmental Quality PO Box 200901 Helena, MT 59620-0901 clecours@mt.gov (406) 841-5040
J. Edward Surbrugg	Tetra Tech	TAPE Project Manager	• Responsible for implementing all activities called out in the task order • Supervises preparation of work plan and approves document • Monitors and directs field activities to ensure compliance with work plan requirements • Provides coordination with DEQ/RD Project Officer • Assist with disseminating project information to the Troy community through prepared information packets and directing questions to DEQ/RD	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 edward.surbrugg@ttemi.com (406) 442-5588
Mark Stockwell	Tetra Tech	- TAPE Field Team Leader - TAPE QA/QC Manager	• Responsible for directing and coordinating day-to-day field activities conducted by Tetra Tech • Verifies that field sampling and measurement procedures follow work plan • Conducts field audits for QA/QC • Provides DEQ/RD Project Officer and TAPE project manager with regular reports on status of field activities • Assist with disseminating project information to the Troy community through prepared information packets and directing questions to TAPE PM or DEQ/RD	Tetra Tech, Sandpoint 7 West 6th Avenue Sandpoint, ID mark.stockwell@ttemi.com (208) 263-4524

Maybe include flow chart that shows EPA and CDM involvement

include Shawn Jerry Volpe-Cart McMan

TABLE 2-1
(Continued)

KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
Jessica Allewalt	Tetra Tech	Troy Field Sample Coordinator	• Responsible for working with TAPE project manager and TAPE field team leader to schedule TAPE inspections • Responsible for compiling and organizing field data sheets and samples submitted daily by field teams. Enters field data hard copy information into electronic format for transfer to CDM and EPA • Sign custody release of samples to CDM and EPA on a regular basis • Coordinate with CDM, EPA, and Volpe managers on sample delivery schedules and logistics • Reviews laboratory data before release to project team • Disseminate project information packets to interested parties and Troy property owners and direct questions to TAPE PM or DEQ/RD	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 jessica.allewalt@ttemi.com (406) 442-5588
Brett Veltri	Tetra Tech	On-site TAPE Safety Officer	• Responsible for implementing health and safety plan and for determining appropriate site control measures and personal protection levels • Conducts safety briefings for Tetra Tech and site visitors • Can suspend operations that threaten health and safety • Disseminate project information packets to interested parties and Troy property owners and direct questions to TAPE PM or DEQ/RD	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 brett.veltri@ttemi.com (406) 442-5588
Ed Madej	Tetra Tech	Database and Geographic Information System Manager	• Responsible for developing, monitoring, and maintaining project database and property maps • Responds to requests from TAPE project manager and TAPE field team leader to provide copies of property maps to field teams on a daily basis • Works with CDM, Volpe, and EPA data and graphic managers to generate needed reports and maps from the Libby V2 database	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 ed.madej@ttemi.com (406) 442-5588

TABLE 2-1
(Continued)

KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
10 members	Tetra Tech	Field Team Member	• Responsible for conducting TAPE inspections and sampling as described in the work plan and for following SOPs. • Disseminate project information packets to interested parties and Troy property owners and direct questions to TAPE PM or DEQ/RD	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 (406) 442-5588

Notes:

CDM	Camp Dresser & McKee	DEQ	Montana Dept. of Environmental Quality
EPA	U.S. Environmental Protection Agency	FSP	Field Sampling Plan
QAPP	Quality Assurance Project Plan	SOP	Standard Operating Procedure
TAPE	Troy Asbestos Property Evaluations	Tetra Tech	Tetra Tech EM Inc.
Volpe	John A. Volpe National Transportation Systems Center		
QA/QC	Quality Assurance/Quality Control		

If Tetra Tech obtains soil or dust samples at a property, Tetra Tech will, if requested, provide the property owner with a receipt for the samples identifying the number and types of samples collected before the field crew leaves the property. Sample results may take weeks or months to obtain; therefore, no results will be available during the TAPE inspection and sampling. An individual property owner who requests a split sample must supply all necessary sample bottles, supplies, and materials required for sampling, as well as arrange and pay for laboratory analysis of all split samples collected.

2.3 SPECIAL TRAINING AND CERTIFICATES

Tetra Tech personnel who work on the TAPE project will have met the Occupational Safety and Health Administration (OSHA) training requirements defined in Title 29 Code of Federal Regulations (29 CFR) Part 1910.120(e) for working on hazardous waste sites. These requirements include: (1) 40 hours of formal off-site instruction; (2) a minimum of 3 days of actual on-site field experience under the supervision of a trained and experienced field supervisor; and (3) 8 hours of annual refresher training. In addition, all Tetra Tech personnel working on the TAPE project will have taken the Asbestos Hazard Emergency Response Act (AHERA) 24-hour asbestos inspector training course and will hold a current asbestos inspector license issued by the State of Montana.

Tetra Tech personnel working on the TAPE project must read and abide by the stipulations and guidelines set forth in Tetra Tech's HASP, which is Appendix A to this TAPE work plan. The HASP provides written instructions for health and safety training requirements, personal protective equipment (PPE) requirements, spill containment program, and health-hazard monitoring procedures and techniques. At least one member of every Tetra Tech field team will maintain current certification in the American Red Cross "Multimedia First Aid" and "Cardiopulmonary Resuscitation (CPR) Modular" or equivalent.

Copies of Tetra Tech's health and safety training records, including course completion certifications for the initial and refresher health and safety training, specialized AHERA training, and first aid and CPR training, are maintained in the Helena Tetra Tech office files for all TAPE field team members.

Before work begins at a specific project site, Tetra Tech personnel are required to undergo site-specific training that thoroughly covers the following areas:

- Names of personnel and alternates responsible for health and safety at a project site
- Health and safety hazards present on site
- Selection of the appropriate personal protection levels
- Correct use of PPE
- Work practices to minimize risks from hazards
- Safe use of engineering controls and equipment on site
- Medical surveillance requirements, including recognition of symptoms and signs that might indicate overexposure to hazardous substances
- Contents of the HASP

3.0 TROY DATA QUALITY OBJECTIVES

This section presents the DQOs for the TAPE inspection and sampling project. The DQOs are qualitative and quantitative statements developed through the seven-step DQO process (EPA 2000a, 2000b). The DQOs help to clarify the study objectives, define the most appropriate data to collect and the conditions under which to collect the data, and specify tolerable limits on decision errors that will be used as the basis for establishing the quantity and quality of data needed to support decision-making. The DQOs are used to develop a scientific and resource-effective design for data collection. The seven steps of the DQO process for this TAPE project are presented in Table 3-1.

why?

Background information for the Troy OU study area was discussed in Section 1 as was a draft site conceptual model (Figure 1-1). The Troy properties, where sources of vermiculite contaminated with LA may be found, are not predictable; DEQ has therefore determined that each property in the Troy OU (including privately-owned and publicly-owned property) will be investigated and screened. The properties may or may not contain a building, or multiple buildings; specific use areas (gardens, former gardens, flower beds, and play areas; all are areas with potentially greater exposure or greater use of vermiculite amendments); and yards and open space. Depending on the individual features for each property and building and the concentration of the LA, one or more of the four cleanup alternatives below will be applicable:

1. Clean the building attic by removing the vermiculite-containing insulation (VCI)
2. Clean the interior living space
3. Clean the outdoor LA-contaminated soil by removing the LA-contaminated soil
4. Take no further action at this time

The DQOs will be used to design the TAPE project so that the sampling and analysis are appropriate to select the correct alternative for each Troy property.

Why are we cleaning props? Mention something about exposure.

