

**PHASE II ENVIRONMENTAL SITE  
ASSESSMENT REPORT  
BONNER MILL**

**STIMSON LUMBER COMPANY  
BONNER MILL SITE  
HIGHWAY 200  
BONNER, MT**

Submitted to

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**December 2008**

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**WO#10829.021.001.0002**

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**LIST OF ABBREVIATIONS AND ACRONYMS**

AOCs	analytes of concern
ASTM	American Society for Testing and Materials
AST	aboveground storage tank
BTEX	benzene, toluene, ethylbenzene and xylenes
bgs	below ground surface
CPOC	contaminate of potential concern
EPA	U.S. Environmental Protection Agency
EPH	extractable petroleum hydrocarbons
ESA	Environmental Site Assessment
GPS	global positioning system
HI	hazard index
HPU	hydraulic pressure units
HQ	hazard quotient
MDEQ	Montana Department of Environmental Quality
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSL	mean sea level
PCBs	polychlorinated biphenyls
PP Metals	priority pollutant metals
PID	photoionization detector
PQL	practical quantitation limit
PRGs	preliminary remediation goals
RBSL	risk-based screening levels
SOPs	standard operating procedures
SSL	soil screening levels
SVOC	semi-volatile organic compounds
ug/kg	micrograms per kilogram
ug/L	micrograms per liter
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VOC	volatile organic compound
VPH	volatile petroleum hydrocarbons
WESTON	WESTON Solutions, Inc.

# **1. INTRODUCTION**

# SECTION 1

## INTRODUCTION

At the request of Stimson Lumber Company (Stimson), Weston Solutions, Inc. (WESTON), conducted a Phase II Environmental Site Assessment (ESA) of the Bonner Mill property located at Highway 200 East, Bonner, MT 59823. The Bonner Mill site occupies approximately 170 acres in a mixed residential, commercial, and industrial area between the unincorporated communities of Bonner and Milltown in western Montana. The site includes an approximately 160-acre portion on the north side of Highway 200 East and an approximately 10-acre portion located on the south side of Highway 200 adjacent to Old Highway 10. The larger northern portion is bounded to the north and northeast by the Blackfoot River. A Phase II ESA sampling event was conducted on 15 through 19 September 2008 at the 160-acre portion of the Stimson Lumber Bonner Mill property located north of Highway 200, in Bonner, Montana (Figure 1).

### 1.1 OBJECTIVES

Stimson intends to sell the property for future industrial use. The primary objectives of the Phase II ESA is to further evaluate recognized environmental conditions identified in the Phase I ESA (WESTON, 2008a) and to assess areas that potentially had a release, due to historical or present operational practices, that resulted in soil, groundwater or surface water contamination that exceeds regulatory target levels. *The Standard Practice for Site Assessments: Phase I Environmental Site Assessment Process* (E1527-05), as issued by the American Society for Testing and Materials (ASTM, 2005), defines recognized environmental conditions as follows:

“The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property (ASTM E-1527).”

As stated in the *Standard Guide of Environmental Site Assessments: Phase II Environmental Site Assessment Process* (ASTM, 2002), the Phase II ESA should provide sufficient information to render a professional opinion whether there is a reasonable basis to suspect the presence of hazardous substances or petroleum products at the site associated with a recognized environmental condition. . As discussed in Section 2 and 3, chemical concentrations detected in soil were compared to industrial screening levels and background concentrations to assess whether further evaluation is warranted.

### 1.2 SITE DESCRIPTION

The Stimson Bonner property occupies approximately 170 acres in a mixed residential, commercial, and industrial area between the unincorporated communities of Bonner and Milltown in western Montana. The property includes an approximately 160-acre portion on the north side of Highway 200 East and an approximately 10-acre portion located on the south side

of Highway 200 East, adjacent to Old Highway 10. Photos of the property taken during the Phase II ESA are included in Appendix A.

The larger northern portion of the property is bound to the north and northeast by the Blackfoot River. As of 30 July 2008, significant buildings at the site from generally northeast to southwest included: the east Sewage Treatment Plant, the Stud Mill Log Processor, the Lumber Sorter building, the Power House, the Fire Pump House, the Boiler Building, six (6) residential buildings, the Main “White House” Office, the Dry Kiln Complex, the Fuel House, the Machine Shop, the Old Stone Warehouse and Storage building, the Carpenter Shop, the Main Garage, the west Sewage Treatment Plant, the Main Gate Guard Shack, the Planer Building, the Plywood Mill, the Plywood Mill Log Processor, the South Log Yard Office Building, the South Log Yard Scale Shack, and the Milltown Community Well House. The site includes two (2) unpaved log yards, the South Log Yard and the East Log Yard, which are located in the western and eastern portions of the site, respectively. In addition, two (2) log sorting areas are located in the western portion of the property adjacent east of the South Log Yard. Two (2) surface water ponds are currently located at the site, the South Pond at the northwest corner of the property, and the Cooling Pond at the northeastern portion of the property. The majority of the site is paved or covered with buildings with the exception of the two log yards and the southern Log Sorting area. The site includes two (2) primary diesel fueling areas, the South Log Yard Aboveground Storage Tank (AST) area and the East Log Yard AST area, and one (1) primary gasoline fueling area, the Main Gate AST. See Figure 2-2, Site Plan for additional detail.

The smaller southern portion of the property, located on the south side of Highway 200 East, is currently occupied by an active electrical substation, operated by the Missoula Electric Cooperative.

