Targeted Brownfields Assessment Report for Former Louisiana Pacific Lumber Mill 15690 Highway 89 Crescent Mills, California

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2014 Ecology and Environment, Inc

Superfund Technical Assessment and Response Team

Targeted Brownfields Assessment
Report for
Former Louisiana Pacific Lumber Mill
15690 Highway 89
Crescent Mills, California

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Approved by: _____
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Ecology and Environment, Inc.

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Acronyms

AST	above-ground storage tank
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
COPC	constituent of potential concern
DTSC	California Department of Toxic Substances Control
E & E	Ecology and Environment, Inc.
ESL	environmental screening level
FSP	field sampling plan
Geocon	Geocon Consultants, Inc.
LBNL	Lawrence Berkeley National Laboratory
LP	Louisiana Pacific Corporation
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
PCDEH	Plumas County Department of Environmental Health
PCP	pentachlorophenol
Phase I ESA	Phase I Environmental Site Assessment
RPD	relative percent difference
RSL	regional screening level
RWQCB	Regional Water Quality Control Board
START	Superfund Technical Assessment and Response Team
TBA	targeted brownfields assessment

Acronyms (cont.)

TCP	tetrachlorophenol
TEQ	toxicity equivalence quotient
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gasoline
TPH-mo	total petroleum hydrocarbons as motor oil
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	underground storage tank

1 Introduction

The United States Environmental Protection Agency (U.S. EPA) Region 9 directed Ecology & Environment, Inc.'s (E & E) Superfund Technical Assessment and Response Team (START) to conduct a Targeted Brownfields Assessment (TBA) at the Former Louisiana Pacific (LP) Lumber Mill property, located at 15690 Highway 89, Crescent Mills, California. This sampling effort was implemented following a TBA assistance award to the Sierra Institute for Community and Environment, the TBA applicant, for assessment of the property for which redevelopment is planned. The applicant is seeking to redevelop the site for processing wood chips into pellets for home heating fuel (Figures 1 and 2, Appendix A).

As part of the TBA for this site, E & E START prepared a *Field Sampling Plan for Targeted Brownfields Assessment of Former Louisiana Pacific Lumber Mill* (FSP), dated August 2014 (E & E 2014a). The FSP describes soil sampling; groundwater sampling, and wood waste stockpile sampling for petroleum hydrocarbon constituents, pentachlorophenol (PCP), metals, and dioxins/furans. The FSP is a site-specific addendum to the draft *Generic Sampling and Analysis Plan for Targeted Brownfields Assessments*, dated December 2010 (E & E 2010). The U.S. EPA Quality Assurance Office approved the FSP on August 13, 2014. This report describes findings and results of the implementation of the FSP.

This assessment characterizes contaminant concentrations in soil, groundwater, and wood waste stockpiles to provide the appropriate environmental data required to make decisions regarding redevelopment of the property for processing wood chips into home heating fuel. The specific sampling objectives for the assessment were the following:

- Assess potential contamination to soil on the site.
- Assess potential contamination to groundwater on the site.

This report was prepared based on information collected from historical file review and August 2014 E & E START field assessment activities. This report contains a summary of historical documents related to the site, a discussion of the E & E START August 2014 site activities, a discussion of laboratory analytical data from this assessment, and a summary of the findings of the assessment.

2 Site Background

2.1 Location

The site is located at 15690 Highway 89, Crescent Mills, California. The geographic coordinates for the approximate center of the site are 40° 05’ 39.34” North Latitude, 120° 54’ 37.23” West Longitude. The site occupies 26.27 acres of land within assessor's parcel numbers 111-050-065, 111-050-066, and 111-050-067 (subject property). Figure 1 is a site vicinity map showing the location and topography of the site and surrounding area. Figure 2 is a site overview map showing parcel and site boundaries. Figures are contained in Appendix A.

2.2 Site Description

The subject property is occupied by a number of stockpiles of wood waste and one stockpile of soil. Except for the stockpiles, the site is vacant with only asphalt paving, concrete floor slabs, and building foundation remnants from the former LP lumber mill. The site and surrounding properties are located near the western margin of the floor of Indian Valley. The surrounding and nearby properties consist of an adjacent railroad (west) with mixed residential and some commercial properties beyond, a golf course (south), a riparian area (east), and an industrial site that is the former Sacramento Valley Moulding facility (north). An electrical sub-station is located on a small parcel between the site and railroad near the center of the western property boundary. The site is secured with a perimeter fence.

2.3 Topographic and Geologic Information

According to the *Crescent Mills 7.5-Minute Quadrangle*, prepared by the United States Geological Survey (USGS), 1994 (USGS 1994), the elevation of the ground surface at the subject property is approximately 3,500 feet above sea level. Topography of the subject property is relatively flat. Local topography slopes gently to moderately in an easterly direction west of Highway 89. East of Highway 89, topography is nearly flat on the floor of Indian Valley. Surface drainage in the northern portion of the site flows toward an easterly flowing storm drain located between the former dry kiln buildings and the former planing mill buildings. Surface drainage in the southern portion of the site flows through perimeter ditches into a log deck recycle pond located along the southeastern property boundary. The storm drain and over-flow from the log deck recycle pond flow in an easterly direction toward Indian Creek. Major features and former structures at the site are shown on Figure 3, Appendix A.

Information on regional geology and hydrogeology is based on *Geology of the Taylorsville Region, California, Bulletin 353*, prepared by the USGS (USGS Bulletin 353), 1908 (USGS 1908). According to USGS Bulletin 353, geologic materials beneath the site consist of Quaternary alluvium on the floor of Indian Valley. The depth to bedrock beneath the site is not known. According to USGS Bulletin 353, nearby outcrops of bedrock consist of pre-Devonian metamorphosed rhyolite and Carboniferous metamorphosed andesite.

According to a November 20, 1992 *Assessment of Soil and Groundwater Contamination, Sacramento Valley Moulding Facility*, prepared by Resna (Resna 1992), native soil below the

adjacent Sacramento Valley Moulding site consists of mixtures of sand and silt with gravel down to the total explored depth of approximately 20 feet below ground surface (bgs). Because the subject property and the Sacramento Valley Moulding site are located in the same geologic environment and at a similar elevation, soil below the subject property is anticipated to be similar to that at the Sacramento Valley Moulding site.

According to the assessment report for the Sacramento Valley Moulding site (Resna 1992), groundwater was encountered at that site at depths ranging from 7 to 9 feet bgs during a groundwater sampling event performed in November 1992. Groundwater gradient was calculated to flow in a southeasterly direction, based on water levels measured in monitoring wells during the November 1992 sampling event. The measured groundwater flow direction is the same as would be expected based on surface topography. Resna did not calculate the magnitude of the groundwater gradient at the Sacramento Valley Moulding site. Because the subject property and the Sacramento Valley Moulding site are located in the same geologic environment and at a similar elevation, depth to groundwater and groundwater flow direction below the subject property is anticipated to be similar to that at the Sacramento Valley Moulding site.

2.4 Site History

According to a July 2014 *Phase I Environmental Site Assessment for Former Louisiana Pacific Lumber Mill* (Phase I ESA), prepared by E & E (E & E 2014b), the subject property was initially developed as a lumber mill in the late 1940s to early 1950s. Before the lumber mill was built, the property was likely used for agriculture. The site was purchased by LP in the early 1970s and the mill was expanded. LP operated the site as a lumber mill until it was closed in 1986. The current owner (Mr. Greg Lehman) purchased the property from LP in 1998.

2.4.1 Previous Investigations

Previous site investigations at the site are described in a California Department of Toxic Substances Control (DTSC) *Preliminary Assessment/Site Inspection Report*, December 14, 1990 (DTSC 1990); a CH2M Hill *Property Transfer Site Assessment, Louisiana Pacific Corporation Crescent Mills Facility*, May 1991 (CH2M Hill 1991); a Geocon Consultants, Inc. (Geocon) *Supplemental Site Investigation Report, Crescent Mills Mitigation Site, Former LP Facility*, December 2002 (Geocon 2002), and the Phase I ESA (E & E 2014b).

***Preliminary Assessment/Site Inspection Report*, December 14, 1990, DTSC**

In 1990, the DTSC performed a preliminary assessment of the former LP lumber mill, as described in its December 14, 1990 report (DTSC 1990). The preliminary assessment was performed because the site was identified by DTSC as a potential hazardous waste site, based on the type and size of the facility and the potential for wood treatment chemical contamination. The DTSC concluded in its report that there were unpermitted ash and wood waste landfill areas at the site that may be of concern to the Plumas County Department of Environmental Health (PCDEH), Regional Water Quality Control Board (RWQCB), California Integrated Waste Management Board, and prospective buyers. The DTSC indicated that no further action was recommended because no evidence was found of a hazardous materials problem or of chemical contamination at the site.

***Property Transfer Site Assessment,* May 1991, CH2M Hill**
The 1991 assessment was performed to determine whether readily available information indicated that on-site activities had resulted in the release of hazardous materials onto the subject property. As part of the 1991 assessment, CH2M Hill visited the site, interviewed individuals and agencies with knowledge of the site, and reviewed available records in regards to the past use and potential release of hazardous materials at the site. CH2M Hill interviewed LP staff and staff at the California Department of Health Services, PCDEH, RWQCB, and the Plumas County Planning Department. CH2M Hill reviewed available records pertaining to the past use and potential releases of hazardous materials on the site as obtained from the PCDEH, RWQCB, Plumas County assessor's office, and LP.

