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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

JUN 30 2003

Paul Cayler, Director
Solid Waste Branch
Mendocino County
559 Low Gap Road
Ukiah, CA 95482

RE: Laytonville Dump
EPA ID# CAD000065532

Dear Mr. Cayler:

Enclosed is the Preliminary Assessment/Site Inspection Report of the Laytonville Dump site. This report contains the results of an environmental sample collection and evaluation conducted by Weston Solutions, Inc. for the U.S. Environmental Protection Agency (EPA) under Section 104 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended [42 U.S.C. 9404], commonly known as Superfund. EPA initiated a Preliminary Assessment to determine whether this site may qualify for placement on the National Priorities List (NPL). EPA proceeded to conduct a Site Inspection because the Preliminary Assessment indicated that the site may be contaminated with hazardous substances, and that such contamination could threaten public health or the environment.

Based on currently available information contained in the enclosed report, EPA has determined that no further assessment is warranted. Although EPA has determined that this site does not qualify for Superfund listing, the State of California may require further assessment or cleanup of this site under State law. You may wish to contact the Department of Toxic Substances Control (DTSC), Barbara Cook at 510/540-3843, for information pertaining to State assessment and cleanup requirements.

Please forward any written comments on the enclosed report to:

Jeff Inglis
Site Assessment Manager
U.S. Environmental Protection Agency
75 Hawthorne Street, SFD-9-1
San Francisco, CA 94105

If you have any questions, please call Jeff Inglis at 415/972-3095

Sincerely,

Betsy Curnow

Betsy Curnow, Chief
States, Tribes, and Site Assessment Section
Superfund Division

Enclosure

cc: Marilyn Underwood, CA DHS EHIB
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FINAL EPA File Copy

Preliminary Assessment/Site Inspection Report
Laytonville Dump
Laytonville, California

USEPA ID No.: CAD000065532
USACE Contract No.: DACA45-98-D0004, Task Order 25
Work Order No.: 20074.025.004

June 20, 2003

Prepared for:
U.S. Environmental Protection Agency
Region IX

Prepared by:
Weston Solutions, Inc.

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List of Acronyms

AOC	Analyte of Concern
AQMD	Air Quality Management District
BIA	Bureau of Indian Affairs
CDHS	California Department of Health Services
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CLPAS	Contract Laboratory Program Analytical Service
DCE	Dichloroethylene
G&A	Gasch and Associates
GAP	General Assistance Program (USEPA)
HRS	Hazard Ranking System
ug/kg	Micrograms per kilogram (parts per billion)
ug/L	Micrograms per liter (parts per billion)
mg/kg	Milligrams per kilogram (parts per million)
MCL	Maximum Contaminant Level
NPL	National Priorities List
PA/SI	Preliminary Assessment/Site Inspection
PCB	Polychlorinated Biphenyl
PG&E	Pacific Gas & Electric
PRG	Preliminary Remediation Goal
RCRIS	Resource Conservation and Recovery Information System
RWQCB	Los Angeles Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SCDM	Superfund Chemical Data Matrix
SECOR	Secor International Incorporated
SVOC	Semivolatile organic compound
TCE	Trichloroethylene
TDS	Total Dissolved Solids
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	Volatile organic compound
WESTON	Weston Solutions, Inc.
WQTI	Water Quality Technology, Inc.

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1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), Weston Solutions, Inc. (WESTON) has been tasked to conduct a Preliminary Assessment/Site Inspection (PA/SI) of the Laytonville Dump site in Laytonville, Mendocino County, California.

The Laytonville Dump site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) on November 30, 1993 (CAD000065532) (1). WESTON completed the PA portion of the evaluation of the site on August 31, 2001. The purpose of the PA evaluation is to review existing information on the site and its environs to assess the threat(s), if any, posed to public health, welfare, or the environment, and to determine if further action under CERCLA/SARA is warranted. The U.S. Environmental Protection Agency (USEPA) decided that further investigation of the Laytonville Dump site was necessary to more completely evaluate the site using the USEPA's Hazard Ranking System (HRS) criteria. The HRS assesses the relative threat associated with the actual or potential releases of hazardous substances at the site. The HRS has been adopted by the USEPA to help set priorities for the further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites at which the USEPA may conduct remedial response actions. This report summarizes the results of the combined PA/SI for the Laytonville Dump site.

More information about the Superfund program is available on the USEPA web site at http://www.epa.gov/superfund. The attached fact sheet describes USEPA's site assessment process.

1.1 Apparent Problem

The apparent problems at the site, which contributed to USEPA's determination that a combined PA/SI was necessary, are presented below.

A 7-acre inactive landfill, which is owned by the Mendocino County Solid Waste Division, is located on the site. The landfill operated under a Class II permit from 1967 until 1993. During operations, the Laytonville Dump facility was permitted to only accept non-hazardous municipal waste; however, there are allegations that materials containing hazardous substances were illegally disposed of at the site (e.g., burial of Pacific Gas & Electric [PG&E] transformers containing polychlorinated biphenyls (PCBs), disposal of waste containing hexavalent chromium from the Remco Hydraulics, Inc. facility, and transfer of illegally disposed waste containing photographic chemicals from the Casper landfill to the Laytonville landfill) (2, 3, 4).

An engineered cover was constructed over the landfill in 1997. However, it appears that there were flaws in the construction (5). Leachate containing volatile organic compounds (VOCs) has been identified at the landfill and could have migrated to groundwater and/or surface water (6, 7).

There are four sedimentation ponds associated with the site that are used to collect stormwater runoff from the site. During heavy precipitation, the ponds overflow and drain through the adjacent Laytonville Rancheria and toward Cahto Creek. Mendocino County regularly collects water samples from two of these sedimentation ponds; however, the samples are not analyzed for all of the analytes of concern

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(AOCs) for the PA/SI (8).

Water level measurements collected from five site-related monitoring wells during Mendocino County's quarterly groundwater monitoring efforts indicate that groundwater flows away from the site in two directions, to the northeast and southwest. The County's analytical results indicate a release of arsenic and barium to the northeast and a release of zinc to the southwest. The County does not sample for hexavalent chromium, one of the AOCs for the PA/SI (9).

There are several active private drinking water wells near the site (10). One of these wells was sampled in 1997 and others have not been sampled since 1993. There is also a municipal drinking water supply well located approximately 1.5 miles east of the site (31). None of the wells have been analyzed for all of the AOCs for the PA/SI (12, 13).

Stormwater runoff from the site, and from the four sedimentation ponds associated with the site, drain toward Cahto Creek (8). Cahto Creek flows through the adjacent Laytonville Rancheria and serves as a fishery to residents of the Rancheria (14).

Residents in the vicinity of the site, including the adjacent Laytonville Rancheria, have raised concerns about the potential migration of contaminants from the landfill into drinking water wells and surface water (15, 16).

2.0 SITE DESCRIPTION

2.1 Location

As shown in Figure 2-1, the Laytonville Dump site is situated on a small ridge located on the south side of Branscomb Road, approximately 1.5 miles west of Laytonville in Mendocino County, California (Latitude 39°40' 21" North, Longitude 123°30' 24" West) (17).

2.2 Site Description and Operational History

The site is owned by the Mendocino County Solid Waste Division and consists of a 7-acre former disposal area. Associated with the site are four sedimentation ponds, a leachate collection system, and five groundwater monitoring wells. An engineered cover has been constructed over the 7-acre former disposal area. Stormwater runoff from the disposal area is collected in the four sedimentation ponds. The sedimentation ponds are located to the east, to the southwest, and to the north of the former disposal area. Overflow from the sedimentation ponds drains to Cahto Creek, a tributary to Tenmile Creek. The leachate collection system includes a French Drain, a cascading water system consisting of five volatilization tanks, and six treatment tanks from which water is pumped to a truck and transported to the Willits Wastewater Treatment Plant for disposal. A locked gate bars road access to the site. The former disposal area is surrounded by a maintained chain-link fence. However, trespassers frequently damage the fence in order to enter the site and ride all-terrain vehicles over the former disposal area. The area surrounding the site is primarily rural. Residences currently reliant on private drinking water wells are located to the north, northeast and southwest of the site. A municipal drinking water supply well is located approximately 1.5 miles east of the site (31). The Laytonville Rancheria, owned by the Cahto Tribe, is located directly adjacent to the east and south of the site. An operative recycling center is

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located directly to the north of the site (8).

The Mendocino County Solid Waste Division has owned the Laytonville Dump site since 1967 (2). The landfill was in operation from 1967 until 1993. The landfill temporarily ceased accepting waste on August 17, 1993, due to public health concerns, and permanently ceased accepting waste on September 28, 1993 (18). During operations, the site accepted, under a Class II solid waste disposal permit, residential and commercial non-hazardous waste. Waste content is estimated to be 90% residential, 5% commercial, and 5% demolition (2). In 1997, a Type-D engineered cover was constructed over the 7-acre disposal area (8). However, it appears that there were flaws in its construction and leachate has been observed on the southwest and east slopes of the landfill (5, 6, 7, 19). In 2000, the French Drain and leachate collection system were installed to collect and treat the leachate (6). Paul Cayler is the current Director of the Mendocino County Solid Waste Division (2).

2.4 Regulatory Involvement

2.4.1 U.S. Environmental Protection Agency

The Laytonville Dump site is not listed in the Resource Conservation and Recovery Information System (RCRIS) database, as of December 9, 2002 (20).

2.4.2 California Environmental Protection Agency, North Coast Regional Water Quality Control Board

During closure activities, the Mendocino County Solid Waste Division reported all plans, activities, and reports to the North Coast Regional Water Quality Control Board (RWQCB). RWQCB also directed the development of the groundwater investigation workplan that is currently implemented by the Solid Waste Division. RWQCB continues to oversee monitoring of the site (8, 27).

2.4.3 County of Mendocino, Solid Waste Division

The County performs quarterly monitoring events at the landfill. During each monitoring event, the landfill is monitored for methane gas using a portable instrument (GasTech GT Instrument) and groundwater samples collected from five site-related monitoring wells are analyzed for total dissolved solids (TDS), chloride, and the purgeable halocarbons and aromatics included in USEPA Methods 601 and 602, respectively (22). The County also performed one round of PCB analysis in groundwater samples collected from the five monitoring wells. No PCBs were detected and further analysis will not be performed (21). The County began collecting groundwater samples from monitoring wells 87-1, 87-2, and 87-3 in 1987. Additionally, monitoring wells 90-1 and 91-1 were installed in 1990 and 1991, respectively. During 1993 and 1994, the 87-well series was replaced with monitoring wells 93-1, 93-2, and 94-1. The County currently collects groundwater samples from monitoring wells 90-1, 91-1, 93-1, 93-2, and 94-1 (9, 12). The County periodically analyzes samples collected from the leachate containment facility and samples collected from two of the sedimentation ponds associated with the site.

There are several active private drinking water wells to the north, northeast, and southwest of the site. Approximately nine of these wells were sampled in 1993. The County also sampled the Shields' private drinking water well in 1997. A municipal drinking water supply well is located approximately 1.5 miles east of the site and is sampled regularly in accordance with Title 22 of the California Code of

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Regulations protocols. None of these wells had been analyzed for all of the AOCs for this investigation (9, 10, 12).

2.4.4 County of Mendocino, Air Quality Management District

The County of Mendocino's Air Quality Management District (AQMD) conducted VOC screening tests on June 8, 2000 and June 14, 2000. No VOC concentrations were measured at levels three times greater than background (23).

2.4.5 Cahto Tribe, Laytonville Rancheria

The Cahto Tribe received funding under USEPA's General Assistance Program (GAP) and the Clean Water Act's Section 106 Program to investigate potential contamination from the Laytonville Dump site to the Laytonville Rancheria . The Cahto Tribe contracted with Gasch & Associates (G&A), Secor International Incorporated (SECOR), and Water Quality Technology, Inc. (WQTI) to perform these investigations.

In May 2001, G&A performed an electrical resistivity study to indicate locations where groundwater may be present near the landfill and on the Rancheria and possible locations of contaminants in groundwater (24). During this study, G&A also collected a grab sample of soil from the southern boundary of the landfill. Analysis of the sample indicated that 0.19 milligrams per kilogram (mg/kg) hexavalent chromium are present in the soil (25). This concentration is significantly below the Reference Dose Screening Concentration (390 mg/kg) for soil listed in the Superfund Chemical Data Matrix (SCDM) and the USEPA Region IX Preliminary Remediation Goal (30 mg/kg) for residential soil (26, 27).

In October 2001, SECOR collected soil samples and installed temporary wellpoints along the southern and eastern boundaries of the landfill and collected sediment samples from Cahto Creek both upstream and downstream of the two probable points of entry for contaminant migration from the landfill. Sediment sampling results indicate that a release to Cahto Creek has not occurred (28).

In June 2002, WQTI prepared a report titled "An Evaluation of Contaminant Sources at the Laytonville Landfill in Mendocino County, California and the Potential for Contaminant Exposure to Cahto Tribe of Laytonville Rancheria Residents and the Environment." The report summarizes site-related water quality data collected before and after the landfill was closed and provides recommendations on how to further evaluate contamination resulting from the landfill. WQTI reports that contaminants have been released from the site via groundwater and surface water, but that the impact to residents of Cahto Tribe's Laytonville Rancheria is inconclusive without further evaluation (29).

3.0 INVESTIGATIVE EFFORTS

3.1 Previous Sampling

3.1.1 Groundwater Sampling

As discussed in Section 2.4.3, groundwater samples are collected from five site-related monitoring wells during the County's quarterly monitoring events at the landfill, and are analyzed for TDS, chloride, and the purgeable halocarbons and aromatics included in USEPA Methods 601 and 602, respectively (22).

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During 2001, the County performed one round of PCB analysis in groundwater samples collected from the five monitoring wells. No PCBs were detected and further analysis will not be performed (21). The County began collecting groundwater samples from monitoring wells 87-1, 87-2, and 87-3 in 1987. Additionally, monitoring wells 90-1 and 91-1 were installed in 1990 and 1991, respectively. During 1993 and 1994, the 87-well series was replaced with monitoring wells 93-1, 93-2, and 94-1. The County currently collects groundwater samples from monitoring wells 90-1, 91-1, 93-1, 93-2, and 94-1 (9, 12). The County's analytical results indicate a release of arsenic and barium to the northeast and a release of zinc to the southwest. The only significant amount of VOCs detected in the site-related groundwater monitoring wells was 8 micrograms per liter (ug/L) of acetone detected in 1997. Although the County analyzes groundwater samples for total chromium, they do not analyze for hexavalent chromium, one of the AOCs for this site.

There are several active private drinking water wells to north, northeast, and southwest of the site. Approximately nine of these wells were sampled in 1993. The County also sampled the Shields' private drinking water well in 1997. A municipal drinking water supply well is located approximately 1.5 miles east of the site and is sampled regularly in accordance with Title 22 of the California Code of Regulations protocols. None of these wells had been analyzed for all of the AOCs for this investigation (9, 10, 12).

3.1.2 Soil/Sediment Sampling

During G&A's May 2001 electrical resistivity study performed for the Cahto Tribe, G&A collected a grab sample of soil from the southern boundary of the landfill. Analysis of the sample indicated that 0.19 milligrams per kilogram (mg/kg) hexavalent chromium are present in the soil (25). This concentration is significantly below the Reference Dose Screen Concentration (RDSC) (390 mg/kg) for soil listed in the SCDM and the USEPA Region IX Preliminary Remediation Goal (30 mg/kg) for residential soil (26, 27).

In October 2001, SECOR collected soil samples and installed temporary wellpoints along the southern and eastern boundaries of the landfill and collected sediment samples from Cahto Creek both upstream and downstream of the two probable points of entry for contaminant migration from the landfill. Sediment sampling results indicate that a release to Cahto Creek has not occurred (28).

3.1.3 Surface Water Sampling

In 2002, WQTI submitted a sampling plan to USEPA to sample shallow groundwater in drainages leading from the Laytonville Dump site to Cahto Creek and to sample surface water and fish tissue in Cahto Creek both upstream and downstream of the two probable points of entry for contaminant migration from the landfill (30). At this time, it appears that WQTI did not conduct this investigation. However, WQTI did produce the report discussed in Section 2.4.5, which is based on previously collected data (29).

3.2 PA/SI Sampling

During November 4 to November 7, 2002, WESTON, on behalf of the USEPA, conducted a PA/SI sampling effort at the Laytonville Dump site. The field work was conducted in accordance with the May 2002 Sampling and Analysis Plan (SAP), as presented in Appendix G. Sampling methodology, locations,

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analyses, and analytical results are summarized below. The sampling locations are show in Figure 3-1 and Figure 3-2. The analytical results are presented in Tables 3-3, 3-4, 3-5, 3-6, 3-7 and 3-8 and in Appendix H (Validated Analytical Results).

3.2.1 Deviations From the Sampling and Analysis Plan

Field modifications to the SAP were as follows:

- As indicated in the SAP, two sample locations (LD-PW-3 and LD-PW-4) were designated for groundwater samples to be collected from wells located on the Cahto Tribe's land. During the November 2002 sampling event, these wells were inspected by representatives of the Cahto Tribe, USEPA, and WESTON. The identified wells appeared abandoned and no longer operational. The above representatives decided that time and resources were insufficient to determine if groundwater samples could be collected from these locations. Subsequently, three Bureau of Indian Affairs (BIA)/USACE monitoring wells were identified by the Cahto Tribe as potential sample locations. The wells were inspected; however, water level measurements indicated that groundwater levels were too low for sample collection.

- Groundwater flow in the area has not been adequately determined. Therefore, three additional private drinking water wells, located well beyond the area of influence from the site, were identified during the November 2002 sampling event and sampled as background locations. The sample location identifiers LD-PW-4, LD-SEP-W1, and LD-SWP-W1 were reassigned from their original locations identified in the SAP to these background locations. Also, another three private drinking water wells were located during the sampling event. The sample location identifiers LD-PW-3, LD-CC-W3, and LD-CC-W4 were reassigned to these locations.

- Prior to the sampling event, Cahto Creek was identified as flowing perennially. However, during the sampling event, areas of the creek bed were observed to be completely dry and water remained stagnant in several other areas. Since Cahto Creek does not flow perennially and Laytonville receives more than 20 inches of annual rainfall, Cahto Creek cannot be evaluated as a surface water pathway under the HRS. Consequently, only one upgradient surface water sample (LD-CC-W1) and one downgradient surface water (LD-CC-W2) sample were collected during the sampling event.

- The southwest and southeast site-related sedimentation ponds did not contain water during the sampling event. As such, water samples were only collected from the previously identified locations in the northwest and northeast site-related sedimentation ponds. As mentioned above, the sample location identifiers LD-SWP-W1 and LD-SEP-W1, originally designated in the SAP for the southwest and southeast ponds, were reassigned to the background groundwater well locations. Sediment samples were collected from the northwest and northeast sedimentation ponds as planned. However, because of the dry, heavily-compacted condition of the sediment in the southwest and southeast sedimentation ponds, only one "sediment" sample was collected from the center of the southwest sedimentation pond and no sample was collected from the southeast sedimentation pond. These conditions also required the reassignment of the duplicate sampling location. Water duplicate sample LD-SWP-W1-2 and sediment duplicate sample LD-SWP-S1 were collected at the entry point to the northwest sedimentation pond at location LD-NWP-W1/S1, rather than in the southwest sedimentation pond.

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3.2.2 Groundwater Sampling

Sixteen investigative groundwater samples were collected from site-related monitoring wells and from municipal and private drinking water wells during the November 2002 PA/SI sampling event. Additionally, two duplicate samples (LD-MW-94-1-2 [duplicate of LD-MW-94-1] and LD-PW-2-2 [duplicate of LD-PW-2]) were also collected. The groundwater samples were collected to support the HRS evaluation of the site, and were analyzed for metals via USEPA Contract Laboratory Program Analytical Services (CLPAS) Method ILM04.1; for VOCs, semi-volatile organic compounds (SVOCs), and PCBs via USEPA CLPAS Method OLM04.2; and for hexavalent chromium via USEPA Method 218.6. The sample locations are shown in Figure 3-1. As mentioned in Section 3.2.1, three drinking water wells located beyond the area of influence from the site were designated as background locations. To be environmentally conservative, the remaining thirteen groundwater well locations were evaluated as hydraulically downgradient of the site.

As presented in Tables 3-3 and 3-4, several analytes were detected in groundwater wells located hydraulically downgradient of the site. An analyte is considered to be present at a concentration significantly above background if one of the following two criteria is met: 1) the analyte is detected in a release/downgradient sample when not detected in the background sample(s) or 2) the analyte is reported in a release/downgradient sample at a concentration equal to or greater than three times the maximum background level. In addition, the analytical data must be of known and documented quality. Data validation results for the Laytonville Dump PA/SI samples indicate that some of the reported concentrations are qualitatively acceptable but quantitatively questionable. These concentrations have been assigned "J" qualifiers to indicate that the analyte was positively identified, but the reported numerical value is an estimated quantity. The sample/analyte-specific reasons for the assignment of "J" qualifiers are presented in Appendix H. HRS guidance allows for the use of some types of J-qualified data in documenting the presence of an analyte at a concentration significantly above background. The J-qualified data used in this evaluation are acceptable for use.

The following VOCs were detected at concentrations significantly above background in groundwater samples collected from monitoring wells and/or drinking water wells:

- Chloromethane was not detected in background groundwater wells, but was detected in monitoring well LD-MW-93-1 at 0.3J ug/L. Chloromethane is a trihalomethane. This concentration is below the USEPA Maximum Contaminant Level (MCL) for total trihalomethanes of 80 ug/L. Chloromethane was not detected in any drinking water well.
- Dichlorodifluoromethane was not detected in background groundwater wells, but was detected in monitoring well LD-MW-93-1 at 0.2J ug/L. This concentration is below the tap water Preliminary Remediation Goal (PRG) of 390 ug/L and below the SCDM RDSC of 7,300 ug/L; there is no MCL established for this substance. Dichlorodifluoromethane was not detected in any drinking water well.
- 1,1-Dichloroethene (1,1-DCE) was detected in monitoring well LD-MW-91-1 at 0.1J ug/L. This concentration is below the California Department of Health Services (CDHS) MCL of 6 ug/L. 1,1-DCE was not detected in any drinking water well.
- Methyl acetate was detected in monitoring well LD-94-1 at 0.3J ug/L. This concentration is below the PRG of 6,100 ug/L; there is no MCL established for this substance. Methyl acetate is not a CERCLA-eligible hazardous substance and is not listed SCDM. Methyl acetate was not detected in any drinking water well.

Several other substances were also detected at concentrations significantly above background in hydraulically downgradient wells, but were not evaluated as attributable to the site, nor as a risk to human health, for the reasons stated below.

Individual metals:

- Arsenic was detected at a concentration significantly above background in the drinking water well LD-PW-7 at 68.2 ug/L. LD-PW-7 is a public water supply well operated by the Laytonville Water District. This arsenic concentration is consistent with the amount usually present in groundwater pumped from this well. The heterogeneous bedrock of the Laytonville area contains significant amounts of arsenic resulting in highly variable arsenic concentrations in groundwater. Prior to public distribution, groundwater from this well is treated and the arsenic level is thereby lowered to about 40 ug/L, which is below the MCL of 50 ug/L (31). Arsenic was not detected at concentrations significantly above background in any of the intervening monitoring wells or drinking water wells that lie between the site and well LD-PW-7. As such, the presence of arsenic cannot be attributed to the site.
- Calcium was detected at concentrations significantly above background in monitoring well LD-MW-93-1 at 330,000 ug/L, in monitoring well LD-MW-93-2 at 61,800 ug/L, and in monitoring well LD-MW-94-1 at 187,000 ug/L. There is no health-based benchmark established for calcium. Calcium is a ubiquitous metal and cannot necessarily be attributed to the site. Calcium was not detected in any drinking water well at a concentration significantly above background.
- Magnesium was detected at concentrations significantly above background in monitoring wells LD-MW-93-1 at 669,000 ug/L and in LD-MW-94-1 at 278,000 ug/L. There is no health-based benchmark established for magnesium. Magnesium is a ubiquitous metal and cannot necessarily be attributed to the site. Magnesium was not detected in any drinking water well at a concentration significantly above background.
- Manganese was detected at concentrations significantly above background in monitoring wells LD-MW-90-1 at 1,480 ug/L, LD-MW-91-1 at 2,820 ug/L, and LD-MW-93-2 at 5,470 ug/L. Manganese was also detected at concentrations significantly above background in drinking water wells LD-PW-2 at 1,970 ug/L, LD-PW-3 at 2,590 ug/L, and LD-PW-7 at 1,480 ug/L. These values exceed the tap water PRG for manganese of 880 ug/L and are below the SCDM RDSC of 5,100 ug/L; there is no MCL established for this substance. Manganese is a commonly found mineral and there is not an adequate reason to suspect that on-site sources have contributed to a release of manganese. Furthermore, sediment samples collected from the site-related sedimentation ponds do not support the documentation of a release of manganese from the site.
- Potassium was detected at concentrations significantly above background in monitoring wells LD-MW-93-1 at 10,300J ug/L and LD-MW-94-1 at 4,990J ug/L. There is no health-based benchmark established for potassium. Potassium is a ubiquitous metal and cannot necessarily be attributed to the site. Potassium was not detected at a concentration significantly above background in any drinking water well.
- Sodium was detected at concentrations significantly above background in monitoring wells LD-MW-93-1 at 603,000 ug/L, LD-MW-93-2 at 67,200 ug/L, and LD-MW-94-1 at 315,000 ug/L. There is no health-based benchmark established for sodium. Sodium was not detected at a concentration significantly above background in any drinking water well.

Individual SVOCs:

- Bis(2-ethylhexyl)phthalate was not detected in background groundwater wells, but was detected in monitoring well LD-MW-90-1 at 5J ug/L, in LD-MW-91-1 at 3J ug/L, in LD-MW-93-2 at 3J ug/L, and in LD-MW-94-1 at 2J ug/L. Bis(2-ethylhexyl)phthalate was also detected in drinking water well LD-PW-2 at 1J ug/L, in LD-PW-6 at 1J ug/L, in LD-PW-7 at 2J ug/L, and in LD-CC-W4 at 2J ug/L. These concentrations are below the USEPA MCL of 6 ug/L; however, the concentration present in LD-MW-90-1 exceeds the CDHS MCL of 4 ug/L. Nonetheless, bis(2-ethylhexyl)phthalate is a

common laboratory cleaning solvent and is evaluated as a laboratory artifact rather than as a substance present in groundwater or attributable to the site.

- Dimethylphthalate was not detected in background groundwater wells, but was detected in monitoring well LD-MW-93-1 at 39 ug/L. This concentration is below the PRG of 360,000 ug/L. Dimethylphthalate is a common laboratory cleaning solvent and is evaluated as a laboratory artifact rather than as a substance present in groundwater or attributable to the site. Dimethylphthalate was not detected in any drinking water well.

Individual VOCs:

- Bromodichloromethane was not detected in background groundwater wells, but was detected in drinking water well LD-PW-5 at 0.2J ug/L and in LD-PW-6 at 10 ug/L. Bromodichloromethane is a trihalomethane. These values are below the USEPA MCL for total trihalomethanes of 80 ug/L. Bromodichloromethane was not detected in any of the intervening monitoring wells that lie between the site and drinking water wells LD-PW-5 and LD-PW-6. As such, the presence of bromodichloromethane cannot be attributed to the site.
- Bromoform was detected in drinking water well LD-PW-6 at 6 ug/L. Bromoform is a trihalomethane. This concentration is below the USEPA MCL for total trihalomethanes of 80 ug/L. Bromoform was not detected in any of the intervening monitoring wells that lie between the site and drinking water well LD-PW-6. As such, the presence of bromoform cannot be attributed to the site.
- Chloroform was not detected in background groundwater wells, but was detected in drinking water well LD-PW-5 at 5J ug/L and in drinking water well LD-PW-6 at 6 ug/L. Chloroform is a trihalomethane. This concentration is below the USEPA MCL for total trihalomethanes of 80 ug/L. Chloroform was not detected in any of the intervening monitoring wells that lie between the site and drinking water wells LD-PW-5 and LD-PW-6. As such, the presence of chloroform cannot be attributed to the site.
- Dibromochloromethane was detected in drinking water well LD-PW-6 at 15 ug/L. Dibromochloromethane is a trihalomethane. This concentration is below the USEPA MCL for total trihalomethanes of 80 ug/L. Dibromochloromethane was not detected in any of the intervening monitoring wells that lie between the site and drinking water wells LD-PW-6. As such, the presence of dibromochloromethane in this well cannot be attributed to the site.
- 2-Butanone was not detected in background groundwater wells, but was detected in drinking water well LD-PW-1 at 0.4J ug/L and in drinking water well LD-PW-7 at 0.4J ug/L. There is no health-based benchmark established for this substance. 2-Butanone is a common laboratory cleaning solvent and is evaluated as a laboratory artifact rather than as a substance attributable to the site. Furthermore, 2-butanone was not detected in any of the intervening monitoring wells that lie between the site and drinking water wells LD-PW-1 and LD-PW-7.

3.2.3 Surface Water Sampling

3.2.3.1 Cahto Creek

Two investigative surface water samples were collected from Cahto Creek, which is an intermittently-flowing creek located near the site. Surface water samples were collected to evaluate whether contamination from the site has been released to Cahto Creek, which is used by local residents. Because Cahto Creek flows intermittently in an area of greater than 20 inches of annual rainfall, the results for these samples cannot be used to support the HRS evaluation of the site. Surface water sample LD-CC-W1 was collected from Cahto Creek from a location upgradient of any probable point-of-entry for contaminant migration from the site. Surface water sample LD-CC-W2 was collected from a location downstream of the probable point-of-entry for contaminant migration from the site. Sample locations are

shown in Figure 3-1. Each of these surface water samples was analyzed for metals via USEPA CLPAS Method ILM04.1; for VOCs, SVOCs, and PCBs via USEPA CLPAS Method OLM04.2; and for hexavalent chromium via USEPA Method 218.6. As presented in Tables 3-5 and 3-6, arsenic is the only analyte that was detected in sample LD-CC-W2 at a concentration significantly above background. However, the concentration (4.1J ug/L) is well below the Ambient Water Quality Criteria (AWQC) environmental health-based benchmark of 150 ug/L.

3.2.3.2 Site-related Sedimentation Ponds

Six investigative surface water samples were collected from two of the site-related sedimentation ponds. Two background surface water samples were also collected from a pond located north of the site and beyond the area of influence from the site. Additionally, one duplicate sample (LD-SWP-W1-2 [duplicate of LD-NWP-W1]) was collected. Surface water from the site-related sedimentation ponds drain over land and eventually into Cahto Creek. Surface water samples were collected to evaluate the extent to which contamination from the site, if any, has affected or has the potential to affect Cahto Creek. However, the results for these samples were not used to support the HRS evaluation of the site. Each surface water sample was analyzed for metals via USEPA CLPAS Method ILM04.1; for VOCs, SVOCs, and PCBs via USEPA CLPAS Method OLM04.2; and for hexavalent chromium via USEPA Method 218.6. Sample locations are shown in Figure 3-1.

As presented in Tables 3-5 and 3-6, several substances were detected in surface water samples collected from the site-related sedimentation ponds at concentrations significantly above the levels found in the surface water samples collected from the background pond.

The following individual metals were detected at concentrations significantly above background in surface water samples collected from the site-related sedimentation ponds:

- Aluminum was detected in sample LD-NEP-W1 at 1,100 ug/L and in LD-NEP-W2 at 940 ug/L. There is no environmental health-based benchmark established for aluminum. Aluminum is a ubiquitous mineral and does not pose a risk to environmental health.
- Arsenic was not detected in background samples but was detected in sample LD-NEP-W1 at 4.0J ug/L and in LD-NWP-W3 at 4.4J ug/L. These concentrations are below the AWQC environmental health-based benchmark of 150 ug/L and do not pose a risk to environmental health.
- Barium was detected in sample LD-NEP-W1 at 50.3J ug/L and in LD-NEP-W2 at 45.6J ug/L. There is no environmental health-based benchmark established for barium. Barium is a ubiquitous mineral and does not pose a risk to environmental health.
- Beryllium was not detected in background samples but was detected in each of the surface water samples collected from the site-related sedimentation ponds. Barium was detected in sample LD-NEP-W1 at 0.49J ug/L, in LD-NEP-W2 at 0.52J ug/L, in LD-NWP-W1 at 0.65J ug/L (and in duplicate LD-SWP-W1-2 at 0.50J ug/L), in LD-NWP-W2 at 0.62J ug/L, and in LD-NWP-W3 at 0.67J ug/L. There is no environmental health-based benchmark established for beryllium. Beryllium is a ubiquitous mineral and does not pose a risk to environmental health.
- Total chromium was not detected in background samples but was detected in sample LD-NEP-W1 at 2.0J ug/L, LD-NEP-W1 at 1.5J ug/L, and in LD-SWP-W1-2 at 1.4J ug/L. These concentrations are below the AWQC environmental health-based benchmark of 11 ug/L and do not pose a risk to environmental health.
- Cobalt was detected significantly above background levels in sample LD-NEP-W1 at 1.9J ug/L and in LD-NEP-W2 at 2.1J ug/L. There is no environmental health-based benchmark established for cobalt.

Cobalt is a ubiquitous mineral and does not pose a risk to environmental health.

- Copper was not detected in background samples but was detected in sample LD-NEP-W1 at 3.1J ug/L, LD-NEP-W1 at 2.5J ug/L, in LD-SWP-W1-2 at 1.0J ug/L, and in LD-NWP-W2 at 1.0J ug/L. These concentrations are below the Ambient Aquatic Life Advisory Concentration (AALAC) environmental health-based benchmark of 12 ug/L and do not pose a risk to environmental health.
- Iron was detected in sample LD-NEP-W1 at 3,590 ug/L and in LD-NEP-W2 at 3,100 ug/L. These concentrations exceed the environmental health-based benchmark of 1,000 ug/L and may pose a risk to environmental health. Iron concentrations detected in Cahto Creek were below the AWQC environmental health-based benchmark.
- Manganese was detected significantly above background levels in sample LD-NEP-W1 at 358 ug/L. There is no environmental health-based benchmark established for manganese. Manganese is a ubiquitous mineral and does not pose a risk to environmental health.
- Nickel was not detected in background samples but was detected in sample LD-NEP-W1 at 2.8J ug/L, LD-NEP-W2 at 3.0J ug/L, in LD-SWP-W1-2 at 2.2J ug/L, in LD-NWP-W2 at 1.9J ug/L, and in LD-NWP-W3 at 3.0J ug/L. These concentrations are below the AALAC environmental health-based benchmark of 160 ug/L and do not pose a risk to environmental health.
- Vanadium was not detected in background samples but was detected in sample LD-NEP-W1 at 7.2J ug/L, in LD-NEP-W2 at 6.4J ug/L, in LD-SWP-W1-2 at 1.4J ug/L, and in LD-NWP-W2 at 1.5J ug/L. These concentrations are below the AALAC environmental health-based benchmark of 160 ug/L and do not pose a risk to environmental health.

The following VOC was detected at concentrations significantly above background:

- Methyl acetate was not detected in background samples but was detected in sample LD-NEP-W1 at 0.9 ug/L and in LD-NEP-W2 at 1 ug/L. There is no environmental health-based benchmark established for methyl acetate. Additionally, methyl acetate was not detected in the northwest sedimentation pond which drains to the northeast sedimentation pond, nor was methyl acetate detected in Cahto Creek, which receives surface water runoff from the sedimentation ponds.

The following Pesticides were detected at concentrations significantly above background:

- Endrin aldehyde was not detected in background samples but was detected in sample LD-NEP-W2 at 0.040 ug/L. There is no environmental health-based benchmark established for endrin aldehyde. Additionally, endrin aldehyde was not detected in the northwest sedimentation pond which drains to the northeast sedimentation pond, nor was endrin aldehyde detected in Cahto Creek, which receives surface water runoff from the sedimentation ponds.
- Endrin ketone was not detected in background samples but was detected in sample LD-NEP-W2 at 0.029 ug/L. There is no environmental health-based benchmark established for endrin ketone. Additionally, endrin ketone was not detected in the northwest sedimentation pond which drains to the northeast sedimentation pond, nor was endrin ketone detected in Cahto Creek, which receives surface water runoff from the sedimentation ponds.
- Gamma-BHC (Lindane) was not detected in background samples but was detected in sample LD-NEP-W2 at 0.007 ug/L. This concentration is below the AWQC environmental health-based benchmark of 0.08 ug/L. Lindane was not detected in the northwest sedimentation pond which drains to the northeast sedimentation pond, nor was Lindane detected in Cahto Creek, which receives surface water runoff from the sedimentation ponds.

No PCBs were detected at concentrations significantly above background in the Site-related Sedimentation Ponds.

Bis(2-ethylhexyl)phthalate was detected at concentrations significantly above background, but is not considered to actually be in the samples for the following reasons:

- Bis(2-ethylhexyl)phthalate was not detected in background samples but was detected in sample LD-NEP-W1 at 11J ug/L, in LD-NEP-W2 at 3J ug/L, in LD-NWP-W2 at 0.9J ug/L, and in LD-NWP-W3 at 2J ug/L. There is no environmental health-based benchmark established for bis(2-ethylhexyl)phthalate. Additionally, bis(2-ethylhexyl)phthalate is a common laboratory cleaning solvent and is evaluated as a laboratory artifact rather than as a substance present in the sedimentation ponds or attributable to the site.

3.2.4 Sediment Sampling

Six investigative sediment samples were collected from three of the site-related sedimentation ponds. Two background sediment samples were also collected from a pond located north of the site and beyond the area of influence from the site. Additionally, one duplicate sediment sample (LD-SWP-S1-2 [duplicate of LD-NWP-S1]) was collected. Surface water from the site-related sedimentation ponds drain over land and eventually into Cahto Creek. Sediment samples were collected from these sedimentation ponds to evaluate the extent to which contamination from the site, if any, has affected or has the potential to affect surface water in the ponds and, consequently, Cahto Creek. However, the results for these samples were not used to support the HRS evaluation of the site. Each sediment sample was analyzed for metals via USEPA CLPAS Method ILM04.1; for VOCs, SVOCs, and PCBs via USEPA CLPAS Method OLM04.2; and for hexavalent chromium via USEPA Method 218.6.

As presented in Tables 3-7 and 3-8, several substances were detected in sediment samples collected from the site-related sedimentation ponds at concentrations significantly above the levels found in the sediment samples collected from the background pond.

The following individual metals were detected at concentrations significantly above background:

- Aluminum was detected in sample LD-NEP-S1 at 23,900 mg/kg, in LD-NEP-S2 at 23,900 mg/kg, in LD-SWP-S1-2 at 24,500 mg/kg, in LD-NWP-S2 at 23,500 mg/kg, and in LD-SWP-S1 at 27,000 mg/kg. These concentrations are below the residential PRG of 76,000 mg/kg and do not pose a risk to environmental health.
- Arsenic was detected in sample LD-NEP-S2 at 4.5J mg/kg, in LD-SWP-S1-2 at 4.2J mg/kg, in LD-NWP-S3 at 2.4J mg/kg, and in sample LD-SWP-S1 at 3.4J mg/kg. These concentrations are below the residential PRG of 22 mg/kg and do not pose a risk to environmental health.
- Beryllium was not detected in background samples but was detected in each of the sediment samples collected from the site-related sedimentation ponds as follows. Beryllium was detected in sample LD-NEP-S1 at 1.2J mg/kg, in LD-NEP-S2 at 1.2J mg/kg, in LD-NWP-S1 at 0.68J mg/kg (and in duplicate LD-SWP-S1-2 at 1.2J mg/kg), in LD-NWP-S2 at 1.1J mg/kg, in LD-NWP-S3 at 0.91J mg/kg, and in LD-SWP-S1 at 1.2J. These concentrations are below the residential PRG of 150 mg/kg and do not pose a risk to environmental health.
- Hexavalent chromium was not detected in background samples but was detected in sample LD-NWP-S3 at 0.43 mg/kg. This concentration is below the residential PRG of 30 mg/kg and does not pose a health risk.
- Cobalt was not detected in background samples but was detected in each of the sediment samples collected from the site-related sedimentation ponds. Cobalt was detected in sample LD-NEP-S1 at 14.2J mg/kg, in LD-NEP-S2 at 15.1J mg/kg, in LD-NWP-S1 at 10.3J mg/kg, in LD-SWP-S1-2 at 16.1J mg/kg, in LD-NP-S2 at 13.8J mg/kg, in LD-NWP-S3 at 20.6 mg/kg, and in LD-SWP-S1 at 16.8 mg/kg.

These concentrations are below the residential PRG of 900 mg/kg and do not pose a risk to environmental health.

- Magnesium was detected in sample LD-SWP-S1-2 at 9,690 mg/kg and in LD-SWP-S1 at 10,400 mg/kg. There is no PRG established for magnesium. Magnesium is a ubiquitous mineral and does not pose a risk to environmental health.
- Silver was not detected in background samples but was detected in each of the sediment samples collected from the site-related sedimentation ponds. Silver was detected in sample LD-NEP-S1 at 1.6J mg/kg, in LD-NEP-S2 at 1.3J mg/kg, in LD-NWP-S1 at 0.94J mg/kg, in LD-SWP-S1-2 at 1.7J mg/kg, in LD-NP-S2 at 1.3J mg/kg, in LD-NWP-S3 at 1.2J mg/kg, and in LD-SWP-S1 at 1.8J mg/kg. These concentrations are below the residential PRG of 390 mg/kg.
- Sodium was not detected in background samples but was detected in sample LD-SWP-S1-2 at 889J mg/kg and in sample LD-SWP-S1 at 373J mg/kg. There is no PRG established for sodium. Sodium is a ubiquitous mineral and does not pose a risk to environmental health.
- Vanadium was not detected in background samples but was detected in each of the sediment samples collected from the site-related sedimentation ponds. Vanadium was detected in sample LD-NEP-S1 at 77 mg/kg, in LD-NEP-S2 at 76.4 mg/kg, in LD-NWP-S1 at 44.7 mg/kg, in LD-SWP-S1-2 at 79.9 mg/kg, in LD-NP-S2 at 74.0 mg/kg, in LD-NWP-S3 at 50.8 mg/kg, and in LD-SWP-S1 at 85.2 mg/kg. These concentrations are below the residential PRG of 550 mg/kg.

The VOC trichloroethene (TCE) was not detected in background samples but was detected in sample LD-NWP-S3 at 3J micrograms per kilogram (ug/kg) and in LD-SWP-S1 at 0.7J ug/kg. These concentrations are below the residential PRG of 53 ug/kg.

The pesticide 4,4-DDT was not detected in background samples but was detected in sample LD-NEP-S1 at 15 ug/kg. This concentration is below the residential PRG of 1,700 ug/kg.

4.0 HAZARD RANKING SYSTEM FACTORS

4.1 Sources of Contamination

For HRS purposes, a source is defined as an area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance.

Potential hazardous substance sources associated with the Laytonville Dump site include, but may not be limited to, those associated with the following:

- The site includes a 7-acre disposal area. During operations, the Laytonville Dump facility was permitted to only accept non-hazardous municipal waste; however, there are allegations that materials containing hazardous substances were illegally disposed of at the site (e.g., burial of PG&E transformers containing PCBs, disposal of waste containing hexavalent chromium from the Remco Hydraulics, Inc. facility, and transfer of illegally disposed waste containing photographic chemicals from the Casper landfill to the Laytonville landfill) (sap ref. 1, 2, 3).

- An engineered cover was constructed over the landfill in 1997. However, it appears that there were flaws in the construction (sap ref. 4). Leachate containing VOCs has been identified at the landfill and may be migrating to groundwater and/or surface water (6, 7).

4.2 Groundwater Pathway

In determining a score for the groundwater migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to groundwater; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on the number of people who regularly obtain their drinking water from wells that are located within 4 miles of the site. The HRS emphasizes drinking water usage over other uses of groundwater (e.g., food crop irrigation and livestock watering), because, as a screening tool, it is designed to give the greatest weight to the most-direct and extensively studied exposure routes.

4.2.1 Hydrogeological Setting

The Laytonville Dump site is located within the northen Coastal Mountain Range province. The Latyonville region is underlain by the Cretaceous age Franciscan Formation, Pleistocene age continental terrace deposits, and Holocene age alluvial deposits. The Franciscan Formation underlying the region is separated into the Coastal Belt, Central Belt, and Yolla Bolly Belt. The nearest active fault is the Maacama Fault, which is located approximately 11/4 miles to the west of the site.

The Franciscan Formation underlies the entire Latyonville Dump site and consists of a tectonic melange comprised of sandstone, shale, and metavolcanic greenstones and cherts. Melange is highly sheared and weathered, and tends to have very low porosity. The Franciscan Formation is generally considered to be a very poor aquifer with the exception of localized zones of high porosity and permeability that have been faulted and/or fractured by past tectonic activity. The continental terrace deposits overlie the older Franciscan Formation and consist of poorly sorted, highly consolidated, silty conglomerate, clayey sandstone, and silty claystone. The alluvium depostis overlie both the Franciscan Formation and continental terrace deposits and consist of localized deposits of unconsolidated gravel, sand, silt, and clay.

According to the district manager for the Laytonville Water District, there are at least four aquifers in the area. None of these aquifers are formally identified. Groundwater is first encountered in the alluvial deposits at depths as shallow as 6.30 feet below ground surface. Unconfined and confined aquifers exist within the Franciscan Formation. For HRS purposes, all aquifers in the area are evaluated as interconnected due to the variable and fractured nature of the geology and lack of aquifer identification. Water-level measurements collected from the monitoring wells during the sampling event indicate that the direction of groundwater flow from the site is to the northeast and to the southwest (31, 32, 33, 34).

4.2.2 Groundwater Targets

The nearest drinking water well is LD-PW-3. This private drinking water well and is located less than 1/4 mile to the north of the site, as shown in Figure 3-1. There may be up to 40 residences operating private drinking water wells in the vicinity of the site (31). The county multiplier is 2.34 (35). Seven private drinking water wells were sampled during the PA/SI investigation. These seven wells are shown in Figure 3-1.

The Laytonville Water District operates one drinking water supply well that serves approximately 2000

people. Currently, the Laytonville Water District obtains all of its drinking water from this one groundwater well. This well is located approximately $1^1/_4$ mile east of the site, as shown in Figure 3-1 (31).

4.2.3 Groundwater Pathway Conclusion

Based on the results of the November 2002 PA/SI sampling effort, a release to groundwater from the Laytonville Dump site has been established. For HRS purposes, a release to groundwater is documented when a hazardous substance is detected in a hydraulically downgradient well at a concentration significantly above background levels, and some portion of the release is attributable to the site. A hazardous substance is considered to be present at a concentration significantly above background levels when one of the following two criteria is met: (1) the analyte is detected in a downgradient sample when not detected in the background sample(s), or (2) the analyte is reported in a downgradient sample at a concentration equal to or greater than three times the maximum background level.

The results used to document a release to groundwater from the Laytonville Dump site are presented in Table 4-1. As shown in Figure 3-2, five monitoring wells are in place around the perimeter of the disposal area at the site. The five monitoring wells are labeled as follows: LD-MW-90-1, LD-MW-91-1, LD-MW-93-1, LD-MW-93-2, and LD-MW-94-1. Seven drinking water wells within 2 miles of the site were also sampled during the November 2001 PA/SI sampling event. The location of each drinking water well is listed in Table 3-1 and shown in Figure 3-1. All groundwater samples were analyzed for metals via USEPA CLPAS Method ILM04.1; for VOCs, SVOCs, and PCBs via USEPA CLPAS Method OLM04.2; and for hexavalent chromium via USEPA Method 218.6. Water-level measurements collected from the monitoring wells during the sampling event indicate that the direction of groundwater flow from the site is to the northeast and to the southwest. Wells LD-SWP-W1, LD-SEP-W1, and LD-PW-4 are considered a background wells, based on the groundwater flow direction and their locations outside the areas of influence from the site. The remaining wells listed in Table 3-1 are considered hydraulically downgradient. Chloromethane was reported in monitoring well LD-MW-93-1 at a concentration significantly above background, dichlorodifluoromethane was reported in monitoring well LD-MW-93-1 at a concentration significantly above background, and 1,1-DCE was reported in monitoring well 91-1 at a concentration significantly above background. These releases are attributable, at least in part, to the Laytonville Dump site, because leachate containing VOCs was previously identified at the landfill (6, 7).

The presence of VOCs at concentrations significantly above background were reported in two of the site-related monitoring. Although VOCs were not reported to have released to other groundwater wells during this sampling event, the potential exists for contamination to migrate to nearby drinking water wells.

4.3 Surface Water Pathway

In determining the score for the surface water pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release hazardous substances to surface water (e.g., streams, rivers, lakes, and oceans); 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, persistence, bioaccumulation potential, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on drinking water intakes, fisheries, and sensitive environments associated with surface water bodies within 15 miles downstream of the site.

Surface runoff from the site enters Cahto Creek, which is approximately 800 feet to the south of the site. Since Cahto Creek does not flow perennially and Laytonville receives more than 20 inches of annual rainfall, Cahto Creek cannot be evaluated as a surface water pathway under the HRS.

To address public concerns regarding contamination in Cahto Creek resulting from the Laytonville Dump site, one upgradient surface water sample and one downgradient surface water sample were collected during the sampling event. These sample locations are indicated in Figure 3-1. According to the reported values for these samples, as presented and discussed in Section 3.2.3.1, the water quality of Cahto Creek does not pose a risk to human or environmental health.

To address public concerns regarding contamination in the site-related sedimentation ponds, which in turn would be available to contaminate Cahto Creek via surface runoff, sediment and surface water samples were collected from the sedimentation ponds and from a background pond. These sample locations are indicated in Figure 3-2. According to the reported values for these samples, as presented and discussed in Sections 3.2.3.2 and 3.2.4, the sediment and water quality of the site-related sedimentation ponds to not pose a risk to environmental health.

4.4 Soil Exposure and Air Pathways

In determining the score for the soil exposure pathway, the HRS evaluates: 1) the likelihood that there is surficial contamination associated with the site (e.g., contaminated soil that is not covered by pavement or at least 2 feet of clean soil); 2) the characteristics of the hazardous substances in the surficial contamination (i,e., toxicity and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, exposed to the contamination. For the targets component of the evaluation, the HRS focuses on populations that are regularly and currently present on or within 200 feet of surficial contamination. The four populations that receive the most weight are residents, students, daycare attendees, and terrestrial sensitive environments.

In determining the score for the air migration pathway, the HRS evaluates: 1) the likelihood that sources at a site actually have released, or potentially could release, hazardous substances to ambient outdoor air; 2) the characteristics of the hazardous substances that are available for a release (i.e., toxicity, mobility, and quantity); and 3) the people or sensitive environments (targets) who actually have been, or potentially could be, impacted by the release. For the targets component of the evaluation, the HRS focuses on regularly occupied residences, schools, and workplaces within 4 miles of the site. Transient populations, such as customers and travelers passing through the area, are not counted.

A locked gate bars road access to the site and the former disposal area is surrounded by a maintained chain-link fence (11). In addition, a Type-D engineered cover was constructed over the 7-acre disposal area in 1997 (8). There are no residences, schools, daycare centers, or terrestrial sensitive environments on the site (5, 36).

5.0 EMERGENCY RESPONSE CONSIDERATIONS

The National Contingency Plan [40 CFR 300.415 (b) (2)] authorizes the USEPA to consider emergency response actions at those sites that pose an imminent threat to human health or the environment. For the following reasons, a referral to Region IX's Emergency Response Section does not appear to be necessary:

- A locked gate bars road access to the site and the former disposal area is surrounded by a maintained chain-link fence (11). In addition, a Type-D engineered cover was constructed over the 7-acre disposal area in 1997 (8).

- A release of hazardous substances from the site to the drinking water wells is currently not documented.

6.0 SUMMARY

The Laytonville Dump site is located on the south side of Branscomb Road, approximately 1.5 miles west of Laytonville in Mendocino County, California. The site is owned by the Mendocino County Solid Waste Division and consists of a 7-acre former disposal area. Associated with the site are four sedimentation ponds, a leachate collection system, and five groundwater monitoring wells.

The landfill operated under a Class II permit from 1967 until 1993. During operations, the Laytonville Dump facility was permitted to only accept non-hazardous municipal waste; however, there are allegations that materials containing hazardous substances, such as PCBs, hexavalent chromium, and photographic chemicals, were illegally disposed of at the site. An engineered cover was constructed over the landfill in 1997. However, it appears that there were flaws in the construction and leachate containing VOCs was identified at the landfill. During heavy precipitation, the four site-related sedimentation ponds overflow and drain through the adjacent Laytonville Rancheria and toward Cahto Creek. Cahto Creek flows through the adjacent Laytonville Rancheria and serves as a fishery to residents of the Rancheria. There are several active private drinking water wells near the site. Residents in the vicinity of the site, including the adjacent Laytonville Rancheria, have raised concerns about the potential migration of contaminants from the landfill into drinking water wells and surface water.

During closure activities, the Mendocino County Solid Waste Division reported all plans, activities, and reports to the North Coast RWQCB. RWQCB also directed the development of the groundwater investigation workplan that is currently implemented by the Solid Waste Division and continues to oversee monitoring of the site. The County performs quarterly monitoring events at the landfill. During each monitoring event, the landfill is monitored for methane gas and groundwater samples are collected from five site-related monitoring wells and analyzed for TDS, chloride, and the purgeable halocarbons and aromatics included in USEPA Methods 601 and 602, respectively. The County also periodically analyzes samples collected from the leachate containment facility and samples collected from two of the sedimentation ponds associated with the site.

The following pertinent Hazard Ranking System factors are associated with the site:

- A release of hazardous substances from the Laytonville Dump site to groundwater has been established. Results from the November 2002 Preliminary Assessment/Site Inspection sampling effort indicate the presence of chloromethane, dichlorodifluoromethane, and 1,1-dichloroethene in site-related monitoring wells located hydraulically downgradient of the 7-acre disposal area. The aquifers in the area are considered interconnected. These releases are attributable, at least in part, to the Laytonville Dump site because leachate containing VOCs has been identified at the site. No analytes attributable to the Laytonville Dump site were detected at significant concentrations in hydraulically downgradient drinking water wells (see Section 3.2.2).

- Surface runoff from the site enters Cahto Creek, which is approximately 800 feet to the south of the site. Since Cahto Creek does not flow perennially and Laytonville receives more than 20 inches of annual rainfall, Cahto Creek cannot be evaluated as a surface water pathway under the HRS. However, to address public concerns regarding contamination in Cahto Creek resulting from the Laytonville Dump site, one upgradient surface water sample and one downgradient surface water sample were collected during the sampling event. According to the reported values for these samples, as presented and discussed in Section 3.2.3.1, the water quality of Cahto Creek does not pose a risk to human or environmental health. Also, to address public concerns regarding contamination in the site-related sedimentation ponds, which in turn would be available to contaminate Cahto Creek via surface runoff, sediment and surface water samples were collected from the sedimentation ponds and from a background pond. According to the reported values for these samples, as presented and discussed in Sections 3.2.3.2 and 3.2.4, the sediment and water quality of the site-related sedimentation ponds do not pose a risk to environmental health.

- A locked gate bars road access to the site and the former disposal area is surrounded by a maintained chain-link fence. In addition, a Type-D engineered cover was constructed over the 7-acre disposal area in 1997. There are no residences, schools, daycare centers, or terrestrial sensitive environments on the site.

7.0 REFERENCE LIST

1. U.S. Environmental Protection Agency (EPA), Envirofacts Data Warehouse, Superfund Query, http://www.epa.gov/enviro, data extracted May 23, 2003.

2. Michael Brandman Associates, Laytonville Landfill Closure Project, September 30, 1996.

3. Cayler, Paul, Mendocino County Solid Waste Division, Memorandum to Members of the Board of Supervisors, January 26, 2001.

4. Barnett, Sandra, Cahto Tribe, Letter to Raho Ortiz, EPA Region IX, September 14, 2001.

5. Walker, Scott, California Integrated Waste Management Board, Letter to Paul Caylor, Mendocino County Solid Waste Division, March 22, 2001.

6. Cayler, Paul, Mendocino County Solid Waste Division, Laytonville Solid Waste Disposal Facility, Leak Detection, Quarterly Monitoring Report, 4th Quarter (October through December), 2000.

7. Cayler, Paul, Mendocino County Solid Waste Division, Laytonville Solid Waste Disposal Facility, Leak Detection, Quarterly Monitoring Report, 1st Quarter (January through March), 2001.

8. Abajian, Paula, Roy F. Weston, Inc., Inter-Agency Site Reconnaissance Interview and Observations Report, Laytonville Dump, December 10 and 11, 2001.

9. Cayler, Paul, Mendocino County Solid Waste Division, Laytonville Solid Waste Disposal Facility, Leak Detection, Quarterly Monitoring Reports, 4st Quarter 1992 through 1st Quarter 1999.

ED_013162_00000569-00026

10. SHN Consulting Engineers & Geologists, Laytonville Solid Waste Disposal Site, Report of Waste Discharge, November, 1991.

11. DELETED

12. Cayler, Paul, Mendocino County Solid Waste Division, Letter (with attachments) to Mr. and Mrs. Shields, September 8, 1997.

13. Cayler, Paul, Mendocino County Solid Waste Division, Facsimile of analytical data for domestic drinking water wells to Paula Abajian, Roy F. Weston, Inc., July 26, 2001.

14. Barnett, Sandra, Cahto Tribe, Laytonville Rancheria, electronic mail to Paula Abajian, Roy F. Weston, Inc., January 26, 2002.

15. U.S. Environmental Protection Agency, Letter to Tom Unsell, California Integrated Waste Management Board (CIWMB), November 9, 1993.

16. Rivera, Luis G., California Regional Water Quality Control Board (RWQCB), North Coast Region, Letter to Bill and Florence Bowler, September 17, 1993.

17. U.S. Geologial Survey, Cahto Peak Quadrangle, California, 7.5 Minute Series (topographic), Photorevised 1988, Edited 1988.

18. Cayler, Paul, Mendocino County Solid Waste Division, Notice to agencies of Closure of the Laytonville Landfill, September 29, 1993.

19. Anderson, Robert, California Integrated Waste Management Board (CIWMB), Closure and Remediation Branch, Site Assessment Data Form (with attachment), October 6, 1993.

20. EPA, Envirofacts Data Warehouse, Hazardous Waste (RCRA Info) Query, http://www.epa.gov/enviro/, data extracted May 23, 2003

21. Cayler, Paul, Mendocino County Solid Waste Division, Memorandum to Jeff Inglis, U.S. Environmental Protection Agency, June 10, 2002.

22. Cayler, Paul, Mendocino County Solid Waste Division, Facsimile regarding Mendocino county's quarterly monitoring events to Paula Abajian, Roy F. Weston, Inc., January 4, 2002.

23. Wolbach, C. D., County of Mendocino Air Quality Management District, Memorandum, Subject: Investigation for VOC emissions at Laytonville Landfill 6/8 and 6/14/00.

24. Gasch, Jerrie W., Kent Gasch, and David Hagin, Gasch and Associates, Letter to Michael Umbrello and Sandra Barnett, Cahto Tribe, May 15, 2000.

25. CLS Labs, Analytical Results Summary, May 31, 2001.

26. U.S. Environmental Protection Agency, Superfund Chemical Data Matrix (SCDM), Publication 9345.1-21, June 1996.

27. Smucker, S. J., U.S. Environmental Protection Agency, Region IX, Preliminary Remediation Goals, November 1, 2000.

28. Gable, Scott, SECOR International, Electronic mail (with electronic attachments) to Stephen Johnston, et al., December 7, 2001

29. Johnson, Stephen W., and Terry A. Geiselman, Water Quality Technology, Inc., An Evaluation of contaminant Sources at the Laytonville Landfill in Mendocino County, California and the Potential for Contaminant Exposure to Cahto Tribe of Laytonville Rancheria Residents and the Environment, June 28, 2002.

30. Taylor, David, U.S. Environmental Protection Agency, Region IX, Quality Assurance Office, Telephone conversation recorded on Contact Report by Paula Abajian, Roy F. Weston, Inc., December 27, 2001.

31. White, David, Laytonville Water District, Telephone conversations recorded on Contact Report by Paula Abajian, Weston Solutions, Inc., dated 8/28/01, 11/14/01, 11/28/01, and 5/20/01.

32. Hart, Nicole C., Anderson Consulting Group, Final Closure and Postclosure Maintenance Plan, Laytonville Landfill, Mendocino County, December 1996.

33. County of Mendocino, Laytonville Landfill Groundwater Well Elevations, Calendar Year 2001, 1st Quarter dated 3/7/01, 2nd Quarter dated 6/21/01, 3rd Quarter dated 9/18/01, and 4th Quarter dated 12/4/01.

34. Bowen, Roberta, Roy F. Weston, Hydrogeology evaluation of the Laytonville Landfill (with attachments, including well logs), February 6, 2002.

35. U.S. Census Bureau, Population, Housing Units, Area, and Density: 2000, http://factfinder.census.gov, data extracted May 21, 2003.

36. GIS Report (located in the Confidential Information Packet).

ED_013162_00000569-00028

Table 3-1
November 2002 Laytonville Dump PA/SI
Groundwater, Surface Water, and Sediment Sample Identification

Matrix: Groundwater

Sample ID	Sample Type	Well Type	Groundwater Level (feet above mean sea level)	Well Owner	Location
LD-SWP-W1	Background	Residential Drinking Water	Not Available	Dawn Caye	801 Steele Lane Laytonville, CA
LD-SEP-W1	Background	Residential Drinking Water	Not Available	Russ Brown	43101 Mather Lane Laytonville, CA
LD-PW-4	Background	Residential Drinking Water	Not Available	Alicia Bliss	43301 Mather Lane Laytonville, CA
LD-MW-90-1	Field	Monitoring	1738.85	Laytonville Dump	Monitoring Well 90-1
LD-MW-91-1	Field	Monitoring	1697.2	Laytonville Dump	Monitoring Well 91-1
LD-MW-93-1	Field	Monitoring	1727.3	Laytonville Dump	Monitoring Well 93-1
LD-MW-93-2	Field	Monitoring	1738.65	Laytonville Dump	Monitoring Well 93-2
LD-MW-94-1	Field	Monitoring	1723.81	Laytonville Dump	Monitoring Well 94-1
LD-MW-94-1-2	Duplicate of LD-MW-94-1	Monitoring	1723.81	Laytonville Dump	Monitoring Well 94-1
LD-PW-1	Field	Residential Drinking Water	Not Available	Donald Briggs	44021 Briggs Lane Laytonville, CA
LD-PW-2	Field	Residential Drinking Water	Not Available	Jerry French	Lower Well 1951 Branscomb Road Laytonville, CA
LD-PW-2-2	Duplicate of LD-PW-2	Residential Drinking Water	Not Available	Jerry French	Lower Well 1951 Branscomb Road Laytonville, CA
LD-PW-3	Field	Residential Drinking Water	Not Available	Jerry French	Upper Well 1951 Branscomb Road Laytonville, CA

LD-PW-5	Field	Residential Drinking Water	Not Available	Jerry Silva	2015 Branscomb Road Laytonville, CA
LD-PW-6	Field	Residential Drinking Water	Not Available	Todd Warner	1380 Branscomb Road Laytonville, CA
LD-PW-7	Field	Public Drinking Water	Not Available	Laytonville Water District	Near the intersection of Willis Avenue and Harwood Road Laytonville, CA
LD-CC-W3	Field	Residential Drinking Water	Not Available	M. Scholt	520 Mulligan Road Laytonville, CA
LD-CC-W4	Field	Residential Drinking Water	Not Available	Kevin Gibson	1970 North Road Laytonville, CA

Matrix: Surface Water

Sample ID	Sample Type	Location
LD-CC-W1	Background	Cahto Creek Upstream of probable point of entries of site runoff (southwest portion of J. Silva's property)
LD-CC-W2	Release	Cahto Creek Downstream of probable point of entry for site runoff (near the bridge on the Laytonville Rancheria)
LD-BGP-W1	Background	Laytonville Dump North of Branscomb Road, Laytonville, CA
LD-BGP-W2	Background	Laytonville Dump North of Branscomb Road, Laytonville, CA
LD-NEP-W1	Release	Laytonville Dump Northeast Sedimentation Pond (west end of pond)
LD-NEP-W2	Release	Laytonville Dump Northeast Sedimentation Pond (east end of pond)
LD-NWP-W1	Release	Laytonville Dump Northwest Sedimentation Pond (south end of pond)
LD-SWP-W1-2	Duplicate of LD-NWP-W1	Laytonville Dump Northwest Sedimentation Pond (south end of pond)

LD-NWP-W2	Release	Laytonville Dump Northwest Sedimentation Pond (north end of pond)
LD-NWP-W3	Release	Laytonville Dump Northwest Sedimentation Pond (center of east side of pond)

Matrix: Sediment

Sample ID	Sample Type	Location
LD-BGP-S1	Background	North of Branscomb Road, Laytonville, CA
LD-BGP-S2	Background	North of Branscomb Road, Laytonville, CA
LD-NEP-S1	Release	Laytonville Dump Northeast Sedimentation Pond (west end of pond)
LD-NEP-S2	Release	Laytonville Dump Northeast Sedimentation Pond(east end of pond)
LD-NWP-S1	Release	Laytonville Dump Northwest Sedimentation Pond (south end of pond)
LD-SWP-S1-2	Duplicate of LD-NWP-S1	Laytonville Dump Northwest Sedimentation Pond (south end of pond)
LD-NWP-S2	Release	Laytonville Dump Northwest Sedimentation Pond (north end of pond)
LD-NWP-S3	Release	Laytonville Dump Northwest Sedimentation Pond (center of east side of pond)
LD-SWP-S1	Release	Laytonville Dump Southwest Sedimentation Pond (center of pond)

Table 3-2
November 2002 Laytonville Dump PA/SI
Complete List of Analytes and
Associated Reporting Limits and Health-Based Benchmarks for Drinking Water

Analytes		Health-Based Benchmarks (ug/L)		
Metals	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
Aluminum	200	—	1,000	36,000
Antimony	60.0	6	6	15
Arsenic	10.0	50	50	0.045 ca
Barium	200	2,000	1,000	2,600
Beryllium	5.0	4	4	73
Cadmium	5.0	5	5	18
Calcium	5,000	—	—	—
Chromium, Total	10.0	100	50	—
Chromium, Hexavalent	5.0	—	—	110
Cobalt	50.0	—	—	730
Copper	25.0	1,300	1,300	1,500
Iron	100	—	—	11,000
Lead	3.0	50	50	—
Magnesium	5,000	—	—	—
Manganese	15.0	—	—	880
Mercury	0.20	2	2	—
Nickel	40.0	—	100	730
Potassium	5,000	—	—	—
Selenium	5,000	50	50	180
Silver	5.0	—	—	180
Sodium	5,000	—	—	—
Thallium	10.0	2	2	2.4
Vanadium	50.0	—	—	260
Zinc	20.0	—	—	11,000
Semi-Volatile Organic Compounds	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
Benzaldehyde	5	—	—	3,600
Phenol	5	—	—	22,000

Table 3-2
November 2002 Laytonville Dump PA/SI
Complete List of Analytes and
Associated Reporting Limits and Health-Based Benchmarks for Drinking Water

Analytes		Health-Based Benchmarks (ug/L)		
Semi-Volatile Organic Compounds	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
bis-(2-Chloroethyl) ether	5	—	—	0.0098 ca
2-Chlorophenol	5	—	—	30
2-Methylphenol	5	—	—	1,800
2,2'-oxybis(1-Chloropropane)	5	—	—	—
Acetophenone	5	—	—	—
4-Methylphenol	5	—	—	180
N-Nitroso-di-n-propylamine	5	—	—	0.0096 ca
Hexachloroethane	5	—	—	4.8 ca
Nitrobenzene	5	—	—	3.4
Isophorone	5	—	—	710 ca
2-Nitrophenol	5	—	—	—
2,4-Dimethylphenol	5	—	—	730
bis(2-Chloroethoxy)methane	5	—	—	—
2,4-Dichlorophenol	5	—	—	110
Naphthalene	5	—	—	6.2
4-Chloroaniline	5	—	—	150
Hexachlorobutadiene	5	—	—	0.86 ca
Caprolactam	5	—	—	18,000
4-Chloro-3-methylphenol	5	—	—	—
2-Methylnaphthalene	5	—	—	—
Hexachlorocyclopentadiene	5	50	50	220
2,4,6-Trichlorophenol	5	—	—	3.6
2,4,5-Trichlorophenol	20	50	50	3,600
1,1'-Biphenyl	5	—	—	300
2-Chloronaphthalene	5	—	—	—
2-Nitroaniline	20	—	—	1.0
Dimethylphthalate	5	—	—	360,000
2,6-Dinitrotoluene	5	—	—	36

Table 3-2
November 2002 Laytonville Dump PA/SI
Complete List of Analytes and
Associated Reporting Limits and Health-Based Benchmarks for Drinking Water

Analytes		Health-Based Benchmarks (ug/L)		
Semi-Volatile Organic Compounds	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
Acenaphthylene	5	—	—	—
3-Nitroaniline	20	—	—	—
Acenaphthene	5	—	—	370
2,4-Dinitrophenol	20	—	—	73
4-Nitrophenol	20	—	—	—
Dibenzofuran	5	—	—	24
2,4-Dinitrotoluene	5	—	—	73
Diethylphthalate	5	—	—	29,000
Fluorene	5	—	—	240
4-Chlorophenyl-phenyl ether	5	—	—	—
4-Nitroaniline	20	—	—	—
4,6-Dinitro-2-methylphenol	20	—	—	—
N-Nitrosodiphenylamine	5	—	—	14 ca
1,2,4,5-Tetrachlorobenzene	5	—	—	11
4-Bromophenyl-phenylether	5	—	—	—
Hexachlorobenzene	5	1	1	0.042 ca
Atrazine	5	3	3	0.30 ca
Pentachlorophenol	5	1	1	0.56 ca
Phenanthrene	5	—	—	—
Anthracene	5	—	—	1,800
Di-n-butylphthalate	5	—	—	—
Fluoranthene	5	—	—	1,500
Pyrene	5	—	—	180
Butylbenzylphthalate	5	—	—	7,300
3,3'-Dichlorobenzidine	5	—	—	0.15 ca
Benzo(a)anthracene	5	—	—	0.092 ca
Chrysene	5	—	—	0.56 ca
bis(2-Ethylhexyl)phthalate	5	—	—	4.8 ca

Table 3-2
November 2002 Laytonville Dump PA/SI
Complete List of Analytes and
Associated Reporting Limits and Health-Based Benchmarks for Drinking Water

Analytes		Health-Based Benchmarks (ug/L)		
Semi-Volatile Organic Compounds	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
Di-n-octylphthalate	5	—	—	1,500
Benzo(b)fluoranthene	5	—	—	0.092 ca
Benzo(k)fluoranthene	5	—	—	0.92 ca
Benzo(a)pyrene	5	—	—	0.0092 ca
Indeno(1,2,3-cd)pyrene	5	—	—	0.092 ca
Dibenzo(a,h)anthracene	5	—	—	—
Benzo(g,h,i)perylene	5	—	—	—
Volatile Organic Compounds	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
Dichlorodifluoromethane	0.5	—	—	390
Chloromethane	0.5	—	—	1.5 ca
Vinyl Chloride	0.5	2	0.5	0.020 ca
Bromomethane	0.5	—	—	8.7
Chloroethane	0.5	—	—	4.6 ca
Trichlorofluoromethane	0.5	—	150	1,300
1,1-Dichloroethene	0.5	7	6	340
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5	—	1,200	—
Acetone	5	—	—	610
Carbon Disulfide	0.5	—	—	1,000
Methyl Acetate	0.5	—	—	6,100
Methylene Chloride (Dichloromethane)	0.5	5	5	4.3 ca
trans-1,2-Dichloroethene	0.5	100	10	120
tert-Butyl Methyl Ether	0.5	—	13	6.2 ca
1,1-Dichloroethane	0.5	—	5	2.0 ca
cis-1,2-Dichloroethene	0.5	70	6	61
2-Butanone	5	—	—	—
Bromochloromethane	0.5	—	—	—
Chloroform	0.5	80[1]	100[1]	0.53 ca
1,1,1-Trichloroethane	0.5	200	200	3,200

Table 3-2
November 2002 Laytonville Dump PA/SI
Complete List of Analytes and
Associated Reporting Limits and Health-Based Benchmarks for Drinking Water

Analytes		Health-Based Benchmarks (ug/L)		
Volatile Organic Compounds	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
Cyclohexane	0.5	—	—	35,000
Carbon Tetrachloride	0.5	5	0.5	0.17 ca
Benzene	0.5	5	1	0.34 ca
1,2-Dichloroethane	0.5	5	0.5	0.12 ca
Trichloroethene	0.5	5	5	0.028 ca
Methylcyclohexane	0.5	—	—	5,200
1,2-Dichloropropane	0.5	5	5	0.16 ca
Bromodichloromethane	0.5	80[1]	100[1]	0.18 ca
cis-1,3-Dichloropropene	0.5	—	0.5	0.40 ca
4-Methyl-2-pentanone	5	—	—	160
Toluene	0.5	1,000	150	720
trans-1,3-Dichloropropene	0.5	—	0.5	0.40 ca
1,1,2-Trichloroethane	0.5	5	5	0.20 ca
Tetrachloroethene	0.5	5	5	0.66 ca
2-Hexanone	5	—	—	—
Dibromochloromethane	0.5	80[1]	100[1]	0.13 ca
1,2-Dibromoethane	0.5	—	—	—
Chlorobenzene (Monochlorobenzene)	0.5	100	70	110
Ethylbenzene	0.5	700	700	2.9 ca
Xylenes (total)	0.5	10,000	1,750	210
Styrene	0.5	100	100	1,600
Bromoform	0.5	80[1]	100[1]	8.5 ca
Isopropylbenzene	0.5	—	—	—
1,1,2,2-Tetrachloroethane	0.5	—	1	0.055 ca
1,3-Dichlorobenzene	0.5	—	—	5.5
1,4-Dichlorobenzene	0.5	75	5	0.50 ca
1,2-Dichlorobenzene	0.5	600	600	370
1,2-Dibromo-3-chloropropane	0.5	0.2	0.2	0.048 ca

Table 3-2
November 2002 Laytonville Dump PA/SI
Complete List of Analytes and
Associated Reporting Limits and Health-Based Benchmarks for Drinking Water

Analytes		Health-Based Benchmarks (ug/L)		
Volatile Organic Compounds	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
1,2,4-Trichlorobenzene	0.5	70	70	190
1,2,3-Trichlorobenzene	0.5	—	—	—
Pesticides/PCBs	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
alpha-BHC	0.010	—	—	0.042 ca
beta-BHC	0.010	—	—	0.037 ca
delta-BHC	0.010	—	—	—
gamma-BHC (Lindane)	0.010	0.2	0.2	0.052 ca
Heptachlor	0.010	0.4	0.01	0.015 ca
Aldrin	0.010	—	—	0.0040 ca
Heptachlor epoxide	0.010	0.2	0.01	0.0074 ca
Endosulfan I	0.010	—	—	220
Dieldrin	0.020	—	—	0.0042 ca
4,4'-DDE	0.020	—	—	0.20 ca
Endrin	0.020	2	2	11
Endosulfan II	0.020	—	—	—
4,4'-DDD	0.020	—	—	0.28 ca
Endosulfan sulfate	0.020	—	—	—
4,4'-DDT	0.020	—	—	0.20 ca
Methoxychlor	0.10	40	40	180
Endrin ketone	0.020	—	—	—
Endrin aldehyde	0.020	—	—	—
alpha-Chlordane	0.010	2	0.1	0.19 ca
gamma-Chlordane	0.010	2	0.1	0.19 ca
Toxaphene	1.0	3	3	0.061 ca
Aroclor-1016	0.20	0.5	0.5	0.96 ca
Aroclor-1221	0.40	0.5	0.5	0.034 ca
Aroclor-1232	0.20	0.5	0.5	0.034 ca
Aroclor-1242	0.20	0.5	0.5	0.034 ca

Table 3-2 November 2002 Laytonville Dump PA/SI Complete List of Analytes and Associated Reporting Limits and Health-Based Benchmarks for Drinking Water				
Analytes		**Health-Based Benchmarks (ug/L)**		
Pesticides/PCBs	**Reporting Limits (ug/L)**	**USEPA MCL**	**CDHS MCL**	**PRG**
Aroclor-1248	0.20	0.5	0.5	0.034 ca
Aroclor-1254	0.20	0.5	0.5	0.034 ca
Aroclor-1260	0.20	0.5	0.5	0.034 ca

[1] = Bromoform, bromodichloromethane, chloroform, and dibromochloromethane are trihalomethanes. This MCL is for total triahlomethanes, rather than for the individually listed analyte.

Reporting limit = The minimum concentration at which an analyte can be quantified and reported by the analytical laboratory.

USEPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level. The USEPA MCL is the highest level of a contaminant that is allowed in drinking water. USEPA MCLs are enforceable standards set by the U.S. Environmental Protection Agency. The purpose of setting and enforcing MCLs is to protect drinking water by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water.

CDHS MCL = California Department of Health Services Maximum Contaminant Level. CDHS MCLs serve the same purpose as USEPA MCLs. However, CDHS MCLs are set by and apply only to the State of California. CDHS MCLs are either as strict or more strict than USEPA MCLs.

PRG = Preliminary Remediation Goal. These are the most recent PRGs as established by Region 9 of the USEPA in October 2002. PRGs are risk-based concentrations that are intended to assist risk assessors in initial screening-level evaluations of environmental measurements. The PRGs presented in this table apply to the risk from the ingestion of tap water. PRGs are not enforceable standards and should always be considered in conjunction with enforceable benchmarks (e.g., MCLs) and background conditions.

ca = Tap water PRGs are chemical concentrations that correspond to fixed levels of risk (i.e., either a one-in-one million [10^{-6}] cancer risk or a noncarcinogenic hazard quotient of 1) in ingested tap water. In most cases, where a substance causes both cancer and noncancer (systemic) effects, the 10^{-6} cancer risk will result in a more stringent criteria and it is this value that is presented in the printed copy of the PRG table, as well as in this table.

ug/L = micrograms per liter (parts per billion)

PCB = Polychlorinated Biphenyl.

— = There is no health-based benchmark in this category established for the analyte.

Table 3-3
November 2002 Laytonville Dump PA/SI Groundwater Sampling Results for Total Metals, including Hexavalent Chromium (μg/L)
(results significantly above background are bolded and underlined[1])

Well ID	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium, Total	Chromium, Hexavalent	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Background Wells																									
LD-SWP-W1	11/6/02	5,060	5.4J	17.3	157J	0.73J	2.7J	8,300	36.5	ND	43.1J	196	140,000	5.3	9,750	399	ND	38.2J	912J	5.6	3.5J	10,100	17.4	33.8J	271
LD-SEP-W1	11/6/02	151J	ND	5.0J	40.8J	0.67J	ND	3,660J	1.7J	ND	ND	2.3J	3,210	ND	4,080J	80.7	ND	6.1J	534J	ND	ND	5,860	ND	ND	8.2J
LD-PW-4	11/6/02	170J	ND	6.4J	20.6J	ND	ND	20,100	ND	ND	ND	ND	180	ND	13,600	98.4	ND	ND	749J	ND	ND	21,200	ND	ND	9.2J
Hydraulically Downgradient Site-Related Monitoring Wells																									
LD-MW-90-1	11/5/02	187J	ND	ND	728	ND	0.72J	31,500	ND	ND	ND	10.6J	32,700	3.2	24,600	**1,480**	ND	ND	2,190J	ND	ND	34,700	ND	ND	4.1J
LD-MW-91-1	11/5/02	155J	ND	13.2	361	ND	ND	47,800	ND	ND	ND	ND	1,670	ND	13,500	**2,820**	ND	ND	1,680J	ND	ND	43,000	ND	ND	ND
LD-MW-93-1	11/5/02	5,980	ND	ND	55.4J	ND	ND	**330,000**	6.4J	ND	105	8.3J	6,360	ND	**669,000**	182	ND	24.1J	**10,300J**	ND	ND	**603,000**	ND	12.8J	32.1
LD-MW-93-2	11/5/02	704	ND	7.9J	59.3J	ND	0.70J	**61,800**	2.5J	ND	1.5J	3.8J	17,500	ND	35,900	**5,470**	ND	4.5J	2,160J	ND	ND	**67,200**	ND	ND	3.5J
LD-MW-94-1	11/5/02	5,140	ND	ND	87.8J	ND	0.87J	**187,000**	7.8J	ND	4.8J	13.4J	8,240	ND	**278,000**	479	ND	17.9J	**4,990J**	ND	ND	**310,000**	ND	17.4J	72.0
LD-MW-94-1-2	11/5/02	3,490	ND	ND	79.4J	ND	1.0J	**186,000**	4.4J	ND	2.6J	11.3J	5,790	ND	**277,000**	414	ND	15.5J	**4,830J**	ND	ND	**315,000**	ND	11.5J	46.0
Hydraulically Downgradient Drinking Water Wells																									
LD-PW-1	11/4/02	163J	ND	ND	229	ND	ND	12,800	ND	ND	ND	2.8J	11,800	ND	3,860J	663	ND	ND	793J	ND	ND	11,500	ND	ND	2.1J
LD-PW-2	11/7/02	1,370	ND	ND	254	ND	ND	28,800	0.81J	ND	4.9J	11.7J	19,500	4.2	12,900	**1,970**	ND	7.0J	1,310J	ND	ND	26,100	ND	2.7J	23.7
LD-PW-2-2	11/7/02	4,370	ND	ND	245	ND	0.68J	25,700	5.5J	ND	6.3J	18.9J	14,800	4.9	12,300	**1,870**	ND	10.8J	1,730J	ND	ND	23,900	ND	10.8J	22.6
LD-PW-3	11/7/02	176J	ND	ND	274	ND	ND	26,500	ND	ND	ND	ND	1,220	ND	10,100	**2,590**	ND	ND	1,370J	ND	ND	29,100	ND	ND	16.8J

Table 3-3
November 2002 Laytonville Dump PA/SI Groundwater Sampling Results for Total Metals, including Hexavalent Chromium (μg/L)
(results significantly above background are bolded and underlined[1])

Well ID	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium, Total	Chromium, Hexavalent	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
LD-PW-5	11/4/02	227	ND	ND	83.7J	ND	ND	37,600	ND	ND	ND	160	174	ND	9,150	82.2	ND	3.5J	1,130J	ND	ND	12,300	ND	ND	81.9
LD-PW-6	11/6/02	195J	ND	36.9	56.0J	ND	ND	36,100	ND	ND	ND	12.4J	339	ND	17,700	14.9J	ND	ND	854J	ND	ND	27,900	ND	ND	13.0J
LD-PW-7[2]	11/4/02	185J	ND	**68.2**	165J	ND	ND	37,800	ND	ND	ND	ND	2,140	ND	19,800	**1,480**	ND	ND	766J	ND	ND	29,500	ND	ND	6.4J
LD-CC-W3	11/7/02	173J	ND	8.1J	145J	0.76J	ND	20,000	ND	ND	ND	6.9J	1,600	ND	11,900	689	ND	ND	672J	ND	ND	12,100	ND	ND	44.8
LD-CC-W4	11/7/02	202	ND	26.2	149J	0.66J	ND	17,000	ND	ND	ND	1.4J	9,240	ND	5,930	1,010	ND	ND	909J	ND	ND	29,100	ND	ND	9.2J

[1] = An analyte is considered to be present at a concentration significantly above background if one of the following two criteria is met 1) the analyte is detected in a downgradient sample when not detected in the background sample(s) or 2) the analyte is reported in a downgradient sample at a concentration equal to or greater than three times the maximum background level.

[2] = Laytonville Water District public supply well

ug/L = micrograms per liter (parts per billion)

ND = Analyte not detected above the reporting limit. The associated reporting limit is listed in Table 1.

J = The associated value is an estimated quantity. The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.

Table 3-4
November 2002 Laytonville Dump PA/SI Sampling Results for Semi-volatile Organic Compounds (SVOCs), Volatile Organic Compounds (VOCs), and Pesticides/PCBs Detected in Groundwater (μg/L)
(results significantly above background are bolded and underlined[1])

Well ID	Sample Date	Analytes Detected in Groundwater Samples								Analytes Detected in Groundwater Samples Suspected to Result from Laboratory Contamination[2]		
		VOCs								SVOCs		VOCs
		Bromodichloro-methane	Bromo-form	Chloroform	Chloro-methane	Dibromo-chloromethane	Dichlorodi-fluoromethane	1,1-Dichloroethene	Methyl acetate	Bis (2-ethylhexyl) phthalate[2]	Dimethyl phthalate[2]	2-Butanone[2]
Background Wells												
LD-SWP-W1	11/6/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LD-SEP-W1	11/6/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LD-PW-4	11/6/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hydraulically Downgradient Site-Related Monitoring Wells												
LD-MW-90-1	11/5/02	ND	ND	ND	ND	ND	ND	ND	ND	5J	ND	ND
LD-MW-91-1	11/5/02	ND	ND	ND	ND	ND	ND	0.1J	ND	3J	ND	ND
LD-MW-93-1	11/5/02	ND	ND	ND	0.3J	ND	0.2J	ND	ND	ND	39	ND
LD-MW-93-2	11/5/02	ND	ND	ND	ND	ND	ND	ND	ND	3J	ND	ND
LD-MW-94-1	11/5/02	ND	ND	ND	ND	ND	ND	ND	ND	0.9J	ND	ND
LD-MW-94-1-2	11/5/02	ND	ND	ND	ND	ND	ND	ND	0.3J	2J	ND	ND
Hydraulically Downgradient Drinking Water Wells												
LD-PW-1	11/4/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4J

Table 3-4
November 2002 Laytonville Dump PA/SI Sampling Results for Semi-volatile Organic Compounds (SVOCs), Volatile Organic Compounds (VOCs), and Pesticides/PCBs Detected in Groundwater (μg/L)
(results significantly above background are bolded and underlined[1])

Well ID	Sample Date	Analytes Detected in Groundwater Samples								Analytes Detected in Groundwater Samples Suspected to Result from Laboratory Contamination[2]		
		VOCs								SVOCs		VOCs
		Bromodichloro-methane	Bromo-form	Chloroform	Chloro-methane	Dibromo-chloromethane	Dichlorodi-fluoromethane	1,1-Dichloroethene	Methyl acetate	Bis (2-ethylhexyl) phthalate[2]	Dimethyl phthalate[2]	2-Butanone[2]
LD-PW-2	11/7/02	ND	ND	ND	ND	ND	ND	ND	ND	**1J**	ND	ND
LD-PW-2-2	11/7/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LD-PW-3	11/7/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LD-PW-5	11/4/02	**0.2J**	ND	**5J**	ND	ND	ND	ND	ND	ND	ND	ND
LD-PW-6	11/6/02	**10**	**6**	**6**	ND	**15**	ND	ND	ND	**1J**	ND	ND
LD-PW-7[3]	11/4/02	ND	ND	ND	ND	ND	ND	ND	ND	**2J**	ND	**0.4J**
LD-CC-W3	11/7/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LD-CC-W4	11/7/02	ND	ND	ND	ND	ND	ND	ND	ND	**2J**	ND	ND

[1] = An analyte is considered to be present at a concentration significantly above background if one of the following two criteria is met 1) the analyte is detected in a downgradient sample when not detected in the background sample(s) or 2) the analyte is reported in a downgradient sample at a concentration equal to or greater than three times the maximum background level.