TABLE 3-1

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY OPERABLE UNIT

STEP 1: State the Problem
Troy, Montana, is located 18 miles from Libby, Montana. Libby is the site of a vermiculite mine and associated processing facilities that operated until 1990 and produced vermiculite insulation and other byproducts. The vermiculite deposit is contaminated with a form of amphibole asbestos (LA). Asbestos is a known and virulent carcinogen and is associated with a multitude of respiratory health effects, including asbestosis, lung cancer, and mesothelioma (DPHHS 2005). Some mine workers lived in Troy and commuted to the mine to work because Troy is close to Libby. The mine workers were exposed to LA-contaminated materials at the mine and processing facilities, and they may have transported contaminated dust to their homes on clothes and equipment. Vermiculite is used for insulation and soil amendments, and the vermiculite and waste rock (in various forms) were used in construction and for general soil amendments in Troy. VCI and waste materials have been documented in Troy. Properties in Troy should be investigated to evaluate whether LA-contaminated vermiculite has been transported to these sites and at concentrations that would pose health risks to the occupants. In 1999, in response to media reports EPA Region 8 dispatched an emergency response team to investigate high rates of asbestos-related deaths in Libby. Originally believed to be a problem limited to mine workers, the scope has increased. Subsequent environmental investigations have found many areas in Libby with LA contamination. EPA began Superfund emergency response removal actions in Libby in 2000 that are ongoing. The Montana DEQ is the lead agency for the Troy OU of the Libby Asbestos Superfund site. **The following are problem statements associated with the Troy Properties investigation:** • Exposure to LA-contaminated vermiculite is a threat to human health (EPA 2000c). • Respirable LA asbestos is released when source materials are disturbed (EPA 2000c). • Potential source materials include VCI, vermiculite waste products, and soils contaminated with LA. • Household dust and indoor air are potential exposure pathways. • LA-contaminated materials may be found randomly in and around Troy. • All properties within the Troy OU should be evaluated for the presence of LA-contaminated materials.

TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY OPERABLE UNIT

STEP 2: Identify the Decisions

Principle Discussion Question: Is a remedial action required at a property to clean up LA contamination?

which properties do we sample
how do we sample each property to answer each question

Sampling Decisions:

- Identify the number of potential properties to investigate by reviewing aerial photographs, defining individual properties, compiling addresses, and determining if the property could be individually bought or sold.
- Identify the number of buildings on each property within the Troy OU.
- Identify the number of specific use areas, yards, and open space areas on each property in the Troy OU.

results will be used to make cleanup decisions later, such as -

confusing

Cleanup Decisions: Visually inspect attics ~~of~~ for

- ~~Identify~~ buildings ~~with open~~, non-contained, or migrating VCI. more to end.
- Identify the individual levels (floors) within each building with LA in the indoor living space above cleanup criteria (EPA 2003b). - take dust samples
- Identify the properties with outdoor specific use areas or yards with LA-contaminated soils above cleanup criteria (EPA 2003b).
- Identify the properties and buildings where no further action is required at this time.

STEP 3: Identify Inputs to the Decisions

Figure 3-1 provides a graphic representation of the inputs described in Step 3.

~~Inspect the attics of buildings within the Troy OU~~ to visually confirm open, non-contained, or migrating ~~VCI~~.

- Inspect the living spaces of buildings within the Troy OU to visually confirm ~~migrating~~ the presence of VCI.
- Collect dust samples from each building level and analyze them to evaluate whether LA contamination exceeds the cleanup criteria.
- Inspect the outdoor areas of the property (specific use areas, yards, and open space) for visible vermiculite. explain
- Collect soil samples from each outdoor area and analyze them to determine if LA contamination exceeds the cleanup criteria. Figure 3-2 provides plan and cross-sectional views of the typical outdoor sampling that will be performed at each property.

STEP 4: Define Study Boundaries

- The Troy OU generally consists of the valley bottom from the north half of Section 25, Township 31 North, Range 34 West, and Section 30, Township 31 North, Range 33 West, east to the junction of Highways 56 and 2, and north to the northern edge of Section 21, Township 32 North, Range 34 West. Figure 1-2 shows the configuration of the study area for the Troy OU.
- Some properties (approximately 25) within the Troy operable unit have previously been inspected and sampled under the Libby OU4 investigation. Data have been recorded in the Libby database for these properties and will be integrated with additional sampling data from the TAPE.

TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 5: Develop Decision Rules
• If VCI is visible in a building attic, then collect dust samples from the living spaces to evaluate whether LA concentrations exceed cleanup criteria. • If VCI is not visible in an attic, then collect dust samples from the living spaces to evaluate whether any secondary indoor source of LA has resulted in LA concentrations that exceed cleanup criteria. • If vermiculite is visible in a building interior, then collect discrete samples to support a small-scale vermiculite removal for the area. In addition, collect dust samples from the other building levels or areas to evaluate whether LA concentrations exceed cleanup criteria in those living spaces. • If vermiculite is not visible in a building interior, then collect dust samples from the living spaces to evaluate whether secondary indoor source of LA has resulted in LA concentrations that exceed cleanup criteria. • Collect discrete soil samples from specific use areas to evaluate whether LA concentrations exceed soil cleanup level. • If the property contains a yard and large open space, then subdivide these areas by similar land uses (for example, grassed areas, driveways, parking areas, and front, back, and side yards) and collect a composite soil sample from each subarea to determine if soils in any subarea contains LA at concentrations that exceed cleanup criteria (EPA 2003). • Figure 3-1 shows the steps used to inspect and sample buildings and exterior property in the Troy OU. Figure 3-2 provides some typical outdoor soil sampling designs for specific use areas, yards, and open spaces.
STEP 6: Specify Tolerable Limits on Decision Errors
• Sampling and measurement error are associated with environmental data collection and may lead to decision errors. Sampling error occurs when the sample is not representative of the true site conditions. Measurement error occurs because of random and systematic errors associated with sample collection, handling, preparation, analysis, data reduction, and data handling. Decision errors are controlled by adopting a scientific approach that uses hypothesis testing to minimize the potential for error. • There are two types of decision error: false negative error, and false positive error. A false negative decision error occurs when the null hypothesis is rejected although it is true. The consequences of a false negative error would be that VCI or LA-contaminated dust or soil at a Troy property is not remediated. A false positive decision error occurs when the null hypothesis is not rejected although it is false. The consequences of a false positive error are that unnecessary resources are expended to undertake remedial action to address contaminated media that do not exist at concentrations that exceed action levels or acceptable risk levels. • Property-specific sampling objectives and the random distribution of vermiculite and LA-contaminant soil limit the usefulness of statistical methods to eliminate sampling error. Therefore, sampling methods and procedures will be based on results from the Libby Asbestos Superfund Site. Tolerable limits on sampling decision errors cannot be precisely defined; however, the decision errors will be minimized by inspecting and screening all properties in the Troy operable unit. Decision errors based on analytical data will be minimized by the use of standard EPA-approved and Libby-specific analytical methods.

TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 7: Optimize the Sampling Design
• All properties in the Troy OU will be uniquely defined in the work plan, and their locations will be identified using existing Lincoln County records, cadastral databases, and low-level aerial photographs. The number of Troy properties to be investigated will be approximately 1,000. Some houses and buildings likely are on multiple platted properties. • Dust and soil samples will be collected using similar methods and standardized procedures that have been employed for the Libby Asbestos Superfund site. With more than 4,000 Libby properties sampled since 2001, the methods have been defined (CDM 2002; CDM 2003a; CDM 2003b; EPA 2003a). • Field QA/QC procedures will be implemented and will include equipment decontamination, QA samples, field documentation, and sample chain of custody. Scientifically valid and legally defensible data will be supported by collection of dust and soil field blanks and other QA samples at a frequency necessary to assess potential cross contamination from equipment and sample integrity during collection. • Additional building and property details will be collected to support the pre-design inspections when visible triggers are noted during the TAPE inspection. Details may include, but are not limited to: ➢ Attics – type of attic; entry locations; vents; barriers in attic; dimensions; and approximate volume of VCI, ➢ Living spaces – number and types of rooms and hallways; ceiling conditions; and electrical, mechanical, and plumbing systems, ➢ Exterior – site sketches of existing landscape, improvements, and potential additional sample locations, ➢ Outside staging areas and electric service. • Field sample data sheets, similar to those used in Libby, will be completed for each sample collected and each property inspected within the Troy OU. The field data sheet information will be recorded onto electronic records that can be easily added to the existing Libby V2 database. • Dust and soil samples collected at each Troy property will be uniquely labeled, and sampling information will be recorded onto electronic records. The electronic sample records, along with the samples, will be transferred under chain-of-custody procedures to a CDM sample data coordinator, who will verify completeness and accuracy of the records. • Montana DEQ and its contractor, Tetra Tech, will work closely with EPA, Volpe, and its contractor, CDM, to ensure that sample integrity is maintained throughout and that data quality is adequate to meet project objectives. • CDM will transfer the electronic sampling and field form information to EPA and Volpe and prepare the samples for analysis. • Figure 3-3 provides a schematic diagram of the TAPE process used by Tetra Tech to organize, conduct the property evaluations and sampling, and provide samples and electronic information to CDM, EPA, and Volpe.

