Final Laureldale Groundwater Site Integrated Assessment

Grants Pass, Oregon

Technical Direction Document Number: 08-03-0010

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Prepared for:

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List of Abbreviations and Acronyms

%R	percent recovery
1,1,1-TCA	1,1,1-trichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRQL	Contract Required Quantitation Limit
DQOs	data quality objectives
E & E	Ecology and Environment, Inc.
ECS	ECS Composites, Inc.
EPA	United States Environmental Agency
GC/MS	gas chromatography/mass spectrometric
gpm	gallons per minute
GPS	Global Positioning System
IDW	Investigation-derived waste
IA	Integrated Assessment
LCS	laboratory control sample
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MS/MSD	matrix spike/matrix spike duplicate
NPL	National Priorities List
ODEQ	Oregon Department of Environmental Quality
PA	Preliminary Assessment
PID	photoionization detector
ppm	parts per million
QA	Quality Assurance
QC	Quality Control
R^2	coefficient of determination
RPD	relative percent difference
SOPs	Standard Operating Procedures
SPAF	Sample Plan Alteration Form
SQAP	sampling and quality assurance plan
SQL	sample quantitation limit
SR	Strategy Recommendation
START	Superfund Technical Assessment and Response Team
TCE	Trichloroethylene
TDL	target distance limit
µg/L	micrograms per liter

List of Abbreviations and Acronyms (cont.)

UST	underground storage tank
VOCs	volatile organic compounds

1 Introduction

Ecology and Environment, Inc., (E & E) was tasked by the United States Environmental Protection Agency (EPA) to provide technical support for completion of an Integrated Assessment (IA) at the Laureldale Groundwater Site located in Grants Pass, Oregon. E & E completed IA activities under Technical Direction Document Number 08-03-0010, issued under EPA, Region 10, Superfund Technical Assessment and Response Team (START)-3 Contract Number EP-S7-06-02.

IAs are intended to merge features of the remedial and the removal programs to speed the site evaluation process and save resources by meeting the requirements and goals of multiple programs with one investigation. The field work for this IA simultaneously met both remedial and removal program needs; with many field elements serving both programs. The work detailed in this IA report is primarily to address remedial program requirements; however, removal options and associated costs are included in this document. A separate report will be developed to address other removal program activities and outcomes.

The specific goals for the Laureldale Groundwater Site IA, identified by the EPA, are:

- Provide the EPA with adequate information to determine whether the site is eligible for placement on the National Priorities List (NPL); and
- Document a threat or potential threat to public health or the environment posed by the site.

Completion of the IA included reviewing existing site information, determining regional characteristics, collecting receptor information within the range of site influence, executing a sampling plan, and producing this report. The report is organized as follows:

- Section 1, Introduction – Authority for performance of this work, goals for the project, and summary of the report contents;
- Section 2, Background – Site description, site operations and waste characteristics, and a summary of investigation locations;
- Section 3, Field Activities and Analytical Protocol – Summary of the field effort;
- Section 4, Quality Assurance/Quality Control (QA/QC) – Summary of the laboratory data;

- Section 5, Analytical Results Reporting and Background Samples - Discussion of results reporting criteria and background sample locations and analytical results;
- Section 6, Ground Water Migration Pathway and Targets – Discussion of the ground water migration pathway, sample locations, and analytical results;
- Section 7, Removal Options and Costs – Discussion of potential removal options and estimated costs;
- Section 8, Summary and Conclusions – Summary of the investigation and recommendation for the site based on the information gathered during the investigation;
- Section 9, References – Alphabetical listing of the references cited throughout the text;
- Appendix A, Photographic Documentation – Photographs taken during the sampling event and site visit;
- Appendix B, Sample Plan Alteration Form (SPAF) – A form documenting changes to the sampling plan;
- Appendix C, Global Positioning System (GPS) Coordinates – Latitude and longitude coordinates of sample locations.
- Appendix D, Chain-of-Custody Forms – Forms documenting sample chain-of-custody for the sampling event;
- Appendix E, Data Validation Memoranda – Laboratory results and quality assurance evaluation for all samples; and
- Appendix F, Geologic Cross-Sections – Figures depicting local geology

2 Site Background

This section describes the background of the site including location, description, ownership history, operations and source characteristics, previous investigations, and a summary of the site investigation locations.

2.1 Site Location

Site Name:	Laureldale Groundwater Site
CERCLIS ID Number:	ORN001002684
Site Address:	Laureldale Lane, Grants Pass, Oregon
Latitude:	42.4281 North
Longitude:	-123.2703 West
Legal Description:	Township 36 South, Range 5 West, Section 22
County:	Josephine
Congressional District:	2

2.2 Site Description

The Laureldale Groundwater Site consists of a solvent-related ground water plume in Grants Pass, Oregon (Figure 2-1). The site is in a rural residential area near the Rogue River. The solvent plume has been identified in an area north of Highway 99 (also known as the Rogue River Highway), and in the vicinity of two county roads (i.e., Whispering Pines Lane and Laureldale Lane). The area south of the Rogue River, north of Highway 99, and between Whispering Pines (formerly Woodbury Lane) on the east and Laureldale Lane on the west has been considered the "study area" in former investigations of the ground water plume. This study area was expanded for this investigation and is depicted in Figure 2-2.

Trichloroethylene (TCE) has been detected in nine domestic wells in this area. The source of the ground water plume has not been determined. Two businesses in the area of the plume have been implicated. These are the former Weber Manufacturing and ECS Composites, Inc. (ECS). These are the only two facilities in the area of the ground water plume that are known to have historically used chemicals; however it is possible that other as yet unidentified, potential users of chemicals may exist in the study area.

The use of TCE at Weber Manufacturing has not been confirmed. ECS used TCE as a parts degreaser in 1988. Based on information provided by ECS, TCE was used during an eight- to ten-month period in 1988. (ODEQ 2007)

2.3 Site Ownership History

The Weber Manufacturing property is owned by Russell Weber, who purchased it in 1977. At that time the land had no improvements (E & E 2008b). Weber Manufacturing operated from approximately 1978 until 1999 (ODEQ 2007). No new manufacturing activities have occurred on the property since Weber Manufacturing ceased operations.

