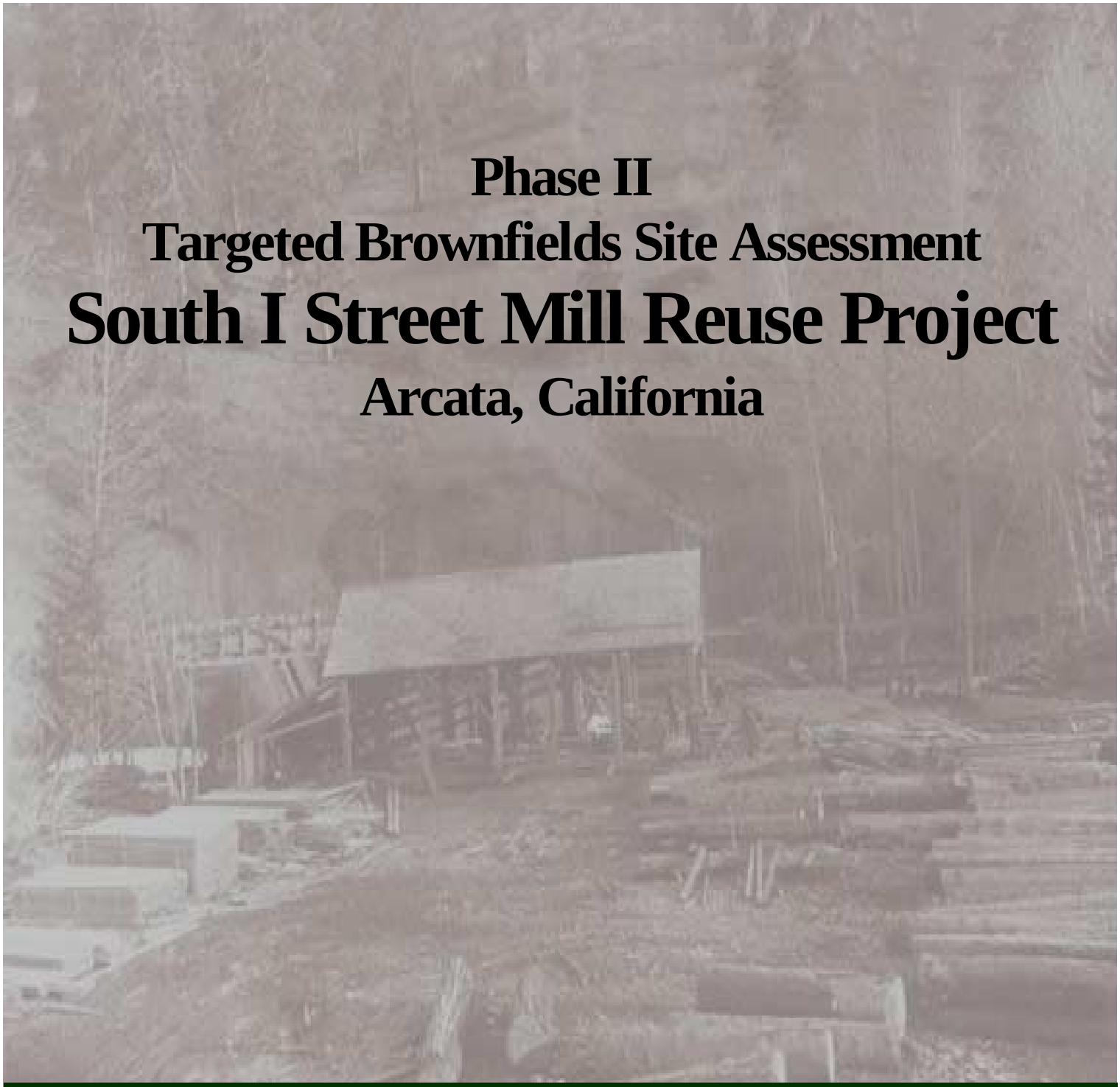
Phase II
Targeted Brownfields Site Assessment
South I Street Mill Reuse Project
Arcata, California



Prepared For:

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Prepared By:

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Final Report
June 2003

South I Street Mill Reuse Project
Arcata, California
Targeted Brownfields Site Assessment
Phase II Investigation
Final Report

USACE Contract Number: DACA45-98-D-0004, Task Order 515
Work Order Number: 20074.515.059

June 2003

Prepared for:
U.S. Environmental Protection Agency
Region 9
Prepared by:
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Weston Solutions, Inc.

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LIST OF ACRONYMS

ACDA	Arcata Community Development Agency
ACM	Asbestos Containing Material
AOC	Analyte of Concern
AST	aboveground storage tank
bgs	below ground surface
b-BHC	beta-benzene hexachloride
CLP	Contract Laboratory Program
CRQL	Contract Required Quantitation Limit
GPS	Global Positioning Survey
HCDEH	Humbolt County Department of Environmental Health
JIMC	Johnson Industries Manufacturing Complex
LLI	Little Lake Industries
mg/kg	milligrams per kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NCRWQCB	North Coast Regional Water Quality Control Board
PAH	Polyaromatic Hydrocarbons
PCP	Pentachlorophenol
PCBs	Polychlorinated Biphenyls
PRG	Preliminary Remediation Goal
SAP	Sampling and Analysis Plan
SISMRP	South I Street Mill Reuse Project
SSL	Soil Screening Level
SVOCs	Semi-volatile Organic Compound
TBA	Targeted Brownfields Assessment
TBSA	Targeted Brownfields Site Assessment
TPH-g	Total Petroleum Hydrocarbons as gasoline
TPH-d,o	Total Petroleum Hydrocarbons as diesel and motor oil
µg/L	micrograms per liter
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	volatile organic compound
y^3	cubic yards

SECTION 1

INTRODUCTION

The U.S. Environmental Protection Agency (USEPA), Region 9, in coordination with the US Army Corps of Engineers (USACE), tasked Weston Solutions, Inc. (WESTON) to conduct a Targeted Brownfields Site Assessment (TBSA), Phase II Investigation of the South I Street Mill Reuse Project (SISMRP) site, located in Arcata, Humboldt County, California. The USEPA Region 9 TBSAs are intended to characterize conditions at Brownfields sites being considered for redevelopment or reuse. This TBSA is being performed in response to an application submitted by the Arcata Community Development Agency (ACDA), which is the current owner of the site. At the time of this TBSA the final use of the site is still undetermined, but the ACDA tentatively plans to re-develop the site as a mixed industrial and residential area with adjacent marshland.

The objectives of the this Phase II Investigation are:

1. to determine whether soil and groundwater at the site have been impacted by analytes of concern (AOCs) from historic site uses,

2. to assess the vertical extent of contamination, if present,

3. to conduct disposal characterization of kiln-sealed cement bricks and pipe insulation located at the site, and

4. to determine if the soil/rock stockpiles located on the site can be reused as construction fill.

This final report summarizes the field activities conducted by WESTON on December 16th through December 20th, 2002 and presents the results from the sampling event.