CH2M Hill identified a number of former site activities and made observations pertaining to those activities. CH2M Hill summarized potential concerns at the site into one of the following categories: above-ground storage tanks (ASTs), underground storage tanks (USTs), wood waste disposal area, saw mill, new planer building, oil shed, boiler building, maintenance shop, log deck, and recycle pond. At the saw mill, CH2M Hill noted that an anti-staining agent, containing PCP, was sprayed on lumber from 1974 to 1979 between the saw mill and the lumber sorter and stacker. Two soil samples were collected by LP in December 1988 from the vicinity of the anti-stain application area from a depth of 10 to 12 inches bgs. CH2M Hill did not indicate specific sample locations in their report, but the general area where the samples were collected. Results of the analysis of soil samples revealed the presence of PCP at concentrations of 2 and 5 milligrams per kilogram (mg/kg) and tetrachlorophenol (TCP) at concentrations of 1 and 3 mg/kg. Laboratory analytical results for PCP were compared to a U.S. EPA May 2014 industrial Regional Screening Level (RSL) as listed in *Regional Screening Level Summary Table*, U.S. EPA, May, 2014 (U.S. EPA 2014). The highest reported PCP concentration at the site exceeds the U.S. EPA's May 2014 industrial RSL for PCP of 4 mg/kg. Laboratory analytical results for PCP were compared to an industrial Environmental Screening Level (ESL) established by the San Francisco Bay RWQCB in a *Summary Table A, Environmental Screening Levels (ESLs), Shallow Soil (≤3 m bgs), Groundwater is a Current or Potential Source of Drinking Water*, December 2013 (RWQCB 2013). The reported concentrations of TCP are below the December 2013 industrial ESL for TCP of 18,000 mg/kg.

At the new planer building, CH2M Hill noted the presence of discolored soil outside the building in an area used for dispensing oil, however, they did not provide any related recommendations. At the oil shed, CH2M Hill noted that it was used to store oil and lubricants and that it was an enclosed and bermed structure. During its site visit CH2M Hill noted oil-soaked sawdust on the floor of the oil shed, but did not indicate that a release was observed. At the boiler building, CH2M Hill noted several sacks and containers of boiler chemicals inside, the presence of empty condensate tanks at the north end and east side of the building, and discolored soil at the southeast corner of the building. At the maintenance shop, CH2M Hill noted an area of discolored soil in front of the building but observed no drains or cracks in the concrete floor below the maintenance area. At the log deck, CH2M Hill noted that a water spray system had been used to prevent cracking of logs during storage, biocides were not used to treat the water, and the log deck was graded to promote runoff to the recycle pond. At the recycle pond, CH2M Hill noted that there was no water in the pond during its site visit, but that the bed of the pond was dark in color. In regards to ASTs at the site, CH2M Hill noted a water storage tank and AST with some discolored soil below it at a location that is beyond the eastern site boundary in the

southern half. The only other AST described was used to collect used oil and was located at the north end of the maintenance shop building, but it had a secondary containment and did not appear to have leaked. The ASTs shown on Figure 3 (Appendix A) near the western site boundary were shown on the figure prepared by CH2M Hill, however, no discussion of these ASTs was provided in their report. In the wood waste disposal area (beyond the eastern site boundary), CH2M Hill noted that ash from the boiler was routinely deposited in an ash disposal area and that ash from the teepee burner may have been disposed in the wood waste disposal area. CH2M Hill also indicated that ash had been spread on roadways, although none was observed during their site visit. During its February 21, 1991 site visit, CH2M Hill observed an area of oil staining with petroleum odor in the wood waste disposal area near the ash disposal area.

In the 1991 assessment report, CH2M Hill identified the past presence of USTs and provided the recommendations described below. Two 6,000-gallon diesel and one 10,000-gallon leaded gasoline USTs had been operated by permit at the site. The impact of three former USTs on soil and groundwater beneath the site is unknown. The USTs were removed by LP in 1987. No soil or groundwater samples were collected when the USTs were removed. CH2M Hill indicated that a fourth tank remained at the site near the maintenance shop and that it had been previously removed from an LP facility in Greenville, California. CH2M Hill did not indicate the fourth UST to be of concern and provided no recommendations in its regard. CH2M Hill recommended sampling soil underlying the former USTs and sampling soil and groundwater in an area of stained pavement it noted around the former USTs.

Possible sump locations were inferred to be present by CH2M Hill from an LP memo dated 1985 that indicated a gravel-lined pit used for disposal of cooling water and boiler blow-down water was replaced with a perforated drum. The 1985 memo indicated that concentrations of the sulfite and aliphatic amines used to treat the water were below hazardous or designated waste levels. CH2M Hill recommended that the area of the discharges should be located and soil sampled, however they were unable to locate the sumps.

During their February 21, 1991 site visit, CH2M Hill identified tires, metal, and other debris along the northern property line and containers of chemicals such as boiler chemicals, paint, oil, and grease at the site. CH2M Hill recommended that the debris be removed and the containers of chemicals either taken to another LP facility for use or disposed of properly. Neither significant quantities of debris nor any containers of chemicals were observed by E & E during an April 10, 2014 site visit.

Supplemental Site Investigation Report, Crescent Mills Mitigation Site, Former LP Facility, December 2002, Geocon

Geocon performed soil and groundwater sampling at the subject property on behalf of the California Department of Transportation. The California Department of Transportation requested the sampling when it considered purchasing the former LP lumber mill as part of a planned wetland restoration project that was later performed in the former LP wood waste disposal area adjacent to the eastern property boundary. As part of its assessment, Geocon collected a total of 19 soil and 6 groundwater samples from 13 boring locations. Samples were collected at depths ranging from the ground surface to 3 meters. Boring locations were selected to target the following areas of concern: former UST location, sawmill/lumber sorter/anti-stain area, dry

kiln/boiler blow-down sump, transformer/oil dispensing unit, wood waste disposal area, maintenance shop trench drain outfall, dry kiln fuel shed drain outfall, and dry kiln/possible fueling area. Soil and groundwater samples were analyzed for one or more of the following: total petroleum hydrocarbons as gasoline (TPH-g), total petroleum hydrocarbons as diesel (TPH-d), and total petroleum hydrocarbons as motor oil (TPH-mo); volatile organic compounds; phenols; and heavy metals. Laboratory analytical results for detected compounds were compared to the December 2013 industrial ESLs (RWQCB 2013). Of the detected compounds, only TPH-mo was present at a concentration exceeding its ESL. TPH-mo was detected only in the soil sample collected at boring HA3 (at the trench drain outfall from the maintenance shop) from a depth of 0.15 meter bgs at a concentration of 550 mg/kg. The reported concentration of TPH-mo slightly exceeds its ESL of 500 mg/kg. Neither the soil sample collected from this boring at a depth of 1 meter nor the groundwater sample from the same boring contained detectable concentrations of TPH-mo. Geocon concluded in its report that it did not appear that additional assessment was warranted. Data tables and a sample location map summarizing the 2002 supplemental site investigation are contained in Appendix C.

***Phase I Environmental Site Assessment,* July 2014, E & E**

In July 2014, a Phase I ESA report was prepared by E & E as part of this TBA. As part of the 2014 Phase I ESA, E & E identified the following recognized environmental conditions in connection with the subject property:

- The documented presence of PCP in soil near the anti-stain application area indicates a release of the anti-stain agent containing PCP has occurred;
- The presence in 1991 of discolored soil in front of the maintenance shop and at the southeast corner of the boiler building;
- The documented historical practice of disposing of boiler and incinerator ash by spreading on mill roadways and along with wood waste; and
- The presence of stockpiles of wood waste at the site that were moved from the wood waste disposal area.

3 E & E START Activities

On August 26 and 27, 2014, the E & E START conducted an investigation consisting of the collection of subsurface soil and groundwater samples at two boring locations near areas of surface oil staining for laboratory analysis of petroleum hydrocarbons and metals; collection of soil and groundwater samples at one boring location at the former anti-stain application area for analysis of PCP; collection of four five-point composite samples from wood waste stockpiles for analysis of PCP, arsenic, lead, and dioxins/furans; and four five-point composite soil samples in areas where ash and used oil are suspected to have been used on road surfaces for analysis of TPH-d, TPH-mo, arsenic, lead, and dioxins/furans. Soil and groundwater sampling locations and wood waste stockpile sample locations are shown on Figure 3 (Appendix A). Soil sample identifiers with the sample collection depths are listed in Table 1 (Appendix B). Laboratory analytical results for soil and rinse blank samples are summarized for petroleum constituents and for metals, PCP, and dioxins in Tables 2 and 3, respectively (Appendix B). Laboratory analytical results for groundwater and rinse blank samples are summarized for petroleum constituents and for metals and PCP in Tables 4 and 5, respectively (Appendix B). Soil boring logs documenting the soil types encountered in the borings are contained in Appendix C. Photographs documenting field sampling activities are contained in Appendix D.

3.1 Deviations from the Field Sampling Plan

E & E START performed field assessment activities in accordance with the FSP (E & E 2014a) with the following exceptions.

- At boring location LP-B02 at the southeast corner of the boiler building, groundwater samples were proposed to be collected for laboratory analysis of petroleum constituents. Due to loose, coarse, gravelly soil from the surface to a depth of 6 feet, the sampler could not be advanced beyond the 8 foot sampling depth for sampling groundwater. A second step-out boring was attempted, but drill tool refusal was encountered at 3 feet depth and no further sampling was attempted. As a result, no groundwater samples could be collected at boring LP-B02.
- The FSP described collection of groundwater samples at LP-B02 for petroleum constituents in triple volumes for matrix spike/matrix spike duplicate (MS/MSD) analysis. To ensure that MS/MSD analysis was performed as described in the FSP, samples at boring LP-B03 were collected in triple volumes and analyzed for petroleum constituents because the borehole at LP-B01 had already been grouted and no water was available for sampling at LP-B02.

3.2 Soil Sampling

E & E START collected soil samples for all constituents of potential concern (COPCs) by using a direct push drilling rig to advance to the sample depth then placing soil in the sample containers as determined by laboratory analytical requirements. The sample jars were sealed, labeled, and placed on ice in a cooler for shipment to the laboratory. The soil samples collected

for analysis of volatile COPCs were obtained by pushing a micro-core sampling device attached to a T-handle into the soil. Each micro-core sampler was filled with approximately 5 grams of soil then the soil was placed into pre-weighed and preserved sample vials, then capped, placed in a zipper locking plastic storage bag, labeled, and placed on ice in a cooler for shipment to the laboratory. No obvious contamination was noted during sampling activities.