Maybe some discussion of why Libby worked

Figure 3-1 TAPE Inputs

Figure 3-2 TAPE Outdoor Soil Sampling Design

Figure 3-3 TAPE Inspection and Sampling Process Diagram

4.0 FIELD PROCEDURES

This section of the Troy work plan describes the field activities to be implemented for the TAPE inspection and sampling project and includes the following tasks:

- Mobilizing and demobilizing
- Obtaining access agreements
- Scheduling inspections with property owners
- Conducting verbal interviews
- Conducting property inspections – indoor, attic, outbuildings, outdoor, yard, specific use areas (using the inspection field form [IFF])
- Collecting indoor dust samples (recorded on field sampling data sheet [FSDS])
- Collecting outdoor soil samples (recorded on the FSDS)
- Collecting QA/QC samples
- Decontaminating equipment and personnel
- Containing and disposing of investigation-derived waste

SOPs are provided in Appendix B and are referenced throughout this section of the TAPE work plan. As appropriate, Tetra Tech personnel will use guidance developed specifically for the Libby Asbestos Superfund Site. Some of the Libby-specific guidance documents are listed below and copies are provided in Appendix B.

- CDM-Libby-03 (Revision 1) Completion of Field Sampling Data Sheets (FSDS)
- CDM-Libby 04 (Revision 1) Completion of Information Field Form
- CDM-Libby 05 (Revision 1) Site-Specific Standard Operating Procedure for Soil Sample Collection

Health and safety protocols and requirements will apply to all field activities and are summarized below. Information on quality control is provided in Sections 5.0 and 7.0 of this work plan.

4.1 HEALTH AND SAFETY PROCEDURES

The TAPE HASP (Appendix A) and Tetra Tech's corporate health and safety program plan will apply to all field activities undertaken as part of this project. All field staff conducting inspection and sampling activities will be required to:

1. Hold a current OSHA hazardous waste operations (HAZWOPER) 40-hour training certification and up-to-date 8-hour refreshers, as required under 29CFR1910.120;

2. Hold a current asbestos inspector training certificate;
3. Hold a State of Montana asbestos inspector license;
4. Have medical clearance to work wearing a half-face air purifying respirator; and
5. Be quantitatively fit-tested for the specific project respirator within the 12 months prior to the field activities.

The TAPE HASP in Appendix A provides detailed health and safety protocols and requirements, including directions for when to use PPE, such as respirators. All attic entries will be conducted in modified level C PPE that will include a half-face or full-face air purifying respirator with HEPA cartridges. Other property inspection activities, including dust sampling and soil sampling, will be conducted in modified level D PPE. Mr. Mark Stockwell will be the Tetra Tech Site Safety Officer for the field activities (see Table 2-1 of this work plan). Negative exposure assessments for the field teams will be performed as necessary, as described in the HASP and at the direction of the Site Safety Officer.

4.2 SITE ACCESS AND LOGISTICS

Section 4.2 provides information about community relations, logistics and schedules, and site access agreements and waivers.

4.2.1 Community Relations and Information Centers

Tetra Tech will coordinate with DEQ to ensure that sufficient public outreach (including public meetings, fact sheets, newspaper articles and notices, and radio announcements) is completed before and during implementation of the TAPE. Tetra Tech will provide personnel to attend public meetings in Troy and will help prepare presentation materials, at DEQ's request. Public outreach and information on the purpose and nature of the TAPE and its role in the overall investigations and cleanup at Troy and Libby are essential to its success.

Tetra Tech and DEQ will set up and staff a field office in Troy at least 1 month before and for the duration of TAPE field activities. The Tetra Tech field office will be the TAPE logistical center for obtaining property access agreements, scheduling field activities, returning samples and field forms at the end of the day, and transferring sample custody from Tetra Tech to CDM. The Tetra Tech field office will also provide a physical location and venue for people in Troy to provide and obtain information about the project. The Tetra Tech field office will also have telephones and answering machines for

contacting project personnel when the office is not staffed and after regular hours (Monday through Friday 8:00 am to 5:00 pm).

The existing EPA Information Center in Libby will also be an information resource for Troy residents, providing access to major project documents. A free 1-800 telephone number will be established and maintained throughout the project to allow interested Troy residents quick and easy access to background information. The 1-800 telephone number for the Information Center will be advertised in the Troy community.

DEQ has established a repository for general and Troy-specific information at the City Hall in Troy, located at 301 E. Kootenai. The Troy City Hall is open Monday through Friday from 8:00 a.m. to 5:00 p.m. Tetra Tech and DEQ will continue to provide updated information in City Hall throughout the field sampling activities.

Section 2.0 of this work plan discusses the roles and responsibilities of the DEQ and Tetra Tech in community relations.

4.2.2 Logistics and Schedule

Tetra Tech will establish a field office in Troy for the duration of TAPE field activities. Tetra Tech will identify and provide all necessary personnel, sampling equipment, PPE, and project materials for implementing this work plan. All Tetra Tech field personnel will be trained not only in specific tasks but also on the overall objectives of the TAPE. This training will facilitate TAPE implementation and allow for effective communication with the public and other team members.

Tetra Tech personnel will include the TAPE project manager, who will oversee all project activities and logistics and will ensure that the lines of communication are maintained to resolve any issues or concerns that may arise during the field efforts. The Tetra Tech project manager will reside in Helena but will be at the project site in Troy for about 50 percent of the field activities. The TAPE field team leader will be based out of Troy and will be responsible for obtaining site access agreements, assisting with public outreach, scheduling daily field activities, and providing quality control and oversight of the five TAPE field teams. Tetra Tech will also provide a field sample coordinator to reside in Troy and assist the project manager and field team leader with daily project tasks. The field sample coordinator will have primary responsibility for checking and cataloging soil and dust samples at the end of each day and for

working closely with the CDM field sample coordinator to ensure that complete, adequate, and secure sample information is collected and transferred to EPA. The detailed responsibilities for these Tetra Tech project personnel are further discussed in Section 5.5.

Tetra Tech will provide five two-person TAPE field teams stationed in Troy for the duration of the field effort. Some substitution and rotation of field staff on and off the TAPE project is expected, but the field staff will work a minimum of 2 weeks before substitutions occur. The Tetra Tech field team leader (Mr. Stockwell) will continuously accompany the field teams to ensure and verify that the teams are conducting the TAPE activities as described and outlined in this work plan. The Tetra Tech field teams may conduct limited TAPE inspections on weekends (both Saturday and Sunday) to better accommodate the schedules of Troy property owners. Both members of a field team will be HAZWOPER certified, hold current asbestos inspector licenses, and be trained to properly handle the health and safety protocols for this project.

On average, a Tetra Tech field team will complete three TAPE inspections per day, depending on the complexity of the properties inspected. With five field teams, Tetra Tech can complete an average of 15 total TAPE inspections per full day. If the field inspections continue uninterrupted, Tetra Tech could complete the inspections of more than 1,000 Troy properties in about 75 full work days, or within a 15 week time frame. Tetra Tech's projected schedule for completing the TAPE inspections will be finalized when additional funding is acquired.

