1191820 - R8 SDMS

Libby Asbestos Superfund Site

Operable Unit 3
Phase IV Remedial Investigation
Field Sampling Summary Report
Activity-Based Sampling

January 2011

MWH

FIELD SAMPLING SUMMARY REPORT

PHASE IV REMEDIAL INVESTIGATION
OPERABLE UNIT 3

ACTIVITY-BASED SAMPLING

LIBBY ASBESTOS SUPERFUND SITE

January 2011

Prepared by:

MWH Americas, Inc.
10619 South Jordan Gateway, Suite 100
Salt Lake City, Utah 84095

TABLE OF CONTENTS

1.0 PROJECT OVERVIEW 1-1

1.1 Background Summary 1-1

1.1.1 Phase I Remedial Investigation 1-2

1.1.2 Phase II Remedial Investigation 1-3

1.1.3 Phase III Remedial Investigation 1-4

1.1.4 Phase IV Remedial Investigation 1-4

1.2 Purpose of the Phase IV Remedial Investigation 1-4

1.3 Purpose of This Document 1-5

1.4 Project Organization 1-6

1.4.1 Project Management 1-6

1.4.2 Technical Support 1-6

1.4.3 Field Sampling Activities 1-7

1.4.4 Sample Preparation and Analysis 1-7

1.4.5 Data Management 1-7

2.0 PHASE IV ACTIVITY-BASED SAMPLING 2-1

2.1 Summary of the Phase IV Activity-Based Sampling Program 2-1

2.2 ABS Locations 2-2

2.3 ABS Conditions 2-2

2.4 Performance of ABS Script 2-2

2.4.1 ABS Participants 2-3

2.4.2 ABS Director 2-5

2.5 ABS Script Components 2-5

2.5.1 Recreational Visitor Along Rainy Creek 2-5

2.5.2 Driving To and From the ABS Area 2-5

2.5.3 Felling/Limbing Trees 2-56

2.5.4 Cutting/Stacking Wood in Truck 2-6

2.5.5 Trail Maintenance/Debris Clearing 2-6

2.5.6 Tree-Thinning/Slash Pile Building 2-7

2.5.7 Tree Stand Examination 2-7

2.5.8 Cutting Fireline by Hand using a Pulaski Tool 2-7

2.5.9 Cutting Fireline by Bulldozer 2-7

2.5.10 ABS Site Reclamation 2-8

2.6 ABS Equipment and Instrumentation 2-8

2.7 Sampling Methods 2-9

2.7.1 Sample Collection 2-9

TABLE OF CONTENTS (cont.)

2.7.2 Field Calibration of Air Sampling Pumps 2-9
2.8 Quality Control Samples 2-10
2.8.1 Lot Blanks 2-10
2.8.2 Field Blanks 2-10
2.9 Sample Handling 2-11
2.9.1 Sample Containers 2-11
2.9.2 Sample Preservation and Storage 2-11
2.10 Sample Documentation and Identification 2-11
2.11 Sample Chain-Of-Custody and Shipment 2-12
2.12 Analysis 2-12
2.13 Health and Safety 2-13

LIST OF TABLES
(Tables follow their respective section)

Table No.	Title
2-1	ABS Area 2, Round 1
2-2	ABS Area 2, Round 2
2-3	ABS Area 2, Round 3
2-4	ABS Area 2, Round 4
2-5	ABS Area 2, Round 5
2-6	ABS Area 7, Round 1
2-7	ABS Area 7, Round 2
2-8	ABS Area 7, Round 3
2-9	ABS Area 7, Round 4
2-10	ABS Area 7, Round 5
2-11	ABS Area 10, Round 1
2-12	ABS Area 10, Round 2
2-13	ABS Area 10, Round 3
2-14	ABS Area 10, Round 4
2-15	ABS Area 10, Round 5
2-16	ABS Rainy Creek, Rounds 1-5

TABLE OF CONTENTS (cont.)

LIST OF FIGURES
(Figures follow their respective section)

Figure No.	Title
1-1	Location of Mine Site and Preliminary OU3 Study Boundaries
2-1	Phase I Downwind Sampling Transects and Phase IV ABS Locations
2-2	OU3 Phase IV Stream Flow Data
2-3	Phase IV ABS Area 2 GPS Locations
2-4	Phase IV ABS Area 7 GPS Locations
2-5	Phase IV ABS Modified Area 10 GPS Locations
2-6	Phase IV ABS Rainy Creek GPS Location

LIST OF APPENDICES
(Appendices on CD in pocket)

Appendix A	Field Modification Approval Forms
Appendix B	Field Sample Data Sheet Scans
Appendix C	Field Logbook Scans
Appendix D	Chain-of-Custody Scans
Appendix E	ISCO Flow Data in Excel Format

LIST OF ACRONYMS AND ABBREVIATIONS

µm	micrometer
ABS	Activity-Based Sampling
AOC	Administrative Order on Consent
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	contaminant(s) of concern; chain-of-custody
EPA	U.S. Environmental Protection Agency
FB	field blank
FSDS	field sample data sheet
FSSR	Field Sampling Summary Report
GIS	geographic information system
GPS	global positioning system
HDR	HDR, Inc. (oversight contractor)
HEPA	high-efficiency particulate-air
Index ID	index identification number
KDC	Kootenai Development Corporation
LA	Libby Amphibole
LPM	liter per minute
MCE	microcellulose ester
MDEQ	Montana Department of Environmental Quality
mL	milliliter
MWH	MWH Americas, Inc.
OU	Operable Unit
PAPR	powered air-purifying respirator
PLM-VE	polarized light microscopy and visual estimation
PPE	personal protective equipment

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

QC	quality control
RI/FS	Remedial Investigation/Feasibility Study
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SRC	Syracuse Research Corporation
TEM	transmission electron microscopy

1.0 PROJECT OVERVIEW

1.1 BACKGROUND SUMMARY

The vermiculite deposit at Vermiculite Mountain, six miles northeast of Libby, Montana, contains veins of asbestiform amphibole minerals (e.g., winchite, richterite and tremolite). The asbestiform amphibole minerals that occur at Vermiculite Mountain are collectively termed "Libby Amphibole" (LA) by the U.S. Environmental Protection Agency (EPA). Historic mining, milling, and processing of vermiculite from the former W.R. Grace mine at Vermiculite Mountain released LA fibers to the environment. Long-term exposure to LA fibers associated with the vermiculite is known to have caused adverse health effects in some workers at the mine and processing facilities and EPA suspects others in Libby.

In 2000, EPA began cleanup actions at Libby under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; also known as Superfund) to eliminate sources of LA exposure to residents and workers. Initial efforts were focused mainly on wastes remaining at former vermiculite processing areas. As work progressed, action shifted to cleanup of homes and workplaces in the residential/commercial areas of Libby, designated by EPA as Operable Unit 4 (OU4) of the Libby Asbestos Site.

As part of the Superfund designation of the Libby Asbestos Site, the former mine and environs at Vermiculite Mountain were designated OU3. OU3 includes the property in and around the former vermiculite mine and forest areas surrounding the mine that may have been impacted by releases and subsequent migration of contaminants from the mine. Figure 1-1 shows the location of the mine site and the preliminary study area boundary of OU3. EPA established the preliminary study area boundary for the purpose of planning and developing the scope of the remedial investigation/feasibility study (RI/FS) for OU3. This study area boundary may be revised as data are obtained on the nature and extent of environmental contamination, if any, associated with releases that may have occurred from the mine site.

1.1.1 Phase I Remedial Investigation

In September 2007, EPA initiated a Remedial Investigation/Feasibility Study (RI/FS) of OU3 and produced the *Phase I Sampling and Analysis Plan for Operable Unit 3, Libby Asbestos Superfund Site* (OU3 Phase I SAP) to begin the characterization of environmental conditions at OU3. The OU3 Phase I SAP contains information on the history and operations of the former mine and discussions on general site geography, geology, hydrology and other relevant background information. The SAP also contains the preliminary sampling locations and the Standard Operating Procedures (SOPs) that were used as guidance during the OU3 Phase I RI performed in October 2007. Phase I included sampling and analysis of soil, mine wastes, sediment, surface water, and ambient air at the former mine site, and tree bark, duff and mineral soil on the mine site and in surrounding forested areas within an eight-mile radius of the mine site. The field sampling performed as part of the Phase I RI is summarized in the *Phase I Field Sampling Summary Report* (Phase I FSSR), which documents the sampling locations and procedures employed during the Phase I RI at OU3.

Prior to implementing the OU3 Phase I RI, EPA had collected very limited information to evaluate contaminants of potential concern at the former Vermiculite Mountain mine property and potential releases to adjacent forest lands, surface water and groundwater. Areas outside the former mine property are of potential concern because they are used by the public for recreation, by logging companies for timber harvesting, and by wildlife as habitat. Contaminants of potential concern at OU3 include not only LA, but other mining-related contaminants that may have been released to the environment. The overall objective of sampling at OU3 is to collect sufficient information to allow evaluation of risks to humans and ecological receptors from exposure to mining-related releases, and to support the development and evaluation of remedial alternatives to address any unacceptable risks that are identified. This will occur over multiple, phased sampling events; the findings of each phase of sampling will be used to guide subsequent phases of investigation.

Phase I sampling and analysis was intended to provide initial information on the nature and extent of asbestiform LA and non-asbestos contamination, to identify contaminants of potential concern to be investigated during the RI, and to begin collection of data to establish a study area boundary for subsequent phases of the RI. Phase I was not expected to provide data that would be sufficient to fully characterize the nature and extent of contamination or to support a risk assessment. Rather, the results of Phase I were intended to provide sufficient information so that a more detailed and extensive sampling effort (Phase II) could be designed for implementation during the 2008 field season.

1.1.2 Phase II Remedial Investigation

The Phase II RI was performed from early April through October, 2008 and consisted of three parts: Part A (surface water and sediment sampling), Part B (groundwater and ambient air sampling) and Part C (ecological sampling). Part A field sampling was performed in accordance with the *Phase II Sampling and Analysis Plan for Operable Unit 3, Libby Asbestos Superfund Site; Part A: Surface Water and Sediment*, final version dated May 29, 2008 (Phase IIA SAP). Part B field sampling was performed in accordance with the *Phase II Sampling and Analysis Plan for Operable Unit 3, Libby Asbestos Superfund Site; Part B: Ambient Air and Groundwater,* final version dated July 2, 2008 (Phase IIB SAP). Part C was performed in accordance with the *Phase II Sampling and Analysis Plan for Operable Unit 3, Libby Asbestos Superfund Site; Part C: Ecological Data,* final version dated September 17, 2008 (Phase IIC SAP).

Parts A and B of the Phase II RI focused on mine-site media (surface water, groundwater, sediments and ambient air) to more fully characterize the nature, extent and seasonal variation of contamination on the former mine property. Field activities performed under Parts A and B of the Phase II SAP are summarized in the *Phase II Field Sampling Summary Report, Parts A and B.* Part C of the Phase II RI included ecological sampling performed by Parametrix, Inc. in late September and early October, 2008, and is summarized in separate documents.

1.1.3 Phase III Remedial Investigation

The Phase III RI at OU3 began in early June, 2009. Activity-based sampling (ABS) was conducted in accordance with the *Remedial Investigation for Operable Unit 3, Libby Asbestos Superfund Site Phase III Sampling and Analysis Plan* (Phase III SAP), as amended by field modifications issued by EPA. ABS activities during Phase III focused on simulating the activities of recreational visitors to the forest lands in the vicinity of the former mine. The ABS scripts included ATV riding, hiking, fire-pit preparation, wood gathering and building and moving about a campfire. Ecological sampling performed by Parametrix, Inc. at OU3 during the 2009 field season is discussed in a separate document.

1.1.4 Phase IV Remedial Investigation

The Phase IV RI began in June, 2010 with site selection and U.S. Forest Service (USFS) approval of trees to be harvested during ABS. Phase IV focused on sampling potential exposures of forest users and USFS personnel downwind (northeast) of the former mine operations. Phase IV ABS activities included timber harvesting, limbing and cutting felled trees into fireplace lengths, trail clearing and thinning, tree thinning, timber inspection, fireline cutting by both hand and machine and shed elk horn hunting along Rainy Creek.

1.2 PURPOSE OF THE PHASE IV REMEDIAL INVESTIGATION

The results of Phase I sampling and analysis of forest materials (tree bark, duff and mineral soil) and Phase III sampling and analysis from lands that surround the mine site were used by EPA to select locations where ABS was performed during Phase IV.

Phase IV ABS began with reconnaissance of candidate sites on June 2, 2010. A ranger from the USFS Canoe Gulch station accompanied MWH and Chapman Construction personnel to assess availability of trees for harvesting and areas where disruptive activities such as fireline cutting would be feasible and acceptable. Phase IV ABS was intended to simulate the activities of recreational visitors, firewood harvesters and USFS personnel in the forest lands that surround the mine site and the concentrations of LA to

which such individuals may be exposed. The Phase IV investigation was performed in accordance with the *Remedial Investigation for Operable Unit 3, Libby Asbestos Superfund Site Phase IV Sampling and Analysis Plan Part A—Data to Support Human Health Risk Assessment* (Phase IV SAP). Data generated during Phase IV ABS will be used in human health risk assessments and possibly as a basis for management decisions by the U.S. Forest Service and other forest-land stakeholders.

1.3 PURPOSE OF THIS DOCUMENT

This Phase IV FSSR is a summary of ABS performed in support of the RI/FS at OU3 during the 2010 field season. OU3 includes the property at and around the former vermiculite mine at Vermiculite Mountain potentially impacted by releases and subsequent migration of hazardous substances from the mine site and former mine operations (the preliminary boundaries of OU3 are depicted on Figure 1-1 of this document). The final boundaries of OU3 had not been defined prior to Phase IV RI field sampling in July 2010. Final boundaries for OU3 will be based primarily upon the extent of contamination associated with releases from the former mine, as determined by analytical results for samples collected during Phases I, II, III, and IV, and any subsequent phases of the RI. The final boundary of OU3 will be defined in the final EPA-approved RI/FS report.

This FSSR is a summary of sampling activities, locations and methods employed during the Phase IV RI at OU3. Analytical results for samples collected during the Phase IV RI are not presented in this document; analytical data and interpretations are summarized as part of Sampling and Analysis Plans (SAPs), which heretofore have been prepared by EPA for implementation during each field season or phase of work. Phase IV analytical results will be part of the basis for the data-gathering activities and scope of subsequent phases of RI at OU3. After all RI activities have been completed, a comprehensive RI Report will be prepared. The RI Report will contain all analytical results, interpretations and conclusions for the OU3 Remedial Investigation.

1.4 PROJECT ORGANIZATION

1.4.1 Project Management

EPA is the lead regulatory agency for Superfund activities within OU3. The EPA Remedial Project Manager (RPM) for all four phases of the OU3 remedial investigations addressed in this report is Bonita Lavelle of EPA Region 8. Ms. Lavelle is a principal data user and decision-maker for Superfund activities within OU3.

The Montana Department of Environmental Quality (MDEQ) is the support regulatory agency for Superfund activities within OU3. The MDEQ Project Manager for OU3 is Dick Sloan. EPA consults with MDEQ as provided for by CERCLA, the National Contingency Plan, and applicable guidance in conducting Superfund activities at OU3.

EPA has entered into an Administrative Order on Consent (AOC) with Respondents W.R. Grace & Co.-Conn. and Kootenai Development Corporation (KDC). Under the terms of the AOC, the Respondents implemented the Phase I, Phase II, Phase III and Phase IV SAPs at OU3. The designated Project Coordinator for the Respondents is Robert Medler of Remedium Group, Inc., a subsidiary of W.R. Grace & Co.-Conn.

1.4.2 Technical Support

EPA was supported in this project by contractors, including:

- Syracuse Research Corporation (SRC) assisted in development of the Phase III SAP and will assist in the evaluation and interpretation of the Phase III analytical data.
- Formation Environmental, LLC, as a subcontractor to SRC, provided support in developing the SAP and with mapping and other geographic information system (GIS) applications, and will assist in the design and evaluation of the feasibility study.

- HDR, Inc. provided periodic field oversight of Phase IV activities on behalf of EPA to ensure that field activities were performed in accordance with the project SAP, SOPs and Modifications.

1.4.3 Field Sampling Activities

Phase IV ABS field sampling activities were performed by W.R. Grace & Co.-Conn. and KDC with support from MWH Americas, Inc. (MWH) and Chapman Construction, Inc. (CCI) of Libby, Montana, in accordance with the Phase IV SAP and field modifications authorized by EPA (see Appendix A of this FSSR). Individuals responsible for implementation of the OU3 Phase III field sampling program are listed below:

- MWH Project Manager/Field Supervisor: John Garr
- MWH Field quality control (QC)/Health and Safety Officer: John Garr
- MWH Quality Assurance Officer: Stephanie Boehnke
- CCI point-of-contact: Mike Chapman

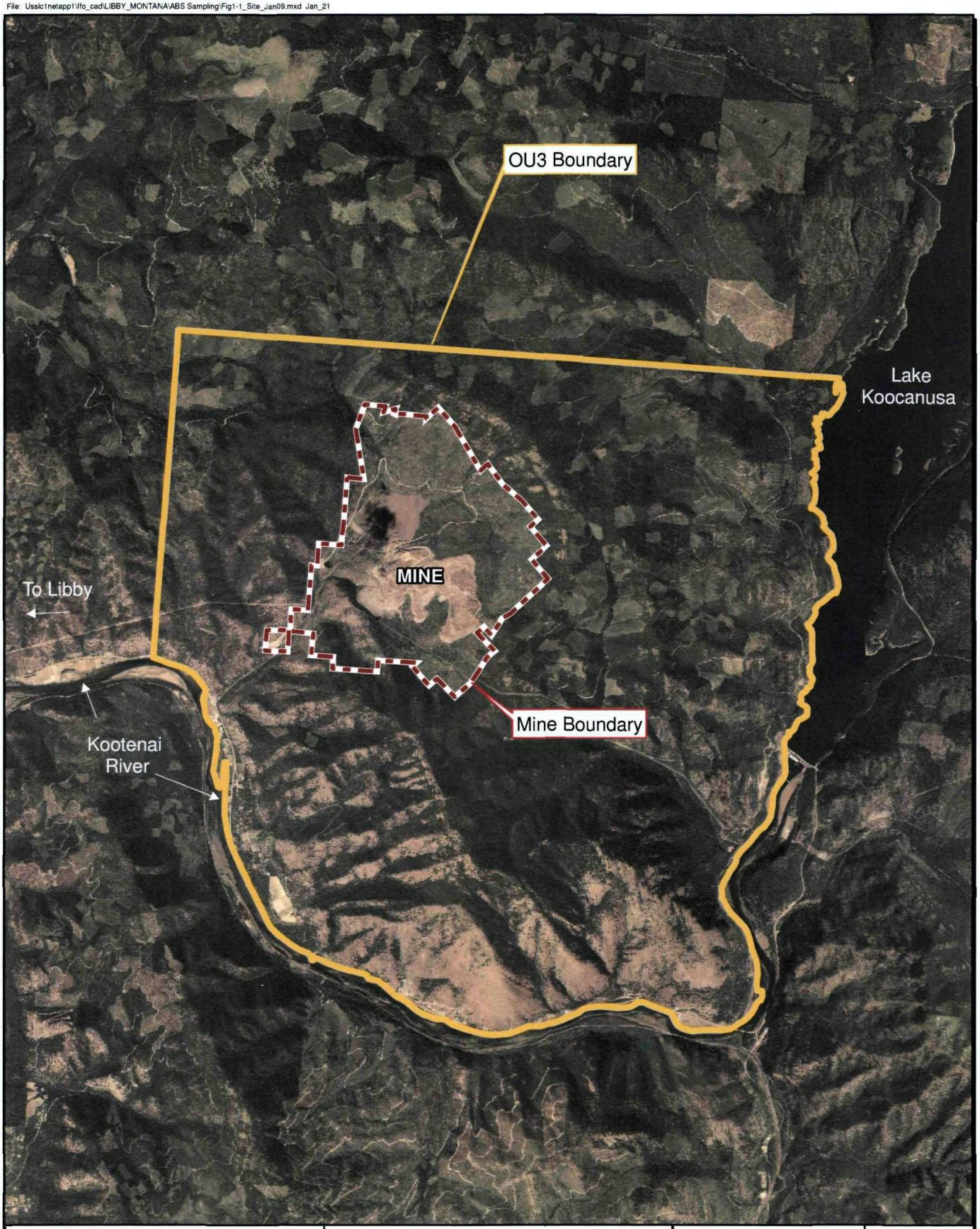
1.4.4 Sample Preparation and Analysis

All samples collected as part of the OU3 Phase IV RI were submitted to an EPA-selected/approved laboratory for preparation and/or analysis. All sample analyses for LA were performed by Hygeia Analytical Laboratories of Sierra Madre, California, and all analytical data validation and verification is to be performed by SRC.

1.4.5 Data Management

Administration of the OU3 master database is performed by EPA contractors. The primary database administrator is Lynn Woodbury of SRC. Ms. Woodbury is responsible for sample tracking, uploading new data, performing error checks to identify inconsistent or missing data, and ensuring that all questionable data are checked and corrected as needed. When the OU3 database has been populated, checked and validated, relevant LA data from the Phase IV RI will be transferred into the Libby2 database for final storage.

File: Ussic1netapp1\fo_cad\LIBBY_MONTANA\ABS Sampling\Fig1-1_Site_Jan09.mxd Jan_21



N
W E
S

0 3,950 7,900 Feet

PROJECT:

W. R GRACE LIBBY, MONTANA

FIGURE TITLE:

LOCATION OF MINE SITE AND PRELIMINARY OU3 STUDY BOUNDARIES

MWH

10619 South Jordan Gateway
Suite 100
Salt Lake City, Utah 84095

Date: 01/21/10
Rev: 12/23/10

FIGURE NO:

1-1

2.0 PHASE IV ACTIVITY-BASED SAMPLING

2.1 SUMMARY OF PHASE IV ACTIVITY-BASED SAMPLING PROGRAM

The objective of OU3 Phase IV activity-based sampling (ABS) and analysis was to provide information to characterize LA concentrations to which visitors to the forest lands and USFS personnel who work on the forest lands that surround the mine site may be exposed while engaging in typical activities, including:

Recreational Activities

- Driving to the area
- Felling and limbing a tree
- Cutting logs into fireplace lengths and stacking them in a truck
- Driving back from the area
- Hunting for shed elk horns along Rainy Creek

USFS Activities

- Trail maintenance/debris clearing
- Tree thinning/slash pile burning
- Tree stand examination
- Cutting fireline by hand with Pulaski tool
- Cutting fireline by bulldozer

These activities were performed according to an ABS script detailed in the Phase IV SAP and amended by field modifications issued by EPA (see Appendix A). The following sections of this FSSR are summaries of the ABS performed during Phase IV.

In addition to the ABS activities, stream flow records were collected using ISCO automated flow recorders/samples installed at LRC06, LRC02 and CC02 during the freeze-free part of the year (from April through November). The flow records are presented in graphical form on Figure 2-2 and in Excel format in Appendix E (on CD in pocket).

2.2 ABS LOCATIONS

Data collected from 2006 through 2009 at the Vermiculite Mountain mine site meteorological station indicate the predominant wind direction in the OU3 area is to the northeast. The three locations selected by EPA for the Phase IV ABS program in 2010 generally coincide with three "downwind" transects along which tree bark, duff and mineral soil were sampled during the Phase I RI in October, 2007. The downwind transects are centered on the mine site and radiate 8 miles out, at bearings of N15°E, N45°E and N75°E (Figure 2-1).

Before final selection of Phase IV ABS locations, the initially proposed locations were field checked by CCI, MWH and the USFS. Based on this reconnaissance, minor adjustments (up to about 0.5-mile) were made to some of the proposed locations to ensure that access, forest and logging roads for vehicle and equipment access, topography, forest density and other site features were such that ABS could be conducted safely, effectively and with minimal damage to the forest.

2.3 ABS CONDITIONS

ABS was conducted only on days when there was no rain, no standing water on the forest and logging roads, and when visible dust was generated by driving trucks on the unpaved roads at normal speeds (20 mph or less).

2.4 PERFORMANCE OF ABS SCRIPT

The activities chosen for ABS during the Phase IV RI were intended to represent those performed by people who harvest firewood and USFS workers who manage the forest

land. The details and durations of the original script components contained in the final SAP dated June 14, 2010 were adjusted during pilot testing in mid-July, 2010, after it was learned that almost all of the samples collected under the original ABS script in July 2009 were heavily loaded with dust and could not be analyzed by direct methods. EPA-issued field modifications to the original ABS script contained in the final SAP dated May 26, 2009 are provided in Appendix A (on CD in pocket).

The ABS script was performed by one team, consisting of two CCI employees (who performed the activities) and one MWH employee (who directed the activities, recorded field data and managed the samples). During the 2010 field season, after the final (third) revision of the Phase IV SAP (dated August 31, 2009) had been issued, five full rounds of ABS were performed at each of the three designated locations. The GPS tracks of activities performed at Area 2, Area 7, Area 10 and Rainy Creek are depicted on Figures 2-3 through 2-6, respectively. Summaries of ABS activities, dates, air sampling flow rates and index I.D. numbers are provided in Tables 2-1 through 2-16, and follow this section.

2.4.1 ABS Participants

Each ABS activity was performed by two CCI employees ("participants"), who were designated "Person 1" and "Person 2." Each ABS participant was fitted with three air-sampling pumps and sampling cassettes for each activity. One pump was set to draw air through the cassette at 4 liters per minute (LPM), another was set to pump at 2 LPM, and a third was set to pump at 1 LPM. The laboratory was instructed to analyze the 4 LPM sample collected by Person 1 if the inner surface of the cassette cowling was free of dust and the filter was not overloaded. If the 4 LPM cassette worn by Person 1 was determined by the laboratory to be overloaded, the 2 LPM cassette worn by Person 1 was selected for analysis. If the 2 LPM cassette worn by Person 1 was determined by the laboratory to be overloaded, the 1 LPM cassette worn by Person 1 was selected for analysis. If the Person 1, 1 LPM cassette was overloaded, that sample would be analyzed by indirect methods. Samples collected by Person 2 were selected in a similar manner, thus, samples from each person were duplicates, with the exception of felling and limbing and cutting fireline by dozer activities. The remaining samples were retained by the

laboratory. Thus, five sets of 54 sample cassettes were used at each location during the five rounds of ABS at each of the three locations. Two sets of three cassettes were used during driving to and from the location. Four sets (two sets for 15 minutes' duration and two sets for 10 minutes' duration) were used during tree felling and limbing. Two sets were used cutting and stacking wood. Two sets were used for trail maintenance/debris clearing. Two sets were used for tree thinning/slash pile building. Two sets were used for tree stand examination. Two sets were used for cutting fireline by hand. Two sets were used for cutting fireline by bulldozer. Two sets of three cassettes were also used during each of five rounds of simulated shed elk horn hunting along the lower 0.25-mile of Rainy Creek.

The felling/limbing (both the 10-minute and 15-minute durations) were done by Person 1 (Person 2 gathered limbs and cast them off the road). The cutting fireline by dozer was also performed by Person 1 operating the dozer the entire 30 minutes while Person 2 served as dozer boss. All other activities were duplicated by Person 1 and Person 2, either by switching roles midway through the activity duration or by performing the roles simultaneously.

Because they were actively disturbing potentially contaminated soil, duff and vegetation during performance of the ABS script, the two ABS participants wore Level C Modified personal protective equipment (PPE) consisting of the following:

- Full-face powered air-purifying respirator (PAPR) fitted with high-efficiency particulate-air (HEPA) filters
- Double-layer Tyvek™ hooded, footed coveralls
- Latex boot covers
- Double-layer nitrile gloves

Respirators were field-decontaminated by a water spray before they were removed. New Tyvek coveralls, latex boot covers and nitrile gloves were donned before each activity. Cutting equipment was also decontaminated before each new activity.

2.4.2 ABS Director

Performance of the ABS script was overseen by an MWH employee ("director") who stayed at a "base station" established upwind of the activity sites on a road within the ABS location. The ABS director used a stopwatch to time each activity and voice/hand signals to communicate lead/follow position switches and activity changes to the participants. The ABS director was also responsible for calibrating and adjusting the air sampling pumps, recording data on the field sampling data sheet (FSDS) and in the logbook, maintaining the sample chain-of-custody (COC) and managing the sample cassettes. Because the ABS director remained at the base station during performance of the ABS script and did not actively disturb potentially contaminated materials, they were not required to wear a respirator or other PPE.

2.5 ABS SCRIPT COMPONENTS

2.5.1 Recreational Visitors Along Lower Rainy Creek

Hunting for shed elk horns is a common past time in the Libby area. To simulate this activity, the two participants hiked 30 minutes up lower Rainy Creek, beginning at the Environmental Restoration, Inc. [what does this stand for?] decontamination trailer just inside the gate on Rainy Creek Road and continuing upstream for 30 minutes (approximately 0.25 miles, due to thick brush). After 30 minutes, the participants switched lead/follow positions and hiked back down to the starting point. This activity was performed during the late summer, when Rainy Creek is at its lowest water level, so that hiking could be done on exposed stream-bottom sediment. New PPE was worn for each of the five rounds of this activity. Because both participants had the same exposures, their samples are replicates.

2.5.2 Driving To and From the ABS Area

To simulate the LA exposures to wood harvesters traveling to and from the forest, both participants wore new Tyvek suits and cassettes during the drive from the Flyway at the mouth of Rainy Creek to the ABS location. The windows were kept open during the

entire drive. For the return trip from the ABS area to the Flyway, new Tyvek suits were donned by the participants and the same cassettes used during the initial drive to the ABS area were re-attached to the pumps. For safety, respirators were not worn during this activity. Because both participants were in the same vehicle under the same conditions, their samples are replicates.

2.5.3 Felling/Limbing Trees

Stihl 24-inch and 30-inch chainsaws were used to fell and limb a Douglas fir tree of minimum 10-inch diameter during each of five rounds at each ABS site. Person 1, the most experienced sawyer, felled and limbed each tree. During felling and limbing, Person 2 collected limbs and cast them off the road into the forest. In an effort to produce cassettes that were not overloaded, felling/limbing was conducted at durations of 15 and 10 minutes using a separate, new cassette. Because the roles of Person 1 and Person 2 were different during this activity, their samples are not replicates

2.5.4 Cutting/Stacking Wood in Truck

Cutting the felled and limbed tree trunk into fireplace-sized logs was done with the same chainsaws used to fell and limb the tree. These activities were performed concurrently, but the participants switched roles midway through the 15-minute activity duration, producing replicate samples.

2.5.5 Trail Maintenance/Debris Clearing

A Stihl 10-inch-diameter sawhead trimmer was used to simulate USFS trail maintenance by cutting and removing sapling trees, brush and debris from a six-foot-wide swath through the forest. Initially, Person 1 would operate the sawhead trimmer and Person 2 would remove the cut materials and cast them off the sides of the "trail." Midway through the 15-minute activity, the two participants would switch roles, thereby producing replicate samples.

2.5.6 Tree-Thinning/Slash Pile Building

This activity was very similar to Trail Maintenance/Debris Clearing, but occurred over a larger area and the cut material was placed into a single "slash pile." This activity was intended to simulate forest management by reducing the shade produced by brush and less-desired trees (such as deciduous species) and opening areas for growth of more-desired trees such as lodgepole, ponderosa and larch. Roles were switched midway through the 15-minute duration of this activity, thus the samples of Person 1 and Person 2 are replicates.

2.5.7 Tree Stand Examination

Tree Stand Examination simulated timber cruising by USFS personnel and included taking age cores, measuring the circumference of Douglas fir trees, and simulating the use of a clinometer to measure the height of a tree. The activity was conducted concurrently by both participants for 30 minutes and typically involved examination of four or five trees during each round. Because the participants performed the same activities concurrently, their samples are replicates.

2.5.8 Cutting Fireline by Hand Using a Pulaski Tool

In hand-cutting fireline with a pulaski tool (a combination axe and adze commonly used to fight wildland fires), the two participants used the adze side of the tool to remove duff, live and dead vegetable matter and any other combustible materials from the forest floor, down to the mineral soil layer. The participants worked in lead/follow positions about 10 feet apart, cutting a swath about 18 inches wide. After 7.5 minutes the participants switched positions so their exposures and sampled air volumes were replicates.

2.5.9 Cutting Fireline by Bulldozer

A John Deere Model 650-F bulldozer was used to simulate cutting fireline by machine. The dozer cut a 10-foot swath down to mineral soil, removing all combustible material. During the 30 minute duration of this activity, the dozer operator and dozer boss did not

switch roles, thus, the samples are not relicates. However, Person 1 was the dozer operator and Person 2 was at least 100 feet away from the dozer (a standard safe distance used by the Forest Sevice). Person 1's cassetteswere analyzeddue to a higher exposure.

2.5.10 ABS Site Reclamation

Areas disturbed by bulldozer fireline cutting were reclaimed after all ABS activities were concluded. Reclamation was accomplished by using the bulldozer to back-drag soil piles and other disturbed materials into the dozer-cut swath and leveling the area to the original contour. A USFS-approved seed blend (Kootenai blend) was applied to the disturbed areas and was observed to be thriving by mid-Fall.

2.6 ABS EQUIPMENT AND INSTRUMENTATION

- Air Sampling Pump: SKC model AirChek XR5000™ (0.005 – 5.0 LPM)
- Sample Cassette: 25mm 0.8-micron pore size, conductive, cowled MCE cassettes
- Inert tubing: Tygon™ R-3603 tubing, 1/4" inner diameter and 7/16" outer diameter
- Primary Calibrator: BIOS Intl. DryCal DC-Lite™ model MH (0.2 – 17 LPM)
- GPS Unit: Garmin Forerunner™ model 205 wrist-worn GPS
- Sample Storage: Vendor-supplied, partitioned cassette shipping boxes.
- Sample shipping: Small insulated plastic coolers with integrated handles on top to ensure the container remained upright during shipment to the laboratory.
- Field logbook: Rite in the Rain™ all-weather journal 390N
- Pens: Rite in the Rain™ all-weather pen #37, various ball point pens, and permanent markers
- Camera: Nikon Coolpix L17™ digital camera

2.7 SAMPLING METHODS

2.7.1 Sample Collection

The participants each wore three AirChek XR5000™ air-sampling pumps attached to belts worn outside their PPE (one set to pump at 4 LPM, one set at 2 LPM and one set at 1 LPM). Tubing from each pump was duct-taped to the back and shoulders of the participant's Tyvek™ coveralls, with the open ends of the tubing positioned on either side of the participant's neck. With the tubing in-place, the ABS director removed the plug from the discharge side of each cassette and attached the cassette to the tubing. Each sample cassette was taped in-place, with the open (intake) end of the cassette cowl aimed downward, within the participant's breathing zone (an area about 9 inches from the participant's face).

Sampling cassette cowl caps remained in-place until the activity began and the pumps were turned on. During the activity, the ABS director retained the caps and stored them in a closed Ziploc™ plastic bag. When the activity ended,the pumps were turned off and the caps were replaced.

2.7.2 Field Calibration of Air Sampling Pumps

A BIOS Intl. DryCal DC-Lite™ model MH air-flow calibrator with a range of 0.2 LPM to 17 LPM was used to calibrate each of the working pumps to set and confirm air sampling pump flow rates in the field. The DC-Lite™ automatically adjusts for temperature and pressure, eliminating the need for manual compensation or correction of flow-rate values. During Phase IV, direct calibration of each pump using the BIOS calibrator produced better results than rotameters, which appeared to vary based on barometric pressure.

The flow rate of each air-sampling pump was measured, adjusted (if necessary) and recorded at the beginning of each ABS activity, and then re-measured and recorded at the conclusion of each activity. The flow-rate measurement procedure consisted of using the BIOS calibrator connected by 8 inches of Tygon™ tubing to a dedicated cassette end cap, which was inserted into the intake (cowl) end of the sampling cassette. The pump was

turned on for a brief period and the pump flow rate was adjusted as close to the target flow rate as possible (4.0 LPM, 2.0 LPM or 1.0 LPM, as appropriate), using the flow-rate value indicated by the BIOS calibrator. Dedicated calibration equipment (cassette caps, and Tygon tubing) were stored in a closed Ziploc™ plastic bag when not in use.

The AirChek XR5000™ pumps used in the ABS program are equipped with isothermal flow sensors that measure air flow directly. The pump is electronically controlled to deliver flow to within 5 percent of the flow set-point, and will automatically shut off and display a flow fault if the flow rate cannot be maintained (due to battery failure, crimped air sampling tubing, pump fault, etc.). The pumps used during Phase IV ABS were observed to consistently deliver flow rates with less than 2.5-percent variation. The Airchek XR5000™ is powered by an internal lithium-ion battery; during periodic battery conditioning run-down, the pumps were observed to run continuously for as long as 96 hours, with no observed variation in flow rate (more than double the running life claimed by the manufacturer).

2.8 QUALITY CONTROL SAMPLES

2.8.1 Lot Blanks

Before any air cassettes were used for ABS, the cassette lot was verified to be asbestos-free. This was accomplished by sending two unopened cassettes per lot of cassettes for TEM analysis using ISO 10312 counting protocols, as modified by Libby-specific laboratory modifications. All lot blanks submitted during ABS in 2010 were analyzed as "ND" (non-detect) by the project analytical laboratory (Hygeia Laboratories of Sierra Madre, California).

2.8.2 Field Blanks

A field blank for ambient air was prepared by removing the sampling cassette from the shipping box, opening the cassette to the air in the area where the ABS samples were to be taken, then closing the cassette and packaging for shipment and analysis. Field blanks

for ambient air were collected at a rate of one for each ABS round; each field blank was collected at a different ABS location.

2.9 SAMPLE HANDLING

At the time of collection, each sample was labeled with a unique 5-digit sequential index identification (index ID) number. The index IDs for all samples collected as part of Phase IV sampling have a prefix of "P4" (e.g., P4-12345). Information on whether the sample was representative of a field sample or a field-based QC sample (e.g., field blank) was documented on the FSDS.

2.9.1 Sample Containers

ABS samples were collected using cowled, 25-mm diameter, 0.8-µm pore size microcellulose ester (MCE), conductive filter cassettes supplied by EMSL Laboratories of Westmont, New Jersey. The sample cassettes remained capped until immediately before the pump was turned on and the ABS activity began. Cassettes were capped immediately after the activity ended and the pump was turned off.

2.9.2 Sample Preservation and Storage

Fresh sampling cassettes were stored in the partitioned cassette shipping box, with end caps on. At the conclusion of each sampling activity, the cassettes were re-capped and returned to the shipping box. Used cassettes were stored cowl-end-up to prevent particles from being dislodged from the filter media during transit. Because there are no special preservation requirements or holding times for asbestos samples, the cassettes were stored at ambient conditions, under custody of the ABS director.

2.10 SAMPLE DOCUMENTATION AND IDENTIFICATION

Field data observed during collection of each ABS sample were documented by the ABS director on OU3 Phase IV RI-specific FSDS. At the time of collection, each sample was assigned a unique index ID number using pre-printed adhesive labels supplied by SRC.

The index ID labels were provided in quadruplicate; one label was attached to the sample cassette, another was placed on the FSDS and a third was placed in the field logbook (the fourth label was reserved for use in re-labeling, if necessary). Index IDs for all samples collected as part of the Phase IV ABS bear the prefix of "P4" (e.g., P4-12345). Information on whether the sample is representative of a field sample or a field-based QC sample (e.g., field blank) was documented on the FSDS, but was not included on the chain-of-custody, to ensure that the sample type was unknown to the analytical laboratory.

The ABS director maintained a field logbook with sequentially numbered, non-removable pages. All potentially relevant information not recorded on the FSDS forms was recorded in the field logbook. Scans of the ABS logbook and FSDS forms are provided as PDF files in Appendix B and C, respectively (on CD in pocket).

2.11 SAMPLE CHAIN-OF-CUSTODY AND SHIPMENT

A chain-of-custody (COC) was maintained until final disposition of the samples by the laboratory and acceptance of analytical results. A COC form specific to the Phase IV ABS program accompanied every shipment of samples to the analytical laboratory. All corrections to the COC record were initialed and dated by the person who made the corrections. Original COCs accompanied the samples to the laboratory; copies were made and retained to document each change of custody. All samples were sent directly to the analytical laboratory by FedEx priority overnight service. Scans of the ABS COCs are provided as PDF files in Appendix D (on CD in pocket).

2.12 ANALYSIS

All samples collected during Phase IV ABS were submitted for asbestos analysis using transmission electron microscopy (TEM) in accordance with the International Organization for Standardization (ISO) 10312:1995 method counting protocols, as modified by Libby-specific laboratory modifications. Detailed descriptions of laboratory protocols and analytical methods are provided in the Phase IV SAP and associated standard operating procedures.

2.13 HEALTH AND SAFETY

"Tailgate" safety meetings for all ABS team members were conducted by an ABS director at the start of each day's work. Bear deterrent spray, first-aid kits, cooling vests (during hot weather) and water were carried in the ABS team vehicles and made available for use by team members during project work.

ABS participants were equipped with Level C personal protective equipment (PPE) consisting of two sets of hooded Tyvek™ coveralls, full-face respirator, nitrile gloves and latex boot covers. Respirators were fitted with P100 high-efficiency particulate-air (HEPA) filter cartridges.

Because ABS was performed in remote areas far from the project decontamination facility, the outer layer of ABS participants' PPE was rinsed thoroughly with water before they removed their PPE at the ABS base station. Coveralls, boot covers and gloves were disposed after one use; fresh PPE was donned for ABS at each location. All equipment (trucks, trailers, chainsaws, shovels, etc.) was decontaminated by pressure-washing between each ABS location, and before being transported off forest lands and onto paved roads.

TABLE 2-1
ACTIVITY BASED SAMPLING
AREA 2 ROUND 1

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 2	7/20/2010	Person 1	4	P4-00003
			2	P4-00004
			1	P4-00005
		Person 2	4	P4-00006
			2	P4-00007
			1	P4-00008
2B-Felling, limbing, cutting, stacking (20 min)	7/20/2010	Person 1	4	P4-00009
			2	P4-00010
			1	P4-00011
		Person 2	4	P4-00012
			2	P4-00013
			1	P4-00014
3A- Trail maintenance, debris clearing (15 min)	7/20/2010	Person 1	4	P4-00015
			2	P4-00016
			1	P4-00017
		Person 2	4	P4-00018
			2	P4-00019
			1	P4-00020
3B- Tree thinning, slash pile building (15 min)	7/20/2010	Person 1	4	P4-00021
			2	P4-00022
			1	P4-00023
		Person 2	4	P4-00024
			2	P4-00025
			1	P4-00026
3C- Tree stand examination (30 min)	7/20/2010	Person 1	4	P4-00027
			2	P4-00028
			1	P4-00029
		Person 2	4	P4-00030
			2	P4-00031
			1	P4-00032
3D- Pulaski fireline cutting (15 min)	7/20/2010	Person 1	4	P4-00033
			2	P4-00034
			1	P4-00035
		Person 2	4	P4-00036
			2	P4-00037
			1	P4-00038
3E- Cutting fireline by bulldozer (30 min)	8/18/2010	Person 1	4	P4-00671
			2	P4-00672
			1	P4-00673
		Person 2	4	P4-00674
			2	P4-00675
			1	P4-00676

TABLE 2-2
ACTIVITY BASED SAMPLING
AREA 2 ROUND 2

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 2	7/27/2010	Person 1	4	P4-00114
			2	P4-00115
			1	P4-00116
		Person 2	4	P4-00117
			2	P4-00118
			1	P4-00119
2B.1- Felling and limbing (20 min)	7/27/2010	Person 1	4	P4-00120
			2	P4-00121
			1	P4-00122
		Person 2	4	P4-00123
			2	P4-00124
			1	P4-00125
2B.2- Cutting and stacking in truck (30 min)	7/27/2010	Person 1	4	P4-00126
			2	P4-00127
			1	P4-00128
		Person 2	4	P4-00129
			2	P4-00130
			1	P4-00131
3A- Trail maintenance, debris clearing (15 min)	7/27/2010	Person 1	4	P4-00132
			2	P4-00133
			1	P4-00134
		Person 2	4	P4-00135
			2	P4-00136
			1	P4-00137
3B- Tree thinning, slash pile building (15 min)	7/27/2010	Person 1	4	P4-00138
			2	P4-00139
			1	P4-00140
		Person 2	4	P4-00141
			2	P4-00142
			1	P4-00143
3C- Tree stand examination (30 min)	7/27/2010	Person 1	4	P4-00144
			2	P4-00145
			1	P4-00146
		Person 2	4	P4-00147
			2	P4-00148
			1	P4-00149
		Field Blank		P4-00150
3D- Pulaski fireline cutting (15 min)	7/27/2010	Person 1	4	P4-00151
			2	P4-00152
			1	P4-00153
		Person 2	4	P4-00154
			2	P4-00155
			1	P4-00156
3E- Cutting fireline by bulldozer (30 min)	8/18/2010	Person 1	4	P4-00677
			2	P4-00678
			1	P4-00679
		Person 2	4	P4-00680
			2	P4-00681
			1	P4-00682

TABLE 2-3
ACTIVITY BASED SAMPLING
AREA 2 ROUND 3

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 2	8/4/2010	Person 1	4	P4-00283
			2	P4-00284
			1	P4-00285
		Person 2	4	P4-00286
			2	P4-00287
			1	P4-00288
		Field Blank		P4-00325
2B.1- Felling and limbing (20 min)	8/4/2010	Person 1	4	P4-00289
			2	P4-00290
			1	P4-00291
		Person 2	4	P4-00292
			2	P4-00293
			1	P4-00294
2B.2- Cutting and stacking in truck (30 min)	8/4/2010	Person 1	4	P4-00295
			2	P4-00296
			1	P4-00297
		Person 2	4	P4-00298
			2	P4-00299
			1	P4-00300
3A- Trail maintenance, debris clearing (15 min)	8/4/2010	Person 1	4	P4-00301
			2	P4-00302
			1	P4-00303
		Person 2	4	P4-00304
			2	P4-00305
			1	P4-00306
3B- Tree thinning, slash pile building (15 min)	8/4/2010	Person 1	4	P4-00307
			2	P4-00308
			1	P4-00309
		Person 2	4	P4-00310
			2	P4-00311
			1	P4-00312
3C- Tree stand examination (30 min)	8/4/2010	Person 1	4	P4-00313
			2	P4-00314
			1	P4-00315
		Person 2	4	P4-00316
			2	P4-00317
			1	P4-00318
3D- Pulaski fireline cutting (15 min)	8/4/2010	Person 1	4	P4-00319
			2	P4-00320
			1	P4-00321
		Person 2	4	P4-00322
			2	P4-00323
			1	P4-00324
3E- Cutting fireline by bulldozer (30 min)	8/18/2010	Person 1	4	P4-00683
			2	P4-00684
			1	P4-00685
		Person 2	4	P4-00686
			2	P4-00687
			1	P4-00688

TABLE 2-4
ACTIVITY BASED SAMPLING
AREA 2 ROUND 4

Activity	Date	Person	Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 2	8/10/2010	Person 1	4	P4-00410
			2	P4-00411
			1	P4-00412
		Person 2	4	P4-00413
			2	P4-00414
			1	P4-00415
2B.1a- Felling and limbing (15 min)	8/10/2010	Person 1	4	P4-00416
			2	P4-00417
			1	P4-00418
		Person 2	4	P4-00419
			2	P4-00420
			1	P4-00421
2B.1b- Felling and limbing (10 min)	8/10/2010	Person 1	4	P4-00454
			2	P4-00455
			1	P4-00456
		Person 2	4	P4-00457
			2	P4-00458
			1	P4-00459
2B.2- Cutting and stacking in truck (15 min)	8/10/2010	Person 1	4	P4-00460
			2	P4-00461
			1	P4-00462
		Person 2	4	P4-00463
			2	P4-00464
			1	P4-00465
3A- Trail maintenance, debris clearing (15 min)	8/10/2010	Person 1	4	P4-00428
			2	P4-00429
			1	P4-00430
		Person 2	4	P4-00431
			2	P4-00432
			1	P4-00433
3B- Tree thinning, slash pile building (15 min)	8/10/2010	Person 1	4	P4-00434
			2	P4-00435
			1	P4-00436
		Person 2	4	P4-00437
			2	P4-00438
			1	P4-00439
3C- Tree stand examination (30 min)	8/10/2010	Person 1	4	P4-00440
			2	P4-00441
			1	P4-00442
		Person 2	4	P4-00443
			2	P4-00444
			1	P4-00445
3D- Pulaski fireline cutting (15 min)	8/10/2010	Person 1	4	P4-00446
			2	P4-00447
			1	P4-00448
		Person 2	4	P4-00449
			2	P4-00450
			1	P4-00451

TABLE 2-4
ACTIVITY BASED SAMPLING
AREA 2 ROUND 4

Activity	Date	Person	Rate (LPM)	Index ID
3E- Cutting fireline by bulldozer (30 min)	8/26/2010	Person 1	4	P4-00775
			2	P4-00776
			1	P4-00777
		Person 2	4	P4-00778
			2	P4-00779
			1	P4-00780

TABLE 2-5
ACTIVITY BASED SAMPLING
AREA 2 ROUND 5

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 2	8/12/2010	Person 1	4	P4-00551
			2	P4-00552
			1	P4-00553
		Person 2	4	P4-00554
			2	P4-00555
			1	P4-00556
2B.1a- Felling and limbing (15 min)	8/12/2010	Person 1	4	P4-00557
			2	P4-00558
			1	P4-00559
		Person 2	4	P4-00560
			2	P4-00561
			1	P4-00562
2B.1b- Felling and limbing (10 min)	8/12/2010	Person 1	4	P4-00563
			2	P4-00564
			1	P4-00565
		Person 2	4	P4-00566
			2	P4-00567
			1	P4-00568
2B.2- Cutting and stacking in truck (15 min)	8/12/2010	Person 1	4	P4-00569
			2	P4-00570
			1	P4-00571
		Person 2	4	P4-00572
			2	P4-00573
			1	P4-00574
3A- Trail maintenance, debris clearing (15 min)	8/12/2010	Person 1	4	P4-00575
			2	P4-00576
			1	P4-00577
		Person 2	4	P4-00578
			2	P4-00579
			1	P4-00580
3B- Tree thinning, slash pile building (15 min)	8/12/2010	Person 1	4	P4-00581
			2	P4-00582
			1	P4-00583
		Person 2	4	P4-00584
			2	P4-00585
			1	P4-00586
3C- Tree stand examination (30 min)	8/12/2010	Person 1	4	P4-00587
			2	P4-00588
			1	P4-00589
		Person 2	4	P4-00590
			2	P4-00591
			1	P4-00592
3D- Pulaski fireline cutting (15 min)	8/12/2010	Person 1	4	P4-00593
			2	P4-00594
			1	P4-00595
		Person 2	4	P4-00596
			2	P4-00597
			1	P4-00598

TABLE 2-5
ACTIVITY BASED SAMPLING
AREA 2 ROUND 5

Activity	Date	Person	Flow Rate (LPM)	Index ID
3E- Cutting fireline by bulldozer (30 min)	8/26/2010	Person 1	4	P4-00781
			2	P4-00782
			1	P4-00783
		Person 2	4	P4-00784
			2	P4-00785
			1	P4-00786

TABLE 2-6
ACTIVITY BASED SAMPLING
AREA 7 ROUND 1

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 7	7/21/2010	Person 1	4	P4-00041
			2	P4-00042
			1	P4-00043
		Person 2	4	P4-00044
			2	P4-00045
			1	P4-00046
2B-Felling, limbing, cutting, stacking (20 min)	7/21/2010	Person 1	4	P4-00047
			2	P4-00048
			1	P4-00049
		Person 2	4	P4-00050
			2	P4-00051
			1	P4-00052
3A- Trail maintenance, debris clearing (15 min)	7/21/2010	Person 1	4	P4-00053
			2	P4-00054
			1	P4-00055
		Person 2	4	P4-00056
			2	P4-00057
			1	P4-00058
3B- Tree thinning, slash pile building (15 min)	7/21/2010	Person 1	4	P4-00059
			2	P4-00060
			1	P4-00061
		Person 2	4	P4-00062
			2	P4-00063
			1	P4-00064
3C- Tree stand examination (30 min)	7/21/2010	Person 1	4	P4-00065
			2	P4-00066
			1	P4-00067
		Person 2	4	P4-00068
			2	P4-00069
			1	P4-00070
3D- Pulaski fireline cutting (15 min)	7/21/2010	Person 1	4	P4-00071
			2	P4-00072
			1	P4-00073
		Person 2	4	P4-00074
			2	P4-00075
			1	P4-00076
3E- Cutting fireline by bulldozer (30 min)	8/20/2010	Person 1	4	P4-00720
			2	P4-00721
			1	P4-00722
		Person 2	4	P4-00723
			2	P4-00724
			1	P4-00725

TABLE 2-7
ACTIVITY BASED SAMPLING
AREA 7 ROUND 2

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 7	7/28/2010	Person 1	4	P4-00157
			2	P4-00158
			1	P4-00159
		Person 2	4	P4-00160
			2	P4-00161
			1	P4-00162
2B.1- Felling and limbing (20 min)	7/28/2010	Person 1	4	P4-00163
			2	P4-00164
			1	P4-00165
		Person 2	4	P4-00166
			2	P4-00167
			1	P4-00168
2B.2- Cutting and stacking in truck (30 min)	7/28/2010	Person 1	4	P4-00169
			2	P4-00170
			1	P4-00171
		Person 2	4	P4-00172
			2	P4-00173
			1	P4-00174
3A- Trail maintenance, debris clearing (15 min)	8/11/2010	Person 1	4	P4-00527
			2	P4-00528
			1	P4-00529
		Person 2	4	P4-00530
			2	P4-00531
			1	P4-00532
3B- Tree thinning, slash pile building (15 min)	8/11/2010	Person 1	4	P4-00533
			2	P4-00534
			1	P4-00535
		Person 2	4	P4-00536
			2	P4-00537
			1	P4-00538
3C- Tree stand examination (30 min)	8/11/2010	Person 1	4	P4-00539
			2	P4-00540
			1	P4-00541
		Person 2	4	P4-00542
			2	P4-00543
			1	P4-00544
3D- Pulaski fireline cutting (15 min)	8/11/2010	Person 1	4	P4-00545
			2	P4-00546
			1	P4-00547
		Person 2	4	P4-00548
			2	P4-00549
			1	P4-00550
3E- Cutting fireline by bulldozer (30 min)	8/24/2010	Person 1	4	P4-00726
			2	P4-00727
			1	P4-00728
		Person 2	4	P4-00729
			2	P4-00730
			1	P4-00731

TABLE 2-8
ACTIVITY BASED SAMPLING
AREA 7 ROUND 3

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 7	8/3/2010	Person 1	4	P4-00199
			2	P4-00200
			1	P4-00201
		Person 2	4	P4-00202
			2	P4-00203
			1	P4-00204
2B.1- Felling and limbing (20 min)	8/3/2010	Person 1	4	P4-00205
			2	P4-00206
			1	P4-00207
		Person 2	4	P4-00208
			2	P4-00209
			1	P4-00210
2B.2- Cutting and stacking in truck (30 min)	8/3/2010	Person 1	4	P4-00211
			2	P4-00212
			1	P4-00213
		Person 2	4	P4-00214
			2	P4-00215
			1	P4-00216
3A- Trail maintenance, debris clearing (15 min)	8/3/2010	Person 1	4	P4-00217
			2	P4-00218
			1	P4-00219
		Person 2	4	P4-00220
			2	P4-00221
			1	P4-00222
3B- Tree thinning, slash pile building (15 min)	8/3/2010	Person 1	4	P4-00223
			2	P4-00224
			1	P4-00225
		Person 2	4	P4-00226
			2	P4-00227
			1	P4-00228
3C- Tree stand examination (30 min)	8/3/2010	Person 1	4	P4-00229
			2	P4-00230
			1	P4-00231
		Person 2	4	P4-00232
			2	P4-00233
			1	P4-00234
3D- Pulaski fireline cutting (15 min)	8/3/2010	Person 1	4	P4-00235
			2	P4-00236
			1	P4-00237
		Person 2	4	P4-00238
			2	P4-00239
			1	P4-00240

TABLE 2-8
ACTIVITY BASED SAMPLING
AREA 7 ROUND 3

Activity	Date	Person	Flow Rate (LPM)	Index ID
3E- Cutting fireline by bulldozer (30 min)	8/24/2010	Person 1	4	P4-00732
			2	P4-00733
			1	P4-00734
		Person 2	4	P4-00735
			2	P4-00736
			1	P4-00737
		Field Blank		P4-00738

TABLE 2-9
ACTIVITY BASED SAMPLING
AREA 7 ROUND 4

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 7	8/5/2010	Person 1	4	P4-00326
			2	P4-00327
			1	P4-00328
		Person 2	4	P4-00329
			2	P4-00330
			1	P4-00331
2B.1- Felling and limbing (20 min)	8/5/2010	Person 1	4	P4-00332
			2	P4-00333
			1	P4-00334
		Person 2	4	P4-00335
			2	P4-00336
			1	P4-00337
2B.2- Cutting and stacking in truck (30 min)	8/5/2010	Person 1	4	P4-00338
			2	P4-00339
			1	P4-00340
		Person 2	4	P4-00341
			2	P4-00342
			1	P4-00343
3A- Trail maintenance, debris clearing (15 min)	8/5/2010	Person 1	4	P4-00344
			2	P4-00345
			1	P4-00346
		Person 2	4	P4-00347
			2	P4-00348
			1	P4-00349
3B- Tree thinning, slash pile building (15 min)	8/5/2010	Person 1	4	P4-00350
			2	P4-00351
			1	P4-00352
		Person 2	4	P4-00353
			2	P4-00354
			1	P4-00355
3C- Tree stand examination (30 min)	8/5/2010	Person 1	4	P4-00356
			2	P4-00357
			1	P4-00358
		Person 2	4	P4-00359
			2	P4-00360
			1	P4-00361
3D- Pulaski fireline cutting (15 min)	8/5/2010	Person 1	4	P4-00362
			2	P4-00363
			1	P4-00364
		Person 2	4	P4-00365
			2	P4-00366
			1	P4-00367

TABLE 2-9
ACTIVITY BASED SAMPLING
AREA 7 ROUND 4

Activity	Date	Person	Flow Rate (LPM)	Index ID
3E- Cutting fireline by bulldozer (30 min)	8/24/2010	Person 1	4	P4-00739
			2	P4-00740
			1	P4-00741
		Person 2	4	P4-00742
			2	P4-00743
			1	P4-00744

TABLE 2-10
ACTIVITY BASED SAMPLING
AREA 7 ROUND 5

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 7	8/11/2010	Person 1	4	P4-00466
			2	P4-00467
			1	P4-00468
		Person 2	4	P4-00469
			2	P4-00470
			1	P4-00471
2B.1a- Felling and limbing (15 min)	8/11/2010	Person 1	4	P4-00472
			2	P4-00473
			1	P4-00474
		Person 2	4	P4-00475
			2	P4-00476
			1	P4-00477
2B.1b- Felling and limbing (10 min)	8/11/2010	Person 1	4	P4-00478
			2	P4-00479
			1	P4-00480
		Person 2	4	P4-00481
			2	P4-00482
			1	P4-00483
2B.2- Cutting and stacking in truck (15 min)	8/11/2010	Person 1	4	P4-00484
			2	P4-00485
			1	P4-00486
		Person 2	4	P4-00487
			2	P4-00488
			1	P4-00489
3A- Trail maintenance, debris clearing (15 min)	8/11/2010	Person 1	4	P4-00490
			2	P4-00491
			1	P4-00492
		Person 2	4	P4-00493
			2	P4-00494
			1	P4-00495
3B- Tree thinning, slash pile building (15 min)	8/11/2010	Person 1	4	P4-00496
			2	P4-00497
			1	P4-00498
		Person 2	4	P4-00499
			2	P4-00500
			1	P4-00501
3C- Tree stand examination (30 min)	8/11/2010	Person 1	4	P4-00502
			2	P4-00503
			1	P4-00504
		Person 2	4	P4-00505
			2	P4-00506
			1	P4-00507

TABLE 2-10
ACTIVITY BASED SAMPLING
AREA 7 ROUND 5

Activity	Date	Person	Flow Rate (LPM)	Index ID
3D- Pulaski fireline cutting (15 min)	8/11/2010	Person 1	4	P4-00508
			2	P4-00509
			1	P4-00510
		Person 2	4	P4-00511
			2	P4-00512
			1	P4-00513
		Field Blank		P4-00514
3E- Cutting fireline by bulldozer (30 min)	8/25/2010	Person 1	4	P4-00751
			2	P4-00752
			1	P4-00753
		Person 2	4	P4-00754
			2	P4-00755
			1	P4-00756

TABLE 2-11
ACTIVITY BASED SAMPLING
AREA 10 ROUND 1

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 10	7/22/2010	Person 1	4	P4-00077
			2	P4-00078
			1	P4-00079
		Person 2	4	P4-00080
			2	P4-00081
			1	P4-00082
2B-Felling, limbing, cutting, stacking (20 min)	7/22/2010	Person 1	4	P4-00083
			2	P4-00084
			1	P4-00085
		Person 2	4	P4-00086
			2	P4-00087
			1	P4-00088
		Field Blank		P4-00095
3A- Trail maintenance, debris clearing (15 min)	7/22/2010	Person 1	4	P4-00089
			2	P4-00090
			1	P4-00091
		Person 2	4	P4-00092
			2	P4-00093
			1	P4-00094
3B- Tree thinning, slash pile building (15 min)	7/22/2010	Person 1	4	P4-00096
			2	P4-00097
			1	P4-00098
		Person 2	4	P4-00099
			2	P4-00100
			1	P4-00101
3C- Tree stand examination (30 min)	7/22/2010	Person 1	4	P4-00102
			2	P4-00103
			1	P4-00104
		Person 2	4	P4-00105
			2	P4-00106
			1	P4-00107
3D- Pulaski fireline cutting (15 min)	7/22/2010	Person 1	4	P4-00108
			2	P4-00109
			1	P4-00110
		Person 2	4	P4-00111
			2	P4-00112
			1	P4-00113
3E- Cutting fireline by bulldozer (30 min)	8/19/2010	Person 1	4	P4-00695
			2	P4-00696
			1	P4-00697
		Person 2	4	P4-00698
			2	P4-00699
			1	P4-00700

TABLE 2-12
ACTIVITY BASED SAMPLING
AREA 10 ROUND 2

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 10	7/30/2010	Person 1	4	P4-00181
			2	P4-00182
			1	P4-00183
		Person 2	4	P4-00184
			2	P4-00185
			1	P4-00186
2B.1- Felling and limbing (20 min)	7/30/2010	Person 1	4	P4-00187
			2	P4-00188
			1	P4-00189
		Person 2	4	P4-00190
			2	P4-00191
			1	P4-00192
2B.2- Cutting and stacking in truck (30 min)	7/30/2010	Person 1	4	P4-00193
			2	P4-00194
			1	P4-00195
		Person 2	4	P4-00196
			2	P4-00197
			1	P4-00198
3A- Trail maintenance, debris clearing (15 min)	8/17/2010	Person 1	4	P4-00641
			2	P4-00642
			1	P4-00643
		Person 2	4	P4-00644
			2	P4-00645
			1	P4-00646
3B- Tree thinning, slash pile building (15 min)	8/17/2010	Person 1	4	P4-00647
			2	P4-00648
			1	P4-00649
		Person 2	4	P4-00650
			2	P4-00651
			1	P4-00652
3C- Tree stand examination (30 min)	8/17/2010	Person 1	4	P4-00653
			2	P4-00654
			1	P4-00655
		Person 2	4	P4-00656
			2	P4-00657
			1	P4-00658
3D- Pulaski fireline cutting (15 min)	8/17/2010	Person 1	4	P4-00659
			2	P4-00660
			1	P4-00661
		Person 2	4	P4-00662
			2	P4-00663
			1	P4-00664

TABLE 2-12
ACTIVITY BASED SAMPLING
AREA 10 ROUND 2

Activity	Date	Person	Flow Rate (LPM)	Index ID
3E- Cutting fireline by bulldozer (30 min)	8/19/2010	Person 1	4	P4-00701
			2	P4-00702
			1	P4-00703
		Person 2	4	P4-00704
			2	P4-00705
			1	P4-00706
		Field Blank		P4-00707

TABLE 2-13
ACTIVITY BASED SAMPLING
AREA 10 ROUND 3

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 10	8/3/2010	Person 1	4	P4-00241
			2	P4-00242
			1	P4-00243
		Person 2	4	P4-00244
			2	P4-00245
			1	P4-00246
2B.1- Felling and limbing (20 min)	8/3/2010	Person 1	4	P4-00247
			2	P4-00248
			1	P4-00249
		Person 2	4	P4-00250
			2	P4-00251
			1	P4-00252
2B.2- Cutting and stacking in truck (30 min)	8/3/2010	Person 1	4	P4-00253
			2	P4-00254
			1	P4-00255
		Person 2	4	P4-00256
			2	P4-00257
			1	P4-00258
3A- Trail maintenance, debris clearing (15 min)	8/3/2010	Person 1	4	P4-00259
			2	P4-00260
			1	P4-00261
		Person 2	4	P4-00262
			2	P4-00263
			1	P4-00264
3B- Tree thinning, slash pile building (15 min)	8/3/2010	Person 1	4	P4-00265
			2	P4-00266
			1	P4-00267
		Person 2	4	P4-00268
			2	P4-00269
			1	P4-00270
3C- Tree stand examination (30 min)	8/3/2010	Person 1	4	P4-00271
			2	P4-00272
			1	P4-00273
		Person 2	4	P4-00274
			2	P4-00275
			1	P4-00276
3D- Pulaski fireline cutting (15 min)	8/3/2010	Person 1	4	P4-00277
			2	P4-00278
			1	P4-00279
		Person 2	4	P4-00280
			2	P4-00281
			1	P4-00282

TABLE 2-13
ACTIVITY BASED SAMPLING
AREA 10 ROUND 3

Activity	Date	Person	Flow Rate (LPM)	Index ID
3E- Cutting fireline by bulldozer (30 min)	8/19/2010	Person 1	4	P4-00708
			2	P4-00709
			1	P4-00710
		Person 2	4	P4-00711
			2	P4-00712
			1	P4-00713

TABLE 2-14
ACTIVITY BASED SAMPLING
AREA 10 ROUND 4

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 10	8/5/2010	Person 1	4	P4-00368
			2	P4-00369
			1	P4-00370
		Person 2	4	P4-00371
			2	P4-00372
			1	P4-00373
2B.1- Felling and limbing (20 min)	8/5/2010	Person 1	4	P4-00374
			2	P4-00375
			1	P4-00376
		Person 2	4	P4-00377
			2	P4-00378
			1	P4-00379
2B.2- Cutting and stacking in truck (30 min)	8/5/2010	Person 1	4	P4-00380
			2	P4-00381
			1	P4-00382
		Person 2	4	P4-00383
			2	P4-00384
			1	P4-00385
3A- Trail maintenance, debris clearing (15 min)	8/5/2010	Person 1	4	P4-00386
			2	P4-00387
			1	P4-00388
		Person 2	4	P4-00389
			2	P4-00390
			1	P4-00391
3B- Tree thinning, slash pile building (15 min)	8/5/2010	Person 1	4	P4-00392
			2	P4-00393
			1	P4-00394
		Person 2	4	P4-00395
			2	P4-00396
			1	P4-00397
3C- Tree stand examination (30 min)	8/5/2010	Person 1	4	P4-00398
			2	P4-00399
			1	P4-00400
		Person 2	4	P4-00401
			2	P4-00402
			1	P4-00403
3D- Pulaski fireline cutting (15 min)	8/5/2010	Person 1	4	P4-00404
			2	P4-00405
			1	P4-00406
		Person 2	4	P4-00407
			2	P4-00408
			1	P4-00409

TABLE 2-14
ACTIVITY BASED SAMPLING
AREA 10 ROUND 4

Activity	Date	Person	Flow Rate (LPM)	Index ID
3E- Cutting fireline by bulldozer (30 min)	8/25/2010	Person 1	4	P4-00757
			2	P4-00758
			1	P4-00759
		Person 2	4	P4-00760
			2	P4-00761
			1	P4-00762

TABLE 2-15
ACTIVITY BASED SAMPLING
AREA 10 ROUND 5

Activity	Date	Person	Flow Rate (LPM)	Index ID
2A- Roundtrip from flyway to Area 10	8/11/2010	Person 1	4	P4-00515
			2	P4-00516
			1	P4-00517
		Person 2	4	P4-00518
			2	P4-00519
			1	P4-00520
2B.1a- Felling and limbing (15 min)	8/12/2010	Person 1	4	P4-00599
			2	P4-00600
			1	P4-00601
		Person 2	4	P4-00602
			2	P4-00603
			1	P4-00604
2B.1b- Felling and limbing (10 min)	8/11/2010	Person 1	4	P4-00521
			2	P4-00522
			1	P4-00523
		Person 2	4	P4-00524
			2	P4-00525
			1	P4-00526
2B.2- Cutting and stacking in truck (15 min)	8/12/2010	Person 1	4	P4-00605
			2	P4-00606
			1	P4-00607
		Person 2	4	P4-00608
			2	P4-00609
			1	P4-00610
3A- Trail maintenance, debris clearing (15 min)	8/17/2010	Person 1	4	P4-00617
			2	P4-00618
			1	P4-00619
		Person 2	4	P4-00620
			2	P4-00621
			1	P4-00622
3B- Tree thinning, slash pile building (15 min)	8/17/2010	Person 1	4	P4-00623
			2	P4-00624
			1	P4-00625
		Person 2	4	P4-00626
			2	P4-00627
			1	P4-00628
3C- Tree stand examination (30 min)	8/17/2010	Person 1	4	P4-00629
			2	P4-00630
			1	P4-00631
		Person 2	4	P4-00632
			2	P4-00633
			1	P4-00634