The E & E START collected soil samples at depths of 0.5, 2, 4, and 6 feet bgs at three boring locations (LP-B01 through LP-B03) and two field duplicate samples (LP-B101-2 and LP-B103-2). Borings LP-B01 and LP-B02 are in areas where surface oil staining was previously noted. Boring LP-B03 is located in the area where an anti-staining agent containing PCP was applied. The E & E START collected 5-point composite soil samples (LP-SC01-0.5 through SP-SC04-0.5) and one field duplicate sample (LP-SC101-0.5) from depths of 0.5 foot bgs in areas where used oil and incinerator ash may have been spread on former mill roads. The E & E START collected 5-point composite soil samples from four wood waste stockpiles (LP-SPC01 through LP-SPC04) from depths of 1-2 feet below the surface. For all composite samples, the five component samples were collected into a zipper locking plastic storage bag then thoroughly homogenized before being placed into sample containers for laboratory analysis.

3.3 Groundwater Sampling

The E & E START collected groundwater samples LP-B01-W and LP-B03-W and field duplicate samples LP-B101-W and LP-B103-W through temporary 0.75-inch diameter disposable well screens placed in each borehole. Groundwater samples for analysis of volatile constituents were collected using a disposable bailer lowered into the temporary well screens. Groundwater samples for analysis of non-volatile constituents were pumped to the surface by hand using a stainless steel ball valve at the bottom of a section of disposable polyethylene tubing. As described above in Section 3.1, the groundwater sample planned to be collected at LP-B02 was not collected due to the presence of coarse gravel at that location, which prevented advancement of the sampler to the depth required for groundwater sampling. As a result, the groundwater sample planned to be collected at LP-B02 in triple volume for MS/MSD analysis was collected from LP-B03 instead.

4 Analytical Data

Soil samples and rinse blank samples that were analyzed for dioxins/furans were analyzed by TestAmerica Laboratories in West Sacramento, California. All other soil and groundwater samples collected from the site were submitted to the U.S. EPA Region 9 Laboratory in Richmond, California. Soil samples collected from borings LP-B01 and LP-B02 were analyzed for the following COPCs:

- TPH-d and TPH-mo by U.S. EPA Method 8015;
- TPH-g by U.S. EPA Method 5035/8015;
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by U.S. EPA Method 5035/8260; and
- Arsenic, cadmium, chromium, lead, nickel, and zinc by U.S. EPA Method 6010B.

Soil samples collected from boring LP-B03 were analyzed for PCP by EPA Method 8270.

5-point composite soil samples collected from areas where incinerator ash and used oil may have been spread on mill roads (LP-SC01-0.5 through SP-SC04-0.5) were analyzed for the following COPCs:

- TPH-d and TPH-mo by U.S. EPA Method 8015;
- Arsenic and lead by U.S. EPA Method 6010B; and
- Dioxins/furans by U.S. EPA Method 8290.

5-point composite soil samples collected from wood waste stockpiles (LP-SPC01 through LP-SPC04) were analyzed for the following COPCs:

- PCP by U.S. EPA Method 8270;
- Arsenic and lead by U.S. EPA Method 6010B; and
- Dioxins/furans by U.S. EPA Method 8290.

Groundwater samples collected from borings LP-B01 and LP-B03 were analyzed for the following COPCs:

- TPH-d, TPH-mo, and TPH-g by U.S. EPA Method 8015;
- BTEX by U.S. EPA Method 8260; and
- Cadmium, chromium, lead, nickel, and zinc by U.S. EPA Method 6010B.

The groundwater sample collected from boring LP-B03 was additionally analyzed for PCP by U.S. EPA Method 8270.

Laboratory analytical results for soil and groundwater samples (except for analysis of dioxins/furans) were provided by the laboratory with Tier 1B data validation. Data were found to be of known quality and were deemed by the laboratory to be usable for the purposes of this investigation with qualifications as indicated in Tables 2, 3, 4, and 5 contained in Appendix B.

The data for dioxins/furans in soil were reviewed following guidelines specified in the *Draft EPA Region 9 Quality Assurance Office Guidance, Region 9 Superfund Data Evaluation/ Validation Guidance*, R9QA/006.1, dated December 2001 (U.S. EPA 2001). E & E START performed Tier 1A validation on all data obtained from the subcontract laboratory (TestAmerica Laboratories) and all parameters were evaluated to be within acceptable quality assurance and quality control limits with some qualifications. Data were found to be of known quality and were deemed by START to be usable for the purposes of this investigation with qualifications as indicated in Tables 3 and 5 (Appendix B). The data validation report and laboratory analytical report are provided on the data disc inside the back cover of this report.

4.1 Soil Sample Results

The E & E START compared COPC concentrations in soil samples to the December 2013 California RWQCB, San Francisco Bay Region (RWQCB) ESLs for TPH, BTEX, lead, nickel, zinc, and dioxins/furans. The only available screening level for total chromium is an obsolete 2010 U.S. EPA RSL for residential soil, which was used as the project screening level. The lowest available screening level for cadmium was selected as the project screening level, a September 23, 2010 California Human Health Screening Level established by the California EPA of 7.5 mg/kg. The lowest available screening level for PCP was selected as the project screening level, a May 2014 U. S. EPA RSL of 4 mg/kg. The screening level for arsenic selected as the project screening level is the lowest available reporting limit for arsenic through standard U.S. EPA analytical resources of 5 mg/kg. The reporting limit for arsenic was selected as the project screening level even though established screening levels are lower because natural background concentrations of arsenic typically exceed all of the established screening levels and because a lower reporting limit is not available through standard U.S. EPA analytical resources. Soil boring locations are shown on Figure 3 (Appendix A). A summary of sample identifiers and associated sampling depths are presented in Table 1 (Appendix B). Soil analytical results for petroleum constituents are presented in Table 2, contained in Appendix B. Soil analytical results for metals, PCP, and dioxins/furans are presented in Table 3, contained in Appendix B. Laboratory analytical reports are provided on the data disc inside the back cover of this report.

TPH-d and TPH-mo were detected in most of the soil samples analyzed. The samples collected from the 0.5 foot sampling depth at boring B01, in sampling area SC01, and in sampling area SC04 contained TPH-d at concentrations ranging from 140 to 640 mg/kg, exceeding the project screening level of 100 mg/kg. The samples collected from the 0.5 foot sampling depth at boring B01 and in sampling areas SC01, SC03, and SC04 contained TPH-mo at concentrations ranging from 560 to 2,700 mg/kg, exceeding the project screening level of 500 mg/kg. The presence of TPH-d and TPH-mo primarily in near surface soil and at concentrations that decline rapidly with depth is consistent with the historical practice of spreading used oil on mill roadways.

Arsenic was detected in all soil samples analyzed at concentrations ranging from 5.9 to 65 mg/kg, which all exceed the project screening level of 5 mg/kg. According to *Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory*, prepared by the Lawrence Berkeley National Laboratory (LBNL), April 2009 (LBNL 2009), natural background concentrations of arsenic in California soil far exceed the project screening level. According to (LBNL 2009), the ninety ninth percentile concentration for natural background concentrations in California soil other than Great Valley group soil is 24 mg/kg. If sample results are compared to a background level of 24 mg/kg, soil samples LP-B02-6, LP-SC02-0.5, LP-SC03-0.5, and LP-SPC04 exhibit arsenic concentrations above background ranging from 26 to 130 mg/kg. The presence of elevated concentrations of arsenic in sampling areas SC02 and SC03 is consistent with the past practice of spreading incinerator ash on mill roads, particularly when considering that the highest concentration of dioxins/furans were detected in the same sample with the highest concentration of arsenic.

Various individual congeners of dioxins/furans were detected in all of the soil samples analyzed. Dioxins/furans were detected at estimated toxicity equivalence quotient (TEQ) adjusted concentrations ranging from 2.02 to 19.98 picograms per gram. The TEQ for dioxins/furans is a total concentration calculated from the individual congener concentrations that have been adjusted for the individual congener toxicities relative to 2,3,7,8-tetrachlorodibenzo-p-dioxin. Many of the individual dioxin/furan congeners were detected at concentrations between the reporting limit and the instrument detection limit so the results were flagged with a “J” to indicate the results are estimated. Because a number of the individual congener component values are estimated, the TEQ concentrations calculated from those values were also flagged with a “J” as estimated results. One sample (LP-SC03-0.5) contained dioxins/furans at a TEQ concentration of 19.98, which slightly exceeds the ESL of 18 picograms per gram, which is the project screening level. All other sample results were below the project screening level for dioxins/furans. The presence of dioxins/furans in the 5-point composite sample LP-SC03-0.5 at estimated concentrations exceeding the project screening level suggests that a portion of the shallow soil in the SC03 sampling area likely contains dioxins/furans at even higher concentrations.

TPH-g, BTEX, and PCP were not detected in any of the soil samples collected. The metals cadmium, chromium, lead, nickel, and zinc were either not detected or were detected at concentrations below their respective screening levels in all of the soil samples collected.

4.2 Groundwater Sample Results

The E & E START compared COPC concentrations in groundwater samples to the ESLs for TPH-g, BTEX, chromium, and zinc and to the lowest available laboratory reporting limits available through U.S. EPA laboratory resources for TPH-d, TPH-mo, cadmium, lead, nickel, and PCP. The lowest available laboratory reporting limits were used as project screening levels for compounds where the available reporting limit exceeds the lowest established screening level. The project screening levels for TPH-g and BTEX are the ESLs of 100, 1, 40, 30, and 20 micrograms per liter (µg/L), respectively. The project screening levels for chromium and zinc are the ESLs of 50 and 81 µg/L, respectively. The project screening levels for TPH-d and TPH-mo are the laboratory reporting limits of 250 and 1,000 µg/L, respectively. The project screening levels for cadmium, lead, nickel, and PCP are the laboratory reporting limits of 10, 10, 40, and

10 µg/L, respectively. Arsenic analysis for groundwater samples was not planned or requested but because the laboratory completed these analyses the results are presented, though without a screening level because this was not in the FSP. Groundwater sample locations are shown on Figure 3 (Appendix A). Groundwater analytical results and rinse blank analytical results for petroleum constituents are presented in Table 4, contained in Appendix B. Groundwater analytical results and rinse blank analytical results for metals, PCP, and dioxins/furans are presented in Table 5, contained in Appendix B. Laboratory analytical reports are provided on the data disc inside the back cover of this report.