The Bonner Mill site was first developed in 1884 and 1885 by the Montana Improvement Company with a dam on the Blackfoot River and a lumber mill located at the northern portion of the property at the present-day location of the Stud Mill. The original sawmill, which had a rated capacity of approximately 11,400 board-feet per hour and was historically identified as the Hammond Mill and/or the Big Blackfoot Mill, initiated operations on 06 June 1886. The adjacent community of Bonner was also constructed by the Montana Improvement Company in 1886 to house the mill employees.

No lumber milling activities are currently conducted at the Bonner Mill site. Plywood manufacturing operations were discontinued in July 2007 and dimensional lumber manufacturing operations were discontinued in May 2008. Existing on-site manufacturing equipment is currently being sold at auction or demolished for sale as scrap metal. The Main “White House” Office continues to be used by Stimson as administrative offices; however, the on-site residential buildings are vacant and boarded. Sewage treatment activities at both the east and west treatment plants are non-operational. The Planer Well and the South Pond Well continue to be used as groundwater supply wells; however, the Plywood Well has been removed from service.

## 1.3 PHYSICAL SETTING

### 1.3.1 Topography

Based on the 1999 *Bonner, Montana* U.S. Geological Survey (USGS) 7.5-minute topographic map the elevation of the Bonner Mill site is approximately 3,296 feet above mean sea level (MSL). The Bonner Mill site extends to the north onto the *Blue Point, Montana* USGS topographic map and to the west onto the *SE Missoula, Montana* USGS topographic map. In general, topography in the vicinity of the site is relatively flat. The western portion of the site, which includes the South Log Yard and the Plywood Mill areas, is engineered with a gentle slope towards the South Pond at the northwest corner of the property. Approximately 500 to 1,000 feet southeast of the site, the topography significantly increases in elevation with a steep slope slanted up towards the southeast.

### 1.3.2 Geology

The Bonner site is located within the boundaries of Glacial Lake Missoula, which was present approximately 12,000 years ago. Glacial Lake Missoula formed as the Cordilleran Ice Sheet dammed the Clark Fork River just as it entered Idaho. The area is characterized by Pre-Cambrian age folded and faulted sedimentary rocks. The structures are related to Sevier style thrust faults trending northwest-southeast. The McNamara Formation, Bonner Quartzite, Mount Shields Formation, and Shepard Formation of the Belt Supergroup form the local bedrock at the site. These formations are composed of interbedded argillite, siltite, and quartzite. The bedrock is exposed on the north bank of the Blackfoot River north of the site. Quaternary age alluvial sediments and anthropogenic fill overlie the bedrock at the site.

### 1.3.3 Groundwater

The mountains surrounding the lower Blackfoot River valley represent the northern boundary of the Sapphire block primarily composed of Precambrian Belt metasedimentary formations. The Clark Fork fault is coincident with the Clark Fork River valley and the Blackfoot thrust fault is coincident with the lower Blackfoot River valley. Quaternary alluvium in the valleys lies on top of the bedrock and generally consists of inter-bedded sand, gravels, and boulders, with clay. The alluvial aquifer is an unconfined system and is hydrologically connected to the larger Missoula Aquifer to the west. The aquifer thickness below the site is estimated to be approximately 100 feet, with the bedrock surface ranging from 120 to 150 feet from east to west. Groundwater recharge is primarily from underflow through the Blackfoot River valley with smaller recharge volumes leaking from the Blackfoot River. Minor recharge likely comes from direct precipitation and groundwater flow from the Precambrian bedrock.

Groundwater flow direction is westerly near the eastern (up-gradient) border of the Bonner Mill site and shifts to the west-northwest near the confluence of the Blackfoot and Clark Fork rivers. Static water levels from onsite monitoring wells were measured between March 2005 and March 2007. The results show high groundwater levels occur in June followed by a gradual decline into the winter months with recharge beginning in March and April. Static water levels measured in March 2007 show groundwater near the former Fire Pond ranging in depth from 18.09 feet bgs to 40.13 feet bgs, and in the East Log Yard ranging from 38.65 feet bgs to 46.61 feet bgs.

Groundwater levels have dropped coincident with the lowering of the Milltown Reservoir. The 2007 winter water levels showed on average a 10 foot decline coincident with a 10 feet decline in Milltown Reservoir water levels. Since the water elevation of the river has continued to decline since the removal of the dam, it is estimated that groundwater elevations will likely also continue to drop; however, the precise amount of groundwater elevation decrease will be heavily influenced by the native bedrock surface. The groundwater gradient across the site will likely increase slightly but the flow patterns are expected to remain similar.

### **1.3.4 Surface Water**

Surface water bodies associated with the Bonner site are summarized below:

#### Cooling Pond

The Cooling Pond is located on the northeastern portion of the property, bordering the Blackfoot River. Between 1905 and 1940, the area was artificially bermed using crib cages to create a pond that caught logs moving downstream. The area was eventually bermed entirely, creating a pond. The cooling pond collects water from various sources at the site including boiler blow down water, yard runoff, and non contact cooling water. The total area that may contribute stormwater to the cooling pond is approximately 45 acres including 10 acres of impermeable surfaces. At capacity, the pond has approximate dimensions of 485 feet long by 68 feet wide with a surface area of approximately 32,100 square feet. The depth of water is variable, ranging from less than one foot at the western edge of the pond to approximately nine feet in the eastern end of the pond at capacity. Water from the pond historically discharged to the Blackfoot River from an outlet located in the eastern area of the pond.