ECS has operated at their current location since approximately 1964 (Rosenberg 2003). The business is owned by Dennis Becklin (ODEQ 2007). No information was available on ownership of the property prior to Becklin or uses of the property prior to ECS (Rosenberg 2003).

2.4 Site Operations and Waste Characteristics

The subsections below describe operations and waste characteristics for Weber Manufacturing and ECS; in addition other properties or activities that may be possible sources of TCE contamination are included.

2.4.1 Weber Manufacturing

Weber Manufacturing (also listed in the business registry as REW Products, Inc.) is a former company that manufactured replacement parts called pin-bands which are used in continuous feed form machines (Figure 2-3). The business operated from approximately 1978 until 1999. The Weber Manufacturing property has river frontage on the Rogue River. Remaining site boundaries are adjacent to residential properties. The residential property to the east (3576 Rogue River Highway) is owned by Dennis Becklin; the owner of ECS. The residential property to the south is owned by Alice Weber (353 Laureldale Lane).

The Weber Manufacturing property covers approximately 2 acres and is essentially flat except for the riverbank which drops sharply between 30 and 40 feet to the riverbed. A residence and a small shop where the former manufacturing business operated are present. This shop contained presses, punches, small cutting tools, metal and rolls, drums of metal waste, tables, shipping supplies, and bathroom facilities. The septic system for this property is shared with the Weber residence. The property is completely fenced with a locking gate with the exception of the northern boundary along the Rogue River (ODEQ 2007; E & E 2008).

TCE is not known to have been used at Weber Manufacturing. Chemicals reportedly used at Weber Manufacturing include:

- Mobilemet Omicron (1985 to 1999) – containing mineral oils, petroleum hydrocarbons, and additives;
- Mobile DTE Heavy Medium (1985 to 1999) – containing phosphorodithoic acid;
- WD40 (1985 to 1999) – containing aliphatic petroleum distillates and A-70 hydrocarbon propellant;
- Trimsol (1985 to 1999) – containing petroleum oil as the main component;

- Kerosene (1996 to 1999) – a complex mixture of hydrocarbons from a variety of chemical processes blended to meet standardized product specifications. Composition varies greatly and includes C9 to C16 hydrocarbons. May also contain traces of sulfur and benzene;
- Natural Blue (1997 to 1999) – containing propylene glycol monomethyl ether, MEA oleate, and tetrasodium, ethylenediamine tetraacetate; and
- Safety-Kleen 105 P/N 6609 (1993 to 1999) – containing mineral spirits (composed of C9 to C13 saturated hydrocarbons), aromatics, toluene, xylene, and ethylbenzene. (ODEQ 2007)

2.4.2 ECS Composites, Inc.

ECS is a manufacturing facility that produces fiberglass shipping and packaging containers (Figure 2-4). The facility is on approximately 3 acres. An 80,000 square foot office and manufacturing building is present. ECS has conducted manufacturing operations on the existing property since the 1960's and has occupied the existing building since 1979 (ODEQ 2007). In 1979, the original ECS manufacturing building was devastated by a major fire. A map depicting the original configuration of the facility is depicted in Figure 2-5. The facility employs approximately 240 people and runs one full day shift and one half evening shift (E & E 2008b).

Land at ECS is nearly flat. The ECS property is zoned rural industrial and is surrounded by residential properties (ODEQ 2007). It is bordered by the Rogue River Highway on the south, residential properties to the west and east, property owned by Casbar Point Trust (a Becklin family trust) to the north, and a storage facility to the southeast.

In 1989, the facility consisted of five major areas including a building containing the mold room, resin storage, and mold storage; the assembly area; the shipping and finish area; the foam shop; and the metal fabrication building. A water supply well is located on the property. The facility uses a septic tank and drain field for its sewage system (Figure 2-6; Rosenberg 2003). Both pre- and post-fire stormwater at the facility has been collected in catch basins connected to drain lines that discharge to the Rogue River (see Figures 2-5 and 2-7, respectively).

In 1989, ECS was described as a custom fabricator of containers used to hold electronic equipment, sensitive hardware, and other objects of value requiring hermetically sealed conditions for storage and protection. The containers made from one or more polyester resins, epoxy resins, polyurethane resins and/or polypropylene. ECS purchased bulk resins in 55-gallon drums. The resins were stored inside next to the mold room and mold storage area. Paints and resin pigments were purchased in 1 to 5 gallon containers. No information was available on where paints and resin pigments were stored. Solvents used to clean equipment and tools at ECS included methylene chloride, acetone, and butyl cellosolve. (Rosenberg 2003)

Three underground storage tanks (USTs) were decommissioned and removed from the ECS facility in 1989. Two of the USTs were used for gasoline storage and one UST was used for acetone storage. Confirmation samples were non-detect for benzene, toluene, ethylbenzene, total xylenes, and acetone (ODEQ 2005; ODEQ 2007). The USTs were located near the current flammable materials storage shed. Since 1989, acetone, which is used as a general solvent in almost all production areas, has been delivered to the facility in 55-gallon drums (Kuhs 2008b).

According to ECS, a search of their records in 1994 showed only one degreasing solvent containing significant percentages of TCE in use at the facility since the early 1980s (Rosenberg 2003). Based on information provided by ECS, TCE was used as a parts degreaser during an eight to ten month period during 1988. ECS purchased a vapor degreaser in early 1988 for use in cleaning metal parts. The degreaser was decommissioned in November 1988. Also during early 1988, ECS reportedly purchased 660 pounds (i.e., about 53 gallons) of TCE from Van Water and Rogers in Portland, Oregon. The delivery of TCE reportedly arrived in one 55-gallon drum. Upon decommissioning the vapor degreaser in November 1988, a total of 75 gallons of TCE and TCE-contaminated sludge were shipped from ECS to Missouri for disposal (ODEQ 2007).