TPH-d was detected at estimated concentrations ranging from 150 to 400 µg/L. The sample collected at boring LP-B01 contained the highest concentration detected at 400 µg/L, exceeding the project screening level of 250 µg/L. While the concentration of TPH-d exceeded the project screening level in sample LP-B01, the presence of substantial TPH-d contamination in the associated method blank indicates the results must be considered an estimate. Additional discussion of the method blank contamination is presented below in Section 4.3.3. TPH-mo was only detected in the sample collected from boring LP-B01 at a concentration of 1,200 µg/L, exceeding the project screening level of 1,000 µg/L.

The presence of low concentrations of TPH-mo and possibly TPH-d in groundwater along with the presence of TPH-d and TPH-mo only in surface soil suggests the presence of a secondary source for groundwater contamination in the vicinity of boring LP-B01 that was not identified in this assessment. The presence of additional soil contamination is likely because the concentrations of TPH-d and TPH-mo detected in soil at boring LP-B01 down to 6 feet bgs are relatively low and are not in contact with groundwater, therefore are unlikely to be the source of TPH-d and TPH-mo detected in groundwater at boring LP-B01.

TPH-g, BTEX, arsenic, cadmium, chromium, lead, nickel, zinc, and PCP were not detected in any of the groundwater samples collected.

4.3 Quality Assurance/Quality Control Sample Results

The E & E START performed a Tier 1A validation review of the sample data generated by TestAmerica Laboratories. Data generated by the U.S. EPA Region 9 Laboratory were Tier 1B validated by the laboratory. The data were qualified by the respective laboratories or by the E & E START data validator as applicable.

The Tier 1A data validation included evaluation of criteria such as laboratory quality assurance/quality control summaries, holding times, method blank contamination, and matrix-related recoveries. The E & E START also reviewed the Tier 1B data validation results to compare data to specific project quality objectives, which included target analytes, sensitivity, analytical accuracy, analytical and sampling precision, and analytical completeness. The E & E START data validation reviews also evaluated the comparison of primary sample to field duplicate results. Laboratory analytical and data validation reports are provided on the data disc inside the back cover of this report. Based on the results of the Tier 1A data validation conducted by the E & E START and the review of Tier 1B validated data results, the data for the former LP Lumber Mill TBA are classified as acceptable for use with qualifications as identified in the data tables contained in Appendix B. The results of the data review are briefly summarized in the following sections.

4.3.1 Analytical Completeness

All samples submitted to the laboratories were analyzed as requested.

4.3.2 Holding Times

Two samples (LP-SC01-0.5 and LP-SC101-0.5) were inadvertently analyzed outside the method prescribed holding time for TPH-d and TPH-mo. Because TPH-d and TPH-mo are not volatile, it is unlikely that sample results are significantly different than if the samples had been analyzed within the proper holding time. Because the two samples were analyzed for TPH-d and TPH-mo outside the prescribed holding time, those results were qualified with a "J" to indicate the results must be considered an estimate. All other samples were analyzed by the laboratories within the holding times prescribed by the analytical methods used for analysis.

4.3.3 Blank Contamination

No method blank contamination was identified in the laboratory analytical reports for all COPCs except for dioxins/furans and TPH-d in water. The laboratory indicated in their report that a number of detections of dioxin/furan congeners were associated with method blank contamination. Though contamination was present below laboratory detection limits for some compounds in the method blank, the associated contribution to sample results is not enough to change the findings of the assessment.

The method blank associated with the sample results for groundwater and rinse blank samples contained TPH-d at a concentration of 150 µg/L. The highest detected concentration of TPH-d in any water sample is only 400 µg/L. Because a large fraction of the highest detected result is associated with method blank contamination, the presence of TPH-d in any water sample cannot be confirmed, based on the data available. Considering the relatively low concentrations of TPH-d detected in groundwater, the fraction not associated with method blank contamination is likely to be below the project screening level. Analytical results for water samples were flagged with the "B1" qualifier to indicate the presence of blank contamination where the reported sample results are less than five times the concentration of associated method blank contamination.

Equipment rinse blank samples were collected after each day of sampling and analyzed for the COPCs that soil and groundwater samples collected on that day were analyzed for, to evaluate the decontamination procedures used on non-dedicated sampling equipment, as described in the FSP (E & E 2014a). The only reported concentrations of any of the COPCs in either of the rinse blank samples are detections of TPH-d at concentrations similar to the concentration of TPH-d reported as contamination in the method blank. None of the other COPCs were detected in any of the rinse blanks. Analytical results for rinse blank samples are presented in Table 4 (Appendix B) for petroleum constituents and in Table 5 for metals, PCP, and dioxins/furans. Analytical results for laboratory method blanks are contained in the laboratory analytical reports on the data disc inside the back cover of this report.

4.3.4 Matrix Related Recoveries

Results of the analysis of MS/MSD samples and detected concentrations of surrogate compounds were within the control limits generated by the laboratory except for:

- The MS and/or MSD associated with sample LP-B01-4 did not meet recovery criteria for m,p-xylenes. The reported result for m,p-xylenes in this sample should be considered an estimated value and was flagged accordingly with a "J" by the laboratory and in Table 2 (Appendix B);
- The MS and/or MSD associated with sample LP-B03-4 did not meet recovery or precision criteria for PCP. The reported result for PCP in this sample should be considered an estimated value and was flagged accordingly with a "J" by the laboratory and in Table 3 (Appendix B);
- The MS and/or MSD associated with sample LP-B03-W did not meet precision criteria for TPH-d or recovery criteria for BTEX. The reported results for TPH-d and BTEX in this sample should be considered estimated values and were flagged accordingly with a "J" by the laboratory and in Table 4 (Appendix B); and
- The surrogate spike associated with sample LP-SC101-0.5 did not meet recovery criteria for TPH-d and TPH-mo. The reported results for TPH-d and TPH-mo in this sample should be considered as estimated values and were flagged accordingly with a "J" by the laboratory and in Table 2 (Appendix B).

Results of the analysis of MS/MSD samples and of internal standards for all tested constituents are presented in the laboratory analytical reports provided on the data disc inside the back cover of this report.

4.3.5 Field Duplicates

As part of the E &E START data review, the analytical results for primary samples and their field duplicates were compared to determine if relative percent differences (RPDs) were within acceptable ranges as defined in the FSP (E & E 2014a). Concentrations of TPH-d, TPH-mo, arsenic, chromium, lead, nickel, and zinc were outside the acceptable RPD range of 35% between soil sample LP-B01-2 and its duplicate sample LP-B101-2. Concentrations of arsenic and lead were outside the acceptable RPD range of 35% between soil sample LP-SC01-0.5 and its duplicate sample LP-SC101-0.5. Concentrations of TPH-d and arsenic were outside the acceptable RPD range of 25% between groundwater sample LP-B01-W and its duplicate sample LP-B101-W. For primary and duplicate samples with COPC concentrations resulting in RPDs outside acceptable quality control limits, the associated reported concentrations were qualified as estimated (flagged with the letter "J").

Based on review of results of the Tier 1B validated data from the laboratories and quality control review of the data, the data for the Former LP Lumber Mill TBA are classified as acceptable for use with qualifications as identified in the laboratory analytical data Tables 2 through 5 (Appendix B).

5 Conclusions and Discussion

Based on review of current laboratory analytical results presented in this report and information presented in the E & E Phase I ESA (E & E 2014b) for the Former LP Mill property, E & E START provides the following conclusions.

Except for TPH-d and TPH-mo in near surface soil at boring LP-B01, TPH-d and TPH-mo in groundwater at boring LP-B01, and arsenic in the soil sample collected from boring B-02 at a depth of 6 feet, concentrations of all tested constituents (TPH-d, TPH-mo, TPH-g, arsenic, cadmium, chromium, lead, nickel, zinc, BTEX, and PCP) are below the project screening levels (or in the case of arsenic below a documented background level) in all samples collected from the borings. TPH was detected at concentrations that exceed screening levels only in the near surface soils, but at generally low concentrations at boring LP-B01. The presence of TPH in the groundwater sample collected from boring LP-B01 suggests that another source of groundwater contamination is present in the vicinity of that boring because contaminated soil is not in contact with groundwater and TPH is not present at high concentrations or volume in shallow soil that appears significant enough to leach to groundwater. The presence of arsenic only at a depth of 6 feet at boring LP-B02 does not appear likely to warrant further assessment unless soil at that depth in the vicinity of that boring is disturbed during redevelopment.

Except for arsenic detected at a concentration of 26 mg/kg in the stockpile composite sample LP-SPC04, concentrations of the COPCs were below project screening levels in all of the composite samples collected from wood waste stockpiles. The detected concentration of arsenic in sample LP-SPC04 only slightly exceeded the documented background concentration of 24 mg/kg (LBNL 2009). The material in wood waste stockpile 4 consists of gravel, cobbles, boulders and large pieces of bark. Due to the large size of most of the material in wood waste stockpile 4, only a small fraction was small enough to fit into a sample container for laboratory analysis. If the sample could have also included the gravel to cobble fraction and the coarse bark, arsenic results are likely to be considerably lower. The slight exceedance of the documented background level for arsenic in the small portion of wood waste stockpile material that is small enough for sampling does not appear to pose a significantly higher risk to the public than background conditions. Additional assessment of the wood waste stockpiles does not appear to be necessary.