[2] = The organic compounds 2-butanone, bis (2-ethylhexyl) phthalate, and dimethyl phthalate are common analytical laboratory contaminants and are considered as such for this evaluation.

[3] = Laytonville Water District public supply well

ug/L = micrograms per liter (parts per billion)

ND = Analyte not detected above the reporting limit. The associated reporting limit is listed in Table 1.

J = The associated value is an estimated quantity. The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.

Table 3-5
November 2002 Laytonville Dump PA/SI Surface Water Sampling Results for Total Metals, including Hexavalent Chromium s (μg/L)
(results significantly above background are bolded and underlined[1])

Sample ID	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium, Total	Chromium, Hexavalent	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Background Sample for Cahto Creek																									
LD-CC-W1	11/7/02	340	ND	ND	106J	0.59J	ND	41,000	ND	ND	ND	1.5J	193	ND	8,940	119	ND	3.8J	2,670J	ND	ND	10,000	ND	ND	2.1J
Downgradient/Release Sample for Cahto Creek																									
LD-CC-W2	11/6/02	210	ND	**4.1J**	122J	0.67J	ND	58,400	ND	ND	ND	1.7J	90.1J	ND	12,900	126	ND	6.4J	1,820J	ND	ND	11,500	ND	ND	3.1J
Background Pond Samples																									
LD-BGP-W1	11/4/02	227	ND	ND	12.5J	ND	ND	4,760J	ND	ND	ND	ND	610	ND	3,160J	109	ND	ND	760J	ND	ND	9,920	ND	ND	6.3J
LD-BGP-W2	11/4/02	248	ND	ND	12.6J	ND	ND	4,620J	ND	ND	ND	ND	655	ND	3,120J	77.7	ND	ND	753J	ND	ND	9,670	ND	ND	7.7J
Downgradient/Release Samples for the Site-Related Sedimentation Ponds																									
LD-NEP-W1	11/5/02	**1,100**	ND	**4.0J**	**50.3J**	**0.49J**	ND	2,210J	**2.0J**	ND	**1.9J**	**3.1J**	**3,590**	ND	2,270J	**358**	ND	**2.8J**	1,760J	ND	ND	8,590	ND	**7.2J**	6.5J
LD-NEP-W2	11/5/02	**940**	ND	ND	**45.6J**	**0.52J**	ND	2,130J	**1.5J**	ND	**2.1J**	**2.5J**	**3,100**	ND	2,140J	322	ND	**3.0J**	1,720J	ND	ND	8,900	ND	**6.4J**	4.9J
LD-NWP-W1	11/5/02	248	ND	ND	3.4J	**0.65J**	ND	1,570J	ND	ND	ND	ND	138	ND	3,580J	8.1J	ND	ND	230J	ND	ND	11,200	ND	ND	4.5J
LD-SWP-W1-2	11/5/02	603	ND	ND	7.8J	**0.50J**	ND	1,610J	**1.4J**	ND	ND	**1.0J**	556	ND	3,730J	14.7J	ND	**2.2J**	280J	ND	ND	11,100	ND	**1.4J**	3.8J
LD-NWP-W2	11/5/02	552	ND	ND	8.9J	**0.62J**	ND	1,450J	ND	ND	ND	**1.0J**	633	ND	3,370J	17.9	ND	**1.9J**	313J	ND	ND	11,200	ND	**1.5J**	7.3J
LD-NWP-W3	11/5/02	504J	ND	**4.4J**	8.8J	**0.67J**	ND	1,520J	ND	ND	ND	ND	485J	ND	3,560J	13.0J	ND	**3.0J**	262J	ND	ND	10,800J	ND	ND.	2.6J
AWQC/AALAC		—	—	150	—	—	1.1	—	11	—	—	12	1,000	3.2	—	—	0.012	160	—	5	4.1	—	—	—	110

[1] = An analyte is considered to be present at a concentration significantly above background if one of the following two criteria is met 1) the analyte is detected in a downgradient sample when not detected in the background sample(s) or 2) the analyte is reported in a downgradient sample at a concentration equal to or greater than three times the maximum background level.

ug/L = micrograms per liter (parts per billion)

ND = Analyte not detected above the reporting limit. The associated reporting limits for surface water samples are the same as those for groundwater and are listed in Table 1.

J = The associated value is an estimated quantity. The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.

AWQC/AALAC = Ambient Water Quality Criteria/Ambient Aquatic Life Advisory Concentration. The AWQC and AALAC, respectively, are human and environmental health-based benchmarks established by the USEPA and used to evaluate the quality of surface water. The AWQC/AALAC values presented in this table apply to freshwater.

Table 3-6

November 2002 Laytonville Dump PA/SI Sampling Results for Semi-Volatile Organic Compounds (SVOCs), Volatile Organic Compounds (VOCs), and Pesticides/PCBs Detected in Surface Water (μg/L)

(results significantly above background are bolded and underlined[1])

Sample ID	Sample Date	Analytes Detected in Surface Water Samples					Analytes Detected in Surface Water Samples Suspected to Result from Laboratory Contamination[2]	
		VOCs	Pesticides/PCBs				SVOCs	VOCs
		Methyl acetate	4,4-DDT	Endrin Aldehyde	Endrin Ketone	gamma-BHC (Lindane)	Bis (2-ethylhexyl) phthalate[2]	2-Butanone[2]
Background Sample for Cahto Creek								
LD-CC-W1	11/7/02	ND	ND	ND	ND	ND	3J	ND
Downgradient/Release Sample for Cahto Creek								
LD-CC-W2	11/6/02	ND	ND	ND	ND	ND	ND	ND
Background Pond Samples								
LD-BGP-W1	11/4/02	ND	ND	ND	ND	ND	ND	0.7J
LD-BGP-W2	11/4/02	ND	0.020J	ND	ND	ND	ND	0.5J
Downgradient/Release Samples for the Site-Related Sedimentation Ponds								
LD-NEP-W1	11/5/02	**0.9**	ND	ND	ND	ND	**11J**	0.8J
LD-NEP-W2	11/5/02	**1**	ND	**0.040**	**0.029**	**0.007J**	**3J**	0.4J
LD-NWP-W1	11/5/02	ND	ND	ND	ND	ND	ND	ND
LD-SWP-W1-2	11/5/02	ND	ND	ND	ND	ND	ND	ND
LD-NWP-W2	11/5/02	ND	ND	ND	ND	ND	**0.9J**	0.5J
LD-NWP-W3	11/5/02	ND	ND	ND	ND	ND	**2J**	0.5J
AWQC/AALAC		—	0.001	—	—	0.08	—	—

[1] = An analyte is considered to be present at a concentration significantly above background if one of the following two criteria is met 1) the analyte is detected in a downgradient sample when not detected in the background sample(s) or 2) the analyte is reported in a downgradient sample at a concentration equal to or greater than three times the maximum background level.

[2] = The organic compounds 2-butanone and bis (2-ethylhexyl) pthalate are common analytical laboratory contaminants and are considered as such for this evaluation.

ug/L = micrograms per liter (parts per billion)

ND = Analyte not detected above the reporting limit. The associated reporting limits for surface water samples are the same as those for groundwater and are listed in Table 1.

J = The associated value is an estimated quantity. The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.

Table 3-7
November 2002 Laytonville Dump PA/SI Sediment Sampling Results for Total Metals, including Hexavalent Chromium (mg/kg)
(results significantly above background are bolded and underlined[1])

Sample ID	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium, Total	Chromium, Hexavalent	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Background Sediment Samples																									
LD-BGP-S1	11/4/02	6,720	ND (43.0)	ND (21.7)	144J	ND (3.9)	3.7J	7,600J	41.3J	ND (4.1)	ND (30.0)	59.7J	17,000	77.7	3,210J	1,240	ND (1.1)	ND (23.0)	1,220J	ND (18.7)	ND (5.7)	ND (2020)	ND (18.3)	ND (25.7)	416
LD-BGP-S2	11/4/02	6,620	ND (38.1)	ND (19.2)	151J	ND (3.5)	3.0J	7,780J	39.1	ND (18)	ND (26.5)	63.1J	17,600	75.3	3,190J	1,330	ND (0.96)	21.0J	1,130J	ND (16.5)	ND (5.0)	ND (1,790)	ND (16.2)	ND (22.7)	433
Downgradient/Release Samples for the Site-Related Sedimentation Ponds																									
LD-NEP-S1	11/6/02	**23,900**	ND (9.1)	ND (4.6)	244	**1.2J**	ND (0.65)	2,050J	48.9	ND (1.0)	**14.2J**	44.3	32,900	12.2	7,530	424	ND (0.23)	49.1	2,180J	ND (4.0)	**1.6J**	ND (428)	ND (3.9)	**77**	116
LD-NEP-S2	11/6/02	**23,900**	ND (8.4)	**4.5J**	255	**1.2J**	ND (0.59)	2,200J	51.0	ND (0.82)	**15.1J**	42.9	33,300	14.4	8,140	467	ND (0.21)	50.3	1,910J	ND (3.6)	**1.3J**	ND (394)	ND (3.6)	**76.4**	121
LD-NWP-S1	11/5/02	13,600	ND (4.3)	ND (2.2)	126	**0.68J**	ND (0.31)	1,280J	27.6	ND (0.88)	**10.3J**	24.4	24,100	5.3	5,490	290	ND (0.11)	29.5	1,130J	ND (1.9)	**0.94J**	ND (204)	ND (1.8)	**44.7**	79.4
LD-SWP-S1-2	11/5/02	**24,500**	ND (8.0)	**4.2J**	223	**1.2J**	ND (0.56)	2,260J	49.6	ND (0.75)	**16.1J**	42.8	39,600	8.9	**9,690**	486	ND (0.20)	51.3	2,240J	ND (3.5)	**1.7J**	**889J**	ND (3.4)	**79.9**	155
LD-NWP-S2	11/5/02	**23,500**	ND (9.9)	ND (5.0)	234	**1.1J**	ND (0.70)	1,800J	45.6	ND (1.1)	**13.8J**	45.2	31,600	10.0	8,400	307	ND (0.25)	47.7	1,960J	ND (4.3)	**1.3J**	ND (467)	ND (4.2)	**74.0**	220
LD-NWP-S3	11/5/02	15,500	ND (3.2)	**2.4J**	257	**0.91J**	ND (0.22)	1,180J	29.1	**0.43J**	**20.6**	27.4	30,100	6.6	5,200	415	ND (0.080)	31.0	814J	ND (1.4)	**1.2J**	ND (148)	ND (1.3)	**50.8**	71.6
LD-SWP-S1	11/5/02	**27,000**	ND (3.1)	**3.4**	276	**1.2J**	ND (0.22)	2,700	58.5	ND (0.30)	**16.8**	51.0	46,100	9.8	**10,400**	545	ND (0.080)	57.8	1,630	ND (1.3)	**1.8J**	**373J**	ND (1.3)	**85.2**	193
Residential PRG		76,000	31	22	5,400	150	37	—	210	30	900	3,100	23,000	150	—	1,800	0	1,600	—	390Z	390	—	5.2	550	23,000

[1] = An analyte is considered to be present at a concentration significantly above background if one of the following two criteria is met 1) the analyte is detected in a downgradient sample when not detected in the background sample(s) or 2) the analyte is reported in a downgradient sample at a concentration equal to or greater than three times the maximum background level.

mg/kg = milligrams per kilogram (ppm)

ND = Analyte not detected above the reporting limit. The number in parentheses is the associated reporting limit.

J = The associated value is an estimated quantity. The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.

Residential PRG = Residential Preliminary Remediation Goal. These are the most recent PRGs as established by Region 9 of the USEPA in October 2002. PRGs are risk-based concentrations that are intended to assist risk assessors in initial screening-level evaluations of environmental measurements. The PRGs presented in this table apply to risk from exposure to residential soil. Residential PRGs are lower than the PRG levels established for industrial soil.

Table 3-8
November 2002 Laytonville Dump PA/SI
Sampling Results for Semi-Volatile Organic Compounds (SVOCs), Volatile Organic Compounds (VOCs), and Pesticides/PCBs Detected in Sediment Samples (μg/kg)
(results significantly above background are bolded and underlined[1])

Sample ID	Sample Date	Analytes Detected in Sediment Samples					Analytes Detected in Sediment Samples Suspected to Result from Laboratory Contamination[2]		
		SVOCs	VOCs			Pesticides/PCBs	SVOCs[2]	VOCs[2]	
		4-Methylphenol	Chloro-benzene	Toluene	Trichloroethene (TCE)	4,4-DDT	bis(2-Ethylhexyl) phthalate[2]	Acetone[2]	2-Butanone[2]
Background Sediment Samples									
LD-BGP-S1	11/4/02	ND (6,600)	11J	340J	ND (210)	ND (66)	1,500J	ND (380)	ND (210)
LD-BGP-S2	11/4/02	320J	ND (190)	690J	ND (190)	ND (66)	940J	1,000J	350J
Downgradient/Release Sediment Samples for the Site-Related Sedimentation Ponds									
LD-NEP-S1	11/6/02	ND (1,300)	ND (39)	ND (39)	ND (39)	**15**	110J	ND (39)	ND (39)
LD-NEP-S2	11/6/02	340J	ND (32)	ND (32)	ND (32)	ND (11)	230J	ND (88)	21J
LD-NWP-S1	11/5/02	ND (850)	ND (17)	ND (17)	ND (17)	ND (8.5)	62J	ND (26)	ND (17)
LD-SWP-S1-2	11/5/02	ND (1,100)	ND (44)	ND (44)	ND (44)	ND (11)	55J	ND (44)	ND (44)
LD-NWP-S2	11/5/02	ND (1,500)	ND (50)	ND (50)	ND (50)	ND (15)	330J	ND (250)	36J
LD-NWP-S3	11/5/02	ND (480)	ND (50)	ND (50)	**3J**	ND (50)	26J	ND (65)	ND (50)
LD-SWP-S1	11/5/02	ND (500)	ND (15)	ND (15)	**0.7J**	ND (15)	27J	ND (15)	ND (15)
Residential PRG		310,000	150,000	520,000	53	1,700	35,000	1,600,000	—

[1] = An analyte is considered to be present at a concentration significantly above background if one of the following two criteria is met 1) the analyte is detected in a downgradient sample when not detected in the background sample(s) or 2) the analyte is reported in a downgradient sample at a concentration equal to or greater than three times the maximum background level.

[2] = The organic compounds acetone and 2-butanone are common analytical laboratory contaminants and are considered as such for this evaluation.

ug/kg = micrograms per kilogram (parts per billion)

ND ( ) = Analyte not detected above the reporting limit. The number in parentheses is the associated reporting limit.

J = The assoicated value is an estimated quantity. The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.

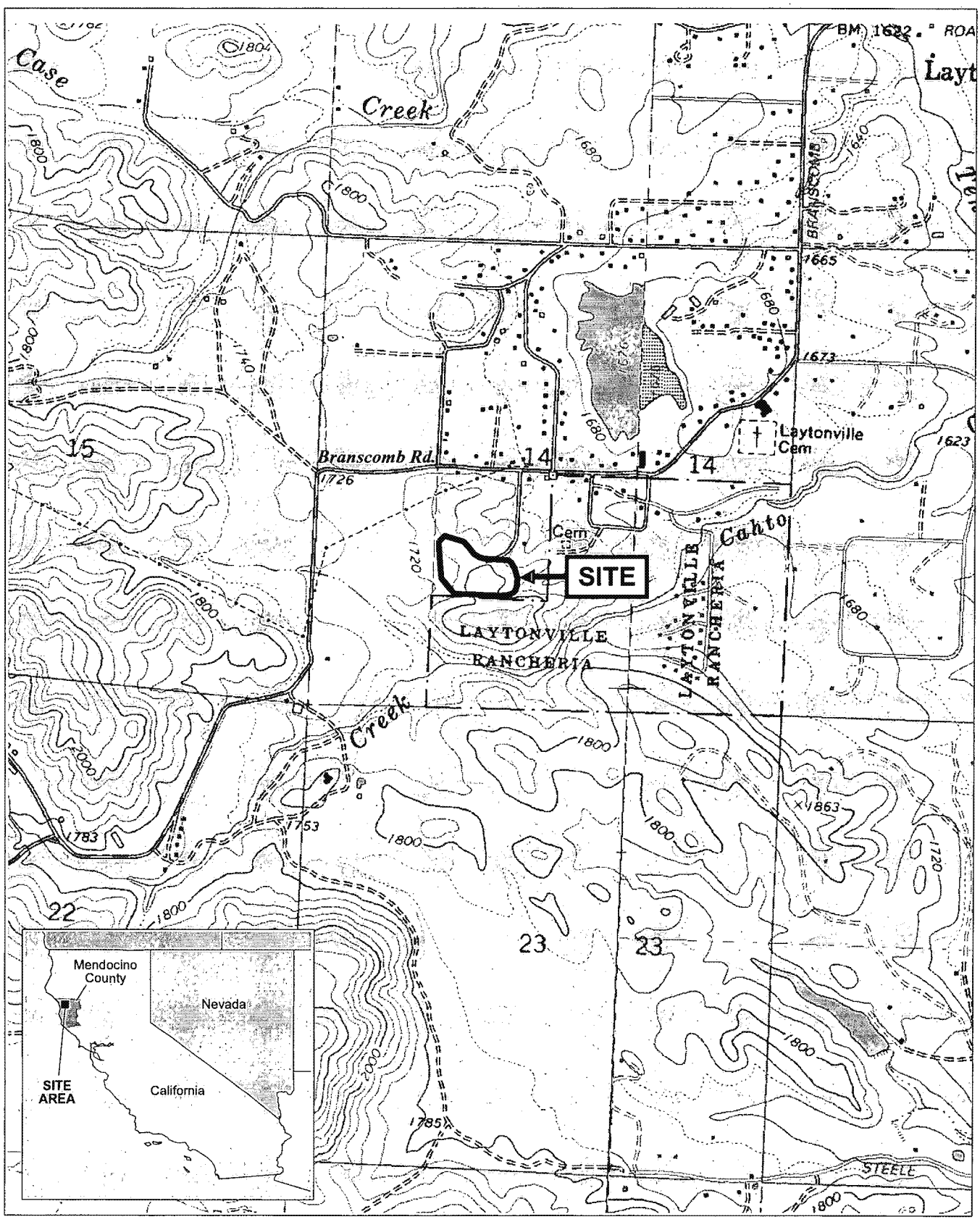
Residential PRG = Residential Preliminary Remediation Goal. These are the most recent PRGs as established by Region 9 of the USEPA in October 2002. PRGs are risk-based concentrations that are intended to assist risk assessors in initial screening-level evaluations of environmental measurements. The PRGs presented in this table apply to risk from exposure to residential soil. Residential PRGs are lower than the PRG levels established for industrial soil.

Table 4-1
Sampling Results Establishing a Release of VOCs to Groundwater
(results significantly above background are bolded and underlined)

Well ID	Sample Date	Groundwater Level (feet amsl)	Chloromethane (ug/L)	Dichlorodifluoromethane (ug/L)	1,1-Dichloroethene (ug/L)
Background Wells					
LD-SWP-W1	11/6/02	NA	ND	ND	ND
LD-SEP-W1	11/6/02	NA	ND	ND	ND
LD-PW-4	11/6/02	NA	ND	ND	ND
Hydraulically Downgradient Site-Related Monitoring Wells					
LD-MW-90-1	11/5/02	1738.85	ND	ND	ND
LD-MW-91-1	11/5/02	1697.2	ND	ND	**0.1J**
LD-MW-93-1	11/5/02	1727.3	**0.3J**	**0.2J**	ND
LD-MW-93-2	11/5/02	1738.65	ND	ND	ND
LD-MW-94-1	11/5/02	1723.81	ND	ND	ND
Health-based Benchmarks:			80	7,300	6
			EPA MCL	SCDM RDSC	CDHS MCL

amsl = above mean sea level
ug/L = micrograms per liter (parts per billion)
NA = not available
ND = not detected

EPA MCL = EPA Maximum Contaminant Level
SCDM RDSC = Superfund Chemical Data Matrix Reference Dose Screen Concentration
CDHS MCL = California Department of Health Services Maximum Contaminant Level



SOURCE: USGS 7.5 Minute Series (Topopgraphic) Quadrangles: Cahto Peak, CA, 1967; Laytonville, CA, 1967, photorevised 1994.

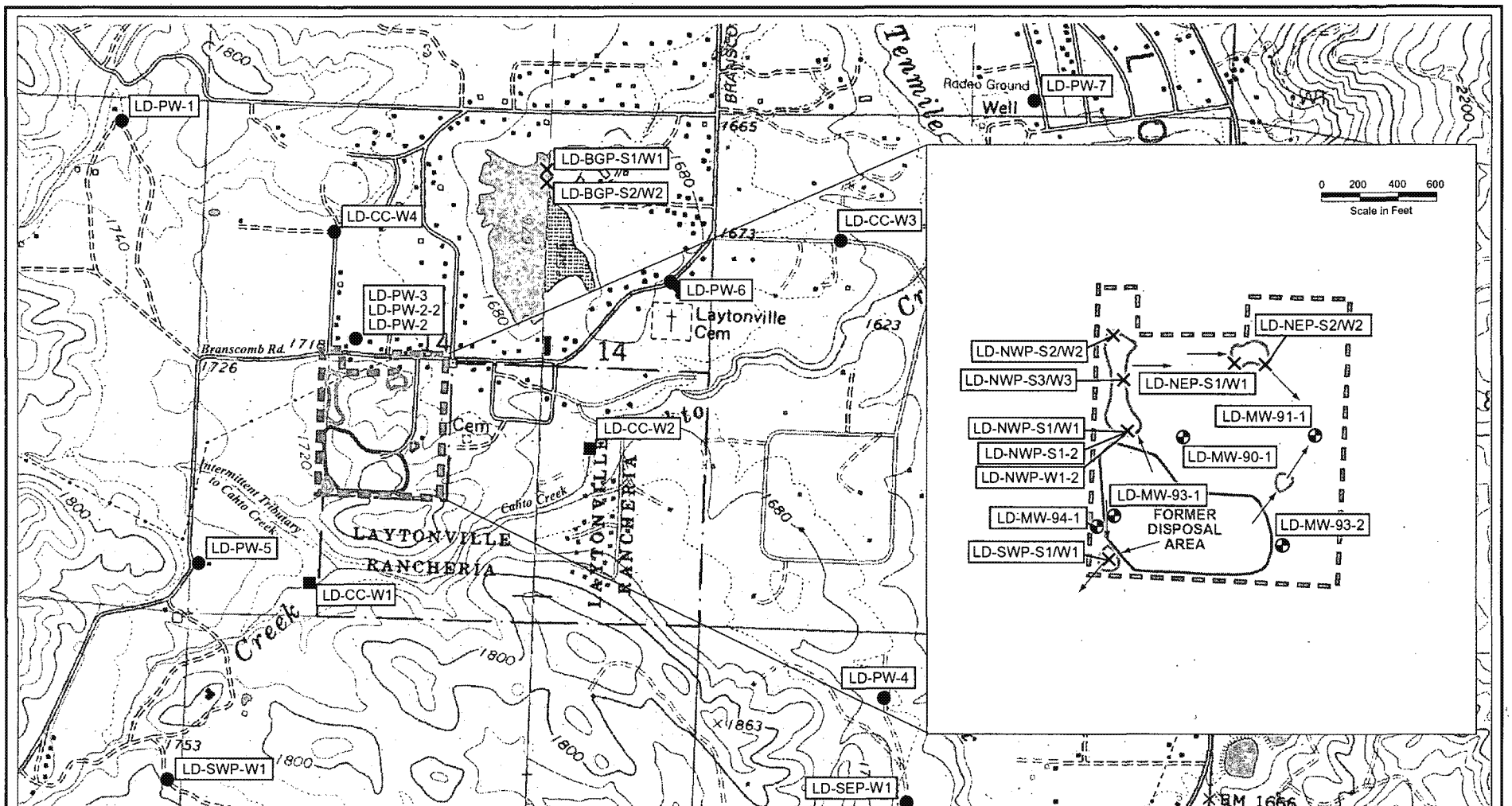
0 500 1000
Scale in Feet

N

DATE: 5/15/03

Figure 2-1
Laytonville Dump
November 2002 PA/SI
Site Location Map
Laytonville, Mendocino County, CA

03-0221 Fig2-1.ai



LEGEND:

- × Co-Located Sediment and Water Sample
- Site-Related Monitoring Well
- Drinking Water Wells
- Cahto Creek Surface Water Sample
- Point of Entry
- Point of Exit
- Area depicted in detail to the right
- Former Disposal Area
- Sedimentation Pond
- Background Pond

SOURCE: USGS 7.5 Minute Series (Topopgraphic) Quadrangles; Cahto Peak, CA, 1967; Laytonville, CA, 1967, photorevised 1994.

DATE: 5/15/03

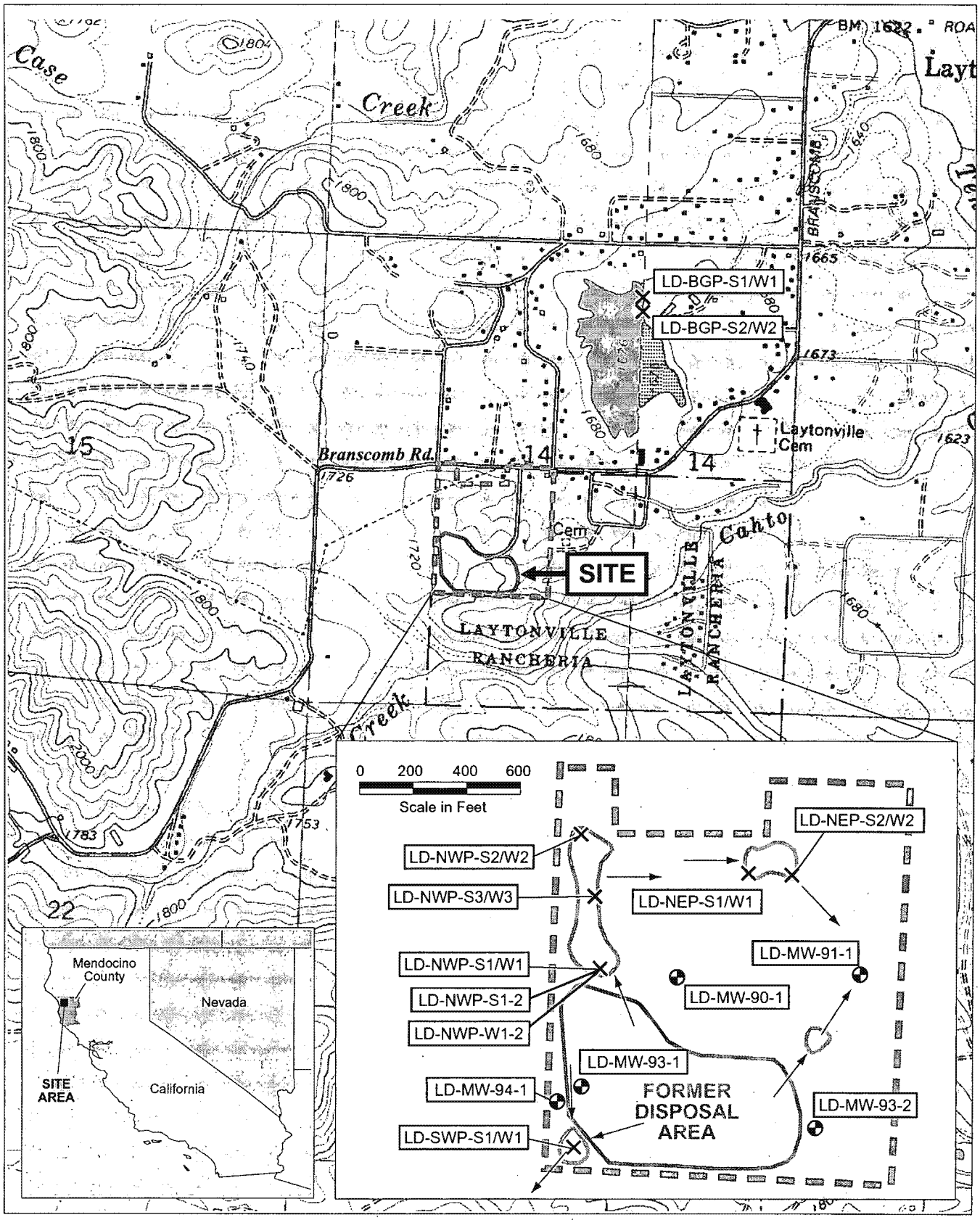
N

1000 0 1000 2000

Scale in Feet

Figure 3-1
Laytonville Dump
November 2002 PA/SI
Sampling Locations
Laytonville, Mendocino County, CA

03-0221 Fig3-1.ai



LEGEND:

× Co-Located Sediment and Water Sample

Area depicted in detail to the right

Former Disposal Area

SOURCE: USGS 7.5 Minute Series (Topopgraphic) Quadrangles: Cahto Peak, CA, 1967; Laytonville, CA, 1967, photorevised 1994.

0 500 1000
Scale in Feet

N

DATE: 5/28/03

Figure 3-2
Laytonville Dump
November 2002 PA/SI
Site-Specific/Related Sampling Locations
Laytonville, Mendocino County, CA

03-0221 Fig3-2.ai

REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IX

EPA ID: CAD000065532 **Site Name:** LAYTONVILLE DUMP **State ID:**

Alias Site Names:

City: LAYTONVILLE **County or Parish:** MENDOCINO **State:** CA

Refer to Report Dated: 06/20/2003 **Report Type:** COMBINED PA/SI 001

Report Developed by: Roy F. Weston

DECISION:

- [X] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
  - [X] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**
  - [ ] **1b. Site may qualify for action, but is deferred to:**
- [ ] **2. Further Assessment Needed Under CERCLA:**
  - **2a. Priority:** [ ] **Higher** [ ] **Lower**
  - **2b. Other: (recommended action)** NFRAP (No Futher Remedial Action Planned

DISCUSSION/RATIONALE:

The U.S. Environmental Protection Agency (EPA) has determined that no further remedial action by the Federal Superfund program is warranted at the Laytonville Dump (aka Landfill) at this time. The Site Inspection did not identify any significant problems associated with the landfill. The sampling performed as part of the Site Inspection is a one-time review and is not meant to be a comprehensive characterization of the site and the surrounding area.

The basis for the no further remedial action planned (NFRAP) determination is provided in the attached report. A NFRAP designation means that no additional remedial steps under the Federal Superfund program will be taken at the site unless new information warranting further Superfund consideration or conditions not previously known to EPA regarding the site are disclosed. In accordance with EPA's decision regarding the tracking of NFRAP sites, the referenced site may be removed from the CERCLIS database and placed in a separate archival database as a historical record if no further Superfund interest is warranted. Archived sites may be returned to the CERCLIS site inventory if new information necessitating further Superfund consideration is discovered.

Site Decision Made by: JEFFREY S. INGLIS

Signature: _____ **Date:** 06/23/2003

EPA Form # 9100-3

APPENDIX A:
Transmittal List

4727

TRANSMITTAL LIST

Date: May 27, 2003
Site Name: Laytonville Dump
EPA ID No.: CAD000065532

A copy of the Preliminary Assessment / Site Inspection Report (i.e., normal public release without HRS Scoresheets, Rationale and Appendices) for the Laytonville Dump site should be sent to the following people:

Paul Cayler, Director
Solid Waste Branch
Mendocino County
559 Low Gap Road
Ukiah, CA 95482

Marilyn Underwood
CA DHS EHIB
1515 Clay St., Suite 1700
Oakland, CA 94612

Gina Morrison
CA RWQCB, North Coast Region
5550 Skylane Blvd, Suite A
Santa Rosa, CA 95403

Barbara Cook
CA DTSC Site Mitigation Program
700 Heinz Avenue, Suite 200
Berkeley, CA 94710

Trey Strickland
Mendocino Co. Dept. of Environmental Health
501 Low Gap Rd.
Room 1326
Ukiah, CA 95482

Mr. Brandon Mitchell
Tribal Chairman
Cahto Tribe
P.O. Box 1239
Laytonville, CA 95454

Mr. Jim Shields
Executive Committee
Laytonville Water District
P.O. Box 490
Laytonville, CA 95454

Ms. Alicia Bliss
P.O. Box 1054
Laytonville, CA 95454

Ms. Dawn Caye
P.O. Box 1201
Laytonville, CA 95454

Mr. Donald Briggs
P.O. Box 221
Laytonville, CA 95454

Mr. Jerry French
P.O. Box 119
Laytonville, CA 95454

Mr. Jerry Silva
P.O. Box 1733
Laytonville, CA 95454

Mr. Kevin Gibson
P.O. Box 1064
Laytonville, CA 95454

Ms. Michelle Schott
P.O. Box 634
Laytonville, CA 95454

Mr. Russ Brown
P.O. Box 908
Laytonville, CA 95454

Mr. Todd Warner
P.O. Box 355
Laytonville, CA 95454

APPENDIX B:
Site Reconnaissance Interview and Observation Report/ Photographic Documentation

INTER-AGENCY SITE RECONNAISSANCE AND OBSERVATIONS REPORT

DATE: December 10 and 11, 2001

SITE NAME: Laytonville Dump

OBSERVATIONS MADE BY: Paula J. Abajian

FACILITY REPRESENTATIVES AND TITLES: Paul Cayler, Director of Solid Waste; Oscar Centoni, Field Operations.

AGENCY REPRESENTATIVES AND TITLES: Gina Morrison, RWQCB, North Coast Region; Brandy Tomhave, TASWER; Rob Rosenheck, TASWER; Sandra Barnett, Cahto Tribe, Laytonville Rancheria; Scott Gable, SECOR; Jeff Inglis, USEPA SAM.

EPA ID: CAD000065532

An inter-agency site reconnaissance was conducted on December 10, 2001. The following information was obtained and photographs were taken during the inter-agency site reconnaissance:

The area surrounding the site is primarily rural. Residences are located to the north, northeast and southwest of the site. The Laytonville Rancheria, owned by the Cahto Tribe, is located directly adjacent to the east and south of the site. An operative recycling center is located directly to the north of the site.

Photos #1and #2

Paul Cayler led a tour of the facility beginning at the eastern entrance to the former disposal area. The first point of observation was the eastern slope of the former disposal area. This is the area where leachate containing VOCs has been identified. The slope was covered with plastic sheeting weighted with tires. It had been determined that the cause of leachate formation was water backing up in the drainage layer of the landfill cover at the bottom of the east slope. As a remedy, a drainage pipe was installed along the base of the east slope at the level of the drainage layer. The pipe drains water from within the drainage to a leachate collection system (described later in this report). The plastic sheeting was installed to prevent superfluous stormwater runoff from entering the drainage layer and overwhelming the leachate collection system.

Photo #3

We continued to the southeastern boundary of the site where groundwater monitoring well 93-2 is located. The southern boundary of the site is described by a 1:1 slope that leads to a natural drainage in which riprap has been placed to prevent erosion from the landfill. A chain link fence along the drainage encloses the site. The Laytonville Dump site shares its southern and eastern boundaries with the Laytonville Rancheria. Paul Cayler noted that vandals have created a hole in the chain link fence along the southern boundary of the site which they use to enter the site and drive all-terrain vehicles over the former disposal area. When this happens, the county repairs the fence as soon as possible.

Photo #4

During closure of the landfill, half-round drainages were installed over the former disposal area to collect and direct stormwater runoff from the former disposal area to sedimentation ponds. The half-round drainages have not functioned adequately and the County is in the process of replacing them. The replacement drainages consist of three layers. The base layer is a drainage net which is topped by filter fabric which is then topped by rocks that are generally less than six inches in size. The replacement drainages continue to collect and direct stormwater runoff to four sedimentation ponds.

Photos #5

The next stop was the western sedimentation pond which is located downslope from the former disposal area and at southwest corner of the site. This pond supports the growth of cattails. The Laytonville Dump site shares its western border with the Silva property. Drainage from the western sedimentation pond sheetflows across the Silva's open pasture to an intermittent stream that drains to Cahto Creek.

Photo #6

We continued north along a dirt maintenance road located between the former disposal area and the western boundary of the site. Monitoring well 93-1 is located in the middle of this road and monitoring well 94-1 is located directly downslope and the west. A stormwater drainage ditch runs along the road to the western sedimentation pond.

Photos #7 and #8

The largest sedimentation pond associated with the site is located to the northwest of the former disposal area. This pond supports wetland growth along its perimeter and water foul were observed on the pond. Drainage from the former disposal area drains to this sedimentation pond via underground drainage pipes.

Photos #9 and #10

After viewing the large sedimentation pond, we walked along the top of the former disposal area. This is the highest area of the site and is referred to by the County as the "top deck". Although rains had fallen in the area two days prior, no standing water was observed on the very gently sloping top deck. However, there was a sheen observed in the small amount of water collected in the stormwater drainage ditches that ran along the base of the top deck. Monitoring well 90-1 is located considerably downslope in an open pasture to the north of the former disposal area (Photo #9).

Photos #11 and #12

From the top deck, we continued past the previously mentioned east slope of the former disposal area to view the "upper sedimentation pond" which is located below and to the east of the east slope. Stormwater runoff from the east slope drains to this sedimentation pond. The leachate collection system runs alongside this pond. The leachate collection system consists of six cascading volatilization tanks which lead to approximately six clustered containment tanks where volatilized leachate water awaits transport off site by truck to the Willits Wastewater Treatment Plant.

Photo #13

Our last stop was the sedimentation pond located to the northwest of the former disposal area. This pond is referred to by the County as the "frog pond". Runoff from the largest sedimentation pond associated with the site drains to this pond before leaving the property. Runoff from the frog pond commingles just below the leachate containment area with runoff from the "upper sedimentation pond". From this point, runoff from both sedimentation ponds drains through the Laytonville Rancheria until it reaches Cahto Creek.

On December 11, 2001, WESTON met with EPA (Jeff Inglis), SECOR (Scott Gable), the Cahto Tribe (Sandra Barnett), and TASWER (Brandy Tomhave and Rob Rosenheck) met at the Laytonville Rancheria to discuss inter-agency coordination for sampling events related to the Laytonville Dump. Next, we met with Regina Dickson of the Silva property. Ms. Dickson lives with her husband and two children on approximately 80 acres adjacent to the west side of the Laytonville Dump. Ms. Dickson's family operates a well on their property; however, they do not drink from the well for fear of contamination from the Laytonville Dump. Ms. Dickson offered WESTON access to her property for sampling of their well and sampling of a pond on their property for use as background in comparison with the site-related sedimentation ponds.

Mr. Inglis collected, reviewed and copied files offered by Ms. Barnett.

Photo #1: Eastern slope where leachate containing VOCs had previously been identified. Slope is covered with plastic sheeting to prevent rainwater from seeping into the slope and creating leachate. Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces west-northwest.

Photo #2: Drainage pipe installed along the base of the east slope at the level of the interior drainage layer. The pipe drains water from within the drainage to a leachate collection system. Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces west.

Photo #3: Southeastern boundary of the Laytonville Dump Site.
Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces east.

Photo #4: Example of the half-round drainages which are being replaced.
Photographer: Paula Abajian, Weston Solutions, Inc.

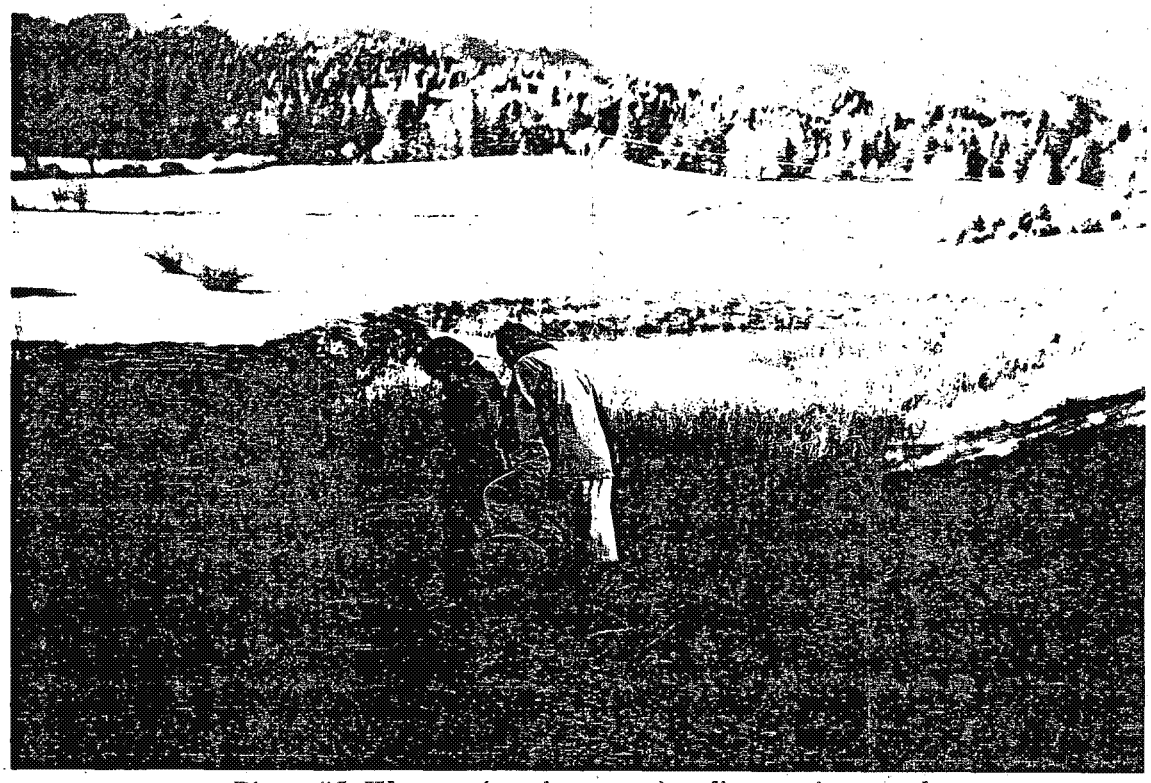


Photo #5: Western (southwestern) sedimentation pond.
Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces west-southwest.

Photo #6: Dirt maintenance road located between the former disposal area and the western boundary of the site. Monitoring well 93-1 is located in the middle of this road and monitoring well 94-1 is located directly downslope and the west. A stormwater drainage ditch runs alongside the road and leads to the western sedimentation pond.

Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces north.

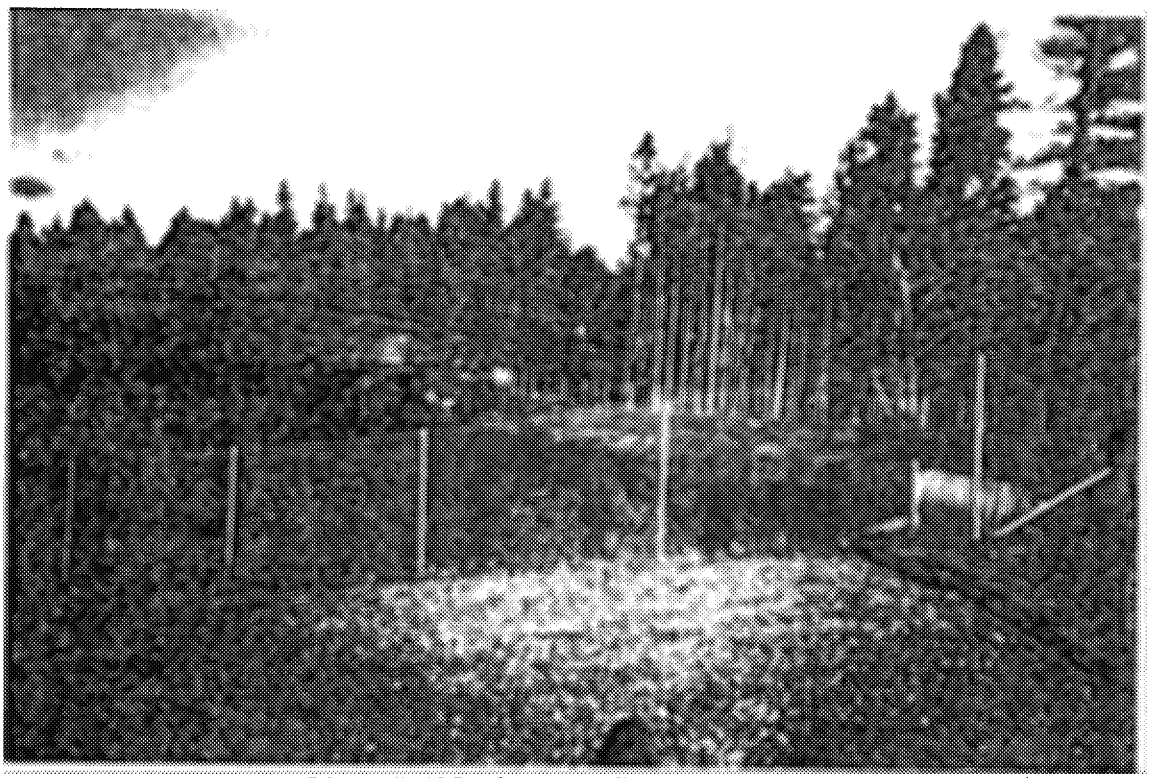


Photo #7: Northwest sedimentation pond.
Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces north.

Photo #8: Northwest Sedimentation Pond. View is from upper deck of the former disposal area.
Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces north.

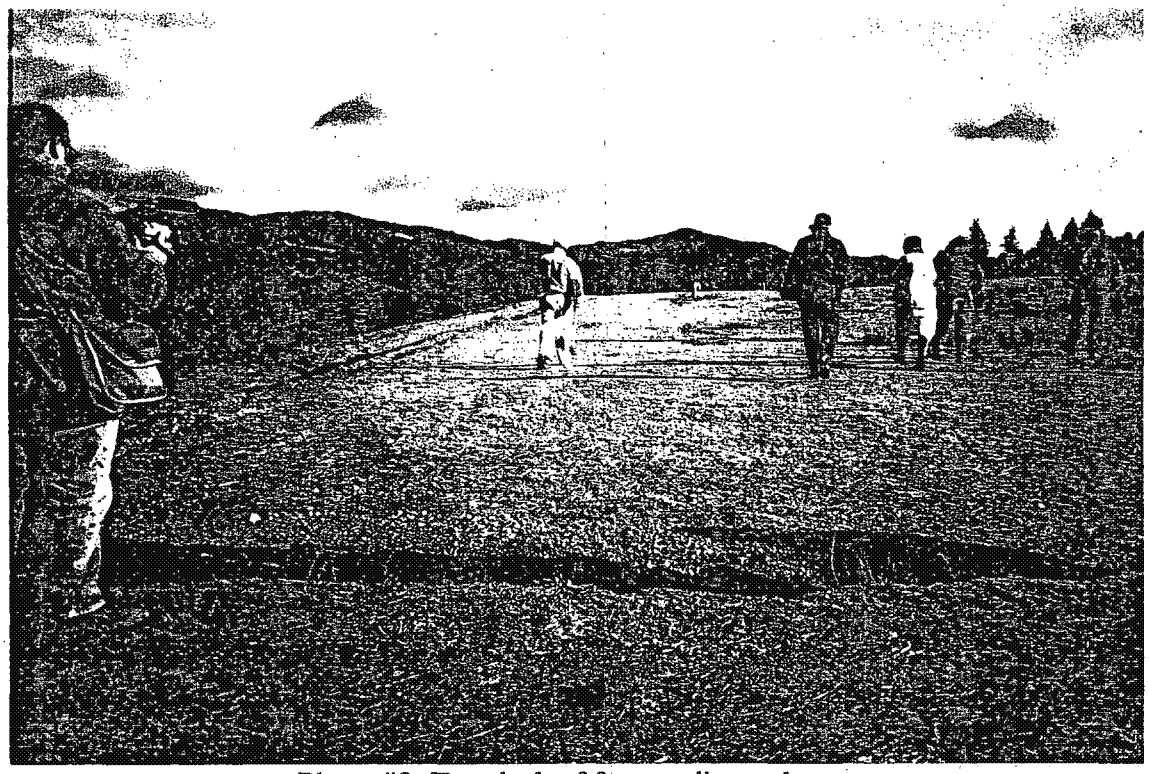


Photo #9: Top deck of former disposal area.
Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces east.

Photo #10: Field located below and to the north of the top deck of the former disposal area.

Monitoring well 90-1 is located in the this open area.
Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces west-northwest.

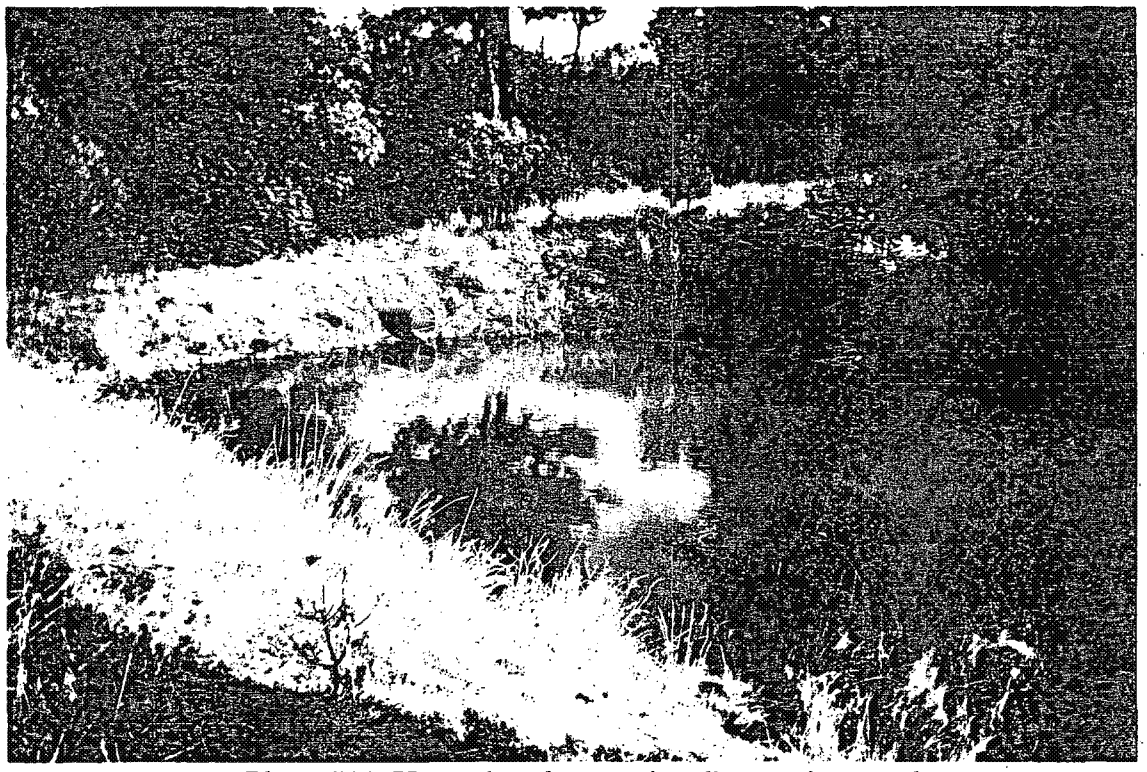


Photo #11: Upper (southeastern) sedimentation pond.
Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces east.

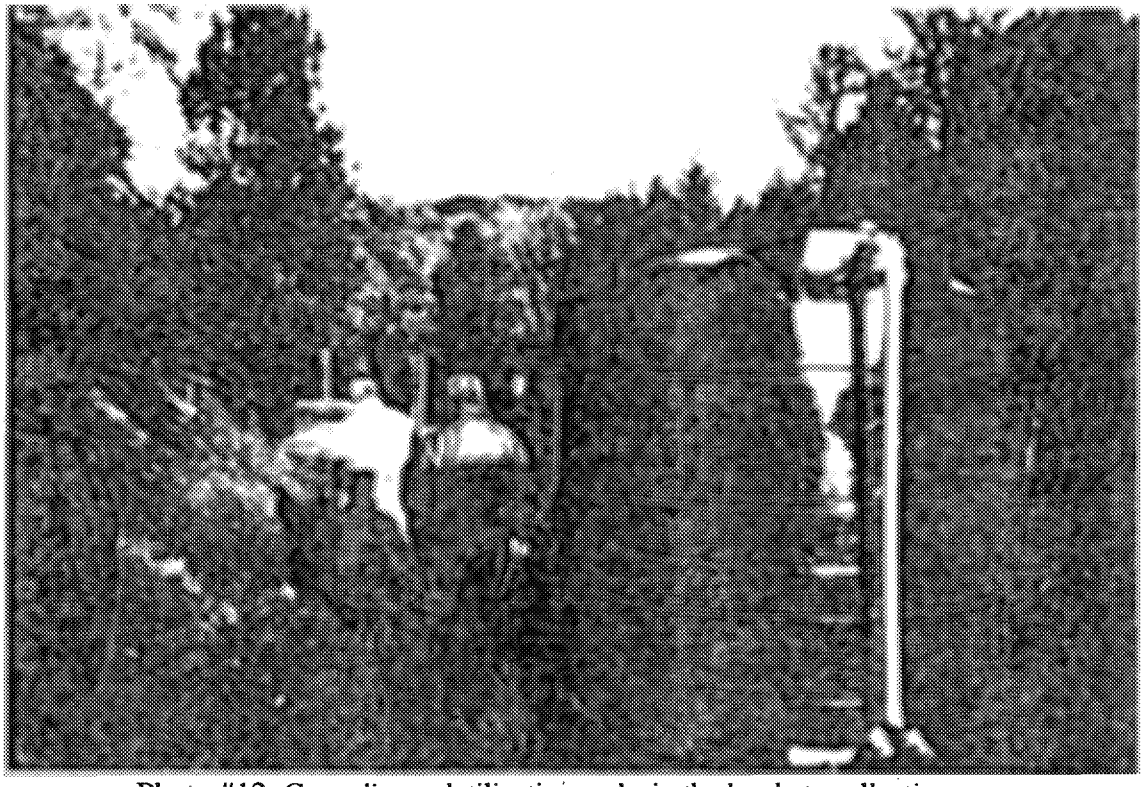


Photo #12: Cascading volatilization tanks in the leachate collection system.
Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces east.

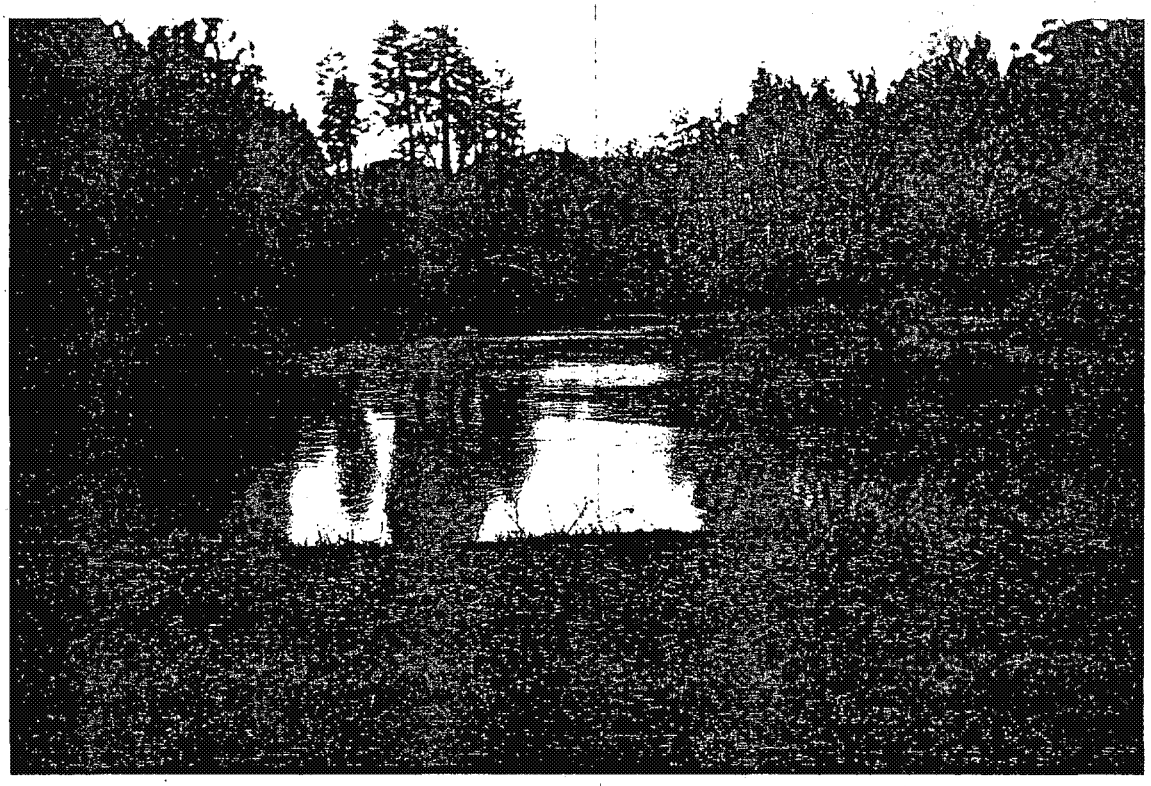


Photo #13: "Frog Pond". The northeastern sedimentation pond.
Photographer: Paula Abajian, Weston Solutions, Inc. Photo faces west.

APPENDIX C:
Contact Log and Contact Reports

CONTACT LOG

SITE: Laytonville Dump
USEPA ID NO.: CAD000065532

	NAME	AFFILIATION	PHONE	DATE	INFORMATION
1	David Taylor	USEPA, Region 9 QAO Office	(415) 972-3803	12/27/01	See Contact Report
2	David White	Laytonville Water District	(707) 984-6444	8/28/01 11/14/01 11/28/01 5/20/03	See Contact Report

CONTACT REPORT 1

AGENCY/AFFILIATION: USEPA, Region IX		
DEPARTMENT: Quality Assurance Office (QAO)		
ADDRESS/CITY:		
COUNTY/STATE/ZIP:		
CONTACT(S)	TITLE	PHONE
David Taylor	QAO Manager	415-972-3803
PERSON MAKING CONTACT: Paula Abajian		DATE: 12/27/01
SUBJECT: Laytonville Dump Sampling		
SITE NAME: Laytonville Dump		EPA ID#:

Dr. Taylor is currently reviewing the SAP/QAPP for WQTI's intended sampling event. Whether WQTI will incorporate surface water sampling in Cahto Creek for HRS purposes has yet to be determined.

CONTACT REPORT 2

AGENCY/AFFILIATION: Laytonville Water District		
DEPARTMENT: n/a		
ADDRESS/CITY: P.O. Box 86		
COUNTY/STATE/ZIP: Laytonville, CA 95454		
CONTACT(S)	TITLE	PHONE
David White	District Manager	707-984-6444
PERSON MAKING CONTACT: Paula Abajian		DATES: 8/28/01, 11/14/01, 11/28/01, 5/20/03
SUBJECT: Public Water Supply Treatment System		
SITE NAME: Laytonville Dump		EPA ID#: CAD000065532

8/28/2001

The Laytonville Water District public supply well is located between the west side of Highway 1 and Tenmile Creek and serves approximately 2000 people year-round, non-supplemented. They have never detected post-treatment contamination in the water supply. Mr. White estimates that there are at least 40 private drinking water wells in the vicinity (on all sides) of the landfil.l

11/14/2001

Technical descriptions of the direction of groundwater flow around the landfill are inconclusive. However, Mr. White's personal understanding of the groundwater flow direction, from living in Laytonville and observing the water for 30 years, is that groundwater follows surface water, in all areas of the valley. Background levels of metals in groundwater vary greatly by aquifer. For example, the City has two wells both screened at about 50 feet bgs that are located 75 feet apart from one another. One well regularly has levels of arsenic at 63-75 mg/L while the other has levels at 15 mg/L. Near the Rancheria, there are two aquifers that can be tapped. Both are shallow, although one is slightly deeper than the other. The shallow aquifer (at 35-50 feet bgs) consistently has good quality water. The deeper of the two aquifers (at 50 feet bgs) has extremely poor quality water in that the iron content is so high that the water is orange-brown and stains any porcelain

dishes or clothing that is washed with it. This aquifer extends from the Rancheria out to the west towards the Trading Post on Branscomb Road. The City is planning to extend their system to include much of the area north of the landfill that is now using private drinking water wells.

11/28/2001

The two municipal wells (only one is active) operated by the Laytonville Water District are located approx. 70 feet apart from each other and are separated by an earthquake pressure ridge. The water table in one well reaches ground level during the winter and drops to 38 feet bgs during the summer. The water table in the other well reaches 38 feet bgs during the winter and drops below the well screen during the summer. The well currently in operation for the city yields 500 gallons per minute. It was originally drilled to 100 feet and now reaches 400 feet. David knows of 4 aquifers in the area.

5/20/2003

The groundwater pumped for use as public water supply by the Laytonville Water District naturally contains arsenic at concentrations around 60 ug/L to 70 ug/L. After treatment, the arsenic concentration drops to about 40 ug/L, which meets the current MCL of 50 ug/L, but will not meet the future MCL of 10 ug/L. Prior to public distribution, the groundwater receives treatment in the following order:

- Potassium permanganate ($KMnO_4$) which serves as a disinfectant and lowers the concentration of manganese and may also lower the concentrations of iron and arsenic;
- Aeration tower;
- Chlorination;
- 1 hour, 20 minutes in a detention tank to allow time for water to react with $KMnO_4$;
- Green sand pressure filters.

APPENDIX D:
Latitude and Longitude Calculations Worksheet

Latitude and Longitude Calculation Worksheet (7.5' quads)
Using an Engineer's Scale (1/50)

Site Name Laytonville Dump **CERCLIS #** CAD000065532

AKA

Address 1.5 west of Laytonville, CA on Branscomb Road

City Laytonville **State** CA **ZIP** 95454

Site Reference Point

USGS Quad Name Cahto Peak, Calif. **Scale** 1:24,000

Township **Range** **Section** ¼ ¼ ¼

Map Datum ☐ 1927 ☐ 1983 **(Check one)** **Meridian**

Map coordinates at southeast corner of 7.5' quadrangle (attach photocopy)

Latitude ° ' "N **Longitude** ° ' " W

Map coordinates at southeast corner of 2.5' grid cell

Latitude ° ' "N **Longitude** ° ' " W

Calculations

LATITUDE(x)

A) Number of ruler graduations between 2.5' (150") grid lines 379 **(a)**

B) Number of ruler graduations between south grid line and the site reference point **(b)**

C) Therefore, a/150 = b/x, where **x= Latitude in decimal seconds, north of the south grid line**

Expressed as minutes and seconds (1' = 60") = ° ' "N

Add to grid cell latitude = ° ' "N + ° ' "N

Site latitude = 39 ° 40 ' 21 "N

LONGITUDE(y)

A) Number of ruler graduations between 2.5' (150") grid lines 305 **(a)**

B) Number of ruler graduations between south grid line and the site reference point **(b)**

C) Therefore, a/150 = b/x, where **x= Longitude in decimal seconds, west of the east grid line**

Expressed as minutes and seconds (1" = 60") = ° ' "W

Add to grid cell longitude = ° ' "N + ° ' "N

Site longitude = 123 ° 30 ' 24 "W

APPENDIX E:
References

REFERENCE
No. 1

U.S. Environmental Protection Agency

Superfund (CERCLIS)

Query Results

Report an Error

Site ID: Equal To: CAD000065532
Results are based on data extracted on MAY-08-2003
Note: Click on the underlined CORPORATE LINK value for links to that company's environmental web pages.
Click on the underlined MAPPING INFO value to obtain mapping information for the facility.
Click on the underlined RECORD OF DECISION value for a RODS Site Report.
Click on the underlined "View Facility Information" link to view EPA Facility information for the facility.

Go To Bottom Of The Page

CERCLIS EPA ID:	CAD000065532	**SITE NAME:**	LAYTONVILLE DUMP
STREET ADDRESS:	BRANSCOMB ROAD	**FACILITY INFORMATION**	View facility information
CITY NAME:	LAYTONVILLE	**OWNERSHIP STATUS:**	Unknown
STATE ABBR:	CA	**FEDERAL FACILITY:**	N
ZIP CODE:	95417	**NPL STATUS:**	Not on the NPL
COUNTY NAME:	MENDOCINO	**SITE INCIDENT TYPE:**	
CORPORATE LINK:	No	**RECORD OF DECISION (ROD) INFO:**	No
LATITUDE:		**EPA REGIONAL LINK:**	No
LONGITUDE:		**MAPPING INFO:**	MAP
SITE SMSA:			

Enforcement and Cleanup Actions

Action	Action ID	Planned Start Date	Planned End Date	Actual Start Date	Actual End Date	Responsibility	Planned Outcome	Urgency
DISCOVERY	001				11/30/1993	EPA Fund-Financed		

Site Description

There were no Site Descriptions reported for this site.

Go To Top Of The Page

Total Number of Facilities Displayed: 1

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REFERENCE
No. 2

96102038

WATER QUALITY
CONTROL BOARD
REGION 1

OCT 15 '96

☐ BK ___ ☐ RK ___
☐ CJ ___ ☐ LR ___
☐ FR ___ ☐ KD ___
☐ RT ___ ☐ PG ___
☐ JH ___ ☐ JS ___
☐ SW ___ ☐ ___
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ALL STAFF ☐ FILE

LAYTONVILLE LANDFILL CLOSURE PROJECT

MENDOCINO COUNTY

Initial Study and Negative Declaration

September 1996

Michael Brandman Associates

ED_013162_00000569-00078

LAYTONVILLE LANDFILL CLOSURE PROJECT

MENDOCINO COUNTY

Initial Study and Negative Declaration

Prepared for:

County of Mendocino
559 Low Gap Road
Ukiah, California 95482

Contact:
Paul Cayler
Director of Solid Waste Division
(707) 463-4078

Prepared by:

Michael Brandman Associates
10423 Old Placerville Road, Suite 100
Sacramento, California 95827

Contact:
Douglas K. Brown
(916) 362-3606

JN: 11840003

September 30, 1996

NOTICE OF PROPOSED NEGATIVE DECLARATION

For review by interested agencies and the public in accordance with Mendocino County Environmental Review Guidelines and the California Environmental Quality Act, an analysis has been made of possible environmental impacts of the following project:

Applicant: Mendocino County
559 Low Gap Road
Ukiah, CA 95482

Project Title and Description: The proposed project is the Laytonville Landfill Closure. The proposed project consists of the final closure actions proposed for the landfill, including final cover, drainage/ erosion controls, and leachate controls. The proposed actions are described in the Final Closure and Postclosure Maintenance Plan for the Laytonville Solid Waste Disposal Site. This report is hereby incorporated by reference into this negative declaration.

Project Location: The Laytonville Landfill is located in northern Mendocino County approximately 1.5 miles southwest of Laytonville in the southwest quarter of Section 14, Township 21 north, Range 15 west, Mount Diablo Base and Meridian. A location map is included in Section 1 of the attached Initial Study.

Findings Which Support A Negative Declaration: After conducting an Initial Study, the Lead Agency has determined that the project will not have a significant effect on the environment for the following reasons:

1. The proposed project consists of the final closure actions proposed for the landfill, including final cover, drainage/erosion controls and leachate controls. The actions would not degrade the quality of the environment, reduce wildlife habitat and/or population, reduce numbers of rare or endangered species, or eliminate examples of history.

2. The short-term construction activities would not adversely affect the long-term productivity of the surrounding environment. The site would be reclaimed through revegation of the landfill after installation of the final cover.

3. The proposed project would not contribute to cumulative adverse impacts. Following installation of final cover on the landfill, activities at the landfill would be limited to site monitoring activities.

4. Although temporary significant adverse impacts associated with construction activities would be anticipated with the proposed project, mitigation measures to reduce these impacts to less-than-significant levels have been identified in the attached Initial Study. In addition, the proposed landfill closure actions are designed to prevent the occurrence of adverse environmental effects, including the prevention of leachate generation, and the monitoring and control of potential landfill gases.

Attached hereto is a copy of the Initial Study which documents reasons to support the above findings. Also attached are mitigation measures proposed to avoid potentially significant effects.

Paul Cayler

Paul Cayler,
Director of Solid Waste
Mendocino County Solid Waste Division

Oct. 9, 1996

Date

ED_013162_00000569-00081

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PREFACE

This document is an Initial Study and Negative Declaration (IS/ND) for the Laytonville Landfill Closure Project proposed by the County of Mendocino. An initial study is a preliminary analysis prepared by the County to determine whether an environmental impact report (EIR) or negative declaration of environmental impact ("negative declaration" hereafter) must be prepared for compliance with the California Environmental Quality Act (CEQA) and guidelines (§15365). It is intended to determine if the project may have a significant effect on the environment (§15036). A negative declaration is a written statement by the County briefly describing the reasons why a proposed project will not have a significant effect on the environment, and therefore does not require the preparation of an EIR (§15371).

According to the State CEQA Guidelines (§15070), a proposed negative declaration shall be prepared for a project subject to CEQA when either:

(a) The initial study shows that there is no substantial evidence that the project may have a significant effect on the environment, or

(b) The initial study identified potentially significant effects, but:

(1) Revisions in the project plans or proposals made by or agreed to by the applicant before the proposed negative declaration is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and

(2) There is no substantial evidence before the County that the project as revised may have a significant effect on the environment.

This IS/ND is being circulated for public review and comment. The County shall consider the proposed IS/ND along with any comments received during the public review process prior to taking action on the proposed project (§15074). There is no requirement in CEQA or the State CEQA Guidelines to prepare responses to public comments on the proposed IS/ND.

This report has been prepared under the direction of Paul Cayler, Director, and Randall Forbes, Engineer IV, of the Mendocino County Solid Waste Division. The report preparers are Douglas Brown, Chris Franchetti, and Brian Hoffmann of Michael Brandman Associates.

ED_013162_00000569-00083

SECTION 1

1.1 INTRODUCTION

The County of Mendocino is proposing the final closure of the Laytonville Solid Waste Disposal Facility (landfill). The closure would be implemented upon the Mendocino County Board of Supervisor's adoption of the Final Closure and Postclosure Maintenance Plan (Final Closure Plan).

This Initial Study has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code §21000 *et seq.*, and the State CEQA Guidelines, California Code of Regulations §15000 *et seq.* The following analysis was performed to determine whether implementation of the proposed Final Closure Plan would have significant effects on the environment.

The Initial Study is divided into three sections:

- Section 1 provides a description of the project setting and characteristics;
- Section 2 includes an environmental evaluation/checklist which identifies the potential environmental impacts associated with implementation of the Final Closure Plan; and
- Section 3 includes a discussion of checklist responses and findings.

Much of the project description information for the Initial Study was derived from the Final Closure Plan for the landfill, prepared by Anderson Consulting Group for Mendocino County in March 1996. The Final Closure Plan is hereby incorporated by reference into this Initial Study.

1.2 PROJECT BACKGROUND

The landfill has been owned and operated by Mendocino County since its opening in 1967, with operations overseen by the Solid Waste Division of the County Administrative Office. In September 1993, the Mendocino County Board of Supervisors voted to close the landfill prior to its originally scheduled closure date. The landfill has since discontinued disposal operations and is awaiting final closure pending approval of the Final Closure Plan, which is the focus of this Initial Study.

The landfill operated under a solid waste facility permit issued by the California Integrated Waste Management Board (CIWMB), and a Class II-2 solid waste disposal permit issued by the Regional Water Quality Control Board (RWQCB) - North Coast Region. In accordance with Title 23 of the California Code of Regulations (CCR), Chapter 15, the landfill qualified for a Class III site designation and accepted nonhazardous solid waste (e.g., household garbage, rubbish, paper, cloth, trees, and brush). Hazardous, designated, and liquid wastes were not accepted at the landfill.

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1.3 ENVIRONMENTAL SETTING

The landfill site encompasses 34.75 acres in northern Mendocino County approximately 1.5 miles southwest of Laytonville in the southwest 1/4 of Section 14, Township 21 north, Range 15 west, Mount Diablo Base and Meridian. Branscomb Road provides primary access to the site by way of U.S. Highway 101 (U.S. 101). The site is generally bounded to the north by a residential area and Branscomb Road, to the west by a parcel currently preserved for agricultural use, and to the south and east by the Laytonville Rancheria. Exhibits 1 and 2 depict the regional location of the site. The landfill is designated Public Service for Solid Waste in the Mendocino County General Plan and is zoned as a Public Facility in the County zoning ordinance. Upon closure of the landfill the site will be revegetated to non-irrigated open space.

Exhibit 3 depicts the existing features of the landfill property. The landfill access road originates at Branscomb Road west of a maintenance yard in the northeastern corner of the site. (This yard is used for storage of County vehicles and equipment and will not be affected by final closure). A pond encompassing approximately 0.5 acre is located to the southwest of the maintenance yard on the west side of the access road. The access road extends south from Branscomb Road for approximately 1,000 feet to the landfill area. The 7-acre fill area is located in the southern half of the site.

The fill area is unlined and contains approximately 311,000 cubic yards of waste. Prior to discontinuing disposal operations, the landfill accepted an average of 920 tons of nonhazardous municipal solid waste (MSW) from the Laytonville service area per year. The majority of accepted waste was from residential sources (90%). The remaining waste came from either commercial (5%) or construction demolition (5%) sources. Waste was deposited into individual debris cells constructed through the layering, shaping, compacting, and covering of refuse. All cover material used in cell construction was excavated from onsite borrow locations. During the last years of landfill operation, a drop-off recycling center was maintained onsite for glass, cans, newspaper and cardboard. Also included were wood waste, yard waste and scrip metal diversion (Mendocino County Department of Public Works 1989).

The natural ground surface of the project site ranges in elevation from approximately 1,810 feet above mean sea level (MSL) in the southwestern corner to approximately 1,690 MSL in the northeastern corner. The maximum fill-slope height of the landfill is approximately 80 feet above the natural ground surface.

Offsite surface drainage is directed away from the landfill by the local topography. The site was characterized by east- and west-draining swales prior to construction of the landfill in 1967. Onsite surface drainage is now channeled into four sedimentation basins located near the site perimeter (Exhibit 3). Drainage is directed offsite via ephemeral streams to Cahto Creek, which runs northeastward approximately 700 feet to the south of the landfill.

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Conifer forest is the dominant undisturbed vegetation community present both onsite and in the project vicinity. Disturbed portions of the landfill are covered primarily with seeded rye grass. No waste handling areas, buildings, or equipment cleaning facilities are located on the project site (except for those located within the maintenance yard, which would not be involved in final closure).

Groundwater monitoring, surface water monitoring, and perimeter landfill gas monitoring are currently conducted at the site. These monitoring systems include 5 groundwater monitoring wells, 5 perimeter landfill gas monitoring wells, 1 leachate extraction well, leachate collection equipment, and annual surface water monitoring from the discharge culverts of onsite sedimentation ponds (refer to Exhibit 3 for locations of operating onsite wells). The existing leachate control and removal system (LCRS) is not in use and would be decommissioned with implementation of the Final Closure Plan. The County currently monitors any leachate seeps observed on the intermediate cover, which occur primarily during wet winter months.

1.4 GROUNDWATER CHARACTERISTICS

Groundwater quality is currently monitored through five onsite monitoring wells (see Exhibit 3 for locations). One well (93-1), located in the southwestern corner of the site adjacent to the fill area, has exhibited evidence of increased mineralization (well 94-1 was installed downgradient of this well to further monitor this situation). Such mineralization is common to landfill sites and sometimes occurs with signs of other types of contamination. Also, leachate sampling of seeps that occurred along the eastern landfill face during the winter of 1992 detected elevated levels of some volatile organic compounds. However, none of the compounds detected in the leachate were detected in surface water samples. Also, the eastern landfill face was covered with a two foot foundation layer to reduce water infiltration. No other evidence of groundwater or surface water contamination onsite or associated with the landfill has been detected to date.

The Final Closure Plan includes the placement of a final cover system that would significantly reduce or eliminate the occurrence of leachate seeps by substantially decreasing the amount of rainwater infiltrating buried waste. The County would continue to monitor the landfill for leachate seeps following closure and would notify the appropriate agencies if any seeps were discovered. The County would then submit a corrective action plan to the governing regulatory agencies for review and approval. The proposed Postclosure Maintenance Plan would also ensure that the landfill's environmental monitoring programs (including the groundwater and surface water monitoring systems) would continue to operate effectively following landfill closure.

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1.5 PROJECT CHARACTERISTICS

The proposed project consists of the following final closure actions proposed for the landfill: final cover of the fill area; construction of drainage/erosion controls; maintenance of existing groundwater and perimeter gas monitoring systems; decommissioning of the former leachate extraction and collection system; continued monitoring for the presence of leachate seeps and potential groundwater contamination; and implementation of a site security system. The proposed actions are described in detail in the Final Closure and Postclosure Maintenance Plan, Sections 3.0 and 4.0, prepared by Anderson Consulting Group. The characteristics of each action are summarized below.

Final Cover System

Proposed Final Cover System

An "engineered alternative" final cover system is proposed for the landfill in accordance with Code of Federal Regulations (CFR) Subtitle D regulations and CCR Title 14 and 23 requirements for an unlined Class III landfill. Installation of an all-clay cover was considered but found to be an inferior final-cover alternative (see discussion below). The following list describes each layer of the proposed cover profile from top to bottom:

- **Vegetative Soil Layer.** This layer would consist of clayey to silty loam which would allow the growth of shallow rooted, drought-resistant native plant species. The 18-inch layer would be constructed from soil excavated from the onsite borrow areas, located in the central and western portions of the site north of the fill area.

- **Drainage Layer.** This layer would remove water that infiltrated through the vegetative cover layer. The rapid removal of infiltrated rainwater would decrease landfill leachate generation and increase the stability of the final cover on steeper side slope areas. On the top deck area, the drainage layer would consist of a minimum 12-ounce-per-square-yard non-woven geotextile filter fabric. On the side slope areas, it would consist of a geonet with minimum 8-ounce-per-square-yard non-woven geotextile filter fabric bonded to both the top and bottom geonet surfaces.

- **Hydraulic Barrier Layer.** This layer would further inhibit leachate generation by minimizing surface water infiltration into the landfill. The hydraulic barrier layer would consist of a geosynthetic clay liner (GCL). The factory-prepared GCL would consist of a low-permeability bentonite clay layer bonded between two geotextile fabrics or glued to a flexible geomembrane liner. The GCL component of the hydraulic barrier layer constitutes the "engineered alternative" final-cover system for the landfill.

- **Gas Migration Layer.** This layer would convey landfill gas migrating to the surface toward passive vents installed through the final cover system. The layer material would consist of 12-

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ounce-per-square-yard non-woven geotextile filter fabric. The vents would be constructed with 6-inch diameter PVC pipe.

- **Foundation Soil Layer.** This layer would bridge the surface irregularities of underlying refuse materials, provide a firm substrate for installation of the hydraulic barrier layer, and minimize the effects of any minor differential settlement of underlying refuse materials. The foundation soil layer would be constructed from existing in-place intermediate soil cover and would adhere to the design requirements delineated in Section 3.4.1 of the Final Closure Report. This layer would have a minimum thickness of 24 inches.

All cover soil used in construction of the final cover system would be excavated from onsite borrow areas.

Other Final Cover Systems Considered

An all-clay final cover system was considered for use in final cover construction but was found to be inferior to the engineered alternative. Anderson Consulting Group investigated the feasibility of an all-clay system in its 1994 Final Cover Investigation Report (which is included in Appendix D of the Final Closure Plan). This report includes an evaluation of the capability of onsite borrow soil to meet CFR Subtitle D and CCR Titles 14 and 23 final cover soil requirements. A number of onsite soil characteristics were analyzed, including particle size gradation, compaction, and permeability. Results indicated that the soil's degree of permeability exceeded the maximum 1.0×10^{-6} centimeters per second (cm/s) allowed under CCR Titles 14 and 23, and would therefore be inadequate in its natural state for use as cover material. Compaction test results showed that artificial compaction of the soil to the required permeability levels would be both difficult and costly, as would admixing (blending the soil with imported clay material) to decrease its permeability. For these reasons, the County investigated alternative final cover types to the all-clay system.

ACG identified two potential engineered-alternative final-cover systems that could be implemented in place of an all-clay system: a system involving the installation of a geomembrane liner and a system utilizing a GCL (as described above). Both alternatives were evaluated for practical and financial feasibility. The GCL alternative was ultimately chosen as the preferred alternative method.

Final Grading

The proposed final cover grades for the landfill are designed to accommodate minor amounts of subsidence and differential settlement, minimize erosion by surface water runoff, and provide a stable landfill configuration. Finished grade slopes on the fill area would range from 3% on the top deck to

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a maximum of 33.33% (3:1, or 3 units horizontal distance to 1 unit vertical distance) on the side slopes. Final slopes in the borrow area(s) would average 20% or less.

Surface Water Drainage Controls

The proposed surface water drainage control system consists of a network of berms, ditches (V-shaped and half-round), downdrains, and culverts and four onsite sedimentation ponds: one in the southwest corner of the site, one in the northwest corner of the site, one to the northeast of the fill area, and one west of the main access road identified as an onsite pond in Exhibit 3. Runoff from the landfill's top deck would be directed along berms and through drainage ditches into overside downdrains. These drains would carry the runoff down the sideslopes and release it into a perimeter ditch at the landfill base. Rain falling directly onto the sideslopes would travel by sheet flow into the perimeter ditch, where it would be transported to one of the sedimentation basins which empty into the natural drainage network southwest and northeast of the landfill site.

Slope Protection and Erosion Controls

Under the proposed Final Closure Plan, erosion control methods would be integrated with the surface water controls described above. The design of the slope protection and erosion control system includes lined drainage ditches, corrugated metal pipe (CMP) in overside drains and culverts, grade controls, and vegetation planting. The following specific features would be incorporated into the erosion control design:

- V-ditches constructed on the landfill mass would be lined with high density polyethylene (HDPE).
- Half-round ditches constructed on the landfill mass would be lined with CMP.
- The perimeter ditch would be grass-lined in areas underlain with native soil, as necessary.
- All overside downdrains and any culverts constructed beneath access roads would be constructed with adequate diameter (12-inch-diameter minimum) to reduce the potential for associated slope failure.
- Energy dissipators would be installed in overside drains at all pipe discharge points.
- Vegetation would be established on the final cover of the top deck and side slope areas.
- Grade controls would include maintenance of a 3% top deck slope and the installation of lined ditches with a 1% slope (Final Closure and Postclosure Maintenance Plan Laytonville Landfill, March 1996).

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These methods are intended to minimize the potential for slope failure and soil erosion associated with the proposed closure activities.

Groundwater Monitoring Network

The five existing onsite groundwater monitoring wells would remain operational throughout the closure and postclosure maintenance periods. However, the elevation of some of the wellheads could change, including wells GWM 93-1 and GWM 90-1, due to anticipated grading and excavation activities. The County would continue to conduct quarterly groundwater sampling in accordance with the Article 5 Monitoring Program prepared by EMCON Associates and approved by the North Coast Regional Water Quality Control Board. No additional groundwater monitoring wells are proposed for the site at this time.

Perimeter Gas Monitoring Network

The five existing onsite perimeter gas monitoring wells would also remain intact and operational throughout the closure and postclosure maintenance periods. The elevation of some of the wellheads could change, including well LFGW No. 6, due to anticipated grading and excavation activities. No methane gas has been detected in the wells since their installation in June 1994 and no gas collection or extraction system is currently required. The County would implement a quarterly monitoring schedule for these wells upon final closure. The results of this monitoring would be submitted to the California Integrated Waste Management Board (CIWMB).

Leachate Control and Monitoring Program

The placement of the final cover would eliminate the need for a leachate extraction and collection system by prohibiting the infiltration of substantial amounts of runoff into the disposed refuse material in the landfill. As discussed above, a formerly operational leachate extraction well and leachate collection equipment are currently in place on the project site. With implementation of the proposed Final Closure Plan, this leachate control system would be decommissioned in-place as part of final closure. Decommissioning would involve the removal and disposal of all above-ground leachate-control equipment from the project site.

As discussed above, the County would continue to monitor for possible leachate seeps following placement of the final cover system. If seeps are discovered at that time, the County will notify the appropriate governing agencies and submit a corrective action plan for the agencies' approval. Upon approval, the corrective action plan would be implemented in accordance with a set implementation schedule.

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Surface Water Monitoring Program

The County currently collects and analyzes surface water samples from the landfill on an annual basis. Samples are extracted from discharge culverts located at the southwestern and northeastern detention basins. With implementation of the proposed Final Closure Plan, the County would continue these regular surface water monitoring activities.

Site Security System

The Final Closure Plan includes implementation of a site security system involving the construction of a 6-foot-high chain link fence around the landfill footprint. Locking gates would be installed at all entrance locations. The main entrance gate to the landfill at Branscomb Road would remain in its current location.