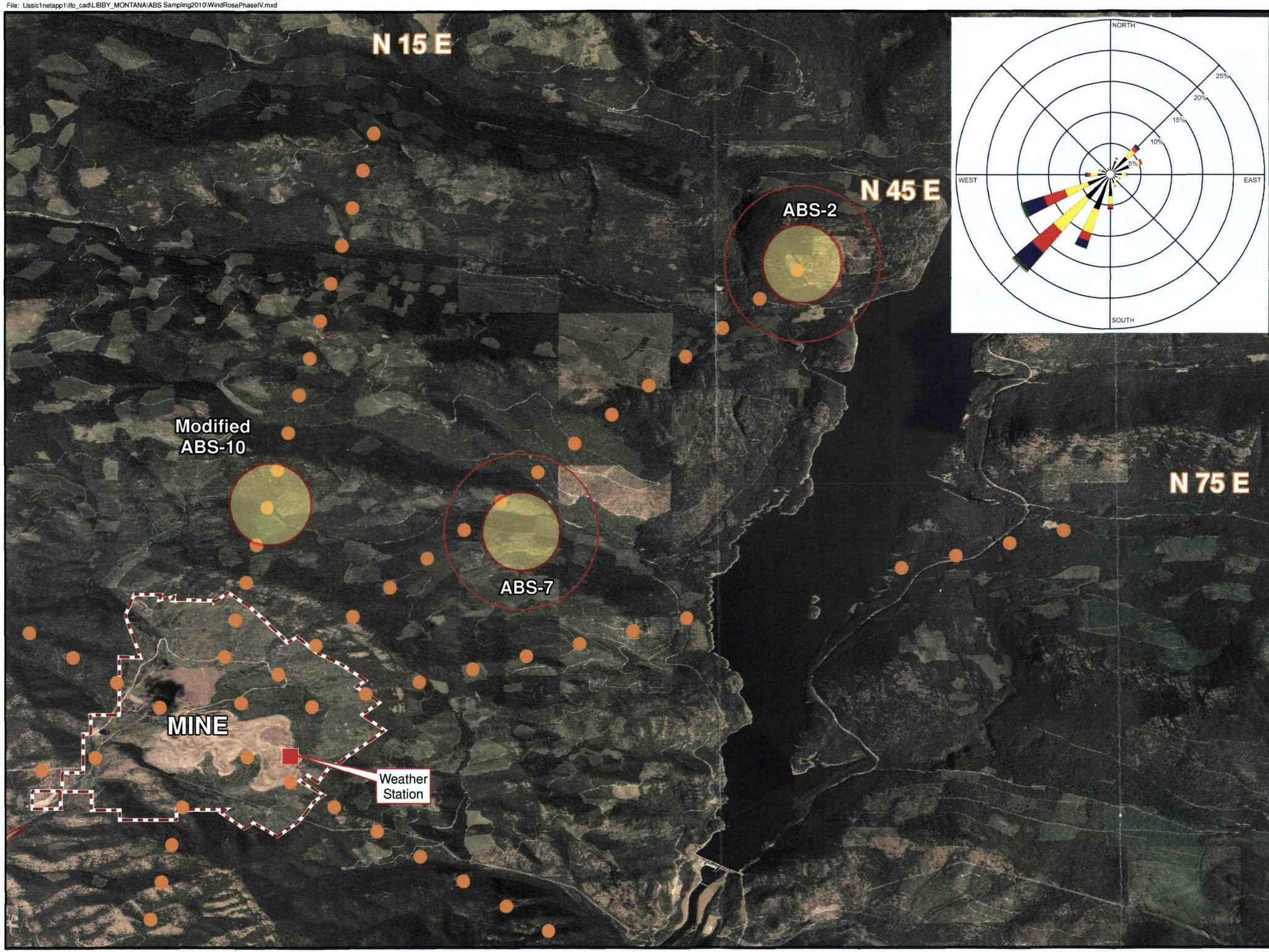
TABLE 2-15
ACTIVITY BASED SAMPLING
AREA 10 ROUND 5

Activity	Date	Person	Flow Rate (LPM)	Index ID
3D- Pulaski fireline cutting (15 min)	8/17/2010	Person 1	4	P4-00635
			2	P4-00636
			1	P4-00637
		Person 2	4	P4-00638
			2	P4-00639
			1	P4-00640
3E- Cutting fireline by bulldozer (30 min)	8/25/2010	Person 1	4	P4-00763
			2	P4-00764
			1	P4-00765
		Person 2	4	P4-00766
			2	P4-00767
			1	P4-00768

TABLE 2-16
ACTIVITY BASED SAMPLING
RAINY CREEK ROUNDS 1-5

Activity	Date	Person	Flow Rate (LPM)	Index ID
1-Recreational Visitor Along Lower Rainy Creek	8/17/2010	Person 1	4	P4-00665
			2	P4-00666
			1	P4-00667
		Person 2	4	P4-00668
			2	P4-00669
			1	P4-00670
	8/19/2010	Person 1	4	P4-00689
			2	P4-00690
			1	P4-00691
		Person 2	4	P4-00692
			2	P4-00693
			1	P4-00694
	8/20/2010	Person 1	4	P4-00714
			2	P4-00715
			1	P4-00716
		Person 2	4	P4-00717
			2	P4-00718
			1	P4-00719
	8/25/2010	Person 1	4	P4-00745
			2	P4-00746
			1	P4-00747
		Person 2	4	P4-00748
			2	P4-00749
			1	P4-00750
	8/26/2010	Person 1	4	P4-00769
			2	P4-00770
			1	P4-00771
		Person 2	4	P4-00772
			2	P4-00773
			1	P4-00774

File: Ussic1netapp1\lfo_cad\LIBBY_MONTANA\ABS Sampling2010\WindRosePhaseIV.mxd



LEGEND

WIND SPEED
(Knots)

- >= 45
- 30 - 45
- 22 - 30
- 17 - 21
- 11 - 17
- 7 - 11
- 4 - 7
- 1 - 4

Calms: 12.77%

Wind Data
from December 2006 to February 2009

Mine Boundary

2007 Tree Bark, Duff and Soil Sampling Location

ABS Location Zones with outer 0.5 mile Buffer Zone

N
W E
S

0 3,250 6,500 Feet

PROJECT:
W. R Grace
Libby, Montana

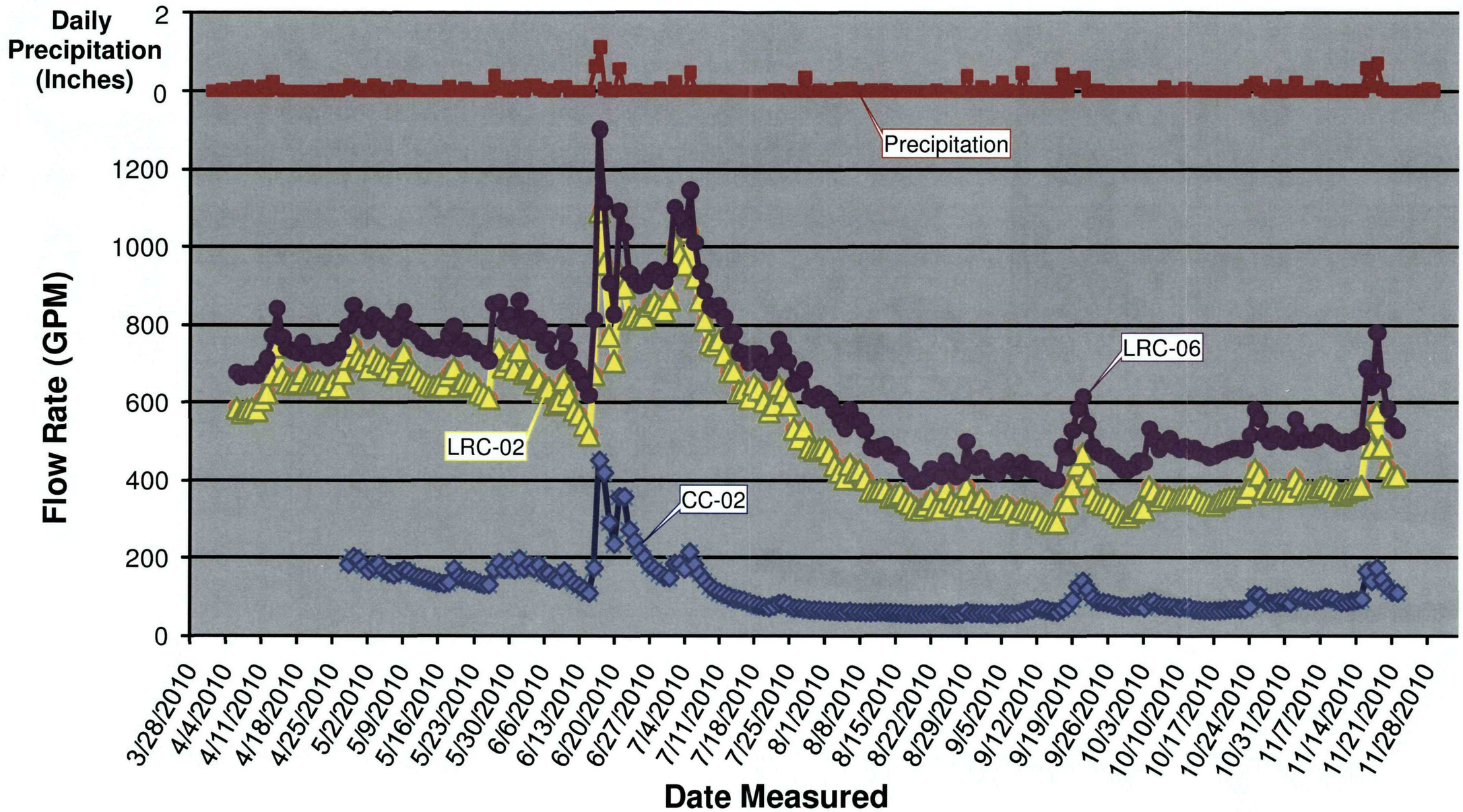
FIGURE TITLE:
PHASE I DOWNWIND SAMPLING TRANSECTS and PHASE IV ABS LOCATIONS

MWH
10619 South Jordan Gateway
Suite 100
Salt Lake City, Utah 84095

Date: 01/11/10
Rev: 12/23/10

FIGURE NO:
2-1

File: I:\LIBBY_MONTANA\ISCOs\ISCO 2010\StreamFlowData2010wTemp.mxd



LEGEND

Flow Stations

CC-02 LRC-02 LRC-06

Precipitation

Weather Station: Libby, Montana

OU3 Phase IV Stream Flow Data

LIBBY ASBESTOS SUPERFUND SITE
OU3 PHASE IV REMEDIAL INVESTIGATION

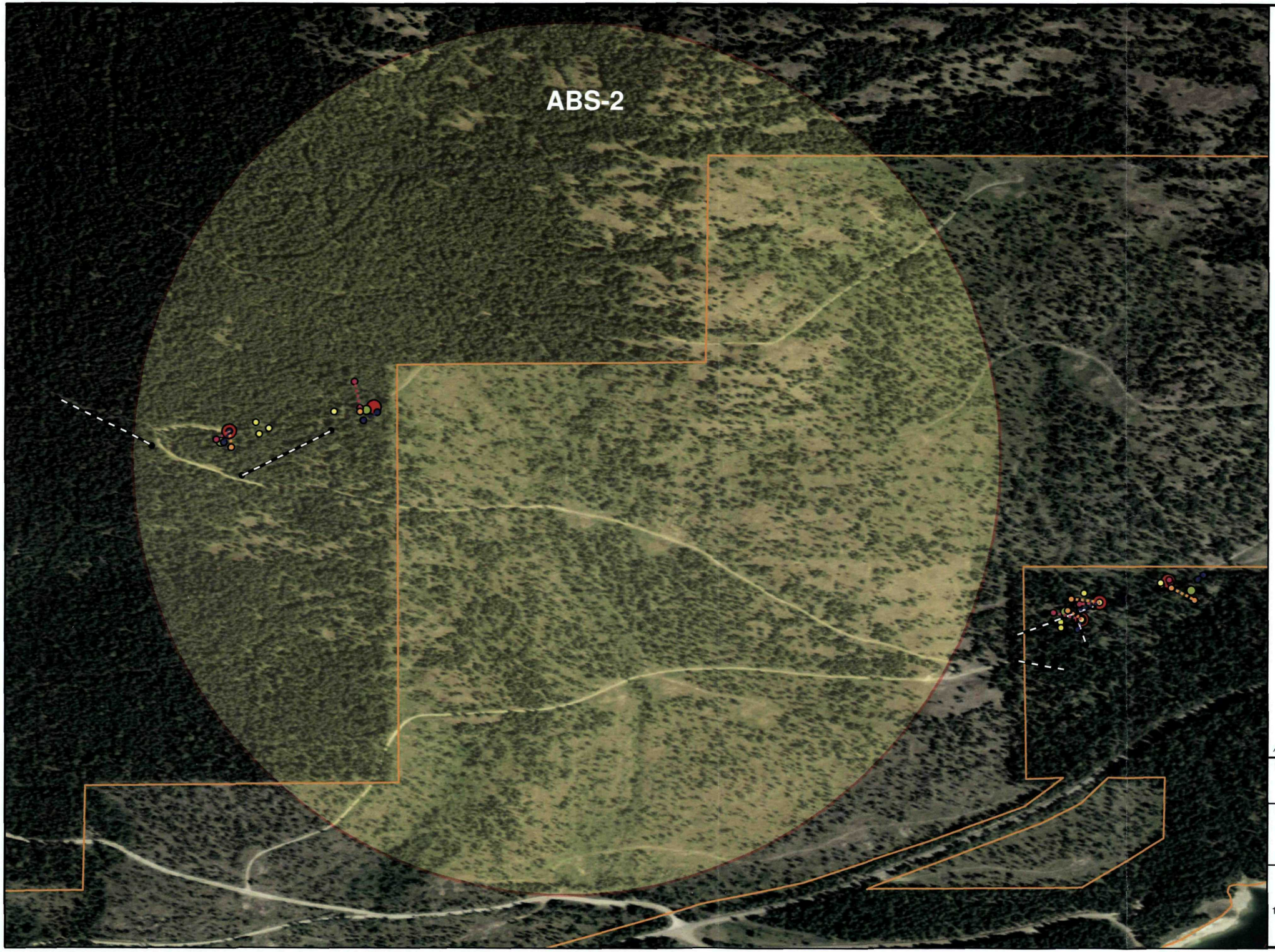
MWH

10619 South Jordan Gateway
Suite 100
Salt Lake City, Utah 84095

Date: 12/08/10
Rev: 12/22/10

FIGURE NO:
2-2

File: Usslc1netapp1\lfo_cad\LIBBY_MONTANA\ABS Sampling2010\ABS_2010_Area2_Dec22.mxd



LEGEND

- Property Boundary
- ABS Location Zones with outer 0.5 mile Buffer Zone

PHASE IV ABS
AREA 2
5 Rounds
(July-August, 2010)

- 2a Base-Truck
- 2b Felling-Limbing and Cutting-Stacking (Stump Location)
- 3a Trail Maintenance and Debris Clearing
- 3b Tree Thinning and Slash Pile Building
- 3c Tree Stand Examination
- 3d Cutting Fireline by Pulaski
- 3e Cutting Fireline by Dozer

N
W E
S

0 300 600
Scale in Feet

Aerial Photography Reference: NAIP 2009

PROJECT:
W. R Grace
Libby, Montana

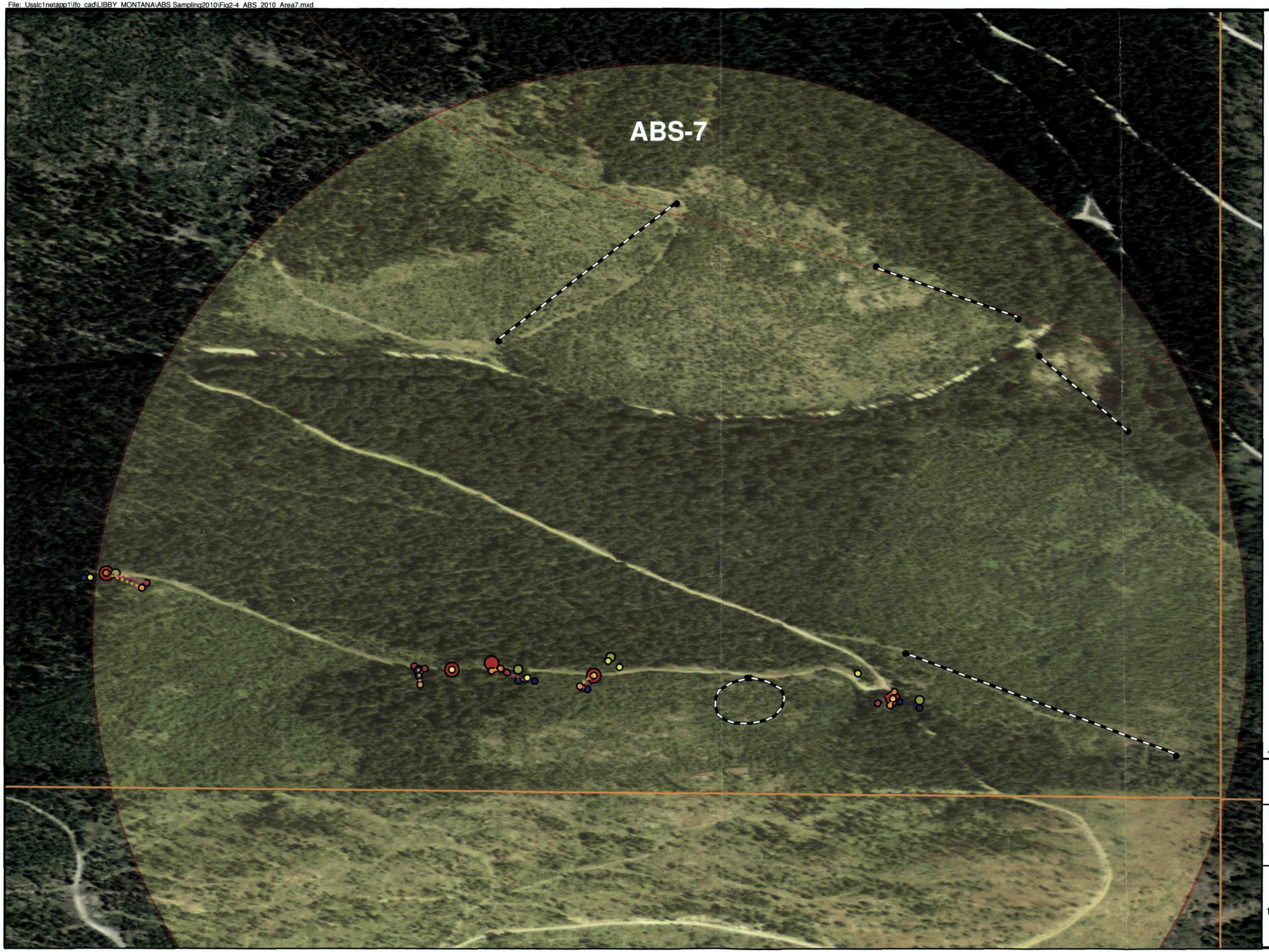
FIGURE TITLE:
Phase IV ABS
Area 2 GPS Locations

MWH
10619 South Jordan Gateway
Suite 100
Salt Lake City, Utah 84095

Date: 10/8/10
Rev: 12/22/10

FIGURE NO:
2-3

File: Ussic1netapp1\lfo_cad\LIBBY_MONTANA\ABS Sampling2010\Fig2-4_ABS_2010_Area7.mxd



LEGEND

Property Boundary

ABS Location Zones with outer 0.5 mile Buffer Zone

PHASE IV ABS
AREA 7
5 Rounds
(July-August, 2010)

- 2a Base-Truck
- 2b Felling-Limbing and Cutting-Stacking
- 3a Trail Maintenance and Debris Clearing
- 3b Tree Thinning and Slash Pile Building
- 3c Tree Stand Examination
- 3d Cutting Fireline by Pulaski
- 3e Cutting Fireline by Dozer

N
W E
S

0 225 450
Scale in Feet

Aerial Photography Reference: NAIP 2009

PROJECT:
W. R Grace
Libby, Montana

FIGURE TITLE:
Phase IV ABS
Area 7 GPS Locations

MWH
10619 South Jordan Gateway
Suite 100
Salt Lake City, Utah 84095

Date: 10/08/10
Rev: 12/22/10

FIGURE NO:
2-4

File: Usslc1netapp1\lfo_cad\LIBBY_MONTANA\ABS Sampling2010\Fig2-5_ABS_2010_Area10.mxd

LEGEND

Property Boundary

ABS Location Zones with outer 0.5 mile Buffer Zone

PHASE IV ABS
MODIFIED AREA 10
5 Rounds
(July-August, 2010)

- 2a Base-Truck
- 2b Felling-Limbing and Cutting-Stacking
- 3a Trail Maintenance and Debris Clearing
- 3b Tree Thinning and Slash Pile Building
- 3c Tree Stand Examination
- 3d Cutting Fireline by Pulaski
- 3e Cutting Fireline by Dozer

N
W E
S

0 150 300
Scale in Feet

Aerial Photography Reference: NAIP 2009

PROJECT:
W. R Grace
Libby, Montana

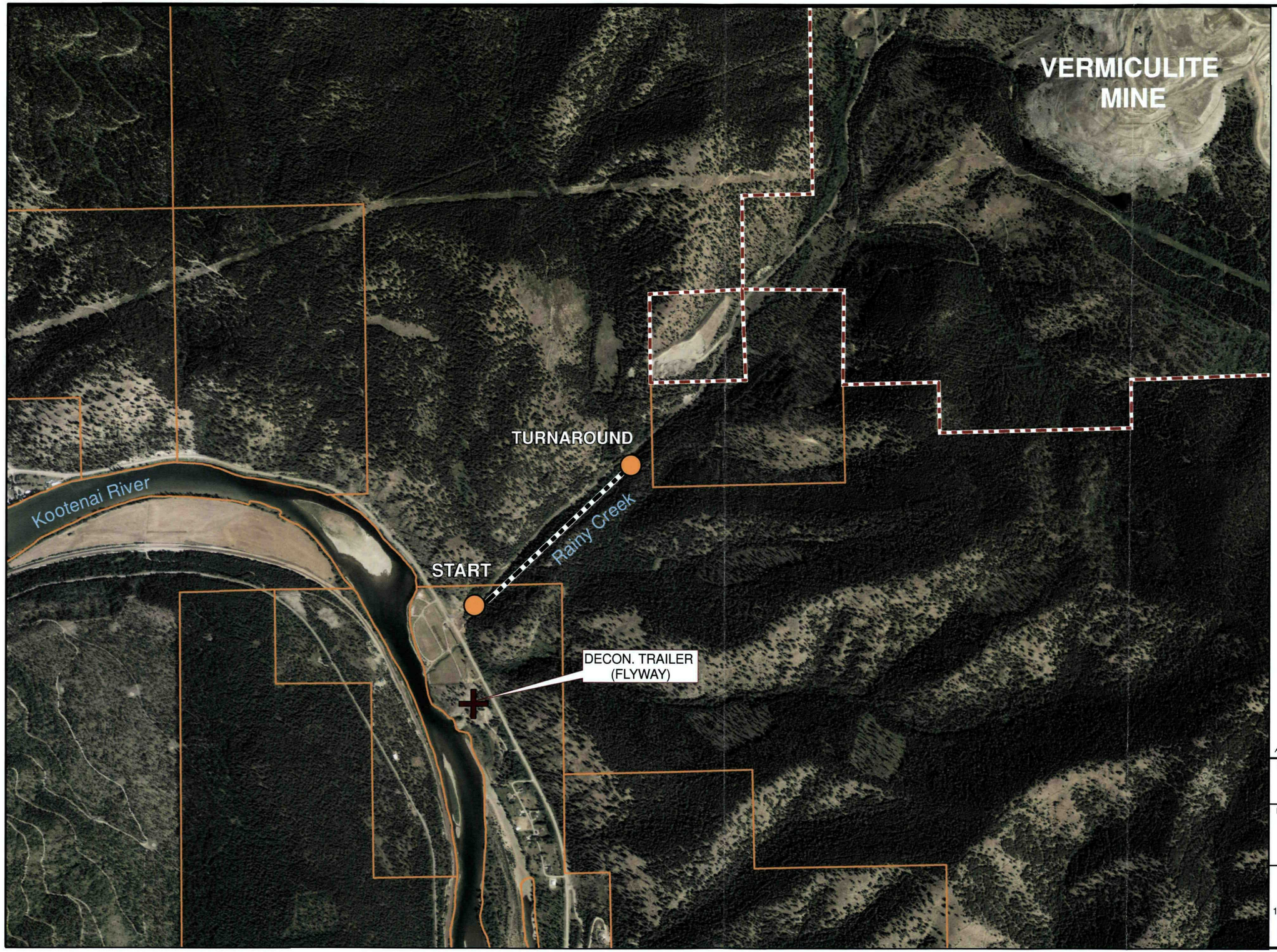
FIGURE TITLE:
Phase IV ABS
Modified Area 10 GPS Locations

MWH
10619 South Jordan Gateway
Suite 100
Salt Lake City, Utah 84095

Date: 10/08/10
Rev: 12/22/10

FIGURE NO:
2-5

File: Usslc1netapp1\lfo_cad\LIBBY_MONTANA\ABS Sampling2010\Figures\Fig2-6_ABS_2010_RainyCreek.mxd



LEGEND

- Property Boundary
- Vermiculite Mine Boundary
- Decon. Trailer (FLYWAY)

PHASE IV ABS
Rainy Creek Activity 1
5 Rounds
(August, 2010)

- Vistor Hike along Rainy Creek

N
W E
S

0 650 1,300
Scale in Feet

Aerial Photography Reference: NAIP 2009

PROJECT:
W. R Grace
Libby, Montana

FIGURE TITLE:
Phase IV ABS
Rainy Creek GPS Location

MWH
10619 South Jordan Gateway
Suite 100
Salt Lake City, Utah 84095

Date: 10/08/10
Rev: 12/22/10

FIGURE NO:
2-6

TARGET SHEET

EPA REGION VIII

SUPERFUND DOCUMENT MANAGEMENT SYSTEM

DOCUMENT NUMBER: 1191820

SITE NAME: LIBBY ASBESTOS SITE

DOCUMENT DATE: 01/01/2011

DOCUMENT NOT SCANNED

Due to one of the following reasons:

- ☐ PHOTOGRAPHS
- ☐ 3-DIMENSIONAL
- ☐ OVERSIZED
- ☑ AUDIO/VISUAL
- ☐ PERMANENTLY BOUND DOCUMENTS
- ☐ POOR LEGIBILITY
- ☐ OTHER
- ☐ NOT AVAILABLE
- ☐ TYPES OF DOCUMENTS NOT TO BE SCANNED
  (Data Packages, Data Validation, Sampling Data, CBI, Chain of Custody)

DOCUMENT DESCRIPTION:

1 CD - APPENDICES (APPENDIX A - D INCLUDED IN THIS PDF)
APPENDIX A - FIELD MODIFICATION APPROVAL FORMS
APPENDIX B - FIELD SAMPLE DATA SHEET SCANS
APPENDIX C - FIELD LOGBOOK SCANS
APPENDIX D - CHAIN-OF-CUSTODY SCANS
APPENDIX E - ISCO FLOW DATA IN EXCEL FORMAT

Contact the Superfund Records Center to view available document.
(303) 312-6473

TABBED PAGE

APPENDIX A

FIELD MODIFICATION APPROVAL FORM
LFM-OU3-01
Libby OU3 Phase 4A Sampling & Analysis Plan

Requested by: Lynn Woodbury Date: 7/15/10

Description of Deviations:

1) SAP Section 4.7, Section 5.5, Section 6.0: Each individual performing ABS will wear an additional "ultra-low" flow pump (1 L/min). During the TEM analysis, if the analyst determines that the high volume sample (4 L/min) is overloaded and a direct preparation is not possible, the low volume sample (2 L/min) should be examined. If the analyst determines that the low volume sample (2 L/min) is overloaded and a direct preparation is not possible, the ultra-low volume sample (1 L/min) should be examined. If it is determined that the ultra-low volume (1 L/min) sample cannot be analyzed directly, contact the EPA Remedial Project Manager for direction.

2) SAP Section 5.1: ABS will be performed in accord with the revised ABS scripts (see Mod Attachment 1).

3) SAP Section 5.5, Section 8.1.2: ABS samples will be collected and handled in accord with the modified procedures in SOP ABS-LIBBY-OU3 Revision 1 (see Mod Attachment 2).

4) SAP Section 7.1: Because each individual performing ABS will wear three personal monitor pumps (flow rates of 4.0 L/min, 2.0 L/min, and 1.0 L/min), no field duplicates of personal monitoring samples are necessary.

5) SAP Section 7.1: No rinsate blanks are necessary following decontamination of non-disposable equipment (e.g., chainsaws).

6) SAP Section 7.1: A total of 5 field blanks will be collected for ABS Scenarios 1-5 (1 per ABS event * 5 events).

7) SAP Figure 4-2 was revised to show ABS areas for the scenario where firelines will be cut using heavy equipment (script #3e) (see Mod Attachment 3). These areas were moved to ensure they were on Forest Service land.

8) SAP Section 1.2: The Field Team Leader was changed to John Garr.

9) SOP No. 9 Field Documentation: COC form was revised to allow for the standardized recording of ABS script # and matched samples (i.e., 4 L/min, 2 L/min, and 1 L/min for the same person for the same ABS script) (see Mod Attachment 4). This information is needed by the analytical laboratory to determine appropriate target sensitivity and allow for analysis of low volume (or ultra-low volume samples) in the event that the high volume sample is overloaded.

10) SAP Table 5-1: The table was modified to distinguish the total number of samples to be collected and analyzed for each ABS Scenario (see Mod Attachment 5).

11) Due to constraints in field implementation, for script #3e (cutting firelines using heavy equipment), multiple events will be performed on the same day at each ABS area. The day selected for performing script #3e should be representative of conditions where asbestos releasability is expected to be high (i.e., dry soil conditions). For all other ABS scripts, multiple events at each ABS area will be performed on different days.

☒ EPA Region 8 has reviewed this field modification approves as proposed.

☐ EPA Region 8 has reviewed this field modification and approves with the following exceptions:

_____

_____

☐ EPA Region 8 has reviewed this field modification and does not agree with the proposed approach for the following reasons:

_____

_____

Bonita Lavelle, EPA RPM Date 7/16/10

Mod Attachment 1

Revised ABS Script

LIBBY SUPERFUND SITE OPERABLE UNIT 3
PHASE IV SAMPLING AND ANALYSIS PLAN

ATTACHMENT A
Revision 1

ACTIVITY BASED SAMPLING (ABS) SCRIPTS

This Attachment describes the activities to be performed by individuals performing each of the ABS scenarios described in the Phase IV-A Sampling and Analysis Plan (SAP). Details on the number, location, and timing of ABS sampling events are provided in the Phase IV-A SAP.

SCRIPT 1: RECREATIONAL VISITORS ALONG LOWER RAINY CREEK

Recreational visitors along lower Rainy Creek (between Highway 37 and the W.R. Grace property line) may engage in activities such as hiking and antler hunting that could disturb LA in source material (soil, dried stream-side sediment, and duff). The following script will be used to simulate exposures during activities that are considered to be representative of recreational visitors along lower Rainy Creek south of the W.R. Grace property boundary.

For this scenario, Rainy Creek south of the W.R.Grace property boundary will be evaluated as a single ABS study area. ABS sampling will be performed by a team of two individual samplers. Three pumps will be worn by each sampler. Target flow rate for the first pump is 1 liters per minute (LPM), the target flow rate for the second pump is 2 LPM, and the target flow rate for the third pump is 4 LPM.

The team of two samplers will walk from the security gate on Rainy Creek Road to Rainy Creek. Once at Rainy Creek, the two samplers will turn on their sampling pumps. This will be time = 0. Both individuals will then begin to walk up along the banks of the creek, disturbing bushes and other vegetation as needed to move along the bank of the creek. Activities will include the samplers using their hands to push aside ground vegetation to simulate hunting for antlers. To the extent possible, the samplers will cross back and forth across the creek several times so that the ABS activities represent exposures to disturbed sediments and brush on both sides of Rainy Creek.

After 30 minutes moving up the drainage, the two samplers will change positions so that the sampler originally in the lead will be in the following position. The team will them make their way back down the drainage toward the starting point. After 30 more minutes (for a total of 60 minutes), the ABS event ends and the air sampling pumps are turned off and the air sampling cassettes are capped.

SCRIPT 2: RESIDENTIAL WOOD HARVESTER

Residents of Libby may harvest firewood within the OU3 study area for personal use as a heating source. Individuals harvesting wood within the OU3 study area may be exposed to LA fibers released from duff and/or soil when disturbed during walking in the woods to the selected trees, from tree bark when cutting down trees and sawing them into manageable size, and from tree bark and/or soil and/or duff when disturbed during hauling the wood to a truck or other vehicle. The following script will be used to simulate residential (non-commercial) wood harvesting activities.

Two individual samplers will perform each residential wood harvesting ABS event. Three pumps will be worn by each sampler. Target flow rate for the first pump is 1 liters per minute (LPM), the target flow rate for the second pump is 2 LPM, and the target flow rate for the third pump is 4 LPM.

For each ABS event at each location, each individual sampler will collect 1 sample to represent exposures that occur while driving to and from the location, and 2 additional samples during the harvesting (felling the tree, cutting it into manageable firewood sizes, stacking into the back of a pickup truck, and cleaning up the area). The scenario is performed in three steps, as follows:

1. Driving to the ABS Area (Script 2a, part 1)
The individual samplers shall initiate the event by entering a pickup truck located in the Flyway, turning on their air monitoring pumps, and riding to the location of trees to be harvested (identified by the US Forest Service) in the truck with the windows open. Once arriving at the tree harvesting location, the truck will be parked along the US Forest Service road, the air monitoring pumps will be turned off and the air sampling cassettes will be capped and set aside until they are re-activated during the drive away from the ABS area.

2. Felling, Limbing, Cutting and Stacking (Script 2b)
The wood harvesting scenario is begun by each individual exiting the pickup truck, attaching new filter cassettes to the low volume and the high volume pumps, and turning the pumps on.

During each ABS event at each designated location, the samplers will harvest one tree identified by the US Forest Service. The samplers shall hike to the tree and one of the samplers will fell the tree and remove branches using a chainsaw. The second individual will haul the cut branches and place them in a pile nearby and perform clean up. The duration of this activity will vary depending on the size of the tree and the distance from the road, but is expected to average approximately 20 minutes. After felling the tree and

removing the branches, if necessary, the samplers shall attach the cut tree to a cable and haul it to the road near the vehicle. Then one sampler will cut the felled tree into pieces of appropriate size for use in wood burning stoves (usually about 16-24 inches in length) and the other sampler will haul the firewood back to the bed of the truck. After 15 minutes, the samplers will reverse roles and continue for another 15 minutes. The total duration for this activity is 50 minutes.

In order to help minimize the chances of generating overloaded filters, the exposures associated with the wood harvesting activities described above may be captured on two sequential cassettes. The optimal break point between the two sequential cassettes will be between felling/limbing and cutting/stacking. In other words, the first wood harvesting sample would include hiking to the tree, felling, limbing, and hauling to the road, and the second wood harvesting sample would include cutting and stacking.

All individuals who perform this activity must be properly trained in the safe use of gasoline powered saws and in safe procedures for felling trees.

After 50 minutes of cutting and hauling wood to the truck, the harvesting scenario is ended. Each individual shall turn off their pumps and remove and cap the cassettes. The area shall be further cleaned up as necessary after sampling has ended.

3. Driving from the ABS Area (Script 2a, part 2)
After removing the cassettes used for wood harvesting, each individual shall re-attach the same cassettes as were used during the truck ride to the area. The pumps will then be re-activated, and the pickup truck shall be driven back to the Flyway (windows open). Once at the Flyway, the driving scenario is ended and the pumps will be turned off and each cassette removed and capped.

At the Flyway, the wood shall be off-loaded from the truck and placed into a pile for potential future use in burning[1]. The wind direction and speed at the sampling location should also be monitored.

SCRIPT 3: US FOREST SERVICE WORKER

U.S. Forest Service workers within the OU3 study area may be exposed to LA fibers during a variety of activities. These include activities routinely performed as part of the Forest Service's land management responsibilities such as maintenance of roads and trails, thinning of trees and vegetation, and surveying trees (stand exam). In addition to routine land management activities, US Forest Service personnel respond to forest fires in the Kootenai National Forest. Fire

[1] The potential risks associated with burning wood collected from OU3 will be evaluated as part of the OU4 risk assessment, and will not be included in OU3.

fighting activities include those associated with initial ground attack, aerial attack, and sustained ground attack.

For the purposes of the Phase IV ABS investigation, the following scripts will be used to simulate a range of activities that are considered to be representative. ABS sampling will be performed by a team of two samplers except where noted. Three pumps will be worn by each sampler. Target flow rate for the first pump is 1 liters per minute (LPM), the target flow rate for the second pump is 2 LPM, and the target flow rate for the third pump is 4 LPM.

Script 3a. Trail Maintenance

Trail maintenance consists mainly of clearing vegetation from the trail. Samplers will travel to the designated ABS locations and park on the roadway. Samplers will exit the vehicle and hike to the designated trail location. Once at the designated trail, samplers will turn on the air sampling pumps. One sampler will use a saw head trimmer to clear trees and brush to a width of about 1-2 feet, and to a height of about 8 feet. The second individual will haul the cut vegetation off the trail. After 15 minutes, the two individuals shall reverse roles. After 30 minutes, the ABS activity is ended, and both individuals shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3b. Tree Thinning

Tree thinning consists of cutting small trees (2-4 inches in diameter) and hauling the wood into a "slash" pile. This activity will be performed for a period of 30 minutes. One individual will cut for 15 minutes, while the second individual hauls wood to a pile. After 15 minutes, the roles are reversed. After 30 minutes, the ABS activity is ended, and both individuals shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3c. Stand Examination

Stand examination consists of obtaining measurements of the girth and height of trees in a stand, and collecting borings from the trees to determine age. Both samplers will perform or simulate all of these activities. Measurement of tree diameter will be performed by passing a measuring tape around the tree at a height of about 1 meter. Measurement of tree height (typically done using a cinometer to measure the angle from a reference point to the top of the tree) will be simulated by walking to a reference point about 10-15 meters from the tree, and looking up to observe the top of the tree (actual measurement of the angle with a clinometers is not required). Collection of a core using an increment borer is described in SOP Tree-Libby-OU3 (see Attachment B). This scenario will be performed by both samplers for a period of 30 minutes. After 30 minutes, the ABS activity is ended, and both individuals shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3d. Cutting a Fireline by Hand

Cutting a fireline by hand consists of establishing a fuel break 18 inches wide by removing as much combustible material as possible. This task requires initial removal of trees and brush using a chainsaw. Then a Pulaski tool or other similar device is used to scrape away all combustible material down to mineral soil to establish a line about approximately 18 inches wide. During an initial attack of a forest fire, these activities are typically done by a crew of 4-6 fire fighters. For the ABS scenario, 2 samplers will participate. This activity will be performed for a period of 30 minutes. The 2 samplers will work approximately 10 feet apart. After 15 minutes, the relative positions of the 2 samplers will be reversed. After 30 minutes, the ABS activity is ended, and both samplers shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3e. Cutting a Fireline with Heavy Equipment

Cutting a fireline with heavy equipment involves using a dozer or tractor plow to remove vegetation and all combustible material down to mineral soil within a line as wide as the dozer or tractor blade. This activity is typically done by a crew consisting of one dozer boss and a crew of several fire fighters. For the ABS scenario, 2 samplers will participate. One sampler will act as the dozer boss and will operate the dozer or tractor plow to cut the fireline. The other sampler will perform activities to simulate a firefighter. The second sampler shall be no closer than 100 feet from the heavy equipment and will pick up and discard excavated combustible material from inside the fireline to outside the fireline. This activity will be performed for a period of 30 minutes. After 30 minutes, both samplers shall turn off their air sampling pumps and cap their sampling cassettes. The dozer/tractor plow operator will then pull back the excavated lines to clean up the area.

SCRIPT 4: EXPOSURE OF GROUND-BASED FIREFIGHTERS TO SMOKE

U.S. Forest Service workers who fight fires on the ground within the OU3 study area may be exposed to LA in air released by burning of contaminated duff and trees. This “smoke” exposure pathway will be evaluated after the results from Scripts 3d and 3e are available and have been evaluated.

The objective of this activity is to characterize LA levels in smoke released from high-intensity fires. This will be achieved by burning two large slash piles that presently exist in OU3. All such simulated wildfire burns in OU3 will be performed in accord with all requirements and recommendations of the U.S. Forest Service. One or more U.S. Forest Service staff will be present at all simulated wildfire events.

Script 4a. Personal ABS Samples

Four samplers will wear personal air monitors during each simulated wildfire. Three pumps will be worn by each sampler. Target flow rate for the first pump is 1 liters per minute (LPM), the target flow rate for the second pump is 2 LPM, and the target flow rate for the third pump is 4 LPM. The pumps will not be activated until the fire is generating significant levels of smoke. When smoke generation is significant, the pumps will be activated and each individual wearing the monitors will move about the area of the controlled burn, including time in the cross-wind and down-wind directions. The primary purpose is to capture exposures related to smoke release rather than soil or duff disturbance. After 30 minutes, the ABS activity is ended, and both samplers shall turn off their air sampling pumps and cap their sampling cassettes.

Script 4b. Stationary Monitors

Four stationary monitors will be installed around the perimeter of each simulated wildfire. These will be positioned approximately 90° apart, with one station being located in the predominant downwind direction at the time the fire is initiated. Each perimeter monitor should be sufficiently distant from the fire that it is not threatened by the heat from the fire. The perimeter monitors will not be activated until the fire is generating significant levels of smoke. Once the pumps are activated, each sample will be collected for a period of 30 minutes. After 30 minutes, the stationary pumps will be turned off and the sampling cassettes capped.

In addition, if smoke from either of the simulated wildfires is blowing towards any of the three fixed-base contingency monitors described in Attachment D (See Section 4.1 of Attachment D), one or more of these monitors should also be activated during the simulated wildfire.

Following the fire, stationary air samples will be collected from each of the four perimeter air monitors for 2 additional days to determine if fibers remain in the air or are dispersed by the wind. Because smoke emission will be much lower than during the fire, sampling time can be increased from 30 minutes to 60 minutes per sample to help decrease the analytical sensitivity.

SCRIPT 5: EXPOSURE OF PILOTS TO SMOKE

Currently, within the Fire Suppression Restricted Zone (FSRZ) of the OU3 study area , U.S. Forest Service personnel fight forest fires by air, either in fixed wing aircraft or in helicopters that are used to drop water or fire retardant on burning areas. These individuals may be exposed to LA that has been released into the air by the fire.

In order to characterize the exposure of aircraft pilots during fire suppression flights, a stationary sampling pump will be installed in the cockpit of one or more aircraft deployed for fighting fires within the OU3 study area. The air sampling cassette will be positioned to sample cockpit air,

but will be located in a position that does not interfere with the pilot's vision or ability to operate the aircraft.

Script 5a. Responding to Simulated Wildfires in OU3

On the day(s) when simulated wildfires are performed in OU3 (see Script 4), one aircraft shall fly over the simulated wildfire area after the smoke plume is well established, simulating a flight path that would be used to attack the fire. Two such simulated aerial attacks shall be performed per simulated wildfire, resulting in 2 filters per wildfire (four total).

For each simulated attack, the air sampling pump will be turned on when the pilot is preparing for takeoff, and will be turned off when the pilot returns to base. For each sample collected, the time of the flight (from takeoff to landing) will be recorded, along with information on the location of the fire and the type of aircraft.

Script 5b. Responding to Authentic Wildfires in OU3

When an aerial response to an authentic wildfire in the exclusion zone of OU3 is called for, the USFS will notify Remedium. If the fire is generating significant smoke, Remedium will immediately send a person to the airfield to perform all necessary activities associated with calibrating and activating the pump and collecting the samples (as described above). It is understood that, in some cases, the pilot may be required to begin flights before this can be achieved. In this event, the pump will be activated during the first available time when the aircraft returns to base between trips to the fire.

SCRIPT 6: EXPOSURE OF AREA RESIDENTS TO SMOKE FROM FOREST FIRES

EPA (2009b) previously established a plan for collecting stationary air samples at three monitoring locations to evaluate exposures of residents in Libby in the event of a significant forest fire in the Fire Suppression Restricted Zone of OU3. This original "contingency air monitoring plan" has been revised to incorporate the addition of one mobile air monitoring station that will be placed in a downwind location from any authentic wildfire that generates significant smoke in OU3. This revised "contingency air monitoring plan" is provided as Attachment D to this SAP.

In brief, when notified by the USFS of a fire in the exclusion zone of OU3 that is large enough to generate significant smoke, a designated point of contact who is a contractor to Remedium will activate stationary air sampling pumps previously deployed at three locations:

- CDM office building in Libby
- USFS Ranger station along Highway 37
- McGillivray Campground on the west shore of Lake Koocanusa.

Unless smoke levels are so high as to cause filter overloading, sampling duration for these samples will be 24 hours, changing to new filters every 24 hours until the fire is extinguished.

In addition to these three stationary monitors at fixed locations, a fourth monitoring station capable of collecting two independent samples (field duplicates) will be established in an accessible area downwind of the fire. The monitors will be transported to the collection site by truck. The sampling location and distance from the fire will depend on the conditions of the fire. Although details may vary, it is envisioned that the two monitors will be placed on a tripod in the back of the truck, which will be driven to the nearest accessible area that is being impacted by smoke from the fire. Once at the sampling location, the pumps shall be calibrated and the pumps turned on. The target flow rate for these samplers will be 4-6 LPM. Unless safety concerns dictate otherwise, this sampler shall be collected for duration of about 30 minutes. During sample collection, the coordinates of the monitor will be recorded. This information will be used later, in combination with data on the fire location, to establish the distance and direction of the monitor relative to the fire. The wind direction and speed at the sampling location should also be monitored.

NOTE: In all cases, it is critical that this sampling effort be performed in a way that does not endanger that health or safety of the sampling personnel. If conditions are considered to be potentially unsafe, the sampler should evacuate the area immediately.

Mod Attachment 2

SOP ABS-LIBBY-OU3, Revision 1

Date: July 13, 2010 SOP ABS-LIBBY-OU3 (Rev. 1)

Title: ACTIVITY-BASED SAMPLING FOR ASBESTOS

APPROVALS:

TEAM MEMBER	SIGNATURE/TITLE	DATE
EPA Remedial Project Manager	Bonita Lavelle, USEPA RPM	7/16/10
SOP Author	Lynn Woodbury, SRC	7/15/10

Revision No.	Date	Reason for Revision
0	06/14/2010	--
1	07/13/2010	Provide changes and clarifications based on field experience

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide a standardized method for collection of air samples during activity-based sampling (ABS) for Libby amphibole asbestos (LA). This SOP was developed based on procedures provided in ERT SOP #2084 (Rev 0) *Activity-Based Sampling for Asbestos* and Libby SOP EPA-LIBBY-01 (Rev 1) *Sampling for Asbestos Fibers in Air*.

This procedure will be used by USEPA Region 8 for the Remedial Investigation work for Operable Unit 3 (OU3) performed at the Libby Asbestos Superfund site.

2.0 RESPONSIBILITIES

All staff involved with the collection of ABS air samples are responsible for understanding and implementing the requirements contained herein as well as other related project-specific requirements.

Team Leader – The team leader is responsible for communication with EPA regarding status and progress of the sampling event and providing support to field team staff to ensure all necessary resources are available for implementation of the ABS program.

Field Team Leader (FTL) – The FTL is responsible for ensuring that the specifics related to the ABS program described in this procedure are followed by all staff and that all quality assurance/quality control (QA/QC) procedures related to this program are implemented.

Field Team Members – The field team members are responsible collection and documentation of samples as described in the applicable Sampling and Analysis Plan (SAP) and this SOP.

3.0 METHOD SUMMARY

At present, models are not available to accurately predict asbestos exposure in air that result from disturbance of an LA-contaminated source based only on measures of LA in the source (e.g., soil). Therefore, personal monitoring in the form of ABS is the most appropriate technique to estimate exposure (USEPA 2008). As part of ABS, USEPA or contractor personnel trained in hazard recognition and mitigation, serve as surrogates for the potentially exposed populace of interest. ABS simulates particular activities in order to mimic and evaluate or predict personal exposures from disturbance of materials potentially contaminated with asbestos. Air is drawn through a fine-pore filter in order to trap any suspended particulate material in the air, including suspended asbestos fibers. ABS air samples are collected from the breathing zone of the subject at an appropriate air flow rate. These filters are then examined using an appropriate microscopic technique to observe, characterize, and quantify the number of asbestos fibers on the filter. Air filters collected in this way are suitable for examination by a variety of microscopic techniques, including transmission electron microscopy (TEM), phase contrast microscopy (PCM), and scanning electron microscopy (SEM).

4.0 FIELD EQUIPMENT

- Personal sampling pump – The selected sampling pump will be capable of a flow-rate and pumping times sufficient to achieve the desired air sample volume. The sampling pump will provide a non-fluctuating air-flow through the filter, and will maintain the initial volume flow-rate to within ± 10% throughout the sampling period. For personal air sampling, a portable high volume AC powered sampler or low volume battery-operated pump are acceptable, depending on whether the activities of the individual are impaired by the tethering imposed by the power cord needed for the high volume pump.

- Filter cassettes – A commercially available, 25-millimeter (mm), three-piece cassette with a 50 mm electrically-conductive extension cowl pre-loaded with a 0.8 micrometer (µm) mixed cellulous ester (MCE) filter.

- Inert tubing – Tygon tubing used in the sampling train to connect the outflow end of the sample cassette to the sampling pump. Tubing has a 1/4" inner diameter and 7/16" outer diameter.

- Rotameter – A rotameter calibrated such that the operator can measure flow rates to ±5% accuracy at the expected sampling flow rate.

- Rotameter calibration source – A bubble burette or other primary calibration standard may be used to calibrate the rotameter.

- Field sample data sheets (FSDS) – Specific data related to the collection of each sample will be recorded on an OU3-specific ABS air FSDS (see Attachment 1). This sheet will contain all relevant information regarding equipment used, flow rates, and collection times.

- Chain of custody (COC) forms – Documentation of chain of custody signatures/dates and requested analyses for each sample collected will be recorded on an OU3-specific COC form.

- Field logbook

- Spring clips

- Plastic bags

- Sample labels

- Clear packaging tape

- Ink pen

- Personal protective equipment (PPE)

- Power sources (e.g., batteries, power inverters, generators)
- Miscellaneous tools (e.g., screwdriver, pliers, scissors)

5.0 REAGENTS

Reagents are not required for the collection or preservation of asbestos air samples.

6.0 SAMPLING PROCEDURES

6.1 Identification of ABS Areas

ABS areas will be specified in the applicable SAP. Within the constraints of ABS, and to the degree practical, the potential for particulate migration from the ABS area to other areas where human exposure might occur should be minimized, and constraints or mitigation protocols should be established to help minimize inadvertent public exposure.

6.2 Selection of Air Volumes and Flow Rates

Target air volumes and flow rates will be specified in the applicable SAP. For activities that generate a large quantity of dust, flow rates and sample times may be adjusted to ensure the sample filter has proper loading for the required analytical analysis and sensitivity goals.

While high flow rate are desirable because they increase the volume of air sampled, high flow rates may result in filter damage due to failure of its physical support associated with increased pressure drop, leakage of air around the filter mount so that the filter is bypassed or damage to the asbestos structures (e.g., breakup of bundles and clusters) due to increased impact velocities (ISO 10312). High flow rates can also tear the filters during initial pump startup due to the shock load placed on the filter when the pump is first started.

In no event shall a sample be collected at a flow rate lower than 0.92 L/min, since the linear flow velocity would fall below 4 cm/sec, which is the minimum velocity specified by ISO 10312.

6.3 Sample Collection

There are a variety of ABS activities that can be performed (e.g., ATV riding, raking, jogging). The specific ABS activity to be performed will be specified in the appropriate SAP. The SAP should include a detailed ABS “script” of these activities.

For all ABS events, except as noted otherwise, air samples will be collected from the breathing zone of the event participants. The breathing zone can be visualized as a hemisphere approximately 6 to 9 inches around an individual’s face. Breathing zone samples provide the best approximation of the concentration of contaminants in the air that an individual is actually breathing. Specific breathing zone heights should be determined on a project-by-project basis.

ABS air samples should be collected as follows:

1. Place a sample label on the sample cassette indicating the unique Index ID.

2. Secure the cassette on the lapel just below the face of the individual being monitored using spring clips. Orient the cassette so the open face of the cowel is pointing downward to avoid any particles entering the filter by precipitation.

3. Remove the protective cap over the open face of the cowel and turn on the calibrated pump. Store cassette covers and end plugs in a clean area (e.g., closed bag) during the sampling period).

4. Record the starting time, initial flow rate, and all other relevant sample information on the appropriate FSDS form.

5. Perform the ABS activity in accordance with the script specified in the appropriate SAP.

6. For sampling events that last longer than 2 hours, perform a check of the filter cassette and flow rate every 2 hours. During this check,

   -inspect the filter cassette to ensure that it has not been disturbed
   -inspect the filter for overloading and particle deposition (note: if particle deposition is observed on the inside of the cowl, it may be necessary to ground the cowl to reduce static charge)
   -check the pump flow rate (see Section 7.3 below)

7. After the sampling period has elapsed, measure the end time and ending flow rate on the appropriate FSDS form.

8. Turn off the pump and remove the cassette from the pump. Cap the input end and plug the pump end of the cassette.

9. At OU3, the sealing and bagging of each cassette will not be performed. Rather, sample cassettes will be stored and transported in the boxes they were shipped in to maintain them in an upright position. The entire box will be sealed with a custody seal.

If it is necessary to relieve a participant from the activity, another sample collector should be suited and ready to participate in the ABS prior to the personnel exchange. The participant will stop the activity, remove any sampling apparatus, and pass it to the relief participant. The original participant will assist the relief participant with donning the sampling apparatus. If the exchange is anticipated to take less than 60 seconds, the sampling pumps and event time clock will not be halted during the exchange. If the exchange requires more than 60 seconds, the pump and event clock will be stopped until activity is reinitiated.

6.4 Sample Handling and Storage

After collection, sample cassettes must be handled gently to avoid disturbing the particulate deposited on the filter and to minimize the potential of imparting a static charge to the cassette. In particular:

- Keep the cassette with the intake end up. This helps prevent any materials on the filter from being dislodged.
- Do not put sampling cassettes in shirt or coat pockets, since this could lead to static charge that could disturb the dust deposited on the filter media.

Place the labeled cassette with the open end of the cowl facing up in the shipping container. Use packing material to prevent jostling or damage to the cassettes. Do not use vermiculite or any other type of fibrous packing material for samples.

Cassettes will be shipped to the analytical laboratory under COC procedures in a cooler with a handle on top. The handle will prevent the cooler from being shipped upside-down and will help ensure the cassettes remain vertical with the open end of the cowl facing up.

7.0 CALIBRATION PROCEDURES

Each sampling pump will be calibrated before the start of each air sample collection event. This is to ensure that each sampling pump is measuring the flow rate or volume of air correctly.

7.1 Calibration of Rotameter with an Electronic Calibrator

Rotameters used for pump calibration are calibrated to a primary flow standard. Calibration of the rotameter to the primary flow standard shall occur once at the beginning of the sampling program, and quarterly thereafter, as needed. Documentation of rotameter calibration may be provided either on FSDS sheets, or using Attachment 2, whichever is most convenient.

Procedures for rotameter calibration with the primary flow standard meter are as follows:

1. If the electronic calibrator does not automatically adjust to account for temperature and pressure changes, obtain the actual temperature and pressure in Libby, MT from the local National Oceanic and Atmospheric Administration (NOAA) weather station or from temperature and weather reference centers. Record actual temperature and pressure in the fields provided on the Precision Rotameter Calibration Data Sheet (Attachment 2).
2. Set up the calibration train as shown in EPA SOP #2015 Figure 4 (Attachment 3) with the sampling pump, rotameter, and primary flow meter.
3. Hold the rotameter as vertical as possible.
4. Turn the sampling pump on.
5. Adjust the pump until the desired flow rate, as indicated by the primary flow meter, is attained.

6. Record the rotameter ball reading, as read from the middle of the flow ball, for this flow rate. Record the value in the Ball Reading column on the rotameter calibration data sheet (Attachment 2) or the FSDS sheet, as appropriate.
7. Unless performed automatically by the primary flow meter, repeat sets 5 and 6 10 times, and average the results.
8. Repeat this process for all target flow rates, or for 10 intervals over the range of the precision rotameter.

7.2 Calibration of Sampling Pump with a Rotameter

Prior to the start of each air sample collection event, each sampling pump will be calibrated with a rotameter that has been calibrated as described above. The procedures used for sampling pump calibration are as follows:

1. Set up the calibration chain as shown in EPA SOP #2015, Figure 5 (Attachment 3) using a rotameter, sampling pump and a representative sample cassette. The sample cassette to be used for sampling is installed between the pump and the calibrator.
2. To set up the calibration train, attach one end of tubing to the sample cassette base; attach the other end of the tubing to the inlet plug on the pump. Another piece of tubing is attached from the sample cassette cap to the rotameter.
3. Hold the rotameter as vertical as possible.
4. Turn the sampling pump on.
5. Adjust the sampling pump until the middle of the float ball on the rotameter is lined up with the pre-calibrated flow rate value.
6. Each rotameter used for field calibration will be transported to and from each sampling location in a sealed zip-top plastic bag. The sample cassette cap and attached tubing for rotameter checks will be stored in the site enclosure in a plastic bag.

7.3 Adjustment of Flow Rates During Flow Checks

For long-duration ABS events (> 2 hours), flow checks will be performed every 2 hours during the ABS activity. During these checks, flow rates will be adjusted back to the target rate. Adjustment of flow rates during flow checks will be performed as described below. Should the flow rate change from the target flow rate, the following procedure will be used to make the adjustment:

1. Connect the rotameter as described in Section 7.2 steps 1 to 3.
2. Record the observed flow rate and time of observation.
3. Adjust the flow rate to the target flow.

8.0 CALCULATION OF AIR VOLUME

Air volume for a sample is calculated based on the flow rate and sample collection duration as follows:

$$\text{Air Volume (L)} = \text{Flow Rate (L/min)} \cdot \text{Sample Collection Duration (min)}$$

The air volume may be calculated manually using the fields on the FSDS (see Attachment 1), or may be calculated electronically using an Excel spreadsheet (e.g., see Attachment 4 for an example). If used, copies of all electronic volume tracking spreadsheets will be provided to the project data manager at the conclusion of each sampling event, and will be placed in the project-specific FTP site within one week from completion of each sampling event.

The sample volume should be recorded on the COC form which is provided to the analytical laboratory. For lot blanks and field blanks, the associated air volume should be recorded as zero.

If the flow rate changes by more than 5% during the sampling period, the average of the pre- and post-sampling rates will be used to calculate the total sample volume. If at any time the measurement indicates that the flow-rate has decreased by more than 30%, sampling should be terminated. Depending on the type of sampling pump used, it may be possible to salvage the sample if sufficient volume was collected; however, it may not be representative of the time it takes for the actual activity to be completed. Depending on the type of sampling pump used, the actual sampling time in hours and minutes before the sampling fault may be displayed and an actual sample volume calculated. If the fault was due to battery failure, it may be possible to check the post-sampling flow.

9.0 QUALITY ASSURANCE / QUALITY CONTROL

Lot Blanks

Before sampling begins, two cassettes from each filter lot should be randomly selected and submitted for analysis. These lot blanks will be analyzed for asbestos by the same method as used for the field samples to ensure that cassettes are free from asbestos contamination. The area of the filter examined should be no less than 0.1 mm^2, unless specified otherwise in a project specific plan. If asbestos is detected in any lot blank, the entire cassette lot should be rejected for use.

Field Blanks

Field blanks are used to determine if any contamination has occurred during sample handling. A field blank is prepared by opening the filter cassette in the area where the field samples will be taken, and then closing and sealing the sample in a manner similar to the field samples. Field blanks should be assigned a unique Index ID. Field blanks will be collected at a frequency specified in the project-specific SAP. In the absence of such specification, the rate should be no less than 5%. The area of the filter examined should be no less than 0.1 mm^2, unless specified otherwise in a project specific plan.

Field Duplicates

Field duplicates are used to evaluate the sampling and analysis variability across air samples. Field duplicate air samples will be collected at a frequency specified in the project-specific SAP. In the absence of such specification, the rate should be no less than 5%. Each field duplicate will be a sample collected concomitantly with the field sample. Field duplicate samples should be labeled

with a unique Index ID. Sample details should be recorded on the appropriate FSDS form, including the unique Index ID of the "parent" field sample.

10.0 HEALTH AND SAFETY

Inhalation of asbestos fibers is hazardous to human health. When working with potentially hazardous materials, personnel should follow USEPA, OSHA, and corporate health and safety procedures. For all ABS, appropriate PPE, including Tyvek coveralls, protective gloves and foot wear, and a respirator with HEPA filter cartridges (P-100 or equivalent) should be worn to protect participants. Details regarding PPE and other protective measures should be specified in the site-specific Health and Safety Plan (HASP). Special consideration should be given to the physical safety of the event participants as well as heat stress associated with performing vigorous activities in impermeable clothing.

11.0 REFERENCES

International Organization for Standardization. 1995. Ambient Air – Determination of asbestos fibres – Direct-transfer transmission electron microscopy method. ISO 10312:1995(E).

USEPA. 2008. Framework for Investigating Asbestos-Contaminated Sites. Report prepared by the Asbestos Committee of the Technical Review Workgroup of the Office of Solid Waste and Emergency Response, U.S. Environmental protection Agency. OSWER Directive #9200.0-68. http://epa.gov/superfund/health/contaminants/asbestos/pdfs/framework_asbestos_guidance.pdf

ATTACHMENT 1

FIELD SAMPLE DATA SHEET (FSDS) FOR ABS AIR SAMPLE COLLECTION

Sheet No.: P4-_____

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: _____ ___ **Sampling Date:** _____ **Sampling Team:** MWH **Field Logbook:**_____ **Pgs:** _____

ACTIVITY: _____

Person #1: _____

(4.0 LPM) (2.0 LPM) (1.0 LPM)

AFFIX LABEL HERE *AFFIX LABEL HERE* *AFFIX LABEL HERE*

Person #2: _____

(4.0 LPM) (2.0 LPM) (1.0 LPM)

AFFIX LABEL HERE *AFFIX LABEL HERE* *AFFIX LABEL HERE*

Cassette Lot Number: _____ **Field Blank ID:** _____

FIELD BLANK
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		**Pump 2**		**Pump 3**		**Pump 4**		**Pump 5**		**Pump 6**	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1														
Person #2														

Person #1: 4.0 LPM Pump ID: _____ 2.0 LPM Pump ID: _____ 1.0 LPM Pump ID: _____ Rotameter ID: _____GPS ID: _____

Person #2: 4.0 LPM Pump ID: _____ 2.0 LPM Pump ID: _____ 1.0 LPM Pump ID: _____ Rotameter ID: _____GPS ID: _____

VOLUME CALCULATION Person #1

4L Ave. Flow Rate =_____LPM x ____ Min. = _____ L

2L Ave. Flow Rate = _____ LPM x ____ Min. = _____ L

1L Ave. Flow Rate= _____ LPM x ____ Min. = _____ L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate =_____LPM x ____ Min. = _____ L

2L Ave. Flow Rate = _____ LPM x ____ Min. = _____ L

1L Ave. Flow Rate= _____ LPM x ____ Min. = _____ L

GPS Location: X:_____ Y:_____

Field Comments: _____

Primary/Rotameter Rate (LPM): Before: _____/_____ End: _____/_____

Wind Direction:_____ Wind Speed: _____ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:		**Field Entries Checked by:**	

Database Entry:		*Database QC:*

ATTACHMENT 2

PRECISION ROTAMETER CALIBRATION DATA SHEET

Calibration Date: _____ Calibration By: _____
Rotameter ID: _____ Primary Standard ID: _____

If calibrator does not automatically adjust for temperature and pressure, specify –

Actual Temp (ºF): _____ Actual Pressure (in. Hg): _____

Ball Reading = Y (mid-ball)	Flow Rate = X_1 (L/min)
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____

Rotameter Calibration Procedure:

1. Obtain the actual temperature and actual pressure in Libby, MT from the MET station. If calibrator does not automatically adjust for temperature and pressure, record the actual temperature and actual pressure in the fields provided above.
2. Calibrate rotameter to desired ball reading with a sampling pump and cassette in-line. Cassette must be the same type and from the same lot of cassettes that will be used for sampling. Record value in Ball Reading column.
3. Check adjusted flow rate of sample pump to the Dry Cal flow calibrator primary flow standard. 10 repetitive flow measurements will be averaged and that result recorded in the Flow Rate column for the selected interval.
4. Repeat this process at 10 intervals over the range of the precision rotameter.
5. Input data into rotameter calculation sheet to generate the corrected flow rate.