4.2.2.1 Communications

Field team members will be provided with cell phones (which will necessitate use of a temporary cell tower), satellite phones, or multi-way radios for the duration of field activities. Contact information, including emergency numbers, for all field teams and for TAPE project management personnel in Helena, Montana, will be stored in the Tetra Tech Troy field office. In addition, the Montana DEQ TAPE Project Officer (Ms. Catherine LeCours), CDM Troy field sample coordinator, and EPA Libby Superfund project personnel will be provided with contact information for ready access to the Tetra Tech field teams.

4.2.2.2 Equipment

Appendix C details equipment and supplies Tetra Tech identified as necessary for the TAPE field activities described in this work plan. Equipment and supplies that are not immediately available to Tetra

Tech will be purchased or rented before TAPE field activities begin. Before purchased or rental equipment or supplies will be accepted, the Tetra Tech field team manager will inspect the goods to ensure they are in good condition and free of defects.

4.2.2.3 Pre-Field Activities

Before field crews mobilize to Troy for the TAPE field inspections, Tetra Tech will prepare detailed property maps that identify individual Troy properties. Property boundary and other details will be gathered from public databases (cadastral) and projected onto a high-quality, high-resolution air photograph. Individual Troy property maps will be used during the TAPE field inspections to record approximate locations of the specific use areas and yard samples collected at each property. These property maps will be field checked and may be revised as necessary during the inspections. Tentative inspection and sampling schedules may be based on a block-by-block TAPE inspection pattern. The TAPE inspection schedule will be refined as Tetra Tech schedules the inspections at times and dates convenient to the property owners.

4.2.2.4 Field Team Organization

Five field teams of two people per team will conduct the TAPE inspections and sampling. On average, 15 properties will be inspected and sampled per day. At the start of each day, the field teams will meet at the Tetra Tech field office for daily safety and organizational briefings (see Section 4.1 and Appendix A HASP).

Before the morning briefing, the Tetra Tech field team leader will have prepared a packet for each property to be inspected and sampled that day. Each packet will include:

- A copy of the signed access agreement,
- Details of the scheduled inspection date and time, and the name and telephone number of the property owner or the person who will be present for inspection and sampling, if different than the property owner,
- A property-specific verbal interview form,
- A property-specific IFF,
- A property-specific FSDS,
- Preprinted property-specific sample labels, and
- Two copies of the property parcel maps.

Additional TAPE inspection and sampling supplies (as described in Appendix C, list of supplies) will be kept at the Tetra Tech field office for use by the field teams. The daily briefings will be used to coordinate daily property inspections, calibrate sampling equipment, and collect supplies. The daily briefing will include a review of any issues or problems that arose the previous day, and will provide an opportunity for field team members to ask questions and share lessons learned. At the end of each day, field teams will return to the field office to deliver samples and paperwork to the Tetra Tech field sample coordinator, download digital cameras, charge rechargeable equipment, and store field equipment for the evening. Section 6.0 of this work plan contains additional logistical details on TAPE data management.

4.2.3 Access Agreements and Waivers

Approximately 1 month before TAPE field activities begin, Tetra Tech will assist DEQ with mailing information packets to every Troy property owner where the property has been identified for inspection and sampling. The information packet will contain information from DEQ on the proposed sampling and contact information for Tetra Tech Troy field office, DEQ, EPA, and the Libby Information Center. The packet will also contain a copy of an access agreement form, an inspection and sampling waiver form, and a postage-paid envelope for the property owners to return the completed access agreement or waiver form. The information packet will explain the need for the signed access agreement or waiver form and encourage any property owners who have questions or concerns about the process to contact the designated parties. An example informational packet is provided in Appendix D.

The Tetra Tech project manager and field team leader will manage information mailed in from the Troy property owners, including signed access agreements and inspection and sampling waiver forms. Two weeks after the informational packets have been mailed, a field team of two Tetra Tech personnel will follow up with properties where no response has been received. Follow up contacts (in person or by telephone) will explain the purpose of the TAPE, describe the inspection and sampling process, and answer any pertinent questions. The field teams will attempt to obtain a signed access agreement for each property and will return signed access agreements to the TAPE field team leader.

If property owners are not available during the reconnaissance, the field team will revisit each location at least three times, and the field team leader (or designee) will continue to follow up with personal visits and by telephone. After repeated attempts to contact the property owner by the field teams and the field team leader, Tetra Tech will repeat the mailing with a letter describing the attempts made to contact the property owner.

When the field team leader has received completed and signed access agreements either by mail or from a field team, Tetra Tech will contact the property owner by telephone to schedule a TAPE inspection and sampling visit. Based on information gathered during the scheduling telephone call, the field team leader may schedule the inspection and sampling of individual properties for reasons including, but not necessarily limited to:

- Remodeling efforts (if an area is exposed or accessible that otherwise would not be)
- Community events (holidays, school activities, fairs, or parades, for example)
- Limited times when property owner is available (for example, inflexible work schedule, childcare or caregiver responsibilities, out-of-area property owner, business activities at a commercial or industrial property, or related factors).

Tetra Tech will make reasonable efforts to find a TAPE inspection and sampling date and time that are convenient for the property owner. TAPE inspections and sampling schedules will include evenings (daylight hours only) and weekends, as needed based on the requests of property owners. If property owners respond to the access agreement favorably, but a property is currently uninhabited (for example, it is only seasonally occupied or is currently for sale, or no buildings are present on the property), Tetra Tech will attempt to inspect and sample the property with a designee of the property owner. Properties will not be exempted from inspection or sampling on the basis that they are currently uninhabited, however.

Tetra Tech will not advise property owners of the likely nature of removals at their properties or estimated removal dates during the TAPE scheduling phase, the personal interviews, or the TAPE inspections and sampling. Property owners will be advised that removals and schedules will not be determined until analytical results have been received and evaluated.

Property owners may choose to sign an inspection and sampling waiver to decline some or all inspection and sampling. The property owner may use the waiver form to decline access to a property for inspection, to allow only limited access to the property for inspection and sampling, or to allow access for inspection but not for sampling. Tetra Tech will maintain a list of all Troy properties for which signed waivers have been received. If limited access is allowed, the field team leader will schedule an inspection and sampling for the property. Tetra Tech will provide DEQ with the list of all Troy property owners who completed the waiver form and decline the TAPE inspection and sampling. Property owners will be advised that authorizing access for sampling does not obligate the property owner to likewise allow

access for remediation; property owners will also have the option to choose to decline remediation, if DEQ proposes remediation.

Some Troy property owners may be non-responsive even when Tetra Tech has attempted to contact them by all reasonable means (telephone, visit to the property, and repeated mailings) to obtain permission for a TAPE inspection and sampling. When attempts to contact are unsuccessful, Tetra Tech will notify DEQ and will continue to attempt to reach the Troy property owner throughout the field sampling. Tetra Tech will provide DEQ with a list of all Troy properties where the property owner could not be contacted at the conclusion of TAPE field activities.

4.3 VERBAL INTERVIEW

The Troy property visit by the TAPE field team will commence with a verbal interview by the field team with the property owner to acquire background information about the property. The field team will interview the property owner using the questions provided on the interview form (Appendix E). Interview topics will include the known or suspected use of VCI in the house or outbuildings and possible introduction of other sources of LA within or near the property (including garden and landscaped areas and neighboring properties).

All buildings encountered during the TAPE inspections will be classified as a primary structure (habitable building, for example, a house, apartment, or main commercial space); or a secondary structure (non-habitable building, such as garages, shops, sheds, barns, or dog houses). The verbal interview will address all primary and secondary buildings and special use and yard areas located on a Troy property.

4.4 BUILDING INSPECTION, SAMPLE COLLECTION, AND RECORDING PROCEDURES

This section describes the inspection, sampling, and recording to be completed for each TAPE inspection.

4.4.1 Indoor Inspection

The two-person field team will visually inspect each building for the presence of VCI. One team member will access and inspect the attic (if safe, present, and reasonably accessible) and will inspect additional areas where VCI may be exposed in living spaces (crawlspaces, closets, and any wall openings). If VCI

is observed, the field team member will estimate the quantity based on field measurements or visual estimation, with field measurements (length, width, and height of item) collected wherever possible.