1.6 PROJECT APPROVAL ACTIONS

Approval of the final closure procedures for the landfill requires actions by Mendocino County and other agencies involved in the regulation of solid waste disposal. These actions include the following:

- Approval of all closure-related plans by the Mendocino County Board of Supervisors.
- Approval of the closure plan and post-closure maintenance plan by the Mendocino County Department of Public Health (Local Enforcement Agency [LEA]), North Coast Regional Water Quality Control Board (RWQCB), and the California Integrated Waste Management Board (CIWMB).

ED_013162_00000569-00091

REFERENCE
No. 3

MENDOCINO COUNTY
SOLID WASTE DIVISION

008

MEMORANDUM

TO: Members of the Board of Supervisors

FROM: Paul Cayler, Solid Waste Division Director Paul Cayler

DATE: January 26, 2001

RE: ALLEGATIONS OF WRONGDOING AT THE LAYTONVILLE LANDFILL

The purpose of this memorandum is to inform the Board of Supervisors that I received a contact yesterday informing me that Mr. Carl Kyle of Laytonville is prepared to come forward and testify to wrongdoing at the Laytonville Landfill in the 1980's.

I contacted Mr. Kyle and questioned him. Mr. Kyle stated that he is a former County employee (retired 1990). He stated that he worked as a Heavy Equipment Operator at the Laytonville Landfill from 1980 to 1986. During his service at the landfill, he claims that on a number of occasions that he buried transformers containing PCD's which were brought in by Pacific Gas and Electric. Mr. Kyle stated that he had not previously come forward because no one had asked him specific questions. It appears that Mr. Kyle decided to come forward after being questioned on this matter by Mr. Jim Shields of the Mendocino County Observer. Mr. Kyle stated that he is prepared to participate in a formal interview at the County's convenience.

I am now proceeding with an investigation. I will be seeking direction from the County Counsel's Office on this matter as soon as possible.

Please contact me at (707) 463-4078 or pcayler@saber.net if you have any questions.

cc: file Laytonville General Corresponce
Jim Andersen, CAO
H. Peter Klien, County Counsel

REFERENCE
No. 4

Jeff – here's data sent to Raho this A.M.

Sandra Cohen

Sept. 14, 2001
9AM

Raho –

Sorry for the informality of this communication, but I want to get something to you first thing this morning, per our telephone conversation.

1. We are delighted that we can extend the sampling/analyses of the groundwater, soils and air under the EPA grants beyond the borders of the Rancheria to the neighboring property on the western side of the landfill, since there is a history of contamination there as well as personal illness, per the owners the Silva family. They have always wanted to be of help to EPA and to the Tribe to resolve the issue of landfill pollution; they have even spent thousands of dollars out of their own pocket to take samples, but Alpha Labs "lost their samples." (This is the same lab which does all the analytical work for the County Solid Waste Division which is in charge of the landfill; we have always suspected that the lab may not be totally objective.)

2. We received the Quarterly Monitoring Report from the County of Mendocino yesterday (one month after it was published on August 13, 2001.) The results (see attached copies) show that the vinyl chloride and other VOC concentrations in aqueous leachate and other samples taken at the landfill are 2 to 4 times higher than they were in the previous report. Based on the analyses done for us by Dr. Stephen Johnson of WQTI, who was recommended to us as a consultant by our 106 Project Officer Kristin Gullat, the previously reported levels were ALREADY well in excess of the maximum contaminant level (MCLs) for drinking water.

3. The investigator (Donna Avis) of the Remco site in Willits has told us that she has evidence that nuclear snubbers from the Navy were retooled at the Remco site, containing hydraulic fluids and possibly plutonium residues; she reportedly has a video which shows Remco wastes being deposited at the Laytonville landfill. We have always suspected the possibility of radioactive material at the Laytonville landfill for several reasons: (a) the confirmed midnight dumping at the Laytonville landfill by men in full contamination suits (the Native American children later picked up and played with these suits and apparatus); (b) the large numbers of tumors and cancers in Native American homes and Laytonville residences along the groundwater gradients; (c) the reported use of military helicopters (per one eye witness who may or may not be credible) to guard the deposition of the wastes in the Laytonville landfill; (d) the intense anger and opposition of a former EPA consultant who initially assisted us in the GAP program, who was a nuclear submarine commander; (e) the fact that several men/women who have talked about the landfill have mysteriously died or moved away suddenly; etc.

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4. We're not trying to stir the pot or point fingers, but our Tribal Chair DOES want to know if the landfill is a real threat to our people, and how bad it is. So do the people of Laytonville.

More to follow. Please call if we you need any more inputs before a possible meeting with Jeff and his consultants from Roy F. Weston.

Thank you for your kind considerations.

REFERENCE
No. 5

California Integrated Waste Management Board

Linda Moulton-Patterson, Chair
1001 I Street • Sacramento, California 95814 • (916) 341-6000
Mailing Address: P. O. Box 4025, Sacramento, CA 95812-4025
www.ciwmb.ca.gov

Gray Davis
Governor

Winston H. Hickox
Secretary for Environmental Protection

March 22, 2001

Mr. Paul Cayler
Director, Mendocino County Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482

SUBJECT: Closure Certification of Laytonville Landfill, Facility No. 23-AA-0008

Dear Mr. Cayler:

The California Integrated Waste Management Board's (CIWMB) Remediation and Closure Technical Services Branch staff (staff) has completed review of the Laytonville Landfill Final Cover, Response to Comments: Construction Quality Assurance Report (RTC), Facility No. 23-AA-0008. Staff's comments are as follows:

GENERAL COMMENTS

The Response to Comments (RTC) confirms that the Laytonville Landfill Final Cover construction did not comply with certain Title 27 regulatory requirements and also did not meet a number of the design specifications included in the approved closure plan. None of the deficiencies appear to be critical construction flaws as explained in the RTC. However, the number and range of deficiencies is troubling. These deficiencies are described below. It appears that quality control failed to perform adequately and a final cover has been constructed to standards less than what were approved by the regulating agencies. As none of the deficiencies appears to be critical, the CQA Report is deemed accepted. However, because of the additional potential for cover failure additional monitoring should be required, as described below. Should any component of the final cover fail, you will be required to perform repairs promptly. Furthermore, depending on the cause and degree of failure you may be required to reconstruct the component to appropriate standards.

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DEFICIENCIES AND REMEDIES

The following Title 27 regulations were not met:

• Title 27, Section 20323, California Code of Regulations (27 CCR 20324(a)); "The construction quality assurance (**CQA**) program, including all relevant aspects of construction quality control (CQC), shall provide evidence that materials and procedures utilized in the placement of the any containment feature at a waste management unit (**Unit**) will be tested and monitored to assure the structure is constructed in accordance with the design specifications approved..." In the following cases, materials and procedures utilized in the placement of liner components were not tested and/or monitored to assure compliance with the approved design specifications.

- Approved specifications required a minimum 6-inch gas migration geotextile overlap. Manufacturer's specifications recommend a minimum 4-inch overlap. The applied minimum overlap was 3-inches. In the opinion of a manufacture's representative, the 3-inch overlap should create no potential concern regarding reduction in gas migration capability. The RTC recommends additional site monitoring to observe for signs of problems related to gas migration, such as monitoring for vegetation distress. This additional monitoring should be performed on a quarterly basis by grid walking the cover. The grid spacing should be no more than 50 feet. This additional site monitoring should be incorporated into the Postclosure Maintenance Plan (PMP).

- Two rolls of geosynthetic clay liner that did not meet minimum thickness specifications were used in the construction of the impermeable layer. Three rolls of geonet that did not meet minimum thickness specifications were used in the construction of the impermeable layer. Nine samples of geotextile were taken and sampled to characterize approximately 334,637 square feet of geotextile. Four out of these nine samples failed the test standard. This should have been an indication that more samples were needed. As a result, there is no assurance that the passed samples were indicative of the quality of the balance of the geotextile. Additional site monitoring, such as monitoring for vegetation distress, should be performed to observe for signs of problems related to gas migration caused by these deficiencies. This additional monitoring should be performed on a quarterly basis, as described above, by grid walking the cover. The grid spacing should be no more than 50 feet. This additional site monitoring should be incorporated into the PMP.

- Transverse geotextile seems were not to be allowed on slopes steeper than 10%. The project engineer modified this specification to allow geotextile seems on slopes steeper than 10%. No justification for this change was provided. Additional site monitoring, such as monitoring for vegetation distress, should be performed to observe for signs of problems related to gas migration caused by this deficiency. This additional monitoring should be performed on a quarterly basis, as described above, by grid walking the cover. The grid spacing should be no more than 50 feet. This additional site monitoring should be incorporated into the PMP.

- A number of the field reports were missing signatures.
- The daily field report for 1/17/97 is missing.
- The Resident Engineer's Daily Reports for 10/1/97 through 10/3/97 are missing.
- The RTC indicates that there are missing Report Numbers between 9/25/97 and 10/4/97, and that Report Numbers were not entered after 10/8/97. Without Report Numbers it is difficult to determine if there are gaps in the record.

• 27 CCR 21090(a); "Final cover slopes shall not be steeper than a horizontal to vertical ratio on one and three quarters to one..." The slope above the detention basin on the southwest boundary of the cover rises about 20 feet above the basin at a one and a half to one (1.5:1) slope ratio. The Final Closure Plan design specified a 2:1 slope. Above the detention basin the landfill cover slope rises a total of about 76 feet above the detention basin. If the 1.5:1 slope fails it is likely that the stability of the 3.4:1 slope above it will be put in jeopardy. The RTC did not address the stability of this redesigned slope. A revised slope stability analysis should be conducted for the redesigned slopes. If the stability analysis shows that the slope is not stable mitigation measures will be required, one possibility being a requirement to reconfigure the slope. Furthermore, to minimize the risk of failure of the 1.5:1 slope, this slope should be thoroughly inspected quarterly for signs of slumping, erosion, cracking, bulging and any other signs indicating movement. The quarterly postclosure monitoring report should have a section devoted to the results of the inspection of this area. This report should also identify any repair work or other work done on this area. This additional site monitoring should be incorporated into the PMP.

• 27 CCR 21090(a); "Final cover slopes...shall have a minimum of one fifteen-foot wide bench for every fifty feet of vertical height." A portion of the bench and the anchor trench on the slope above the detention basin was eliminated during construction. Additionally, the width of the bench on the east slope was reduced from 15-feet to 8-feet. To minimize the risk of failure these slopes should be thoroughly inspected quarterly for signs of slumping, erosion, cracking, bulging and any other signs indicating movement. The quarterly postclosure monitoring report should have a section devoted to the results of the inspection of these areas. This report should also identify any repair work or other work done on these areas. This additional site monitoring should be incorporated into the PMP.

• 27 CCR 21890(a); "The operator shall adhere to the final closure and postclosure maintenance plans approved pursuant to §21860. Significant changes to the closure and postclosure maintenance plans, after approval of the final plan, shall upon concurrence with the EA be approved by the CIWMB, and the RWQCB." Approval for significant changes were not solicited and not given to the EA or the California Integrated Waste Management Board.

Should you have any questions or comments concerning the above matter, please call me at (916) 341-6319 or Mr. Michael Wochnick of my staff at (916) 341-6318.

Sincerely,

Scott Walker, C.E.G., P.E.
Supervising Engineering Geologist
Permitting and Enforcement Division

cc: Michael Wochnick, California Integrated Waste Management Board
Scott Humpert, California Integrated Waste Management Board
John Morley, Mendocino County Public Health Department, Division of Environmental Health
Gina Morrison, North Coast Rosa Regional Water Quality Control Board
R. Jeffrey Dunn, GeoSyntec Consultants, Inc.
Gary F. Anderson, Anderson Consulting Group

REFERENCE
No. 6

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

LEAK DETECTION

QUARTERLY MONITORING REPORT

OCTOBER THROUGH DECEMBER
2000

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

The following information shall provide an overview of the test results received during this quarter. Test methods, frequency and statistical analysis was conducted in accordance with Article 5 Monitoring Program Laytonville Landfill.

A County Technician under the requirements of the "GROUND WATER SAMPLING PROCEDURES MANUAL" took all on-site ground water samples. Alpha Analytical Laboratory of Ukiah, CA, performed all laboratory testing which is a State Certified laboratory. Statistical tolerance limits were performed using Sanitas for Groundwater Version 7.5, which is a groundwater statistical software package. Attached is a map showing groundwater and surface water locations.

GAS MONITORING

During this quarter, the County tested six landfill gas-monitoring probes that were installed around the perimeter of the landfill and 12 landfill passive gas vents installed during the final cover construction in 1997. A County Technician performed all monitoring using a Gastech Model GT201 calibrated for LEL methane. The results are attached.

GROUNDWATER

Groundwater sampling was performed on October 24, 2000. All compiled historical data for all sampling locations is transmitted on the enclosed 3.5" diskette as Sanitas data files.

LEAK DETECTION MONITORING

Fourth quarter groundwater monitoring wells sampled are as follows: 90-1, 91-1, 93-1, 93-2, and 94-1. Constituents Tested: Volatile Organic Compounds (VOC's), Chloride, Total Dissolved Solids (TDS), pH (field test), Electrical Conductivity (field test). Tolerance limits have been calculated for all constituents sampled. Articles 5 monitoring parameters are limited to VOC's, Chloride, TDS, pH (field), and Electrical Conductivity (field).

The tables compare current sample results to intra-well tolerance limits established for period ending December 1997. One monitoring parameter result exceeded its Tolerance Limit. Monitoring Well 93-1 detected TDS at 5740.00 mg/L with an Upper tolerance limit of 5400.00 mg/L. Since only one inorganic constituent exceeded its tolerance limit in the same sampling event and not two or more in the same event, this exceeded limit is not considered under the "Laytonville Landfill Article 5 Monitoring Program" to be a tentative indication of a release. Therefore, no retest is required at this time. No VOC's were detected in any Monitoring Wells.

ED_013162_00000569-00104

FRENCH DRAIN

An area on the Laytonville Landfill's East Slope was observed during the winter of 2000 with what appeared to be leachate. The Division conducted a study, and concluded that the problem was related to water backing up in the drainage net on the East Slope. This backed up water then absorbed volatile organic compounds (VOC's) from landfill gas. A drain was installed at the end of the drainage layer so that the water could quickly move off the slope. The water was tested during the first rainstorm in late October 2000. There were no detections for VOC's. The North Coast Regional Water Quality Control Board (NCRWQCB) gave permission to discharge water from the drain into surface waters. Subsequent sampling of the East Slope Drain has detected VOC's as follows:
Dec 2000 / Sample Point FD1 Chloroethane = 2.2 ug/l, Vinyl Chloride = 0.77 ug/l
Sample Point FD2 No Detect.
Jan 2001 / Sample Point FD1 Chloroethane = 8.0 ug/l, Vinyl Chloride = 6.5 ug/l
Sample Point FD2 Chloroethane = 3.4 ug/l Vinyl Chloride = 1.3 ug/l. Sample Point FD1 is the drain source. Sample Point FD2 is the discharge point. Upon receipt of positive sampling results from the laboratory, the Division immediately closed the drain discharge valve, and began collecting VOC impacted water in the leachate collection system. The Division also informed the NCRWQCB of the positive sampling results, as well as the cessation of discharge into surface waters. The collected leachate will be hauled by truck to the Willits Wastewater Treatment Plant for disposal. The Division will continue to monitor and study the problem.

SURFACE WATER

Surface water samples were taken. Results are attached.

LEACHATE

French Drain water was collected in the Leachate containment facility. Results are attached.

GROUNDWATER ELEVATIONS

Groundwater elevations for groundwater monitoring wells are set forth in the following table.

ATTACHMENTS:
Site Map
Gas Monitoring Field Logs
Tolerance Limit Table
Test Results – On-site Wells
Groundwater Elevation

TABLE A - LAYTONVILLE -- INTRA WELL TOLERANCE LIMIT
CURRENT DATA COMPARED TO 1999 TOLERANCE LIMIT
WELL 90-1

General Water Quality

Well	Constituent	Upper Limit	Lower Limit	Current 10/24/2000	Exceeds Limit
90-1	Chloride (mg/l)	140.00	n/a	92.00	NO
90-1	pH (ph)	7.60	5.80	7.00	NO
90-1	Specific Conductance (umhos)	820.00	n/a	668.00	NO
90-1	Total Dissolved Solids (mg/l)	460.00	n/a	346.00	NO

Metals: None Tested

VOCs: None detected.

NE [1] Concentration Limit not established at this time as alpha level is greater than 1%.
NE [2] Concentration Limit not established at this time as alpha level is greater than 1% and less than 50% of the data were detected above the MDL.

TABLE A - LAYTONVILLE -- INTRA WELL TOLERANCE LIMIT
CURRENT DATA COMPARED TO 1999 TOLERANCE LIMIT
WELL 91-1

General Water Quality

Well	Constituent	Upper Limit	Lower Limit	Current 10/24/2000	Exceeds Limit
91-1	Chloride (mg/l)	29.00	n/a	14.00	NO
91-1	pH (ph)	8.50	6.80	7.00	NO
91-1	Specific Conductance (umhos)	610.00	n/a	476.00	NO
91-1	Total Dissolved Solids (mg/l)	360.00	n/a	287.00	NO

Metals: None Tested

VOCs: None detected.

NE [1] Concentration Limit not established at this time as alpha level is greater than 1%.
NE [2] Concentration Limit not established at this time as alpha level is greater than 1% and less than 50% of the data were detected above the MDL.

TABLE A - LAYTONVILLE -- INTRA WELL TOLERANCE LIMIT
CURRENT DATA COMPARED TO 1999 TOLERANCE LIMIT
WELL 93-1

General Water Quality

Well	Constituent	Upper Limit	Lower Limit	Current 10/24/2000	Exceeds Limit
93-1	Chloride (mg/l)	1900.00	n/a	1260.00	NO
93-1	pH (ph)	7.90	6.10	7.00	NO
93-1	Specific Conductance (umhos)	8100.00	n/a	7230.00	NO
93-1	Total Dissolved Solids (mg/l)	5400.00	n/a	5740.00	YES

Metals: None Tested

VOCs: None detected.

NE [1] Concentration Limit not established at this time as alpha level is greater than 1%.
NE [2] Concentration Limit not established at this time as alpha level is greater than 1% and less than 50% of the data were detected above the MDL.

TABLE A - LAYTONVILLE -- INTRA WELL TOLERANCE LIMIT
CURRENT DATA COMPARED TO 1999 TOLERANCE LIMIT
WELL 93-2

General Water Quality

Well	Constituent	Upper Limit	Lower Limit	Current 10/24/2000	Exceeds Limit
93-2	Chloride (mg/l)	60.00	n/a	42.00	NO
93-2	pH (ph)	8.10	5.90	7.00	NO
93-2	Specific Conductance (umhos)	950.00	n/a	879.00	NO
93-2	Total Dissolved Solids (mg/l)	600.00	n/a	550.00	NO

Metals: None Tested

VOCs: None detected.

NE [1] Concentration Limit not established at this time as alpha level is greater than 1%.
NE [2] Concentration Limit not established at this time as alpha level is greater than 1% and less than 50% of the data were detected above the MDL.

TABLE A - LAYTONVILLE -- INTRA WELL TOLERANCE LIMIT
CURRENT DATA COMPARED TO 1999 TOLERANCE LIMIT
WELL 94-1

General Water Quality

Well	Constituent	Upper Limit	Lower Limit	Current 10/24/2000	Exceeds Limit
94-1	Chloride (mg/l)	1000.00	n/a	575.00	NO
94-1	pH (ph)	8.10	6.00	7.00	NO
94-1	Specific Conductance (umhos)	4700.00	n/a	3420.00	NO
94-1	Total Dissolved Solids (mg/l)	3100.00	n/a	2430.00	NO

Metals: None Tested

VOCs: None detected

NE [1] Concentration Limit not established at this time as alpha level is greater than 1%.
NE [2] Concentration Limit not established at this time as alpha level is greater than 1% and less than 50% of the data were detected above the MDL.

COUNTY OF MENDOCINO
LAYTONVILLE LANDFILL

GROUNDWATER WELL ELEVATIONS
CALENDAR YEAR 2000

Quarter: 2nd Date: 10/24/2000

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	17.20	1738.15
91-1	1709.20	10.90	1698.30
93-1	1766.10	38.30	1727.80
93-2	1777.65	38.80	1738.85
94-1	1745.41	21.30	1724.11

Mendocino County
Solid Waste Division

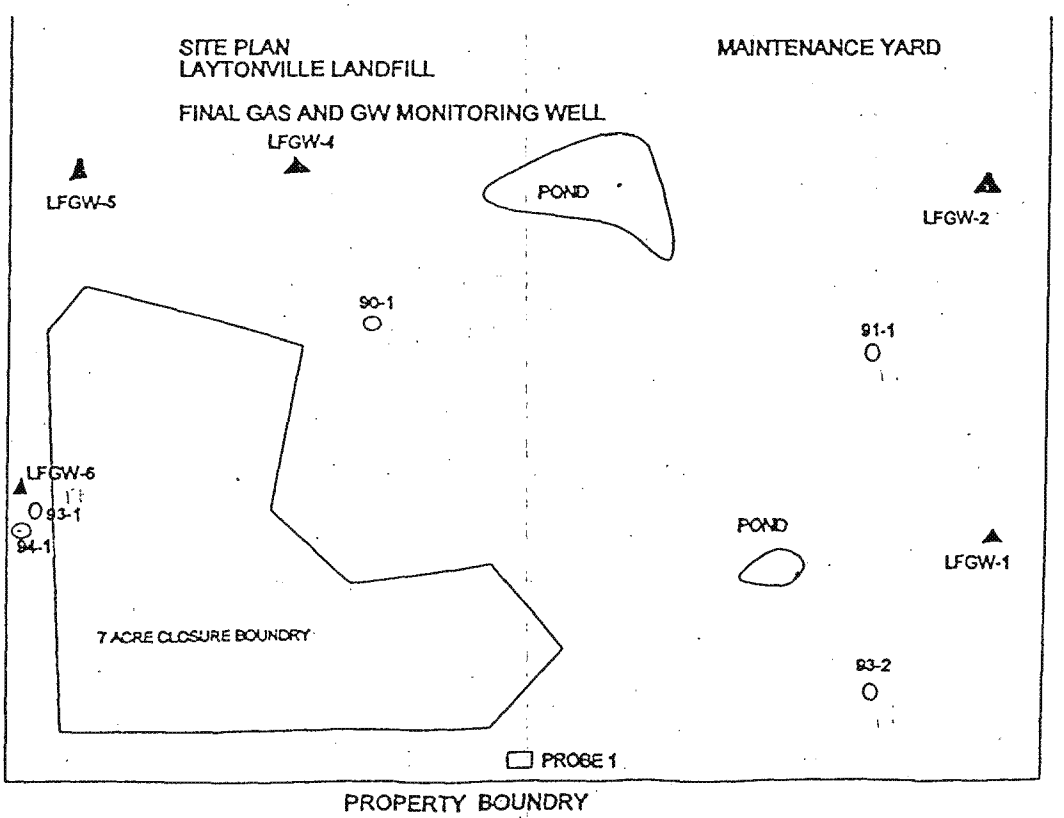
Laytonville Landfill

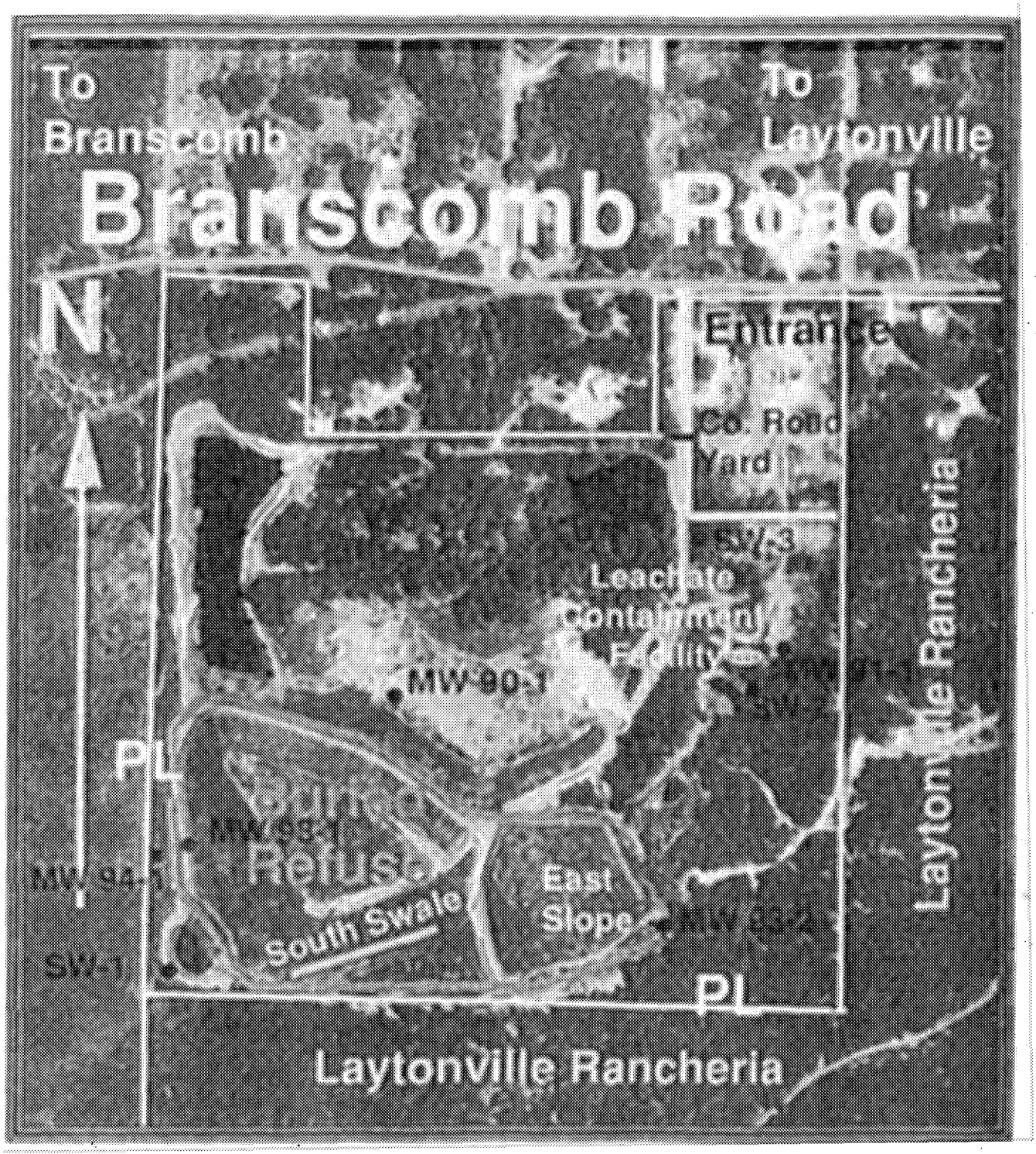
GAS WELLS FIELD LOG

Gas Testing Instrument Gastech GT201
Calibration Date 10-8-99
Technician O. Centoni

Test Well Test Data
–% Methane

Month	Well G1	Well G2	Well G4	Well G5	Well G6	Probe 1
10/24/00	0	0	0	0	0	0





Laytonville Landfill Monitoring System Map

August 8, 2000 rsf

laywell.map.wpd

TABLE A - LAYTONVILLE -- INTRA WELL TOLERANCE LIMIT
CURRENT DATA COMPARED TO 1999 TOLERANCE LIMIT
WELL 93-1

General Water Quality

Well	Constituent	Upper Limit	Lower Limit	Current 8/28/2000	Exceeds Limit
93-1	Chloride (mg/l)	1900.00	n/a	1700	NO
93-1	pH (ph)	7.90	6.10	6.40	NO
93-1	Specific Conductance (umhos)	8100.00	n/a	2550.00	NO
93-1	Total Dissolved Solids (mg/l)	5400.00	n/a	6020	YES

Metals: None Tested

VOCs: None detected.

NE [1] Concentration Limit not established at this time as alpha level is greater than 1%.
NE [2] Concentration Limit not established at this time as alpha level is greater than 1% and less than 50% of the data were detected above the MDL.

TABLE A - LAYTONVILLE -- INTRA WELL TOLERANCE LIMIT
CURRENT DATA COMPARED TO 1999 TOLERANCE LIMIT
WELL 93-2

General Water Quality

Well	Constituent	Upper Limit	Lower Limit	Current 8/28/2000	Exceeds Limit
93-2	Chloride (mg/l)	60.00	n/a	48	NO
93-2	pH (ph)	8.10	5.90	7.00	NO
93-2	Specific Conductance (umhos)	950.00	n/a	962.00	YES
93-2	Total Dissolved Solids (mg/l)	600.00	n/a	559	NO

Metals: None Tested

VOCs: None detected.

NE [1] Concentration Limit not established at this time as alpha level is greater than 1%.
NE [2] Concentration Limit not established at this time as alpha level is greater than 1% and less than 50% of the data were detected above the MDL.

TABLE A - LAYTONVILLE -- INTRA WELL TOLERANCE LIMIT
CURRENT DATA COMPARED TO 1999 TOLERANCE LIMIT
WELL 94-1

General Water Quality

Well	Constituent	Upper Limit	Lower Limit	Current 8/28/2000	Exceeds Limit
94-1	Chloride (mg/l)	1000.00	n/a	1230	YES
94-1	pH (ph)	8.10	6.00	6.80	NO
94-1	Specific Conductance (umhos)	4700.00	n/a	3490.00	NO
94-1	Total Dissolved Solids (mg/l)	3100.00	n/a	2650	NO

Metals: None Tested

VOCs: None detected

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NE [2] Concentration Limit not established at this time as alpha level is greater than 1% and less than 50% of the data were detected above the MDL.

TABLE A - LAYTONVILLE -- INTRA WELL TOLERANCE LIMIT
CURRENT DATA COMPARED TO 1999 TOLERANCE LIMIT
WELL 93-1

General Water Quality

Well	Constituent	Upper Limit	Lower Limit	Current 5/11/2000	Exceeds Limit
93-1	Chloride (mg/l)	1900.00	n/a	1700	No
93-1	pH (ph)	7.90	6.10	6.40	No
93-1	Specific Conductance (umhos)	8100.00	n/a	6940.00	No
93-1	Total Dissolved Solids (mg/l)	5400.00	n/a	5490	Yes

Metals: None Tested

VOCs: None detected.

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Mendocino County
Solid Waste Division

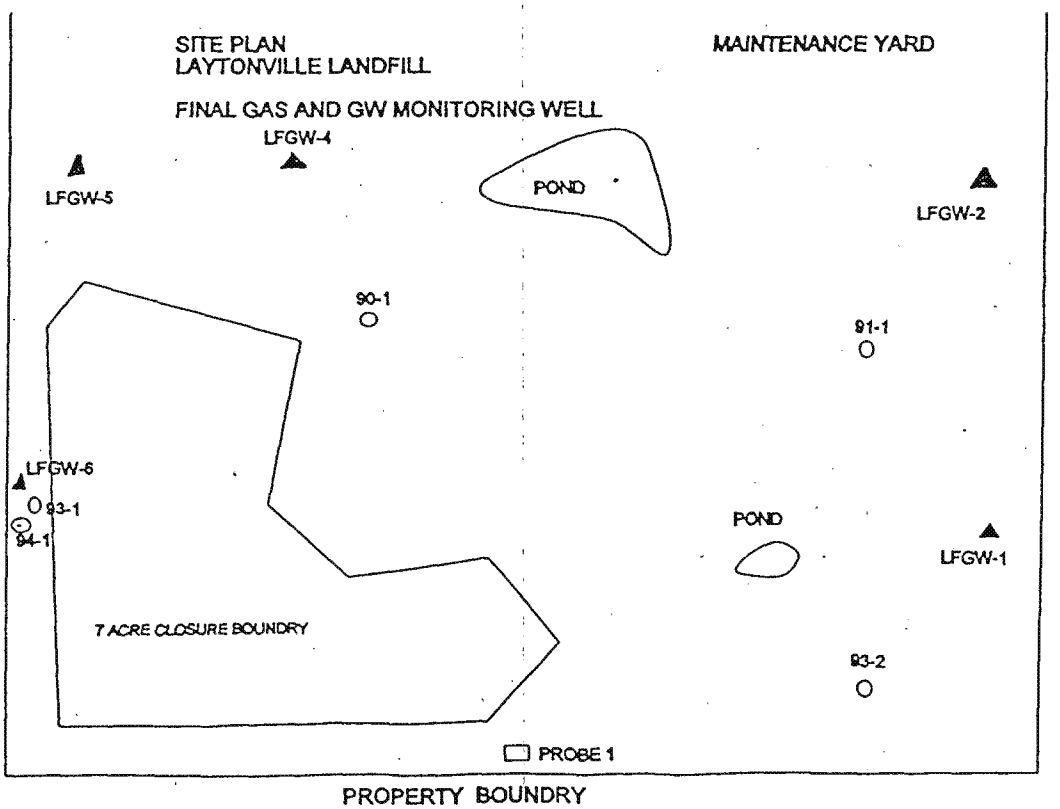
Laytonville Landfill

GAS WELLS FIELD LOG

Gas Testing Instrument Gas Tech GT 201
Calibration Date 11/99
Technician O. Centoni

Test Well Test Data
–% Methane

Month	Well G1	Well G2	Well G4	Well G5	Well G6	Probe 1
May	0	0	0	0	0	5



Mendocino County
Solid Waste Division

Laytonville Landfill

GAS WELLS FIELD LOG

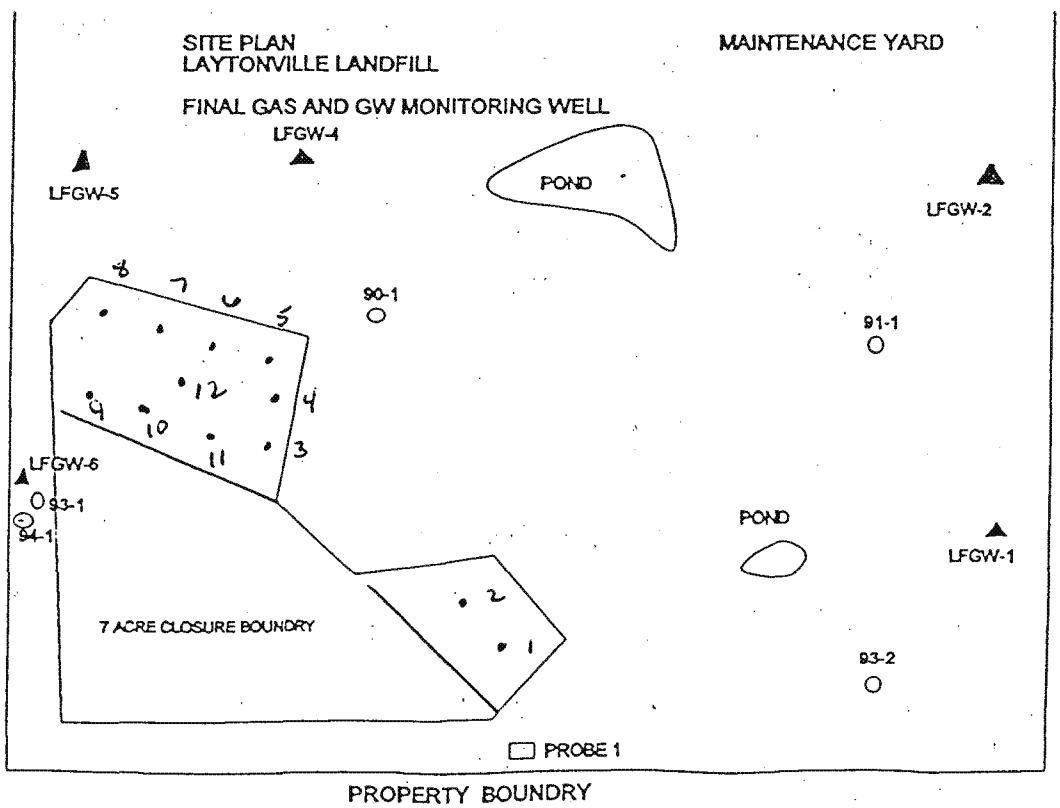
Gas Testing Instrument GasTech Model GT 201
Calibration Date 10/99
Technician O. Centoni

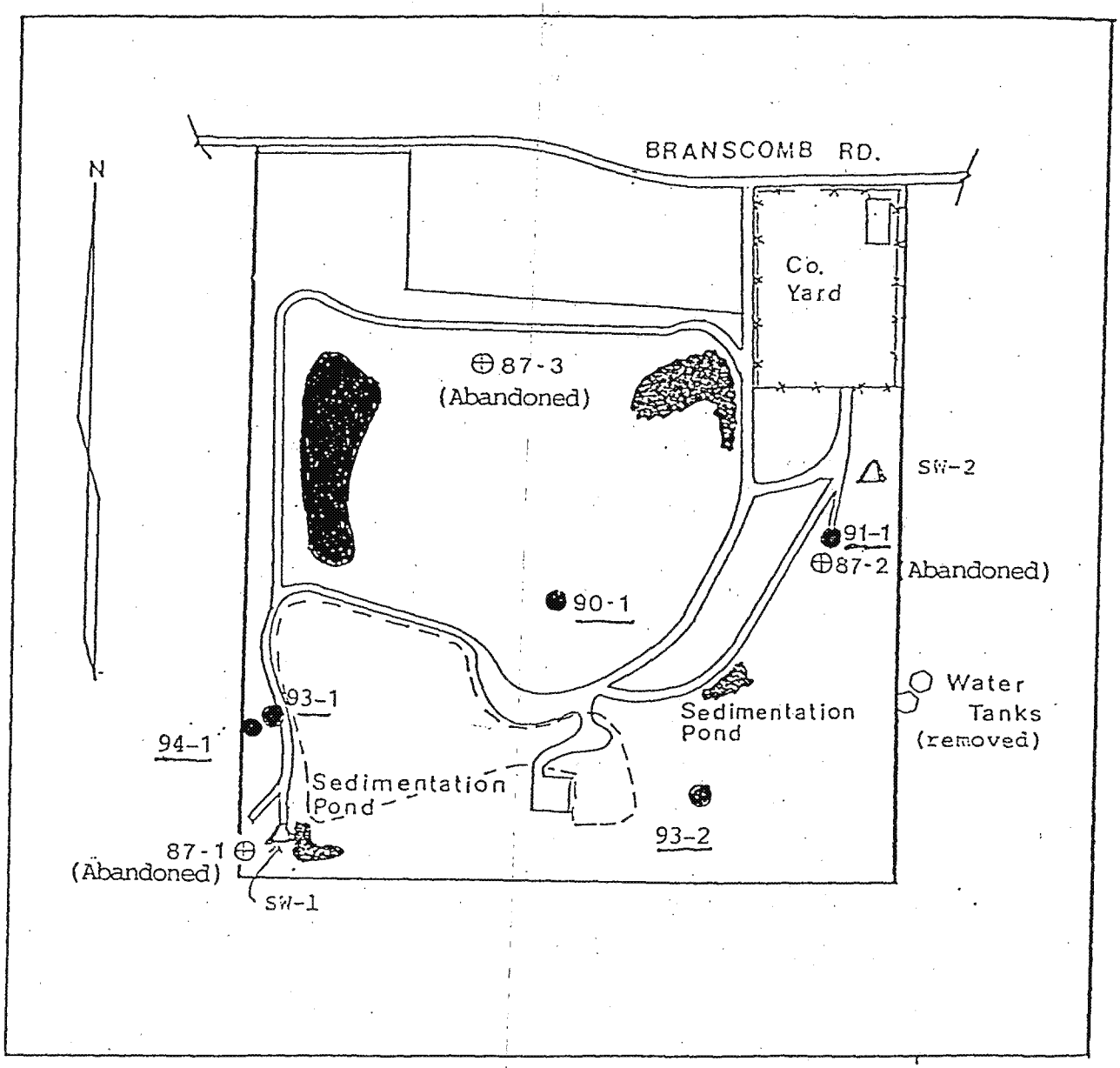
Test Well Test Data
–% Methane

Month	Well G1	Well G2	Well G4	Well G5	Well G6	Probe 1
10/18/99	Ø	Ø	Ø	Ø	Ø	002%

GAS VENTS

Vent 1 Ø
Vent 2 Ø
Vent 3 Ø
Vent 4 Ø
Vent 5 Ø
Vent 6 Ø
Vent 7 Ø
Vent 8 Ø
Vent 9 Ø
Vent 10 Ø
Vent 11 Ø
Vent 12 Ø





LAYTONVILLE LANDFILL

SITE PLAN

● WELLS (5)
△ SURFACE WATER SAMPLE POINT

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

LEAK DETECTION

QUARTERLY MONITORING REPORT

OCTOBER THROUGH DECEMBER 2000

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

The following information shall provide an overview of the test results received during this quarter. Test methods, frequency and statistical analysis was conducted in accordance with Article 5 Monitoring Program Laytonville Landfill.

A County Technician under the requirements of the "GROUND WATER SAMPLING PROCEDURES MANUAL" took all on-site ground water samples. Alpha Analytical Laboratory of Ukiah, CA, performed all laboratory testing which is a State Certified laboratory. Statistical tolerance limits were performed using Sanitas for Groundwater Version 7.5, which is a groundwater statistical software package. Attached is a map showing groundwater and surface water locations.

GAS MONITORING

During this quarter, the County tested six landfill gas-monitoring probes that were installed around the perimeter of the landfill and 12 landfill passive gas vents installed during the final cover construction in 1997. A County Technician performed all monitoring using a Gastech Model GT201 calibrated for LEL methane. The results are attached.

GROUNDWATER

Groundwater sampling was performed on October 24, 2000. All compiled historical data for all sampling locations is transmitted on the enclosed 3.5" diskette as Sanitas data files.

LEAK DETECTION MONITORING

Fourth quarter groundwater monitoring wells sampled are as follows: 90-1, 91-1, 93-1, 93-2, and 94-1. Constituents Tested: Volatile Organic Compounds (VOC's), Chloride, Total Dissolved Solids (TDS), pH (field test), Electrical Conductivity (field test). Tolerance limits have been calculated for all constituents sampled. Articles 5 monitoring parameters are limited to VOC's, Chloride, TDS, pH (field), and Electrical Conductivity (field).

The tables compare current sample results to intra-well tolerance limits established for period ending December 1997. One monitoring parameter result exceeded its Tolerance Limit. Monitoring Well 93-1 detected TDS at 5740.00 mg/L with an Upper tolerance limit of 5400.00 mg/L. Since only one inorganic constituent exceeded its tolerance limit in the same sampling event and not two or more in the same event, this exceeded limit is not considered under the "Laytonville Landfill Article 5 Monitoring Program" to be a tentative indication of a release. Therefore, no retest is required at this time. No VOC's were detected in any Monitoring Wells.

2nd Sampling

Alpha Analytical Laboratories Inc. 860 Waugh Lane, H-1, Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482
Attn: O. Centoni

Date Printed
12/19/00
Project No:
Project Id: Laytonville Landfill

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via
A00121427	12/14/00 03:05PM	MCDPW		MAIL

Order A00121427 consisted of 3 Samples and 3 Tests.

Sample 1 FD-1
Sample Type: Aqueous Sampled By: O.Centoni Sampled: 12/14/00

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL
EPA 601/602 Analytes	8260B		12/15/00			
Bromodichloromethane				ND	ug/L	.50
Bromoform				ND	ug/L	.50
Bromomethane				ND	ug/L	.50
Carbon Tetrachloride				ND	ug/L	.50
Chlorobenzene				ND	ug/L	.50
Chloroethane				2.2	ug/L	.50
Chloroform				ND	ug/L	.50
Chloromethane				ND	ug/L	.50
Chlorotoluene				ND	ug/L	.50
Dibromochloromethane				ND	ug/L	.50
1,2-Dichlorobenzene				ND	ug/L	.50
1,3-Dichlorobenzene				ND	ug/L	.50
1,4-Dichlorobenzene				ND	ug/L	.50
Dichlorodifluoromethane				ND	ug/L	.50
1,1-Dichloroethane				ND	ug/L	.50
1,2-Dichloroethane				ND	ug/L	.50
1,1-Dichloroethene				ND	ug/L	.30
cis-1,2-Dichloroethene				ND	ug/L	.50
trans-1,2-Dichloroethene				ND	ug/L	.50
1,2-Dichloropropane				ND	ug/L	.50
cis-1,3-Dichloropropene				ND	ug/L	.50
trans-1,3-dichloropropene				ND	ug/L	.50
Methylene Chloride				ND	ug/L	.50
1,1,2,2-Tetrachloroethane				ND	ug/L	.50
Tetrachloroethene				ND	ug/L	.50

PQL = Practical Quantitation Limit ND = None Detected

Bruce L. Gove
Laboratory Director

Bruce L. Gove

Date Printed: 12/19/00

Alpha Analytical Laboratories Inc. 860 Waugh Lane, H-1, Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482
Attn: O. Centoni

Date Printed
12/19/00
Project No:
Project Id: Laytonville Landfill

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via
A00121427	12/14/00 03:05PM	MCDPW		MAIL

Order A00121427 consisted of 3 Samples and 3 Tests.

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL
1,1,1-Trichloroethane				ND	ug/L	.50
1,1,2-Trichloroethane				ND	ug/L	.50
Trichloroethene				ND	ug/L	.50
Trichlorofluoromethane				ND	ug/L	.50
Vinyl Chloride				.77	ug/L	.50
Benzene				ND	ug/L	.30
Ethylbenzene				ND	ug/L	.50
Toluene				ND	ug/L	.30
Total Xylenes				ND	ug/L	.50

Sample 2 FD-2
Sample Type: Aqueous Sampled By: O.Centoni Sampled: 12/14/00

EPA 601/602 Analytes	8260B	12/15/00			
Bromodichloromethane			ND	ug/L	.50
Bromoform			ND	ug/L	.50
Bromomethane			ND	ug/L	.50
Carbon Tetrachloride			ND	ug/L	.50
Chlorobenzene			ND	ug/L	.50
Chloroethane			ND	ug/L	.50
Chloroform			ND	ug/L	.50
Chloromethane			ND	ug/L	.50
Chlorotoluene			ND	ug/L	.50
Dibromochloromethane			ND	ug/L	.50
1,2-Dichlorobenzene			ND	ug/L	.50
1,3-Dichlorobenzene			ND	ug/L	.50
1,4-Dichlorobenzene			ND	ug/L	.50
Dichlorodifluoromethane			ND	ug/L	.50
1,1-Dichloroethane			ND	ug/L	.50

PQL - Practical Quantitation Limit ND - None Detected

Bruce L. Gove
Laboratory Director

Bruce L. Gove

Date Printed: 12/19/00

3rd sampling

Alpha Analytical Laboratories Inc. 860 Waugh Lane, H-1, Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482
Attn: O. Centoni

Date Printed
01/19/01
Project No:
Project Id: Laytonville Landfill

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via
A01011120	01/11/01 03:03PM	MCDPW		MAIL

Order A01011120 consisted of 3 Samples and 3 Tests.

Sample 1 FD-1
Sample Type: Aqueous Sampled By: O.Centoni Sampled: 01/11/01

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL
EPA 601/602 Analytes	8260B		01/17/01			
Bromodichloromethane				ND	ug/L	.50
Bromoform				ND	ug/L	.50
Bromomethane				ND	ug/L	.50
Carbon Tetrachloride				ND	ug/L	.50
Chlorobenzene				ND	ug/L	.50
Chloroethane				8.0	ug/L	.50
Chloroform				ND	ug/L	.50
Chloromethane				ND	ug/L	.50
Chlorotoluene				ND	ug/L	.50
Dibromochloromethane				ND	ug/L	.50
1,2-Dichlorobenzene				ND	ug/L	.50
1,3-Dichlorobenzene				ND	ug/L	.50
1,4-Dichlorobenzene				ND	ug/L	.50
Dichlorodifluoromethane				ND	ug/L	.50
1,1-Dichloroethane				ND	ug/L	.50
1,2-Dichloroethane				ND	ug/L	.50
1,1-Dichloroethene				ND	ug/L	.30
cis-1,2-Dichloroethene				ND	ug/L	.50
trans-1,2-Dichloroethene				ND	ug/L	.50
1,2-Dichloropropane				ND	ug/L	.50
cis-1,3-Dichloropropene				ND	ug/L	.50
trans-1,3-dichloropropene				ND	ug/L	.50
Methylene Chloride				ND	ug/L	.50
1,1,2,2-Tetrachloroethane				ND	ug/L	.50
Tetrachloroethene				ND	ug/L	.50

PQL - Practical Quantitation Limit ND - None Detected

Bruce L. Gove
Laboratory Director

Date Printed: 01/19/01

Alpha Analytical Laboratories Inc. 860 Waugh Lane, H-1, Ukiah, California 95482
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CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482
Attn: O. Centoni

Date Printed
01/19/01
Project No:
Project Id: Laytonville Landfill

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via
A01011120	01/11/01 03:03PM	MCDPW		MAIL

Order A01011120 consisted of 3 Samples and 3 Tests.

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL
1,1,1-Trichloroethane				ND	ug/L	.50
1,1,2-Trichloroethane				ND	ug/L	.50
Trichloroethene				ND	ug/L	.50
Trichlorofluoromethane				ND	ug/L	.50
Vinyl Chloride				6.5	ug/L	.50
Benzene				ND	ug/L	.30
Ethylbenzene				ND	ug/L	.50
Toluene				ND	ug/L	.30
Total Xylenes				ND	ug/L	.50

Sample 2 FD-2
Sample Type: Aqueous Sampled By: O.Centoni Sampled: 01/11/01

EPA 601/602 Analytes	8260B		01/17/01			
Bromodichloromethane				ND	ug/L	.50
Bromoform				ND	ug/L	.50
Bromomethane				ND	ug/L	.50
Carbon Tetrachloride				ND	ug/L	.50
Chlorobenzene				ND	ug/L	.50
Chloroethane				3.4	ug/L	.50
Chloroform				ND	ug/L	.50
Chloromethane				ND	ug/L	.50
Chlorotoluene				ND	ug/L	.50
Dibromochloromethane				ND	ug/L	.50
1,2-Dichlorobenzene				ND	ug/L	.50
1,3-Dichlorobenzene				ND	ug/L	.50
1,4-Dichlorobenzene				ND	ug/L	.50
Dichlorodifluoromethane				ND	ug/L	.50
1,1-Dichloroethane				ND	ug/L	.50

PQL = Practical Quantitation Limit ND - None Detected

Bruce L. Gove
Laboratory Director

Date Printed: 01/19/01

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CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482
Attn: O. Centoni

Date Printed
01/19/01
Project No:
Project Id: Laytonville Landfill

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via
A01011120	01/11/01 03:03PM	MCDPW		MAIL

Order A01011120 consisted of 3 Samples and 3 Tests.

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL
1,2-Dichloroethane				ND	ug/L	.50
1,1-Dichloroethene				ND	ug/L	.30
cis-1,2-Dichloroethene				ND	ug/L	.50
trans-1,2-Dichloroethene				ND	ug/L	.50
1,2-Dichloropropane				ND	ug/L	.50
cis-1,3-Dichloropropene				ND	ug/L	.50
trans-1,3-dichloropropene				ND	ug/L	.50
Methylene Chloride				ND	ug/L	.50
1,1,2,2-Tetrachloroethane				ND	ug/L	.50
Tetrachloroethene				ND	ug/L	.50
1,1,1-Trichloroethane				ND	ug/L	.50
1,1,2-Trichloroethane				ND	ug/L	.50
Trichloroethene				ND	ug/L	.50
Trichlorofluoromethane				ND	ug/L	.50
Vinyl Chloride				1.3	ug/L	.50
Benzene				ND	ug/L	.30
Ethylbenzene				ND	ug/L	.50
Toluene				ND	ug/L	.30
Total Xylenes				ND	ug/L	.50

Sample 3 Travel Blank
Sample Type: Aqueous Sampled By: O.Centoni Sampled: 01/11/01

EPA 601/602 Analytes	8260B		01/17/01		
Bromodichloromethane				ND	ug/L	.50
Bromoform				ND	ug/L	.50
Bromomethane				ND	ug/L	.50
Carbon Tetrachloride				ND	ug/L	.50
Chlorobenzene				ND	ug/L	.50

PQL = Practical Quantitation Limit ND - None Detected

Bruce L. Gove
Laboratory Director

Date Printed: 01/19/01

FRENCH DRAIN

An area on the Laytonville Landfill's East Slope was observed during the winter of 2000 with what appeared to be leachate. The Division conducted a study, and concluded that the problem was related to water backing up in the drainage net on the East Slope. This backed up water then absorbed volatile organic compounds (VOC's) from landfill gas. A drain was installed at the end of the drainage layer so that the water could quickly move off the slope. The water was tested during the first rainstorm in late October 2000. There were no detections for VOC's. The North Coast Regional Water Quality Control Board (NCRWQCB) gave permission to discharge water from the drain into surface waters. Subsequent sampling of the East Slope Drain has detected VOC's as follows:

FD = French Drain

Dec 2000 / Sample Point FD1 Chloroethane = 2.2 ug/l, Vinyl Chloride = 0.77 ug/l
Sample Point FD2 No Detect.
Jan 2001 / Sample Point FD1 Chloroethane = 8.0 ug/l, Vinyl Chloride = 6.5 ug/l
Sample Point FD2 Chloroethane = 3.4 ug/l, Vinyl Chloride = 1.3 ug/l. Sample Point FD1 is the drain source. Sample Point FD2 is the discharge point. Upon receipt of positive sampling results from the laboratory, the Division immediately closed the drain discharge valve, and began collecting VOC impacted water in the leachate collection system. The Division also informed the NCRWQCB of the positive sampling results, as well as the cessation of discharge into surface waters. The collected leachate will be hauled by truck to the Willits Wastewater Treatment Plant for disposal. The Division will continue to monitor and study the problem.

? for 1 yr, VOCs into air/water

SURFACE WATER

Surface water samples were taken. Results are attached.

LEACHATE

French Drain water was collected in the Leachate containment facility. Results are attached.

GROUNDWATER ELEVATIONS

Groundwater elevations for groundwater monitoring wells are set forth in the following table.

ATTACHMENTS:

Site Map
Gas Monitoring Field Logs
Tolerance Limit Table
Test Results – On-site Wells
Groundwater Elevation

COUNTY OF MENDOCINO
LAYTONVILLE LANDFILL

GROUNDWATER WELL ELEVATIONS
CALENDAR YEAR 2000

Quarter: 4th Date: 10/24/2000

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	17.20	1738.15
91-1	1709.20	10.90	1698.30
93-1	1766.10	38.30	1727.80
93-2	1777.65	38.80	1738.85
94-1	1745.41	21.30	1724.11

REFERENCE
No. 7

SECOR-SACRAMENTO

PAUL CAYLER
Director

- If with highest size
93-2, 91-1
[illegible]

SOLID WASTE DIVISION
559 LOW GAP ROAD
UKIAH, CALIFORNIA 95482
(707) 463-4078
FAX: (707) 468-3427

August 13, 2001

Ms. Gina Morrison
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

RE: QUARTERLY MONITORING REPORT - LAYTONVILLE DISPOSAL FACILITY

Dear Ms. Morrison:

Attached is the Quarterly Monitoring Report for the Laytonville Disposal Facility as prepared by the Mendocino County Solid Waste Division. This report covers the First quarter of 2001 (January through March).

If you have any questions or concerns after reviewing this report please contact me.

Sincerely,

Paul Cayler

Paul Cayler
Director

PC/OWC/ask

cc: Monitoring Binder (Report & Original Lab Tests)
Laytonville RWQCB Reports & Correspondence File (Report Only)
Dave Koppel, Mendocino County Environmental Health (Report & Gas Well Log)
Mr. and Mrs. Bowler (Report Only)
Cahto Tribe
Jared Silva

Test results are available upon request

Monitoring Well 91-1 detected specific conductance at 794.0 umhos with an upper tolerance limit of 610.0 umhos. Monitoring Well 93-2 detected specific conductance at 3520.0 umhos with an upper tolerance limit of 950.0 umhos. No VOC's or PCB's were detected in any of the monitoring wells.
Per Article 5 Monitoring Program, Laytonville Landfill, Section 3.4.2 (Inorganic Constituents), two or more inorganic monitoring parameters must exceed tolerance limits in a single well during a monitoring event to require a retest. No retest required.

FRENCH DRAIN

Two additional tanks have been installed in the cascading water system to further treat water from the East Slope French Drain. French Drain water now enters tank #1 impacted and exits tank #5 (FD-2) un-impacted. Un-impacted French Drain water is collected in the Leachate Containment Facility and disposed of at the Willits Sewage Treatment Plant in Willits. French Drain Tanks were sampled on January 11, 2001, February 13, 2001 and March 5, 2001. Results are attached.

SURFACE WATER

Surface water samples were taken on March 5, 2001 with the results attached. VOC's were inadvertently overlooked during current testing period. VOC's were included in the 4th quarter of 2000. The results were non-detect. Historically, sample points SW-1, SW-2 and SW-3 have been non-detect. In addition, storm water samples were taken at the same time in accordance with the Storm Water Monitoring and Reporting Plan with the results attached. Samples were taken from SW-1 (Upstream), SW-2 (Downstream) and SW-3 (Downstream) sample points.

LEACHATE

French Drain water was collected in the Leachate Tanks during this quarter. Results are attached.

GROUNDWATER ELEVATIONS

Groundwater elevations for groundwater monitoring wells are set forth in the following table.

ATTACHMENTS:

Site Map
Gas Monitoring Field Logs
Tolerance Limit Table
Test Results – On-site Wells
Groundwater Elevation
French Drain Results
Leachate Tank Farm Results

Alpha
Alpha Analytical Laboratories Inc. 860 Waugh Lane, H-1, Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

26 March 2001

O. Centoni
Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482
RE: Laytonville French Drain (F)

Enclosed are the results of analyses for samples received by the laboratory on 03/05/01 15:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sheryl Speaks

Sheryl L. Speaks For Karen A. Daly
Project Manager

Alpha
Alpha Analytical Laboratories Inc. 860 Waugh Lane, H-1, Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah CA, 95482
Attn: O. Centoni

Report Date: 03/26/01 09:54
Project No: [none]
Project ID: Laytonville French Drain

Order Number	Receipt Date/Time	Client Code	Client PO/Reference
A103083	03/05/2001 15:30	MCDPW	

Alpha Analytical Laboratories, Inc.

	METHOD	BATCH	PREPARED	ANALYZED	DILUTION	RESULT	PQL	NOTE
FD - 1 (A103083-01)			Sample Type: Water			Sampled: 03/05/01 00:00		
601/602 Volatile Organic Compounds by EPA Method 8260B								
Bromodichloromethane	8260B	AC12501	03/18/01	03/19/01	1	ND ug/l	0.50	
Bromoform	"	"	"	"	"	ND "	0.50	
Bromomethane	"	"	"	"	"	ND "	0.50	
Carbon tetrachloride	"	"	"	"	"	ND "	0.50	
Chlorobenzene	"	"	"	"	"	ND "	0.50	
Chloroethane	"	"	"	"	"	6.3 "	0.50	
Chloroform	"	"	"	"	"	ND "	0.50	
Chloromethane	"	"	"	"	"	ND "	0.50	
Chlorotoluene	"	"	"	"	"	ND "	0.50	
Dibromochloromethane	"	"	"	"	"	ND "	0.50	
1,2-Dichlorobenzene	"	"	"	"	"	ND "	0.50	
1,3-Dichlorobenzene	"	"	"	"	"	ND "	0.50	
1,4-Dichlorobenzene	"	"	"	"	"	ND "	0.50	
Dichlorodifluoromethane	"	"	"	"	"	ND "	0.50	
1,1-Dichloroethane	"	"	"	"	"	ND "	0.50	
1,2-Dichloroethane	"	"	"	"	"	ND "	0.50	
1,1-Dichloroethene	"	"	"	"	"	ND "	0.30	
cis-1,2-Dichloroethene	"	"	"	"	"	ND "	0.50	
trans-1,2-Dichloroethene	"	"	"	"	"	ND "	0.50	
1,2-Dichloropropane	"	"	"	"	"	ND "	0.50	
cis-1,3-Dichloropropene	"	"	"	"	"	ND "	0.50	
trans-1,3-Dichloropropene	"	"	"	"	"	ND "	0.50	
Methylene chloride	"	"	"	"	"	ND "	0.50	
1,1,2,2-Tetrachloroethane	"	"	"	"	"	ND "	0.50	
Tetrachloroethene	"	"	"	"	"	ND "	0.50	
1,1,1-Trichloroethane	"	"	"	"	"	ND "	0.50	
1,1,2-Trichloroethane	"	"	"	"	"	ND "	0.50	
Trichloroethene	"	"	"	"	"	ND "	0.50	
Trichlorofluoromethane	"	"	"	"	"	ND "	0.50	
Vinyl chloride	"	"	"	"	"	2.6 "	0.50	
Benzene	"	"	"	"	"	ND "	0.30	
Ethylbenzene	"	"	"	"	"	ND "	0.50	
Toluene	"	"	"	"	"	ND "	0.30	

Sheryl Speaks

Sheryl L. Speaks For Karen A. Daly 3/26/01
Project Manager

Alpha Analytical Laboratories Inc. 860 Waugh Lane, H-1, Ukiah, California 95482
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CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482
Attn: D. Centoni

Date Printed
02/15/01
Project No:
Project Id: Laytonville Landfill

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via
A01021314	02/13/01 02:25PM	MCDPW		MAIL

Order A01021314 consisted of 2 Samples and 2 Tests.

Sample 1 FD-2
Sample Type: Aqueous Sampled By: D.Centoni Sampled: 02/13/01 14:25

EPA 601/602 Analytes	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL
	8260B		02/13/01			
Bromodichloromethane				ND	ug/L	.50
Bromoform				ND	ug/L	.50
Bromomethane				ND	ug/L	.50
Carbon Tetrachloride				ND	ug/L	.50
Chlorobenzene				ND	ug/L	.50
Chloroethane				1.3	ug/L	.50
Chloroform				ND	ug/L	.50
Chloromethane				ND	ug/L	.50
Chlorotoluene				ND	ug/L	.50
Dibromochloromethane				ND	ug/L	.50
1,2-Dichlorobenzene				ND	ug/L	.50
1,3-Dichlorobenzene				ND	ug/L	.50
1,4-Dichlorobenzene				ND	ug/L	.50
Dichlorodifluoromethane				ND	ug/L	.50
1,1-Dichloroethane				ND	ug/L	.50
1,2-Dichloroethane				ND	ug/L	.50
1,1-Dichloroethene				ND	ug/L	.30
cis-1,2-Dichloroethene				ND	ug/L	.50
trans-1,2-Dichloroethene				ND	ug/L	.50
1,2-Dichloropropane				ND	ug/L	.50
cis-1,3-Dichloropropene				ND	ug/L	.50
trans-1,3-dichloropropene				ND	ug/L	.50
Methylene Chloride				ND	ug/L	.50
1,1,2,2-Tetrachloroethane				ND	ug/L	.50
Tetrachloroethene				ND	ug/L	.50

PQL - Practical Quantitation Limit ND - None Detected

Bruce L. Gove
Laboratory Director
Date Printed: 02/15/01

Alpha Analytical Laboratories Inc. 860 Waugh Lane, H-1, Ukiah, California 95482
e-mail: clientservices@alpha-labs.com • Phone: (707) 468-0401 • Fax: (707) 468-5267

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482
Attn: O. Centoni

Date Printed
01/19/01
Project No:
Project Id: Laytonville Landfill

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via
A01011120	01/11/01 03:03PM	MCDPW		MAIL

Order A01011120 consisted of 3 Samples and 3 Tests.

Sample 1 PD-1
Sample Type: Aqueous Sampled By: O.Centoni Sampled: 01/11/01

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL
EPA 601/602 Analytes	8260B		01/17/01			
Bromodichloromethane				ND	ug/L	.50
Bromoform				ND	ug/L	.50
Bromomethane				ND	ug/L	.50
Carbon Tetrachloride				ND	ug/L	.50
Chlorobenzene				ND	ug/L	.50
Chloroethane				8.0	ug/L	.50
Chloroform				ND	ug/L	.50
Chloromethane				ND	ug/L	.50
Chlorotoluene				ND	ug/L	.50
Dibromochloromethane				ND	ug/L	.50
1,2-Dichlorobenzene				ND	ug/L	.50
1,3-Dichlorobenzene				ND	ug/L	.50
1,4-Dichlorobenzene				ND	ug/L	.50
Dichlorodifluoromethane				ND	ug/L	.50
1,1-Dichloroethane				ND	ug/L	.50
1,2-Dichloroethane				ND	ug/L	.50
1,1-Dichloroethene				ND	ug/L	.30
cis-1,2-Dichloroethene				ND	ug/L	.50
trans-1,2-Dichloroethene				ND	ug/L	.50
1,2-Dichloropropane				ND	ug/L	.50
cis-1,3-Dichloropropene				ND	ug/L	.50
trans-1,3-dichloropropene				ND	ug/L	.50
Methylene Chloride				ND	ug/L	.50
1,1,2,2-Tetrachloroethane				ND	ug/L	.50
Tetrachloroethene				ND	ug/L	.50

PQL - Practical Quantitation Limit ND - None Detected

Bruce L. Gove
Laboratory Director

Date Printed: 01/19/01

5

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CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482
Attn: D. Centoni

Date Printed
01/19/01
Project No:
Project Id: Laytonville Landfill

Order Number	Receipt Date/Time	Client	Client P.O.	Send Via
A01011120	01/11/01 03:03PM	MCDPW		MAIL

Order A01011120 consisted of 3 Samples and 3 Tests.

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL
1,1,1-Trichloroethane				ND	ug/L	.50
1,1,2-Trichloroethane				ND	ug/L	.50
Trichloroethene				ND	ug/L	.50
Trichlorofluoromethane				ND	ug/L	.50
Vinyl Chloride				6.5	ug/L	.50
Benzene				ND	ug/L	.30
Ethylbenzene				ND	ug/L	.50
Toluene				ND	ug/L	.30
Total Xylenes				ND	ug/L	.60

Sample 2 FD-2
Sample Type: Aqueous Sampled By: D.Centoni Sampled: 01/11/01

EPA 601/602 Analytes	8260B		01/17/01			
Bromodichloromethane				ND	ug/L	.50
Bromoform				ND	ug/L	.50
Bromomethane				ND	ug/L	.50
Carbon Tetrachloride				ND	ug/L	.50
Chlorobenzene				ND	ug/L	.50
Chloroethane				3.4	ug/L	.50
Chloroform				ND	ug/L	.50
Chloromethane				ND	ug/L	.50
Chlorotoluene				ND	ug/L	.50
Dibromochloromethane				ND	ug/L	.50
1,2-Dichlorobenzene				ND	ug/L	.50
1,3-Dichlorobenzene				ND	ug/L	.50
1,4-Dichlorobenzene				ND	ug/L	.50
Dichlorodifluoromethane				ND	ug/L	.50
1,1-Dichloroethane				ND	ug/L	.50

PQL = Practical Quantitation Limit ND - None Detected

Bruce L. Gove
Laboratory Director

Date Printed: 01/19/01

[illegible]ation	Chlor[illegible] PQL .50 ug/L	Vinyl [illegible] PQL .5[illegible] ug/L	
[illegible] FD-1 2000	N/D	N/D	3 Tank system
[illegible] FD-2 2000	N/D	N/D	3 tank system
[illegible]/14 FD-1 2000	2.2 ug/L	.77 ug/L	3 Tank system
[illegible]/14 FD-2 2000	N/D	N/D	3 Tank system
[illegible]/11 FD-1 2001	8.0 ug/L	6.5 ug/L	3 Tank system
[illegible]/11 FD-2 2001	3.4 ug/L	1.3 ug/L	3 Tank system
[illegible]/13 FD-1 2001	Not Sampled	Not Sampled	4 Tank system
[illegible]/13 FD-2 2001	1.3 ug/L	.65 ug/L	4 Tank system
[illegible]/15 Leachate Tanks 2001	N/D	N/D	Leachate Tank Farm contains 4 T[illegible]
3/5 FD-1 2001	6.3 ug/L	2.6 ug/L	5 Tank system
3/5 FD-2 2001	N/D	N/D	5 Tank system

REFERENCE
No. 8

INTER-AGENCY SITE RECONNAISSANCE AND OBSERVATIONS REPORT

DATE: December 10 and 11, 2001

SITE NAME: Laytonville Dump

OBSERVATIONS MADE BY: Paula J. Abajian

FACILITY REPRESENTATIVES AND TITLES: Paul Cayler, Director of Solid Waste; Oscar Centoni, Field Operations.

AGENCY REPRESENTATIVES AND TITLES: Gina Morrison, RWQCB, North Coast Region; Brandy Tomhave, TASWER; Rob Rosenheck, TASWER; Sandra Barnett, Cahto Tribe, Laytonville Rancheria; Scott Gable, SECOR; Jeff Inglis, USEPA SAM.

EPA ID: CAD000065532

An inter-agency site reconnaissance was conducted on December 10, 2001. The following information was obtained and photographs were taken during the inter-agency site reconnaissance:

The area surrounding the site is primarily rural. Residences are located to the north, northeast and southwest of the site. The Laytonville Rancheria, owned by the Cahto Tribe, is located directly adjacent to the east and south of the site. An operative recycling center is located directly to the north of the site.

Photos #1and #2

Paul Cayler led a tour of the facility beginning at the eastern entrance to the former disposal area. The first point of observation was the eastern slope of the former disposal area. This is the area where leachate containing VOCs has been identified. The slope was covered with plastic sheeting weighted with tires. It had been determined that the cause of leachate formation was water backing up in the drainage layer of the landfill cover at the bottom of the east slope. As a remedy, a drainage pipe was installed along the base of the east slope at the level of the drainage layer. The pipe drains water from within the drainage to a leachate collection system (described later in this report). The plastic sheeting was installed to prevent superfluous stormwater runoff from entering the drainage layer and overwhelming the leachate collection system.

Photo #3

We continued to the southeastern boundary of the site where groundwater monitoring well 93-2 is located. The southern boundary of the site is described by a 1:1 slope that leads to a natural drainage in which riprap has been placed to prevent erosion from the landfill. A chain link fence along the drainage encloses the site. The Laytonville Dump site shares its southern and eastern boundaries with the Laytonville Rancheria. Paul Cayler noted that vandals have created a hole in the chain link fence along the southern boundary of the site which they use to enter the site and drive all-terrain vehicles over the former disposal area. When this happens, the county repairs the fence as soon as possible.

Photo #4

During closure of the landfill, half-round drainages were installed over the former disposal area to collect and direct stormwater runoff from the former disposal area to sedimentation ponds. The half-round drainages have not functioned adequately and the County is in the process of replacing them. The replacement drainages consist of three layers. The base layer is a drainage net which is topped by filter fabric which is then topped by rocks that are generally less than six inches in size. The replacement drainages continue to collect and direct stormwater runoff to four sedimentation ponds.

Photos #5

The next stop was the western sedimentation pond which is located downslope from the former disposal area and at southwest corner of the site. This pond supports the growth of cattails. The Laytonville Dump site shares its western border with the Silva property. Drainage from the western sedimentation pond sheetflows across the Silva's open pasture to an intermittent stream that drains to Cahto Creek.

Photo #6

We continued north along a dirt maintenance road located between the former disposal area and the western boundary of the site. Monitoring well 93-1 is located in the middle of this road and monitoring well 94-1 is located directly downslope and the west. A stormwater drainage ditch runs along the road to the western sedimentation pond.

Photos #7 and #8

The largest sedimentation pond associated with the site is located to the northwest of the former disposal area. This pond supports wetland growth along its perimeter and water foul were observed on the pond. Drainage from the former disposal area drains to this sedimentation pond via underground drainage pipes.

Photos #9 and #10

After viewing the large sedimentation pond, we walked along the top of the former disposal area. This is the highest area of the site and is referred to by the County as the "top deck". Although rains had fallen in the area two days prior, no standing water was observed on the very gently sloping top deck. However, there was a sheen observed in the small amount of water collected in the stormwater drainage ditches that ran along the base of the top deck. Monitoring well 90-1 is located considerably downslope in an open pasture to the north of the former disposal area (Photo #9).

Photos #11 and #12

From the top deck, we continued past the previously mentioned east slope of the former disposal area to view the "upper sedimentation pond" which is located below and to the east of the east slope. Stormwater runoff from the east slope drains to this sedimentation pond. The leachate collection system runs alongside this pond. The leachate collection system consists of six cascading volatilization tanks which lead to approximately six clustered containment tanks where volatilized leachate water awaits transport off site by truck to the Willits Wastewater Treatment Plant.

Photo #13

Our last stop was the sedimentation pond located to the northwest of the former disposal area. This pond is referred to by the County as the "frog pond". Runoff from the largest sedimentation pond associated with the site drains to this pond before leaving the property. Runoff from the frog pond commingles just below the leachate containment area with runoff from the "upper sedimentation pond". From this point, runoff from both sedimentation ponds drains through the Laytonville Rancheria until it reaches Cahto Creek.

On December 11, 2001, WESTON met with EPA (Jeff Inglis), SECOR (Scott Gable), the Cahto Tribe (Sandra Barnett), and TASWER (Brandy Tomhave and Rob Rosenheck) met at the Laytonville Rancheria to discuss inter-agency coordination for sampling events related to the Laytonville Dump. Next, we met with Regina Dickson of the Silva property. Ms. Dickson lives with her husband and two children on approximately 80 acres adjacent to the west side of the Laytonville Dump. Ms. Dickson's family operates a well on their property; however, they do not drink from the well for fear of contamination from the Laytonville Dump. Ms. Dickson offered WESTON access to her property for sampling of their well and sampling of a pond on their property for use as background in comparison with the site-related sedimentation ponds.

Mr. Inglis collected, reviewed and copied files offered by Ms. Barnett.

REFERENCE
No. 9

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

OCTOBER THRU DECEMBER
1992

PREPARED BY:
RANDALL S. FORBES
OPERATIONS MANAGER

MENDOCINO COUNTY
SOLID WASTE DIVISION

RECEIVED
JAN 14 1993
MEND. CO. HEALTH DEPT.

GENERAL

This report covers the water monitoring performed at the Laytonville Landfill during the period from October thru December 1992. This report is required by the Revised Monitoring and Reporting Program, No. 75-50, dated December 7, 1988. It is intended to provide the North Coast Regional Water Quality Control Board (NCRWQCB) with information on the water monitoring data acquired on the site.

All groundwater samples were collected by a County Technician using the "GROUNDWATER SAMPLING PROCEDURES MANUAL" and the "SAMPLING SCHEDULE FOR FY 92/93" dated February 1992 as prepared by the Mendocino County Solid Waste Division. Both documents have been reviewed by the NCRWQCB.

All laboratory testing was performed by Alpha Analytical Laboratories of Ukiah. All test results are sent to the NCRWQCB through the Quarterly Reports.

The following information will briefly describe the results of the on-site water tests.

GROUNDWATER

Water Samples were collected on two on-site monitoring wells; Well 90-1 and 91-1.

All samples were taken in conformance with the "SAMPLING SCHEDULE FOR FY 92/93" dated February 1992 and the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL".

Sampling was performed on October 20, 1992 and the results are attached.

Due to the possibility of cross contamination the NCRWQCB has recommended discontinuing the sampling of the 87 Series Wells; Wells 87-1, 87-2, and 87-3. Therefore, these wells were not sampled this quarter.

WELL 90-1

No constituent was detected at a level exceeding the Action Level or MCL.

WELL 91-1

No constituent was detected at a level exceeding an Action Level or MCL.

SURFACE WATER

Surface water was sampled on December 11, 1992 at both the up stream and down stream sample points, with the test results attached.

LEACHATE

No measurable quantities of leachate were observed during this quarter.

GRADIENT

Water table elevations were measured in each existing well on each month of this reporting period. Gradients have been plotted on the attached Gradient Map using elevations of each well and straight line interpolation.

ATTACHMENTS

1. Monitoring Well Test Reports
2. Field Logs
3. Water Table Elevation Table
4. Gradient Map
5. Site Map

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

JANUARY THRU MARCH
1993

Babe Check to see what is in 90-1 & 91-1 NOT IN Dale

PREPARED BY:
RANDALL S. FORBES
OPERATIONS MANAGER

MENDOCINO COUNTY
SOLID WASTE DIVISION

RECEIVED
APR 21 1993
MEND. CO. HEALTH DEPT.

GENERAL

This report covers the water monitoring performed at the Laytonville Landfill during the period from January thru March 1993. This report is required by the Revised Monitoring and Reporting Program, No. 75-50, dated December 7, 1988. It is intended to provide the North Coast Regional Water Quality Control Board (NCRWQCB) with information on the water monitoring data acquired on the site.

All groundwater samples were collected by a County Technician using the "GROUNDWATER SAMPLING PROCEDURES MANUAL" and the "SAMPLING SCHEDULE FOR FY 92/93" dated February 1992 as prepared by the Mendocino County Solid Waste Division. Both documents have been reviewed by the NCRWQCB.

All laboratory testing was performed by Alpha Analytical Laboratories of Ukiah. All test results are sent to the NCRWQCB through the Quarterly Reports.

The following information will briefly describe the results of the on-site water tests.

GROUNDWATER

Water Samples were collected on two on-site monitoring wells; Well 90-1 and 91-1.

All samples were taken in conformance with the "SAMPLING SCHEDULE FOR FY 92/93" dated February 1992 and the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL".

Sampling was performed on January 14, 1993 and the results are attached.

Due to the possibility of cross contamination the NCRWQCB has recommended discontinuing the sampling of the 87 Series Wells; Wells 87-1, 87-2, and 87-3. Therefore, these wells were not sampled this quarter.

WELL 90-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 91-1

No constituent was detected at a level exceeding an Action Level or MCL.

ED_013162_00000569-00148

OFFSITE WELLS

Attached are test results, performed by others, for the following owners of the offsite wells:

French
Dodd
Schliep
Bowler
Smith
Bennett
Brock

SURFACE WATER

Surface water was sampled on January 14, 1993 at SW-2 (east side of landfill), with the test results attached.

One constituent was detected at a level exceeding an Action Level or MCL.

Iron was detected at 0.46 mg/L (Secondary Action Level = 0.3 mg/L)

Other detected constituents:

Aluminum at 0.25 mg/L
Manganese at 0.022 mg/L

LEACHATE

Leachate seeps were observed this quarter as shown on the attached field log map. The seeps were collected in catch basins and plumbed with plastic pipe to either 55 gallon drums or a leachate storage tank. A sample of this stored leachate was taken on January 14, 1993 with the results attached.

GRADIENT

Water table elevations were measured in each existing well on each month of this reporting period. Gradients have been plotted on the attached Gradient Map using elevations of each well and straight line interpolation.

ATTACHMENTS

1. Monitoring Well Test Reports
2. Field Logs
3. Water Table Elevation Table
4. Gradient Map
5. Site Map

ED_013162_00000569-00149

COUNTY OF MENDOCINO
Solid Waste Division

Laytonville Landfill
Monthly Well Log for Calendar Year 1993

		Jan	Feb	Mar	Min Lvls	Max Lvls
87-1	Day=	14	10	19		
EL= 1727.56	WL=	3.9	10.8	2.9	2.90	10.80
H= 1.25	GW=	1723.7	1716.8	1724.7	1716.76	1724.66
D= 100.75	C=	96.8	89.9	97.8	89.95	97.85
87-2	Day=	14	5	19		
EL= 1708.00	WL=	5.8	4.9	4.1	4.10	5.80
H= 0.65	GW=	1702.2	1703.1	1703.9	1702.20	1703.90
D= 101.50	C=	95.7	96.6	97.4	95.70	97.40
87-3	Day=	14	5	19		
EL= 1745.73	WL=	33.4	32.4	31.7	31.70	33.40
H= 0.60	GW=	1712.3	1713.3	1714.0	1712.33	1714.03
D= 90.50	C=	57.1	58.1	58.8	57.10	58.80
90-1	Day=	14	5	19		
EL= 1779.03	WL=	48.7	46.7	43.1	43.10	48.70
H= 1.20	GW=	1730.3	1732.3	1735.9	1730.33	1735.93
D= 86.18	C=	37.5	39.5	43.1	37.48	43.08
91-1	Day=	14	5	19		
EL= 1709.16	WL=	9.4	7.8	6.2	6.20	9.40
H= 2.24	GW=	1699.8	1701.4	1703.0	1699.76	1702.96
D= 43.00	C=	33.6	35.2	36.8	33.60	36.80

Ledgend:

EL = Top of well case elevation
H = Top of well case above ground
D = Well depth from top of case
WL = Water level from top of well case
GW = Ground water elevation
C = Water level from bottom of well

4-6/1993 1
QUARTERLY MONITORING REPORT

GENERAL

This report covers the water monitoring performed at the Laytonville Landfill during the period from April thru June 1993. This report is required by the Revised Monitoring and Reporting Program, No. 75-50, dated December 7, 1988. It is intended to provide the North Coast Regional Water Quality Control Board (NCRWQCB) with information on the water monitoring data acquired on the site.

All groundwater samples were collected by a County Technician using the "GROUNDWATER SAMPLING PROCEDURES MANUAL" and the "SAMPLING SCHEDULE FOR FY 92/93" dated February 1992 as prepared by the Mendocino County Solid Waste Division. Both documents have been reviewed by the NCRWQCB.

All laboratory testing was performed by Alpha Analytical Laboratories of Ukiah. All test results are sent to the NCRWQCB through the Quarterly Reports.

The following information will briefly describe the results of the on-site water tests.

GROUNDWATER

Water Samples were collected on two on-site monitoring wells; Well 90-1 and 91-1.

All samples were taken in conformance with the "SAMPLING SCHEDULE FOR FY 92/93" dated February 1992 and the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL".

Sampling was performed on April 15, 1993 and the results are attached.

Due to the possibility of cross contamination the NCRWQCB has recommended discontinuing the sampling of the 87 Series Wells; Wells 87-1, 87-2, and 87-3. Therefore, these wells were not sampled this quarter but were abandoned during June 1993.

In addition, two groundwater monitoring wells, 93-1 and 93-2, were installed and initial testing will be performed during the third quarter of 1993.

WELL 90-1

Manganese was the only constituent at a level exceeding an Action Level or MCL.

ED_013162_00000569-00151

Managenese was detected at 1.82 mg/L (Secondary Action Level = 0.05 mg/L)

WELL 91-1

Manganese was the only constituent at a level exceeding an Action Level or MCL.

Manganese was detected at 2.92 mg/L (Secondary Action Level = 0.05 mg/L)

OFFSITE WELLS

Attached are test results, performed by others, for the following owners of the offsite wells:

Barefield
Haskell
Bowler
French

SURFACE WATER

Surface water was sampled on March 23, and again on April 22, 1993 at both SW-1 and SW-2. All samples detected Aluminum, Iron and Manganese at levels exceeding their MCL's

In addition, the samples taken on March 23, 1993 both detected exceeds in Chromium and Lead as follows:

SW-1	Chromium was detected at 0.085 mg/L (Action Level = 0.05 mg/L)
	Lead was detected at 0.017 mg/L (Action Level = 0.015 mg/L)
SW-2	Chromium was detected at 0.087 mg/L (Action Level = 0.05 mg/L)
	Lead was detected at 0.011 mg/L (Action Level = 0.015 mg/L)

ED_013162_00000569-00152

LEACHATE

Leachate seeps were observed this quarter as shown on the attached field log map. The seeps were collected in catch basins and plumbed with plastic pipe to a leachate storage tank. A sample of this stored leachate was taken on March 23 and April 15, 1993 with the results attached.

In addition, one leachate well was installed during this quarter with initial testing scheduled for the third quarter of 1993.

SPECIAL TESTING

On April 15, 1993 a sample was taken from the North Pond.

Two constituents were detected at a level exceeding an Action Level or MCL.

Aluminum at 3.1 mg/L. (MCL = 1.0 mg/L)
Iron at 1.93 mg/L (Secondary Action Level = 0.3 mg/L)

In addition, on April 29, 1993 a soil sample was taken from the cover material borrow area to determine background mineral/metal content. The results are attached. These results indicated the presence of Arsenic, Chromiums, Copper, Lead, Titanium and Aluminum as naturally occurring in the native soils.

GAS MONITORING PROBES

During this quarter, twelve gas monitoring probes were installed, seven probes near the landfill perimeter and five within the waste unit. The probes have been sampled by the California Air Quality Control Board, with the results forthcoming.

Attached is a report from SHN Consulting Engineers detailing the installation of the gas probes.

GRADIENT

Water table elevations were measured in each existing well on each month of this reporting period. Gradients have been plotted on the attached Gradient Map using elevations of each well and straight line interpolation.

ED_013162_00000569-00153

ATTACHMENTS

1. Monitoring Well Test Reports
2. Field Logs
3. Water Table Elevation Table
4. Gradient Map
5. Site Map
6. Gas Probe Installation Report

ED_013162_00000569-00154

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

JULY THROUGH SEPTEMBER
1994

PREPARED BY:
RANDALL S. FORBES
OPERATIONS MANAGER

MENDOCINO COUNTY
SOLID WASTE DIVISION

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Senior Technician and tested by Alpha Analytical Laboratory of Ukiah.

GROUNDWATER

Groundwater sampling was performed on August 1, 1994. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

During this quarter, an additional well was added, 94-1. Initial testing was performed on August 1, 1994 with confirmation testing on August 31, 1994, the test results are attached.

During this quarter, five gas monitoring wells were installed around the perimeter of the landfill. These wells will be tested each quarter using a Gastech gas monitor testing for LEL methane. The test results are attached.

WELL 90-1

Two constituent was detected at a level exceeding an Action Level or MCL.

Iron was detected at 14.0 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at 1.0 mg/L. (Secondary Action Level = 0.05 mg/L).

WELL 91-1

One constituent was detected at a level exceeding an Action Level or MCL.

Manganese was detected at 1.18 mg/L. (Secondary Action Level = 0.05 mg/L)

Other detected constituents:
Arsenic was detected at 0.0081 mg/L.

ED_013162_00000569-00156

nville Landfill
toring Report

(West Side)

tuents were detected at a level exceeding an Action Level or MCL.

or MCL.