SECTION 2

BACKGROUND

2.1 Location and Description

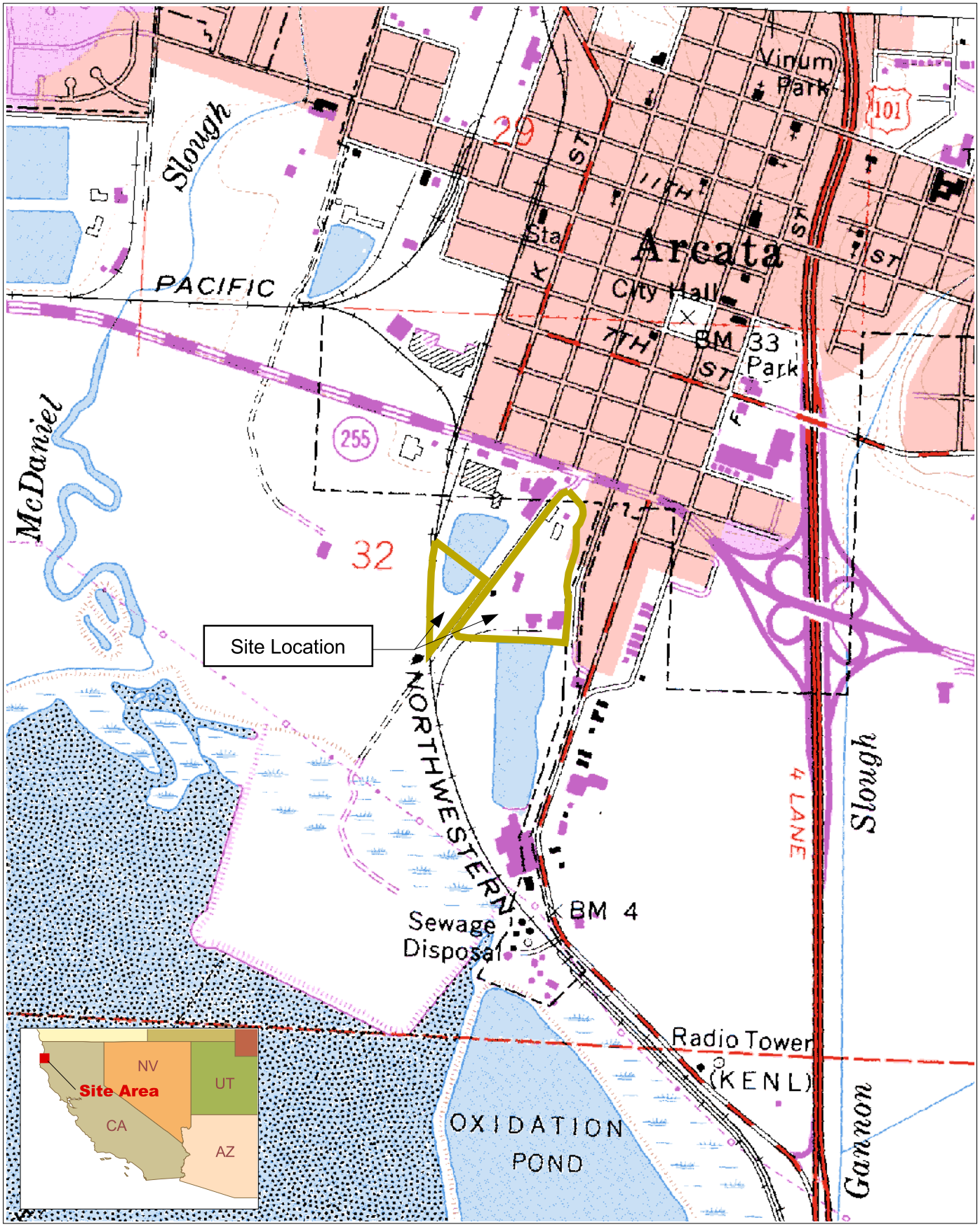
As shown in Figure 2-1, the SISMRP site is composed of two adjacent areas located on the eastern and western portions of South I Street near its intersection with Somoa Boulevard in Arcata, Humbolt County, California. The eastern portion of the site (the Little Lake Industries [LLI] Property) occupies approximately 12 acres and is bounded by an Enterprise Rental Car Building to the north, Jolly Giant Creek to the east, South I Street to the west, and Butcher's Slough to the south. The western portion of the site (the Johnson Tract) occupies approximately 3 acres and is bounded by the Johnson Industries Manufacturing Complex (JIMC) to the north, by Northwestern Pacific Railroad tracks to the west and south, and by South I Street to the east.

The LLI Property is the site of a former lumber remanufacturing mill. The property is dissected by several concrete and dirt roads. In the center of LLI Property lies the foundation of a remanufacturing complex and sorting building, which was the largest structure on the site. Three drains originate in the center of the remanufacturing complex and discharge out of the northern and southern ends of the concrete foundation. Approximately 100 feet to the north of the remanufacturing complex is the area of a historic teepee burner.

The only structures still standing on the LLI Property are a boiler building and a kiln structure, located in the northwestern portion of the property. A boiler water well exists inside the boiler building as does a 3-inch diameter pipe that runs out of the well, through the boiler building, and discharges above the LLI Property's shared boundary with South I Street. Additionally, a 10-inch diameter insulated pipe runs out of a large boiler to the kilns. North of the boiler building is a concrete pad formerly used for an aboveground storage tank (AST). East of the kilns and boiler building are the foundations for the former drying shed and the former maintenance shed. A leach field exists in the vicinity of an office foundation by the gate entering LLI Property along South I Street.

At the time of production of this report, three large soil/rock stockpiles were staged on the remanufacturing complex, maintenance shed, and drying shed foundations. Three other smaller soil/rock stockpiles, ranging from 400 y^3 to 1200 y^3, were located on the eastern perimeter of the site along Jolly Giant Creek. One small soil/rock stockpile, approximately 400 y^3, was staged immediately north of the remanufacturing complex. All the stockpiles were covered with 5 millimeter plastic sheeting to prevent contact with rainwater. The stockpiles are from the recent re-contouring of the Butcher Slough corridor.

The Johnson Tract is covered with thick vegetation and crossed by several footpaths originating on South I Street and terminating at various transient encampments and illegal dump areas. During a survey of the Johnson Tract, WESTON observed several areas of scrap metal and concrete dumping along the shared fence line between the JIMC and the Tract. WESTON also observed several areas of stressed vegetation that may be historic burn areas.



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles: Arcata South, CA, 1959, photorevised 1972.

DATE: 11/07/02

Scale in Feet

0 500 1000

N W E S

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Figure 2-1
Site Location Map
South I Street Mill Reuse Project
Arcata, CA

2.2 Operational History

The following is an abbreviated site operational history. A more detailed account is contained in the Phase I Targeted Brownfields Assessment (TBA) (ITSI 2002). The LLI Property was historically agricultural land prior to the 1940s and was used to grow and mill barley. In 1947, Tacoma Lumber Sales bought the parcels comprising the LLI Property and began lumber remanufacturing operations. Operations included lumber milling, drying, burning, and storage. Over the next 40 years, the LLI Property changed ownership several times, but site operations remained the same. As part of operations hazardous materials such as fuels, oils, paint, paint thinners, lacquer, varnish, and insecticides were used on site and predominately stored in the maintenance shed. Forklift maintenance was conducted in the drying shed as was waste oil storage. Additionally, prior to 1979, waste oil was sprayed on the dirt roads for dust control.

A teepee burner was operated on site between 1948 and 1970 to burn wood debris and no details are known about the disposal of the fly ash. In March 1973, a fire destroyed the central remanufacturing building. The Phase I TBA concluded that there were possibly polychlorinated biphenyl (PCB)-containing transformers, as well as petroleum containing machinery, in the building when it burned down. Although lumber staining was reportedly not conducted at the site, an accidental spill of iron oxide pigment was discovered in 1989 in an area south of the remanufacturing complex. The spill is believed to be from a drum stored on the property. A natural gas powered boiler provided heat to the kiln structures for wood drying. Boiler water chemicals were routinely stored and used in the boiler building. In 1988, remanufacturing operations ceased under the ownership of LLI, who maintained ownership until 1990. Beaver Lumber of Arcata purchased the property in 1990, but never reactivated it.

A clandestine drug laboratory was discovered in 2000 at a trailer located in the vicinity of the office building which had a septic system that fed into a leach field. Hazardous material removed from the laboratory included: muriatic acid, iodine, phosphorus, denatured alcohol and caustic soda. The Phase I TBA concluded that hazardous materials may have been disposed of into the leach field from the drug laboratory. In 2001, the ACDA purchased the site from Beaver Lumber of Arcata. In 2002, the majority of the existing dilapidated structures from site operations were demolished due to public health concerns. Also in 2002, the City of Arcata begin the re-contouring of the Butcher Slough corridor across the southern portion of the property. Currently, the site is abandoned and is owned by the ACDA.

Prior to 1951, the Johnson Tract was also used as agricultural land. In 1951, the Arcata Plywood Corporation purchased the land and began lumber remanufacturing operations. The majority of the operations were conducted north of the Johnson Tract; however, a log pond was constructed within the current site boundary. The log pond was abandoned between 1974 and 1981 and allowed to re-vegetate. A composting business was operated on the Johnson Tract during the 1990s. In 2002, the ACDA purchased the Johnson Tract from Ms. Kay Johnson who had owned the land since 1978. The ACDA is current owner of the property.