Concentrations of one or more of TPH-d, TPH-mo, arsenic, and dioxins/furans were detected at concentrations above project screening levels in all of the composite soil samples collected from areas of former mill roads. Soil samples were collected at depths of 0.5 feet in areas of former mill roads because used oil and incinerator ash were historically spread on mill roads. Additional sampling will likely be necessary to assess the vertical extent of the detected COPCs in the areas of former mill roads particularly if soil in those areas will be disturbed during redevelopment.

6 Recommendations

Based on review of current and historical laboratory analytical results presented in this report and information presented in the E & E Phase I ESA (E & E 2014b) for the Former LP Lumber Mill property, E & E START provides the following recommendations:

- Soil and groundwater samples should be collected at step out borings from boring LP-B01 to investigate the potential for a source or secondary source of the TPH detected in groundwater at boring LP-B01 and to assess the extent of TPH detected in surface soil at boring LP-B01.
- Additional assessment of the wood waste stockpiles should not be necessary based on the absence of concentrations of the COPCs that exceed project screening levels or, in the case of arsenic, any significant exceedances of the documented background level. All of the material in the wood waste stockpiles should be re-used or recycled. If the materials in the wood waste stockpiles are not re-used or recycled, the stockpiles can be considered to be un-permitted landfills by the local RWQCB. As un-permitted landfills, the wood waste stockpiles may be subject to extensive assessment, permitting, and/or monitoring requirements for the site to achieve compliance with land disposal regulations.
- Additional composite soil samples should be collected in the areas of former mill roads to assess the vertical extent of TPH-d, TPH-mo, arsenic, and dioxins/furans where those constituents are present at concentrations that exceed project screening levels. In former mill road area LP-SC03, where the presence of dioxins/furans and arsenic is more likely to result in higher disposal costs, it may helpful to sub-divide the area into smaller sampling areas for further composite sampling to more precisely define the extent of contamination with the hope of reducing the area and volume of soil requiring cleanup.

7 Report References

California Department of Toxic Substance Control. 1990. "Preliminary Assessment/Site Inspection Report". December 14.

CH2M Hill. 1991. "Property Transfer Site Assessment, Louisiana-Pacific Corporation Crescent Mills Facility". May.

Ecology and Environment, Inc. 2010. draft "Generic Sampling and Analysis Plan for Targeted Brownfields Assessments". December 2010.

Ecology and Environment, Inc. 2014a. "Field Sampling Plan for Targeted Brownfields Assessment of Former Louisiana Pacific Lumber Mill." August.

Ecology and Environment, Inc. 2014b. "Phase I Environmental Site Assessment Report for Former Louisiana Pacific Lumber Mill." July.

Geocon. 2002. "Supplemental Site Investigation Report, Crescent Mills Mitigation Site, Former LP Facility." December.

LBNL. 2009. Analysis of Background Distributions of Metals in the Soil at the Lawrence Berkeley National Laboratory. April.

Resna. 1992. "Assessment of Soil and Groundwater Contamination, Sacramento Valley Moulding Facility". November 20.

San Francisco Bay Regional Water Quality Control Board. 2013. Summary Table A. Environmental Screening Levels (ESLs), Shallow Soil (≤3 m bgs), Groundwater is Current or Potential Source of Drinking Water. December.

United States Environmental Protection Agency. 2001. Draft EPA Region 9 Quality Assurance Office Guidance, Region 9 Superfund Data Evaluation/Validation Guidance. December.

United States Environmental Protection Agency. 2014. Regional Screening Level Summary Table. May.

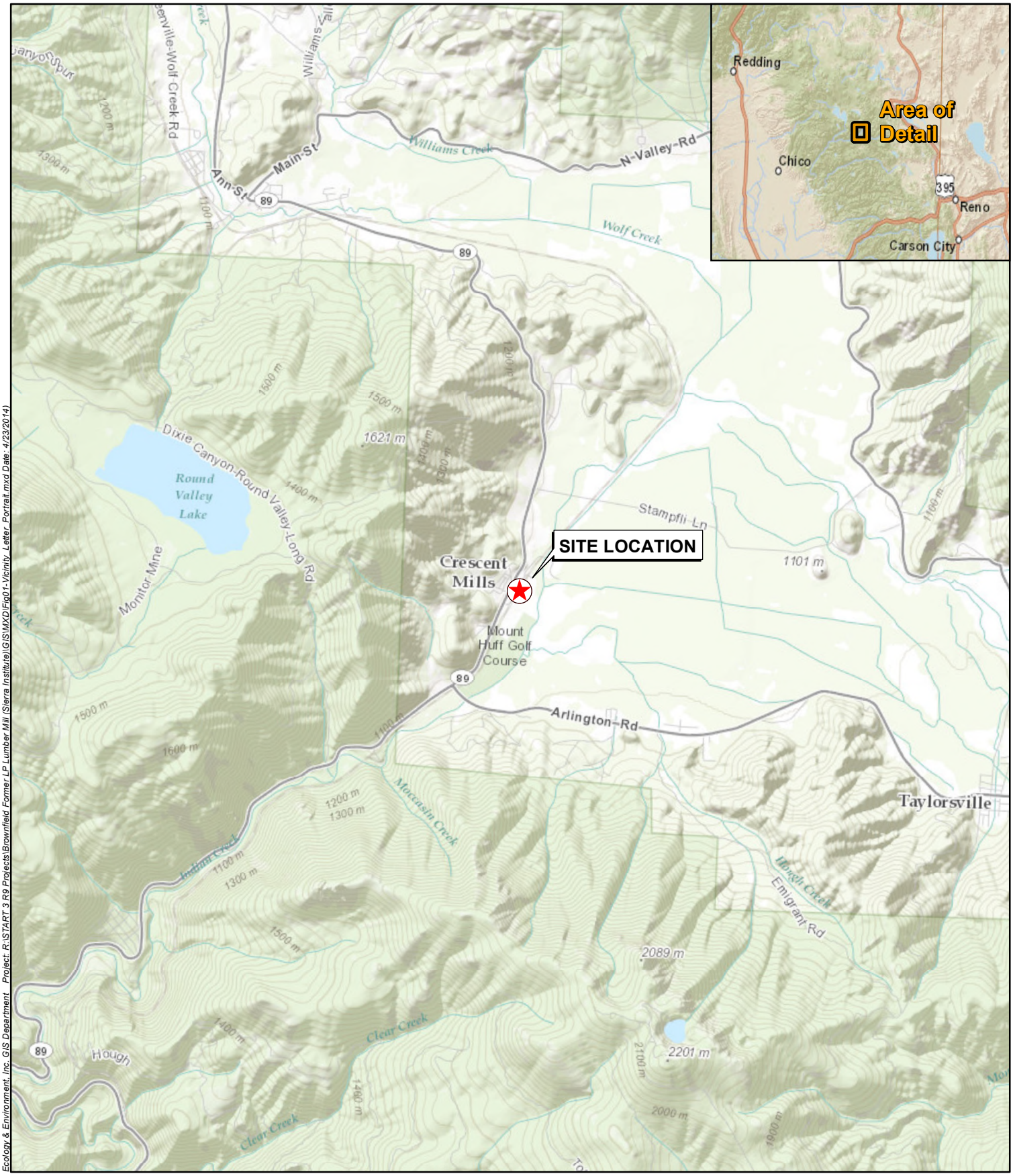
United States Geological Survey. 1994. Crescent Mills 7.5-Minute Quadrangle. 1994.

United States Geological Survey. 1908. Geology of the Taylorsville Region, California, Bulletin 353. 1908.

Appendix A Figures

Project # EE-002693-6035
TDD # TO6-09-14-02-0003

Basemap Source: ESRI World Topo Overview Basemap Source: ESRI World Street Map



Ecology & Environment, Inc. GIS Department Project: R:\START 3 R9 Projects\Brownfield Former LP Lumber Mill (Sierra Institute)\GIS\MXD\Fig01-Vicinity_Letter_Portrait.mxd Date: 4/23/2014

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Figure 1

Site Vicinity Map
Former LP Lumber Mill

15690 Highway 89, Crescent Mills, CA

N

0 1 2 Miles

Project # EE-002693-6035
TDD # TO6-09-14-02-0003

Basemap Source: ESRI World Imagery, Parcel Boundaries from Plumas County GIS Dept

Ecology & Environment, Inc. GIS Department Project: R:\START 3 R9 Projects\Brownfield\ Former LP Lumber Mill (Sierra Institute)\GIS\MXD\Fig02-Overview_Letter_Portrait.mxd Date: 4/23/2014

LEGEND

Site Boundary

Site Parcels (Labeled with Assessor's Parcel Number)