Conductance was detected at 4150 umhos. (Secondary Action Level
umhos).

ction Level

ssolved Solids were detected at 2655 mg/L (Secondary Action
1000 mg/L).

tion

was detected at 1500 mg/L. (MCL = 500 mg/L).

ese was detected at 0.096 mg/L. (Secondary Action Level = 0.05

0.05 mg/L)

tuents were detected at a level exceeding an Action Level or MCL.

s detected at 1.9 mg/L. (Secondary Action Level = 0.3 mg/L).

ese was detected at 2.27 mg/L. (Secondary Action Level = 0.05 mg/L)

tuents were detected at a level exceeding an Action Level or MCL.

g under
ed.

Conductance was detected at 2600 umhos. (Secondary Action Level
) umhos).

ssolved Solids were detected at 1665 mg/L (Secondary Action
1000 mg/L).

was detected at 650 mg/L (MCL = 500 mg/L)

iese was detected at 0.79 mg/L. (Secondary Action Level = 0.05 mg/L)

etected constituents:
was detected at 1.46 mg/L.
tylbenzene was detected at 1.6 ug/L.
5-Trimethylbenzene was detected at 0.77 ug/L.

Solvent [illegible]
[illegible]
[illegible]
contamination
[illegible]
flushed [illegible]

Well 94-1 cont.

Three constituents were detected at a level exceeding an Action Level or MCL.

Second Test:

Specific Conductance was detected at 2910 umhos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 1862 mg/L (Secondary Action Level = 1000 mg/L).

Manganese was detected at 0.65 mg/L. (Secondary Action Level = 0.05 mg/L)

Other detected constituents;

Aluminum was detected at 0.11 mg/L.

SURFACE WATER

No surface water samples are required to be taken this quarter.

LEACHATE

No leachate seeps were observed this quarter.

GRADIENT

Due to the abandonment of the 87 Series Wells and the new wells being under hydrostatic pressure, gradient maps can no longer be accurately produced.

ATTACHMENTS

1. Monitoring Well Test Reports
2. Field Logs
3. Site map
4. Sampling Schedule

ED_013162_00000569-00158

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

OCTOBER THROUGH DECEMBER
1994

PREPARED BY:
RANDALL S. FORBES
OPERATIONS MANAGER

MENDOCINO COUNTY
SOLID WASTE DIVISION

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Senior Technician and tested by Alpha Analytical Laboratory of Ukiah.

GROUNDWATER

Groundwater sampling was performed on October 12, 1994 and October 19, 1994. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

During this quarter, five gas monitoring wells were tested around the perimeter of the landfill. These wells will be tested each quarter using a Gastech gas monitor testing for LEL methane. The test results are attached.

WELL 90-1

Two constituents were detected at a level exceeding an Action Level or MCL.

Iron was detected at 21.2 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at 1.14 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituents:
Barium at 0.54 mg/L.

WELL 91-1

One constituent was detected at a level exceeding an Action Level or MCL.

Manganese was detected at 2.71 mg/L. (Secondary Action Level = 0.05 mg/L)

Other detected constituents:
Arsenic at 0.014 mg/L.
Barium at 0.11 mg/L.

ED_013162_00000569-00160

WELL 93-1 (West Side)

Four constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 5260 umhos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 3365 mg/L (Secondary Action Level = 1000 mg/L).

Sulfate was detected at 1520 mg/L. (MCL = 500 mg/L).

Manganese was detected at 0.1 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituents:
Aluminum at 0.17 mg/L.
Iron at 0.19 mg/L.

WELL 93-2

Two constituents were detected at a level exceeding an Action Level or MCL.

Iron was detected at 0.51 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at 3.02 mg/L. (Secondary Action Level = 0.05 mg/L)

WELL 94-1

Five constituents were detected at a level exceeding an Action Level or MCL.

Sulfate was detected at 695 mg/L. (MCL = 500 mg/L.).

Specific Conductance was detected at 3320 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 2125 mg/L. (Secondary Action Level = 1000 mg/L.).

Iron was detected at 4.52 mg/L. (Secondary Action Level = 0.3 mg/L.).

Manganese was detected at 1.82 mg/L. (Secondary Action Level = 0.05 mg/L.)

ED_013162_00000569-00161

Well 94-1 cont.

Other detected constituents:
Aluminum at 0.18 mg/L.
Zinc at 0.079 mg/L.

SURFACE WATER

Surface water samples were taken at both sample points, SW-A (SW-1) and SW-B (SW-2) on December 12, 1994 with the test results attached. Unusual high levels of metals has caused us to implement a verification test of SW-A in January 1995.

Test results will be submitted in our 1995 first quarter test report.

LEACHATE

No leachate seeps were observed this quarter.

GRADIENT

Due to the abandonment of the 87 Series Wells and the new wells being under hydrostatic pressure, gradient maps can no longer be accurately produced.

ATTACHMENTS

1. Monitoring Well Test Reports
2. Field Logs
3. Site map
4. Sampling Schedule
5. Gas Well Field Log
6. Surface Water

ED_013162_00000569-00162

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

JANUARY THROUGH MARCH
1995

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill. These wells will be tested each quarter using a Gastech gas monitor testing for LEL methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on January 30, 1995. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

WELL 90-1

Three constituents were detected at a level exceeding an Action Level or MCL.

Iron was detected at 16.4 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at 0.98 mg/L. (Secondary Action Level = 0.05 mg/L).

Silver was detected at 0.63 mg/L. (MCL = 0.05 mg/L).

Other detected constituents:
Barium at 0.54 mg/L.

WELL 91-1

One constituent was detected at a level exceeding an Action Level or MCL.

Manganese was detected at 2.0 mg/L. (Secondary Action Level = 0.05 mg/L)

ED_013162_00000569-00164

Other detected constituents:
Aluminum at 0.07 mg/L.
Barium at 0.15 mg/L.

WELL 93-1 (West Side)

Four constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 5020 umhos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 3210 mg/L (Secondary Action Level = 1000 mg/L).

Sulfate was detected at 1700 mg/L. (MCL = 500 mg/L).

Manganese was detected at 0.091 mg/L. (Secondary Action Level = 0.05 mg/L).

WELL 93-2

Two constituents were detected at a level exceeding an Action Level or MCL.

Iron was detected at 1.87 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at 4.13 mg/L. (Secondary Action Level = 0.05 mg/L)

Other detected constituent:
Silver at 0.028 mg/L.

WELL 94-1

Five constituents were detected at a level exceeding an Action Level or MCL.

Sulfate was detected at 730 mg/L. (MCL = 500 mg/L.).

Specific Conductance was detected at 2940 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 1880 mg/L. (Secondary Action Level = 1000 mg/L.).

ED_013162_00000569-00165

Iron was detected at 1.16 mg/L. (Secondary Action Level = 0.3 mg/L.).

Manganese was detected at 1.35 mg/L. (Secondary Action Level = 0.05 mg/L.).

Other detected constituents:
Silver at 0.021 mg/L.

SURFACE WATER

No Surface water samples were taken this quarter.

LEACHATE

Six leachate seeps were observed on the landfill this quarter. These seeps were developed and plumbed into the two leachate containment facilities. Samples were taken and the stored leachate will be taken to Willits Sewer Treatment Plant for disposal.

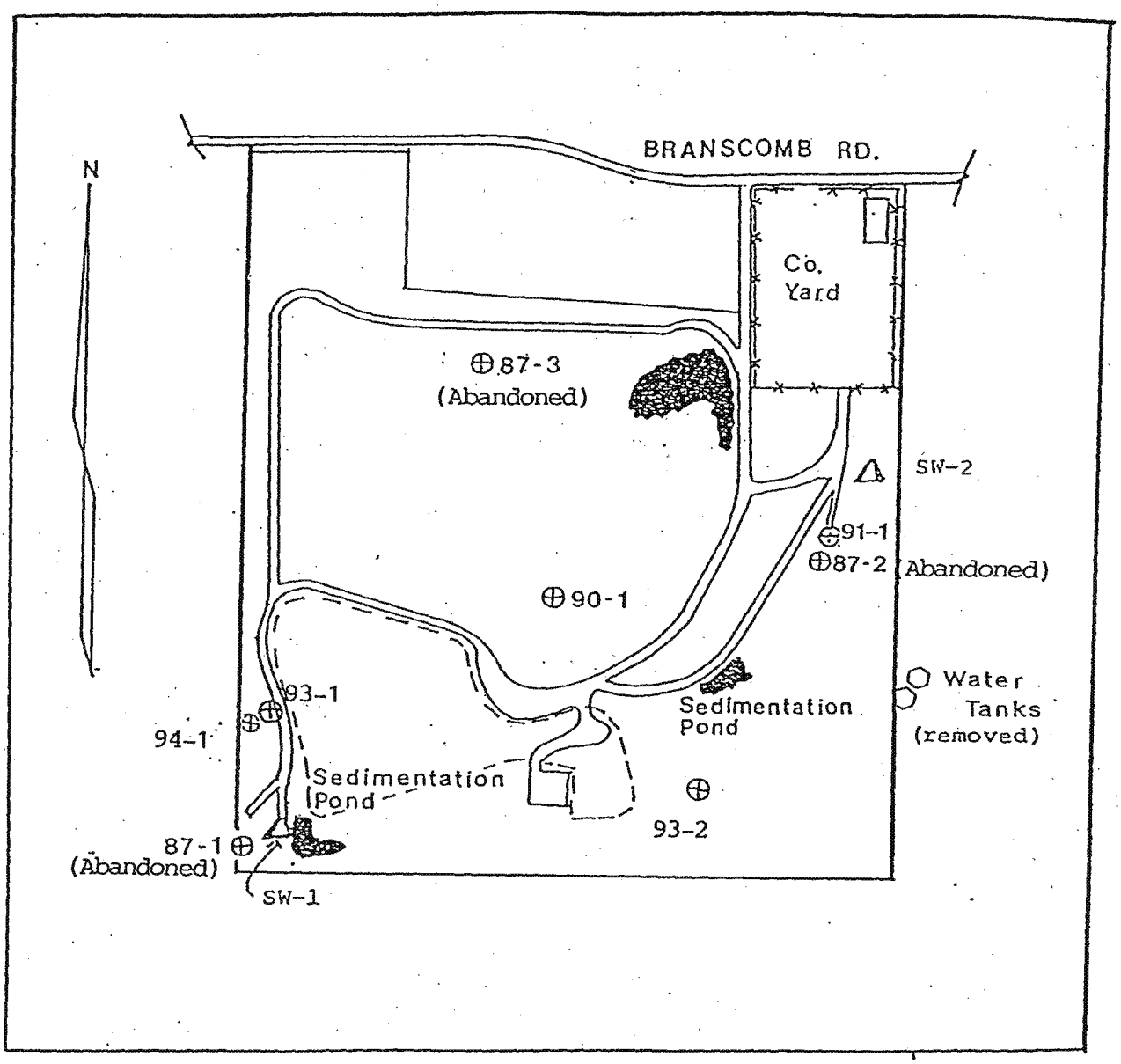
GRADIENT

Due to the abandonment of the 87 Series Wells and the new wells being under hydrostatic pressure, gradient maps can no longer be accurately produced.

ATTACHMENTS

Site map
Sampling Schedule
Gas Well Field Log

ED_013162_00000569-00166



LAYTONVILLE LANDFILL

SITE PLAN

⊕ WELLS
△ SURFACE WATER SAMPLE POINT

Mendocino County
Solid Waste Division

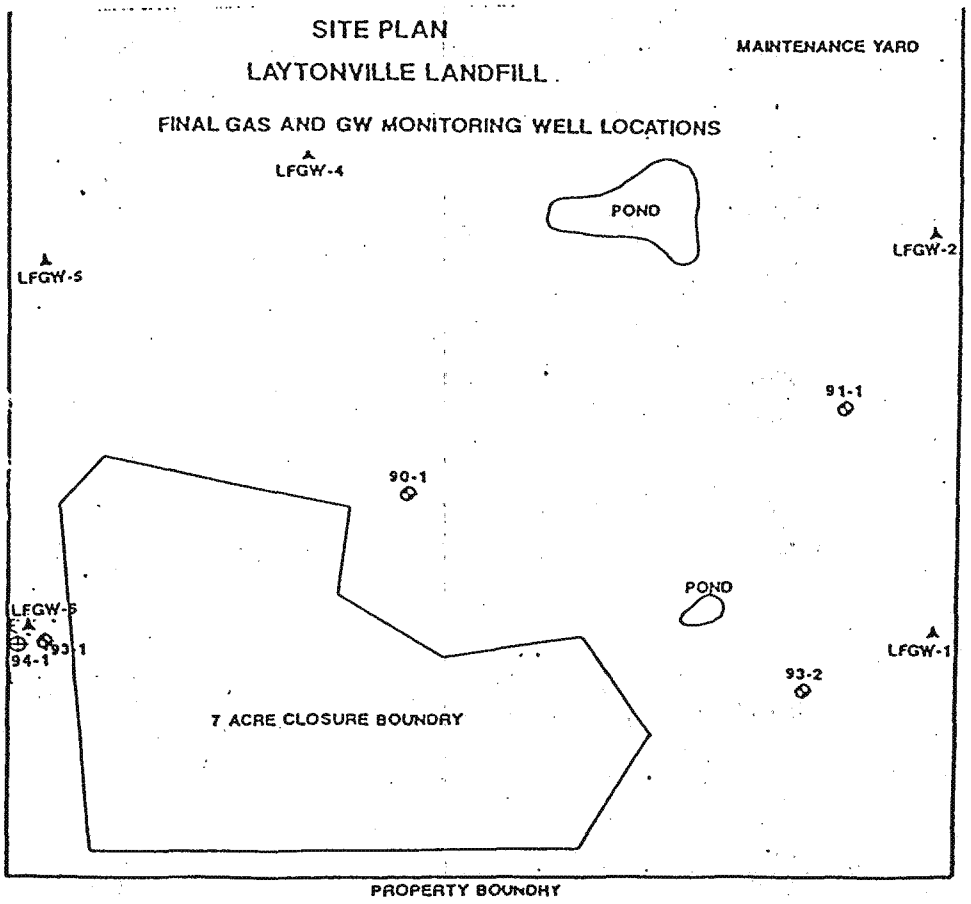
Laytonville Landfill

GAS WELLS FIELD LOG

Gas Testing Instrument Gas Tech
Calibration Date Jan. 1995
Technician Tim Garrison

Tests Well Test Data
--% Methane

Month	Well G1	Well G2	Well G3	Well G4	Well G5	Other 12
1-30-95	N.D.	N.D.	N.D.	N.D.	N.D	N.D.



LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

APRIL THROUGH JUNE
1995

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill. These wells will be tested each quarter using a Gastech gas monitor testing for LEL methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on April 10, 1995. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

WELL 90-1

Two constituents were detected at a level exceeding an Action Level or MCL.

Iron was detected at 2.6 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at 1.1 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituent:
Barium at 0.49 mg/L.

WELL 91-1

One constituent was detected at a level exceeding an Action Level or MCL.

Manganese was detected at 2.9 mg/L. (Secondary Action Level = 0.05 mg/L)

Other detected constituents:
Arsenic at 0.0088 mg/L.
Barium at 0.16 mg/L.

ED_013162_00000569-00170

WELL 93-1 (West Side)

Four constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 5960 umhos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 3810 mg/L (Secondary Action Level = 1000 mg/L).

Sulfate was detected at 1750 mg/L. (MCL = 500 mg/L).

Manganese was detected at 0.079 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituent:
Aluminun at 0.088 mg/L.

WELL 93-2

One constituent was detected at a level exceeding an Action Level or MCL.

Manganese was detected at 5.3 mg/L. (Secondary Action Level = 0.05 mg/L)

WELL 94-1

Two constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 1780 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 1140 mg/L. (Secondary Action Level = 1000 mg/L.).

SURFACE WATER

The surface water sample from the fourth quartrer of 1994 taken from the west outlet (SW-A) showed unusually high metal results. Therefore, a second verification test was taken on May 9, 1995 with the test results attached.

The following table compares metals results from the two surface water samples:

ED_013162_00000569-00171

METALS	DECEMBER 12, 1994	MAY 9, 1995
Aluminum	28 mg/L	18 mg/L
Calcium	2.8 mg/L	5.8 mg/L
Barium	.19 mg/L	.12 mg/L
Chromium	.037 mg/L	.031 mg/L
Magnesium	7.2 mg/L	5.8 mg/L
Iron	29.2 mg/L	13 mg/L
Potassium	4.8 mg/L	2.6 mg/L
Lead	.0052 mg/L	None Detected
Maganese	.2 mg/L	.067 mg/L
Sodium	5.5 mg/L	5.3 mg/L
Titanium	.74 mg/L	.56 mg/L
Boron	.6 mg/L	None Detected
Silver	.031 mg/L	None Detected
Zinc	.14 mg/L	.59 mg/L

LEACHATE

No additional leachate seeps were observed on the landfill this quarter. A sample of the stored leachate was taken prior to it being transported to the Willits Sewer Treatment Plant for disposal. Test results are attached.

GRADIENT

Due to the abandonment of the 87 Series Wells and the new wells being under hydrostatic pressure, gradient maps can no longer be accurately produced.

ATTACHMENTS
Site map
Sampling Schedule
Gas Well Field Log

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

JULY THROUGH SEPTEMBER
1995

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill. These wells will be tested each quarter using a Gastech gas monitor testing for LEL methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on July 12, 1995. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

WELL 90-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 91-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 93-1 (West Side)

Two constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 5450 umhos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 3490 mg/L (Secondary Action Level = 1000 mg/L).

WELL 93-2

No constituent was detected at a level exceeding an Action Level or MCL.

ED_013162_00000569-00174

WELL 94-1

Two constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 2870 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 1837 mg/L. (Secondary Action Level = 1000 mg/L.).

SURFACE WATER

No surface water samples were required to be taken this quarter.

LEACHATE

No leachate seeps were observed on the landfill this quarter.

GRADIENT

Due to the abandonment of the 87 Series Wells and the new wells being under hydrostatic pressure, gradient maps can no longer be accurately produced.

ATTACHMENTS
Site map
Sampling Schedule
Gas Well Field Log

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

OCTOBER THROUGH DECEMBER
1995

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill. These wells will be tested each quarter using a Gastech gas monitor testing for LEL methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on October 11, 1995. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

WELL 90-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 91-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 93-1 (West Side)

Three constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 6080 umhos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 3890 mg/L. (Secondary Action Level = 1000 mg/L).

Sulfate was detected at 1420 mg/L. (MCL = 500 mg/L).

WELL 93-2

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 94-1

Two constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 3130 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 2000 mg/L. (Secondary Action Level = 1000 mg/L).

SURFACE WATER

Surface water samples were taken on December 4 and 5, 1995, with the results attached. In addition, storm water samples were taken at the same time in accordance with the Storm Water Monitoring and Report Plan with the results attached. Samples were taken from both SW-1 (Southwest Outflow) and SW-2 (Northwest Outflow) sample points.

SW-1

Acetone was detected at 7.9 ug/L. A confirmation sample was taken with results reported next quarter.

LEACHATE

No leachate seeps were observed on the landfill this quarter.

GRADIENT

Due to the abandonment of the 87 Series Wells and the new wells being under hydrostatic pressure, gradient maps can no longer be accurately produced.

ATTACHMENTS
Test Results
Site Map
Sampling Schedule
Gas Well Field Log

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

JANUARY THROUGH MARCH
1996

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill. These wells will be tested each quarter using a Gastech gas monitor testing for LEL methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on January 9, 1996. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

WELL 90-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 91-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 93-1 (West Side)

Three constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 5790 umhos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 3700 mg/L. (Secondary Action Level = 1000 mg/L).

Sulfate was detected at 1830 mg/L. (MCL = 500 mg/L).

WELL 93-2

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 94-1

Three constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 3060 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 1960 mg/L. (Secondary Action Level = 1000 mg/L.).

Sulfate was detected at 629 mg/L (MCL = 500 mg/L).

SURFACE WATER

Surface water samples were taken on February 20, 1996, with the results attached. In addition, storm water samples were taken at the same time in accordance with the Storm Water Monitoring and Report Plan with the results attached. Samples were taken from both SW-1 (Southwest Outflow) and SW-2 (Northwest Outflow) sample points.

SW-1

Last quarter's SW-1 Surface Water samples detected Acetone at 7.9 ug/L, as reported a confirmation sample would be taken. That sample was taken on December 29, 1995. As shown, the attached results indicate non-detect for Acetone.

LEACHATE

No leachate seeps were observed on the landfill this quarter.

GRADIENT

Due to the abandonment of the 87 Series Wells and the new wells being under hydrostatic pressure, gradient maps can no longer be accurately produced.

ATTACHMENTS
Test Results
Site Map
Sampling Schedule
Gas Well Field Log

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

APRIL THROUGH JUNE,
1997

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill. These wells will be tested each quarter using a Gastech gas monitor testing for LEL methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on April 23, 1997. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

In addition, attached are test results from Silva drinking water well adjacent to Laytonville Landfill taken on May 2, 1997.

WELL 90-1

Two constituent were detected at a level exceeding an Action Level or MCL.

Iron was detected at 15.0 mg/L (Secondary Action Level = 0.3 mg/L).

Manganese was detected at 1.3 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituent:
Barium at 0.6 mg/L.

WELL 91-1

One constituent was detected at a level exceeding an Action Level or MCL.

Manganese was detected at 2.8 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituents:
Arsenic at 0.016 mg/L.
Barium at 0.2 mg/L.

WELL 93-1 (West Side)

Four constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 7130 umhos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 4560 mg/L. (Secondary Action Level = 1000 mg/L).

Sulfate was detected at 2310 mg/L. (MCL = 500 mg/L).

Manganese was detected at 0.1 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituent:
Aluminum at 0.062 mg/L.

WELL 93-2

Two constituents were detected at a level exceeding an Action Level or MCL.

Iron was detected at 1.1 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at 4.4 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituents:
Acetone at 8 ug/L.

A retest was taken on July 24, 1997 and as shown on the attached results, no Acetone was detected.

WELL 94-1

Four constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 3640 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 2330 mg/L. (Secondary Action Level = 1000 mg/L.).

Sulfate was detected at 868 mg/L (MCL = 500 mg/L).

Manganese was detected at 0.41 mg/L. (Secondary Action Level = 0.05 mg/L).

SURFACE WATER

No surface water samples were taken this quarter.

LEACHATE

No leachate seeps were observed on the landfill this quarter.

GRADIENT

Due to the abandonment of the 87 Series Wells and the new wells being under hydrostatic pressure, gradient maps can no longer be accurately produced.

ATTACHMENTS
Test Results
Site Map
Sampling Schedule
Gas Well Field Log

Mendocino County
Solid Waste Division

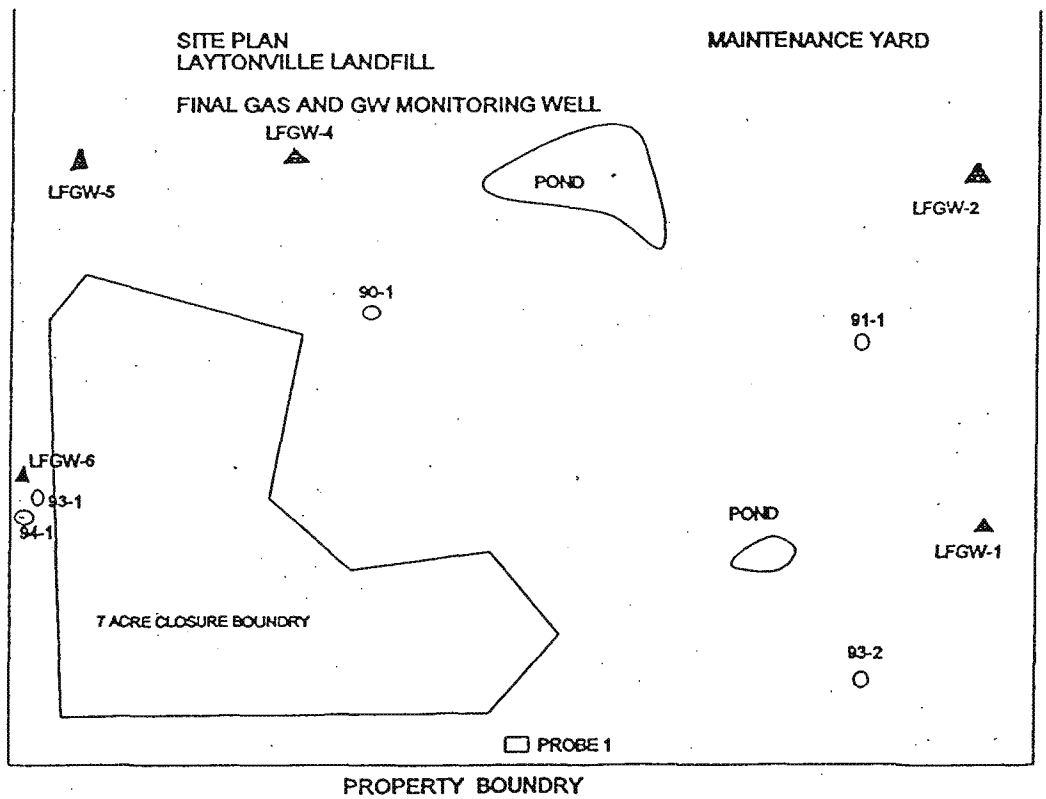
Laytonville Landfill

GAS WELLS FIELD LOG

Gas Testing Instrument Gas tech
Calibration Date 4-10-97
Technician Tim Garrison

Test Well Test Data
--% Methane

Month	Well G1	Well G2	Well G4	Well G5	Well G6	Probe 1
4-23-97	N.D.	N.D.	N.D.	N.D.	N.D	N.D.



LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

JULY THROUGH SEPTEMBER
1997

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill. These wells will be tested each quarter using a Gastech gas monitor testing for LEL methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on July 24, 1997. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

In addition, attached are test results from Shields drinking water well adjacent to Laytonville Landfill taken on August 22, 1997.

WELL 90-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 91-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 93-1 (West Side)

This well was not tested this quarter due to inaccessability during closure construction.

WELL 93-2

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 94-1

Three constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 3420 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 2190 mg/L. (Secondary Action Level = 1000 mg/L.).

Sulfate was detected at 736 mg/L (MCL = 500 mg/L).

SURFACE WATER

No surface water samples were taken this quarter.

LEACHATE

No leachate seeps were observed on the landfill this quarter.

GRADIENT

Due to the abandonment of the 87 Series Wells and the new wells being under hydrostatic pressure, gradient maps can no longer be accurately produced.

ATTACHMENTS
Test Results
Site Map
Sampling Schedule
Gas Well Field Log

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

APRIL THROUGH JUNE
1998

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill. Gastech Model Gt 201 is used each quarter to test these wells for LEL Methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on May 19 and June 12, 1998. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

WELL 90-1

Two constituents were detected at a level exceeding an Action Level or MCL.

Iron was detected at 4.1 mg/L. (Secondary Action Level = .03 mg/L).

Manganese was detected at 1.2 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituent:
Barium at .59 mg/L.

WELL 91-1

One constituent was detected at a level exceeding an Action Level or MCL.

Manganese was detected at 2.6 mg/L. (Secondary Action Level = 0.05 mg/L).

Other detected constituents:
Arsenic GF at .0085 mg/L.
Barium at .21 mg/L.
Iron at .13 mg/L.

WELL 93-1 (West Side)

Five constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 5130 umhos. (Secondary Action Level = 1600 umhos.).

Iron was detected at .73 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at .17 mg/L. (Secondary Action Level = 0.05 mg/L).

Total Dissolved Solids were detected at 3280 mg/L. (Secondary Action Level = 1000 mg/L.).

Sulfate was detected at 1680 mg/L (MCL = 500 mg/L).

Other detected constituents:
- Aluminum at .16 mg/L.
- Zinc at .13 mg/L.
- Dichlorodifluoromethane at .8 ug/L.

WELL 93-2

Two constituents were detected at a level exceeding an Action Level or MCL.

Iron was detected at 5.6 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at 4.7 mg/L. (Secondary Action Level = 0.05 mg/L).

WELL 94-1

Five constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 3070 umhos. (Secondary Action Level = 1600 umhos.).

Iron was detected at .97 mg/L. (Secondary Action Level = 0.3 mg/L).

Manganese was detected at .07 mg/L. (Secondary Action Level = 0.05 mg/L.)

Total Dissolved Solids were detected at 1970 mg/L. (Secondary Action Level = 1000 mg/L.).

Sulfate was detected at 741 mg/L (MCL = 500 mg/L).

Other detected constituent:
Aluminum at .43 mg/L.

SURFACE WATER

No surface water samples were taken.

LEACHATE

No leachate samples were taken.

ATTACHMENTS
Test Results
Gas Well Field Log

Mendocino County
Solid Waste Division

Laytonville Landfill

GAS WELLS FIELD LOG

Gas Testing Instrument _____
Calibration Date _____
Technician _____

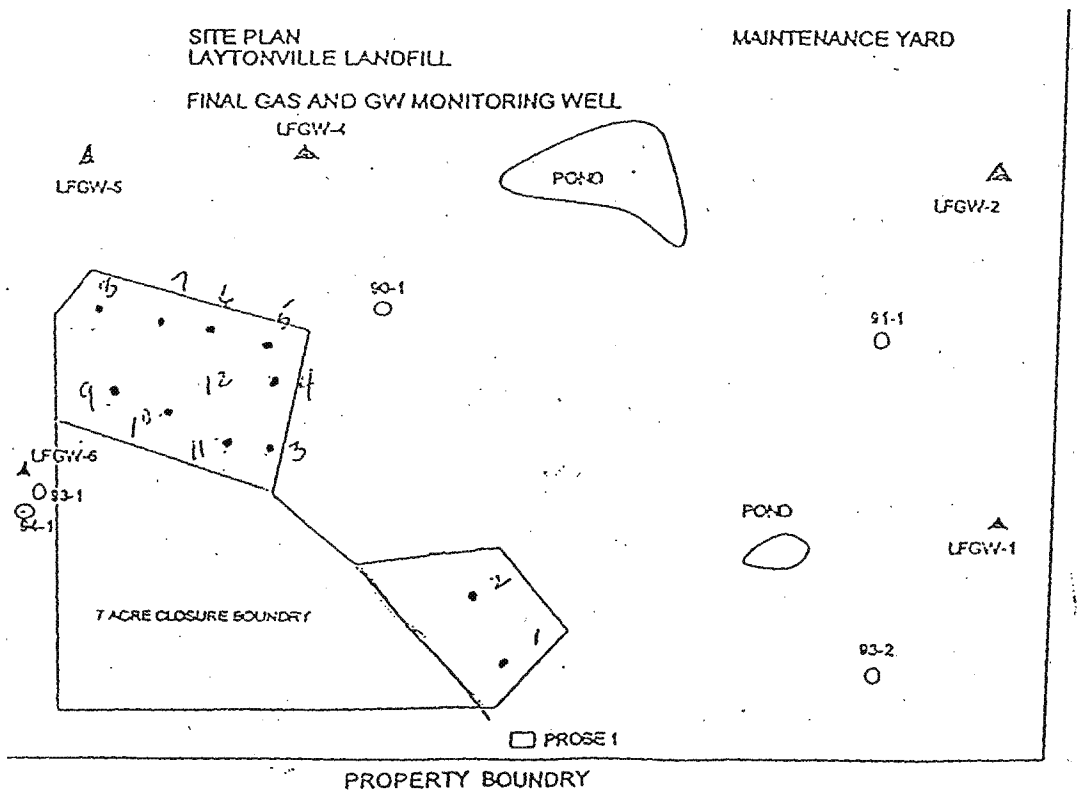
Temp: 80°
Wind: 11 Km/h

Test Well Test Data
--% Methane

Month	Well G1	Well G2	Well G4	Well G5	Well G6	Probe 1
5/10/98	0	0	0	0	0	0

GAS VENTS

Vent 1 0
Vent 2 0
Vent 3 0
Vent 4 0
Vent 5 0
Vent 6 0
Vent 7 0
Vent 8 0
Vent 9 0
Vent 10 0
Vent 11 0
Vent 12 0



LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

JULY THROUGH SEPTEMBER
1998

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

GENERAL

All sampling and testing was performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill, and 12 landfill gas vents. Gastech Model Gt 201 is used each quarter to test these wells for LEL Methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on August 17, 1998. Samples were collected from five of the site monitoring wells. The five well samples collected were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

WELL 90-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 91-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 93-1 (West Side)

Three constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 7280 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 4660 mg/L. (Secondary Action Level = 1000 mg/L.).

Sulfate was detected at 1980 mg/L (MCL = 500 mg/L).

WELL 93-2

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 94-1

Three constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 3660 umhos. (Secondary Action Level = 1600 umhos.).

Total Dissolved Solids were detected at 2340 mg/L. (Secondary Action Level = 1000 mg/L.).

Sulfate was detected at 733 mg/L (MCL = 500 mg/L).

SURFACE WATER

No surface water samples were taken.

LEACHATE

No leachate samples were taken.

ATTACHMENTS
Test Results
Gas Well Field Log
Site Map

LAYTONVILLE
SOLID WASTE DISPOSAL FACILITY

QUARTERLY MONITORING REPORT

OCTOBER THROUGH DECEMBER
1998

Prepared By:
Paul Cayler
Director

Mendocino County
Solid Waste Division

ED_013162_00000569-00198

GENERAL

All sampling and testing were performed using a sampling schedule developed by the Mendocino County Solid Waste Division. These procedures meet the requirements of the Water Quality Control Board Monitoring and Reporting Program No. 75-50 dated December 7, 1988. All samples were collected by a County Technician and tested by Alpha Analytical Laboratory of Ukiah.

During this quarter, six gas monitoring wells were tested around the perimeter of the landfill, and 12 landfill gas vents on top of the landfill, using a Gastech (Model No. GT201) for LEL methane. The test results are attached.

GROUNDWATER

Groundwater sampling was performed on December 8, 1998. Samples were collected from five site monitoring wells. Samples were collected only after purging the wells using the County adopted, modified purging system.

All samples were taken in conformance with the "MENDOCINO COUNTY GROUNDWATER SAMPLING PROCEDURES MANUAL."

WELL 90-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 91-1

No constituent was detected at a level exceeding an Action Level or MCL.

WELL 93-1

Three constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 6160 umbos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 3940 mg/L. (Secondary Action Level = 1000 mg/L).

Sulfate was detected at 1460 mg/L. (MCL = 500 mg/L).

WELL 93-2

No constituent was detected at a level exceeding an Action Level or MCL.

ED_013162_00000569-00199

WELL 94-1

Three constituents were detected at a level exceeding an Action Level or MCL.

Specific Conductance was detected at 4000 umbos. (Secondary Action Level = 1600 umhos).

Total Dissolved Solids were detected at 2560 mg/L. (Secondary Action Level = 1000 mg/L).

Sulfate was detected at 742 mg/L. (MCL = 500 mg/L).

SURFACE WATER

Surface water samples were taken to December 8, 1998 with the results attached. In addition, storm water samples were taken on November 11, 1998 in accordance with the Storm Water Monitoring and Reporting Plan with the results attached. Samples were taken from both SW-1 (Upstream) and SW-2 (Downstream) sample points.

LEACHATE

No leachate samples were taken this quarter

ATTACHMENTS

Site Map
Gas Well Field Log
Test Results

Mendocino County
Solid Waste Division

Laytonville Landfill

GAS WELLS FIELD LOG

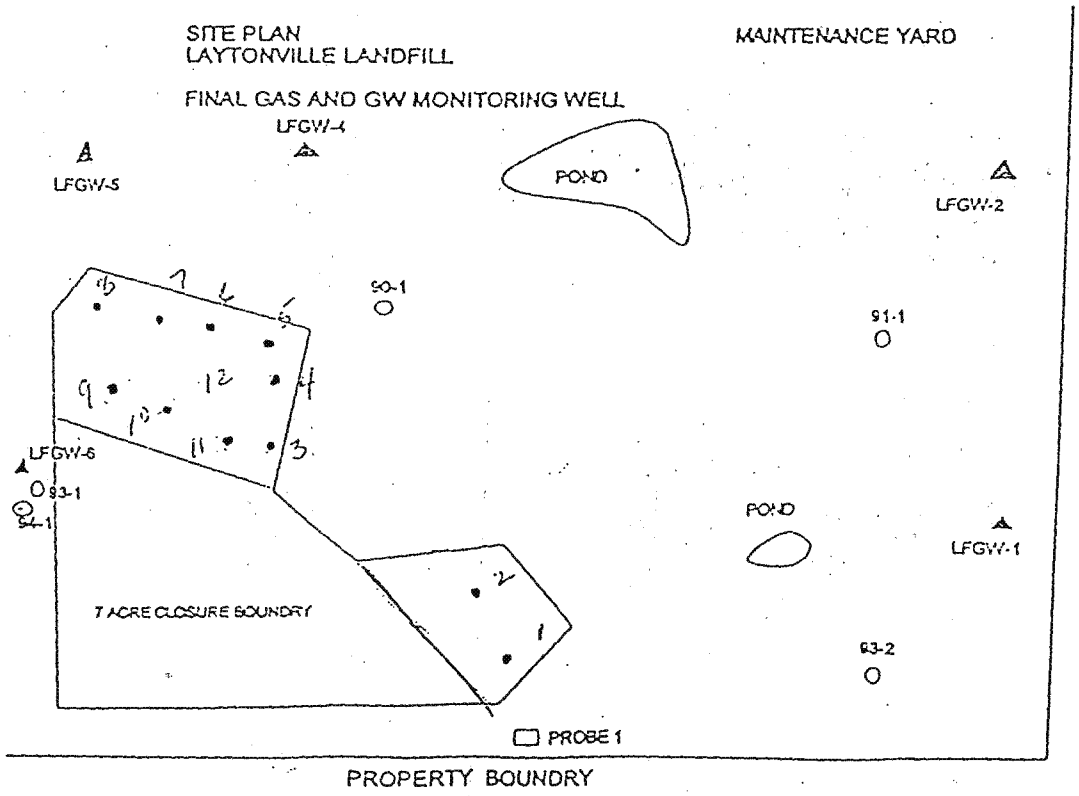
Gas Testing Instrument Gas Tech GT 201
Calibration Date 12/97
Technician O. Centoni

Test Well Test Data
--% Methane

Month	Well G1	Well G2	Well G4	Well G5	Well G6	Probe 1
12/98	0	0	0	0	0	11

GAS VENTS

Vent 1 0
Vent 2 1
Vent 3 0
Vent 4 0
Vent 5 0
Vent 6 0
Vent 7 0
Vent 8 0
Vent 9 0
Vent 10 0
Vent 11 0
Vent 12 0



2/2/99

Laytonville Landfill - Intra-Well Tolerance Limit
CURRENT DATA COMPARED TO 1997 TOLERANCE LIMIT
*1999 - 1st QUARTER RESULTS

1999 QUARTERLY REPORT

General Water Quality Paramaters

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
90-1	Alkalinity Hydroxide (mg/l)	1.00	n/a	<1	No
90-1	Bicarbonate (mg/l)	250.49	n/a	191.00	No
90-1	Chemical Oxygen Demand (mg	NE [1]	n/a	27.00	
90-1	Chloride (mg/l)	154.49	n/a	115.00	No
90-1	Fluoride (mg/l)	5.29	n/a	0.15	No
90-1	Nitrate (mg/l)	5.25	n/a	<1	No
90-1	pH (ph)	7.87	5.52	6.80	No
90-1	Specific Conductance (umhos)	860.39	n/a	553.00	No
90-1	Sulfate (mg/l)	9.38	n/a	5.50	No
90-1	Total Dissolved Solids (mg/l)	485.36	n/a	354.00	No
90-1	Total Hardness, Calculation (m	249.30	n/a	193.00	No

METALS

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
90-1	Aluminum (mg/l)	NE [2]	n/a		
90-1	Antimony (mg/l)	0.50	n/a		
90-1	Arsenic GF (mg/l)	NE [2]	n/a		
90-1	Banum (mg/l)	1.12	n/a		
90-1	Beryllium (mg/l)	0.01	n/a		
90-1	Boron (mg/l)	NE [2]	n/a		
90-1	Cadmium (mg/l)	0.00	n/a		
90-1	Calcium (mg/l)	47.07	n/a	43.00	No
90-1	Chromium (mg/l)	0.01	n/a		
90-1	Cobalt (mg/l)	0.10	n/a		
90-1	Copper (mg/l)	NE [2]	n/a		
90-1	Iron (mg/l)	41.42	n/a		
90-1	Lead (mg/l)	NE [2]	n/a		
90-1	Magnesium (mg/l)	38.32	n/a	21.00	No
90-1	Manganese (mg/l)	2.41	n/a		
90-1	Mercury (mg/l)	NE [2]	n/a		
90-1	Molybdenum (mg/l)	0.50	n/a		
90-1	Nickel (mg/l)	NE [2]	n/a		
90-1	Potassium (mg/l)	3.75	n/a	8.40	4.65
90-1	Selenium GF (mg/l)	NE [2]	n/a		
90-1	Silver (mg/l)	NE [2]	n/a		
90-1	Sodium (mg/l)	44.58	n/a	42.00	No
90-1	Thallium (mg/l)	NE [2]	n/a		
90-1	Tin (mg/l)	NE [2]	n/a		
90-1	Titanium (mg/l)	NE [2]	n/a		
90-1	Vanadium (mg/l)	NE [2]	n/a		
90-1	Zinc (mg/l)	NE [2]	n/a		

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Laytonville Landfill - Intra-Well Tolerance Limit
CURRENT DATA COMPARED TO 1997 TOLERANCE LIMIT
1999 - 1st QUARTER RESULTS

General Water Quality Paramaters

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
91-1	Alkalinity Hydroxide (mg/l)	1.00	n/a	<1	No
91-1	Bicarbonate (mg/l)	293.94	n/a	259.00	No
91-1	Chemical Oxygen Demand (mg/l)	NE [1]	n/a	23.00	
91-1	Chloride (mg/l)	32.90	n/a	18.00	No
91-1	Fluoride (mg/l)	NE [2]	n/a	<.1	
91-1	Nitrate (mg/l)	7.64	n/a	<1	No
91-1	pH (ph)	8.59	6.71	7.00	No
91-1	Specific Conductance (umhos)	597.00	n/a	421.00	No
91-1	Sulfate (mg/l)	NE [1]	n/a	0.69	
91-1	Total Dissolved Solids (mg/l)	380.94	n/a	269.00	No
91-1	Total Hardness, Calculation (mg/l)	208.98	n/a	170.00	No

METALS

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
91-1	Aluminum (mg/l)	NE [2]	n/a		
91-1	Antimony (mg/l)	0.50	n/a		
91-1	Arsenic GF (mg/l)	0.02	n/a		
91-1	Barium (mg/l)	0.32	n/a		
91-1	Beryllium (mg/l)	0.01	n/a		
91-1	Boron (mg/l)	NE [2]	n/a		
91-1	Cadmium (mg/l)	0.001	n/a		
91-1	Calcium (mg/l)	60.82	n/a	47.00	No
91-1	Chromium (mg/l)	0.01	n/a		
91-1	Cobalt (mg/l)	0.10	n/a		
91-1	Copper (mg/l)	0.05	n/a		
91-1	Iron (mg/l)	NE [2]	n/a		
91-1	Lead (mg/l)	0.01	n/a		
91-1	Magnesium (mg/l)	15.98	n/a	13.00	No
91-1	Manganese (mg/l)	4.91	n/a		
91-1	Mercury (mg/l)	0.001	n/a		
91-1	Molybdenum (mg/l)	0.50	n/a		
91-1	Nickel (mg/l)	0.05	n/a		
91-1	Potassium (mg/l)	14.39	n/a	2.30	No
91-1	Selenium GF (mg/l)	0.50	n/a		
91-1	Silver (mg/l)	0.01	n/a		
91-1	Sodium (mg/l)	56.34	n/a	35.00	No
91-1	Thallium (mg/l)	0.20	n/a		
91-1	Tin (mg/l)	0.50	n/a		
91-1	Titanium (mg/l)	0.50	n/a		
91-1	Vanadium (mg/l)	0.50	n/a		
91-1	Zinc (mg/l)	0.05	n/a		

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99_1TL.XLS

Laytonville Landfill - Intra-Well Tolerance Limit
CURRENT DATA COMPARED TO 1997 TOLERANCE LIMIT
1999 - 1st QUARTER RESULTS

General Water Quality Paramaters

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
93-1	Alkalinity Hydroxide (mg/l)	1.00	n/a	<1	No
93-1	Bicarbonate (mg/l)	537.69	n/a	451.00	No
93-1	Chemical Oxygen Demand (mg/l)	83.64	n/a	39.00	No
93-1	Chloride (mg/l)	2004.98	n/a	1620.00	No
93-1	Fluoride (mg/l)	17.19	n/a	4.10	No
93-1	Nitrate (mg/l)	36.79	n/a	<1	No
93-1	pH (ph)	8.23	5.83	6.40	No
93-1	Specific Conductance (umhos)	8544.01	n/a	6360.00	No
93-1	Sulfate (mg/l)	2772.87	n/a	1980.00	No
93-1	Total Dissolved Solids (mg/l)	5465.96	n/a	4070.00	No
93-1	Total Hardness, Calculation (mg/l)	4847.40	n/a	3500.00	No

METALS

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
93-1	Aluminum (mg/l)	0.31	n/a		
93-1	Antimony (mg/l)	0.50	n/a		
93-1	Arsenic GF (mg/l)	0.01	n/a		
93-1	Barium (mg/l)	0.10	n/a		
93-1	Beryllium (mg/l)	0.01	n/a		
93-1	Boron (mg/l)	NE [2]	n/a		
93-1	Cadmium (mg/l)	0.001	n/a		
93-1	Calcium (mg/l)	548.90	n/a	370.00	No
93-1	Chromium (mg/l)	0.01	n/a		
93-1	Cobalt (mg/l)	0.10	n/a		
93-1	Copper (mg/l)	0.05	n/a		
93-1	Iron (mg/l)	NE [2]	n/a		
93-1	Lead (mg/l)	NE [2]	n/a		
93-1	Magnesium (mg/l)	889.89	n/a	620.00	No
93-1	Manganese (mg/l)	0.69	n/a		
93-1	Mercury (mg/l)	0.001	n/a		
93-1	Molybdenum (mg/l)	0.50	n/a		
93-1	Nickel (mg/l)	0.05	n/a		
93-1	Potassium (mg/l)	19.40	n/a	9.20	No
93-1	Selenium GF (mg/l)	0.50	n/a		
93-1	Silver (mg/l)	0.01	n/a		
93-1	Sodium (mg/l)	541.34	n/a	410.00	No
93-1	Thallium (mg/l)	0.20	n/a		
93-1	Tin (mg/l)	0.50	n/a		
93-1	Titanium (mg/l)	0.50	n/a		
93-1	Vanadium (mg/l)	0.50	n/a		
93-1	Zinc (mg/l)	0.05	n/a		

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Laytonville Landfill - Intra-Well Tolerance Limit
CURRENT DATA COMPARED TO 1997 TOLERANCE LIMIT
1999 - 1st QUARTER RESULTS

General Water Quality Paramaters

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
93-2	Alkalinity Hydroxide (mg/l)	1.00	n/a	<1	No
93-2	Bicarbonate (mg/l)	433.95	n/a	269.00	No
93-2	Chemical Oxygen Demand (mg/l)	76.07	n/a	47.00	No
93-2	Chloride (mg/l)	66.98	n/a	46.00	No
93-2	Fluoride (mg/l)	0.29	n/a	0.24	No
93-2	Nitrate (mg/l)	5.51	n/a	<1	No
93-2	pH (ph)	8.40	5.86	6.70	No
93-2	Specific Conductance (umhos)	1001.88	n/a	671.00	No
93-2	Sulfate (mg/l)	227.71	n/a	113.00	No
93-2	Total Dissolved Solids (mg/l)	636.30	n/a	429.00	No
93-2	Total Hardness, Calculation (mg/l)	369.42	n/a	264.00	No

METALS

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
93-2	Aluminum (mg/l)	0.05	n/a		
93-2	Antimony (mg/l)	0.50	n/a		
93-2	Arsenic GF (mg/l)	0.01	n/a		
93-2	Barium (mg/l)	0.10	n/a		
93-2	Beryllium (mg/l)	0.01	n/a		
93-2	Boron (mg/l)	NE [2]	n/a		
93-2	Cadmium (mg/l)	0.001	n/a		
93-2	Calcium (mg/l)	78.09	n/a	53.00	No
93-2	Chromium (mg/l)	0.01	n/a		
93-2	Cobalt (mg/l)	0.10	n/a		
93-2	Copper (mg/l)	0.05	n/a		
93-2	Iron (mg/l)	NE [2]	n/a		
93-2	Lead (mg/l)	NE [2]	n/a		
93-2	Magnesium (mg/l)	43.10	n/a	32.00	No
93-2	Manganese (mg/l)	7.97	n/a		
93-2	Mercury (mg/l)	0.001	n/a		
93-2	Molybdenum (mg/l)	0.50	n/a		
93-2	Nickel (mg/l)	0.05	n/a		
93-2	Potassium (mg/l)	11.57	n/a	2.30	No
93-2	Selenium GF (mg/l)	0.50	n/a		
93-2	Silver (mg/l)	NE [2]	n/a		
93-2	Sodium (mg/l)	101.91	n/a	52.00	No
93-2	Thallium (mg/l)	0.20	n/a		
93-2	Tin (mg/l)	0.50	n/a		
93-2	Titanium (mg/l)	0.50	n/a		
93-2	Vanadium (mg/l)	0.50	n/a		
93-2	Zinc (mg/l)	NE [2]	n/a		

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Laytonville Landfill - Intra-Well Tolerance Limit
CURRENT DATA COMPARED TO 1997 TOLERANCE LIMIT
1999 - 1st QUARTER RESULTS

General Water Quality Paramaters

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
94-1	Alkalinity Hydroxide (mg/l)	1.00	n/a	<1	No
94-1	Bicarbonate (mg/l)	484.41	n/a	424.00	No
94-1	Chemical Oxygen Demand (mg/l)	27.88	n/a	33.00	Yes
94-1	Chloride (mg/l)	1183.27	n/a	713.00	No
94-1	Fluoride (mg/l)	0.58	n/a	0.36	No
94-1	Nitrate (mg/l)	26.14	n/a	<1	No
94-1	pH (ph)	8.50	5.67	6.70	No
94-1	Specific Conductance (umhos)	4845.79	n/a	3360.00	No
94-1	Sulfate (mg/l)	1256.96	n/a	788.00	No
94-1	Total Dissolved Solids (mg/l)	3099.24	n/a	2150.00	No
94-1	Total Hardness, Calculation (mg/l)	2536.28	n/a	1500.00	No

METALS

Well	Constituent	Upper Limit	Lower Limit	Current 2/22/99	Exceeds Limit
94-1	Aluminum (mg/l)	NE [2]	n/a		
94-1	Antimony (mg/l)	0.50	n/a		
94-1	Arsenic GF (mg/l)	0.01	n/a		
94-1	Barium (mg/l)	0.10	n/a		
94-1	Beryllium (mg/l)	0.01	n/a		
94-1	Boron (mg/l)	NE [2]	n/a		
94-1	Cadmium (mg/l)	0.001	n/a		
94-1	Calcium (mg/l)	317.76	n/a	180.00	No
94-1	Chromium (mg/l)	0.01	n/a		
94-1	Cobalt (mg/l)	0.10	n/a		
94-1	Copper (mg/l)	0.05	n/a		
94-1	Iron (mg/l)	NE [2]	n/a		
94-1	Lead (mg/l)	NE [2]	n/a		
94-1	Magnesium (mg/l)	428.76	n/a	250.00	No
94-1	Manganese (mg/l)	3.28	n/a		
94-1	Mercury (mg/l)	0.001	n/a		
94-1	Molybdenum (mg/l)	0.50	n/a		
94-1	Nickel (mg/l)	0.05	n/a		
94-1	Potassium (mg/l)	16.95	n/a	3.90	No
94-1	Selenium GF (mg/l)	0.50	n/a		
94-1	Silver (mg/l)	NE [2]	n/a		
94-1	Sodium (mg/l)	407.59	n/a	260.00	No
94-1	Thallium (mg/l)	0.20	n/a		
94-1	Tin (mg/l)	0.50	n/a		
94-1	Titanium (mg/l)	0.50	n/a		
94-1	Vanadium (mg/l)	0.50	n/a		
94-1	Zinc (mg/l)	NE [2]	n/a		

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Mendocino County
Solid Waste Division

Laytonville Landfill

GAS WELLS FIELD LOG

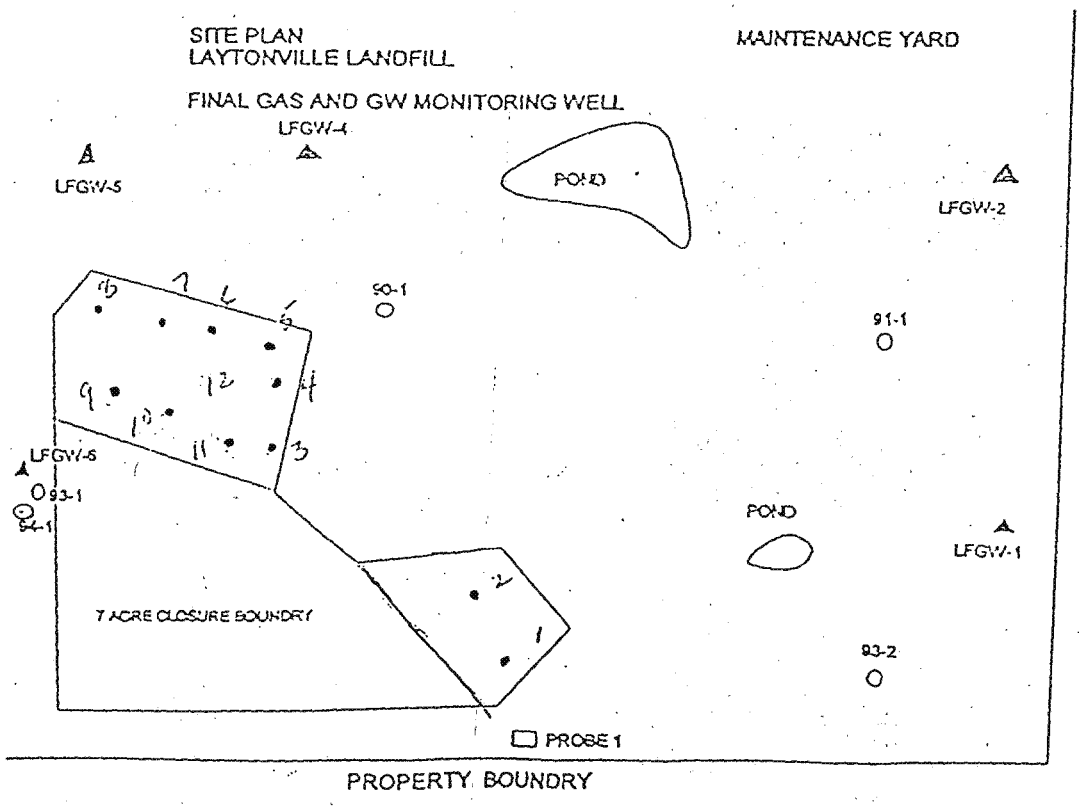
Gas Testing Instrument Gastech 201
Calibration Date 12/97
Technician O. Centoni

Test Well Test Data
--% Methane

Month	Well G1	Well G2	Well G4	Well G5	Well G6	Probe 1
2/22/99	0	0	0	0	0	7%

GAS VENTS

Vent 1 0
Vent 2 0
Vent 3 0
Vent 4 0
Vent 5 0
Vent 6 0
Vent 7 0
Vent 8 0
Vent 9 0
Vent 10 0
Vent 11 0
Vent 12 0



REFERENCE
No. 10

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Reference: 900189.300

WATER QUALITY
CONTROL BOARD

DEC 26 '91

☐ BK ___ ☐ BK ___
☐ CJ ___ ☑ LR ___
☐ FR ___ ☐ BB ___
☐ FT ___ ☐ KD ___
☐ JH ___ ☐ JS ___
☐ SW ___ ☐ ___
☐ ___ ☐ REPLY
☐ ALL STAFF ☐ FILE

LAYTONVILLE SOLID WASTE DISPOSAL SITE
REPORT OF WASTE DISCHARGE

REGISTERED PROFESSIONAL ENGINEER
JOHN R. SELVAGE
No. C21099
Exp 9/30/93
CIVIL
STATE OF CALIFORNIA

NOVEMBER 1991

QA/QC:JS

TABLE 3. WELL COMPLETION DATA SUMMARY

Well Information	91-1	87-1	87-2	87-3	90-1
Elevation (feet)	1709.16	1727.56	1708.00	1745.73	1779.35
Total depth of well (feet)	43	100	100	90	80
Well casing	2" PVC	4" PVC	4" PVC	4" PVC	4" PVC
Total depth of well casing (feet)	43	98	100	89	70
Drilling method used	12" HSA	8" RW	8" RW	8" RW	8" RW
Depth and type of perforations	33' to 43' 0.02" slots	18' to 98' 0.02" slots	20' to 100' 0.02" slots	19' to 89' 0.02" slots	60' to 80' 0.02" slots
Well Driller	All Terrain	Herzog & Associates	Herzog & Associates	Herzog & Associates	Taber Consultants
Year well constructed	1991	1987	1987	1987	1990
Use of well	monitor	monitor	monitor	monitor	monitor
Depth and type of seals	0' to 30' C5B 30' to 32' BP	0' to 14' C5B 14' to 16' BP	0' to 16' C5B 16' to 18' BP	0' to 15' C5B 15' to 17' BP	0' to 55' lean cement; 55' to 57' BP
Type(s) of well logs	SEL	SEL	SEL	SEL	SEL
Depth to First Encountered Groundwater, from ground surface (feet)	33	No confirmed initial measurements	No confirmed initial measurements	No confirmed initial measurements	45 (apparent initial on 1/3/90)
Stabilized depth to groundwater, from top of casing (feet)	7.8 on 3/11/91	3.1 to 8.7	3.2 to 8.4	31.8 to 34.1	45.4 to 46.3
Aquifer tests	Slug test on 3/11/91	None	None	None	None
Water Quality sampling	2/1/91	10/9/87 to current	10/9/87 to current	10/9/87 to current	1/18/90 to current

HSA = Hollow Stem Auger
RW = 7-7/8" Tricone Rotary Wash
C5B = Cement with 5 percent Bentonite
BP = Bentonite Pellets
SEL = Subsurface Exploration Log

TABLE 4. CLIMATOLOGICAL DATA[1]

TEMPERATURE NORMALS (DEG F) - COVELO STATION NO. 2081

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVE
Max	51.5	57.6	61.3	67.9	75.9	84.7	93.4	92.4	88.1	75.5	60.5	52.1	71.7
Min	30.1	32.3	33.5	36.2	40.9	46.6	50.4	49.2	44.3	38.2	33.5	30.5	38.8
Mean	40.8	45.0	47.4	52.1	58.4	65.6	72.0	70.8	66.2	56.8	47.1	41.3	55.3

MEAN PRECIPITATION (INCHES) - LAYTONVILLE STATION NO. 4851

1941 TO 1978

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
12.21	8.22	6.79	3.48	1.43	0.41	0.10	0.41	0.78	3.75	7.73	10.64	56.02

MEAN EVAPORATION DATA (MILLIMETERS) - COVELO STATION NO. 2081

1966 to 1970

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
34	40	93	127	201	245	330	302	209	110	45	18	1,754

1 Climatology of the United States No. 81 (By State) - Monthly Normals of Temperature, Precipitation, and Heating and Cooling Days 1951-80 compiled by the National Oceanic and Atmospheric Administration. Evaporation Data from DWR Bulletin 73-79, November 1979. Provided by Mr. William Mork, State Climatologist, Department of Water Resources, Division of Flood Management.

TABLE 6. VICINITY WELL SURVEY DATA.

ADDRESS OR ASSESSOR'S PARCEL NUMBER	NUMBER OF WELLS	USE	OWNER	DATE INSTALLED	TOTAL DEPTH, FEET
1480 BRANSCOMB ROAD	1	Domestic	Hill	1972	60
1500 BRANSCOMB ROAD	1	Domestic	Gover	1962	60
1540 BRANSCOMB ROAD	1	Unknown	Frost	Unknown	Unknown
STAR ROUTE 7, BOX 23	1	Domestic	Burke	1965	30
1560 BRANSCOMB ROAD	1	Domestic	Henry	pre 1976	16
1640 BRANSCOMB ROAD	1	Not used (on City water)	Frost	pre 1954	20
1720 BRANSCOMB ROAD	1	Domestic	Harpe	pre 1976	30
1750 BRANSCOMB ROAD	0	On City water	Morales	--	--
1840 BRANSCOMB ROAD 14-060-36	1?	Domestic	Dodd	pre 1950	Unknown
1840 BRANSCOMB ROAD	1	Domestic	Sala	1950's	40
1851 BRANSCOMB ROAD	1	Domestic (not potable)	Hawkins	Unknown	70
1900 BRANSCOMB ROAD	2	1 Domestic/ 1 not used	Brown	1986	65/ Unknown
1920 BRANSCOMB ROAD	1	Domestic	Sala	1950's	30
1951 BRANSCOMB ROAD	3	1 Domestic/ 2 capped and not used	Ross	Unknown	Unknown
1960 BRANSCOMB ROAD	2	1 Domestic/ 1 not used	Sowells	1968/ pre 1964	48/18
44170 STUMP ROAD 014-30-27	1	Domestic (not potable)	Foltz	Sept, 1990	90
44101 STUMP ROAD	1	Domestic	Sala	1950's	Unknown
STUMP ROAD	1	Domestic (not potable)	Dale	1976	75
014-30-44/STUMP ROAD	1	Domestic	Robbins	Unknown	Unknown
2101 NORTH ROAD	1	Domestic	Bennett	1970's	35

TABLE 6. CONTINUED

ADDRESS OR ASSESSOR'S PARCEL NUMBER	NUMBER OF WELLS	USE	OWNER	DATE INSTALLED	TOTAL DEPTH, FEET
1971 NORTH ROAD	1	Domestic	Haskell & Michaels	1985	Unknown
1961 NORTH ROAD	1	Domestic	Michaels	Unknown	Unknown
1951 NORTH ROAD	1	Domestic	Shepard & Johnson	pre 1950	90
1850 NORTH ROAD	2	Domestic	Kiloh	1982/ Unknown	190/85
1820 NORTH ROAD	2	1 Domestic/ 1 not used	Parker	1975	65/ Unknown
1641 NORTH ROAD 14-250-34	1	Unknown	Jacobs	Unknown	Unknown
44025 LAKEVIEW DRIVE	2	1 Domestic/ 1 used for yard irrigation	Ricketts	1960's	20/30
44050 LAKEVIEW DRIVE	2	1 Domestic/ 1 used for yard irrigation	Pence	1950's	Unknown
44100 LAKEVIEW DRIVE	1	Domestic (not potable)	Coughlin	1961	56
44120 LAKEVIEW DRIVE	1	Domestic (dry in summer)	Robinson	Unknown	20
44170 LAKEVIEW DRIVE	1?	Domestic	Miller	Unknown	Unknown
44201 LAKEVIEW DRIVE	1	Domestic	Wormington	Unknown	12.5
44210 LAKEVIEW DRIVE	1	Domestic	Harder	1972	44
44220 LAKEVIEW DRIVE	2	1 Domestic/ 1 not used	Libinate	Unknown	65/ Unknown
44231 LAKEVIEW DRIVE	2	1 Domestic/ 1 not used	Shields	Unknown	Unknown
44301 LAKEVIEW DRIVE	1	Domestic	Patterson	Unknown	Unknown
44351 LAKEVIEW DRIVE	2	1 Domestic/ 1 not used	Stephenson & Marcelli	Unknown	80/ Unknown
UNKNOWN	1	Domestic	Thompson	pre 1963	35

TABLE 6. CONTINUED

ADDRESS OR ASSESSOR'S PARCEL NUMBER	NUMBER OF WELLS	USE	OWNER	DATE INSTALLED	TOTAL DEPTH, FEET
14-220-19 (EBA #8)	1	Domestic	Ahmann (1971)	June, 1971	33
14-230-25 (EBA #9)	1	Domestic	Ahmann (1971)	June, 1971	20.5
LAYTONVILLE RANCHERIA WELL #1	1	Not in use (Dry)	Rancheria	1941	100
LAYTONVILLE RANCHERIA WELL #2	1	Abandoned	Rancheria	Unknown	120
LAYTONVILLE RANCHERIA WELL #3	1	Abandoned	Rancheria	1953	246
LAYTONVILLE RANCHERIA WELL #4	1	Abandoned	Rancheria	Unknown	320
LAYTONVILLE RANCHERIA WELL #5	1	Abandoned due to gas	Rancheria	1953	381
LAYTONVILLE RANCHERIA WELL #6	1	Abandoned due to gas	Rancheria	1953	Unknown

NOTE:

- Most dates of installations and depths of wells are close approximations.
- Question marks indicate information which the respondent could not confirm.
- Data for wells with designations EBA #8 and EBA #9 was obtained from Department of Water Resources (DWR) Water Well Drillers' Reports.
- Laytonville Rancheria well information from the Multi-Purpose Water Resources Investigation, Laytonville Rancheria, prepared for the Tribal Council and Bureau of Indian Affairs, by OTT Water Engineers, Inc., February 28, 1979.
- Questionnaires in Appendix G.

WELLS

Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CLIENT EBA Wastechnologies
ADDRESS P.O. Box 4600
Santa Rosa, CA 95402

DATE COLLECTED 1-18-90
DATE IN LAB 1-19-90
COLLECTED BY Carl Schwab
SAMPLE TYPE Water

LABORATORY NO.: 90-0119-4-2
CLIENT I.D. : MW 87-1

Parameter	Results	Units	Reporting Limit	Analytical Method
Antimony	ND	mg/L	0.060	Method 200.7
Arsenic	ND	mg/L	0.100	Method 200.7
Barium	0.126	mg/L	0.020	Method 200.7
Beryllium	ND	mg/L	0.005	Method 200.7
Cadmium	ND	mg/L	0.005	Method 200.7
Chromium	ND	mg/L	0.010	Method 200.7
Cobalt	ND	mg/L	0.020	Method 200.7
Copper	0.065	mg/L	0.010	Method 200.7
Lead	ND	mg/L	0.075	Method 200.7
Molybdenum	ND	mg/L	0.020	Method 200.7
Nickel	ND	mg/L	0.020	Method 200.7
Selenium	ND	mg/L	0.040	Method 200.7
Silver	ND	mg/L	0.010	Method 200.7
Thallium	ND	mg/L	0.100	Method 200.7
Vanadium	ND	mg/L	0.020	Method 200.7
Zinc	0.027	mg/L	0.020	Method 200.7
Aluminum	ND	mg/L	0.200	Method 200.7
Boron	ND	mg/L	1.00	Method 200.7
Calcium	42.5	mg/L	1.00	Method 200.7
Iron	0.537	mg/L	0.100	Method 200.7
Lithium	ND	mg/L	0.100	Method 200.7
Magnesium	10.4	mg/L	1.00	Method 200.7
Manganese	1.54	mg/L	0.010	Method 200.7
Potassium	ND	mg/L	2.00	Method 200.7
Sodium	41.3	mg/L	1.00	Method 200.7
Tin	ND	mg/L	0.100	Method 200.7
Titanium	0.126	mg/L	0.050	Method 200.7

ND = None detected

Alpha
Analytical Laboratories, Inc.

LABORATORY DIRECTOR 2-14-90 DATE

Alpha
Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CLIENT EBA Wastechnologies
ADDRESS P.O. Box 4600
Santa Rosa, CA 95402

DATE COLLECTED 1-18-90
DATE IN LAB 1-19-90
COLLECTED BY Carl Schwab
SAMPLE TYPE Water

LABORATORY NO.: 90-0119-4-3
CLIENT I.D. : MW 87-2

Parameter	Results	Units	Reporting Limit	Analytical Method
Antimony	ND	mg/L	0.060	Method 200.7
Arsenic	ND	mg/L	0.100	Method 200.7
Barium	0.247	mg/L	0.020	Method 200.7
Beryllium	ND	mg/L	0.005	Method 200.7
Cadmium	ND	mg/L	0.005	Method 200.7
Chromium	ND	mg/L	0.010	Method 200.7
Cobalt	ND	mg/L	0.020	Method 200.7
Copper	0.113	mg/L	0.010	Method 200.7
Lead	ND	mg/L	0.075	Method 200.7
Molybdenum	ND	mg/L	0.020	Method 200.7
Nickel	ND	mg/L	0.020	Method 200.7
Selenium	ND	mg/L	0.040	Method 200.7
Silver	ND	mg/L	0.010	Method 200.7
Thallium	ND	mg/L	0.100	Method 200.7
Vanadium	ND	mg/L	0.020	Method 200.7
Zinc	0.090	mg/L	0.020	Method 200.7
Aluminum	2.10	mg/L	0.200	Method 200.7
Boron	0.120	mg/L	1.00	Method 200.7
Calcium	35.3	mg/L	1.00	Method 200.7
X Iron	10.2	mg/L	0.100	Method 200.7
Lithium	ND	mg/L	0.100	Method 200.7
Magnesium	10.7	mg/L	1.00	Method 200.7
X Manganese	2.02	mg/L	0.010	Method 200.7
Potassium	ND	mg/L	2.00	Method 200.7
Sodium	30.6	mg/L	1.00	Method 200.7
Tin	ND	mg/L	0.100	Method 200.7
Titanium	0.184	mg/L	0.050	Method 200.7

ND = None detected

Alpha
Analytical Laboratories, Inc.

2-14-90
LABORATORY DIRECTOR DATE

Alpha
Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CLIENT EBA Wastechnologies
ADDRESS P.O. Box 4600
Santa Rosa, CA 95402

DATE COLLECTED 1-18-90
DATE IN LAB 1-19-90
COLLECTED BY Carl Schwab
SAMPLE TYPE Water

LABORATORY NO.: 90-0119-4-4
CLIENT I.D. : MW 87-3

Parameter	Results	Units	Reporting Limit	Analytical Method
Antimony	ND	mg/L	0.060	Method 200.7
Arsenic	ND	mg/L	0.100	Method 200.7
Barium	0.330	mg/L	0.020	Method 200.7
Beryllium	ND	mg/L	0.005	Method 200.7
Cadmium	ND	mg/L	0.005	Method 200.7
Chromium	ND	mg/L	0.010	Method 200.7
Cobalt	ND	mg/L	0.020	Method 200.7
Copper	ND	mg/L	0.010	Method 200.7
Lead	ND	mg/L	0.075	Method 200.7
Molybdenum	ND	mg/L	0.020	Method 200.7
Nickel	ND	mg/L	0.020	Method 200.7
Selenium	ND	mg/L	0.040	Method 200.7
Silver	ND	mg/L	0.010	Method 200.7
Thallium	ND	mg/L	0.100	Method 200.7
Vanadium	ND	mg/L	0.020	Method 200.7
Zinc	ND	mg/L	0.020	Method 200.7
Aluminum	0.407	mg/L	0.200	Method 200.7
Boron	0.17	mg/L	1.00	Method 200.7
Calcium	26.0	mg/L	1.00	Method 200.7
X Iron	18.2	mg/L	0.100	Method 200.7
Lithium	ND	mg/L	0.100	Method 200.7
Magnesium	16.7	mg/L	1.00	Method 200.7
X Manganese	1.55	mg/L	0.010	Method 200.7
Potassium	2.51	mg/L	2.00	Method 200.7
Sodium	31.8	mg/L	1.00	Method 200.7
Tin	ND	mg/L	0.100	Method 200.7
Titanium	0.132	mg/L	0.050	Method 200.7

ND = None detected

Alpha
Analytical Laboratories, Inc.

[signature] 2-14-90
LABORATORY DIRECTOR DATE

Alpha
Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CLIENT EBA Wastechnologies
ADDRESS P.O. Box 4600
Santa Rosa, CA 95402

DATE COLLECTED 1-18-90
DATE IN LAB 1-19-90
COLLECTED BY Carl Schwab
SAMPLE TYPE Water

LABORATORY NO.: 90-0119-4-1
CLIENT I.D. : MW 90-1

Parameter	Results	Units	Reporting Limit	Analytical Method
Antimony	ND	mg/L	0.060	Method 200.7
Arsenic	ND	mg/L	0.100	Method 200.7
Barium	0.232	mg/L	0.020	Method 200.7
Beryllium	ND	mg/L	0.005	Method 200.7
Cadmium	ND	mg/L	0.005	Method 200.7
Chromium	ND	mg/L	0.010	Method 200.7
Cobalt	ND	mg/L	0.020	Method 200.7
Copper	0.134	mg/L	0.010	Method 200.7
Lead	ND	mg/L	0.075	Method 200.7
Molybdenum	ND	mg/L	0.020	Method 200.7
Nickel	ND	mg/L	0.020	Method 200.7
Selenium	ND	mg/L	0.040	Method 200.7
Silver	ND	mg/L	0.010	Method 200.7
Thallium	ND	mg/L	0.100	Method 200.7
Vanadium	ND	mg/L	0.020	Method 200.7
Zinc	0.046	mg/L	0.020	Method 200.7
Aluminum	0.350	mg/L	0.200	Method 200.7
Boron	0.18	mg/L	1.00	Method 200.7
Calcium	32.5	mg/L	1.00	Method 200.7
Iron	2.40	mg/L	0.100	Method 200.7
Lithium	ND	mg/L	0.100	Method 200.7
Magnesium	9.35	mg/L	1.00	Method 200.7
Manganese	2.12	mg/L	0.010	Method 200.7
Potassium	ND	mg/L	2.00	Method 200.7
Sodium	23.6	mg/L	1.00	Method 200.7
Tin	ND	mg/L	0.100	Method 200.7
Titanium	0.122	mg/L	0.050	Method 200.7

ND = None detected

Alpha
Analytical Laboratories, Inc.

Brent Lee 2-14-90
LABORATORY DIRECTOR DATE

MAY 11, 1990

TABLE 1: QUANTITATIVE RESULTS

EPA METHOD 8015-PURGE AND TRAP: NONHALOGENATED VOLATILE ORGANICS (ZR57)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Joblink
MB1446	COUNTY OF MENDOCINO	600-081	L L87-1	900416	802795

Compound	Results: Sample Concen. ug/L	Report DL ug/L	Blank Concen. ug/L	Batch #
Acetone	3	1	ND	Q900798
Methyl ethyl ketone	ND	1	ND	Q900798

TABLE 1: QUANTITATIVE RESULTS

APR 26, 1990

METALS (ZR52)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Joblink
MB1446	COUNTY OF MENDOCINO	600-081	L L87-1	900416	802795

Compound	Results: Sample Concen. mg/L	Report DL mg/L	Blank Concen. mg/L	Batch #
Aluminum, Total	1.76	.200	ND	Q1213
Antimony, Total	ND	.060	ND	Q1213
Arsenic, Total	ND	.100	ND	Q1213
Barium, Total	.223	.020	ND	Q1213
Beryllium, Total	ND	.005	ND	Q1213
Boron, Total	ND	.500	ND	Q1213
Cadmium, Total	ND	.005	ND	Q1213
Calcium, Total	28.0	1.00	ND	Q1213
Chromium, Total	ND	.010	ND	Q1213
Cobalt, Total	ND	.020	ND	Q1213
Copper, Total	.057	.010	ND	Q1213
Iron, Total	2.43	.100	ND	Q1213
Lead, Total	ND	.075	ND	Q1213
Lithium, Total	ND	.050	ND	Q1213
Magnesium, Total	9.21	1.00	ND	Q1213
Manganese, Total	1.68	.010	ND	Q1213
Molybdenum, Total	ND	.020	ND	Q1213
Nickel, Total	ND	.020	ND	Q1213
Potassium, Total	ND	2.00	ND	Q1213
Selenium, Total	ND	.100	ND	Q1213
Silver, Total	ND	.010	ND	Q1213
Sodium, Total	20.6	1.00	ND	Q1213
Thallium, Total	ND	.100	ND	Q1213
Tin, Total	ND	.100	ND	Q1213
Titanium, Total	.087	.050	ND	Q1213
Vanadium, Total	ND	.020	ND	Q1213
Zinc, Total	.038	.020	ND	Q1213

TABLE 1: QUANTITATIVE RESULTS

CHAIN OF CUSTODY DATA REQUIRED FOR ETC DATA MANAGEMENT SUMMARY REPORTS

ETC Sample No.	Company	Facility	Sample Point	Date	Joblink
MB1446	COUNTY OF MENDOCINO	600-081	L87-1	04-16-90	802795

Compound		Results			
		Sample Concen.	Report DL	Blank Concen.	Batch #
Hydroxide as CaCO3	mg/l	0	0	ND	
Bicarbonate as CaCO3	mg/l	179	0	ND	
Carbonate as CaCO3	mg/l	0	0	ND	
Hardness as CaCO3	mg/l	100	5.0	ND	
pH	std	7.4	-	N/A	
Specific Conductance	um/cm	296	20	ND	
Chemical Oxygen Demand (COD)	mg/l	<1	1	ND	
Total Dissolved Solids (TDS)	mg/l	189	10	ND	
Chloride	mg/l	14	2.0	ND	
Fluoride	mg/l	.11	.1	ND	
Calcium	mg/l	26	.1	ND	
Magnesium	mg/l	8.8	.1	ND	
Nitrate as NO3	mg/l	.62	.04	ND	
Potassium	mg/l	.99	.2	ND	
Sodium	mg/l	21	.4	ND	
Sulfate	mg/l	4	1	ND	

JUL. 19, 1990

TABLE 1: QUANTITATIVE RESULTS

EPA METHOD 601: PURGEABLE HALOCARBONS (ZR42)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Joblink
MB1357	COUNTY OF MENDOCINO	600-081	L L87-2	900413	802784

Compound	Results: Sample Concen. ug/L	Report DL ug/L	Blank Concen. ug/L	Batch #
Bromodichloromethane	ND	.5	ND	Q900859
Bromoform	ND	.5	ND	Q900859
Bromomethane	ND	1.0	ND	Q900859
Carbon tetrachloride	ND	.5	ND	Q900859
Chloroethane	ND	-	ND	Q900859
2-Chloroethylvinyl ether	ND	.5	ND	Q900859
Chloroform	ND	.5	ND	Q900859
Chloromethane	ND	1.0	ND	Q900859
Dibromochloromethane	ND	.5	ND	Q900859
1,2-Dichlorobenzene	ND	.5	0	Q900859
1,3-Dichlorobenzene	ND	.500	0	Q900859
1,4-Dichlorobenzene	ND	.500	0	Q900859
1,1-Dichloroethane	ND	.5	ND	Q900859
1,2-Dichloroethane	ND	.5	ND	Q900859
1,1-Dichloroethene	ND	.5	ND	Q900859
trans-1,2-Dichloroethene	ND	.5	ND	Q900859
1,2-Dichloropropane	ND	.5	ND	Q900859
cis-1,3-Dichloropropene	ND	.5	ND	Q900859
trans-1,3-Dichloropropene	ND	.5	ND	Q900859
Methylene chloride	1.3	.5	2.2	Q900859
1,1,2,2-Tetrachloroethane	ND	.5	ND	Q900859
Tetrachloroethene	ND	.5	ND	Q900859
1,1,1-Trichloroethane	ND	.5	ND	Q900859
1,1,2-Trichloroethane	ND	.5	ND	Q900859
Trichloroethene	ND	.5	ND	Q900859
Trichlorofluoromethane	ND	.5	ND	Q900859
Vinyl chloride	ND	1.0	ND	Q900859

- Methylene chloride: The analyte was present in the method blank.

TABLE 1: QUANTITATIVE RESULTS

METALS (ZR52)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Joblink
MB1357	COUNTY OF MENDOCINO	600-081	L L87-2	900413	802784

Compound	Results: Sample Concen. mg/L	Report DL mg/L	Blank Concen. mg/L	Batch #
Aluminum, Total	.352	.200	ND	Q1213
Antimony, Total	ND	.060	ND	Q1213
Arsenic, Total	ND	.100	ND	Q1213
Barium, Total	.259	.020	ND	Q1213
Beryllium, Total	ND	.005	ND	Q1213
Boron, Total	ND	.500	ND	Q1213
Cadmium, Total	ND	.005	ND	Q1213
Calcium, Total	44.1	1.00	ND	Q1213
Chromium, Total	ND	.010	ND	Q1213
Cobalt, Total	ND	.020	ND	Q1213
Copper, Total	.040	.010	ND	Q1213
Iron, Total	.596	.100	ND	Q1213
Lead, Total	ND	.075	ND	Q1213
Lithium, Total	ND	.050	ND	Q1213
Magnesium, Total	12.6	1.00	ND	Q1213
Manganese, Total	2.07	.010	ND	Q1213
Molybdenum, Total	ND	.020	ND	Q1213
Nickel, Total	ND	.020	ND	Q1213
Potassium, Total	ND	2.00	ND	Q1213
Selenium, Total	ND	.100	ND	Q1213
Silver, Total	ND	.010	ND	Q1213
Sodium, Total	36.4	1.00	ND	Q1213
Thallium, Total	ND	.100	ND	Q1213
Tin, Total	ND	.100	ND	Q1213
Titanium, Total	ND	.050	ND	Q1213
Vanadium, Total	ND	.020	ND	Q1213
Zinc, Total	ND	.020	ND	Q1213

TABLE 1: QUANTITATIVE RESULTS

CHAIN OF CUSTODY DATA REQUIRED FOR ETC DATA MANAGEMENT SUMMARY REPORTS

ETC Sample No.	Company	Facility	Sample Point	Date	Joblink
MB1357	COUNTY OF MENDOCINO	600-081	L87-2	04-13-90	802784

Compound		Results				
		Sample Concen.	Report DL	Blank Concen.	Batch #	
Hydroxide as CaCO3	mg/l	0	0	ND		
Bicarbonate as CaCO3	mg/l	252	0	ND		
Carbonate as CaCO3	mg/l	0	0	ND		
Hardness as CaCO3	mg/l	130	5.0	ND		
pH	std	7.6	-	N/A		
Specific Conductance	µm/cm	430	20	ND		
Chemical Oxygen Demand (COD)	mg/l	<1	1	ND		
Total Dissolved Solids (TDS)	mg/l	275	10	ND		
Chloride	mg/l	24	2.0	ND		
Fluoride	mg/l	<.1	.1	ND		
Calcium	mg/l	35	.1	ND		
Magnesium	mg/l	10	.1	ND		
Nitrate as NO3	mg/l	.74	.04	ND		
Potassium	mg/l	1.61	.2	ND		
Sodium	mg/l	36	.4	ND		
Sulfate	mg/l	.78	1	ND		

Ał.. 26, 1990

TABLE 1: QUANTITATIVE RESULTS

METALS (ZR52)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Joblink
MB1358	COUNTY OF MENDOCINO	600-081	L L87-3	900413	802784

Compound	Results: Sample Concen. mg/L	Report DL mg/L	Blank Concen. mg/L	Batch #
Aluminum, Total	.257	.200	ND	Q1213
Antimony, Total	ND	.060	ND	Q1213
Arsenic, Total	ND	.100	ND	Q1213
Barium, Total	.194	.020	ND	Q1213
Beryllium, Total	ND	.005	ND	Q1213
Boron, Total	ND	.500	ND	Q1213
Cadmium, Total	ND	.005	ND	Q1213
Calcium, Total	26.8	1.00	ND	Q1213
Chromium, Total	ND	.010	ND	Q1213
Cobalt, Total	ND	.020	ND	Q1213
Copper, Total	.027	.010	ND	Q1213
Iron, Total	6.06	.100	ND	Q1213
Lead, Total	ND	.075	ND	Q1213
Lithium, Total	ND	.050	ND	Q1213
Magnesium, Total	8.78	1.00	ND	Q1213
Manganese, Total	1.63	.010	ND	Q1213
Molybdenum, Total	ND	.020	ND	Q1213
Nickel, Total	ND	.020	ND	Q1213
Potassium, Total	ND	2.00	ND	Q1213
Selenium, Total	ND	.100	ND	Q1213
Silver, Total	ND	.010	ND	Q1213
Sodium, Total	26.7	1.00	ND	Q1213
Thallium, Total	ND	.100	ND	Q1213
Tin, Total	ND	.100	ND	Q1213
Titanium, Total	ND	.050	ND	Q1213
Vanadium, Total	ND	.020	ND	Q1213
Zinc, Total	ND	.020	ND	Q1213

TABLE 1: QUANTITATIVE RESULTS

CHAIN OF CUSTODY DATA REQUIRED FOR ETC DATA MANAGEMENT SUMMARY REPORTS

ETC Sample No.	Company	Facility	Sample Point	Date	Joblink
MB1358	COUNTY OF MENDOCINO	600-081	L87-3	04-13-90	802784

Compound		Results				
		Sample Concen.	Report DL.	Blank Concen.	Batch #	
Hydroxide as CaCO3	mg/l	0	0	ND		
Bicarbonate as CaCO3	mg/l	181	0	ND		
Carbonate as CaCO3	mg/l	0	0	ND		
Hardness as CaCO3	mg/l	92	5.0	ND		
pH	std	7.0	-	N/A		
Specific Conductance	um/cm	327	20	ND		
Chemical Oxygen Demand (COD)	mg/l	<1	1	ND		
Total Dissolved Solids (TDS)	mg/l	209	10	ND		
Chloride	mg/l	27	2.0	ND		
Fluoride	mg/l	<.1	.1	ND		
Calcium	mg/l	23	.1	ND		
Magnesium	mg/l	8.4	.1	ND		
Nitrate as NO3	mg/l	.48	.04	ND		
Potassium	mg/l	1.16	.2	ND		
Sodium	mg/l	28	.4	ND		
Sulfate	mg/l	4	1	ND		

SURFACE WATER AND LEACHATE

Alpha
Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CLIENT EBA Wastechnologies
ADDRESS P.O. Box 4600
Santa Rosa, CA 95402

DATE COLLECTED 1-12-90
DATE IN LAB 1-12-90
COLLECTED BY Steve Ford
SAMPLE TYPE Water

LABORATORY NO.: 90-0112-21-1
CLIENT I.D. : Laytonville LSW-1

Parameter	Results	Units	Reporting Limit	Analytical Method
Methyl ethyl ketone	7.8	µg/L (ppb)	1	Modified 602
Acetone	13	µg/L (ppb)	5	Modified 602

Alpha
Analytical Laboratories, Inc.