In April 1994, ECS engaged the Safety-Kleen Corporation for the maintenance of a parts cleaning station. The maintenance agreement includes removal of old solvent/contaminants and replacement with new solvent (Rosenberg 2003). Two wash water booths and an acetone recycler unit were in operation at ECS. Sludges from the booths were placed in drums and stored “at the back of the facility”, then sent to the local landfill for disposal. In 2003, following an inspection of the ECS facility, Oregon Department of Environmental Quality (ODEQ) inspectors reported that ECS representatives had stated that the sludges from the wash booths and an acetone recycler were placed in the dumpster. No information was available on the make-up of the sludge waste. (Gasik 1994; Rosenberg 2003)

In 2008, ECS stated that prior to August 2006, waste acetone was collected in 55-gallon drums and transported off-site by Safety Kleen. ECS reported in 2008 that the acetone recycler unit was purchased in August 2006. This information appears to conflict with the earlier report by ODEQ that this unit was present in 2003 during their inspection. In 2008, ECS reported that approximately every 4 to 6 months, residue that collects in the recycler is transported off-site for disposal. (Kuhs 2008b)

Relating to other solvents used at their facility, ECS reported in August 2008 that they include lacquer thinner, butyl cellosolve, and the Safety Kleen serviced parts washer previously discussed. The lacquer thinner is used in the “pad area” of their production area. Small quantities are used to dissolve foam cushions. This lacquer thinner is completely used in the process. ECS reports lacquer has been used at their facility since 1993. Butyl cellosolve is used in a different production

area as a solvent for their silk screening process. Waste butyl cellosolve is collected into 55-gallons drums and transported off-site for disposal by a disposal contractor (Univar Corporation). ECS reports that approximately 190 gallons of this solvent has been used at their facility since 1993. (Kuhs 2008b)

2.4.3 Other Possible Sources

Port-a-Potty Business - In an e-mail to ODEQ written in January 2004, a representative of ECS speculated that a former port-a-potty business may be the source of TCE contamination in groundwater. This business reportedly operated from a location on Nancy Place; however, the exact address was not provided. The ECS representative stated in this e-mail that residents adjacent to this business had expressed concerns about this operation. (Weidig 2004)

ODEQ researched this concern and responded via e-mail in February 2004. In this e-mail, ODEQ stated the business was called "DnD Porta Potti" which moved from its Nancy Place location in 1991. The owner of this business reported to ODEQ that the port-a-potty toilet holding tanks were currently filled with an enzyme-based product which also contained perfumes. When the business operated from Nancy Place, a product containing 20% formaldehyde was used; however, the owner stated that no products containing TCE or similar compounds ever were used. ODEQ also noted that the two domestic wells nearest to this business' former location (i.e., 201 Nancy Place and 255 Nancy Place) did not contain TCE when sampled. (Nichols 2004)

Area Septic Tanks – TCE is known to have been used in commercial septic tank biocide products. Commercial septic tanks may exist at RV and mobile home parks. One RV park and three mobile home parks are located within 0.5 mile of the study area. The locations of these parks are depicted on Figure 2-8. Use of septic tank cleaners containing TCE at these parks has not been determined.

Aircraft Building – During one period of time, a business called Chief Aircraft operated from 345 Whispering Pines Lane. This business built kit airplanes; and also was reported by one area resident as having manufactured aircraft parts. This business is no longer in operation at this location. The years of operation are not known. It is possible that this business may have used TCE for parts cleaning; however, its use at this location has not been confirmed.

2.5 Previous Investigations

2.5.1 Areawide

Under the 1989 State of Oregon Groundwater Protection Act, the ODEQ and the Oregon Water Resources Department cooperatively monitored and assessed the quantity and quality of ground water resources in the Grants Pass area. As a part of the assessment, the Laureldale Lane Area was targeted for evaluation due to its hydrogeologic limitations and vulnerability to ground water contamination. Initially, ground water was collected from one domestic well located at 296 Laureldale Lane. This well was sampled three times in 1990 and analyzed for volatile organic compounds (VOCs). No VOCs were detected.

In 1994, the monitoring was expanded to include three additional domestic wells located at 178 Laureldale Lane, 3525 Rogue River Highway, and 345 Woodbury Lane. The samples were analyzed for VOCs, metals, pesticides, and nitrates. These samples contained TCE; 1,1-dichloroethene (1,1-DCE); 1,1,1-trichloroethane (1,1,1-TCA); and 1,2-dichloroethane (1,2-DCA) in varying combinations (Rosenberg 2003). Nitrates also were detected as were a few metals considered to be common earth crust elements. No pesticides were detected (Weick 1994).

As an outcome of the TCE ground water contamination discovery, ODEQ searched for and contacted facilities in the area (i.e., Weber Manufacturing and ECS) that may have used TCE in their processes; and later sampled 21 wells in the study area between September 2003 and October 2004. Some of these wells were sampled more than once over this interval. Analytical results indicated the presence of TCE in eight domestic wells with concentrations in six of the wells above the EPA Safe Drinking Water Act Maximum Contaminant Level (MCL) of 5 micrograms per liter (µg/L). Maximum TCE concentrations per well are provided in Figure 2-9. Subsequently, ODEQ installed carbon filtration treatment units on all eight of the impacted wells. Each unit has two carbon filters. ODEQ has conducted operation and maintenance of these filtration units since they were installed. Each filtration unit has a spigot for sampling prior to treatment, one between the two carbon filters, and one post treatment. In addition to the impacted wells discover by ODEQ, ECS identified a ninth impacted domestic well, a private well owned by Dennis Becklin. Mr. Becklin installed a carbon filtration unit on this well.

In 2007, ODEQ completed a Preliminary Assessment (PA) of the Laureldale Groundwater Study Area to evaluate potential solvent contamination in shallow ground water and soil on the former Weber Manufacturing site and in surrounding domestic water supply wells within the study area. ODEQ collected eight domestic water samples from residential wells fitted with the carbon filters. Samples were collected both before and after the treatment systems to determine whether the treatment systems were adequately effective and to assess the current levels of TCE in area ground water. The PA report only included pre-treatment results. All samples were analyzed for VOCs using EPA Method 8260B. Pre-treatment sample results are presented in Table 2-1 and depicted on Figure 2-10. TCE was detected in seven of the eight wells prior to treatment. These concentrations ranged from 1.16 to 39.1 µg/L. No other VOCs were detected. One sample contained TCE following the treatment system, indicating that this system was not functioning properly. At the time of sampling, the wells serve a total of 14 people as follows:

- 259 Laureldale Lane – 1 person
- 287 Laureldale Lane – 2 people
- 296 Laureldale Lane – 2 people
- 345 Woodbury Lane – 2 people

- 353 Laureldale Lane – 1 person
- 377 Laureldale Lane – 2 people
- 434 Laureldale Lane – 2 people
- 410 Woodbury Lane – 2 people

In July 2008, ODEQ resampled the domestic wells with carbon filtration treatment systems. ODEQ sampled each well prior to treatment, between the two carbon filters, and post treatment. All samples were analyzed for VOCs using EPA Method 8260B. Sample results are presented in Table 2-2 and depicted on Figure 2-11. TCE was detected in seven of the eight wells prior to treatment. These concentrations ranged from 1.00 to 42.7 µg/L. No VOCs were detected in samples collected between the carbon filters or post treatment.