ATTACHMENT 3

CALIBRATION TRAIN FIGURES
(from EPA SOP #2015)

FIGURE 4. Calibrating a Rotameter with a Bubble Meter

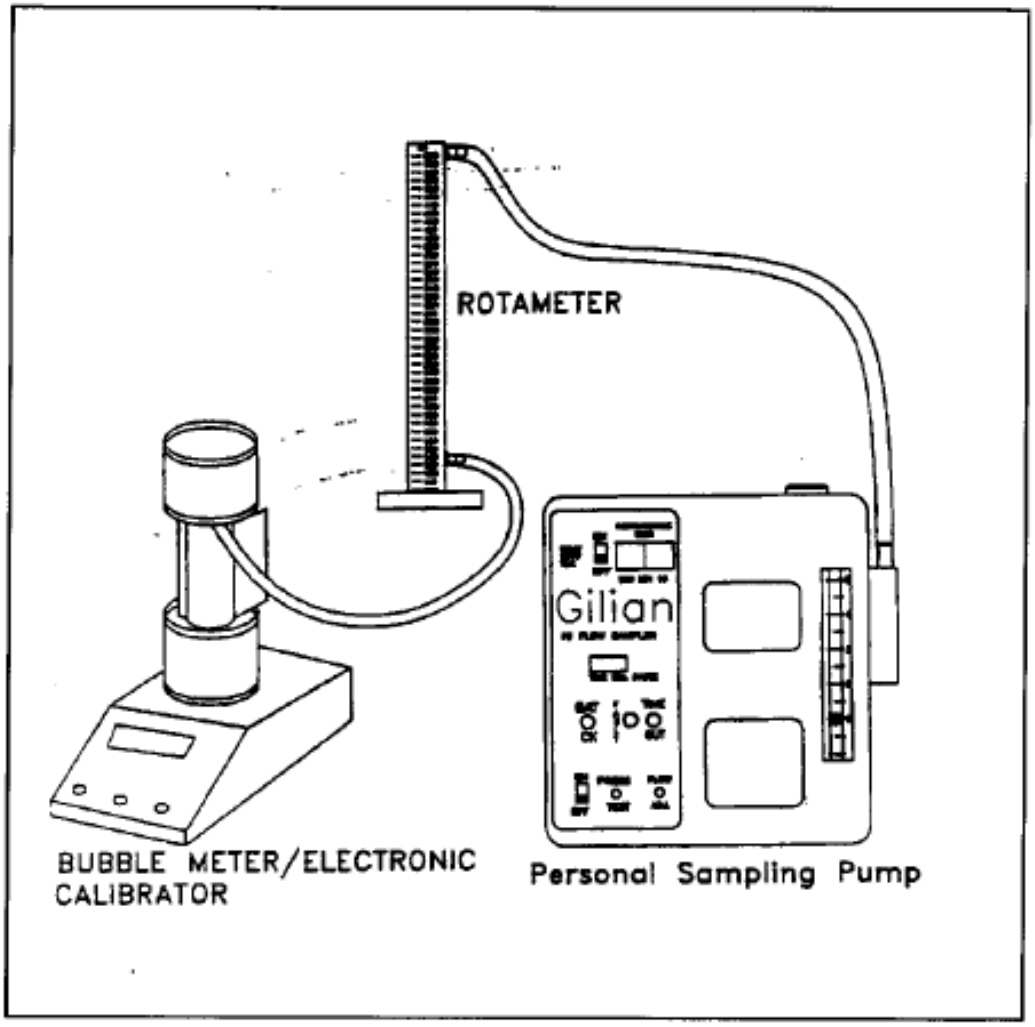
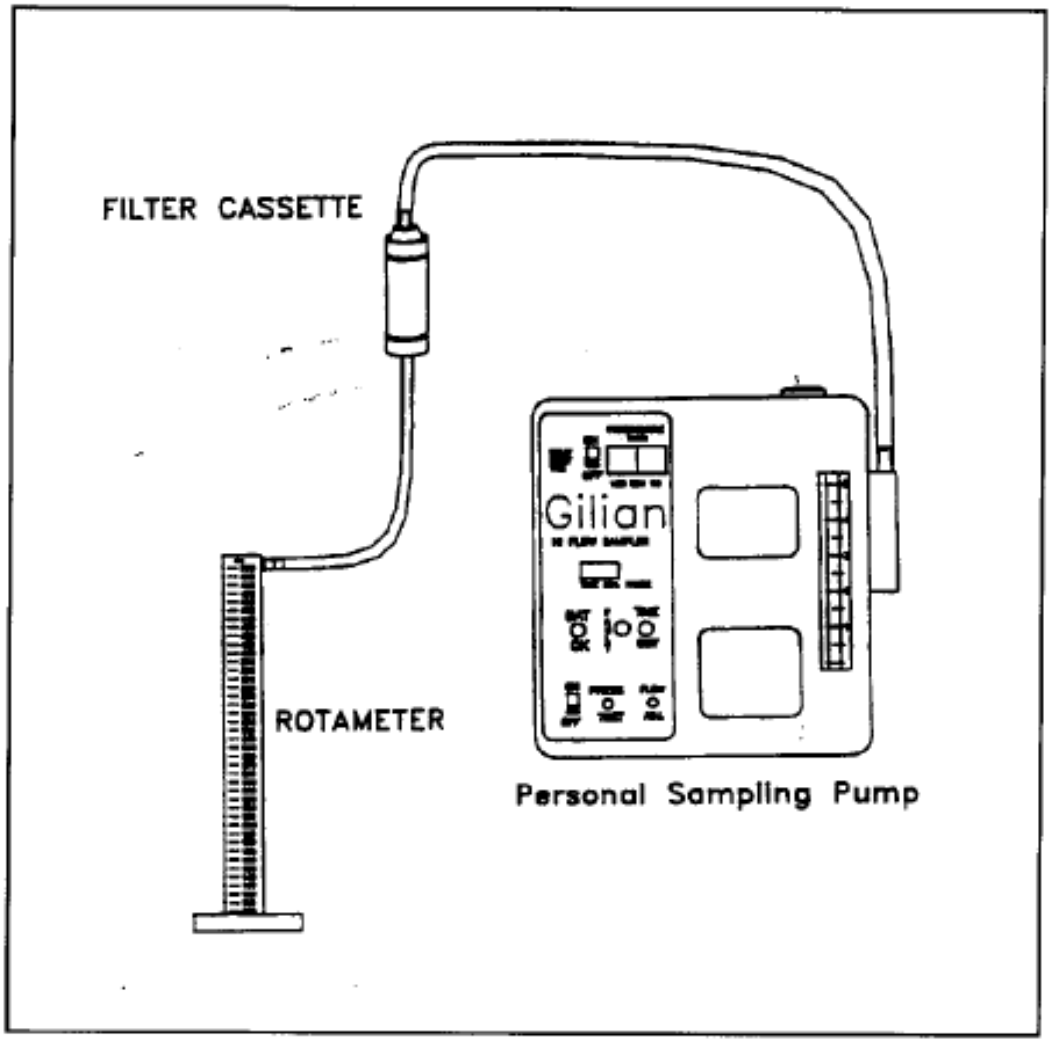


FIGURE 5. Calibrating a Sampling Pump with a Rotameter



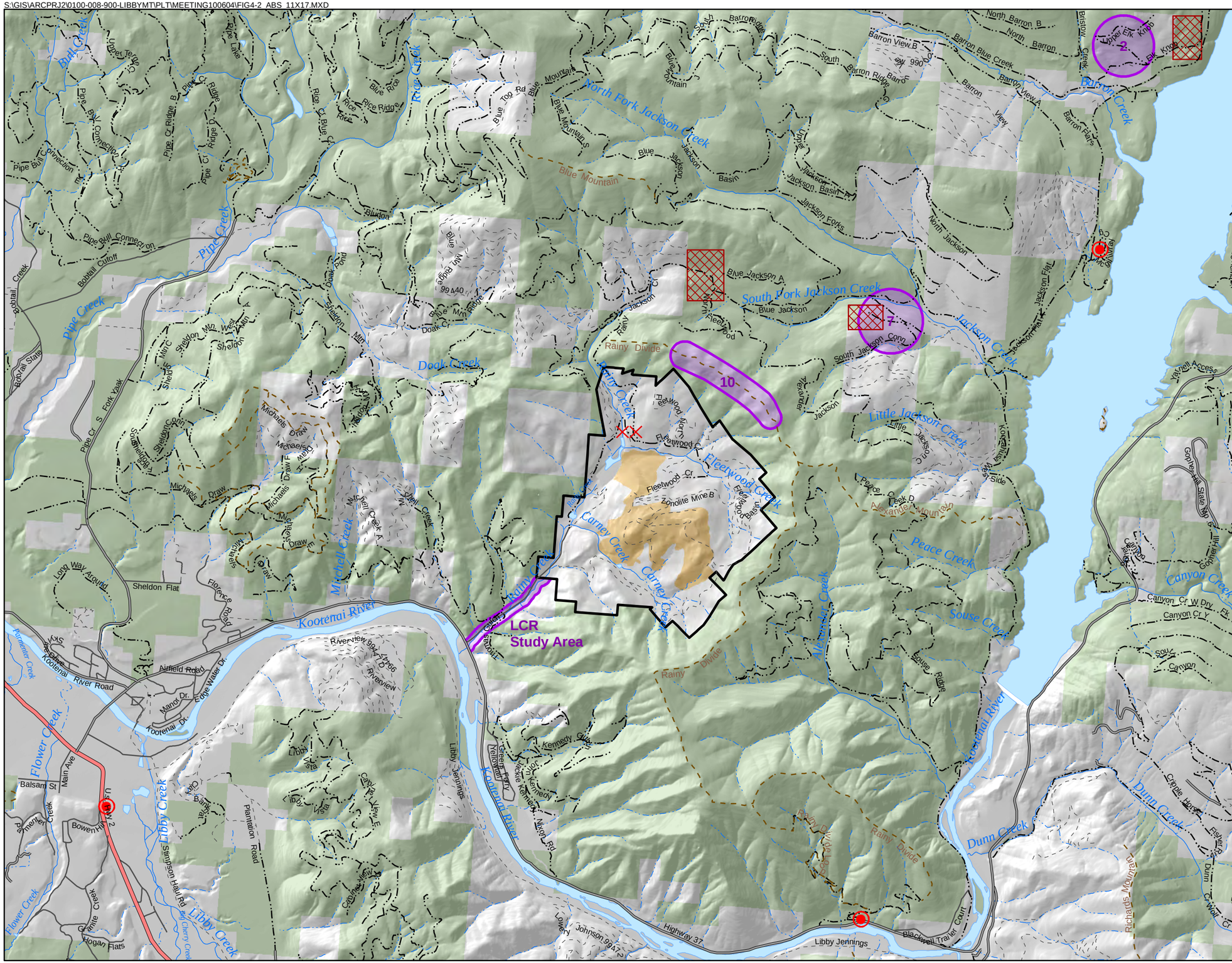
ATTACHMENT 4
EXAMPLE VOLUME TRACKING SPREADSHEET

Index ID	Pump ID	Flow Meter	Pump Fault? (Yes/No)	Pump Comments	Start Information			Stop Information				Data Entry Checked by	Total Sample Volume (L)
					Date (mm/dd/yy)	Time (hh:mm)	Counter	Date (mm/dd/yy)	Time (hh:mm)	Counter	Flow (L/min)		
Example P4-00001	G-04897	677YHG	No	No issues encountered	08/01/07	8:00	1256.7	08/06/07	14:15	1456.8	1.8	CLW	14,392

Mod Attachment 3

Revised Figure 4-2

S:\GIS\ARCPRJ2\0100-008-900-LIBBYMT\PLT\MEETING100604\FIG4-2_ABS_11X17.MXD



Legend

- U.S.
- State
- County
- Forest Service
- P - PRIVATE
- USFS Trails (Libby District)
- Kootenai Development Company
- ABS Target Area
- Open Water
- Water Diversion
- Perennial Stream
- Intermittent Stream
- MineDisturbance
- ownership
- Slash Piles
- Stationary Air Monitor
- Heavy Equipment Activity Area

0 6,000 12,000
Feet

N

LIBBY, MONTANA-SUPERFUND SITE

OPERABLE UNIT 3

FIGURE 4-2

PROPOSED ABS STUDY AREA AND FIXED MONITORING STATIONS

PRJ: 0100-0080900	DATE: JUL 15, 2010	
REV: 0	BY: CRL	FOR: ACK

FORMATION ENVIRONMENTAL

Mod Attachment 4

Revised Chain-of-Custody Form

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. _____

PAGE: _____ OF: _____

ENTERED BY: (Signature) _____ PROJECT MANAGER: John Garr, MWH DATE: _____

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		

TOTAL NUMBER OF CASSETTES | LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
		MWH					

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

Mod Attachment 5

Revised Table 5-1

TABLE 5-1 OVERVIEW OF PHASE IV ABS SAMPLING DESIGN

Population	ABS Scenario	ABS Script	Number of ABS Study Areas	Number of ABS Events per Area	Number of People per Event	Number of Samples per Person per Event	Number of Samples to be Collected		Number of Samples to be Analyzed (a)	
							per Area	total	per Area	total
Recreational visitor along Rainy Creek	Hiking along Rainy Creek	1	1	5	2	3	30	30	10	10
Residential wood harvester	Driving to and from harvest area	2a	3	5	2	3	30	90	10	30
	Cutting and hauling firewood	2b	3	5	2	3 (b)	30	90	10	30
USFS Worker (forest management activities)	Trail maintainance	3a	3	5	2	3	30	90	10	30
	Thinning trees	3b	3	5	2	3	30	90	10	30
	Stand exam	3c	3	5	2	3	30	90	10	30
USFS Firefighter (ground-based)	Cutting firelines by hand	3d	3	5	2	3	30	90	10	30
	Cutting firelines with heavy equipment	3e	3	5	2	3	30	90	10	30
	Personal monitors worn during simulated wildfire burns	4a	2	1	4	3	12	24	4	8
	Stationary monitors activated during simulated wildfire burns	4b	2	1	--	--	12 (c)	24	12	24
USFS Firefighter (pilot of aircraft)	Fly through smoke from simulated wildfires	5a	2	1	1	1	1	2	1	2
	Fly through smoke from authentic wildfires	5b	TBD	1	1	TBD	TBD	TBD	TBD	TBD
Area Residents and campers	Smoke monitoring near town from authentic wildfires	6	TBD	1	--	--	TBD (d)	TBD	TBD	TBD
	Smoke monitoring downwind from authentic wildfires	6	TBD	1	--	--	TBD (e)	TBD	TBD	TBD

TBD = to be determined based on authentic wildfire frequency and duration

(a) Although each individual performing ABS activities will wear three pumps, it is assumed that only one of the resulting filters will be analyzed by TEM. The other filters will be archived for analysis if needed.

(b) Scenario may be split into two parts. If so, the total number of samples collected per person will be 6 samples (2 parts * 3 pumps), of which 2 samples per person (one for each part) will be analyzed by TEM.

(c) Includes 4 stationary monitors, one sample per monitor, for a total of 3 days.

(d) Includes 3 fixed stationary monitors, one sample per monitor per day, for the duration of the wildfire.

(e) Includes 1 mobile monitor, one sample per day, for the duration of the wildfire.

Planned	710	254
TBD (est)	30	30
Total (est)	740	284

FIELD MODIFICATION APPROVAL FORM
LFM-OU3-02
Libby OU3 Phase 4A Sampling & Analysis Plan

Requested by: John Garr, MWH Date: 7/26/2010

Description of Deviations:

1. Sampling cassettes from the first round of ABS at sites 2 and 7 were overloaded and were not able to be analyzed directly. In order to minimize the chance of overloading during future sampling, Remedium and MWH propose to decrease the duration of several ABS activities.

Attachment A, Revision 1 (issued in Field Modification 1 approved by EPA on July 16, 2010) is modified as follows:

Script 2, Residential Wood Harvester: The exposures associated with wood harvesting activities will be captured on 2 sequential cassettes. The first wood harvesting sample will include hiking to the tree, felling, limbing, and hauling to the road. The duration of this activity will vary depending on the size of the tree and the distance from the road, but is expected to average approximately 20 minutes. The second wood harvesting sample will include cutting and stacking for a duration of 30 minutes. All other details of Script 2 as described in Attachment A, Revision 1 remain the same.

Script 3a, Trail Maintenance: The duration of this activity is decreased to 15 minutes. One sampler will use a saw head trimmer to clear trees and brush to a width of about 1-2 feet and to a height of about 8 feet. The second individual will haul the cut vegetation off the trail. After 7.5 minutes, the two individuals shall reverse roles. After 15 minutes, the ABS activity is ended, and both individuals shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3b, Tree Thinning: This activity will be performed for a period of 15 minutes. One individual will cut for 7.5 minutes, while the second individual hauls wood to a pile. After 7.5 minutes, the roles are reversed. After 15 minutes, the ABS activity is ended, and both individuals shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3d, Cutting a Fireline by Hand: This activity will be performed for a period of 15 minutes. The 2 samplers will work approximately 10 feet apart. After 7.5 minutes, the relative positions of the 2 samplers will be reversed. After 15 minutes, the ABS activity is ended, and both samplers shall turn off their air sampling pumps and cap their sampling cassettes.

2. In addition to the modifications to the Attachment 1, Revision 1, Field Sample Data Sheet for activity based sampling personal air monitoring has been revised. The new FSDS is attached to this field modification form.

☒ EPA Region 8 has reviewed this field modification and approves as proposed.

☐ EPA Region 8 has reviewed this field modification and approves with the following exceptions:

_____

_____

☐ EPA Region 8 has reviewed this field modification and does not agree with the proposed approach for the following reasons:

_____

_____

Bonita Lavelle, EPA RPM

7/30/2010
Date

FSDS Rev7

Sheet No.: P4-_____

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: _____ ___ **Sampling Date:** _____ **Sampling Team:** MWH **Field Logbook:**_____ **Pgs:** _____

ACTIVITY: _____

Person #1: _____

(4.0 LPM) *AFFIX LABEL HERE*

(2.0 LPM) *AFFIX LABEL HERE*

(1.0 LPM) *AFFIX LABEL HERE*

Person #2: _____

(4.0 LPM) *AFFIX LABEL HERE*

(2.0 LPM) *AFFIX LABEL HERE*

(1.0 LPM) *AFFIX LABEL HERE*

Cassette Lot Number: _____ **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1														
Person #2														

Person #1: 4.0 LPM Pump ID: _____ 2.0 LPM Pump ID: _____ 1.0 LPM Pump ID: _____ BIOS ID: ___1___ GPS ID: ___1___

Person #2: 4.0 LPM Pump ID: _____ 2.0 LPM Pump ID: _____ 1.0 LPM Pump ID: _____ BIOS ID: ___1___ GPS ID: ___1___

VOLUME CALCULATION Person #1

4L Ave. Flow Rate =_____ LPM x ____ Min. = _____ L

2L Ave. Flow Rate = _____LPM x ____ Min. =_____L

1L Ave. Flow Rate= _____ LPM x ____ Min. = _____ L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate =_____LPM x ____ Min. = _____ L

2L Ave. Flow Rate = _____ LPM x ____ Min. =_____ L

1L Ave. Flow Rate= _____ LPM x ____ Min. =_____L

GPS Loc. Start: N: 48._____ W:115._____ GPS Loc. End: N:48._____ W:115._____

Field Comments: _____

Wind Direction:_____ Wind Speed: _____ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:		**Field Entries Checked by:**	

Database Entry:		*Database QC:*

FIELD MODIFICATION APPROVAL FORM
LFM-OU3-03 (CORRECTED)
Libby OU3 Phase 4A Sampling & Analysis Plan

Requested by: Erin Kelly Date: 9/16/10

Description of Deviation: This field modification incorporates Indirect Preparation of Selected Samples. Two sections of the Phase IVA SAP are modified.

Implications: The indirect preparation procedure may cause a change in the measured concentration due to changes in the size distribution and matrix association of asbestos particles in the sample. The Phase IVA data are expected to be used in the baseline risk assessment for OU3. The potential impact on the measured concentration of samples prepared using indirect methods will be discussed in the uncertainty analysis of the OU3 baseline risk assessment. Additionally, if the calculated risks are close to a decision threshold, EPA may undertake additional analyses to support a correction factor to be applied to the data for use in risk assessment and management decisions.

Section 6.2 *Analytical Methods and Counting Rules* is modified as follows:

In the event that all three filters collected from the same individual at the same place and time are determined to be inappropriate for direct preparation (e.g., the filter is overloaded and/or the cassette contains loose dust), one sample will be prepared for analysis using an indirect preparation method. The selection process for the three filters will be as follows:

> The high volume sample is preferred over the medium volume and low volume samples. If the high volume sample is damaged, the medium volume sample will be selected. In the event that the medium volume sample is also damaged, the low volume sample will be selected. In the event that the low volume is damaged, no analysis will be performed.

Preparation of the selected sample will follow the indirect preparation method specified in the Libby-specific standard operating procedure EPA-LIBBY-08 (see Attachment 1). Because the air samples collected are considered to be investigative (i.e. collected to characterize concentration values in air for use in risk assessment and risk management decision making), they should be ashed and analyzed as specified in section 4.1 of the SOP (Procedure 1 – Indirect Preparation with Ashing). Table 1 summarizes samples that have been selected for indirect preparation and identifies high priority samples. Table 2 summarizes information on overloading status in the event that a sample in Table 1 is not able to be analyzed.

Section 8.2.2 Documentation and Records is modified as follows:

Data reports submitted by the laboratory for samples that were prepared using indirect preparation methods will include the following language from ASTM D-5755, section 1.4.1 and 5.2:

"The samples were analyzed with a test method that employs an indirect sample preparation technique. That technique is intended to disperse aggregated asbestos into fundamental fibrils, fiber bundles, clusters, or matrices that can be more accurately quantified by transmission electron microscopy. However, as with all indirect sample preparation techniques, the asbestos observed for quantification may not represent the physical form of the asbestos as sampled. More specifically, the procedure described neither creates nor destroys asbestos, but it may alter the physical form of the mineral fibers. Thus, a single, large asbestos containing particle (from the large end of the particle size distribution) dispersed during sample preparation may result in anomalously large asbestos surface loading results in the TEM analyses of that sample."

☒ EPA Region 8 has reviewed this field modification approves as proposed.

☐ EPA Region 8 has reviewed this field modification and approves with the following exceptions:

_____

_____

_____

_____

_____

☐ EPA Region 8 has reviewed this field modification and does not agree with the proposed approach for the following reasons:

_____

_____

_____

_____

_____

Bonita Lavelle, EPA RPM

9/16/10
Date

Table 1. Phase 4A ABS Samples Selected for Indirect Preparation

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	High Priority
P4-00036	20-Jul-10	ABS-02	3d Cutting firelines by hand	2	4	Y
P4-00151	27-Jul-10	ABS-02	3d Cutting firelines by hand	1	4	Y
P4-00154	27-Jul-10	ABS-02	3d Cutting firelines by hand	2	4	Y
P4-00319	04-Aug-10	ABS-02	3d Cutting firelines by hand	1	4	Y
P4-00322	04-Aug-10	ABS-02	3d Cutting firelines by hand	2	4.05	Y
P4-00362	05-Aug-10	ABS-07	3d Cutting firelines by hand	1	4	Y
P4-00365	05-Aug-10	ABS-07	3d Cutting firelines by hand	2	4	Y
P4-00446	10-Aug-10	ABS-02	3d Cutting firelines by hand	1	4	Y
P4-00508	11-Aug-10	ABS-07	3d Cutting firelines by hand	1	4	Y
P4-00511	11-Aug-10	ABS-07	3d Cutting firelines by hand	2	4	Y
P4-00545	11-Aug-10	ABS-10	3d Cutting firelines by hand	1	4	Y
P4-00548	11-Aug-10	ABS-10	3d Cutting firelines by hand	2	4	Y
P4-00593	12-Aug-10	ABS-02	3d Cutting firelines by hand	1	4	Y
P4-00596	12-Aug-10	ABS-02	3d Cutting firelines by hand	2	4	Y
P4-00671	18-Aug-10	ABS-02	3e Cutting firelines with heavy equipment	1	4	Y
P4-00674	18-Aug-10	ABS-02	3e Cutting firelines with heavy equipment	2	4	Y
P4-00677	18-Aug-10	ABS-02	3e Cutting firelines with heavy equipment	1	4	Y
P4-00680	18-Aug-10	ABS-02	3e Cutting firelines with heavy equipment	2	4.05	Y
P4-00683	18-Aug-10	ABS-02	3e Cutting firelines with heavy equipment	1	4	Y
P4-00686	18-Aug-10	ABS-02	3e Cutting firelines with heavy equipment	2	4	Y
P4-00695	19-Aug-10	ABS-10	3e Cutting firelines with heavy equipment	1	4	Y
P4-00698	19-Aug-10	ABS-10	3e Cutting firelines with heavy equipment	2	4	Y
P4-00704	19-Aug-10	ABS-10	3e Cutting firelines with heavy equipment	2	4	Y
P4-00708	19-Aug-10	ABS-10	3e Cutting firelines with heavy equipment	1	4	Y
P4-00711	19-Aug-10	ABS-10	3e Cutting firelines with heavy equipment	2	4	Y
P4-00720	20-Aug-10	ABS-07	3e Cutting firelines with heavy equipment	1	4	Y
P4-00723	20-Aug-10	ABS-07	3e Cutting firelines with heavy equipment	2	3.95	Y
P4-00726	24-Aug-10	ABS-07	3e Cutting firelines with heavy equipment	1	4	Y
P4-00729	24-Aug-10	ABS-07	3e Cutting firelines with heavy equipment	2	4.05	Y
P4-00739	24-Aug-10	ABS-07	3e Cutting firelines with heavy equipment	1	4	Y
P4-00742	24-Aug-10	ABS-07	3e Cutting firelines with heavy equipment	2	4.05	Y
P4-00751	25-Aug-10	ABS-07	3e Cutting firelines with heavy equipment	1	4.05	Y
P4-00754	25-Aug-10	ABS-07	3e Cutting firelines with heavy equipment	2	4.05	Y
P4-00760	25-Aug-10	ABS-10	3e Cutting firelines with heavy equipment	2	4	Y
P4-00766	25-Aug-10	ABS-10	3e Cutting firelines with heavy equipment	2	4	Y
P4-00784	26-Aug-10	ABS-02	3e Cutting firelines with heavy equipment	2	4	Y
P4-00047	21-Jul-10	ABS-07	2b Residential wood harvester cutting	1	4	
P4-00050	21-Jul-10	ABS-07	2b Residential wood harvester cutting	2	4	
P4-00059	21-Jul-10	ABS-07	3b USFS worker thinning trees	1	4	
P4-00083	22-Jul-10	ABS-10	2b Residential wood harvester cutting	1	4	
P4-00086	22-Jul-10	ABS-10	2b Residential wood harvester cutting	2	4	
P4-00092	22-Jul-10	ABS-10	3a USFS worker trail maintenance	2	4	
P4-00099	22-Jul-10	ABS-10	3b USFS worker thinning trees	2	4.05	
P4-00120	27-Jul-10	ABS-02	2b.1 Felling and limbing	1	4	
P4-00123	27-Jul-10	ABS-02	2b.1 Felling and limbing	2	4	

Table 1. Phase 4A ABS Samples Selected for Indirect Preparation

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	High Priority
P4-00126	27-Jul-10	ABS-02	2b.2 Cutting and stacking	1	4	
P4-00129	27-Jul-10	ABS-02	2b.2 Cutting and stacking	2	4	
P4-00132	27-Jul-10	ABS-02	3a USFS worker trail maintenance	1	4	
P4-00144	27-Jul-10	ABS-02	3c USFS worker stand exam	1	4	
P4-00163	28-Jul-10	ABS-07	2b.1 Felling and limbing	1	4	
P4-00187	30-Jul-10	ABS-10	2b.1 Felling and limbing	1	4	
P4-00205	03-Aug-10	ABS-07	2b.1 Felling and limbing	1	4.05	
P4-00208	03-Aug-10	ABS-07	2b.1 Felling and limbing	2	4.05	
P4-00211	03-Aug-10	ABS-07	2b.2 Cutting and stacking	1	4	
P4-00214	03-Aug-10	ABS-07	2b.2 Cutting and stacking	2	4	
P4-00220	03-Aug-10	ABS-07	3a USFS worker trail maintenance	2	4	
P4-00226	03-Aug-10	ABS-07	3b USFS worker thinning trees	2	4	
P4-00229	03-Aug-10	ABS-07	3c USFS worker stand exam	1	4	
P4-00232	03-Aug-10	ABS-07	3c USFS worker stand exam	2	4	
P4-00247	03-Aug-10	ABS-10	2b.1 Felling and limbing	1	4	
P4-00250	03-Aug-10	ABS-10	2b.1 Felling and limbing	2	4	
P4-00253	03-Aug-10	ABS-10	2b.2 Cutting and stacking	1	4	
P4-00256	03-Aug-10	ABS-10	2b.2 Cutting and stacking	2	4	
P4-00265	03-Aug-10	ABS-10	3b USFS worker thinning trees	1	4	
P4-00268	03-Aug-10	ABS-10	3b USFS worker thinning trees	2	3.95	
P4-00289	04-Aug-10	ABS-02	2b.1 Felling and limbing	1	4	
P4-00292	04-Aug-10	ABS-02	2b.1 Felling and limbing	2	4	
P4-00295	04-Aug-10	ABS-02	2b.2 Cutting and stacking	1	4	
P4-00298	04-Aug-10	ABS-02	2b.2 Cutting and stacking	2	4	
P4-00310	04-Aug-10	ABS-02	3b USFS worker thinning trees	2	4	
P4-00313	04-Aug-10	ABS-02	3c USFS worker stand exam	1	4	
P4-00332	05-Aug-10	ABS-07	2b.1 Felling and limbing	1	4.05	
P4-00335	05-Aug-10	ABS-07	2b.1 Felling and limbing	2	4.05	
P4-00338	05-Aug-10	ABS-07	2b.2 Cutting and stacking	1	4.05	
P4-00341	05-Aug-10	ABS-07	2b.2 Cutting and stacking	2	3.95	
P4-00344	05-Aug-10	ABS-07	3a USFS worker trail maintenance	1	4	
P4-00350	05-Aug-10	ABS-07	3b USFS worker thinning trees	1	4	
P4-00353	05-Aug-10	ABS-07	3b USFS worker thinning trees	2	4	
P4-00374	05-Aug-10	ABS-10	2b.1 Felling and limbing	1	4	
P4-00377	05-Aug-10	ABS-10	2b.1 Felling and limbing	2	4	
P4-00383	05-Aug-10	ABS-10	2b.2 Cutting and stacking	2	4	
P4-00416	10-Aug-10	ABS-02	2b.1 Felling and limbing	1	4	
P4-00419	10-Aug-10	ABS-02	2b.1 Felling and limbing	2	4	
P4-00434	10-Aug-10	ABS-02	3b USFS worker thinning trees	1	4	
P4-00454	10-Aug-10	ABS-02	2b.1 Felling and limbing	1	4	
P4-00460	10-Aug-10	ABS-02	2b.2 Cutting and stacking	1	4	
P4-00472	11-Aug-10	ABS-07	2b.1 Felling and limbing	1	4	
P4-00475	11-Aug-10	ABS-07	2b.1 Felling and limbing	2	4	
P4-00478	11-Aug-10	ABS-07	2b.1 Felling and limbing	1	4	
P4-00484	11-Aug-10	ABS-07	2b.2 Cutting and stacking	1	4	
P4-00487	11-Aug-10	ABS-07	2b.2 Cutting and stacking	2	4	

Table 1. Phase 4A ABS Samples Selected for Indirect Preparation

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	High Priority
P4-00515	11-Aug-10	ABS-10	2a Residential wood harvester driving	1	4	
P4-00518	11-Aug-10	ABS-10	2a Residential wood harvester driving	2	4	
P4-00521	11-Aug-10	ABS-10	2b.1 Felling and limbing	1	4	
P4-00524	11-Aug-10	ABS-10	2b.1 Felling and limbing	2	4	
P4-00527	11-Aug-10	ABS-10	3a USFS worker trail maintenance	1	4	
P4-00530	11-Aug-10	ABS-10	3a USFS worker trail maintenance	2	4	
P4-00533	11-Aug-10	ABS-10	3b USFS worker thinning trees	1	4	
P4-00536	11-Aug-10	ABS-10	3b USFS worker thinning trees	2	4	
P4-00539	11-Aug-10	ABS-10	3c USFS worker stand exam	1	4	
P4-00551	12-Aug-10	ABS-02	2a Residential wood harvester driving	1	4	
P4-00557	12-Aug-10	ABS-02	2b.1 Felling and limbing	1	4	
P4-00560	12-Aug-10	ABS-02	2b.1 Felling and limbing	2	4	
P4-00563	12-Aug-10	ABS-02	2b.1 Felling and limbing	1	4	
P4-00566	12-Aug-10	ABS-02	2b.1 Felling and limbing	2	4	
P4-00575	12-Aug-10	ABS-02	3a USFS worker trail maintenance	1	4	
P4-00578	12-Aug-10	ABS-02	3a USFS worker trail maintenance	2	4	
P4-00581	12-Aug-10	ABS-02	3b USFS worker thinning trees	1	4	
P4-00584	12-Aug-10	ABS-02	3b USFS worker thinning trees	2	4	
P4-00590	12-Aug-10	ABS-02	3c USFS worker stand exam	2	4	
P4-00599	12-Aug-10	ABS-10	2b.1 Felling and limbing	1	4	
P4-00602	12-Aug-10	ABS-10	2b.1 Felling and limbing	2	4	
P4-00623	17-Aug-10	ABS-10	3b USFS worker thinning trees	1	4	
P4-00626	17-Aug-10	ABS-10	3b USFS worker thinning trees	2	4	
P4-00644	17-Aug-10	ABS-10	3a USFS worker trail maintenance	2	4.05	
P4-00665	17-Aug-10	RAINY	1 Recreational visitor hiking	1	4	
P4-00689	19-Aug-10	RAINY	1 Recreational visitor hiking	1	4	
P4-00692	19-Aug-10	RAINY	1 Recreational visitor hiking	2	4	
P4-00714	20-Aug-10	RAINY	1 Recreational visitor hiking	1	4	
P4-00717	20-Aug-10	RAINY	1 Recreational visitor hiking	2	4	
P4-00745	25-Aug-10	RAINY	1 Recreational visitor hiking	1	3.95	
P4-00769	26-Aug-10	RAINY	1 Recreational visitor hiking	1	4	

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00003	7/20/10	ABS-02	2a Residential wood harvester driving	1	4	Y		
P4-00004	7/20/10	ABS-02	2a Residential wood harvester driving	1	2			
P4-00005	7/20/10	ABS-02	2a Residential wood harvester driving	1	1			
P4-00006	7/20/10	ABS-02	2a Residential wood harvester driving	2	4	Y		
P4-00007	7/20/10	ABS-02	2a Residential wood harvester driving	2	2			
P4-00008	7/20/10	ABS-02	2a Residential wood harvester driving	2	1			
P4-00009	7/20/10	ABS-02	2b Residential wood harvester cutting	1	4			
P4-00010	7/20/10	ABS-02	2b Residential wood harvester cutting	1	2.05			
P4-00011	7/20/10	ABS-02	2b Residential wood harvester cutting	1	1	Y		
P4-00012	7/20/10	ABS-02	2b Residential wood harvester cutting	2	4			
P4-00013	7/20/10	ABS-02	2b Residential wood harvester cutting	2	2.05			
P4-00014	7/20/10	ABS-02	2b Residential wood harvester cutting	2	1	Y		
P4-00015	7/20/10	ABS-02	3a USFS worker trail maintenance	1	4			
P4-00016	7/20/10	ABS-02	3a USFS worker trail maintenance	1	2			
P4-00017	7/20/10	ABS-02	3a USFS worker trail maintenance	1	1	Y		
P4-00018	7/20/10	ABS-02	3a USFS worker trail maintenance	2	4			
P4-00019	7/20/10	ABS-02	3a USFS worker trail maintenance	2	2.05			
P4-00020	7/20/10	ABS-02	3a USFS worker trail maintenance	2	1	Y		
P4-00021	7/20/10	ABS-02	3b USFS worker thinning trees	1	4			
P4-00022	7/20/10	ABS-02	3b USFS worker thinning trees	1	2	Y		
P4-00023	7/20/10	ABS-02	3b USFS worker thinning trees	1	1			
P4-00024	7/20/10	ABS-02	3b USFS worker thinning trees	2	4			
P4-00025	7/20/10	ABS-02	3b USFS worker thinning trees	2	2			
P4-00026	7/20/10	ABS-02	3b USFS worker thinning trees	2	1	Y		
P4-00027	7/20/10	ABS-02	3c USFS worker stand exam	1	4	Y		
P4-00028	7/20/10	ABS-02	3c USFS worker stand exam	1	1			
P4-00029	7/20/10	ABS-02	3c USFS worker stand exam	1	2			
P4-00030	7/20/10	ABS-02	3c USFS worker stand exam	2	4	Y		
P4-00031	7/20/10	ABS-02	3c USFS worker stand exam	2	2			
P4-00032	7/20/10	ABS-02	3c USFS worker stand exam	2	1			
P4-00033	7/20/10	ABS-02	3d Cutting firelines by hand	1	4			
P4-00034	7/20/10	ABS-02	3d Cutting firelines by hand	1	2			
P4-00035	7/20/10	ABS-02	3d Cutting firelines by hand	1	1	Y		
P4-00036	7/20/10	ABS-02	3d Cutting firelines by hand	2	4		Y	Y
P4-00037	7/20/10	ABS-02	3d Cutting firelines by hand	2	2		Y	
P4-00038	7/20/10	ABS-02	3d Cutting firelines by hand	2	1		Y	
P4-00041	7/21/10	ABS-07	2a Residential wood harvester driving	1	4			
P4-00042	7/21/10	ABS-07	2a Residential wood harvester driving	1	2			
P4-00043	7/21/10	ABS-07	2a Residential wood harvester driving	1	1	Y		
P4-00044	7/21/10	ABS-07	2a Residential wood harvester driving	2	4	Y		
P4-00045	7/21/10	ABS-07	2a Residential wood harvester driving	2	2			
P4-00046	7/21/10	ABS-07	2a Residential wood harvester driving	2	1			
P4-00047	7/21/10	ABS-07	2b Residential wood harvester cutting	1	4		Y	Y
P4-00048	7/21/10	ABS-07	2b Residential wood harvester cutting	1	2		Y	
P4-00049	7/21/10	ABS-07	2b Residential wood harvester cutting	1	1		Y	
P4-00050	7/21/10	ABS-07	2b Residential wood harvester cutting	2	4		Y	Y
P4-00051	7/21/10	ABS-07	2b Residential wood harvester cutting	2	2.05		Y	
P4-00052	7/21/10	ABS-07	2b Residential wood harvester cutting	2	1		Y	
P4-00053	7/21/10	ABS-07	3a USFS worker trail maintenance	1	4			
P4-00054	7/21/10	ABS-07	3a USFS worker trail maintenance	1	2	Y		
P4-00055	7/21/10	ABS-07	3a USFS worker trail maintenance	1	1			
P4-00056	7/21/10	ABS-07	3a USFS worker trail maintenance	2	4			
P4-00057	7/21/10	ABS-07	3a USFS worker trail maintenance	2	2			
P4-00058	7/21/10	ABS-07	3a USFS worker trail maintenance	2	1	Y		
P4-00059	7/21/10	ABS-07	3b USFS worker thinning trees	1	4		Y	Y
P4-00060	7/21/10	ABS-07	3b USFS worker thinning trees	1	2.05		Y	
P4-00061	7/21/10	ABS-07	3b USFS worker thinning trees	1	1		Y	
P4-00062	7/21/10	ABS-07	3b USFS worker thinning trees	2	4			
P4-00063	7/21/10	ABS-07	3b USFS worker thinning trees	2	2.05			
P4-00064	7/21/10	ABS-07	3b USFS worker thinning trees	2	1	Y		
P4-00065	7/21/10	ABS-07	3c USFS worker stand exam	1	4			
P4-00066	7/21/10	ABS-07	3c USFS worker stand exam	1	2	Y		
P4-00067	7/21/10	ABS-07	3c USFS worker stand exam	1	1			
P4-00068	7/21/10	ABS-07	3c USFS worker stand exam	2	4	Y		

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00069	7/21/10	ABS-07	3c USFS worker stand exam	2	2			
P4-00070	7/21/10	ABS-07	3c USFS worker stand exam	2	1			
P4-00071	7/21/10	ABS-07	3d Cutting firelines by hand	1	4.05			
P4-00072	7/21/10	ABS-07	3d Cutting firelines by hand	1	2	Y		
P4-00073	7/21/10	ABS-07	3d Cutting firelines by hand	1	1			
P4-00074	7/21/10	ABS-07	3d Cutting firelines by hand	2	4.05			
P4-00075	7/21/10	ABS-07	3d Cutting firelines by hand	2	2			
P4-00076	7/21/10	ABS-07	3d Cutting firelines by hand	2	1	Y		
P4-00077	7/22/10	ABS-10	2a Residential wood harvester driving	1	4	Y		
P4-00078	7/22/10	ABS-10	2a Residential wood harvester driving	1	2			
P4-00079	7/22/10	ABS-10	2a Residential wood harvester driving	1	1			
P4-00080	7/22/10	ABS-10	2a Residential wood harvester driving	2	4	Y		
P4-00081	7/22/10	ABS-10	2a Residential wood harvester driving	2	2			
P4-00082	7/22/10	ABS-10	2a Residential wood harvester driving	2	1			
P4-00083	7/22/10	ABS-10	2b Residential wood harvester cutting	1	4		Y	Y
P4-00084	7/22/10	ABS-10	2b Residential wood harvester cutting	1	2		Y	
P4-00085	7/22/10	ABS-10	2b Residential wood harvester cutting	1	1		Y	
P4-00086	7/22/10	ABS-10	2b Residential wood harvester cutting	2	4		Y	Y
P4-00087	7/22/10	ABS-10	2b Residential wood harvester cutting	2	2		Y	
P4-00088	7/22/10	ABS-10	2b Residential wood harvester cutting	2	1		Y	
P4-00089	7/22/10	ABS-10	3a USFS worker trail maintenance	1	4			
P4-00090	7/22/10	ABS-10	3a USFS worker trail maintenance	1	2			
P4-00091	7/22/10	ABS-10	3a USFS worker trail maintenance	1	1	Y		
P4-00092	7/22/10	ABS-10	3a USFS worker trail maintenance	2	4		Y	Y
P4-00093	7/22/10	ABS-10	3a USFS worker trail maintenance	2	2		Y	
P4-00094	7/22/10	ABS-10	3a USFS worker trail maintenance	2	1		Y	
P4-00096	7/22/10	ABS-10	3b USFS worker thinning trees	1	4.05			
P4-00097	7/22/10	ABS-10	3b USFS worker thinning trees	1	2.05			
P4-00098	7/22/10	ABS-10	3b USFS worker thinning trees	1	1	Y		
P4-00099	7/22/10	ABS-10	3b USFS worker thinning trees	2	4.05		Y	Y
P4-00100	7/22/10	ABS-10	3b USFS worker thinning trees	2	2		Y	
P4-00101	7/22/10	ABS-10	3b USFS worker thinning trees	2	1.05		Y	
P4-00102	7/22/10	ABS-10	3c USFS worker stand exam	1	4			
P4-00103	7/22/10	ABS-10	3c USFS worker stand exam	1	2			
P4-00104	7/22/10	ABS-10	3c USFS worker stand exam	1	1	Y		
P4-00105	7/22/10	ABS-10	3c USFS worker stand exam	2	4			
P4-00106	7/22/10	ABS-10	3c USFS worker stand exam	2	2	Y		
P4-00107	7/22/10	ABS-10	3c USFS worker stand exam	2	1			
P4-00108	7/22/10	ABS-10	3d Cutting firelines by hand	1	4			
P4-00109	7/22/10	ABS-10	3d Cutting firelines by hand	1	2			
P4-00110	7/22/10	ABS-10	3d Cutting firelines by hand	1	1	Y		
P4-00111	7/22/10	ABS-10	3d Cutting firelines by hand	2	4			
P4-00112	7/22/10	ABS-10	3d Cutting firelines by hand	2	2	Y		
P4-00113	7/22/10	ABS-10	3d Cutting firelines by hand	2	1			
P4-00114	7/27/10	ABS-02	2a Residential wood harvester driving	1	4	Y		
P4-00115	7/27/10	ABS-02	2a Residential wood harvester driving	1	2			
P4-00116	7/27/10	ABS-02	2a Residential wood harvester driving	1	1			
P4-00117	7/27/10	ABS-02	2a Residential wood harvester driving	2	4	Y		
P4-00118	7/27/10	ABS-02	2a Residential wood harvester driving	2	2			
P4-00119	7/27/10	ABS-02	2a Residential wood harvester driving	2	1			
P4-00120	7/27/10	ABS-02	2b.1 Felling and limbing	1	4		Y	Y
P4-00121	7/27/10	ABS-02	2b.1 Felling and limbing	1	2		Y	
P4-00122	7/27/10	ABS-02	2b.1 Felling and limbing	1	1		Y	
P4-00123	7/27/10	ABS-02	2b.1 Felling and limbing	2	4		Y	Y
P4-00124	7/27/10	ABS-02	2b.1 Felling and limbing	2	2		Y	
P4-00125	7/27/10	ABS-02	2b.1 Felling and limbing	2	1		Y	
P4-00126	7/27/10	ABS-02	2b.2 Cutting and stacking	1	4		Y	Y
P4-00127	7/27/10	ABS-02	2b.2 Cutting and stacking	1	2		Y	
P4-00128	7/27/10	ABS-02	2b.2 Cutting and stacking	1	1		Y	
P4-00129	7/27/10	ABS-02	2b.2 Cutting and stacking	2	4		Y	Y
P4-00130	7/27/10	ABS-02	2b.2 Cutting and stacking	2	2.05		Y	
P4-00131	7/27/10	ABS-02	2b.2 Cutting and stacking	2	1.05		Y	
P4-00132	7/27/10	ABS-02	3a USFS worker trail maintenance	1	4		Y	Y
P4-00133	7/27/10	ABS-02	3a USFS worker trail maintenance	1	2		Y	

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00134	7/27/10	ABS-02	3a USFS worker trail maintenance	1	1		Y	
P4-00135	7/27/10	ABS-02	3a USFS worker trail maintenance	2	4			
P4-00136	7/27/10	ABS-02	3a USFS worker trail maintenance	2	2	Y		
P4-00137	7/27/10	ABS-02	3a USFS worker trail maintenance	2	1			
P4-00138	7/27/10	ABS-02	3b USFS worker thinning trees	1	4			
P4-00139	7/27/10	ABS-02	3b USFS worker thinning trees	1	2			
P4-00140	7/27/10	ABS-02	3b USFS worker thinning trees	1	1	Y		
P4-00141	7/27/10	ABS-02	3b USFS worker thinning trees	2	4			
P4-00142	7/27/10	ABS-02	3b USFS worker thinning trees	2	2			
P4-00143	7/27/10	ABS-02	3b USFS worker thinning trees	2	1	Y		
P4-00144	7/27/10	ABS-02	3c USFS worker stand exam	1	4		Y	Y
P4-00145	7/27/10	ABS-02	3c USFS worker stand exam	1	2		Y	
P4-00146	7/27/10	ABS-02	3c USFS worker stand exam	1	1		Y	
P4-00147	7/27/10	ABS-02	3c USFS worker stand exam	2	4			
P4-00148	7/27/10	ABS-02	3c USFS worker stand exam	2	2			
P4-00149	7/27/10	ABS-02	3c USFS worker stand exam	2	1	Y		
P4-00151	7/27/10	ABS-02	3d Cutting firelines by hand	1	4		Y	Y
P4-00152	7/27/10	ABS-02	3d Cutting firelines by hand	1	2		Y	
P4-00153	7/27/10	ABS-02	3d Cutting firelines by hand	1	1		Y	
P4-00154	7/27/10	ABS-02	3d Cutting firelines by hand	2	4		Y	Y
P4-00155	7/27/10	ABS-02	3d Cutting firelines by hand	2	2		Y	
P4-00156	7/27/10	ABS-02	3d Cutting firelines by hand	2	1		Y	
P4-00157	7/28/10	ABS-07	2a Residential wood harvester driving	1	4	Y		
P4-00158	7/28/10	ABS-07	2a Residential wood harvester driving	1	2			
P4-00159	7/28/10	ABS-07	2a Residential wood harvester driving	1	1			
P4-00160	7/28/10	ABS-07	2a Residential wood harvester driving	2	4	Y		
P4-00161	7/28/10	ABS-07	2a Residential wood harvester driving	2	2			
P4-00162	7/28/10	ABS-07	2a Residential wood harvester driving	2	1			
P4-00163	7/28/10	ABS-07	2b.1 Felling and limbing	1	4		Y	Y
P4-00164	7/28/10	ABS-07	2b.1 Felling and limbing	1	2		Y	
P4-00165	7/28/10	ABS-07	2b.1 Felling and limbing	1	1		Y	
P4-00166	7/28/10	ABS-07	2b.1 Felling and limbing	2	4			
P4-00167	7/28/10	ABS-07	2b.1 Felling and limbing	2	2			
P4-00168	7/28/10	ABS-07	2b.1 Felling and limbing	2	1	Y		
P4-00169	7/28/10	ABS-07	2b.2 Cutting and stacking	1	4			
P4-00170	7/28/10	ABS-07	2b.2 Cutting and stacking	1	2			
P4-00171	7/28/10	ABS-07	2b.2 Cutting and stacking	1	1	Y		
P4-00172	7/28/10	ABS-07	2b.2 Cutting and stacking	2	4			
P4-00173	7/28/10	ABS-07	2b.2 Cutting and stacking	2	2	Y		
P4-00174	7/28/10	ABS-07	2b.2 Cutting and stacking	2	1			
P4-00181	7/30/10	ABS-10	2a Residential wood harvester driving	1	4	Y		
P4-00182	7/30/10	ABS-10	2a Residential wood harvester driving	1	2			
P4-00183	7/30/10	ABS-10	2a Residential wood harvester driving	1	1			
P4-00184	7/30/10	ABS-10	2a Residential wood harvester driving	2	4	Y		
P4-00185	7/30/10	ABS-10	2a Residential wood harvester driving	2	2			
P4-00186	7/30/10	ABS-10	2a Residential wood harvester driving	2	1			
P4-00187	7/30/10	ABS-10	2b.1 Felling and limbing	1	4		Y	Y
P4-00188	7/30/10	ABS-10	2b.1 Felling and limbing	1	2		Y	
P4-00189	7/30/10	ABS-10	2b.1 Felling and limbing	1	1		Y	
P4-00190	7/30/10	ABS-10	2b.1 Felling and limbing	2	4			
P4-00191	7/30/10	ABS-10	2b.1 Felling and limbing	2	2			
P4-00192	7/30/10	ABS-10	2b.1 Felling and limbing	2	1	Y		
P4-00193	7/30/10	ABS-10	2b.2 Cutting and stacking	1	4			
P4-00194	7/30/10	ABS-10	2b.2 Cutting and stacking	1	2			
P4-00195	7/30/10	ABS-10	2b.2 Cutting and stacking	1	1	Y		
P4-00196	7/30/10	ABS-10	2b.2 Cutting and stacking	2	4			
P4-00197	7/30/10	ABS-10	2b.2 Cutting and stacking	2	2			
P4-00198	7/30/10	ABS-10	2b.2 Cutting and stacking	2	1	Y		
P4-00199	8/3/10	ABS-07	2a Residential wood harvester driving	1	4			
P4-00200	8/3/10	ABS-07	2a Residential wood harvester driving	1	2	Y		
P4-00201	8/3/10	ABS-07	2a Residential wood harvester driving	1	1			
P4-00202	8/3/10	ABS-07	2a Residential wood harvester driving	2	4	Y		
P4-00203	8/3/10	ABS-07	2a Residential wood harvester driving	2	2			
P4-00204	8/3/10	ABS-07	2a Residential wood harvester driving	2	1			

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00205	8/3/10	ABS-07	2b.1 Felling and limbing	1	4.05		Y	Y
P4-00206	8/3/10	ABS-07	2b.1 Felling and limbing	1	2		Y	
P4-00207	8/3/10	ABS-07	2b.1 Felling and limbing	1	1		Y	
P4-00208	8/3/10	ABS-07	2b.1 Felling and limbing	2	4.05		Y	Y
P4-00209	8/3/10	ABS-07	2b.1 Felling and limbing	2	2		Y	
P4-00210	8/3/10	ABS-07	2b.1 Felling and limbing	2	1		Y	
P4-00211	8/3/10	ABS-07	2b.2 Cutting and stacking	1	4		Y	Y
P4-00212	8/3/10	ABS-07	2b.2 Cutting and stacking	1	2		Y	
P4-00213	8/3/10	ABS-07	2b.2 Cutting and stacking	1	1		Y	
P4-00214	8/3/10	ABS-07	2b.2 Cutting and stacking	2	4		Y	Y
P4-00215	8/3/10	ABS-07	2b.2 Cutting and stacking	2	2		Y	
P4-00216	8/3/10	ABS-07	2b.2 Cutting and stacking	2	1		Y	
P4-00217	8/3/10	ABS-07	3a USFS worker trail maintenance	1	4		Y	
P4-00218	8/3/10	ABS-07	3a USFS worker trail maintenance	1	2		Y	
P4-00219	8/3/10	ABS-07	3a USFS worker trail maintenance	1	1	Y		
P4-00220	8/3/10	ABS-07	3a USFS worker trail maintenance	2	4		Y	Y
P4-00221	8/3/10	ABS-07	3a USFS worker trail maintenance	2	2		Y	
P4-00222	8/3/10	ABS-07	3a USFS worker trail maintenance	2	1		Y	
P4-00223	8/3/10	ABS-07	3b USFS worker thinning trees	1	4	Y		
P4-00224	8/3/10	ABS-07	3b USFS worker thinning trees	1	2			
P4-00225	8/3/10	ABS-07	3b USFS worker thinning trees	1	1			
P4-00226	8/3/10	ABS-07	3b USFS worker thinning trees	2	4		Y	Y
P4-00227	8/3/10	ABS-07	3b USFS worker thinning trees	2	2		Y	
P4-00228	8/3/10	ABS-07	3b USFS worker thinning trees	2	1		Y	
P4-00229	8/3/10	ABS-07	3c USFS worker stand exam	1	4		Y	Y
P4-00230	8/3/10	ABS-07	3c USFS worker stand exam	1	2		Y	
P4-00231	8/3/10	ABS-07	3c USFS worker stand exam	1	1		Y	
P4-00232	8/3/10	ABS-07	3c USFS worker stand exam	2	4		Y	Y
P4-00233	8/3/10	ABS-07	3c USFS worker stand exam	2	2		Y	
P4-00234	8/3/10	ABS-07	3c USFS worker stand exam	2	1		Y	
P4-00235	8/3/10	ABS-07	3d Cutting firelines by hand	1	4			
P4-00236	8/3/10	ABS-07	3d Cutting firelines by hand	1	2			
P4-00237	8/3/10	ABS-07	3d Cutting firelines by hand	1	1	Y		
P4-00238	8/3/10	ABS-07	3d Cutting firelines by hand	2	4			
P4-00239	8/3/10	ABS-07	3d Cutting firelines by hand	2	2			
P4-00240	8/3/10	ABS-07	3d Cutting firelines by hand	2	1	Y		
P4-00241	8/3/10	ABS-10	2a Residential wood harvester driving	1	4	Y		
P4-00242	8/3/10	ABS-10	2a Residential wood harvester driving	1	2			
P4-00243	8/3/10	ABS-10	2a Residential wood harvester driving	1	1			
P4-00244	8/3/10	ABS-10	2a Residential wood harvester driving	2	4	Y		
P4-00245	8/3/10	ABS-10	2a Residential wood harvester driving	2	2			
P4-00246	8/3/10	ABS-10	2a Residential wood harvester driving	2	1			
P4-00247	8/3/10	ABS-10	2b.1 Felling and limbing	1	4		Y	Y
P4-00248	8/3/10	ABS-10	2b.1 Felling and limbing	1	2		Y	
P4-00249	8/3/10	ABS-10	2b.1 Felling and limbing	1	1		Y	
P4-00250	8/3/10	ABS-10	2b.1 Felling and limbing	2	4		Y	Y
P4-00251	8/3/10	ABS-10	2b.1 Felling and limbing	2	2		Y	
P4-00252	8/3/10	ABS-10	2b.1 Felling and limbing	2	1		Y	
P4-00253	8/3/10	ABS-10	2b.2 Cutting and stacking	1	4		Y	Y
P4-00254	8/3/10	ABS-10	2b.2 Cutting and stacking	1	2		Y	
P4-00255	8/3/10	ABS-10	2b.2 Cutting and stacking	1	1		Y	
P4-00256	8/3/10	ABS-10	2b.2 Cutting and stacking	2	4		Y	Y
P4-00257	8/3/10	ABS-10	2b.2 Cutting and stacking	2	2		Y	
P4-00258	8/3/10	ABS-10	2b.2 Cutting and stacking	2	1		Y	
P4-00259	8/3/10	ABS-10	3a USFS worker trail maintenance	1	4	Y		
P4-00260	8/3/10	ABS-10	3a USFS worker trail maintenance	1	2			
P4-00261	8/3/10	ABS-10	3a USFS worker trail maintenance	1	1			
P4-00262	8/3/10	ABS-10	3a USFS worker trail maintenance	2	4			
P4-00263	8/3/10	ABS-10	3a USFS worker trail maintenance	2	2	Y		
P4-00264	8/3/10	ABS-10	3a USFS worker trail maintenance	2	1			
P4-00265	8/3/10	ABS-10	3b USFS worker thinning trees	1	4		Y	Y
P4-00266	8/3/10	ABS-10	3b USFS worker thinning trees	1	2		Y	
P4-00267	8/3/10	ABS-10	3b USFS worker thinning trees	1	1		Y	
P4-00268	8/3/10	ABS-10	3b USFS worker thinning trees	2	3.95		Y	Y

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00269	8/3/10	ABS-10	3b USFS worker thinning trees	2	2		Y	
P4-00270	8/3/10	ABS-10	3b USFS worker thinning trees	2	1		Y	
P4-00271	8/3/10	ABS-10	3c USFS worker stand exam	1	4			
P4-00272	8/3/10	ABS-10	3c USFS worker stand exam	1	2			
P4-00273	8/3/10	ABS-10	3c USFS worker stand exam	1	1	Y		
P4-00274	8/3/10	ABS-10	3c USFS worker stand exam	2	4			
P4-00275	8/3/10	ABS-10	3c USFS worker stand exam	2	2	Y		
P4-00276	8/3/10	ABS-10	3c USFS worker stand exam	2	1			
P4-00277	8/3/10	ABS-10	3d Cutting firelines by hand	1	4	Y		
P4-00278	8/3/10	ABS-10	3d Cutting firelines by hand	1	2			
P4-00279	8/3/10	ABS-10	3d Cutting firelines by hand	1	1			
P4-00280	8/3/10	ABS-10	3d Cutting firelines by hand	2	4	Y		
P4-00281	8/3/10	ABS-10	3d Cutting firelines by hand	2	2			
P4-00282	8/3/10	ABS-10	3d Cutting firelines by hand	2	1			
P4-00283	8/4/10	ABS-02	2a Residential wood harvester driving	1	4	Y		
P4-00284	8/4/10	ABS-02	2a Residential wood harvester driving	1	2			
P4-00285	8/4/10	ABS-02	2a Residential wood harvester driving	1	1			
P4-00286	8/4/10	ABS-02	2a Residential wood harvester driving	2	4	Y		
P4-00287	8/4/10	ABS-02	2a Residential wood harvester driving	2	2			
P4-00288	8/4/10	ABS-02	2a Residential wood harvester driving	2	1			
P4-00289	8/4/10	ABS-02	2b.1 Felling and limbing	1	4		Y	Y
P4-00290	8/4/10	ABS-02	2b.1 Felling and limbing	1	2		Y	
P4-00291	8/4/10	ABS-02	2b.1 Felling and limbing	1	1		Y	
P4-00292	8/4/10	ABS-02	2b.1 Felling and limbing	2	4		Y	Y
P4-00293	8/4/10	ABS-02	2b.1 Felling and limbing	2	2		Y	
P4-00294	8/4/10	ABS-02	2b.1 Felling and limbing	2	1		Y	
P4-00295	8/4/10	ABS-02	2b.2 Cutting and stacking	1	4		Y	Y
P4-00296	8/4/10	ABS-02	2b.2 Cutting and stacking	1	2		Y	
P4-00297	8/4/10	ABS-02	2b.2 Cutting and stacking	1	1		Y	
P4-00298	8/4/10	ABS-02	2b.2 Cutting and stacking	2	4		Y	Y
P4-00299	8/4/10	ABS-02	2b.2 Cutting and stacking	2	2		Y	
P4-00300	8/4/10	ABS-02	2b.2 Cutting and stacking	2	1		Y	
P4-00301	8/4/10	ABS-02	3a USFS worker trail maintenance	1	4			
P4-00302	8/4/10	ABS-02	3a USFS worker trail maintenance	1	2			
P4-00303	8/4/10	ABS-02	3a USFS worker trail maintenance	1	1	Y		
P4-00304	8/4/10	ABS-02	3a USFS worker trail maintenance	2	4.05			
P4-00305	8/4/10	ABS-02	3a USFS worker trail maintenance	2	2			
P4-00306	8/4/10	ABS-02	3a USFS worker trail maintenance	2	1	Y		
P4-00307	8/4/10	ABS-02	3b USFS worker thinning trees	1	4			
P4-00308	8/4/10	ABS-02	3b USFS worker thinning trees	1	2.05			
P4-00309	8/4/10	ABS-02	3b USFS worker thinning trees	1	1	Y		
P4-00310	8/4/10	ABS-02	3b USFS worker thinning trees	2	4		Y	Y
P4-00311	8/4/10	ABS-02	3b USFS worker thinning trees	2	2.05		Y	
P4-00312	8/4/10	ABS-02	3b USFS worker thinning trees	2	1		Y	
P4-00313	8/4/10	ABS-02	3c USFS worker stand exam	1	4		Y	Y
P4-00314	8/4/10	ABS-02	3c USFS worker stand exam	1	2		Y	
P4-00315	8/4/10	ABS-02	3c USFS worker stand exam	1	1		Y	
P4-00316	8/4/10	ABS-02	3c USFS worker stand exam	2	4.05			
P4-00317	8/4/10	ABS-02	3c USFS worker stand exam	2	2			
P4-00318	8/4/10	ABS-02	3c USFS worker stand exam	2	1	Y		
P4-00319	8/4/10	ABS-02	3d Cutting firelines by hand	1	4		Y	Y
P4-00320	8/4/10	ABS-02	3d Cutting firelines by hand	1	2		Y	
P4-00321	8/4/10	ABS-02	3d Cutting firelines by hand	1	1		Y	
P4-00322	8/4/10	ABS-02	3d Cutting firelines by hand	2	4.05		Y	Y
P4-00323	8/4/10	ABS-02	3d Cutting firelines by hand	2	2		Y	
P4-00324	8/4/10	ABS-02	3d Cutting firelines by hand	2	1		Y	
P4-00326	8/5/10	ABS-07	2a Residential wood harvester driving	1	4			
P4-00327	8/5/10	ABS-07	2a Residential wood harvester driving	1	2			
P4-00328	8/5/10	ABS-07	2a Residential wood harvester driving	1	1	Y		
P4-00329	8/5/10	ABS-07	2a Residential wood harvester driving	2	4			
P4-00330	8/5/10	ABS-07	2a Residential wood harvester driving	2	2	Y		
P4-00331	8/5/10	ABS-07	2a Residential wood harvester driving	2	1			
P4-00332	8/5/10	ABS-07	2b.1 Felling and limbing	1	4.05		Y	Y
P4-00333	8/5/10	ABS-07	2b.1 Felling and limbing	1	2.05		Y	

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00334	8/5/10	ABS-07	2b.1 Felling and limbing	1	1		Y	
P4-00335	8/5/10	ABS-07	2b.1 Felling and limbing	2	4.05		Y	Y
P4-00336	8/5/10	ABS-07	2b.1 Felling and limbing	2	2.05		Y	
P4-00337	8/5/10	ABS-07	2b.1 Felling and limbing	2	1		Y	
P4-00338	8/5/10	ABS-07	2b.2 Cutting and stacking	1	4.05		Y	Y
P4-00339	8/5/10	ABS-07	2b.2 Cutting and stacking	1	2		Y	
P4-00340	8/5/10	ABS-07	2b.2 Cutting and stacking	1	1		Y	
P4-00341	8/5/10	ABS-07	2b.2 Cutting and stacking	2	3.95		Y	Y
P4-00342	8/5/10	ABS-07	2b.2 Cutting and stacking	2	2		Y	
P4-00343	8/5/10	ABS-07	2b.2 Cutting and stacking	2	1		Y	
P4-00344	8/5/10	ABS-07	3a USFS worker trail maintenance	1	4		Y	Y
P4-00345	8/5/10	ABS-07	3a USFS worker trail maintenance	1	2		Y	
P4-00346	8/5/10	ABS-07	3a USFS worker trail maintenance	1	1		Y	
P4-00347	8/5/10	ABS-07	3a USFS worker trail maintenance	2	4			
P4-00348	8/5/10	ABS-07	3a USFS worker trail maintenance	2	2			
P4-00349	8/5/10	ABS-07	3a USFS worker trail maintenance	2	1	Y		
P4-00350	8/5/10	ABS-07	3b USFS worker thinning trees	1	4		Y	Y
P4-00351	8/5/10	ABS-07	3b USFS worker thinning trees	1	2		Y	
P4-00352	8/5/10	ABS-07	3b USFS worker thinning trees	1	1		Y	
P4-00353	8/5/10	ABS-07	3b USFS worker thinning trees	2	4		Y	Y
P4-00354	8/5/10	ABS-07	3b USFS worker thinning trees	2	2		Y	
P4-00355	8/5/10	ABS-07	3b USFS worker thinning trees	2	1		Y	
P4-00356	8/5/10	ABS-07	3c USFS worker stand exam	1	4			
P4-00357	8/5/10	ABS-07	3c USFS worker stand exam	1	2			
P4-00358	8/5/10	ABS-07	3c USFS worker stand exam	1	1	Y		
P4-00359	8/5/10	ABS-07	3c USFS worker stand exam	2	4			
P4-00360	8/5/10	ABS-07	3c USFS worker stand exam	2	2			
P4-00361	8/5/10	ABS-07	3c USFS worker stand exam	2	1	Y		
P4-00362	8/5/10	ABS-07	3d Cutting firelines by hand	1	4		Y	Y
P4-00363	8/5/10	ABS-07	3d Cutting firelines by hand	1	2		Y	
P4-00364	8/5/10	ABS-07	3d Cutting firelines by hand	1	1		Y	
P4-00365	8/5/10	ABS-07	3d Cutting firelines by hand	2	4		Y	Y
P4-00366	8/5/10	ABS-07	3d Cutting firelines by hand	2	2		Y	
P4-00367	8/5/10	ABS-07	3d Cutting firelines by hand	2	1		Y	
P4-00368	8/5/10	ABS-10	2a Residential wood harvester driving	1	3.95			
P4-00369	8/5/10	ABS-10	2a Residential wood harvester driving	1	2			
P4-00370	8/5/10	ABS-10	2a Residential wood harvester driving	1	1	Y		
P4-00371	8/5/10	ABS-10	2a Residential wood harvester driving	2	4	Y		
P4-00372	8/5/10	ABS-10	2a Residential wood harvester driving	2	2			
P4-00373	8/5/10	ABS-10	2a Residential wood harvester driving	2	1			
P4-00374	8/5/10	ABS-10	2b.1 Felling and limbing	1	4		Y	Y
P4-00375	8/5/10	ABS-10	2b.1 Felling and limbing	1	2		Y	
P4-00376	8/5/10	ABS-10	2b.1 Felling and limbing	1	1		Y	
P4-00377	8/5/10	ABS-10	2b.1 Felling and limbing	2	4		Y	Y
P4-00378	8/5/10	ABS-10	2b.1 Felling and limbing	2	2.05		Y	
P4-00379	8/5/10	ABS-10	2b.1 Felling and limbing	2	1		Y	
P4-00380	8/5/10	ABS-10	2b.2 Cutting and stacking	1	4			
P4-00381	8/5/10	ABS-10	2b.2 Cutting and stacking	1	2			
P4-00382	8/5/10	ABS-10	2b.2 Cutting and stacking	1	1	Y		
P4-00383	8/5/10	ABS-10	2b.2 Cutting and stacking	2	4		Y	Y
P4-00384	8/5/10	ABS-10	2b.2 Cutting and stacking	2	2		Y	
P4-00385	8/5/10	ABS-10	2b.2 Cutting and stacking	2	1		Y	
P4-00386	8/5/10	ABS-10	3a USFS worker trail maintenance	1	4			
P4-00387	8/5/10	ABS-10	3a USFS worker trail maintenance	1	2			
P4-00388	8/5/10	ABS-10	3a USFS worker trail maintenance	1	1	Y		
P4-00389	8/5/10	ABS-10	3a USFS worker trail maintenance	2	4			
P4-00390	8/5/10	ABS-10	3a USFS worker trail maintenance	2	2			
P4-00391	8/5/10	ABS-10	3a USFS worker trail maintenance	2	1	Y		
P4-00392	8/5/10	ABS-10	3b USFS worker thinning trees	1	4			
P4-00393	8/5/10	ABS-10	3b USFS worker thinning trees	1	2			
P4-00394	8/5/10	ABS-10	3b USFS worker thinning trees	1	1	Y		
P4-00395	8/5/10	ABS-10	3b USFS worker thinning trees	2	4			
P4-00396	8/5/10	ABS-10	3b USFS worker thinning trees	2	2			
P4-00397	8/5/10	ABS-10	3b USFS worker thinning trees	2	1	Y		

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00398	8/5/10	ABS-10	3c USFS worker stand exam	1	4			
P4-00399	8/5/10	ABS-10	3c USFS worker stand exam	1	2.05			
P4-00400	8/5/10	ABS-10	3c USFS worker stand exam	1	1	Y		
P4-00401	8/5/10	ABS-10	3c USFS worker stand exam	2	4			
P4-00402	8/5/10	ABS-10	3c USFS worker stand exam	2	2	Y		
P4-00403	8/5/10	ABS-10	3c USFS worker stand exam	2	1			
P4-00404	8/5/10	ABS-10	3d Cutting firelines by hand	1	4			
P4-00405	8/5/10	ABS-10	3d Cutting firelines by hand	1	2	Y		
P4-00406	8/5/10	ABS-10	3d Cutting firelines by hand	1	1			
P4-00407	8/5/10	ABS-10	3d Cutting firelines by hand	2	4			
P4-00408	8/5/10	ABS-10	3d Cutting firelines by hand	2	2	Y		
P4-00409	8/5/10	ABS-10	3d Cutting firelines by hand	2	1			
P4-00410	8/10/10	ABS-02	2a Residential wood harvester driving	1	4			
P4-00411	8/10/10	ABS-02	2a Residential wood harvester driving	1	2			
P4-00412	8/10/10	ABS-02	2a Residential wood harvester driving	1	1	Y		
P4-00413	8/10/10	ABS-02	2a Residential wood harvester driving	2	4			
P4-00414	8/10/10	ABS-02	2a Residential wood harvester driving	2	2			
P4-00415	8/10/10	ABS-02	2a Residential wood harvester driving	2	1	Y		
P4-00416	8/10/10	ABS-02	2b.1 Felling and limbing	1	4		Y	Y
P4-00417	8/10/10	ABS-02	2b.1 Felling and limbing	1	2		Y	
P4-00418	8/10/10	ABS-02	2b.1 Felling and limbing	1	1		Y	
P4-00419	8/10/10	ABS-02	2b.1 Felling and limbing	2	4		Y	Y
P4-00420	8/10/10	ABS-02	2b.1 Felling and limbing	2	2		Y	
P4-00421	8/10/10	ABS-02	2b.1 Felling and limbing	2	1		Y	
P4-00428	8/10/10	ABS-02	3a USFS worker trail maintenance	1	4			
P4-00429	8/10/10	ABS-02	3a USFS worker trail maintenance	1	2			
P4-00430	8/10/10	ABS-02	3a USFS worker trail maintenance	1	1	Y		
P4-00431	8/10/10	ABS-02	3a USFS worker trail maintenance	2	4			
P4-00432	8/10/10	ABS-02	3a USFS worker trail maintenance	2	2			
P4-00433	8/10/10	ABS-02	3a USFS worker trail maintenance	2	1	Y		
P4-00434	8/10/10	ABS-02	3b USFS worker thinning trees	1	4		Y	Y
P4-00435	8/10/10	ABS-02	3b USFS worker thinning trees	1	2		Y	
P4-00436	8/10/10	ABS-02	3b USFS worker thinning trees	1	1		Y	
P4-00437	8/10/10	ABS-02	3b USFS worker thinning trees	2	4			
P4-00438	8/10/10	ABS-02	3b USFS worker thinning trees	2	2			
P4-00439	8/10/10	ABS-02	3b USFS worker thinning trees	2	1	Y		
P4-00440	8/10/10	ABS-02	3c USFS worker stand exam	1	4			
P4-00441	8/10/10	ABS-02	3c USFS worker stand exam	1	2			
P4-00442	8/10/10	ABS-02	3c USFS worker stand exam	1	1	Y		
P4-00443	8/10/10	ABS-02	3c USFS worker stand exam	2	4			
P4-00444	8/10/10	ABS-02	3c USFS worker stand exam	2	2			
P4-00445	8/10/10	ABS-02	3c USFS worker stand exam	2	1	Y		
P4-00446	8/10/10	ABS-02	3d Cutting firelines by hand	1	4		Y	Y
P4-00447	8/10/10	ABS-02	3d Cutting firelines by hand	1	2		Y	
P4-00448	8/10/10	ABS-02	3d Cutting firelines by hand	1	1		Y	
P4-00449	8/10/10	ABS-02	3d Cutting firelines by hand	2	4			
P4-00450	8/10/10	ABS-02	3d Cutting firelines by hand	2	2			
P4-00451	8/10/10	ABS-02	3d Cutting firelines by hand	2	1	Y		
P4-00454	8/10/10	ABS-02	2b.1 Felling and limbing	1	4		Y	Y
P4-00455	8/10/10	ABS-02	2b.1 Felling and limbing	1	2		Y	
P4-00456	8/10/10	ABS-02	2b.1 Felling and limbing	1	1		Y	
P4-00457	8/10/10	ABS-02	2b.1 Felling and limbing	2	4			
P4-00458	8/10/10	ABS-02	2b.1 Felling and limbing	2	2			
P4-00459	8/10/10	ABS-02	2b.1 Felling and limbing	2	1	Y		
P4-00460	8/10/10	ABS-02	2b.2 Cutting and stacking	1	4		Y	Y
P4-00461	8/10/10	ABS-02	2b.2 Cutting and stacking	1	2		Y	
P4-00462	8/10/10	ABS-02	2b.2 Cutting and stacking	1	1		Y	
P4-00463	8/10/10	ABS-02	2b.2 Cutting and stacking	2	4			
P4-00464	8/10/10	ABS-02	2b.2 Cutting and stacking	2	2			
P4-00465	8/10/10	ABS-02	2b.2 Cutting and stacking	2	1	Y		
P4-00466	8/11/10	ABS-07	2a Residential wood harvester driving	1	4	Y		
P4-00467	8/11/10	ABS-07	2a Residential wood harvester driving	1	2			
P4-00468	8/11/10	ABS-07	2a Residential wood harvester driving	1	1			
P4-00469	8/11/10	ABS-07	2a Residential wood harvester driving	2	4			