The second team member will document results, including estimated quantities of VCI, on the IFF and will record additional pertinent information in the field logbook. As much as is possible in a non-destructive manner, the visual inspection will include checking under other types of insulation (such as blown-in or fiberglass insulation) for VCI. Visual inspections will not involve opening up walls or ductwork to inspect for VCI within the building wall cavities, but will include removal of a representative sample of electrical switch plates to inspect wall interiors. Furthermore, it will include inspecting ductwork in accessible, unfinished areas of the building for VCI. In particular, the field team will note whether utility conduits (including heat/cooling vents) run from the attic to the living space. Visual inspections will not include inspecting the roof.

Attics will be considered reasonably accessible if they can be reached by stairs, hanging stairs, or a stepladder. Attics will be inspected in a manner that, in the judgment of the field team, is not likely to release additional VCI into the living space. The field team will compare exterior roof lines and interior ceiling heights with attic interiors in an effort to identify isolated attic areas that may exist between the roof and the main attic, or between the attic and the interior ceilings. If isolated attics are found, they will be inspected if possible, and barriers between attic areas and access points will be described in the IFF. Attic inspections will also involve inspection of kneewalls (areas where the pitch of the roofline meets the walls). Kneewalls may be used for storage or to improve the finished look of an attic. Kneewalls will be accessed wherever possible, as these areas may provide additional information on construction material. (For example, kneewalls may have unfinished floors compared with the finished floors in the rest of the attic.) If trusses or bracing posts are present in the attic that may pose an obstacle to potential cleanup, these items will be briefly described in the inspection form.

The TAPE inspections will also include noting any special factors that may potentially assist with or impede remediation, if required. For example, some special factors that may be noted include the presence of fragile decorative trim or stonework, exposed electrical wiring in the attic, the type of materials stored if the attic is used for storage, the type of furniture if the attic is finished, indications of potential structural issues such as cracked ceilings or walls, or unusually narrow entryways or corridors. If potted plants are located inside the primary building, the field teams will note whether vermiculite-containing potting soil is present, as this type of soil could affect results of dust sampling.

The field team will note the location of the electrical shut off panel and fuse box, if located during the inspection, and the type of water source for the property (city water or private well). The information on electrical panel and water source will be used for planning in the event that remediation is proposed for the property. The exterior of each primary and secondary building (walls, foundation, and trim) will also be inspected for VCI.

As described in the HASP (Appendix A), the field team will not be required to access any attics, crawl spaces, or living areas if there is an unacceptable safety hazard, including biologic hazards. The field team will not inspect Troy properties for non-VCI and non-LA asbestos. However, damaged or friable suspect asbestos-containing materials that are observed in the inspection will be noted in the field notebook. This information may be of use in interpreting sampling results and planning potential remediation efforts.

The field team may choose to photo-document specific conditions in the building during the TAPE inspection for future reference. The property owner will be asked for permission before any photographs are taken.

TAPE inspections will be documented on IFFs (Appendix E) and in the field logbooks. Pertinent details will include, but are not limited to, identifying the primary and secondary buildings, defining attic spaces, and sketching on the detailed property maps.

As described in Section 4.3, buildings on a property will be classified as primary or secondary. Every primary building will be subject to a TAPE inspection, an IFF will be completed, and samples collected, unless the property owner declines access or sampling. Secondary buildings on Troy properties will be inspected, but only an IFF will be completed. No routine sampling in secondary buildings will be conducted; however, samples may be collected if the field team observes VCI in the secondary building or if the property owner indicates the building was historically used to store VCI.

4.4.1.2 Record Building Locations with GPS

As part of the TAPE inspection, the location of each primary and secondary building on the property will be recorded using the backpack-mounted Trimble XRS-Pro global positioning system (GPS). The GPS location will be recorded at the primary entrance to each building. Coordinates will be saved on the GPS

with a unique identification number that starts with the notation "BD-XXXX," where "BD" indicates a building location, and will also be recorded by the field team on the IFF and in the field log book.

4.4.2 Indoor Dust Sampling

Dust samples will be collected using microvacuum (microvac) sampling techniques in all primary buildings, regardless of whether VCI is observed. Dust samples will be collected in secondary buildings only if the building was reportedly used to store VCI or if VCI is observed. Dust samples will be collected following the procedures provided in American Society for Testing and Materials (ASTM) *Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations* (D 5755-95). A copy of this standard ASTM method is provided in Appendix B, with site-specific applications described below (ASTM 1995).

The decision to use microvac sampling, rather than wipe sampling, for the TAPE inspection and sampling was based primarily on the need to collect data that are consistent with data collected for the Libby Asbestos Superfund Site. EPA, and its contractor CDM, have used microvac sampling methods to collect the indoor dust samples in Libby. Microvac sampling methods are assumed to collect samples that more accurately measure releasable asbestos fibers when compared with wipe samples. Each indoor dust sample will be composed of a three-point composite sample, as described in the above-mentioned ASTM standard (ASTM 1995).

4.4.2.1 Select Sampling Locations

The TAPE field team will select sample locations based on the team's visual inspection of the buildings and estimation of where contaminated dust is most likely to be found. The number and locations of dust samples will be selected as described below.

Primary Buildings

Dust samples will be collected in every primary building regardless of whether VCI was observed during the visual inspection, unless the property owner declines sampling.

- Two dust samples will be collected on each level of the building's living space (including finished basements):

- ➢ One three-point composite sample will be collected from accessible horizontal surfaces (for example, windowsill, shelving, and cabinets). The TAPE field team will select the surface or surfaces based on factors including proximity to observed VCI and dust accumulation. (Preference will be given to surfaces with higher dust accumulation that are closer to observed VCI.)
- ➢ One three-point composite sample will be collected from high-traffic walkways, which will be selected by the TAPE field team based on the most probably walkway for tracking contamination into the building, including walkways adjacent to entry doors on the main floor. It will include main walkways and corridors between living areas on upper floors and in basements without walk-out access. Walkways may be solid surfaces or covered with rugs and carpets, or a combination.

- One three-point composite sample will be collected from each unfinished basement, if present. This sample will be collected from both walkways and horizontal surfaces inside the basement, with specific aliquots selected at the discretion of the TAPE field team.
- One three-point composite sample will be collected from each attached garage or shop, if present. This sample will be collected from both high-traffic walkways and horizontal surfaces inside the attached building, with specific aliquots selected at the discretion of the TAPE field team.
- No dust samples will be collected in attics or crawlspaces or outside of the building (for example, ambient air).
- The field team may choose to collect additional, targeted dust samples if migrating VCI is observed in the living space of a primary structure. These data would be used to design small scale vermiculite removal actions if necessary.

Secondary Buildings

Secondary buildings will be subject to dust sampling only if VCI is observed in the secondary building, or if the property owner indicates that the building was historically used to store VCI.

- One three-point composite sample will be collected from horizontal surfaces and the entry walkway.

4.4.2.2 Dust Sample Collection

Collecting a microvac dust sample involves vacuuming dust from a surface and drawing the sample through a filter designed to capture particulates larger than 0.45 micrometers (μm). The ASTM method D5755-95 provides the procedural details for properly collecting a microvac dust sample (Appendix B, ASTM 1995).

The microvac device will consist of a battery-operated low-volume sampling pump connected to a 25-millimeter (mm) vacuum dust sampler cassette. The analytical laboratory will provide the cassettes in sealed bags and will be certified asbestos-free. The cassettes will contain a 0.45-μm mixed cellulose ester filter. A 6.35-mm diameter plastic tubing will be used to connect the cassette to the pump. A 25- to 37.5-

mm length of 6.35-mm diameter tubing will be used to create a "nozzle" on the cassette for sampling. The nozzle tubing will be cut at the sampling end at an approximate 45-degree angle.

The pump will be calibrated each morning in the Tetra Tech field office using a standard calibration device such as a Dry-Cal. The pump will be calibrated using a 25-mm vacuum dust sampler cassette to simulate field operation. The flow rate used for sampling will be approximately 2 liters per minute, which provides an approximate air velocity of 100 centimeters per second through the 6.35-mm diameter tubing.