2.5.2 Weber Manufacturing

As a part of the PA performed in 2007, ODEQ conducted shallow soil and ground water sampling from borings located in areas where disposal of TCE at Weber Manufacturing, if ever used at the facility, would likely have occurred. These included those areas outside of doorways, the area east of the shop where metal debris had reportedly been disposed of in the past, and the septic system. A total of seven boreholes (SB1 through SB7) were drilled to depths ranging from 13.5 to 22 feet below ground surface (bgs; Figure 2-12). Soil samples were collected every 4 feet and screened for VOCs in air headspace. With the exception of one sample (i.e., SB5 with 8 parts per million VOCs), VOCs were not detected. No chemical odors were noted.

Soil sampling focused on the unsaturated zone, between depths of 3 and 11 feet bgs, and intentionally avoided sampling beneath the water table. The soil samples collected from around the former machine shop (i.e., SB3 through SB7) were collected from shallower depths (generally between 3 and 7.5 feet bgs), which are the depths most likely to contain contamination resulting from surface spills. Soil samples near the septic system drain field (i.e., SB1 and SB2) were deeper (i.e., 13.5 and 15.5 bgs, respectively) since the drain lines were expected to be as deep as 4 feet. A total of seven soil samples were submitted for off-site fixed laboratory analysis of VOCs using EPA Method 8260B from soil horizons suspected as being most likely to contain contamination based on either headspace results or depth. No VOCs were detected in the soil samples.

One ground water sample was collected from each borehole (GW-1 through GW-7). Ground water was encountered at depths ranging from 12.5 to 14.5 feet bgs. All ground water samples were submitted for off-site fixed laboratory analysis of VOCs using EPA Method 8260B. Following sampling, all boreholes were abandoned in accordance with Oregon Department of Water Resources regulations. Sample results are provided in Table 2-3. Several petroleum-related VOCs were detected in ground water near the former machine shop; however, TCE was not detected in any ground water sample. Detected VOCs included benzene at 1.31 and 1.24 µg/L, toluene ranging from 1.82 to 120 µg/L, and m,p-xylene at 2.73 µg/L; all at levels below their respective MCLs, of 5 µg/L, 1,000

µg/L, and 10,000 µg/L respectively. The chemical p-isopropyltoluene was detected at 45.7 µg/L in ground water near the septic system drain field. An MCL for this contaminant has not been established.

The PA concluded with respect to shallow ground water on the Weber Manufacturing property, it was possible that the observed contamination was due to gasoline. None of these contaminants were detected in the nearby residential wells, including the Weber residential well located between the machine shop and the Rogue River, indicating that, although these contaminants could migrate to deeper ground water, they were not currently posing a significant threat to nearby domestic wells. The PA also concluded that Weber Manufacturing did not appear to be the source of TCE contamination in ground water in the study area. Based on this PA, ODEQ recommended no further investigation of TCE at Weber Manufacturing.

2.5.3 ECS

In December 1989, ODEQ Hazardous Waste staff inspected ECS due to complaints of fugitive air emissions. Based on this inspection, ODEQ staff noted that several solvents including methylene chloride, acetone, and butyl cellosolve were being used to wipe down equipment and tools. No liquid hazardous wastes were generated and the wipe down rags were disposed in the landfill (presumably the county municipal landfill) after air drying. At the time, ODEQ found that process emissions were insignificant and consistent with the land use designation for the property. TCE was not reported as a solvent used at the facility; possibly since the degreaser unit had been removed by this time (ODEQ 2007).

As an outcome of the 1994 discovery of a solvent plume in the Laureldale Lane area, ODEQ looked for nearby facilities that were using or had used TCE and identified one business, ECS, as having used this compound. In July 1994, ODEQ inspectors re-visited the facility. It was during this site visit that ECS reported their 1988 former use of TCE in a parts degreaser (described in Subsection 2.4.2 above).

In 2003, ODEQ conducted a site evaluation of the ECS property and issued a strategy recommendation (SR). The SR was for sampling of area wells and for further investigation of ECS as a potential source (Rosenberg 2003).

In response to the SR, ECS conducted independent investigations of its property between January 2004 and March 2005. This work was conducted without ODEQ oversight. Following review of the work conducted by ECS, ODEQ concluded that the data did not yield enough information to either confirm or rule out ECS as a source of TCE. Meanwhile, ECS had concluded, based on their work, that Weber Manufacturing was the most likely source of TCE in groundwater (ODEQ 2007). These ECS investigations are described in the following paragraphs.

In January 2004, four soil samples were collected from 3 feet bgs by environmental consultants for ECS near the septic system drainfield. Two were from approximately 12 feet east of the septic tank (Samples #1 and #2) and two were composite samples of soil collected from the north and south ends of the center lateral drainfield lines (Samples #3 and #4). Samples #1 and #3 were analyzed for VOCs (EPA Method 8260B) and samples #2 and #4 were analyzed for eight metals consisting of mercury, arsenic, barium, cadmium, chromium, lead, selenium, and zinc (EPA Methods 7471A and 6010B). No VOCs were detected. Metals concentrations were 0.0405 and 0.0400 milligrams per kilogram (mg/kg) for mercury, 93.0 and 69.5 mg/kg for barium, 0.344 and 0.269 mg/kg for cadmium, 31.8 and 29.8 mg/kg for chromium, and 4.27 and 4.31 mg/kg for lead. The remaining metals were not detected. The sample locations were not depicted on a figure (ODEQ 2005; Kuhs 2008b).