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00470	8/11/10	ABS-07	2a Residential wood harvester driving	2	2	Y		
P4-00471	8/11/10	ABS-07	2a Residential wood harvester driving	2	1			
P4-00472	8/11/10	ABS-07	2b.1 Felling and limbing	1	4		Y	Y
P4-00473	8/11/10	ABS-07	2b.1 Felling and limbing	1	2		Y	
P4-00474	8/11/10	ABS-07	2b.1 Felling and limbing	1	1		Y	
P4-00475	8/11/10	ABS-07	2b.1 Felling and limbing	2	4		Y	Y
P4-00476	8/11/10	ABS-07	2b.1 Felling and limbing	2	2		Y	
P4-00477	8/11/10	ABS-07	2b.1 Felling and limbing	2	1		Y	
P4-00478	8/11/10	ABS-07	2b.1 Felling and limbing	1	4		Y	Y
P4-00479	8/11/10	ABS-07	2b.1 Felling and limbing	1	2		Y	
P4-00480	8/11/10	ABS-07	2b.1 Felling and limbing	1	1		Y	
P4-00481	8/11/10	ABS-07	2b.1 Felling and limbing	2	4		Y	
P4-00482	8/11/10	ABS-07	2b.1 Felling and limbing	2	2	Y		
P4-00483	8/11/10	ABS-07	2b.1 Felling and limbing	2	1			
P4-00484	8/11/10	ABS-07	2b.2 Cutting and stacking	1	4		Y	Y
P4-00485	8/11/10	ABS-07	2b.2 Cutting and stacking	1	2		Y	
P4-00486	8/11/10	ABS-07	2b.2 Cutting and stacking	1	1		Y	
P4-00487	8/11/10	ABS-07	2b.2 Cutting and stacking	2	4		Y	Y
P4-00488	8/11/10	ABS-07	2b.2 Cutting and stacking	2	2		Y	
P4-00489	8/11/10	ABS-07	2b.2 Cutting and stacking	2	1		Y	
P4-00490	8/11/10	ABS-07	3a USFS worker trail maintenance	1	4		Y	
P4-00491	8/11/10	ABS-07	3a USFS worker trail maintenance	1	2		Y	
P4-00492	8/11/10	ABS-07	3a USFS worker trail maintenance	1	1	Y		
P4-00493	8/11/10	ABS-07	3a USFS worker trail maintenance	2	4		Y	
P4-00494	8/11/10	ABS-07	3a USFS worker trail maintenance	2	2		Y	
P4-00495	8/11/10	ABS-07	3a USFS worker trail maintenance	2	1	Y		
P4-00496	8/11/10	ABS-07	3b USFS worker thinning trees	1	4		Y	
P4-00497	8/11/10	ABS-07	3b USFS worker thinning trees	1	2		Y	
P4-00498	8/11/10	ABS-07	3b USFS worker thinning trees	1	1	Y		
P4-00499	8/11/10	ABS-07	3b USFS worker thinning trees	2	4		Y	
P4-00500	8/11/10	ABS-07	3b USFS worker thinning trees	2	2		Y	
P4-00501	8/11/10	ABS-07	3b USFS worker thinning trees	2	1	Y		
P4-00502	8/11/10	ABS-07	3c USFS worker stand exam	1	4		Y	
P4-00503	8/11/10	ABS-07	3c USFS worker stand exam	1	2		Y	
P4-00504	8/11/10	ABS-07	3c USFS worker stand exam	1	1	Y		
P4-00505	8/11/10	ABS-07	3c USFS worker stand exam	2	4		Y	
P4-00506	8/11/10	ABS-07	3c USFS worker stand exam	2	2		Y	
P4-00507	8/11/10	ABS-07	3c USFS worker stand exam	2	1	Y		
P4-00508	8/11/10	ABS-07	3d Cutting firelines by hand	1	4		Y	Y
P4-00509	8/11/10	ABS-07	3d Cutting firelines by hand	1	2		Y	
P4-00510	8/11/10	ABS-07	3d Cutting firelines by hand	1	1		Y	
P4-00511	8/11/10	ABS-07	3d Cutting firelines by hand	2	4		Y	Y
P4-00512	8/11/10	ABS-07	3d Cutting firelines by hand	2	2		Y	
P4-00513	8/11/10	ABS-07	3d Cutting firelines by hand	2	1		Y	
P4-00515	8/11/10	ABS-10	2a Residential wood harvester driving	1	4		Y	Y
P4-00516	8/11/10	ABS-10	2a Residential wood harvester driving	1	2		Y	
P4-00517	8/11/10	ABS-10	2a Residential wood harvester driving	1	1		Y	
P4-00518	8/11/10	ABS-10	2a Residential wood harvester driving	2	4		Y	Y
P4-00519	8/11/10	ABS-10	2a Residential wood harvester driving	2	2		Y	
P4-00520	8/11/10	ABS-10	2a Residential wood harvester driving	2	1		Y	
P4-00521	8/11/10	ABS-10	2b.1 Felling and limbing	1	4		Y	Y
P4-00522	8/11/10	ABS-10	2b.1 Felling and limbing	1	2		Y	
P4-00523	8/11/10	ABS-10	2b.1 Felling and limbing	1	1		Y	
P4-00524	8/11/10	ABS-10	2b.1 Felling and limbing	2	4		Y	Y
P4-00525	8/11/10	ABS-10	2b.1 Felling and limbing	2	2		Y	
P4-00526	8/11/10	ABS-10	2b.1 Felling and limbing	2	1		Y	
P4-00527	8/11/10	ABS-10	3a USFS worker trail maintenance	1	4		Y	Y
P4-00528	8/11/10	ABS-10	3a USFS worker trail maintenance	1	2		Y	
P4-00529	8/11/10	ABS-10	3a USFS worker trail maintenance	1	1		Y	
P4-00530	8/11/10	ABS-10	3a USFS worker trail maintenance	2	4		Y	Y
P4-00531	8/11/10	ABS-10	3a USFS worker trail maintenance	2	2		Y	
P4-00532	8/11/10	ABS-10	3a USFS worker trail maintenance	2	1		Y	
P4-00533	8/11/10	ABS-10	3b USFS worker thinning trees	1	4		Y	Y
P4-00534	8/11/10	ABS-10	3b USFS worker thinning trees	1	2		Y	

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00535	8/11/10	ABS-10	3b USFS worker thinning trees	1	1		Y	
P4-00536	8/11/10	ABS-10	3b USFS worker thinning trees	2	4		Y	Y
P4-00537	8/11/10	ABS-10	3b USFS worker thinning trees	2	2		Y	
P4-00538	8/11/10	ABS-10	3b USFS worker thinning trees	2	1		Y	
P4-00539	8/11/10	ABS-10	3c USFS worker stand exam	1	4		Y	Y
P4-00540	8/11/10	ABS-10	3c USFS worker stand exam	1	2		Y	
P4-00541	8/11/10	ABS-10	3c USFS worker stand exam	1	1		Y	
P4-00542	8/11/10	ABS-10	3c USFS worker stand exam	2	4		Y	
P4-00543	8/11/10	ABS-10	3c USFS worker stand exam	2	2		Y	
P4-00544	8/11/10	ABS-10	3c USFS worker stand exam	2	1	Y		
P4-00545	8/11/10	ABS-10	3d Cutting firelines by hand	1	4		Y	Y
P4-00546	8/11/10	ABS-10	3d Cutting firelines by hand	1	2		Y	
P4-00547	8/11/10	ABS-10	3d Cutting firelines by hand	1	1		Y	
P4-00548	8/11/10	ABS-10	3d Cutting firelines by hand	2	4		Y	Y
P4-00549	8/11/10	ABS-10	3d Cutting firelines by hand	2	2		Y	
P4-00550	8/11/10	ABS-10	3d Cutting firelines by hand	2	1		Y	
P4-00551	8/12/10	ABS-02	2a Residential wood harvester driving	1	4		Y	Y
P4-00552	8/12/10	ABS-02	2a Residential wood harvester driving	1	2		Y	
P4-00553	8/12/10	ABS-02	2a Residential wood harvester driving	1	1		Y	
P4-00554	8/12/10	ABS-02	2a Residential wood harvester driving	2	4		Y	
P4-00555	8/12/10	ABS-02	2a Residential wood harvester driving	2	2		Y	
P4-00556	8/12/10	ABS-02	2a Residential wood harvester driving	2	1	Y		
P4-00557	8/12/10	ABS-02	2b.1 Felling and limbing	1	4		Y	Y
P4-00558	8/12/10	ABS-02	2b.1 Felling and limbing	1	2		Y	
P4-00559	8/12/10	ABS-02	2b.1 Felling and limbing	1	1		Y	
P4-00560	8/12/10	ABS-02	2b.1 Felling and limbing	2	4		Y	Y
P4-00561	8/12/10	ABS-02	2b.1 Felling and limbing	2	2		Y	
P4-00562	8/12/10	ABS-02	2b.1 Felling and limbing	2	1		Y	
P4-00563	8/12/10	ABS-02	2b.1 Felling and limbing	1	4		Y	Y
P4-00564	8/12/10	ABS-02	2b.1 Felling and limbing	1	2		Y	
P4-00565	8/12/10	ABS-02	2b.1 Felling and limbing	1	1		Y	
P4-00566	8/12/10	ABS-02	2b.1 Felling and limbing	2	4		Y	Y
P4-00567	8/12/10	ABS-02	2b.1 Felling and limbing	2	2		Y	
P4-00568	8/12/10	ABS-02	2b.1 Felling and limbing	2	1		Y	
P4-00569	8/12/10	ABS-02	2b.2 Cutting and stacking	1	4		Y	
P4-00570	8/12/10	ABS-02	2b.2 Cutting and stacking	1	2		Y	
P4-00571	8/12/10	ABS-02	2b.2 Cutting and stacking	1	1	Y		
P4-00572	8/12/10	ABS-02	2b.2 Cutting and stacking	2	4		Y	
P4-00573	8/12/10	ABS-02	2b.2 Cutting and stacking	2	2		Y	
P4-00574	8/12/10	ABS-02	2b.2 Cutting and stacking	2	1	Y		
P4-00575	8/12/10	ABS-02	3a USFS worker trail maintenance	1	4		Y	Y
P4-00576	8/12/10	ABS-02	3a USFS worker trail maintenance	1	2		Y	
P4-00577	8/12/10	ABS-02	3a USFS worker trail maintenance	1	1		Y	
P4-00578	8/12/10	ABS-02	3a USFS worker trail maintenance	2	4		Y	Y
P4-00579	8/12/10	ABS-02	3a USFS worker trail maintenance	2	2		Y	
P4-00580	8/12/10	ABS-02	3a USFS worker trail maintenance	2	1		Y	
P4-00581	8/12/10	ABS-02	3b USFS worker thinning trees	1	4		Y	Y
P4-00582	8/12/10	ABS-02	3b USFS worker thinning trees	1	2		Y	
P4-00583	8/12/10	ABS-02	3b USFS worker thinning trees	1	1		Y	
P4-00584	8/12/10	ABS-02	3b USFS worker thinning trees	2	4		Y	Y
P4-00585	8/12/10	ABS-02	3b USFS worker thinning trees	2	2		Y	
P4-00586	8/12/10	ABS-02	3b USFS worker thinning trees	2	1		Y	
P4-00587	8/12/10	ABS-02	3c USFS worker stand exam	1	4		Y	
P4-00588	8/12/10	ABS-02	3c USFS worker stand exam	1	2		Y	
P4-00589	8/12/10	ABS-02	3c USFS worker stand exam	1	1	Y		
P4-00590	8/12/10	ABS-02	3c USFS worker stand exam	2	4		Y	Y
P4-00591	8/12/10	ABS-02	3c USFS worker stand exam	2	2		Y	
P4-00592	8/12/10	ABS-02	3c USFS worker stand exam	2	1		Y	
P4-00593	8/12/10	ABS-02	3d Cutting firelines by hand	1	4		Y	Y
P4-00594	8/12/10	ABS-02	3d Cutting firelines by hand	1	2		Y	
P4-00595	8/12/10	ABS-02	3d Cutting firelines by hand	1	1		Y	
P4-00596	8/12/10	ABS-02	3d Cutting firelines by hand	2	4		Y	Y
P4-00597	8/12/10	ABS-02	3d Cutting firelines by hand	2	2		Y	
P4-00598	8/12/10	ABS-02	3d Cutting firelines by hand	2	1		Y	

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00599	8/12/10	ABS-10	2b.1 Felling and limbing	1	4		Y	Y
P4-00600	8/12/10	ABS-10	2b.1 Felling and limbing	1	2		Y	
P4-00601	8/12/10	ABS-10	2b.1 Felling and limbing	1	1		Y	
P4-00602	8/12/10	ABS-10	2b.1 Felling and limbing	2	4		Y	Y
P4-00603	8/12/10	ABS-10	2b.1 Felling and limbing	2	2		Y	
P4-00604	8/12/10	ABS-10	2b.1 Felling and limbing	2	1		Y	
P4-00605	8/12/10	ABS-10	2b.2 Cutting and stacking	1	4		Y	
P4-00606	8/12/10	ABS-10	2b.2 Cutting and stacking	1	2	Y		
P4-00607	8/12/10	ABS-10	2b.2 Cutting and stacking	1	1			
P4-00608	8/12/10	ABS-10	2b.2 Cutting and stacking	2	4		Y	
P4-00609	8/12/10	ABS-10	2b.2 Cutting and stacking	2	2		Y	
P4-00610	8/12/10	ABS-10	2b.2 Cutting and stacking	2	1	Y		
P4-00617	8/17/10	ABS-10	3a USFS worker trail maintenance	1	4		Y	
P4-00618	8/17/10	ABS-10	3a USFS worker trail maintenance	1	2		Y	
P4-00619	8/17/10	ABS-10	3a USFS worker trail maintenance	1	1	Y		
P4-00620	8/17/10	ABS-10	3a USFS worker trail maintenance	2	3.95		Y	
P4-00621	8/17/10	ABS-10	3a USFS worker trail maintenance	2	2	Y		
P4-00622	8/17/10	ABS-10	3a USFS worker trail maintenance	2	1			
P4-00623	8/17/10	ABS-10	3b USFS worker thinning trees	1	4		Y	Y
P4-00624	8/17/10	ABS-10	3b USFS worker thinning trees	1	2		Y	
P4-00625	8/17/10	ABS-10	3b USFS worker thinning trees	1	1		Y	
P4-00626	8/17/10	ABS-10	3b USFS worker thinning trees	2	4		Y	Y
P4-00627	8/17/10	ABS-10	3b USFS worker thinning trees	2	2		Y	
P4-00628	8/17/10	ABS-10	3b USFS worker thinning trees	2	1		Y	
P4-00629	8/17/10	ABS-10	3c USFS worker stand exam	1	4		Y	
P4-00630	8/17/10	ABS-10	3c USFS worker stand exam	1	2	Y		
P4-00631	8/17/10	ABS-10	3c USFS worker stand exam	1	1			
P4-00632	8/17/10	ABS-10	3c USFS worker stand exam	2	4	Y		
P4-00633	8/17/10	ABS-10	3c USFS worker stand exam	2	2			
P4-00634	8/17/10	ABS-10	3c USFS worker stand exam	2	1			
P4-00635	8/17/10	ABS-10	3d Cutting firelines by hand	1	4		Y	
P4-00636	8/17/10	ABS-10	3d Cutting firelines by hand	1	2		Y	
P4-00637	8/17/10	ABS-10	3d Cutting firelines by hand	1	1	Y		
P4-00638	8/17/10	ABS-10	3d Cutting firelines by hand	2	4.05		Y	
P4-00639	8/17/10	ABS-10	3d Cutting firelines by hand	2	2	Y		
P4-00640	8/17/10	ABS-10	3d Cutting firelines by hand	2	1			
P4-00641	8/17/10	ABS-10	3a USFS worker trail maintenance	1	4.05		Y	
P4-00642	8/17/10	ABS-10	3a USFS worker trail maintenance	1	2.05		Y	
P4-00643	8/17/10	ABS-10	3a USFS worker trail maintenance	1	1	Y		
P4-00644	8/17/10	ABS-10	3a USFS worker trail maintenance	2	4.05		Y	Y
P4-00645	8/17/10	ABS-10	3a USFS worker trail maintenance	2	2.05		Y	
P4-00646	8/17/10	ABS-10	3a USFS worker trail maintenance	2	1.05		Y	
P4-00647	8/17/10	ABS-10	3b USFS worker thinning trees	1	4		Y	
P4-00648	8/17/10	ABS-10	3b USFS worker thinning trees	1	2	Y		
P4-00649	8/17/10	ABS-10	3b USFS worker thinning trees	1	1			
P4-00650	8/17/10	ABS-10	3b USFS worker thinning trees	2	3.95		Y	
P4-00651	8/17/10	ABS-10	3b USFS worker thinning trees	2	2		Y	
P4-00652	8/17/10	ABS-10	3b USFS worker thinning trees	2	1	Y		
P4-00653	8/17/10	ABS-10	3c USFS worker stand exam	1	4		Y	
P4-00654	8/17/10	ABS-10	3c USFS worker stand exam	1	2	Y		
P4-00655	8/17/10	ABS-10	3c USFS worker stand exam	1	1			
P4-00656	8/17/10	ABS-10	3c USFS worker stand exam	2	4		Y	
P4-00657	8/17/10	ABS-10	3c USFS worker stand exam	2	2	Y		
P4-00658	8/17/10	ABS-10	3c USFS worker stand exam	2	1			
P4-00659	8/17/10	ABS-10	3d Cutting firelines by hand	1	4	Y		
P4-00660	8/17/10	ABS-10	3d Cutting firelines by hand	1	2			
P4-00661	8/17/10	ABS-10	3d Cutting firelines by hand	1	1			
P4-00662	8/17/10	ABS-10	3d Cutting firelines by hand	2	4		Y	
P4-00663	8/17/10	ABS-10	3d Cutting firelines by hand	2	2	Y		
P4-00664	8/17/10	ABS-10	3d Cutting firelines by hand	2	1			
P4-00665	8/17/10	RAINY	1 Recreational visitor hiking	1	4		Y	Y
P4-00666	8/17/10	RAINY	1 Recreational visitor hiking	1	2		Y	
P4-00667	8/17/10	RAINY	1 Recreational visitor hiking	1	1		Y	
P4-00668	8/17/10	RAINY	1 Recreational visitor hiking	2	4		Y	

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00669	8/17/10	RAINY	1 Recreational visitor hiking	2	2		Y	
P4-00670	8/17/10	RAINY	1 Recreational visitor hiking	2	1	Y		
P4-00671	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	1	4		Y	Y
P4-00672	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00673	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	1	1		Y	
P4-00674	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	2	4		Y	Y
P4-00675	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00676	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00677	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	1	4		Y	Y
P4-00678	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00679	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	1	1		Y	
P4-00680	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	2	4.05		Y	Y
P4-00681	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00682	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00683	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	1	4		Y	Y
P4-00684	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00685	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	1	1		Y	
P4-00686	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	2	4		Y	Y
P4-00687	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00688	8/18/10	ABS-02	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00689	8/19/10	RAINY	1 Recreational visitor hiking	1	4		Y	Y
P4-00690	8/19/10	RAINY	1 Recreational visitor hiking	1	2		Y	
P4-00691	8/19/10	RAINY	1 Recreational visitor hiking	1	1		Y	
P4-00692	8/19/10	RAINY	1 Recreational visitor hiking	2	4		Y	Y
P4-00693	8/19/10	RAINY	1 Recreational visitor hiking	2	2		Y	
P4-00694	8/19/10	RAINY	1 Recreational visitor hiking	2	1		Y	
P4-00695	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	1	4		Y	Y
P4-00696	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00697	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	1	1		Y	
P4-00698	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	2	4		Y	Y
P4-00699	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00700	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00701	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	1	4		Y	
P4-00702	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00703	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	1	1	Y		
P4-00704	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	2	4		Y	Y
P4-00705	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00706	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00708	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	1	4		Y	Y
P4-00709	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00710	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	1	1		Y	
P4-00711	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	2	4		Y	Y
P4-00712	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00713	8/19/10	ABS-10	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00714	8/20/10	RAINY	1 Recreational visitor hiking	1	4		Y	Y
P4-00715	8/20/10	RAINY	1 Recreational visitor hiking	1	2		Y	
P4-00716	8/20/10	RAINY	1 Recreational visitor hiking	1	1		Y	
P4-00717	8/20/10	RAINY	1 Recreational visitor hiking	2	4		Y	Y
P4-00718	8/20/10	RAINY	1 Recreational visitor hiking	2	2		Y	
P4-00719	8/20/10	RAINY	1 Recreational visitor hiking	2	1		Y	
P4-00720	8/20/10	ABS-07	3e Cutting firelines with heavy equipment	1	4		Y	Y
P4-00721	8/20/10	ABS-07	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00722	8/20/10	ABS-07	3e Cutting firelines with heavy equipment	1	1		Y	
P4-00723	8/20/10	ABS-07	3e Cutting firelines with heavy equipment	2	3.95		Y	Y
P4-00724	8/20/10	ABS-07	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00725	8/20/10	ABS-07	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00726	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	1	4		Y	Y
P4-00727	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00728	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	1	1		Y	
P4-00729	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	2	4.05		Y	Y
P4-00730	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	2	2.05		Y	
P4-00731	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00732	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	1	4		Y	
P4-00733	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	1	2		Y	

Table 2. Phase 4A ABS Sample Summary

SampleID	Sample Date	Location	Scenario	Individual	Flow Rate (lpm)	Direct Prep Complete(Y/N)	Overloaded (Y/N)	Selected for Indirect Prep (Y/N)
P4-00734	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	1	1	Y		
P4-00735	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	2	4.05		Y	
P4-00736	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00737	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	2	1	Y		
P4-00739	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	1	4		Y	Y
P4-00740	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00741	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	1	1		Y	
P4-00742	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	2	4.05		Y	Y
P4-00743	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00744	8/24/10	ABS-07	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00745	8/25/10	RAINY	1 Recreational visitor hiking	1	3.95		Y	Y
P4-00746	8/25/10	RAINY	1 Recreational visitor hiking	1	2		Y	
P4-00747	8/25/10	RAINY	1 Recreational visitor hiking	1	1		Y	
P4-00748	8/25/10	RAINY	1 Recreational visitor hiking	2	3.95		Y	
P4-00749	8/25/10	RAINY	1 Recreational visitor hiking	2	2		Y	
P4-00750	8/25/10	RAINY	1 Recreational visitor hiking	2	1	Y		
P4-00751	8/25/10	ABS-07	3e Cutting firelines with heavy equipment	1	4.05		Y	Y
P4-00752	8/25/10	ABS-07	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00753	8/25/10	ABS-07	3e Cutting firelines with heavy equipment	1	1		Y	
P4-00754	8/25/10	ABS-07	3e Cutting firelines with heavy equipment	2	4.05		Y	Y
P4-00755	8/25/10	ABS-07	3e Cutting firelines with heavy equipment	2	2.05		Y	
P4-00756	8/25/10	ABS-07	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00757	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	1	4		Y	
P4-00758	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00759	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	1	1	Y		
P4-00760	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	2	4		Y	Y
P4-00761	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00762	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00763	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	1	4		Y	
P4-00764	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00765	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	1	1	Y		
P4-00766	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	2	4		Y	Y
P4-00767	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00768	8/25/10	ABS-10	3e Cutting firelines with heavy equipment	2	1		Y	
P4-00769	8/26/10	RAINY	1 Recreational visitor hiking	1	4		Y	Y
P4-00770	8/26/10	RAINY	1 Recreational visitor hiking	1	2		Y	
P4-00771	8/26/10	RAINY	1 Recreational visitor hiking	1	1		Y	
P4-00772	8/26/10	RAINY	1 Recreational visitor hiking	2	4		Y	
P4-00773	8/26/10	RAINY	1 Recreational visitor hiking	2	2		Y	
P4-00774	8/26/10	RAINY	1 Recreational visitor hiking	2	1	Y		
P4-00775	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	1	4		Y	
P4-00776	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00777	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	1	1	Y		
P4-00778	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	2	4		Y	
P4-00779	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00780	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	2	1	Y		
P4-00781	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	1	4		Y	
P4-00782	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	1	2		Y	
P4-00783	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	1	1	Y		
P4-00784	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	2	4		Y	Y
P4-00785	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	2	2		Y	
P4-00786	8/26/10	ABS-02	3e Cutting firelines with heavy equipment	2	1		Y	

ATTACHMENT 1

EPA-LIBBY-08

Libby Standard Operating Procedure
Indirect Preparation of Air and Dust Samples for TEM Analysis
Approved for Use at the Libby Superfund Site Only

Date: 1/23/07 SOP No. EPA-LIBBY-08

Title: INDIRECT PREPARATION OF AIR AND DUST SAMPLES FOR TEM ANALYSIS

Author: Ron Mahoney, Ed Cahill EMSL Analytical, Inc.

SYNOPSIS: A standardized method is presented for indirect preparation of air and dust samples for analysis by TEM.

Received by QA Unit:

APPROVALS:

TEAM MEMBER	SIGNATURE/TITLE	DATE
EPA Region 8	[illegible]	1/23/07

REVISION LOG

Revision	Date	Reason
0	11/28/06	--
1	1/23/07	Clarification of filter configuration, secondary and tertiary dilution procedures.

1.0 PURPOSE

Some air samples collected at the Libby Superfund site are overloaded with debris and/or have obvious non-uniform loading, so analysis for asbestos by Transmission Electron Microscopy (TEM) requires an indirect preparation of the sample. All dust samples collected at the Libby Superfund site are prepared for TEM analysis using an indirect preparation. The purpose of this SOP is to provide a standardized procedure for the indirect preparation of air and dust samples that minimizes the loss of sensitivity. In addition, this SOP allows for the retention of a portion of the original air sample filter for archive whenever possible.

2.0 RESPONSIBILITIES

The Laboratory Director is responsible for ensuring that all laboratories participating in the analysis of air samples at the Libby site are aware of this SOP and that all analysts follow this SOP. Laboratory managers and analysts are responsible for communicating to the Libby laboratory coordinator (CDM), Volpe Center and appropriate USEPA Region 8 Remedial Project Manager or Regional Chemist any recommended changes or proposed improvements to the SOP.

3.0 EQUIPMENT

Equipment needed to perform indirect preparations of air samples includes the following:

- Transmission electron microscope (NVLAP compliant)
- Energy dispersive X-ray system (NVLAP compliant)
- High vacuum carbon evaporator with rotating stage
- HEPA hood (NVLAP compliant)
- Exhaust or fume hood
- Particle-free water
- Glass container for ashing
- Disposable single use containers of at least 100 ml capacity
- Waterproof marker
- Forceps
- Ultrasonic bath
- Appropriate disposable glass or variable pipets with disposable tips
- Disposable 25 mm filter funnels
- Side arm filter flask
- Cellulose support pad, 25 mm diameter
- MCE filters, 25 mm diameter, $\leq$ 0.22 µm and 5.0 µm pore size
- Storage container for 25 mm filter
- Glass slides, approximately 25 x 76 mm in size
- Scalpel blades, # 10 or equivalent and handle
- Desiccator or low temperature drying oven
- Acetone, reagent grade
- Glacial acetic acid

- Plasma asher, low temperature
- pH paper
- Tygon tubing, or equivalent
- Small vacuum pump for filtration
- Glass petri dishes
- Jaffe washer
- Carbon evaporator rods
- Wash bottles, plastic
- Reagent alcohol

4.0 METHOD SUMMARY

Figure 1 presents a simplified overview of the TEM indirect preparation procedure for overloaded air samples and dust samples. As seen, there are two general indirect preparation procedures, one that includes ashing of the primary filter and one that does not include ashing of the primary filter.

Laboratory modification LB-000053 provides a list of which sample prefix codes shall be prepared using an ashing procedure and which should not be prepared using an ashing procedure. In cases where there is a conflict regarding sample type between the sample prefix as defined by the most recent version of LB-000053 and the chain of custody instructions, the chain of custody instructions take precedent. Additionally, once sample preparations have begun, there may be cases where the analyst determines that ashing is necessary to obtain acceptable filter loading. Samples for which ashing may be warranted include indoor air or dust samples collected from properties with elevated levels of organic particulates (e.g., due to cigarette smoke or use of a wood-burning stove). In these samples, ashing may further reduce particulate loading, thus allowing for an improved analytical sensitivity.

The sections below present the detailed steps associated with each procedure. For all indirect preparations, specimen preparation should be performed in a clean facility that is separate from both bulk and air preparation areas and preparation shall take place in a negative flow HEPA hood to prevent any possible contamination of the laboratory or personnel.

4.1 PROCEDURE 1: Indirect Preparation with Ashing

This procedure should be followed for air and dust samples where LB-000053 or the chain of custody form indicates that ashing should be performed. For the purpose of the Libby Superfund Site, air samples are defined as overloaded if there is >25% obscuration on the majority of the grid openings.

If there is no loose material present in the air cassette or adhering to the cowl, this procedure is generally similar to the indirect preparation method specified in ISO 13794, but has been modified to increase the total solution volume from 40 ml to 100 ml and to retain a portion of the original filter. The use of a 100 ml final volume is selected because it allows for preparation of a

series of indirect samples with volumes that are sufficiently large that secondary dilution is not needed to ensure uniform deposition on the filter.

If there is loose material present in the air cassette or adhering to the cowl, or if the sample is a dust sample, a portion of the original filter is not retained for archive, since it is assumed that there will be uneven loading on the filter. Because of this, an archived portion of the original filter is unlikely to be representative. In this case, the indirect preparation procedure is similar to the method specified in ASTM D-5755, but has been modified to include an ashing of the primary filter.

4.1.1 Carefully wet-wipe the exterior of the cassettes to remove any possible contamination prior to taking the cassettes into the clean preparation area.

4.1.2 Within a safety hood, carefully open the cassette and verify if there is any loose material in the cassette or adhering to the cowl. **If this is an air sample and there is no visible loose material present, proceed to Step 4.1.6.**

4.1.3 Any loose material that is present in the cassette should be poured into a disposable 50 ml glass beaker or similar container.

4.1.4 Using freshly cleaned forceps, remove the sample collection filter from the sampling cassette and place it in the same disposable 50 ml glass beaker or similar container with the side containing the sample facing down.

4.1.5 Using a 50/50 alcohol/particle-free water solution, rinse any material adhering to the cowl into a new 25 mm diameter disposable filtration funnels. If the filtration unit does not come pre-assembled with the necessary components (e.g. contains a glass fiber filter instead of the required MCE filter), it will be necessary to disassemble the stock cassette as it comes from Whatman and discard the glass-fiber filter. Rinse the filter unit thoroughly with particle free water and reassemble the filter unit using a cellulose support pad (Pall 66238), a 5.0µm pore size MCE diffuser filter (Enviropore FILA500A025A), and a 0.2 µm pore size MCE final filter (Enviropore FILA020A025A). Apply vacuum. When all solution has passed through, rinse sides of filter funnel with a stream of particle free water to dislodge any particulate that might be adhering to the sides of the filter funnel. Once filtration is complete turn off vacuum, remove filter from unit and dry. Once the filter is dry, place it in the container with the original filter and **proceed to Step 4.1.8**.

4.1.6 Using freshly cleaned forceps, remove the sample collection filter from the sampling cassette and place it on a clean glass microscope slide that will be used as a cutting surface. Using a freshly cleaned curved scalpel blade, cut off ½ of the filter (estimate the ½ as precisely as possible as this affects the final concentration) with a rocking motion.

4.1.7 Place the remaining portion of the original filter in archive. (Note: In cases where an initial direct preparation of an air sample was attempted and found to be overloaded, this archive portion will be approximately ¼ of the original filter.) Place ½ of the primary filter

in a clean, single use disposable glass container with the side containing the sample facing down.

4.1.8 Cover the container with aluminum foil, forming a tight seal around the mouth.

4.1.9 Perforate the foil in 15-20 places with a syringe needle to allow for gas exchange during plasma ashing.

4.1.10 Place the sample container in the plasma asher chamber. Depending on the size of the plasma asher chamber, several samples may be ashed simultaneously.

4.1.11 Operate the plasma asher using the minimum power at which a glow-discharge is observed, until the filter appears to be completely ashed. Loss of particulate and fibers from the container will occur if the plasma asher is operated at excessive radio-frequency power. During ashing of mixed cellulose ester (MCE) filters, a critical point is reached during the oxidation at which a sudden, violent ignition may occur if the radio-frequency power is excessive. This may result in a loss of fibers from the container, contamination of the interior of the chamber, and possible cross-contamination of the samples. For this reason, ashing of the blank should be observed closely during the early stages of oxidation, in order to ensure that the radio-frequency power setting is such that sudden ignition does not occur.

4.1.12 After 100% ashing is complete based on visual observation, increase the plasma asher power to maximum and ash for a period of one additional hour.

4.1.13
While final ashing is in progress, set up the filtration system to be used. In order to minimize the chances of contamination, only 25 mm diameter disposable filtration funnels shall be used. If the filtration unit does not come pre-assembled with the necessary components (e.g. contains a glass fiber filter instead of the required MCE filter), it will be necessary to disassemble the stock cassette as it comes from Whatman and discard the glass-fiber filter. Rinse the filter unit thoroughly with particle free water and reassemble the filter unit using a cellulose support pad (Pall 66238), a 5.0µm pore size MCE diffuser filter (Enviropore FILA500A025A), and a 0.2 µm pore size MCE final filter (Enviropore FILA020A025A). Filter as usual, using restraint with the amount of vacuum applied to avoid uneven loading. Add 20 ml of particle-free water to the filtration apparatus prior to applying vacuum and introduction of the sample suspension. When seating the filters in the filtration unit, it is essential that the vacuum be evenly applied to help ensure an even distribution of particulate on the filter. There should be no air bubbles or surface abnormalities anywhere in the filter assemblage. This is accomplished through wetting each successive filter as it is placed in the filtration unit and applying a light vacuum. This will ensure that the filters are flat and that there are no air bubbles.

4.1.14 After ashing is complete, admit air slowly to the chamber and remove the samples from the plasma asher chamber and place back into a safety hood.

4.1.15 Remove the aluminum foil from the top of the sample container.

4.1.16 Using particle free water in a squirt bottle, carefully rinse the ashed residue from the ashing container into a clean disposable sample container of at least 100 ml with a watertight lid, such as a sealed specimen cup. Rinse the residue into the 100 ml container to an initial volume of approximately 90 ml. Adjust pH to approximately 3-4 using a 10% solution of glacial acetic acid, and checking with pH paper. Bring the final volume to 100 ml and cap tightly.

4.1.17 Briefly hand shake (3 seconds) the capped container containing the sample suspension.

4.1.18 Place the container in a calibrated tabletop ultrasonic bath and sonicate at 50 - 100 nW/ml for three minutes. The liquid level in the bath should be ½ to ¾ the height of the sample containers. Wipe the outside of the sample containers dry when removing them from the bath.

4.1.19 After sonication, lightly hand shake the suspension for 3 seconds, and allow it to stand undisturbed for 2 minutes to allow large particles to settle to the bottom or float to the top.

4.1.20 For each sample, prepare three secondary filters by applying volumes of 50 ml, 25 ml, and 10 ml. For air samples where the direct preparation proves to be overloaded, it is acceptable to filter aliquot volumes other than the usual 10 ml, 25 ml, and 50 ml series, either a greater or lesser volume, in order to produce a sample with the highest possible f-factor without violating the overload criteria. Draw each aliquot to be filtered with the same pipette and dispense into the appropriate filter funnel. Avoid pipetting any large settled or floating particles. Apply vacuum to the filtration apparatus to draw each volume through the filter. For samples where the 10 ml aliquot filter is obviously overloaded and a secondary dilution will be required (see 4.1.21), it is not necessary to attempt to filter the 25 ml and 50 ml aliquots through 25 mm filter units.

4.1.21 If a preliminary observation of the 10 ml secondary filter appears overloaded take 10 ml of the remaining volume and dilute to 100 ml. From this secondary dilution, prepare a second series of filters using 50 ml, 25 ml, and 10 ml (corresponding to 5 ml, 2.5 ml, and 1 ml of the original suspension). Based on the original 10 ml aliquot filter loading, it is acceptable to filter aliquot volumes other than the usual 10 ml, 25 ml, and 50 ml series in order to produce a sample with the highest possible f-factor without violating the overload criteria. In some instances, it may be necessary to perform a tertiary serial dilution, taking 10 ml of the secondary dilution, adding it to 90 ml of particle free water, and filtering another series of aliquots of 10 ml, 25 ml, and 50 ml.

4.1.22 Disassemble the filtration units. Carefully remove the filters from the filtration apparatus using fine forceps, being careful to only touch the inactive rim of the filter that has not been exposed to the sample. Place each filter in a labeled petri dish or other similar container, active side up and dry.

4.1.23 Select the secondary filter from the dilution series yielding the largest possible f-factor (highest possible volume) which does not violate the criteria for an overloaded sample. Experience has shown that a light staining of the filter will yield a suitable preparation for analysis.

4.1.24 Perform a standard TEM sample preparation procedure.

4.1.25 If TEM examination of the lowest volume aliquot filtered is deemed overloaded (>25% particulate), consult with the Libby laboratory coordinator (CDM) to select the most appropriate next step.

4.1.26 Carefully label and place each of the unused secondary filters and the remaining portion of the selected secondary filter in archive.

4.1.27 Place any remaining sample solution in a graduated cylinder or pipet. The largest known quantity of the remaining solution should be filtered through a 25 mm disposable filtration unit with a $\leq$ 0.22 µm/5.0 µm pore size MCE filter set in conjunction with a cellulose support pad and dried after removal from the filtration unit. A larger diameter (e.g. 47 mm) filtration unit with the same filter configuration may be used as needed to avoid situations where a 25 mm diameter filter may become obstructed with material. The dried filter shall be placed in an appropriate container, and labeled with the sample number, filter type, and volume applied to the filter. This filter will then be archived with the other archived filters from the sample.

4.1.28 Discard the remaining portion of the sample solution using standard laboratory protocols.

4.2 PROCEDURE 2: Indirect Preparation without Ashing

This procedure should be followed for air and dust samples where LB-000053 or the chain of custody form indicates that ashing should not be performed. For the purpose of the Libby Superfund Site, samples are defined as overloaded if there is >25% obscuration on the majority of the grid openings.

If there is no loose material present in the air cassette or adhering to the cowl, this procedure is generally similar to the indirect preparation method specified in ASTM D-5755, but has been modified to allow for an archive of the original filter.

If there is loose material present in the air cassette or adhering to the cowl, or if the sample is a dust sample, a portion of the original filter is not retained for archive, since it is assumed that there will be uneven loading on the filter. Because of this, an archived portion of the original filter is unlikely to be representative. In this case, the indirect preparation procedure is equivalent to the method specified in ASTM D-5755.

4.2.1 Carefully wet-wipe the exterior of the cassettes to remove any possible contamination prior to taking the cassettes into the clean preparation area.

4.2.2 Carefully open the cassette and verify if there is any loose material in the cassette or adhering to the cowl. **If this is an air sample and there is no visible loose material present, proceed to Step 4.2.5**.

4.2.3 Using a 50/50 alcohol/particle-free water solution, rinse any material adhering to the cowl down onto the sample collection filter (still inside the sampling cassette).

4.2.4 Using freshly cleaned forceps, remove the sample collection filter from the sampling cassette and place it into a clean disposable sample container of at least 100 ml with a watertight lid, such as a sealed specimen cup. **Proceed to Step 4.2.7**.

4.2.5 Using freshly cleaned forceps, remove the sample collection filter from the sampling cassette and place it on a clean glass microscope slide that will be used as a cutting surface. Using a freshly cleaned curved scalpel blade, cut off ½ of the filter (estimate the ½ as precisely as possible as this affects the final concentration) with a rocking motion.

4.2.6 Place the remaining portion of the original filter in archive. (Note: In cases where an initial direct preparation of an air sample was attempted and found to be overloaded, this archive portion will be approximately ¼ of the original filter.) Place ½ of the primary filter in a clean disposable sample container of at least 100 ml with a watertight lid, such as a sealed specimen cup.

4.2.7 Bring the total volume of the suspension up to approximately 90 ml using particle-free water only.

4.2.8 Adjust the suspension to a pH of 3-4 using a 10 % solution of acetic acid. Use pH paper to test.

4.2.9 Bring the total volume up to 100 ml using particle-free water and cap tightly.

4.2.10 Set up the filtration system to be used. In order to minimize the chances of contamination, only 25 mm disposable filtration funnels (such as Whatman cat. #:1922-1820) shall be used. If the filtration unit does not come pre-assembled with the necessary components (e.g. contains a glass fiber filter instead of the required MCE filter), it will be necessary to disassemble the stock cassette as it comes from Whatman and discard the glass-fiber filter. Rinse the filter unit thoroughly with particle free water and reassemble the filter unit using a cellulose support pad (Pall 66238), a 5.0µm pore size MCE diffuser filter (Enviropore FILA500A025A), and a 0.2 µm pore size MCE final filter (Enviropore FILA020A025A). Filter as usual, using restraint with the amount of vacuum applied to avoid uneven loading. Add 20 ml of particle-free water to the filtration apparatus, prior to applying vacuum and introduction of the sample suspension. When seating the filters in the filtration unit, it is essential that the vacuum be evenly applied resulting in even distribution. There should be no air bubbles or surface abnormalities anywhere in the filter assemblage. This is accomplished through wetting each successive filter as it is placed in the filtration unit and

applying a light vacuum. This will assure that the filters are flat and that there are no air bubbles. Ensure that suspension is filtered within 24 hours to avoid problems associated with bacterial and fungal growth.

4.2.11 Briefly hand shake (3 seconds) the capped container containing the sample suspension.

4.2.12 Place the container in a calibrated tabletop ultrasonic bath and sonicate at 50 - 100 nW/ml for three minutes.

4.2.13 After sonication, lightly hand shake the suspension for 3 seconds, and allow it to stand undisturbed for 2 minutes to allow large particles to settle to the bottom or float to the top.

4.2.14 For each sample, prepare three secondary filters by drawing aliquots of 50 ml, 25 ml, and 10 ml. For air samples where the direct preparation is overloaded, it is acceptable to filter aliquot volumes other than the usual 10 ml, 25 ml, and 50 ml series (either greater or lesser volumes) in order to produce a sample with the highest possible f-factor without violating the overload criteria. Draw each aliquot to be filtered with the same pipette and dispense into the appropriate filter funnel. Avoid pipetting any large settled or floating particles. Apply vacuum to the filtration apparatus to draw each volume through the filter. For samples where the 10 ml aliquot filter is obviously overloaded and a secondary dilution will be required (see 4.2.15), it is not necessary to attempt to filter the 25 ml and 50 ml aliquots through 25 mm filter units.

4.2.15 If a preliminary observation of the 10 ml secondary filter appears overloaded take 10 ml of the remaining volume and dilute to 100 ml. From this secondary dilution, prepare a second series of filters using 50 ml, 25 ml, and 10 ml (corresponding to 5 ml, 2.5 ml, and 1 ml of the original suspension). Based on the original 10 ml aliquot filter loading, it is acceptable to filter aliquot volumes other than the usual 10 ml, 25 ml, and 50 ml series (either greater or lesser volumes) in order to produce a sample with the highest possible f-factor without violating the overload criteria. In some instances, it may be necessary to perform a tertiary serial dilution, taking 10 ml of the secondary dilution, adding it to 90 ml of particle free water, and filtering another series of aliquots of 10 ml, 25 ml, and 50 ml.

4.2.16 Disassemble the filtration unit. Carefully remove the filter from the filtration apparatus using fine forceps, being careful to only touch the inactive rim of the filter that has not been exposed to the sample. Place the filter in a labeled petri dish or other similar container, active side up and dry.

4.2.17 Select the secondary filter from the dilution yielding the largest possible f-factor (highest volume) which does not violate the criteria for an overloaded sample. Experience has shown that a light staining of the filter will yield a suitable preparation for analysis.

4.2.18 Perform a standard TEM sample preparation procedure.

4.2.19 If TEM examination of the lowest volume aliquot filtered is deemed overloaded, consult with the Libby laboratory coordinator (CDM) to select the most appropriate next step.

4.2.20 Place each of the unused secondary filters and the remaining portion of the selected secondary filter in archive.

4.2.21 Place any remaining sample solution in a graduated cylinder or pipet and add to a prepared 25 mm filtration unit containing a $\leq$ 0.22 µm/5.0 µm pore size filter set with a cellulose support pad in a disposable filtration unit with a small volume of particle free water to facilitate the production of a homogeneous solution and record the volume of sample solution added. A larger diameter (e.g. 47 mm) filtration unit with the same filter configuration may be used as needed to avoid situations where a 25 mm diameter filter may become obstructed with material. Add 10 ml particle free water to the sample container containing the residual filter and sonicate for three minutes. Add this solution to the filtration unit for the corresponding filtration unit for each sample as described in the first part of this paragraph. Do not include this 10 ml in the volume calculation of the sample solution added. This solution should then be filtered through the filtration unit and dried after removal from the filtration unit. The dried filter shall be placed an appropriate container, and labeled with the sample number, filter type, and volume applied to the filter. This filter will then be archived with the other archived filters from the sample.

4.2.22 Discard the remaining portion of the sample solution using standard laboratory protocols.

5.0 DOCUMENTATION AND ARCHIVE STORAGE

Project-specific Index IDs are recorded on all air samples. During each indirect preparation step, this Index ID is noted on the sample-specific beakers, containers, and filtration units.

In those cases where no loose material is present in the cassette or adhering to the cowl, the remaining portion of the original primary filter is placed in a suitable container and clearly labeled with the sample number and indicated that it is the original primary filter. In those cases where secondary or tertiary filters are prepared, all filters or remnants of filters will be archived into suitable containers, and clearly labeled with the sample number and the volume of the aliquot applied to each filter.

Analysis-specific details about the indirect preparation will be recorded in the sample TEM electronic data deliverable (EDD) spreadsheet. In the TEM EDD, if the sample is prepared using Procedure 1 (see Section 4.1) the preparation method should be identified as “IA – Indirect, ashed” and the appropriate inputs should be recorded in the fields provided. If the sample is prepared using Procedure 2 (see Section 4.2), the preparation method should be identified as “I – Indirect” and the appropriate inputs should be recorded in the fields provided. The spreadsheet is designed to automatically calculate the dilution factor, or f-factor, which is used in the calculation the sample air or dust concentration.

6.0 QUALITY ASSURANCE

All quality control sample results will be monitored for potential contamination. If sample results indicate cross-contamination, the laboratory will identify the affected samples and notify the USEPA Regional Chemist and project laboratory coordinator (CDM). Laboratory procedures will be re-assessed and appropriate changes will be made and documented accordingly by the project laboratory coordinator.

6.1 Lot Blanks

All cassettes utilized in the Libby project are screened for contamination by either TEM analysis or a combination of TEM and PCM analysis. One lot blank is prepared and analyzed from each carton of cassettes prior to using the lot of cassettes for sampling. The entire carton of cassettes will be rejected if any asbestos fiber is detected on the lot blank.

6.2 Filter blanks

Prior to filtration of the sample aliquot, 100ml particle-free water should be filtered. Acceptance criteria for filter blanks are as specified for laboratory blanks in the latest version of laboratory modification of LB-000029.

6.3 Plasma asher blanks

To ensure that contamination is not introduced during the ashing process, a container with an unused filter should be run as a blank with each batch of samples ashed. This sample will be prepared using the standard TEM sample preparation procedure and examined as per the established QC sequence. Acceptance criteria for plasma asher blanks are as specified for laboratory blanks in the latest version of laboratory modification of LB-000029.

7.0 DECONTAMINATION

All non-disposable equipment used during sample preparation must be decontaminated prior to use. Because the prescribed filtration units used to prepare the secondary filters are disposable, decontamination of filtration units is not required.

8.0 GLOSSARY

EDD - Electronic Data Deliverable. A Libby-specific spreadsheet designed to capture the detailed analysis and raw structure data generated during a TEM analysis. Contact the project laboratory coordinator (CDM) for the current TEM spreadsheet version.

HEPA - High Efficiency Particulate Air

MCE - Mixed Cellulose Ester

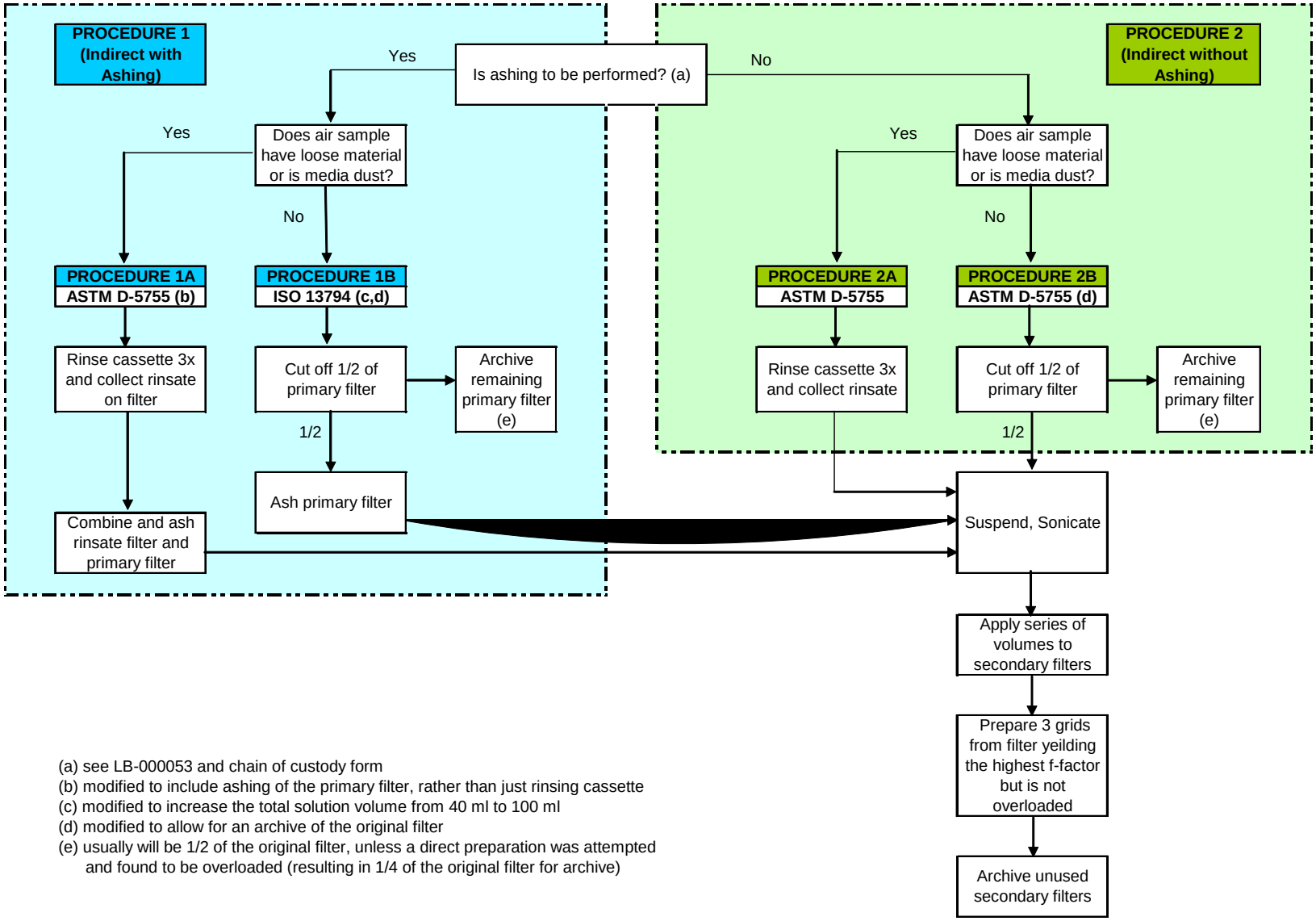
TEM - Transmission Electron Microscopy

9.0 REFERENCES

ISO 13794. Ambient air - Determination of asbestos fibres - Indirect-transfer transmission electron microscopy method. International Organization for Standardization (ISO) 13794:1999. November 15, 1999.

ASTM D-5755. Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Surface Loading. ASTM D 5755-03. October 2003.

FIGURE 1. INDIRECT PREPARATION OF OVERLOADED AIR SAMPLES AND DUST SAMPLES FOR TEM ANALYSIS



(a) see LB-000053 and chain of custody form
(b) modified to include ashing of the primary filter, rather than just rinsing cassette
(c) modified to increase the total solution volume from 40 ml to 100 ml
(d) modified to allow for an archive of the original filter
(e) usually will be 1/2 of the original filter, unless a direct preparation was attempted and found to be overloaded (resulting in 1/4 of the original filter for archive)

FIELD MODIFICATION APPROVAL FORM
LFM-OU3-04
Libby OU3 Phase 4A Sampling & Analysis Plan

Requested by: Bonnie Lavelle, EPA Remedial Project Manager Date: 10/1/10

Description of Deviation: This field modification changes the number of personal breathing zone samples and perimeter samples in ABS Script 4, specifies the target pump flow rates, and clarifies details of the script. Modifications are based on results of pilot testing performed on September 15, 2010.

- Replace "Libby Superfund Site Operable Unit 3, Phase IV Sampling and Analysis Plan, Attachment A, Activity Based Sampling (ABS) Scripts" with the attached Revision 2 (Attachment 1).
- ABS Script 4b, Stationary Monitors (including perimeter monitors, downwind monitors, fixed-base monitors, and post-fire monitoring), shall be performed in accordance with SOP EPA-LIBBY-01, Revision #1, dated March 2001, "Standard Operating Procedure for the Sampling of Asbestos Fibers in Air" (Attachment 2)
- Field data for stationary monitors shall be recorded on "Libby OU3 Field Sample Data Sheet (FSDS), Smoke Monitoring Stationary A Monitor (Attachment 3)

☒ EPA Region 8 has reviewed this field modification and approves as proposed.

☐ EPA Region 8 has reviewed this field modification and approves with the following exceptions:

☐ EPA Region 8 has reviewed this field modification and does not agree with the proposed approach for the following reasons:

Bonita Lavelle, EPA RPM

Date 10/5/10

LIBBY SUPERFUND SITE OPERABLE UNIT 3
PHASE IV SAMPLING AND ANALYSIS PLAN

ATTACHMENT A
Revision 2

ACTIVITY BASED SAMPLING (ABS) SCRIPTS

This Attachment describes the activities to be performed by individuals performing each of the ABS scenarios described in the Phase IV-A Sampling and Analysis Plan (SAP). Details on the number, location, and timing of ABS sampling events are provided in the Phase IV-A SAP.

SCRIPT 1: RECREATIONAL VISITORS ALONG LOWER RAINY CREEK

Recreational visitors along lower Rainy Creek (between Highway 37 and the W.R. Grace property line) may engage in activities such as hiking and antler hunting that could disturb LA in source material (soil, dried stream-side sediment, and duff). The following script will be used to simulate exposures during activities that are considered to be representative of recreational visitors along lower Rainy Creek south of the W.R. Grace property boundary.

For this scenario, Rainy Creek south of the W.R.Grace property boundary will be evaluated as a single ABS study area. ABS sampling will be performed by a team of two individual samplers. Three pumps will be worn by each sampler. Target flow rate for the first pump is 1 liters per minute (LPM), the target flow rate for the second pump is 2 LPM, and the target flow rate for the third pump is 4 LPM.

The team of two samplers will walk from the security gate on Rainy Creek Road to Rainy Creek. Once at Rainy Creek, the two samplers will turn on their sampling pumps. This will be time = 0. Both individuals will then begin to walk up along the banks of the creek, disturbing bushes and other vegetation as needed to move along the bank of the creek. Activities will include the samplers using their hands to push aside ground vegetation to simulate hunting for antlers. To the extent possible, the samplers will cross back and forth across the creek several times so that the ABS activities represent exposures to disturbed sediments and brush on both sides of Rainy Creek.

After 30 minutes moving up the drainage, the two samplers will change positions so that the sampler originally in the lead will be in the following position. The team will them make their way back down the drainage toward the starting point. After 30 more minutes (for a total of 60 minutes), the ABS event ends and the air sampling pumps are turned off and the air sampling cassettes are capped.

SCRIPT 2: RESIDENTIAL WOOD HARVESTER

Residents of Libby may harvest firewood within the OU3 study area for personal use as a heating source. Individuals harvesting wood within the OU3 study area may be exposed to LA fibers released from duff and/or soil when disturbed during walking in the woods to the selected trees, from tree bark when cutting down trees and sawing them into manageable size, and from tree bark and/or soil and/or duff when disturbed during hauling the wood to a truck or other vehicle. The following script will be used to simulate residential (non-commercial) wood harvesting activities.

Two individual samplers will perform each residential wood harvesting ABS event. Three pumps will be worn by each sampler. Target flow rate for the first pump is 1 liters per minute (LPM), the target flow rate for the second pump is 2 LPM, and the target flow rate for the third pump is 4 LPM.

For each ABS event at each location, each individual sampler will collect 1 sample to represent exposures that occur while driving to and from the location, and 2 additional samples during the harvesting (felling the tree, cutting it into manageable firewood sizes, stacking into the back of a pickup truck, and cleaning up the area). The scenario is performed in three steps, as follows:

1. Driving to the ABS Area (Script 2a, part 1)
The individual samplers shall initiate the event by entering a pickup truck located in the Flyway, turning on their air monitoring pumps, and riding to the location of trees to be harvested (identified by the US Forest Service) in the truck with the windows open. Once arriving at the tree harvesting location, the truck will be parked along the US Forest Service road, the air monitoring pumps will be turned off and the air sampling cassettes will be capped and set aside until they are re-activated during the drive away from the ABS area.

2. Felling, Limbing, Cutting and Stacking (Script 2b)
The wood harvesting scenario is begun by each individual exiting the pickup truck, attaching new filter cassettes to the low volume and the high volume pumps, and turning the pumps on.

During each ABS event at each designated location, the samplers will harvest one tree identified by the US Forest Service. The samplers shall hike to the tree and one of the samplers will fell the tree and remove branches using a chainsaw. The second individual will haul the cut branches and place them in a pile nearby and perform clean up. The duration of this activity will vary depending on the size of the tree and the distance from the road, but is expected to average approximately 20 minutes. After felling the tree and

removing the branches, if necessary, the samplers shall attach the cut tree to a cable and haul it to the road near the vehicle. Then one sampler will cut the felled tree into pieces of appropriate size for use in wood burning stoves (usually about 16-24 inches in length) and the other sampler will haul the firewood back to the bed of the truck. After 15 minutes, the samplers will reverse roles and continue for another 15 minutes. The total duration for this activity is 50 minutes.

In order to help minimize the chances of generating overloaded filters, the exposures associated with the wood harvesting activities described above may be captured on two sequential cassettes. The optimal break point between the two sequential cassettes will be between felling/limbing and cutting/stacking. In other words, the first wood harvesting sample would include hiking to the tree, felling, limbing, and hauling to the road, and the second wood harvesting sample would include cutting and stacking.

All individuals who perform this activity must be properly trained in the safe use of gasoline powered saws and in safe procedures for felling trees.

After 50 minutes of cutting and hauling wood to the truck, the harvesting scenario is ended. Each individual shall turn off their pumps and remove and cap the cassettes. The area shall be further cleaned up as necessary after sampling has ended.

3. Driving from the ABS Area (Script 2a, part 2)
After removing the cassettes used for wood harvesting, each individual shall re-attach the same cassettes as were used during the truck ride to the area. The pumps will then be re-activated, and the pickup truck shall be driven back to the Flyway (windows open). Once at the Flyway, the driving scenario is ended and the pumps will be turned off and each cassette removed and capped.

At the Flyway, the wood shall be off-loaded from the truck and placed into a pile for potential future use in burning[1]. The wind direction and speed at the sampling location should also be monitored.

SCRIPT 3: US FOREST SERVICE WORKER

U.S. Forest Service workers within the OU3 study area may be exposed to LA fibers during a variety of activities. These include activities routinely performed as part of the Forest Service's land management responsibilities such as maintenance of roads and trails, thinning of trees and vegetation, and surveying trees (stand exam). In addition to routine land management activities, US Forest Service personnel respond to forest fires in the Kootenai National Forest. Fire

[1] The potential risks associated with burning wood collected from OU3 will be evaluated as part of the OU4 risk assessment, and will not be included in OU3.

fighting activities include those associated with initial ground attack, aerial attack, and sustained ground attack.

For the purposes of the Phase IV ABS investigation, the following scripts will be used to simulate a range of activities that are considered to be representative. ABS sampling will be performed by a team of two samplers except where noted. Three pumps will be worn by each sampler. Target flow rate for the first pump is 1 liters per minute (LPM), the target flow rate for the second pump is 2 LPM, and the target flow rate for the third pump is 4 LPM.

Script 3a. Trail Maintenance

Trail maintenance consists mainly of clearing vegetation from the trail. Samplers will travel to the designated ABS locations and park on the roadway. Samplers will exit the vehicle and hike to the designated trail location. Once at the designated trail, samplers will turn on the air sampling pumps. One sampler will use a saw head trimmer to clear trees and brush to a width of about 1-2 feet, and to a height of about 8 feet. The second individual will haul the cut vegetation off the trail. After 15 minutes, the two individuals shall reverse roles. After 30 minutes, the ABS activity is ended, and both individuals shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3b. Tree Thinning

Tree thinning consists of cutting small trees (2-4 inches in diameter) and hauling the wood into a "slash" pile. This activity will be performed for a period of 30 minutes. One individual will cut for 15 minutes, while the second individual hauls wood to a pile. After 15 minutes, the roles are reversed. After 30 minutes, the ABS activity is ended, and both individuals shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3c. Stand Examination

Stand examination consists of obtaining measurements of the girth and height of trees in a stand, and collecting borings from the trees to determine age. Both samplers will perform or simulate all of these activities. Measurement of tree diameter will be performed by passing a measuring tape around the tree at a height of about 1 meter. Measurement of tree height (typically done using a clinometer to measure the angle from a reference point to the top of the tree) will be simulated by walking to a reference point about 10-15 meters from the tree, and looking up to observe the top of the tree (actual measurement of the angle with a clinometers is not required). Collection of a core using an increment borer is described in SOP Tree-Libby-OU3 (see Attachment B). This scenario will be performed by both samplers for a period of 30 minutes. After 30 minutes, the ABS activity is ended, and both individuals shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3d. Cutting a Fireline by Hand

Cutting a fireline by hand consists of establishing a fuel break 18 inches wide by removing as much combustible material as possible. This task requires initial removal of trees and brush using a chainsaw. Then a Pulaski tool or other similar device is used to scrape away all combustible material down to mineral soil to establish a line about approximately 18 inches wide. During an initial attack of a forest fire, these activities are typically done by a crew of 4-6 fire fighters. For the ABS scenario, 2 samplers will participate. This activity will be performed for a period of 30 minutes. The 2 samplers will work approximately 10 feet apart. After 15 minutes, the relative positions of the 2 samplers will be reversed. After 30 minutes, the ABS activity is ended, and both samplers shall turn off their air sampling pumps and cap their sampling cassettes.

Script 3e. Cutting a Fireline with Heavy Equipment

Cutting a fireline with heavy equipment involves using a dozer or tractor plow to remove vegetation and all combustible material down to mineral soil within a line as wide as the dozer or tractor blade. This activity is typically done by a crew consisting of one dozer boss and a crew of several fire fighters. For the ABS scenario, 2 samplers will participate. One sampler will act as the dozer boss and will operate the dozer or tractor plow to cut the fireline. The other sampler will perform activities to simulate a firefighter. The second sampler shall be no closer than 100 feet from the heavy equipment and will pick up and discard excavated combustible material from inside the fireline to outside the fireline. This activity will be performed for a period of 30 minutes. After 30 minutes, both samplers shall turn off their air sampling pumps and cap their sampling cassettes. The dozer/tractor plow operator will then pull back the excavated lines to clean up the area.

SCRIPT 4: EXPOSURE OF GROUND-BASED FIREFIGHTERS TO SMOKE

U.S. Forest Service workers who fight fires on the ground within the OU3 study area may be exposed to LA in air released by burning of contaminated duff and trees. This “smoke” exposure pathway will be evaluated after the results from Scripts 3d and 3e are available and have been evaluated.

The objective of this activity is to measure LA levels in smoke released from high-intensity fires in order to characterize exposures associated with initial attack fire fighting activities. This will be achieved by burning two large slash piles that presently exist in OU3 on W. R Grace-owned property, and during the burning, collecting air samples near the fire and in the predominantly downwind direction. All such simulated wildfire burns in OU3 will be performed in accord with all requirements and recommendations of the U.S. Forest Service for conducting controlled burns. It’s expected that each burn will take no more than 2 hours for ignition and collection of

air samples. After the required air samples have been collected, based on the judgment of the field sampling crew, each fire will either be extinguished or allowed to burn out if that is determined to be the safest option. The slash piles will then be monitored as necessary to ensure that re-ignition does not occur.

On the day(s) selected for the burns, one slash pile will be burned in the morning and, if it can be done safely, the second fire will be burned in the afternoon to capture varying meteorological conditions. If the second slash pile can't be performed on the same day due to safety concerns, it will be performed during the afternoon of the following day.

In order to minimize the additive smoke impacts from the first slash pile burn on the second slash pile burn, the slash pile located in the downwind direction will be ignited and monitored first.

Script 4a. Personal ABS Samples

Two samplers will wear personal air monitors during each simulated wildfire. One pump will be worn by each sampler. Target flow rate for the pump is 4 liters per minute (LPM). The pumps will not be activated until the fire is generating significant levels of smoke. When smoke generation is significant, the pumps will be activated and each individual wearing a monitor will move about the area of the controlled burn, including time in the cross-wind and down-wind directions. The primary purpose is to capture exposures related to smoke release rather than soil or duff disturbance and to characterize exposures representative of initial attack fire fighting activities. After 30 minutes, both samplers shall turn off their air sampling pump and remove and cap their sampling cassette. Immediately thereafter, both samplers shall connect a new cassette to the pump, and collect a second 30-minute sample, as above. If conditions allow, a third 30-minute sample will be collected following the second round.

Samplers will also wear thermometers to monitor temperatures during the sample collection events. Samplers will move no closer to the fire than the distance where the temperature is at or below 120° F.

Script 4b. Stationary Monitors

A number of stationary monitors will also be used to collect air samples during and after the burn events. These stationary monitors will be mounted on a tripod, rebar or other device to collect samples at a height of approximately 5 feet from the ground.

Perimeter Monitors

Four stationary monitors will be installed around the perimeter of each simulated wildfire. These will be positioned approximately 90° apart, with one station being located in the predominant

downwind direction at the time the fire is initiated. Each perimeter monitor should be sufficiently distant from the fire that the temperature is at or below 120° F.
The perimeter monitors will be activated when the fire is generating significant levels of smoke. Once the pumps are activated, each sample will be collected for a period of 30 minutes. The target flow rate for the pump is 4 LPM. After 30 minutes, the stationary pumps will be turned off and the sampling cassettes capped.

Downwind Monitors

In addition to the four perimeter monitors, two additional monitors will be placed in the general down-wind direction from the fire. The distance from the fire will be determined by the field crews, based on observations of the smoke. To the extent possible, the monitors will be positioned to capture smoke coming to the ground. For each downwind monitor, the field crew will record the distance from the slash pile. These monitors will be operated at a flow rate of 4 L/min, and the sampling period will be 30 minutes.

Fixed-Base Monitors

During the time that the fire is burning, each of the three fixed-base contingency monitors described in Attachment D (See Section 4.1 of Attachment D) will also be activated. Samples shall be collected in accordance with the requirements described in Attachment D except that the target pump rates will be 5 +/- 0.5 LPM and the samples will be collected for a period of approximately 10 hours.

Post-Fire Monitoring

Following the fire, stationary air samples will be collected at locations near the fire for 2 additional days to determine if fibers remain in the air or are dispersed by the wind, or if continuing releases are occurring. Four stationary monitors will be installed around the perimeter of the area encompassing the 2 slash piles. These monitors will be positioned approximately 90° apart, with one station being located in the predominant downwind direction. On each day, two samples will be collected from each of the four perimeter monitors and from each of two downwind monitors. The locations of the two downwind monitors may be adjusted as needed, based on field observations of smoke emanation from the smoldering slash pile, or if there is no smoke, based on access to suitable monitoring areas. The downwind monitors should be placed at distances approximately 1/8 mile and ¼ mile from the area of the slash piles. Sample flow rates for all post-fire stationary air monitors will be approximately 4/L min, and sampling time will be approximately 1 hour. One sample set shall be collected during the morning (e.g., at approximately 10:00 AM) and the second set shall be collected during the afternoon (e.g., approximately 3:00 PM).

SCRIPT 5: EXPOSURE OF PILOTS TO SMOKE

Currently, within the Fire Suppression Restricted Zone (FSRZ) of the OU3 study area , U.S. Forest Service personnel fight forest fires by air, either in fixed wing aircraft or in helicopters that are used to drop water or fire retardant on burning areas. These individuals may be exposed to LA that has been released into the air by the fire.