N

0 250 500 1,000 Feet

1 in = 500 feet

Figure 2

Site Overview Map

Former LP Lumber Mill

15690 Highway 89,
Crescent Mills, CA

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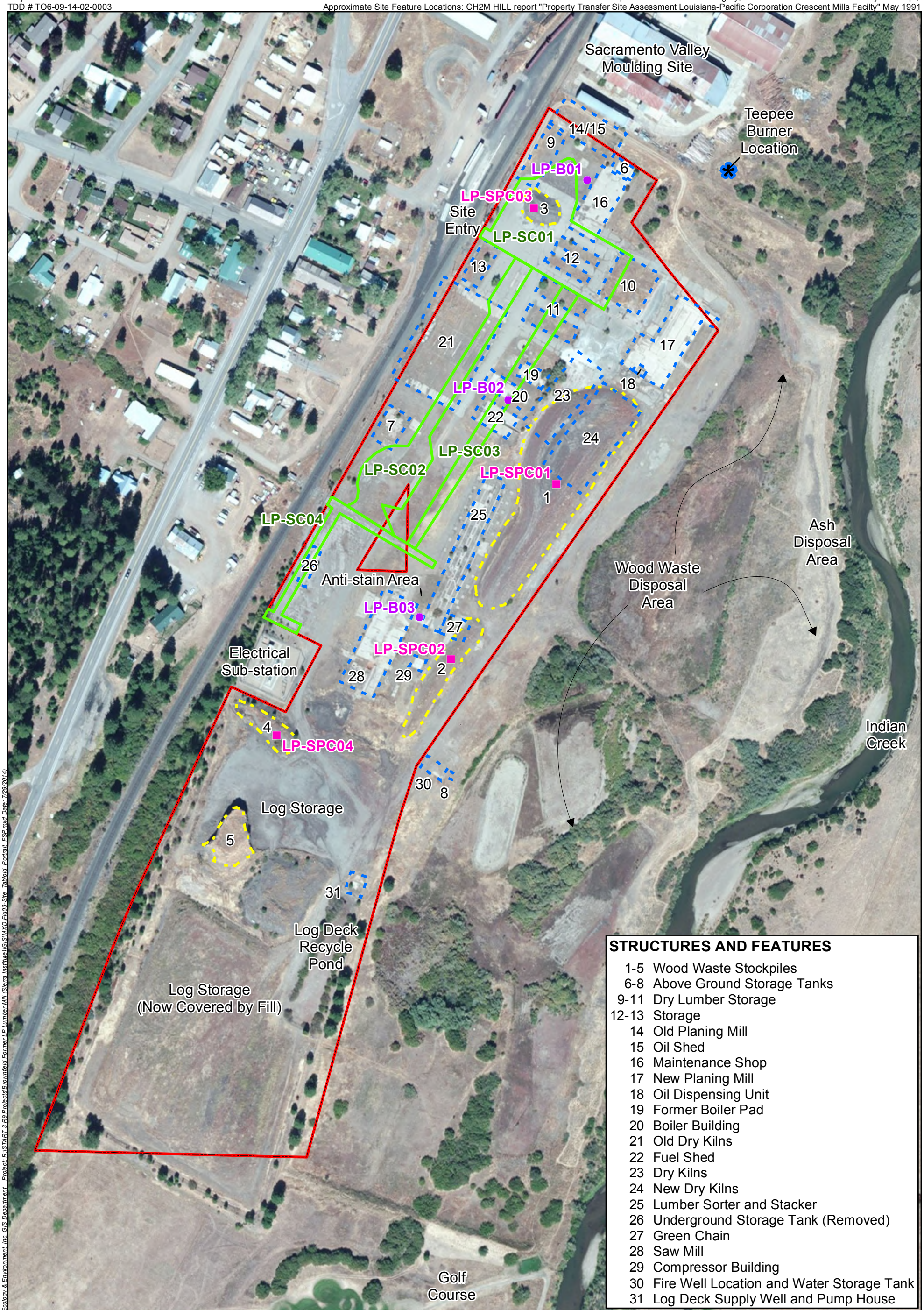
Project # EE-002693-6035
TDD # TO6-09-14-02-0003

Basemap Source: ESRI World Imagery, Parcel Boundaries: Plumas County GIS Dept,
Approximate Site Feature Locations: CH2M HILL report "Property Transfer Site Assessment Louisiana-Pacific Corporation Crescent Mills Facilty" May 1991



STRUCTURES AND FEATURES

1-5	Wood Waste Stockpiles
6-8	Above Ground Storage Tanks
9-11	Dry Lumber Storage
12-13	Storage
14	Old Planing Mill
15	Oil Shed
16	Maintenance Shop
17	New Planing Mill
18	Oil Dispensing Unit
19	Former Boiler Pad
20	Boiler Building
21	Old Dry Kilns
22	Fuel Shed
23	Dry Kilns
24	New Dry Kilns
25	Lumber Sorter and Stacker
26	Underground Storage Tank (Removed)
27	Green Chain
28	Saw Mill
29	Compressor Building
30	Fire Well Location and Water Storage Tank
31	Log Deck Supply Well and Pump House

LEGEND

- Boring Location
- Stockpile Sample Location
- Sampling Area Boundary for Former Mill Roads
- Approximate Location of Former Features
- Approximate Extent of Wood Waste Stockpiles
- Site Boundary

N

0 100 200 400 Feet

1 inch = 200 feet

Figure 3

Sample Locations
Former LP Lumber Mill
15690 Highway 89,
Crescent Mills, CA

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Ecology & Environment, Inc. GIS Department Project: R:\START 3 R9 Projects\Brownfield Former LP Lumber Mill (Sierra Institute)\GIS\MXD\Fig03-Site_Tabloid_Portrait_FSP.mxd Date: 7/29/2014

Appendix B Tables

Table 1
Soil Sampling Summary
Former Louisiana Pacific Lumber Mill
Targeted Brownfields Assessment
Crescent Mills, California

TDD: TO06 09-14-02-0003 1002693.6035

Sample ID	Sampling Depth in feet bgs
LP-B01-0.5	0.5
LP-B01-2	2.0
LP-B101-2	2.0
LP-B01-4	4.0
LP-B01-6	6.0
LP-B02-0.5	0.5
LP-B02-2	2.0
LP-B02-4	4.0
LP-B02-6	6.0
LP-B03-0.5	0.5
LP-B03-2	2.0
LP-B103-2	2.0
LP-B03-4	4.0
LP-B03-6	6.0
LP-SC01-0.5	0.5

Sample ID	Sampling Depth in feet bgs
LP-SC101-0.5	0.5
LP-SC02-0.5	0.5
LP-SC03-0.5	0.5
LP-SC04-0.5	0.5

Notes:
bgs - below ground surface

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Table 2
Soil Analytical Results for Petroleum Constituents
Former Louisiana Pacific Lumber Mill
Targeted Brownfields Assessment
Crescent Mills, California
(All concentrations are in mg/kg)

TDD: TO06 09-14-02-0003

1002693.6035

		TPH-d	TPH-mo	TPH-g	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene
Project Screening Level*		110	500	500	0.044	2.9	3.3	2.3	
Sample ID	Sample Date								
LP-B01-0.5	8/27/2014	170	1,200	NA	NA	NA	NA	NA	NA
		F13	F13						
LP-B01-2	8/27/2014	22	100	<3.8	<0.0028	<0.0028	<0.0028	<0.0056	<0.0028
		F13, J	F13, J	U	U	U	U	U	U
LP-B101-2	8/27/2014	91	490	<4.1	<0.0024	<0.0024	<0.0024	<0.0048	<0.0024
		F13, J	F13, J	U	U	U	U	U	U
LP-B01-4	8/27/2014	4.2	19	<2.5	<0.0025	<0.0025	<0.0025	<0.0051	<0.0025
		C1,F13,J	C1,F13,J	U	U	U	U	U,J,Q4	U
LP-B01-6	8/27/2014	<5.6	<22	<2.6	<0.0023	<0.0023	<0.0023	<0.0045	<0.0023
		U	U	U	U	U	U	U	U
LP-B02-0.5	8/27/2014	<5.3	<21	NA	NA	NA	NA	NA	NA
		U	U						
LP-B02-2	8/27/2014	<5.4	<22	<4.3	0.0039	0.0027	<0.0027	<0.0054	<0.0027
		U	U	U			U	U	U
LP-B02-4	8/27/2014	9	36	<3	<0.0024	<0.0024	<0.0024	<0.0047	<0.0024
		F13	F13	U	U	U	U	U	U
LP-B02-6	8/27/2014	11	54	<2.2	<0.0024	<0.0024	<0.0024	<0.0047	<0.0024
		F13	F13	U	U	U	U	U	U
LP-SC01-0.5	8/27/2014	640	2,700	NA	NA	NA	NA	NA	NA
		A3,F13,J	A3,F13,J						
LP-SC101-0.5	8/27/2014	650	2,500	NA	NA	NA	NA	NA	NA
		A3,F13,J,Q7	A3,F13,J,Q7						

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Table 2
Soil Analytical Results for Petroleum Constituents
Former Louisiana Pacific Lumber Mill
Targeted Brownfields Assessment
Crescent Mills, California
(All concentrations are in mg/kg)

TDD: TO06 09-14-02-0003 **1002693.6035**

		TPH-d	TPH-mo	TPH-g	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene
Project Screening Level*		**110**	**500**	**500**	**0.044**	**2.9**	**3.3**	**2.3**	
Sample ID	**Sample Date**								
LP-SC02-0.5	8/26/2014	62	460	NA	NA	NA	NA	NA	NA
		F13	F13						
LP-SC03-0.5	8/26/2014	66	**560**	NA	NA	NA	NA	NA	NA
		F13	F13						
LP-SC04-0.5	8/26/2014	**140**	**690**	NA	NA	NA	NA	NA	NA
		F13	F13						

Notes:
ESL - Environmental Screening Level, California State Water Resources Control Board, December 2013
for industrial/commercial land use where water is a potential drinking water source.
mg/kg - milligrams per kilogram
NA - Not analyzed
TPH-d - Total Petroleum Hydrocarbons as diesel
TPH-g - Total Petroleum Hydrocarbons as gasoline
TPH-mo - Total Petroleum Hydrocarbons as motor oil
Constituent detections above the project screening level are indicated in bold
* - Project screening levels are based on ESLs.

Laboratory Data Qualifiers:
A3 - The sample was prepped/analyzed past the recommended holding time.
J - The reported result for this analyte should be considered an estimated value.
C1 - The reported concentration for this analyte is below the quantitation limit.
Q4 - The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte.
Q7 - Surrogate spike recoveries for this sample were outside control limits.
U - The contaminant was not detected at the indicated laboratory reporting limit.