In March 2004, ECS hired an environmental consulting firm to conduct soil and ground water sampling on their property. This investigation was conducted without ODEQ oversight. At the time of this investigation, a total of 11 soil borings were drilled (i.e., B1 through B9, B12, and B13; Figure 2-13). Using a Geoprobe™ direct push drill rig, five boreholes were placed along the west property boundary, four along the north property boundary, and two near the septic drain field. The depth of the boreholes ranged between 12 and 19 feet bgs. Two soil samples were collected from each boring, one at the soil/water interface and one from 7 to 15 feet bgs. One water sample was collected from each boring at the depth that ground water was first encountered. Samples were submitted for VOC analysis using EPA Method 8260. VOCs were not detected in soil or ground water samples (Strickler 2004d; ODEQ 2005).

In December 2004, one mechanical press was replaced. Three soil samples were collected from the excavation created when removing the press foundation (Figure 2-14). The press pit is located within the manufacturing building in the area that once housed the TCE degreaser unit (E & E 2008b). This sampling work was conducted without ODEQ oversight. Two samples were from the excavation sidewalls (S-1 and S-2) and one was from the bottom of the excavation (S-3). Sample S-1 was collected from the south excavation sidewall at a depth of 3 feet bgs and sample S-2 was collected from the north excavation sidewall at a depth of 3.2 feet bgs. Sample S-3 was collected from a depth of 5.25 feet bgs. Samples were analyzed for VOCs using EPA Method 8260 (Strickler 2004a).

Analysis of these samples indicated the presence of methylene chloride in all samples at concentrations ranging from 0.62 to 0.82 mg/kg. This analyte was also detected in the laboratory method blank associated with this batch of samples, indicating that it may have been introduced into the samples from the laboratory equipment. Methylene chloride is a common laboratory contaminant. These samples were reanalyzed two days later. This latter set of sample results did not indicate the presence of methylene chloride. No other VOCs were detected in either analytical run (Strickler 2004a).

In March/April 2005, environmental consultants for ECS conducted follow-on sampling at ECS to supplement the original site investigation conducted in March 2004. This work also was conducted without ODEQ oversight. The intent of the sampling program was to determine the condition of deeper soils and ground water in greater detail than had previously been done at the property. To this end, four borings were advanced using a hollow-stem auger drill rig along the west and north property line (HSA-1 through HSA-4). Boring locations are depicted on Figure 2-15 (Strickler 2005b).

Two soil samples were collected from borings HSA-1, HSA-2, and HAS-4; only one soil sample was collected from boring HSA-3; apparently due to poor sample recovery caused by the presence of dense river gravels encountered in the boring. Soil sample depths were 11.5 feet bgs and 21 feet bgs with the exception of borings HSA-1 and HSA-4, which had deeper sample depths of 34 feet bgs and 41 feet bgs, respectively. All borings were advanced to a total depth of 50 feet bgs. Groundwater was present in borings a depths ranging from 30 to 35 feet bgs. A ground water sample was collected from each boring using new, disposable polyethylene bailers. All ground water samples were described on the chain-of-custody form as "very silty." All soil and ground water samples were analyzed for VOCs using EPA Method 8260B (Strickler 2005b).

No VOCs were detected in the soil samples. TCE and toluene were detected in three water samples each. TCE concentrations ranged from 9.0 to 10 µg/L. Toluene concentrations ranged from 1.8 to 2.3 µg/L. TCE and toluene concentrations are provided on Figure 2-15. All TCE concentrations were above the EPA MCL of 5 µg/L (Strickler 2005b). No toluene concentrations exceeded the EPA MCL of 1,000 µg/L.

In July 2005, five more ground water samples at the ECS facility were collected by environmental consultants hired by ECS to determine the environmental condition of ground water during the summer irrigation season. This work also was conducted without ODEQ oversight. Four new borings were installed as close as possible to the previous borings HSA-1 through HSA-4 on the west and north property boundary. These new borings were given the designations, "HSA-5 through HSA-8" (Figure 2-16). As before, these borings were installed with a hollow-stem auger drill rig to 50 feet bgs. Five ground water samples were collected from the borings (GW-1 through GW-5). GW-3 and GW-4 were duplicate samples. Once again, new, disposable polyethylene bailers were used to collect the ground water samples. The samples were analyzed for VOCs using EPA Method 8260B. (Strickler 2005a)

Acetone was detected in GW-1 at 25 µg/L, toluene was detected in GW-2 at 0.71 µg/L, and TCE was detected in GW-2, GW-3, GW-4, and GW-5 at concentrations ranging from 3.5 to 18 µg/L (Figure 2-16; Strickler 2005b). Acetone once was stored in an UST at the site, as was gasoline. The location of the former USTs was near the south-central portion of the property. It is possible the detections of

acetone and toluene may be related to leaks from the former acetone and gasoline USTs or from the former use of these products at the site.

2.5.4 Becklin Private Property

At some time in the past, the property line between Weber Manufacturing and Mr. Becklin's private property had been mis-surveyed. When the error was noticed, the property line was resurveyed, resulting in the adjustment of the property line approximately 10 feet to the west. Reportedly, waste from the Weber Manufacturing facility was deposited east of the old property line resulting in this waste being on the Becklin property following the adjustment of the property line. The waste included small metal punches, or chads. The chads were concentrated in shallow soils around fence line gate posts. The chads were spread over an area approximately 8 feet wide by 14 feet long. In 2004, these soils were removed with metal shovels and were placed into a labeled 55-gallon drum. Approximately 0.3 cubic yards of soil and chads were removed from the area. The chads were spread over an area approximately eight feet wide and 14 feet long. No stained soil or odors were observed within the chad removal area (Strickler 2004c). ECS reports that the drum of chads was disposed a year later in July 2005 along with several other drums of soil and water from borings drilled in 2005. The disposal and transport paperwork provided by ECS to document this disposal does not provide sufficient detail to confirm that this drum was a part of this shipment (Kuhs 2008c).

In 2004, two soil samples were collected by environmental consultants for ECS from the two areas observed to hold the most metal chads. The soil samples were collected at a depth of 1 foot bgs. The samples were analyzed for VOCs using EPA Method 8260 and heavy metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by EPA Methods 7471A and 6010B. No VOCs were detected. Arsenic, cadmium, selenium, and silver also were not detected. Barium, chromium, lead, and mercury were detected in the soil samples. All but mercury had concentrations below EPA Region 9 residential preliminary remediation goals (Strickler 2004a). The report for this site investigation does not include a sample location map. A representative for the facility indicated that a map is not available (Kuhs 2008a).