In order to characterize the exposure of aircraft pilots during fire suppression flights, a stationary sampling pump will be installed in the cockpit of one or more aircraft deployed for fighting fires within the OU3 study area. The air sampling cassette will be positioned to sample cockpit air, but will be located in a position that does not interfere with the pilot's vision or ability to operate the aircraft.

Script 5a. Responding to Simulated Wildfires in OU3

On the day(s) when simulated wildfires are performed in OU3 (see Script 4), one aircraft shall fly over the simulated wildfire area after the smoke plume is well established, simulating a flight path that would be used to attack the fire. The pilot shall make at least 3 passes over the fire. Two such simulated aerial attacks shall be performed per simulated wildfire, resulting in 2 filters per wildfire (four total).

For each simulated attack, the air sampling pump will be turned on when the pilot is preparing for takeoff, and will be turned off when the pilot returns to base after completing at least 3 passes over the fire. For each sample collected, the time of the flight (from takeoff to landing) will be recorded, along with information on the location of the fire and the type of aircraft. Target flow rate for the pump is 4 LPM.

Script 5b. Responding to Authentic Wildfires in OU3

When an aerial response to an authentic wildfire in the exclusion zone of OU3 is called for, the USFS will notify Remedium. If the fire is generating significant smoke, Remedium will immediately send a person to the airfield to perform all necessary activities associated with calibrating and activating the pump and collecting the samples (as described above). It is understood that, in some cases, the pilot may be required to begin flights before this can be achieved. In this event, the pump will be activated during the first available time when the aircraft returns to base between trips to the fire.

SCRIPT 6: EXPOSURE OF AREA RESIDENTS TO SMOKE FROM FOREST FIRES

EPA (2009b) previously established a plan for collecting stationary air samples at three monitoring locations to evaluate exposures of residents in Libby in the event of a significant forest fire in the Fire Suppression Restricted Zone of OU3. This original "contingency air monitoring plan" has been revised to incorporate the addition of one mobile air monitoring station that will be placed in a downwind location from any authentic wildfire that generates

significant smoke in OU3. This revised "contingency air monitoring plan" is provided as Attachment D to this SAP.

In brief, when notified by the USFS of a fire in the exclusion zone of OU3 that is large enough to generate significant smoke, a designated point of contact who is a contractor to Remedium will activate stationary air sampling pumps previously deployed at three locations:

- CDM office building in Libby
- USFS Ranger station along Highway 37
- McGillivray Campground on the west shore of Lake Koocanusa.

Unless smoke levels are so high as to cause filter overloading, sampling duration for these samples will be 24 hours, changing to new filters every 24 hours until the fire is extinguished.

In addition to these three stationary monitors at fixed locations, a fourth monitoring station capable of collecting two independent samples (field duplicates) will be established in an accessible area downwind of the fire. The monitors will be transported to the collection site by truck. The sampling location and distance from the fire will depend on the conditions of the fire. Although details may vary, it is envisioned that the two monitors will be placed on a tripod in the back of the truck, which will be driven to the nearest accessible area that is being impacted by smoke from the fire. Once at the sampling location, the pumps shall be calibrated and the pumps turned on. The target flow rate for these samplers will be 4-6 LPM. Unless safety concerns dictate otherwise, this sampler shall be collected for duration of about 30 minutes. During sample collection, the coordinates of the monitor will be recorded. This information will be used later, in combination with data on the fire location, to establish the distance and direction of the monitor relative to the fire. The wind direction and speed at the sampling location should also be monitored.

NOTE: In all cases, it is critical that this sampling effort be performed in a way that does not endanger that health or safety of the sampling personnel. If conditions are considered to be potentially unsafe, the sampler should evacuate the area immediately.

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 8

STANDARD OPERATING PROCEDURE (SOP) FOR THE SAMPLING OF ASBESTOS FIBERS IN AIR

Prepared by: for W. Brattin (Author) Date: 3/8/01

Reviewed by: (Project Director) Date: 3/8/01

(Quality Assurance Coordinator) Date: 3/8/01

Approved by: for Paul Peronard (Project Manager) Date: 3/9/01

REVISION LOG

Revision Date	Reason for Revision
02/28/01	--
03/07/01	Further define pump calibration procedures.

PROCEDURAL SECTION

1.0 Scope and Applicability

This Standard Operating Procedure (SOP) provides a standardized method for sampling air to measure the concentration of asbestos fibers. This SOP is applicable to any type of asbestos fiber (amphibole, chrysotile) that may exist in air (either indoor or outdoor), and is applicable to both personal and ambient air (referred as stationary air throughout this SOP) sampling techniques. Filters collected in this way are suitable for examination by a variety of microscopic techniques, including TEM, PCM, and SEM.

2.0 Summary of Method

This SOP is based on air sampling techniques described in EPA SOP 2015, ISO 10312, OSHA Technical Manual, NIOSH 7400 and NIOSH 7402.

Air is drawn through a fine-pore filter in order to trap any suspended particulate matter in the air, including suspended asbestos fibers and other mineralogic materials. The filters are then examined using an appropriate microscopic technique to observe, characterize and quantify the number of asbestos fibers on the filter. The concentration of fibers in air is then calculated by dividing the total number of fibers on the filter by the volume of air drawn through the filter.

3.0 Health and Safety Warnings

Asbestos fibers are hazardous to human health when inhaled. Exposure to excessive levels may increase the risk of lung cancer, mesothelioma, and asbestosis. All personnel engaged in collection of air samples in areas where asbestos fibers may be present must have adequate health and safety training and must wear an appropriate level of personal protective equipment (PPE). Refer to the Health and Safety Plan for further details.

4.0 Cautions

None, refer to Section 3.0.

5.0 Interferences

High levels of dust or other suspended particulates may clog or overload the filter and reduce the ability to observe and characterize asbestos fibers on the filters. Precautions should be taken to avoid any unnecessary sources of dust emissions or use of aerosol sprays. Sampling conditions

(flow rate, sampling time) should be adjusted accordingly to avoid filter overload.

6.0 Personnel Qualifications

Field personnel engaged in collection of filter cassettes must be trained in the proper use and calibration of the air sampling equipment (as specified in this SOP), as well as proper methods for data recording and sample handling. Additionally, all field personnel must maintain appropriate and current training and/or certifications to meet all federal, state, and local regulations.

7.0 Apparatus and Equipment

Filter Cassettes

All samples will be collected on conductive filter holders consisting of 25-mm diameter, three piece filter cassettes having a 50-mm long electrically conductive extension cowl. The cassette shall be pre-loaded with a mixed cellulose ester (MCE) filter with pore size 0.8 um. Use of the 0.8 um pore size is recommended for all samples so that samples collected using a high volume pump are comparable to samples collected with a low volume pump. The 0.8 um pore size filters are used for samples collected with a low volume pump in order to decrease back-pressure and increase flow rate.

To reduce contamination and to hold the cassette tightly together, seal the crease between the cassette base and the cowl with a shrink band or adhesive tape. If particle deposition on the inside of the cowl is observed, it may be necessary to ground the cowl to reduce static charge. This is done by attaching one end of a length of flexible wire to the plastic cowl with a hose clamp and attaching the other end of the wire to a suitable ground (e.g., a cold water pipe).

Air Pumps

The sampling pump used shall provide a non-fluctuating airflow through the filter and shall maintain the initial flow rate within ± 10% throughout the sampling period.

A variety of different types of air pump may be used, depending on the flow rates that are required to achieve the data quality objectives and desired analytical sensitivity of the project. In general, the pump should be selected to deliver a flow rate that is as high as possible without overloading the filter with dust or fibers. The minimum flow rate is 0.5 L/min, and rates up to 10 L/min may be appropriate in some cases.

For stationary air monitors, a high volume pump that operates on AC power is recommended. For personal air sampling, either a portable high volume AC powered sampler or a low volume

battery-operated pump are acceptable, depending on whether the activities of the individual are impaired by the tethering imposed by the power cord needed for the high volume pump.

Tripod

For stationary air monitors, a tripod or other similar device is required to hold the filter cassette at a specified elevation above the floor. As noted below, this will typically be a height that represents the breathing zone (1.5-2 meters).

Spring Clips

For personal air monitors, the filter cassette is held in place using spring clips or other similar devices.

Rotameter

A rotameter that has been calibrated to a primary calibration source is required to calibrate the air flow rate at the start and the end of each sampling period. Due to its dependency on changes in atmospheric pressure, the rotameter must be calibrated to a primary calibration source at the site location (e.g., City of Libby) prior to sampling and re-calibrated on-site every week. Record calibration and re-calibration to the primary standard in the field logbook.

Primary Calibration Source

A bubble buret or other primary calibration standard may be used to calibrate the rotameter.

Sample Labels

A pre-printed sheet of sample labels (2 identical labels per sample number) is required. One label should be attached to the filter cassette before the sample collection period begins, and the matching label should be attached to the field data sheet that records relevant data on the sample being collected.

Field Log Book

A field log book is required to record relevant information regarding the collection of samples (location, time, unusual conditions or problems, etc.).

Field Data Sheet

A personal air or stationary air monitoring field data sheet (as appropriate) is required to record the relevant sampling information. Refer to the Phase 2 QAPP (EPA, March 2001) for the form.

8.0 Instrument Calibration

External calibration devices such as a bubble buret or a rotometer that have been calibrated to a primary calibration source may be used to calibrate air flow rate prior to air sampling. The flow rate must also be measured by the same method at the end of the sampling period.

8.1 Calibrating a Rotameter with an Electronic Calibrator (DryCal)

- See manufacturer's manual for operational instructions.
- To set up the calibration train, attach one end of the tygon tubing to the outlet plug of the rotameter; attach the other end of the tubing to the inlet plug on the pump. Another piece of tubing is attached from the inlet plug of the rotameter to the outlet plug on the DryCal.
- Rest or firmly stabilize the rotameter so that it is vertical (± 6°).
- Attach an isolating load with a pressure drop of about 10 to 20 inches of water column in series with a stable pump (a filter cassette of same lot number as will be used for field samples works well for this).
- Turn the DryCal and sampling pump on.
- Turn the flow adjust screw (or knob) on the pump until the desired flow rate is attained.
- Record the DryCal flow rate reading and the corresponding rotameter reading in the field logbook. The rotameter should be able to work within the desired flow range.
- Perform the calibration three times until the desired flow rate of ± 5% is attained. Once at the sampling location, a secondary calibrator (e.g., rotameter) may be used to calibrate sampling pumps.

8.2 Calibrating an Air Pump with a Rotameter

A rotameter can be used provided it has been precalibrated to a primary calibration source at the site location (e.g., City of Libby). Three separate constant flow calibration readings should be obtained both before sampling and after sampling. The mean value of these flow rate measurements shall be used to calculate the total air volume sampled.

Turn on the sampling pump and run for 5 minutes before performing calibration.

- Remove the end plugs on the filter cassette. A cassette, representative of the lot planned for use in air sampling, must be used.
- To set up the calibration train, attach one end of the tygon tubing to the cassette base; attach the other end of the tubing to the inlet plug on the pump. Another piece of tubing is attached from the cassette cap to the rotameter.

- Rest or firmly stabilize the flow meter so that it is vertical (± 6°).
- Turn the flow adjust screw (or knob) on the sampling pump until the center of the float ball on the rotameter meets the flow rate value specified in the project plan.

9.0 Sample Collection

Apply one of the pre-printed adhesive labels to the filter cassette and apply the other to the field data sheet for the sample.

Secure the filter cassette in the appropriate sampling location. For a fixed air monitor, this will generally be at a height that represents the breathing zone of the potentially exposed population (e.g., 1.5- 2 meters above the floor). For personal air monitoring, the cassette will typically be placed on the lapel just below the face of the individual being monitored. For personal air sampling for Scenarios 2 and 3 [Refer to Phase 2 QAPP (EPA March 2001)] , secure the cassette on the lapel of the dominant hand of the worker. The distance from the nose/mouth of the person to the cassette should be about 10 cm. Secure the cassette on the collar or lapel using spring clips or other similar devices. In all cases, orient the cassette so the open face of the cowel is pointing downward to avoid any particles entering the filter by precipitation. Remove the protective cap over the open face of the cowel and turn on the calibrated pump. Record the starting time, the initial flow rate, and all other relevant sample data on the field data sheet for the sample. Store covers and end plugs in a clean area (e.g., a closed bag or box) during the sampling period.

For sampling events lasting longer than 2 hours, in-field pump checks should be performed approximately every 2 hours. These periodic checks should include the following activities:

- Observe the sampling apparatus (filter cassette, pump, tripod, etc.) to determine whether it's been disturbed.

- Check the pump to ensure it is working properly and the flow rate is stable at the prescribed flow rate.

- Inspect the filter for overloading and particle deposition. Inspect the filter using a small flashlight. Look for particle adhesion or deposition on the side of the cassette and check the filter surface for accumulation of visible dust or smoke particles. If particle deposition on the inside of the cowl is observed, it may be necessary to ground the cowl to reduce static charge.

After the specified sampling period has elapsed, measure the ending flow rate and ending clock time on the data sheet. Turn off the pump and remove the cassette from the pump. Attach and secure a sample seal around each sample cassette in such a way as to assure that the end cap and

base plug cannot be removed without destroying the seal. Tape the ends of the seal together since the seal is not long enough to be wrapped end-to-end. Initial and date the seal.

10. Sample Handling and Preservation

Package the cassettes so they will not rattle during shipment nor be exposed to static electricity. Place custody seals, dated and marked with the packager's signature, onto the shipping container. Do not ship samples in polystyrene peanuts, vermiculite, paper shreds, or excelsior. Tape sample cassettes to sheet bubbles and place in a container that will cushion the samples in such a manner that they will not rattle. For additional shipping requirements, see the project plan.

Ship the sealed cassette to the analytical laboratory under proper chain of custody procedures. No preservation of the cassette is required.

QUALITY CONTROL and QUALITY ASSURANCE

Pre-Project Filter ("Lot") Blanks

Before samples are collected, two cassettes from each filter lot of 100 cassettes should be randomly selected and submitted for analysis. The lot blanks will be analyzed for asbestos fibers by the same method as will be used for field samples. The entire batch of cassettes should be rejected if any asbestos fiber is detected on any filter.

Field Blanks

Blank samples are used to determine if any contamination has occurred during sample handling. Prepare two blanks (from the sample lot used for field sampling) for the first 1 to 20 samples. For sets containing greater than 20 samples, prepare blanks as 10% of the samples. Filter blanks should be taken to a sampling location and prepared there. Remove the caps on the filter cassette and hold the cassette open for about 30 seconds. Close and seal the cassette as described in Section 9. Store blanks for shipment with the sample cassettes.

REFERENCES

NIOSH 7400

NIOSH 7402

ISO 10312

OSHA Technical Manual

EPA SOP 2015

LIBBY OU3 FIELD SAMPLE DATA SHEET (FSDS)
SMOKE MONITORING STATIONARY AIR MONITOR

Station ID: _____ Field Logbook No: _____ Page No: _____

Station Comments: _____

GPS Coordinate System: UTM Zone 11 North, NAD83 datum, meters

X coord: _____ Y coord: _____ Elevation: _____m

Data Item	Cassette 1	Cassette 2	Cassette 3	Cassette 4
Index ID	*[affix label here]*	*[affix label here]*	*[affix label here]*	*[affix label here]*
Field QC Type (circle one)	FS-(field sample) FB-(field blank)	FS-(field sample) FB-(field blank)	FS-(field sample) FB-(field blank)	FS-(field sample) FB-(field blank)
Pump ID Number				
Flow Meter ID Number				
Start Date (mm/dd/yy)				
Start Time (hh:mm)				
Start Flow (L/min)				
Stop Date (mm/dd/yy)				
Stop Time (hh:mm)				
Stop Flow (L/min)				
Pump fault? (circle one)	Yes No	Yes No	Yes No	Yes No
Sample Air Volume (L)				
Field Comments Cassette Lot Number: _____				

For Data Entry Completion (Provide Initials)	Completed by:	QC by:

TABBED PAGE

APPENDIX B

ABS AREA 2

ROUND 1

FSDS Rev6

Sheet No.: P4- 1 -

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 Sampling Date: 7-20-10 Sampling Team: MWH Field Logbook: #1 Pgs: 1-2

2a ACTIVITY: DRIVE FROM FLYWAY TO AREA 2 & RETURN

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00003	P4-00004	P4-00005

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00006	P4-00007	P4-00008

Cassette Lot Number: JDM ~~200~~ 19420 Field Blank ID: JDM ~~P4-00001~~ ~~P4-00002~~

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0910 / 0955	1625 / 1700	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0910 / 0955	1625 / 1700												

Person #1: 4.0 LPM Pump ID: #1 2.0 LPM Pump ID: #2 1.0 LPM Pump ID: #3 Rotameter ID: BIOS 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: #4 2.0 LPM Pump ID: #5 1.0 LPM Pump ID: #6 Rotameter ID: BIOS 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x ~~35~~ 45 / 80 Min. = 320 L

2L Ave. Flow Rate = 2.0 LPM x 80 Min. = 160 L

1L Ave. Flow Rate= 1.0 LPM x 80 Min. = 80 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = ~~80~~ 4 LPM x 80 Min. = 320 L

2L Ave. Flow Rate = ~~80~~ 2 LPM x 80 Min. = 160 L

1L Ave. Flow Rate= ~~80~~ 1 LPM x 80 Min. = 80 L

GPS Location: N 48.52541 W 115.30181 OF AREA #2 BASE (END OF TRIP)

Field Comments: ROUND-TRIP DRIVE FROM FLYWAY TO AREA #2 AND BACK TO FLYWAY

Primary/Rotameter Rate (LPM): Before: JDM ~~4.0~~ / End: / BIOS (SEE LOG BOOK)

Wind Direction: CALM Wind Speed: — MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDM	Field Entries Checked by:	JDM

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4-~~1~~ 2

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-20-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 3-4

ACTIVITY: 2b FELLING, LIMBING, CUTTING, STACKING

Person #1: JEREMY ~~SAWYER~~ SFB 8/3/10

(4.0 LPM) P4-00009 | (2.0 LPM) P4-00010 | (1.0 LPM) P4-00011

Person #2: BYRON

(4.0 LPM) P4-00012 | (2.0 LPM) P4-00013 | (1.0 LPM) P4-00014

Cassette Lot Number: 19420 **Field Blank ID:** ~~—~~

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1110	1200	4.0	4.0	2.0	2.1	1.0	1.0	4.0	4.0	2.0	2.1	1.0	1.0
Person #2	1110	1200												

Person #1: 4.0 LPM Pump ID: #1 2.0 LPM Pump ID: #2 1.0 LPM Pump ID: #3 Rotameter ID: BIOS 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: #4 2.0 LPM Pump ID: #5 1.0 LPM Pump ID: #6 Rotameter ID: BIOS 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 50 Min. = 200 L

2L Ave. Flow Rate = 2.05 LPM x 50 Min. = 1025 L

1L Ave. Flow Rate= 1.0 LPM x 50 Min. = 50 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 50 Min. = 200 L

2L Ave. Flow Rate = 2.05 LPM x 50 Min. = 1025 L

1L Ave. Flow Rate= 1.0 LPM x 50 Min. = 50 L

GPS Location: N: 48.52533° W 115.30250° (~30' N UPHILL OF ROAD)

Field Comments:

Primary/Rotameter Rate (LPM): Before: — / — End: — / — (USED BIOS)

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- 3

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-20-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 5-

ACTIVITY: (3a) TRAIL MAINTENANCE / DEBRIS CLEARING

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00015	P4-00016	P4-00017

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00018	P4-00019	P4-00020

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1300	1330	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.4	2.0	1.0	1.0
Person #2	1300	1330												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: — GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: — GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.05 LPM x 30 Min. = 61.5 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Location: START N 48.52539° W 115.30205° STOP N 48.52585° W 115.30215°

Field Comments: _____

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ SEE LOG BOOK

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4-4

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-2-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 6

ACTIVITY: 3b TREE THINNING / SLASH PILE BUILDING

Person #1: JEREMY #1

(4.0 LPM) P4-00021 (2.0 LPM) P4-00022 (1.0 LPM) P4-00023

Person #2: BYRON #2

(4.0 LPM) P4-00024 (2.0 LPM) P4-00025 (1.0 LPM) P4-00026

Cassette Lot Number: 19420 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1345	1415	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1345	145												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Location: N 48.52533° W 115.30205° (DONE IN 20m RADIUS, NO END GPS)

Field Comments: FORGOT TO DECON CHAINSAW BETWEEN TREE CUTTING & THIS ACTIVITY

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ JDH (SEE LOGBOOK)

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDH	Field Entries Checked by:	JDH

Database Entry:		Database QC:	

FSDS Rev6

Sheet No.: P4- 5

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-20-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 7

ACTIVITY: 3c TREE STAND EXAMINATION

Person #1: JEREMY (4.0 LPM)

SFB 8/3/10 ~~(2.0 LPM)~~ 1.0 LPM

SFB 8/3/10 ~~(1.0 LPM)~~ 2.0 LPM

P4-00027 | P4-00029 | P4-00028

JDG

Person #2: BYRON (4.0 LPM) (2.0 LPM) (1.0 LPM)

P4-00030 | P4-00031 | P4-00032

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1435	1507	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1435	1507												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 32 Min. = 128 L

2L Ave. Flow Rate = 2.0 LPM x 32 Min. = 64 L

1L Ave. Flow Rate= 1.0 LPM x 32 Min. = 32 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 32 Min. = 128 L

2L Ave. Flow Rate = 2.0 LPM x 32 Min. = 64 L

1L Ave. Flow Rate= 1.0 LPM x 32 Min. = 32 L

GPS Location: N 48.52536° W 115.30194° CENTER OF 50m RADIUS OF ACTIVITY

Field Comments: WENT OVER BY 2 MINUTES 32 MIN. DURATION

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ SEE LOG BOOK CALIBRATED SEVERAL TIMES W/ BUBS IN MORNING

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- 6

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-20-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 8

ACTIVITY: (3d) PULASKI FIRELINE

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00033	P4-00034	P4-00035

Person #2: BIRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00036	P4-00037	P4-00038

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	~~1435~~ 1535	~~1507~~ 1605	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	~~1435~~ 1535	~~1507~~ 1605												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Location: ~~N 48.52536~~ ~~W 115.30144~~ ~~CENTER OF 50m ACTIVITY RADIUS~~ SEE LOGBOOK FOR GPS START & STOP

Field Comments: ~~WENT OVER BY 2 MINUTES~~ ~~32 MIN. DURATION~~ JDK

~~Primary/Rotameter Rate (LPM): Before: / End: /~~

Wind Direction: CALM Wind Speed: 0 MPH (START) AT 1345 HRS, 0-1.5 MPH FROM EAST

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDK	Field Entries Checked by:	JDK

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-108

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-18-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 32

ACTIVITY: 3e CUTTING FIRELINE BY DOZER ROUND 1

Person #1: JEREMY DOZER BOSS

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00671	P4-00672	P4-00673

Person #2: BYRON DOZER OPERATOR

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00674	P4-00675	P4-00676

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

BYRON IS OPERATOR, JEREMY IS FIREBOSS

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0906	0936	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0906	0936												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. ~~52.162~~ 31.288' W:115. ~~29.057~~ 17.435" GPS Loc. End: N:48. 31.317' W:115. 17.356'

Field Comments: NOTE- COORDS IN DEGREES & MINUTES

Wind Direction: CALM Wind Speed: 0 MPH **NOTE: Use primary (true) equivalent flow rate for volume calculation**

BARO 26.85 IN Hg 64.6°F

Field Data Entered by:	JDG	**Field Entries Checked by:**	JDG

Database Entry:	SFB	Database QC:

ABS AREA 2

ROUND 2

FSDS Rev6

Sheet No.: P4-19

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-27-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 23-24, 31

ACTIVITY: 2a Drive from FLYWAY TO AREA 2 & RETURN

Person #1: Jeremy

(4.0 LPM) P4-00114 (2.0 LPM) P4-00115 (1.0 LPM) P4-00116

Person #2: Byron

(4.0 LPM) P4-00117 (2.0 LPM) P4-00118 (1.0 LPM) P4-00119

Cassette Lot Number: 19420 **Field Blank ID:** ~~NA~~

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	~~Start~~ START	~~Stop~~ STOP	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0900	1525	4.0	4.0	2.0	2.0	1.0	1.0						
	0940	1607	4.0	4.0	2.0	2.0	1.0	1.0						
Person #2	0900	1525							4.0	4.0	2.0	2.0	1.0	1.0
	0940	1607							4.0	4.0	2.0	2.0	1.0	1.0

Person #1: 4.0 LPM Pump ID: #1 2.0 LPM Pump ID: #2 1.0 LPM Pump ID: #3 Rotameter ID: BIOS GPS ID: #1

Person #2: 4.0 LPM Pump ID: #4 2.0 LPM Pump ID: #5 1.0 LPM Pump ID: #6 Rotameter ID: BIOS GPS ID: #1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 82 Min. = 328 L

2L Ave. Flow Rate = 2 LPM x 82 Min. = 164 L

1L Ave. Flow Rate= 1 LPM x 82 Min. = 82 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 82 Min. = 328 L

2L Ave. Flow Rate = 2 LPM x 82 Min. = 164 L

1L Ave. Flow Rate= 1 LPM x 82 Min. = 82 L

GPS Location: X: START : FLYWAY TO GPS Y: N 48.52203° W 115.28916°

Field Comments: ROUNDTRIP FROM FLYWAY TO AREA #2 and Back to FLYWAY

Primary/Rotameter Rate (LPM): Before: / ~~End: /~~ BIOS ONLY

Wind Direction: CALM Wind Speed: 0.0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- 20

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-27-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 24-25

ACTIVITY: 2b.1 felling & Limbing

Person #1: Jeremy

(4.0 LPM) P4-00120 (2.0 LPM) P4-00121 (1.0 LPM) P4-00122

Person #2: Byron

(4.0 LPM) P4-00123 (2.0 LPM) P4-00124 (1.0 LPM) P4-00125

Cassette Lot Number: 19420 **Field Blank ID:** NA

FIELD BLANK AFFIX ~~LABEL~~ HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1012	1032	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1012	1032												

Person #1: 4.0 LPM Pump ID: #1 2.0 LPM Pump ID: #2 1.0 LPM Pump ID: #3 Rotameter ID: BJOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: #4 2.0 LPM Pump ID: #5 1.0 LPM Pump ID: #6 Rotameter ID: BJOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1 LPM x 20 Min. = 20 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1 LPM x 20 Min. = 20 L

GPS Location: X: W 115.28943° Y: N 48.52~~206~~ 1890° JK

Field Comments: GPS Taken @ TREE

Primary/Rotameter Rate (LPM): Before: — End: — USED BJOS

Wind Direction: CALM Wind Speed: 0.0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4-21

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-27-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 25-26

ACTIVITY: 2b.2 Cutting / STACKING

Person #1: Jeremy

(4.0 LPM) P4-00126 (2.0 LPM) P4-00127 (1.0 LPM) P4-00128

Person #2: Byron

(4.0 LPM) P4-00129 (2.0 LPM) P4-00130 (1.0 LPM) P4-00131

Cassette Lot Number: 19420 **Field Blank ID:** NA

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1059	1129	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.05	2.05	1.05	1.05
Person #2	1059	1129												

Person #1: 4.0 LPM Pump ID: #1 2.0 LPM Pump ID: #2 1.0 LPM Pump ID: #3 Rotameter ID: BJOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: #4 2.0 LPM Pump ID: #5 1.0 LPM Pump ID: #6 Rotameter ID: BJOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.05 LPM x 30 Min. = 61.5 L

1L Ave. Flow Rate= 1.05 LPM x 30 Min. = 31.5 L

GPS Location: X: W 115.28916° Y: N 48.52203°

Field Comments: GPS - same as ABS #2 / ROUND #2 Arrival

Primary/Rotameter Rate (LPM): Before: ~~/~~ End: ~~/~~ BJOS USED

Wind Direction: ~~0-~~ from JCK from N Wind Speed: 0-2.2 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- 22

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-27-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 26-27

ACTIVITY: 3a Trail Maintenance / Debris Clearing

Person #1: Jeremy

(4.0 LPM) P4-00132 (2.0 LPM) P4-00133 (1.0 LPM) P4-00134

Person #2: Byron

(4.0 LPM) P4-00135 (2.0 LPM) P4-00136 (1.0 LPM) P4-00137

Cassette Lot Number: 19420 **Field Blank ID:** NA

FIELD BLANK
~~AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1210	1225	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1210	1225												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: BIOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: BIOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Location: END N: 48.52200° W: 115.28951° START: @ BASE STATION N: 48.52203° W 115.28916°

Field Comments: WIND ONLY Occational Gusts

Primary/Rotameter Rate (LPM): Before: ~~/~~ ~~End: /~~ USED BIOS

Wind Direction: North Wind Speed: 0-28 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- 23

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-27-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 27-28

ACTIVITY: 3b Tree Thinning / Slash Pile

Person #1: Jeremy

(4.0 LPM) P4-00138 (2.0 LPM) P4-00139 (1.0 LPM) P4-00140

Person #2: Byron

(4.0 LPM) P4-00141 (2.0 LPM) P4-00142 (1.0 LPM) P4-00143

Cassette Lot Number: 19420 **Field Blank ID:** NA

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1255	1310	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1255	1310												

Person #1: 4.0 LPM Pump ID: #1 2.0 LPM Pump ID: #2 1.0 LPM Pump ID: #3 Rotameter ID: BJOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: #4 2.0 LPM Pump ID: #5 1.0 LPM Pump ID: #6 Rotameter ID: BJOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L JCK 7-27-10

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L JCK 7-27-10

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Location: N: 48.52209° W: 115.28965° START @ TRUCK / BASE STATION N: 48.52203 W: 115.28916°

Field Comments: Occational Breeze & Gust

Primary/Rotameter Rate (LPM): Before: / End: / BJOS (USED)

Wind Direction: N Wind Speed: 0-2.0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4-24

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-27-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 28-29

ACTIVITY: 3c Tree Stand Examination

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00144	P4-00145	P4-00146

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00147	P4-00148	P4-00149

Cassette Lot Number: 19420 **Field Blank ID:** Round #2 P4-00150

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1340	1410	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1340	1410												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: BIOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: BIOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

GPS Location: N 48.52187° W 115.28957°

Field Comments: GPS Center of Activity

Primary/Rotameter Rate (LPM): Before: / End: / BIOS only

Wind Direction: N Wind Speed: 0-1 MPH Occational Breeze

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4-25

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 7-27-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 29-30

ACTIVITY: 3d Cutting fireline by Hand

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00151	P4-00152	P4-00153

Person #2: Brandon

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00154	P4-00155	P4-00156

Cassette Lot Number: 19420 **Field Blank ID:** NA

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1440	1455	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1440	1455												

Person #1: 4.0 LPM Pump ID: #1 2.0 LPM Pump ID: #2 1.0 LPM Pump ID: #3 Rotameter ID: B105 GPS ID: 1

Person #2: 4.0 LPM Pump ID: #4 2.0 LPM Pump ID: #5 1.0 LPM Pump ID: #6 Rotameter ID: B105 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Location: START N: 48.52203° W: 115.28916° GPS END: N: 48.52188° W: 115.28950°

Field Comments: Mild Breeze (Occasional)

Primary/Rotameter Rate (LPM): Before: ~~/~~ End: / B105 only

Wind Direction: N/NE Wind Speed: 0.0 MPH Not strong enough to measure

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4-109

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-18-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 33

ACTIVITY: 3e DOZER FIRELINE ROUND 2 @ AREA 2

Person #1: JEREMY DOZER BOSS

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00677	P4-00678	P4-00679

Person #2: BYRON DOZER OPERATOR

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00680	P4-00681	P4-00682

Cassette Lot Number: 19659 **Field Blank ID:** —

FIELD BLANK
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1022	1052	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	1022	1052												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 30 Min. = 121.5 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48.52102° W:115.29057° GPS Loc. End: N:48.52083° W:115.25978°

Field Comments:

Wind Direction: S Wind Speed: 2-3 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

ABS AREA 2

ROUND 3

3RD ROUND AT AREA 2

FSDS Rev7

Sheet No.: P4-32

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-04-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 58

ACTIVITY: 2a DRIVING TO AND FROM AREA FROM FLYWAY

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00283	P4-00284	P4-00285

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00286	P4-00287	P4-00288

Cassette Lot Number: 19420 **Field Blank ID:** 3RD FB P4-00325

32 MINS UP + 30 MINS BACK = 62 MIN TOTAL

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0725 / 1218	0757 / 1248	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0757 / 1218	0757 / 1248	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 62 Min. = 248 L

2L Ave. Flow Rate = 2.0 LPM x 62 Min. = 124 L

1L Ave. Flow Rate= 1.0 LPM x 62 Min. = 62 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 62 Min. = 248 L

2L Ave. Flow Rate = 2.0 LPM x 62 Min. = 124 L

1L Ave. Flow Rate= 1.0 LPM x 62 Min. = 62 L

GPS Loc. Start: N: 48. FLYWAY W:115. GPS Loc. End: N:48. 57248 W:115. 28747

Field Comments: BLUE SKY ~60°F RAIN LIMITED TO LIBBY VALLEY LAST NIGHT PLENTY OF DUST ON ROAD TO AREA 2. NO DEW.

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4-34

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-04-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 59

ACTIVITY: 26.1 FELLING / LIMBING (20 MINS)

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00289	P4-00290	P4-00291

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00292	P4-00293	P4-00294

Cassette Lot Number: 19420 **Field Blank ID:** ____

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0815	0835	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0815	0835												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2.0 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2.0 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

GPS Loc. Start: N: 48. 52234 W:115. 28809 ~~GPS Loc. End: N:48. W:115.~~

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH ~ 65°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JFB	Database QC:

FSDS Rev7

Sheet No.: P4-35

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-04-16 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 60

ACTIVITY: 2b,2 CUTTING/STACKING IN TRUCK 15/15 (30 MINS)

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00295	P4-00296	P4-00297

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00298	P4-00299	P4-00300

Cassette Lot Number: 19420 **Field Blank ID:** ~~_____~~

~~FIELD BLANK AFFIX LABEL HERE~~

SWITCH AT 0902 HRS

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0847	0917	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0847	0917												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 52237 W:115. 28810 ~~GPS Loc. End: N:48. W:115.~~

Field Comments: CLEAR BLUE SKY

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 30

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-04-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 61

ACTIVITY: 3a TRAIL MAINTENANCE / DEBRIS CLEARING 7.5 / 7.5 (15 MINS)

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00301	P4-00302	P4-00303

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00304	P4-00305	P4-00306

Cassette Lot Number: 19420 **Field Blank ID:** ~~FIELD BLANK AFFIX LABEL HERE~~

SWITCH AT 0939.5 HRS

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0932	0947	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	0932	0947												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 15 Min. = 60.8 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52238 W:115. 28793° GPS Loc. End: N:48. 52242 W:115. 28795°

Field Comments: CLEAR ~70°F

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

BARO. 27.1 in Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 37

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-04-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 62

ACTIVITY: 3b TREE THINNING/ SLASH PILE BUILDING 7.5/7.5 (15 MINUTES)

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00307	P4-00308	P4-00309

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00310	P4-00311	P4-00312

Cassette Lot Number: 19420 **Field Blank ID:** ~~_____~~

SWITCH AT 1032.5 HRS

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1025	1040	4.0	4.0	2.0	2.1	1.0	1.0	4.0	4.0	2.0	2.1	1.0	1.0
Person #2	1025	1040												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.05 LPM x 15 Min. = 30.8 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.05 LPM x 15 Min. = 30.8 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52228 W:115. 28791 GPS Loc. End: N:48. 52207 W:~~115. 27751~~ 115.287510 SFD 10/12/10

Field Comments: CLEAR BLUE SKY 73°F

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-38

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-04-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 63

ACTIVITY: 3C TREE STAND EXAMINATION 30 MINUTES

Person #1: JEREMY

(4.0 LPM) P4-00313 (2.0 LPM) P4-00314 (1.0 LPM) P4-00315

Person #2: BYRON

(4.0 LPM) P4-00316 (2.0 LPM) P4-00317 (1.0 LPM) P4-00318

Cassette Lot Number: 19420 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1105	1135	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	1105	1135												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.1 LPM x 30 Min. = 123 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 52224° W:115. 25757° GPS Loc. End: ~~N:48.~~ CENTER OF 50m RADIUS ~~W:115.~~

Field Comments: CLEAR BLUE SKY

Wind Direction: CALM Wind Speed: 0 MPH BARO. 27.1 IN HG

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-39

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-04-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 64

ACTIVITY: 3d CUTTING FIRELINE BY PULASKI 7.5/7.5 (15 MINS)

Person #1: JEREMY

(4.0 LPM) P4-00319 | (2.0 LPM) P4-00320 | (1.0 LPM) P4-00321

Person #2: BYRON

(4.0 LPM) P4-00322 | (2.0 LPM) P4-00323 | (1.0 LPM) P4-00324

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

SWITCH AT 1155.5

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1148	1203	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	1148	1203												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 15 Min. = 60.8 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52243 W:115. 28746 GPS Loc. End: N:48. _____ W:115. _____

Field Comments: CLEAR, ~80°F

Wind Direction: CALM Wind Speed: 0-1 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4-110

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-18-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 34

ACTIVITY: 3e FIRELINE BY DOZER ROUND 3

Person #1: JEREMY DOZER BOSS

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00683	P4-00684	P4-00685

Person #2: BYRON DOZER OPERATOR

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00686	P4-00687	P4-00688

Cassette Lot Number: 19489 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1140	1210	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1140	1210												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 52166 W:115. 28953 GPS Loc. End: N:48. 52130 W:115. 28940

Field Comments: NOTE - DOZER WENT SEVERAL HUNDRED FEET TO THE SOUTH, THEN RETURNED

Wind Direction: CALM Wind Speed: 0-1 MPH 77.4°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

BARO 26.8

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JFB	Database QC:	

ABS AREA 2

ROUND 4

FSDS Rev7

Sheet No.: P4- ~~BM~~ JCK 67

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** ~~8-06-10~~ 8-10-10 JCK **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 3

ACTIVITY: 2a ROUND TRIP FLYWAY → AREA 2 AND BACK

Person #1: JEREMY

(4.0 LPM) P4-00410 | (2.0 LPM) P4-00411 | (1.0 LPM) P4-00412

Person #2: BYRON

(4.0 LPM) P4-00413 | (2.0 LPM) P4-00414 | (1.0 LPM) P4-00415

Cassette Lot Number: 19989 **Field Blank ID:** ——

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0735 1628	0810 1659	4.0 4.0	4.02 3.97	2.0 2.0	2.0 1.98	1.0 1.0	0.99 0.99						
Person #2	0735 1628	0810 1659	4.0	4.0	2.0	2.03	1.0	0.97 →	4.0	3.95	2.0	1.97	1.0	0.97

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 66 Min. = 264 L

2L Ave. Flow Rate = 2.0 LPM x 66 Min. = 132 L

1L Ave. Flow Rate= 1.0 LPM x 66 Min. = 66 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 3.98 LPM x 66 Min. = 263 L

2L Ave. Flow Rate = 2.0 LPM x 66 Min. = 132 L

1L Ave. Flow Rate= 0.99 LPM x 66 Min. = 65 L

GPS Loc. Start: N: 48. ~~52 173~~ JCK 8-10-10 W:115. ~~28 947~~ JCK 8-10-10 GPS Loc. End: N:48. 52 173° W:115. 28 947°

Field Comments: Overcast

Wind Direction: Calm Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	~~JAT~~ JCK 8-10-10	Field Entries Checked by:	~~JAT~~ JCK 8-10-10

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~PSM~~ JCK 68

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** ~~8-06-10~~ 8-10-10 JCK **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 4

ACTIVITY: 2b.1a FELLING / LIMBING ~~20 MINS~~ 15 mins JCK

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00416	P4-00417	P4-00418

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00419	P4-00420	P4-00421

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0846	0901	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0846	0901												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52 173° W:115. 28 947° GPS Loc. End: TREE N:48. 52 169° W:115. 28 983°

Field Comments: Overcast

Wind Direction: Calm Wind Speed: X MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	~~JDG~~ JCK 8-10-10	Field Entries Checked by:	~~JDG~~ JCK 8-10-10

Database Entry:	JFB	Database QC:	

FSDS Rev6

Sheet No.: P4-69

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 Sampling Date: 8-10-10 Sampling Team: MWH Field Logbook: 2 Pgs: 5

ACTIVITY: 2b.1b Felling/Limbing 10 mins

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00454	P4-00455	P4-00456

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00457	P4-00458	P4-00459

Cassette Lot Number: 19989 Field Blank ID: —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1343	1353	4.0	3.98	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1343	1353												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 ~~Rotameter ID~~ BJOS: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: BJOS 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 3.99 LPM x 10 Min. = 39.9 L

2L Ave. Flow Rate = 2.0 LPM x 10 Min. = 20 L

1L Ave. Flow Rate= 1.0 LPM x 10 Min. = 10 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 10 Min. = 40 L

2L Ave. Flow Rate = 2.0 LPM x 10 Min. = 20 L

1L Ave. Flow Rate= 1.0 LPM x 10 Min. = 10 L

~~GPS Location~~ TREE: N ~~X~~: 48.52 159° W ~~Y~~: 115.28 983°

Field Comments: Return (REDO) Sunny w/ spot clouds

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ BJOS USED

Wind Direction: Calm Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~[illegible]~~ JCK 70

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 Sampling Date: ~~8-06-10~~ 8-10-10 JCK Sampling Team: MWH Field Logbook: 2 Pgs: 5

ACTIVITY: 2b.2 CUTTING/STACKING IN TRUCK ~~15/15~~ 7.5/7.5 JCK ~~(30 mins)~~ 15 mins JCK

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00460	P4-00461	P4-00462

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00463	P4-00464	P4-00465

Cassette Lot Number: 19989 Field Blank ID: ~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1405	1420	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1405	1420												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52 173° W:115. 28 947° GPS Loc. End: N:48. DRAG TO TRUCK ~~W:115.~~

Field Comments: Sunny w/ spot clouds occational light breeze

Wind Direction: NE Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	~~JDG~~ JCK 8-10-10	Field Entries Checked by:	~~JDG~~ JCK 8-10-10

Database Entry:	FB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~59~~ 71 JCK

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** ~~8-10-10~~ 8-10-10 JCK **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 6

ACTIVITY: 3a TRAIL MAINTENANCE / DEBRIS CLEARING 7.5/7.5 (15 MINS)

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00428	P4-00429	P4-00430

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00431	P4-00432	P4-00433

Cassette Lot Number: 19989 **Field Blank ID:** ~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1430	1445	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1430	1445												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52 173° W:115. 28 947° GPS Loc. End: N:48. 52 185° W:115. 28 996°

Field Comments: Sunny w/ Spot clouds

Wind Direction: N-NE Wind Speed: 3.0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	~~JDG~~ JCK 8-10-10	Field Entries Checked by:	~~JDG~~ JCK 8-10-10

Database Entry:	JB	Database QC:	

FSDS Rev7

Sheet No.: P4-~~58~~ 72 JCK

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** ~~8-00-10~~ 8-10-10 JCK **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 7

ACTIVITY: 3b TREE THINNING / SLASH PILE BUILDING 7.5/7.5 (15 MINS)

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00434	P4-00435	P4-00436

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00437	P4-00438	P4-00439

Cassette Lot Number: 19989 **Field Blank ID:** ~~_____~~

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1455	1510	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1455	1510												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52 173° W:115. 28 947° GPS Loc. End: N:48. 52 189° W:115. 28 971°

Field Comments: Partly Cloudy - Stronger occasional Wind

Wind Direction: E Wind Speed: 3 to 5 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	~~JDG~~ JCK 8-10-10	Field Entries Checked by:	~~JDG~~ JCK 8-10-10

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~59~~ 73 JCK

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** ~~8-10-10~~ 8-10-10 JCK **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 8

ACTIVITY: 3c TREE STAND EXAMINATION 30 mins

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00440	P4-00441	P4-00442

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00443	P4-00444	P4-00445

Cassette Lot Number: 19989 **Field Blank ID:** ~~_____~~

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1519	1549	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.04	2.0	2.03	1.0	1.0
Person #2	1519	1549												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.02 LPM x 30 Min. = 120.5 L

2L Ave. Flow Rate = 2.015 LPM x 30 Min. = 60.5 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 52 156° W:115. 28 937° GPS Loc. End: N:48. ~~_____~~ ~~W:115. N/A~~

Field Comments: Partly cloudy - Calm - Hot 85-90°

Wind Direction: — Wind Speed: ~~_____~~ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	~~JDG~~ JCK 8-10-10	Field Entries Checked by:	~~JDG~~ JCK 8-10-10

Database Entry:	SJB	Database QC:	

FSDS Rev7

Sheet No.: P4-~~60~~ 74 JCK

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** ~~8-00-10~~ 8-10-10 JCK **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 9

ACTIVITY: 3d FIRELINE BY PULASKI 7.5/7.5 (15 mins)

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00446	P4-00447	P4-00448

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00449	P4-00450	P4-00451

Cassette Lot Number: 14989 **Field Blank ID:** ~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1602	1617	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1602	1617												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52 173° W:115. 28 947° GPS Loc. End: N:48. 52 156° W:115. 28 954

Field Comments: Partly Cloudy - (warm) Slight Breeze

Wind Direction: _____ Wind Speed: ~~0~~ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG JCK 8-10-10	Field Entries Checked by:	JAG JCK 8-10-10

Database Entry:	FB	Database QC:	

FSDS Rev7

Sheet No.: P4-175

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 02 **Sampling Date:** 08-26-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 49

ACTIVITY: 3e Cutting Fireline by Dozer Round #4

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00775	P4-00776	P4-00777

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00778	P4-00779	P4-00780

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0920	0950	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0920	0950												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 36 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

GPS Loc. Start: N: 48. 31453 W:115. 18246 GPS Loc. End: N:48. 31500 W:115. 18153

Field Comments: sunny, clear, dry & dusty

Wind Direction: calm Wind Speed: ∅ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	KB	Field Entries Checked by:	KB

Database Entry:	SFB	Database QC:	

ABS AREA 2

ROUND 5

FSDS Rev7

Sheet No.: P4-89

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-12-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 17

ACTIVITY: ~~5c~~ 2a Round TRIP FLYWAY to Area #2

Person #1: Jeremy

(4.0 LPM) P4-00551 | (2.0 LPM) P4-00552 | (1.0 LPM) P4-00553

Person #2: Byron

(4.0 LPM) P4-00554 | (2.0 LPM) P4-00555 | (1.0 LPM) P4-00556

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0930	1001	4.0	4.04	2.0	2.03	1.0	1.0						
	1339	1412	4.0	3.95	2.0	1.98	1.0	1.0						
Person #2	0930	1001							4.0	4.04	2.0	2.03	1.0	1.0
	1339	1412							4.0	3.95	2.0	1.98	1.0	0.98

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 64 Min. = 256 L

2L Ave. Flow Rate = 2 LPM x 64 Min. = 128 L

1L Ave. Flow Rate= 1 LPM x 64 Min. = 64 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 64 Min. = 256 L

2L Ave. Flow Rate = 2 LPM x 64 Min. = 128 L

1L Ave. Flow Rate= 1 LPM x 64 Min. = 64 L

GPS Loc. Start: N: 48. FLYWAY W:115. GPS Loc. End: N:48. 52 499° W:115. 30 432°

Field Comments:

Wind Direction: NA Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4-90

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-12-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 18

ACTIVITY: ~~3d~~ 2b.1a Felling & Limbing (15 mins)

Person #1: Jeremy

(4.0 LPM) P4-00557 (2.0 LPM) P4-00558 (1.0 LPM) P4-00559

Person #2: Byron

(4.0 LPM) P4-00560 (2.0 LPM) P4-00561 (1.0 LPM) P4-00562

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1020	1035	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1020	1035												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: TREE #1 N: 48. 52 494° W:115. 30 380° GPS Loc. End: N:48. — W:115. —

Field Comments: Full Sun w/ TRACE Clouds - Calm

Wind Direction: NA Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4-91

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-12-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 18

ACTIVITY: 2b.1b Felling & Limbing 10 mins

Person #1: Jeremy

(4.0 LPM) P4-00563 | (2.0 LPM) P4-00564 | (1.0 LPM) P4-00565

Person #2: Byron

(4.0 LPM) P4-00566 | (2.0 LPM) P4-00567 | (1.0 LPM) P4-00568

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1045	1055	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1045	1055												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 10 Min. = 40 L

2L Ave. Flow Rate = 2 LPM x 10 Min. = 20 L

1L Ave. Flow Rate= 1 LPM x 10 Min. = 10 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 10 Min. = 40 L

2L Ave. Flow Rate = 2 LPM x 10 Min. = 20 L

1L Ave. Flow Rate= 1 LPM x 10 Min. = 10 L

GPS Loc. Start: TREE#2 N: 48. 52 514° W:115. 30 386° GPS Loc. End: ~~N:48.~~ W:115.

Field Comments: Full SUN 70-75° - CALM

Wind Direction: NA Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JR	Field Entries Checked by:	JR

Database Entry:	JTB	Database QC:	

FSDS Rev7

Sheet No.: P4-92

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-12-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 19

ACTIVITY: 2b.2 Cutting / Stacking in Truck 7.5/7.5 (mins 15)

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00569	P4-00570	P4-00571

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00572	P4-00573	P4-00574

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK ~~AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1106	1121	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1106	1121												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x ____ Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52 504° W:115. 30 363° GPS Loc. End: N:48. ____ W:115. ____

Field Comments: Clear - Sun - calm

Wind Direction: NA Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	JB	Database QC:	

FSDS Rev7

Sheet No.: P4-93

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-12-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 19

ACTIVITY: 3a Trail Maintenance / Debris Clearing 7.5/7.5 (15 mins)

Person #1: Jeremy

(4.0 LPM) P4-00575 (2.0 LPM) P4-00576 (1.0 LPM) P4-00577

Person #2: Byron

(4.0 LPM) P4-00578 (2.0 LPM) P4-00579 (1.0 LPM) P4-00580

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1135	1150	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1135	1150												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52 499° W:115. 30 432° GPS Loc. End: N:48. 52 485° W:115. 30 454°

Field Comments: - Clear - SUN - CALM

Wind Direction: NA Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	SJB	Database QC:	

FSDS Rev7

Sheet No.: P4-94

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-12-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 20

ACTIVITY: 3b Tree Thinning/Slash Pile Building 7.5/7.5 (15 mins)

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00581	P4-00582	P4-00583

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00584	P4-00585	P4-00586

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK
~~AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1202	1217	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.03	1.0	1.0
Person #2	1202	1217												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.015 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52 499° W:115. 30 432° GPS Loc. End: N:48. 52 471° W:115. 30 428°

Field Comments: Sun - TRACE CLOUDS - Light Breeze

Wind Direction: SW Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCR	Field Entries Checked by:	JCR

Database Entry:	JB	Database QC:	

FSDS Rev7

Sheet No.: P4-95

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-12-16 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 20

ACTIVITY: 3c Tree Stand Examination (30 min)

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00587	P4-00588	P4-00589

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00590	P4-00591	P4-00592

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1229	1259	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1229	1259												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 30 Min. = ~~120~~ (120) L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 52481° W:115. 30446° GPS Loc. End: N:48. W:115.

Field Comments: Partly Cloudy - Light Breeze

Wind Direction: SW Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:		Field Entries Checked by:	

Database Entry:		Database QC:	

FSDS Rev7

Sheet No.: P4-96

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 2 **Sampling Date:** 8-12-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 21

ACTIVITY: 3d Fireline by Pulaski 7.5/7.5 (15 min)

Person #1: Jeremy

(4.0 LPM) P4-00593 (2.0 LPM) P4-00594 (1.0 LPM) P4-00595

Person #2: Byron

(4.0 LPM) P4-00596 (2.0 LPM) P4-00597 (1.0 LPM) P4-00598

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK ~~AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1315	1330	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.03	1.0	1.0
Person #2	1315	1330												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.015 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 52 499° W:115. 30 432° GPS Loc. End: N:48. 52 480° W:115. 30 441°

Field Comments: Partly Cloudy Occational Gust up to 9 mph - average 4 mph (Seven)

Wind Direction: SW Wind Speed: 0-7 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	**Field Entries Checked by:**	JK

Database Entry:	FB	*Database QC:*	

FSDS Rev7

Sheet No.: P4-126

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 02 **Sampling Date:** 08-26-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 50

ACTIVITY: 3e Cutting Fireline by Dozer Round #5

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00781	P4-00782	P4-00783

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00784	P4-00785	P4-00786

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK
~~AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1015	1045	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1015	1045												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

GPS Loc. Start: N: 48.31484 W:115.18339 GPS Loc. End: N:48.31533 W:115.18438

Field Comments: Clear, sunny, dry & dusty

Wind Direction: Calm Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	KB	Field Entries Checked by:	KB

Database Entry:	SFB	Database QC:	

ABS AREA 7

ROUND 1

FSDS Rev6

Sheet No.: P4- ~~9~~ ~~8~~ 7 JDG

SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 7-21-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 9-

ACTIVITY: SCRIPT 2a DRIVE OUT/BACK

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00041	P4-00042	P4-00043

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00044	P4-00045	P4-00046

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

ROUND TRIP = 68 MINS

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0645 1330	0720 1403	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0645 1330	0720 1403												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 68 Min. = 272 L

2L Ave. Flow Rate = 2.0 LPM x 68 Min. = 136 L

1L Ave. Flow Rate= 1.0 LPM x 68 Min. = 68 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 68 Min. = 272 L

2L Ave. Flow Rate = 2.0 LPM x 68 Min. = 136 L

1L Ave. Flow Rate= 1.0 LPM x 68 Min. = 68 L

GPS Location: ~~X~~ N 48.47454 ~~Y~~ W 115.359705 (START @ FLYWAY) & STOP

Field Comments: SFB 10/18/10

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ CALIBRATED THROUGHOUT DAY W/BIOS EVERY HOUR OR SO - ROTAMETER DRIFT

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	**Field Entries Checked by:**	JDG

Database Entry: SFB	*Database QC:*

FSDS Rev6

Sheet No.: P4- ~~10~~ ~~9~~ 8

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

SFB

ABS Area: 7 **Sampling Date:** 7-21-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** ~~10~~ ~~8~~ 10 JDG 8/3/10

ACTIVITY: (2b) FELLING/LIMBING/CUTTING/STACKING

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00047	P4-00048	P4-00049

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00050	P4-00051	P4-00052

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0750	0840	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.05	2.05	1.0	1.0
Person #2	0750	0840												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 50 Min. = 200 L

2L Ave. Flow Rate = 2.0 LPM x 50 Min. = 100 L

1L Ave. Flow Rate= 1.0 LPM x 50 Min. = 50 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 50 Min. = 200 L

2L Ave. Flow Rate = 2.05 LPM x 50 Min. = 102.5 L

1L Ave. Flow Rate= 1.0 LPM x 50 Min. = 50 L

GPS Location: ~~N 48.47574~~ SFB ~~W 115.35973~~ SFB 10/12/10 (TREE) N. 48.474485 W 115.359919

Field Comments: CALM, ~50°F

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ ACCORDING TO EQUIVS. ON TAPE/ROTA.

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	**Field Entries Checked by:**	JDG

Database Entry: SFB	*Database QC:*

FSDS Rev6

Sheet No.: P4- ~~11~~ ~~9~~ ~~10~~ 9
JDL
SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 7-21-10 **Sampling Team:** MWH **Field Logbook:** # 1 **Pgs:** 11

ACTIVITY: 3a TRAIL MAINT. / DEBRIS CLEARING

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00053	P4-00054	P4-00055

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00056	P4-00057	P4-00058

Cassette Lot Number: 19420 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0912	0942	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	~~2.0~~ JDL 2.0	2.0	1.0	1.0
Person #2	0912	0942												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Location: ~~N 48.47579°~~ SFB W ~~115.35973~~ SFB (START) N ~~48.47426~~ SFB W ~~115.35973~~ SFB (END) 10/18/10

Field Comments: 48.474415 115.359178 48.474540 115.359705

~~Primary/Rotameter Rate (LPM): Before: / End: /~~

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDL	**Field Entries Checked by:**	JDL

Database Entry: SFB	*Database QC:*

FSDS Rev6

Sheet No.: P4- ~~12~~ ~~10~~ 10 JDG

SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 7-21-10 **Sampling Team:** MWH **Field Logbook:** # 1 **Pgs:** 12

ACTIVITY: (3b) TREE THINNING / SLASH PILE BUILDING

Person #1: JEREMY

(4.0 LPM) P4-00059 (2.0 LPM) P4-00060 (1.0 LPM) P4-00061

Person #2: BYRON

(4.0 LPM) P4-00062 (2.0 LPM) P4-00063 (1.0 LPM) P4-00064

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1012	1042	4.0	4.0	2.0	2.1	1.0	1.0	4.0	4.0	2.0	2.1	1.0	1.0
Person #2	192	1042												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.05 LPM x 30 Min. = 61.5 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.05 LPM x 30 Min. = 61.5 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Location: 10/12/10 ~~N: 48.50880°~~ SFB ~~W: 115.34991~~ SFB (START) ~~N 48.50826~~ SFB ~~W 115.34911~~ SFB (END)

Field Comments: 48.474544 115.359708 48.474353 115.359241

Primary/Rotameter Rate (LPM): Before: ____/____ End: ____/____ (SEE LOGBOOK)

Wind Direction: _____ Wind Speed: _____ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- ~~13~~ JDG ~~JC~~ 11

SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 7-21-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 13

ACTIVITY: 3c TREE STAND EXAMINATION

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00065	P4-00066	P4-00067

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00068	P4-00069	P4-00070

Cassette Lot Number: 19420 **Field Blank ID:** ~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1122	1152	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1122	1152												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Location: ~~N 48.50715~~ SFB 10/13/10 ~~W 115.34981~~ GENERAL AREA ~ 50 M DIAM.

Field Comments: N 48.474540 W 115.35958

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ RE-CAL ROTAMETER/BIDS/PUMPS

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- ~~14~~ ~~12~~ 12
JDG
SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 7-21-10 **Sampling Team:** MWH **Field Logbook:** #1 **Pgs:** 14

3d. **ACTIVITY:** CUTTING FIRELINE BY PULASKI

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00071	P4-00072	P4-00073

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00074	P4-00075	P4-00076

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1235	1305	4.0	4.1	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	1235	1305												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.05 LPM x 30 Min. = 121.5 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 30 Min. = 121.5 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Location: ~~N 48.40310~~ SFB W ~~115.35131~~ SFB (START) N ~~48.40250~~ SFB W ~~115.35017~~ SFB (END)

Field Comments: N 48.474522 W 115.359968 N 48.474482 W 115.360004

~~Primary/Rotameter Rate (LPM): Before: / End: /~~

Wind Direction: CALM Wind Speed: 0 MPH **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	**Field Entries Checked by:**	JDG

Database Entry: SFB	*Database QC:*

FSDS Rev7

Sheet No.: P4-116

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-20-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 40

ACTIVITY: 3e CUTTING FIRELINE BY DOZER ROUND #1

Person #1: JEREMY

(4.0 LPM) P4-00720 | (2.0 LPM) P4-00721 | (1.0 LPM) P4-00722

Person #2: BYRON

(4.0 LPM) P4-00723 | (2.0 LPM) P4-00724 | (1.0 LPM) P4-00725

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK~~ AFFIX ~~LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1120	1150	4.0	4.0	2.0	2.0	1.0	1.0	4.0	3.9	2.0	2.0	1.0	1.0
Person #2	1120	1150												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 3.95 LPM x 30 Min. = 119 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47758° W:115. 35458° GPS Loc. End: N:48. 47937° W:115. 35224°

Field Comments:

Wind Direction: W Wind Speed: 0-2 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

75.6°F 26.75 IN Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

ABS AREA 7

ROUND 2

FSDS Rev6

Sheet No.: P4- 26

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 Sampling Date: 7-28-10 Sampling Team: MWH Field Logbook: #1 Pgs: 32 - 35

ACTIVITY: 2a - Driving to ABS Area #7 & BACK TO FLYWAY

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00157	P4-00158	P4-00159

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00160	P4-00161	P4-00162

Cassette Lot Number: 19420 Field Blank ID: NA

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1307 - 1337 1555 - 1629		4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.05	2.0	2.0	1.0	1.0
Person #2	1307 - 1339 1555 - 1629		4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: BJOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: BJOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 66 Min. = 264 L

2L Ave. Flow Rate = 2 LPM x 66 Min. = 132 L

1L Ave. Flow Rate= 1 LPM x 66 Min. = 66 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 66 Min. = 264 L

2L Ave. Flow Rate = 2 LPM x 66 Min. = 132 L

1L Ave. Flow Rate= 1 LPM x 66 Min. = 66 L

GPS Location: N 48.47291 W 115.34939 ° @ Area 7 BASE

Field Comments: Drive to Area 7 = 32 min Drive back to Flyway = 34 min Total = 66 min

Primary/Rotameter Rate (LPM): Before: ~~/ End: /~~ WITH BJOS

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4-27

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 7-28-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 33-34

ACTIVITY: 2b.1 Felling & Limbing

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00163	P4-00164	P4-00165

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00166	P4-00167	P4-00168

Cassette Lot Number: 19420 **Field Blank ID:** NA

FIELD BLANK
~~AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1405	1425	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1405	1425												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: BIOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: BIOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1 LPM x 20 Min. = 20 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1 LPM x 20 Min. = 20 L

GPS Location: N 48.47324 W 115.34985

Field Comments: GPS @ Fellin TREE

Primary/Rotameter Rate (LPM): Before: ~~/ /~~ ~~End: / /~~ BIOS ONLY

Wind Direction: NE Wind Speed: 1 to 3 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4-28

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 7-28-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 34-35

ACTIVITY: 2b.2 Cutting & Stacking

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00169	P4-00170	P4-00171

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00172	P4-00173	P4-00174

Cassette Lot Number: 19420 **Field Blank ID:** NA

FIELD BLANK
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1504	1534	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1504	1534												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: BIOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: BIOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

GPS Location: N 48.47291° W 115.34939°

Field Comments: Photo taken - Weather: Sunny warm - some clouds

Primary/Rotameter Rate (LPM): Before: ~~/~~ End: ~~/~~ BIOS ONLY

Wind Direction: NE/E Wind Speed: 2.0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JLF	Field Entries Checked by:	

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-85

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 Sampling Date: ~~8-10-10~~ 8-11-10 JCK Sampling Team: MWH Field Logbook: 2 Pgs: 15

ACTIVITY: ~~2b.1b~~ JCK 3a TRAIL MAINTENANCE/DEBRIS CLEARING (15 mins) 7.5/7.5

Person #1: Jeremy

(4.0 LPM) P4-00527 | (2.0 LPM) P4-00528 | (1.0 LPM) P4-00529 AF

Person #2: Byron

(4.0 LPM) P4-00530 | (2.0 LPM) P4-00531 | (1.0 LPM) P4-00532

Cassette Lot Number: 19989 Field Blank ID: ~~0~~

FIELD BLANK AFFIX LABEL ~~HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1549	1604	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1549	1604												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47 300° W:115. 34 937° GPS Loc. End: N:48. 47 285° W:115. 34 959°

Field Comments:

Wind Direction: NA Wind Speed: ~~0~~ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	FB	Database QC:	

FSDS Rev7

Sheet No.: P4-86

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 16

ACTIVITY: ~~2b. 2xx~~ 3b Tree Thinning / Slash Pile Building 7.5/7.5 (15min)

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00533	P4-00534	P4-00535

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00536	P4-00537	P4-00538

Cassette Lot Number: 19989 **Field Blank ID:** ~~0~~

FIELD BLANK AFFIX LABEL HERE ~~0~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1612	1627	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1612	1627												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47 300° W:115. 34 937° GPS Loc. End: N:48. 47 282° W:115. 34 943°

Field Comments: Overcast w/ Sun areas - Occational Breeze Clouds from West

Wind Direction: NW Wind Speed: 0-2 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	YK	Field Entries Checked by:	YK

Database Entry:	FB	Database QC:	

FSDS Rev7

Sheet No.: P4-87

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 16

ACTIVITY: ~~3a~~ ~~3b~~ 3c Tree Stand Examination (30 mins)

Person #1: Jeremy

(4.0 LPM) P4-00539 (2.0 LPM) P4-00540 (1.0 LPM) P4-00541

Person #2: Byron

(4.0 LPM) P4-00542 (2.0 LPM) P4-00543 (1.0 LPM) P4-00544

Cassette Lot Number: 19989 **Field Blank ID:** ~~0~~

FIELD BLANK
~~*AFFIX LABEL HERE*~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1635	1705	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1635	1705												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47 289° W:115. 34 904° GPS Loc. End: N:48. ~~W:115.~~

Field Comments: Sun - Partly Cloudy (Hot) - Calm

Wind Direction: Calm Wind Speed: ~~0~~ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JH	**Field Entries Checked by:**	JH

Database Entry:	JB	*Database QC:*	

FSDS Rev7

Sheet No.: P4-88

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 17

ACTIVITY: ~~3b~~ JCK 3d fireline by Pulaski 7.5/7.5 (15 min)

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00545	P4-00546	P4-00547

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00548	P4-00549	P4-00550

Cassette Lot Number: 19989 **Field Blank ID:** ∅

FIELD BLANK
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1715	1730	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1715	1730												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47 287° W:115. 34 930° GPS Loc. End: N:48. 47 279° W:115. 34 904°

Field Comments: Sun w/ clouds moving in from SW - calm @ site

Wind Direction: Calm Wind Speed: ∅ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	8-13	Database QC:	

KAITLIN'S START-OFF SHEET

FSDS Rev7

Sheet No.: P4-117

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** ~~8-20-10~~ 08-24-10 KB **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 41

ACTIVITY: 3e CUTTING FIRELINE BY DOZER ROUND #2

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00726	P4-00727	P4-00728

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00729	P4-00730	P4-00731

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0822	0852	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.1	1.0	1.0
Person #2	0822	0852												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: ~~EXTRA~~ 6 JDG BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 30 Min. = 121.5 L

2L Ave. Flow Rate = 2.05 LPM x 30 Min. = 61.5 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

GPS Loc. Start: N: 48.47787 W:115.34776 GPS Loc. End: N:48.47855 W:115.34962

Field Comments: sunny, clear, calm, dry

Wind Direction: calm Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

ABS AREA 7

ROUND 3

2ND ROUND AT AREA 7

FSDS Rev6

Sheet No.: P4- 1~~8~~ 54

SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 43

ACTIVITY: DRIVE OUT & BACK TO AREA 7 (2a)

Person #1: Jeremy

(4.0 LPM) P4-00199 | (2.0 LPM) P4-00200 | (1.0 LPM) P4-00201

Person #2: Byron

(4.0 LPM) P4-00202 | (2.0 LPM) P4-00203 | (1.0 LPM) P4-00204

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

35 MINS OUT 25 MINS BACK (TOTAL 60)

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0745 1245	0820 1305	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0745 1240	0820 1305	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60 L

GPS Location: ~~X~~ FLYWAY ~~Y~~ AREA 7

Field Comments: _____

~~Primary/Rotameter Rate (LPM): Before: / End: /~~

Wind Direction: CALM Wind Speed: 0 MPH 63°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~20~~ 55

SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 44

ACTIVITY: 2b.1 FELLING, LIMBING 20 MINS

Person #1: Jeremy

(4.0 LPM) P4-00205 (2.0 LPM) P4-00206 (1.0 LPM) P4-00207

Person #2: Byron

(4.0 LPM) P4-00208 (2.0 LPM) P4-00209 (1.0 LPM) P4-00210

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0850	0910	4.0	4.1	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	0850	0910												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.05 LPM x 20 Min. = 81 L

2L Ave. Flow Rate = 2.2 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 20 Min. = 81 L

2L Ave. Flow Rate = 2.0 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

GPS Loc. Start: N: 48.47310° W:115.35517° GPS Loc. End: N:48.____ W:115.____

Field Comments: _____

Wind Direction: CALM Wind Speed: 0 MPH 60°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 2X 56
SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 45

ACTIVITY: 2b.2 CUTTING, STACKING IN TRUCK 15/15 (30 MINS)

Person #1: JEREMY

(4.0 LPM) P4-00211 (2.0 LPM) P4-00212 (1.0 LPM) P4-00213

Person #2: BYRON

(4.0 LPM) P4-00214 (2.0 LPM) P4-00215 (1.0 LPM) P4-00216

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0930	1000	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0930	1000												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48.47310° W:115.35517° GPS Loc. End: N:48.— W:115.—

Field Comments: HIGH THIN CLOUDS SMOKY FROM FIRE TO WEST

Wind Direction: CALM Wind Speed: 0 MPH 60° F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~22~~ 57
SFB 5/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 4/6

ACTIVITY: 3a. TRAIL MAINTENANCE / DEBRIS CLEARING 7.5/7.5 (15 MINS)

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00217	P4-00218	P4-00219

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
A P4-00220	P4-00221	P4-00222

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1022	1037	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1022	1037												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47330 W:115. 35555 GPS Loc. End: N:48. 47333 W: ~~115. 36569~~ 115. 355690 SFB 10/12/10

Field Comments: HIGH THIN CLOUDS

Wind Direction: CALM Wind Speed: 0 MPH 60°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 2/3 58
SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 47

ACTIVITY: 3.10 TREE THINNING / SLASH PILE BURNING

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	7.5/7.5 (15 min) (1.0 LPM)
P4-00223	P4-00224	P4-00225

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00226	P4-00227	P4-00228

Cassette Lot Number: 19420 **Field Blank ID:** _____

START 1100
SWITCH @ ~~1027~~ 1107.5 END 1115

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	~~1027~~ 1100 JDG	1115	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	~~1027~~ 1100 JDG	1115												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L
2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L
1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L
2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L
1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47329° W:115.35564° GPS Loc. End: N:48.47309° W:115.35561°