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Table 3
Soil Analytical Results for Metals, Pentachlorophenol, and Dioxins/Furans
Former Louisiana Pacific Lumber Mill
Targeted Brownfields Assessment
Crescent Mills, California
(All Concentrations in mg/kg except where noted)

TDD: TO06 09-14-02-0003 1002693.6035

		Arsenic	Cadmium	Chromium	Lead	Nickel	Zinc	PCP	Dioxins/ Furans (pg/g)**
Project Screening Levels*		5	7.5	280	320	150	600	4	18
Sample ID	Sample Date								
LP-B01-0.5	8/27/2014	23	0.39	40	52	20	150	NA	NA
			C1,J						
LP-B01-2	8/27/2014	9.9	<0.56	16	16	6.3	88	NA	NA
		J	U	J	J	J	J		
LP-B101-2	8/27/2014	56	0.61	8.4	74	17	180	NA	NA
		J		J	J	J	J		
LP-B01-4	8/27/2014	7	<0.55	21	8.2	6.9	61.0	NA	NA
			U						
LP-B01-6	8/27/2014	6.9	<0.57	17	5.8	6.1	43	NA	NA
			U						
LP-B02-0.5	8/27/2014	5.9	<0.53	9.1	5.4	7.1	64	NA	NA
			U						
LP-B02-2	8/27/2014	8.3	<0.54	40	3.7	18	45	NA	NA
			U		J				
LP-B02-4	8/27/2014	5.9	<0.51	45	8.2	34	56	NA	NA
			U						
LP-B02-6	8/27/2014	44	0.36	8.9	67	9.7	190	NA	NA
			C1,J		C1, J				
LP-B03-0.5	8/27/2014	NA	NA	NA	NA	NA	NA	<0.37	NA
								U	

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Table 3
Soil Analytical Results for Metals, Pentachlorophenol, and Dioxins/Furans
Former Louisiana Pacific Lumber Mill
Targeted Brownfields Assessment
Crescent Mills, California
(All Concentrations in mg/kg except where noted)

TDD: TO06 09-14-02-0003 1002693.6035

		Arsenic	Cadmium	Chromium	Lead	Nickel	Zinc	PCP	Dioxins/ Furans (pg/g)**
Project Screening Levels*		5	7.5	280	320	150	600	4	18
Sample ID	Sample Date								
LP-B03-2	8/27/2014	NA	NA	NA	NA	NA	NA	<0.37	NA
								U	
LP-B103-2	8/27/2014	NA	NA	NA	NA	NA	NA	<0.37	NA
								U	
LP-B03-4	8/27/2014	NA	NA	NA	NA	NA	NA	<0.38	NA
								J,Q4,Q6,U	
LP-B03-6	8/27/2014	NA	NA	NA	NA	NA	NA	<0.41	NA
								U	
LP-SC01-0.5	8/27/2014	15	NA	NA	15	NA	NA	NA	5.99
		J			J				J
LP-SC101-0.5	8/27/2014	25	NA	NA	35	NA	NA	NA	7.52
		J			J				J
LP-SC02-0.5	8/26/2014	65	NA	NA	26	NA	NA	NA	5.49
									J
LP-SC03-0.5	8/26/2014	130	NA	NA	11	NA	NA	NA	19.98
									J
LP-SC04-0.5	8/26/2014	6.9	NA	NA	7.3	NA	NA	NA	2.02
									J
LP-SPC01	8/26/2014	13	NA	NA	9.4	NA	NA	<1	9.88
								U	J
LP-SPC02	8/26/2014	18	NA	NA	13	NA	NA	<0.90	4.89
								U	J

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Table 3
Soil Analytical Results for Metals, Pentachlorophenol, and Dioxins/Furans
Former Louisiana Pacific Lumber Mill
Targeted Brownfields Assessment
Crescent Mills, California
(All Concentrations in mg/kg except where noted)

TDD: TO06 09-14-02-0003 1002693.6035

		Arsenic	Cadmium	Chromium	Lead	Nickel	Zinc	PCP	Dioxins/ Furans (pg/g)**
Project Screening Levels*		5	7.5	280	320	150	600	4	18
Sample ID	Sample Date								
LP-SPC03	8/26/2014	9.7	NA	NA	14	NA	NA	<1.3	6.85
								U	J
LP-SPC04	8/26/2014	26	NA	NA	29	NA	NA	<2.0	3.00
								U	J

Notes:
mg/kg - milligrams per kilogram
pg/g - picograms per gram
NA - not analyzed
ESL - Environmental Screening Level, California State Water Resources Control Board, December 2013 for industrial/commercial land use where groundwater is a potential drinking water source.
RSL - Regional Screening Level, United States Environmental Protection Agency, May 2014
CHHSL - California Human Health Screening Level, California Envronmental Protection Agency, September 23, 2010.
* - All screeening levels except for arsenic, chromium, cadmium, and pentachlorophenol are based on ESLs
The project screening level for arsenic is the laboratory reporting limit. The project screening level for cadmium is its CHHSL.
The project screening level for pentachlorphenol is its RSL. The project screening level for chromium is a withdrawn 2010 RSL.
** - Total dioxins/furans expressed as total toxicity equivalent to 2,3,7,8 tetrachlorodibenzo dioxin.

Laboratory Data Qualifiers:
C1- The reported concentration for this analyte is below the quantitation limit
Q4 - The matrix spike and/or matrix spike duplicate asociated with this sample did not meet recovery criteria for this analyte.
Q6 - The matrix spike/ matrix spike duplicate precision criteria were not met for this analyte.
J - The reported result for this analyte should be considered an estimated value.
U - The contaminant was not detected at the indicated laboratory reporting limit.

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Table 4
Water Analytical Results for Petroleum Constituents
Former Louisiana Pacific Lumber Mill
Targeted Brownfields Assessment
Crescent Mills, California
(All concentrations are in µg/L)

TDD: TQ06 09-14-02-0003 1002693.6035

		TPH-d	TPH-mo	TPH-g	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene
Project Screening Level*		250	1000	100	1	40	30	20	
Sample ID	Sample Date								
LP-B01-W	8/27/2014	400	1,200	<50	<0.5	<0.5	<0.5	<1	<0.5
		B1,F13,J	F13	U	U	U	U	U	U
LP-B101-W	8/27/2014	150	<1000	<50	<0.5	<0.5	<0.5	<1	<0.5
		B1,C1,J	U	U	U	U	U	U	U
LP-B03-W	8/27/2014	<250	<1000	<50	<0.5	<0.5	<0.5	<1	<0.5
		J,Q6,U	U	U	J,Q4,U	J,Q4,U	J,Q4,U	J,Q4,U	J,Q4,U
LP-B103-W	8/27/2014	NA	NA	NA	NA	NA	NA	NA	NA
LP-082614-RB	8/26/2014	200	<1000	NA	NA	NA	NA	NA	NA
		B1,C1,F6,J	U						
LP-082714-RB	8/27/2014	190	<1000	<50	<0.5	<0.5	<0.5	<1	<0.5
		B1,C1,F6,J	U	U	U	U	U	U	U

Notes:
ESL - Environmental Screening Level, California State Water Resources Control Board, December 2013
for industrial/commercial land use where water is a potential drinking water source.
µg/L - micrograms per liter
NA - Not analyzed
TPH-d - Total Petroleum Hydrocarbons as diesel
TPH-g - Total Petroleum Hydrocarbons as gasoline
TPH-mo - Total Petroleum Hydrocarbons as motor oil
Constituent detections above the project screening level are indicated in bold
* - Except for TPH-d and TPH-mo, project screening levels are based on ESLs.
The project screening levels for TPH-d and TPH-mo are their laboratory reporting limits.

Laboratory Data Qualifiers:
B1 - The concentration of this analyte in the sample is less than five times the concentration found in the associated method blank.
C1 - The reported concentration for this analyte is below the quantitation limit.
F6 - Product type: hydraulic fluid
F13 - Fuel or product type mixed or unknown
J - The reported result for this analyte should be considered an estimated value.
Q4 - The matrix spike and/or matrix spike duplicate asociated with this sample did not meet recovery criteria for this analyte.
Q6 - The matrix spike/ matrix spike duplicate precision criteria were not met for this analyte.
U - The contaminant was not detected at the indicated laboratory reporting limit.

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Table 5
Water Analytical Results for Metals, Pentachlorophenol, and Dioxins/Furans
Former Louisiana Pacific Lumber Mill
Targeted Brownfields Assessment
Crescent Mills, California
(All Concentrations in µg/L)

TDD: TO06 09-14-02-0003 1002693.6035

		Arsenic	Cadmium	Chromium	Lead	Nickel	Zinc	PCP	Dioxins/Furans
Project Screening Levels**		***	10*	50	10*	40*	81	10*	***
Sample ID	Sample Date								
LP-B01-W	8/27/2014	<20	<5	<10	<20	<10	<10	NA	NA
		U	U	U	U	U	U		
LP-B101-W	8/27/2014	<20	<5	<10	<20	<10	<10	NA	NA
		U	U	U	U	U	U		
LP-B03-W	8/27/2014	<20	<5	<10	<20	<10	<10	<10	NA
		U	U	U	U	U	U	J,Q4,Q6,U	
LP-B103-W	8/27/2014	NA	NA	NA	NA	NA	NA	<6.6	NA
								U	
LP-082614-RB	8/26/2014	<20	NA	NA	<20	NA	NA	<5	All ND
		U						U	U
LP-082714-RB	8/27/2014	<20	<5	<10	<20	<10	<10	<4.8	All ND
		U	U	U	U	U	U	U	U

Notes:
µg/L - micrograms per liter
NA - not analyzed
All ND - None of the dioxin/furan compounds were detected at individual reporting limits ranging from 10 to 100 picograms per liter.
ESL - Environmental Screening Level, California State Water Resources Control Board, December 2013 for industrial/commercial land use where groundwater is a potential drinking water source.
* - The screening level was set at the available laboratory reporting limit.
** - Screeening levels for chromium and zinc are based on ESLs.
*** - No screening level was established because no groundwater samples were proposed to be analyzed for arsenic or dioxins/furans in the field sampling plan. The laboratory analyzed groundwater and rinse blank samples for arsenic.