2.3 Previous Investigations and Regulatory Involvement

In 1987, an Underground Storage Tank (UST) removal was conducted at the LLI Property. The Humbolt County Department of Environmental Health (HCDEH) site record documents the removal of three USTs from the site, but conflicting accounts of the removal suggest that perhaps two USTs and a gasoline AST may have been removed. Analytical results from the 1987 UST removal documented total petroleum hydrocarbons as diesel (TPH-d) up to 130 milligrams per kilogram (mg/kg) in soil. TPH-d were not detected in groundwater.

In 1990, LLI re-excavated the UST location and collected soil and groundwater samples. Analytical results documented TPH-d up to 1,200 mg/kg in soil and up to 130 micrograms per liter (µg/L) in groundwater. The North Coast Regional Water Quality Control Board (NCRWQCB) ordered removal of approximately 200 y^3 of soil. The removed soil was stockpiled on the site.

In 1991, the NCRWQCB ordered LLI to conduct an additional subsurface soil and groundwater investigation in the area of the UST removal. The investigation documented TPH-d in soil up to 43 mg/kg and in groundwater up to 140 µg/L. Analytical results from the soil stockpile indicated TPH-d up to 2,000 mg/kg.

In 1992, LLI declared bankruptcy and the investigation was abandoned. In 1998, the investigation was re-initiated as part of the sale of the property to the ACDA and the HCDEH assumed regulatory oversight of the property. Further sampling and analysis was performed at the site, documenting a maximum TPH-d concentration in the soil stockpile of 350 mg/kg. TPH-d was not detected in the groundwater. A report submitted by the consulting firm Winzler & Kelly in 1998 concluded that over-excavation of the soils from the UST pit had removed the source of groundwater contamination and recommended cleanup closure. The HCDEH issued closure for the UST cleanup on March 8, 2000.

Public records document several hazardous materials disposal and management violations by the JIMC in the vicinity of the shared property line with Johnson Tract during the 1990s. Hazardous materials violations issued to the JIMC included illegal disposal of oily absorbents, lead batteries, and miscellaneous zinc containing wastes.

Three Phase I investigations have been conducted on the LLI Property. The first Phase I investigation was conducted in 1989. The second Phase I investigation was conducted by Winzler and Kelly for the ACDA in 1998 and included only changes that occurred on the site between 1989 and 1998. The third Phase I investigation, conducted in 2002 by Innovative Technical Solutions, Inc., was the Phase I TBA mentioned previously in this report. The Phase I TBA encompasses all the recommendations from the previous two Phase I investigations. The 2002 Phase I investigation also included the Johnson Tract.

2.4 Geological Information

The topography of the site is relatively flat with an average elevation of approximately 20 feet above mean sea level. The LLI Property is graded to drain surface water runoff to the east and south into Jolly Giant Creek and Butcher's Slough. The Johnson Tract is graded to drain surface water primarily to a drainage channel that borders its western boundary.

Several previous site investigations have characterized the soils on the LLI Property as silty gravel, grading with depth to fine sandy silt. The surface soils are primarily river-run gravel fill with documented high concentrations of organic matter primarily as wood debris. In this site investigation, WESTON noted that the river-run fill was highly compacted and contained predominately ½ to 1½ -inch rock. The fill interfaced with native bay mud at approximately 3-feet below ground surface (bgs). Varying amounts of organic matter were noted in several sample locations on the LLI Property. The soils on the Johnson Tract are similar to those on the LLI Property and composed of river-run gravel fill interspersed with high concentrations of organic matter.

The depth to groundwater on the site varies. Groundwater has been reported as deep as 36-inches bgs during the summer and at the surface during the winter. During this investigation, groundwater was encountered at 12 to 18-inches bgs. The groundwater gradient was determined to be non-distinct in previous investigations due to tidal influence. Previous efforts to determine groundwater flow during the UST investigation documented groundwater flowing to the east-southeast and then to the northeast the following month. WESTON did not measure the groundwater gradient during this event.

SECTION 3

ASSESSMENT ACTIVITIES

On December 16 through December 20, 2002, WESTON collected samples from 29 soil, seven groundwater, and five building material locations to evaluate environmental concerns on the SISMRP site. Sampling was conducted in accordance with the SISMRP Sampling and Analysis Plan (SAP) (WESTON 2002) which was approved by the USEPA Quality Assurance Office on December 11, 2002. An outline of sampling activities is presented below. A more detailed account of sample procedures and locations is found in the SISMRP SAP and the Amendments to the SISMRP SAP contained in Appendix C of this report.

3.1 Soil Sampling Activities

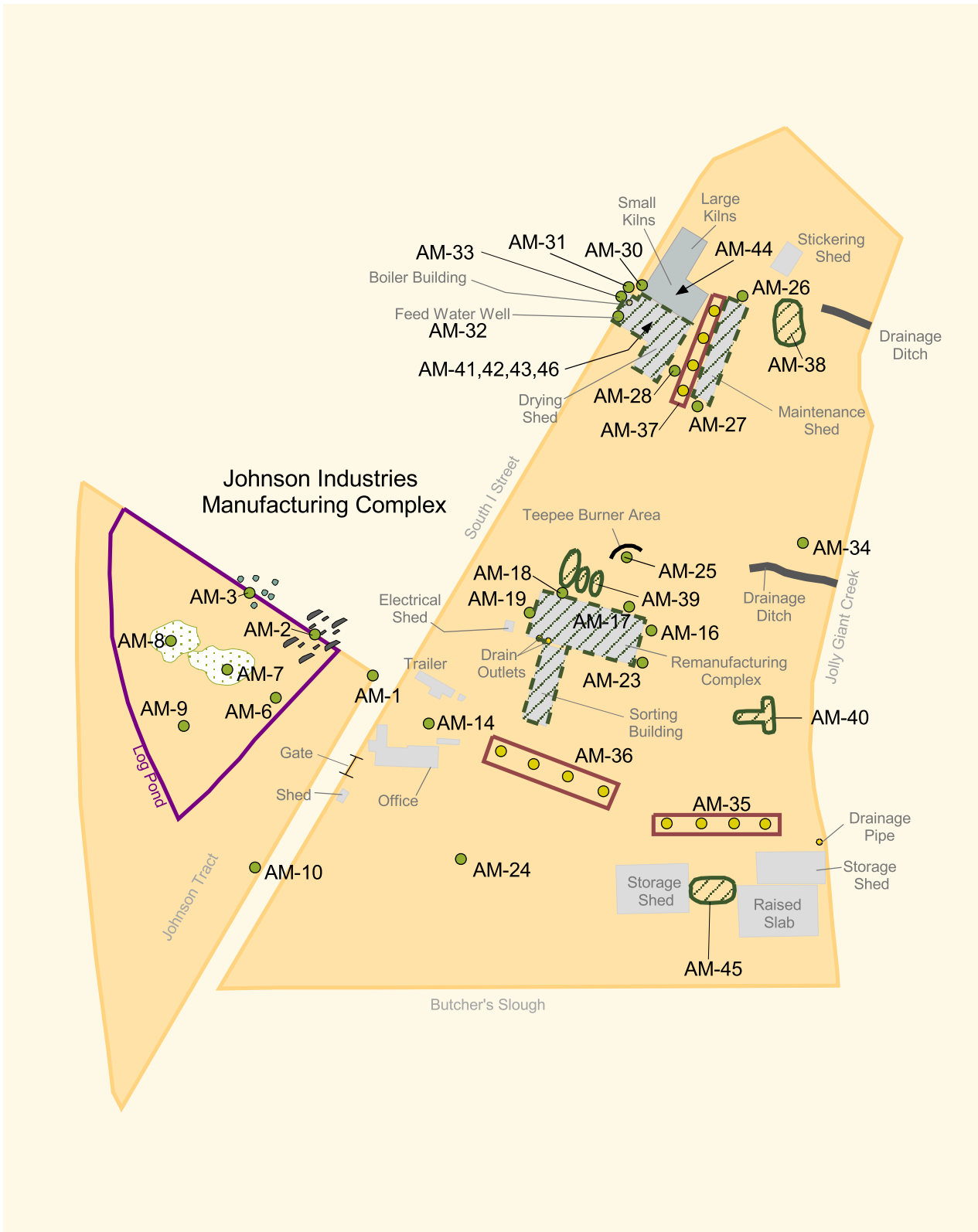
To determine whether site soils had been impacted from historic use of hazardous substances, WESTON collected soil samples from 29 locations. Biased soil sampling locations were selected based on concerns outlined in the SISMRP Phase I TBA. Surface soil samples were collected from 0 to 6 inches bgs, using a combination of stainless steel hand trowels, spade shovels, and EnCore® Samplers. Subsurface soil samples were collected from 12 to 36 inches bgs on the Johnson Tract using a hand auger and GeoProbe® hydraulic push unit. All subsurface samples on the LLI Property were collected from the river-run fill/native bay mud interface (approximately 36-inches bgs) using the GeoProbe® hydraulic push unit. Sample locations are shown on Figure 3-1. Instrument error prevented WESTON from recording sample locations using a global positioning system. Below is a summary of WESTON's sampling effort organized by location.