Field Comments: HIGH THIN CLOUDS SMOKY

Wind Direction: CALM Wind Speed: 0 MPH 73°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~24~~ 59
SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 48

ACTIVITY: 3C. TREE STAND EXAMINATION

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00229	P4-00230	P4-00231

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00232	P4-00233	P4-00234

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1130	1200	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1130	1200												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48.47328° W:115.35562° CENTER OF 50M RADIUS GPS Loc. End: ~~N:48.~~ ~~W:115.~~

Field Comments: HIGH THIN CLOUDS

Wind Direction: CALM Wind Speed: 0 MPH 79°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~25~~ 60
SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 49

ACTIVITY: 3d FIRELINE BY PULASKI

Person #1: JEREMY

(4.0 LPM) P4-00235 | (2.0 LPM) P4-00236 | (1.0 LPM) P4-00237

Person #2: BYRON

(4.0 LPM) P4-00238 | (2.0 LPM) P4-00239 | (1.0 LPM) P4-00240

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

SWITCH AT 1217.5 HRS

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1210	1225	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1210	1225												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 48.41327 W:115. 35565 GPS Loc. End: N:48. 47320 W:115. 35563

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH 82°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

~~KAITLIN'S SINGLE OFF SHEET~~

FSDS Rev7

Sheet No.: P4- 118

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 07 **Sampling Date:** 08-24-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 42

ACTIVITY: 3e Cutting Fireline by Dozer Round #3

Person #1: Jeremy

(4.0 LPM) P4-00732 1

(2.0 LPM) P4-00733 2

(1.0 LPM) P4-00734 3

Person #2: Byron

(4.0 LPM) P4-00735 4

(2.0 LPM) P4-00736 5

(1.0 LPM) P4-00737 6

Cassette Lot Number: 19989 **Field Blank ID:** —

P4-00738

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0933	1003	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	0933	1003												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 30 Min. = 121.5 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

GPS Loc. Start: N: 48. 47738 W:115. 34750 GPS Loc. End: N:48. 47639 W:115. 34634

Field Comments: sunny, clear, calm, dry

Wind Direction: Calm Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	KB	Field Entries Checked by:	KB

Database Entry: SFB	Database QC:

ABS AREA 7

ROUND 4

NOTE: JEREMY'S YOUNG SON WAS RUSHED TO HOSPITAL IN KALISPELL LAST NIGHT @ 12:00, REPLACED W/ TOM OBLENESS, BYRON'S FATHER. TOM IS OSHA CURRENT, TRAINED IN RESPIRATOR, FIT-TEST,

FSDS Rev7

Sheet No.: P4-40

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 66

ACTIVITY: 2a ROUND TRIP FROM FLYWAY TO AREA 7

Person #1: ~~JEREMY~~ TOM

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00326	P4-00327	P4-00328

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00329	P4-00330	P4-00331

Cassette Lot Number: 19420 **Field Blank ID:** ✓

~~FIELD BLANK AFFIX LABEL HERE~~

TOTAL TIME: 30+25 = 55 MINS

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0825	0855	4.0	4.1	2.0	2.1	1.0	1.1	X	X	X	X	X	X
	1347	1412	4.0	4.0	2.0	2.0	1.0	1.0						
Person #2	0825	0855	X	X	X	X	X	X	4.0	4.1	2.0	2.1	1.0	1.0
	1347	1412							4.0	3.9	2.0	2.0	1.0	1.0

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 55 Min. = 220 L

2L Ave. Flow Rate = 2.0 LPM x 55 Min. = 110 L

1L Ave. Flow Rate= 1.0 LPM x 55 Min. = 55 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 55 Min. = 220 L

2L Ave. Flow Rate = 2.0 LPM x 55 Min. = 110 L

1L Ave. Flow Rate= 1.0 LPM x 55 Min. = 55 L

GPS Loc. Start: N: 48. FLYWAY W:115. GPS Loc. End: N:48. 47337 W:115. 35467

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4-41

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 67

ACTIVITY: 26.1 FELLING / LIMBING 20 MINS

Person #1: ~~JEREMY~~ TOM

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00332	P4-00333	P4-00334

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00335	P4-00336	P4-00337

Cassette Lot Number: 19420 **Field Blank ID:** ~~____~~

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0925	0945	4.0	4.1	2.0	2.1	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	0925	0945												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.05 LPM x 20 Min. = 81 L

2L Ave. Flow Rate = 2.05 LPM x 20 Min. = 41 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 20 Min. = 81 L

2L Ave. Flow Rate = 2.0 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

GPS Loc. ~~Start~~ STUMP N: 48. 47318 W:115. 35420 GPS Loc. ~~End:~~ ~~N:48.~~ ____ W:115. ____

Field Comments: BLUE SKY, NO CLOUDS

Wind Direction: CALM Wind Speed: 0 MPH 75°F BARO 26.50 IN Hg

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 42

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-05-18 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 68

ACTIVITY: 2b.2 CUTTING/ STACKING IN TRUCK 15/15 30 MINS,

Person #1: ~~JEREMY~~ TOM

(4.0 LPM) P4-00338

(2.0 LPM) P4-00339

(1.0 LPM) P4-00340

Person #2: BYRON

(4.0 LPM) P4-00341

(2.0 LPM) P4-00342

(1.0 LPM) P4-00343

Cassette Lot Number: 19420 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

SWITCH AT 1018

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1003	1033	4.0	4.0	2.0	2.0	1.0	1.0	4.0	3.9	2.0	2.0	1.0	1.0
Person #2	1003	1033												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 3.95 LPM x 30 Min. = 118.5 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47318 W:115. 35420 GPS Loc. End: N:48. 47318 W:115. 35420

Field Comments: CLEAR BLUE CLOUDLESS SKY ~75°F

Wind Direction: CALM Wind Speed: 0 MPH 80°F 26.50 IN. Hg

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-43

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-05-12 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 69

ACTIVITY: 3a TRAIL MAINTENANCE / DEBRIS CLEARING 7.5/7.5 15 MINS

Person #1: ~~JEREMY~~ TOM

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00344	P4-00345	P4-00346

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00347	P4-00348	P4-00349

Cassette Lot Number: 19420 **Field Blank ID:** ~~FIELD BLANK AFFIX LABEL HERE~~

SWITCH AT 1102.5

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1055	1110	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1055	1110												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47325° W:115.35447° GPS Loc. End: N:48.47316° W:115.35423°

Field Comments: CLEAR, BLUE SKY ~82°F

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

26.45 IN Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 44

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 70

ACTIVITY: 36 TREE THINNING / SLASH PILE BUILDING 7.5/7.5 15 MINS

Person #1: ~~JEREMY~~ TOM

(4.0 LPM) P4-00350 (2.0 LPM) P4-00351 (1.0 LPM) P4-00352

Person #2: BYRON

(4.0 LPM) P4-00353 (2.0 LPM) P4-00354 (1.0 LPM) P4-00355

Cassette Lot Number: 19420 **Field Blank ID:** —

SWITCH AT 1135.5 HRS

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1128	1143	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1128	1143												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47330° W:115.35455° GPS Loc. End: N:48.47327 W:115.35467

Field Comments: CLEAR

Wind Direction: CALM Wind Speed: 0 MPH 83° F BARO. 26.45 **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 45

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 71

ACTIVITY: 3c TREE STAND EXAMINATION 30 MINS

Person #1: ~~JEROMY~~ TOM

(4.0 LPM) P4-00356 | (2.0 LPM) P4-00357 | (1.0 LPM) P4-00358

Person #2: BYRON

(4.0 LPM) P4-00359 | (2.0 LPM) P4-00360 | (1.0 LPM) P4-00361

Cassette Lot Number: 19420 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1217	1247	4.0	4.	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1217	1247												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47329 W:115. 35432 (CENTER OF 50m RADIUS) ~~GPS Loc. End: N:48. W:115.~~

Field Comments: CLEAR

Wind Direction: CALM Wind Speed: 0 MPH 83° 26.45 IN Hg

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-46

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 72

ACTIVITY: 3d CUTTING FIRELINE BY PULASKI 7.5/7.5 15 MINS

Person #1: ~~JEREMY~~ TOM

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00362	P4-00363	P4-00364

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00365	P4-00366	P4-00367

Cassette Lot Number: 19420 **Field Blank ID:** ~~—~~

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1300	1315	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1300	1315												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47314° W:115.35410° GPS Loc. End: N:48.47314° W:115.35432

Field Comments: CLEAR BLUE SKIES

Wind Direction: CALM Wind Speed: 0 MPH 33°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

26.50 in Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 119

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 08-24-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 43

ACTIVITY: 3e cutting Fireline by Dozer Round ~~#~~34 KB

Person #1: Jeremy

(4.0 LPM) P4-00739 | (2.0 LPM) P4-00740 | (1.0 LPM) P4-00741

Person #2: Byron

(4.0 LPM) P4-00742 | (2.0 LPM) P4-00743 | (1.0 LPM) P4-00744

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1105	1135	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	1105	1135												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 30 Min. = 121.5 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

GPS Loc. Start: N: 48. 47350 W:115. 34923 GPS Loc. End: N:48. 47217 W:115. 34569

Field Comments: clear, sunny, calm, dry

Wind Direction: calm Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	KB	Field Entries Checked by:	KB

Database Entry:	SFB	Database QC:	

ABS AREA 7

ROUND 5

FSDS Rev7

Sheet No.: P4-75

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 10

ACTIVITY: 2a Round-Trip FLYWAY

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00466	P4-00467	P4-00468

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00469	P4-00470	P4-00471

Cassette Lot Number: 19989 **Field Blank ID:** X

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0908	0936	4.0	4.1	2.0	2.1	1.0	1.0						
	1318	1344	4.0	3.95	2.0	1.98	1.0	1.0						
Person #2	0908	0936							4.0	4.05	2.0	2.04	1.0	1.01
	1318	1344							4.0	3.95	2.0	2.0	1.0	1.05

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 54 Min. = 216 L

2L Ave. Flow Rate = 2 LPM x 54 Min. = 108 L

1L Ave. Flow Rate= 1 LPM x 54 Min. = 54 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = ~~4.02~~ JKK LPM x 54 Min. = 216 L

2L Ave. Flow Rate = 2.02 LPM x 54 Min. = 109 L

1L Ave. Flow Rate= 1 LPM x 54 Min. = 54 L

GPS Loc. Start: N: 48. FLYWAY W:115. — GPS Loc. End: N:48. ~~47 326~~ JKK 47 321° W:115 ~~35 362~~ JKK 35 332°

Field Comments: Overcast warm (70°)

Wind Direction: Calm Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JLK	Field Entries Checked by:	JLK

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-76

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 11

ACTIVITY: 2b.1a Felling/Limbing 15 mins

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00472	P4-00473	P4-00474

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00475	P4-00476	P4-00477

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK
~~AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1010	1025	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1010	1025												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47 321° W:115. 35 332° @ TREE #1 GPS Loc. End: N:48. 47 332° W:115. 35 298°

Field Comments: Overcast warm (70-75°) light Breeze (occational)

Wind Direction: N Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	JB	Database QC:	

FSDS Rev7

Sheet No.: P4-77

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 11

ACTIVITY: 2b.1b Felling/Limbing 10 mins

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00478	P4-00479	P4-00480

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00481	P4-00482	P4-00483

Cassette Lot Number: 19989 **Field Blank ID:** Ø

FIELD BLANK
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1037	1047	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1037	1047												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 10 Min. = 40 L

2L Ave. Flow Rate = 2 LPM x 10 Min. = 20 L

1L Ave. Flow Rate= 1 LPM x 10 Min. = 10 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 10 Min. = 40 L

2L Ave. Flow Rate = 2 LPM x 10 Min. = 20 L

1L Ave. Flow Rate= 1 LPM x 10 Min. = 10 L

GPS Loc. Start: N: 48. 47 321° W:115. 35 332° @TREE #2 GPS Loc. End: N:48. 47 ~~321~~ 340° JCC 8-11-10 W:115. 35 ~~298~~ 313° JCC 8-11-10

Field Comments: Overcast - warm ~75° Light Breeze

Wind Direction: N Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCC	Field Entries Checked by:	JCC

Database Entry:	FB	Database QC:	

FSDS Rev7

Sheet No.: P4-78

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** ~~8-10~~ 8-11-10 JCK **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 12

ACTIVITY: 2b.2 Cutting & Stacking in Truck 7.5/7.5 15 mins

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00484	P4-00485	P4-00486

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00487	P4-00488	P4-00489

Cassette Lot Number: 19989 **Field Blank ID:** ✓

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1058	1113	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1058	1113												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: @ Truck N: 48. 47 321° W:115. 35 332° GPS Loc. End: N:48. ~~W:115.~~

Field Comments: Sun w/ Clouds ~ 80° - occational N-NE Breeze (light)

Wind Direction: N-NE Wind Speed: 5 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	FB	Database QC:	

FSDS Rev7

Sheet No.: P4-79

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 12

ACTIVITY: 3a Trail Maintenance / Debris Clearing 7.5/7.5 (15 mins)

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00490	P4-00491	P4-00492

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00493	P4-00494	P4-00495

Cassette Lot Number: 19989 **Field Blank ID:** Ø

FIELD BLANK AFFIX ~~LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1123	1138	4.0	3.96	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1123	1138												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 3.98 LPM x 15 Min. = 59.7 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47 321° W:115. 35 332° GPS Loc. End: N:48. 47 305° W:115. 35 347°

Field Comments: Overcast - Occational Light Breeze

Wind Direction: NE Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	JCK

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-80

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 13

ACTIVITY: 3b Tree Thinning / Slash Pile Building 7.5/7.5 (15 mins)

Person #1: Jeremy

(4.0 LPM) P4-00496 | (2.0 LPM) P4-00497 | (1.0 LPM) P4-00498

Person #2: Byron

(4.0 LPM) P4-00499 | (2.0 LPM) P4-00500 | (1.0 LPM) P4-00501

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK AFFIX ~~LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1150	1205	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1150	1205												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47 321° W:115. 35 332° GPS Loc. End: N:48. 47 307° W:115. 35 350°

Field Comments: Overcast - Calm to light breeze from E-SE

Wind Direction: E-SE Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-81

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 13

ACTIVITY: 3C TREE STAND EXAMINATION 30 mins

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00502	P4-00503	P4-00504

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00505	P4-00506	P4-00507

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1215	1245	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1215	1245												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47 345° W:115. 35 310° GPS Loc. End: N:48. ~~W:115.~~

Field Comments: Center Radius (50m) GPS Location

Wind Direction: E-SE Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	FB	Database QC:	

FSDS Rev7

Sheet No.: P4-82

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 8-11-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 14

ACTIVITY: 3d Fireline By Pulaski 7.5/7.5 (15 min)

Person #1: Jeremy

(4.0 LPM) P4-00508 | (2.0 LPM) P4-00509 | (1.0 LPM) P4-00510

Person #2: Byron

(4.0 LPM) P4-00511 | (2.0 LPM) P4-00512 | (1.0 LPM) P4-00513

Cassette Lot Number: 19989 **Field Blank ID:** _____

P4-00514 TIME: 1315

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1255	1310	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1255	1310												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47 321° W:115. 35 332° GPS Loc. End: N:48. 47 303° W:115. 35 340°

Field Comments: Overcast Occational Gusts

Wind Direction: E Wind Speed: up to 5 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	FB	Database QC:	

FSDS Rev7

Sheet No.: P4-121

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 7 **Sampling Date:** 08-25-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 45

ACTIVITY: 3e Cutting Fireline by Dozer Round #5

Person #1: Jeremy

(4.0 LPM) P4-00751 (2.0 LPM) P4-00752 (1.0 LPM) P4-00753

Person #2: Byron

(4.0 LPM) P4-00754 (2.0 LPM) P4-00755 (1.0 LPM) P4-00756

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0920	0950	4.0	4.1	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.1	1.0	1.0
Person #2	0920	0950												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.05 LPM x 30 Min. = 121.5 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 30 Min. = 121.5 L

2L Ave. Flow Rate = 2.05 LPM x 30 Min. = 61.5 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

GPS Loc. Start: N: 48. 47318 W:115. 35126 GPS Loc. End: N:48. 47318 W:115. 35130

Field Comments: sunny, clear, dusty & dry

Wind Direction: calm Wind Speed: ϕ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	KB	Field Entries Checked by:	KB

Database Entry:	KB	Database QC:	

ABS AREA 10

ROUND 1

FSDS Rev6

Sheet No.: P4- ~~13~~ ~~14~~ 13 JDL

SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 Sampling Date: 7-22-10 Sampling Team: MWH Field Logbook: # 1 Pgs: 16

ACTIVITY: 2a DRIVE OUT FROM FLYWAY TO AREA 10, RETURN TO FLYWAY

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00077	P4-00078	P4-00079

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00080	P4-00081	P4-00082

Cassette Lot Number: 19420

Field Blank ID: —

~~FIELD BLANK~~
~~AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0625 0705	1250	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0625 0705	1250												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 ~~Rotameter ID~~ BIOS: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 ~~Rotameter ID~~ BIOS: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 78 Min. = 312 L

2L Ave. Flow Rate = 2.0 LPM x 78 Min. = 156 L

1L Ave. Flow Rate= 1.0 LPM x 78 Min. = 78 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 78 Min. = 312 L

2L Ave. Flow Rate = 2.0 LPM x 78 Min. = 156 L

1L Ave. Flow Rate= 1.0 LPM x 78 Min. = 78 L

GPS Location: N 48.47750 W 115.40120 BASE AT AREA 10 (END OF DRIVE UP)

Field Comments:

Primary/Rotameter Rate (LPM): Before: 1.0 4.0 2.0 / 1.0 4.0 2.0 End: / CAL W/ BIOS ONLY

Wind Direction: CALM Wind Speed: 0 MPH 50°F NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDL	Field Entries Checked by:	JDL

Database Entry: SFB	Database QC:

FSDS Rev6

Sheet No.: P4- ~~14~~ 15 14

SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 Sampling Date: 7-22-10 Sampling Team: MWH Field Logbook: #1 Pgs: 17

ACTIVITY: 2b FELLING, LIMBING, CUTTING, STACKING ROUND #1

Person #1: JEREMY

(4.0 LPM) P4-00083

(2.0 LPM) P4-00084

(1.0 LPM) P4-00085

Person #2: BYRON

(4.0 LPM) P4-00086

(2.0 LPM) P4-00087

(1.0 LPM) P4-00088

Cassette Lot Number: 19420

Field Blank ID: ROUND #1 P4-00095

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0730 ~~0750~~	0820	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0730	0820												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 ~~Rotameter ID:~~ BIOS 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 ~~Rotameter ID:~~ BIOS 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 50 Min. = 200 L

2L Ave. Flow Rate = 2.0 LPM x 50 Min. = 100 L

1L Ave. Flow Rate= 1.0 LPM x 50 Min. = 50 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 50 Min. = 200 L

2L Ave. Flow Rate = 2.0 LPM x 50 Min. = 100 L

1L Ave. Flow Rate= 1.0 LPM x 50 Min. = 50 L

GPS Location: N 48.47887 W 115.40127 (TREE LOCATION)

Field Comments: FELLING/LIMBING START 0730, END 0750, CUTTING/STACK 0750-0820

~~Primary/Rotameter Rate (LPM):~~ Before: ____/____ End: ____/____ CAL W/ BIOS ONLY MORE LESS/NO DRIFT ACCURATE/PRECISE

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- ~~16~~ 15
SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 7-22-10 **Sampling Team:** MWH **Field Logbook:** # 1 **Pgs:** 18

ACTIVITY: 3a TRAIL MAINT. & DEBRIS CLEARING

Person #1: JEREMY

(4.0 LPM) P4-00089 | (2.0 LPM) P4-00090 | (1.0 LPM) P4-00091

Person #2: BYRON

(4.0 LPM) P4-00092 | (2.0 LPM) P4-00093 | (1.0 LPM) P4-00094

Cassette Lot Number: 19420 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

15+15 = 30 MINS

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0850	0920	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0850	0920												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 ~~Rotameter~~ BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 ~~Rotameter~~ BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Location: START N 48.47891 W 115.40192° END N48.47910 W 115.40186°

Field Comments: OVERCAST, ~60° F CALIBRATE W/ BIOS, ONLY

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ CALIBRATE W/ BIOS, ONLY

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDK	Field Entries Checked by:	JDK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- ~~10~~ 17/16
SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 7-22-10 **Sampling Team:** MWH **Field Logbook:** # 1 **Pgs:** 19

ACTIVITY: 3b. TREE THINNING / SLASH PILE BUILDING

Person #1: JEREMY

(4.0 LPM) P4-00096 | (2.0 LPM) P4-00097 | (1.0 LPM) P4-00098

Person #2: BYRON

(4.0 LPM) P4-00099 | (2.0 LPM) P4-00100 | (1.0 LPM) P4-00101

Cassette Lot Number: 19420 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

15/15 MINS = 30 MINS

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0955	1025	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.05 (RECORDED TO 1.0) JDH
Person #2	0955	1025												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 ~~Rotameter~~ BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = ~~120~~ JDH L ~~123~~ 121.5 L

2L Ave. Flow Rate = 2.05 LPM x 30 Min. = ~~60~~ JDH L 63 L JDH

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L 61.5

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = ~~120~~ JDH L ~~123~~ 121.5 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.05 LPM x 30 Min. = ~~30~~ JDH L 31.5 L

GPS Location: START N48.47892 W115.40177 END N48.47918° W115.40193°

Field Comments: COOL ~ 60°F OVERCAST

~~Primary/Rotameter~~ Rate (LPM): Before: ___/___ End: ___/___ BIOS CAL. ONLY

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDH

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- ~~18~~ 17

SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 7-22-10 **Sampling Team:** MWH **Field Logbook:** # 1 **Pgs:** 20

ACTIVITY: 3c TREE STAND EXAM

Person #1: JEREMY

(4.0 LPM) P4-00102 | (2.0 LPM) P4-00103 | (1.0 LPM) P4-00104

Person #2: BYRON

(4.0 LPM) P4-00105 | (2.0 LPM) P4-00106 | (1.0 LPM) P4-00107

Cassette Lot Number: 19420 **Field Blank ID:** —

FIELD ~~BLANK~~ AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1400	1130	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1400	1130												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 ~~Rotameter~~ BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 ~~Rotameter~~ BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Location: N 48.47920 W 115.40190 CIRCULAR AREA ~50m RADIUS

Field Comments: COOL, ~55°F

~~Primary/Rotameter Rate (LPM)~~: Before: ___/___ End: ___/___ BIOS PRIMARY USED FOR CAL EACH ACTIVITY

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- ~~18~~ ~~19~~ 18
JDM
SFB 8/3/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 Sampling Date: 7-22-10 Sampling Team: MWH Field Logbook: # 1 Pgs: 21

ACTIVITY: 3d FIRELINE BY PULASKI (15/15 = 30 MINS)

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00108	P4-00109	P4-00110

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00111	P4-00112	P4-00113

Cassette Lot Number: 19420 Field Blank ID: —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1155	1225	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1155	1225												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 ~~Rotameter ID~~ BIOS: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 ~~Rotameter ID~~ BIOS: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

START GPS Location: N 48.47898 W 115.40174 END: N 48.47906 W115.40179

Field Comments: PC, ~65°F

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ CALIBRATE BEFORE/AFTER ACTIVITY W/BIOS

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-112

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-19-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 36

ACTIVITY: 3e CUTTING FIRELINE WITH DOZER

Person #1: JEREMY - DOZER BOSS

(4.0 LPM) P4-00695

(2.0 LPM) P4-00696

(1.0 LPM) P4-00697

Person #2: BYRON - DOZER OPERATOR

(4.0 LPM) P4-00698

(2.0 LPM) P4-00699

(1.0 LPM) P4-00700

Cassette Lot Number: 19939 **Field Blank ID:** —

~~FIELD BLANK~~
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1110	1140	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1110	1140												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48.47928 W:115.40090 GPS Loc. End: N:48.47894 W:115.39817

Field Comments:

Wind Direction: NE Wind Speed: 2-3 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

ABS AREA 10

ROUND 2

FSDS Rev6

Sheet No.: P4-29

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** July 30-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 39-40 & 42

ACTIVITY: 2a Driving to ABS Area 10 & Return

Person #1: Jeremy

(4.0 LPM) P4-00181 (2.0 LPM) P4-00182 (1.0 LPM) P4-00183

Person #2: Byron

(4.0 LPM) P4-00184 (2.0 LPM) P4-00185 (1.0 LPM) P4-00186

Cassette Lot Number: 19420 **Field Blank ID:** NA

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	6:42 - 0932	7:20 - 1010	4.0	4.05	2.0	2.05	1.0	1.0	4.0	4.05	2.0	2.0	1.0	1.0
Person #2	6:42 - 0932	7:20 - 1010	4.0	3.90	2.0	2.0	1.0	1.0	4.0	3.90	2.0	1.95	1.0	1.0

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: BIOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: BIOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 3.99 LPM x 76 Min. = 303 L

2L Ave. Flow Rate = 2.01 LPM x 76 Min. = ~~152.8~~ 153 L

1L Ave. Flow Rate= 1 LPM x 76 Min. = 76 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 3.99 LPM x 76 Min. = 303 L

2L Ave. Flow Rate = 1.99 LPM x 76 Min. = 151 L

1L Ave. Flow Rate= 1 LPM x 76 Min. = 76 L

GPS Location: N 48.47946° W 115.40285° @ ABS AREA #10

Field Comments: 75% to 80% of Rd dry dusty - Near site start to have moist areas (shade)

Primary/Rotameter Rate (LPM): Before: ~~/~~ End: ~~/~~ With BIOS

Wind Direction: Calm Wind Speed: 0.0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JCK	Field Entries Checked by:	

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4-30

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 7-30-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 40

ACTIVITY: 2b.1 Felling & Limbing

Person #1: Jeremy

(4.0 LPM) P4-00187 | (2.0 LPM) P4-00188 | (1.0 LPM) P4-00189

Person #2: Byron

(4.0 LPM) P4-00190 | (2.0 LPM) P4-00191 | (1.0 LPM) P4-00192

Cassette Lot Number: 19420 **Field Blank ID:** NA

FIELD BLANK
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0755	0815	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0755	0815												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: BIOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: BIOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1 LPM x 20 Min. = 20 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1 LPM x 20 Min. = 20 L

GPS Location: N: 48.47965° W 115.40312°

Field Comments: GPS @ CUT TREE / Photo Taken

Primary/Rotameter Rate (LPM): Before: ~~/~~ End: ~~/~~ BIOS

Wind Direction: Calm Wind Speed: 0.0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4-31

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 7-30-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 41

ACTIVITY: 2b.2 Cutting & Stacking

Person #1: Jeremy

(4.0 LPM) P4-00193 (2.0 LPM) P4-00194 (1.0 LPM) P4-00195

Person #2: Byron

(4.0 LPM) P4-00196 (2.0 LPM) P4-00197 (1.0 LPM) P4-00198

Cassette Lot Number: 19420 **Field Blank ID:** NA

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0840	0910	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0840	0910												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 Rotameter ID: BJOS GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 Rotameter ID: BJOS GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1 LPM x 30 Min. = 30 L

GPS Location: N 48.47946° W 115.40285°

Field Comments: Weather Over Cast

Primary/Rotameter Rate (LPM): Before: ~~/~~ End: ~~/~~ WITH BJOS

Wind Direction: Calm Wind Speed: 0.0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	SK	Field Entries Checked by:	

Database Entry:	SF-B	Database QC:	

FSDS Rev7

Sheet No.: P4-103

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-17-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 27

ACTIVITY: 3a TRAIL MAINTENANCE / DEBRIS CLEARING 7.5 / 7.5 = 15 MINS.

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00641	P4-00642	P4-00643

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00644	P4-00645	P4-00646

Cassette Lot Number: 19989 **Field Blank ID:** ~~FIELD BLANK AFFIX LABEL HERE~~

SWITCH AT 1134.5 HRS

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1127 ~~1127~~	1142 ~~1142~~	4.0	4.1	2.0	2.1	1.0	1.0	4.0	4.1	2.0	2.1	1.0	1.1
Person #2	1127 ~~1127~~	1142 ~~1142~~												

SDA 8-17-10

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.05 LPM x 15 Min. = 60.8 L

2L Ave. Flow Rate = 2.05 LPM x 15 Min. = 30.8 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 15 Min. = 60.8 L

2L Ave. Flow Rate = 2.05 LPM x 15 Min. = 30.8 L

1L Ave. Flow Rate= 1.05 LPM x 15 Min. = 15.8 L

GPS Loc. Start: N: 48.47829° W:115.4011° GPS Loc. End: N:48.47821 W:115.40044

Field Comments: BLUE SKY, CLEAR, CALM, WARM

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDA	Field Entries Checked by:	SDA

Database Entry:	SKB	Database QC:	

FSDS Rev7

Sheet No.: P4- 104

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-17-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 28

ACTIVITY: 3b TREE THINNING / SLASH PILE BUILDING 7.5/7.5 = 15 MINS

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00647	P4-00648	P4-00649

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00650	P4-00651	P4-00652

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK AFFIX LABEL HERE

SWITCH AT 1207.5 HRS

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1200	1215 ~~1207.5~~	4.0	4.0	2.0	2.0	1.0	1.0	4.0	3.9	2.0	2.0	1.0	1.0
Person #2	1200	1215 ~~1207.5~~ JDG 8-17-10												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 3.95 LPM x 15 Min. = 59.3 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47819° W:115.40033° GPS Loc. End: N:48.47831° W:115.40046°

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH 83°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

BARO 26.05 in Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 105

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-17-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 29

ACTIVITY: 3c TREE STAND EXAMINATION 30 MINS

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00653	P4-00654	P4-00655

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00656	P4-00657	P4-00658

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1228	1258	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1228	1258												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

CENTER OF 50-M RADIUS
GPS Loc. Start: N: 48. 47824 W:115. 40038 ~~GPS Loc. End: N:48. W:115.~~

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH 85°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDA	Field Entries Checked by:	JDA

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 109

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-17-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 30

ACTIVITY: 3d CUTTING FIRELINE BY PULASKI

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00659	P4-00660	P4-00661

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00662	P4-00663	P4-00664

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

SWITCH AT 1313.5 HRS

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1306	1321	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1306	1321												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47824° W:115.40039° GPS Loc. End: N:48.47823° W:115.40038°

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH 87°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDK	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 113

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 Sampling Date: 8-19-10 Sampling Team: MWH Field Logbook: 2 Pgs: 37

ACTIVITY: 3e CUTTING FIRELINE WITH DOZER ROUND #2

Person #1: JEREMY (DOZER BOSS)

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00701	P4-00702	P4-00703

Person #2: BYRON (DOZER OPERATOR)

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00704	P4-00705	P4-00706

Cassette Lot Number: 19989

Field Blank ID: ~~04~~ 5 JDG 8-19-10

WEEK OF 8-16-10

P4-00707

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1232	1302	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1232	1302												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47869 W:115. 40190 GPS Loc. End: N:48. 47925 W:115. 40385

Field Comments:

Wind Direction: NE Wind Speed: 0-2 MPH 74.4°F NOTE: Use primary (true) equivalent flow rate for volume calculation

25.40 in Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SEB	Database QC:

ABS AREA 10

ROUND 3

2ND ROUND AT AREA 10

FSDS Rev7

Sheet No.: P4- ~~26~~ 61

SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 51 & 57

ACTIVITY: 2a DRIVE OUT TO AREA 10 FROM FLYWAY, RETURN TRIP

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00241	P4-00242	P4-00243

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00244	P4-00245	P4-00246

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

25 MINS OUT, 30 MINS BACK

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1330 1745	1355 1815	4.0 4.0	4.1 3.9	2.0 2.0	2.1 1.9	1.0 1.0	1.1 0.9	4.0 4.0	4.1 3.9	2.0 2.0	2.1 1.93	1.0 1.0	1.0 1.2
Person #2	1330 1745	1355 1815	~~[illegible]~~ JDG	3.9 JDG										

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 55 Min. = 220 L

2L Ave. Flow Rate = 2.0 LPM x 55 Min. = 110 L

1L Ave. Flow Rate= 1.0 LPM x 55 Min. = 55 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 55 Min. = 220 L

2L Ave. Flow Rate = 2.0 LPM x 55 Min. = 110 L

1L Ave. Flow Rate= 1.0 LPM x 55 Min. = 55 L

GPS Loc. Start: N: 48. FLYWAY W:115. _____ GPS Loc. End: N:48. 47960 W:115. 40424

Field Comments: HIGH THIN CLOUDS

Wind Direction: E Wind Speed: ~2 MPH 80°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-~~27~~ 62

SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 52

ACTIVITY: 2b.1 FELLING/LIMBING (20 MINS)

Person #1: JEREMY

(4.0 LPM) P4-00247 | (2.0 LPM) P4-00248 | (1.0 LPM) P4-00249

Person #2: BYRON

(4.0 LPM) P4-00250 | (2.0 LPM) P4-00251 | (1.0 LPM) P4-00252

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1425	1445	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1425	1445												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 4 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2.0 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2.0 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

GPS Loc. Start: N: 48.47958° W:115.40417° GPS Loc. End: ~~N:48.~~ ~~W:115.~~

Field Comments: GPS OF STUMP

Wind Direction: E Wind Speed: 0-2 MPH ~80°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~33~~ ~~28~~ 63

JDG SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 53

ACTIVITY: CUTTING / STACKING IN TRUCK 2,b,2

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00253	P4-00254	P4-00255

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00256	P4-00257	P4-00258

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1500	1530	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1500	1530												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47958° W:115. 40417° ~~GPS Loc. End: N:48. W:115.~~

Field Comments: COOLING, BARO. PRESS DROP TO 25.15 FROM 26.65 2 HRS AGO

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	**Field Entries Checked by:**	JDG

Database Entry: SFB	*Database QC:*

FSDS Rev7

Sheet No.: P4-~~28~~ 29 (64)

JDG SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 1D **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 54

ACTIVITY: 3a TRAIL MAINTENANCE/ DEBRIS CLEANING

Person #1: JEREMY

(4.0 LPM) P4-00259 (2.0 LPM) P4-00260 (1.0 LPM) P4-00261

Person #2: BYRON

(4.0 LPM) P4-00262 (2.0 LPM) P4-00263 (1.0 LPM) P4-00264

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

SWITCH AT 1545 2.5 HRS, END AT 1600 HRS

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1545	1600	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1545	1600												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47963° W:115.40468° GPS Loc. End: N:48.47956° W:115.40447°

Field Comments: SUN BREAKING THROUGH

Wind Direction: E Wind Speed: 0-4 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-~~24~~ ~~30~~ 65
JDG
SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 55

ACTIVITY: 3b TREE THINNING / SLASH PILE BUILDING

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00265	P4-00266	P4-00267

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00268	P4-00269	P4-00270

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

SWITCH AT ~~1625~~ 1617.5 END AT ~~1640~~ 1625

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1610	1625	4.0	4.0	2.0	2.0	1.0	1.0	4.0	3.9	2.0	2.0	1.0	1.0
Person #2	1610	1625												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 3.45 LPM x 15 Min. = 59.2 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47953 W:115. 40447 GPS Loc. End: N:48. 47948 W:115. 40440

Field Comments: INCR CLOUDS

Wind Direction: E Wind Speed: 0-2 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	**Field Entries Checked by:**	JDG

Database Entry: SFB	*Database QC:*

FSDS Rev7

Sheet No.: P4- ~~30~~ 31 66
JDG
SFB 8/9/10

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-03-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 56

ACTIVITY: 3c TREE STAND EXAMINATION

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00271	P4-00272	P4-00273

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00274	P4-00275	P4-00276

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1640	1710	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1640	1710												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48.47957 W:115.40431 CENTER OF 50-m RADIUS

~~GPS Loc. End: N:48. W:115.~~

Field Comments: MORE SUN BREAKING THROUGH

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- ~~31~~ 32
JDK

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-23-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 57

ACTIVITY: 3d CUTTING FIRELINE BY PULASKI 7.5/7.5 (15 MINS)

Person #1: _____

(4.0 LPM) P4-00277 (2.0 LPM) P4-00278 (1.0 LPM) P4-00279

Person #2: _____

(4.0 LPM) P4-00280 (2.0 LPM) P4-00281 (1.0 LPM) P4-00282

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1720	1735	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1720	1735												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47926 W:115. 40453 GPS Loc. End: N:48. 47945 W:115. 40457

Field Comments: CONTINUING TO GET MORE SUNNY, THINNER CLOUDS

Wind Direction: CALM Wind Speed: 0 MPH ~80°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDK	Field Entries Checked by:	JDK

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 114

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-19-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 38

ACTIVITY: 3e CUTTING FIRELINE BY DOZER ROUND #3

Person #1: JEREMY DOZER BOSS

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00708	P4-00709	P4-00710

Person #2: BYRON OPERATOR

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00711	P4-00712	P4-00713

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK
AFFIX ~~LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1342	1412	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1342	1412												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47899 W:115. 40234 GPS Loc. End: N:48. 47902 W:115. 40447

Field Comments:

Wind Direction: WEST/CALM Wind Speed: 0-3 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

ABS AREA 10

ROUND 4

FSDS Rev7

Sheet No.: P4-47

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 73

ACTIVITY: 2a ROUND TRIP FROM FLYWAY TO AREA 10

Person #1: ~~JEREMY~~ TOM

(4.0 LPM) P4-00368 (2.0 LPM) P4-00369 (1.0 LPM) P4-00370

Person #2: BYRON

(4.0 LPM) P4-00371 (2.0 LPM) P4-00372 (1.0 LPM) P4-00373

Cassette Lot Number: 19420 **Field Blank ID:** ~~—~~

~~FIELD BLANK AFFIX LABEL HERE~~

32 MIN + 30 MIN = 62 MIN

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1458	1530	4.0	4.0	2.0	2.0	1.0	1.0						
	1930	2000	4.0	3.85	2.0	1.9	1.0	1.0						
Person #2	1458	1530							4.0	4.1	2.0	2.0	1.0	1.0
	1930	2000							4.0	3.9	2.0	1.9	1.0	1.0

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 3.45 LPM x 62 Min. = 245 L

2L Ave. Flow Rate = 2.0 LPM x 62 Min. = 124 L

1L Ave. Flow Rate= 1.0 LPM x 62 Min. = 62 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 62 Min. = 248 L

2L Ave. Flow Rate = 2.0 LPM x 62 Min. = 124 L

1L Ave. Flow Rate= 1.0 LPM x 62 Min. = 62 L

GPS Loc. Start: N: 48. FLYWAY W:115. ~~GPS Loc. End: N:48. W:115.~~

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH 85°

NOTE: Use primary (true) equivalent flow rate for volume calculation

27.45 IN Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 48

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 74

ACTIVITY: 2b.1 FELLING/LIMBING 20 MINS

Person #1: ~~JEREMY~~ TOM

(4.0 LPM) P4-00374 (2.0 LPM) P4-00375 (1.0 LPM) P4-00376

Person #2: BYRON

(4.0 LPM) P4-00377 (2.0 LPM) P4-00378 (1.0 LPM) P4-00379

Cassette Lot Number: 19420 **Field Blank ID:** ~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1550	1610	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.1	1.0	1.0
Person #2	1550	1610												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2.0 LPM x 20 Min. = 40 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 20 Min. = 80 L

2L Ave. Flow Rate = 2.05 LPM x 20 Min. = 41 L

1L Ave. Flow Rate= 1.0 LPM x 20 Min. = 20 L

GPS Loc. Start: STUMP N: 48. 47974° W:115. 40704 ~~GPS Loc. End: N:48. W:115.~~

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 49

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 75

ACTIVITY: 26.2 CUTTING / STACKING IN TRUCK 15/15 30 MINS

Person #1: ~~JEREMY~~ TOM

(4.0 LPM) P4-00380

(2.0 LPM) P4-00381

(1.0 LPM) P4-00382

Person #2: BYRON

(4.0 LPM) P4-00383

(2.0 LPM) P4-00384

(1.0 LPM) P4-00385

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

SWITCH AT 1645

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1630	1700	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1630	1700												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47974 W:115. 40704 (STUMP LOCATION) GPS Loc. ~~End: N:48. W:115.~~

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

26.00 in Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JB	Database QC:	

FSDS Rev7

Sheet No.: P4- 50

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 76

ACTIVITY: 3a TRAIL MAINTENANCE / DEBRIS CLEARING 7.5/7.5 15 MINS

Person #1: ~~JEREMY~~ TOM

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00386	P4-00387	P4-00388

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00389	P4-00390	P4-00391

Cassette Lot Number: 19420 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1715.5	1730.5	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1715.5	1730.5												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47983° W:115.40721° GPS Loc. End: N:48.47972° W:115.40720°

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

BARO 25.95 IN Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JB	Database QC:	

FSDS Rev7

Sheet No.: P4-51

48
15
3

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 1 **Pgs:** 77

ACTIVITY: 3b TREE THINNING / SLASH PILE BUILDING 7.5/7.5 15 MINS

Person #1: ~~JEREMY~~ TOM

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00392	P4-00393	P4-00394

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00395	P4-00396	P4-00397

Cassette Lot Number: 19420 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

SWITCH AT 175505

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1748	1803	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1748	1803												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47974° W:115.40730° GPS Loc. End: N:48.47968° W:115.40755°

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

BARO 25.45 in Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

NOTE: NEXT ACTIVITY IN LOGBOOK #2

Database Entry:	SAB	Database QC:	

FSDS Rev7

Sheet No.: P4-52

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-05-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 1

ACTIVITY: 3c TREE STAND EXAMINATION 30 MINS

Person #1: ~~JEREMY~~ TOM

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00398	P4-00399	P4-00400

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00401	P4-00402	P4-00403

Cassette Lot Number: 19420 **Field Blank ID:** ~~—~~

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1815	1845	4.0	4.0	2.0	2.1	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1815	1845												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.05 LPM x 30 Min. = 61.5 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

GPS Loc. Start: N: 48. 47969 W:115. 40155 (CENTER OF 50-m RADIUS) GPS ~~Loc. End: N:48. W:115.~~

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

25.45 IN Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JPB	Database QC:	

FSDS Rev7

Sheet No.: P4- 53

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 805-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 2

ACTIVITY: 3d FIRELINE BY PULASKI 7.5/7.5 (15 MINS)

Person #1: ~~JEREMY~~ tom

(4.0 LPM) P4-00404 | (2.0 LPM) P4-00405 | (1.0 LPM) P4-00406

Person #2: BYRON

(4.0 LPM) P4-00407 | (2.0 LPM) P4-00408 | (1.0 LPM) P4-00409

Cassette Lot Number: 19420 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1858.5	1913.5	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1858.5	1913.5												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47982° W:115. 40738° GPS Loc. End: N:48. 47984° W:115. 40748°

Field Comments: BLUE SKY, STILL,

Wind Direction: CALM Wind Speed: 0 MPH 82.6°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

25.95 IN Hg

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4- 122

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 08-25-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 46

ACTIVITY: 3e. ~~Cutty~~ Cutting Fireline by Dozer Pound #4

Person #1: Jeremy

(4.0 LPM) P4-00757 (2.0 LPM) P4-00758 (1.0 LPM) P4-00759

Person #2: Byron

(4.0 LPM) P4-00760 (2.0 LPM) P4-00761 (1.0 LPM) P4-00762

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1100	1130	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1100	1130												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

GPS Loc. Start: N: 48. 47866 W:115. 40113 GPS Loc. End: N:48. 47948 W:115. 40037

Field Comments: Calm, clear, sunny

Wind Direction: Calm Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	KB	Field Entries Checked by:	KB

Database Entry:	SFB	Database QC:	

ABS AREA 10

ROUND 5

FSDS Rev7

Sheet No.: P4-83

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 Sampling Date: 8-11-10/8-12-10 Sampling Team: MWH Field Logbook: 2 Pgs: 14

ACTIVITY: 2a Round Trip FLYWAY to Area 10

Person #1: Jeremy

(4.0 LPM) P4-00515 (2.0 LPM) P4-00516 (1.0 LPM) P4-00517

Person #2: Byron

(4.0 LPM) P4-00518 (2.0 LPM) P4-00519 (1.0 LPM) P4-00520

Cassette Lot Number: 19989 Field Blank ID: —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1354 1617	1423 1649	4.0 4.0	4.05 3.95	2.0 2.0	2.02 1.93	1.0 1.0	1.0 0.98						
Person #2	1354 1617	1423 1649							4.0 4.0	4.04 3.92	2.0 2.0	2.0 1.95	1.0 1.0	1.0 0.97

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 61 Min. = 244 L

2L Ave. Flow Rate = 1.99 LPM x 61 Min. = 121 L

1L Ave. Flow Rate= 1.0 LPM x 61 Min. = 61 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 3.99 LPM x 61 Min. = 243 L

2L Ave. Flow Rate = 1.99 LPM x 61 Min. = 121 L

1L Ave. Flow Rate= 0.99 LPM x 61 Min. = 60 L

GPS Loc. Start: N: 48. FLYWAY W:115. GPS Loc. End: N:48. 47 864° W:115. 40 051°

Field Comments: Split between two days

Wind Direction: NA Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	SB	Database QC:	

FSDS Rev7

Sheet No.: P4- 84

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 Sampling Date: 8-11-10 Sampling Team: MWH Field Logbook: 2 Pgs: 15

ACTIVITY: 2b.1b JCK felling / Limbing (10 mins)

Person #1: Jeremy

(4.0 LPM) P4-00521 (2.0 LPM) P4-00522 (1.0 LPM) P4-00523

Person #2: Byron

(4.0 LPM) P4-00524 (2.0 LPM) P4-00525 (1.0 LPM) P4-00526

Cassette Lot Number: 19989 Field Blank ID: —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1432	1442	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1432	1442												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 10 Min. = 40 L

2L Ave. Flow Rate = 2 LPM x 10 Min. = 20 L

1L Ave. Flow Rate= 1 LPM x 10 Min. = 10 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 10 Min. = 40 L

2L Ave. Flow Rate = 2 LPM x 10 Min. = 20 L

1L Ave. Flow Rate= 1 LPM x 10 Min. = 10 L

GPS Loc. Start: N: 48. 47 837° W:115. 40 063° GPS Loc. End: N:48. — W:115. —

Field Comments: TREE LOCATION - Overcast - @ end started to rain

Wind Direction: NA Wind Speed: NA MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-97

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-12-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 21

ACTIVITY: 2b.1a Felling / Limbing (15 mins)

Person #1: Jeremy

(4.0 LPM) P4-00599 (2.0 LPM) P4-00600 (1.0 LPM) P4-00601

Person #2: Byron

(4.0 LPM) P4-00602 (2.0 LPM) P4-00603 (1.0 LPM) P4-00604

Cassette Lot Number: 19989 **Field Blank ID:** ~~0~~

FIELD BLANK AFFIX ~~LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1522	1537	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.04	2.0	2.0	1.0	1.0
Person #2	1522	1537												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.02 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47 821° W:115. 40 027° GPS Loc. End: N:48. ~~W:115.~~

Field Comments: TREE #1 Partly cloudy light breeze

Wind Direction: SW Wind Speed: ~~/~~ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	**Field Entries Checked by:**	JK

Database Entry:	SFB	*Database QC:*	

FSDS Rev7

Sheet No.: P4-98

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-12-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 22

ACTIVITY: 2b.2 Cutting & Stacking in Truck 7.5/7.5 (15 min)

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00605	P4-00606	P4-00607

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00608	P4-00609	P4-00610

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK
AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1550	1605	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1550	1605												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47 819° W:115. 40 005° GPS Loc. End: N:48. — W:115. —

Field Comments: Overcast - Light breeze - SW

Wind Direction: SW Wind Speed: — MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JK	Field Entries Checked by:	JK

Database Entry:	SFB	Database QC:	

FSDS Rev6

Sheet No.: P4- 99

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 Sampling Date: 8-17-10 Sampling Team: MWH Field Logbook: 2 Pgs: 23

ACTIVITY: 3a TRAIL MAINTENANCE / DEBRIS CLEARING

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00617	P4-00618	P4-00619

Person #2: BYREN

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00620	P4-00621	P4-00622

Cassette Lot Number: 19989 Field Blank ID: —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		Corrected Rotameter Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0552.5	0909.5	4.0	4.0	2.0	2.0	1.0	1.0	4.0	3.9	2.0	2.0	1.0	1.0
Person #2	0552.5	0907.5												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 ~~Rotameter~~ BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 ~~Rotameter~~ BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 3.95 LPM x 15 Min. = 59 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Location: START N 48.47950° W: 115.40273° STOP N. 48.47923 W. 115.40287

Field Comments:

~~Primary/Rotameter Rate (LPM): Before: / End: /~~ BIOS ONLY

Wind Direction: CALM Wind Speed: 0 MPH ~58°F NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	FB	Database QC:	

FSDS Rev7

Sheet No.: P4-100

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-17-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 24

ACTIVITY: 3b TREE THINNING / SLASH PILE BUILDING

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00623	P4-00624	P4-00625

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00626	P4-00627	P4-00628

Cassette Lot Number: 19959 **Field Blank ID:** —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0920	0935	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0920	0935												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48.47936° W:115.40266° GPS Loc. End: N:48.47922° W:115.40292

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-101

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-17-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 25

ACTIVITY: 3c TREE STAND EXAMINATION 30 MINS

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00629	P4-00630	P4-00631

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00632	P4-00633	P4-00634

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0945	1015	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0945	1015												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30 L

CENTER OF 50-m RADIUS

GPS Loc. Start: N: 48.47920° W:115.40292° ~~GPS Loc. End: N:48. W:115.~~

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JB	Database QC:

FSDS Rev7

Sheet No.: P4- 102

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 8-17-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 26

ACTIVITY: 3d CUTTING FIRELINE BY PULASKI 7.5/7.5 = 15 MINS.

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00635	P4-00636	P4-00637

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00638	P4-00639	P4-00640

Cassette Lot Number: 19989 **Field Blank ID:** —

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1025	1040	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.1	2.0	2.0	1.0	1.0
Person #2	1025	1040												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 15 Min. = 60 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.05 LPM x 15 Min. = 61 L

2L Ave. Flow Rate = 2.0 LPM x 15 Min. = 30 L

1L Ave. Flow Rate= 1.0 LPM x 15 Min. = 15 L

GPS Loc. Start: N: 48. 47937 W:115. 40263 GPS Loc. End: N:48. W:115.

Field Comments:

Wind Direction: CALM Wind Speed: 0 MPH ~64° **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:

FSDS Rev7

Sheet No.: P4-123

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: 10 **Sampling Date:** 08-25-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 47

ACTIVITY: 3e Cutting Fireline by Dozer Round #5

Person #1: Jeremy

(4.0 LPM) P4-00763 (2.0 LPM) P4-00764 (1.0 LPM) P4-00765

Person #2: Byron

(4.0 LPM) P4-00766 (2.0 LPM) P4-00767 (1.0 LPM) P4-00768

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1153	1223	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1153	1223												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0 L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0 L

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 30 Min. = 120.0L

2L Ave. Flow Rate = 2.0 LPM x 30 Min. = 60.0

1L Ave. Flow Rate= 1.0 LPM x 30 Min. = 30.0L

GPS Loc. Start: N: 48. 47928 W:115. 40197 GPS Loc. End: N:48. 48044 W:115. 40125

Field Comments: Sunny, clear, calm, warm

Wind Direction: Calm Wind Speed: Ø MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	KB	Field Entries Checked by:	KB

Database Entry:	SFB	Database QC:	

LOWER RAINY CREEK

FSDS Rev7

Sheet No.: P4-107

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: RAINY **Sampling Date:** 8-17-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 31

ACTIVITY: WALK UP STREAMBED, BACK DOWN 30 MIN EACH WAY

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00665	P4-00666	P4-00667

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00668	P4-00669	P4-00670

Cassette Lot Number: 19989 **Field Blank ID:** _____

FIELD BLANK AFFIX LABEL HERE

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	1438	1538	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	1438	1538												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60 L

GPS Loc. Start: N: 48. 417995 W:115. 446747 GPS Loc. End: N:48.____ W:115.____

ER DECON TRAILER, UP ~ 0.25-MILE, TURN AT 30 MINS, RETURN TO BASE

Field Comments: SFB 10/2/10

Wind Direction: CALM Wind Speed: 0 MPH ~90°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDK

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-111

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: RAINY **Sampling Date:** 8-19-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 35

ACTIVITY: 1 RAINY CREEK WALK UP 30 MINS, DOWN 30 MINS

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00689	P4-00690	P4-00691

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00692	P4-00693	P4-00694

Cassette Lot Number: 19989 **Field Blank ID:** ~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0750	0852	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0750	0850												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60 L

GPS Loc. Start: N: 48.41283 (BOTTOM OF RAINY) W:115.45579 GPS Loc. End: N:48. ~~45579~~ (JDG 8-K-10) W:115.

Field Comments: START AT ER DECON TRAILER - UP 30 MINS, BACK DOWN 30 MINS

Wind Direction: S Wind Speed: 0-1 MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	JFB	Database QC:	

FSDS Rev7

Sheet No.: P4-115

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: RAINY **Sampling Date:** 8-20-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 39

ACTIVITY: 1 WALK UP RAINY FROM ER DECON 30 MINS, TURN AND WALK BACK 30 MINS. ROUND #3

Person #1: JEREMY

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00714	P4-00715	P4-00716

Person #2: BYRON

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00717	P4-00718	P4-00719

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0800	0900	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0800	0900												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60 L

GPS Loc. Start: N: 48. 417995 W:115. 446745 (START, STOP AT ER DECON TRAILER) GPS Loc. End: N:48. W:115.

Field Comments: SFB 10/12/10

Wind Direction: CALM Wind Speed: 0 MPH ~58°F **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	JDG	Field Entries Checked by:	JDG

Database Entry:	SFB	Database QC:	

FSDS Rev7

Sheet No.: P4-120

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: Rainy **Sampling Date:** 08-25-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 44

ACTIVITY: #1 Rainy Creek Hiking for 1 hour Round #4

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00745 (1)	P4-00746 (2)	P4-00747 (3)

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00748 (4)	P4-00749 (5)	P4-00750 (6)

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0730	0830	4.0	3.9	2.0	2.0	1.0	1.0	4.0	3.9	2.0	2.0	1.0	1.0
Person #2	0730	0830												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 3.95 LPM x 60 Min. = 237.0 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120.0 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 3.95 LPM x 60 Min. = 237.0 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120.0 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60.0 L

SEB 10/13/10 GPS Loc. Start: N: 48. 48.417995 W:115. 115.446747 GPS Loc. End: N:48. — W:115. —

Field Comments: Flow @ LRC-06 = 446.9 gpm; calm, clear, cool

Wind Direction: Calm Wind Speed: ϕ MPH

NOTE: Use primary (true) equivalent flow rate for volume calculation

Field Data Entered by:	KB	Field Entries Checked by:	KB

Database Entry:	SEB	Database QC:	

FSDS Rev7

Sheet No.: P4-124

PHASE IV
LIBBY OU3 FIELD SAMPLE DATA SHEET
ACTIVITY-BASED SAMPLING (ABS) PERSONAL AIR MONITORING

ABS Area: Rainy **Sampling Date:** 08-26-10 **Sampling Team:** MWH **Field Logbook:** 2 **Pgs:** 48

ACTIVITY: Hiking Rainy Creek Round #5 Activity #1 X10

Person #1: Jeremy

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00769	P4-00770	P4-00771

Person #2: Byron

(4.0 LPM)	(2.0 LPM)	(1.0 LPM)
P4-00772	P4-00773	P4-00774

Cassette Lot Number: 19989 **Field Blank ID:** —

~~FIELD BLANK AFFIX LABEL HERE~~

	Activity Sample Time (hh:mm)		BIOS Primary Calibrator Flow Rate (LPM)											
			Pump 1		Pump 2		Pump 3		Pump 4		Pump 5		Pump 6	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Person #1	0716	0816	4.0	4.0	2.0	2.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	1.0
Person #2	0716	0816												

Person #1: 4.0 LPM Pump ID: 1 2.0 LPM Pump ID: 2 1.0 LPM Pump ID: 3 BIOS ID: 1 GPS ID: 1

Person #2: 4.0 LPM Pump ID: 4 2.0 LPM Pump ID: 5 1.0 LPM Pump ID: 6 BIOS ID: 1 GPS ID: 1

VOLUME CALCULATION Person #1

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240.0 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120.0 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60.0 L

VOLUME CALCULATION Person #2

4L Ave. Flow Rate = 4.0 LPM x 60 Min. = 240.0 L

2L Ave. Flow Rate = 2.0 LPM x 60 Min. = 120.0 L

1L Ave. Flow Rate= 1.0 LPM x 60 Min. = 60.0 L

SFB 10/18/10

GPS Loc. Start: N: 48. 48.417995 W:115. 446745 GPS Loc. End: N:48. — W:115. —

Field Comments: Flow @ LRC-06 = 455.5 gpm

Wind Direction: calm Wind Speed: Ø MPH **NOTE: Use primary (true) equivalent flow rate for volume calculation**

Field Data Entered by:	KB	**Field Entries Checked by:**	KB

Database Entry: SFB	Database QC:

TABBED PAGE

APPENDIX C

PHASE IV ABS

FIRST DAY

7-20-10 0730 GO TO DEZON TO RIG UP PUMPS, ETC

0800 JEREMY & BURON ARRIVE. SEAN E. FROM HDR ARRIVES.

0832 CALIBRATE PUMPS W/ BIOS

	START LPM (AVG)	STOP LPM
PUMP #1	4.00	4.05
PUMP #2	1.99	2.02
PUMP #3	1.00	1.00
PUMP #4	3.99	4.02
PUMP #5	1.99	2.00
PUMP #6	1.03	~~OFF~~ SAM 1.00

LOT BLANK: P4-00001

LOT BLANK P4-00002

JEREMY #1	P4-00003	4 LPM
	P4-00004	2 LPM
	P4-00005	1 LPM
BYRON #2	P4-00006	4 LPM
	P4-00007	2 LPM
	P4-00008	1 LPM

0900 PICK UP TO HEAD TO AREA #2
START SCRIPT #2 2a DRIVE FROM
FLYWAY TO AREA #2

0910 DEPART FLYWAY, PUMPS ON.
0955 PUMPS OFF, ARRIVE AT USFS APPROVED
TREE-CUTTING AREA #2 45 MINS OUT
TRIP FROM FLYWAY TO AREA.

1010 RIG UP FOR SCRIPT 2b - FELLING, LIMBING, CUTTING, STACKING COMBINED ACTIVITIES (ALL 4 ONE CASSETTE).

TREE #1 LOCATION

N 48.52533°
W 115.30250°

ABOUT 30' UPHILL (N) OF ROAD.

JEREMY #1	P4-00009	4 LPM
	P4-00010	2 LPM
	P4-00011	1 LPM
BYRON #2	P4-00012	4 LPM
	P4-00013	2 LPM
	P4-00014	1 LPM

CHECK PUMP CAL,

	START	STOP
P1	4.02 LPM	4.03
P2	2.05 LPM	2.07
P3	1.01 LPM	1.03
P4	4.03 LPM	4.05
P5	2.06 LPM	2.09
P6	1.04 LPM	1.05

START 2b @ 1110

START FELLING/LIMBING @ 1110 END @ 1130, SWITCH TO CUTTING/STACKING 15 MINS EACH PERSON. JEREMY #1 FIRST, THEN BYRON IS SAWYER. CUT ONLY ONE TREE AT THIS SPOT. TOTAL DURATION 50 MINS. END ACTIVITY @ 1200. CREW RESTS & LUNCHES

ACTIVITY: 3a TRAIL MAINT./DEBRIS CLEARING
AT LOCATION #2

	START	END
GPS LOCATION	N 48.525390°	N 48.525885°
	W 115.30205°	W 115.30215°

JEREMY #1	P4-00015	4 LPM
	P4-00016	2 LPM
	P4-00017	1 LPM
BYRON #2	P4-00018	4 LPM
	P4-00019	2 LPM
	P4-00020	1 LPM

PUMP CAL	START (BIOS)	STOP (CORR. ROTA)
1	3.99	4.0
2	2.01	2.0
3	1.02	1.0
4	4.04	4.0
5	2.06	2.0
6	1.03	1.0

BEGIN AT 1300 HRS, END AT 1330 HRS

1345 START

Activity 3b - TREE THINNING / ~~DEBRIS CLEARING~~ (SLASH PILE)

AREA 2 - ROUND 1

GPS START N 48.52533° W 115.30205°

STOP N 48. W 115.

1400 SWITCH

JEREMY #1	P4-00021	4 LPM
	P4-00022	2 LPM
	P4-00023	1 LPM
BYRON #2	P4-00024	4 LPM
	P4-00025	2 LPM
	P4-00026	1 LPM

~~ROTA~~

PUMP #	START	STOP
1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.0	2.0
6	1.0	1.0

ACTIVITY 3C - TREE STAND EXAMINATION
30 MINS, SIMULTANEOUS DUPE.

JEREMY #1	P4-00027	4 LPM
	P4-00028	~~1~~ LPM SDL
	P4-00029	2 LPM SDL
BYRON #2	P4-00030	4 LPM
	P4-00031	2 LPM
	P4-00032	1 LPM

START ~~1430~~ SDL 1435
END ~~1500~~ 1507

GPS LOCATION OF CENTER OF 50m RADIUS OF ACTIVITY IS N48.52536 W 115.30194

ACTIVITY 3d - PULASKI FIRELINE

START AT 1535 END AT 1605 HRS

GPS START N 48.52532° W115.30175°

GPS END N 48.52518° W 115.30199

SWITCH AT 1548 HRS (2 MINS EARLY MISTAKE - JDK)

END AT 1605 HRS

JEREMY #1

PUMP	START	END
1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.0	2.0
6	1.0	1.0

BYRON #2

P4-00033	4 LPM
P4-00034	2 LPM
P4-00035	1 LPM
P4-00036	4 LPM
P4-00037	2 LPM
P4-00038	1 LPM

1625 DEPART FOR DECON TRAILER - PUMPS ON, WINDOWS OPEN, WITH SAME CARTRIDGES USED IN DRIVE OUT TO AREA 2 THIS MORNING.

1700 ARRIVE AT DECON, PUMPS OFF. 35 MIN TRIP. TOTAL DRIVING DURATION = 80 MINUTES

7-21-10 2ND DAY OF P4 ABS
0600 MEET @ DECON, RIG UP

INDEX I.D.S FOR 38/39/40 THROWN OUT –
NON SEQUENTIAL

DRIVE OUT TO LOCATION # 7

JEREMY #1

	BIOS	COR. ROTA
PUMP 1	3.98	4.0
2	2.01	2.0
3	1.00	1.0
4	4.00	4.0
5	2.01	2.05
6	1.00	1.0

BYRON #2

P4-00041	4 LPM
P4-00042	2 LPM
P4-00043	1 LPM
P4-00044	4 LPM
P4-00045	2 LPM
P4-00046	1 LPM

0645 BEGIN DRIVE OUT TO AREA 7
0720 PUMPS OFF, AT SITE 7. (35 MINS OUT)

N 48.47454
W 115.359705

SFB 10/12/10

SCRIPT 2b COMBINED FELLING/LIMBING/
CUTTING/STACKING

JEREMY #1

	REP.	
PUMP 1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.05	2.05
6	1.0	1.0
	(START)	(END)

BYRON #2

P4-00047	4 L
P4-00048	2 L
P4-00049	1 L
P4-00050	4 L
P4-00051	2 L
P4-00052	1 L

0750 START 2b 48.474485 115.359919

TREE LOCATION ~~N 48.47574°~~ W ~~115.35973°~~ JEB 10/12/10

0840 END FELLING/LIMBING, SWITCH TO
CUTTING/STACK SAME CASSETTES 15/15 MINS

0825 SWITCH

0840 END 2b

SCRIPT 3a - TRAIL MAINT./DEBRIS

START ACTIVITY 0912

SWITCH 0927, END 0942

JEREMY #1	P4-00053	4 LPM
	P4-00054	2 LPM
	P4-00055	1 LPM
BYRON #2	P4-00056	4 LPM
	P4-00057	2 LPM
	P4-00058	1 LPM

START 3a

PUMPS	START	STOP	
1	4.0	~~4.0~~ 4.2	BIOS CHECK
2	2.0	2.0	
3	1.0	1.0	
4	4.0	~~3.0~~ 4.26	BIOS CHECK
5	2.0	~~2.0~~ 2.1	BIOS CHECK
6	1.0	~~1.0~~ 1.1	BIOS CHECK

SFD 10/12/10

GPS START ~~N 46.47574°~~ 48.474415 W ~~115.35973~~ 115.359178

STOP ~~N 46.47426°~~ 48.474540 W ~~115.35973~~ 115.359705

(3b) TREE THINNING / SLASH PILE BUILDING

START 3b 1012 HRS
SWITCH AT 1027
END AT 1042

JEREMY #1	P4-00059	4 L
	P4-00060	2 L
	P4-00061	1 L
BYRON #2	P4-00062	4 L
	P4-00063	2 L
	P4-00064	1 L

	START	END
PUMPS 1	4.0	4.2
2	2.0	2.0
3	1.0	1.0
4	4.0	4.2
5	2.0	2.1
6	1.0	1.1

GPS: START: N ~~45.50550°~~ 48.474544 W ~~115.34944°~~ 115.359708
END N ~~46.50826°~~ 48.474353 W ~~115.34944°~~ 115.359241

SFB
10/12/10

(3c) TREE STAND EXAMINATION

RE-CAL PUMPS TO BIOS

	BIOS	ROTA.
PUMP 1	4.0	3.75
2	2.0	1.95
3	1.0	0.9
4	4.0	3.75
5	2.0	1.95
6	1.0	0.9

JEREMY #1

P4-00065	4	LPM
P4-00066	2	LPM
P4-00067	1	LPM
P4-00068	4	LPM
P4-00069	2	LPM
P4-00070	1	LPM

BYRON #2

~~3.05 on Pump #1 & 4~~

~~20 graph~~

Re-checked w/ BIOS --
Rotameter drift --
AIR TEMP? (90° F)

START ACTIVITY AT 1122 HRS
END " AT 1152 HRS

GPS OF GENERR AREA ~50m RADIUS
N ~~48.50718~~ W ~~-115.34997~~

END ACTIVITY ROTA. CHECK

JFB 10/12/10

48.479540 115.359586

	LPM	
1	4.0	BY BIOS
2	2.0	
3	1.0	
4	4.0	BY BIOS
5	2.0	
6	1.0	

3d. CUTTING FIRELINE BY PULASKI

START ACTIVITY AT 1235 HRS
STOP " AT 1305 HRS

JEREMY #4	P4-00071	4 LPM
	P4-00072	2 LPM
	P4-00073	1 LPM
BYRON #2	P4-00074	4 LPM
	P4-00075	2 LPM
	P4-00076	1 LPM

SFB 10/12/10

GPS LOC. START ~~N 48.40310~~ W ~~115.38181~~
STOP N 48.~~40310~~ 40256° W 115.~~38017~~°

	START	STOP
PUMP 1	4.0	4.07
2	2.0	2.04
3	1.0	1.04
4	4.0	4.07
5	2.0	2.04
6	1.0	1.02

Start
N W
48.474522 115.359768

End
N W
48.474482 115.360004

1330 START DRIVE BACK TO DECON
RE-ATTACH THIS MORNING'S CASSETTES
FROM DRIVE OUT TO AREA 7

1403 ARRIVE AT DECON. PUMPS OFF

		START	STOP
PUMP	1	4.04	4.03
	2	2.04	2.04
	3	1.03	1.02
	4	4.04	4.03
	5	2.04	2.01
	6	1.02	1.02

TRIP BACK WAS 33 MINS

ROUNDTRIP 68 MINS.

ABS AREA 10

7-22-10

0530 CALIBRATE PUMPS W/ BIOS

	START	STOP
PUMP 1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.0	2.0
6	1.0	1.0

ACTIVITY 2a.

0600 AT DECON AREA TO MEET JEROMY & BYRON

JEROMY #1	P4-00077	1
	P4-00078	2
	P4-00079	3
BYRON #2 ~~JEREY~~	P4-00080	4
	P4-00081	5
	P4-00082	6

START 0625 STOP 0705 (40 mins out)
GPS @ BASE N48.47869° W115.40134°

ACTIVITY 2b FELLING, LIMBING CUTTING, STACKING

START ACTIVITY @ 0730 HRS

START GPS: N 48.47887° W 115.40127°

~~END GPS: N 48.~~ (SAME) ~~W 115.~~

FELLING, LIMBING 20 MINS, CUTTING/STACK 15/15

JEREMY #1	P4-00083	4 LPM
	P4-00084	2 LPM
	P4-00085	1 LPM
BYRON #2	P4-00086	4 LPM
	P4-00087	2 LPM
	P4-00088	1 LPM

	START	STOP
PUMP 1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.0	2.0
6	1.0	1.0

USING BIOS ONLY - NO DRIFT, MORE PRECISE & ACCURATE THAN ROTAMETER ROUND TO X.X (TENTHS)

FIELD BLANK @ 0800 P4-00095

END 0820

ACTIVITY 3a - TRAIL MAINT. / DEBRIS CLEANUP

START ACTIVITY: 0850 HRS

START GPS: N 48, 47891 W 115, 40192

END GPS: N 48, 47910 , W 115, 40186

(15/15 MINS = 30)

		LPM
JEROME #1	P4-00089	4
	P4-00090	2
	P4-00091	1
BYRON #2	P4-00092	4
	P4-00093	2
SWITCH AT 0905	P4-00094	1

		START	STOP
	PUMP 1	4.0	4.0
	2	2.0	2.0
	3	1.0	1.0
	4	4.0	4.0
END ACTIVITY: 0920 HRS	5	2.0	2.0
	6	1.0	1.0

ACTIVITY 3b TREE THINNING/SLASH PILE BUILDING

START ACTIVITY: 0955 HRS

START GPS N 48. 47892 W 115. 40177

END GPS N 48. W 115.