The sampling area for each dust sample point (aliquot) will be 100 square centimeters (cm^2) delineated using a fixed template or set of rulers. The aliquot sample will be collected by activating the pump and passing the angled nozzle across the delineated surface for 2 minutes.

Each indoor dust sample will contain three sample aliquots; that is, three separate 100 cm^2 surfaces will be vacuumed using one cassette. The cassette will therefore contain dust from a total 300 cm^2 surface area. To collect aliquots, the pump will be turned off and the sampling device moved to the next sample point. Once the next aliquot area has been delineated using a template or rulers, the pump will be turned on and the next 100 cm^2 surface area will be vacuumed. When all three sample aliquots have been collected, the sampling device will be turned upside down so that any loose dust falls into the cassette. The exterior of the cassette and nozzle will be wiped clean with a wet towel (wet wipe). The cassette will be detached from the pump, and both the cassette and the nozzle will be placed in a Ziploc sample bag for shipment to the laboratory (see Appendix B for detail). The nozzle will be included in the shipment because significant quantities of dust can remain in the nozzle. The sample will be labeled using the pre-printed sample labels and will be wrapped in bubble-wrap for shipment. Chain-of-custody procedures will be followed as described in Section 5.5.2.

Indoor dust sample point locations will be described and recorded in the TAPE field log book and on the FSDS and may be photographed and sketched on the property map at the discretion of the field team.

4.4.3 Outdoor Inspection

All areas of the Troy properties that are not covered with buildings will be inspected for vermiculite product in soil and surface materials. The areas of the Troy properties that are not covered by buildings

will be grouped into two general types: (1) outdoor yards and open space, and (2) specific use areas. Figure 3-2 provides typical outdoor soil sampling designs for these two general types of outdoor areas.

Special attention will be paid to areas where known sources of LA may have been introduced (including fill areas) and to "high traffic areas" where potential LA is likely to be tracked indoors. The TAPE field team may further subdivide the outdoor yards and open space by land use types, such as yards or grassy areas; driveways; parking areas, and filled areas, if known or visible. Sketches will be drawn on the individual property maps to show the separate land use areas. The property sketch will also show fences, large trees, or other potential obstructions to potential future remediation. Properties that do not have yards, such as commercial properties, will be described as such on the IFF and in the field logbooks; outdoor areas such as paved parking or driveways will still be inspected. As best identified by the property owner, property boundary lines will also be noted on the IFF.

One member of the TAPE field team will visually inspect each area for the presence of vermiculite product or LA-containing rock while the second team member documents the locations and estimated quantities of observed vermiculite product on the IFF and in the field log book. Locations of vermiculite product observed will also be sketched on the property map. Visual outdoor property inspections will not include digging below the soil surface or destructive techniques to investigate underneath asphalt or concrete. It will not be necessary to delineate the vertical extent of contamination because the default excavation depth for remediation of specific use areas is 18 inches below ground surface (EPA 2003b). Similarly, the default excavation depth for remediation of general yard areas, open space, and driveways is 12 inches below ground surface (EPA 2003b).

Specific use areas include current and former flower beds, current or former gardens, planters, compost piles, play areas, and stockpiles. These areas will be included in the inspection. Visual inspections of specific use areas will not include digging below the soil surface.

As part of the yard visual inspection, the field team will note the location of visible utilities (overhead and buried, if marked) and will ask the property owner for any additional information on utility locations. Information on utility locations may be used for planning, but will not satisfy the utility locate requirements for the State of Montana should excavation be required for remedial activities. The field team may elect to photo-document specific conditions on the property for future reference. The property owner will be asked for permission before photographs are taken.

4.4.4 Outdoor Soil Sampling

After the visual inspection of the property has been conducted, the TAPE field team will collect soil samples from special use and yard areas following the procedures described below and in the SOPs in Appendix B. Soil will be sampled regardless of the results of the visual inspection. Soil sampling will include the following steps:

- Identify sampling locations
- Collect samples
- Record locations on Troy property map
- Record sample locations using GPS

4.4.4.1 Identify Sampling Locations

TAPE soil samples will be collected as five-point composites with composite subsamples taken from similar use areas. Typical designs for outdoor soil sampling are shown graphically on Figure 3-2. It can be assumed that LA sources would have been distributed across an area, for example by tilling into a yard or garden. A minimum of one five-point composite soil sample will be collected at each Troy property, unless the property has no soil-covered areas (for example, all outdoor areas are paved). A five-point composite will also be collected from the specific use areas; however, the size and dimensions of the specific use area may require that less than five subsamples be collected for some specific use areas. At least one five-point composite sample will be collected from the yard area. In general, five-point composite samples will not cover more than approximately 5,000 square feet. A maximum of five, five-point composite samples will be collected at each property, but additional composite or grab samples may be collected at the discretion of the TAPE field team. The Tetra Tech TAPE field team will use professional judgment to select the appropriate numbers of soil samples to collect at each property. In addition, the TAPE field team will collect all soil samples with the minimum amount of disturbance to the surface. Sod will be carefully removed and immediately replaced after sampling and care will be taken to collect soil samples without disturbing growing flowers and vegetables. To ensure consistency, all TAPE field teams will be provided the same training and guidelines, and training will include "brainstorming" potential property scenarios and discussing proposed sampling approaches.

4.4.4.2 Collect Soil Samples

Soil samples will be collected from (1) outdoor yards and open spaces, and (2) specific use areas at properties in the Troy OU. Figure 3-2 provides typical outdoor soil sampling designs for these two types of outdoor areas.

A typical Troy yard sample will be composed of a five-point composite soil sample collected from the 0 to 1 inch depth. As shown in Figure 3-2, the five individual sample points that will make up each composite sample will be located within a similar land use area, such as the back yard, front yard, or side yard. A minimum of one five-point composite sample will be collected from each Troy OU property with a yard. Additional five-point composite samples will be collected when the yards are larger than 5,000 square feet.

A typical open space sample will also be composed of a five-point composite soil sample, as shown on Figure 3-2, collected from the 0 to 1 inch depth. Typical spacing for the individual five-point locations are shown as approximately 30 feet, but this distance can be modified to best fit the land use area. Additional five-point composite samples will be collected for each open space area of approximately 5,000 square feet. The Tetra Tech field team will use professional judgment to select the appropriate number and type of soil samples to collect for each yard and open space. Not all open spaces may be sampled, depending on current and historical uses. To ensure consistency, all field teams will be provided the same training and guidelines, and training will include "brainstorming" potential property scenarios and discussing proposed sampling approaches.

Specific use areas in Troy include outdoor gardens, former gardens, flower-beds, play areas, and other areas with potentially greater exposure or greater use of vermiculite amendments. Five-point composite soil samples will be collected from the 0 to 6 inch depth interval in specific use areas. Figure 3-2 presents typical layouts for a garden plot, flower bed, and undefined areas. Typical sample spacing shown on Figure 3-2 is for 10 feet separation, but the distance can be modified to best fit the specific use area. The TAPE field teams will be provided training and guidelines for consistent sampling of specific use areas.

Hand trowels will be used to collect approximately 500 grams of soil sample from the 0 to 1 inch or 0 to 6 inch soil interval at each subsample location. Subsamples will be placed in a stainless steel mixing bowl and mixed with a stainless steel sampling spoon for approximately 3 minutes. After they have been combined, the mixed subsamples will be placed into one Ziploc bag using the same stainless steel mixing

spoon. During sample collection and mixing, the field team will attempt to shield the soil samples from the wind to avoid potentially losing lighter fractions of the soil to the ambient air.

The Ziploc bag will be placed inside a second bag as a precaution. The outer Ziploc bag will be labeled using the pre-printed sample labels for shipment. Chain-of-custody procedures will be followed as described in Section 5.5.2.

The field team will attempt to restore the land surface to its prior condition after sampling, but Tetra Tech will not be responsible for re-laying sod or replanting. It is not envisioned that sampling will require large-scale disturbance of yards, since the sample size required is small.