#### South Pond

The asphalt-lined South Pond is located on the northwestern portion of the property, bordering the Blackfoot River. It was originally constructed in 1972, and re-sealed in approximately 1995. The south pond collects drainage from the western portion of the site. The total area draining to this pond is approximately 85 acres, including 30 acres of impervious surface. Runoff from these areas is overland and generally flows to a berm or concrete wall parallel to the river bank, and then flows toward the pond. Most of the runoff flows through a solids removal structure, then into the pond. At capacity, the pond has approximate dimensions of 181 feet long by 67 feet wide with a surface area of approximately 12,127 square feet. The exact depth of water is unknown. However, the depth is variable, being shallow in the eastern portion of the pond and gradually increases in depth towards the western portion of the pond. The south pond has no outlet, and reportedly fills throughout the wet season. Periodically, when the level of the pond reaches a predetermined level, the contents of the pond were purportedly pumped through a sprinkler system to the south end of the log yard, where the water would infiltrate into the soil in the yard, or return via overland flow to the pond.

#### Fire Pond Lagoon

The Fire Pond Lagoon, which was removed in 2005, was located adjacent west to the Cooling Pond. The pond measured 100 feet long and 50 feet wide. A wood structure framed the pond on both the mill side (river bank) and the riverside (Blackfoot River). The fire pond was

constructed to capture river water for withdrawal through two turbine pumps. Water from the pond had been the primary supply for the fire suppression system and boilers. The wood frame had inlets on the upstream and downstream side to allow the river water to flow into and through the pond.

### Blackfoot River

The south bank of the Blackfoot River runs along the northern border of the Bonner site. The Blackfoot River drains an area of approximately 2,290 square miles upstream of the site. The USGS Bonner gauging station on the Blackfoot River is located approximately 5.5 miles upstream of the site. Stream flow records at the gauging station for the periods 1899 to 1905 and 1940 to 2006 show that flows ranged from approximately 200 to 19,200 cubic feet per second.

The former Bonner Dam that stretched across the Blackfoot River was located adjacent to the former fire pond. In late November 2005, the dam site was removed in a joint effort by the USFWS, EPA, the State of Montana, BP-ARCO, and Stimson Lumber. The dam was removed to the streambed elevation of the river at that time.

### Clark Fork River

The site is located on the banks of the Blackfoot River from approximately Mile 0.37 to Mile 1.40 above the river's confluence with the Clark Fork River. The Milltown Dam was formerly located immediately downstream of the confluence of the two rivers. The Milltown Dam was constructed in 1908, and in March 2008 the dam was intentionally breached in preparation for the dam's removal. The area is part of the Milltown Reservoir Sediments Superfund Site. Currently, the spillway is being removed and contaminated sediments from the Clark Fork River are being excavated and removed from the Superfund Site

## **1.3.5 Current and Future Land and Water Use**

No lumber milling activities are currently conducted at the Bonner Mill site. Plywood manufacturing operations were discontinued in July 2007 and dimensional lumber manufacturing operations were discontinued in May 2008. Existing on-site manufacturing equipment is currently being sold at auction or demolished for sale as scrap metal. The Main "White House" Office continues to be used by Stimson as administrative offices; however, the on-site residential buildings are vacant and boarded. Sewage treatment activities at both the east and west treatment plants are non-operational. The Planer Well and the South Pond Well continue to be used as groundwater supply wells; however, the Plywood Well has been removed from service.

The proposed future land use is to remain industrial. Stimson intends to sell the property to a buyer for industrial redevelopment.

## **1.4 SCOPE OF WORK**

Sample locations selected by WESTON for the Phase II evaluation were targeted in areas identified as on-site recognized environmental conditions (RECs) and de minimis conditions in the Phase I ESA (WESTON, 2008a). A description of each area, as discussed in the findings section of the Phase I ESA (Section 6), is included in Appendix B. As discussed in the Phase I

ESA, the areas identified as RECs are grouped below into categories: 1) areas associated with previous investigations; and 2) areas not associated with previous investigations. The areas in each group are generally listed from east to west.

Areas associated with previous investigations:

- East Log Yard Bunker Fuel Release
- Cooling Pond
- East Log Track
- Fire Pond Lagoon
- South Pond and Drainage Ditch

Areas not associated with previous investigations:

- East Log Yard 3,000-gallon Diesel AST
- Historic Stull Mill
- Stud Mill Log Processor
- Stud Mill Red Deck
- Stud Mill Chip Shaker
- Elevated Log Track
- Historic “Gas and Oil” Structure
- Former Gasoline UST near Old Stone Warehouse
- Main Garage and Old Truck Shop
- PCB-containing Electrical Equipment
- Stormwater Dry Wells
- Plywood Mill Vat
- Plywood Mill Press Pits
- Plywood Glue Room Fill Area
- South Log Yard
- South Log Yard Fuel ASTs

Areas located onsite that were identified as de minimis conditions are as follows:

- Historic “Oil Room”
- Stud Mill Hydraulic Oil AST
- Main Gate Gasoline AST
- Plywood Mill Log Processor

- Glue/Resin/Dryer Rinse Tank

Of the areas listed above, the following areas were not evaluated in this Phase II ESA:

- The five areas associated previous environmental investigations – The East Log Yard Bunker Fuel Release, Cooling Pond, East Log Track, Fire Pond Lagoon, and South Pond were not evaluated in this Phase II ESA because these areas have been evaluated by others to assess the presence of hazardous substances and/or petroleum products. Although samples were not collected from the South Pond, soil samples were collected within the South Pond Drainage Ditch (TB023 and TB024 on Table 1 and Figure 3).
- Historic Stull Mill – Samples were not collected from the area of the historic Stull Mill because this area is located adjacent to the Cooling Pond which is the subject of an ongoing investigation.
- Stud Mill Red Deck - Samples were not collected from the area of the Stud Mill Red Deck because approximately 3 feet of soil was excavated by Champion prior to the transfer of the property to Stimson in 1993. No samples were collected in this area during the Phase II sampling event because it was WESTON's understanding that a report documenting the cleanup was available. However, to date, WESTON has been unable to obtain a copy of this report.
- Plywood Mill Press Pits – The integrity of the concrete walls and base of the press pits could not be evaluated during the Phase II sampling event due to the presence of oily liquids within the pits. Once the pits are thoroughly cleaned, an inspection of these pits could be conducted and the need for collecting soil and/or groundwater samples could be evaluated. However, the continued presence of standing water would imply that the concrete pits have maintained their integrity.

## **2. REGULATORY COMPARISON**

## SECTION 2

### REGULATORY COMPARISON

#### 2.1 COMPARISON TO REGULATORY TARGET LEVELS AND BACKGROUND

Chemical concentrations detected in soil samples collected during the Phase II ESE were compared to conservative screening levels to assess whether additional evaluation is needed to propose cleanup levels or actions that are applicable to the property. Section 75-10-734(3)(a)(i), Montana Code Annotated (MCA), requires that the proposed cleanup levels be protective of public health, safety, and welfare, and the environment based on the current and reasonably anticipated future uses of the facility. The attainment of cleanup levels are demonstrated by the comparison of contaminant concentrations in representative confirmation samples collected from environmental media of concern to appropriate cleanup levels. WESTON compared soil concentrations detected at the property to applicable regulatory target levels and background values in accordance with Montana Department of Environmental Quality (MDEQ) guidance. Additional information pertaining to the approach described below can be found in the MDEQ Volunteer Cleanup and Redevelopment Act Application Guide (MDEQ, 2002). Detected concentrations were compared to industrial and commercial screening levels because the intended future industrial use of the property is industrial.

##### 2.1.1 Screening Levels

In accordance with MDEQ guidance (MDEQ, 2002), contaminant concentrations were compared to screening levels to identify the contaminants of potential concern (COPCs) for the facility. The following is a description of the MDEQ process used for determining the COPCs for soil:

- Determine whether the contaminant is a petroleum compound for which there is a Montana Risk-Based Corrective Action (RBCA) risk-based screening level (RBSL) (MDEQ 2007). These RBSLs are based on both direct contact with contaminated soil and leaching to groundwater. RBSLs are also based on either residential or commercial exposure, and various depths to groundwater, and take into account multiple pathways and cumulative exposure. If the total extractable hydrocarbon (TEH) concentration exceeds 200 parts per million (ppm), additional analyses are required by MDEQ. Ceiling concentrations were also developed by MDEQ to assure that total concentrations of all non-target COCs do not interfere with the beneficial uses of the soil or groundwater. Ceiling values applicable to industrial properties are as follows:
  - Commercial surface and subsurface soil - 500 milligrams per kilograms (mg/kg; or parts per million, ppm) for the total of the gasoline range fractions and 5,000 mg/kg for TEH.

The contaminant concentration from each sample collected at the facility was then compared directly to the appropriate RBSL and /or ceiling value. If the compound concentration exceeds the RBSL or the ceiling, it is a COPC for the facility and requires further evaluation.

- If the contaminant is not a compound with an RBSL, determine whether it is a contaminant for which there is an EPA SSLs (EPA 2002) for the soil to groundwater pathway. These SSLs are based entirely on leaching from the soil to the groundwater. The MDEQ has determined that the application of a dilution attenuation factor (DAF) of 10 is appropriate for conditions in Montana. The SSL for a 10 DAF is calculated by multiplying the SSL for a DAF of 1 by 10. Compare the contaminant concentration from the facility to the 10 DAF SSL. If the compound concentration exceeds the SSL, it is a COPC for the leaching pathway at the facility and requires further evaluation.
- In addition to determining if the contaminant is a COPC for the leaching pathway, the contaminant concentrations were also compared to the EPA Region IX PRGs (EPA 2008) to determine if it is a COPC for direct contact. These PRGs are based on direct contact (ingestion, inhalation, and dermal contact) and include residential and industrial exposure. For the Bonner property, soil concentrations were compared to industrial PRGs based on the current and reasonably anticipated future use of the facility. Carcinogenic compound concentrations are to be compared directly to the carcinogenic PRGs as these PRGs are based on a  $1 \times 10^{-6}$  risk. This ensures that cumulative carcinogenic risks at facilities do not exceed  $1 \times 10^{-5}$ , the cumulative risk level MDEQ allows. Non-carcinogenic compound PRGs are divided by 10 before comparison to contaminant concentrations from the facility to account for potential cumulative effects. This ensures that the cumulative non-carcinogenic hazard quotients do not exceed one and are, therefore, not expected to cause adverse health effects. The PRG for lead is not divided by 10 since lead effects are considered separately from overall non-carcinogenic effects. MDEQ guidance states that if the compound concentration exceeds the carcinogenic PRG or one tenth of the non-carcinogenic PRG, it is a COPC for direct contact at the facility and requires further evaluation.