15/15 min

		LPM
JEREMY #1	P4-00096	4
	P4-00097	2
	P4-00098	1

SWITCH AT 1010

BYRON #2	P4-00099	4
	P4-00100	2
	P4-00101	1

	START	STOP
PUMP 1	4.0	4.1
2	2.0	2.1
3	1.0	1.0
4	4.0	4.1
5	2.0	2.0
6	1.0	1.05

END ACTIVITY: 1025 HRS

1032 RECALL PUMPS - SLIGHT DRIFT THIS ACTIVITY

ACTIVITY 3C TREE STAND EXAM.
START: 1100 HRS

JEREMY #1 P4-00102

P4-00103

P4-00104

BYRON #2 P4-00105

P4-00106

P4-00107

		START	STOP
PUMP	1	4.0	4.0
	2	2.0	2.0
	3	1.0	1.0
	4	4.0	4.0
	5	2.0	2.0
	6	1.0	1.0

END ACTIVITY 1130 HRS

START GPS: N48.47920 W115.40190
END GPS (SAME) CIRCULAR AREA ~ 50m
RADIUS FROM GPS POINT

ACTIVITY 3d, FIRELINE BY PULASKI
START 1155 HRS

		LPM
JEREMY #1	P4-00108	4
	P4-00109	2
	P4-00110	1
BYRON #2	P4-00111	4
	P4-00112	2
SWITCH AT 1210 HRS	P4-00113	1

	START	STOP
PUMP 1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.0	2.0
6	1.0	1.0

END ACTIVITY @ 1225 HRS

START GPS N 48.47898° W 115.40174°
END GPS N 48.47906° W 115.40179°

2ND HALF OF ACTIVITY 2a RETURN TO FLYWAY FROM AREA 10

			START	STOP
		PUMP 1	4.0	
LEAVE AREA 10 @ 1250HRS		2	2.0	
BACK TO FLYWAY, PUMPS		3	1.0	
OFF AT 1328	38 MINS	4	4.0	
	+ 40 OUT	5	2.0	
	78 MINS ROUNDTRIP	6	1.0	

1400 RIGGED DOWN FOR DAY, RETURN TO LIBBY TO DO PAPERWORK

JDH

~~July 27, 2010~~ YCK

LIBBY Phase IV ABS (Thin clouds) Cool
ROUND #2

23

July 27, 2010

MWH - Joan Kester
Chapman - Byron Oieness
Jeremy Peterson

0730 - @ Office / Gather Supplies
0800 - @ flyway - update
Chapman Crew on Script Changes

0830 CALIBRATE PUMPS w/BIOS

		START	STOP	(LPM)
2a(Up)	Pump #1	4.0	4.02	
	Pump #2	2.0	2.0	
	Pump #3	1.0	1.02	
	Pump #4	4.0	4.03	
	Pump #5	2.0	2.0	
	Pump #6	1.01	1.0	

Jeremy #1	P4-00114	=	4 LPM
	P4-00115	=	2 LPM
	P4-00116	=	1 LPM
BYRON #2	P4-00117	=	4 LPM
	P4-00118	=	2 LPM
	P4-00119	=	1 LPM

~~0900~~ JK

LIBBY PHASE IV ABS
ROUND #2

24

July 27, 2010 JK, BO, JP

0900 START DRIVE / HEAD TO
AREA TWO (2) ABS AREA #2
START WAS @ FLYWAY
PUMPS ON / WINDOWS DOWN

0940 PUMPS OFF / Check Pumps
Arrive @ GPS: N: 48.52203°
Area #2 W 115.28916°

2b.1 Felling / Limbing - Area #2

Jeremy #1	P4-00120	=4LPM
	P4-00121	=2LPM
	P4-00122	=1LPM
Byron #2	P4-00123	=4LPM
	P4-00124	=2LPM
	P4-00125	=1LPM

1012 START (2b.1)
1032 STOP (2b.1)

July 27, 2010

LIBBY PHASE IV ABS
ROUND #2

Weather: Partly cloudy
Wind: CALM

July 27, 2010 RND #2

25

JK, JP, BO

2b.1 Cal. Check	START	STOP	(LPM)
Pump 1	4.0	3.99 → Recal	4.0
Pump 2	2.0	2.04	
Pump 3	1.0	1.00	
Pump 4	4.0	4.05 → Recal	4.0
Pump 5	2.0	2.05	
Pump 6	1.0	1.04	

GPS Location 2b.1 N 48.52~~200~~ 189° YCK 7-27-10
W 115.28943°

2b.2 Cutting / STACKING - Area #2

		L=LPM
Jeremy #1	P4-00126	4.0 L
	P4-00127	2.0 L
	P4-00128	1.0 L
Byron #2	P4-00129	4.0 L
	P4-00130	2.0 L
	P4-00131	1.0 L

July 27, 2010

LIBBY PHASE IV ABS

ROUND #2

WEATHER: PARTLY CLOUDY / WARM

WIND: Occational Breeze
(Changes directions)
2.2 mph From North @ 1128

July 27, 2010 RND #2

26

JK, BO, JP

2b.2 Cal. Check	START	STOP	(LPM)
Pump 1	4.0	4.01	
2	2.04	2.04	→ Recal 2.0
3	1.00	1.00	
4	4.0	4.02	
5	2.05	2.06	→ Recal 2.0
6	1.04	1.05	→ Recal 1.0

1059 START 2b.2 (Cutting / STACKING)
1114 Switch
1129 STOP 2b.2 / check pumps

GPS LOCATION: As Arrival

SCRIPT 3 – Area #2

3a Trail Maintenance / Debris Clearing

3a Cal. Check	START	STOP	(LPM)
Pump 1	4.01	4.06	→ Recal 4.0
2	2.0	2.05	→ Recal 2.0
3	1.0	1.0	
4	4.02	4.05	→ Recal 4.0
5	2.0	2.03	→ Recal 2.0
6	1.0	1.0	

July 27, 2010

Libby Phase IV ABS

Round #2 / Area 2

Weather: Partly Cloudy / WARM

WIND Occational Gust
From The North
up to 2.8 mph

☆ END 3a GPS N 48.52200°
W 115.28951°

July 27, 2010 RND #2

27

JK, JP, BO

Jeremy #1 P4-00132 = 4L
P4-00133 = 2L
P4-00134 = 1L

L = LPM

Byron #2 P4-00135 = 4L
P4-00136 = 2L
P4-00137 = 1L

1210 START 3a (#1 lead) @ TRUCK
1217.5 Switch (#2 lead)
1225 STOP 3a / Check Cal ☆

3b Tree Thinning / Slash Pile

3b Cal Check	START	STOP	(LPM)
Pump 1	4.0	4.0	
2	2.0	2.03	→ Recal
3	1.0	1.04	→ Recal
4	4.0	4.0	
5	2.0	2.0	
6	1.0	1.0	

July 27, 2010

LIBBY Phase IV ABS
Round #2/Area 2

Weather Thin Clouds WARM
Wind: As before / more CALM

July 27, 2010

RND #2

JK, JP, BO

Jeremy #1	P4-00138	= 4L	
	P4-00139	= 2L	
	P4-00140	= 1L	
		L=LPM	
Byron #2	P4-00141	= 4L	
	P4-00142	= 2L	
	P4-00143	= 1L	

1255 START 3b (#1 lead) @ START TRUCK
1302.5 Switch (#2 lead)
1310 STOP 3b
7-27-10

GPS START @ TRUCK (ARRIVAL)
GPS END 3b N: 48.52209°
W: 115.28965°

3c Tree STAND EXAMINATION

3c Cal/Check

PUMP	START	STOP	(LPM)
#1	4.0	4.03	— Real 4.0
#2	2.0	2.0	
#3	1.0	1.0	
#4	4.0	4.0	
#5	2.0	2.0	
#6	1.0	1.0	

July 27, 2010
LIBBY PHASE IV ABS

ROUND #2/Area 2

~~Jeremy #1~~
JCK

Weather: Partly Cloudy / Very Warm in Sun
Wind: Occational Breeze (light) from North
0.0 mph

~~Byron #~~ JCK 7-27-10

July 27, 2010 RND #2

		JK, JP, BO
Jeremy #1	P4-00144	= 4L
	P4-00145	= 2L
	P4-00146	= 1L
		L=LPM
Bryon #2	P4-00147	= 4L
	P4-00148	= 2L
	P4-00149	= 1L

1340 START 3c
1410 STOP 3c

GPS : N 48.52187°
W 115.28957°

1415 Field BLANK P4-00150

3d Cutting Fireline
(Cont Next Page)

July 27, 2010

LIBBY Phase IV ABS
Round #2 / Area 2

Weather: Overcast WARM
Wind: Occasional Light Breeze from North
not measured (not strong enough)

JK, JP, BO

3d Cal. Check		START	STOP (LPM)	
Pump	1	4.0	4.03	→ Recal 4.0
	2	2.0	2.02	
	3	1.0	1.00	
	4	4.0	4.04	→ Recal 4.0
	5	2.0	2.03	→ Recal 2.0
	6	1.0	1.00	

L = LPM

Jeremy #1

P4-00151 = 4L

P4-00152 = 2L

P4-00153 = 1L

Byron #2

P4-00154 = 4L

P4-00155 = 2L

P4-00156 = 1L

1440 START 3d (#1 lead) - GPS START @ TRUCK
1447.5 Switch (#2 lead)
1455 STOP 3d

END GPS: N: 48.52188°
W: 115.28950°

July 27, 2010

LIBBY Phase II ASI
Round 2 / Area 2

Weather Overcast / warm
Wind Calm - light breeze Occational from North

July 27, 2020 RUD #2

JK, JP, BO

1505 Clean up /
2nd Half of Activity 2a
Return to FLYWAY - ATI.

2a Check Cal.	START	STOP (LPM)
Pump 1	4.0	3.99 JK 7-27-10
2	2.02	1.99
3	1.00	1.00
4	4.0	3.98
5	2.0	1.99
6	1.0	0.99

1525 Leave AREA 2 - START
1607 Arrive @ FLYWAY - STOP
1645 Depart FLYWAY
1700 Back in Libby
- Drop off Supplies / Get
- QA FSDS Sheets
Emails
1830 Done for Evening

JK

LIBBY PHASE IV ABS
Round #2 / AREA #7

Weather: Morning Overcast Clouds
Noon Sunny Warm
Wind: Calm in morning

July 28, 2010 RND #2

JK, JP, BO

0800: @ FLYWAY
- Drive to Area Seven (7) to Recon if wet from Yesterday Evening Rain - Was moist not wet

0915: BACK @ FLYWAY - BREAK to wait for Sun

1030: RETURN TO Area Seven (7), dust was now on Roads and duff, trees & grass dry on Sunward Slopes. Drove to Area 10 - Some areas still moist (not wet) .... DUST ALSO LOWER JACKSON ROAD

1230: BACK @ FLYWAY SUIT UP TO to cut down Dry area tree @ AREA SEVEN AREA #7
Calibrate Pumps w/ BIOS

		START	STOP	(LPM)
2a Up	Pump 1	4.00	4.04	
	2	2.00	2.04	
	3	1.00	1.00	
	4	4.00	4.05	
	5	2.00	2.04	
	6	1.00	1.03	

1307 Leave FLYWAY
1339 Arrive @ AREA #7 Seven
GPS N: 48.47291°
W: 115.34939°

LIBBY PHASE IV ABS
Round 2 / Area 7

Weather: Clear to Partly Cloudy / Warm
Wind: Light BREEZE
Up to 3.0 mph average ≈ 1.5 to 2.0 mph from the NorthEast

July 28, 2010 RND #2

JK, JP, BO

Jeremy #1
P4-00157 = 4L
P4-00158 = 2L
P4-00159 = 1L

L = LPM

Byron #2
P4-00160 = 4L
P4-00161 = 2L
P4-00162 = 1L

1350 - Cal check - seems to go up ≈ .04 lpm slightly @ elevation / vise versa.

2b.1 felling & Limbing

	Pump	START	STOP
Recal to 4.0	Pump JK #1	4.0	4.04
Recal to 2.0	Pump #2	2.0	1.998
Recal to 1.0	Pump #3	1.0	1.02 JK
	Pump #4	4.0	4.00
Cal = Calibration	Pump #5	2.0	2.01
	Pump 6	1.0	1.00
			(LPM)

1405 START 2b.1

LIBBY PHASE IV ABS
Round 2/Area 7

Weather: As pg 33
Wind: " "

July 28, 2010 RND #2

K, JP, BG

Jeremy #1

P4-00163 4L

P4-00164 2L

P4-00165 1L

L=LPM

Byron #2

P4-00166 4L

P4-00167 2L

P4-00168 1L

1425 STOP 2b.1 / Check Pumps

2b.2 Cutting & Stacking

Jeremy #1

P4-00169 = 4L

P4-00170 = 2L

P4-00171 = 1L

L=LPM

Byron #2

P4-00172 = 4L

P4-00173 = 2L

P4-00174 = 1L

July 28, 2010 RND #2 . 35

JK, JP, BO

LIBBY PHASE IV ABS
ROUND 2 / AREA 7

GPS @ TREE FELLING N. 48.47324°
W: 115.34985°

Weather: Less Clouds / WARMER - full sun
Wind: As before

1504 START 2b.2
1519 Switch (Photo Taken)
1534 STOP 2b.2 / Check Pumps

Pump	START	STOP (LPM)
1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.0	2.0
6	1.0	0.99

2a BACK

1555 Depart Area 7 for Flyway
1629 Arrive @ Flyway

Check Pumps	START	STOP (LPM)
Pump 1	4.0	3.99
2	2.0	1.99
3	1.0	1.0
4	4.0	3.99
5	2.0	2.0
6	1.0	1.02

1700 Back @ office / QC

LIBBY PHASE IV ABS
ROUND 2 / AREA 10

Weather: Overcast / Clearing (Spot Rains previous evening)
Wind: CALM

July 29, 2010

JK, JP, BO

0730 @ FLYWAY – Calibrate Pumps

w/Rotometer (3.7)	Pump				LPM
		1	4.0	4.04	
(1.9)		2	2.0	2.03	
(0.9)		3	1.0	1.0	
(3.7)		4	4.0	4.05	
(1.9)		5	2.0	2.0	
(0.9)		6	1.0	1.0	
			START	STOP	

Area 10 Activity 2a

(LPM)

Jeremy #1
P4-00175 = 4
P4-00176 = 2
P4-00177 = 1

Byron #2
P4-00178 = 4
P4-00179 = 2
P4-00180 = 1

JK 7-30-10

REDO Did not use

0820 2a Pumps On / Leave Flyway
0903 Arrive @ AREA 10 GPS

Did not get to most of area

LIBBY Phase IV ABS
ROUND #2 / AREA #7 (Seven)

Weather: Overcast / more clouds
Wind: Slight Breeze / not strong enough to measure (0955)(Area 7)

-@1335 WIND HAS PICKED UP
GUSTS vary between
3 and 10 mph from
the North / North West (Area 7)
- Occational Sun

@1440 WIND DIED DOWN
light occational Breeze
from the North West
- Overcast

JK, JP, BO

0905 Check pumps / fine tune if needed
- Areas moist in shaded areas.
Dry in sun areas - Return to
Area 7 - Finish Script 3 to let shaded area dry more

0945 Arrive @ Area 7
3a

		Start	Stop	(LPM)
Pump	1	4.0		
	2	2.0		
	3	1.0		
	4	4.0		
	5	2.0		
	6	1.0		

0955 Still slightly moist in
brush & trees - Return if
Sun comes out...

1040 @ FLYWAY

1245 Return to FLYWAY - Drive
back to AREA 7

1330 - Dry Grass & Trees & Duff still moist

1350 Drive to AREA 10
- Area Drier - Duff still moist
Double check forest Line Boundary
- Clouds back - Wind died down.

1430 Drive Back to Area 7
Still moist under Duff for
Walking & Fire Line

July 29, 2010

JK, JP, BO

1450 Head Back to FIYWAY
1525 Back @ FIYWAY
1530 Back in Libby
@ Office check inventory
organize etc. / email
1700 Done for Day

JK

LIBBY PHASE IV ABS
Round 2/Area 10

Weather: @ FIYWAY - Clear/Cool
Wind: Calm

July 30, 2010

0600 @ FIYWAY - MWH - Joan Kester
Chapman - Byron O.
Jeremy P.
HOR Sean E.

0610 Check Pumps

w/Rotameter - X-check (#1)		START	STOP	(LPM)
3.7 @ 4 BIOS	1	4.0	4.07	w/(BIOS)
1.9 @ 2 BIOS	2	2.0	2.05	
0.9 @ 1 BIOS	3	1.0	1.02	
3.7 @ 4 BIOS	4	4.0	4.07	
1.9 @ 2 BIOS	5	2.0	2.03	
0.9 @ 1 BIOS	6	1.0	0.99	

2a Driving to ABS Area 10 (LPM)

Jeremy #1
P4-00181 = 4
P4-00182 = 2
P4-00183 = 1

Byron #2
P4-00184 = 4
P4-00185 = 2
P4-00186 = 1

0642 Leave FIYWAY
0720 Arrive @ ABS AREA 10

TOTAL: 38 min Up

LIBBY PHASE IV ABS
Round 2 / Area 10

Weather: Thin Cloud layer / Cool
Wind: Calm

July 30, 2010

JK, JP, BO, SE

Area 10 GPS N 48.47946°
W 115.40285°

2b.1 Fellins & Limbing (LPM)

Jeremy #1
P4-00187 = 4.
P4-00188 = 2
P4-00189 = 1

Byron #2
P4-00190 = 4
P4-00191 = 2
P4-00192 = 1

0755 START Activity 2b.1

	Start	stop	(LPM)
Pump 1	4.0	4.01	w/BJOS
2	2.0	2.0	
3	1.0	0.99	
4	4.0	4.0	
5	2.0	2.01	
6	1.0	1.0	

0815 STOP 2b.1 - Photo Taken
GPS: N: 48.47965° (TREE LOCATION)
W: 115.40312°

LIBBY PHASE II ABS
Round 2 / Area 10

Weather: Thin cloud layer
Wind: Calm

July 30, 2010

JK, JP, BO, SE

2b.2 Cuttings & Stacking

		START	STOP	(LPM)
Pump	1	4.0	4.0	w/BJOS
	2	2.0	2.0	
	3	1.0	1.0	
	4	4.0	4.0	
	5	2.0	2.01	
	6	1.0	1.0	

(LPM)

Jeremy #1
P4-00193 = 4
P4-00194 = 2
P4-00195 = 1

Byron #2
P4-00196 = 4
P4-00197 = 2
P4-00198 = 1

0840 START 2b.2 @ AREA 10 BASE STATION
0855 Switch
0910 STOP 2b.2
0915 Check Pumps

LIBBY PHASE IV ABS
Round 2 / Area 10

Weather: Overcast - Cool
Wind: Sparse real light Breeze
(Can not measure) Not strong enough

July 30 2010

JK, JP, BO, SE

0920 - STOP Activity - Sun did not come out to dry under duff - Drive Back To FLYWAY with Cassette

0932 Leave ABS - AREA 10 [2a (Back)]
1010 Arrive @ FLYWAY

2a (BACK)	Pumps	START	STOP	(LPM)
Pump	1	4	3.90	w/ BIOS
	2	2	1.97	
Total: 38 min BACK	3	1	1.01	
	4	4	3.90	
	5	2	1.95	
	6	1	0.99	

1030 Leave FLYWAY
- Go to Hotel / Pack-Up - Check OUT
1100 Touch BASE / CALL TRAVEL INK
1200 5:00 pm. Flight (FULL) - @ Office unload Supplies
Finish Chains / Pack Samples
1415 Done for et (Make Copies)

JK

AREA 7

43

8-03-10 DRY - LAST RAIN LAST WEDNESDAY

0700 MEET AT FLYWAY, RIG UP TO DRIVE OUT TO AREA 7 2a.

START 0745 DRIVE UP

			PUMP RATES START / STOP
JOREMY	#1	P4-00199	4.0/4.0
		P4-00200	2.0/2.0
		P4-00201	1.0/1.0
BYRON	#2	P4-00202	4.0/4.0
		P4-00203	2.0/2.0
		P4-00204	1.0/1.0

STOP 0820

OUT 35 MINS

BACK 25 MINS

	PUMP	RETURN
1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.0	2.0
6	1.0	1.0

AREA 7

8-03-10

FELLING, LIMBING 20 MINS (2.b.1)

START 0850

		PUMP RATES START / STOP
JEREMY #1	P4-00205	4.0/4.1
	P4-00206	2.0/2.0
	P4-00207	1.0/1.0
BYRON #2	P4-00208	4.0/4.1
	P4-00209	2.0/2.0
	P4-00210	1.0/1.0

ADJUST 4 LPM PUMPS BEFORE NEXT ACTIVITY

STOP 0910 20 MINS.

GPS LOC N 48.47310° W. 115.35517°

AREA T

45

503-10

CUTTING, STACKING (2.5.2)

START 0930

JEREMY #1

P4-00211 4

P4-00212 2

P4-00213 1

BARON #2

P4-00214 4

P4-00215 2

P4-00216 1

PUMP RATES

SWITCH @ 0945

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

END 1100

SP2 200. SAME AS PREVIOUS

5-03-10

3a. TRAIL MAINTENANCE 7.5/7.5 (15 mins)

START 1022

JEREMY #1

P4-00217

P4-00218

P4-00219

BYRON #2

P4-00220

P4-00221

P4-00222

SWITCH AT 1029.5

PUMP RATES

1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.0	2.0
6	1.0	1.0

STOP: 1037 HRS

GPS LOC. N 48.47330 W 115.35555

END ~~N 48.47337~~ ~~W 115.35564~~

SFB 10/12/10 48.47333 115.355690

AREA 7

8-03-10

3b, TREE THINNING/SLASH PILE BUILDING

START: 1100

JEREMY #1

P4-00223

P4-00224

P4-00225

BYRON #2

P4-00226

P4-00227

P4-00228

PUMP RATES

1	4.0	/ 4.0
2	2.0	/ 2.0
3	1.0	/ 1.0
4	4.0	/ 4.0
5	2.0	/ 2.0
6	1.0	/ 1.0

STOP 1115

GPS LOC START: N 48.47329 W 115.35504

END N 48.47309 W 115.35561

5-03-10 AREA 7

48

3C TREE STAND EXAMINATION 30 MINS

START: 1130 HRS

JEREMY #1

P4-00229 4

P4-00230 2

P4-00231 1

BYRON #2

P4-00232 4

P4-00233 2

P4-00234 1

		PUMP RATES
	1	4.0 / 4.0
	2	2.0 / 2.0
	3	1.0 / 1.0
STOP: 1200 HRS	4	4.0 / 4.0
	5	2.0 / 2.0
	6	1.0 / 1.0

GPS START N 48.47325° W 115.35502° (CENTER OF 50m RADIUS)

~~STOP~~

JDA

AREA 7

3d. FIRELINE BY PULASKI 8-03-10

START: 1210
SWITCH: 12175
STOP: 1225

JEREMY #1	P4-00235	4
	P4-00236	2
	P4-00237	1
BYRON #2	P4-00238	4
	P4-00239	2
	P4-00240	1

PUMP RATES

1	4.0	/ 4.0
2	2.0	/ 2.0
3	1.0	/ 1.0
4	4.0	/ 4.0
5	2.0	/ 2.0
6	1.0	/ 1.0

GPS START N48. 47327 W 115. 35565
STOP N48. W 115.

2ND HALF (RETURN) OF DRIVE.
LEAVE AREA 7 1240 HRS
ARRIVE FLYWAY 1305 HRS
25 MINUTES

	PUMP RATES	
1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.0
5	2.0	2.0
0	1.0	1.0

RIG UP FOR 2ND ROUND OF THE DAY
AT AREA 10

AREA 10 5-03-10

1315 RIG UP AT FLYWAY, CAL. PUMPS, LABEL & ATTACH CASSETTES, ETC..

JEREMY #1	P4-00241	4.0
	P4-00242	2.0
	P4-00243	1.0
BYRON #2	P4-00244	4.0
	P4-00245	2.0
	P4-00246	1.0

LEAVE FLYWAY AT 1330

ARRIVE AREA 10 AT 1355 25 MINS

PUMP RATES

1	4.0	4.1
2	2.0	2.1
3	1.0	1.1
4	4.0	4.1
5	2.0	2.1
6	1.0	1.0

ADJUST BEFORE NEXT ACTIVITY

RECALIBRATE PUMPS

AREA 10 5-3-10

52

2b.1 FELLING/ LIMBING 20 MINS

START 1425 HRS

JEREMY #1	P4-00247	4
	P4-00248	2
	P4-00249	1
BYRON #2	P4-00250	4
	P4-00251	2
	P4-00252	1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

STOP 1445 HRS

GPS N48.47958° W115.40417

8-03-10 AREA 10

2.6.2 CUTTING/STACKING IN TRUCK 15/15 (30) 53

NEW CASSETTES

START 1500 HRS

JEREMY #1

P4-00253	4
P4-00254	2
P4-00255	1

SWITCH 1515 HRS

BYRON #2

P4-00256	4
P4-00257	2
P4-00258	1

PUMP RATES

1	4.0	/ 4.0
2	2.0	/ 2.0
3	1.0	/ 1.0
4	4.0	/ 4.0
5	2.0	/ 2.0
6	1.0	/ 1.0

(GPS LOCATION SAME AS PREVIOUS)

STOP 1530 HRS

8-03-10 AREA 1C

54

3a TRAIL MAINTENANCE / DEBRIS CLEARING

7.5/7.5 (15 HRS)

START 1545 HRS

JEREMY #1

P4-00259 4

P4-00260 2

P4-00261 1

SWITCH 1552.5 HRS

BYRON #2

P4-00262 4

P4-00263 2

P4-00264 1

PUMP RATES

1 40 / 40
2 20 / 20
3 10 / 10
4 40 / 40
5 20 / 20
6 10 / 10

STOP 1600 HRS

GPS START N48. 47903 W115. 40408

END ~~W115.~~ N48. 47956 W115. 40447

9-03-10 AREA 1C

55

3b TREE THINNING / SLASH PILE BUILDING

7.5/7.5 (15 MINS)

START AT 1610 HRS

FREMY #1 P4-00265 4

P4-00266 2

SWITCH AT 1617.5 HRS P4-00267 1

BYRON #2 P4-00268 4

P4-00269 2

P4-00270 1

PUMP RATES

1 4.0 / 4.0

2 2.0 / 2.0

3 1.0 / 1.0

4 4.0 / 3.9 ADJUST BEFORE NEXT ACTIVITY

5 2.0 / 2.0

6 1.0 / 1.0

STOP AT 1625 HRS

GPS START N 48.47953 W 115.40447

STOP N 48.47946 W 115.40443

8-03-10 AREA 10

56

3C. TREE STAND EXAMINATION (30 mins)

START AT 1640 HRS

JEREMY #1	P4-00271	4
	P4-00272	2
	P4-00273	1
BYRON #2	P4-00274	4
	P4-00275	2
	P4-00276	1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 (RECALIBRATED BEFORE) / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

STOP AT 1710 HRS

GPS LOCATION AT CENTER OF 50 m RADIUS

N48, 47957 W115, 40431

8-03-10 AREA 10 57

3d. CUTTING FIRELINE BY PULASKI 7.5/7.5 (15)

START. 1720 HRS

JEREMY #1

P4-00277 4

SWITCH AT 1727.5 HRS

P4-00278 2

P4-00279 1

END AT 1735 HRS

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

BAREN #2

P4-00280 4

P4-00281 2

P4-00282 1

GPS START: N48 47926 W 115. 40453
STOP N48. 47945 W 115. 40457

DEPART FOR DECON FOR 2ND HALF OF ROUND-TRIP

PUMP RATES

1 4.0 / 3.9
2 2.0 / 1.9
3 1.0 / 0.9
4 4.0 / 3.9
5 2.0 / 1.9
6 1.0 / 1.0

TIME LEFT AREA 10. 1745

TIME ARRIVE AT DECON - 1815 HRS

2a. 3-04-10 AREA 2

DRIVE OUT & BACK FROM AREA 2

START 0725

	JEREMY #1	P4-00283	1
		P4-00284	2
		P4-00285	1
	BYRON #2	P4-00286	4
		P4-00287	2
		P4-00288	1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

STOP 0757 (32 MINS)

CLEAR ~60°F CALM

END GPS: N48.52240 W 115.28797

8-04-10 AREA 2 54

2b.1 FELLING/LIMBING 20 MINS

START 0815

SEREMY #1

P4-00289 4

P4-00290 2

P4-00291 1

BYRON #2

P4-00292 4

P4-00293 2

P4-00294 1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

STOP 0835

GPS OF STUMP N 45.52234° W 115.28809°

TOOK FIELD BLANK @ 0821 P4-00325

(ON 2a sheet)

8-04-10 AREA 2 60

2b.2 CUTTING / STACKING IN TRUCK
15/15 (30 MINS)

START: 0847

JEREMY
#1

SWITCH 0902

P4-00295 4
P4-00296 2
P4-00297 1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

BYRON
#2

P4-00298 4
P4-00299 2
P4-00300 1

STOP: 0917

GPS LOC N 44.52237 W115.25510

CLEAR 70°F BARO 27.1 in Hg

8-04-10 AREA 2 61

3a TRAIL MAINTENANCE / DEBRIS CLEARING
7.5/7.5 (15)

START: 0932 HRS

JEREMY
#
1

SWITCH: 0939.5

P4-00301	4
P4-00302	2
P4-00303	1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.1
5 2.0 / 2.0
6 1.0 / 1.0

BYRON
#
2

ADJUST BERMS
NEXT ACTIVITY

P4-00304	4
P4-00305	2
P4-00306	1

STOP: 0947

START GPS N48, 52238 W 115, 28795
STOP GPS N48, 52242 W 115, 28795

8-04-10 AREA 2 02

3b TREE THINNING / SLASH PILE BUILDING
7.5/7.9 (15 MIN)

START: 1025

JEREMY
#1

P4-00307 4

P4-00308 2

SWITCH: 1032.5

P4-00309 1

P4-00310 4

BYRON
#2

P4-00311 2

PUMP RATES

P4-00312 1

1 4.0 / 4.0
2 2.0 / 2.1 ADJUST BEFORE NEXT ACTIVITY
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.1 ADJUST BEFORE NEXT ACTIVITY
6 1.0 / 1.0

STOP: 1040

GPS START N48. 62228 W115. 25741 SFB
STOP N48. 62207 ~~W115. 21151~~ 10/12/10
W115. 287510

8-04-10 ~~3-13~~ AREA 2 63

3C TREE STAND EXAMINATION
30 MINS

START: 1105

JEREMY #1

P4-00313	4
P4-00314	2
P4-00315	1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.1
5 2.0 / 2.0
6 1.0 / 1.0

BYRON #2

P4-00316	4
P4-00317	2
P4-00318	1

ADJUST PUMP 4 TO 4.0 BEFORE NEXT ACTIVITY

STOP: 1135

CLEAR SKIES ~75°F BARO. = 27.1 IN Hg

GPS OF CENTER 50M RADIUS
N 48.52224 W 115.23757

8-04-10 AREA 2 64

3d CUTTING FIRELINE W/ PULASKI

7.5/7.5 (15 MINS)

START: 1148 HRS

SWITCH: 1155.5 JEREMY

1

P4-00319 4

P4-00320 2

P4-00321 1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.1
5 2.0 / 2.0
6 1.0 / 1.0

BYRON

2

P4-00322 4

P4-00323 2

P4-00324 1

STOP: 1203 HRS

GPS START N48. 52243° W115. 28746°

STOP N 48. 52251° W115. 28736°

AREA 2

RETURN TRIP FROM AREA 2 TO DECON.

START: 1218 HRS

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.2 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

STOP: 1248

RIG DOWN, GO TO DO PAPERWORK. BYRON HAS HIS HAZMAT PHYSICAL AT 1330.

AREA 7

NOTE: JEREMY'S CHILD RUSHED TO HOSPITAL IN KALISPELL AT MIDNIGHT. TOM OBLENS (BYRON'S FATHER) FILLS IN

66

8-05-10

2a ROUND-TRIP DRIVE FROM FLYWAY TO AREA 7

START: 0525

TOM ~~JEREMY~~ #1

P4-00326	1
P4-00327	2
P4-00328	1

PUMP RATES (OUT)

1 4.0 / 4.1
2 2.0 / 2.1
3 1.0 / 1.1
4 4.0 / 4.1
5 2.0 / 2.1
6 1.0 / 1.0

BYRON #2

P4-00329	4
P4-00330	2
P4-00331	1

PUMP RATES (BACK)

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 3.9
5 2.0 / 2.0
6 1.0 / 1.0

STOP 0555 (30 MINS)

LEAVE AREA 7: 1347 ARS

RETURN TO FLYWAY 1412 (25 MINS)

TOTAL TIME 55 MINS.

GPS OF STOP AT AREA 7

N48.47337 W115.35407

805-10

2b.1 FELLING/LIMBING 20 MINS.

START 0925

TCM
~~JEROME~~
#
1

P4-00332 4
P4-00333 2
P4-00334 1

RECAL

PUMP RATES

1 4.0 / 4.1
2 2.0 / 2.1
3 1.0 / 1.0
4 4.0 / 4.1
5 2.0 / 2.0
6 1.0 / 1.0

BYRON
#
2

P4-00335 4
P4-00336 2
P4-00337 1

STOP 0945

GPS OF STUMP N48. 47 318' W115. 35420

2b.2 CUTTING/STACKING IN TRUCK 15/15 (30 MINS)

	TOM ~~JEREMY~~	P4-00338	4
START 1003	# 1	P4-00339	2
SWITCH 1018		P4-00340	1
PUMP RATES	BARCO	P4-00341	4
1 4.0 / 4.0	#		
2 2.0 / 2.0	2	P4-00342	2
3 1.0 / 1.0		P4-00343	1
4 4.0 / 3.9			
5 2.0 / 2.0			
6 1.0 / 1.0			

STOP. 1033

GPS OF SUMP: N48.47315 W115.35420

8-05-10

3a TRAIL MAINT. / DEBRIS CLEARING 7.5/7.5 (15 MIN)

TOM
~~JEREMY~~
#1
1

START 10:55

SWITCH AT 11:02:5

PUMP RATES
1 4.0 / 21.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

BARON
#
2

P4-00344	4
P4-00345	2
P4-00346	1
P4-00347	4
P4-00348	2
P4-00349	1

STOP 11:10 HRS

GPS START N48.47325 W115.35417
STOP N48.47316 W115.35423

8-05-10

3b TREE THINNING / SLASH PILE 75/75 (15 MINS)

START 1125

SWITCH AT 1135.5

TOM
~~JEREMY~~
#
1

P4-00350 4
P4-00351 2
P4-00352 1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

BYRON
#
2

P4-00353 4
P4-00354 2
P4-00355 1

STOP 1143

GPS START N 48, 47330 W 115, 35435
STOP N 48, 47327 W 115, 35407

8-05-10

3c TREE STAND EXAMINATION 30 MINS

TOM
~~JERSHY~~
#
1

START: 1217

P4-00356 4

P4-00357 2

P4-00358 1

P4-00359 4

BYRON
#
2

P4-00360 2

P4-00361 1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

STOP: 1247

GPS OF CENTER OF 50m RADIUS
N45.47329 W115.35432

8-05-10

3d FIRELINE BY PULASKI 7.5/7.5 (1.5 MINS)

TOM
~~JEREMY~~
#
1

START 1300 HR

SWITCH 1307.5 HRS

BYRON
#
2

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

STOP 1315 HRS

P4-00362	4
P4-00363	2
P4-00364	1
P4-00365	4
P4-00366	2
P4-00367	1

GPS START N48.47314 W115.35410
STOP N48.47314 W115.35432

8-05-10 AREA 10 73

2a ROUND TRIP DRIVE FROM FLYWAY TO AREA 10

START: 1458 HRS TOM ~~JEREMY~~ #1

P4-00368 4

P4-00369 2

P4-00370 1

BYRON #2

P4-00371 4

P4-00372 2

P4-00373 1

(OUT)

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.1
5 2.0 / 2.0
6 1.0 / 1.0

(BACK)

PUMP RATES

1 4.0 / 3.8
2 2.0 / 1.9
3 1.0 / 1.0
4 4.0 / 3.9
5 2.0 / 1.9
6 1.0 / 1.0

STOP: 1530 HRS

RETURN: 1930 HRS

ARRIVE FLYWAY: 2000 HRS

FLYWAY TO GPS N48.47995° W115.40742

26.1 FELLING / LIMBING 20 MINS

TOM ~~JEREMY~~ #1

START 1550

P4-00374 4

P4-00375 2

P4-00376 1

BIRCH #2

P4-00377 4

P4-00378 2

P4-00379 1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.1
6 1.0 / 1.0

STOP 1610

GPS OF STUMP N48.47974° W115.40704°

2b.2 CUTTING/STACKING IN TRUCK 15/15 (30 MINS)

TOM
~~JERRY~~
#1

START 1630

P4-00380 4
P4-00381 2
P4-00382 1

SWITCH AT 1645

BYRON
#2

P4-00383 4
P4-00384 2
P4-00385 1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

STOP 1700

GPS OF STUMP N48.47974 W115.40704

39 TRAIL MAINT. / DEBRIS CLEARING 7.5/7.5 (15 MINS)

START; 1715.5

TOM
~~JEREMY~~
#1

P4-00386	4
P4-00387	2
P4-00388	1

SWITCH AT 1723

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 3.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

BYRON
#2

P4-00389	4
P4-00390	2
P4-00391	1

STOP: 1730.5

GPS START N 48. 47983° W115. 40721°
STOP N 48. 47972° W115. 40720°

3b TREE THINNING / SLASH PILE 7.5/7.5 (15 MINS)

TOM
~~JEREMY~~
#1

START: 1748

P4-00392	4
P4-00393	2
P4-00394	1

SWITCH AT 1755.5

BARN
#2

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

P4-00395	4
P4-00396	2
P4-00397	1

STOP: 1803

GPS START N45. 47974° W115. 40730°
STOP N45. 47968° W115. 40755°

★ CONTINUED IN LOGBOOK #2

LOGBOOK #2

1

3c TREE STAND EXAMINATION 30 MINS

START 1815

TOM ~~JEREMY~~ #1

P4-00398 4
P4-00399 2
P4-00400 1

BYRON #2

P4-00401 4
P4-00402 2
P4-00403 1

PUMP RATES
1 4.0/4.0
2 2.0/2.1
3 1.0/1.0
4 4.0/4.0
5 2.0/2.0
6 1.0/1.0

STOP 1845

GPS OF CENTER OF 50m RADIUS
N48.47960° W115.40155°

3d FIRELINE BY PULASKI 7.5/7.5 (15 MINS)

TOM
~~JEREMY~~
#1

START: 1358.5

P4-00404	4
P4-00405	2
P4-00406	1

SWITCH 1906

BYRON
#2

P4-00407	4
P4-00408	2
P4-00409	1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

STOP: 1913.5

GPS LOCATION
START N48.47982° W115.40738°
STOP N48.47984° W115.40743°

8-10-10
0635 @ Lobby Office
0700 @ Flyway w/ Chapman Crew
0715 Bonnie arrive / Calibrate Pumps
0810 Arrive @ AREA 2
GPS N 48.52 173°
W 115.28 947°

- Photo of Cassettes

- Wind is calm -

AREA 2

8-10-10 JCK
~~8-00-10~~

2a ROUND TRIP FLYWAY → AREA 2 AND BACK

START: 0735

PUMP RATES (OUT)
1 4.0 / 4.02
2 2.0 / 2.0
3 1.0 / 0.99
4 4.0 / 4.0
5 2.0 / 2.03
6 1.0 / 0.97

SCROLL #1

BARN #2

P4-00410	4
P4-00411	2
P4-00412	1
P4-00413	4
P4-00414	2
P4-00415	1

STOP: 0810

RETURN START: 1628
STOP: 1659

MINS OUT: 35
MINS BACK: 31
TOTAL: 66 min

PUMP RATES (BACK)
1 4.0 / 3.97
2 2.0 / 1.98
3 1.0 / 0.99
4 4.0 / 3.95
5 2.0 / 1.97
6 1.0 / 0.97

8-10-10

0918 STARTED TO RAIN
- Went into Town

1130 - Chapman Crew to check on site
Area #2 - Sun is out

1230 @ FLYWAY - Drove back to
Area #2 Dry

Weather Overcast w/Sun

AREA 2 4

8-10-10 JCK
~~8-10-10~~

2b:1a FELLING/LIMBING ~~20 MINS~~ JCK 8-10-10 15 mins

START: 0846 JEREMY #1 P4-00416 4

P4-00417 2

STOP: 0901 P4-00418 1

BYRON #2 P4-00419 4

P4-00420 2

P4-00421 1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

GPS Location Tree #1
N 48.52 169°
W 115.28 983°

Area 2

8-10-10

2b.1b Felling/Limbing 10 mins

START 0916 Jeremy #1

0918 (STARTED TO RAIN)

STOP

REDO Only ≈ 5-10 mins

~~(P4-00422 to P4-00427)~~

P4-00454	4
P4-00455	2
P4-00456	1

Byron #2

START 1343

STOP 1353

P4-00457	4
P4-00458	2
P4-00459	1

Pump Rates

1 4.0 / 3.98
2 2.0 / 2.01
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

GPS N 48 52 159° #2 TREE
W 115 28 983°

AREA 2

5

8-10-10
~~8-10-10~~ JCK

2b.2 CUTTING/STACKING IN TRUCK 7.5/7.5 (15min) ~~15/15 (30 min)~~ JCK 8-10-09

START: 1405

SWITCH: 1412.5

STOP: 1420

JEREMY #1

P4-00460	4
P4-00461	2
P4-00462	1

BYRON #2

P4-00463	4
P4-00464	2
P4-00465	1

PUMP RATES

1 4.0 / 3.99
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

Occasional light Breeze (unable to measure) to light

~~Trail END~~ JCK 8-10-10 GPS: @ ~~NEAR~~ TRUCK BASE STATION
N 48 52 173°
W 115 28 947°

AREA Z

6

8-10-10 JCK
~~8-10-10~~

3c1 TRAIL MAINTENANCE / DEBRIS CLEARING 75/75 (15 MIN)

START 1430
SWITCH 14:37.5
STOP 1445

JEREMY
#1

P4-00428 4
P4-00429 2
P4-00430 1

BYRON
#2

P4-00431 4
P4-00432 2
P4-00433 1

FLUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

START N. 48.52 175° W 115 28 997°
TRAIL END: GPS: 48 52 185 W 115 28 996°

Sunny / Spot Clouds

Wind ≈ 3mph occasional
from N-NE

8-10-10
~~5-06~~ TO JCK

35 TREE THINNING / SLASH PILE BUILDING 7.5/7.5 (15 MIN)

START 1455
SWITCH 1502.5
STOP 1510

JEREMY #1
P4-00434 4
P4-00435 2
P4-00436 1

BYRON #2
P4-00437 4
P4-00438 2
P4-00439 1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.02
5 2.0 / 2.01
6 1.0 / 1.01

- Partly cloudy occational East wind up to 5 mph

START N 48 52 173° W 115. 28 947°
STOP N 48. 52 189° W 115. 28 971°

8-10-10 JCK
~~8-10-10~~

3C TREE STAND EXAMINATION 30 MINS

START 1519 JEROMY #1 P4-00440 4

P4-00441 2

STOP 1549 P4-00442 1

BARON #2 P4-00443 4

P4-00444 2

PUMP RATES P4-00445 1

1 4.0 / 4.01
2 2.0 / 2.02
3 1.0 / 1.0
4 4.0 / 4.04
5 2.0 / 2.03
6 1.0 / 1.02

- Calm - Hot - Partly Cloudy

GPS Center of 50 m Radius
N 48.52 156° W 115. 28 937°

8-10-10
1700 - Check pumps
1715 Back @ Libby office / Supplies

1800 - Paper work Prep
~~1730~~ JCK 8-11-10

AREA2 9

8-10-10 JCK
~~8-9-10~~

3d FIRELINE BY PULASKI 7.5/7.5 (15 MIN)

START: 1602
SWITCH: 1609.5
STOP 1617

JEREMY #1

P4-00446	4
P4-00447	2
P4-00448	1

BYRON #2

P4-00449	4
P4-00450	2
P4-00451	1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.01
4 4.0 / 3.99
5 2.0 / 2.0
6 1.0 / 1.0

Let Blanks - 19989

P4-00452	LB
P4-00453	LB

Partly Cloudy (warm) Slight Breeze

GPS Location
START N 48.52 173° W 115.28 947°
STOP N 48.52 156° W 115.28 954°

8-11-10
0830 Drop off Cooler (samples) @ Copy this / Copy that
0845 @ FLYWAY with Jeremy & Byron

AREA 7

8-11-10
2a Round Trip FLYWAY to Area 7

START: 0908 Jeremy #1

Pump Rates (Out)
1 4.0 / 4.1
2 2.0 / 2.1
3 1.0 / 1.0
4 4.0 / 4.05 Byron #2
5 2.0 / 2.04
6 1.0 / 1.01

STOP: 0936

P4-00466	4
P4-00467	2
P4-00468	1
P4-00469	4
P4-00470	2
P4-00471	1

Return START: 1318
STOP: 1344

mins out: 28
mins back: 26
Total: 54

Pump Rates (Back)
1 4.0 / 3.95
2 2.0 / 1.98
3 1.0 / 1.0
4 4.0 / 3.95
5 2.0 / 2.0
6 1.0 / 1.05

GPS @ Area (TRUCK) N 48.47321° W 115.35332°

Area 7

8-11-10

2b.1a felling / Limbing 15 mins

START. 1010 Jeremy #1

STOP 1025

P4-00472 4

P4-00473 2

P4-00474 1

Byron #2

P4-00475 4

P4-00476 2

P4-00477 1

Pump Rates

1 4.0 / 4.0
2 2.0 / 1.99
3 1.0 / 1.01
4 4.0 / 4.02
5 2.0 / 2.02
6 1.0 / 1.02

^ Overcast - 70-75° light occasional Breeze

GPS TREE #1: N 48 47332° W 115 35298°

Area 7

8-11-10

2b.1b felling / Limbing 10 mins

START 1037 Jeremy #1

STOP 1047

P4-00478 4

P4-00479 2

P4-00480 1

Byron #2

P4-00481 4

P4-00482 2

P4-00483 1

Pump Rates

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 3.98
5 2.0 / 2.01
6 1.0 / 1.0

- Overcast warm ~ 75° light occ. Breeze

GPS TREE #2: ~~N 48 47332° W 115 35298°~~ N 48 47340° W 115 35313°

Area 7

8-11-10

2b.2 Cutting & STACKING IN TRUCK (7.5/7.5) 15 mins

Jeremy #1

START: 1058
Switch: 1105.5
STOP: 1113

P4-00484 4
P4-00485 2
P4-00486 1

Byron #2

P4-00487 4
P4-00488 2
P4-00489 1

Pump Rates
1 4.0 / 4.01
2 2.0 / 2.01
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.01
6 1.0 / 1.01

- Sun w/Clouds ~80° - Occational light NNE breeze

GPS: @ Area TRUCK LOCATION
N 48.47 321°
W 115.35 332°

Area 7

8-11-10

3a TRAIL MAINTENANCE/DEBRIS CLEARING 7.5/7.5 15 mins

START: 1123
Switch: 1130.5
STOP: 1138

Jeremy #1

P4-00490 4
P4-00491 2
P4-00492 1

Byron #2

P4-00493 4
P4-00494 2
P4-00495 1

Pump Rates
1 4.0 / 3.96
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 3.99
5 2.0 / 1.99
6 1.0 / 0.98

- Overcast occational Light Breeze NE

GPS Location
START N 48.47 321° W 115.35 332°
STOP N 48.47 305° W 115.35 347°

Area 7

8-11-10

3b Tree Thinning / Slash Pile Building 7.5/7.5 (15 min)

START: 1150 Jeremy #1
Switch: 1157.5
STOP: 1205

P4-00496	4
P4-00497	2
P4-00498	1

Byron #2

P4-00499	4
P4-00500	2
P4-00501	1

Pump Rates

1	4.0 / 3.99
2	2.0 / 2.0
3	1.0 / 1.0
4	4.0 / 3.99
5	2.0 / 2.0
6	1.0 / 1.0

Over cast Calm - ~~clouds above~~ yet to light Breeze - now from E-SE

GPS Location

START: N 48.47 321° W 115.35 352°
STOP: N 48.47 307° W 115.35 350°

Area 7

8-11-10

3c TREE STAND EXAMINATION (30 mins)

START: 1215 Jeremy #1
STOP: 1245

P4-00502	4
P4-00503	2
P4-00504	1

Byron #2

P4-00505	4
P4-00506	2
P4-00507	1

Pump Rates

1	4.0 / 4.0
2	2.0 / 1.19
3	1.0 / 1.0
4	4.0 / 3.99
5	2.0 / 1.98
6	1.0 / 1.0

Overcast - light breeze from East-SE

GPS Location: Center Radius (50m)
N 48.47 345° W 115.35 310°

Area 7

8-11-10

3d Fireline By Pulaski 7.5/7.5 (15 min)

Jeremy #1

START 1255
Switch 1302.5
STOP 1310

P4-00508 4
P4-00509 2
P4-00510 1

Byron #2

P4-00511 4
P4-00512 2
P4-00513 1

Pump Rates
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.01
4 4.0 / 4.02
5 2.0 / 2.0
6 1.0 / 1.0

1315 Field Blank P4-00514

Overcast - Occasional Gust up to 5mph from East

GPS LOCATION:
START N 48 47 321° W 115.35 332°
STOP N 48 47 303° W 115.35 340°

Area 10

8-11-10

2a Round Trip FIYWAY to Area 10

START 1354

Pump Rates (Up)
1 4.0 / 4.05
2 2.0 / 2.02
3 1.0 / 1.0
4 4.0 / 4.04
5 2.0 / 2.0
6 1.0 / 1.0

Jeremy #1
P4-00515 4
P4-00516 2
P4-00517 1

Byron #2
P4-00518 4
P4-00519 2
P4-00520 1

STOP : 1423

(8-12-10)
Return START: 1617
STOP 1649

Pump Rates (Back)
1 4.0 / 3.95
2 2.0 / 1.93
3 1.0 / 0.98
4 4.0 / 3.92
5 2.0 / 1.95
6 1.0 / 0.97

Mins out: 29
mins back: 32
Total: 61

GPS @ Area 10 (TRUCK) N 48.47864° W 115.40051°

Area 10

8-11-10
2b 1b JCK

Felling / Limbing

(15 mins) JCK
10 mins

START 14.32

Jeremy #1

STOP 14.42
– STARTED TO RAIN

P4-00521 4
P4-00522 2
P4-00523 1

Byron #2

P4-00524 4
P4-00525 2
P4-00526 1

Pump Rates
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 0.99
4 4.0 / 4.01
5 2.0 / 2.02
6 1.0 / 1.0

RAIN

GPS TREE ~~#1~~ #2 JCK 8-12-10
N 48. 47 837° W 115. 40 063°

~~Area 10~~ JCK
Area 7 3a

8-11-10
~~2b 1b Felling/Limbing~~ (10 mins)
* WAS NOT RAINING [illegible] AREA 6 *

START 1549
Switch 1556.5
STOP 1604

Jeremy #1

P4-00527 4
P4-00528 2
P4-00529 1

Byron #2

P4-00530 4
P4-00531 2
P4-00532 1

Pump Rates
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 0.99
4 4.0 / 3.99
5 2.0 / 1.99
6 1.0 / 1.0

GPS LOCATION
START W 48 47 [illegible]
FINISH W 48 47 285 [illegible]

Area 7

8-11-10

3b Tree Thinning/Slash Pile Building 75/75 (15 mins)

START 1612
Switch 1619.5 Jeremy #1
STOP 1627

P4-00533 4
P4-00534 2
P4-00535 1

Byron #2

P4-00536 4
P4-00537 2
P4-00538 1

Pump Rates
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 0.99
4 4.0 / 3.99
5 2.0 / 2.01 (2.0) SCK 8-11-10
6 1.0 / 1.0

Overcast Sun in Spots - Clouds moving from West
Occational Breeze up to 2 mph NW (from)

GPS LOCATION
START: N 48.47300° W 115.34937°
STOP: N 48.47289° W 115.34943°

Area 7

8-11-10

3c Tree STAND EXAMINATION (30 min)

START 1635
STOP 1705 Jeremy #1

P4-00539 4
P4-00540 2
P4-00541 1

Byron #2

P4-00542 4
P4-00543 2
P4-00544 1

Pump Rates
1 4.0 / 4.0
2 2.0 / 2.02
3 1.0 / 0.99
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

- Sun - Partly Cloudy (Hot) - Calm

GPS LOCATION: Center Radius (50m)
N 48.47289° W 115.34904°

Area 7

8-11-10

3d Fireline by Pulaski 7.5/7.5 (15min)

START 1715
Switch 1722.5 Jeremy #1
STOP 1730

P4-00545 4
P4-00546 2
P4-00547 1

Byron #2

P4-00548 4
P4-00549 2
P4-00550 1

Pump Rates
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.01
5 2.0 / 2.01
6 1.0 / 0.98

Sunny @ First · Clouds moving in from SW
CALM @ Site

GPS Location:
START N 48.47 287° W 115.34 930°
END N 48 47 279° W 115.34 904°

1815: BACK IN LIBBY JCK

Area 2

17

8-12-10

0900 At FLYWAY / Calibrate Pumps
w/Chapman Crew Jeremy / Byron

2a Round TRIP FLYWAY to Area 2

START(up) 0930

Pump Rates
1 4.0 / 4.04
2 2.0 / 2.03
3 1.0 / 0.99
4 4.0 / 4.04
5 2.0 / 2.03
6 1.0 / 1.02

STOP 1001

P4-00551 4
P4-00552 2
P4-00553 1
P4-00554 4
P4-00555 2
P4-00556 1

Return
START 1339
STOP 1412
Out mins 31
Back mins 33
Total - 64

Pump Rates (BACK)
1 4.0 / 3.95
2 2.0 / 1.98
3 1.0 / 1.0
4 4.0 / 3.95
5 2.0 / 1.98
6 1.0 / 0.98

GPS LOCATION
@ Area 2 N 48 52499° W 115.30432°

*STARTED LATER TO LET SUN DRY ANY AREAS W/RAIN (Cleaning Flyway)

Area 2

8-12-10

2D.1a Felling/Limbing (15 mins)

START 1020
STOP 1035 Jeremy #1

P4-00557 4
P4-00558 2
P4-00559 1

Byron #2

P4-00560 4
P4-00561 2
P4-00562 1

Pump Rates

1	4.0 / 4.0
2	2.0 / 2.02
3	1.0 / 1.0
4	4.0 / 4.0
5	2.0 / 2.0
6	1.0 / 0.98

- Full Sun - w/ TRACE CLOUDS - Calm

GPS Location: TREE #1
N 48.52494° W 115.30380°

Area 2

8-12-10

2b.1b Felling/Limbing (10 mins)

START 1045
STOP 1055 Jeremy #1

P4-00563 4
P4-00564 2
P4-00565 1

Byron #2

P4-00566 4
P4-00567 2
P4-00568 1

Pump Rates

1	4.0 / 4.02
2	2.0 / 2.01
3	1.0 / 1.02
4	4.0 / 4.01
5	2.0 / 2.01
6	1.0 / 1.0

- Full Sun - Calm ≈ 70-75°

GPS Location: TREE #2
N 48 52514° W 115.30386°

AREA 2

8-12-10

2b.2 Cutting & STACKING in TRUCK 7.5/7.5 (15min)

START 1106
Switch 1113.5 Jeremy #1
STOP 1121

P4-00569 4
P4-00570 2
P4-00571 1

Byron #2

P4-00572 4
P4-00573 2
P4-00574 1

Pump Rates
1 4.0 / 4.02
2 2.0 / 2.01
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.01

- Clear - SUN - CALM

GPS Location (New TRUCK LOCATION) moved to pull TREES
~~START~~
~~STOP~~ N 48.52504° W 115.30363°

Area 2

8-12-10

3a Trail Maintenance/Debris Clearing 7.5/7.5 (15min)

START 1135
Switch 1142.5 Jeremy #1
STOP 1150

P4-00575 4
P4-00576 2
P4-00577 1

Byron #2

P4-00578 4
P4-00579 2
P4-00580 1

Pump Rates
1 4.0 / 4.01
2 2.0 / 2.02
3 1.0 / 0.99
4 4.0 / 4.02
5 2.0 / 2.01
6 1.0 / 1.0

- Clear - Sun - Calm

GPS Location
START N 48.52499° W 115.30432°
STOP: N 48.52485° W 115.30454°

Area 2

8-12-10

3b Tree Thinning/Slash Pile Building 75/75 (15 min)

START 1202
Switch 1209.5 Jeremy #1
STOP 1217

P4-00581 4
P4-00582 2
P4-00583 1

Byron #2

P4-00584 4
P4-00585 2
P4-00586 1

Pump Rates
1 4.0 / 4.0
2 2.0 / 2.01
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.03
6 1.0 / 1.0

- Sun - TRACE CLOUDS - Light Breeze SW

GPS LOCATION
START N 48.52499° W 115.30432°
STOP N 48.52471° W 115.30428°

8-12-10

3c Tree Stand Examination (30 min)

START 1229
STOP 1259 Jeremy #1

P4-00587 4
P4-00588 2
P4-00589 1

Byron #2

P4-00590 4
P4-00591 2
P4-00592 1

Pump Rates
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.02
4 4.0 / 4.0
5 2.0 / 2.01
6 1.0 / 1.0

- Partly Cloudy - Light Breeze

GPS Location: 50m Radius (Center)
N 48.52481° W 115.30446°

AREA 2

8-12-10

3d Fireline by Pulaski 7.5/7.5 (15 mins)

START 1315
Switch 1322.5 Jeremy #1
STOP 1330

P4-00593 4
P4-00594 2
P4-00595 1

P4-00596 4
Byron #2
P4-00597 2
P4-00598 1

Pump Rates
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.03
6 1.0 / 1.0

- Partly Cloudy - Occasional Gust up to 7 mph from SW
Average ≈ 4 mph

GPS Location
START N 48.52 499° W 115.30 432°
STOP N 48.52 480° W 115.30 441°

AREA 10

8-12-10

2b.1a Felling/Limbing (15 mins)

START 1522
STOP 1537

P4-00599 4
P4-00600 2
P4-00601 1

P4-00602 4
P4-00603 2
P4-00604 1

Pump Rates
1 4.0 / 3.98
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.04
5 2.0 / 2.0
6 1.0 / 0.99

- Drive up to 2b.1b (8-11-10)

- Partly Cloudy - light breeze - SW

GPS Location: TREE #1 JCK 8-12-10
N 48.47 821° W 115.40 027°

AREA 10

8-12-10
2b 2 Cutting & Stacking in Truck 7.5/7.5 (15 min)

START 1550
STOP JCK ~~16~~
Switch 1557.5
STOP 1605

Jeremy #1

P4-00605 1
P4-00606 2
P4-00607 1

Byron #2

P4-00608 4
P4-00609 2
P4-00610 1

Pump Rates
1 4.0 / 3.99
2 2.0 / 2.0
3 1.0 / 1.01
4 4.0 / 4.0
5 2.0 / 1.99
6 1.0 / 0.99

- Overcast - Light breeze - SW

GPS Location:
N 48. 17 819° W 115. 40 005°

AREA 10

8-13-10
0730 C. Office
0740 2a Round Trip Flyway to Area 10

START 0807
STOP 0838

- Area 10 (Wet)

P4-00611 4
P4-00612 2
P4-00613 1
P4-00614 4
P4-00615 2
P4-00616 1

Pump Rates
1 4.0 4.
2 2.0 2.05
3 1.0 1.0
4 4.0 4.1
5 2.0 2.06
6 1.0 1.02

- Area Wet - Clear & Calm
- Some Road areas drying will Return in a couple hours
- Finish Chains -
1130 Back @ Site still wet - clouds moving in (Overcast)
- Call it for Day JCK

8-17-10 SITE 10 SDG

0832 PUMPS CALIBRATED. DUING ACTIVITIES 3a - 3d that WERE RAINEDOUT LAST WEEK

P4-00617 4 LPM

P4-00618 2 LPM ← JEREMY #1 ACTIVITY 3a TRAIL MAINT./DEBRIS 7.5/7.5 mins

P4-00619 1 LPM

START 0852.5
SWITCH 0900
END 0907.5

PUMP RATES

1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	3.9
5	2.0	2.0
6	1.0	1.0

P4-00620 4 LPM

P4-00621 2 LPM ← BYRON #2

P4-00622 1 LPM

GPS LOCATION START N48, 47950 W. 115.40275
STOP N48, 47923° W 115.40287°

AREA 10

3b TREE THINNING / SLASH PILE BUILDING 7.5/7.5

	JEREMY #1	P4-00623	4 LPM
		P4-00624	2
START 0920		P4-00625	1
SWITCH 0927.5			
STOP 0935			
		P4-00626	4 LPM
	BYRON #2	P4-00627	2
		P4-00628	1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

GPS START N 48.47936° W 115.40266°
STOP N 48.47922° W 115.40292°

AREA 10

3c TREE STAND EXAMINATION

START 0945

STOP 1015

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

JEREMY #1

BYRON #2

P4-00629 4 LPM

P4-00630 2

P4-00631 1

P4-00632 4 LPM

P4-00633 2

P4-00634 1

CENTER OF 50 m RADIUS: N48.47920° W115.40242°

AREA 10

3d CUTTING FIRELINE BY PULASKI

START 1025
SWITCH 10325
STOP 1040

JEREMY #1

P4-00635

P4-00636

P4-00637

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.1
5 2.0 / 2.0
6 1.0 / 1.0

BYRON #2

P4-00638

P4-00639

P4-00640

GPS START: N48.47937° W115.40203°
STOP: N48.47923° W115.40277°

AREA 10 8-17-10

3a TRAIL MAINTENANCE / DEBRIS CLEARING

START 1127
SWITCH 1134.5
STOP 1142

JEREMY #1

P4-00641 4 LPM
P4-00642 2
P4-00643 1

PUMP RATES
1 4.0 / 4.1
2 2.0 / 2.1
3 1.0 / 1.0
4 4.0 / 4.1
5 2.0 / 2.1
6 1.0 / 1.1

BYRON #2

P4-00644 4 LPM
P4-00645 2
P4-00646 1

GPS LOC. START N48.47828° W115.40012°
STOP N48.47821° W115.40044°

AREA 10 8-17-10

3b TREE THINNING/ SLASH PILE BUILDING

~~START 1127~~ JDG 5-17-10

~~SWITCH 1134.5~~ JEREMY #1

~~STOP 1142~~

START 1200

SWITCH 1207.5

STOP 1215

PUMP RATES BYRON #2

1 4.0/4.0

2 2.0/ 2.0

3 1.0/ 1.0

4 4.0/ 3.9

5 2.0/ 2.0

6 1.0 / 1.0

P4-00647 4 LPM

P4-00648 2

P4-00649 1

P4-00650 4 LPM

P4-00651 2

P4-00652 1

GPS START N48.47819° W.115.40033°

STOP N48.47831° W.115.40046°

29

AREA 10 8-17-10

3C TREE STAND EXAMINATION

START 1228

STOP 1258

JEREMY #1

P4-00653	4	LPM
P4-00654	2	
P4-00655	1	

PUMP RATES

1 4.0 / 4.0

2 2.0 / 2.0

3 1.0 / 1.0

4 4.0 / 4.0

5 2.0 / 2.0

6 1.0 / 1.0

BYRON #2

P4-00656	4	LPM
P4-00657	2	
P4-00658	1	

CENTER OF 50-M RADIUS N48.47824° W115.40038°

AREA 10 8-17-10

3d CUTTING FIRELINE BY PULASKI

START 1300
SWITCH 1313.5
STOP 1321

JEREMY #1

PUMP RATES
1 4.0/4.0
2 2.0/2.0
3 1.0/1.0
4 4.0/4.0
5 2.0/2.0
6 1.0/1.0

BYRON #2

P4-00659 4 LPM
P4-00660 2
P4-00661 1

P4-00662 4 LPM
P4-00663 2
P4-00664 1

GPS START N48.47824° W115.40039°
STOP N48.47823° W115.40038°

RIG DOWN, LEAVE AREA 10 FOR RAINY CREEK.