3.1.1 Johnson Tract Sample Locations

As shown in Figure 3-1, WESTON collected surface soil from seven locations on the Johnson Tract (AM-1 to AM-3 and AM-6 to AM-9) to evaluate suspected contamination from a historic log-pond and the possible illegal dumping of hazardous material by the JIMC. WESTON biased sample locations AM-2 and AM-3 toward areas of scrap metal and concrete dumping along the shared fence line between the JIMC and the Johnson Tract and samples AM-7 and AM-8 toward areas of stressed vegetation which appeared to be from a historic burn.

Subsurface soil was collected from three locations, AM-1, AM-3 and AM -8, on the Johnson Tract. Due to shallow groundwater and boring refusal, subsurface soils were collected at 12 and 18 inches bgs at locations AM-3 and AM-8, respectively. The subsurface sample at location AM-1 was collected at 3 feet bgs.

The soils in the area of the historic log pond were composed of non-compacted silty, river-run fill. The lithology appeared consistent from surface to 18 inches bgs, revealing no evidence of the long pond. Soil samples collected on the Johnson Tract were analyzed for TPH-gasoline (TPH-g), TPH-d,o, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals.



Legend:

Structures
- Demolished
- Existing

Project Site

Railroad

Stockpile

Stressed Vegetation

Scattered Concrete

Scattered Metal Debris

Composite Sample Location

Sample Location

Approximate Scale in Feet
0 190

N W E S

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Figure 3-1
Sample Location Map
South I Street Mill
Reuse Project
Arcata, CA

3.1.2 Leach Field Sample Location

WESTON collected one subsurface soil sample, AM-14-2 from the leach field area to evaluate the potential disposal of hazardous materials from an illegal drug laboratory. WESTON attempted to collect additional samples from the area using a hand auger and spade shovel, but the compacted river run fill was impenetrable without a hydraulic push rig. The soil sample from the leach field area was analyzed for TPH-d,o, VOCs, and metals.

3.1.3 Remanufacturing Complex Sample Locations

WESTON collected surface soil at six locations around the remanufacturing complex (AM-16 through AM-19 and AM-23) to evaluate contamination that may have been released during a fire that destroyed the building or rinsed down the drains during routine operations. When WESTON arrived on site, a large stockpile of gravel covered the majority of the anticipated sample locations. WESTON could not identify the suspected drain locations or access the southern face of the complex's concrete pad. Sample locations were moved to the north, east, and west sides of the complex foundation. One subsurface soil sample was collected at location AM-16. Soil samples from the remanufacturing complex locations were analyzed for TPH-g, TPH-d,o, VOCs, SVOCs, Pesticide/PCBs and metals.

3.1.4 Teepee Burner and Red Stained Soil Area Sample Locations

WESTON collected one surface and one subsurface soil sample at the location of a historic teepee burner (AM-25) and the area of a red wood-stain spill (AM-24). Due to site disturbances from heavy equipment used in re-routing Jolly Giant Creek, and soil saturation from heavy rains, WESTON could not identify any discoloration of the soils in the area of the suspected wood-stain spill or any ash in the area of the suspected teepee burner. Alternatively, sample locations were located based on measurements taken from the Phase I TBA Site Layout Map. A spill of what appeared to be red latex paint was identified approximately 25 feet south of the former sorting building; however, the spill appeared recent and did not match the location cited in the Phase I TBA. The soil sample from the teepee burner was analyzed for SVOCs, and the sample from the wood-stain spill was analyzed for VOCs and metals.

3.1.5 Former Drying Shed Sample Location

WESTON collected one surface soil sample, AM-28, to evaluate potential contamination at the former drying shed which was used to store waste oils and service forklifts. Upon arrival at the site, a large, hydro-seeded soil stockpile was located on the anticipated sample locations. Therefore, WESTON relocated one sample point to the eastern portion of the former structure. A second sample location could not be relocated because the soil stockpiled covered the entire south side of the former drying shed. The soil sample from the drying shed was analyzed for TPH-d,o, VOCs, SVOCs, and metals.

3.1.6 Former Maintenance Shed Sample Locations

WESTON collected surface soil samples from two locations (AM-26 to AM-27) at the northern and southern end of the maintenance shed foundation to evaluate potential contamination from hazardous materials once stored in the shed. Additionally, a subsurface sample was collected from location AM-26. WESTON was not able to locate the soil staining in the vicinity of the shed documented in the Phase I TBA. Soil samples from the maintenance shed locations were analyzed for TPH-g, TPH-d,o, VOCs, SVOCs, Pesticide/PCBs and metals.

3.1.7 Roadway Sample Locations

WESTON collected three composite surface soil samples (AM-35 to AM-37) to evaluate potential contamination from the use of motor oils for dust suppression along the former site roadways. Contrary to the Phase I TBA descriptions, several of the major site roads are concrete. Therefore, samples collected at locations AM-36 and AM-37 were collected from the side of the paved areas because motor oil may have been used for dust suppression prior to being concreted. Sample AM-35-0 was collected from the middle of an unpaved road. Additionally, one subsurface grab sample was collected at sample location AM-35. The soil samples collected from the roadway locations were analyzed for TPH-d,o, SVOCs, and metals.

3.1.8 Aboveground Diesel Storage Tank Sample Locations

WESTON collected surface soil from two locations (AM-30 and AM-31) on the northern and eastern sides of the former diesel AST pad to evaluate contamination from spills and leaks. The pad appeared structurally intact and had no signs of staining. Surface water around the pad had no apparent sheen and the soils were odorless. A thick mulch of organic material covered the adjacent soils. The soil samples collected from the AST area were analyzed for TPH-d,o, VOCs, SVOCs, and metals.

3.1.9 Boiler Well Discharge Sample Location

WESTON collected one sample (AM-33-0) from beneath the drainage of the boiler well blow-off pipe on the South I Street side of the LLI Property fence line. Thickets prevented the sample from being collected any closer to the boiler building. The sample collected from the pipe discharge area was analyzed for TPH-g, TPH-d,o, VOCs, SVOCs, and metals.

3.1.10 Stockpiled Soil/Rock Area Sample Locations

WESTON collected four composite soil samples (AM-38 to AM-40 and AM-45) to evaluate contamination associated with four of the previously unsampled soil/rock stockpiles located on site. The stockpiles, ranging from approximately 400 y^3 to 1200 y^3, were excess soil and rock from the re-contouring of Jolly Giant Creek and Butcher's Slough. Stockpile samples AM-38-0, AM-39-0, AM-40-0 were analyzed for TPH-d,o, SVOCs, and metals. Stockpile sample AM-45-0 was added in the field and analyzed for TPH-d,o and metals.

3.2 Groundwater Sampling

To evaluate whether groundwater at the site has been impacted by historic site use, WESTON collected samples from seven locations, including the on-site boiler water well. Due to suspended silt, most groundwater samples, including VOCs, were collected using a peristaltic pump with dedicated tubing drawing through an inline filter from a PVC lined GeoProbe Macrocore® hole. The boiler-well sample was collected using a dedicated Teflon bailer. In general, groundwater was encountered at 18 inches bgs. Recovery and recharge varied throughout the site, with several borings yielding sufficient sample volume and others yielding none.