Soil sample results for petroleum hydrocarbons were compared to Montana Tier 1 Risk-Based Screening Levels (RBSLs) developed by the MDEQ in the 2007 Corrective Action Guidelines for Petroleum Releases (MDEQ, 2007). The Tier 1 RBSLs for commercial properties are listed by surface soil (0-2 feet bgs) and subsurface soil (greater than 2 feet bgs). The Tier 1 screening levels also vary according to the depth to groundwater. The screening levels for groundwater greater than 20 feet were used for comparison.

Soil sample results for VOCs, SVOCs, PP Metals, and PCBs were compared to 2002 EPA Soil Screening Levels (SSLs) for the protection of groundwater, and 2008 EPA Region IX Preliminary Remediation Goals (PRGs) for direct contact at industrial properties.

Arsenic concentrations detected in soil were compared to a Montana background soil screening level of 40 mg/kg instead of EPA's PRG or SSL values. The screening level of 40 mg/kg is based on an arsenic soil background study conducted by MDEQ (MDEQ, 2005). MDEQ developed a generic screening level of 40 mg/kg for arsenic in residential soil using the 95% UCL of the mean for arsenic in Montana soils. DEQ gathered data from 209 native soil samples collected from unimpacted soils across Montana. DEQ calculated the 95% upper confidence limit (UCL) of the mean of this data and selected 40 mg/kg as a generic action level for arsenic in residential surface soil.

### 2.1.2 Cleanup Levels

Once the COPCs for the facility have been determined, cleanup levels derived via one of the following four methods or a combination of methods are typically approved by MDEQ.

- Background cleanup levels: MDEQ accepts attainment of facility-specific background levels based on samples collected from unimpacted areas representative of conditions at the facility for compounds such as metals. Established literature values for background concentrations may also be proposed. In some cases, background concentrations may exceed screening levels and may, therefore, be used in place of screening levels.
- Established generic screening levels: The screening levels described in Section 2.1.1 above may be appropriate as cleanup levels.
- Previously approved cleanup levels: MDEQ will consider, on a case-by-case basis, cleanup levels it has approved at other similar facilities that were determined based on the same current and proposed exposure scenarios as the subject facility.
- Facility-specific risk-based cleanup levels: Cleanup levels based on a facility-specific risk analysis conducted using standard EPA human health risk assessment guidance and/or, as applicable, standard EPA ecological risk assessment guidance may also be proposed. For human health MDEQ allows cleanup levels calculated based on cumulative risk levels less than or equal to a total excess cancer risk of  $1 \times 10^{-5}$  for carcinogens or a total hazard index less than or equal to 1 for non-carcinogens. Ecological risks are also evaluated and acceptable risk determinations are made by MDEQ on a facility-specific basis. All exposure assumptions must be acceptable to MDEQ and are best determined in consultation with MDEQ.

Soil samples with detected concentrations exceeding the screening levels discussed in Section 2.1.1 were also compared to background soil concentrations and other cleanup levels that may be applicable. For the purpose of this Phase II ESA, site-specific risk-based cleanup levels were not calculated.

PCB concentrations detected in soil were also compared to cleanup levels established by the Toxic Substance Control Act (TSCA), as described in 40 CFR 761.61(a). PCB soil cleanup levels established in TSCA include: 1) 1 ppm for high occupancy areas (i.e., residential) without further conditions; 2) 10 ppm for high occupancy areas with an approved cap; and 3) 25 ppm for low occupancy areas (i.e., most industrial areas) without a cap.

### **3. PHASE II INVESTIGATION**

## SECTION 3

### PHASE II INVESTIGATION

Sampling activities conducted at the site included the collection of 108 soil samples. Groundwater was not encountered within a maximum depth of 20 feet bgs attained during soil sampling. As discussed in Section 1.4, soil samples were collected at areas identified as RECs and de minimis conditions in the Phase I ESA (WESTON, 2008a). The areas sampled and sample location IDs are presented in Table 1. The sample identification number (ID) and a matrix showing the laboratory analyses conducted at each sample ID is included in Table 2. All sample locations are presented in Figures 3 and 4. Soil boring logs are provided in Appendix C, sample location coordinates are included in Appendix D, and an electronic copy of the laboratory data reports is included in Appendix E.

#### 3.1 SOIL SAMPLING LOCATIONS AND PROCEDURES

Sampling procedures were completed according to the September 2008 Phase II investigation work plan developed by WESTON (WESTON, 2008b). On 16 through 18 September 2008, soil samples were collected from 44 locations (BB001 through BB012, TB001 through TB026, and HB001 through HB006), as shown on Figures 3 and 4. Each of these soil samples were collected from the Bonner Mill property except for HB005 and HB006. These two samples were collected northeast of the Bonner Mill property on undeveloped land adjacent to the Blackfoot River. These soil samples were analyzed for priority pollutant metals in order to evaluate background concentrations of these compounds.

Soil sample locations were selected in areas where petroleum hydrocarbons and/or hazardous substances, such as polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) were stored, where staining was observed, or where releases of these materials to surface and subsurface soil may have occurred.

A sonic drill rig was used to collect a total of 38 subsurface soil samples from 12 locations (BB001 through BB012). Continuous soil cores were obtained by drilling a 10-foot long sampler with a dedicated disposable liner. Soil samples were collected from varying depths, as determined by WESTON field personnel, dependent on the soil material encountered. Soil from each interval was collected with dedicated plastic spoons and placed into pre-cleaned and labeled sample containers.

A backhoe was used to collect a total of 63 subsurface soil samples from 26 locations (TB001 through TB026). The backhoe was used to dig a test pits approximately 3-feet wide by 8-feet long at depths up to 8.5-feet bgs. Soil samples were collected from varying depths, as determined by WESTON field personnel, dependent on the soil material encountered. Soil was collected from the center of the backhoe-bucket at each interval, so as to eliminate the potential of cross-contamination. Each sample was collected with dedicated plastic spoons and placed into pre-cleaned and labeled sample containers.