LABORATORY DIRECTOR 1-13-90 DATE

Alpha
Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CLIENT EBA Wastechnologies
ADDRESS P.O. Box 4600
Santa Rosa, CA 95402

DATE COLLECTED 1-12-90
DATE IN LAB 1-12-90
COLLECTED BY Steve Ford
SAMPLE TYPE Water

LABORATORY NO.: 90-0112-21-1
CLIENT I.D. : Laytonville LSW-1

Parameter	Results	Units	Reporting Limit	Analytical Method
Aluminum	3.4	mg/L (ppm)	0.1	Method 200.7
Antimony	ND	mg/L (ppm)	0.05	Method 200.7
Arsenic	ND	mg/L (ppm)	0.1	Method 200.7
Barium	0.052	mg/L (ppm)	0.01	Method 200.7
Beryllium	ND	mg/L (ppm)	0.002	Method 200.7
Boron	0.047	mg/L (ppm)	0.02	Method 200.7
Cadmium	ND	mg/L (ppm)	0.005	Method 200.7
Calcium	5.1	mg/L (ppm)	0.1	Method 200.7
Chromium	ND	mg/L (ppm)	0.01	Method 200.7
Cobalt	ND	mg/L (ppm)	0.01	Method 200.7
Copper	0.012	mg/L (ppm)	0.01	Method 200.7
Iron	5.4	mg/L (ppm)	0.1	Method 200.7
Lead	ND	mg/L (ppm)	0.05	Method 200.7
Lithium	ND	mg/L (ppm)	0.05	Method 200.7
Magnesium	7.5	mg/L (ppm)	0.2	Method 200.7
Manganese	0.12	mg/L (ppm)	0.01	Method 200.7
Molybdenum	ND	mg/L (ppm)	0.02	Method 200.7
Nickel	ND	mg/L (ppm)	0.04	Method 200.7
Potassium	ND	mg/L (ppm)	5	Method 200.7
Selenium	ND	mg/L (ppm)	0.2	Method 200.7
Silver	ND	mg/L (ppm)	0.01	Method 200.7
Sodium	17.3	mg/L (ppm)	5	Method 200.7
Thallium	ND	mg/L (ppm)	2	Method 200.7
Tin	ND	mg/L (ppm)	0.05	Method 200.7
Titanium	0.084	mg/L (ppm)	0.005	Method 200.7
Vanadium	0.016	mg/L (ppm)	0.01	Method 200.7
Zinc	0.050	mg/L (ppm)	0.01	Method 200.7

ND = None detected

Alpha
Analytical Laboratories, Inc.

Bruce L. Lowe 2-13-90
LABORATORY DIRECTOR DATE

Alpha
Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CLIENT EBA Wastechnologies
ADDRESS P.O. Box 4600
Santa Rosa, CA 95402

DATE COLLECTED 1-12-90
DATE IN LAB 1-12-90
COLLECTED BY Steve Ford
SAMPLE TYPE Water

LABORATORY NO.: 90-0112-21-2
CLIENT I.D. : Laytonville LSW-2

Parameter	Results	Units	Reporting Limit	Analytical Method
Aluminum	52.2	mg/L (ppm)	0.1	Method 200.7
Antimony	ND	mg/L (ppm)	0.05	Method 200.7
Arsenic	ND	mg/L (ppm)	0.1	Method 200.7
Barium	0.45	mg/L (ppm)	0.01	Method 200.7
Beryllium	0.0028	mg/L (ppm)	0.002	Method 200.7
Boron	ND	mg/L (ppm)	0.02	Method 200.7
Cadmium	ND	mg/L (ppm)	0.005	Method 200.7
Calcium	5.6	mg/L (ppm)	0.1	Method 200.7
Chromium	0.097	mg/L (ppm)	0.01	Method 200.7
Cobalt	0.019	mg/L (ppm)	0.01	Method 200.7
Copper	0.070	mg/L (ppm)	0.01	Method 200.7
Iron	66.1	mg/L (ppm)	0.1	Method 200.7
Lead	ND	mg/L (ppm)	0.05	Method 200.7
Lithium	ND	mg/L (ppm)	0.05	Method 200.7
Magnesium	14.9	mg/L (ppm)	0.2	Method 200.7
Manganese	0.78	mg/L (ppm)	0.01	Method 200.7
Molybdenum	ND	mg/L (ppm)	0.02	Method 200.7
Nickel	0.10	mg/L (ppm)	0.04	Method 200.7
Potassium	ND	mg/L (ppm)	5	Method 200.7
Selenium	ND	mg/L (ppm)	0.2	Method 200.7
Silver	ND	mg/L (ppm)	0.01	Method 200.7
Sodium	7.3	mg/L (ppm)	5	Method 200.7
Thallium	ND	mg/L (ppm)	2	Method 200.7
Tin	ND	mg/L (ppm)	0.05	Method 200.7
Titanium	0.71	mg/L (ppm)	0.005	Method 200.7
Vanadium	0.14	mg/L (ppm)	0.01	Method 200.7
Zinc	0.16	mg/L (ppm)	0.01	Method 200.7

ND = None detected

Alpha
Analytical Laboratories, Inc.

Bruce L. Gore 2-13-90
LABORATORY DIRECTOR DATE

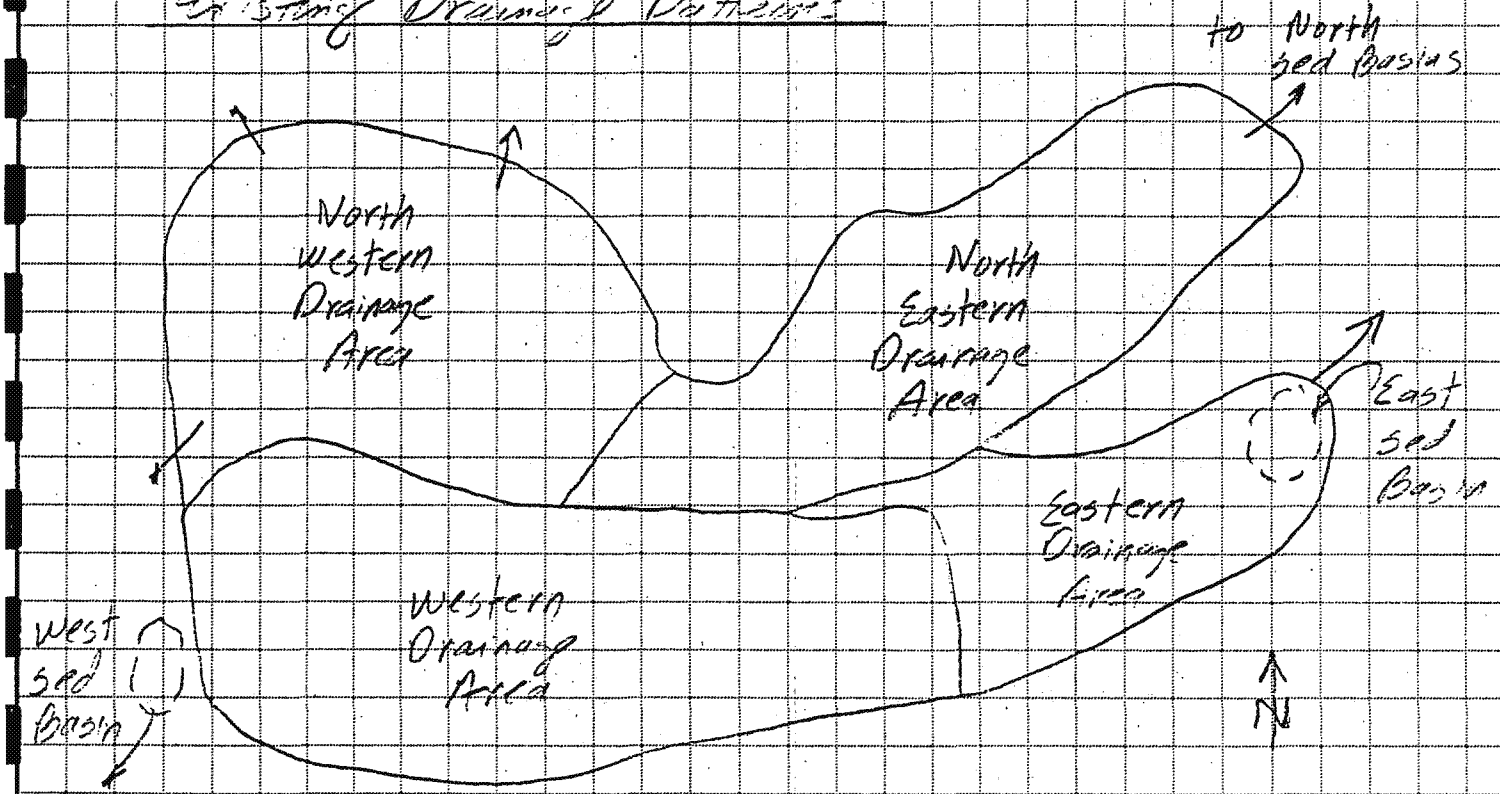
SHN CONSULTING ENGINEERS & GEOLOGISTS
2630 Harrison Avenue
EUREKA, CA 95501
(707) 444-0427

JOB 400189.300
SHEET NO. 1 OF 7
CALCULATED BY TJT DATE 10/31/91
CHECKED BY DATE
SCALE

County of Mendocino

Laytonville Landfill

Existing Drainage Patterns



PRODUCT 204-1 (Single Sheets) 205-1 (Padded) NEBS Inc., Groton, Mass. 01471. To Order PHONE TOLL FREE 1-800-225-6380

REFERENCE
No. 11

DELETED

REFERENCE
No. 12

MICHAEL K. SCANNELL
County Administrative Officer

PAUL CAYLER
Director

SOLID WASTE DIVISION
559 LOW GAP ROAD
UKIAH, CALIFORNIA 95482
(707) 463-4078
FAX: (707) 468-3427

September 8, 1997

Anthony & Marissa Shields
44241 Lakeview Road
Laytonville, CA 95454

RE: DOMESTIC WELL TESTING

Dear Mr. & Mrs. Shields:

Please find attached a chemical examination report from samples taken on 8/22/97 from the drinking water well at the above address (AP No. 14-374-12). If you have any questions, please contact me at (707) 463-4078.

Sincerely,

Paul Cayler

Paul Cayler,
Solid Waste Division Director

cc: file Laytonville Landfill General Correspondence
John Pinches, 3rd Dist. Supervisor
David Evans, NCRWQCB
X John Morley, MCEHD

RECEIVED
SEP 10 1997
MENDO. ENV. HEALTH

RECEIVED
SEP 05 1997
MENDOCINO COUNTY
SOLID WASTE DIVISION

Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482

Date Printed	Page
9/05/97	1

Batch Number	Receipt Date	Client	Client P.O.	Send Via
97-0822-026	08/22/97 09:07	MCDPW		Mail

Batch 97-0822-026 consisted of 1 Sample and 40 Tests

Sample 1 Outside Faucet - Lakeview Ave/Shields
Sample Type: Water Sampled by: Client Sampled: 8/22/97 15:20

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL	DILUTION
Stan Min - Mod.							
Carbonate Alkalinity	403		8/22/97	0	mg/l	0	
Bicarbonate Alkalinity	403		8/22/97	75	mg/l	1	
Alkalinity, Hydroxide	310.1		8/22/97	ND	mg/l	1	
Chloride	300.0		8/25/97	28	mg/l	1	
Fluoride	300.0		8/22/97	.14	mg/l	.1	
Nitrate	300.0		8/22/97	ND	mg/l	1	
Sulfate	300.0		8/22/97	ND	mg/l	.5	
pH	150		8/22/97	6.9	pH	1	
Specific Conductance	120.1		8/22/97	214	umhos	20	
Total Dissolved Solids	160.1		8/22/97	107	mg/l	10	
Chemical Oxygen Demand	410.4		8/28/97	ND	mg/l	1	
Total Hardness, Calculation	130.2		8/26/97	46	mg/l	5	
27 Metals							
Antimony	EPA 6010		8/25/97	ND	mg/l	0.50	
Aluminum	EPA 6010		8/25/97	.38	mg/l	0.05	
Beryllium	EPA 6010		8/25/97	ND	mg/l	0.01	
Cadmium	EPA 6010		8/25/97	ND	mg/l	.001	
Calcium	EPA 6010		8/25/97	12	mg/l	1.0	
Arsenic GF	EPA 200.9		8/26/97	.016	mg/l	.005	
Cobalt	EPA 6010		8/25/97	ND	mg/l	0.10	
Barium	EPA 6010		8/25/97	.1	mg/l	0.10	

PQL - Practical Quantitation Limit ND - None Detected
* - Indicates Detection Limit altered due to Sample Dilution

NOTES:

Bruce L. Gove
Laboratory Director

Bruce L. Gove

Date Printed: 9/05/97

Alpha
Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482

Date Printed 9/05/97 | Page 2

Batch Number	Receipt Date	Client	Client P.O.	Send Via
97-0822-026	08/22/97 09:07	MCDPH		Mail

(Sample 1 Outside Faucet - Lakeview Ave/Shields -- continued)

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL	DILUTION
Chromium	EPA 6010		8/25/97	ND	mg/l	0.01	
Magnesium	EPA 6010		8/25/97	3.3	mg/l	1.0	
Copper	EPA 6010		8/25/97	ND	mg/l	0.05	
Iron	EPA 6010		8/25/97	5.7	mg/l	0.10	
Molybdenum	EPA 6010		8/25/97	ND	mg/l	0.50	
Nickel	EPA 6010		8/25/97	ND	mg/l	0.05	
Potassium	EPA 6010		8/25/97	ND	mg/l	1.0	
Lead GF	EPA 200.9		8/25/97	ND	mg/l	.005	
Manganese	EPA 6010		8/25/97	.78	mg/l	0.03	
Sodium	EPA 6010		8/25/97	33	mg/l	1.0	
Mercury	EPA 7470		8/25/97	ND	mg/l	.001	
Thallium	EPA 6010		8/25/97	ND	mg/l	0.20	
Tin	EPA 6010		8/25/97	ND	mg/l	0.50	
Titanium	EPA 6010		8/25/97	ND	mg/l	0.50	
Vanadium	EPA 6010		8/25/97	ND	mg/l	0.50	
Selenium GF	EPA200.9		8/26/97	ND	mg/l	0.50	
Silver	EPA 6010		8/25/97	ND	mg/l	0.01	
Zinc	EPA 6010		8/25/97	.27	mg/l	0.05	
Boron	EPA 6010		8/25/97	.12	mg/l	0.10	
Volatile Organic Compounds	EPA502.2		8/30/97				
Benzene				ND	ug/l	.300	
Bromobenzene				ND	ug/l	.500	
Bromochloromethane				ND	ug/l	.500	
Bromodichloromethane				ND	ug/l	.500	
Bromoform				ND	ug/l	.500	
Bromomethane				ND	ug/l	.500	

PQL - Practical Quantitation Limit ND - None Detected
* - Indicates Detection Limit altered due to Sample Dilution

NOTES:

Bruce L. Gove
Laboratory Director

Bruce L. Gove

Date Printed: 9/05/97

Alpha
Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482

Date Printed 9/05/97 Page 3

Batch Number	Receipt Date	Client	Client P.O.	Send Via
97-0822-026	08/22/97 09:07	MCDPW		Mail

(Sample 1 Outside Faucet - Lakeview Ave/Shields -- continued)

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL	DILUTION
n-Butylbenzene				ND	ug/l	.500	
sec-Butylbenzene				ND	ug/l	.500	
tert-Butylbenzene				ND	ug/l	.500	
Carbon Tetrachloride				ND	ug/l	.500	
Chlorobenzene				ND	ug/l	.500	
Chloroethane				ND	ug/l	.500	
2-Chloroethylvinyl Ether				ND	ug/l	1.0	
Chloroform				ND	ug/l	.500	
Chloromethane				ND	ug/l	.500	
2-Chlorotoluene				ND	ug/l	.500	
4-Chlorotoluene				ND	ug/l	.500	
Dibromochloromethane				ND	ug/l	.500	
Dibromomethane				ND	ug/l	.500	
1,2-Dichlorobenzene				ND	ug/l	.500	
1,3-Dichlorobenzene				ND	ug/l	.500	
1,4-Dichlorobenzene				ND	ug/l	.500	
Dichlorodifluoromethane				ND	ug/l	.500	
1,1-Dichloroethane				ND	ug/l	.500	
1,2-Dichloroethane				ND	ug/l	.500	
1,1-Dichloroethylene				ND	ug/l	.300	
cis-1,2-Dichloroethylene				ND	ug/l	.500	
trans-1,2-Dichloroethylene				ND	ug/l	.500	
1,2-Dichloropropane				ND	ug/l	.500	
1,3-Dichloropropane				ND	ug/l	.500	
2,2-Dichloropropane				ND	ug/l	.500	
1,1-Dichloropropene				ND	ug/l	.500	
1,3-Dichloropropene				ND	ug/l	.500	

PQL - Practical Quantitation Limit ND - None Detected
* - Indicates Detection Limit altered due to Sample Dilution

NOTES:

Bruce L. Gove
Laboratory Director

Bruce L Gove
Date Printed: 9/05/97 EO

Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482

Date Printed: 9/05/97
Page: 4

Batch Number	Receipt Date	Client	Client P.O.	Send Via
97-0822-026	08/22/97 09:07	MCDPW		Mail

(Sample 1 Outside Faucet - Lakeview Ave/Shields -- continued)

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL	DILUTION
Ethylbenzene				ND	ug/l	.500	
Hexachlorobutadiene				ND	ug/l	.500	
Isopropylbenzene				ND	ug/l	.500	
p-Isopropyltoluene				ND	ug/l	.500	
Methyl Ethyl Ketone				ND	ug/l	1.0	
Methyl Isobutyl Ketone				ND	ug/l	1.0	
Methylene Chloride				ND	ug/l	.500	
Naphthalene				ND	ug/l	.500	
n-Propylbenzene				ND	ug/l	.500	
Styrene				ND	ug/l	.500	
1,1,1,2-Tetrachloroethane				ND	ug/l	.500	
1,1,2,2-Tetrachloroethane				ND	ug/l	.500	
Tetrachloroethylene				ND	ug/l	.500	
Toluene				ND	ug/l	.300	
1,2,3-Trichlorobenzene				ND	ug/l	.500	
1,2,4-Trichlorobenzene				ND	ug/l	.500	
1,1,1-Trichloroethane				ND	ug/l	.500	
1,1,2-Trichloroethane				ND	ug/l	.500	
Trichloroethylene				ND	ug/l	.500	
Trichlorofluoromethane				ND	ug/l	.500	
Trichlorotrifluoroethane				ND	ug/l	.500	
1,2,3-Trichloropropane				ND	ug/l	.500	
Total Trihalomethanes				ND	ug/l	.500	
1,2,4-Trimethylbenzene				ND	ug/l	.500	
1,3,5-Trimethylbenzene				ND	ug/l	.500	
Vinyl Chloride				ND	ug/l	.500	
m,p-Xylene				ND	ug/l	.500	

PQL - Practical Quantitation Limit ND - None Detected
* - Indicates Detection Limit altered due to Sample Dilution

NOTES:

Bruce L. Gove
Laboratory Director

Bruce L Gove
Date Printed: 9/05/97

Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
559 Low Gap Road
Ukiah, CA 95482

Date Printed	Page
9/05/97	5

Batch Number	Receipt Date	Client	Client P.O.	Send Via
97-0822-026	08/22/97 09:07	MCDPW		Mail

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	PQL	DILUTION
(Sample 1 Outside Faucet - Lakeview Ave/Shields -- continued)							
o-Xylene				ND	ug/l	.500	
Total Xylenes				ND	ug/l	.500	

PQL - Practical Quantitation Limit ND - None Detected
* - Indicates Detection Limit altered due to Sample Dilution

NOTES:

Bruce L. Gove
Laboratory Director

Bruce L. Gove

Date Printed: 9/05/97

REFERENCE
No. 13

COUNTY MENDOCINO
SOLID WASTE DIVISION
559 LOW GAP ROAD
UKIAH CA 95482
TEL:(707)-463-4078
FAX:(707)-468-3427

FACSIMILE TRANSMITTAL SHEET

TO: Paula Abajian
FROM: ~~Allen Kyle~~ Paul Taylor
COMPANY: Weston, Inc.
DATE: 7/26/2001
FAX NUMBER: 925 945 6485
TOTAL NO. OF PAGES INCLUDING COVER: 14
PHONE NUMBER:
SENDER'S REFERENCE NUMBER:
RE:
YOUR REFERENCE NUMBER:

☐ URGENT ☑ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Paula:

This is the data which you requested.

Paul

NET

Client No: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.01279

Date: 04/21/1993
Page: 2

Ref: Laytonville Well Survey

Descriptor, Lab No. and Results

Parameter	French Well 04/02/1993 10:30 154297	Trip Blank 04/02/1993 10:30 154298	Reporting Limit	Units	Method
METHOD 601 & 602 (GC,Liquid)					
DATE ANALYZED	04-07-93	04-06-93			
DILUTION FACTOR*	1	1			
Bromodichloromethane	ND	ND	0.4	ug/L	601
Bromoform	ND	ND	0.4	ug/L	601
Bromomethane	ND	ND	0.4	ug/L	601
Carbon tetrachloride	ND	ND	0.4	ug/L	601
Chlorobenzene	ND	ND	0.4	ug/L	601
Chloroethane	ND	ND	0.4	ug/L	601
2-Chloroethylvinyl ether	ND	ND	1.0	ug/L	601
Chloroform	ND	ND	0.4	ug/L	601
Chloromethane	ND	ND	0.4	ug/L	601
Dibromochloromethane	ND	ND	0.4	ug/L	601
1,2-Dichlorobenzene	ND	ND	0.4	ug/L	602
1,3-Dichlorobenzene	ND	ND	0.4	ug/L	601
1,4-Dichlorobenzene	ND	ND	0.4	ug/L	601
Dichlorodifluoromethane	ND	ND	0.4	ug/L	601
1,1-Dichloroethane	ND	ND	0.4	ug/L	601
1,2-Dichloroethane	ND	ND	0.4	ug/L	601
1,1-Dichloroethene	ND	ND	0.4	ug/L	601
trans-1,2-Dichloroethene	ND	ND	0.4	ug/L	601
1,2-Dichloropropane	ND	ND	0.4	ug/L	601
cis-1,3-Dichloropropene	ND	ND	0.4	ug/L	601
trans-1,3-Dichloropropene	ND	ND	0.4	ug/L	601
Methylene chloride	ND	ND	10	ug/L	601
1,1,2,2-Tetrachloroethane	ND	ND	0.4	ug/L	601
Tetrachloroethene	ND	ND	0.4	ug/L	601
1,1,1-Trichloroethane	ND	ND	0.4	ug/L	601
1,1,2-Trichloroethane	ND	ND	0.4	ug/L	601
Trichloroethene	ND	ND	0.4	ug/L	601
Trichlorofluoromethane	ND	ND	0.4	ug/L	601
Vinyl chloride	ND	ND	0.4	ug/L	601
Benzene	ND	ND	0.5	ug/L	602
Ethylbenzene	ND	ND	0.6	ug/L	602
Toluene	4.1	ND	0.5	ug/L	602
Xylenes (total)	ND	ND	0.6	ug/L	602
SURROGATE RESULTS	--	--			
1,4-Difluorobenzene	100	99		% Rec.	601&602
1,4-Dichlorobutane	106	100		% Rec.	601&602

NET®

Client Acct: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.00813

Date: 03/25/1993
Page: 2

Ref: Laytonville Well Survey

SAMPLE DESCRIPTION: French Well
Date Taken: 03/03/1993
Time Taken: 14:45
LAB Job No: (-152183)

Parameter	Results	Reporting Limit	Units	Method
pH	6.6	N/A	pH units	150.1
Conductivity	320	1.0	umhos/cm	9050
Tot. Dissolved Solids (TFR)	210	10	mg/L	160.1
Chloride	26	1.0	mg/L	300.0
Sulfate	ND	1.0	mg/L	300.0
Chemical Oxygen Demand	21	10	mg/L	410.4
Hardness (Total, as CaCO3)	470	5.0	mg/L	2340B
EPA Method 6010 (ICAP Scan)				
Antimony (ICP)	ND	0.1	mg/L	EPA 6010
Arsenic (GFAA)	ND	0.005	mg/L	EPA 7060
Barium (ICP)	0.31	0.02	mg/L	EPA 6010
Beryllium (ICP)	ND	0.02	mg/L	EPA 6010
Cadmium (ICP)	ND	0.02	mg/L	EPA 6010
Calcium (ICP)	24	0.5	mg/L	EPA 6010
Chromium (ICP)	ND	0.02	mg/L	EPA 6010
Cobalt (ICP)	ND	0.05	mg/L	EPA 6010
Copper (ICP)	ND	0.02	mg/L	EPA 6010
Iron (ICP)	17	0.05	mg/L	EPA 6010
Lead (ICP)	ND	0.2	mg/L	EPA 6010
Magnesium (ICP)	10	0.5	mg/L	EPA 6010
Manganese (ICP)	2.5	0.02	mg/L	EPA 6010
Mercury (CVAA)	ND	0.0005	mg/L	EPA 7470
Molybdenum (ICP)	ND	0.05	mg/L	EPA 6010
Nickel (ICP)	ND	0.05	mg/L	EPA 6010
Potassium (FLAA)	1.2	0.05	mg/L	EPA 7610
Selenium (GFAA)	ND	0.005	mg/L	EPA 7740
Silver (ICP)	ND	0.02	mg/L	EPA 6010
Sodium (FLAA)	30	0.05	mg/L	EPA 7770
Thallium (ICP)	ND	0.2	mg/L	EPA 6010
Vanadium (ICP)	ND	0.05	mg/L	EPA 6010
Zinc (ICP)	ND	0.05	mg/L	EPA 6010

NET®

Client Acct: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.00813

Date: 03/25/1993
Page: 3

Ref: Laytonville Well Survey

SAMPLE DESCRIPTION: French Well **
Date Taken: 03/03/1993
Time Taken: 14:45
LAB Job No: (-152183)

Parameter	Results	Reporting Limit	Units	Method
METHOD 601 & 602 (GC,Liquid)				
DATE ANALYZED	03-05-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	0.4	ug/L	601
Bromoform	ND	0.4	ug/L	601
Bromomethane	ND	0.4	ug/L	601
Carbon tetrachloride	ND	0.4	ug/L	601
Chlorobenzene	ND	0.4	ug/L	601
Chloroethane	ND	0.4	ug/L	601
2-Chloroethylvinyl ether	ND	1.0	ug/L	601
Chloroform	ND	0.4	ug/L	601
Chloromethane	ND	0.4	ug/L	601
Dibromochloromethane	ND	0.4	ug/L	601
1,2-Dichlorobenzene	ND	0.4	ug/L	602
1,3-Dichlorobenzene	ND	0.4	ug/L	601
1,4-Dichlorobenzene	ND	0.4	ug/L	601
Dichlorodifluoromethane	ND	0.4	ug/L	601
1,1-Dichloroethane	ND	0.4	ug/L	601
1,2-Dichloroethane	ND	0.4	ug/L	601
1,1-Dichloroethene	ND	0.4	ug/L	601
trans-1,2-Dichloroethene	ND	0.4	ug/L	601
1,2-Dichloropropane	ND	0.4	ug/L	601
cis-1,3-Dichloropropene	ND	0.4	ug/L	601
trans-1,3-Dichloropropene	ND	0.4	ug/L	601
Methylene chloride	ND	10	ug/L	601
1,1,2,2-Tetrachloroethane	ND	0.4	ug/L	601
Tetrachloroethene	ND	0.4	ug/L	601
1,1,1-Trichloroethane	0.5	0.4	ug/L	601
1,1,2-Trichloroethane	ND	0.4	ug/L	601
Trichloroethene	ND	0.4	ug/L	601
Trichlorofluoromethane	ND	0.4	ug/L	601
Vinyl chloride	ND	0.4	ug/L	601
Benzene	ND	0.5	ug/L	602
Ethylbenzene	ND	0.6	ug/L	602
Toluene	ND	0.5	ug/L	602
Xylenes (total)	ND	0.6	ug/L	602
SURROGATE RESULTS	--			
1,4-Difluorobenzene	94		% Rec.	601&602
1,4-Dichlorobutane	74		% Rec.	601&602

** Headspace found in VOA vials for this sample upon receipt at laboratory

NET®

Client Acct: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.00813

Date: 03/25/1993
Page: 4

Ref: Laytonville Well Survey

SAMPLE DESCRIPTION: Dodd Well 112 CREEKSIDE RD. (?)
Date Taken: 03/03/1993
Time Taken: 14:20
LAB Job No: (-152184)

Parameter	Results	Reporting Limit	Units	Method
pH	6.0	N/A	pH units	150.1
Conductivity	120	1.0	umhos/cm	9050
Tot. Dissolved Solids (TFR)	90	10	mg/L	160.1
Chloride	16	1.0	mg/L	300.0
Sulfate	4.7	1.0	mg/L	300.0
Chemical Oxygen Demand	36	10	mg/L	410.4
Hardness (Total, as CaCO3)	8.6	5.0	mg/L	2340B
EPA Method 6010 (ICAP Scan)				
Antimony (ICP)	ND	0.1	mg/L	EPA 6010
Arsenic (GFAA)	ND	0.005	mg/L	EPA 7060
Barium (ICP)	0.02	0.02	mg/L	EPA 6010
Beryllium (ICP)	ND	0.02	mg/L	EPA 6010
Cadmium (ICP)	ND	0.02	mg/L	EPA 6010
Calcium (ICP)	2.0	0.5	mg/L	EPA 6010
Chromium (ICP)	ND	0.02	mg/L	EPA 6010
Cobalt (ICP)	ND	0.05	mg/L	EPA 6010
Copper (ICP)	ND	0.02	mg/L	EPA 6010
Iron (ICP)	0.91	0.05	mg/L	EPA 6010
Lead (ICP)	ND	0.2	mg/L	EPA 6010
Magnesium (ICP)	0.89	0.5	mg/L	EPA 6010
Manganese (ICP)	0.12	0.02	mg/L	EPA 6010
Mercury (CVAA)	ND	0.0005	mg/L	EPA 7470
Molybdenum (ICP)	ND	0.05	mg/L	EPA 6010
Nickel (ICP)	ND	0.05	mg/L	EPA 6010
Potassium (FLAA)	ND	0.05	mg/L	EPA 7610
Selenium (GFAA)	ND	0.005	mg/L	EPA 7740
Silver (ICP)	ND	0.02	mg/L	EPA 6010
Sodium (FLAA)	23	0.05	mg/L	EPA 7770
Thallium (ICP)	ND	0.2	mg/L	EPA 6010
Vanadium (ICP)	ND	0.05	mg/L	EPA 6010
Zinc (ICP)	ND	0.05	mg/L	EPA 6010

NET®

Client Acct: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.00813

Date: 03/25/1993
Page: 5

Ref: Laytonville Well Survey

SAMPLE DESCRIPTION: Dodd Well
Date Taken: 03/03/1993
Time Taken: 14:20
LAB Job No: (-152184)

Parameter	Results	Reporting Limit	Units	Method
METHOD 601 & 602 (GC,Liquid)				
DATE ANALYZED	03-05-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	0.4	ug/L	601
Bromoform	ND	0.4	ug/L	601
Bromomethane	ND	0.4	ug/L	601
Carbon tetrachloride	ND	0.4	ug/L	601
Chlorobenzene	ND	0.4	ug/L	601
Chloroethane	ND	0.4	ug/L	601
2-Chloroethylvinyl ether	ND	1.0	ug/L	601
Chloroform	ND	0.4	ug/L	601
Chloromethane	ND	0.4	ug/L	601
Dibromochloromethane	ND	0.4	ug/L	601
1,2-Dichlorobenzene	ND	0.4	ug/L	602
1,3-Dichlorobenzene	ND	0.4	ug/L	601
1,4-Dichlorobenzene	ND	0.4	ug/L	601
Dichlorodifluoromethane	ND	0.4	ug/L	601
1,1-Dichloroethane	ND	0.4	ug/L	601
1,2-Dichloroethane	ND	0.4	ug/L	601
1,1-Dichloroethene	ND	0.4	ug/L	601
trans-1,2-Dichloroethene	ND	0.4	ug/L	601
1,2-Dichloropropane	ND	0.4	ug/L	601
cis-1,3-Dichloropropene	ND	0.4	ug/L	601
trans-1,3-Dichloropropene	ND	0.4	ug/L	601
Methylene chloride	ND	10	ug/L	601
1,1,2,2-Tetrachloroethane	ND	0.4	ug/L	601
Tetrachloroethene	ND	0.4	ug/L	601
1,1,1-Trichloroethane	ND	0.4	ug/L	601
1,1,2-Trichloroethane	ND	0.4	ug/L	601
Trichloroethene	ND	0.4	ug/L	601
Trichlorofluoromethane	ND	0.4	ug/L	601
Vinyl chloride	ND	0.4	ug/L	601
Benzene	ND	0.5	ug/L	602
Ethylbenzene	ND	0.6	ug/L	602
Toluene	ND	0.5	ug/L	602
Xylenes (total)	ND	0.6	ug/L	602
SURROGATE RESULTS	--			
1,4-Difluorobenzene	104		% Rec.	601&602
1,4-Dichlorobutane	80		% Rec.	601&602

NET®

Client Acct: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.00813

Date: 03/25/1993
Page: 6

Ref: Laytonville Well Survey

SAMPLE DESCRIPTION: Schliep Ranch
Date Taken: 03/03/1993
Time Taken: 13:45
LAB Job No: (-152185)

Parameter	Results	Reporting Limit	Units	Method
pH	6.8	N/A	pH units	150.1
Conductivity	52	1.0	umhos/cm	9050
Tot. Dissolved Solids (TFR)	53	10	mg/L	160.1
Chloride	7.8	1.0	mg/L	300.0
Sulfate	1.3	1.0	mg/L	300.0
Chemical Oxygen Demand	ND	10	mg/L	410.4
Hardness (Total, as CaCO3)	14	5.0	mg/L	2340B
EPA Method 6010 (ICAP Scan)				
Antimony (ICP)	ND	0.1	mg/L	EPA 6010
Arsenic (GFAA)	ND	0.005	mg/L	EPA 7060
Barium (ICP)	0.02	0.02	mg/L	EPA 6010
Beryllium (ICP)	ND	0.02	mg/L	EPA 6010
Cadmium (ICP)	ND	0.02	mg/L	EPA 6010
Calcium (ICP)	2.3	0.5	mg/L	EPA 6010
Chromium (ICP)	ND	0.02	mg/L	EPA 6010
Cobalt (ICP)	ND	0.05	mg/L	EPA 6010
Copper (ICP)	ND	0.02	mg/L	EPA 6010
Iron (ICP)	0.92	0.05	mg/L	EPA 6010
Lead (ICP)	ND	0.2	mg/L	EPA 6010
Magnesium (ICP)	1.9	0.5	mg/L	EPA 6010
Manganese (ICP)	0.05	0.02	mg/L	EPA 6010
Mercury (CVAA)	ND	0.0005	mg/L	EPA 7470
Molybdenum (ICP)	ND	0.05	mg/L	EPA 6010
Nickel (ICP)	ND	0.05	mg/L	EPA 6010
Potassium (FLAA)	ND	0.05	mg/L	EPA 7610
Selenium (GFAA)	ND	0.005	mg/L	EPA 7740
Silver (ICP)	ND	0.02	mg/L	EPA 6010
Sodium (FLAA)	5.3	0.05	mg/L	EPA 7770
Thallium (ICP)	ND	0.2	mg/L	EPA 6010
Vanadium (ICP)	ND	0.05	mg/L	EPA 6010
Zinc (ICP)	ND	0.05	mg/L	EPA 6010

NET®

Client Acct: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.00813

Date: 03/25/1993
Page: 7

Ref: Laytonville Well Survey

SAMPLE DESCRIPTION: Schliep Ranch
Date Taken: 03/03/1993
Time Taken: 13:45
LAB Job No: (-152185)

Parameter	Results	Reporting Limit	Units	Method
METHOD 601 & 602 (GC,Liquid)				
DATE ANALYZED	03-05-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	0.4	ug/L	601
Bromoform	ND	0.4	ug/L	601
Bromomethane	ND	0.4	ug/L	601
Carbon tetrachloride	ND	0.4	ug/L	601
Chlorobenzene	ND	0.4	ug/L	601
Chloroethane	ND	0.4	ug/L	601
2-Chloroethylvinyl ether	ND	1.0	ug/L	601
Chloroform	ND	0.4	ug/L	601
Chloromethane	ND	0.4	ug/L	601
Dibromochloromethane	ND	0.4	ug/L	601
1,2-Dichlorobenzene	ND	0.4	ug/L	602
1,3-Dichlorobenzene	ND	0.4	ug/L	601
1,4-Dichlorobenzene	ND	0.4	ug/L	601
Dichlorodifluoromethane	ND	0.4	ug/L	601
1,1-Dichloroethane	ND	0.4	ug/L	601
1,2-Dichloroethane	ND	0.4	ug/L	601
1,1-Dichloroethene	ND	0.4	ug/L	601
trans-1,2-Dichloroethene	ND	0.4	ug/L	601
1,2-Dichloropropane	ND	0.4	ug/L	601
cis-1,3-Dichloropropene	ND	0.4	ug/L	601
trans-1,3-Dichloropropene	ND	0.4	ug/L	601
Methylene chloride	ND	10	ug/L	601
1,1,2,2-Tetrachloroethane	ND	0.4	ug/L	601
Tetrachloroethene	ND	0.4	ug/L	601
1,1,1-Trichloroethane	ND	0.4	ug/L	601
1,1,2-Trichloroethane	ND	0.4	ug/L	601
Trichloroethene	ND	0.4	ug/L	601
Trichlorofluoromethane	ND	0.4	ug/L	601
Vinyl chloride	ND	0.4	ug/L	601
Benzene	ND	0.5	ug/L	602
Ethylbenzene	ND	0.6	ug/L	602
Toluene	ND	0.5	ug/L	602
Xylenes (total)	ND	0.6	ug/L	602
SURROGATE RESULTS	--			
1,4-Difluorobenzene	109		% Rec.	601&602
1,4-Dichlorobutane	83		% Rec.	601&602

NET®

Client No: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.00537

Date: 03/04/1993
Page: 2

Ref:

Descriptor, Lab No. and Results

Parameter	No. 1 Bowler Well 02/11/1993 10:40 151080	No. 2 Smith Well 02/11/1993 11:00 151081	Reporting Limit	Units	Method
pH	6.0	6.4	N/A	pH unit	150.1
Conductivity	68	130	1.0	umhos/c	9050
Tot. Dissolved Solids (TFR)	71	92	10	mg/L	160.1
Chloride	1.5	9.2	1.0	mg/L	300.0
Sulfate	ND	2.2	1.0	mg/L	300.0
Chemical Oxygen Demand	ND	73	10	mg/L	410.4
Hardness (Total, as CaCO3)	18	30	5.0	mg/L	2340B
Cadmium (ICP)	ND	ND	0.02	mg/L	EPA 6010
Calcium (ICP)	4.3	6.9	0.5	mg/L	EPA 6010
Chromium (ICP)	ND	ND	0.02	mg/L	EPA 6010
Copper (ICP)	0.07	0.02	0.02	mg/L	EPA 6010
Lead (GFAA)	0.033	0.005	0.002	mg/L	EPA 7421
Magnesium (ICP)	1.5	3.2	0.5	mg/L	EPA 6010
Mercury (CVAA)	ND	ND	0.0005	mg/L	EPA 7470
Nickel (ICP)	ND	ND	0.05	mg/L	EPA 6010
Zinc (ICP)	0.07	ND	0.05	mg/L	EPA 6010

NET

Client No: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.00537

Date: 03/04/1993
Page: 3

Ref:

Descriptor, Lab No. and Results

Parameter	No. 1 Bowle Well 02/11/1993 10:40 151080	No. 2 Smith Well 02/11/1993 11:00 151081	Reporting Limit	Units	Method
METHOD 601 & 602 (GC,Liquid)					
DATE ANALYZED	02-15-93	02-15-93			
DILUTION FACTOR*	1	1			
Bromodichloromethane	ND	ND	0.4	ug/L	601
Bromoform	ND	ND	0.4	ug/L	601
Bromomethane	ND	ND	0.4	ug/L	601
Carbon tetrachloride	ND	ND	0.4	ug/L	601
Chlorobenzene	ND	ND	0.4	ug/L	601
Chloroethane	ND	ND	0.4	ug/L	601
2-Chloroethylvinyl ether	ND	ND	1.0	ug/L	601
Chloroform	ND	ND	0.4	ug/L	601
Chloromethane	ND	ND	0.4	ug/L	601
Dibromochloromethane	ND	ND	0.4	ug/L	601
1,2-Dichlorobenzene	ND	ND	0.4	ug/L	602
1,3-Dichlorobenzene	ND	ND	0.4	ug/L	601
1,4-Dichlorobenzene	ND	ND	0.4	ug/L	601
Dichlorodifluoromethane	ND	ND	0.4	ug/L	601
1,1-Dichloroethane	ND	ND	0.4	ug/L	601
1,2-Dichloroethane	ND	ND	0.4	ug/L	601
1,1-Dichloroethene	ND	ND	0.4	ug/L	601
trans-1,2-Dichloroethene	ND	ND	0.4	ug/L	601
1,2-Dichloropropane	ND	ND	0.4	ug/L	601
cis-1,3-Dichloropropene	ND	ND	0.4	ug/L	601
trans-1,3-Dichloropropene	ND	ND	0.4	ug/L	601
Methylene chloride	ND	ND	10	ug/L	601
1,1,2,2-Tetrachloroethane	ND	ND	0.4	ug/L	601
Tetrachloroethene	ND	ND	0.4	ug/L	601
1,1,1-Trichloroethane	ND	ND	0.4	ug/L	601
1,1,2-Trichloroethane	ND	ND	0.4	ug/L	601
Trichloroethene	ND	ND	0.4	ug/L	601
Trichlorofluoromethane	ND	ND	0.4	ug/L	601
Vinyl chloride	ND	ND	0.4	ug/L	601
Benzene	ND	ND	0.5	ug/L	602
Ethylbenzene	ND	ND	0.6	ug/L	602
Toluene	ND	ND	0.5	ug/L	602
Xylenes (total)	ND	ND	0.6	ug/L	602
SURROGATE RESULTS	--	--			
1,4-Difluorobenzene	118	105		% Rec.	601&602
Bromochloromethane	84	107		% Rec.	601&602

NET

Client No: 1215
Client Name: Calif. Reg. Water Quality
NET Log No: 93.00537

Date: 03/04/1993

Page: 4

Ref:

Descriptor, Lab No. and Results

Parameter		No. 3Bennett Well 02/11/1993 12:30 151082	No. 4 Brock Well 02/11/1993 13:00 151083	Reporting Limit	Units	Method
pH		7.2	6.0	N/A	pH unit	150.1
Conductivity		280	50	1.0	umhos/c	9050
Tot. Dissolved Solids (TFR)		200	52	10	mg/L	160.1
Chloride		55	3.2	1.0	mg/L	300.0
Sulfate		16	ND	1.0	mg/L	300.0
Chemical Oxygen Demand		12	ND	10	mg/L	410.4
Hardness (Total, as CaCO3)		73	14	5.0	mg/L	2340B
Cadmium	(ICP)	ND	ND	0.02	mg/L	EPA 6010
Calcium	(ICP)	19	3.0	0.5	mg/L	EPA 6010
Chromium	(ICP)	ND	ND	0.02	mg/L	EPA 6010
Copper	(ICP)	ND	0.07	0.02	mg/L	EPA 6010
Lead	(GFAA)	ND	0.005	0.002	mg/L	EPA 7421
Magnesium	(ICP)	6.3	1.5	0.5	mg/L	EPA 6010
Mercury	(CVAA)	ND	ND	0.0005	mg/L	EPA 7470
Nickel	(ICP)	ND	ND	0.05	mg/L	EPA 6010
Zinc	(ICP)	0.09	ND	0.05	mg/L	EPA 6010

Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
Courthouse
Ukiah, CA 95482
Attn: Randy Forbes

Date Printed: 10/18/93
Page: 1

Batch Number	Receipt Date	Client	Client P.O.	Send Via
93-1005-002	10/05/93 08:50	MCDPW		Mail

Batch 93-1005-002 consisted of 2 Samples and 2 Tests

Sample 1 Garry Russ Domestic Well - JM-1005-01
Sample Type: Water Sampled by: John Morley Sampled: 10/05/93 07:20

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	MDL	DILUTION
502.2 Volatile Organics	EPA502.2		10/06/93				
Bromodichloromethane				ND	ug/L	0.5	
Bromoform				ND	ug/L	.5	
Chloroform				ND	ug/L	.5	
Dibromochloromethane				ND	ug/L	.5	
Total Trihalomethanes				ND	ug/L	.5	
Benzene				ND	ug/L	.3	
Carbon Tetrachloride				ND	ug/L	.5	
Ethylbenzene				ND	ug/L	.5	
1,4-Dichlorobenzene				ND	ug/L	.5	
1,2-Dichloroethane				ND	ug/L	.5	
1,1-Dichloroethylene				ND	ug/L	.5	
1,3-Dichloropropene				ND	ug/L	.5	
Chlorobenzene				ND	ug/L	.5	
1,1,2,2-Tetrachloroethane				ND	ug/L	.5	
Tetrachloroethylene				ND	ug/L	.5	
1,1,1-Trichloroethane				ND	ug/L	.5	
1,1,2-Trichloroethane				ND	ug/L	.5	
Trichloroethylene				ND	ug/L	.5	
Vinyl Chloride				ND	ug/L	.5	
m,p-Xylene				ND	ug/L	.5	
o-Xylene				ND	ug/L	.5	
Total Xylenes				ND	ug/L	.5	
Bromobenzene				ND	ug/L	.5	
Bromochloromethane				ND	ug/L	.5	

MDL - Minimum Detection Limit ND - None Detected
* - Indicates Detection Limit altered due to Sample Dilution

NOTES:

Bruce L. Gove
Laboratory Director

Bruce L. Gove
Date Printed: 10/18/93

Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
Courthouse
Ukiah, CA 95482
Attn: Randy Forbes

Date Printed: 9/15/93
Page: 1

Batch Number	Receipt Date	Client	Client P.O.	Send Via
93-0903-023	09/03/93 13:40	MCDPW		Mail

Batch 93-0903-023 consisted of 1 Sample and 1 Test

Sample 1 Laytonville Landfill - Well tap
Bowler Home, 1501 Branscomb Rd.
Sample Type: Water Sampled by: D. Koppel Sampled: 9/03/93 11:05

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	MDL	DILUTION
Lead GF	239.2		9/07/93	ND	mg/l	.005	

MDL - Minimum Detection Limit ND - None Detected
* - Indicates Detection Limit altered due to Sample Dilution

NOTES:

Bruce L. Gove
Laboratory Director

Bruce L. Gove
Date Printed: 9/15/93

Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
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CHEMICAL EXAMINATION REPORT

Mendocino Co. Solid Waste Division
Courthouse
Ukiah, CA 95482
Attn: Randy Forbes

Date Printed 6/14/93 | Page 1

Batch Number	Receipt Date	Client	Client P.O.	Send Via
93-0528-004	05/27/93 13:19	MCDPW		Mail

Batch 93-0528-004 consisted of 3 Samples and 29 Tests

Sample 1 Bridget Barefield, 1710 North Road
Laytonville 95454
Sample Type: Water Sampled by: Dave Koppel Sampled: 5/27/93 10:15

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	MDL	DILUTION
Lead GF	239.2		6/02/93	ND	mg/l	.005	

Sample 2 Merton Haskell, Box 1224, 1971 North Rd.
Laytonville 95454
Sample Type: Water Sampled by. Dave Koppel Sampled: 5/27/93 10:40

27 Metals

	METHOD	EXTRACTED	TEST DATE	RESULT	UNITS	MDL	DILUTION
Antimony	204.1		6/03/93	ND	mg/l	.5	
Aluminum	202.1		6/07/93	ND	mg/l	.1	
Beryllium	210.1		6/04/93	ND	mg/l	.01	
Cadmium GF	213.2		6/10/93	ND	mg/l	.001	
Calcium	215.1		6/04/93	9.5	mg/l	1	
Arsenic	206.3		6/02/93	.017	mg/l	.01	
Cobalt	219.1		6/03/93	ND	mg/l	.1	
Barium	208.1		6/04/93	.14	mg/l	.1	
Chromium	218.1		6/07/93	ND	mg/l	.01	
Magnesium	242.1		6/07/93	3.8	mg/l	1	
Copper	210.1		6/08/93	.019	mg/l	.01	
Iron	236.1		6/10/93	14.6	mg/l	.05	
Molybdenum	246.1		6/07/93	ND	mg/l	.5	
Nickel	249.1		6/03/93	ND	mg/l	.05	

MDL - Minimum Detection Limit ND - None Detected
* - Indicates Detection Limit altered due to Sample Dilution

NOTES:

Bruce L. Gove
Laboratory Director

Bruce L. Gove
Date Printed: 6/14/93

REFERENCE
No. 14

Abajian, Paula

From: Sandra C. Barnett [sandra.barnett@verizon.net]
Sent: Saturday, January 26, 2002 12:34 PM
To: Abajian, Paula
Subject: Re: Fishing in Cahto Creek

Yes, they do -- when there ARE any fish.
The harvest has been decimated by a combination factors, including reduced water flow in the creek from upstream damming, as well as possible environmental pollution. The Tribe also swims and plays in the creek, and uses it for ceremonial purposes.

----- Original Message -----
From: "Abajian, Paula" <ABAJIANP@mail.rfweston.com>
To: <sandra.barnett@verizon.net>
Sent: Friday, January 25, 2002 2:58 PM
Subject: Fishing in Cahto Creek

> Hello Sandra,
>
> It has been mentioned that residents of the Laytonville Rancheria harvest
> and eat fish from Cahto Creek. Can you please verify to me that this is
> true so that I can incorporate it into the HRS?
>
> Thank you,
>
> Paula J. Abajian
> Roy F. Weston, Inc.
> 925.975.0758
>
>

REFERENCE
No. 15

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

NOV 12 1993

November 9, 1993

Tom Unsell, Manager
Local Enforcement Agency Branch
California Integrated Waste Management Board
8800 California Center Drive
Sacramento, CA 95826

Dear Mr. Unsell:

The Environmental Protection Agency is concerned about potential impacts of the Laytonville landfill in Mendocino County on the nearby Laytonville Rancheria. Several parties, including Rancheria residents and the Bureau of Indian Affairs, have asserted that the landfill may have caused contamination of both groundwater and surface water.

We are requesting an opinion from your agency about whether the landfill is responsible for any contamination. If this is the case, please inform us of the corrective actions the County will be required to take to protect groundwater and surface water on the Laytonville Rancheria.

We are aware that the Regional Water Quality Control Board took steps to effect recent improvements to the landfill's groundwater monitoring and runoff control programs. Drinking water wells of some nearby residents were also tested for contamination.

The Water Board and the Mendocino County Health Department have indicated that the residential well tests did not reveal any contamination associated with the recently closed landfill. Our understanding is that one groundwater monitoring well at the landfill showed mineralization, which will require follow-up observation as part of the facility's quarterly monitoring regimen. Concerns raised to us regarding potential impacts on the Rancheria prompt us to request your agency's confirmation of these facts.

FACILITY FILE CARBON COPY
ORIGINAL TO FILE # 23-AA-0008
SUBMITTED BY [illegible] DATE 11/16/93
COPY TO LEA/EA [illegible]/TU
COPY TO G
COPY TO D

Printed on Recycled Paper

REFERENCE
No. 16

STATE OF CALIFORNIA - CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

PETE WILSON, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
NORTH COAST REGION
5550 SKYLANE BLVD. SUITE A
SANTA ROSA, CA 95403
PHONE: (707) 576-2220

JM

September 17, 1993

Bill and Florence Bowler
31050 Highway 101 North
Willits, CA 95490

Subject: Laytonville Landfill

Dear Mr. and Mrs. Bowler:

This letter responds to your correspondence of April 9, 1993, and August 25, 1993.

I apologize for the length of time which has passed since your letter of April 9, 1993. It is my understanding that you have been in close contact with Dave Evans of my staff regarding the issues raised in your letter. The following discussion responds in writing to those issues.

Your letter references complaints reported to Dave Evans during a site inspection on April 8, 1993 regarding: (a) full sedimentation ponds, (b) leachate contaminated site runoff to Cahto Creek, (c) landfilling beyond the one acre size limit contained in Board Order No. 74-50, (d) the threat to public health represented by the landfill, and e) inadequate response to these problems by Mendocino County solid waste personnel.

Dave Evans concurred with your observation regarding overloaded sedimentation basins and addressed this matter in his letter dated February 16, 1993 to Randy Forbes with the Mendocino Solid Waste Division. The letter also directed the County to collect all surface leachate seeps and prevent subsequent leachate discharges to surface waters. I was informed that the County could not immediately clean out the sedimentation ponds as heavy rains prevented access for the equipment necessary to do this work. Since then Mr. Evans, working with the Fish and Game Department, has presented a list of erosion control tasks to the County by letter dated September 3, 1993, a copy of which was provided to you. The County is presently carrying out the tasks specified in Mr. Evans' letter. The County is also preparing to improve leachate seep collection facilities for use this coming winter.

RECEIVED

SEP 21 1993

MEND. CO. HEALTH DEPT

We acknowledge that landfilling activities have gone beyond the one acre limit contained in Board Order No. 74-50. We previously requested the County to submit a new Report of Waste Discharge (ROWD). The ROWD is to provide the information necessary to support a decision by the Regional Board on permitting an expanded landfill proposal. The ROWD was received on August 30, 1993, and is being reviewed by Dave Evans. The ROWD did not include the required CEQA document so formal action by the Regional Board will be deferred until an appropriate CEQA document is completed.

We have received very little in the way of evidence regarding health impacts related to the Laytonville landfill. If you have or can obtain documentation of health problems related to the landfill, we would like to review the evidence.

Your April 9, 1993 letter closes by requesting that the Regional Board fulfill its responsibilities by ordering the landfill to be closed. When the ROWD is determined complete, Regional Board staff will prepare a staff report with recommendations regarding the future of the landfill. After the Regional Board has considered this and other testimony, a formal decision will be made. As regards keeping you informed, be assured that you are on our mailing list for all documents related to the Laytonville landfill. If you have additional questions or comments, please contact Mr. Evans or myself.

Your letter dated August 25, 1993, raises two new issues in addition to the leachate discharges in the past, including last winter. The new issues are the mineralization found in monitoring well 93-1, and the trench which was found to contain soil contaminated with petroleum hydrocarbons. Our comments on the ROWD will include a request that the County further investigate the extent of groundwater mineralization. Depending on the findings of that investigation, corrective action work may be necessary to mitigate any potential problems.

The results from the trench sampling are complete and available at the County Health Department or Solid Waste Division. The contamination was found to be primarily diesel fuel and motor oil. Paul Caylor with the Solid Waste Division is currently arranging the services of a waste hauling contractor to take the material to a permitted treatment facility. The trench sidewalls will be tested after the material has been removed to confirm that no residual contamination is left on site.

I hope this answers your questions. If you would like to discuss anything further, please call either Dave Evans or myself.

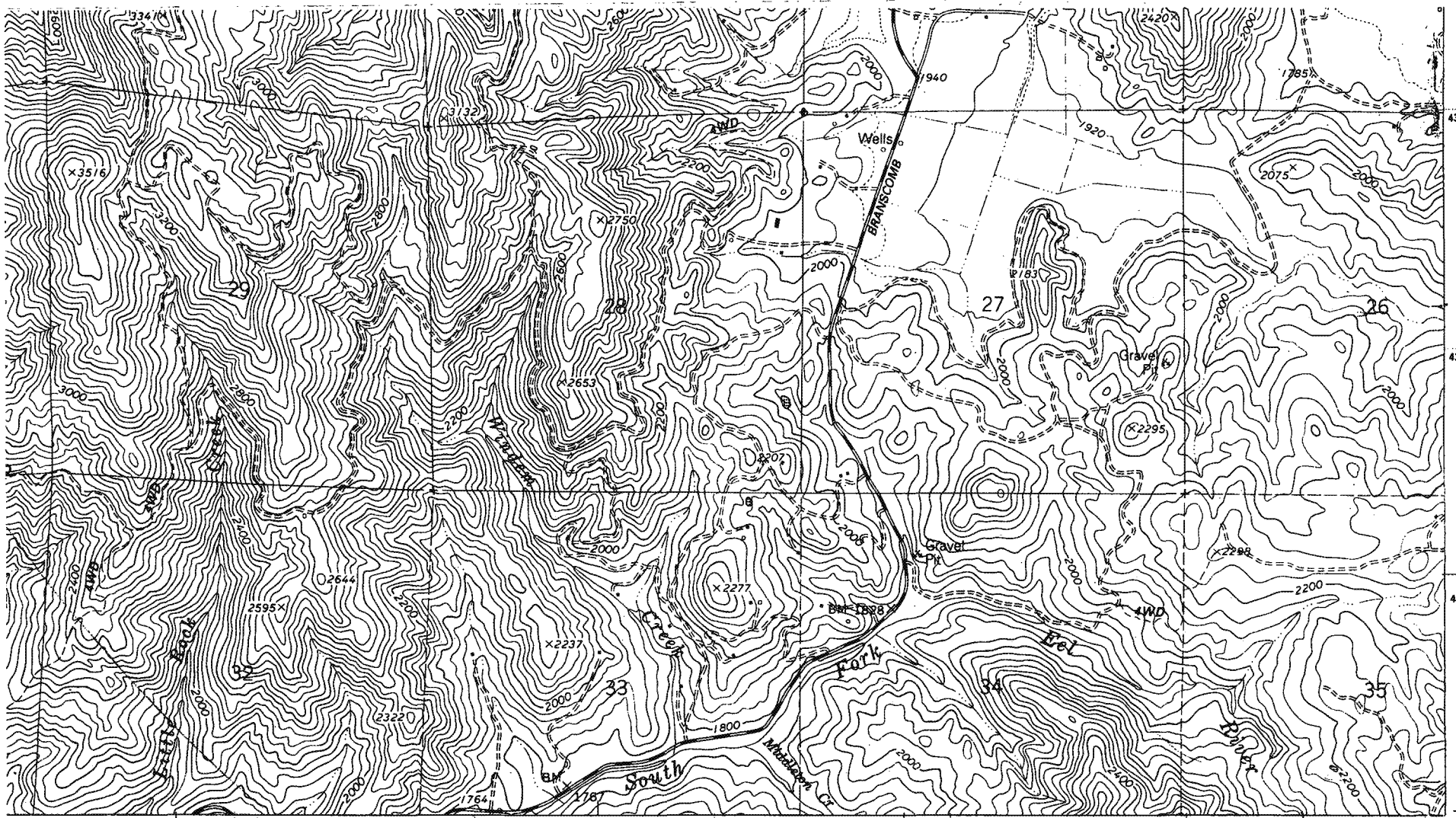
Sincerely,

Luis G. Rivera
Senior Water Resource Control Engineer

DSE:tab/bowler

cc: ✓Dave Koppel, Mendocino County Health Department
Paul Caylor, Mendocino County Solid Waste Division, 559 Low Gap Road, Ukiah, CA 95482

REFERENCE
No. 17



INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1994

SCALE 1:24 000

0 — 1 MILE

1000 2000 3000 4000 5000 6000 7000 FEET

.5 — 0 — 1 KILOMETER

CONTOUR INTERVAL 40 FEET
TED LINES REPRESENT 20-FOOT CONTOURS
IONAL GEODETIC VERTICAL DATUM OF 1929

COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
OR SALE BY U.S. GEOLOGICAL SURVEY
COLORADO 80225, OR RESTON, VIRGINIA 22092
TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy-duty — Light-duty

Medium-duty — Unimpr

U. S. Route

CAHTO PEAK, CALIF.

39123-F5-TF-024

1967
REVISED 1994
DMA 1263 II NE-SERIES V895

REFERENCE
No. 18

MICHAEL K. SCANNELL
COUNTY ADMINISTRATIVE OFFICER

JAMES M. ANDERSEN
DEPUTY COUNTY ADMINISTRATIVE OFFICER

ADMINISTRATIVE OFFICE
SOLID WASTE DIVISION
301 S. STATE ST.
UKIAH, CALIFORNIA 95482
(707) 463-4441
FAX (707) 463-4245

September 29, 1993

ALL CONCERNED AGENCIES

SUBJECT: CLOSURE OF THE LAYTONVILLE LANDFILL

This letter is to officially notify your agency that the County of Mendocino Board of Supervisors took action on September 28, 1993, to permanently cease accepting waste at the Laytonville Landfill. This action is effective immediately. The action to permanently cease accepting waste followed a Board of Supervisors' action taken on August 17, 1993, which temporarily ceased the acceptance of waste.

If you have any questions or comments regarding this matter please contact me at (707) 463-4078.

Sincerely,

Paul Cayler

Paul Cayler,
Solid Waste Division Director

cc:
David Koppel, Mendocino Environmental Health Division
David Evans, North Coast Regional Water Quality Control Board
Brian Hunter, California Department of Fish and Game
Robert Anderson, California Integrated Waste Management Board
David Faulkner, Mendocino County Air Pollution Control District
Gordon Logan, City of Willits
Gary Anderson, Anderson Consulting Group

RECEIVED
OCT 1 1993
MEND. CO. HEALTH DEPT.

REFERENCE
No. 19

had been installed.

Landfill Gas: The site had been ranked the fifth worst landfill gas site for MSW sites in the state by the Air Resources Board (ARB) in a draft report that had compared some landfill gasresults with other landfills in the state. However, the Air Resources Board information was not beyond suspicion as to the quality of the data and the ranking was never finalized by the the ARB. The ARB performed some additional sampling and testing for ten Calderon Gasses in June of 1993. The results of the ARB sampling and testing have yet to be released. Dr. Susan Knadle of OHEA, had been contacted in August by Board staff as to claims by Laytonville community members that a child had temporarily stopped breathing due to exposure to landfill gas the had migrated off-site.

Leachate: The southwestern slope of the main cell has had a slope failure. Since the failure has not been repaired, rain water and final cover run-off can seep into the cell and generate leachate. Until the intermediate cover had been applied, leachate was generated each time that the refuse had not been covered and it rained. The leachate was not separated from run-off in the western portion of the site and left the site towards a pasture. Landfill gas monitoring well no. 12 has had readings of greater than 5% by volume of methane

Other:

RECOMMENDATION

Emergency Response: Notify the LEA, CDF, Fish and Game, the RWQCB and the CIWMB. Repair the southwestern slope, clean out the sediment basins, enlarge the sediment basins under construction and provide for adequate site security especially along northern portion of the site boundary.

Other (e.g. small scale illegal dumping that warrants removal): N/A

Reassess Site? (Y/N/NA): Y Further Action Required

Priority for Site Assessment (High/Med/Low): High site has had landfill gas problems and a small pocket of waste suspected to be hazardous was found at the site in August 1993. Site has been temporarily closed by the County BOS, site is likely to remain closed.

Prepared By: Robert Anderson Date: 10/06/93

CIWMB Approval: C&R Branch 10/6/93 Enforcement Susan Markle 10/19/93

SITE ASSESSMENT DATA FORM

(Attach additional description or explanation as needed or include in comment Section VII.)

I. Disposal Site Characteristics

A. Waste Area(s) Dimensions

1. Area and Volume (acre and yd^3): 7 acres* approx. 90,000 cy in place

2. Estimate Maximum Depth of Waste (ft): 65 ft per cost estimates (1988)

3. Estimate Average Depth of Waste (ft): 40 ft per cost estimates (1988)

B. Soil Type (check appropriate soil type)

	Native	Cover
1. Clay, silt, loam (low permeability):	x	N/A
2. Sand, pebble (medium permeability):		N/A
3. Gravel, cobble, rocks (high permeability):	x	N/A

The final cover has not been installed yet.

C. Mean annual precipitation (in): 55" 2-Yr. 24-Hr.(in): Unk

D. Estimated separation between waste and ground water (ft): Unk Depth to gw at Herzog boring no. one was only eight feet. Other borings encountered water up to 40 feet below egs (Herzog boring no. 3)
Water SWAT indicates that the GW flow direction is to the northeast.

E. Is waste area within a 100-year flood plain? (Y/N): N

F. Show the following items on a site map(s):

1. Property boundaries
2. Waste disposal area(s) boundary
3. Structures on or within 1000 ft. of waste
4. Topographical Contours
5. Access points and roads
6. Site security systems
7. Surface water bodies and drainage patterns
8. Monitoring and control systems
9. Areas where landfill gas migration was detected
10. Areas where leachate migration was detected

See attached maps

G. Provide a chronological list of enforcement actions for the site. See attached list

H. Provide reference list of technical documents for the site (Give date and report, e.g. SWAT, Design, Control System, and Monitoring

Plans). Mendocino County Department of Public Works, Solid Waste Division (SWD), Dec. 1989, Report of Disposal Site Information
SWD, Dec. 1989, Periodic Site Review
EBA Wastechnologies, Air Quality Solid Waste Assessment Test Report for the Laytonville, South Coast, and Caspar Solid Waste Disposal Sites, March 1988.
EBA Wastechnologies, Water Quality SWAT Report for Laytonville Solid Waste Disposal Site, April 1990

II. Landfill Gas Migration

A. Status

1. Has an Air Quality Solid Waste Assessment Test (Air Swat) been completed for the site? (Y/N) Y (March 1988)

2. Have surface or structure landfill gas monitoring surveys been conducted for the site? (Y/N) Y surface gas monitoring

3. Does the site have a landfill gas monitoring system? (Y/N) Y but not in compliance with 14 CCR 17783

4. Does the site have a landfill gas control system? (Y/N) N

B. Migration

1. Do surface methane emissions exceed 500 ppm? (Y/N/U) N

   If **unknown**, conduct a field survey for presence of landfill gas.

   If **no**, based on field observations or measurements, age, and moisture content of the waste and the existing cover, are surface emissions > 500 ppm likely to occur? (Y/N) Not determined

2. Has >1.25% methane by volume accumulated in on site structures? (Y/N/U) N/A

   If **unknown**, conduct a field structure survey for presence of landfill gas.

   If **no**, based on field measurements, the age and nature of the waste, land use, and cover conditions is landfill gas accumulation likely to occur in structures on or around the site? (Y/N) N/A

3. Do the methane concentrations exceed 5% at the site boundary? (Y/N/U) No, but historic landfill gas readings have exceed 5% at the boundary

If **unknown**, conduct perimeter field survey for landfill gas migration.

If **no**, based on a perimeter field survey, age and moisture content of the waste, and the existing cover, is landfill migration likely to occur beyond the boundaries of the site? (Y/N) ___Y___

III. Leachate Migration

A. Status

1. Has a Water Quality Solid Waste Assessment Test been completed for the site? (Y/N/NA) __Y____ If applicable, what is the SWAT rank? __N/A____

2. Does the site have a water quality monitoring system and program? (Y/N) __N____ If **yes**, briefly describe the monitoring system and program: The ROWD is being prepared by the County's consultant.

3. Does the site have a leachate control system? (Y/N) __N____ If **yes**, briefly describe the leachate control system: The site has a leachate seepage collection network, but is unlined and does not have a LCRS.

4. Does the landfill have an engineered lining system? (Y/N) __N____ If **yes**, briefly describe the liner system:

5. Does the site have a final cover? (Y/N) __N____ If **yes**, briefly describe the final cover and any agency approvals: Site to prepare final closure and postclosure maintenance plans

B. Migration

1. Is the waste generating significant quantities of leachate? Based on SWAT or other water quality information (Y/N/NA) Unk, but monitoring well 93-1 has shown elevated dissolved minerals, over and above background levels, per LEA John Morley (Via telephone call 9/16/93). It is believed that the elevated minerals content indicates a leachate plume in the vicinity of the subject well. 96 hr. fish bio-assay test came back with a 0% mortality rate from run-off. The only cause for concern was elevated turbidity levels from run-off into cotton creek.

   Based on field observations (Y/N) not at present

SITE ASSESSMENT DATA FORM
(Continued)

2. Is the monitoring system adequate for:

Surface Water-SW	(Y/N/U/NA)	N
Vadose Zone-VZ	(Y/N/U/NA)	N
Ground Water-GW	(Y/N/U/NA)	N

3. Are the following constituent of concern levels of leachate release present outside the boundaries of the waste? (Y/N/U/NA)

Hazardous	_____(SW)	_____(VZ)	_____(GW)
Above MCL or limiting criteria:	_____(SW)	_____(VZ)	X (GW)
Above background:	X (SW)	_____(VZ)	_____(GW)

List general waste constituents that leaked: Aluminum has periodically exceeded the primary drinking water standards in wells 87-1, 87-2 & 87-3, this may be due to background conditions. Turbidity was elevated in surface water run-off, but the 96 hour fish bio-assay had a 0% mortality rate.

ED_013162_00000569-00273

SITE ASSESSMENT DATA FORM
(Continued)

IV. Surface Conditions

A. Is site access adequately restricted? (Y/N) N

B. Is the waste adequately covered to prevent human contact? (Y/N) N

C. Is the final drainage system for the site adequate to prevent erosion? (Y/N) N

D. Is the final grading adequate to promote run-off? (Y/N) N

E. Are slopes greater than 3:1 (33% or 18 degrees)? (Y/N) Y

F. Are slopes greater than 1.75:1 (57% or 30 degrees)? (Y/N) Y

V. Postclosure Land Use

A. Has the land use of the site significantly changed since closure? (Y/N) N/A If **yes**, include or reference site improvement plans and answer the following: _____

1. Give the date that the improvements were constructed. N/A

2. Have the improvements compromised the integrity of the final cover? (Y/N/NA) N/A

3. Has differential settlement affected the improvements? (Y/N) N/A

B. Is there a proposed change in postclosure land use that may jeopardize the integrity of previously closed sites or pose a potential threat to public health and safety or the environment? (Y/N) N If **yes**, briefly describe the proposed project: _____

C. Is there a postclosure land use tracking system? (Y/N) N If **yes**, describe the tracking system: _____

VI. Disposal Site Priority (See Prioritization Chart)

A1:	A2:	A3:	B1: X	B2:
B3:	C1:	C2:	C3:	D :

VII. Comments

The Air Resources Board sampling, and testing results for landfill gas samples taken this summer are due out this month.

Prepared By: Robert Anderson Date: 10/06/93

Enforcement Branch Review: Ellen Martie 10/19 Date: 10/19/93

Closure and Remediation Branch Approval: [signature] Date: 10/6/93

ED_013162_00000569-00274

REFERENCE
No. 20

U.S. Environmental Protection Agency

Resource Conservation and Recovery Act (RCRAInfo)

Query Results

Report an Error

RCRAInfo

Only RCRAInfo facility information was searched to select facilities

name: Containing: Laytonville
Results are based on data extracted on DEC-09-2002

Total Number of Facilities Displayed: 0

REFERENCE
No. 21

MEMORANDUM

County of Mendocino
Solid Waste Division

To: Jeff Ingliss, USEPA

From: Paul Cayler, Solid Waste Division Director

Date: June 10, 2002

Re: COMMENTS ON LAYTONVILLE DUMP PRELIMINARY ASSESSMENT/SITE INSPECTION SAMPLING AND ANALYSIS - MAY 2002

The purpose of this memorandum is to respond to your email that I put my comments regarding the Laytonville Dump Preliminary Assessment/Site Inspection Sampling and Analysis - May 2002 (Report) in writing and transmit said comments to you.

My comments are as follows:

1) I was surprised by the Title of the Report using the term "Dump". This is a colloquial term. I believe that the more appropriate professional and regulatory term is "Landfill".

2) Page 3 Section 2.1 Location and Description: The report states, "However, an opening has been created in the fence along the southern boundary of the site." This statement is misleading and would lead a reader to believe that the site is not properly maintained. Trespassers frequently damage site fences and access the site. The Solid Waste Division takes action to repair such damage in a timely manner, and reports vandalism to law enforcement.

2) Page 5 Section 2.5 HRS Pathways:
This section refers to the "City of Laytonville". This statement is inaccurate. Laytonville is an unincorporated community located within the jurisdiction of the County of Mendocino.

The Section refers to the fact that the County is performing four quarters groundwater testing for PCB's. In fact, no PCB's were detected during County testing. The North Coast Regional Water Quality

Control Board (NCRWQCB) has released the County from further PCB testing.

There is no mention under this section that the NCRWQCB directed the development of a groundwater investigation workplan. Said workplan was submitted and approved by the NCRWQCB. The County is implementing said workplan.

The report states, "Analytical results indicate a release of arsenic…". The County's groundwater monitoring network has found sporadic low levels of arsenic detection.

The report states, "The County does not sample for hexavalent chromium…". The County does sample for total chromium in groundwater. The results are non-detect.

3) Page 15 Section 4.1.2.2 Private and Municipal Drinking Water Wells: This section refers to LD-DW-1 on Figure 4-1. I could not find said location on the figure.

Please contact me at 463-4078 or pcayler@saber.net if you have any questions.

cc: file Laytonville Landfill General Correspondence
Oscar Centoni, S.W. Supervisor

REFERENCE
No. 22

COUNTY MENDOCINO
SOLID WASTE DIVISION
559 LOW GAP ROAD
UKIAH CA 95482
TEL:(707)-463-4078
FAX:(707)-468-3427

FACSIMILE TRANSMITTAL SHEET

TO: Paula Abajian	FROM: Paul Cayler
COMPANY: Weston	DATE: 1/4/2002
FAX NUMBER: 925 ~~975~~ ~~0158~~	TOTAL NO. OF PAGES INCLUDING COVER: 2
PHONE NUMBER: 945 6485	SENDER'S REFERENCE NUMBER:
RE:	YOUR REFERENCE NUMBER:

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Paula:

Pls. find attached my comments to your 1/4/2002 email.

Paul

Paul Cayler

From: "Abajian, Paula" <ABAJIANP@mail.rfweston.com>
To: "'Paul Cayler'" <pcayler@saber.net>
Sent: Friday, January 04, 2002 9:59 AM
Subject: Verification of quarterly monitoring.

Hi Paul,
Below is an excerpt from the in-progress sampling plan that addresses which samples are collected and which analyses are performed during the County's quarterly monitoring efforts. Will you please review it to see that I have written the correct information?

Thank you,

Paula J. Abajian
Roy F. Weston, Inc.
925.975.0758

The County performs quarterly monitoring events at the landfill. During each monitoring event, the County performs the following: methane analysis in samples collected from six gas-monitoring probes installed around the perimeter of the former disposal area and from 12 passive gas vents installed in the engineered cover; metal and VOC analysis in groundwater samples collected from five site-related monitoring wells; VOC analysis in water samples collected from the leachate containment facility; and metal and VOC analysis in surface water samples collected from two site-related sedimentation ponds (5). The County is also currently performing at least 4 quarters of PCB analysis in groundwater samples collected from the five monitoring wells (7). The County began collecting groundwater samples from monitoring wells 87-1, 87-2, and 87-3 in 1987. Monitoring wells 90-1 and 91-1 were installed in 1990 and 1991, respectively. The U.S. Army Corps of Engineers (USACE) replaced the 87-series wells with monitoring wells 93-1, 93-2, and 94-1 during 1993 and 1994. The County currently collects groundwater samples from monitoring wells 90-1, 91-1, 93-1, 93-2, and 94-1 (9, 7).

1) methane monitoring is for landfill gas using instrument (Gastech GT 201)
2) this is quarterly groundwater sampling: TDS, Chloride, 601 & 602 (purgeable halocarbons, purgeable aromatics)
3) leachate is not monitored quarterly.
4) surface water is not monitored quarterly. There are 3 surface water sample points.
5) I don't understand reference to USACE.

REFERENCE
No. 23

COUNTY OF MENDOCINO

AIR QUALITY MANAGEMENT DISTRICT

MEMORANDUM

DATE:

TO: File

FROM: C. D. Wolbach, Ph.D.
Sr. Air Quality Specialist

SUBJECT: Investigation for VOC emissions at Laytonville Landfill 6/8 and 6/14/00

Summary

The district conducted volatile organic carbon (VOC) screening tests at the Laytonville Landfill on two separate days, Thursday, June 8, and Wednesday, June 14, 2000. June 8 was two days after a rain, so tests were repeated at a more extensive level on June 14. On each day an hnu VOC analyzer was used to look for "hot spots" of VOC concentrations, "hot spots" being defined as >3x background levels.

On each day the site was circumnavigated, measuring VOC levels along the periphery of the cap. In addition all vents were checked, along with vole holes and visible surface cracks. During the second day, in addition to the above locations, water monitoring wells were checked, along with traversing the cap and monitoring under the tarps of the opened areas on the North-east face of the cap.

Background levels of 1-3 ppmv as propane were measured at the Rancheria headquarters, at the entrance gate to the landfill, and on the Northwest face of the landfill at 3-8 ft. above ground level (breeze 1-5 mph from the NNW). All tracking measurements were taken at 3-6 inches above ground level. All well, vent, and vole hole measurements were taken 2-6 inches inside the respective enclosure. Values ranged from 0.5 ppmv to 6 ppmv. By the criteria defined in paragraph 1, no values were measured above background levels.

REFERENCE
No. 24

May 15, 2000

Mr. Michael Umbrello
Ms. Sandra Barnett
Cahto Tribe
Laytonville Rancheria
P.O. Box 1239
Laytonville, CA 95454

Re: Groundwater Geophysical Exploration at the Laytonville Rancheria, Mendocino County, California.
G&A Project #2000-13.01

Dear Mr. Umbrello and Ms. Barnett:

At your request and authorization, Gasch & Associates (G&A) has completed three electrical resistivity (ER) lines at field locations jointly selected by yourself and G&A personnel. The included Line Location Map shows the specific location and length of each ER line. ER Lines were arranged to border as much of the closed Mendocino County, Laytonville Landfill as field conditions would allow.

Purpose

The purpose of this investigation was to determine the potential for movement of groundwater from the adjacent county landfill onto the Laytonville Rancheria lands and other surrounding private lands. Further, to identify areas where such groundwater movement could be occurring, and to suggest placement of monitor wells based upon results of the geophysical exploration and previously published data.

Geophysical Methods

Electrical Resistivity Method (ER)

The resistivity acquisition system used by G&A was a Sting/Swift R1 IP, Automatic, DC Electrical Resistivity unit with a 56 electrode, Dipole-Dipole field array. Data were stored on the system's RAM and downloaded to our field workstation for preliminary processing. Final processing and drafting were done in house, on our data reduction and plotting workstation.

The electrical resistivity geophysical survey method is a known reliable exploration tool commonly used for groundwater and ore deposit studies. The "state of the art" ER system described and used for this work by G&A, allowed for very dense, detailed and cost effective subsurface profiling. The method

entails quantitative measurement of the specific resistance of a material to the flow of electrical current within the subsurface geology. It is greatly affected by moisture variations within the various soil and rock material making up the subsurface geology.

Interpretation and Recommendations

In general, the lower resistivity values are indicative of groundwater bearing strata. Values from 10 to 150 ohm-meters are considered representative of groundwater, depending on the concentration of dissolved minerals or salts. Therefore, low-resistivity anomalies probably indicate the presence of groundwater. Figures 1, 2 and 3 exhibit a typical range of resistivity values and suggest that the selection of groundwater monitor well locations should be straight forward based on these data and site geology.

Line 1 (Figure 2) is an east-west line which borders the southern boundary of the landfill. This line shows a distinct anomaly centered at approximately 660 feet. This anomaly is within a "channel" shaped feature, and may indicate the location of an ancient stream channel or shear zone. The direction of groundwater flow at this location is unknown, however, based upon the size and character of the anomaly, this is a suggested location for a groundwater monitor well. The smaller anomalies, centered at 1,185 feet and 1,350 feet, are also candidates for groundwater monitor well locations.

Line 2 parallels the eastern boundary of the landfill, and is oriented north-south (see Figures 1 and 3). The results of this line are interesting, as much lower resistivity is indicated at depth on the northern portion of the line as compared to the southern portion. In fact, this deep zone reveals lower resistivity at depth than either Line 1 or Line 3. This may be a remnant effect of the ancient drainage toward the northeast which is indicated on pre-landfill topographic maps (Figure 1). In particular, anomalies at 175 feet, 260 feet and 560 feet indicate additional locations for monitor wells which may intercept groundwater moving offsite along this boundary.

Figure 4 shows the results of Line 3, which extends north-south, parallel to the western boundary of the landfill. Line 3 reveals several noteworthy features which may indicate "channels or fractures" where groundwater flow could be concentrated due to gravel lenses, fractures or other porous and permeable subsurface features. An anomaly centered at about 220 feet along the line may indicate a northern channel or fracture, and is a logical location for a monitor well. A broad anomaly centered at approximately 750 feet seems to be a general depression in the local bedrock, and is a prime location for monitoring. Additional locations for monitoring are suggested at 1,160 feet, and 1,460 feet. Bedrock

appears to drop off toward the south, which may point to another pathway for groundwater flow.

Summary and Conclusions

The results of the three ER sections indicate that several areas exist which may be underground "pathways" for the movement of groundwater. The existence of contaminants in these areas is undetermined, and therefore G&A recommends placement of groundwater monitor wells for sampling and testing of subsurface waters in each of these areas. The suggested locations for monitor wells have been addressed in the section "Interpretation of Electrical Resistivity Sections", and have also been marked on each of the ER Sections (Figures 2-4). Each line has several potential locations where monitor wells may intercept subsurface waters moving down-gradient. For each line these potential MW locations have been listed, along with a primary recommendation. A summary of these locations follows for your convenience.

SUMMARY TABLE

LINE NUMBER	POTENTIAL MW LOCATIONS	PRIMARY RECOMMENDATION
Line 1	660 feet	660 feet
	1,185 feet	
	1,350 feet	
Line 2	175 feet	175 feet
	260 feet	
	560 feet	
Line 3	220 feet	220 feet or 1,460 feet
	750 feet	
	1,160 feet	
	1,460 feet	

The results of this investigation indicate that several areas of concern exist at the Laytonville Rancheria. The ER method has been successful in pinpointing the areas which may be affected by groundwater. It is our recommendation that additional ER lines be collected after monitor wells and sampling has been completed and the presence of contaminants has been verified.

In addition to the monitor wells, G&A recommends the sampling of surface waters from all drainages and ponds within a one-half mile radius of the landfill. Results of surface water sampling can be compared to monitor well sampling results for potential correlation. Positive correlation may establish the landfill to be the source of contaminants that have moved outside the landfill.

This completes our report on this phase of this project. We trust that this is the information you require, however, should you have comments or questions please contact our Sacramento office at (916) 635-8906. Thank you for this opportunity to be of service.

Sincerely,

Jerrie W. Gasch
Registered Geologist No. 1203
Registered Geophysicist No. 516
Engineering Geologist No. 450

Kent Gasch
Geophysicist
Geologist

David Hagin
Geophysicist
Geologist

GASCH & ASSOCIATES

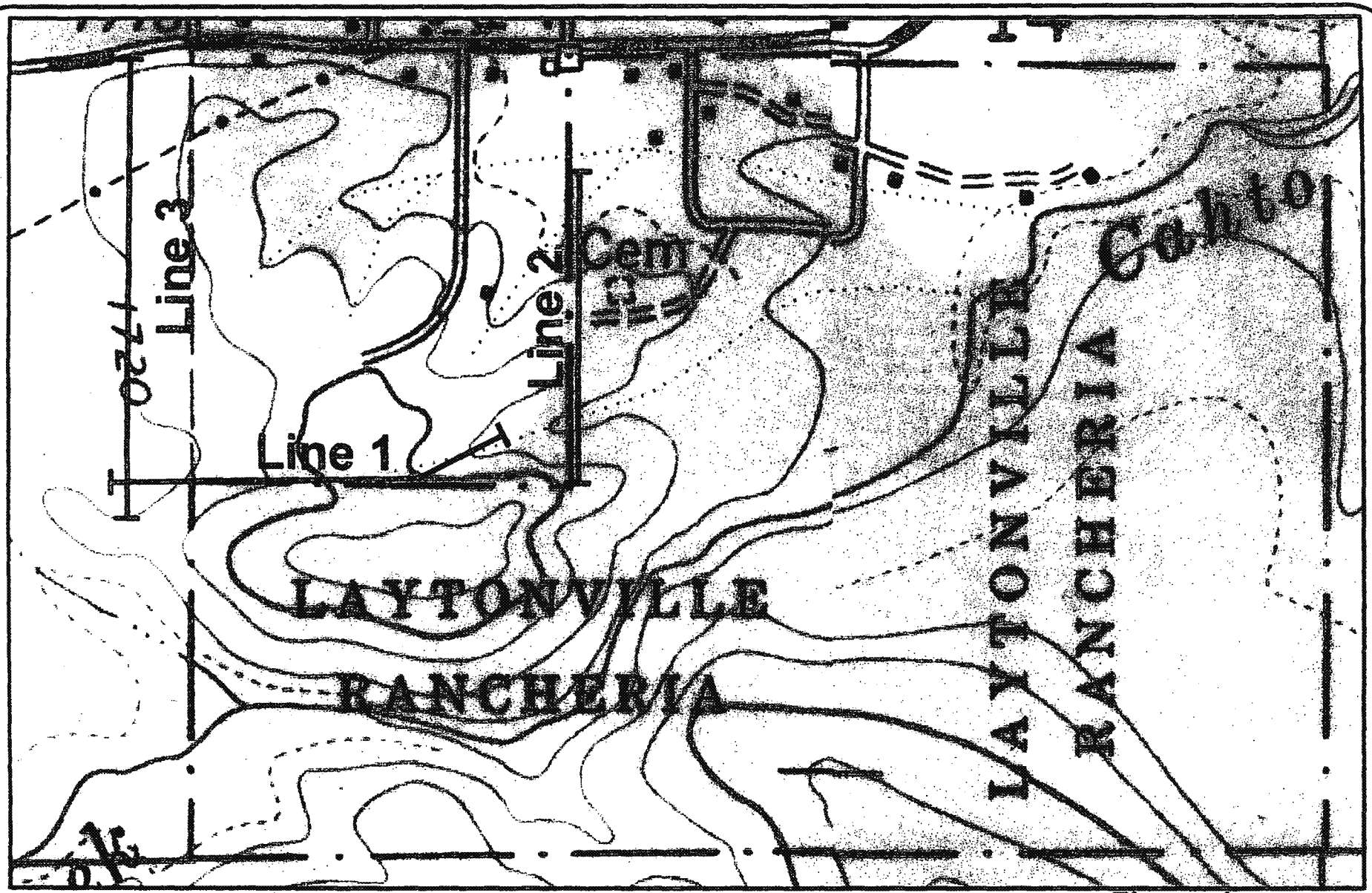


Figure 1

North

0 ¼ Mile

Scale: 1' = 500'

GA
CONSULTANTS IN GEOPHYSICS AND GEOLOGY FOR THE ENGINEERING, GEOTECHNICAL and ENVIRONMENTAL INDUSTRIES
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Cahto Tribe, Laytonville Rancheria
Groundwater Investigation

Prepared for: Cahto Indian Tribe

Project Number: 2000-13.01 **Date:** May, 2000

REFERENCE
No. 25

GASCH REPORT

ANALYTICAL RESULTS SUMMARY

Client: Cahto Tribe
P.O. Box 1239
Laytonville, CA 95454

Project No.:
Contact: Sandra Barnett
Phone: (707)984-6197

Project: Cahto Landfill

Lab Contact: James Liang
Lab ID No.: S8606
Job No.: 030606
COC Log No.: 12594

Date Received: 05/21/2001
Date Reported: 05/31/2001

ALL RESULTS(cont.)