4.4.4.3 Record Sample Location on Troy Property Map and with GPS

The field team will mark each soil subsample location on the Troy property map with labeling to indicate the composite sample for which the subsample was collected. A backpack-mounted Trimble XRS-Pro GPS will be used to record the midpoint subsample location for each composite soil sample. The GPS location coordinates will be recorded on the GPS unit with a unique identification number that starts with the notation "TSP-XXXX" where "TSP" indicates a "Troy Sample Point" soil sample. The GPS coordinates will also be recorded in the FSDS and field logbook for backup and verification of sample locations.

4.4.5 Photography

Each TAPE field team will have a camera for photo-documenting the conditions at a property, if the conditions are not readily described in writing or if, in the judgment of the field team, photographs may assist in development of a remedial action plan for that property. Permission from the property owner will be obtained before any photograph is taken, other than for photographs taken from the public right-of-way.

All photographs will be recorded in the field logbook and on the IFF, and on the property map using the following symbol to indicate the position where the photograph was taken and the direction it was taken (•⟶). No accurate distance scales will be used for landscape photographs, but general distances can be estimated by noting the location where the photograph was taken. All photographs will be taken using digital cameras and will be download the same day at the Troy Tetra Tech field office and saved.

5.0 FIELD QUALITY CONTROL PROCEDURES

Section 5.0 describes the methods and procedures for decontamination, quality assurance samples, field documentation, handling investigation-derived wastes, and maintaining chain of custody of samples and records.

5.1 EQUIPMENT DECONTAMINATION

Dust samples will be collected using laboratory-provided filter cassettes with a new cassette for each sample collected. In addition, new tubing will be used to connect the cassette to the air pump and to the end of the cassette for each sample collected. The air pump will not require decontamination between samples as a matter of course because of its position behind the sample filter during sample collection. If the exterior of the air pump becomes visibly dusty, it will be wiped clean with a damp paper towel to avoid transferring dust from one location to another.

The 100 cm^2 template or set of rulers used to delineate dust sampling area will be wiped clean with wet wipes between sampling locations.

The stainless steel mixing bowl, spoon, and trowel used for the composite soil sampling will be decontaminated between samples by removing surface soil and wiping clean with wet paper towels. If outdoor conditions create wet or muddy samples, the sampling equipment may require washing with soapy water (Alconox solution) and a wet brush until no visible soil remains. Clean water will be used for the final rinse, and the sampling equipment will be dried with paper towels.

Visible soil on hands or clothing will be removed by dry brushing or by washing with soap and water. No additional personnel decontamination is expected to be necessary. PPE will include disposable gloves, work boots, and respirators. The respirators will be cleaned and decontaminated as discussed in the HASP (Appendix A).

5.2 QUALITY ASSURANCE SAMPLES

Dust field blank samples will collected at a frequency of one blank sample per 20 samples, or at 5 percent. Field blank dust samples will be collected at locations selected by the TAPE field team, and will be collected by attaching a cassette to the pump and pumping for 1 minute at the same rate as for dust

sample collection. However, the cassette will not have a nozzle, and the end of the cassette will be exposed to indoor air at the selected sampling location, rather than passed over a surface of any kind. Data for the dust field blank samples will be evaluated to assess whether a potential exists for airborne asbestos to cause analytical detections of asbestos in dust, or for cross-contamination to occur during sampling. Dust lot blank samples will also be submitted by the laboratory for each lot or batch of cassettes received from the laboratory. Data for dust lot blank samples will be used to evaluate whether cartridges were received asbestos-free from the laboratory.

Soil field equipment blanks will be collected at a rate of one per calendar week (Monday through Sunday) of sampling per field team. Field equipment blanks will be collected by placing silica sand (that is asbestos-free as analyzed by polarized light microscopy [PLM]) in a decontaminated stainless steel mixing bowl. The silica sand will be mixed in the bowl using the decontaminated equipment that was used to collect the soil samples. The silica sand will then be containerized and submitted for analysis following the same PLM methods. Data from field equipment blank samples will be used to evaluate the effectiveness of equipment decontamination between sampling locations or, in other words, the potential for cross-contamination between samples. Based on results for field equipment blanks, the frequency for soil field equipment blanks may be increased at the discretion of the Tetra Tech project QA/QC manager (however, the frequency will not be decreased to below one sample per week).

Soil field duplicate samples will collected at a frequency of one blank sample per 20 composite soil samples or a rate of 5 percent. Field duplicate samples will be collected as samples collocated in the same land use area (yard or landscaped area, for example) and will contain the same number of subsamples (typically five), but will be collected from different subsample locations. Data for soil field duplicates will be used to evaluate the potential variability in LA concentrations in a specific land use area. These data will not be used to evaluate precision in sampling or analytical techniques.

5.3 FIELD DOCUMENTATION

Example field forms (interview forms, IFFs, and FSDS) are provided in Appendix E. Before the TAPE field activities begin, all members of the Tetra Tech field team will receive the same training on implementation of this work plan in general and on use of these forms in particular. Property owner interviews, property inspections, and sample collections will be conducted using these forms to ensure consistency between properties and between TAPE field teams. Use of these forms will also allow compilation of TAPE-derived data into the Libby V2 database (see Section 5.5).

Any additional information that is not recorded on field forms will be recorded in the TAPE field logbooks. Each field team will maintain a field log book for recording the date and time of each property inspection, the names of the people who allowed property access and completed the interview, the property-specific ID number and IFF number, the number and type of samples collected at the property including sample ID numbers and FSDS numbers, chain of custody numbers, and any other pertinent information. A new page will be started in the field log book for each property. The field logbook will serve as an independent (backup) record for all activities conducted and samples collected at a property, in the event that IFFs or FSDSs are lost or damaged. The field logbook will also be used to record additional observations of the field team that relate to potential remedial action at a property, such as locations, quantities and types of suspect asbestos-containing material that is not VCI or LA, and access limitations that were not noted on the IFF.

Information will also be recorded on the individual property maps by sketching directly onto the property maps, which will have an aerial photograph base. Property map sketches will show the locations of any observed VCI and LA-containing rock, primary and secondary buildings and the main entrance of each building, and the outdoor sample (including subsample) locations.

5.4 CONTAINMENT AND DISPOSAL OF INVESTIGATION-DERIVED WASTE

Investigation-derived waste will include used wet wipes, wet paper towels, disposable gloves, used respirator cartridges, used plastic tubing, decontamination water, and other minimal waste. It is possible, but not likely, that these investigation-derived waste materials may contain some asbestos. Therefore, all investigation-derived waste will be double-bagged and labeled with asbestos labels and stored at the Tetra Tech field office until it can be properly disposed of at an approved landfill. Non-sampling waste generated by the TAPE field teams, such as food containers and waste paper, will be separately bagged and disposed of as solid waste at a solid waste landfill.

5.5 RECORD KEEPING AND CHAIN OF CUSTODY

At the end of each day, or more often if required, the TAPE field teams will return to the Troy Tetra Tech field office to transfer the dust and soil samples, IFFs, interview forms, and FSDSs to the Tetra Tech sample coordinator (or the coordinator's designee). All verbal interview forms, IFFs, and FSDSs will be compiled at the Troy field office, photocopied, and the original copies forwarded to the Tetra Tech office in Helena, Montana, on a weekly basis. An individual file will be maintained for each property inspected.

Photocopies of all field forms and appropriate log book pages in each individual property file will be maintained in the Troy field office for the duration of the TAPE project so that information is available if questions arise. The original forms will be stored in the Tetra Tech office in Helena, Montana, for the duration of the sampling, inspection, and reporting phases of the TAPE project. The original forms will be transferred to DEQ at the end of the TAPE project. Copies of the field forms and field logbook will be available on request at any time during the TAPE project to DEQ, EPA, or to the Troy property owners.

After the field forms have been received from the TAPE field teams, the Tetra Tech field sample coordinator will manually enter the information into electronic format for ultimate transfer to the Libby V2 database. The Tetra Tech field sample coordinator will verify that the data were entered and correct and then transfer the electronic data to the CDM Troy coordinator, along with hard copies of the field forms and the associated dust and soil samples collected for the Troy properties. The CDM Troy coordinator will conduct a 100 percent data check to ensure that all information has been entered correctly. When the data check is complete, the CDM Troy coordinator will export the data to the Libby V2 database, via Volpe.