Because of the slow and sporadic groundwater recovery, WESTON prioritized groundwater sample collection to include the locations judged to best characterize conditions at the site. Historically, the groundwater flow direction at the site has been indeterminate with data suggesting that the gradient is tidally influenced toward the northeast or southeast. Therefore, WESTON prioritized three water samples that were downgradient (along the eastern boundary) of suspected contamination on the LLI Property (AM-26-GW, AM-34-GW, and AM-35-GW) and two samples (AM-01-GW and AM-10-GW) upgradient (along the western boundary) of the LLI Property, but downgradient of the Johnson Tract. Unfortunately, sample location AM-01 had no recovery and had to be abandoned after three attempts to recover groundwater. Because the of the lack of recovery at AM-01, WESTON collected a sample instead from AM-14, which was located 50 feet to east of AM-01, just inside the LLI Property fence line. WESTON also collected a groundwater sample at location AM-24 which was the suspected site of the red stained soils.

Additionally, WESTON collected a groundwater sample (AM-32-GW) from the boiler water well located on-site. Due to the uncertainty in well construction and the expense of waste water disposal, sample AM-32-GW was collected without purging the well. As a result, the data collected are more indicative of the current conditions in the well casing, than the groundwater re-charging the well. At the time of sampling, groundwater was at the surface of the concrete well casing. WESTON measured the depth of the well to be 5 feet, where a solid surface was encountered. The diameter of the well could not be determined through the steel cover, but WESTON estimated it to be approximately 3 feet.

3.3 Building Material Sampling

3.3.1 Asbestos Containing Material Sampling

WESTON subcontracted Terry Clark of Winzler and Kelly, Inc in Arcata, California to collect four samples of insulation encapsulating the 10-inch diameter pipe running from the boiler to the large kilns. Mr. Clark surveyed 6 locations on the 100 foot pipe. Of the six locations, two were determined to be fiberglass insulation by inspection. The remaining four locations were sampled for asbestos containing materials (ACM). The Sample IDs and locations are presented in Table 3-1.

Table 3-1: Sample Locations for the Boiler Pipe Insulation	
Sample ID	**Location**
AM-41	White tape patching the insulation as the pipe elbows eastward along the drying kiln.
AM-42	Insulation wrapped in sheet-metal running horizontally westward above the boiler.
AM-43	Insulation wrapped in sheet-metal running vertically above the boiler.
AM-46	Insulation wrapped in sheet-metal from the pipe-elbow above the boiler.

3.3.2 Kiln Sealed Cement Bricks

WESTON collected one sample, AM-44, from the kiln-sealed cement bricks located in the large kilns. The chip sample was collected from a small opening in the lower, northeast corner of the large kiln. A sample of the material was chipped away from the cement bricks and appeared consistent with the coating covering the remainder of the kilns.

SECTION 4

RESULTS

Soil and groundwater samples were collected and sent to USEPA Contract Laboratory Program (CLP) laboratories for analysis of metals, VOCs, SVOCs, and Pesticide/PCBs and to EMAX Laboratory in Torrance, California for analysis of TPH. All extractable TPH samples underwent a silica-gel clean up to remove naturally occurring organic interferences prior to analysis. Insulation material was sent to the RJ Lee Group in Berkeley, California for asbestos analysis by Polarized Light Microscopy and the kiln-sealed cement chip sample was sent to the USEPA Region 9 Laboratory in Richmond, California for analysis of VOCs and SVOCs. Data generated by the CLP laboratories was validated using the Computer-Aided Data Review and Evaluation program. Data generated by EMAX Laboratories, USEPA Region 9 Laboratory, and the RJ Lee Group underwent no further validation. All validated data was found to be of acceptable quality.

Data for AOCs are compared to action levels selected by the project scoping team and include the following:

1. California Regional Water Quality Control Board (CRWQCB), Los Angeles Region Soil Screening Levels (SSL) - 1996 for TPH in soil,
2. USEPA residential Preliminary Remeadiation Goals (PRG) and SSLs for inorganics and organics in soil,
3. Site-Specific Water Quality Protection Levels (SSWQPL), as supplied by the NCRWQCB, for TPH, inorganics, and organics in groundwater,
4. California Assessment Code Title 26 Total Threshold Limit Concentration for asbestos in building materials;
5. The presence of the Resource Conservation and Recovery Act (RCRA) compounds for the kiln sealant.

Detected analytes that were not listed as AOCs in the SAP are compared to applicable California and federal benchmarks for protection of human health and the environment. A summary and discussion of the significant results is presented below. Complete copies of the data are included in Appendix D.

4.1 Soil Sampling Results

4.1.1 Total Petroleum Hydrocarbon Results

TPH results are summarized in Table 4-1. Analytical results for TPH-d in surface and subsurface soils ranged from 4.9 mg/kg to 390 mg/kg with an mean concentration of 82 mg/kg.

Ten soil samples collected on the LLI Property exceeded the TPH-d action level. These locations include: the leach field (AM-14-2), the remanufacuring complex (AM-18-0), the maintenance shed (AM-26-0), the AST pad (AM-30-0), below the boiler well discharge pipe (AM-33-0), two of the soil rock stockpiles (AM-39-0 and AM-40-0), the dying shed (AM-28-0), and two former roads (AM-36-0 and AM-37-0). Samples results from the Johnson Tract did not exceed the TPH-d action level.

The highest TPH-d concentrations on the LLI Property were documented in the vicinity of the former drying shed and on a historic road immediately adjacent to the drying shed. Subsurface TPH-d concentrations were generally less than surface results.

TPH-o concentrations in surface and subsurface soils ranged from 5.5 to 850 mg/kg with a mean concentration of 139 mg/kg. No TPH-o sample results exceeded the action level of 1000 mg/kg. The highest TPH-o concentrations were also detected in samples collected near the former drying shed and on a historic road adjacent to the drying shed (AM-28-0 and AM-37-0). The ACDA has noted that previous investigations at similar sites have documented bio-genic interference that was not removed by a silica gel cleanup and was quantified as TPH-o. TPH-g was not detected in any soil samples.

Table 4-1: Total Petroleum Hydrocarbons in Soil
South I Street Mill Reuse Project
Arcata, California

Sample ID	TPH-g (mg/kg)	TPH-d (mg/kg)	TPH-o (mg/kg)
Action Level*	**100**	**100**	**1000**
AM-01-0	<1.3	54	57
AM-01-2	<1.3	11 J	13
AM-02-0	<1.6	24	20
AM-02-B	<1.5	28	25
AM-03-0	<1.4	19	22
AM-03-2	<1.2	16	14
AM-06-0	<1.6	26	33
AM-07-0	<1.4	8.5 J	5.5 J
AM-08-0	<1.3	16	15
AM-08-2	<1.4	14	14
AM-09-0	<1.2	13	30
AM-14-2	NA	**230**	8.1
AM-16-0	NA	17	19
AM-16-2	NA	14	7.2
AM-17-0	NA	39	67
AM-17-B	NA	18	38
AM-18-0	NA	**140**	150
AM-19-0	NA	39	81
AM-23-0	NA	7.9 J	15
AM-26-0	<1.1	**170**	270
AM-26-B	<1.1	**130**	280
AM-26-2	<1.3	33	119
AM-27-0	<1.3	82	140
AM-28-0	NA	**370**	800
AM-30-0	NA	**150**	360
AM-31-0	NA	4.9 J	5.8 J

Table 4-1: Total Petroleum Hydrocarbons in Soil (continued)
South I Street Mill Reuse Project
Arcata, California

Sample ID	TPH-g (mg/kg)	TPH-d (mg/kg)	TPH-o (mg/kg)
Action Level*	**100**	**100**	**1000**
AM-33-0	NA	**140**	240
AM-35-0	NA	90	160
AM-35-2	NA	97	200
AM-36-0	NA	**160**	270
AM-37-0	NA	**390**	850
AM-38-0	NA	53	68
AM-39-0	NA	91	180
AM-39-B	NA	**110**	210
AM-40-0	NA	**150**	210
AM-45-0	NA	8.7 J	13

TPH-g = Total Petroleum Hydrocarbons as Gasoline
TPH-d = Total Petroleum Hydrocarbons as Diesel
TPH-o = Total Petroleum Hydrocarbons as Motor Oil
mg/kg = milligrams per kilogram
* = California Regional Water Quality Control Board, Los Angeles Region, Soil Screening Level

J = estimated
bold = result above the action level
NA = Not Analyzed
< # = Non-detect above given reporting limit

4.1.2 Metals Results

Cadmium and zinc were the only metals detected above naturally occurring background concentrations and applicable action levels. Both cadmium and zinc were detected above associated action levels in sample AM-30-0, which was collected from the soil immediately northeast of a former AST pad. Zinc was also detected above its action level in sample AM-33-0, which was collected below the boiler-well discharge pipe. Low concentrations of cadmium were detected in several other samples, but this may be the result of laboratory contamination also detected in an associated laboratory quality control blank. Both cadmium and zinc are associated with petroleum hydrocarbon contamination.