Sample I.D. Client	Lab	Analyte	Method I.D.	Results	Rep. Limit	
		tert-Butylbenzene		ND	5.0	ug/kg
		Bis(2-chloroisopropyl)ether		ND	330	ug/kg
		Carbon tetrachloride		ND	5.0	ug/kg
		Bis(2-ethylhexyl)phthalate		ND	330	ug/kg
		Chlorobenzene		ND	5.0	ug/kg
		4-Bromophenyl phenyl ether		ND	330	ug/kg
		Chloroethane		ND	10	ug/kg
		Butylbenzyl phthalate		ND	330	ug/kg
		Chloroform		21 ppb	5.0	ug/kg
		4-Chloroaniline		ND	330	ug/kg
		Chloromethane		ND	10	ug/kg
		2 Chloronaphthalene		ND	330	ug/kg
		o-Chlorotoluene		ND	5.0	ug/kg
		4-Chlorophenyl phenyl ether		ND	330	ug/kg
		p-Chlorotoluene		ND	5.0	ug/kg
		Chrysene		ND	330	ug/kg
		Dibromochloromethane		ND	5.0	ug/kg
		Dibenzo(a,h)anthracene		ND	330	ug/kg
		Dibromomethane		ND	5.0	ug/kg
		1,2-Dibromo-3-chloropropane		ND	10	ug/kg
		Dibenzofuran		ND	330	ug/kg
		1,2-Dichlorobenzene		ND	5.0	ug/kg
		Di-n-butylphthalate		ND	330	ug/kg
		1,2-Dichlorobenzene		ND	330	ug/kg
		1,3 Dichlorobenzene		ND	5.0	ug/kg
		1,3-Dichlorobenzene		ND	330	ug/kg

CA DOHS ELAP Accreditation/Registration Number 1233

ED_013162_00000569-00292

REFERENCE
No. 26

Publication 9345.1-21
EPA/540/R-96/028
PB96-963509
June 1996

Superfund Chemical Data Matrix

Office of Emergency and Remedial Response
U.S. Environmental Protection Agency
Washington, DC 20460

REFERENCE
No. 27

U.S. Environmental Protection Agency

Region 9: Superfund

Serving Arizona, California, Hawaii, Nevada, the Pacific Islands, and over 140 Tribal Nations

Preliminary Remediation Goals: What's New in 2002

October 1, 2002

The PRGs table contains over 600 preliminary remediation goals (PRGs) for contaminants in soil, air, and tap water. Region 9 PRGs are risk-based concentrations that are intended to assist risk assessors and others in initial screening-level evaluations of environmental measurements. As their name implies, Region 9 PRGs may also be viewed as preliminary cleanup goals for an individual chemical, but in this context, they are best viewed as dynamic and subject to change because they are generic and based on direct contact exposures which may not address site-specific conditions and/or indirect exposure pathways at sites (See Exhibit 1-1 in "Region 9 PRGs Table Users Guide/Technical Background Document").

Also for planning purposes, these human health based PRGs should always be considered in conjunction with ARAR-based PRGs (e.g. MCLs), ecological benchmarks, and "background" conditions before establishing a final cleanup level for a particular site.

We view risk-based PRGs as "evergreen". Ongoing changes to the PRGs reflect continuing improvements in our scientific knowledge base and state-of-the-art approaches to risk assessment. In the new Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (Supplemental SSL Guidance, EPA 2001a), two different soil ingestion rates are assumed for nonconstruction workers: 100 mg/day is assumed for outdoor workers whereas 50 mg/day is assumed for indoor workers. The default value of 100 mg/day for outdoor workers is also recommended by EPA's Technical Review Workgroup for Lead (TRW), and it reflects increased exposures to soils for outdoor workers relative to their indoor counterparts. For more on this, please see Section 4.1 of the "Region 9 PRGs Table Users Guide/Technical Background Document" or refer to the Supplemental SSL Guidance.

Because the Region 9 PRGs are generic and intended for screening sites early in the investigation process (often before site-specific information is available), we have chosen to use the 100 mg/day soil ingestion (i.e. outdoor worker) assumption to calculate industrial soil PRGs. Please note that previous issues of the Region 9 PRGs table assumed 50 mg/day soil ingestion rate for workers. This change in soil ingestion rates is reflected in a somewhat lower (more stringent) industrial soils PRG for many contaminants. The appropriateness of this assumption for a particular site may be evaluated when additional information becomes available regarding site conditions or site development. In addition to changes in exposure factor assumptions, several chemicals have new or revised toxicity values that results in changes to the PRG calculations.

To facilitate the user's review, chemicals with new and revised toxicological criteria are presented in bold in the 2002 table and also listed here for convenience: acetonitrile, benzyl chloride, boron, bromate, 1,3-butadiene, 1-butanol, butylbenzenes, cacodylic acid, cadmium (California State value), chloroform, chloronitrobenzenes, chrysene (California State value), cobalt, 1,2-dibromo-3-chloropropane (California State value), 1,1-dichloroethylene, diethylene glycol ethers, diethylformamide, dinitrobenzenes, di-n-octyl phthalate, diphenyl sulfone, ethylbenzene, HCH, hexachlorocyclopentadiene, kepone, lead (California State value), MTBE, 2-nitroaniline, carcinogenic PAHs, perchlorate, polychlorinated terphenyls, benzo(k)fluoranthene (California State value), propylbenzene, propylene glycol, quinoline, tetrachloroethylene, tetrahydrofuran, thiocyanate, 1,1,1-trichloroethane, trichloroethylene, 2,4,6-trichlorophenol, 1,2,3-trichloropropane, triphenylphosphine oxide, tris(2-chloroethyl) phosphate, vinyl chloride, and xylene.

Also in this update to the "Region 9 PRGs Table User's Guide/Technical Background Document", we have added a brief discussion of special case chemicals for which an alternate approach was applied in the derivation of the Region 9 PRGs (Section 2.3). Increasingly, chemical-specific approaches are being used that do not lend themselves to a single PRG model. Special case chemicals that are discussed include: cadmium, chromium 6, lead, manganese, nitrate/nitrite, thallium, and vinyl chloride.

Finally, it should be recognized by all that use the PRGs table that not all PRG values in the table are "created equal". For some chemicals, a robust data set exists upon which the toxicological criteria are based whereas for others, there may be relatively few studies that form the basis of the PRG calculation. Also, PRGs for some chemicals are based on withdrawn toxicity values or route extrapolated values. Withdrawn and route-extrapolated numbers are shown in the table because we still need to deal with these contaminants during the long delays before replacement numbers are ready. Please consult with your toxicologist or agency risk assessor to best address potential uncertainties associated with chemical-specific PRGs, especially if the chemical is a risk driver at your site.

As with any risk-based tool, there exists the potential for misuse. We try to highlight potential problems in Section 3.8. However, it should be noted that the use of PRGs at a particular site becomes the responsibility of the user. It is recommended that the user verify the numbers with an agency toxicologist or risk assessor because the toxicity / exposure information in the table may contain errors or default assumptions that need to be refined based on further evaluation. If you find an error please contact Stan Smucker via e-mail at smucker.stan@epa.gov.

Last updated on Thursday, October 3rd, 2002
URL: http://www.epa.gov/region09/waste/sfund/prg/whatsnew.htm

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS h=HEAST n=NCEA x=Withdrawn o=Other EPA Source r=Route-extrapolation ca=Cancer PRG nc=Noncancer PRG ca* (where: nc < 100X ca) ca**(where: nc < 10X ca)
++++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION												CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
8.7E-03	i	4.0E-03	i	8.7E-03	r	4.0E-03	r	0	0.10	30560-19-1	Acephate	5.6E+01	ca**	2.0E+02	ca*	7.7E-01	ca*	7.7E+00	ca*		
				7.7E-03	i	2.6E-03	i	1		75-07-0	Acetaldehyde	1.1E+01	ca**	2.3E+01	ca**	8.7E-01	ca*	1.7E+00	ca		
		2.0E-02	i			2.0E-02	r	0	0.10	34256-82-1	Acetochlor	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			1.0E-01	r	1		67-64-1	Acetone	1.6E+03	nc	6.0E+03	nc	3.7E+02	nc	6.1E+02	nc	1.6E+01	8.0E-01
		8.0E-04	h			8.0E-04	r	0	0.10	75-86-5	Acetone cyanohydrin	4.9E+01	nc	4.9E+02	nc	2.9E+00	nc	2.9E+01	nc		
		1.7E-02	r			1.7E-02	i	1		75-05-8	Acetonitrile	4.2E+02	nc	1.8E+03	nc	6.2E+01	nc	1.0E+02	nc		
		2.0E-02	h			5.7E-06	i	1		107-02-8	Acrolein	1.0E-01	nc	3.4E-01	nc	2.1E-02	nc	4.2E-02	nc		
4.5E+00	i	2.0E-04	i	4.5E+00	i	2.0E-04	r	0	0.10	79-06-1	Acrylamide	1.1E-01	ca	3.8E-01	ca	1.5E-03	ca	1.5E-02	ca		
		6.0E-01	i			2.9E-04	i	0	0.10	79-10-7	Acrylic acid	2.9E+04	nc	1.0E+05	max	1.0E+00	nc	1.8E+04	nc		
5.4E-01	i	1.0E-03	h	2.4E-01	i	5.7E-04	i	1		107-13-1	Acrylonitrile	2.1E-01	ca*	4.9E-01	ca*	2.8E-02	ca*	3.9E-02	ca*		
8.1E-02	h	1.0E-02	i	8.0E-02	r	1.0E-02	r	0	0.10	15972-60-8	Alachlor	6.0E+00	ca	2.1E+01	ca	8.4E-02	ca	8.4E-01	ca		
		1.5E-01	i			1.5E-01	r	0	0.10	1596-84-5	Alar	9.2E+03	nc	9.2E+04	nc	5.5E+02	nc	5.5E+03	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	116-06-3	Aldicarb	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	1646-88-4	Aldicarb sulfone	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
1.7E+01	i	3.0E-05	i	1.7E+01	i	3.0E-05	r	0	0.10	309-00-2	Aldrin	2.9E-02	ca*	1.0E-01	ca	3.9E-04	ca	4.0E-03	ca	5.0E-01	2.0E-02
		2.5E-01	i			2.5E-01	r	0	0.10	74223-64-6	Ally	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	107-18-6	Allyl alcohol	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		6.0E-02	h			2.9E-04	i	0	0.10	107-05-1	Allyl chloride	3.0E+03	nc	3.0E+04	nc	1.0E+00	nc	1.8E+03	nc		
		1.0E+00	n			1.4E-03	n	0		7429-90-5	Aluminum	7.6E+04	nc	1.0E+05	max	5.1E+00	nc	3.6E+04	nc		
		4.0E-04	i					0		20859-73-8	Aluminum phosphide	3.1E+01	nc	4.1E+02	nc			1.5E+01	nc		
		3.0E-04	i			3.0E-04	r	0	0.10	67485-29-4	Amdro	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
		9.0E-03	i			9.0E-03	r	0	0.10	834-12-8	Ametryn	5.5E+02	nc	5.5E+03	nc	3.3E+01	nc	3.3E+02	nc		
		7.0E-02	h			7.0E-02	r	0	0.10	591-27-5	m-Aminophenol	4.3E+03	nc	4.3E+04	nc	2.6E+02	nc	2.6E+03	nc		
		2.0E-05	h			2.0E-05	r	0	0.10	504-24-5	4-Aminopyridine	1.2E+00	nc	1.2E+01	nc	7.3E-02	nc	7.3E-01	nc		
		2.5E-03	i			2.5E-03	r	0	0.10	33089-61-1	Amitraz	1.5E+02	nc	1.5E+03	nc	9.1E+00	nc	9.1E+01	nc		
						2.9E-02	i			7664-41-7	Ammonia					1.0E+02	nc				
		2.0E-01	i					0	0.10	7773-06-0	Ammonium sulfamate	1.2E+04	nc	1.0E+05	max			7.3E+03	nc		
5.7E-03	i	7.0E-03	n	5.7E-03	r	2.9E-04	i	0	0.10	62-53-3	Aniline	8.5E+01	ca**	3.0E+02	ca*	1.0E+00	nc	1.2E+01	ca*		
		4.0E-04	i					0		7440-36-0	Antimony and compounds	3.1E+01	nc	4.1E+02	nc			1.5E+01	nc	5.0E+00	3.0E-01
		5.0E-04	h					0		1314-60-9	Antimony pentoxide	3.9E+01	nc	5.1E+02	nc			1.8E+01	nc		
		9.0E-04	h					0		28300-74-5	Antimony potassium tartrate	7.0E+01	nc	9.2E+02	nc			3.3E+01	nc		
		4.0E-04	h					0		1332-81-6	Antimony tetroxide	3.1E+01	nc	4.1E+02	nc			1.5E+01	nc		
		4.0E-04	h			5.7E-05	i	0		1309-64-4	Antimony trioxide	3.1E+01	nc	4.1E+02	nc	2.1E-01	nc	1.5E+01	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	74115-24-5	Apollo	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
2.8E-02	i	5.0E-02	h	2.5E-02	i	5.0E-02	r	0	0.10	140-57-8	Aramite	1.9E+01	ca	6.9E+01	ca	2.7E-01	ca	2.7E+00	ca		
		3.0E-04	i					0	0.03	7440-38-2	Arsenic (noncancer endpoint)	2.2E+01	nc	2.6E+02	nc						

REFERENCE
No. 28

Abajian, Paula

From: Scott Gable [sgable@secor.com]

Sent: Friday, December 07, 2001 2:04 PM

To: Stephen Johnston; Sandra Barnett; Raho Ortiz (EPA IX); Paula Abajian; Kristin Gullatt (EPA IX); Jeff Inglis (EPA IX); David Taylor (EPA IX); Brandy Tomhave

Cc: Molly Koch; Chuck Graves

Subject: Laytonville Analytical Data Summary

Attached please find analytical data summaries (spreadsheets) for the 2001 Site Investigation at the Cahto Tribe of Laytonville Rancheria. Data are provided in an MS Excel 2000 format. The spreadsheet is a precursor to a electronic data deliverable (EDD) in progress by Severn Trent Laboratories. If you have any questions, please contact me at your convenience prior to Friday December 21, 2001 or after January 3, 2002.

Thank You.

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Rancho Cordova, California 95670
Desk 916-861-0400 x 231
Fax 916-861-0430
Cell 916-825-2235

REFERENCE
No. 29

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

To PAULA HAASJAN	# of pages ▶ 24
Dept./Agency	From LAN SIMMONS
Fax # 925/948-2601	Phone # EPA
	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

An Evaluation of Contaminant Sources at the Laytonville Landfill in Mendocino County, California and the Potential for Contaminant Exposure to Cahto Tribe of Laytonville Rancheria Residents and the Environment

Prepared for

Environmental Department
Cahto Tribe of Laytonville Rancheria
P.O. Box 1239 – 300 Cahto Drive
Laytonville, California 95454

Prepared by

Water Quality Technology, Inc.
123 North College Avenue, Suite 215
Fort Collins, Colorado 80524

June 28, 2002

Executive Summary

This study was conducted in response to concerns of potential contaminant exposure to Cahto Tribal residents on the Laytonville Rancheria as a result of contaminant sources originating on the Laytonville Landfill which is located adjacent to the Laytonville Rancheria in Mendocino County, California. The Laytonville Landfill is owned by Mendocino County and is operated by the Mendocino County Solid Waste Division. Water quality data generated at the Laytonville Landfill by the Mendocino County Solid Waste Division have been collected according to sampling plans approved by the California Regional Water Quality Control Board (CRWQCB), North Coast Region and sample analyses have been conducted by laboratories certified by California's Environmental Laboratory Accreditation Program (ELAP).

The Laytonville Landfill had a dismal history of housekeeping practices before closing in September 1993 including the issuance of keys to commercial haulers thus allowing seven days a week 24-hours a day access to the Laytonville Landfill and the resultant lack of proper regulatory inspections of refuse loads and consistent bookkeeping records. Although the Laytonville Landfill was closed by Mendocino County as a municipal waste landfill, these poor housekeeping practices allowed for the possibility of illegal dumping of non-municipal wastes, such as industrial or hazardous wastes. Before the Laytonville Landfill was closed in September 1993: (1) leachate seeps at the landfill were contaminated with volatile organic compounds (VOCs); (2) surface water runoff at the landfill was contaminated with VOCs and acetone; and (3) ground water beneath the landfill was contaminated with VOCs, acetone, and possibly DDT. Pesticide analyses, which include DDT, were subsequently dropped by Mendocino County from the monitoring plan. Since closure of the Laytonville Landfill in September 1993, seeps located along the east, west, and south slopes of the landfill have contained acetone and VOC-contaminated leachate that exceeds California MCLs. According to the Region IX EPA Federal Facilities Cleanup Branch, the suite of chemicals detected at the Laytonville Landfill could be indicative of industrial waste disposal.

During winter 2000/2001, Mendocino County conducted an unpermitted point source discharge of french-drain water from the Laytonville Landfill into an intermittent stream located upstream of Laytonville Rancheria residential homes and tributary to Cahto Creek despite the detection of VOCs in landfill seeps and drains in early 2000. The discharge effluent was later found to contain VOCs and discontinued. According to the Region IX EPA CWA Standards and Permits Office, neither french drain water nor storm water can be discharged from a landfill without a permit. Water quality sampling in March 2002 of a well located along the intermittent stream within the Laytonville Rancheria indicted the likely presence of mutagens/carcinogens (AMES testing).

Acknowledgments

The principal authors of this water quality evaluation report are listed below:

Stephen W. Johnson, Ph.D., Water Quality Hydrologist, Water Quality Technology, Inc.
Terry A. Geiselman, R.G. California Registered Geologist, Water Quality Technology, Inc.

This report has been produced under the direction and guidance of Sandra Barnett, Director of the Cahto Tribe's Environmental Department.

The following individuals provided valuable information used to produce this report:

- Katherine Baylor, Hydrogeologist, EPA Region IX Federal Facilities Cleanup Branch
- Eugene Bromley, Environmental Engineer, EPA Region IX CWA Standards and Permits Office
- Genevieve Campbell, Previously Tribal Chair for the Cahto Tribe
- Regina Dickson, Rancher with private property located adjacent to the Laytonville Landfill
- Kristin Gullatt, EPA Project Officer, U.S. Environmental Protection Agency, Region IX
- Terri Kinney, CRWQCB, North Coast Region
- Gina Morrison, CRWQCB, North Coast Region
- Jared Silva, Rancher with private property located adjacent to the Laytonville Landfill
- Mark Whitney, Microbiologist, Aquatic Consulting and Testing, Inc.
- Dean Wolback, Ph.D., Air Pollution Control Officer, Mendocino County Air Quality

The authors wish to express their appreciation to Jodi Johnson for editing and to Dr. James Drever, Ph.D., P.G.. Department of Geology & Geophysics, University of Wyoming, Laramie for a peer review of this report.

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Appendix A Mendocino County Solid Waste Division Laytonville Solid Waste Disposal Facility Quarterly Monitoring Report, January through March 1993

Appendix B Mendocino County Solid Waste Division Ground Water Sampling Procedures

Appendix C Mendocino County Solid Waste Division Report of Investigation, Detection of Odors at the Laytonville Landfill (includes Appendix B Surface Water Results)

Appendix D Ames Mutagenicity Test Overview for Laytonville Rancheria Site MW-96-1

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1.0 Introduction

1.1 Background

Tribal residents at the Cahto Tribe of Laytonville Rancheria (*Figure 1*) are concerned about cancer rates for individuals with homes located along an intermittent drainage on the Laytonville Rancheria (Personal Communication 2001). The intermittent drainage is tributary to Cahto Creek and its headwaters are located within the Laytonville Landfill (*Figure 2*). Mendocino County Solid Waste Division water quality data indicated detectable levels of contaminants in ground water at the landfill before the landfill was closed in September 1993 and volatile organic compounds (VOCs) in seeps, drains, and ambient air at the Laytonville Landfill after the landfill was closed. This report is in response to Tribal concerns regarding potential contaminant exposure to Cahto Tribe of Laytonville Rancheria residents and the environment as a result of contaminate sources originating at the Laytonville Landfill.

1.2 Purpose

The purpose of this report is to evaluate existing contaminant information on the Laytonville Landfill with respect to the potential for contaminant exposure to the adjacently located Cahto Tribe of Laytonville Rancheria residents and the environment.

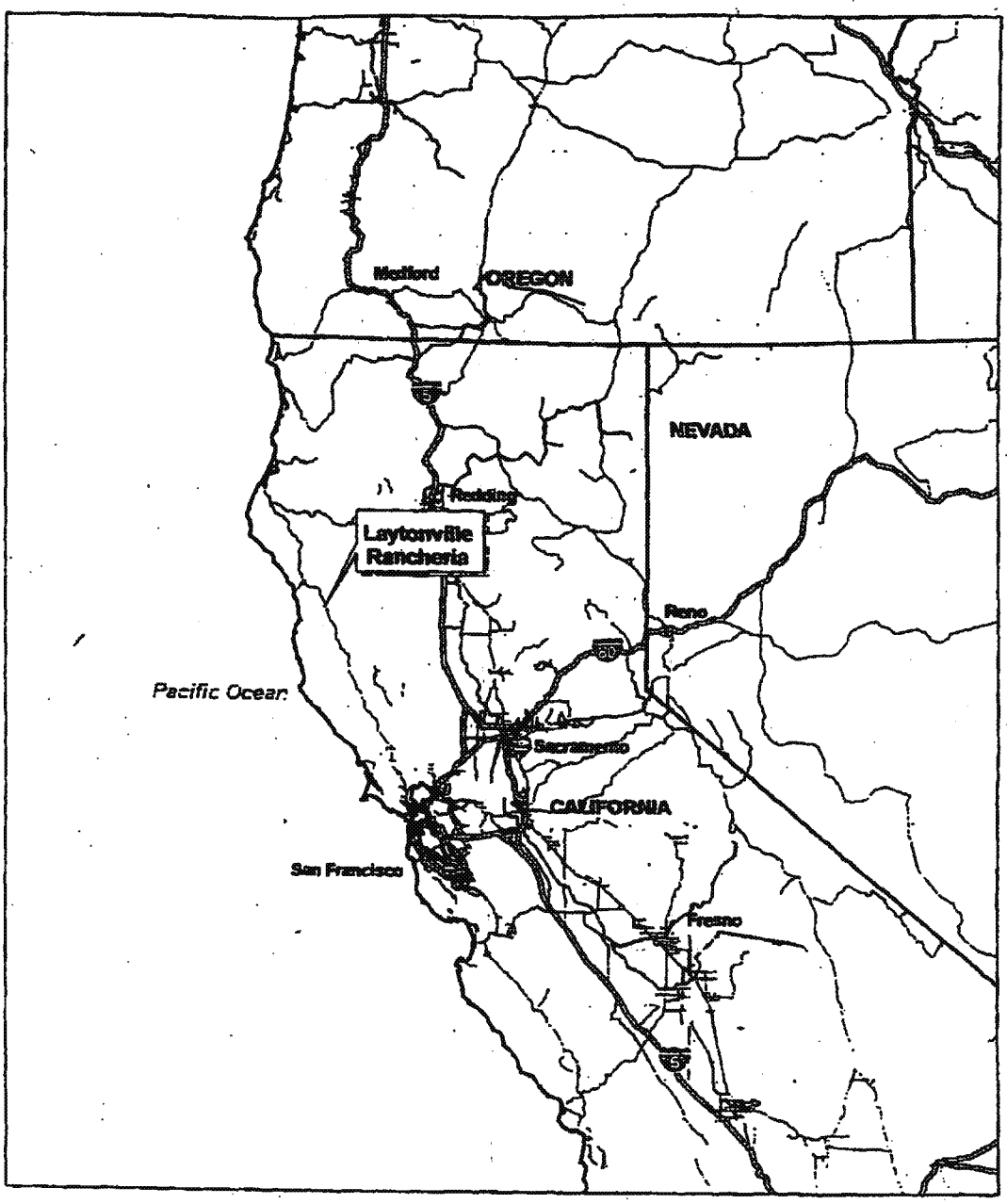
1.3 Objectives

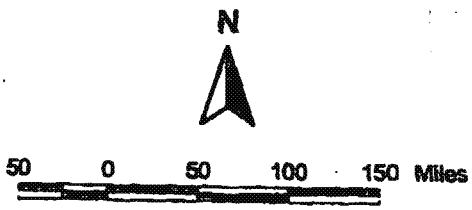
The following three objectives are designed to fulfill the purpose of this report.

(1) Evaluate information on the Laytonville Landfill prior to its closure to determine the ground water quality and surface water quality conditions and the potential for off-site contaminant plume migration.

(2) Evaluate information on the Laytonville Landfill after its closure to determine the ground water quality, surface water quality, and air quality conditions and the potential for off-site contaminant plume migration.

(3) Provide recommendations for notification and further studies to assess both water quality and air quality conditions on the Laytonville Landfill and for off-site contaminate plume migration.





Water Quality Technology, Inc.
Wherever there's water

Figure 1
Laytonville Rancheria Location

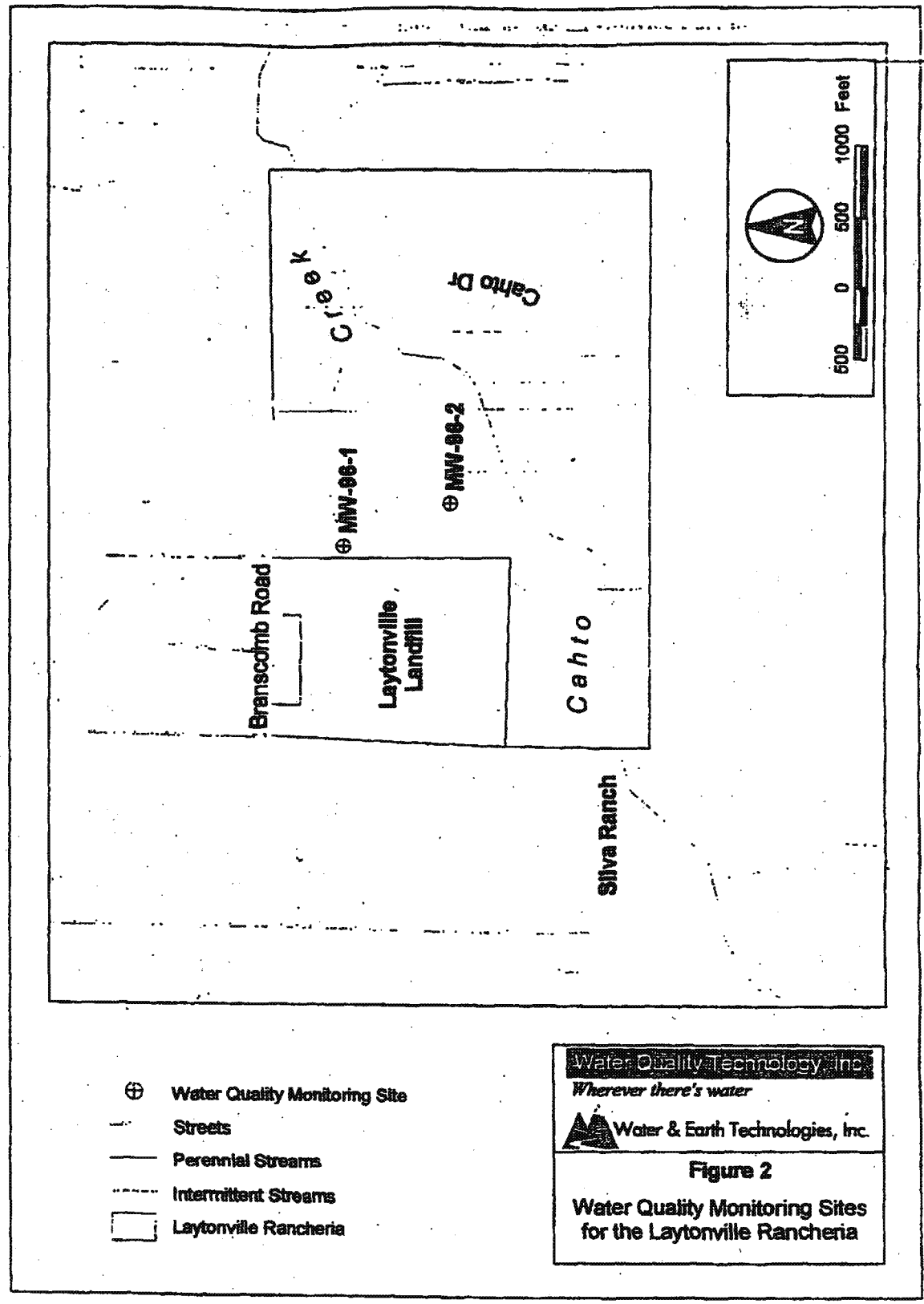


Figure 2

Water Quality Monitoring Sites for the Laytonville Rancheria

2.0 Contaminant Sources at the Laytonville Landfill

2.1 Background Information on the Laytonville Landfill

The Laytonville Landfill is located in northern California within Mendocino County, 1.5 miles southwest of the town of Laytonville, California. The landfill is bordered on the north by Brandscomb Road, on the east and south by the Laytonville Rancheria, and on the west by the Silva family ranch. The landfill is located within a 34.75 acre parcel in the northwest quarter of the southwest quarter of Section 14, Township 21 North Range 15 West, Mount Diablo Base and Meridian. The final landfill configuration is approximately seven acres within the southwestern portion of the parcel.

The landfill has been in operation since 1967 during which time the sole owner and operator has been Mendocino County. The landfill was designed to accept disposal of municipal solid waste generated from the surrounding service area. In September 1993 the Laytonville Landfill was closed. The closure plan followed Class III municipal waste landfill regulations to minimize infiltration of surface waters. During 1997 the landfill was capped using a geosynthetic/clay liner as the primary barrier layer. The barrier layer materials consist of a geocomposite drainage layer for landfill gas transmission, overlain by a geosynthetic/clay liner, overlain by geotextile filter fabric which is finally overlain by a vegetative layer. The landfill is unlined and does not contain a comprehensive leachate collection and removal system. More recently, a french drain was installed along the east slope to collect leachate that is thought to be infiltrated precipitation. Mendocino County retains responsibility for post-closure maintenance and protection of public health and the environment from contaminant sources originating on the Laytonville Landfill. Although the Laytonville Landfill was designed to accept only non-hazardous solid waste from the Laytonville service area, commercial haulers were issued their own keys to the landfill (SHN Consulting Engineers & Geologists, Inc. 1991) allowing unregulated access seven days a week, 24-hours a day.

2.2 Evaluation of Pre-Closure Contaminant Sources on the Laytonville Landfill

Water quality data collected by the Mendocino County Solid Waste Division (1993) reveal that the ground water, surface water runoff, and seeps at the Laytonville Landfill were contaminated prior to closure in September 1993 (see Appendix A). *Table 1* displays pre-closure water quality data documenting contaminated ground water for four ground water wells, two surface water sites, and seeps from July 1989 to January 1993 at the Laytonville Landfill. The ground water monitoring procedures

Table 1. Pre-Closure Water Quality Data for the Laytonville Landfill

Constituent	Units	MCL	Reported Value	Analytical Method	Sample Date	Analytical Laboratory	Chain of Custody
Ground Water Monitoring Sites							
Well No. 87-1							
Methylene Chloride	ug/L	—	0.6	EPA 601	04-16-90	Alpha Analytical	unknown
Acetone	ug/L	—	3	EPA 8015	04-16-90	Alpha Analytical	unknown
Methyl Chloride	ug/L	—	0.77	EPA 502.2	05-01-91	Alpha Analytical	yes
Well No. 87-2							
Methylene Chloride	ug/L	—	1.3	EPA 601	04-13-90	Alpha Analytical	unknown
Acetone	ug/L	—	9.2	EPA 602-M	05-01-91	Alpha Analytical	yes
Methyl Chloride	ug/L	—	1.2	EPA 502.2	05-01-91	Alpha Analytical	yes
Well No. 87-3							
4.4'-DDT	ug/L	—	0.11	EPA 608	07-11-89	Alpha Analytical	unknown
Methyl Chloride	ug/L	—	1.1	EPA 502.2	05-01-91	Alpha Analytical	unknown
Well No. 90-1							
Methyl Chloride	ug/L	—	1.3	EPA 502.2	05-01-91	Alpha Analytical	yes
Surface Water Monitoring Sites							
Surface Water Site No. LSW-1							
Acetone	ug/L	—	13	EPA 8015	01-12-90	Alpha Analytical	unknown
Methyl Ethyl Ketone	ug/L	—	7.8	EPA 602	01-12-90	Alpha Analytical	unknown
Surface Water Site No. LSW-2							
Acetone	ug/L	—	5.5	EPA 8015	01-12-90	Alpha Analytical	unknown
Methyl Ethyl Ketone	ug/L	—	1	EPA 602	01-12-90	Alpha Analytical	unknown

Legend

Alpha Analytical = Alpha Analytical Laboratories, Inc. in Ukiah, California

Data Sources: Mendocino County Solid Waste Division Quarterly Monitoring Reports for the Laytonville Landfill

MCL = California maximum contaminant level for protection of drinking water

Unknown = chain of custody information was not available for review

Table 1. Pre-Closure Water Quality Data for the Laytonville Landfill (continued)

Constituent	Units	MCL	Reported Value	Analytical Method	Sample Date	Analytical Laboratory	Chain of Custody
Leachate Seep Sites							
..1-Dichloroethane	ug/L	5	0.59	EPA 502.2	01-14-93	Alpha Analytical	yes
Benzene	ug/L	1	0.44	EPA 502.2	01-14-93	Alpha Analytical	yes
Chloroethane	ug/L	—	4.1	EPA 502.2	01-14-93	Alpha Analytical	yes
cis-1,2-Dichloroethylene	ug/L	6	**11**	EPA 502.2	01-14-93	Alpha Analytical	yes
m,p-Xylene	ug/L	1,750	1.2	EPA 502.2	01-14-93	Alpha Analytical	yes
Methyl Ethyl Ketone	ug/L	—	171	EPA 502.2	01-14-93	Alpha Analytical	yes
Methylene Chloride	ug/L	—	0.61	EPA 502.2	01-14-93	Alpha Analytical	yes
o-Xylene	ug/L	1,750	1	EPA 502.2	01-14-93	Alpha Analytical	yes
sec-Butylbenzene	ug/L	—	0.96	EPA 502.2	01-14-93	Alpha Analytical	yes
Tetrachloroethylene	ug/L	5	0.54	EPA 502.2	01-14-93	Alpha Analytical	yes
Toluene	ug/L	150	30	EPA 502.2	01-14-93	Alpha Analytical	yes
Total Xylenes	ug/L	1,750	2.2	EPA 502.2	01-14-93	Alpha Analytical	yes
Vinyl Chloride	ug/L	0.5	**8.4**	EPA 502.2	01-14-93	Alpha Analytical	yes
No. 2 East Seep							
..1-Dichloroethane	ug/L	5	1.8	EPA 601/602	01-29-93	Alpha Analytical	yes
Benzene	ug/L	1	**9.3**	EPA 601/602	01-29-93	Alpha Analytical	yes
Chloroethane	ug/L	—	2.7	EPA 601/602	01-29-93	Alpha Analytical	yes
Ethylbenzene	ug/L	700	11	EPA 601/602	01-29-93	Alpha Analytical	yes
Toluene	ug/L	150	61	EPA 601/602	01-29-93	Alpha Analytical	yes
Total Xylenes	ug/L	1,750	6.4	EPA 601/602	01-29-93	Alpha Analytical	yes
Trichloroethene	ug/L	—	0.5	EPA 601/602	01-29-93	Alpha Analytical	yes

Legend

Data Sources: Mendocino County Solid Waste Division Quarterly Monitoring Reports for the Laytonville Landfill

Alpha Analytical = Alpha Analytical Laboratories, Inc. in Ukiah, California

MCL = California maximum contaminant level for protection of drinking water

Reported values in bold exceed California MCLs

followed by Mendocino County Solid Waste Division for the landfill (Mendocino County 2002 [revised]) are presented in Appendix B.

Pre-closure ground water, seeps, and surface water quality data indicate that liquid and/or solid waste in the Laytonville Landfill refuse areas had contaminated the underlying ground water and surface runoff with organic chemicals (*Table 1*). The eighth page of Appendix A includes a map indicating the pre-closure ground water and surface water monitoring locations. The pre-closure ground water was contaminated with acetone (a solvent) and the volatile organic compounds (VOCs): methylene chloride and methyl chloride (a chlorination byproduct). Ground water contamination was documented as occurring to the north, south, and eastern portions of the landfill. The surface water monitoring sites indicate contamination with acetone and methyl ethyl ketone (found in paint thinner). Water quality for seeps indicated the greatest contamination comprising 13 different VOCs in which California MCLs (State of California 2000) were exceeded for cis-1,2-dichloroethylene (a chlorination byproduct), vinyl chloride (a plastics byproduct), and benzene (a gasoline byproduct).

The single value for dichlorodiphenyltrichloroethane (DDT) in landfill ground water cannot be reliably evaluated because no additional analyses were conducted for this banned insecticide. Although DDT was detected in landfill ground water monitoring well number 87-3 (located on the northern portion of the landfill) in July 1989, this well was not retested for DDT because Mendocino County Solid Waste Division's 1990 revisions to the monitoring plan did not include DDT or any other pesticide analyses (Mendocino County Solid Waste Division 1990).

Based on the detectable levels of contaminants in seeps, surface water, and ground water quality monitoring sites (*Table 1*), off-site contaminant migration likely occurred before the landfill was closed in September 1993, but the extent and duration of the contaminant plume(s) cannot be substantiated. The hydrogeology of the landfill and potential contaminant migration pathways were not determined as part of any study to evaluate off-site contaminate migration for contaminate sources on the Laytonville Landfill. A report by Anderson Consulting Group (1996) concludes that the direction of ground water flow across the landfill site is complicated by the diverse geology and aquifer configuration and therefore was difficult to determine as part of their study. However, the direction of ground water flow near the landfill was estimated to be radially away from the landfill (Anderson Consulting Group 1996).

2.3 Evaluation of Post-Closure Contaminant Sources on the Laytonville Landfill

A single sample analysis for ground water monitoring well number 93-1 indicated contamination based on a single diethyl phthalate concentration of 27 ug/L, but subsequent sampling of this well has not indicated that a ground water contaminant plume is present. On February 3, 2000 Mendocino County Solid Waste Division identified leachate seeps on the east slope of the landfill (Mendocino County Solid Waste Division 2000). Since February 2000, leachate seeps containing VOCs and acetone (a common solvent) have also been detected by the Mendocino County Solid Waste Division (2000 and 2001) along the east, west, and south slopes (*Table 2*). Water quality data collected by Mendocino County Solid Waste Division as part of an investigation at the landfill are presented in Appendix C. Detectable levels of vinyl chloride and benzene in seeps and drains at the Laytonville Landfill are a human health concern because both of these VOCs have been determined by the U.S. Environmental Protection Agency as human carcinogens (cancer-causing agents) (USEPA 2000). Contaminant levels of vinyl chloride exceed California drinking water maximum contaminant levels (MCLs) (*Table 2*). Exceedances of California MCLs in leachate at the Laytonville Landfill triggers a public health protection mechanism requiring Mendocino County Solid Waste Division to contain the contaminated leachate water within the landfill boundary to ensure that no contaminated discharges occur off-site. According to the Region IX EPA Federal Facilities Cleanup Branch, the suite of chemicals detected at the Laytonville Landfill could be indicative of industrial waste disposal (Personal Communication 2002d).

The waste materials buried in refuse piles within the Laytonville Landfill appear to be contaminated with VOCs that are degassing beneath the landfill liner. If the Mendocino Solid Waste Division's investigation conclusions (Mendocino County Solid Waste Division 2000) are correct, then the buried refuse within the Laytonville Landfill does not come in contact with either ground water or rain water. Considering this, the only mechanism for VOC contamination of seeps and drains at the Laytonville Landfill is for degassed VOCs (beneath the landfill liner) to dissolve into rain water as the water migrates through the overlying cap liner materials and daylights as contaminated leachate in seeps and drains. The gaseous VOCs beneath the liner would need to reach a sufficiently high concentration to reach an equilibrium, according to Henry's law, between the gaseous VOCs and the rainwater to dissolve the VOCs into the contacted rainwater. The gaseous VOCs that do not dissolve into rainwater would then evaporate into the air above the landfill liner. In addition, because the VOCs dissolved into water are not stable without a partial pressure of overlying gaseous VOCs, the VOCs would evaporate into the air as the leachate flows out of the seeps and drains into open-air containment vessels. Both of these VOC degassing mechanisms would contribute to contaminated air quality originating on the Laytonville Landfill.

Table 2. Post-Closure Water Quality Data for the Laytonville Landfill

Constituent	Units	MCL	Reported Value	Analytical Method	Sample Date	Analytical Laboratory	Chain of Custody
First Test Hole (East Slope Seep)							
Acetone	ug/L	—	111	EPA 602-M	02-08-00	Alpha Analytical	yes
Benzene	ug/L	1.0	0.57	EPA 502.2	02-08-00	Alpha Analytical	yes
Vinyl Chloride	ug/L	0.5	4.1	EPA 502.2	02-08-00	Alpha Analytical	yes
n-Butylbenzene	ug/L	—	0.87	EPA 502.2	02-08-00	Alpha Analytical	yes
Chloroethane	ug/L	—	11	EPA 502.2	02-08-00	Alpha Analytical	yes
Chloromethane	ug/L	—	13	EPA 502.2	02-08-00	Alpha Analytical	yes
Methyl Ethyl Ketone	ug/L	—	3.3	EPA 502.2	02-08-00	Alpha Analytical	yes
1,1-Dichloroethane	ug/L	5.0	0.91	EPA 502.2	02-08-00	Alpha Analytical	yes
West Slope Drain Net							
Vinyl Chloride	ug/L	0.5	**0.83**	EPA 502.2	03-02-00	Alpha Analytical	yes
South Slope Drain Net							
Acetone	ug/L	—	190	EPA 602-M	03-02-00	Alpha Analytical	yes
Benzene	ug/L	1.0	0.53	EPA 502.2	03-02-00	Alpha Analytical	yes
Vinyl Chloride	ug/L	0.5	**3.7**	EPA 502.2	03-02-00	Alpha Analytical	yes
Chloroethane	ug/L	—	7.1	EPA 502.2	03-02-00	Alpha Analytical	yes
1,1-Dichloroethane	ug/L	5.0	0.54	EPA 502.2	03-02-00	Alpha Analytical	yes
Weep Hole (Saddle)							
Acetone	ug/L	—	7.2	EPA 602-M	03-02-00	Alpha Analytical	yes
Benzene	ug/L	1.0	0.52	EPA 502.2	03-02-00	Alpha Analytical	yes
Vinyl Chloride	ug/L	0.5	**7.5**	EPA 502.2	03-02-00	Alpha Analytical	yes
Chloroethane	ug/L	—	7.9	EPA 502.2	03-02-00	Alpha Analytical	yes
1,1-Dichloroethane	ug/L	5.0	4.1	EPA 502.2	03-02-00	Alpha Analytical	yes
1,1,1-Trichloroethane	ug/L	200	1.2	EPA 502.2	03-02-00	Alpha Analytical	yes
Weep Hole (Ditch Line)							
Acetone	ug/L	—	8.4	EPA 602-M	03-02-00	Alpha Analytical	yes
Benzene	ug/L	1.0	0.50	EPA 502.2	03-02-00	Alpha Analytical	yes
Vinyl Chloride	ug/L	0.5	**3.3**	EPA 502.2	03-02-00	Alpha Analytical	yes
Surface Water Re-Test (East Slope Seep)							
Acetone	ug/L	—	16	EPA 602-M	03-02-00	Alpha Analytical	yes
Vinyl Chloride	ug/L	0.5	**3.9**	EPA 502.2	03-02-00	Alpha Analytical	yes
Chloroethane	ug/L	—	4.2	EPA 502.2	03-02-00	Alpha Analytical	yes
Ground Water Monitoring Well No. 93-1							
Diethyl Phthalate	ug/L	—	27	EPA 625/3510 or 8270/3550	06-21-01	McCampbell Analytical, Inc.	yes

Legend
Data Sources: Mendocino County Solid Waste Division (2000)
MCL = California maximum contaminant level for protection of drinking water
Reported values in **bold** exceed California MCLs

During the winter of 2000/2001, a point source discharge containing volatile organic compounds (VOCs) originating on the Laytonville Landfill occurred that resulted in contaminated surface water flows within an intermittent stream on the Laytonville Rancheria that is tributary to Cahto Creek (*Table 3*). According to the Mendocino County Solid Waste Division (Mendocino County Solid Waste Division 2001) and the California Regional Water Quality Control Board, North Coast Region (Personal Communication 2002c), permission was obtained from the California Regional Water Quality Control Board, North Coast Region to discharge french drain water that was collected from the east slope of the Laytonville Landfill to an intermittent stream located within 100 feet and upstream of the Laytonville Rancheria. According to the California Regional Water Quality Control Board, North Coast Region (Personal Communication 2002c), the french drain water was considered to be storm water and VOC analyses conducted on the french drain water in October 2000 had indicated undetected VOCs. However, VOCs had been detected in east slope seeps in February 2000 (*Table 2*) as well as a total of 21 detections of VOCs in seeps, drains, and weep holes at the landfill in February and March 2000 by the Mendocino County Solid Waste Division as indicated in *Table 2*. According to the Region IX EPA CWA Standards and Permits Office, neither french drain water nor storm water can be discharged from a landfill without a permit (Personal Communication 2002a). The unpermitted discharge continued until routine sampling results indicated detectable VOCs (*Table 3*). Contaminated drain water (leachate) from the east slope is currently collected at the Laytonville Landfill and hauled to the Willits Wastewater Treatment Plant for disposal, but leachate from the west and south slopes of the landfill appears to be mixing with precipitation runoff which is routed to unlined ponds containing outflow structures.

Neither the Cahto Tribal Council or the Cahto Tribe's Environmental Department were notified of the point source discharge of french drain water upstream of the Laytonville Rancheria (Personal Communication 2001). It is not known how long after October 2000 that levels of VOCs in the discharge water were detected, but the January 2001 data revealed VOC contamination in the point source discharge water (*Table 3*). The contaminated point source discharge was located within 100 feet and upstream of the Laytonville Rancheria in an intermittent stream reach that is bordered on the Laytonville Rancheria with residential homes. Analyses of the VOC-contaminated point source discharge of leachate water from the Laytonville Landfill reveal that drinking water MCLs were exceeded (*Table 3*) and the human carcinogen, vinyl chloride (USEPA 2000), was detected in the discharge water (Mendocino County Solid Waste Division 2001). The federal maximum contaminate level goal (MCLG) for vinyl chloride has been set at zero by the U.S. Environmental Protection Agency (USEPA 2000) because the USEPA is concerned human exposure to this carcinogen can cause potential health problems, such as damage to liver and nervous systems, and cancer. Because of the volatile nature of vinyl chloride, this VOC wc

Table 3. Water Quality Analyses for the Point Source Discharge from the Laytonville Landfill

Constituent	Units	MCL	MCLG	Reported Value	Sample Site	Sample Date
VOCs	ug/L	no detectable VOCs			FD-1 Drain Source	10-00
Leachate from East Slope Drain was discharged without a permit (with permission from the CRWQCB – North Coast Region) at FD-2 Discharge Point into an intermittent stream located upstream of the Laytonville Rancheria.						
Chloroethane	ug/L	—	—	2.2	FD-1 Drain Source	12-14-00
Vinyl Chloride	ug/L	0.5	0	**0.77**	FD-1 Drain Source	12-14-00
Chloroethane	ug/L	—	—	8.0	FD-1 Drain Source	01-11-01
Vinyl Chloride	ug/L	0.5	0	**6.5**	FD-1 Drain Source	01-11-01
Chloroethane	ug/L	—	—	3.4	FD-2 Discharge Point	01-11-01
Vinyl Chloride	ug/L	0.5	0	**2.6**	FD-2 Discharge Point	01-11-01
According to Laytonville Landfill quarterly monitoring reporting by the Mendocino County Solid Waste Division (2001) the point source discharge was stopped upon receipt of detectable-VOC analytical results and VOC-contaminated leachate was contained on site.						
Chloroethane	ug/L	—	—	6.3	FD-1 Drain Source	03-05-01
Vinyl Chloride	ug/L	0.5	0	**2.6**	FD-1 Drain Source	03-05-01

Legend
MCL = California maximum contaminant level for protection of drinking water
MCLG = federal maximum contaminant level goal under the Safe Drinking Water Act
Reported values in **bold** exceed California MCLs

have been expected to evaporate from the discharge water as it flowed through the Laytonville Rancheria. VOCs in the contaminated discharge water that did not evaporate along the intermittent stream reach would have flowed into Cahto Creek and exposed aquatic life to VOCs. However, no environmental sampling of Cahto Creek is recommended because no accumulations of VOCs would have likely occurred in either aquatic life or the sediment of Cahto Creek resulting from a VOC-contaminated surface water plume.

If the Mendocino Solid Waste Division's investigation conclusions are incorrect (as indicated in Mendocino County Solid Waste Division 2000), then the buried refuse within the Laytonville Landfill may come in contact with ground water which would result in a contaminant plume beneath the landfill. Unfortunately, the ground water monitoring configuration currently implemented by Mendocino County Solid Waste Division is not adequate for detecting contaminant plumes originating on the Laytonville Landfill or any ground water contaminate plumes migrating off-site of the landfill. Any ground water contaminant plumes originating on the Laytonville Landfill that could migrate off-site would need to be evaluated with respect to potential pathways from ground water to humans such as aquifers protected as potential drinking water sources and the potential for vapor-transport of VOCs into building foundations on the Laytonville Rancheria

Air quality monitoring for pollutants other than methane at the Laytonville Landfill is not conducted on a routine basis. A single air quality sample collected by the Mendocino County Solid Waste Division on March 8, 2000 revealed the presence of VOCs (*Table 4*). According to the Mendocino County Air Quality Division (Personal Communication 2002b), the air quality levels presented in *Table 4* do not exceed air quality standards for the State of California.

Table 4. Post-Closure Air Quality Data for the Laytonville Landfill

Constituent	Units	Value	MRL	Analytical Method	Sample Date	Landfill Gas Sample Site
Benzene	ppb	0.080	0.050	EPA 8240A	03-08-00	GV-2
Chloroethane	ppb	0.77	0.050	EPA 8240A	03-08-00	GV-2
cis-1,2-Dichloroethene	ppb	0.050	0.050	EPA 8240A	03-08-00	GV-2
Toluene	ppb	0.050	0.050	EPA 8240A	03-08-00	GV-2
Vinyl Chloride	ppb	0.52	0.050	EPA 8240A	03-08-00	GV-2

Legend
Analytical Laboratory: Kiff Analytical, LLC
ppb = parts per billion
MLR = method reporting limit
Data Source: Mendocino County Solid Waste Division (2000)

3.0 Contaminant Exposure to Rancheria Residents and the Environment

3.1 Background Information on the Laytonville Rancheria

The Cahto Tribe of Laytonville Rancheria is located in northern Mendocino County on Branscomb Road, two miles west of Laytonville California on Highway 101. There are a total of 140 Tribal members including their families residing on the 200-acre Rancheria. The Cahto Tribe is recognized by the U.S. Government and resides on established land bought for the Cahto Tribe in 1908.

Water resources on the Laytonville Rancheria include Cahto Creek (a perennial stream), intermittent and ephemeral streams tributary to Cahto Creek, a short reach of Dead Cow Creek (tributary to Cahto Creek), the Terrace Deposits aquifer, the Franciscan Formation aquifer, and extensive riparian areas along both creeks and tributaries. The Laytonville Rancheria is adjacent to the Laytonville Landfill.

3.2 Potential Contaminant Exposure to Laytonville Rancheria Residents from the Laytonville Landfill

Tribal residents have voiced concerns of high cancer rates for residents with homes located along an intermittent drainage on the Laytonville Rancheria. The intermittent drainage is tributary to Cahto Creek and its headwaters are located within the Laytonville Landfill. During the winter of 2000/2001, Mendocino County conducted an unpermitted point source discharge of french-drain water collected at the Laytonville Landfill into an intermittent stream located within 100 feet and upstream of the Laytonville Rancheria despite the detection of VOCs in seeps and drains at the landfill in early 2000. Residential homes border the intermittent stream that flows through the Laytonville Rancheria to become tributary to Cahto Creek, a perennial stream. The discharge effluent was later found to contain VOCs and discontinued, but would have exposed Laytonville Rancheria residents to any volatilized VOCs during the unpermitted discharge time period.

Mendocino County Solid Waste Division water quality data indicate detectable levels of volatile organic compounds (VOCs) in seeps at the Laytonville Landfill. The east slope seeps with detectable levels of VOCs are located upstream of the intermittent drainage. A literature search revealed documentation of contaminants (e.g., detectable VOCs) in seeps and ground water at the Laytonville Landfill (Mendocino County Solid Waste Division 1990, 1993, 2000, and 2001). Two pathways for contaminant migration from the Laytonville Solid Waste Disposal Facility to the Laytonville Rancheria are (1) degassing of

landfill VOCs that contaminate the air quality of down-wind residents on the Laytonville Rancheria and (2) contaminant plumes in landfill ground water that flow down-gradient and through the Laytonville Rancheria towards Cahto Creek. The second theory was preliminarily tested during a ground water investigation conducted on the Laytonville Rancheria on March 13, 2002. The following is a summary of findings.

The purpose of the preliminary study was to sample and analyze the ground water quality of two existing wells on the Laytonville Rancheria located adjacent to and down hill of the Laytonville Landfill for cancer-causing agents.

Well number MW-96-2 had a total depth of 20 feet and a depth to ground water of 10 feet. Well number MW-96-1 had a total depth of 20 feet and a depth to ground water of 1 foot. Sampling depths for both wells was at approximately 15 feet below the ground surface. Locations of these two monitoring wells are displayed on *Figure 2*.

The sampling and analyses were conducted according to the Cahto Tribe's EPA-approved QAPP and involved the following tests:

1. Volatile organic compounds (EPA Method 8260B)
2. Radionuclides (Gross alpha and gross beta activities) (EPA Methods 600/00-02 and 900.0)
3. Chlorinated pesticides (EPA Method 608)
4. Polychlorinated biphenyls (PCBs) (EPA Method 608/8081)
5. AMES Mutagenicity Test (Standard Method 8030B) (APHA, AWWA, and WEF 1998)

The wells were purged with a Teflon bailer until conductivity and water temperature values were within 10%.

Results of the preliminary study were that no VOCs, chlorinated pesticides, or PCBs were detected in the two ground water samples and levels of gross alpha and gross beta activities were below drinking water MCLs. However, all five of the different test strains (*Salmonella typhimurium*) used in the AMES assay (also called the Salmonella Microsomal Mutagenicity Test) indicated mutagenic activity (Appendix D). The positive results from all five strains of S. typhimurium were conducted with metabolic activation. The AMES test was refined with the addition of an S9 rat liver enzyme mix to allow the test to more closely resemble a mammalian

system. The AMES test uses the bacterium, *Salmonella typhimurium*, as a sensitive indicator of DNA damage and the mammalian liver extract are used for metabolic conversion of the carcinogens to their active mutagenic forms for which there is a high correlation between human carcinogenicity and mutagenicity (McCann and Ames 1976). The AMES test was conducted by Aquatic Consulting and Testing, Inc. in Tempe, Arizona. The laboratory has released the AMES data in a laboratory report that includes scientifically-defensible controls and a statistically-defensible conclusion of a strong indicator for the possible presence of one or more mutagenic compounds. The laboratory indicated that the AMES data would be admissible in court. The AMES test results provide preliminary data on the likely presence of mutagens in the Laytonville Rancheria ground water. The AMES test measures mutagenic activity for which there is a relationship between mutagenic activity and carcinogenicity (cancer-causing agents).

The microbiologist in charge of the AMES Test, Mark Whitney, researched literature on carcinogens associated with the detection of mutagenic activity by each of the test strains of *Salmonella typhimurium* that tested positive. Possible carcinogens that were not tested along with the AMES samples are synthetic organics, certain petroleum products and dioxin. As a follow up to the preliminary study, the Laytonville Rancheria well (MW 96-1) will be re-sampled for the AMES test while concurrently collecting samples for a new suite of contaminants (carcinogens) in order to draw conclusions about the source of the mutagenic activity.

3.3 Potential Contaminant Exposure to the Environment from the Laytonville Landfill

Potential contaminant exposure to the environment includes both water quality and air quality contaminant pathways. The Laytonville Landfill continues to produce VOC-contaminated leachate exceeding California drinking water MCLS and the landfill is degassing VOCs into the air. The operator of the Laytonville Landfill, Mendocino County Solid Waste Division, has not implemented an air quality monitoring program or a hydrogeologically-based ground water monitoring program in an effort to evaluate the potential for off-site migration of contaminants (especially VOCs) originating on the landfill.

Surface water and ground water flows are towards Cahto Creek that is a perennial stream supporting a cold water fishery. Any surface or ground water quality contaminant plume originating at the Laytonville Landfill that is not contained on-site at the landfill, would migrate towards Cahto Creek. VOCs that

originate at the Laytonville Landfill as volatilized gases would migrate down wind and off-site to expose birds, insects (bees are especially susceptible), and terrestrial animals.

Except for an isolated contaminated point source discharge off-site during the winter 2000/2001, Mendocino County Solid Waste Division data indicate that contaminated surface waters are being contained at the Laytonville Landfill (Mendocino County Solid Waste Division 2001). However, there is a lack of reliable information on (1) the transport and fate of leachate from seeps on the southern and western slopes of the landfill and (2) ground water flow paths identified to determine whether the existing landfill monitoring wells would detect any contaminant plumes originating on the landfill. Without reliable ground water and surface water quality data as well as air quality data for the Laytonville Landfill, a comprehensive evaluation of off-site contaminant exposure to the environment from the Laytonville Landfill is not possible.

4.0 Conclusions and Recommendations

Contaminant sources originating at the Laytonville Landfill contaminated surface water runoff at the landfill and ground water beneath the landfill before the landfill closed in September 1993, and since closure have produced leachate exceeding California drinking water standards. Water quality and air quality data are not routinely being collected to allow for a comprehensive determination of the potential for off-site contaminant plume migration. Unidentified substances exhibiting mutagenic activity were detected in ground water on the Laytonville Rancheria along an intermittent stream with its headwaters on the Laytonville Landfill. A follow-up investigation is planned. Recommendations are provided below.

(1) Mendocino County needs to accurately map the ground water gradients (flow paths) for both the shallow and deeper aquifers underlying the landfill footprint. Ground water monitoring wells need to be installed beneath buried refuse areas and in areas ensuring that any contaminate plumes originating within the landfill will be detected. Pesticides, VOCs, synthetic organics, and radionuclides need to be included in the analyses. Finally, an evaluation needs to be conducted using new ground water and surface water (leachate in runoff) data to assess the potential for off-site contaminant plume migration and any threats to human health and the environment.

(2) Mendocino County needs to install air quality monitors for VOCs along the perimeter of the Laytonville Landfill to generate reliable data on air quality to allow for an evaluation of air quality exposure to humans and the environment. Based on these results, a gas collection and extraction system may need to be installed at the Laytonville Landfill.

(3) Mendocino County needs to be give notice to the Cahto Tribe's Environmental Protection Department prior to any future point source discharges to stream reaches located upstream of the Laytonville Rancheria.

(4) Mendocino County needs to provide copies to the Cahto Tribe's Environmental Protection Department of all documents released as part of the Laytonville Landfill closure process.

(5) The Laytonville Landfill needs to be reevaluated to determine whether existing or newly generated environmental data indicate that industrial or hazardous wastes were received at the landfill and whether more stringent landfill closure regulations are warranted.

5.0 References Cited

Anderson Consulting Group. 1996. *Final Closure and Postclosure Maintenance Plan, Laytonville Landfill, Mendocino County.* Roseville, California.

APHA, AWWA, and WEF (American Public Health Association, American Water Works Association, and Water Environment Federation. 1998. *Standard Methods for the Examination of Water and Wastewater.* Method 8030 B. *Salmonella* Microsomal Mutagenicity Test. 20th Edition. Washington, DC.

McCann, J. and B. N. Ames. 1976. *Detection of carcinogens as mutagens in the Salmonella microsome test: Assay of 300 chemicals: Discussion.* Proc. Nat. Acad. Sci. Volume 73, No. 3: pages 950-954.

Mendocino County Solid Waste Division. 1990. *Laytonville Solid Waste Disposal Facility, Quarterly Monitoring Report, October thru December 1989. February 5, 1990.* Ukiah, California.

Mendocino County Solid Waste Division. 1993. *Laytonville Solid Waste Disposal Facility, Quarterly Monitoring Report, January thru March 1993.* Ukiah, California.

Mendocino County Solid Waste Division. 2000. *Report of Investigation, Detection of Odors at the Laytonville Landfill.* Ukiah, California.

Mendocino County Solid Waste Division. 2001. *Laytonville Solid Waste Disposal Facility, Leak Detection, Quarterly Monitoring Report, October through December 2000.* Ukiah, California.

Mendocino County Solid Waste Division. 2002. (revised March 2002). *Ground Water Sampling Procedures.* Ukiah, California.

Personal Communication. 2001. Conversation between Sandra Barnett, Director of the Cahto Tribe's Environmental Department and Stephen Johnson, Ph.D., Water Quality Hydrologist with Water Quality Technology, Inc.

Personal Communication. 2002a. Conversation between Eugene Bromley, Environmental Engineer with the U.S. Environmental Protection Agency Region IX Clean Water Act Standards and Permits Office (WTR-5) and Stephen Johnson, Ph.D., Water Quality Hydrologist with Water Quality Technology, Inc.

Personal Communication. 2002b. Conversation between Dean Wolback, Ph.D., Air Pollution Control Officer with the Mendocino County Air Quality Management Division and Stephen Johnson, Ph.D., Water Quality Hydrologist with Water Quality Technology, Inc.

Personal Communication. 2002c. Conversation between Gina Morrison, Water Resources Control Engineer with the California Regional Water Quality Control Board (CRWQCB), North Coast Region and Stephen Johnson, Ph.D., Water Quality Hydrologist with Water Quality Technology, Inc.

Personal Communication. 2002d. Conversation between Katherine Baylor, Hydrogeologist with the U.S. Environmental Protection Agency Region IX Superfund Division, Federal Facilities Cleanup Branch and Stephen Johnson, Ph.D., Water Quality Hydrologist with Water Quality Technology, Inc.

SHN Consulting Engineers & Geologists, Inc. 1991. *Laytonville Solid Waste Disposal Site Report of Waste Discharge*. Eureka, California.

State of California. 2002. (in promulgation as of 2002) *California Code of Regulations, Title 22, Division 4 Environmental Health, Chapter 15 Domestic Water Quality and Monitoring. Article 5.5 Primary Standards-Organic Chemicals. Table 64444-A Maximum Levels, Organic Chemicals*. Sacramento, California.

U.S. Environmental Protection Agency. 2000. *Drinking Water Standards and Health Advisories*. Office of Water. Washington, DC. EPA 822-B-00-001.

REFERENCE
No. 30

CONTACT REPORT

AGENCY/AFFILIATION: USEPA, Region IX		
DEPARTMENT: Quality Assurance Office (QAO)		
ADDRESS/CITY:		
COUNTY/STATE/ZIP:		
CONTACT(S)	TITLE	PHONE
David Taylor	QAO Manager	415-972-3803
PERSON MAKING CONTACT: Paula Abajian		DATE: 12/27/01
SUBJECT: Laytonville Dump Sampling		
SITE NAME: Laytonville Dump		EPA ID#:

Dr. Taylor is currently reviewing the SAP/QAPP for WQTI's intended sampling event. Whether WQTI will incorporate surface water sampling in Cahto Creek for HRS purposes has yet to be determined.

REFERENCE
No. 31

CONTACT REPORT

AGENCY/AFFILIATION: Laytonville Water District		
DEPARTMENT: n/a		
ADDRESS/CITY: P.O. Box 86		
COUNTY/STATE/ZIP: Laytonville, CA 95454		
CONTACT(S)	TITLE	PHONE
David White	District Manager	707-984-6444
PERSON MAKING CONTACT: Paula Abajian		DATES: 8/28/01, 11/14/01, 11/28/01, 5/20/03
SUBJECT: Public Water Supply Treatment System		
SITE NAME: Laytonville Dump		EPA ID#: CAD000065532

8/28/2001

The Laytonville Water District public supply well is located between the west side of Highway 1 and Tenmile Creek and serves approximately 2000 people year-round, non-supplemented. They have never detected post-treatment contamination in the water supply. Mr. White estimates that there are at least 40 private drinking water wells in the vicinity (on all sides) of the landfil.l

11/14/2001

Technical descriptions of the direction of groundwater flow around the landfill are inconclusive. However, Mr. White's personal understanding of the groundwater flow direction, from living in Laytonville and observing the water for 30 years, is that groundwater follows surface water, in all areas of the valley. Background levels of metals in groundwater vary greatly by aquifer. For example, the City has two wells both screened at about 50 feet bgs that are located 75 feet apart from one another. One well regularly has levels of arsenic at 63-75 mg/L while the other has levels at 15 mg/L. Near the Rancheria, there are two aquifers that can be tapped. Both are shallow, although one is slightly deeper than the other. The shallow aquifer (at 35-50 feet bgs) consistently has good quality water. The deeper of the two aquifers (at 50 feet bgs) has extremely poor quality water in that the iron content is so high that the water is orange-brown and stains any porcelain dishes or clothing that is washed with it. This aquifer extends from the Rancheria out to the west towards the Trading Post on Branscomb Road. The City is planning to extend their system to

include much of the area north of the landfill that is now using private drinking water wells.

11/28/2001

The two municipal wells (only one is active) operated by the Laytonville Water District are located approx. 70 feet apart from each other and are separated by an earthquake pressure ridge. The water table in one well reaches ground level during the winter and drops to 38 feet bgs during the summer. The water table in the other well reaches 38 feet bgs during the winter and drops below the well screen during the summer. The well currently in operation for the city yields 500 gallons per minute. It was originally drilled to 100 feet and now reaches 400 feet. David knows of 4 aquifers in the area.

5/20/2003

The groundwater pumped for use as public water supply by the Laytonville Water District naturally contains arsenic at concentrations around 60 ug/L to 70 ug/L. After treatment, the arsenic concentration drops to about 40 ug/L, which meets the current MCL of 50 ug/L, but will not meet the future MCL of 10 ug/L. Prior to public distribution, the groundwater receives treatment in the following order:

- Potassium permanganate ($KMnO_4$) which serves as a disinfectant and lowers the concentration of manganese and may also lower the concentrations of iron and arsenic;
- Aeration tower;
- Chlorination;
- 1 hour, 20 minutes in a detention tank to allow time for water to react with $KMnO_4$;
- Green sand pressure filters.

REFERENCE
No. 32

ANDERSON CONSULTING GROUP

Final Closure and Postclosure
Maintenance Plan
Laytonville Landfill, Mendocino County

ENVIRONMENTAL SOLID WASTE GEOTECHNICAL

Report to

MENDOCINO COUNTY SOLID WASTE DIVISION

WATER QUALITY
CONTROL BOARD
REGION 1

MAR 31 '97

- ☐ BK ____ ☐ RK ____
- ☐ CJ ____ ☐ LR ____
- ☐ FR ____ ☐ TW ____
- ☑ RT ____ ☐ KD ____
- ☐ JH ____ ☐ PG ____
- ☐ SW ____ ☐ JS ____
- ☐ TD ____ ☑ DSE
- ☐ ALL STAFF ☐ FILE

December 1996
File No. 3200-77.606

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320077P1.wpl

Report to

MENDOCINO COUNTY SOLID WASTE DIVISION

Prepared by
Anderson Consulting Group
631 Commerce Drive
Roseville, CA 95678

The information presented in this Final Closure and Postclosure Maintenance Plan is to the best of our knowledge accurate and correct. This Plan was prepared by the undersigned and is stamped by the responsible engineer in charge.

Nicole C. Hart, P.E., C53289
Project Engineer

3/24/97

Donald M. Olsen, P.E., C49514
Project Manager

REGISTERED CIVIL ENGINEER
DONALD M. OLSEN
No. 49514
Exp. 09-30-00
STATE OF CALIFORNIA

3/24/97

320077P1.wpl

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1.0 INTRODUCTION

This Final Closure and Postclosure Maintenance Plan (Final Plan) was prepared for the Laytonville Landfill in accordance with the applicable requirements. These requirements are contained in the California Code of Regulations (CCR), Title 14, Division 7, Chapters 3 and 5 (Title 14), CCR Title 23, Chapter 15 (Title 23) and the Code of Federal Regulations (CFR) Title 40, Part 258 (Subtitle D). The purpose of the Final Plan is to provide the necessary information from which the operator of the landfill (Mendocino County Solid Waste Division) can prepare both cost estimates and schedules for closure and postclosure maintenance of the landfill. This document presents a detailed plan and schedule for closure and postclosure maintenance of the landfill.

Information regarding the landfill operation was obtained from the following documents:

- *Revised Monitoring and Reporting Program No. 75-50 (Revised December 7, 1988)*, prepared for the County of Mendocino, Laytonville Solid Waste Disposal Site, prepared by California Regional Water Quality Control Board;
- *Report of Waste Discharge, Laytonville Solid Waste Disposal Site, November 1991*, prepared by SHN Consulting Engineers & Geologists;
- *Water Quality Solid Waste Assessment Test Report, Laytonville Landfill*, County of Mendocino, April 1989, prepared by EBA Wastechnologies;
- *Air Quality Solid Waste Assessment Test Reports, Laytonville, South Coast and Caspar Solid Waste Disposal Sites*, County of Mendocino, March 1988, prepared by EBA Wastechnologies;
- *Operating Permit for Facilities Receiving Solid Waste, #23-AA-0008*, 20 August 1992, prepared by Mendocino County, Department of Health, Environmental Health Division;
- *Report of Disposal Site Information, Laytonville Solid Waste Disposal Facility*, December 1989, prepared by Mendocino County Department of Public Works, Solid Waste Division;
- *Article 5 Monitoring Program*, Laytonville Landfill, Mendocino County, California, November 1993, prepared by EMCON Associates.

2.0 SITE DESCRIPTION

The following section presents descriptions of the site location, waste disposal history, current landfill configuration, environmental conditions, current landfill monitoring and control systems, and current land use zoning and proposed postclosure land uses.

2.1 SITE LOCATION

The Laytonville Landfill is located approximately 1½ miles southwest of the community of Laytonville, on the south side of Branscomb Road. Access to the landfill site from Laytonville is along west bound Branscomb Road to a south bound service road located immediately west of the Mendocino County Public Works Maintenance Yard. The site is located on a 34.75 acre parcel in the northeast ¼ of the southwest ¼ of Section 14, Township 21 north, Range 15 west, Mount Diablo Base and Meridian. The landfill final closure area encompasses approximately 7 acres. Figure 1 shows the vicinity of the landfill.

2.2 WASTE DISPOSAL HISTORY

The Laytonville Landfill has been owned and operated since opening in 1967 by Mendocino County. The Mendocino County Board of Supervisors voted to have the landfill closed earlier than the original scheduled closure date during a meeting held on 28 September 1993, even though the landfill had not yet reached its permitted capacity.

The landfill accepted for on-site disposal municipal solid waste (MSW) generated from the surrounding service area. The MSW refuse disposed at the landfill primarily consisted of 90 percent residential wastes, 5 percent commercial wastes and 5 percent demolition wastes. No designated or hazardous wastes (i.e., special wastes, liquids, sludges or slurries) were accepted for on-site disposal.

2.3 CURRENT LANDFILL CONFIGURATION

The landfill area encompasses approximately 7 acres and is situated in the southwestern portion of the site. The landfill was generally constructed with 3H:1V (horizontal:vertical slope ratio) side slopes and with a minimum of 3 percent top deck slopes. Some slopes were constructed with 2H:1V side slopes. The maximum fill slope vertical height is approximately 80 feet. Side slope benches have been constructed at the mid slope height or at a maximum vertical height of approximately 50 feet. Sheets 1, 2, and 3 present the Title Sheet and Legend, Site Topography Map, and Existing Landfill Contour Map, respectively. The landfill configuration and topographic elevation contours shown on Sheets 2 and 3 were prepared from a survey conducted in June of 1994.

2.4 ENVIRONMENTAL CONDITIONS

The climate, topography, geology and hydrogeology environmental conditions of the landfill site and near vicinity are described below.

2.4.1 Climate

The climate of the Laytonville area is typically hot and dry during the summer months and cool and wet during the winter months. Climatic data are collected for the general area at Covelo, Willits and Laytonville weather stations. The Covelo, Willits and Laytonville weather stations are located approximately 25 miles east, 25 miles south and 2 miles east of the landfill, respectively. Weather data were collected at the Covelo and Willits stations from 1960 to 1990 and at the Laytonville station from 1941 to 1974 [1, 2]. A complete set of temperature, precipitation, and evaporation data was not collected at each station during these periods. Therefore, the data collected from all of the weather stations was used to evaluate the climatic conditions at the landfill site.

The temperature data collected at the Covelo and Willits stations indicates that the mean monthly temperature averages approximately 55 degrees Fahrenheit and ranges from a low of approximately 43 degrees in January to a high of approximately 69 degrees in July. Table 1 presents the mean monthly and mean annual temperature data collected at the Covelo and Willits weather stations.

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The precipitation data collected at these two stations indicates an average annual precipitation of approximately 45 inches. A low mean precipitation of approximately 0.06 inches was recorded at the Covelo Station for the month of July, and a high mean precipitation of approximately 10 inches was recorded at the Willits Station for the month of January. Table 2 presents the mean monthly and mean annual precipitation data collected at the Covelo and Willits weather stations.

The maximum precipitation intensity computed for a 100-year, 24-hour storm event for the area is estimated to be approximately 0.67 inches per hour. A maximum short duration 100-year, 24-hour storm of 11.03 inches was recorded at the Laytonville weather station.

Pan evaporation data collected at the Covelo 1NNE and Covelo E weather stations between 1967 and 1970 indicate that the mean annual evaporation rate is between 54 and 69 inches [3]. Of the monthly mean values obtained during this period, the highest mean value of 13 inches of evaporation was recorded for the month of July.

The closest weather station that collects wind direction and velocity data is located in Ukiah [4]. The wind data collected between 1950 and 1964 indicates that the win generally blows to the southeast with an average velocity of 8 miles per hour (mph) during the fall and winter months, and to the northwest with a velocity of approximately 8 mph during the spring and summer months.

2.4.2 Natural Topography

The landfill is situated within the northern Coastal Mountain Range geomorphic province. The landfill is bounded on the south by an east-west trending ridge and by gently sloping valley floor terrain to the north, east, and west. The natural ground surface elevations range from approximately 1,750 feet above mean sea level (MSL) in the southwestern corner of the site to approximately 1,690 feet MSL in the northeastern corner of the site. The maximum relief of the natural ground surface is approximately 60 feet. A detailed topographic map of the natural ground surface was not prepared prior to constructing the landfill. However, the general predevelopment natural topography of the landfill site can be inferred from the 1967 edition of the Cahto Peak 7.5 Minute Quandragle topographic map prepared by the United States Geological Survey (USGS). Figure 2 shows an enlargement of a portion of this USGS topographic map that encompasses the landfill site.

2.4.3 Geology and Hydrogeology

The County retained Anderson Consulting Group (ACG) to evaluate the geology and hydrogeology of the site and near vicinity. ACG conducted a literature review, performed field explorations, and prepared a report presenting their findings. The ACG report [5] is entitled *Geological and Hydrogeological Report, Laytonville Sanitary Landfill, October 1994* and is included as Appendix A. A summary of the findings is presented below.

Regional Geology

The landfill site is situated in the northern Coastal Mountain Range geomorphic province. The landfill site and vicinity are underlain by the Cretaceous age (65 to 190 million years before present [mybp]) Franciscan Formation, Pleistocene age (11,000 to 2,000,000 years before present) continental terrace deposits, and by Holocene age (present to 11,000 years before present) alluvial deposits. The Franciscan Formation underlying the region is separated into the Coastal Belt, Central Belt, and Yolla Bolly Belt.

Local Geology

Three geologic units underlie the landfill site. The Franciscan Formation underlies the entire site and consists of a tectonic melange comprised of sandstone, shale and metavolcanic greenstones and cherts. These rock units are highly sheared and weathered, and tend to have very low porosity. The Franciscan Formation is generally considered to be a very poor aquifer with the exception of localized zones of high porosity and permeability that have been faulted and/or fractured by past tectonic activity. The continental terrace deposits overlie the older Franciscan Formation and consist

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of poorly sorted, highly consolidated, silty conglomerate, clayey sandstone, and silty claystone. The alluvium deposits overlie both the Franciscan Formation and continental terrace deposits and consist of localized deposits of unconsolidated gravel, sand, silt and clay.

Faults and Seismicity

The landfill is situated within an area of relatively high seismic activity; however, no known active or potentially active faults have been identified on or within the near vicinity of the site. The nearest active fault is the Maacama Fault, which is located approximately 1¼ miles to the west of the site. Additional faults which were evaluated for their potential risk to the site include the San Andreas Fault, located approximately 25 miles west of the site; the Sierran Block of the Coast Range Fault, located approximately 45 miles to the east of the site; the Healdsburg-Rogers Creek Fault, located approximately 74 miles to the south of the site; and the Zamora Fault, located approximately 98 miles to the southeast of the site. The maximum probable earthquake (MPE) and peak horizontal ground acceleration (Kp) for each fault are presented in Table 3.

The Maacama Fault is considered to pose the greatest threat to the site, due to its close proximity to the site, and the MPE and Kp values estimated for the fault. Therefore, the seismic parameters estimated for the Maacama Fault (MPE = 7.5 Richter magnitude and Kp = 0.64g) should be used for design of the landfill.

Hydrogeology

Groundwater at the landfill and near vicinity is generally encountered at depths ranging from 20 to 50 feet below the ground surface. Five wells monitor the groundwater piezometric surfaces underlying the site. Typically, groundwater is first encountered within the alluvial deposits at relatively shallow depths on the western side of the landfill, and within the Franciscan Formation at greater depths on the northern and eastern sides of the landfill. Groundwater encountered within the Franciscan Formation occurs as both unconfined aquifers and confined aquifers (artesian). The water table aquifer will show little to no change between the first encountered and stabilitzed water levels (elevations), while artesian aquifers will show a significant increase (rise) in the stabilized elevation over the first encountered water elevation.

The direction of groundwater flow across the site is complicated by the diverse geology and the presence of both water table and confined aquifers, and is therefore difficult to determine at this time. The natural direction of groundwater flow near the landfill is estimated to be radially away from the landfill.

2.5 CURRENT MONITORING AND CONTROL SYSTEMS

The current monitoring and control systems employed at the landfill include groundwater monitoring, surface water monitoring and perimeter landfill gas migration monitoring systems. The landfill is unlined and does not contain a leachate collection and removal system (LCRS). The County has intermittently monitored leachate seeps observed on the intermediate cover, which have primarily occurred during the rainy winter months. Leachate collected from these seeps will be transported and disposed at the Willits Sewage Treatment Plant.

A description of each monitoring and control system is presented below.

2.5.1 Groundwater Monitoring System

Groundwater monitoring requirements are currently regulated by Waste Discharge Requirements (WDR) Order No. 75-50 as revised on December 7, 1988. Prior to the Board's decision to close the landfill, the County retained ACG to prepare an addendum to the November 1991 Report of Waste Discharge (ROWD) that was prepared by SHN Consultants.

The ROWD addendum was required by the California Regional Water Quality Control Board (CRWQCB) North Coast Region as a condition for updating the landfill WDR. Due to the early closure of the landfill, the CRWQCB recommended updating the WDR according to the information provided in the Final Plan instead of

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preparing and submitting an addendum to the ROWD.

Groundwater at the site is currently being monitored by five groundwater monitoring wells (wells 90-1, 91-1, 93-1, 93-2, and 94-1). Groundwater monitoring wells 87-1, 87-2, and 87-3 were abandoned during the installation of wells 93-1 and 93-2. Groundwater sampling results of the 93-series wells indicated increased mineralization of groundwater monitored by well 93-1. Groundwater monitoring well 94-1 was installed downgradient of well 93-1, along the western perimeter of the landfill. A description of the procedures used to abandon the 87-series wells and the installation procedures used to construct the 93-series wells and well 94-1 are presented in Appendix B.

Groundwater wells 93-1 and 94-1 monitor groundwater in the Holocene alluvium, while groundwater wells 90-1, 91-1, and 93-2 monitor groundwater in the Franciscan Formation. Table 4 summarizes the monitoring well construction data (total well depth, and depth and elevation of the screened interval), and Table 5 presents monitoring data (depth and elevation of groundwater) for each well. The encountered aquifers exhibit both water table and confined aquifer characteristics.

The County conducts quarterly monitoring in accordance with WDR Order No. 75-50 and the *Mendocino County Sampling Procedures Manual* [6]. Groundwater monitoring wells 90-1, 91-1, 93-1, 93-2, and 94-1 are currently being monitored. The County retained EMCON Associates to prepare an Article 5 Monitoring Program [7] which describes the water quality monitoring program conducted at the site. During the postclosure period, the County will monitor the 5 wells in accordance with the Article 5 program and the *Mendocino County Sampling Procedures Manual.* Table 6 presents the analytical parameters and monitoring frequencies.

2.5.2 Surface Water Monitoring

Surface water at the site occurs as rainfall runoff. In accordance with WDR Order No. 75-50, surface water samples are collected and analyzed annually from discharge culverts located at the southwestern and northeastern sedimentation ponds. The sampling procedures are outlined in the *Mendocino County Sampling Procedures Manual* [6].

2.5.3 Landfill Gas Monitoring

Mendocino County originally installed shallow gas monitoring probes around the perimeter of the landfill. The screen interval length was typically 5-feet, with a sand filter pack around the screen. Five new landfill gas monitoring probes were installed along the landfill perimeter in June 1994 (LFGW-1, LFGW-2, LFGW-4, LFGW-5, and LFGW-6[1]). The additional landfill gas wells were installed in order to bring the landfill site into compliance with new State and Federal regulations (CCR Titles 14 and 23 and CFR Subtitle D). The well locations are shown on Sheet 2.

The installation depths of the 1994 gas probes were determined by reviewing historical aerial photographs and previous field investigation data. Based on this information, the bottom of the landfill was estimated to be at an elevation of approximately 1760 feet above mean sea level (MSL). The screened intervals are generally at or below the landfill bottom elevation. Appendix C presents a description of the 1994 gas probe installation program, boring logs, and the construction details prepared for each landfill gas probe. Table 7 presents a summary of the gas monitoring well construction information.

The County is currently monitoring for methane gas in each of the newly installed perimeter gas wells. Methane gas has not been detected in any of the wells as of the date of this report.

[1] LFGW-3 was not installed because the proposed well was located at an area approximately 40 feet below the bottom elevation of the refuse.. In addition, a ravine exists between the proposed location and the Landfill, and the distance between LFGW-2 and LFGW-4 is less than 1000 feet.

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2.6 CURRENT LAND USE ZONING AND POSTCLOSURE LAND USE

The Mendocino County General Plan shows the 34.75 acre landfill parcel as zoned for Public Service for Solid Waste. The surrounding areas are zoned as follows: federally owned Laytonville Indian Rancheria to the east and south of the site; Williamson Act Agricultural Preserve to the west of the site; and rural residential and upland residential to the north of the site. Upon closure of the landfill, the area will be revegetated with grasses and sedges and used as non-irrigated open space.

3.0 CLOSURE PROCEDURES

This report section presents detailed procedures for removal of structures, decommissioning of environmental controls, site security, final cover placement, construction quality assurance, final site face, drainage control installation, slope protection and erosion controls, groundwater monitoring network and perimeter landfill gas monitoring network. These procedures are prepared consistent with the applicable CCR Title 14 sections listed.

3.1 REMOVAL OF STRUCTURES (SECTION 17771)

Currently, there are no structures to be removed at the site for closure of the landfill.

3.2 DECOMMISSIONING OF ENVIRONMENTAL CONTROLS (SECTION 17772)

The existing environmental controls at the landfill site include groundwater monitoring wells, perimeter landfill gas monitoring wells, a leachate extraction well, and leachate collection equipment. The groundwater monitoring wells and perimeter landfill gas monitoring wells will remain intact during both the closure and postclosure maintenance periods. The leachate extraction well will be decommissioned in-place prior to final closure. The leachate collection equipment will be removed and disposed of after closure of the landfill.