In February 2004, it appears that two locations were sampled on Mr. Becklin's private property at 3576 Rogue River Highway. A sample location map was not provided for this work making it difficult to determine which property was sampled. One sample was collected from approximately 10 feet north of the well (presumably Mr. Becklin's private well) at a depth of 4 feet bgs and one sample was collected from approximately 13 feet south of the well and west 18 feet at a depth of 3.5 feet bgs. The samples were analyzed for VOCs (EPA Method 8260B) and eight metals consisting of mercury, arsenic, barium, cadmium, chromium, lead, selenium, and zinc (EPA Methods 7471A and 6010B). No VOCs were detected. Metals concentrations were 93.3 and 69.1 mg/kg for barium, 17.6 and 13.2 mg/kg for chromium, and 3.19 and 2.23 mg/kg for lead. The remaining metals were not detected. (ODEQ 2005; Kuhs 2008b)

In March 2004, environmental consultants hired by Mr. Becklin conducted a second round of sampling of his private property. Two borings (B-10 and B-11) were drilled in the vicinity of the domestic well located on the Becklin property. A map depicting sample locations was not provided in the summary report generated for this work (Strickler 2004b, c). A representative for the facility indicated that a map is not available (Kuhs 2008a).

The borings were advanced using a Geoprobe™ direct push drill rig. Two soil samples were collected from B-10 (i.e., one at 15 feet bgs and one at 19 feet bgs) and B-11 (i.e., one at 13 feet bgs and one at 18 feet bgs). Additionally, one ground water sample was collected from each boring. All soil and ground water samples were analyzed for VOCs using EPA Method 8260. No VOCs were detected in these samples (Strickler 2004b, c).

In July 2004, environmental consultants hired by Mr. Becklin conducted another round of sampling of his private property near the Weber Manufacturing property line. The investigation was conducted to determine whether disposal of manufacturing debris from Weber Manufacturing on the west property line had affected soil and ground water on the Becklin property. In total, four borings were installed (B-14 through B-17) along the western property line. A map depicting sample locations was not provided in the summary report generated for this work (Strickler 2004b, c). A representative for the facility indicated that a map is not available (Kuhs 2008a).

All borings were advanced using a Geoprobe™ direct push drill rig. The borings were advanced to 15 feet bgs. One soil sample was collected from borings B-14 through B-17; all at 15 feet bgs. Additionally, one ground water sample was collected from boring B-16. Groundwater was encountered at a depth of approximately 10 to 15 feet bgs in most of the borings. All soil and ground water samples were analyzed for VOCs using EPA Method 8260. No VOCs were detected in any of the samples (Strickler 2004b, 2004c).

In October 2007, environmental consultants for ECS conducted a characterization program on Mr. Becklin's private property to attempt to determine the source of VOCs to ground water in the area. This work appears to have been conducted without ODEQ oversight. For this effort, six soil borings were drilled (B-1 to B-6) as close to the western property fence line and the former Weber Manufacturing shop as possible. A map was not supplied for these sample locations. The borings were advanced using a track-mounted roto-sonic drill rig. Boring depths ranged from 20 to 40 feet bgs. Soil samples were collected continuously from the surface to the total depth of each boring. The soil cores were vibrated from the core barrel into new, clean polyethylene bags. The soil bags were sealed at both ends, perforated, and the soil cuttings screened with a photoionization detector (PID). Soil samples for laboratory analyses were collected at 10-foot intervals or from areas with elevated PID readings. Two to four soil samples were collected per boring. (Strickler 2007)

Based on elevated PID readings in soil cuttings, ground water samples were collected from borings B-5 and B-6. These samples were collected using new, disposable polyethylene bailers. All borings were abandoned following sampling. All soil and water samples were analyzed using EPA Method 8260B. PID readings ranged from 40 to 240 parts per million (ppm) in three samples. At boring B-5, a PID reading of 40 ppm was recorded at an approximate depth of 4 feet bgs, and a reading of 240 ppm was recorded at an approximate depth of 16 feet bgs. At boring B-6, a PID reading of 223 ppm was recorded at an approximate depth of 18 feet bgs. Each of these soil intervals was selected for laboratory analysis. No VOCs were detected in these samples, or in other soil samples. Likewise, no VOCs were detected in the two ground water samples. Both ground water samples were collected near to the highest PID reading in borings B-5 and B-6. (Strickler 2007)

In the February 2008, Mr. Becklin installed two monitoring wells on his private property. One was installed in the area of the former chad pile (Well 2). The other was installed west of this location (Well 1). Both wells were installed and designed to match as closely as possible the pre-existing Becklin domestic well (E & E 2008b). Both were drilled to 100 feet bgs. No soil samples were collected during installation. Soil cuttings were not screened with a PID during drilling (Kuhs 2008a).

Since installation, these wells have been sampled seven times and analyzed for VOCs using EPA Method 524.2. A summary of analytical results is provided in Table 2-4. In most cases, Mr. Becklin's private well was sampled at the same time as the monitoring wells. These results have been included in Table 2-4 for comparison purposes. TCE and toluene have been detected in both monitoring wells. TCE was detected in all three wells during each round of sampling. Concentrations ranged from 14.7 to 61.5 µg/L, exceeding the EPA MCL of 5 µg/L in all instances. Toluene was detected in both monitoring wells during each round of sampling with the exception of one round in Well 1. Concentrations ranged from 0.5 to 55.6 µg/L. Toluene was not detected in Mr. Becklin's private well and did not exceed the EPA MCL of 1,000 µg/L in any well.

2.5.5 Rogue River Seeps

On September 20, 2005, ECS conducted a sampling effort of seep water emanating from the southern bank of the Rogue River. A summary report of this work was not provided; only analytical data forms which provide a sample number. Based on the analytical data forms, it appears that 39 seep water samples were collected. All samples were analyzed for VOCs using EPA Method 524.2. TCE was not detected in any of these samples; however, bromomethane was present in three samples ranging from 0.0009 to 0.0016 milligrams per liter (mg/L; Kuhs 2008a).