Arsenic, chromium, iron, and nickel were detected at concentrations above their action levels; however, two background samples (AM-BG-1 and AM-BG-2) collected near the site, documented that naturally occurring concentrations of these analytes were greater than or equal to the results detected in the samples. Table 4-2 summarizes metals data that exceeded the background concentrations and action levels.

Table 4-2: Metals that Exceeded their Action Levels and Background Concentrations in Soil (mg/kg)
South I Street Mill Reuse Project
Arcata, California

Sample ID	Cadmium	Zinc
Action Level	0.4*	620*
AM-BG-1 (Background)	<0.25	168
AM-BG-2 (Background)	<0.21	118
AM-18-0	**0.57 B**	387
AM-19-0	**0.59 B**	227
AM-30-0	**6.9**	**664 J**
AM-33-0	**0.44 B**	**637**
AM-37-0	**0.53 B**	309
AM-40-0	**0.90 B**	22.9

< # = Not detected above the given reporting limit
B = Analyte detected in associated blank
J = Concentration is estimated
mg/kg = milligrams per kilogram
Bold = Result is above action level and naturally occurring concentration
* = USEPA Soil Screening Level, DAF = 1

4.1.3 Volatile Organic Compounds Results

Benzene, in sample AM-17-0, was the only VOC detected above its action level in soil. Toluene and acetone were detected below their action levels in several locations. Other VOCs detected included trichlorofluoromethane and 2-butanone. Both were detected in concentrations below their respective federal benchmarks for protection of human health. Detected VOC results are summarized in Table 4-3.

4.1.4 Semi-Volatile Organic Compound Results

Three SVOCs, benzo(a)pyrene, benzo(a)anthracene and benzo(b)flouranthene, were detected in excess of their action levels in sample AM-40-0, which was collected from a soil stockpile. Benzo(a)pyrene, benzo(a)anthracene and benzo(b)flouranthene are all polyaromatic hydrocarbons (PAHs) associated with petroleum contamination.

Pentachlorophenol (PCP) was detected at four sample locations (AM-16, AM-18, AM-19 and AM-39) on the LLI Property. PCP was historically used as an insecticide in wood treatment. No previous evidence has documented that wood treatment occurred on the site, but PCP's presence suggests that perhaps wood may have been treated prior to arriving on the site. PCP results ranged from 0.078 to 0.190 mg/kg, which exceeds the USEPA SSL of 0.001 mg/kg.

Other non-PAH SVOCs frequently detected included: benzaldehyde, caprolactam, and bis(2-ethylhexylphthalate) all of which were below federal benchmarks. Table 4-3 summarizes detected SVOC results.

4.1.5 Chlorinated Pesticide and PCB Results

Two chlorinated pesticides, beta-benzene hexachloride (b-BHC) and Endrin Aldehyde were detected in sample AM-19-0 collected in the vicinity of the remanufacturing complex. Endrin Aldehyde is a breakdown product of the insecticide Endrin and b-BHC is a isomer of the insecticide Lindane. Additionally, 4,4-DDT was detected near the southern portion of the maintenance shed (AM-27-0). The detected concentration of b-BHC exceeded the USEPA SSL of 0.0001 mg/kg. Concentrations of Endrin Aldehyde and 4,4-DDT were below federal benchmarks. Detected chlorinated pesticide results are summarized in Table 4-3.

Table 4-3: Summary of Detected VOC, SVOC, and Chlorinated Pesticide/PCB Results in Soil
South I Street Mill Reuse Project
Arcata, California

Analyte	**Action Level/ Benchmark**	**Number of Detects**	**Range (mg/kg)**	**Detected in Samples:**
Volatile Organic Compounds				
Acetone	0.8[b]	17	ND - 0.250	AM-01-0; AM-02-0; AM-02-B; AM-06-0; AM-17-0; AM-17-B; AM-18-0; AM-23-0; AM-24-2; AM-26-0; AM-26-B; AM-26-2; AM-28-0; AM-27-0; AM-30-0; AM-33-0; AM-35-2
Benzene	0.002[a]	1	ND - **0.009J**	AM-17-0
2-Butanone	7300[a]	6	ND - 0.027	AM-06-0; AM-16-2; AM-17-0; AM-26-0; AM-27-0; AM-33-0
cis-Dichloroethene	0.020[b]	1	ND - 0.004J	AM-26-0
Methyl Acetate	22,000[a]	3	ND - 0.044	AM-17-0; AM-17-B; AM-19-0
Toluene	0.6[a]	6	ND - 0.030	AM-01-0; AM-06-0; AM-17-0; AM-18-0; AM-19-0; AM-26-B
Trichlorofluoromethane	390[b]	9	ND - 0.003J	AM-03-0; AM-03-2; AM-06-0; AM-07-0; AM-09-0; AM-23-0; AM-24-0; AM-30-0; AM-35-2
Semi-Volatile Organic Compounds				
Anthracene	590[b]	1	ND - 0.072 J	AM-08-2
Benzaldehyde	610[a]	6	ND - 0.250 J	AM-01-0; AM-03-0; AM-08-0; AM-30-0; AM-35-0; AM-40-0
Benzo(a)anthracene	0.080[b]	1	ND - **0.110J**	AM-40-0
Benzo(a)pyrene	0.062[a]	1	ND - **0.120J**	AM-40-0
Benzo(b)fluoranthene	0.200[b]	1	ND - **0.250J**	AM-40-0
Benzo(g,h,i)perylene	NAB	1	ND - 0.150 J	AM-31-0
Benzo(k)fluoranthene	2.0[b]	1	ND - 0.120 J	AM-40-0
bis(2-ethylhexyl) phthalate	35[a]	11	ND - 0.360 J	AM-01-2; AM-02-B; AM-03-2; AM-23-0; AM-26-B; AM-26-2;AM-30-0;AM-31-0; AM-33-0;AM-35-0; AM-35-2

Table 4-3: Summary of Detected VOC, SVOC, and Chlorinated Pesticide/PCB Results in Soil
South I Street Mill Reuse Project
Arcata, California

Analyte	**Action Level/ Benchmark**	**Number of Detects**	**Range (mg/kg)**	**Detected in Samples:**
Butylbenzylphthalate	810[b]	2	ND - 0.250 J	AM-39-0; AM-40-0
Caprolactam	3,100[a]	8	ND - 0.160 J	AM-01-0; AM06-0; AM-08-0;AM-17-B; AM-19-0; AM-35-0;AM-36-0; AM-39-B
Chrysene	8[b]	1	ND - 0.210J	AM-40-0
Dibenzofuran	290[a]	1	ND - 0.051 J	AM-25-2
Di-n-butylphthalate	NAB	1	ND - 0.096 J	AM-39-0
Fluoranthene	210[b]	2	ND - 0.330 J	AM-39-B; AM-40-0
2-Methylnaphthalene	NAB	1	ND - 0.065 J	AM-01-0
4-Methylphenol	310[a]	1	ND - 0.049 J	AM-36-0
Naphthalene	4[b]	1	ND - 0.041 J	AM-25-2
2,2'-oxybis (1-chloropropane)	NAB	1	ND - 0.065 J	AM-39-B
Pentachlorophenol	0.001[b]	4	ND -**0.190 J**	AM-16-2; AM-18-0; AM-19-0;AM-39-0
Phenanthrene	NAB	5	ND - 0.220 J	AM-01-0; AM-35-0; AM-35-2; AM-39-B; AM-40-0
Pyrene	210[b]	2	ND - 0.290 J	AM-39-B; AM-40-0
Chlorinated Pesticides/PCBs				
b-BHC	0.0001[b]	1	ND - **0.006 NJ**	AM-19-0
4,4-DDT	1.7[a]	1	ND - 0.032J	AM-19-0
Endrin Aldehyde	NAB	1	ND - 0.006 J	AM-27-0

a = USEPA Residential Preliminary Remeadiation Goal
b = USEPA Soil Screening Level, DAF = 1
ND = Non-detect