The decommission of each environmental control system will be performed after receiving written authorization from the California Integrated Waste Management Board (CIWMB), CRWQCB and the Local Enforcement Agency (LEA). Dismantling of the landfill gas and groundwater monitoring wells will be performed consistent with the procedures and at the direction of the appropriate regulatory agency.

3.3 SITE SECURITY (SECTION 17767)

Upon closure of the landfill, a site security system

will be implemented. Site security measures will consist of constructing a 6-foot-high chain link fence along the perimeter footprint only of the closed landfill with locking gates at all entrance locations. This fence will be about 2,000 feet long and will follow the perimeter of the landfill refuse limits and extended final cover areas as shown on Sheet 4 (Final Grading Plan).

The existing about 6,000 foot long barbed wire and post fence that runs along the facility property line will remain unchanged. The main entrance gate to the facility will continue to be located off of Branscomb Road.

Presently, a sign posted at the Branscomb Road entrance gate states the date when the landfill was permanently closed, the alternate permitted facilities available for disposal of solid waste, and a telephone number for emergency notification. Once the Final Plan is submitted and approved, a sign will be posted at the entrance which states the address where the public may view the Final Plan.

3.4 FINAL COVER SYSTEM (SECTION 17773)

The final cover system to be placed over the landfill was designed consistent with the requirements of both CCR Titles 14 and 23 for a Class III landfill, and CFR Subtitle D. The final cover system is designed to maintain the integrity of the cover materials and minimize infiltration of surface waters. CCR Titles 14 and 23 require that the minimum prescriptive standard final cover system for an unlined Class III landfill, such as the Laytonville Landfill, be constructed with the following components (described from bottom to top):

- Minimum 24-inch-thick foundation soil layer;
- Minimum 12-inch-thick hydraulic barrier soil layer;
- Minimum 12-inch-thick vegetative soil layer.

The hydraulic barrier soil layer must meet or exceed the following requirements:

- Minimum thickness of 12 inches;
- Constructed with soil classified consistent with the Unified Soil Classification System (USCS) as low-plasticity clay (CL), high-plasticity clay (CH), or clayey sand (SC);
- Minimum percent (by dry weight) clay and silt size particles comprising 30 percent of the material (percent passing the No. 200 mesh sieve);
- Maximum in place permeability (hydraulic conductivity) of 1.0×10^{-6} centimeters per second (cm/s).

However, an engineered alternative final cover system may be used, provided the following can be demonstrated: 1) performance of the engineered alternative final cover system design will equal or exceed the performance of the minimum prescriptive standard final cover system design; and 2) construction of the minimum prescriptive final cover system design will impose a severe financial burden on the landfill owner/operator.

An engineered alternative final cover system is proposed because construction of a final cover system with a 12-inch-thick hydraulic barrier soil layer will impose a severe financial burden on the County. The proposed engineered alternative final cover systems to be constructed on the top deck and side slope areas will consist of the components listed below:

Top Deck Area Final Cover System (from bottom to top)

- Foundation Soil Layer (minimum 24-inch-thick)
- Gas Migration Layer (minimum 12-ounce per square yard, nonwoven geotextile filter fabric)
- Hydraulic Barrier Layer (Geosynthetic Clay Liner [GCL])

- Drainage Layer (minimum 12-ounce per square yard, nonwoven geotextile filter fabric), and
- Vegetative Soil Layer (minimum 18-inch-thick).

Side Slope Area Final Cover System (from bottom to top)

- Foundation Soil Layer (minimum 24-inch-thick)
- Gas Migration Layer (minimum 12-ounce per square yard, nonwoven geotextile filter fabric
- Hydraulic Barrier Layer (Geosynthetic Clay Liner [GCL])
- Drainage Layer (geonet with minimum 6-ounce per square yard, nonwoven geotextile filter fabric bonded to both the top and bottom geonet surfaces), and
- Vegetative Soil Layer (minimum 18-inch-thick).

Each final cover system component is discussed below.

3.4.1 Foundation Soil Layer

The purpose of the foundation soil layer is to: 1) bridge the surface irregularities of the underlying refuse materials; 2) provide a firm and competent surface on which the hydraulic barrier layer can be constructed; and 3) minimize the impacts of minor differential settlements of the underlying refuse waste materials. The foundation soil layer will be constructed with a minimum thickness of 24 inches.

ACG performed an investigation of the thickness and suitability of the existing intermediate cover soil layer for use as part of the final cover system foundation soil layer, and a borrow soil investigation to determine the suitability of available on-site soil for use in constructing the hydraulic barrier soil layer. The results of this investigation were presented in an October 1994 report entitled Final Cover Investigation Report [8]. This report is included in Appendix D. A summary of the findings, conclusion, and recommendations presented in this report are provided below.

The field investigation of the existing intermediate cover soil layer was performed for the purpose of determining whether it could be used as part of the final cover system foundation soil layer. The field investigation included hand augering 18 soil borings, taking field moisture and density tests at each soil boring location, and taking representative soil samples for laboratory testing. The laboratory tests and field tests were performed consistent with the American Society for Testing and Materials (ASTM) standardized procedures. The soil borings were excavated to a maximum depth of 24 inches or until refuse was encountered, which ever occurred first. The field moisture and density tests were taken at soil boring locations where the soil thickness was greater than or equal to 12 inches. The soil laboratory tests included the following:

- Particle Size Gradation by Sieve Method Only (ASTM D422);
- Modified Proctor Compaction Curve (ASTM D1557).

The soil borings revealed an average 12-inch-thick intermediate soil cover, ranging from an approximate low of 6-inch-thick to greater than a 24-inch-thick cover. The average relative compaction measured for areas where the intermediate soil cover was approximately 12 inches thick was 92 percent and ranged from a low of 88 percent to a high of 97 percent. The average relative compaction measured for areas where the intermediate soil cover was greater than or equal to 18 inches was 88 percent and ranged from a low of 80 percent to a high of 91 percent. Table 8 presents a summary of the existing intermediate soil cover thickness and relative compaction data measured at each grid control point location. Appendix D presents the soil laboratory test results for the in-place intermediate soil cover.

Based on the results of this limited field investigation, ACG has concluded that the existing

in place intermediate soil cover can be considered to be part of the final cover system foundation soil layer. However, it will be assumed that only 6 inches of intermediate cover soil are present over the entire landfill area, thus requiring the placement of an additional 18 inches of foundation soil to achieve a minimum thickness of 24 inches. This assumption will insure that all areas of the landfill will have a minimum 24 inch thick foundation soil layer, while eliminating the need to provide detailed construction controls during grading.

Prior to placing the overlying hydraulic barrier layer, construction of the foundation soil layer must be completed and meet the requirements listed below.

- Minimum 24-inch-thick compacted foundation soil layer.
- Prior to placing and compacting additional foundation soil, the existing in-place soil shall be scarified to a minimum depth of 4 inches. The scarified soil shall be moisture conditioned to attain a uniform moisture content of ± 3 percent of the ASTM D1557 optimum moisture content. The soil shall then be recompacted to a minimum 90 percent of the ASTM D1557 maximum dry density.
- After areas to receive fill have been prepared, the remaining earthfill and/or foundation soil layer shall be moisture conditioned and placed in maximum 8-inch-thick loose lifts (layers). The soil will be compacted to a minimum of 90 percent of the ASTM D1557 maximum dry density with a uniform moisture content of ± 3 percent of the ASTM D1557 optimum moisture content.
- The upper 6 inches of the foundation soil layer shall be free of rocks that are greater than 3/4 inches in diameter, and shall not contain sharp objects, demolition debris or other deleterious materials that may adversely impact the overlying hydraulic barrier layer.
- The foundation soil layer shall be graded to within the thickness and grade control tolerances required by the construction plans and specifications.
- The top surface of the foundation soil layer shall be proof rolled with a smooth drum compactor to identify soft areas that will need to be repaired, such that the finished grade surfaces consist of relatively smooth surfaces without abrupt changes in grade.

3.4.2 Gas Migration Layer

The purpose of the gas migration layer is to control gas migration through the surface of the landfill. The gas migration layer will consist of a minimum 12-ounce per square yard, nonwoven geotextile filter fabric. The gas migration layer will convey landfill gas migrating to the landfill surface towards passive vents installed through the final cover system at evenly spaced intervals. The vents will consist of a 6-inch-diameter PVC pipe assembly. The passive venting system will assist in the control of potential landfill gas buildup under the final cover.

3.4.3 Hydraulic Barrier Layer

The purpose of the hydraulic barrier layer is to minimize surface water infiltration into the landfill, which ultimately becomes leachate after filtering through the refuse materials. ACG proposes the use of an engineered alternative final cover system consisting of a geosynthetic clay liner (GCL). The following presents a discussion of the information that was evaluated and used in support of the proposed engineered alternative final cover system.

The 1994 ACG Final Cover Investigation Report [8] presented in Appendix D includes an evaluation of the suitability of the on-site borrow soil for use in constructing the final cover system hydraulic barrier soil layer. The investigation included observing the excavation of 13 backhoe trenches, logging the subsurface conditions encountered, collecting representative soil samples, and laboratory testing consistent with the

ASTM procedures.

The laboratory testing program included USCS classification (ASTM D2487 and ASTM D2488), Atterberg indices (ASTM D4318), particle size gradation (ASTM D422, sieve only), compaction (ASTM D1557), and permeability (ASTM D5084). The permeability tests were performed on fabricated (remolded) soil samples at several moisture contents and percent relative compactions.

The laboratory test results indicate that the on-site soil consists of low-plasticity clay (CL) and clayey sand (SC) with silt and clay size particles comprising from 45 to 65 percent (by dry weight) of the material samples. The soil samples were remolded at 90 percent of the ASTM D1557 maximum dry density and with moisture contents greater than 3 percent above optimum moisture content. The remolded permeabilities ranged from a low of 2.7×10^{-6} cm/s to a high of 3.2×10^{-6} cm/s. The measured permeabilities exceeded the maximum allowable permeability of 1.0×10^{-6} cm/s required by CCR Titles 14 and 23 for an unlined Class III landfill.

The affects of increasing the relative compaction to 95 percent of the ASTM D1557 maximum dry density on the remolded permeability were also evaluated. Although the remolded permeability decreased to approximately 2×10^{-7} cm/s, it is ACG's opinion that a 95 percent relative compaction effort in addition to obtaining a maximum in-place permeability of 1×10^{-6} cm/s will be very difficult and costly to achieve by commonly used field compaction equipment. Therefore, the County directed ACG to evaluate various engineered alternative final cover system designs that can be used for the hydraulic barrier layer.

ACG evaluated soil admixtures, geomembrane liners and geosynthetic clay liners (GCLs) for use as the hydraulic barrier layer. A brief description of each hydraulic barrier considered is presented below:

- **Soil admixture**: consists of mixing a relatively small percentage of imported bentonite clay or other low-permeability clay with the on-site soil. The purpose of admixing the soil is to lower the permeability of the on-site soil to a desired value.

- **Geomembrane**: consists of various types of plastics that are manufactured in sheet form. The sheets are transported in rolls to the construction site where they are seamed together by a fusion process.

- **GCL**: consists of factory prepared low-permeability bentonite clay layers that are either bonded between two geotextile fabrics or glued to a flexible geomembrane liner. The permeability of GCLs generally range from 1×10^{-9} cm/s to 1×10^{-10} cm/s.

The performance of geomembrane liners and GCLs are well documented and have been shown to equal or exceed the performance of a minimum prescriptive standard final cover system hydraulic barrier layer.

The cost of using soil admixtures, geomembrane liners or GCLs is generally governed by the transportation costs of the materials to the construction site, and required test procedures during installation. A preliminary cost analysis was performed to determine cost estimates for constructing the hydraulic barrier with a soil admixture, geomembrane liner and GCL. The soil admixture would be prepared using either bentonite clay imported from the nearest source located in the state of Wyoming or with kaolinite clay imported from the nearest source located in Ione, California. The estimated costs for transporting either clay to the landfill and then preparing, placing and compacting the admixture makes this engineered alternative design cost prohibitive.

The estimated transportation, placement and testing costs for a geomembrane liner and GCL were then compared. The installation and testing costs of GCLs were significantly less costly than that of geomembrane liners. Therefore, ACG recommended that a GCL be used as the final

cover system hydraulic barrier layer. Bentomat®, manufactured by CETCO, and Gundseal®, manufactured by Gundle Lining Systems, Inc. were both evaluated and considered to be suitable GCLs for constructing the final cover system hydraulic barrier layer. Other GCLs may be used provided they also meet or exceed the minimum required material properties specified in the Construction Documents and Specifications.

The performance of GCLs as final cover system hydraulic barrier layer was further evaluated with regard to the following:

- effects of desiccation of the bentonite clay layer on permeability;
- effects of root penetrations on the permeability of the bentonite clay layer; and
- the stability effects of hydrated bentonite clay on the steeper side slopes of the final cover system.

These design considerations are discussed below.

Effects of Desiccation on GCL Permeability

GeoSyntec [9] evaluated the effects of desiccation on permeability of GCLs by conducting ASTM D5084 laboratory permeameter tests on samples of Bentomat®. The Bentomat® GCL samples were tested by measuring its permeability after each desiccation-hydration cycle. The permeability increased from approximately 1×10^{-9} cm/s to a high of approximately 1×10^{-8} cm/sec after four desiccation-hydration cycles and remained relatively constant for each additional cycle.

The highly expansive properties of the bentonite clay allow the desiccation cracks to self-heal upon rehydrating. These test results indicate that the adverse affects of repeated desiccation-hydration cycles on the permeability of GCLs is negligible. CETCO [10] documented the same self-healing behavior of the bentonite clay in GCLs during a comparison study of GCLs and compacted clay liners constructed for landfill final cover system hydraulic barriers.

Effects of Vegetation Root Penetration on GCL Permeability

The effects of vegetation root penetration on the permeability of GCLs is dependent on the vegetation type and thickness of the vegetative soil layer. ACG has provided additional protection for the GCL by specifying the use of shallow rooted grasses and sedges and by increasing the thickness of the vegetative soil layer design from 12 inches (minimum prescriptive standard design) to a minimum of 18 inches.

Use of the Gundseal® GCL would minimize root penetration because the geomembrane side would be placed on top and in contact with the vegetative layer.

CETCO [11] conducted a study of potential root penetration using the Bentomat® GCL product. The results of the CETCO study indicate that large diameter roots did not penetrate the GCL and the smaller fibers which did penetrate the GCL did not adversely affect the hydraulic conductivity of the material.

Final Cover Side Slope Stability

Several studies have been conducted at the University of Texas at Austin by Dr. David Daniels [12] to determine the shear strength of the partially hydrated bentonite clay components of Gundseal®. The results of these studies indicate that the internal friction angle of the partially hydrated bentonite clay component of Gundseal® varied from 35 to 39 degrees. Another study conducted at the University of Texas at Austin described direct shear tests conducted on fully hydrated GCLs. The internal friction angle of the fully hydrated bentonite clay component of Bentomat® was measured at 26 degrees.

ACG measured the interface friction angle shear strengths between both fully hydrated Bentomat® test specimens and the proposed gas migration layer and the drainage layer. The shear strength tests were performed with a direct shear test apparatus consistent with the ASTM D5321 standardized test procedures. The laboratory test results are presented in Appendix E.

In general, the documented and laboratory measured test results indicate the internal shear strength of both GCLs and the interface shear strengths between the GCLs and the gas migration and drainage layers are adequate for static loading conditions, but are marginal for seismic loading conditions of the final cover system. Thus, the final cover placed on side slopes may experience localized failures during seismic events. The areas showing distress or failure due to seismic loading will need to be evaluated and repaired, as necessary.

The use of a drainage layer beneath the vegetative soil layer will remove excess infiltrating water, thereby significantly increasing both the static and seismic stability of the final cover system.

3.4.4 Drainage Layer

A drainage layer will be placed beneath the vegetative soil layer and directly over the GCL. The drainage layer to be placed over the gently sloping top deck area of the landfill will consist of a minimum 12-ounce per square yard, nonwoven geotextile filter fabric. The drainage layer constructed over the side slope areas will consist of a geonet with a nonwoven geotextile filter fabric bonded to both the top and bottom sides of the geonet. The drainage layer will rapidly convey infiltrating rain water off both the top deck and side slope areas. The following significant benefits will be realized by the rapid removal of infiltrating rain water:

- Decreased landfill leachate generation due to a reduction of infiltration into the underlying refuse materials.
- Increased stability of the final cover placed on the steeper side slope areas due to a reduction of excess pore water pressures and minimal hydration of the GCL.

3.4.5 Vegetative Soil Layer

The purpose of the vegetative soil layer is to protect the hydraulic barrier layer so that it does not become damaged from surface water, wind erosion, desiccation, and both foot and vehical traffic. The vegetative soil layer will consist of clayey to silty loam, which will allow the growth of shallow rooted, drought resistant native plant species.

According to the US Department of Agriculture Soil Conservation Service (SCS), Ukiah office, sufficient quantities of clayey loam should be available at the site. An analysis of the gradation test results conducted for the final cover investigation further indicated that sufficient on-site soil is suitable for use as the vegetative layer. The proposed vegetative soil layer will be a minimum of 18 inches thick. The seed mix design for the vegetative soil layer is presented in Section 3.8.

3.5 CONSTRUCTION QUALITY ASSURANCE (SECTION 17774)

A construction quality assurance (CQA) plan has been prepared and is provided in Appendix F. The CQA plan describes the documentation procedures to be used and information to be collected during construction of the final cover system. The information will be used to provide assurance that the final cover is constructed in accordance with the Construction Documents and Specifications. The information collected as part of the CQA plan will be used to prepare a certification report for construction of the final cover system.

3.6 FINAL GRADING PLAN (SECTION 17776)

The final grading plan is shown on Sheet 4. The final grades were developed to accommodate future anticipated settlement, minimize erosion caused by surface water run-off, and provide a stable landfill configuration. The finished grade slopes of the landfill range from 3 percent on the top deck area to a maximum of 33⅓ (3H:1V) percent on the side slope areas. Sheet 4 shows the proposed final contours. Sheets 5 through 9 show the Sections and Details for the final grading plan.

A slope stability analysis of the final landfill configuration was performed for both static and seismic (earthquake) loading conditions. The slope

stability analyses and results are presented in Section 3.7 (Final Landfill Site Face Design).

3.6.1 Anticipated Landfill Settlements

The total expected settlement of the landfill is estimated to be approximately 10 percent of the finished grade thickness of the waste. The center of the western landfill cell is estimated to be approximately 40-feet-thick and is expected to undergo a total settlement of approximately 4 feet. Based on the age of this landfill cell, it is estimated that approximately one-half of the total expected settlement has occurred. Therefore, the area is anticipated to experience a future settlement of approximately 2 feet.

The center of the eastern landfill cell is estimated to be approximately 30-feet-thick and is expected to undergo a total settlement of approximately 3 feet. Based on the age of this landfill cell, it is estimated that approximately one-third of the total expected settlement has occurred. Therefore, the area is anticipated to experience a future settlement of approximately 2 feet. The final design grades for both of these landfill cells have been designed to maintain positive drainage flow.

3.6.2 Settlement Monitoring (Section 17776)

Two permanent survey monuments will be constructed on the western portion of the landfill and one permanent monument will be constructed on the eastern portion of the landfill. These survey monuments will be used to monitor landfill refuse settlement. Upon closure of the landfill, aerial photographs will be taken and survey control points will be established by a licenced land surveyor. The aerial photographs and survey control points will be used to prepare a finished grade topographic map of the landfill. Topographic maps will be prepared from aerial photographs taken every five years following closure of the landfill. Settlement of the landfill refuse will then be calculated from these topographic maps.

3.6.3 Surface Water Drainage Control Design Calculations

The surface water drainage controls were designed using the Rational Formula Method. The precipitation intensity-duration-frequency curves used to design the drainage controls were computed from the precipitation records collected at the Laytonville weather station [1]. The maximum allowable flow computed for each drainage ditch was compared to the anticipated calculated flow. A summary of the drainage control calculations is presented in Section 3.8 (Surface Water Drainage Controls).

3.7 FINAL LANDFILL SITE FACE DESIGN (SECTION 17777)

A slope stability analysis of the final landfill site face was performed for both static and seismic (earthquake) loading conditions consistent with the requirements of CCR, Title 23, Chapter 15, Article 9, Section 2595(f)(5), "Seismic Deformations and Slope Stability Analyses". The slope stability analysis of the proposed final refuse fill grades was performed with PCSTABL5M [14], a commercially available computer program that was developed at Purdue University.

The stability of the proposed final grade slopes was evaluated for a circular failure mode using the theory of limit equilibrium of forces and moments acting within a particular slope to determine the safety factor against failure. The safety factor is defined as the dimensionless ratio of the resisting forces that act to preserve stability in the slope to the driving forces that act to make the slope unstable. The generally accepted minimum safety factor for static loading conditions is 1.5. The stability of a slope subjected to seismic loading conditions is evaluated in terms of the resulting amount of permanent deformation of the slope. The generally accepted maximum seismically induced permanent slope deformation for a refuse landfill is 12 inches (31 centimeters) [15].

The slope stability analysis of the final landfill refuse slopes is presented in Appendix G. The methodologies, seismic parameters, engineering material properties, and stability results are

described below.

3.7.1 Methodologies

The methodologies used to evaluate a slope subjected to static and seismic loading conditions are described below.

Static Stability Analysis

Bishop's Method [16] was used to evaluate the stability of the proposed slopes subject to static loading conditions. The analytical procedures used to determine the static safety factor involve: 1) passing an assumed circular failure surface through a slope; 2) dividing the inscribed slope mass lying above the failure surface into slices; and 3) determining the safety factor from the statically loaded forces and moments acting on each slice. The stability of each slope considered in the analysis was evaluated for a circular failure mode. PCSTABL5M performs a search for the critical failure surface through the slope being considered. The critical failure surface is defined as the failure surface with the lowest safety factor under static loading conditions.

Seismic Stability Analysis

The Newmark Method [17] was used to evaluate the stability of the proposed slopes subject to seismic loading conditions. This method evaluates the stability of the slopes in terms of permanent displacements or deformations that result when seismically induced ground accelerations exceed the yield accelerations of the critical slope mass. The yield acceleration (Ky) of the critical slope mass is defined as the applied acceleration that reduces the safety factor to unity (1.0). The total amount of slope deformation is estimated by summing only the downslope displacements that occurred during each brief period of time when the yield acceleration of the critical slope mass is exceeded.

Makdisi and Seed [18] modified the Newmark Method and developed the graph shown in Figure G1 of Appendix G. This graph presents a relationship which can be used to estimate the expected seismically induced permanent slope deformation from the Richter magnitude of the earthquake, and the ratio of the yield acceleration of the critical slope mass to the seismically induced average peak horizontal ground acceleration at the site (Ky/Kp).

3.7.2 Seismicity Parameters

ACG evaluated the seismicity of the Laytonville Landfill and vicinity and presented the results in the 1994 Geologic and Hydrogeologic Report [5] included in Appendix A. The investigation evaluated known faults within a 100-kilometer radial distance to the landfill site. Table 3 lists the major faults identified and the shortest radial distance to the landfill site, the estimated maximum probable earthquake (MPE), and the peak horizontal ground acceleration (Kp) associated with each fault. The ground accelerations are expressed as decimal fractions of a constant "g", where the constant "g" represents gravitational acceleration (32.2 feet per second squared or 9.81 meters per second squared).

The site design MPE is expected to occur on the Macaama Fault located approximately one mile to the southwest of the landfill. The Richter magnitude of the design MPE is estimated to be approximately 7.5 and is expected to induce a peak horizontal ground acceleration of approximately 0.64g at the landfill site.

3.7.3 Engineering Material Properties

The engineering material properties used in the slope stability analysis were determined from laboratory tests, published information and our experience with similar soil, rock and waste materials. The engineering material properties used in the slope stability analyses are presented in Table 9.

3.7.4 Slope Stability Analyses Results

The stability of the landfill final grade slopes were evaluated at cross section location S1-S1, shown on Figure G2 of Appendix G. The slope configuration shown on Section S1-S1 has a 3H:1V toe berm constructed with on-site borrow soil and a 3H:1V refuse slope. Section S1-S1 represents the steepest slope and greatest refuse fill height of the landfill. The slope configuration,

material properties, and critical failure surfaces determined for these locations are shown on Figure G3 of Appendix G.

The static safety factor computed for the slope was greater than 1.5 and the estimated seismic deformation for the slope was less than 12 inches. The slope stability results indicate that the proposed landfill slopes are expected to remain stable under both static and seismic loading conditions. However, the final cover system may experience shallow, localized failures during seismic loading (shaking). Table 10 presents a summary of the slope stability results.

3.7.5 Final Cover Stability Analyses Results

The final cover system stability of the side slope areas where the maximum slope ratio is 3H:1V (horizontal to vertical) was evaluated. The slope stability analysis was performed for static loading conditions and assumed saturated soil conditions. Residual shear strength values determined from ACG's laboratory testing program were used in the analysis.

Separate analysis of the final cover system geosynthetic components were performed using a limit equilibrium infinite slope analysis method. The slope stability analysis indicated that the proposed final cover system should remain stable under static loading conditions. However, the final cover system may experience localized sloughing of the vegetative soil layer when subjected to seismic forces (earthquake shaking) caused by the site design Maximum Probable Earthquake. The results of this analysis and of the anchor trench design for the geosynthetic components are presented in Appendix G.

3.8 SURFACE WATER DRAINAGE CONTROLS (SECTION 17778)

The surface water drainage controls were designed to accommodate flows caused by a 24-hour, 100-year precipitation event storm (design storm) without overtopping. The drainage controls proposed for the site include: 1) surface water run-off originating primarily from the landfill surfaces, and 2) surface water run-on originating primarily from adjacent properties. The proposed surface water run-off and run-on drainage controls are described below.

3.8.1 Surface Water Run-off Drainage Controls

The design storm was used to compute the time of concentration and expected discharge rate for each contributory area of the landfill. This data was then used to size the surface water runoff drainage controls for the landfill. This storm was also used to design three on-site sedimentation ponds. The proposed drainage controls are shown on Sheet 4 (Final Grading Plan). The drainage calculations presented in Appendix H were computed for the tributary drainage areas shown on Figure H1 of Appendix H. A brief description of the drainage controls are presented below.

Pipes, Ditches and Culverts

The surface water run-off drainage controls to be constructed on the top deck area of the landfill consist of drainage berms and half-round ditches. Overside down drains will convey run-off originating on the top-deck areas down the steeper 3H:1V side slope areas to the perimeter trapezoidal ditch at the base of the landfill. The perimeter drainage ditch will convey the surface water run-off to one of the three sedimentation ponds. The half-round ditches constructed on the landfill mass will be lined with a minimum 24-inch-diameter, half-round section of corrugated metal pipe (CMP).

The half-round ditch liner system is intended to prevent erosion of the final cover system. The perimeter drainage ditches may be grass-lined in areas that are underlain by native soil and general earthfill. Culverts constructed beneath access roads situated both on and off the landfill mass will be made with minimum 24-inch-diameter CMPs. Overside down drains should be constructed of a minimum 12-inch-diameter CMPs.

Sedimentation Basins

Three sedimentation basins will be constructed with sufficient capacities to temporarily contain surface water run-off originating on the western

and eastern portions of the landfill. The sedimentation basin locations are shown on Sheet 4 (Final Grading Plan). The sedimentation ponds are designed with sufficient capacity and freeboard to prevent overtopping during the design storm and with a residence time that will allow soil particles larger than 40 microns to settle out of solution prior to discharging from the pond. A minimum 24-inch-diameter CMP will be installed through each sedimentation basin berm. These CMPs will serve as discharge spillway pipes to the adjoining natural drainage courses.

3.8.2 Surface Water Run-on Drainage Controls

The only source of surface water run-on to the landfill site occurs from a small area situated adjacent to the southern property line. Flow from this area is collected by a grass-lined, V-ditch which conveys the flow to a natural drainage course situated along the southeastern property line.

3.9 SLOPE PROTECTION AND EROSION CONTROL (SECTION 17779)

The slope protection and erosion controls were designed to minimize soil loss from the final cover system. The proposed design includes lined drainage ditches, use of CMP overside drains and culverts, grade controls, and vegetation. The lined drainage ditches and both CMP overside drains and culverts were discussed in the preceding section.

The grade controls consist of a minimum top deck area slope of 3 percent and the installation of lined ditches with a maximum slope of 1 percent. Overside drains will be constructed with CMP and have rip rap energy dissipators at all pipe discharge points. The vegetation to be planted on both the top deck and side slope areas is an integral part of the slope protection and erosion controls. The vegetation seed mix is discussed below.

Vegetation will be established on the top deck and side slopes of the final cover to further reduce erosion. The seed mixture was determined based on the following factors:

- drought resistant and native plant species;
- survivability of the seed mixture on the landfill surface;
- shallow rooting depth to minimize the potential for root penetration into the underlying GCL;
- successful seed mixture used in the landfill vicinity[2]; and
- cost considerations.

The seed mixture includes Blando Brome (applied at approximately 25 pounds per acre) and Rose Clover (applied at approximately 20 pounds per acre). The seed mixture should be placed on the final cover in late September prior to the beginning of the winter rainy season. The postclosure inspections and maintenance of the final cover system includes reseeding as necessary to achieve an adequate protective vegetation cover.

The universal soil loss equation (USLE) [19] was used to estimate the amount of soil loss from the final cover system due to erosion caused by surface water runoff. The U.S. Environmental Protection Agency (EPA) [20] recommends that the annual soil loss from the landfill final cover system should not exceed 2 tons per acre per year. The annual soil loss estimated by the USLE for the Laytonville Landfill final cover system is less than 2 tons per acre per year. Appendix I presents the data, assumptions, and soil loss estimates computed for the final cover system by the USLE.

3.10 GROUNDWATER MONITORING NETWORK (SECTION 17782)

The County currently conducts quarterly groundwater monitoring and sampling in accordance with WDR Order No. 75-50. The current monitoring plan includes monitoring and

2 Telephone conversation (6 December 1994) with representative of USDA Soil Conservation Service, Ukiah, California.

sampling wells 90-1, 91-1, 93-1, 93-2 and 94-1. No additional groundwater monitoring wells are proposed for the site at this time.

3.11 PERIMETER GAS MONITORING NETWORK (SECTION 17783)

As discussed in Section 2.5.3, the County currently monitors five landfill gas wells that were installed in June 1994. Methane gas has not been detected in any of these wells as of the date of this report. Therefore a gas collection and extraction system is not required at this time. However, to minimize potential impact to the final cover due to gas migration, the final cover system will be constructed with a passive gas collection and removal system (GCRS). Upon closure of the landfill, the County will implement a quarterly monitoring schedule for these five landfill gas wells. The results of the quarterly sampling events will be submitted to the CIWMB.

3.12 CLOSURE COST ESTIMATE (SECTION 18263)

The closure cost estimate is presented in Appendix J. The total cost estimate for closure is $1,278,710. This cost estimate is based on the material and labor description discussed in this Final Plan.

4.0 POSTCLOSURE MAINTENANCE PLAN

Postclosure maintenance of the landfill will be performed in accordance with the applicable regulatory standards presented in CCR, Title 14, Chapter 3, Article 7.8 and CCR, Title 23, Chapter 15, Article 8, Sections 2580 and 2581. The postclosure maintenance plan includes:

- identification of the responsible people in charge of postclosure maintenance;
- description of monitoring and control systems operating during the postclosure maintenance period;
- description and development of the inspection and maintenance procedures for the closed landfill;
- description of the operation procedures for the environmental control and monitoring systems; and
- provision of a postclosure maintenance cost estimate to maintain, monitor and inspect the closed landfill.

Mendocino County is the owner and operator of the Laytonville Landfill and retains responsibility for closure and postclosure maintenance of the landfill. Pursuant to CCR, Title 14, Chapter 5, Article 3.4, Section 18265.3(a)(1), the name of the person or agency responsible for the postclosure maintenance operations of the landfill as well as their address and telephone number appear below.

Mr. Paul Cayler
Solid Waste Division Director
Mendocino County Solid Waste Division
559 Low Gap Road
Ukiah, California 95482
Phone:
Business: (707) 463-4078

4.1 POSTCLOSURE MAINTENANCE PROGRAMS

A postclosure maintenance program will be implemented by County personnel. The purpose of this postclosure maintenance program is to verify that the containment and monitoring facilities are functioning as intended. The postclosure maintenance program will include separate monitoring programs for environmental monitoring systems, final cover monitoring, drainage system inspections and maintenance, slope protection and erosion control prevention measures, and a security monitoring program. A description of each monitoring program is presented below.

4.1.1 Environmental Monitoring Systems

The environmental monitoring systems include groundwater, surface water, and landfill gas. The procedures used for each monitoring system are described below.

4.1.1.1 Groundwater Monitoring Program

The current groundwater monitoring system is described in Section 2.5.1 of the Final Closure Plan, pursuant to CCR, Title 14, Chapter 5, Article 3.4, Section 18265.3(a)(2). Descriptions of the groundwater monitoring system will be kept current throughout the postclosure maintenance period by submittal of updated descriptions when and if the system is modified. The groundwater monitoring requirements are currently regulated by WDR Order No. 75-50.

Groundwater underlying the site is currently monitored by five wells (90-1, 91-1, 93-1, 93-2, and 94-1). Each well is equipped with a dedicated submersible electric sampling pump. The groundwater monitoring system will remain in operation throughout the closure and postclosure maintenance period. During the postclosure period, the County will monitor the five monitoring wells in accordance with the procedures presented in the Article 5 Monitoring Program and the *Mendocino County Sampling Procedures Manual.* The sampling parameters and intervals are presented in Table 6.

During the postclosure maintenance period, the physical condition of each monitoring well will be inspected for signs of failure and wear. Worn or failed equipment, such as well caps and discharge hoses, will be replaced as necessary. The dedicated pumps will require periodic servicing and repair consistent with the pump manufacturer's suggested maintenance schedule.

The monitoring well system will be decommissioned only after receiving written authorization from local, state and federal regulatory agencies. The wells will be decommissioned according to local and state regulations.

4.1.1.2 Surface Water Monitoring Program

The current surface water monitoring system is described in Section 2.5.2 of the Final Closure Plan, pursuant to CCR, Title 14, Chapter 5, Article 3.4, Section 18265.3(a)(2). The surface water monitoring requirements are currently regulated by WDR Order No. 75-50. Descriptions of the surface water monitoring system will be kept current throughout the postclosure maintenance period by submittal of updated descriptions when and if the system is modified.

Surface water samples will be collected from discharge culverts at the three sedimentation ponds. During the postclosure period, the surface water samples will be taken consistent with the procedures presented in the Article 5 Monitoring Program and the *Mendocino County Sampling Procedures Manual.* The sampling parameters and intervals are presented in Table 6.

The surface water monitoring program will be discontinued only after receiving written authorization from the CIWMB, CRWQCB, and LEA.

4.1.1.3 Landfill Gas Monitoring Program

The current landfill gas (LFG) monitoring system consists of five perimeter gas monitoring wells and is described in Section 2.5.3. Descriptions of the gas monitoring system will be kept current throughout the postclosure maintenance period by submittal of updated descriptions when and if the system is modified. As outlined in CCR Title 14, Division 7, Chapter 3, Article 7.8, Section 17783, the concentration of methane gas making up the air migrating from the landfill must not exceed 5 percent at the site property boundary.

Gas monitoring and testing at each well has been conducted on a quarterly schedule since the wells were installed in June 1994. No methane gas has been detected in any of these monitoring wells as of the date of this report; therefore, the installation of a landfill gas collection and removal system is not required at this time by CCR, Title 14, Section 17783. However, a passive gas collection system will be constructed as part of the final cover system as a precaution against future gas generation.

Methane concentrations will be monitored on a quarterly basis. Each sampling well will be inspected and repaired as necessary during each sampling event. The results will be submitted to the CIWMB and the LEA. The quarterly reports will include copies of the field data sheets, a tabulation of all results, and a summary of the filed monitoring procedures. An annual report will be submitted and will include a summary of all monitoring data.

If methane gas is determined to be migrating away from the landfill and beyond the property boundary, then the County will contact the appropriate regulatory agencies. The County will then conduct an investigation to assess the potential hazards to the surrounding community and environment. If landfill gas becomes a threat to the surrounding community and environment, then the County will prepare a corrective action plan and implementation schedule. The County will then submit the corrective action plan to the governing regulatory agencies for approval. Upon approval, the corrective action plan will be implemented in accordance with the schedule.

The LFG monitoring program will be discontinued only after receiving written authorization from the LEA and CIWMB. Authorization to cease monitoring will be based on the data collected from the LFG wells. The LFG data must demonstrate that there is no potential for gas migration beyond the property boundary.

4.1.1.4 Landfill Leachate Monitoring Program

The landfill is unlined and does not have a leachate collection and removal system (LCRS). The County has been monitoring for the presence of leachate seeps occurring through the existing intermediate cover soil during the winter rainy season. Placement of a final cover system over the landfill should significantly reduce the occurrence of leachate seeps, because the amount of rainfall that infiltrates the landfill waste will be significantly reduced. However, the County will continue to monitor the landfill for leachate seeps following placement of the final cover system. If leachate seeps are identified after placement of the final cover system, then the County will notify the appropriate governing regulatory agencies. The County will then submit a corrective action plan to the governing regulatory agencies for approval. Upon approval, the corrective action plan will be implemented in accordance with the schedule.

4.1.2 Final Cover Monitoring Program

The purpose of final cover monitoring program is to insure that the final cover continues to perform as a hydraulic barrier, thereby minimizing the volume of leachate that will be generated by surface waters that percolate into the underlying refuse materials. The final cover system will be monitored quarterly during each year of the postclosure maintenance period. The final cover monitoring program will include general

monitoring, vegetative growth monitoring, and settlement monitoring, as described below.

4.1.2.1 General Monitoring

The final cover system will be monitored by conducting visual inspections. Damaged areas will be investigated to determine the cause of the damage before repairs are made. The final cover area will be inspected for the following:

- evidence of erosion
- ponded water
- odor
- exposed refuse
- cracks
- settlement
- slope failure, and
- leachate seeps.

Significant cracks identified in the vegetative soil layer will be sealed. Erosion damage caused by extremely heavy rainfall will be repaired immediately. Temporary measures such as berms, ditches, and straw mulch will be used to prevent further erosion of the vegetative soil layer. These damaged areas will be repaired as quickly as weather conditions permit. Repairs may include replacing the eroded soil, reseeding, regrading, and installing other drainage controls, among others.

Vegetative Growth Monitoring

The vegetation growing on the final cover system is designed to protect the final cover system from erosion. If erosion of the vegetative growth is observed, an investigation of the cause shall be undertaken. If erosion damage is observed, the area will be repaired and reseeded. The site inspections will be performed by County personnel, and any maintenance of the final cover system will be conducted by County personnel.

Settlement Monitoring

The settlement monitoring program will be conducted every five years and will include an aerial photograph taken of the site, and surveying the settlement monuments that were installed at the time of closure. The aerial photographs and survey data will be used to evaluate the rate and amount of landfill settlement taking place, and to prepare topographic maps of the landfill surface. This data will enable the County to identify problem areas that will require regrading to ensure that the minimum final cover system grades are maintained and to prevent ponding on the top deck area of the landfill. The topographic maps shall be prepared at a scale of 1 inch equals 60 feet with equal elevation contour intervals of 2 feet. Continuance of taking aerial photographs every five years will be evaluated based on the results of each successive settlement survey.

4.1.3 Drainage Control System Inspection and Maintenance

The surface water drainage control system will be monitored by visual inspections for evidence of damage on a quarterly schedule and after major storm events or significant earthquakes. Damage to the drainage berms and ditches, rip rap rock erosion protection, corrugated metal pipes, and the sedimentation ponds caused by erosion, obstructions, settlement, seismic shaking, or other factors will be repaired, as soon as possible.

The drainage ditches and pipes will be kept free of debris, and excess soil and vegetation. Repairs to the structures will be implemented if the inspections reveal excessive erosion in the ditches, damage to the corrugated metal pipes or damage to the sedimentation ponds. Ditches that do not drain due to settlement will be regraded as necessary to re-establish proper drainage. Excessive erosion of the rip rap due to heavy storm water flow will be evaluated and repaired, as necessary.

4.1.4 Slope Protection and Erosion Control Prevention Measures

Slope protection and erosion control prevention measures shall be conducted as part of the quarterly final cover system monitoring program. Damaged areas will be identified and repaired as necessary. If the damaged area is greater than 10

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square feet, then these area shall be reseeded using the appropriate grass seed mixture.

4.1.5 Security Monitoring Program

All locks, gates, signs, and fences shall be inspected on a quarterly basis. Any damage to the security system due to vandalism or natural wear and tear should be immediately repaired or replaced. Signs should be repaired or repainted every 5 years in order to maintain their visibility. Any damage to the final cover or surface water drainage system due to vehicles tires should be repaired immediately in order to reduce the possibility of future erosion problems. The local sheriff department should be notified if the site is vandalized.

4.2 PROPOSED POSTCLOSURE LAND USE

The postclosure land use will be consistent with the surrounding terrain, land uses and zoning. The closed landfill area will used as non-irrigated open space. Presently, there are no plans to construct any facilities or plant deep-rooted vegetation on the landfill. An engineered alternative final cover system consisting of the following components will be constructed over the existing intermediate cover soil:

Final Cover System (from bottom to top)

- Foundation Soil Layer (minimum 24-inch-thick)
- Gas Migration Layer (minimum 12-ounce per square yard, nonwoven geotextile filter fabric)
- Hydraulic Barrier Layer (Geosynthetic Clay Liner [GCL])
- Drainage Layer top deck: minimum 12-ounce per square yard, nonwoven geotextile filter fabric
  Drainage Layer side slopes: composite geonet; and
- Vegetative Soil Layer (minimum 18-inch-thick).

This final cover system is intended to minimize infiltration, while allowing native vegetation to grow on the surface of the completed landfill. Landscaping of the landfill area will consist of planting native drought tolerant grasses common to the surrounding area.

4.3 POSTCLOSURE COST ESTIMATE

The postclosure maintenance cost estimate is presented in Appendix J. This cost estimate is based on the material and labor descriptions discussed in the Final Plans. The postclosure maintenance costs are assumed to continue for a minimum period of 30 years after closure, although closure fund need only have reserves for only 15 years. The annual postclosure maintenance cost is estimated to be approximately $32,000.

4.4 EMERGENCY RESPONSE PLAN

In accordance with CCR, Title 14, Chapter 3, Article 7.8, Section 17766, an Emergency Response Plan (ERP) is required for closure of the landfill. The ERP is presented in Appendix K. The ERP describes the procedures to be followed at the landfill if an emergency occurs and lists the appropriate contact personnel. Vandalism and flooding emergencies are covered in Section 4.0 of the postclosure maintenance plan. Other emergencies conditions, such as a chemical spill or automobile accidents occurring on Branscombe Road, are to be referred to the California Highway Patrol, County Sheriff's Department, or the Mendocino County Department of Public Health.

5.0 FINANCIAL RESPONSIBILITY (Section 18280)

A description of the financial responsibility for closure and postclosure maintenance of the landfill will be prepared by the Mendocino County Solid Waste Division in a separate document. This document will present the financial assurance mechanism(s) to be implemented by the County to assure that the closure and postclosure maintenance plans will be fully funded.

6.0 SCHEDULE FOR CLOSURE

The proposed closure schedule is presented below.

- Winter 1996 - Closure and Postclosure Plans approved by regulatory agencies
- Summer 1997 - Select CQA Firm
- Fall 1997 - Construction bid preparation
- Winter 1998 - Award construction contract
- Spring 1998 - Construction of final cover system
- Fall 1998 - Postclosure Maintenance Period begins
- Fall 2028 - Postclosure Maintenance Period ends

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Abandonment of Monitoring Wells 87-1, 87-2, and 87-3

Monitoring wells 87-1, 87-2, and 87-3 were installed in 1987 as part of the SWAT program. There was evidence that these wells may not have been screened in discrete water bearing zones. The monitoring wells were therefore abandoned by destruction in accordance with the requirements of the California Well Standards, Bulletin 74-90. The materials within the original boreholes including the casing, screen, annular seal, and filter pack were removed by over drilling the existing wells. Once the material was removed, the holes were filled with a neat cement bentonite slurry, placed by tremie to prevent bridging.

Monitor Well Installation - 93-1, 93-2

To aid in the assessment of hydrogeologic conditions at the Laytonville Landfill site, two monitoring wells, 93-1 and 93-2, were installed with screens at the first encountered groundwater. Monitoring well 93-1 screens the formation overlying the Franciscan Formation, while monitoring well 93-2 screens the Franciscan Formation. Initial groundwater level measurements obtained after construction of the wells indicate confined geologic conditions to exist at the respective locations. The monitoring wells were installed using a BK-81 drill rig equipped with hollow stem augers. The boreholes were initially drilled with 8 inch hollow stem augers and continuously sampled to obtain accurate determination of subsurface conditions. The encountered subsurface soil was logged in accordance with the Unified Soil Classification System. Once the appropriate depth for the well screen was determined, the hole was over drilled with 10 inch augers and the monitoring wells installed within the augers.

Monitoring well 93-1 was drilled to a depth of 32.5 feet below ground surface. The first water bearing zone was encountered at approximately 28 feet below ground surface and continued to approximately 32 feet. The well was constructed with a 4 inch diameter, Schedule 40 PVC riser and screen. A .02 inch slotted screen was installed extending from 22 feet below ground surface to 32 feet below ground surface. The sand filter pack, Monterey Sand #3, was placed between the screen and wall of the borehole while the augers were gradually pulled from the hole. The filter pack extended from the bottom of the borehole to approximately 2 feet above the top of the screen. A 2 feet thick bentonite seal was placed on top of the filter pack and charged with water. The annular space between the well casing and the wall of the well borehole was then sealed with a neat cement bentonite slurry. The cement slurry seal extended from the top of the bentonite seal to the ground surface. The well was completed above ground with a casing cap, and equipped with a Redi-Flo 2 pump, piping, electrical control and safety cable. A monument with locking cover was installed on top of the well.

Monitoring well 93-2 was drilled to a depth of 57 feet below ground surface. The first water bearing zone was encountered at approximately 53 feet below ground surface and continued to approximately 56 feet. The well was constructed with a 4 inch diameter, Schedule 40 PVC riser and screen. The well was screened from 46 feet below ground surface to 56 feet below ground surface with .02 inch slotted screen and #3 sand filter pack. The filter pack was placed while the augers were gradually pulled from the hole, and extended from the bottom of the borehole to approximately 2 feet above the top of the screen. A 2.5 feet thick bentonite seal was placed on top of the filter pack and charged with water. The annular space between the well casing and the wall of the well borehole was then sealed with a neat cement bentonite slurry. The cement slurry seal extended from the top of the bentonite seal to the ground surface. The well was completed above ground with a casing cap, and equipped with a Redi-Flo 2 pump, piping, electrical control and

safety cable. A monument with locking cover was installed on top of the well.

Exploratory Boring

An exploratory boring was performed at Laytonville Landfill adjacent to monitoring well 90-1 to determine if 90-1 is screened in the first water zone. The boring was advanced using a BK-81 drill rig equipped with hollow stem augers. Samples were obtained on 1 foot intervals, and the subsurface conditions were similar to those noted on the log of boring 90-1. A small seam of wet clay (approximately 2 inches thick) was noted at approximately 50 feet below ground surface, yet the soil material above and below were not wet. As drilling continued, a defined water bearing zone was not encountered. The boring was advanced to approximately 65 feet (exceeding the depth of the screened interval of 90-1).

The borehole was left open to measure potential groundwater infiltration. Groundwater was noted in the borehole the following day at approximately 50 feet below ground surface and continued to rise over a two day period. On the third day, when the water appeared to stabilize, the groundwater elevation was measured and compared to the groundwater elevation in 90-1. The groundwater elevation in the borehole appeared to be hydrostatically connected to the groundwater elevation in 90-1 (both of which were noted to demonstrate confined conditions because the water level is higher than the top of the screen). Because a distinct water bearing zone was not noted during drilling and the hydrostatic head corresponded with the hydrostatic head of 90-1, it was determined by the Regional Water Quality Control Board, Mendocino County Solid Waste Division and Anderson Consulting Group that 90-1 is screened in the first water bearing zone. The exploratory boring was therefore abandoned and sealed with a neat cement bentonite slurry using a tremie pipe from the bottom of the borehole to ground surface to prevent bridging.

Leachate Extraction Well Installation

A leachate extraction well, LEW-1, was constructed in a section of the closed disposal area at Laytonville Landfill. The location of the extraction well was determined by Mendocino County and was constructed to assess the existence of leachate in the Laytonville Landfill. LEW-1 was installed using a BK-81 drill rig equipped with hollow stem augers. The borehole was initially drilled with 8 inch hollow stem augers to the anticipated depth of the waste. A sample was then obtained to verify the bottom of the waste. The borehole was then over drilled with 12 inch augers to the bottom of the refuse, and the leachate extraction well was installed within the augers.

LEW-1 was drilled to a depth of 41.5 feet. A sample was obtained from 40 feet to 41.5 feet below ground surface. The bottom of the refuse was determined to be approximately 40 feet below ground surface because Franciscan fractured and highly weathered rock material was noted at the bottom of the sample. A 6 inch inside diameter, Schedule 40 PVC riser and screen well was constructed. The well was screened from 9.5 feet below ground surface to 39.5 feet below ground surface with .02 inch slotted screen and pea gravel pack. The pea gravel pack was placed while the augers were gradually pulled from the hole, and extended from the bottom of the borehole to approximately 4 feet above the top of the screen. A 2.5 foot bentonite seal was placed on top of the gravel pack and charged with water. The annular space between the well casing and the wall of the well borehole was then sealed with a concrete slurry. The concrete slurry extended from the top of the bentonite seal to the ground surface. The well was completed above ground with a casing cap, and a monument with locking cover was installed over the well.

Monitor Well Installation - 94-1

Groundwater monitoring well 94-1 was installed west and downgradient of monitoring well 93-1 at the Laytonville Landfill, in the field west of the tree line within County property. The borehole was drilled with an 8-inch diameter hollow stem auger and continuously cored and logged to facilitate accurate determination of first water. The upper 34 feet consisted of alluvial deposits, generally yellowish brown with gray and red mottling, moist, fine sandy clay with sandstone, siltstone, and claystone fragments. A 2-foot thick light gray clay layer was encountered approximately 20 feet below the ground surface. The Franciscan Formation was encountered underlying the alluvial deposits at approximately 34 feet below the ground surface. The Franciscan at the borehole consisted of dark gray, moist, dense blue schist.

First water was noted seeping through an open crack in the clay layer, yet the flow appeared too low to be considered as first water. However, at 30 feet below ground surface, a significant volume of water was seeping in the borehole from above. As the only wet zone encountered existed in the clay layer, it was determined that the water seeping through the clay was first encountered water.

ACG constructed a 2-inch monitoring well with Schedule 40 PVC riser and screen to a total depth of 34 feet. A 0.02-inch slotted screen was installed from 18 feet to 33 feet below ground surface. The filter pack consisted of #3 Lonestar Sand, extending from the bottom of the borehole to approximately 2 feet above the top of the screen. A 3-foot layer of bentonite chips was placed and hydrated over the filter pack. The remaining annular space above the bentonite seal was sealed with a cement/bentonite grout mix, extending to the ground surface.

REFERENCE
No. 33

LAYTONVILLE LANDFILL
CALENDAR YEAR 2001

Quarter: 4th

Date: 12/04/01

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	17.60	1737.75
91-1	1709.20	10.80	1698.40
93-1	1766.10	38.60	1727.50
93-2	1777.65	39.60	1738.05
94-1	1745.41	21.70	1723.71

COUNTY OF MENDOCINO
LAYTONVILLE LANDFILL

GROUNDWATER WELL ELEVATIONS
CALENDAR YEAR 2001

Quarter: 3rd Date: 09/18/01

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	17.00	1738.35
91-1	1709.20	10.80	1698.40
93-1	1766.10	38.30	1727.80
93-2	1777.65	38.90	1738.75
94-1	1745.41	21.40	1724.01

LAYTONVILLE LANDFILL
CALENDAR YEAR 2001

Quarter: 2nd

Date: 06/21/01

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	6.30	1749.05
91-1	1709.20	7.20	1702.00
93-1	1766.10	6.50	1759.60
93-2	1777.65	6.40	1771.25
94-1	1745.41	6.70	1738.71

COUNTY OF MENDOCINO
LAYTONVILLE LANDFILL

GROUNDWATER WELL ELEVATIONS
CALENDAR YEAR 2001

Quarter: 1st

Date: 03/07/2001

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	17.60	1737.75
91-1	1709.20	7.00	1702.20
93-1	1766.10	38.00	1728.10
93-2	1777.65	39.20	1738.45
94-1	1745.41	20.50	1724.91

REFERENCE
No. 34

Hydrogeology evaluation of the Laytonville Landfill
Produced by Roberta Bowen, Roy F. Weston, Inc.
February 6, 2002

Landfill Monitoring Wells

There are five monitoring wells located at the Laytonville Landfill. Monitoring well 91-1 is located on the east side of the site. Monitoring well 90-1 is located in the center. Monitoring well 93-2 is located near the southeast corner and wells 93-1 and 94-1 are located in the southwestern corner of the site. All of the wells are less than 80 feet deep.

The description of the materials encountered during the drilling of the five wells indicates that the wells may tap two different hydrogeologic environments. The boring log for Well 91-1 describes the sediments as sands and well-rounded gravels which the logger characterized as alluvium. The boring logs for the other four wells all describe the materials as red/brown clay, claystone or silt. Three of the wells, 90-1, 93-2 and 94-1, encountered the Franciscan Formation, which is described in the logs as either blue-gray schist or sandstone/siltstone at depths ranging from 32 to 44.5 feet. The geologic map for the Laytonville area (Cardwell, 1965) confirms the presence of both the Franciscan Formation and alluvium in the landfill area.

The construction information and date when the monitoring wells were drilled are listed in Table 1.

Table 1: Construction information for Laytonville Landfill Monitoring Wells

Monitoring Well	Total Depth (ft)	Screened Interval (ft)	Depth for First Water (ft)	Date Drilled	Installed By	Geologic Environment
90-1	80	60-80	44	1990	Taber Consultants	Brown/orange claystone, sandstone and conglomerate (blue gray sandstone and siltstone at 32 ft)
91-1	44.5	unk	34	1991	Unk	Sand and gravel
93-1	32.5	unk	28	1993	Anderson Consulting Group	Red/brown clay/silt
93-2	57	unk	53	1993	Anderson Consulting Group	Red/brown clay/silt (blue/gray at 44.5 ft)
94-1	34	unk	20	1994	Anderson Consulting Group	Red/brown clay/silt (bedrock blue shist at 34 feet)

Water was encountered in all of the wells when they were installed. The well log for 90-1 noted that the water was entering the well bore at a depth of 45 feet and stabilized at a depth of 44.1 feet. The log for 93-1 noted that water was encountered at a depth of 28 feet and that they were out of the water-bearing zone at 32.5 ft. From the information on the boring logs it appears that the water and flow beneath the site are restricted to thin zones of coarser material or layers that are more fractured. Water levels in the landfill wells were measured four times between October 2000 and December 2001. Hydrographs for these wells (attached) show that the water levels remained relatively stable during that time period, except for June 2001 when water levels rose as much 30 foot in all of the wells except 91-1.

Domestic Wells

WESTON also obtained the Drillers Reports (attached) for eight domestic wells located in the valley to the north of the Laytonville Landfill. These wells range in depth from 20 ft to 90 ft. All encountered brown and blue clay with embedded gravel and sand. The depth to water for all but two of the wells was between 10 and 15 feet when they were first drilled. The well furthest to the west had the deepest water, 35 feet. The well closest to the Laytonville landfill had the shallowest depth to water, 4 feet. Elevations for these wells, water usage and more recent water level data are not available.

Hydrogeology

There appear to be three flow systems within the area surrounding the Laytonville Landfill. Monitoring well 91-1 appears to be completed in alluvial sediments. From the topographic map, it appears that the well may be located in a small drainage feature that originally drained toward the northeast into the valley created by Cahto Creek. The water elevation in 91-1 at approximately 1700 ft amsl is more than 25 feet deeper than in any of the other monitor wells on-site.

The four remaining on-site monitor wells are completed in a thin veneer of weathered clays and fractured material. The difference in the water elevations in these wells is less than 15 feet. Although the two wells located in the southwest corner of the site, 93-1 and 94-1, are completed at similar depths of 32.5 and 34 feet respectively, the water elevations when initially drilled differed by 8 feet and currently differ by almost 4 feet. Well 93-2, located at the highest elevation in the southeastern portion of the landfill has a water elevation that is very similar to that measured in 90-1, 1738.05 and 1737.75 ft amsl, respectively. This may indicate that there is a horizontal zone that is more permeable that both wells are completed across.

The eight domestic wells north of the site are completed in clays with sand and gravel. Although elevations are not available for the domestic wells, the land surface elevation appears to be less than 1680 ft amsl. If the water levels in the monitor wells average 10 to 15 feet below land surface, than the elevation of water in these wells is approximately 1670 to 1665 ft amsl. This elevation is 30 to 35 feet deeper than water in 91-1 and as much as 70 feet deeper than the other landfill wells.

The topographic map also provides information on the locations of both recharge and discharge to the system. The topographic map shows that the site is part of a topographic high that is isolated to the south by Cahto Creek. In addition, the geology of the topographic high is the Franciscan Formation while the areas to the north, east and west are mapped as terrace deposits. Water beneath the site is located in the weathered material above the Franciscan Formation, not in the bedrock. This would suggest that the water levels in the weathered material beneath the site are not part of a regional water table, but restricted to the weathered material.

The hydrographs for the landfill wells provide a potential clue to recharge locations. If the data for June 2001 are correct, water levels measured in June 2001 were from 14 feet to 34 feet higher than those measured in March. Wells 93-02 and 93-1, both located at higher elevations than the other wells, had the maximum water level rise. This could indicate the proximity of the two wells to recharge from a precipitation event.

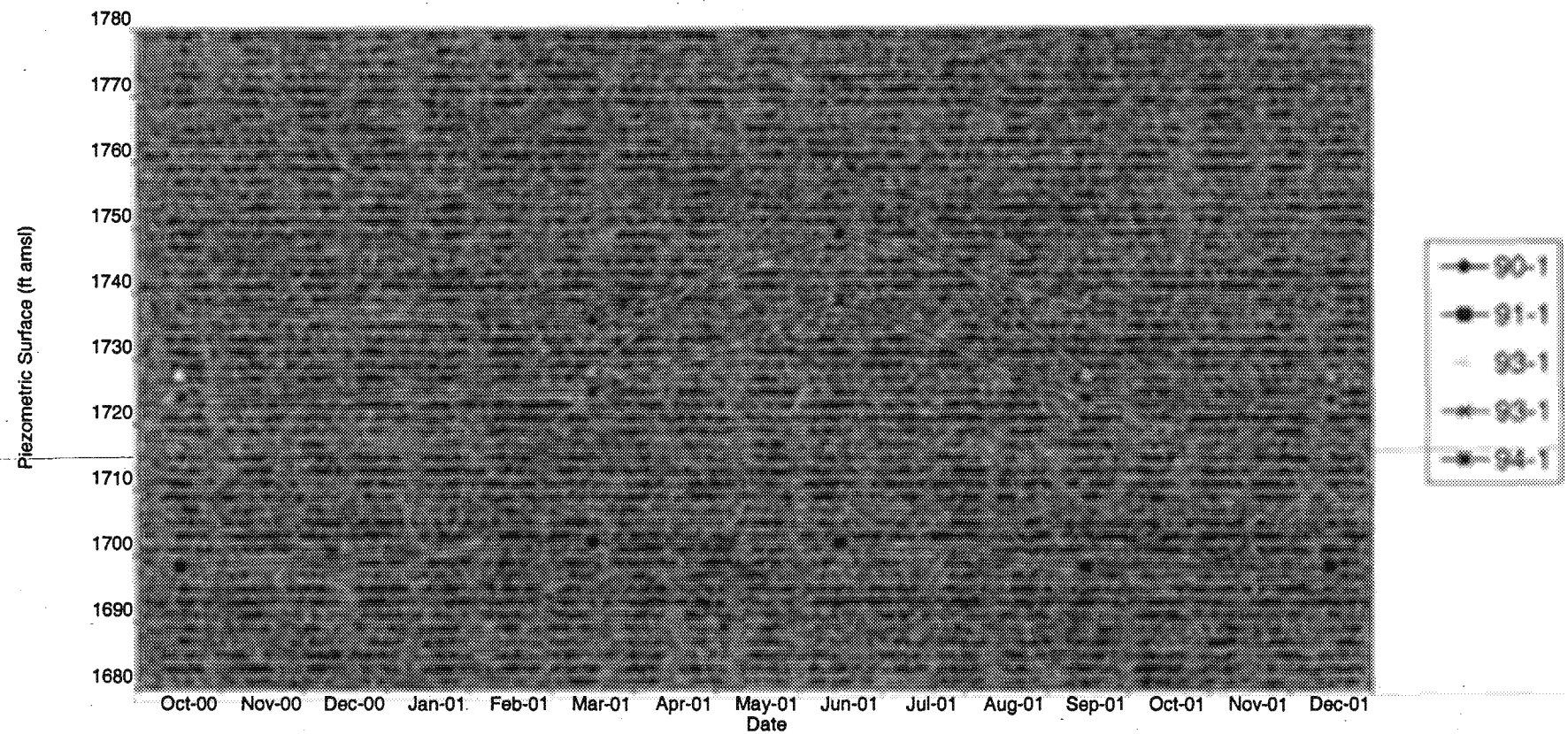
The discharge and direction of groundwater movement from the site can be evaluated using the differences in the water elevations and the topographic map. Cahto Creek is the nearest surface water channel to the Laytonville Landfill. If groundwater were to move to the south, it would need to either discharge into Cahto Creek or flow at an elevation that is deeper than the Creek. From the topographic map it appears that the Creek bottom elevation directly south of the site is approximately 1680 ft amsl. This is a lower elevation than water levels in the site, which indicates that the banks and hillslope above the Creek could act as a discharge area for the site, but that groundwater does not move beyond the Creek.

The topographic map also shows that the land surface slopes to the northeast toward the Cahto Creek and its confluence with Tenmile Creek. Although groundwater movement in fractured material is usually controlled by the orientation of the fractures and bedding planes. It appears that the location of the groundwater at the site is more controlled by coarser sediments within the clays. Because the flow is in weathered materials, it is likely that the majority of the flow from the site follows the topography of the site and is toward the northeast. The southwestern portion of the site may drain toward the west-southwest.

Questions to be answered:

1. Are there seeps/springs along the hillslope at the south side of the site?
2. How does the water quality compare between the domestic wells and the landfill wells? Do different geologic environments show different chemistry?
3. Do aerial photographs show any differences in vegetation that could be related to water quality or quantity?
4. The domestic wells need to be sampled and surveyed so direction of flow can be determined.
5. Need construction information for the landfill wells.
6. Need to doublecheck June 2001 water levels. Was there rainfall just prior to the measurement? What could have caused sudden rise?
7. How much water do the wells produce when they're purged for sampling? What's the resulting drawdown in the well?

Hydrographs for Wells Located at Laytonville Landfill



	10/24/2000	3/7/2001	6/21/2001	9/18/2001	12/4/2001
90-1	1738.15	1735.75	1749.05	1738.35	1737.75
91-1	1698.3	1702.2	1702	1698.4	1698.4
93-1	1727.8	1728.1	1759.6	1727.8	1727.5
93-1	1738.85	1738.45	1771.25	1738.75	1738.05
94-1	1724.11	1724.91	1738.71	1724.01	1723.71

(1)

ORIGINAL
File with DWR

CONFIDENTIAL LOG
Water Code Sec. 13752

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

T21N/R15W-14
Do Not Fill In

№ 59297

State Well No.
Other Well No. CONFIDENTIAL LOG
Water Code Sec. 13752

(1) OWNER:

Name Ormar Ahmann
Address Rt. 7 Box 20
Laytonville, Calif.

(2) LOCATION OF WELL:

County Mendocino Owner's number, if any
Township, Range, and Section Corner of Branscom Rd. & Lake
Distance from cities, roads, railroads, etc. View Ave.

(3) TYPE OF WORK *(check)*:

New Well ☐ Deepening ☒ Reconditioning ☐ Destroying ☐
If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE *(check)*:

Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) EQUIPMENT:

Rotary ☐
Cable ☐
Other Bucket ☒

(6) CASING INSTALLED:

STEEL: SINGLE ☐ DOUBLE ☐ OTHER: Cement

If gravel packed

From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.
0	20½	18"	2"	32"	0	20½

Size of shoe or well ring: None Size of gravel: 3/4
Describe joint Cement

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen Punched

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
7	20½	4	1	¼ x ¼

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes ☒ No ☐ To what depth 10 ft.
Were any strata sealed against pollution? Yes ☐ No ☒ If yes, note depth of strata
From ft. to ft.
From ft. to ft.
Method of sealing Cement on pack

(9) WATER LEVELS:

Depth at which water was first found, if known 10 ft.
Standing level before perforating, if known 10 ft.
Standing level after perforating and developing 10 ft.

(10) WELL TESTS:

Was pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: 15 gal./min. with ft. drawdown after hrs.
Temperature of water Cold Was a chemical analysis made? Yes ☐ No ☒
Was electric log made of well? Yes ☐ No ☒ If yes, attach copy

(11) WELL LOG:

Total depth 20½ ft. Depth of completed well 20½ ft.
Formation: *Describe by color, character, size of material, and structure*
ft. to ft.

10 - 20½ Brown clay w/ embedded gravel

Work started 6/14 19 71, Completed 6/14 19 71

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Weeks Drilling & Pump Company
(Person, firm, or corporation) *(Typed or printed)*
Address 6100 Sebastopol Road
Sebastopol, Calif.
[SIGNED] Gerald G. Thompson
By Mary E. Thompson *(Well Driller)* Mary E. Thompson
License No. 177681 Dated June 18, 19 71

SKETCH LOCATION OF WELL ON REVERSE SIDE

CONFIDENTIAL LOG
Water Code Sec. 13752

DWR 188 (REV. 9-68)

25179-950 9-68 50M TRIP ΔD OS

ED_013162_00000569-00372

ORIGINAL (2)

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

21N 15W 14m

Do not fill in

No. 12355

Notice of Intent No. _____

Local Permit No. or Date _____

State Well No. _____

Other Well No. _____

(1) OWNER: Name Byers

Address [illegible]

City Concord Zip _____

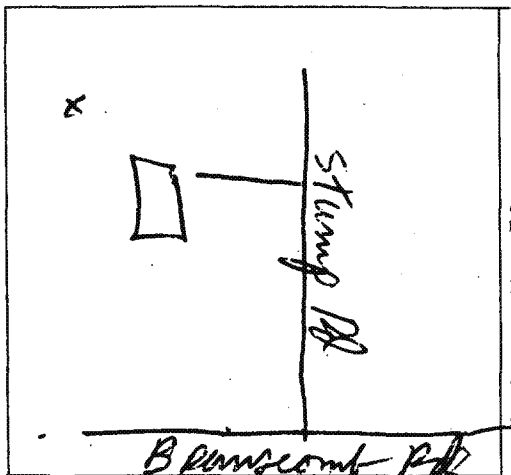
(2) LOCATION OF WELL (See instructions): 14-230-43

County Mendo Owner's Well Number _____

Well address if different from above 44130 Stump Rd, Laytonville

Township 21N Range 15W Section 14

Distance from cities, roads, railroads, fences, etc. _____



WELL LOCATION SKETCH

(3) TYPE OF WORK:

New Well ☒ Deepening ☐

Reconstruction ☐

Reconditioning ☐

Horizontal Well ☐

Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☒

Irrigation ☐

Industrial ☐

Test Well ☐

Stock ☐

Municipal ☐

Other ☐

(5) EQUIPMENT:

Rotary ☐ Reverse ☐

Cable ☐ Air ☐

Other ☐ Bucket ☒

(6) GRAVEL PACK:

Yes ☒ No ☐ Size Pea

Diameter of bore 30"

Packed from 20 to 61 ft.

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS: Saw

Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	61	8	160#	20	61	6x1/8

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 20 ft.

Were strata sealed against pollution? Yes ☐ No ☒ Interval _____ ft.

Method of sealing Concrete

(10) WATER LEVELS:

Depth of first water, if known 13 ft.

Standing level after well completion — ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? Driller

Type of test Pump ☐ Bailer ☒ Air lift ☐

Depth to water at start of test 13 ft. At end of test 21 ft

Discharge 40 gal/min after 1 hours Water temperature _____

Chemical analysis made? Yes ☐ No ☒ If yes, by whom? _____

Was [illegible]ic log made? Yes ☐ No ☒ If yes, attach copy to this report

(12) WELL LOG: Total depth 61 ft. Depth of completed well 61 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	14	Brown clay
14	17	Blue clay
17	61	Blue clay + gravel

Work started 27 June 1983 Completed 27 June 1983

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED M Kelley 850 (Well Driller)

NAME Kelley Pump + Drilling (Person, firm, or corporation) (Typed or printed)

Address Bx 272

City Ft. Bragg Zip 95437

License No. 325572 Date of this report 27 June 83

CONFIDENTIAL
NOT FOR PUBLIC USE
WATER CODE SEC. 13752

FEB 7 1984

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM 43816-950 7-76 50M QUAD ①T OSP

③ 2 1N/15W-14

ORIGINAL LOCATION ON MAP IS A GUESS (NO ADDRESS)

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill in

No. 105146

Notice of Intent No. _____

Permit No. or Date _____

State Well No. ~~CONFIDENTIAL LOG~~

Other Well No. _____ Water Code Sec. 13752

(1) OWNER: Name George Carver

Address P.O. Box 40

City Leggett, California Zip 95455

(2) LOCATION OF WELL (See instructions):

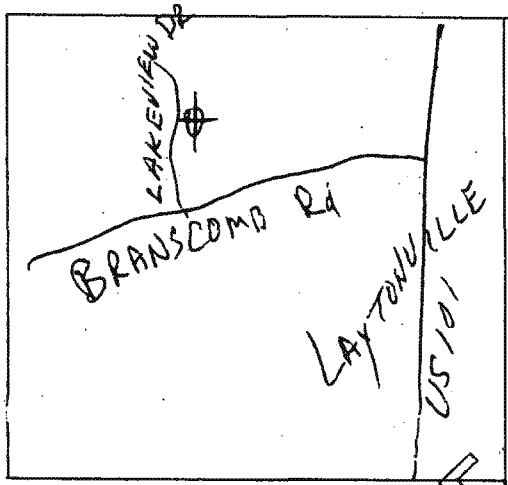
County Mendocino Owner's Well Number _____

Well address if different from above _____

Township _____ Range _____ Section _____

Distance from cities, roads, railroads, fences, etc.

Lakeview Drive
Laytonville



WELL LOCATION SKETCH

(3) TYPE OF WORK:

New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☒
Irrigation ☐
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

(5) EQUIPMENT:

Rotary ☐ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☒

(6) GRAVEL PACK:

Yes ☒ No ☐ Size pea
Diameter of bore 32"
Packed from 19' to 49' ft.

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS: sawn

Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	50	8"	160PVC	19	49	6x3/16

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 19' ft.

Were strata sealed against pollution? Yes ☐ No ☒ Interval _____ ft.

Method of sealing concrete on gravel pack

(10) WATER LEVELS:

Depth of first water, if known _____ ft.

Standing level after well completion 17'? ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? Weeks

Type of test Pump ☐ Bailer ☒ Air lift ☐

Depth to water at start of test 17'? ft. At end of test 44' ft

Discharge 20 gal/min after 3/4 hours Water temperature cold

ical analysis made? Yes ☐ No ☒ If yes, by whom? _____

Was electric log made? Yes ☐ No ☒ If yes, attach copy to this report

(12) WELL LOG: Total depth 49 ft. Depth of completed well 49 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	4	Brown sandy clay
4	11	Brown clayee sand
11	14	Brown & blue clayee sand
14	18	Brown & blue clay w/gravel & water
18	22	Blue clay w/embedded gravel
22	49	Blue clay w/embedded gravel, sand & gravel w/water

Work started Oct. 18, 1978 Completed Oct. 19, 1978

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED Gerald Thompson By: Gerald Thompson (Well Driller)

NAME WEEKS DRILLING AND PUMP COMPANY (Person, firm, or corporation) (Typed or printed)

Address Sebastopol Road

City Sebastopol, California Zip 95472

License No. C57-177681 Date of this report October 25, 1978

CONFIDENTIAL
NOT FOR PUBLIC USE
WATER CODE SEC. 13752

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

(4)

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

21N/15W-14M

Do not fill in

No. 333541

State Well No. _____
Other Well No. _____

Notice of Intent No. _____
Local Permit No. or Date 5176

(1) OWNER: Name RICHARD FOLTZ
Address BOX 387
City LAYTONVILLE, CA. ZIP _____

(2) LOCATION OF WELL (See instructions): 14-373-29
County MENDO Owner's Well Number _____
Well address if different from above 44170 STUMP RD. LAYTONVILLE
Township 21N Range 15W Section 14
Distance from cities, roads, railroads, fences, etc. _____

WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☑ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☑
Irrigation ☐
Industrial ☐
Test Well ☐
Municipal ☐
Other ☐
(Describe)

(5) EQUIPMENT:
Rotary ☐ Reverse ☐
Cable ☐ Air ☑
Other ☐ Bucket ☐

(6) GRAVEL PACK:
Yes ☑ No ☐ Size PEA
Diameter of bore 10 5/8
Packed from 20 to 90 ft.

(7) CASING INSTALLED:
Steel ☐ Plastic ☑ Concrete ☐

(8) PERFORATIONS:
Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	90	6"	#160	30	90	.032

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☑ No ☐ If yes, to depth 20 ft.
Were strata sealed against pollution? Yes ☐ No ☑ Interval _____ ft.
Method of sealing NEAT CEMENT

(10) WATER LEVELS:
Depth of first water, if known _____ ft.
Standing level after well completion 4' ft.

(11) WELL TESTS:
Was well test made? Yes ☑ No ☐ If yes, by whom? DRILLER
Type of test Pump ☐ Bailer ☐ Air lift ☑
Depth to water at start of test _____ ft. At end of test _____ ft.
Discharge 12 gal/min after 1 hours Water temperature _____
Chemical analysis made? Yes ☐ No ☑ If yes, by whom? _____
Was electric log made Yes ☐ No ☑ If yes, attach copy to this report

(12) WELL LOG: Total depth 90 ft. Completed depth 90 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	8	BROWN CLAY - BROWN SANDSTONE
8	79	GRAY CLAY - GRAY SANDSTONE
79	90	GRAY CLAY

MAY 25 1990

Work started 5-16 1990 Completed 5-16 1990

WELL DRILLER'S STATEMENT: 850

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Signed Tobey Thompson (Well Driller)
NAME KELLEY PUMP + DRILLING, INC (Person, firm, or corporation) (Typed or printed)
Address BOX 272
City FT. BRAGG, CA. ZIP 95437
License No. 325572 Date of this report 5-16-90

CONFIDENTIAL
NOT FOR PUBLIC USE
WATER CODE SEC. 13752

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

DWR 188 (REV. 12-86) 86 96355

(5)

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do Not Fill In

№ 58780

State Well No.

Other Well No. 21N/15W-14

CONFIDENTIAL LOG
Water Code Sec. 13752

(1) OWNER:

Name E. G. Reeder
Address 1033 16th Ave.
Redwood City, Calif.

(2) LOCATION OF WELL:

County Mendocino Owner's number, if any
Township, Range, and Section 2 miles west Laytonville
Distance from cities, roads, railroads, etc. on Branscomb Rd.

(3) TYPE OF WORK *(check)*:

New Well [X] Deepening [ ] Reconditioning [ ] Destroying [ ]
If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE *(check)*:

Domestic [X] Industrial [ ] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

(5) EQUIPMENT:

Rotary [ ]
Cable [ ]
Other Bucket [X]

(6) CASING INSTALLED:

STEEL: X OTHER:
SINGLE [ ] DOUBLE [ ]

From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	If gravel packed From ft.	To ft.
0	78	8 5/8	8G	32"	0	78
BULLNOSED						

Size of shoe or well ring: Size of gravel: 3/4
Describe joint Welded

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen Slots

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
19	78	5	1	1/4 x 10

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes [X] No [ ] To what depth 10 ft.
Were any strata sealed against pollution? Yes [ ] No [X] If yes, note depth of strata
From ft. to ft.
From ft. to ft.
Method of sealing Cement on pack

(9) WATER LEVELS:

Depth at which water was first found, if known 35 ft.
Standing level before perforating, if known 22 ft.
Standing level after perforating and developing 22 ft.

(10) WELL TESTS:

Was pump test made? Yes [ ] No [X] If yes, by whom? Bail
Yield: 4 gal./min. with ft. drawdown after hrs.
Temperature of water Cold Was a chemical analysis made? Yes [ ] No [X]
Was electric log made of well? Yes [ ] No [X] If yes, attach copy

(11) WELL LOG:

Total depth 78 ft. Depth of completed well 78 ft.

Formation: *Describe by color, character, size of material, and structure*

ft. to		ft.	
0	-	3	Brown topsoil
3	-	15	Brown dirt
15	-	35	Brown dirt w/ embedded gravel
35			Little seep
35	-	40	Blue clay w/ embedded gravel
40	-	45	Blue gravel making water
45	-	65	Blue clay
65	-	70	Embedded gravel & sand
70	-	78	Blue clay

Work started 9/21, 19 71. Completed 9/21, 19 71

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Weeks Drilling & Pump Co.
(Person, firm, or corporation) (*Typed or printed*)

Address 6100 Sebastopol Rd.
Sebastopol, Calif.

[SIGNED] Gerald G. Thompson
By Mary E. Thompson (Well Driller)

License No. 177681 Dated 9/23, 19 71

SKETCH LOCATION OF WELL ON REVERSE SIDE

DWR 188 (REV. 9-68) 25179-950 9-68 50M TRIP △D OSP

ED_013162_00000569-00376

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do Not Fill In

№ 58779

State Well No. CONFIDENTIAL LOG

Other Well No. 2N/15W-14M

2N/15W-14M

Do not fill in

No. 211305

State Well No.

Other Well No.

Calif.

...er's number, if any

...les west Laytonville

...nscomb Rd.

...ioning ☐ Destroying ☐

...in Item 11.

...l ☐ (5) EQUIPMENT:

...er ☐ Rotary ☐

Cable ☐

Other Bucket ☒

If gravel packed

Diameter of Bore	From ft.	To ft.
32"	0	39

Size of gravel: 3/4

...EN:
Slots

Rows per ft.	Size in. x in.
1	¼ x 10

☐ To what depth 12 ft.

...o ☐ If yes, note depth of strata

...ack

18 ft.

15 ft.

15 ft.

...es, by whom? Bail

...ft. drawdown after hrs.

...analysis made? Yes ☐ No ☒

...If yes, attach copy

(11) WELL LOG:

Total depth 39 ft. Depth of completed well 39 ft.

Formation: Describe by color, character, size of material, and structure

ft.		ft. to	
0	-	4	Brown topsoil
4	-	15	Brown dry gravel
15	-	18	Brown gravel making water
18	-	30	Brown clay making water
30	-	35	Blue clay w/ imbedded gravel
35	-	39	Brown clay

Work started 9/22 19 71, Completed 9/22 19 71

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Weeks Drilling & Pump Co.
(Person, firm, or corporation) (Typed or printed)

Address 6100 Sebastopol Rd.
Sebastopol, Calif.

[SIGNED] Gerald G. Thompson
By Mary E. Thompson (Well Driller)

License No. 177681 Dated 9/23 19 71

...70 ft. Depth of completed well 70 ft.

...be by color, character, size or material)

clay with embedded

...lay

sand and gravel

...ith embedded

...ith embedded gravel,

...nd gravel with

...rs

...752

NOV 1 1 1993

... Completed 9-15 1993

...T:

...tion and this report is true to the best of my

By: Don Sinclair

...ll Driller)

...G AND PUMP COMPANY 98

...ration) (Typed or printed)

...5100 Sebastopol Road

...ifornia Zip 95473

Date of this report September 21, 1993

...RED FORM

SKETCH LOCATION OF WELL ON REVERSE SIDE

25179-950 9-68 50M TRIP △D OSP

ED_013162_00000569-00377

(7)

ORIGINAL

File with DWR

RECEIVED

NOV 03 1993

D.W.R.

21N/15W-14M

Do not fill in

No. 211305

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

No. [redacted] Intent No. D.W.R.

Local Permit No. or Date 9403

State Well No.

Other Well No.

(1) OWNER: Name ROBERTSON, Mark

Address P.O. Box 1162

City Laytonville, California Zip 95454

(2) LOCATION OF WELL (See instructions):

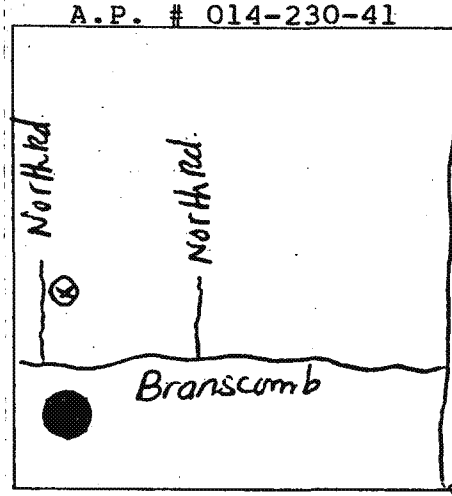
County MENDOCINO Owner's Well Number

Well address if different from above

Township 21N Range 15W Section 14

Distance from cities, roads, railroads, fences, etc.

2051 North Road
Laytonville
A.P. # 014-230-41



WELL LOCATION SKETCH

(3) TYPE OF WORK:

New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☒
Irrigation ☐
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

(5) EQUIPMENT:

Rotary ☐ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☒

(6) GRAVEL PACK:

Yes ☒ No ☐ Size pea

Diameter of bore 24"

Packed from 21 to 70 ft.

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS:

Type of perforation or size of screen micro

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	71	8"	CL200	20	70	.032

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 21 ft.

Were strata sealed against pollution? Yes ☐ No ☒ Interval ft.

Method of sealing concrete on gravel pack

(10) WATER LEVELS:

Depth of first water, if known ft.

Standing level after well completion 15 ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? Weeks

Type of test Pump ☐ Bailer ☒ Air lift ☐

Depth to water at start of test 15 ft. At end of test 25 ft

Discharge 30 gal/min after 1 hours Water temperature cool

Chemical analysis made? Yes ☐ No ☒ If yes, by whom?

Was electric log made? Yes ☐ No ☒ If yes, attach copy to this report

(12) WELL LOG: Total depth 70 ft. Depth of completed well 70 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	12	Brown clay with embedded gravel
12	25	Blue clay
25	30	Clay, sand and gravel
30	40	Clay with embedded gravel
40	70	Clay with embedded gravel, sand and gravel with boulders

Work started 9-15 1993 Completed 9-15 1993

NOV 1 1 1993

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED Ward Thompson By: Don Sinclair (Well Driller)

NAME WEEKS DRILLING AND PUMP COMPANY 98 (Person, firm or corporation) (Typed or printed)

Address P.O. Box 176-6100 Sebastopol Road

City Sebastopol, California Zip 95473

License No. C57-177681 Date of this report September 21, 1993

CONFIDENTIAL NOT FOR PUBLIC USE WATER CODE SEC. 13752

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL
File with DWR

RECEIVED JUL 24 1992

Page 1 of 4

Owner's Well No. _____

Date Work Began 7/6/92, Ended 7/10/92

Local Permit Agency Mendocino County Environmental Health

Permit No. 9446 Permit Date 6/30/92

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 485047

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO. 21N/15W-14M

LATITUDE _____ LONGITUDE _____

APN/TRS/OTHER _____

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER 35 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	2	Top Soil
2	14	Yellow Clay
14	35	Gravel
35	60	Blue Clay

TOTAL DEPTH OF BORING 60 (Feet)

TOTAL DEPTH OF COMPLETED WELL 61 (Feet)

WELL OWNER

Name Rodney Weaver

Mailing Address P. O. Box 268

Laytonville, CA. 95454

CITY STATE ZIP

WELL LOCATION

Address 2000 North Road

City Laytonville, CA. 95454

County Mendocino

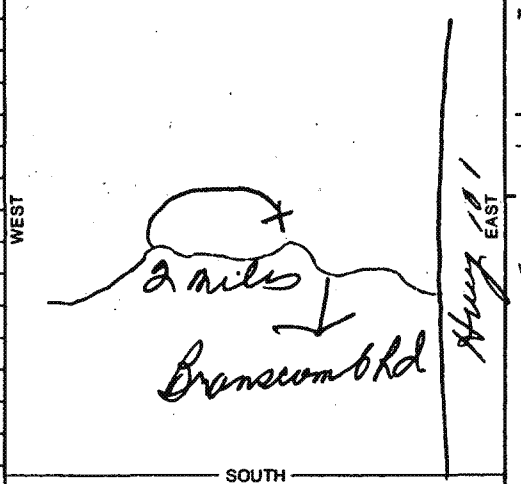
APN Book 14 Page 250 Parcel 28

or Township 21N Range 15W Section 14

or Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH

NORTH



SOUTH

Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY

X Domestic

___ Public

___ Irrigation

___ Industrial

___ "TEST WELL"

___ CATHODIC PROTECTION

___ OTHER (Specify)

DRILLING METHOD Air Rotary FLUID _____

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 10 (Ft.) & DATE MEASURED 7/10/92

ESTIMATED YIELD* 10 (GPM) & TEST TYPE Air Lift

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN _____ (Ft.)

* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
1	60	9"		Steel			12 gauge	6 5/8"	12	1/4x1"
							PERFORATIONS		22	ft. to

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	20	X			Pea gravel
57 ft.					