Laboratory Data Qualifiers:
J - The reported result for this analyte should be considered an estimated value.
Q4 - The matrix spike and/or matrix spike duplicate asociated with this sample did not meet recovery criteria for this analyte.
Q6 - The matrix spike/ matrix spike duplicate precision criteria were not met for this analyte.
U - The contaminant was not detected at the indicated laboratory reporting limit.

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Appendix C Boring Logs

E&E Overburden Borehole Logging Form

Location: LP- B01

Client: U.S. EPA
Project: Former LP Lumber Mill
Site/Area: 15690 Highway 89, Crescent Mills, CA
Project No. 1002693.6035
Geologist: Craig Tibalti
Signature:

Date: 8/27/2014
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Direct Push
Drill Bit - Type/Size: Macro Core
Sample Method:

Start Time: 08:30
Top Depth: 0 Ft.
Bottom Depth: 15 Ft.
Finish Time: 09:15

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Dark Grayish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 30 % ___ ANG (SUB) RND NA
SND: 30 % ___ ANG SUB (RND) NA
SLT: 30 %
CLY: 10 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: (WEL) MOD POR NA
Plasticity: (NON) LOW MED HGH NA
Moisture: (DRY) MST WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: SHP GRD DIF SME (NA)
Silty, sandy, clayey GRAVEL fill.

3.0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Dark Reddish Brown
Coloration: UNI MTO VAR STN
Texture: GVL: 10 % ___ ANG (SUB) RND NA
SND: 30 % ___ ANG SUB (RND) NA
SLT: 50 %
CLY: 10 %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:
25% sand, 60% silt, and 5% clay.

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: NON (LOW) MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: NON (SLT) MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA
Sandy, gravelly, clayey SILT. Grades 10-12 feet

12.0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 40 % ___ (ANG) SUB RND NA
SND: 20 % ___ ANG SUB (RND) NA
SLT: 30 %
CLY: 10 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: (WEL) MOD POR NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY MST WET (SAT) NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA
Silty, sandy, clayey, saturated GRAVEL.

13.0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 10 % ___ (ANG) SUB RND NA
SND: 20 % ___ ANG SUB (RND) NA
SLT: 60 %
CLY: 10 %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type:_____ Reading _____
Intrument #2: Type:_____ Reading _____
Sorting: WEL MOD POR (NA)
Plasticity: NON (LOW) MED HGH NA
Moisture: DRY MST (WET) SAT NA
Cementation: NON (SLT) MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA
Sandy, gravelly, clayey, wet SILT. Bottom of Boring 15 feet.

15.0 FT BGS

E&E Overburden Borehole Logging Form

Location: LP- B02

Client: U.S. EPA
Project: Former LP Lumber Mill
Site/Area: 15690 Highway 89, Crescent Mills, CA
Project No. 1002693.6035
Geologist: Craig Tiballi
Signature:

Date: 8/27/2014
Page: 1 of 1
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Direct Push
Drill Bit - Type/Size: Macro Core
Sample Method:

Start Time: 11:00
Top Depth: 0 Ft.
Bottom Depth: 8 Ft.
Finish Time: 11:45

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Dark Grayish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 30 % ___ ANG (SUB) RND NA
SND: 30 % ___ ANG SUB (RND) NA
SLT: 30 %
CLY: 10 %
ORG: ___ %
USCS SYM: GM
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: (WEL) MOD POR NA
Plasticity: (NON) LOW MED HGH NA
Moisture: (DRY) MST WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA
Silty, sandy, clayey GRAVEL fill.

4.0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Grayish and Reddish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 25 % ___ ANG (SUB) RND NA
SND: 30 % ___ ANG SUB (RND) NA
SLT: 35 %
CLY: 10 %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: WEL MOD POR (NA)
Plasticity: NON (LOW) MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: NON (SLT) MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA
Sandy, gravelly, clayey SILT.

6.0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Dark Grayish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 5 % ___ ANG (SUB) RND NA
SND: 10 % ___ ANG SUB (RND) NA
SLT: 70 %
CLY: 15 %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: WEL MOD POR (NA)
Plasticity: NON (LOW) MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: NON (SLT) MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA
Sandy, clayey, SILT with some gravel. Bottom of Boring 8.0 feet.

8.0 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA:
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

E&E Overburden Borehole Logging Form

Location: LP- B03

Client: U.S. EPA
Project: Former LP Lumber Mill
Site/Area: 15690 Highway 89, Crescent Mills, CA
Project No. 1002693.6035
Geologist: Craig Tiballi
Signature:

Date: 8/27/2014
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Direct Push
Drill Bit - Type/Size: Macro Core
Sample Method:

Start Time: 12:45
Top Depth: 0 Ft.
Bottom Depth: 16 Ft.
Finish Time: 14:00

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

0 FT BGS

Material: Natural (Fill) Uncertain
Color: (MUN) GSA: Dark Green
Coloration: UNI MTD VAR STN
Texture: GVL: 30 % ___ ANG (SUB) RND NA
SND: 25 % ___ ANG SUB (RND) NA
SLT: 30 %
CLY: 15 % USCS SYM: GM
ORG: ___ %
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: (WEL) MOD POR NA
Plasticity: (NON) LOW MED HGH NA
Moisture: (DRY) MST WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: (NOC) / COH
Upper Contact: SHP GRD DIF SME (NA)
Silty, sandy, clayey GRAVEL fill.

3.0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Dark Grayish Green
Coloration: UNI MTD VAR STN
Texture: GVL: 25 % ___ (ANG) SUB RND NA
SND: 20 % ___ ANG (SUB) (RND) NA
SLT: 35 %
CLY: 20 % USCS SYM: ML
ORG: ___ %
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: NON (SLT) MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA
Sandy, gravelly, clayey SILT.

7.0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Dark Grayish Green
Coloration: UNI MTD VAR STN
Texture: GVL: 5 % ___ ANG (SUB) RND NA
SND: 20 % ___ ANG (SUB) RND NA
SLT: 60 %
CLY: 15 % USCS SYM: ML
ORG: ___ %
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: WEL (MOD) POR NA
Plasticity: NON (LOW) MED HGH NA
Moisture: DRY (MST) WET SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA
Sandy, clayey SILT with some gravel.

11.0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 35 % ___ (ANG) SUB RND NA
SND: 30 % ___ ANG (SUB) (RND) NA
SLT: 30 %
CLY: 5 % USCS SYM: GM
ORG: ___ %
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: (WEL) MOD POR NA
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY MST WET (SAT) NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA
Silty, sandy saturated GRAVEL with some clay.

13.0 FT BGS

E&E Overburden Borehole Logging Form

Location: LP- B03

Client: U.S. EPA
Project: Former LP Lumber Mill
Site/Area: 15690 Highway 89, Crescent Mills, CA
Project No. 1002693.6035
Geologist: Craig Tiballi
Signature:

Date: 8/27/2014
Drilling Company: E & E
Operator(s): P. Jones
Rig/Type: Direct Push
Drill Bit - Type/Size: Macro Core
Sample Method:

Start Time: 12:45
Top Depth: 0 Ft.
Bottom Depth: 16 Ft.
Finish Time: 14:00

Analyses	Recovery (ft)	Sample ID	Interval	Type

GRAPHIC LOG

13.0 FT BGS

Material: (Natural) Fill Uncertain
Color: (MUN) GSA: Reddish Brown
Coloration: UNI MTD VAR STN
Texture: GVL: 15 % ___ ANG (SUB) RND NA
SND: 20 % ___ ANG SUB (RND) NA
SLT: 45 %
CLY: 20 %
ORG: ___ %
USCS SYM: ML
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: WEL MOD POR (NA)
Plasticity: (NON) LOW MED HGH NA
Moisture: DRY MST (WET) SAT NA
Cementation: (NON) SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

Sandy, clayey, gravelly wet SILT. Bottom of Boring 16 feet.

16.0 FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA: Dark Grayish Green
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA: Dark Grayish Green
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Material: Natural Fill Uncertain
Color: (MUN) GSA: Dark Grayish Green
Coloration: UNI MTD VAR STN
Texture: GVL: ___ % ___ ANG SUB RND NA
SND: ___ % ___ ANG SUB RND NA
SLT: ___ %
CLY: ___ %
ORG: ___ %
USCS SYM:
Observed: STN SHN ODR PRD NA Other:

Intrument #1: Type: ___ Reading ___
Intrument #2: Type: ___ Reading ___
Sorting: WEL MOD POR NA
Plasticity: NON LOW MED HGH NA
Moisture: DRY MST WET SAT NA
Cementation: NON SLT MOD WEL NA
Strength: NOC / COH
Upper Contact: SHP GRD DIF SME NA

FT BGS

Appendix D Photographs

ECOLOGY AND ENVIRONMENT, INC.
Superfund Technical Assessment and Response Team
Targeted Brownfields Assessment, Former LP Lumber Mill
Crescent Mills, Plumas County, California

E&E Project. No.: 1002693.6035 TDD No: TO06 09-14-02-0003

PHOTO 1

Date: 8/27/14

Direction: West

Photographer: C. Sullivan

Description: Collecting composite component sample in the LP-SC04 sampling area.

PHOTO 2

Date: 8/27/14

Direction: North

Photographer: C. Sullivan

Description: Decontamination of drill tools in the southern portion of sampling area LP-SC02.

PHOTO 3

Date: 8/27/14

Direction: West Southwest

Photographer: C. Sullivan

Description: Collecting composite component sample in the LP-SC02 sampling area.

PHOTO 4

Date: 8/27/14

Direction: Southeast

Photographer: C. Sullivan

Description: Collecting groundwater samples at sample location LP-B01.

PHOTO 5

Date: 8/27/14

Direction: South Southeast

Photographer: C. Sullivan

Description: Collecting soil samples at boring location LP-B02.

PHOTO 6

Date: 8/27/14

Direction: South Southwest

Photographer: C. Sullivan

Description: Collecting composite component sample in the LP-SC02 sampling area.