2.6 Site Visit

E & E conducted a visit of the site on July 8 and 9, 2008. E & E was accompanied throughout the site visit by representatives from EPA and ODEQ. The site visit consisted of a drive-through of the study area, noting the locations of homes, topography, and irrigation canals. The site visit also included a site walk of the Former Weber Manufacturing facility, ECS, and portions of Mr. Becklin's private property. Photographs were taken and are included as Appendix A. The site visit of each property is discussed below:

Weber Manufacturing – The site visit of Weber Manufacturing was conducted on July 8, 2008. Russell and Judy Weber (property owners), Jonathan Williams with Environmental Management Services (environmental consultant), and Dwayne Schultz (attorney) were present for the site visit.

The riverbank along the Rogue River was viewed. The Weber Manufacturing property borders the south bank of the river and sits at an elevation approximately 40 feet above the water. Seeps exit the bank above the water. Although the seeps could not be viewed from the Weber Manufacturing property due to undercutting of the riverbank in this area, the seeps could be heard discharging to the water below. Mr. Weber reported that the water volume of the seeps is greater during the six months of the year that the irrigation canals in the area are in use. Mr. Weber stated that most of the sprinklers used in the neighborhood were using water from the irrigation district, rather than private wells.

The former Weber Manufacturing shop was viewed. The shop currently is being used for storage of miscellaneous items. The shop is divided into two offices, a bathroom, and four work areas. A carport is present on the northeast corner of the building. One of the work areas formerly had a self-contained Safety Kleen™ station. The only drains in the building are those associated with the shower, toilet, and sink in the bathroom. Mr. Weber stated that these drains are tied into the on-site septic system. No stains in the concrete foundation were observed; although several cracks in the foundation were noted.

Mr. Weber reported that there once was a 500-gallon above ground diesel storage tank on the property. The tank was located just south of the storage building (i.e., this building is just north of the manufacturing building). It was used for approximately 2 years beginning in 1981 to store diesel for use in Mr. Weber's personal automobiles.

The east fence line was walked. This fence line borders Mr. Becklin's private property. No evidence of metal chads were observed. No stained soils were observed around the former manufacturing building. Land on the east side of the manufacturing building is used for storage; primarily of windows, garden supplies, and burn barrels. The area of the septic drain field was viewed, as was the location of the septic vault. Mr. Weber reported that there are about four drain lines in the septic drain field. He stated he believes they are 60-foot lines. The septic vault has a capacity of 1,200 gallons.

The filtration system on the wellhead was viewed. This system includes a canister for sediment collection and two in-series carbon filters, followed by a second sedimentation canister for collecting carbon particles carried by the water after filtration. Three spigots for sampling are present: one prior to the carbon filters, one between the carbon filters, and one following the carbon filters.

ECS - The site visit of ECS was conducted on July 9, 2008. Dennis Becklin (ECS chairman and CEO) and Ted Bennett (executive vise president and CFO) were present for the site visit.

The site visit began with a briefing in the company's offices. Mr. Becklin stated ECS has not received any notices of violation from ODEQ in the history of their operation. The company had made a copy of all material safety data sheets (MSDS), analytical data forms, regulatory correspondence, and reports of former investigations in support of this site visit.

Allegations related to the former port-a-potty business were discussed. Mr. Becklin stated this company went by "DnD" and while still active, it no longer operates from the Nancy Place location. Mr. Becklin was unsure of the address for the business' former location, but believes it was at 223 Nancy Place.

The site walk began in the parking lot south of the office building. This is the area that once contained the manufacturing building that burned in 1979. Mr. Becklin stated that neither that building nor the current manufacturing building contain floor drains. Currently, this area is paved; having catch basins for stormwater control. Paving occurred in 1989.

The flammable materials storage shed was viewed. This building is constructed of cinderblock with a poured concrete foundation, has no floor drains, and is dammed at the door to provide secondary contaminant in the event of a release. The shed stores 55-gallon drums of acetone and lacquer thinner.

The hazardous waste storage area is present under the roof of the main manufacturing building near a shipping and receiving ramp. This area is surrounded by a locking chain-link fence. At present, 55-gallon drums of waste oil (i.e., cutting fluid from the milling machines), a 250-gallon tank of waste oil, and a 55-gallon drum containing waste rags are in the area. With the exception of the drum of waste rags, all drums and the tank have secondary containment. ECS contracts with a disposal company for hazardous waste removal.

The locations of the borings that were drilled on the west and northwest property boundaries were observed. One small (approximately 1 foot by 2 feet) area of stained soil was observed near the west property line; as was a small wet area.

The area of the septic system tanks and drain field were observed. The location of the drain field lines are evidenced by greener grass over them. It appears there

are four or five drain lines. The depth of the lines is 18 inches (Kuhs 2008c). The system has three in-series septic tanks, one being 2,000 gallons, the second also being 2,000 gallons, and the third being 300 gallons (Kuhs 2008b).

The facility contains several sump pumps and catch basins for stormwater collection. These flow to a central line which runs along the main access road. The central line flows to the north; discharging into the Rogue River. The date the stormwater collection system was installed is not known (Kuhs 2008c).

A storage yard is present to the north of the septic system. This yard is fenced and has a row of cargo containers on the south side. These containers are used to store items required for product manufacturing. One container is used by the grounds keeper for storage of garden and maintenance supplies. The storage yard contains several stacked piles of firewood on the north side. Out of service equipment and an RV also are located in this area. Other RVs are stored on the east side of the yard. Stained soil was not observed in this area.

The main manufacturing building was also toured. All process and manufacturing areas were viewed. No floor drains were noted; however, several cracks in the concrete foundation were present. The area that once contained the TCE degreaser was viewed. A press is currently present at this location.

Mr. Becklin's Private Property – As previously discussed, in the spring of 2008, Mr. Becklin installed two wells to monitor TCE concentrations on his property. Both were drilled to approximately 100 feet bgs to match the depth of his private drinking water well. One well is positioned on the location of the former chad pile. The other is located to the east of this well and Mr. Becklin's private well. Mr. Becklin indicated the well placement was intended to allow for triangulation of groundwater in this area for TCE monitoring. The location of the three wells was observed. The Weber Manufacturing shop can be seen over the privacy fence in this area. A few remaining metals chads were observed near the fence line.