At sample locations inaccessible to the sonic rig or backhoe (HB001 through HB006), soil samples were collected using pre-cleaned hand tools (i.e., hand auger, shovel) and dedicated sampling scoops. Soil samples were collected at a depth of 2.0 feet bgs. Soil samples were collected with dedicated plastic spoons and placed into pre-cleaned and labeled sample containers.

A portion of each soil sample interval was placed into a clean resealable plastic bag, and homogenized thoroughly for VOC headspace analysis with a photo ionization detector (PID). All samples were stored in an iced cooler during field activities and delivery to the laboratory.

### 3.1.1 Sample Location Coordinates

The coordinates of each sample location were estimated using a Garmin V Global Positioning System (GPS) unit. This hand-held unit was Wide Area Augmentation System (WAAS)-enabled and accurate to approximately 20 feet. The coordinates of each sample location are included in Appendix D. Sample locations were confirmed by measuring from building corners, where possible.

## 3.2 SOIL SAMPLE RESULTS AND SCREENING LEVEL COMPARISON

As shown on Table 2, selected soil samples were analyzed for total extractable hydrocarbons (TEH), extractable petroleum hydrocarbon fractionation (EPH), volatile petroleum hydrocarbon fractionation (VPH), PCBs, VOCs, SVOCs, and priority pollutant metals (PP metals). Laboratory analyses pertaining to petroleum hydrocarbons were performed by Northern Analytical Labs, Inc. (NAL) located in Billings, MT. Analyses conducted by NAL included TEH; EPH; VPH; benzene, toluene, ethylbenzene and xylenes (BTEX), naphthalene, and methyl-tert-butyl ether (MTBE). The remaining analyses (PCBs, VOCs, SVOCs and priority pollutant metals) were conducted by Pace Analytical Services, Inc. (Pace) located in Seattle, WA.

Soil sampling results are discussed below and summarized in Tables 3 through 6. The analyses for each sample were determined based on previous use of the sample location area, where soil staining was observed, and/or where releases of these materials to surface and subsurface soil may have occurred.

As discussed in Section 2, soil sample results for petroleum hydrocarbons were compared to Montana Tier 1 Risk-Based Screening Levels (RBSLs) developed by the Montana Department of Environmental Quality (MDEQ) in the 2007 Corrective Action Guidelines for Petroleum Releases (MDEQ, 2007).

Soil sample results for VOCs, SVOCs, PP Metals, and PCBs were compared to 2002 EPA Soil Screening Levels (SSLs) for the protection of groundwater, and 2008 EPA Region IX Preliminary Remediation Goals (PRGs) for Direct Exposure Pathway in Industrial Soil. As stated in Section 2.1.1, arsenic concentrations in soil were compared to the background value of 40 mg/kg established by MDEQ.

### Petroleum Hydrocarbons – Gasoline and Light Hydrocarbons

A total of 18 soil samples were analyzed for gasoline and light hydrocarbons. Concentrations of total purgeable hydrocarbons, benzene, ethylbenzene, total xylenes, C5-C8 aliphatics, C9-C12 aliphatics, and MTBE were not detected above the practical quantitation limit (PQL) in any of these soil samples. Low concentrations of toluene, naphthalene and C9-C10 Aromatics were detected below the Tier 1 industrial RBSL, as discussed below.

A toluene concentration of 0.07 milligrams per kilogram (mg/kg) was detected in one sample (BB009-SL-0050). The detected concentration is well below the Tier 1 commercial RBSL of 60 mg/kg.

Naphthalene concentrations, ranging from 0.69 to 1.9 mg/kg, were detected in 4 samples. These concentrations are well below the Tier 1 commercial RBSL of 40 mg/kg.

C9-C10 Aromatics concentrations, ranging from 2.4 to 2.8 mg/kg, were detected in 2 samples. These concentrations are well below the Tier 1 commercial RBSL of 700 mg/kg.

### Petroleum Hydrocarbons – Diesel and Heavy Hydrocarbons

A total of 89 soil samples collected were analyzed for diesel and heavy hydrocarbons. Samples were analyzed for total extractable hydrocarbons (TEH) and concentrations, ranging from 11 to 6,670 mg/kg, were detected in 70 samples. Of these 70 samples, 37 soil samples contained TEH concentrations exceeding 200 mg/kg and required additional analyses for C9-C18 aliphatics, C19-C36 aliphatics, C11-C22 aromatics, and polycyclic aromatic hydrocarbons (PAHs).

Three soil samples collected near the Stud Mill Log Processor contained TEH concentrations above the MDEQ commercial ceiling level of 5,000 mg/kg. As shown on Table 4, soil sample TB022-SL-0020, collected at 2 feet bgs near the Stud Mill Log Processor log crane, contained TEH concentrations above the MDEQ commercial ceiling level of 5,000 mg/kg for surface soil (0-2 feet). The TEH concentration in this soil sample was 6,670 mg/kg. As shown on Table 5, soil sample TB022-SL-0060, collected at 6 feet bgs near the Stud Mill Log Processor log crane, contained TEH concentrations of 6,170 mg/kg, which is above the MDEQ commercial ceiling level of 5,000 mg/kg for subsurface soil (> 2 feet). Soil sample TB021-SL-0035 was collected at 3.5 feet bgs on the north side of the Stud Mill Log Processor in an area of unpaved soil beneath hydraulic-operated log transfer equipment. This sample contained TEH concentrations of 5,330 mg/kg, which is slightly above the MDEQ commercial ceiling level of 5,000 mg/kg for subsurface soil.