J = estimated
NJ = Presumptive evidence of the presence of the material at an estimated quantity.
NAB = No Applicable Benchmark

4.2 Groundwater Sampling Results

4.2.1 Total Petroleum Hydrocarbon Results

TPH-d exceeded its action level in all nine groundwater samples collected at the site. Results ranged from 140 to 1100 µg/L. In general, lower TPH-d concentrations were recorded along the western perimeter (upgradient) of the LLI Property (AM-10-GW and AM-14-GW) and in the northwest corner of the LLI Property (AM-26-GW). The highest TPH-d concentrations were detected in samples AM-34-GW and AM-35-GW, located on the eastern and southeastern perimeter of the LLI Property, respectively.

TPH-o was not detected in any groundwater samples. TPH-g was detected above its action level, in every TPH-g sample, but concentrations were similar to those found in equipment blanks, suggesting results may be from ambient gasoline vapor. Data for TPH in groundwater are presented in Table 4-4.

4.2.2 Dissolved Metals Results

Arsenic exceeded its action level in three groundwater samples, however two of these had associated laboratory blank contamination. Similarly nickel exceeded its action level in nine groundwater samples, but eight of the samples had associated laboratory blank contamination. The highest concentrations of both arsenic and nickel were detected in sample AM-35-GW, which was collected on the southeastern portion of the LLI Property.

Copper, iron, and zinc exceeded their action levels in multiple samples. The highest copper and zinc concentrations were detected in sample AM-32-GW, which was collected from the boiler water well. The highest iron concentration was detected in sample AM-35-GW. Additionally, both lead and chromium exceeded their action levels in sample AM-35-GW.

Two non-suspected priority pollutant metals, thallium and selenium, were detected above applicable federal and state benchmarks. Thallium was detected up to 15.8 µg/L (AM-35-GW) and selenium was detected in sample AM-34-GW at 5.8 µg/L. Thallium was historically used as a pesticide and selenium was occasionally used as a fungicide. Data for dissolved metals in groundwater are presented in Table 4-5.

Table 4-4: Total Petroleum Hydrocarbons in Groundwater
South I Street Mill Reuse Project
Arcata, California

Sample ID	TPH-g (ug/L)	TPH-d (ug/L)	TPH-o (ug/L)
Action Level	**5***	**56***	**175***
AM-10-GW	**12 J**	**140**	<100
AM-14-GW	**13 J**	**340**	<100
AM-24-GW	**11 J**	**230**	<100
AM-26-GW	**16 J**	**210**	<100
AM-26-GW-B	**7 J**	**260**	<100
AM-32-GW	**6 J**	**840**	<100
AM-32-GW-B	**10 J**	**920**	<100
AM-34-GW	**16 J**	**1100**	<100
AM-35-GW	**7 J**	**880**	<120
AM-EB-1 (Blank)	NA	<49	<98
AM-EB-2 (Blank)	14 J	<47	<94
AM-EB-3 (Blank)	6 J	<49	<98
AM-EB-4 (Blank)	5 J	<51	<100

TPH-g = Total Petroleum Hydrocarbons as Gas
TPH-d = Total Petroleum Hydrocarbons as Diesel
TPH-o = Total Petroleum Hydrocarbons as Motor Oil
µg/L = micrograms per liter
* = Site-specific water quality protection level supplied by the North Coast Regional Water Quality Control Board.

J = estimated
< # = Not detected above the given reporting limit
NA = Not Analyzed
bold = result above the action level

Table 4-5: Dissolved Metals Data for Groundwater Samples (µg/L)
South I Street Mill Reuse Project
Arcata, California

		Sample ID								
Analyte	Action Level/ Benchmark	AM-10-GW	AM-14-GW	AM-24-GW	AM-26-GW	AM-26-GW-B	AM-32-GW	AM-32-GW-B	AM-34-GW	AM-35-GW
Analytes of Concern										
Arsenic	0.023[d]	**8.2 B**	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	**3.8 B**	**16.3**
Cadmium	0.092[a]	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	**2.5 B**
Chromium (total)	2.5[a]	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	**84.4**
Copper	170[d]	<1.5	32.3	17.7 B	9.1 B	12.6 B	**179**	**181**	3.6 B	156
Iron	300[a]	**5070**	118	183	140	190	**1750**	**1680**	**11,900**	**58,800**
Lead	0.54[a]	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	**1.7 B**	<1.2	**92.4**
Nickel	1.0[a]	**9.6 B**	**8.9 B**	**3.9 B**	**4.1B**	**4.8 B**	**6.5 B**	**6.2 B**	**26.8 B**	**148**
Zinc	36[a]	<1.1	2.7 B	9.7 B	**176**	**266**	**358**	**358**	<1.1	**205**
Other Detected Priority Pollutant Metals										
Thallium	0.5[c]	**10.8**	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	**6.9 B**	**15.8**
Selenium	5.0[b]	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	**5.8**	3.2 B

a = Action level set in Sampling and Analysis Plan
b = California Toxics Rule Criteria for Freshwater Aquatic Protection
c = USEPA Suggested No Adverse Response Level (SNARL)
d = Revised action level from that set in the Sampling and Analysis Plan. New action level is provided by North Coast Regional Water Quality Control Board for the protection of groundwater.

B = Analyte also detected in associated quality control blank
J = Estimated
ND = Non-detect
< # = Non-detect above given reporting limit
bold = exceeds action level or applicable state/federal benchmark

4.2.3 Volatile Organic Compound, Semi-volatile Organic Compound & Chlorinated Pesticide/PCB Results

Ethylbenzene, naphthalene, diethylphthalate, phenol, and caprolactam, were detected at low concentrations (<5 µg/L) in groundwater samples. Only phenol, collected along the eastern boundary of hte LLI Property, exceeded a state or federal benchmark. Phenol is a breakdown product of several chlorinated pesticides including b-BHC and PCP (which were detected in soil samples). No chlorinated pesticides or PCBs were detected in any sample. Detected VOC and SVOC results are summarized in Table 4-6.

Table 4-6: Detected Volatile Organic Compounds and Semi-Volatile Organic Compounds in Groundwater
South I Street Reuse Project
Arcata, California

	Sample ID	AM-10-GW	AM-24-GW	AM-26-0	AM-34-GW
Analyte	Action Level/ Benchmark (µg/L)	Concentration (µg/L)			
Volatile Organic Compounds					
Ethylbenzene	30[a]	ND	ND	1 J	ND
Semi-Volatile Organic Compounds					
Caprolactam	3500[b]	<10	<10	<10	1 J
Diethylphthalate	NAB	<10	1 J	<10	4 J
Naphthalene	14[a]	2 J	<10	<10	<10
Phenol	5[c]	<10	<10	<10	**5 J**

< # = Non-detect above given reporting limit
J = Estimated
bold = meets state benchmark
NAB = No Applicable Benchmark

a = site-specific action levels set by NCRWQCB
b = USEPA Integrated Risk Information System (IRIS) Reference Dose
c = California State Department of Health Service, Water Quality Objective

4.3 Building Material Results

4.3.1 Asbestos Containing Material

No asbestos was detected in the four insulation samples that were submitted for analysis. The majority of the mineralogy appeared to be cellulose or non-fibrous materials such as quartz or carbonates.

4.3.2 Kiln Sealed Cement Bricks

No RCRA regulated VOCs or SVOCs were detected in the chip sample collected from the kiln-sealed cement blocks. Cresol and pyridine were not included in the analysis and may need to be characterized prior to disposal depending on landfill requirements.