8-17-10 RAINY CREEK ROUND #1

1400 AT DECON AT FLYWAY. RECALIBRATE PUMPS w/ BIOS. FLOW @ LRC-06 = 424.5 GPM

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

JEREMY #1

P4-00665
P4-00666
P4-00667

BYRON #2

P4-00668
P4-00669
P4-00670

START: 1435, TURN 1508
STOP: 1538

RKDOWN, RETURN TO DECON. DRIVE TO TOWN FOR PHONE CALLS/PAPERWORK

FLOW AT ISCO = 424.5 GPM
GPS START:
N 48.417995
W 115.446747

JFB 10/12/10

ACTIVITY 3e

8-18-10 DOZER FIRELINE AREA 2

FIRST ROUND

0700 MEET & DECON

0820 ARRIVE AT AREA 2.

CALIBRATE PUMPS

BYRON WILL BE OPERATOR AT ALL TIMES

JEREMY WILL BE FIRE BOSS AT ALL TIMES

30 MINUTES

PUMP RATES

1 4.0 /

2 2.0 /

3 1.0 /

4 4.0 /

5 2.0 /

6 1.0 / 1.0

START: 0900

STOP: 0934

	P4-00671	4	LPM
JEREMY # 1	P4-00672	2	
	P4-00673	1	
	P4-00674	4	LPM
BYRON # 2	P4-00675	2	
	P4-00676	1	

NOTE- VERY DUSTY ON DOZER

GPS LOCATION

START N48, 31.255' W115, 17.435'

STOP N48, 31.317' W115, 17.356'

NOTE: DEGREES & MINUTES

ACTIVITY 3e

8-18-10 DOZER FIRELINE AREA 2
2ND ROUND

START 1022
STOP 1052

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.1
5 2.0 / 2.0
6 1.0 / 1.0

SCREW #1

P4-00677 4
P4-00678 2
P4-00679 1

BYRON #2

P4-00680 4
P4-00681 2
P4-00682 1

NOTE: VERY DUSTY ON DOZER

GPS LOCATION
START N45. 52102° W115. 29057°
STOP N45. 52055° W115. 29978°

ACTIVITY 3e

8-15-10 DOZER FIRELINE AREA 2
ROUND 3

START 1140 P4-00683
STOP 1210 P4-00684

PUMP RATES P4-00685
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0 P4-00686
4 4.0 / 4.0
5 2.0 / 2.0 P4-00687
6 1.0 / 1.0 P4-00688

NOTE: VERY DUSTY ON DOZER

GPS LOCATION N48.52166 W115.28953 START
N48.52130 W115.28940 STOP
WENT SEVERAL HUNDRED
FEET TO SOUTH OF
THIS POINT, TURNED BACK UP

ACTIVITY 1 RAINY CREEK ROUND 2 35

8-14-10

0700 ARRIVE AT DECON, CALIBRATE PUMPS

PUMPRATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

JEREMY

P4-00689 4 LPM
P4-00690 2
P4-00691 1

BYRON

P4-00692 4 LPM
P4-00693 2
P4-00694 1

START: 0750
STOP: 0850

FLOW AT ISCO 338.5 GPM

8-19-10 AREA 10 DOZER FIRELINE
ACTIVITY 3e. FIRST ROUND

1040 ARRIVE AREA 10, CALIBRATE PUMPS

JEREMY #1

P4-00695	4 LPM
P4-00696	2
P4-00697	1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

BYRON #2

P4-00698	4
P4-00699	2
P4-00700	1

BYRON IS OPERATOR

START 1110 HRS
STOP 1140 HRS

GPS START N48.47928 W115.40040
STOP N48.47874 W115.39877

AREA 10

8-19-10 3e DOZOR FIRELINE ROUND #2

START 1232
STOP 1302

JEROMY #1 (BOSS)

P4-00701 4 LPM
P4-00702 2
P4-00703 1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

BYRON H_2 (OPERATOR)

P4-00704 4 LPM
P4-00705 2
P4-00706 1

FIELD BLANK P4-00707

GPS START N48, 47869° W115, 40190°
STOP N48, 47425° W115, 40385°

8-19-10 3e FIRELINE BY DOZER AREA 10
ROUND #3

START 1342
STOP 1412

JEREMY
BOYS

P4-00708	4
P4-00709	2
P4-00710	1

PUMP RATES
1 4.0/4.0
2 2.0/2.0
3 1.0/1.0
4 4.0/4.0
5 2.0/2.0
6 1.0/1.0

BYRON
#2
OBSERVER

P4-00711	4
P4-00712	2
P4-00713	1

GPS START N48. 47899 W115. 40234
STOP N48. 47962 W115. 40447

1430 DECON, RIG DOWN, HEAD TO FLYWAY

8-20-10 ACTIVITY 1 RAINY CREEK WALK 1 HR

START 0900 JEREMY #1
STOP 0400

P4-00714	4 LPM
P4-00715	2
P4-00716	1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.0
5 2.0 / 2.0
6 1.0 / 1.0

BYRON #2

P4-00717	4
P4-00718	2
P4-00719	1

LOCATION START, UPSTREAM FROM ER DECON TRAILER, 30 MINS, BACK DOWNSTREAM 30 MINS

FLOW AT ISCO = 413.8 GPM

GPS START:
N 48.417995 JSB 10/2/10
W 115.446747

AREA 7

8-20-10 ACTIVITY 3e FIRELINE BY DOZER 1ST ROUND

START 1120
STOP 1150

JEREMY #1

P4-00720 4 LPM
P4-00721 2
P4-00722 1

PUMP RATES
1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 3.4
5 2.0 / 2.0
6 1.0 / 1.2

BYRON #2

P4-00723 4
P4-00724 2
P4-00725 1

GPS START N48, 47.758° W115, 35.458°
STOP N48, 47.937° W115, 35.224°

1220 MOVE DOWN ROAD TO NEXT LOCATION, JUST AS BYRON HEED OFF ROAD TO BEGIN, SEAL ON PISTON THAT RAISES BLADE BLEW, MAJOR REPAIR, TO TOWN TO DO PAPERWORK, PREP SAMPLES FOR SHIPMENT

08-24-10
~~8-20-10~~ AREA 7 3e DOZER FIRELINE ROUND #2

0700 Meet at Flyway, calibrate pumps

START 0822

STOP 0852

JEREMY #1	1	P4-00726	4 LPM
	2	P4-00727	2
	3	P4-00728	1
BYRON #2	4	P4-00729	4
	5	P4-00730	2
	6	P4-00731	1

PUMP RATES

1 4.0 / 4.0
2 2.0 / 2.0
3 1.0 / 1.0
4 4.0 / 4.1
5 2.0 / 2.1
6 1.0 / 1.0

GPS START N48.47787 W115.34776
STOP N48.47855 W115.34962

calm, clear, no wind

Field Blank = P4-00738

08-24-10 Area 7 3e Dozer Fireline Round ~~#2~~ #3
Activity 3e

START 0933
STOP 1003

Jeremy #1

1	P4-00732	4 LPM
2	P4-00733	2
3	P4-00734	3

PUMP RATES

1	4.0	4.0
2	2.0	2.0
3	1.0	1.0
4	4.0	4.1
5	2.0	2.0
6	1.0	1.0

Byron #2

4	P4-00735	4 LPM
5	P4-00736	2
6	P4-00737	1

GPS START N48.47738 W115.34750
STOP N48.47639 W115.34634

calm, no wind, clear & sunny

08-24-10 Cutting Fireline by Dozer Area 7 Round #4
Activity 3e

START 1105
STOP 1135

JEROMY #1

1	P4-00739	4.0 LPM
2	P4-00740	2.0
3	P4-00741	1.0

BYRON #2

4	P4-00742	4.0 LPM
5	P4-00743	2.0
6	P4-00744	1.0

PUMP RATES
1 4.0/ 4.0
2 2.0/ 2.0
3 1.0/ 1.0
4 4.0/ 4.1
5 2.0/2.0
6 1.0/ 1.0

GPS START N48.47350 W115.34923
STOP N48.47217 W115.34569

calm, no wind, clear & sunny

1245 Back to Libby Field Office for paperwork

KB

08-25-10 Activity 1 Rainy Creek Hiking

0700 Meet at Flyway
calibrate pumps

START 0730
STOP 0830

Jeremy #1

P4-00745 4.0 UP
P4-00746 2.0
P4-00747 1.0

PUMP RATES
1 4.0/3.9
2 2.0/2.0
3 1.0/1.0
4 4.0/3.9
5 2.0/2.0
6 1.0/1.0

Byron #2

P4-00748 4.0 U
P4-00749 2.0
P4-00750 1.0

GPS Start – upstream of ER decon
Stop – turn after 30 min of hiking
SFB N 48.417995
10/12/10 W ~~115.446747~~ 115.446747
Flow @ LRC-06 = 446.9 gpm

Calm, Clear, COOL

08-25-10 Activity 3e Fireline by Dozer Area 7 Round #5

START 0920
STOP 0950

Jeremy #1

P4-00751	4.0 LPM
P4-00752	2.0
P4-00753	1.0

PUMP RATES
1 4.0/ 4.1
2 2.0/ 2.0
3 1.0/ 1.0
4 4.0/ 4.1
5 2.0/ 2.1
6 1.0/ 1.0

Byron #2

P4-00754	4.0 LPM
P4-00755	2.0
P4-00756	1.0

GPS Start N48.47318 W115.35126
Stop N48.47318 W115.35130

clear, sunny, calm, dry & dusty

08-25-10 Activity 3e Fireline by Dozer Area 10 Round #4

START 1100
STOP 1130

		P4-00757	4.0 LPM
	Jeremy #1	P4-00758	2.0
		P4-00759	1.0
		P4-00760	4.0 LPM
	Byron #2	P4-00761	2.0
		P4-00762	1.0

PUMP RATES
1 4.0/4.0
2 2.0/2.0
3 1.0/1.0
4 4.0/4.0
5 2.0/2.0
6 1.0/1.0

GPS START N48.47866 W115.40113
STOP N48.47948 W115.40037

clear, calm, sunny

08-25-10 Activity 3e Cutting Fireline by Dozer Area 10 Round #5

START 1153
STOP 1223

Jeremy #1

P4-00763	4.0 LPM
P4-00764	2.0
P4-00765	1.0

PUMP RATES
1 4.0/4.0
2 2.0/2.0
3 1.0/ 1.0
4 4.0/4.0
5 2.0/ 2.0
6 1.0/ 1.0

Byron #2

P4-00766	4.0 LPM
P4-00767	2.0
P4-00768	1.0

GPS START N48.47928 W115.40197
STOP N48.48044 W115.40125

calm, clear, sunny, warm

1330 Back to Libby Field Office to do COCs and paperwork

KB

08-26-10 Activity | Hiking Rainy Creek Round #5

0700 Meet @ Flyway, calibrate pumps

START 0716
STOP 0816

PUMP RATES
1 4.0/4.0
2 2.0/2.0
3 1.0/1.0
4 4.0/4.0
5 2.0/2.0
6 1.0/1.0

Jeremy #1

P4-00769 4.0 LPM
P4-00770 2.0
P4-00771 1.0

Byron #2

P4-00772 4.0 LPM
P4-00773 2.0
P4-00774 1.0

Start upstream of ER decon trailer
turn around after 30 min of hiking

Flow @ LRC-06 = 455.5 gpm

Calm, clear, cool

GPS START N 48.417995
W 115.446747

SFB 10/12/10

08-26-10 Activity 3e Fireline by Dozer Area 2 Round #4

START 0920
STOP 0950

PUMP RATES
1 4.0/4.0
2 2.0/2.0
3 1.0/1.0
4 4.0/4.0
5 2.0/2.0
6 1.0/1.0

Jeremy #1

Byron #2

P4-00775	4.0 LPM
P4-00776	2.0
P4-00777	1.0
P4-00778	4.0
P4-00779	2.0
P4-00780	1.0

GPS START N48.31453 W115.18246
STOP N48.31500 W115.18153

Clear, calm, dusty & dry

50

0826 10 Activity 3e Fireline by Dozer Area 2
Round #5

START 1015
STOP 1045

PUMP RATES

1	4.0/4.0
2	2.0/2.0
3	1.0/1.0
4	4.0/4.0
5	2.0/2.0
6	1.0/1.0

Jeremy #1

Byron #2

P4-00781	4.0 LPM
P4-00782	2.0
P4-00783	1.0
P4-00784	4.0 LPM
P4-00785	2.0
P4-00786	1.0

GPS START N48. 31484 W115. 18339
STOP N48. 31533 W115. 18438

clear, calm, sunny, dry & dusty

1230 Back to Libby Field Office to do paperwork, prep samples, etc.

TABBED PAGE

APPENDIX D

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 1

PAGE: 1 OF: 60

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 7-20-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604 9001 6471

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00001	NA	NA	7-20-10	0800	Air	0	0		x		LOT BLANK, LOT # 19420
P4-00002	NA	NA	"	0800	Air	0	0		x		LOT BLANK, LOT # 19420
P4-00003	2a	1	"	0910	Air	4.0	320		x		AREA 2, ROUND #1
P4-00004	2a	1	"	0910	Air	2.0	160		x		"
P4-00005	2a	1	"	0910	Air	1.0	80		x		"
P4-00006	2a	2	"	0910	Air	4.0	320		x		"
P4-00007	2a	2	"	0910	Air	2.0	160		x		"
P4-00008	2a	2	"	0910	Air	1.0	80		x		"
P4-00009	2b	1	"	1110	Air	4.0	200		x		"
P4-00010	2b	1	"	1110	Air	2.05	102.5		x		"
P4-00011	2b	1	"	1110	Air	1.0	50		x		"
P4-00012	2b	2	"	1110	Air	4.0	200		x		"
P4-00013	2b	2	"	1110	Air	2.05	102.5		x		"
P4-00014	2b	2	"	1110	Air	1.0	50		x		"

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	7-21-10	1600			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 2

PAGE: 2 OF: 6

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 7-20-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00015	3a	1	7-20-10	1300	Air	4.0	120		x		AREA 2, ROUND #1
P4-00016	3a	1	"	1300	Air	2.0	60		x		"
P4-00017	3a	1	"	1300	Air	1.0	30		x		"
P4-00018	3a	2	"	1300	Air	4.0	120		x		"
P4-00019	3a	2	"	1300	Air	2.05	61.5		x		"
P4-00020	3a	2	"	1300	Air	1.0	30		x		"
P4-00021	3b	1	"	1345	Air	4.0	120		x		"
P4-00022	3b	1	"	1345	Air	2.0	60		x		"
P4-00023	3b	1	"	1345	Air	1.0	30		x		"
P4-00024	3b	2	"	1345	Air	4.0	120		x		"
P4-00025	3b	2	"	1345	Air	2.0	60		x		"
P4-00026	3b	2	"	1345	Air	1.0	30		x		"
P4-00027	3c	1	"	1435	Air	4.0	128		x		"
P4-00028	3c	1	"	1435	Air	1.0	~~64~~ 32		x		NOTE: P4-00028 & 29 ARE OUT OF 4L/2L/1L SEQUENCE

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	7-21-10	1600			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 3

PAGE: 3 OF: 6

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 7-20-10, 7-21-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00029	3c	1	7-20-10	1435	Air	2.0	64		x		AREA 2, ROUND #1
P4-00030	3c	2	"	1435	Air	4.0	128		x		"
P4-00031	3c	2	"	1435	Air	2.0	64		x		"
P4-00032	3c	2	"	1435	Air	1.0	32		x		"
P4-00033	3d	1	"	1535	Air	4.0	120		x		"
P4-00034	3d	1	"	1535	Air	2.0	60		x		"
P4-00035	3d	1	"	1535	Air	1.0	30		x		"
P4-00036	3d	2	"	1535	Air	4.0	120		x		"
P4-00037	3d	2	"	1535	Air	2.0	60		x		"
P4-00038	3d	2	"	1535	Air	1.0	30		x		"
~~P4-00039~~					Air				x		NOT USED - LABELS THROWN OUT - JDG
~~P4-00040~~					Air				x		NOT USED - LABELS THROWN OUT - JDG
P4-00041	2a	1	7-21-10	0645	Air	4.0	272		x		AREA 7, ROUND 1
P4-00042	2a	1	7-21-10	0645	Air	2.0	136		x		AREA 7, ROUND 1

TOTAL NUMBER OF CASSETTES 12

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	7-21-10	1600			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 4

PAGE: 4 OF: 6

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 7-21-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00043	2a	1	7-21-10	0645	Air	1.0	68		x		AREA 7, ROUND #1
P4-00044	2a	2	"	0645	Air	4.0	272		x		"
P4-00045	2a	2	"	0645	Air	2.0	136		x		"
P4-00046	2a	2	"	0645	Air	1.0	68		x		"
P4-00047	2b	1	"	0750	Air	4.0	200		x		"
P4-00048	2b	1	"	0750	Air	2.0	100		x		"
P4-00049	2b	1	"	0750	Air	1.0	50		x		"
P4-00050	2b	2	"	0750	Air	4.0	200		x		"
P4-00051	2b	2	"	0750	Air	2.05	102.5		x		"
P4-00052	2b	2	"	0750	Air	1.0	50		x		"
P4-00053	3a	1	"	0912	Air	4.0	120		x		"
P4-00054	3a	1	"	0912	Air	2.0	60		x		"
P4-00055	3a	1	"	0912	Air	1.0	30		x		"
P4-00056	3a	2	"	0912	Air	4.0	120		x		"

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	7-21-10	1600			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 5

PAGE: 5 OF: 6

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 7-21-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00057	3a	2	7-21-10	0912	Air	2.0	60		x		AREA 7, ROUND #1
P4-00058	3a	2	"	0912	Air	1.0	30		x		"
P4-00059	3b	1	"	1012	Air	4.0	120		x		"
P4-00060	3b	1	"	1012	Air	2.05	61.5		x		"
P4-00061	3b	1	"	1012	Air	1.0	30		x		"
P4-00062	3b	2	"	1012	Air	4.0	120		x		"
P4-00063	3b	2	"	1012	Air	2.05	61.5		x		"
P4-00064	3b	2	"	1012	Air	1.0	30		x		"
P4-00065	3c	1	"	1122	Air	4.0	120		x		"
P4-00066	3c	1	"	1122	Air	2.0	60		x		"
P4-00067	3c	1	"	1122	Air	1.0	30		x		"
P4-00068	3c	2	"	1122	Air	4.0	120		x		"
P4-00069	3c	2	"	1122	Air	2.0	60		x		"
P4-00070	3c	2	"	1122	Air	1.0	30		x		"

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	7-21-10	1600			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 6

PAGE: 6 OF: 6

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE:

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00071	3d	1	7-21-10	1235	Air	4.05	121.5		x		AREA 7, ROUND #1
P4-00072	3d	1	7-21-10	1235	Air	2.0	60		x		
P4-00073	3d	1	"	1235	Air	1.0	30		x		
P4-00074	3d	2	"	1235	Air	4.05	121.5		x		
P4-00075	3d	2	"	1235	Air	2.0	60		x		
P4-00076	3d	2	"	1235	Air	1.0	30		x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		

TOTAL NUMBER OF CASSETTES 6

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	7-21-10	1600			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 7

PAGE: 1 OF: 3

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 7-23-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00077	2a	1	7-23-10	0025	Air	4.0	312		x		
P4-00078	2a	1	"	"	Air	2.0	156		x		
P4-00079	2a	1	"	"	Air	1.0	78		x		
P4-00080	2a	2	"	"	Air	4.0	312		x		
P4-00081	2a	2	"	"	Air	2.0	156		x		
P4-00082	2a	2	"	"	Air	1.0	78		x		
P4-00083	2b	1	"	0730	Air	4.0	200		x		
P4-00084	2b	1	"	"	Air	2.0	100		x		
P4-00085	2b	1	"	"	Air	1.0	50		x		
P4-00086	2b	2	"	"	Air	4.0	200		x		
P4-00087	2b	2	"	"	Air	2.0	100		x		
P4-00088	2b	2	"	"	Air	1.0	50		x		
P4-00089	3a	1	"	0850	Air	4.0	120		x		
P4-00090	3a	1	"	"	Air	2.0	60		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	7-23-10	1100			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 8

PAGE: 2 OF: 3

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 7-23-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00091	3a	1	7-22-10	0850	Air	1.0	30		x		
P4-00092	3a	2	"	"	Air	4.0	120		x		
P4-00093	3a	2	"	"	Air	2.0	60		x		
P4-00094	3a	2	"	"	Air	1.0	30		x		
P4-00095	NA	NA	7-22-10	0800	Air	0	0		x		FIELD BLANK
P4-00096	3b	1	"	0955	Air	4.05	121.5		x		
P4-00097	3b	1	"	"	Air	2.05	61.5		x		
P4-00098	3b	1	"	"	Air	1.0	30		x		
P4-00099	3b	2	"	"	Air	4.05	121.5		x		
P4-00100	3b	2	"	"	Air	2.0	60		x		
P4-00101	3b	2	"	"	Air	1.05	31.5		x		
P4-00102	3c	1	"	1100	Air	4.0	120		x		
P4-00103	3c	1	"	"	Air	2.0	60		x		
P4-00104	3c	1	"	"	Air	1.0	30		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	7-23-10	1100			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 9

PAGE: 3 OF: 3

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 7-23-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00105	3c	2	7-22-10	1100	Air	4.0	120		x		
P4-00106	3c	2	"	"	Air	2.0	60		x		
P4-00107	3c	2	"	"	Air	1.0	30		x		
P4-00108	3d	1	"	1155	Air	4.0	120		x		
P4-00109	3d	1	"	"	Air	2.0	60		x		
P4-00110	3d	1	"	"	Air	1.0	30		x		
P4-00111	3d	2	"	"	Air	4.0	120		x		
P4-00112	3d	2	"	"	Air	2.0	60		x		
P4-00113	3d	2	"	"	Air	1.0	30		x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	7-23-10	1100			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 10

PAGE: 1 OF: 6

ENTERED BY: (Signature) Joan C Kester

PROJECT MANAGER: John Garr, MWH

DATE: 7-30-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604-9601-6438

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00114	2a	1	7-27-10	0900	Air	4.0	328		x		Area #2, ROUND #2
P4-00115	2a	1	"	0900	Air	2.0	164		x		
P4-00116	2a	1	"	0900	Air	1.0	82		x		
P4-00117	2a	2	"	0900	Air	4.0	328		x		
P4-00118	2a	2	"	0900	Air	2.0	164		x		
P4-00119	2a	2	"	0900	Air	1.0	82		x		
P4-00120	2b.1	1	"	1012	Air	4.0	80		x		
P4-00121	2b.1	1	"	"	Air	2.0	40		x		
P4-00122	2b.1	1	"	"	Air	1.0	20		x		
P4-00123	2b.1	2	"	"	Air	4.0	80		x		
P4-00124	2b.1	2	"	"	Air	2.0	40		x		
P4-00125	2b.1	2	"	"	Air	1.0	20		x		
P4-00126	2b.2	1	"	1059	Air	4.0	120		x		
P4-00127	2b.2	1	"	1059	Air	2.0	60		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Joan C Kester	Joan C Kester	MWH	7-30-10	1400			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 11

PAGE: 2 OF: 6

ENTERED BY: (Signature) Joan C Kester

PROJECT MANAGER: John Garr, MWH

DATE: 7-30-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604-9601-6438

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00128	2b.2	1	7-27-10	1059	Air	1.0	30		x		Area #2 / ROUND #2
P4-00129	2b.2	2	"	1059	Air	4.0	120		x		
P4-00130	2b.2	2	"	1059	Air	2.05	61.5		x		
P4-00131	2b.2	2	"	1059	Air	1.05	31.5		x		
P4-00132	3a	1	"	1210	Air	4	60		x		
P4-00133	3a	1	"	1210	Air	2	30		x		
P4-00134	3a	1	"	1210	Air	1	15		x		
P4-00135	3a	2	"	1210	Air	4	60		x		
P4-00136	3a	2	"	1210	Air	2	30		x		
P4-00137	3a	2	"	1210	Air	1	15		x		
P4-00138	3b	1	"	1255	Air	4	60		x		
P4-00139	3b	1	"	1255	Air	2	30		x		
P4-00140	3b	1	"	1255	Air	1	15		x		
P4-00141	3b	2	"	1255	Air	4	60		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Joan C Kester	Joan C Kester	MWH	7-30-10	1400			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 12

PAGE: 3 OF: 6

ENTERED BY: (Signature) Joan C Kester

PROJECT MANAGER: John Garr, MWH

DATE: 7-30-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604-9601-6438

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00142	3b	2	7-27-10	1255	Air	2	30		x		Area #2 / ROUND #2
P4-00143	3b	2	"	1255	Air	1	15		x		
P4-00144	3c	1	"	1340	Air	4	120		x		
P4-00145	3c	1	"	1340	Air	2	60		x		
P4-00146	3c	1	"	1340	Air	1	30		x		
P4-00147	3c	2	"	1340	Air	4	120		x		
P4-00148	3c	2	"	1340	Air	2	60		x		
P4-00149	3c	2	"	1340	Air	1	30		x		
P4-00150	3c	—	"	1415	Air	0	0		x		
P4-00151	3d	1	"	1440	Air	4	60		x		
P4-00152	3d	1	"	1440	Air	2	30		x		
P4-00153	3d	1	"	1440	Air	1	15		x		
P4-00154	3d	2	"	1440	Air	4	60		x		
P4-00155	3d	2	"	1440	Air	2	30		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Joan C Kester	Joan C Kester	MWH	7-30-10	1400			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 13

PAGE: 4 OF: 6

ENTERED BY: (Signature) Joan C Kester

PROJECT MANAGER: John Garr, MWH

DATE: 7-30-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604-9601-6438

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00156	3d	2	7-27-10	1440	Air	1	15		x		Area #2 / ROUND #2
P4-00157	2a	1	7-28-10	1307	Air	4	264		x		Area #7 / ROUND #2
P4-00158	2a	1	"	"	Air	2	132		x		"
P4-00159	2a	1	"	"	Air	1	66		x		
P4-00160	2a	2	"	"	Air	4	264		x		
P4-00161	2a	2	"	"	Air	2	132		x		
P4-00162	2a	2	"	"	Air	1	66		x		
P4-00163	2b.1	1	"	1405	Air	4	80		x		
P4-00164	2b.1	1	"	"	Air	2	40		x		
P4-00165	2b.1	1	"	"	Air	1	20		x		
P4-00166	2b.1	2	"	"	Air	4	80		x		
P4-00167	2b.1	2	"	"	Air	2	40		x		
P4-00168	2b.1	2	"	"	Air	1	20		x		
P4-00169	2b.2	1	"	1504	Air	4	120		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Joan C Kester	Joan C Kester	MWH	7-30-10	1400			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 14

PAGE: 5 OF: 6

ENTERED BY: (Signature) Joan C Kester

PROJECT MANAGER: John Garr, MWH

DATE: 7-30-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604-9601-6438

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00170	2b.2	1	7-28-10	1504	Air	2	60		x		Area #7 / ROUND #2
P4-00171	2b.2	1	"	"	Air	1	30		x		"
P4-00172	2b.2	2	"	"	Air	4	120		x		
P4-00173	2b.2	2	"	"	Air	2	60		x		
P4-00174	2b.2	2	"	"	Air	1	30		x		
P4-00181	2a	1	7-30-10	0642	Air	4	303		x		Area #10 / ROUND #2
P4-00182	2a	1	"	0642	Air	2	153		x		"
P4-00183	2a	1	"	"	Air	1	76		x		
P4-00184	2a	2	"	"	Air	4	303		x		
P4-00185	2a	2	"	"	Air	2	151		x		
P4-00186	2a	2	"	"	Air	1	76		x		
P4-00187	2b.1	1	"	0755	Air	4	80		x		
P4-00188	2b.1	1	"	"	Air	2	40		x		
P4-00189	2b.1	1	"	"	Air	1	20		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Joan C Kester	Joan C Kester	MWH	7-30-10	1400			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 15

PAGE: 6 OF: 6

ENTERED BY: (Signature) Joan C. Keefer

PROJECT MANAGER: John Garr, MWH

DATE: 7-30-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604-9601-6438

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00190	2b.1	2	7-30-10	0755	Air	4	80		x		Area #10 / ROUND # 2
P4-00191	2b.1	2	"	"	Air	2	40		x		"
P4-00192	2b.1	2	"	"	Air	1	20		x		
P4-00193	2b.2	1	"	0840	Air	4	120		x		
P4-00194	2b.2	1	"	"	Air	2	60		x		
P4-00195	2b.2	1	"	"	Air	1	30		x		
P4-00196	2b.2	2	"	"	Air	4	120		x		
P4-00197	2b.2	2	"	"	Air	2	60		x		
P4-00198	2b.2	2	"	"	Air	1	30		x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Joan C Keefer	Joan C Keefer	MWH	7-30-10	1400			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

AREA 1

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100803

PAGE: 1 OF: 6

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-04-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00199	2a	1	8-03-10	0745	Air	4.0	240		x		
P4-00200	2a	1	"	"	Air	2.0	120		x		
P4-00201	2a	1	"	"	Air	1.0	60		x		
P4-00202	2a	2	"	"	Air	4.0	240		x		
P4-00203	2a	2	"	"	Air	2.0	120		x		
P4-00204	2a	2	"	"	Air	1.0	60		x		
P4-00205	2b.1	1	"	0850	Air	4.05	81		x		
P4-00206	2b.1	1	"	"	Air	2.0	40		x		
P4-00207	2b.1	1	"	"	Air	1.0	20		x		
P4-00208	2b.1	2	"	"	Air	4.05	81		x		
P4-00209	2b.1	2	"	"	Air	2.0	40		x		
P4-00210	2b.1	2	"	"	Air	1.0	20		x		
P4-00211	2b.2	1	"	0930	Air	4.0	120		x		
P4-00212	2b.2	1	"	"	Air	2.0	60		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-04-10	1405			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100803

PAGE: 2 OF: 6

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-04-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00213	2b.2	1	8-03-10	0930	Air	1.0	~~120~~ 30 504		x		
P4-00214	2b.2	2	"	"	Air	4.0	120		x		
P4-00215	2b.2	2	"	"	Air	2.0	60		x		
P4-00216	2b.2	2	"	"	Air	1.0	30		x		
P4-00217	3a	1	"	1022	Air	4.0	60		x		
P4-00218	3a	1	"	"	Air	2.0	30		x		
P4-00219	3a	1	"	"	Air	1.0	15		x		
P4-00220	3a	2	"	"	Air	4.0	60		x		
P4-00221	3a	2	"	"	Air	2.0	30		x		
P4-00222	3a	2	"	"	Air	1.0	15		x		
P4-00223	3b	1	"	1100	Air	4.0	60		x		
P4-00224	3b	1	"	"	Air	2.0	30		x		
P4-00225	3b	1	"	"	Air	1.0	15		x		
P4-00226	3b	2	"	"	Air	4.0	60		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-04-10	1405			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100803

PAGE: 3 OF: 6

ENTERED BY: (Signature) John D. Garr

PROJECT MANAGER: John Garr, MWH

DATE: 8-04-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00227	3b	2	8-03-10	1100	Air	2.0	30		x		
P4-00228	3b	2	"	"	Air	1.0	15		x		
P4-00229	3c	1	"	1130	Air	4.0	120		x		
P4-00230	3c	1	"	"	Air	2.0	60		x		
P4-00231	3c	1	"	"	Air	1.0	30		x		
P4-00232	3c	2	"	"	Air	4.0	120		x		
P4-00233	3c	2	"	"	Air	2.0	60		x		
P4-00234	3c	2	"	"	Air	1.0	30		x		
P4-00235	3d	1	"	1210	Air	4.0	60		x		
P4-00236	3d	1	"	"	Air	2.0	30		x		
P4-00237	3d	1	"	"	Air	1.0	15		x		
P4-00238	3d	2	"	"	Air	4.0	60		x		
P4-00239	3d	2	"	"	Air	2.0	30		x		
P4-00240	3d	2	"	"	Air	1.0	15		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
John D. Garr	JOHN D. GARR	MWH	8-04-10	1405			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

AREA 10

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100803

PAGE: 4 OF: 6

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-04-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00 241	2a	1	8-03-10	1330	Air	4.0	220		x		
P4-00 242	2a	1	"	"	Air	2.0	110		x		
P4-00 243	2a	1	"	"	Air	1.0	55		x		
P4-00 244	2a	2	"	"	Air	4.0	220		x		
P4-00 245	2a	2	"	"	Air	2.0	110		x		
P4-00 246	2a	2	"	"	Air	1.0	55		x		
P4-00 247	2b.1	1	"	1425	Air	4.0	80		x		
P4-00 248	2b.1	1	"	"	Air	2.0	40		x		
P4-00 249	2b.1	1	"	"	Air	1.0	20		x		
P4-00 250	2b.1	2	"	"	Air	4.0	80		x		
P4-00 251	2b.1	2	"	"	Air	2.0	40		x		
P4-00 252	2b.1	2	"	"	Air	1.0	20		x		
P4-00 253	2b.2	1	"	1500	Air	4.0	120		x		
P4-00 254	2b.2	1	"	"	Air	2.0	60		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-04-10	1439			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100803

PAGE: 5 OF: 6

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-04-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00255	2b.2	1	8-03-10	1500	Air	1.0	30		x		
P4-00256	2b.2	2	"	"	Air	4.0	120		x		
P4-00257	2b.2	2	"	"	Air	2.0	60		x		
P4-00258	2b.2	2	"	"	Air	1.0	30		x		
P4-00259	3a	1	"	1545	Air	4.0	60		x		
P4-00260	3a	1	"	"	Air	2.0	30		x		
P4-00261	3a	1	"	"	Air	1.0	15		x		
P4-00262	3a	2	"	"	Air	4.0	60		x		
P4-00263	3a	2	"	"	Air	2.0	30		x		
P4-00264	3a	2	"	"	Air	1.0	15		x		
P4-00265	3b	1	"	1610	Air	4.0	60		x		
P4-00266	3b	1	"	"	Air	2.0	30		x		
P4-00267	3b	1	"	"	Air	1.0	15		x		
P4-00268	3b	2	"	"	Air	3.95	59.2		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-04-10	1439			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100803

PAGE: 6 OF: 6

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-04-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00 269	3b	2	8-03-10	1610	Air	2.0	30		x		
P4-00 270	3b	2	"	"	Air	1.0	15		x		
P4-00 271	3c	1	"	1640	Air	4.0	120		x		
P4-00 272	3c	1	"	"	Air	2.0	60		x		
P4-00 273	3c	1	"	"	Air	1.0	30		x		
P4-00 274	3c	2	"	"	Air	4.0	120		x		
P4-00 275	3c	2	"	"	Air	2.0	60		x		
P4-00 276	3c	2	"	"	Air	1.0	30		x		
P4-00 277	3d	1	"	1720	Air	4.0	60		x		
P4-00 278	3d	1	"	"	Air	2.0	30		x		
P4-00 279	3d	1	"	"	Air	1.0	15		x		
P4-00 280	3d	2	"	"	Air	4.0	60		x		
P4-00 281	3d	2	"	"	Air	2.0	30		x		
P4-00 282	3d	2	"	"	Air	1.0	15		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-04-10	1439			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

AREA 2

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100804

PAGE: 1 OF: 3

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-04-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00283	2a	1	8-04-10	0725	Air	4.0	248		x		
P4-00284	2a	1	"	"	Air	2.0	124		x		
P4-00285	2a	1	"	"	Air	1.0	62		x		
P4-00286	2a	2	"	"	Air	4.0	248		x		
P4-00287	2a	2	"	"	Air	2.0	124		x		
P4-00288	2a	2	"	"	Air	1.0	62		x		
P4-00289	2b.1	1	"	0815	Air	4.0	80		x		
P4-00290	2b.1	1	"	"	Air	2.0	40		x		
P4-00291	2b.1	1	"	"	Air	1.0	20		x		
P4-00292	2b.1	2	"	"	Air	4.0	80		x		
P4-00293	2b.1	2	"	"	Air	2.0	40		x		
P4-00294	2b.1	2	"	"	Air	1.0	20		x		
P4-00295	2b.2	1	"	0847	Air	4.0	120		x		
P4-00296	2b.2	1	"	"	Air	2.0	60		x		
P4-00325	FIELD BLANK	—	8-04-10	0800	AIR	0	0				

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-04-10	1443			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100804

PAGE: 2 OF: 3

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-04-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00 297	2b.2	1	8-04-10	0847	Air	1.0	30		x		
P4-00 298	2b.2	2	"	"	Air	4.0	120		x		
P4-00 299	2b.2	2	"	"	Air	2.0	60		x		
P4-00 300	2b.2	2	"	"	Air	1.0	30		x		
P4-00 301	3a	1	"	0932	Air	4.0	60		x		
P4-00 302	3a	1	"	"	Air	2.0	30		x		
P4-00 303	3a	1	"	"	Air	1.0	15		x		
P4-00 304	3a	2	"	"	Air	4.05	60.8		x		
P4-00 305	3a	2	"	"	Air	2.0	30		x		
P4-00 306	3a	2	"	"	Air	1.0	15		x		
P4-00 307	3b	1	"	1025	Air	4.0	60		x		
P4-00 308	3b	1	"	"	Air	2.05	30.8		x		
P4-00 309	3b	1	"	"	Air	1.0	15		x		
P4-00 310	3b	2	"	"	Air	4.0	60		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-04-10	1443			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100804

PAGE: 3 OF: 3

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-04-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00 311	3b	2	8-04-10	1025	Air	2.05	30.8		x		
P4-00 312	3b	2	"	"	Air	1.0	15		x		
P4-00 313	3c	1	"	1105	Air	4.0	120		x		
P4-00 314	3c	1	"	"	Air	2.0	60		x		
P4-00 315	3c	1	"	"	Air	1.0	30		x		
P4-00 316	3c	2	"	"	Air	4.05	123		x		
P4-00 317	3c	2	"	"	Air	2.0	60		x		
P4-00 318	3c	2	"	"	Air	1.0	30		x		
P4-00 319	3d	1	"	1148	Air	4.0	60		x		
P4-00 320	3d	1	"	"	Air	2.0	30		x		
P4-00 321	3d	1	"	"	Air	1.0	15		x		
P4-00 322	3d	2	"	"	Air	4.05	60.8		x		
P4-00 323	3d	2	"	"	Air	2.0	30		x		
P4-00 324	3d	2	"	"	Air	1.0	15		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-04-10	1443			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

07

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100805

PAGE: 1 OF: 6

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-05-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00326	2a	1	8-05-10	0825	Air	4.0	220		x		
P4-00327	2a	1	"	"	Air	2.0	110		x		
P4-00328	2a	1	"	"	Air	1.0	55		x		
P4-00329	2a	2	"	"	Air	4.0	220		x		
P4-00330	2a	2	"	"	Air	2.0	110		x		
P4-00331	2a	2	"	"	Air	1.0	55		x		
P4-00332	2b.1	1	"	0925	Air	4.05	81		x		
P4-00333	2b.1	1	"	"	Air	2.05	41		x		
P4-00334	2b.1	1	"	"	Air	1.0	20		x		
P4-00335	2b.1	2	"	"	Air	4.05	81		x		
P4-00336	2b.1	2	"	"	Air	2.0	40		x		
P4-00337	2b.1	2	"	"	Air	1.0	20		x		
P4-00338	2b.2	1	"	1003	Air	4.0	120		x		
P4-00 ~~340~~ 339	2b.2	1	"	"	Air	2.0	60		x		

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-05-10	2111			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

07

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100805

PAGE: 2 OF: 6

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-05-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00 340	2b.2	1	8-05-10	1003	Air	1.0	30		x		
P4-00 341	2b.2	2	"	"	Air	3.95	118.5		x		
P4-00 342	2b.2	2	"	"	Air	2.0	60		x		
P4-00 343	2b.2	2	"	"	Air	1.0	30		x		
P4-00 344	3a	1	"	1055	Air	4.0	60		x		
P4-00 345	3a	1	"	"	Air	2.0	30		x		
P4-00 346	3a	1	"	"	Air	1.0	15		x		
P4-00 347	3a	2	"	"	Air	4.0	60		x		
P4-00 348	3a	2	"	"	Air	2.0	30		x		
P4-00 349	3a	2	"	"	Air	1.0	15		x		
P4-00 350	3b	1	"	1128	Air	4.0	60		x		
P4-00 351	3b	1	"	"	Air	2.0	30		x		
P4-00 352	3b	1	"	"	Air	1.0	15		x		
P4-00 353	3b	2	"	"	Air	4.0	60		x		

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-05-10	2111			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

07

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100805

PAGE: 3 OF: 6

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-05-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00 354	3b	2	8-05-10	1128	Air	2.0	30		x		
P4-00 355	3b	2	"	"	Air	1.0	15		x		
P4-00 356	3c	1	"	1217	Air	4.0	120		x		
P4-00 357	3c	1	"	"	Air	2.0	60		x		
P4-00 358	3c	1	"	"	Air	1.0	30		x		
P4-00 359	3c	2	"	"	Air	4.0	120		x		
P4-00 360	3c	2	"	"	Air	2.0	60		x		
P4-00 361	3c	2	"	"	Air	1.0	30		x		
P4-00 362	3d	1	"	1300	Air	4.0	60		x		
P4-00 363	3d	1	"	"	Air	2.0	30		x		
P4-00 364	3d	1	"	"	Air	1.0	15		x		
P4-00 365	3d	2	"	"	Air	4.0	60		x		
P4-00 366	3d	2	"	"	Air	2.0	30		x		
P4-00 367	3d	2	"	"	Air	1.0	15		x		

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-05-10	2111			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

10

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 2000805

PAGE: 4 OF: 6

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 08-05-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00368	2a	1	8-05-10	1458	Air	3.95	245		x		
P4-00369	2a	1	"	"	Air	2.0	124		x		
P4-00370	2a	1	"	"	Air	1.0	62		x		
P4-00371	2a	2	"	"	Air	4.0	248		x		
P4-00372	2a	2	"	"	Air	2.0	124		x		
P4-00373	2a	2	"	"	Air	1.0	62		x		
P4-00374	2b.1	1	"	1550	Air	4.0	80		x		NOTE LABEL SMEARED BY INSECT REPELLENT: P4-00374
P4-00375	2b.1	1	"	"	Air	2.0	40		x		
P4-00376	2b.1	1	"	"	Air	1.0	20		x		
P4-00377	2b.1	2	"	"	Air	4.0	80		x		
P4-00378	2b.1	2	"	"	Air	2.05	41		x		
P4-00379	2b.1	2	"	"	Air	1.0	20		x		
P4-00380	2b.2	1	"	1630	Air	4.0	120		x		
P4-00381	2b.2	1	"	"	Air	2.0	60		x		

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-05-10	1128			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

10

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100805

PAGE: 5 OF: 6

ENTERED BY: (Signature) John D. Garr PROJECT MANAGER: John Garr, MWH DATE: 08-05-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00382	2b.2	1	8-05-10	1630	Air	1.0	30		x		
P4-00383	2b.2	2	"	"	Air	4.0	120 ~~60~~		x		
P4-00384	2b.2	2	"	"	Air	2.0	60		x		
P4-00385	2b.2	2	"	"	Air	1.0	30		x		
P4-00386	3a	1	"	1715.5	Air	4.0	60		x		
P4-00387	3a	1	"	"	Air	2.0	30		x		
P4-00388	3a	1	"	"	Air	1.0	15		x		
P4-00389	3a	2	"	"	Air	4.0	60		x		
P4-00390	3a	2	"	"	Air	2.0	30		x		
P4-00391	3a	2	"	"	Air	1.0	15		x		
P4-00392	3b	1	"	1748	Air	4.0	60		x		
P4-00393	3b	1	"	"	Air	2.0	30		x		
P4-00394	3b	1	"	"	Air	1.0	15		x		
P4-00395	3b	2	"	"	Air	4.0	60		x		

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
John D. Garr	JOHN D. GARR	MWH	8-05-10	1132			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

10

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100805

PAGE: 6 OF: 6

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-05-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00396	3b	2	08-05-10	1748	Air	2.0	30		x		
P4-00 397	3b	2	"	"	Air	1.0	15		x		
P4-00 398	3c	1	"	1815	Air	4.0	120		x		
P4-00 399	3c	1	"	"	Air	2.05	61.5		x		
P4-00 400	3c	1	"	"	Air	1.0	30		x		
P4-00 401	3c	2	"	"	Air	4.0	120		x		
P4-00 402	3c	2	"	"	Air	2.0	60		x		
P400 403	3c	2	"	"	Air	1.0	30		x		
P4-00 404	3d	1	"	1858.5	Air	4.0	60		x		
P4-00 405	3d	1	"	"	Air	2.0	30		x		
P4-00 406	3d	1	"	"	Air	1.0	15		x		
P4-00 407	3d	2	"	"	Air	4.0	60		x		
P400 408	3d	2	"	"	Air	2.0	30		x		
P4-00409	3d	2	"	"	Air	1.0	15		x		

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-05-10	1132			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100~~806~~10 JCK

PAGE: 1 OF: 4

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: ~~8-06-10~~ 8-10-10 JCK

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: 8604 9601 6232 DESTINATION: Hygela Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00410	2a	1	8-10-10	0735	Air	4.0	264		x		
P4-00411	2a	1	" "	" "	Air	2.0	132		x		
P4-00412	2a	1			Air	1.0	66		x		
P4-00413	2a	2			Air	3.98	263		x		
P4-00414	2a	2			Air	2.0	132		x		
P4-00415	2a	2			Air	0.99	65		x		
P4-00416	2b.1a	1		0846	Air	4.0	60		x		
P4-00417	2b.1a	1		" "	Air	2.0	30		x		
P4-00418	2b.1a	1			Air	1.0	15		x		
P4-00419	2b.1a	2			Air	4.0	60		x		
P4-00420	2b.1a	2			Air	2.0	30		x		
P4-00421	2b.1a	2			Air	1.0	15		x		
P4-00 ~~422~~ JCK 454	2b.1b	1		1343	Air	3.99	39.9		x		
P4-00 ~~423~~ JCK 455	2b.1b	1		1343	Air	2.0	20		x		

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature] JCK	JOHN D. GARR	MWH	8-11-10 ~~8-06-10~~ JCK	0830 ~~1200~~ JCK			
	Joan C Kester						

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 2010 08 ~~06~~ 10 JCK

PAGE: 2 OF: 4

ENTERED BY: (Signature) [signature] Jean Kester

PROJECT MANAGER: John Garr, MWH

DATE: ~~8-06-10~~ JCK 8-10-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00 ~~424~~ JCK 456	2b.1b	1	8-10-10	1343	Air	1.0	10		x		
P4-00 ~~425~~ JCK 457	2b.1b	2	" "	" "	Air	4.0	40		x		
P4-00 ~~426~~ JCK 458	2b.1b	2			Air	2.0	20		x		
P4-00 ~~427~~ JCK 459	2b.1b	2			Air	1.0	10		x		
P4-00 428	3a	1		1430	Air	4.0	60		x		
P4-00 429	3a	1		" "	Air	2.0	30		x		
P4-00 430	3a	1			Air	1.0	15		x		
P4-00 431	3a	2			Air	4.0	60		x		
P4-00 432	3a	2			Air	2.0	30		x		
P4-00 433	3a	2			Air	1.0	15		x		
P4-00 434	3b	1		1455	Air	4.0	60		x		
P4-00 435	3b	1		" "	Air	2.0	30		x		
P4-00 436	3b	1			Air	1.0	15		x		
P4-00 437	3b	2			Air	4.0	60		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES 14

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-11-10	0830			
			~~8-06-10~~ JCK	~~1200~~ JCK			

(a) Libby specific modifications Jean C. Kester

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100800 10 JCK

PAGE: 3 OF: 4

ENTERED BY: (Signature) John Garr / Joan Kester

PROJECT MANAGER: John Garr, MWH

DATE: 8-10-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00438	3b	2	8-10-10	1455	Air	2.0	30		x		
P4-00 439	3b	2	" "	1455	Air	1.0	15		x		
P4-00 440	3c	1		1519	Air	4.0	120		x		
P4-00 441	3c	1		" "	Air	2.0	60		x		
P4-00 442	3c	1			Air	1.0	30		x		
P4-00 443	3c	2			Air	4.02	120.5		x		
P4-00 444	3c	2			Air	2.01	60.5		x		
P4-00 445	3c	2			Air	1.0	30		x		
P4-00 446	3d	1		1602	Air	4.0	60		x		
P4-00 447	3d	1		" "	Air	2.0	30		x		
P4-00 448	3d	1			Air	1.0	15		x		
P4-00 449	3d	2			Air	4.0	60		x		
P4-00 450	3d	2			Air	2.0	30		x		
P4-00 451	3d	2			Air	1.0	15		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY	8-10-10 JCK	0830	SIGNATURE	PRINTED NAME	COMPANY
John Garr JCK	JOHN D. GARR	MWH	~~8-10-10~~ JCK	~~1200~~ JCK			

(a) Libby specific modifications

Joan Kester

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 2010 08 ~~06~~ 10 JCK

PAGE: 4 OF: 4

ENTERED BY: (Signature) [signature] / Joan Kester

PROJECT MANAGER: John Garr, MWH

DATE: ~~8-06-10~~ 8-10-10 JCK

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00452	—	—	8-06-10	1200	Air	0	0		x		LOT BLANK LOT # 19989
P4-00453	—	—	8-06-10	1200	Air	0	0		x		LOT BLANK LOT # 19989
					Air				x		
					Air				x		ALL SAMPLES COLLECTED UNDER THIS
					Air				x		C-O-C (20100806) USED THIS LOT
					Air				x		OF CASSETTES. WILL BE USING THIS LOT
					Air				x		THROUGH COMPLETION OF PROJECT.
P4-00460	2b.2	1	8-10 10	1405	Air	4.0	60		x		
P4-00461	2b.2	1	" "	" "	Air	2.0	30		x		
P4-00462	2b.2	1			Air	1.0	15		x		
P4-00463	2b.2	2			Air	4.0	60		x		
P4-00464	2b.2	2			Air	2.0	30		x		
P4-00465	2b.2	2			Air	1.0	15		x		
					Air				x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-11-10 ~~8-06-10~~ JCK	0830 ~~1200~~ JCK			
Joan C Kester			8-10-10				

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 1 OF: 11

ENTERED BY: (Signature) Joan Kester

PROJECT MANAGER: John Garr, MWH

DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604 9601 6243 8604 9601 6254

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00466	2a	1	8-11-10	0908	Air	4.0	216		x		(TWO-Coolers Sent)
P4-00467	2a	1	" "	" "	Air	2.0	108		x		
P4-00468	2a	1			Air	1.0	54		x		
P4-00469	2a	2			Air	4.0	216		x		
P4-00470	2a	2			Air	2.02	109		x		
P4-00471	2a	2			Air	1.0	54		x		
P4-00472	2b.1a	1		1010	Air	4.0	60		x		
P4-00473	2b.1a	1		" "	Air	2.0	30		x		
P4-00474	2b.1a	1			Air	1.0	15		x		
P4-00475	2b.1a	2			Air	4.0	60		x		
P4-00476	2b.1a	2			Air	2.0	30		x		
P4-00477	2b.1a	2			Air	1.0	15		x		
P4-00478	2b.1b	1		1037	Air	4.0	40		x		
P4-00479	2b.1b	1		1037	Air	2.0	20		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
Joan Kester	Joan Kester	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD, REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 2 OF: 11

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00480	2b.1b	1	8-11-10	1037	Air	1.0	10		x		
P4-00481	" "	2	8-11-10	" "	Air	4.0	40		x		
P4-00482		2	" "		Air	2.0	20		x		
P4-00483		2			Air	1.0	10		x		
P4-00484	2b.2	1		1058	Air	4.0	60		x		
P4-00485	" "	1		" "	Air	2.0	30		x		
P4-00486		1			Air	1.0	15		x		
P4-00487		2			Air	4.0	60		x		
P4-00488		2			Air	2.0	30		x		
P4-00489		2			Air	1.0	15		x		
P4-00490	3a	1		1123	Air	3.98	59.7		x		
P4-00491	" "	1		" "	Air	2.0	30		x		
P4-00492		1			Air	1.0	15		x		
P4-00493		2			Air	4.0	60		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	Joan Keister	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 3 OF: 11

ENTERED BY: (Signature) Joan Kester

PROJECT MANAGER: John Barr, MWH

DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

Index ID	Activity Code	Person	Date	Time	Medi	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00494	3a	2	8-11-10	123	Air	2.0	30		x		
P4-00495	3a	2	8-11-10	1123	Air	1.0	15		x		
P4-00496	3b	1	" "	1150	Air	4.0	60		x		
P4-00497	" "	1		" "	Air	2.0	30		x		
P4-00498		1			Air	1.0	15		x		
P4-00499		2			Air	4.0	60		x		
P4-00500		2			Air	2.0	30		x		
P4-00501		2			Air	1.0	15		x		
P4-00502	3c	1		1215	Air	4.0	120		x		
P4-00503	" "	1		" "	Air	2.0	60		x		
P4-00504		1			Air	1.0	30		x		
P4-00505		2			Air	4.0	120		x		
P4-00506		2			Air	2.0	60		x		
P4-00507		2			Air	1.0	30		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
Joan Kester	Joan Kester	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 4 OF: 11

ENTERED BY: (Signature) Joan Kester

PROJECT MANAGER: John Garr, MWH

DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES

ANALYSIS REQUEST

TO LAB: analyze highest volume, non-overloaded sample from each person, each activity code.

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00508	3d	1	8-11-10	1255	Air	4.0	60		x		
P4-00509	" "	1	" "	" "	Air	2.0	30		x		
P4-00510		1			Air	1.0	15		x		
P4-00511		2			Air	4.0	60		x		
P4-00512		2			Air	2.0	30		x		
P4-00513		2			Air	1.0	15		x		
P4-00514		NA		1315	Air	0	0		x		
P4-00515	2a	1		1354	Air	4.0	244		x		
P4-00516	" "	1		" "	Air	1.99	121		x		
P4-00517		1			Air	1.0	61		x		
P4-00518		2			Air	3.99	243		x		
P4-00519		2			Air	1.99	121		x		
P4-00520		2			Air	0.99	60		x		
P4-00521	2b 1b	1		1432	Air	4.0	40		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
Joan Kester	Joan Kester	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 5 OF: 11

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00522	2b.1b	1	8-11-10	1432	Air	2.0	20		x		
P4-00523	" "	1	" "	" "	Air	1.0	10		x		
P4-00524		2			Air	4.0	40		x		
P4-00525		2			Air	2.0	20		x		
P4-00526		2			Air	1.0	10		x		
P4-00527	3a	1		1549	Air	4.0	60		x		
P4-00528	" "	1		" "	Air	2.0	30		x		
P4-00529		1			Air	1.0	15		x		
P4-00530		2			Air	4.0	60		x		
P4-00531		2			Air	2.0	30		x		
P4-00532		2			Air	1.0	15		x		
P4-00533	3b	1		1612	Air	4.0	60		x		
P4-00534	3b	1		" "	Air	2.0	30		x		
P4-00535	3b	1			Air	1.0	15		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	Sloan Lester	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 6 OF: 11

ENTERED BY: (Signature) Jan Rost

PROJECT MANAGER: John Garr, MWH

DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00536	3b	2	8-11-10	1612	Air	4.0	60		x		
P4-00537	3b	2	" "	1612	Air	2.0	30		x		
P4-00538	3b	2		1612	Air	1.0	15		x		
P4-00539	3c	1	8-11-10	1635	Air	4.0	120		x		
P4-00540	3c	1	" "	" "	Air	2.0	60		x		
P4-00541	3c	1			Air	1.0	30		x		
P4-00542	3c	2			Air	4.0	120		x		
P4-00543	3c	2			Air	2.0	60		x		
P4-00544	3c	2			Air	1.0	30		x		
P4-00545	3d	1		1715	Air	4.0	60		x		
P4-00546	3d	1		" "	Air	2.0	30		x		
P4-00547	3d	1			Air	1.0	15		x		
P4-00548	3d	2			Air	4.0	60		x		
P4-00549	3d	2			Air	2.0	30		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
Jan Kester	Jan Kester	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 7 OF: 11

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00550	3d	2	8-11-10	1715	Air	1.0	15		x		
P4-00551	2a	1	8-12-10	0930	Air	4.0	256		x		
P4-00552	2a	1	"	"	Air	2.0	128		x		
P4-00553	2a	1			Air	1.0	64		x		
P4-00554	2a	2			Air	4.0	256		x		
P4-00555	2a	2			Air	2.0	128		x		
P4-00556	2a	2			Air	1.0	64		x		
P4-00557	2b.1a	1		1020	Air	4.0	60		x		
P4-00558	2b.1a	1		"	Air	2.0	30		x		
P4-00559	2b.1a	1			Air	1.0	15		x		
P4-00560	2b.1a	2			Air	4.0	60		x		
P4-00561	2b.1a	2			Air	2.0	30		x		
P4-00562	2b.1a	2			Air	1.0	15		x		
P4-00563	2b.1b	1		1045	Air	4.0	40		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	Joan Kester	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 8 OF: 11

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00564	2b.1b	1	8-12-10	1045	Air	2.0	20		x		
P4-00565	2b.1b	1	" "	" "	Air	1.0	10		x		
P4-00566	2b.1b	2			Air	4.0	40		x		
P4-00567	2b.1b	2			Air	2.0	20		x		
P4-00568	2b.1b	2			Air	1.0	10		x		
P4-00569	2b.2	1		1106	Air	4.0	60		x		
P4-00570	2b.2	1		" "	Air	2.0	30		x		
P4-00571	2b.2	1			Air	1.0	15		x		
P4-00572	2b.2	2			Air	4.0	60		x		
P4-00573	2b.2	2			Air	2.0	30		x		
P4-00574	2b.2	2			Air	1.0	15		x		
P4-00575	3a	1		1135	Air	4.0	60		x		
P4-00576	3a	1		" "	Air	2.0	30		x		
P4-00577	3a	1			Air	1.0	15		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	Joan Kester	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 9 OF: 11

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00578	3a	2	8-12-10	1135	Air	4.0	60		x		
P4-00579	3a	2	"	1135	Air	2.0	30		x		
P4-00580	3a	2		1135	Air	1.0	15		x		
P4-00581	3b	1		1202	Air	4.0	60		x		
P4-00582	3b	1		"	Air	2.0	30		x		
P4-00583	3b	1			Air	1.0	15		x		
P4-00584	3b	2			Air	4.0	60		x		
P4-00585	3b	2			Air	2.0	30		x		
P4-00586	3b	2			Air	1.0	15		x		
P4-00587	3c	1		1229	Air	4.0	120		x		
P4-00588	3c	1		"	Air	2.0	60		x		
P4-00589	3c	1			Air	1.0	30		x		
P4-00590	3c	2			Air	4.0	120		x		
P4-00591	3c	2			Air	2.0	60		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	Joan Kester	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 10 OF: 11

ENTERED BY: (Signature) Joan Kester

PROJECT MANAGER: John Garr, MWH

DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO:

DESTINATION: Hygeia Laboratories

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

SAMPLES									ANALYSIS REQUEST		
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00592	3c	2	8-12-10	1229	Air	1.0	30		x		
P4-00593	3d	1	8-12-10	1315	Air	4.0	60		x		
P4-00594	3d	1	"	"	Air	2.0	30		x		
P4-00595	3d	1			Air	1.0	15		x		
P4-00596	3d	2			Air	4.0	60		x		
P4-00597	3d	2			Air	2.0	30		x		
P4-00598	3d	2			Air	1.0	15		x		
P4-00599	2b.1a	1		1522	Air	4.0	60		x		
P4-00600	2b.1a	1		"	Air	2.0	30		x		
P4-00601	2b.1a	1			Air	1.0	15		x		
P4-00602	2b.1a	2			Air	4.0	60		x		
P4-00603	2b.1a	2			Air	2.0	30		x		
P4-00604	2b.1a	2			Air	1.0	15		x		
P4-00605	2b.2	1		1550	Air	4.0	60		x		

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Joan Kester	Joan Kester	MWH	8-13-10	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100813

PAGE: 11 OF: 11

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-13-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	~~Date~~ JCK TIME	~~Time~~ JCK DATE	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00606	2b.2	1	1550	8-12-10	Air	2.0	30		x		
P4-00607	2b.2	1	" "	" "	Air	1.0	15		x		
P4-00608	2b.2	2			Air	4.0	60		x		
P4-00609	2b.2	2			Air	2.0	30		x		
P4-00610	2b.2	2			Air	1.0	15		x		
					Air				x		
					Air				x		(Two Coolers Sent)
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	Joan Kester	MWH	8-13-10 ~~1315~~ JCK	1315			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100819

PAGE: 1 OF: 7

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-21-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00617	3a	1	8-17-10	0852.5	Air	4.0	60		x		
P4-00618	"	1	"	"	Air	2.0	30		x		
P4-00619	"	1	"	"	Air	1.0	15		x		
P4-00620	"	2	"	"	Air	3.95	59		x		
P4-00621	"	2	"	"	Air	2.0	30		x		
P4-00622	"	2	"	"	Air	1.0	15		x		
P4-00623	3b	1	8-17-10	0920	Air	4.0	60		x		
P4-00624	"	1	"	"	Air	2.0	30		x		
P4-00625	"	1	"	"	Air	1.0	15		x		
P4-00626	"	2	"	"	Air	4.0	60		x		
P4-00627	"	2	"	"	Air	2.0	30		x		
P4-00628	"	2	"	"	Air	1.0	15		x		
P4-00629	3c	1	"	0945	Air	4.0	120		x		
P4-00630	"	1	"	"	Air	2.0	60		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES 14 of 98

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-21-10	1200			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 2010 08 19

PAGE: 2 OF: 7

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-21-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)	ANALYSIS REQUEST:	Remarks
P4-00631	3a	1	8-17-10	~~1025~~ 0945	Air	1.0	30		x		
P4-00632	"	2	"	"	Air	4.0	120		x		
P4-00633	"	2	"	"	Air	2.0	60		x		
P4-00634	"	2	"	"	Air	1.0	30		x		
P4-00635	3d	1	"	1025	Air	4.0	60		x		
P4-00636	"	1	"	"	Air	2.0	30		x		
P4-00637	"	1	"	"	Air	1.0	15		x		
P4-00638	"	2	"	"	Air	4.05	61		x		
P4-00639	"	2	"	"	Air	2.0	30		x		
P4-00640	"	2	"	"	Air	1.0	15		x		
P4-00641	3a	1	"	1127	Air	4.05	60.8		x		
P4-00642	"	1	"	"	Air	2.05	30.8		x		
P4-00643	"	1	"	"	Air	1.0	15		x		
P4-00644	"	2	"	"	Air	4.05	60.8		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES 14 OF 98

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-21-10	1200			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100819

PAGE: 3 OF: 7

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-21-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00645	3a	2	8-17-10	1127	Air	2.05	30.8		x		
P4-00646	"	2	"	"	Air	1.05	15.8		x		
P4-00647	3b	1	8-17-10	1208	Air	4.0	60		x		
P4-00648	"	1	"		Air	2.0	30		x		
P4-00649	"	1	"		Air	1.0	15		x		
P4-00650	"	2	"		Air	3.95	59.3		x		
P4-00651	"	2	"		Air	2.0	30		x		
P4-00652	"	2	"		Air	1.0	15		x		
P4-00653	3c	1	"	1228	Air	4.0	120		x		
P4-00654	"	1	"	"	Air	2.0	60		x		
P4-00655	"	1	"	"	Air	1.0	30		x		
P4-00656	"	2	"	"	Air	4.0	120		x		
P4-00657	"	2	"	"	Air	2.0	60		x		
P4-00658	"	2	"	"	Air	1.0	30		x		

TOTAL NUMBER OF CASSETTES 14 OF 98 | LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-21-10	1200			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100819

PAGE: 4 OF: 7

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-21-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00659	3d	1	8-17-10	1306	Air	4.0	60		x		
P4-00660	"	1	"		Air	2.0	30		x		
P4-00661	"	1	"		Air	1.0	15		x		
P4-00662	"	2	"		Air	4.0	60		x		
P4-00663	"	2	"		Air	2.0	30		x		
P4-00664	"	2	"		Air	1.0	15		x		
P4-00665	1	1	" [redacted]	1438	Air	4.0	240		x		
P4-00666	"	1	"	"	Air	2.0	120		x		
P4-00667	"	1	"	"	Air	1.0	60		x		
P4-00668	"	2	"	"	Air	4.0	240		x		
P4-00669	"	2	"	"	Air	2.0	120		x		
P4-00670	"	2	"	"	Air	1.0	60		x		
P4-00671	3e	1	8-18-10	0906	Air	4.0	120		x		
P4-00672	"	1	"	"	Air	2.0	60		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES 14 OF 98

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-21-10	1200			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100819

PAGE: 5 OF: 7

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-21-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: _____ DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00673	3e	1	8-18-10	0906	Air	1.0	30		x		
P4-00674	"	2	"		Air	4.0	120		x		
P4-00675	"	2	"		Air	2.0	60		x		
P4-00676	"	2	"		Air	1.0	30		x		
P4-00677	3e	1	"	1022	Air	4.0	120		x		
P4-00678	"	1	"		Air	2.0	60		x		
P4-00679	"	1	"		Air	1.0	30		x		
P4-00680	"	2	"		Air	4.05	121.5		x		
P4-00681	"	2	"		Air	2.0	60		x		
P4-00682	"	2	"		Air	1.0	30		x		
P4-00683	"	1	"	1140	Air	4.0	120		x		
P4-00684	"	1	"	"	Air	2.0	60		x		
P4-00685	"	1	"	"	Air	1.0	30		x		
P4-00686	"	2	"	"	Air	4.0	120		x		

TOTAL NUMBER OF CASSETTES 14 OF 98

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-21-10	1200			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100819

PAGE: 6 OF: 7

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-21-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00687	3e	2	8-18-10	1140	Air	2.0	60		x		
P4-00688	"	2	"	"	Air	1.0	30		x		
P4-00689	1	1	8-19-10	0758	Air	4.0	240		x		
P4-00690	"	1	"	"	Air	2.0	120		x		
P4-00691	"	1	"	"	Air	1.0	60		x		
P4-00692	"	2	"	"	Air	4.0	240		x		
P4-00693	"	2	"	"	Air	2.0	120		x		
P4-00694	"	2	"	"	Air	1.0	60		x		
P4-00695	3e	1	"	1110	Air	4.0	120		x		
P4-00696	"	1	"	"	Air	2.0	60		x		
P4-00697	"	1	"	"	Air	1.0	30		x		
P4-00698	"	2	"	"	Air	4.0	120		x		
P4-00699	"	2	"	"	Air	2.0	60		x		
P4-00700	"	2	"	"	Air	1.0	30		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES 14 of 98

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-21-10	1200			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100819

PAGE: 7 OF: 7

ENTERED BY: (Signature) [signature] PROJECT MANAGER: John Garr, MWH DATE: 8-21-10

METHOD OF SHIPMENT: FEDEX CARRIER/WAYBILL NO: DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00701	3e	1	8-19-10	1232	Air	4.0	120		x		
P4-00702	"	1	"	"	Air	2.0	60		x		
P4-00703	"	1	"	"	Air	1.0	30		x		
P4-00704	"	2	"	"	Air	4.0	120		x		
P4-00705	"	2	"	"	Air	2.0	60		x		
P4-00706	"	2	"	"	Air	1.0	30		x		
P4-00707	—	—	"	1235	Air	—	—		x		FIELD BLANK
P4-00708	3e	1	"	1342	Air	4.0	120		x		
P4-00709	"	1	"	"	Air	2.0	60		x		
P4-00710	"	1	"	"	Air	1.0	30		x		
P4-00711	"	2	"	"	Air	4.0	120		x		
P4-00712	"	2	"	"	Air	2.0	60		x		
P4-00713	"	2	"	"	Air	1.0	30		x		
					Air				x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES 13 OF 98

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-21-10	1200			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100820

PAGE: 1 OF: 1

ENTERED BY: (Signature) [signature]

PROJECT MANAGER: John Garr, MWH

DATE: 8-20-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: _____

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00 714	1	1	8-20-10	0800	Air	4.0	240		x		
P4-00 715	1	1	"	"	Air	2.0	120		x		
P4-00 716	1	1	"	"	Air	1.0	60		x		
P4-00 717	1	2	"	"	Air	4.0	240		x		
P4-00 718	1	2	"	"	Air	2.0	120		x		
P4-00 719	1	2	"	"	Air	1.0	60		x		
P4-00 720	3e	1	"	1120	Air	4.0	120		x		
P4-00 721	3e	1	"	"	Air	2.0	60		x		
P4-00 722	3e	1	"	"	Air	1.0	30		x		
P4-00 723	3e	2	"	"	Air	3.95	119		x		
P4-00 724	3e	2	"	"	Air	2.0	60		x		
P4-00 725	3e	2	"	"	Air	1.0	30		x		
					Air				x		
					Air				x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES 12

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
[signature]	JOHN D. GARR	MWH	8-20-10	1200			

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100827

PAGE: 1 OF: 5

ENTERED BY: (Signature) Kaitlin Barklow

PROJECT MANAGER: John Garr, MWH

DATE: 08-27-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604 9601 6324

DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00726	3e	1	08-24-10	0822	Air	4.0	120.0		x		
P4-00727	3e	1			Air	2.0	60.0		x		
P4-00728	3e	1			Air	1.0	30.0		x		
P4-00729	3e	2			Air	4.05	121.5		x		
P4-00730	3e	2			Air	2.05	61.5		x		
P4-00731	3e	2		0822	Air	1.0	30.0		x		
P4-00732	3e	1		0933	Air	4.0	120.0		x		
P4-00733	3e	1			Air	2.0	60.0		x		
P4-00734	3e	1			Air	1.0	30.0		x		
P4-00735	3e	2			Air	4.05	121.5		x		
P4-00736	3e	2			Air	2.0	60.0		x		
P4-00737	3e	2		0933	Air	1.0	30.0		x		
P4-00738	3e	—	08-24-10	0800	Air	Ø	Ø		x		Field Blank
P4-00739	3e	1	08-24-10	1105	Air	4.0	120.0		x		

TOTAL NUMBER OF CASSETTES 61

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Kaitlin Barklow	Kaitlin Barklow	MWH	08/27/10	1000	FedEx		

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100827

PAGE: 2 OF: 5

ENTERED BY: (Signature) Kaitlin Barlow

PROJECT MANAGER: John Garr, MWH

DATE: 08-27-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604 9601 6324

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00740	3e	1	08-24-10	1105	Air	2.0	60.0		x		
P4-00741	3e	1			Air	1.0	30.0		x		
P4-00742	3e	2			Air	4.05	121.5		x		
P4-00743	3e	2			Air	2.0	60.0		x		
P4-00744	3e	2	08-24-10	1105	Air	1.0	30.0		x		
P4-00745	1	1	08-25-10	0730	Air	3.95	237.0		x		
P4-00746	1	1			Air	2.0	120.0		x		
P4-00747	1	1			Air	1.0	60.0		x		
P4-00748	1	2			Air	3.95	237.0		x		
P4-00749	1	2			Air	2.0	120.0		x		
P4-00750	1	2		0730	Air	1.0	60.0		x		
P4-00751	3e	1		0920	Air	4.05	121.5		x		
P4-00752	3e	1			Air	2.0	60.0		x		
P4-00753	3e	1	08-25-10	0920	Air	1.0	30.0		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES 61

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
Kaitlin Barlow	Kaitlin Barlow	MWH	08-27-10	1000	FedEx		

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100827

PAGE: 3 OF: 5

ENTERED BY: (Signature) Kaitlin Barlow

PROJECT MANAGER: John Garr, MWH

DATE: 08-27-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604 9601 6324

DESTINATION: Hygeia Laboratories

SAMPLES

Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	ANALYSIS REQUEST: TEM ISO 10312 (a)		Remarks
P4-00754	3e	2	08-25-10	0920	Air	4.05	121.5		x		
P4-00755	3e	2		↓	Air	2.05	61.5		x		
P4-00756	3e	2		0920	Air	1.0	30.0		x		
P4-00757	3e	1		1100	Air	4.0	120.0		x		
P4-00758		1			Air	2.0	60.0		x		
P4-00759		1			Air	1.0	30.0		x		
P4-00760		2			Air	4.0	120.0		x		
P4-00761	↓	2		↓	Air	2.0	60.0		x		
P4-00762	3e	2		1100	Air	1.0	30.0		x		
P4-00763		1		1153	Air	4.0	120.0		x		
P4-00764		1			Air	2.0	60.0		x		
P4-00765		1			Air	1.0	30.0		x		
P4-00766	↓	2		↓	Air	4.0	120.0		x		
P4-00767	3e	2	08-25-10	1153	Air	2.0	60.0		x		

TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.

TOTAL NUMBER OF CASSETTES 61

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY: SIGNATURE	PRINTED NAME	COMPANY	DATE	TIME	RECEIVED BY: SIGNATURE	PRINTED NAME	COMPANY
Kaitlin Barlow	Kaitlin Barlow	MWH	08/27/10	1000	FedEx		

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100827

PAGE: 4 OF: 5

ENTERED BY: (Signature) Kaitlin Barlow

PROJECT MANAGER: John Garr, MWH

DATE: 08-27-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 2604 9601 6324

DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00768	3e	2	08-25-10	1153	Air	1.0	30.0		x		
P4-00769	1	1	08-26-10	0716	Air	4.0	240.0		x		
P4-00770	1	1			Air	2.0	120.0		x		
P4-00771	1	1			Air	1.0	60.0		x		
P4-00772	1	2			Air	4.0	240.0		x		
P4-00773	1	2			Air	2.0	120.0		x		
P4-00774	1	2		0716	Air	1.0	60.0		x		
P4-00775	3e	1		0920	Air	4.0	120.0		x		
P4-00776	3e	1			Air	2.0	60.0		x		
P4-00777	3e	1			Air	1.0	30.0		x		
P4-00778	3e	2			Air	4.0	120.0		x		
P4-00779	3e	2			Air	2.0	60.0		x		
P4-00~~778~~780	3e	2		0920	Air	1.0	30.0		x		
P4-00781	3e	1	08-26-10	1015	Air	4.0	120.0		x		

TOTAL NUMBER OF CASSETTES 61

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Kaitlin Barlow	Kaitlin Barlow	MWH	08/27/10	1000	FedEx		

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy

LIBBY OU3 PHASE IV - CHAIN-OF-CUSTODY RECORD/REQUEST FOR ANALYSIS

COC No. 20100827

PAGE: 5 OF: 5

ENTERED BY: (Signature) Kaitlin Barlow

PROJECT MANAGER: John Garr, MWH

DATE: 08-27-10

METHOD OF SHIPMENT: FEDEX

CARRIER/WAYBILL NO: 8604 9601 6324

DESTINATION: Hygeia Laboratories

SAMPLES									ANALYSIS REQUEST		TO LAB: Analyze highest volume, non-overloaded sample from each person, each activity code.
Index ID	Activity Code	Person	Date	Time	Media	Flow Rate (LPM)	Air Volume (L)	Archive (to be checked by lab.)	TEM ISO 10312 (a)		Remarks
P4-00782	3e	1	08-26-10	1015	Air	2.0	60.0		x		
P4-00783		1			Air	1.0	30.0		x		
P4-00784		2			Air	4.0	120.0		x		
P4-00785		2			Air	2.0	60.0		x		
P4-00786	3e	2	08-26-10	1015	Air	1.0	30.0		x		
					Air				x		KB
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		
					Air				x		

TOTAL NUMBER OF CASSETTES 6

LABORATORY COMMENTS/CONDITION OF SAMPLES

RELINQUISHED BY:			DATE	TIME	RECEIVED BY:		
SIGNATURE	PRINTED NAME	COMPANY			SIGNATURE	PRINTED NAME	COMPANY
Kaitlin Barlow	Kaitlin Barlow	MWH	08-27-10	1000	FedEx		

(a) Libby specific modifications

DISTRIBUTION: PINK: Field Copy YELLOW: Return to Originator WHITE: Laboratory Copy