Concentrations of C9-C18 aliphatics were detected in seven of the 37 samples analyzed. In these seven samples, concentrations ranged from 21 to 289 mg/kg. None of these samples contained a C9-C18 aliphatics concentration above the Tier 1 surface soil commercial RBSL of 900 mg/kg.

For the 37 soil samples analyzed for C19-C36 aliphatics, concentrations ranging from 75 to 4,470 mg/kg were detected in 34 samples. None of these samples contained a C9-C18 aliphatics concentration above the Tier 1 surface soil commercial RBSL of 5,000 mg/kg.

Concentrations of C11-C22 Aromatics, ranging from 14 to 640 mg/kg, were detected in 22 of the 37 soil samples analyzed. None of the soil samples exceeded the Tier 1 commercial RBSL of 2,000 mg/kg.

### VOCs

A total of 7 soil samples were analyzed for VOCs. VOC concentrations were not detected above the screening levels in any of the soil samples analyzed.

### SVOCs

A total of 65 soil samples were analyzed for SVOCs. SVOC analyses include PAHs, which are required for soil samples exceeding 200 mg/kg TEH. PAHs above the Tier 1 commercial RBSLs were not detected in any of these soil samples.

### Priority Pollutant Metals

A total of 45 soil samples were analyzed for priority pollutant metals. None of the 13 metals analyzed (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium and zinc) were detected above any of the screening levels.

Arsenic was detected in 39 soil samples, with concentrations ranging from 2.2 to 10.4 mg/kg. All of the arsenic concentrations in soil were well below the Montana background value of 40 mg/kg established for residential soil by MDEQ (MDEQ, 2005). The average arsenic concentration of the soil samples analyzed (4.67 mg/kg) did not exceed the arsenic concentrations detected in the two background soil samples collected. Background samples HB005-SL-0020 and HB006-SL-0020 contained arsenic concentrations of 4.7 and 5.43 mg/kg, respectively.

### PCBs

A total of 44 soil samples were analyzed for PCBs as Aroclors. As shown on Table 3, Aroclor 1254 was detected in 18 samples with concentrations ranging from 14 to 1100 micrograms per kilogram (ug/kg, or parts per billion, ppb). Aroclor 1260 was detected in one sample at a concentration of 450 ug/kg. As shown on Table 6, two of these samples (TB025-SL-0020 and TB026-SL-0020) contained Aroclor 1254 concentrations above the industrial PRG of 740 ug/kg. The Aroclor 1254 concentration detected in TB025-SL-0020 (1100 ug/kg) was also slightly above the TSCA unrestricted residential standard of 1000 ug/kg. The Aroclor 1254 concentration detected in TB026-SL-0020 (750 ug/kg) was slightly above the industrial PRG of 740 ug/kg but below the TSCA unrestricted residential standard of 1000 ug/kg. PCB concentrations detected in both samples were well below the 10,000 ug/kg for high occupancy areas with an approved cap and the low occupancy standard of 25,000 ug/kg applicable to most industrial areas. These two samples were collected near the hydraulic pump houses for the former Elevated Log Track.

#### **4. SUMMARY AND CONCLUSIONS**

## SECTION 4

### SUMMARY AND CONCLUSIONS

On 15 through 19 September 2008, WESTON conducted Phase II ESA sampling at a 160-acre portion of the Stimson Lumber Bonner Mill property located in Bonner, MT. The Bonner Mill site occupies approximately 170 acres in a mixed residential, commercial, and industrial area between the unincorporated communities of Bonner and Milltown in western Montana. The Bonner Mill property used hazardous substances and/or petroleum products primarily in association with vehicle maintenance, and lumber/plywood production activities. The primary objectives of this assessment was to further evaluate recognized environmental conditions and de minimis conditions identified in the Phase I ESA (WESTON, 2008a), and to assess areas that could potentially have had a release that resulted in soil contamination that exceeds regulatory target levels.

During the Bonner Phase II ESA, soil samples were collected from 12 soil borings (BB001 through BB012), 26 test pits (TB001 through TB026), and six hand auger locations (HB001 through HB006). A total of 108 soil samples were collected and analyzed for total extractable hydrocarbons (TEH), extractable petroleum hydrocarbon fractionation (EPH), volatile petroleum hydrocarbon fractionation (VPH), PCBs, VOCs, SVOCs, and/or priority pollutant metals (PP metals). Groundwater was not encountered during any of the sampling activities, so groundwater samples were not collected. The depth to groundwater is typically 20 feet to 45 feet bgs.

Of the soil samples analyzed for petroleum hydrocarbons (i.e., TEH, EPH or VPH), only three soil samples contained concentrations of above MDEQ RBSLs. TEH concentrations in three soil samples collected near the Stud Mill Log Processor (TB021-SL-0035, TB022-SL-0020 and TB022-SL-0060) ranged from 5,330 to 6,670 mg/kg, exceeding the MDEQ commercial ceiling level of 5,000 mg/kg. None of the remaining soil samples contained petroleum concentration above the Tier 1 commercial RBSLs.

VOC and SVOC concentrations were not detected above the screening levels in any of the soil samples analyzed.