2.7 Post-Site Visit ECS Work

Following the site visit for this IA, ECS conducted sampling on their property to address concerns relating to observed wet and stained soil visible on the ground on the west side of the main manufacturing building. ECS determined the wet material was from distilled water mixed with vinegar that had been used to clean out oil and other foreign substances from heat exchangers. They sampled this soil; analyzed it for metals (EPA Methods 7471A and 6010B); TPH as diesel, gasoline, and lube oil (Method NW-HCID); and VOCs (EPA Method 8260B). Metals present were mercury (0.0514 mg/kg), barium (97.2 mg/kg), cadmium (2.98 mg/kg), chromium (29.7 mg/kg), and lead (11.8 mg/kg). No TPHs or VOCs were detected in the sample. (Bennett 2008)

They also took a sample of the rag and of the oily soil. They suspected this material was heating oil from their presses. These samples were analyzed for

TPH as diesel and lube oil (C24 to C40 range; Method NWTPH-Dx). The rag contained 4,260,000 mg/kg lube oil; while the soil contained 170,000 mg/kg lube oil. Both samples were non-detect for TPH as diesel. The MSDS for heating oil used at the ECS facility indicates this material is 100% minerals spirits. The lab determined that the analytical results resembled the MSDS sheet. (Bennett 2008)

In August 2008, ECS conducted an investigation of a drain cleanout in the vicinity of the former acetone UST. During the investigation, a video camera inspection was conducted of the drain line which was found to drain to a nearby truck unloading dock. Also, seven soil samples were collected for VOC analysis (EPA Method 8260B). Two samples were collected from three shallow Geoprobe™ borings placed near the drain cleanout: one from 0.5 foot bgs and one from 1 foot bgs. In addition, one surface soil sample was collected near the soil borings. No VOCs were detected in these samples. A map depicting these sample locations is not available. (Strickler 2008; Kuhs 2008a)

2.8 Summary of IA Locations

Sampling under the Laureldale Groundwater Site IA was conducted at those areas that may have been contaminated with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-regulated hazardous substances. Sampling of potential sources was not included in this IA. Based on a review of background information and discussions with ODEQ, the following areas or features were identified for investigation under the Laureldale Groundwater Site IA.

Sources:

- A source of TCE contamination in the study area has not been identified. Additional information is required to postulate likely source locations, such as ground water direction of flow and more complete information about the configuration of the current ground water plume. For these reasons, sampling at potential source locations will take place as a component of a follow-up investigation.

Targets:

- **Domestic Wells:** Nine domestic wells in the study area are known to be impacted by TCE contamination. This IA is intended to assist in determining whether additional wells are being affected.

Table 2-1 2007 ODEQ Domestic Well Sample Results (µg/L)

Analyte	259 Laureldale	287 Laureldale	296 Laureldale	345 Woodbury	353 Laureldale	377 Laureldale	434 Laureldale	410 Woodbury
Pre-Treatment								
TCE	**1.92**	**1.16**	**3.52**	<0.5	**14.9**	**2.54**	**39.1**	**6.97**

Source: ODEQ 2007.
Note: Bold type indicates the sample result is above the detection limit

Key:
< = Not detected at or above the indicated method reporting limit.
TCE = Trichloroethene.
µg/L = micrograms per liter.

Table 2-2 2008 ODEQ Domestic Well Sample Results (µg/L)

Analyte	259 Laureldale	287 Laureldale	296 Laureldale	345 Woodbury	353 Laureldale	377 Laureldale	434 Laureldale	410 Woodbury
Pre-Treatment								
TCE	**4.23**	**1.00**	**3.64 (3.81 dup)**	< 1.00	**18.0**	**13.2**	**42.7**	**12.2**
Mid-Treatment								
TCE	< 1.00	< 1.00	< 1.00	< 1.00	**1.18**	< 1.00	< 1.00	< 1.00
Post-Treatment								
TCE	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00

Source: ODEQ 2008.
Note: Bold type indicates the sample result is above the detection limit.

Key:
< = Not detected at or above the indicated method reporting limit.
dup = Duplicate sample.
TCE = Trichloroethene.
µg/L = micrograms per liter.

Table 2-3 2007 ODEQ Monitoring Well Sample Results (µg/L)

Analyte	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7
TCE	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
cis-1,2-DCE	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
p-Isopropyl-toluene	**45.4**	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Benzene	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	**1.24**
Toluene	< 1.00	**1.82**	**3.55**	**1.91**	**7.59**	**3.47**	**5.26**
m,p-Xylenes	< 1.00	< 1.00	< 1.00	< 1.00	**2.73**	< 1.00	< 1.00

Source: ODEQ 2007.
Note: Bold type indicates the sample result is above the detection limit.
Key:
< = Not detected at or above the indicated method reporting limit.
DCE = Dichloroethene.
TCE = Trichloroethene.
µg/L = micrograms per liter.

Table 2-4 2008 Groundwater Well Sample Results for the Becklin Property (µg/L)

Analyte	Domestic Well (Pre-Treatment)	Well 1	Well 2
TCE			
3/27/08	**18.3**	No Data	No Data
4/08/08	No Data	**18.0**	**36.5**
4/21/08	**21.7**	**22.8**	**42.1**
5/12/08	**24.7**	**27.1**	**61.5**
5/27/08	**19.2**	**27.5**	**53.7**
5/30/08	**16.8**	**29.8**	**58.9**
6/10/08	No Data	**30.4**	**58.3**
6/24/08	**14.7**	**32.8**	**48.5**
Toluene			
3/27/08	<0.5	No Data	No Data
4/08/08	No Data	**22.6**	**3.3**
4/21/08	<0.5	**55.6**	**46.8**
5/12/08	<0.5	**42.1**	**7.1**
5/27/08	<0.5	**9.0**	**28.7**
5/30/08	<0.5	**0.5**	**5.2**
6/10/08	No Data	**0.6**	**48.2**
6/24/08	<0.5	<0.5	**24.3**

Source: ECS 2008b.
Note: Bold type indicates the sample result is above detection limit.

Key:
< = Not detected at or above the indicated method reporting limit.
No Data = The well was not sampled on the corresponding date.
TCE = Trichloroethene.
µg/L = micrograms per liter.