SECTION 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Summary & Conclusions

Analytical results indicate that soil and groundwater at the LLI Property have been impacted by historic site use. TPH-d contamination in the soil of the LLI Property is elevated above action levels in several areas and appears to be impacting groundwater. TPH-d soil sample results exceeded the action level in the following areas: the leach field, the remanufacuring complex, the maintenance shed, the AST pad, below the boiler well discharge pipe, the dying shed, and two former roads. Metals contamination associated with petroleum is also present above action levels in soil collected near the boiler water well discharge and the AST pad, as well as in the groundwater. Benzene was detected above its action level in one soil sample collected near the remanufacturing complex. PCP is also present in soil above its USEPA SSL in samples collected near the remanufacturing complex. Beta-BHC was detected above its USEPA SSL in a sample collected near the maintenance shed. Neither b-BHC or PCP were detected in groundwater, but phenol, a breakdown product of b-BHC and PCP, was detected in one groundwater sample above a California water quality benchmark. Copper, arsenic, thallium, and selenium were detected in a downgradient groundwater sample collected on the LLI Property above applicable federal or state benchmarks, but not detected in appreciable quantities in soil samples.

Soil data from the Johnson Tract documented no contamination above action levels, but groundwater collected downgradient of the Tract contained elevated concentrations of TPH-d. Therefore, the data are inconclusive as to whether the Johnson Tract has been impacted by historic site use.

TPH-d soil contamination appears to extend vertically on the LLI Property to at least to the fill/bay mud interface (3 feet bgs); however, concentrations of TPH-d are generally below the action level at this depth with the exception of one subsurface sample, collected in the vicinity of the leach field. The elevated TPH-d documented at this location may be due to the dumping of petroleum down the septic system. PCP, above the USEPA SSL, was also detected in one subsurface sample located on the east side of the remanufacturing complex.

Analytical results documented TPH-d contamination in two of the soil stockpiles to be greater than the action level rendering them inappropriate for construction fill. Additionally, SVOC data from same two stockpiles also documented the presence of PCP and PAHs above federal benchmarks. The analytical data on the remaining two sampled stockpiles suggest that they may be appropriate for use as construction fill.

Samples collected from the boiler pipe documented that it is not an ACM. Analytical results suggest that the kiln sealed cement blocks do not need to be disposed of as a federally regulated hazardous waste.

5.2 Recommendations

Because the analytical data suggests that groundwater downgradient of the LLI Property is being impacted above established action levels for TPH-d and metals, remediation or removal of contamination on the property is recommended. Capping or land use restrictions would eliminate human exposure to the soil, but would not mitigate the threat to groundwater. Due to the widespread nature of TPH-d soil contamination on the LLI Property, further characterization is necessary to cost effectively remediate or remove the contamination sources. Future investigation efforts should focus on the areas of contamination documented in this Phase II TBSA and attempt to more precisely characterize the horizontal and vertical extent of TPH-d contamination. Metals contamination on the LLI Property appears to be partially associated with petroleum and may be remediated or removed with TPH-d contaminated soils. Benzene, detected in the area of the remanufacturing complex, may also be remediated with the petroleum contamination.

PCP contamination was not anticipated at the site, but was detected in several soil samples. PCP's presence may warrant a wider investigation including the collection of a groundwater sample from the southeast portion of the LLI Property, where a SVOC sample was not collected due to lack of groundwater recharge. The presence of PCP also suggests that dioxins may be present in the vicinity of the teepee burner due to their association with the combustion of chlorinated organic compounds. Further investigation may also be warranted to determine the extent of b-BHC in the vicinity of the maintenance shed.

Non-petroleum associated metals, such as arsenic and copper, were detected in groundwater above their action levels, but not detected in appreciable quantities in soil. Further investigation may be necessary to determine if the site is contributing metals to groundwater and characterize the potential source.

Soil data from the Johnson Tract documented no AOCs above their action levels, but groundwater collected downgradient of the Tract did contain TPH-d above the action level. This may be due to an off-site contributor or from a source on the site that is not yet identified. If further investigation is deemed warranted, WESTON recommends clearing the tract of vegetation first to better identify the potential TPH-d source.

APPENDIX A: References

References Cited

Innovative Technical Solutions, Inc., Phase I - Targeted Brownfields Assessment South I Street Mill Reuse Project, September 2002.

Weston Solutions Inc, Sampling and Analysis Plan South I Street Mill Reuse Project, December 2002.

APPENDIX B: Photographic Documentation

Figure B-1 - WESTON collecting a surface soil sample at location AM-24.

Figure B-2 - WESTON collecting a surface soil sample at location AM-31.

Figure B-3 - Terry Clark of Winzler & Kelly, Inc. collects an insulation sample.

Figure B-4 - WESTON prepares to collect a groundwater sample at location AM-34.

Figure B-5 - WESTON collects a soil sample from location AM-19. The stockpiled rock and soil in the background is resting on the Remanufacturing Complex pad.

Figure B-6 - Photo of location AM-07, with stressed vegetation, facing West.

APPENDIX C: Amendments to the Sampling and Analysis Plan

Amendments to the Sampling and Analysis Plan

WESTON conducted field work in accordance with the South I Street Targeted Site Assessment SAP (December 2002) with the following exceptions:

1) WESTON attempted to hand auger and dig through the compacted fill material covering the LLI Property. Although several attempts were made with many different pieces of equipment, the following subsurface samples had to be abandoned because the desired depth could not be reached through the fill.: AM-11-2, AM-12-2, AM-13-2, AM-15-2, and AM-31-2.

2) The following sample locations were abandoned because fill piles of soil and rock (removed from Jolly Giant Creek) covered the sample location: AM-21, AM-22, AM-23, and AM-29.
Additionally, sample locations AM-23 and AM-28 were relocated.

3) The following sample locations on the Johnson Tract were abandoned because they were inaccessible due to dense vegetation: AM-4 and AM-5.

4) Groundwater was encountered at approximately 6-12 inches bgs at the site. The SAP stated that subsurface samples would be collected from the deepest soil above the saturated zone. Because of the shallow groundwater, WESTON collected the subsurface samples at locations AM-14, AM-16, AM-24, AM-25, AM-26, and AM-35 from the gravel/native bay mud interface at approximately 3 feet bgs, per the City of Arcata's request.

5) Because WESTON could not hand auger through the compacted fill on the LLI Property, sample AM-35-2 was collected as a grab sample using the Geoprobe® as oppose to a composite sample.

6) Due to the abandoned sample locations, the MS/MSD at location AM-27 and the duplicate at location AM-33 were not collected.

7) A TPH-d,o sample was collected from location AM-14-2, per the City of Arcata's request.

8) A pile of soil at the south-east corner of the site was sampled as location AM-45, per the City of Arcata's request. Sample AM-45 was a 4-aliquot, composite sample analyzed for TPH-d,o, inorganics, and SVOCs.

9) An additional asbestos containing material sample, AM-46, was collected from the insulation covered pipe in the boiler room. The pipe appeared to have a different insulation type than the remainder of the pipe insulation.

10) Due to slow recharge of groundwater, the following groundwater sample locations were abandoned: AM-01, AM-16, AM-22, and AM-25. Additionally, WESTON only could pump enough water to submit a TPH-g, VOCs, TPH-d,o and inorganics sample at location AM-35.

11) Due to heavy silt load in the groundwater samples, WESTON collected all the samples using a peristaltic pump with a 0.45 micron filter.

12) Sample locations AM-36 and AM-37 had to be relocated because the anticipated dirt roads were concrete. AM-36 and AM-37 were relocated to the side of the concrete.

13) Sample location AM-33 had to be relocated on the South I Street site of the property line, due to thickets.

14) Samples analyzed for TPH-d,o, underwent a silica gel cleanup at the laboratory, due to the high concentrations of potentially interfering organic matter.

APPENDIX D: Laboratory Data

Total Petroleum Hydrocarbons
Soil and Groundwater

Weston Solutions, Inc.

VOCs, SVOCs, Pesticides/PCBs and Metals
Soil and Groundwater

VOCs, SVOCs, and Asbestos

Kiln Sealant and Insulation

Weston Solutions, Inc.