At the end of each day, or more often if needed, the TAPE field teams will return to the Troy Tetra Tech field office to complete chain-of-custody forms for all dust and soil samples, including QC samples, collected earlier. Until they have been transferred to the CDM Troy coordinator, all TAPE dust and soil samples will be held by Tetra Tech. Samples may be stored in locked vehicles or in a secured (locked) area of the Troy Tetra Tech field office. All TAPE dust and soil samples collected from the Troy properties, including QC samples, will be transferred along with a signed chain of custody form to the CDM Troy coordinator at least on a weekly basis. The CDM Troy coordinator will be required to sign the chain of custody forms to acknowledge receipt of the samples. The CDM Troy coordinator will provide Tetra Tech with a copy of this chain of custody. The CDM Troy coordinator will then transfer the samples to the laboratory for preparation and analysis.

Digital photographs will be downloaded daily to a computer at the Tetra Tech Troy field office. Photographs will be downloaded and labeled using a standard labeling procedure that is based on property-specific ID numbers.

6.0 DATA MANAGEMENT

Data management during the inspection and sampling will be under the supervision of the Tetra Tech TAPE field sample coordinator in the Troy field office. At the conclusion of inspection and sampling, that responsibility will pass to the Tetra Tech TAPE project manager.

6.1 DATA REQUISITION

The laboratory will report all analytical data to CDM, and CDM will oversee integration of that data into the Libby V2 database. Tetra Tech and DEQ will obtain sampling data from the Libby V2 database by requesting that data from Volpe (through EPA) on a standard information request form. Tetra Tech will request the following information from the Libby V2 database for each sample, including QC samples, collected during the TAPE project:

- Sample location
- Sample name
- Sample date
- Sample results
- Identification numbers, dates, and results for laboratory quality control samples

Volpe will provide this information (through EPA) in the standard Libby V2 data report format. All other information necessary for reporting purposes will be obtained from Tetra Tech internal files (copies of IFFs, FSDSs, property sketches, and log books).

6.2 DATA REPORTING

Data from the Libby V2 database will be obtained through a geographic information system interface software (ArcView). This interface will provide maps showing all TAPE sample locations. Dust and soil sampling results will be provided from the Libby V2 database in tabulated form, as Microsoft Access files. Tetra Tech will prepare a TAPE project report that describes the activities conducted, the results of the property inspections, and the results of the sampling, evaluates data quality, and recommends follow-up actions. The TAPE project report will include maps for each property where asbestos in soil or in dust exceeded screening levels. TAPE project maps will show sample locations and results for the property and delineate the areal extent of asbestos.

7.0 QA/QC PROCEDURES

The TAPE quality objectives, QC checks and samples, and audits completed for the TAPE project are described in the sections below. Field quality control procedures are described in Section 5.0 above.

7.1 QA/QC OBJECTIVES

The quality objectives of the TAPE project are to obtain 100 percent usable and accurate data. These data will be achieved through inspection and sampling using standardized field forms and procedures, auditing field operations, observing chain of custody procedures, and analyzing field quality control samples and laboratory quality control samples. The DQOs are further discussed in Section 3.0 of this work plan.

7.2 INTERNAL QC CHECKS

When laboratory analytical data are received, Volpe will conduct a thorough quality review of that data. Volpe will review data from both laboratory QC samples described below and field QC samples described in Section 5.2. Standard protocols exist for validation of soil samples analyzed by PLM for asbestos and will be followed. Standard protocols do not exist for validation of dust samples for asbestos; however, Volpe (and EPA) will follow the QC review procedures for dust data established at the Libby Asbestos Superfund Site. Volpe will prepare validation and review packages for all TAPE data and will transmit the reports to Tetra Tech to be included in the TAPE project report.

Dust and soil samples will be analyzed by one of EPA's contract laboratories following Libby Asbestos Superfund Site protocols, including EPA's most recent protocols relating to QA/QC for the Libby Asbestos Superfund Site. As such, the QA/QC protocols followed by the laboratories are not within Tetra Tech's immediate control.

Laboratory QA/QC samples and standard protocols that the contract laboratory will perform for routine analysis will include the analysis of the following sample types:

- Preparation Duplicate Samples
- Preparation Laboratory Equipment Blanks (grinding and other equipment)
- Method Blank Samples
- Matrix Spike/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Duplicates

- Standard Reference Material
- Surrogates

Volpe will enter data into the Libby V2 project database with a 100 percent QC of the data. This check will be performed daily on the data entered from the previous day.

7.3 AUDITS, CORRECTIVE ACTIONS, AND QA REPORTS

Field audits will be an integral part of Tetra Tech's field operations for the duration of the TAPE project. Field audits and corrective actions will be the responsibility of the Tetra Tech QA/QC manager. (See Section 2.0 and Table 2-1 for designated key project personnel.) The TAPE project report will include a discussion of data quality that will include a summary of field audit results. Copies of field audit forms will be provided as an appendix to the TAPE project report.

7.3.1 Field Inspections and Sampling Procedures Audits

The Tetra Tech QA/QC manager will be responsible for audits of TAPE field inspections and sampling procedures. Audits will be conducted daily for the first 5 days of inspection and sampling and at least biweekly for the duration of the TAPE. Audits will consist of the QA/QC manager or his designee attending a Troy property inspection and sampling event and observing the TAPE field team's activities. The field team will not be warned of the audit. The auditor will compare the field team's activities with the protocols provided in this work plan and the attached SOPs and evaluate compliance with the protocols using the audit form provided in Appendix E. After the audit, the auditor will provide the completed audit form to the DEQ and Tetra Tech project managers.

7.3.2 Corrective Action Procedures

The QA/QC auditor may use his or her discretion to provide immediate verbal feedback to the TAPE field team if necessary to ensure that deficiencies are fixed as quickly as possible. The Tetra Tech field team leader and QA/QC manager will review the report with the TAPE field team within 48 hours of the audit to correct any deviations or deficiencies. If any deviations or deficiencies were noted, the field team will be audited again within 1 week of the original audit to ensure that any deficiencies have been fixed.

If gross deficiencies are noted, the Tetra Tech QA/QC manager will determine whether re-inspection or re-sampling of any Troy properties is required. Re-inspection or re-sampling will be required only if the

TAPE field team failed to correctly identify VCI during inspection, collected samples incorrectly, or collected a grossly inadequate number of samples.

7.3.3 Laboratory Audits

The EPA contract laboratories used to analyze the Troy project samples will be required to provide proof of current certifications. Examples of certifications include the following: American Industrial Hygiene Association and the National Voluntary Laboratory Accreditation Program. The verification of laboratory certifications and QC controls will be under the jurisdiction of Volpe or EPA. These agencies are responsible for conducting the laboratory audits if required.

REFERENCES

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APPENDIX A

SITE-SPECIFIC HEALTH AND SAFETY PLAN
TROY ASBESTOS PROPERTY EVALUATION

APPENDIX B

STANDARD OPERATING PROCEDURES (SOPs)
TROY ASBESTOS PROPERTY EVALUATION

CDM/EPA – Libby

- CDM-Libby-03 (Rev 1) Completion of Field Sampling Data Sheets
- CDM-Libby-04 (Rev 1) Completion of Inspection Field Forms
- CDM-Libby-05 (Rev 1) Site-Specific Standard Operating Procedure for Soil Sample Collection

American Society for Testing and Materials (ASTM)

- ASTM D5755-95 Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Building Number Concentrations

APPENDIX C

EQUIPMENT/SUPPLIES LIST
TROY ASBESTOS PROPERTY EVALUATION

APPENDIX D

INFORMATION PACKET FOR RESIDENTS
TROY ASBESTOS PROPERTY EVALUATION

To be developed in conjunction with DEQ

APPENDIX E

FIELD FORMS
TROY ASBESTOS PROPERTY EVALUATION