Priority pollutant metals were not detected above EPA screening levels and/or established background values in any of the soil samples analyzed. Although one soil sample (TB002-SL-0075; 10.4 mg/kg) contained arsenic concentrations above the EPA SSL of 10 mg/kg, this concentration is well below the MDEQ background value of 40 mg/kg established for residential soil (MDEQ, 2005).

PCB concentrations (Aroclor 1254) were detected in two soil samples (TB025-SL-0020 and TB026-SL-0020) above the industrial PRG of 740 ug/kg. These two samples were collected near the hydraulic pump houses for the former Elevated Log Track. Only sample TB025-SL-0020 (1100 ug/kg) had concentrations above the TSCA high occupancy (i.e., residential) standard of 1000 ug/kg. PCB concentrations detected in both samples were well below the

10,000 ug/kg standard for high occupancy areas with an approved cap and the low occupancy standard of 25,000 ug/kg applicable to most industrial areas.

As previously discussed in Section 1.4, RECs and de minimis conditions that were not evaluated further during the Phase II ESA included the five areas associated with previous environmental investigations (East Log Yard Bunker Fuel Release, Cooling Pond, East Log Track, Fire Pond Lagoon, and South Pond), as well as the Historic Stull Mill, Stud Mill Red Deck, Plywood Mill Press Pits. Because future work that may be needed at any of the five areas previously investigated would be requested by MDEQ or recommended by the other environmental professionals that historically addressed these areas, WESTON makes no recommendations regarding these areas. Although stained soil was not observed in the area of Historic Stull Mill further evaluation of this area is warranted due to the historical use of hydraulic equipment in this area. Unless soil cleanup documentation can be obtained, additional soil samples should be collected beneath the Stud Mill Red Deck to verify the soil excavation conducted in 1993. The integrity of the concrete walls and base of the Plywood Mill Press Pits could not be evaluated during the Phase II sampling event due to the presence of oily liquids within the pits. Once the pits are thoroughly cleaned, a visual inspection of pits should be conducted so the need for collecting soil and/or groundwater samples can be evaluated.

Of the areas identified as RECs and de minimis conditions that were evaluated during the Phase II ESA, the only soil samples that exceed the MDEQ industrial screening levels were collected near the Stud Mill Log Processor and the hydraulic pump houses for the former Elevated Log Track. WESTON's recommendations for these areas are as follows:

- Stud Mill Log Processor - Three soil samples contained TEH concentrations of above MDEQ commercial ceiling level of 5,000 mg/kg. One sample (TB021-SL-0035) was collected at 3.5 feet bgs on the north side of the Stud Mill Log Processor in an area of unpaved soil beneath hydraulic-operated log transfer equipment. This sample contained TEH concentrations of 5,330 mg/kg, which is slightly above the MDEQ commercial ceiling level of 5,000 mg/kg for subsurface soil. Although significant surface soil staining was not observed, soil removal in this area is recommended to reduce TEH concentrations below 5,000 mg/kg. Two soil samples (TB022-SL-0020 and TB022-SL-0060), collected at 2 feet and 6 feet, contained TEH concentrations of 6,670 mg/kg and 6,170 mg/kg. Significant soil staining covered an area of approximately 100 square feet near the base of the log crane. Soil removal in this area is recommended to reduce TEH concentrations in soil below 5,000 mg/kg.
- Elevated Log Track – Although PCB concentrations (Aroclor 1254) were detected in two soil samples (TB025-SL-0020 at 1100 ug/kg and TB026-SL-0020 at 750 ug/kg) above the industrial PRG of 740 ug/kg, the concentrations detected in both samples were similar to the TSCA unrestricted residential standard of 1000 ug/kg, and well below the 10,000 ug/kg standard for high occupancy areas with an approved cap and the low occupancy standard of 25,000 ug/kg applicable to most industrial areas. Because the anticipated future use of the property is industrial, soil removal in these areas is not warranted.

## **5. REFERENCES**

## SECTION 5

### REFERENCES

American Society for Testing and Materials (ASTM). 2005. *E 1527-05, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. West Conshohocken, Pennsylvania.

ASTM. 2002. *E 1903-97 (Reapproved 2002), Standard Guide of Environmental Site Assessments: Phase II Environmental Site Assessment Process* West Conshohocken, Pennsylvania.

Montana Department of Environmental Quality (MDEQ), 2007. *Tier-1 Risk-Based Corrective Action Guidelines for Petroleum Releases*, Montana. October.

MDEQ, 2005. *Action Level for Arsenic in Surface Soil*. April.

MDEQ, 2002. *Volunteer Cleanup and Redevelopment Act Application Guide*. August

PBS&J. 2007. *Groundwater Sampling and Analysis Plan*. May

United States Environmental Protection Agency (EPA), 2008. *Preliminary Remediation Goals*. September.

EPA, 2002. *Generic Soil Screening Levels for the Residential and Commercial/Industrial Scenarios*, December.

WESTON Solutions, Inc. (WESTON), 2008a. *Phase I Environmental Site Assessment*, Stimson Lumber Company, Bonner Mill Site, Bonner, MT. November.

WESTON, 2008b. *Phase II Investigation Work Plan*, Stimson Lumber Company, Bonner Mill Site, Bonner, MT. September.

## **FIGURES**

## **TABLES**

**APPENDIX A**  
**PHOTOGRAPH LOG**

**APPENDIX B**  
**PHASE I ESA FINDINGS**

**APPENDIX C**  
**SOIL BORING LOGS**

**APPENDIX D**  
**SAMPLE LOCATION COORDINATES**

## **APPENDIX E**

### **LABORATORY DATA REPORTS AND DATA VALIDATION MEMORANDUM**