JUL 27 1992

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME R & B Drilling 380
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

580 Milani Drive, Ukiah, CA. 95482
ADDRESS CITY STATE ZIP

Signed John T Brown
WELL DRILLER/AUTHORIZED REPRESENTATIVE

7/14/92
DATE SIGNED

482117
C-57 LICENSE NUMBER

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

COUNTY OF MENDOCINO
SOLID WASTE DIVISION
559 LOW GAP ROAD
UKIAH CA 95482
TEL:(707)-463-4078
FAX:(707)-468-3427

FACSIMILE TRANSMITTAL SHEET

TO: PAULA ABAJIAN	FROM: PAUL CAYLER
COMPANY: Weston	DATE: 1/8/2002
FAX NUMBER: 925 945 6485	TOTAL NO. OF PAGES INCLUDING COVER: 3
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
RE:	YOUR REFERENCE NUMBER:

☐ URGENT ☒ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Paula:

Here's the info. you requested in your voice mail yesterday.

Paul

1 LAYTONVILLE LANDFILL DRILLING ACTIVITIES

1.1 Groundwater Monitoring Well Installation

Groundwater monitoring well 94-1 was installed west and downgradient of monitoring well 93-1 at the Laytonville Landfill, in the field west of the tree line within County property. The borehole was drilled with an 8-inch diameter hollow stem auger and continuously cored and logged to facilitate accurate determination of first water. The upper 34 feet consisted of alluvial deposits, generally yellowish brown with gray and red mottling, moist, fine sandy clay with sandstone, siltstone, and claystone fragments. A 2-foot thick light gray clay layer was encountered approximately 20 feet below the ground surface. The Franciscan Formation was encountered underlying the alluvial deposits at approximately 34 feet below the ground surface. The Franciscan at the borehole consisted of dark gray, moist, dense blue schist. The boring log is presented as Figure 1 in Appendix A.

First water was noted seeping through an open crack in the clay layer, yet the flow appeared too low to be considered as first water. However, at 30 feet below ground surface, a significant volume of water was seeping in the borehole from above. As the only wet zone encountered existed in the clay layer, it was determined that the water seeping through the clay was first encountered water.

94-1

ACG constructed a 2-inch monitoring well with Schedule 40 PVC riser and screen to a total depth of 34 feet. A 0.02-inch slotted screen was installed from 18 feet to 33 feet below ground surface. The filter pack consisted of #3 Lonestar Sand, extending from the bottom of the borehole to approximately 2 feet above the top of the screen. A 3-foot layer of bentonite chips was placed and hydrated over the filter pack. The remaining annular space above the bentonite seal was sealed with a cement/bentonite grout mix, extending to the ground surface. The final construction details for the groundwater monitoring well is presented on Figure 2.

Abandonment of Monitoring Wells 87-1, 87-2, and 87-3

Monitoring wells 87-1, 87-2, and 87-3 were installed in 1987 as part of the SWAT program. There was evidence that these wells may not have been screened in discrete water bearing zones. The monitoring wells were therefore abandoned by destruction in accordance with the requirements of the California Well Standards, Bulletin 74-90. The materials within the original boreholes including the casing, screen, annular seal, and filter pack were removed by overdrilling the existing wells. Once the material was removed, the holes were filled with a neat cement/5% bentonite slurry, placed by tremie to prevent bridging.

Monitor Well Installation

To aid in the assessment of hydrogeologic conditions at the Laytonville Landfill site, two monitoring wells, 93-1 and 93-2, were installed with screens at the first encountered groundwater. Monitoring well 93-1 screens the formation overlying the Franciscan Formation, while monitoring well 93-2 screens the Franciscan Formation. Initial groundwater level measurements obtained after construction of the wells indicate confined geologic conditions to exist at the respective locations. The monitoring wells were installed using a BK-81 drill rig equipped with hollow stem augers. The boreholes were initially drilled with 8 inch hollow stem augers and continuously sampled to obtain accurate determination of subsurface conditions. The encountered subsurface soil was logged in accordance with the Unified Soil Classification System. Once the appropriate depth for the well screen was determined, the hole was overdrilled with 10 inch augers and the monitoring wells installed within the augers. The approximate well locations are shown on Drawing 1, and the soil boring logs are presented in Attachment C.

Monitoring well 93-1 was drilled to a depth of 32.5 feet below ground surface. The first water bearing zone was encountered at approximately 28 feet below ground surface and continued to approximately 32 feet. The well was constructed with a 4 inch diameter, Schedule 40 PVC riser and screen. A .02 inch slotted screen was installed extending from 22 feet below ground surface to 32 feet below ground surface. The sand filter pack, Monterey Sand #3, was placed between the screen and wall of the borehole while the augers were gradually pulled from the hole. The filter pack extended from the bottom of the borehole to approximately 2 feet above the top of the screen. A 2 feet thick bentonite seal was placed on top of the filter pack and charged with water. The annular space between the well casing and the wall of the well borehole was then sealed with a neat cement/5% bentonite slurry. The cement slurry seal extended from the top of the bentonite seal to the ground surface. The well was completed above ground with a casing cap, and equipped with a Redi-Flo 2 pump, piping, electrical control and safety cable. A monument with locking cover was installed on top of the well. The monitoring well diagram for 93-1 is presented in Attachment D. 93-1

Monitoring well 93-2 was drilled to a depth of 57 feet below ground surface. The first water bearing zone was encountered at approximately 53 feet below ground surface and continued to approximately 56 feet. The well was constructed with a 4 inch diameter, Schedule 40 PVC riser and screen. The well was screened from 46 feet below ground surface to 56 feet below ground surface with .02 inch slotted screen and #3 sand filter pack. The filter pack was placed while the augers were gradually pulled from the hole, and extended from the bottom of the borehole to approximately 2 feet above the top of the screen. A 2.5 feet thick bentonite seal was placed on top of the filter pack and charged with water. The annular space between the well casing and the wall of the well borehole was then sealed with a neat cement/5% bentonite slurry. The cement slurry seal extended from the top of the bentonite seal to the ground surface. The well was completed above ground with a casing cap, and equipped with a Redi-Flo 2 pump, piping, electrical control and safety cable. A monument with locking cover was installed on top of the well. The monitoring well diagram for 93-2 is presented in Attachment D. 93-2

ANDERSON CONSULTING GROUP

90-1

TABER SINCE 1954 TABER CONSULTANTS Engineers & Geologists

MONITORING WELL LOG

Project Name: Laytonville Landfill
Client: EBA Wastechnologies
Job No.: 1P2/589/113

MW 90-1

WELL CASING: 4" Diameter PVC	FROM 0 TO 60 ft.	Well No. 4	Location: See Plan
TYPE OF PERFORATION: .020" machine slotted	FROM 60 TO 80 ft.	Elevation: 1778	Reference: 1" = 50' topo map
SIZE AND TYPE OF FILTER: #3 Sand	FROM 80 TO 57 ft.	Drilling Equipment: Failing CF-15	
		Drilling Method: 8" Tricone--rotary wash	
TYPE OF SEAL: NO. 1 1/2" bentonite pellets	FROM 57 TO 55 ft.	Notes: 8" locking well sleeve placed over 4" PVC casing with locking cap	
TYPE OF SEAL: NO. 2 lean cement	FROM 55 TO 0 ft.		

Elevation	Free Water Surface Observations	Graphic Log	Depth (feet)	Geologic Unit	REMARKS (drill rate, fluid loss, odor, etc.)	SOIL TESTS	BLOWS/FOOT 350 ft lb.	SAMPLE SIZE (inches)	SAMPLE No.	DEPTH (feet)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Material Description
1775			5							5			(Compact to dense) brown-orange-tan interbedded CLAYSTONE, SILTSTONE, SANDSTONE and CONGLOMERATE. (highly weathered rock)
1770			10							10			
								2.5	1				(Compact to very dense) brown-gray CONGLOMERATE (weathered rock)
1765			15	KJf_1	Very slow drilling ±15 to ±21 ft					15			
1760			20							20			Brown-orange CLAYEY very fine-fine SANDSTONE
1755			25		Interbeds of fast and slow drilling					25			Brown-gray-orange interbedded very fine-coarse SANDSTONE, SILTSTONE, CLAYSTONE
1750			30							30			
1745			35	KJf_2	32 ft, very slow drilling localized zones of chattering (fractured rock)					35			Blue-gray interbedded SANDSTONE/SILTSTONE (locally fractured)

--continued--

LOGGED BY: EAS | CHECKED BY: RDS | DATE: 1-3-90

FIGURE 1 Page 1 of 3

EBA

LAYTONVILLE LANDFILL

MONITORING WELL LOG

PLATE 16

TABER SINCE 1954. TABER CONSULTANTS Engineers & Geologists

MONITORING WELL LOG

Job No. 1P2/589/113

Project Name: Laytonville Landfill

Client: EBA Wastechnologies

WELL CASING		FROM	TO	ft.	Well No. 4 Con't. / Location: See Plan
TYPE OF PERFORATION		FROM	TO	ft.	Elevation: 1778 / Reference:
SIZE AND TYPE OF FILTER		FROM	TO	ft.	Drilling Equipment: Failing CF-15
		FROM	TO	ft.	Drilling Method:
TYPE OF SEAL	NO. 1	FROM	TO	ft.	Notes:
	NO. 2	FROM	TO	ft.	

Elevation	Free Water Surface Observations	Graphic Log	Depth (feet)	Geologic Unit	REMARKS (drill rate, fluid loss, odor, etc.)	SOIL TESTS	BLOWS/FOOT 350 ft lb.	SAMPLE SIZE (inches)	SAMPLE No.	DEPTH (feet)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Material Description
								2.5	2				
1740			40							40			Blue-gray interbedded SANDSTONE/SILTSTONE (locally fractured)
1735	1733.9		45		Slow drilling; "chatters" through fractured rock					45			
1730			50	KJf_2						50			
1725			55							55			
1720			60							60			
1715			65							65			
1710			70							70			

--continued--

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FIGURE 1 Page 2 of 3

EBA

LAYTONVILLE LANDFILL

MONITORING WELL LOG

PLATE 17

TABER
SINCE 1954
TABER CONSULTANTS

MONITORING WELL LOG

Job No.: 1P2/589/113

Project Name: Laytonville Landfill

Client: EBA Wastechnologies

WELL CASING		FROM	TO	ft
TYPE OF PERFORATION		FROM	TO	ft
SIZE AND TYPE OF FILTER		FROM	TO	ft
TYPE OF SEAL	NO. 1	FROM	TO	ft
	NO. 2	FROM	TO	ft

Well No. 4 Cont. | Location: See Prior
Elevation: 1778 | Reference:
Drilling Equipment: Failing CF-15
Drilling Method:
Notes:

Elevation	Free Water Surface Observations	Graphic Log	Depth (feet)	Geologic Unit	REMARKS (drill rate, fluid loss, odor, etc.)	SOIL TESTS	BLOWS/FOOT 330 ft lb	SAMPLE SIZE (inches)	SAMPLE No.	DEPTH (feet)	MATERIAL SYMBOL	UNIFIED SOIL CLASSIFICATION	Material Description
1705			75	K,fl_2						75			Blue-gray interbedded SANDSTONE/SILTSTONE (locally fractured)
1700			80							80			

After drilling, hole bailed to ±60 ft. Water coming in at ±45 ft. Completed well installation, groundwater surface 44.1 ft 15 mins later.

Developed well by agitation with 3 1/2" bailer, then bailed 3-4 well volumes. Rough field calculations show well producing 1-1.25 gal/min.

LEGEND

K,fl_1 = Franciscan Formation; highly weathered Jura-Cretaceous

K,fl_2 = Franciscan Formation; less weathered Jura-Cretaceous

LOGGED BY: EAS | CHECKED BY: RDS | DATE: 1-3-90

FIGURE 1 Page 3 of 3

EBA

LAYTONVILLE LANDFILL

MONITORING WELL LOG

PLATE 18

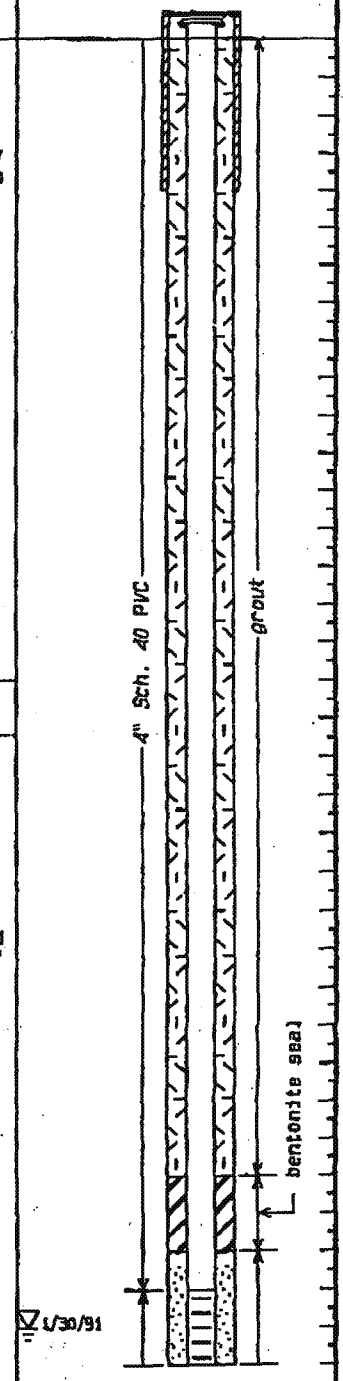
HOLE NUMBER 91-1

PROJECT Mendocino County
JOB NUMBER 900189.300
LOCATION Laytonville Landfill
DATE DRILLED 1/30/91
GROUND SURFACE ELEVATION
SAMPLER TYPE 5' Dry Core
EXCAVATION METHOD CME-95
LOGGED BY TAS
TOTAL DEPTH OF HOLE 44.5 ft.

Top of Casing Elev: ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION
	1				GM	GRAVEL, sandy, silty, dense, moist, dark brown
	2					
	3				SC	SAND, clayey, gravelly and CLAY, sandy gravelly, moist, mottled reddish brown and gray. Sandstone cobble in shoe Alluvium
	4				CH	
	5		95			
	6					
	7					
	8				SC	SAND, very clayey, very gravelly, 30% subrounded sandstone and chert gravel, clay is mottled, Alluvium
	9				CH	
	10		95			
	11					
	12					
	13				CH	GRAVEL, clayey, sandy, dense, moist, reddish brown
	14				GP	
	15		90			
	16					minor wet zone at 16'
	17				SC	SAND, clayey, dense, moist, gray. minor wet zone at 17.5'
	18				SC	
	19				SW	SAND, gravelly, clayey, dense, moist, gray; minor 2" thick clay stata; gravels well rounded, predominantly sandstone, up to 3" in diameter, Alluvium
	20		50			
	21					
	22					
	23				SW	SAND, gravelly, dense, moist, gray; minor 1" thick clay strata, subrounded to well rounded sandstone clasts to 2" diameter, minor, well rounded chert
	24					
	25		95			minor wet zone 1" thick
	26					
	27					
	28					SAND, gravelly, dense, moist, gray; gravel in shoe of sampler is wet
	29					
	30		45			
	31					
	32					
	33				GW	GRAVEL, sandy, minor clay, dense, moist and wet (stratified), gray, predominantly (50%) well rounded and subrounded sandstone, wet from 34 to 37 feet
	34					
	35					

WELL DIAGRAM



HOLE NUMBER 91-1

PROJECT *Mendocino County* JOB NUMBER *900189.300*

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	WELL DIAGRAM
	36		90		GW		
	37						
	38				GW	GRAVEL, sandy, dense, wet	
	39						
	40		90				
	41						
	42						
	43						
	44						
	45					Bottom of Boring	
	46						
	47						
	48						
	49						
	50						
	51						
	52						
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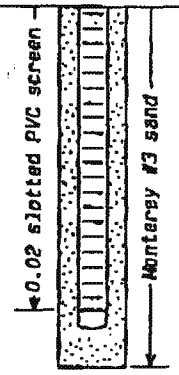
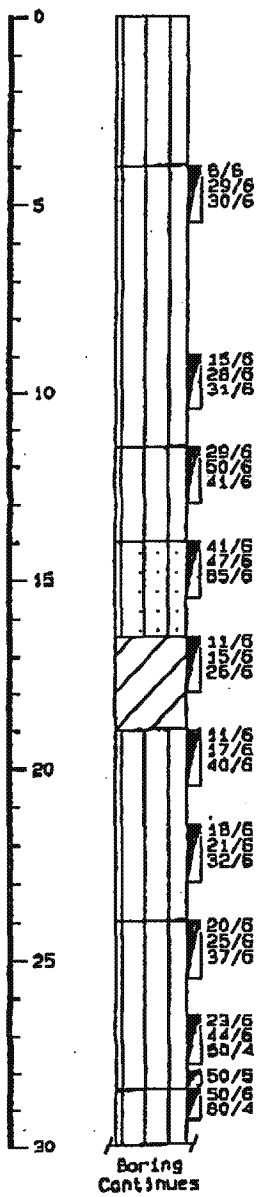
	75						



LOG OF BORING

Boring No.: 93-1
Date: 6/25/93

Project: 3200-77-22
Elevation: ~1753



ELEV / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	Sample Number	Density p.c.f.	Moisture %
		ML	Light red brown, moist sandy Silt				
		ML	Light red brown, moist, dense sandy Silt, mottled red streak small fragments of sandstone	Layers of silty fine sand	1-1		
				Same material with increase percentage of silty sand and clay pockets	1-2		
		ML	Light red brown, moist, dense sandy Silt, silty sand, grey fragments of clay	Increase percentage of Siltstone and Claystone fragments	1-3		
		SM	Light brown, moist, dense Sandstone grading to fine Sand		1-4		
		CL	Light red brown, moist, dense silty Clay with fine sand grading to orange grey clay	Sandstone fragments up to 1/8"	1-5		
		ML	Light brown, moist, dense clayey Silt	Increase in percentage of siltstone/claystone	1-6		
				Increase diameter of siltstone/claystone (3/4")	1-7		
		ML	Red/grey, moist, dense silty Clay, increase in fine sand layers	Increase percentage of siltstone/claystone	1-8		
				No Recovery	1-9		
		ML	Red brown, saturated dense highly fractured Sandstone with silt and clay	Sampler came up wet, No Recovery, fragments of highly fractured siltstone first water at 28 feet	1-10 1-11		

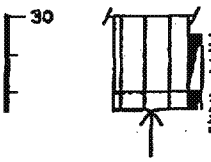
Figure Number 1

ANDERSON CONSULTING GROUP

LOG OF BORING

Boring No.: 93-1
Date: 6/25/93

Project: 3200-77-22
Elevation: ~1753

ELEV / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	Sample Number	Density p.c.f.	Moisture %
30	 36/6 38/6 42/6 10/6 19/6 20/6	ML	Red brown, moist, dense fine sandy Silt with clay lense throughout	Increase difficulty in drilling Little Recovery Material change determined from drilling at 31' Out of water bearing zone	1-12 1-13		

Bottom of Boring at 32.5 feet

ANDERSON CONSULTING GROUP

LOG OF BORING

Boring No. 93-2
Date: 6/24/93

Project: 3200-77-22
Elevation: ~1775

ELEV / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	Sample Number	Density p.c.f.	Moisture %
0		ML	Red brown, moist, soft sandy Silt, with clay fragments of sandstone	interbedded layers of sand, silt and clay with small gravels			
5	8/6 29/6 38/6	ML	Red brown, moist, dense sandy Silt, with clay fragments of sandstone (1")	Mottling red brown/dark brown	2-1		
	17/6 58/6 50/5.5	ML	Same material grading to light brown, dry, dense, sandy Silt slightly cemented		2-2		
10	18/6 30/6 32/6	ML	Brown, dry, desne sandy Silt grading to red brown, dry dense sandy Silt with clay		2-3		
	21/6 50/5.5			Increase clay intrusion	2-4		
15	50/4	SM	Light olive, dry, cemented silty Sand	Sampling terminated at 50 blows	2-5		
	11/6 14/6 28/6				2-6		
20	21/6 56/6	SM	Same material, less cemented grading to cemented silt/clay Some red brown streaking	Begin continuous coring HQ Core Sampler Recovery of 1'/4'	2-7 2-8		
25		SM	Light brown, slightly moist, well cemented silty Sand with cobble and clay intrusion	Recovery of 1'/6'	2-9		
30	Boring Continues	SM	Olive brown, predominantly dry cemented Sand/Sandstone grading to moist Sand				

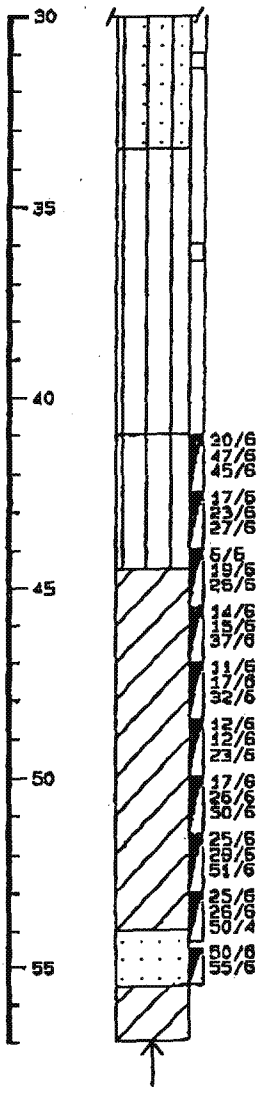
Figure Number 2

ANDERSON CONSULTING GROUP

LOG OF BORING

Boring No.: 93-2
Date: 6/24/93

Project: 3200-77-22
Elevation: ~1775



ELEV / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	Sample Number	Density p.c.f.	Moisture %
				Recovery of 2'/5'	2-10		
		ML	Light brown, slightly mottled red, moist, predominantly siltstone with fine sandy silt	Poor Recovery			
				Poor recovery with sampler-changing to SPT	2-11		
		ML	Light brown, moist, dense, fine sandy silt with clay and intrusion siltstone/claystone		2-12		
					2-13		
					2-14		
		CL	Blue grey, moist, moderately dense Clay with intrusion of sandstone/siltstone/claystone	Definite material change Small intrusion of red brown moist silt	2-15		
					2-16		
					2-17		
				Free water noted in broken sample at ~49'			
					2-18		
				Increase in sand layer intrusion			
					2-19		
				Coarse sand intrusion at bottom of Sample 2-19			
				First water at 53' - 54.5' Grade to moist clay with sand and sandstone fragment	2-20		
		SP	Blue grey, wet to saturated coarse Sand with fractured sandstone	Sampler filled with water No Recovery	2-21		
		CL	Blue grey, moist, dense Clay with sand and sandstone intrusion				

Bottom of Boring at 57 feet

ANDERSON CONSULTING GROUP

LOG OF BORING: GWMW-1

94-1

Project: Laytonville Landfill GWMW/GMW Construction

File: 3200-77-602/604

Date: 18 July 1994

Elevation: ~1742 feet

Surface:

Water: ~20 feet bgs

ELEV / DEPTH	Soil Symbols / Sampler Symbols & Blow Counts	Sample Number	USCS	Material Description and Remarks	Dry Density (pcf)	Moisture Content (%)	Phi	C (ksf)
0–2			CL-ML	Yellow red, dry to moist, stiff, fine sandy Clay with fragments of sandstone/siltstone/claystone and metamorphic rock				
3–4			CL-ML	Yellow red, gray and red mottling, moist, stiff, fine sandy Clay				
5–6			CL	Yellow red, gray mottling, moist, dense, clayey fine Sand with fragments of siltstone/sandstone/claystone				
7–8			CL	Red, increase in gray and red mottling, moist, stiff, fine sandy Clay, increase in clay content and siltstone/sandstone/claystone fragments.				
9–11			GC	Brown, dry to moist, dense, sandy, clayey Gravel with some clay and silt Gravel consisting of claystone/siltstone/sandstone				
12–13			GC	Red, moist, dense, clayey Gravel (gravel consists of siltstone/claystone/sandstone).				
14–16			GC	Strong brown, moist, dense, clayey Gravel (claystone/siltstone and metamorphic rock) Layer of yellow red, moist, dense, fine sand with clay interbedded.				
17–18			CL	Strong brown, moist, stiff, gravelly Clay - gravel consists of siltstone/claystone/sandstone				
19–20			CL	Gray red, moist, firm, clay matrix with sandstone/siltstone/claystone. Approximately 2 feet of gray clay. Water seepage through seam within clay zone.				
21–23			CL	Strong brown, moist, very stiff, silty, sandy Clay, mottled gray clay, less gravel.				
24–26			SC	Strong brown, moist, dense, gravelly, clayey Sand				

Site description and comments: West of MW 93-1, within fenced in area (Groundwater elevation 93-1 ~1724)

ANDERSON CONSULTING GROUP

Boring: GWMW-1
Depth: 34.0 ft
Figure: 1

LOG OF BORING: GWMW-1 (Continued)

Project: Laytonville Landfill GWMW/GMW Construction **File:** 3200-77-602/604

ELEV / DEPTH	SOIL SYMBOLS SAMPLER SYMBOLS & BLOW COUNTS	Sample Number	USCS	Material Description and Remarks	Dry Density (pcf)	Moisture Content (%)	Phi	C (ksf)
26								
27			GC	First 6" siltstone/claystone - friable and weathered - moist, gray, grading to brown, moist, dense, clayey Sand, mottled gray and red.				
28								
29			CL	Strong brown, moist, stiff, sandy Clay				
30								
31				At 31' a very moist localized area, at 31.5 feet clayey Sand.				
32								
33								
34			BEDROCK	Dark gray, moist, dense, blue shist - Franciscan Bedrock				

Boring terminated at 34 feet

ANDERSON CONSULTING GROUP

Boring: GWMW-1
Depth: 34.0 ft
Figure: 1

COUNTY OF MENDOCINO
LAYTONVILLE LANDFILL

GROUNDWATER WELL ELEVATIONS
CALENDAR YEAR 2000

Quarter: 2nd Date: 10/24/2000

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	17.20	1738.15
91-1	1709.20	10.90	1698.30
93-1	1766.10	38.30	1727.80
93-2	1777.65	38.80	1738.85
94-1	1745.41	21.30	1724.11

COUNTY OF MENDOCINO
LAYTONVILLE LANDFILL

GROUNDWATER WELL ELEVATIONS
CALENDAR YEAR 2001

Quarter: 1st

Date: 03/07/2001

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	17.60	1737.75
91-1	1709.20	7.00	1702.20
93-1	1766.10	38.00	1728.10
93-2	1777.65	39.20	1738.45
94-1	1745.41	20.50	1724.91

LAYTONVILLE LANDFILL
CALENDAR YEAR 2001

Quarter: 2nd Date: 06/21/01

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	6.30	1749.05
91-1	1709.20	7.20	1702.00
93-1	1766.10	6.50	1759.60
93-2	1777.65	6.40	1771.25
94-1	1745.41	6.70	1738.71

COUNTY OF MENDOCINO
LAYTONVILLE LANDFILL

GROUNDWATER WELL ELEVATIONS
CALENDAR YEAR 2001

Quarter: 3rd

Date: 09/18/01

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	17.00	1738.35
91-1	1709.20	10.80	1698.40
93-1	1766.10	38.30	1727.80
93-2	1777.65	38.90	1738.75
94-1	1745.41	21.40	1724.01

LAYTONVILLE LANDFILL
CALENDAR YEAR 2001

Quarter: 4th

Date: 12/04/01

Well No.	Casing Elevation	Depth to Water	Ground Water Surface Elevations (In feet and hundredths M.S.L.)
90-1	1755.35	17.60	1737.75
91-1	1709.20	10.80	1698.40
93-1	1766.10	38.60	1727.50
93-2	1777.65	39.60	1738.05
94-1	1745.41	21.70	1723.71

REFERENCE
No. 35

U.S. Census Bureau American FactFinder

Main | Search | Feedback | FAQs | Glo

GCT-PH1. **Population, Housing Units, Area, and Density: 2000**
Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data
Geographic Area: **California -- County**

NOTE: For information on confidentiality protection, nonsampling error, and definitions, see http://factfinder.census.gov/home/en/datanotes/expsf1u.htm.

Geographic area	Population	Housing units	Area in square miles			Density per square mile of land area	
			Total area	Water area	Land area	Population	Housing units
California	33,871,648	12,214,549	163,695.57	7,736.23	155,959.34	217.2	78.3
COUNTY							
Alameda County	1,443,741	540,183	821.15	83.57	737.57	1,957.4	732.4
Alpine County	1,208	1,514	743.19	4.57	738.62	1.6	2.0
Amador County	35,100	15,035	604.69	11.73	592.97	59.2	25.4
Butte County	203,171	85,523	1,677.11	37.62	1,639.49	123.9	52.2
Calaveras County	40,554	22,946	1,036.84	16.81	1,020.04	39.8	22.5
Colusa County	18,804	6,774	1,156.22	5.54	1,150.68	16.3	5.9
Contra Costa County	948,816	354,577	802.15	82.20	719.95	1,317.9	492.5
Del Norte County	27,507	10,434	1,229.75	221.94	1,007.81	27.3	10.4
El Dorado County	156,299	71,278	1,788.10	77.25	1,710.85	91.4	41.7
Fresno County	799,407	270,767	6,017.42	54.70	5,962.73	134.1	45.4
Glenn County	26,453	9,982	1,327.16	12.36	1,314.79	20.1	7.6
Humboldt County	126,518	55,912	4,052.22	479.74	3,572.49	35.4	15.7
Imperial County	142,361	43,891	4,481.73	307.00	4,174.73	34.1	10.5
Inyo County	17,945	9,042	10,226.98	23.88	10,203.10	1.8	0.9
Kern County	661,645	231,564	8,161.42	20.46	8,140.96	81.3	28.4
Kings County	129,461	36,563	1,391.49	0.50	1,390.99	93.1	26.3
Lake County	58,309	32,528	1,329.48	71.52	1,257.96	46.4	25.9
Lassen County	33,828	12,000	4,720.37	163.10	4,557.27	7.4	2.6
Los Angeles County	9,519,338	3,270,909	4,752.32	691.45	4,060.87	2,344.2	805.5
Madera County	123,109	40,387	2,153.32	17.46	2,135.86	57.6	18.9
Marin County	247,289	104,990	828.20	308.39	519.80	475.7	202.0
Mariposa County	17,130	8,826	1,462.79	11.67	1,451.12	11.8	6.1
Mendocino County	86,265	36,937	3,878.14	369.17	3,508.97	24.6	10.5
Merced County	210,554	68,373	1,971.87	43.18	1,928.69	109.2	35.5
Modoc County	9,449	4,807	4,203.37	259.28	3,944.10	2.4	1.2
Mono County	12,853	11,757	3,131.80	87.40	3,044.40	4.2	3.9
Monterey County	401,762	131,708	3,771.07	449.12	3,321.95	120.9	39.6
Napa County	124,279	48,554	788.27	34.53	753.73	164.9	64.4
Nevada County	92,033	44,282	974.49	16.88	957.61	96.1	46.2
Orange County	2,846,289	969,484	947.98	158.57	789.40	3,605.6	1,228.1
Placer County	248,399	107,302	1,502.78	98.41	1,404.37	176.9	76.4
Plumas County	20,824	13,386	2,613.48	59.78	2,553.69	8.2	5.2
Riverside County	1,545,387	584,674	7,303.13	95.76	7,207.37	214.4	81.1
Sacramento County	1,223,499	474,814	995.48	29.83	965.65	1,267.0	491.7
San Benito County	53,234	16,499	1,390.73	1.68	1,389.06	38.3	11.9
San Bernardino County	1,709,434	601,369	20,105.32	52.82	20,052.50	85.2	30.0
San Diego County	2,813,833	1,040,149	4,525.52	325.62	4,199.89	670.0	247.7
San Francisco County	776,733	346,527	231.92	185.22	46.69	16,634.4	7,421.2
San Joaquin County	563,598	189,160	1,426.25	26.97	1,399.28	402.8	135.2
San Luis Obispo County	246,681	102,275	3,615.54	311.22	3,304.32	74.7	31.0
San Mateo County	707,161	260,576	741.01	291.95	449.07	1,574.7	580.3
Santa Barbara County	399,347	142,901	3,789.08	1,052.07	2,737.01	145.9	52.2
Santa Clara County	1,682,585	579,329	1,304.01	13.32	1,290.69	1,303.6	448.9
Santa Cruz County	255,602	98,873	607.16	161.92	445.24	574.1	222.1

Geographic area	Population	Housing units	Area in square miles			Density per square mile of land area	
			Total area	Water area	Land area	Population	Housing units
Shasta County	163,256	68,810	3,847.44	62.24	3,785.19	43.1	18.2
Sierra County	3,555	2,202	961.97	8.59	953.38	3.7	2.3
Siskiyou County	44,301	21,947	6,347.46	60.68	6,286.78	7.0	3.5
Solano County	394,542	134,513	906.67	77.48	829.19	475.8	162.2
Sonoma County	458,614	183,153	1,768.23	192.35	1,575.88	291.0	116.2
Stanislaus County	446,997	150,807	1,514.67	20.88	1,493.79	299.2	101.0
Sutter County	78,930	28,319	608.58	6.04	602.54	131.0	47.0
Tehama County	56,039	23,547	2,962.27	11.28	2,950.99	19.0	8.0
Trinity County	13,022	7,980	3,207.54	28.93	3,178.61	4.1	2.5
Tulare County	368,021	119,639	4,839.09	15.12	4,823.97	76.3	24.8
Tuolumne County	54,501	28,336	2,274.34	38.93	2,235.41	24.4	12.7
Ventura County	753,197	251,712	2,208.20	362.90	1,845.30	408.2	136.4
Yolo County	168,660	61,587	1,022.89	9.62	1,013.27	166.5	60.8
Yuba County	60,219	22,636	643.73	13.04	630.69	95.5	35.9

(X) Not applicable
Source: U.S. Census Bureau, Census 2000 Summary File 1

REFERENCE
No. 36

GIS Report
(Located in Confidential Information Packet)

APPENDIX F:
USEPA Quick Reference Fact Sheet

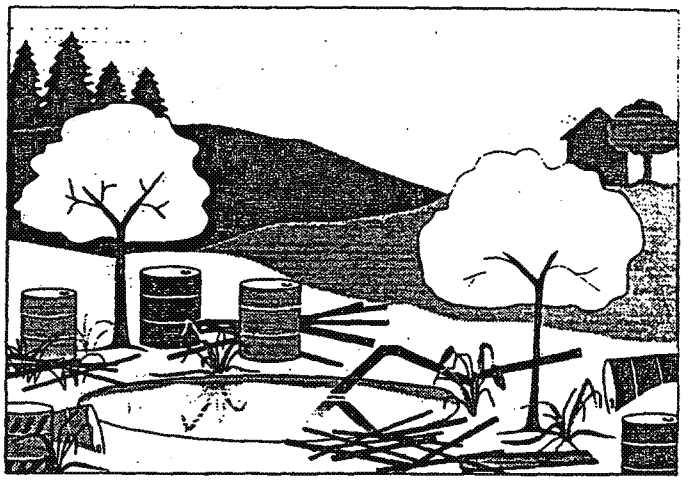
United States Environmental Protection Agency
Office of Solid Waste and Emergency Response
Publication 9345.4-03FS
September 1993

EPA

SITE ASSESSMENT:
Evaluating Risks at Superfund Sites

Office of Emergency and Remedial Response
Hazardous Site Evaluation Division 5204G
Quick Reference Fact Sheet

The Challenge of the Superfund Program



A series of headline-grabbing stories in the late 1970s, such as Love Canal, gave Americans a crash course in the perils of ignoring hazardous waste. At that time, there were no Federal regulations to protect the country against the dangers posed by hazardous substances (mainly industrial chemicals, accumulated pesticides, cleaning solvents, and other chemical products) abandoned at sites throughout the nation. And so, in 1980 Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, to address these problems.

The major goal of the Superfund program is to protect human health and the environment by cleaning up areas, known as "sites," where hazardous waste contamination exists. The U.S. Environmental Protection Agency (EPA) is responsible for implementing the Superfund program.

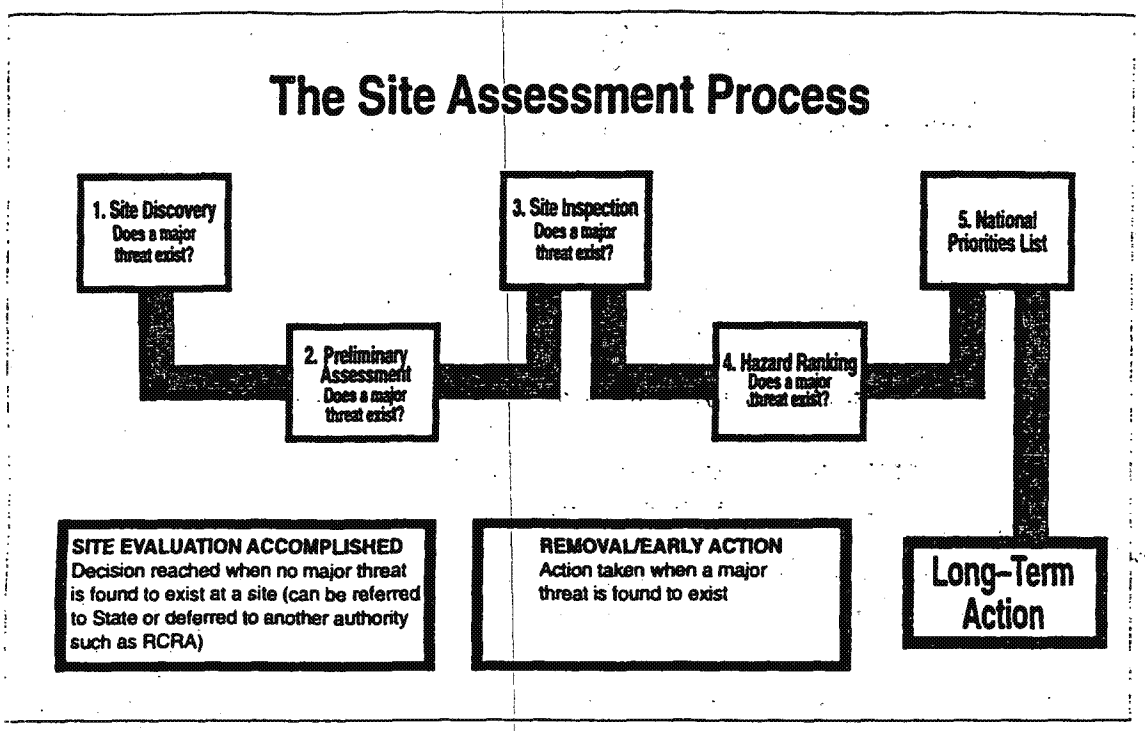
At the time it passed the Superfund law, Congress believed that the problems associated with uncontrolled releases of hazardous waste could be handled in five years with $1.6 billion dollars. However, as more and more sites were identified, it became apparent that the problems were larger than anyone had originally believed. Thus, Congress passed the Superfund Amendments and Reauthorization Act (SARA) in 1986. SARA expanded and strengthened the authorities given to EPA in the original legislation and provided a budget of $8.5 billion over five years. Superfund was extended for another three years in 1991.

What is EPA's Job at Superfund Sites?

For more than 10 years, EPA has been implementing the Superfund law by:

- Evaluating potential hazardous waste sites to determine if a problem exists;
- Finding the parties who caused the hazardous waste problems and directing them to address these problems under EPA oversight or requiring them to repay EPA for addressing these problems; and
- Reducing immediate risks and tackling complex hazardous waste problems.

The Superfund site assessment process generally begins with the discovery of contamination at a site and ends with the completion of remediation (i.e., cleaning up the waste at a site) activities. This fact sheet explains the early part of the process, called the *site assessment* phase.



However, if hazardous substances do pose an immediate threat, EPA quickly acts to address the threat. When a site presents an immediate danger to human health or the environment—for example, there is the potential for a fire or an explosion or the drinking water is contaminated as a result of hazardous substances leaking out of drums—EPA can move quickly to address site contamination. This action is called a *removal* or an *early action*. Additional information on early actions can be found on page 4.

EPA or the State environmental agency then decides if further Federal actions are required. Of the more than 35,000 sites discovered since 1980, only a small percentage have needed further remedial action under the Federal program.

A report is prepared at the completion of the preliminary assessment. The report includes a description of any hazardous substance release, the possible source of the release, whether the contamination could endanger people or the environment, and the pathways of the release. The information outlined in this report is formed into hypotheses that are tested if further investigation takes place. You can request a copy of this report once it becomes final— just send your name and address to your EPA regional Superfund office. See page 8 for further information on these contacts.

Sometimes it is difficult to tell if there is contamination at the site based on the initial information gathering. When this happens, EPA moves on to the next step of the site assessment, called the *site inspection*.

Making Polluters Pay

One of the major goals of the Superfund program is to have the responsible parties pay for or conduct remedial activities at hazardous waste sites. To accomplish this goal, EPA:

- Researches and determines who is responsible for contaminating the site;
- Issues an order requiring the private parties to perform cleanup actions with EPA oversight; and
- Recovers costs that EPA spends on site activities from the private parties.

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4 Hazard Ranking System

EPA uses the information collected during the preliminary assessment and site inspection to evaluate the conditions at the site and determine the need for long-term remedial actions. When evaluating the seriousness of contamination at a site, EPA asks the following questions:

- Are people or sensitive environments, such as wetlands or endangered species, on or near the site?
- What is the toxic nature and volume of waste at the site?
- What is the possibility that a hazardous substance is in or will escape into ground water, surface water, air, or soil?

Based on answers to these questions, each site is given a score between zero and 100. Sites that score 28.5 or above move to the next step in the process: listing on the *National Priorities List*. Sites that score below 28.5 are referred to the State for further action.

Site Evaluation Accomplished

In many instances, site investigators find that potential sites do not warrant Federal action under the Superfund program. This conclusion can be attributed to one of two reasons:

- The contaminants present at the site do not pose a major threat to the local population or environment; or
- The site should be addressed by another Federal authority, such as EPA's Resource Conservation and Recovery Act (RCRA) hazardous waste management program.

When investigators reach this conclusion, the site evaluation is considered accomplished. A site can reach this point at several places during the site assessment process, namely at the conclusion of the preliminary assessment or the site inspection, or once the site is scored under the Hazard Ranking System.

5 National Priorities List

Sites that are listed on the *National Priorities List* present a potential threat to human health and the environment, and require further study to determine what, if any, remediation is necessary. EPA can pay for and conduct remedial actions at NPL sites if the responsible parties are unable or unwilling to take action themselves. There are three ways a site can be listed on the National Priorities List:

- It scores 28.5 or above on the Hazard Ranking System;
- If the State where the site is located gives it top priority, the site is listed on the National Priorities List regardless of the HRS score; or
- EPA lists the site, regardless of its score, because all of the following are true about the site:
  - The Agency for Toxic Substances and Disease Registry (ATSDR), a group within the U.S. Public Health Service, issues a health advisory recommending that the local population be *dissociated* from the site (i.e., that the people be temporarily relocated or the immediate public health threat be removed);
  - EPA determines that the site poses a significant threat to human health; and
  - Conducting long-term remediation activities will be more effective than addressing site contamination through early actions.

The list of proposed sites is published in the *Federal Register*, a publication of legal notices issued by Federal agencies. The community typically has 60 days to comment on the list. After considering all comments, EPA publishes a list of those sites that are officially on the National Priorities List. When a site is added to the National Priorities List, the site assessment is completed. Long-term actions take place during the next phase. See page 6 for more details on long-term actions.

As a Concerned Citizen, How Can I Help ?

- Read this fact sheet.
- Call EPA with any potential sites in your area.
- Provide EPA with site information.
- Comment on proposed listing of sites on the National Priorities List.
- If the site is listed on the NPL, work with your citizens' group to apply for a technical assistance grant.

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about Superfund Sites

Q: If a site is added to the National Priorities List, how will we know when EPA has completed the cleanup efforts?

A: EPA notifies the public and requests their comments on the actions proposed to treat site contaminants. In addition, the community is notified when a site will be deleted from the National Priorities List. The entire process can take as long as 7 years; at sites where ground water is contaminated, it can take even longer.

Q: I live next door to a site and I see EPA and contractor personnel wearing "moon suits." Am I safe?

A: EPA and contractor personnel wear protective gear because they might actually be handling hazardous materials. Also, these people are regularly exposed to contaminants at different sites and do not always know what contaminants they are handling. EPA takes steps to protect the public from coming in contact with the site contamination. If a dangerous situation arises, you will be notified immediately.

Q: If a site is added to the National Priorities List, who pays for the activities?

A: EPA issues legal orders requiring the responsible parties to conduct site cleanup activities under EPA oversight. If the parties do not cooperate, Superfund pays and files suit for reimbursement from responsible parties. The sources of this fund are taxes on the chemical and oil industries; only a small fraction of the fund is generated by income tax dollars.

Q: How can I get more information on any health-related concerns?

A: Contact your EPA regional Superfund office for more information. The ATSDR also provides information to the public on the health effects of hazardous substances. Ask your EPA regional Superfund office for the phone number of the ATSDR office in your region.

Q: How can I verify your findings? What if I disagree with your conclusions?

A: You can request copies of the results of the site assessment by writing to your EPA regional Superfund office. The public is given the opportunity to comment on the proposal of a site to the National Priorities List and the actions EPA recommends be taken at the site. If a site in your community is listed on the National Priorities List, a local community group may receive grant funds from EPA to hire a technical advisor. Call your EPA regional Superfund office (see page 8) for the location of an information repository and for information on applying for a **technical assistance grant.**

Q: How can I get further information? How can I get a list of the sites EPA has investigated?

A: Contact your EPA regional Superfund office (see page 8) for more information and a list of sites in your area.

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APPENDIX G:
Sampling and Analysis Plan

Laytonville Dump
Laytonville, California
Preliminary Assessment/
Site Inspection
Sampling and Analysis Plan

USACE Contract Number: DACA45.98.D0004, Task Order 25
Document Control Number: 20074.025.004

May 2002

Prepared for:
U.S. Environmental Protection Agency
Region IX

Prepared by:
Paula J. Abajian
Roy F. Weston, Inc.

Laytonville Dump
Laytonville, California
Preliminary Assessment/Site Inspection
Sampling and Analysis Plan

USACE Contract Number: DACA45.98.D0004, Task Order 25
Document Control Number: 20074.025.004

Approved by: _____
Joe De Fao, Project Manager and Field Sampling Quality Control Coordinator
Roy F. Weston, Inc.

Approved by: _____
Vance S. Fong, P.E., Manager, Quality Assurance Office
U.S. Environmental Protection Agency, Region IX

Approved by: _____
Jeff Inglis, USEPA Site Assessment Manager
U.S. Environmental Protection Agency, Region IX

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List of Acronyms

AOC	Analyte of Concern
AQMD	Air Quality Management District (County of Mendocino)
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CLPAS	Contract Laboratory Program Analytical Services
CWA	Clean Water Act
DQO	Data Quality Objective
DQI	Data Quality Indicator
ERO	USEPA Region 9 Emergency Response Office
GAP	General Assistance Program
HRS	Hazard Ranking System
IDW	Investigation-Derived Wastes
MS/MD	Matrix Spike/Matrix Duplicate (Inorganic Analysis)
MS/MSD	Matrix Spike/Matrix Spike Duplicate (Organic Analysis)
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
PA/SI	Preliminary Assessment/Site Inspection
PCB	Polychlorinated Biphenyls
PM	Project Manager
PPE	Personal Protective Equipment; also Probable Point of Entry
QA	Quality Assurance
QAO	Quality Assurance Office
QC	Quality Control
RPD	Relative Percent Difference
RWQCB	California Regional Water Quality Control Board
SAM	Site Assessment Manager
SAP	Sampling and Analysis Plan
SECOR	SECOR International Incorporated
SOP	Standard Operating Procedure
SWAT	Solid Waste Assessment Test
TIC	Tentatively Identified Compound
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WQTI	Water Quality Technology, Inc.

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1.0 INTRODUCTION

The United States Environmental Protection Agency (USEPA) has directed Roy F. Weston, Inc. (WESTON) to conduct a Hazard Ranking System (HRS) Preliminary Assessment/Site Inspection (PA/SI) of the Laytonville Dump site, located approximately 1.5 miles west of Laytonville, in Mendocino County, California. The HRS assesses the relative threat associated with actual or potential releases of hazardous substances to the environment, and has been adopted by the USEPA to assist in setting priorities for further site evaluation and eventual remedial action. The HRS is the primary method for determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites where the USEPA may conduct remedial actions.

A 7-acre inactive landfill, which is owned by the Mendocino County Solid Waste Division, is located on the site. The landfill operated under a Class II permit from 1967 until 1993. There are allegations that illegal dumping occurred at the landfill and neighboring residents have raised concerns about contaminant migration to groundwater and surface water.

The objectives of the sampling effort are to establish whether any of the analytes of concern (AOCs) for this site are present in any of the four sedimentation ponds associated with the site, establish whether a release to groundwater has occurred; establish whether a release to and actual contamination of drinking water wells has occurred; and establish whether a release to and actual contamination of Cahto Creek, which supports a fishery, has occurred. Sediment, groundwater, and surface water samples will be analyzed for total metals via USEPA CLPAS ILM04.1 (or equivalent) and for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and pesticides/polychlorinated biphenyls (PCBs) via USEPA CLPAS OLM04.2 (or equivalent). Sediment samples will be analyzed for hexavalent chromium via USEPA Method 7196 (or equivalent). Groundwater and surface water samples will be analyzed for hexavalent chromium via USEPA Method 218.6 (or equivalent).

This Sampling and Analysis Plan (SAP) describes the project and data use objectives, data collection rationale, quality assurance goals, and requirements for sampling and analysis activities. The SAP also defines the sampling and data collection methods that will be used for this project. The SAP is intended to accurately reflect the planned data-gathering activities for this site investigation; however, site conditions and additional USEPA direction may warrant modifications. All significant changes will be documented in the final report.

1.1 Project Organization

The following is a list of project personnel and their responsibilities:

USEPA Site Assessment Manager (SAM) - The USEPA SAM is Jeff Inglis. Mr. Inglis is the primary decision maker for this investigation and is the primary contact for the WESTON Project Manager.

WESTON Project Manager (PM) and Field Sampling Quality Control (QC) Coordinator - The WESTON PM and Field Sampling QC Coordinator is Joe De Fao. Mr. De Fao is responsible for the overall performance of all tasks assigned to WESTON by the USEPA and for making sure that field QC requirements are met during the sampling event.

WESTON Field Manager (FM) - The WESTON FM is Paula Abajian. Ms. Abajian is responsible for preparing the SAP; working with the laboratories; implementing the sampling design; collecting, handling, documenting, and transporting samples; generating field documentation of sampling activities; and working with the WESTON Field Sampling QC Coordinator and the USEPA Quality Assurance Office (QAO) to ensure project quality control and quality assurance goals are met.

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Analytical Laboratory - The USEPA QAO will arrange for laboratory services and data validation activities.

Table 1-1: Organizational Chart

Title/Responsibility	Name	Phone Number
USEPA Site Assessment Manager	Jeff Inglis	(415) 972-3095
USEPA QAO Officer	Gail Jones	(415) 972-3807
WESTON Project Manager and Field Sampling QC Coordinator	Joe De Fao	(925) 975-0757
WESTON Field Manager	Paula J. Abajian	(925) 975-0758
EPA Region IX Sample Control Coordinator	Carl Brickner	(415) 972-3814

1.2 Distribution List

Copies of the final SAP will be distributed to the following persons and organizations:

Jeff Inglis, USEPA Region IX
USEPA Region IX Quality Assurance Office
Dan McMindes, U.S. Army Corps of Engineers
John Yaremchuk, U.S. Army Corps of Engineers
Paul Cayler, Mendocino County Solid Waste Division
Roy F. Weston, Inc. files

1.3 Statement of the Specific Problem

During operations, the Laytonville Dump facility was permitted to only accept non-hazardous municipal waste; however, there are allegations that materials containing hazardous substances were illegally disposed of at the site (e.g., burial of PG&E transformers containing PCBs, disposal of waste containing hexavalent chromium from the Remco Hydraulics, Inc. facility, and transfer of illegally disposed waste containing photographic chemicals from the Casper landfill to the Laytonville landfill) (1, 2, 3).

An engineered cover was constructed over the landfill in 1997. However, it appears that there were flaws in the construction (4). Leachate containing VOCs has been identified at the landfill and may be migrating to groundwater and/or surface water (5, 6).

There are four sedimentation ponds associated with the site that are used to collect stormwater runoff from the site. During heavy precipitation, the ponds overflow and drain through the adjacent Laytonville Rancheria and toward Cahto Creek. Mendocino County regularly collects water samples from two of these sedimentation ponds; however, the samples are not analyzed for all of the AOCs for the PA/SI (7).

Water level measurements collected from five site-related monitoring wells during Mendocino County's quarterly groundwater monitoring efforts indicate that groundwater flows away from the site in two directions, to the northeast and southwest. The County's analytical results indicate a release of arsenic and barium to the northeast and a release of zinc to the southwest. The County does not sample for hexavalent chromium, one of the AOCs for the PA/SI (8).

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There are several active private drinking water wells to the north, northeast, and southwest of the site (9). One of these wells was sampled in 1997 and the others have not been sampled since 1993. There is also a municipal drinking water supply well located approximately 1.5 miles east of the site (26). None of the wells have been analyzed for all of the AOCs for the PA/SI (10, 11).

Stormwater runoff from the site, and from the four sedimentation ponds associated with the site, drain toward Cahto Creek (7). Cahto Creek flows through the adjacent Laytonville Rancheria and serves as a fishery to residents of the Rancheria (25).

Residents in the vicinity of the site, including the adjacent Laytonville Rancheria, have raised concerns about the potential migration of contaminants from the landfill into drinking water wells and surface water (12, 13).

Based on this information, the AOCs for this investigation are metals (specifically arsenic, barium, zinc, and hexavalent chromium), VOCs (specifically acetone, chloroform, dichlorodifluoromethane, and 1,1-dichloroethane), SVOCs and PCBs.

2.0 BACKGROUND

2.1 Location and Description

As shown in Figure 2-1, the Laytonville Dump site is situated on a small ridge located on the south side of Branscomb Road, approximately 1.5 miles west of Laytonville in Mendocino County, California (Latitude 39°40' 21" North, Longitude 123°30' 24" West) (14). The site is owned by the Mendocino County Solid Waste Division and consists of a 7-acre former disposal area. Associated with the site are four sedimentation ponds, a leachate collection system, and five groundwater monitoring wells. An engineered cover has been constructed over the 7-acre former disposal area. Stormwater runoff from the disposal area is collected in the four sedimentation ponds. The sedimentation ponds are located to the east, to the southwest, and to the north of the former disposal area. Overflow from the sedimentation ponds drains to Cahto Creek, a tributary to Tenmile Creek. The leachate collection system includes a French Drain, a cascading water system consisting of five volatilization tanks, and six treatment tanks from which water is pumped to a truck and transported to the Willits Wastewater Treatment Plant for disposal. A locked gate bars road access to the site. The former disposal area is surrounded by a maintained chain-link fence. However, trespassers frequently damage the fence in order to enter the site and ride all-terrain vehicles over the former disposal area. The area surrounding the site is primarily rural. Residences currently reliant on private drinking water wells are located to the north, northeast and southwest of the site. A municipal drinking water supply well is located approximately 1.5 miles east of the site (26). The Laytonville Rancheria, owned by the Cahto Tribe, is located directly adjacent to the east and south of the site. An operative recycling center is located directly to the north of the site (7).

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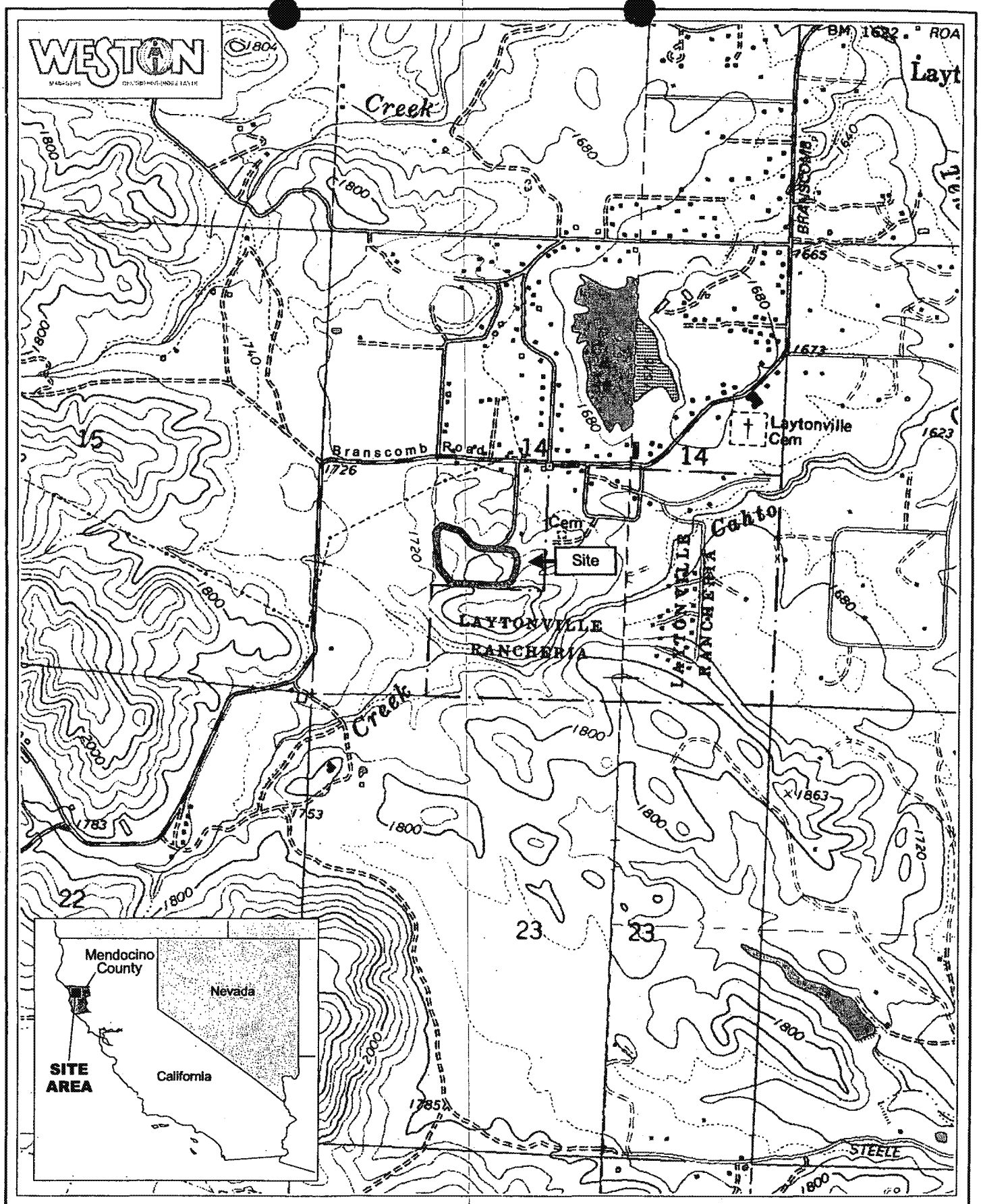

SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles: Cahto Peak, CA, 1967; Laytonville, CA, 1967, photorevised 1994.

DATE: 5/10/02

Scale in Feet
0 500 1000

N W E S

Figure 2-1
Site Location Map
Laytonville Dump
Laytonville, Mendocino County, CA

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2.2 Operational History

The Mendocino County Solid Waste Division has owned the Laytonville Dump site since 1967 (1). The landfill was in operation from 1967 until 1993. The landfill temporarily ceased accepting waste on August 17, 1993, due to public health concerns, and permanently ceased accepting waste on September 28, 1993 (15). During operations, the site accepted, under a Class II solid waste disposal permit, residential and commercial non-hazardous waste. Waste content is estimated to be 90% residential, 5% commercial, and 5% demolition (1). In 1997, a Type-D engineered cover was constructed over the 7-acre disposal area (7). However, it appears that there were flaws in its construction and leachate has been observed on the southwest and east slopes of the landfill (4, 5, 6, 16). In 2000, the French Drain and leachate collection system were installed to collect and treat the leachate (5). Paul Cayler is the current Director of the Mendocino County Solid Waste Division (1).

2.3 Previous Investigations and Regulatory Involvement

During closure activities, the Mendocino County Solid Waste Division reported all plans, activities, and reports to the Regional Water Quality Control Board (RWQCB), North Coast Region. RWQCB also directed the development of the groundwater investigation workplan that is currently implemented by the Solid Waste Division. RWQCB continues to oversee monitoring of the site (7, 27).

The County performs quarterly monitoring events at the landfill. During each monitoring event, landfill gas monitoring for methane is performed using a portable instrument (GasTech GT Instrument) and analyzes groundwater samples collected from five site-related monitoring wells for total dissolved solids (TDS), chloride, and the purgeable halocarbons and aromatics included in USEPA Methods 601 and 602, respectively (24). The County is also currently performing at least 4 quarters of PCB analysis in groundwater samples collected from the five monitoring wells (7). The County began collecting groundwater samples from monitoring wells 87-1, 87-2, and 87-3 in 1987. Additionally, monitoring wells 90-1 and 91-1 were installed in 1990 and 1991, respectively. During 1993 and 1994, the 87-well series was replaced with monitoring wells 93-1, 93-2, and 94-1. The County currently collects groundwater samples from monitoring wells 90-1, 91-1, 93-1, 93-2, and 94-1 (9, 7). The County periodically analyzes samples collected from the leachate containment facility and samples collected from two of the sedimentation ponds associated with the site.

There are several active private drinking water wells to north, northeast, and southwest of the site. Approximately nine of these wells were sampled in 1993. The County also sampled the Shields' private drinking water well in 1997. A municipal drinking water supply well is located approximately 1.5 miles east of the site (26). None of these wells were analyzed for all of the AOCs for this investigation (7, 8, 9).

The County of Mendocino's Air Quality Management District (AQMD) conducted VOC screening tests on June 8, 2000 and June 14, 2000. No VOC concentrations were measured at three times greater than background levels (17).

The Cahto Tribe has received funding under USEPA's General Assistance Program (GAP) and the Clean Water Act's Section 106 Program to investigate potential contamination from the Laytonville Dump site to the Laytonville Rancheria . The Cahto Tribe has contracted with Gasch & Associates (G&A), Secor International Incorporated (SECOR), and Water Quality Technology, Inc. (WQTI) to perform these investigations.

In May 2001, G&A performed an electrical resistivity study to indicate locations where groundwater may be present near the landfill and on the Rancheria and possible locations of contaminants in groundwater (18). During this study, G&A also collected a grab sample of soil from the southern boundary of the

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landfill. Analysis of the sample indicated that 0.19 milligrams per kilogram (mg/kg) hexavalent chromium are present in the soil (19). This concentration is significantly below the Reference Dose Screening Concentration for soil listed in the Superfund Chemical Data Matrix (SCDM) and the EPA Region IX Preliminary Remediation Goal for residential soil (20, 21).

In October 2001, SECOR collected soil samples and installed temporary wellpoints along the southern and eastern boundaries of the landfill and collected sediment samples from Cahto Creek both upstream and downstream of the two probable points of entry for contaminant migration from the landfill. SECOR followed HRS guidelines for the sediment sampling portion of this event. Sediment sampling results indicate that a release to Cahto Creek has not occurred (22). Analysis of surface water samples collected from Cahto Creek during the PA/SI sampling event will further indicate whether a release to the creek has occurred.

WQTI has submitted a sampling plan to USEPA to sample shallow groundwater in drainages leading from the Laytonville Dump site to Cahto Creek and to sample surface water and fish tissue in Cahto Creek both upstream and downstream of the two probable points of entry (PPEs) for contaminant migration from the landfill. At the time this SAP was written, WQTI's sampling plan was under review by the USEPA QAO (23).

2.4 Waste Characteristics

The Laytonville Dump site operated under permit to accept non-hazardous waste (1). The amount of illegally disposed hazardous waste at the site, if any, is unknown. Leachate containing VOCs has been identified on the southwest and east slopes of the landfill (5, 6, 16).

2.5 HRS Pathways

Surface water and sediment samples will be collected from the four sedimentation ponds associated with the site. However, the analytical results will be used by the USEPA SAM to address the concerns raised by Laytonville residents and may not be integrated into the HRS score for the site.

Five site-related monitoring wells are sampled quarterly by the Mendocino County Solid Waste Division and analyzed for total metals and VOCs (8). The County is also currently performing at least 4 quarters of PCB analysis in groundwater samples collected from the five monitoring wells (7). Water level measurements collected from these five site-related monitoring wells indicate that groundwater flows away from the site in two directions, to the northeast and southwest. Analytical results indicate a release of arsenic and barium to the northeast and a release of zinc to the southwest. The only significant amount of VOCs detected in the site-related groundwater monitoring wells was 8 micrograms per liter (μg/L) of acetone detected in 1997. The County does not sample for hexavalent chromium, one of the AOCs for this site. The PA/SI sampling event will be used to further evaluate whether a release of metals (including hexavalent chromium), VOCs, SVOCs and/or PCBs from the site to groundwater has occurred (8).

There are several active private drinking water wells to north, northeast, and southwest of the site and one municipal drinking water supply well located approximately 1.5 miles east of the site (9, 26). One of the private drinking water wells was sampled in 1997 and others have not been sampled since 1993. None of the wells have been analyzed for all of the AOCs for this site (10, 11). The PA/SI sampling event will be used to establish whether a release to and actual contamination of five private drinking water wells and one municipal drinking water supply well located hydraulically downgradient of the site has occurred. Depending on the results of the PA/SI sampling event, additional private drinking water wells may be sampled at a later date.

Stormwater runoff from the site, and from the four sedimentation ponds associated with the site, drain toward Cahto Creek (7). Cahto Creek flows through the adjacent Laytonville Rancheria and serves as a fishery to residents of the Rancheria (7, 25). The Cahto Tribe (Laytonville Rancheria) funded the analyses of sediment samples collected from Cahto Creek; however, surface water samples have not been collected. Results from the sediment sampling event indicate that a release to Cahto Creek has not occurred (22). Analysis of surface water samples collected during the PA/SI sampling event will further indicate whether a release to the creek has occurred.

3.0 PROJECT OBJECTIVES

3.1 Project Task and Problem Definition

USEPA has tasked WESTON to conduct sampling to identify whether hazardous substances are present in the four sedimentation ponds associated with the site, and to determine whether there has been a release of contaminants to the groundwater and/or surface water pathway that is, at least in part, attributable to the site. To determine whether any of the AOCs for this site are present in the four site-related sedimentation ponds and are available for off-site migration, sediment and water samples will be collected from these ponds. To establish whether a release to the groundwater pathway has occurred, groundwater samples will be collected from the five site-related monitoring wells. To establish whether a release to and actual contamination of drinking water wells near the site has occurred, groundwater samples will be collected from the five private drinking water wells that are located hydraulically downgradient of the site and from one municipal drinking water supply well that is located approximately 1.5 miles east of the site. To establish whether a release to and actual contamination of Cahto Creek, which supports a fishery, has occurred, surface water samples will be collected from the creek at two locations upstream of all PPEs from the Laytonville Dump site and at three locations downstream of the PPEs from the site. All samples will be submitted for laboratory analysis of metals (including hexavalent chromium), VOCs, SVOCs and pesticides/PCBs.

3.2 Data Use Objectives

Data collected during this site investigation will be used to:

- Document the concentrations of metals (including hexavalent chromium), VOCs, SVOCs and PCBs in sediment and surface water samples collected from the four sedimentation ponds associated with the site to identify whether hazardous substances are present in any of the ponds and are, therefore, available for off-site migration.
- Document the concentrations of metals (including hexavalent chromium), VOCs, SVOCs and PCBs in groundwater samples collected from the five site-related monitoring wells to evaluate whether a release to the groundwater pathway has occurred.
- Document the concentrations of metals (including hexavalent chromium), VOCs, SVOCs and PCBs in groundwater samples collected from five private drinking water wells that are located hydraulically downgradient of the site, and from one municipal drinking water supply well located approximately 1.5 miles east of the site, to evaluate whether a release to and actual contamination of private drinking water wells has occurred.
- Document the concentrations of metals (including hexavalent chromium), VOCs, SVOCs and PCBs in surface water samples collected from Cahto Creek to evaluate whether a release to and actual contamination of the associated fishery has occurred.

3.3 Action Levels

The action levels for sediment and water samples collected from the four sedimentation ponds associated with the site are concentrations elevated above the background levels of the AOCs found in sediment and

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water samples collected from a comparable pond located outside of the area potentially influenced by the site. The action levels for groundwater samples collected from the five site-related monitoring wells are, as dictated by the HRS, concentrations significantly above the background levels (i.e., detected at three times background or at a measurable concentration if the background level is non-detect) of the AOCs found in groundwater samples collected from a groundwater well located cross-gradient of the site. The action levels for groundwater samples collected from the five private drinking water wells and from the municipal drinking water supply well are, as dictated by the HRS, concentrations significantly above background levels and HRS health-based benchmarks. The action levels for surface water samples collected from Cahto Creek are, as dictated by the HRS, concentrations significantly above background levels.

3.4 Decision Rules

If sediment and/or water samples from any of the four sedimentation ponds associated with the site are found to contain concentrations of individual metals, VOCs, SVOCs, and/or PCBs elevated above the background levels, then the results will be reported to the SAM for consideration.

If groundwater samples collected from the five site-related monitoring wells are found to contain concentrations of individual metals, VOCs, SVOCs, and/or PCBs significantly above the background concentrations, then a release to groundwater will be documented and integrated into the site's HRS score.

If groundwater samples collected from the five private drinking water wells and the municipal drinking water supply well are found to contain concentrations of individual metals, VOCs, SVOCs, and/or PCBs significantly above the background concentrations, then a release to and actual contamination (Level II) of drinking water wells will be documented and integrated into the site's HRS score. If, in addition, concentrations in the drinking water wells exceed HRS health-based benchmarks, Level I concentrations will be documented and integrated into the site's HRS score.

If surface water samples collected from Cahto Creek, which supports a fishery, are found to contain concentrations of individual metals, VOCs, SVOCs, and/or PCBs significantly above the background concentrations, then a release to and actual contamination (Level II) of Cahto Creek will be documented and integrated into the site's HRS score.

3.5 Data Quality Objectives

3.5.1 Data Quality Objective (DQO) Process

The DQO process, as set forth in the USEPA document, *Guidance for the Data Quality Objectives Process,* EPA QA/G-4, was followed to establish the data quality objectives for this project. An outline of the process and the outputs for this project are included in Appendix A.

3.5.2 DQO Data Categories

This investigation will involve the generation of definitive data for sediments and water from sedimentation ponds associated with the site, for groundwater in site-related monitoring wells and drinking water wells (private and municipal), and for surface water from Cahto Creek. The specific requirements for this data category are detailed in Section 9. The data generated under this project will comply with the requirements for that data category as defined in *Data Quality Objective Process for Superfund,* EPA 540/G-93/71, September 1993. All definitive analytical methods employed for this project will be methods approved by the USEPA.

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3.5.3 Data Quality Indicators

Data quality indicator goals (DQIs) for this project were developed following guidelines in *EPA Guidance for Quality Assurance Project Plans,* EPA QA/G-5 Final. All sampling will be guided by procedures detailed in Section 6.2 to ensure representativeness of sample results. Tables 3-1 through 3-7 document the DQIs for this project. As presented in these tables, the published reporting limits for USEPA-approved analytical methods were determined to be appropriate for this project.

3.6 Data Management

Samples will be collected and logged on a chain-of-custody form as discussed in Section 8.5. Samples will be kept secure in the custody of the sampler at all times, who will assure that all preservation parameters are being followed. Samples will be transferred to the CLP Laboratory via a certified carrier in a properly custody-sealed container with chain-of-custody documentation. The laboratory should note any evidence of tampering upon receipt.

The completed laboratory data report will be available for validation; however, data validation will not be conducted until the results are reviewed by the USEPA SAM. If direction is given by the USEPA SAM, data validation will be conducted by the QAO, who will provide the data validation reports to the SAM. The laboratory data summary sheets will be included in the final PA/SI report to be submitted to the USEPA SAM. Before submittal, the final PA/SI report will undergo a technical review to ensure that all data have been reported and discussed correctly.

3.7 Schedule of Sampling Activities

It is anticipated that field activities will be performed during June or July 2002. Field activities are expected to last four days. Subsequently, samples will be analyzed, data will be evaluated, and a final report will be prepared. The target date for completion of the final PA/SI report is December 15, 2002.

3.8 Special Training Requirements/Certifications

There are no special training or certification requirements specific to this project. Training requirements relevant to WESTON's health and safety program comply with 29 CFR 1910.120. The Site-Specific Health and Safety Plan is presented in Appendix B.

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Table 3-1:
Data Quality Indicator Goals - Sediments
(AOCs for Samples Collected from the Site-Related Sedimentation Ponds)

Method ----- Analytes[2]	Action Level[1]	Reporting Limit	Accuracy (% Recovery for MS/MSD)	Precision (RPD for MS/MSD and duplicates)	Percent Complete
CLPAS ILM04.1		**CRDL**			
Arsenic	Elevated above background	2	75-125	≤35	≥90
Barium	Elevated above background	40	75-125	≤35	≥90
Zinc	Elevated above background	4	75-125	≤35	≥90
EPA Method 3060					
Alkaline Digestion for	N/A	N/A	80-120	≤20	≥90
EPA Method 7196		**PQL (mg/kg)**			
Hexavalent Chromium	Elevated above background	1.0	75-125	≤20	≥90
CLPAS OLM04.2		**CRQL (µg/kg)**			
Acetone	Elevated above background	10	50-150	≤50	≥90
Chloroform	Elevated above background	10	50-150	≤50	≥90
Dichlorodifluoromethane	Elevated above background	10	50-150	≤50	≥90
1,1-Dichloroethane	Elevated above background	10	50-150	≤50	≥90
Aroclor-1016	Elevated above background	33	50-150	≤50	≥90
Aroclor-1221	Elevated above background	67	50-150	≤50	≥90
Aroclor-1232	Elevated above background	33	50-150	≤50	≥90
Aroclor-1242	Elevated above background	33	50-150	≤50	≥90
Aroclor-1248	Elevated above background	33	50-150	≤50	≥90
Aroclor-1254	Elevated above background	33	50-150	≤50	≥90
Aroclor-1260	Elevated above background	33	50-150	≤50	≥90

CRDL = CLP Contract Required Detection Limits
CRQL = CLP Contract Required Quantitation Limits
MS/MSD = Matrix Spike/Matrix Spike Duplicate
PQL = Practical Quantitation Limit
RPD = Relative Percent Difference
mg/kg = milligrams per kilogram (ppm)
(µg/kg) = micrograms per kilogram (ppb)

[1] = These action levels do not include health-based benchmarks because it is anticipated that analytical results for the sedimentation ponds will not be used for HRS purposes.
[2] = This table lists only the primary analytes of concern for CLPAS ILM04.1 and CLPAS OLM04.2. However, the entire target analyte list for metals (CLPAS ILM04.1), except cyanide, and the entire target compound list for VOC, SVOC, and pesticide/PCB analyses (CLPAS OLM04.2) will be reported.

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Table 3-2:
Data Quality Indicator Goals - Water
(AOCs for Samples Collected from the Site-Related Sedimentation Ponds)

Method ----- Analytes[2]	Action Level[1]	Reporting Limits	Accuracy (% Recovery for MS/MSD)	Precision (RPD for MS/MSD and duplicates)	Percent Complete
CLPAS ILM04.1		**CRDL**			
Arsenic	Elevated above background	10	75-125	≤20	≥90
Barium	Elevated above background	200	75-125	≤20	≥90
Zinc	Elevated above background	20	75-125	≤20	≥90
EPA Method 218.6					
Hexavalent Chromium	Elevated above background	10	80-120	≤10	≥90
CLPAS OLM04.2		**CRQL (μg/L)**			
Acetone	Elevated above background	10	50-150	≤50	≥90
Chloroform	Elevated above background	10	50-150	≤50	≥90
Dichlorodifluoromethane	Elevated above background	10	50-150	≤50	≥90
1,1-Dichloroethane	Elevated above background	10	50-150	≤50	≥90
Aroclor-1016	Elevated above background	1	50-150	≤50	≥90
Aroclor-1221	Elevated above background	2	50-150	≤50	≥90
Aroclor-1232	Elevated above background	1	50-150	≤50	≥90
Aroclor-1242	Elevated above background	1	50-150	≤50	≥90
Aroclor-1248	Elevated above background	1	50-150	≤50	≥90
Aroclor-1254	Elevated above background	1	50-150	≤50	≥90
Aroclor-1260	Elevated above background	1	50-150	≤50	≥90

CRDL = CLP Contract Required Detection Limits
CRQL = CLP Contract Required Quantitation Limits
MS/MSD = Matrix Spike/Matrix Spike Duplicate
RPD = Relative Percent Difference
μg/L = micrograms per liter (ppb)

[1] = These action levels do not include health-based benchmarks because it is anticipated that analytical results for the sedimentation ponds will not be used for HRS purposes.
[2] = This table lists only the primary analytes of concern for CLPAS ILM04.1 and CLPAS OLM04.2. However, the entire target analyte list for metals (CLPAS ILM04.1), except cyanide, and the entire target compound list for VOC, SVOC, and pesticide/PCB analyses (CLPAS OLM04.2) will be reported.

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Table 3-3:
Data Quality Indicator Goals - Groundwater
(AOCs for Samples Collected from Site-Related Monitoring Wells)

Method / Analytes[2]	Action Level[1]	Reporting Limits	Accuracy (% Recovery for MS/MSD)	Precision (RPD for MS/MSD and duplicates)	Percent Complete
CLPAS ILM04.1		**CRDL**			
Arsenic	Significantly above background	10	75-125	≤20	≥90
Barium	Significantly above background	200	75-125	≤20	≥90
Zinc	Significantly above background	20	75-125	≤20	≥90
EPA Method 218.6					
Hexavalent Chromium	Significantly above background	10	80-120	≤10	≥90
CLPAS OLM04.2		**CRQL (μg/L)**			
Acetone	Significantly above background	10	50-150	≤50	≥90
Chloroform	Significantly above background	10	50-150	≤50	≥90
Dichlorodifluoromethane	Significantly above background	10	50-150	≤50	≥90
1,1-Dichloroethane	Significantly above background	10	50-150	≤50	≥90
Aroclor-1016	Significantly above background	1	50-150	≤50	≥90
Aroclor-1221	Significantly above background	2	50-150	≤50	≥90
Aroclor-1232	Significantly above background	1	50-150	≤50	≥90
Aroclor-1242	Significantly above background	1	50-150	≤50	≥90
Aroclor-1248	Significantly above background	1	50-150	≤50	≥90
Aroclor-1254	Significantly above background	1	50-150	≤50	≥90
Aroclor-1260	Significantly above background	1	50-150	≤50	≥90

CRDL = CLP Contract Required Detection Limits
CRQL = CLP Contract Required Quantitation Limits
MS/MSD = Matrix Spike/Matrix Spike Duplicate
RPD = Relative Percent Difference
μg/L = micrograms per liter (ppb)

[1] = These action levels do not include health-based benchmarks because the monitoring wells have no targets associated with them and, therefore, no possibility of Level I concentrations.

[2] = This table lists only the primary analytes of concern for CLPAS ILM04.1 and CLPAS OLM04.2. However, the entire target analyte list for metals (CLPAS ILM04.1), except cyanide, and the entire target compound list for VOC, SVOC, and pesticide/PCB analyses (CLPAS OLM04.2) will be reported.

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Table 3-4:
Data Quality Indicator Goals - Groundwater
(AOCs for Samples Collected from Private and Municipal Drinking Water Wells)

Method / Analytes[2]	Action Level	Reporting Limits	Accuracy (% Recovery for MS/MSD)	Precision (RPD for MS/MSD and duplicates)	Percent Complete
CLPAS ILM04.1		**CRDL**			
Arsenic	Significantly above background; 11 μg/L (RDSC)	10	75-125	≤20	≥90
Barium	Significantly above background; 2000 μg/L (MCL)	200	75-125	≤20	≥90
Zinc	Significantly above background; 11,000 μg/L (RDSC)	20	75-125	≤20	≥90
EPA Method 218.6					
Hexavalent Chromium	Significantly above background; 180 μg/L (RDSC)	10	80-120	≤10	≥90
CLPAS OLM04.2		**CRQL (μg/L)**			
Acetone	Significantly above background; 3700 μg/L (RDSC)	10	50-150	≤50	≥90
Chloroform	Significantly above background; 14 μg/L (CRSC)	10	50-150	≤50	≥90
Dichlorodifluoromethane	Significantly above background; 7300 μg/L (RDSC)	10	50-150	≤50	≥90
1,1-Dichloroethane	Significantly above background; 3700 μg/L (RDSC)	10	50-150	≤50	≥90
Aroclor-1016	Significantly above background[1]	1	50-150	≤50	≥90
Aroclor-1221	Significantly above background[1]	2	50-150	≤50	≥90
Aroclor-1232	Significantly above background[1]	1	50-150	≤50	≥90
Aroclor-1242	Significantly above background[1]	1	50-150	≤50	≥90
Aroclor-1248	Significantly above background[1]	1	50-150	≤50	≥90
Aroclor-1254	Significantly above background[1]	1	50-150	≤50	≥90
Aroclor-1260	Significantly above background[1]	1	50-150	≤50	≥90

CRDL = CLP Contract Required Detection Limits
CRSC = Cancer Risk Screening Concentration
MS/MSD = Matrix Spike/Matrix Spike Duplicate
MCL = Maximum Contaminant Level
RDSC = Reference Dose Screening Concentration
RPD = Relative Percent Difference
μg/L = micrograms per liter (ppb)

[1] = Health-based benchmarks are not included as action levels for PCBs because, given the relatively low mobility value of PCBs (i.e., 0.0004), it is unlikely that Level I concentrations of PCBs would be present in drinking water wells.
[2] = This table lists only the primary analytes of concern for CLPAS ILM04.1 and CLPAS OLM04.2. However, the entire target analyte list for metals (CLPAS ILM04.1), except cyanide, and the entire target compound list for VOC, SVOC, and pesticide/PCB analyses (CLPAS OLM04.2) will be reported.

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Table 3-5:
Data Quality Indicator Goals - Surface Water
(AOCs for Samples Collected from the Cahto Creek Fishery)

Method ----- Analytes[2]	Action Level[1]	Reporting Limits	Accuracy (% Recovery for MS/MSD)	Precision (RPD for MS/MSD and duplicates)	Percent Complete
CLPAS ILM04.1		**CRDL**			
Arsenic	Significantly above background	10	75-125	≤20	≥90
Barium	Significantly above background	200	75-125	≤20	≥90
Zinc	Significantly above background	20	75-125	≤20	≥90
EPA Method 218.6					
Hexavalent Chromium	Significantly above background	10	80-120	≤10	≥90
CLPAS OLM04.2		**CRQL (μg/L)**			
Acetone	Significantly above background	10	50-150	≤50	≥90
Chloroform	Significantly above background	10	50-150	≤50	≥90
Dichlorodifluoromethane	Significantly above background	10	50-150	≤50	≥90
1,1-Dichloroethane	Significantly above background	10	50-150	≤50	≥90
Aroclor-1016	Significantly above background	1	50-150	≤50	≥90
Aroclor-1221	Significantly above background	2	50-150	≤50	≥90
Aroclor-1232	Significantly above background	1	50-150	≤50	≥90
Aroclor-1242	Significantly above background	1	50-150	≤50	≥90
Aroclor-1248	Significantly above background	1	50-150	≤50	≥90
Aroclor-1254	Significantly above background	1	50-150	≤50	≥90
Aroclor-1260	Significantly above background	1	50-150	≤50	≥90

AWQC = Ambient Water Quality Criteria
AALAC = Ambient Aquatic Life Advisory Concentrations
CRDL = CLP Contract Required Detection Limits
MS/MSD = Matrix Spike/Matrix Spike Duplicate
RPD = Relative Percent Difference
μg/L = micrograms per liter (ppb)

[1] = These action levels do not include health-based benchmarks because there are no health-based benchmarks presented in SCDM for water samples collected from fisheries.
[2] = This table lists only the primary analytes of concern for CLPAS ILM04.1 and CLPAS OLM04.2. However, the entire target analyte list for metals (CLPAS ILM04.1), except cyanide, and the entire target compound list for VOC, SVOC, and pesticide/PCB analyses (CLPAS OLM04.2) will be reported.

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4.0 SAMPLING RATIONALE

4.1 Sampling Locations and Rationale

Sediment and water samples will be collected from the four sedimentation ponds associated with the site and from one background pond to determine whether any of the AOCs for this site are present in the sedimentation ponds and are available for off-site migration. Groundwater samples will be collected from the five site-related groundwater monitoring wells to establish whether a release to groundwater from the site has occurred. Groundwater samples will be collected from five private drinking water wells (including one background well) and from one municipal drinking water supply well to establish whether a release to and actual contamination of drinking water wells from the site has occurred. Surface water samples will be collected from Cahto Creek at locations upstream and downstream of any PPEs from the site to establish whether a release to the creek has occurred. All sampling locations are illustrated in Figure 4-1.

4.1.1 Sediment and Surface Water Sampling of Site-Related Sedimentation Ponds

To determine whether any of the AOCs for this site are present in the sedimentation ponds and are available for off-site migration, sediment and surface water samples will be collected from three of the four site-related sedimentation ponds and from the confluence of two stormwater drainage paths that lead from sedimentation ponds to the Laytonville Rancheria. Alternatively, if surface water is not present at the confluence during the sampling event, a sediment sample and a surface water sample will be collected from the point of stormwater exit in the remaining sedimentation pond. All sediment and surface water samples will be co-located. For the three sedimentation ponds from which samples will necessarily be collected, samples will be collected at or near the points of stormwater entry and exit for each pond. One sediment sample and one surface water sample will also be collected from an additional location in the largest sedimentation pond to define the extent of any contamination. The co-located sediment/surface water sampling locations for the sedimentation ponds and point of confluence are indicated in Figure 4-1. The samples are designated LD-SEP-S1 (sediment) and LD-SEP-W1 (water), LD-NWP-S1/-W1 through LD-NWP-S6/-W6, LD-NEP-S1/-W1 through -S5/-W5, and LD-SWP-S1/-W1 through LD-SWP-S5/-W5.

Two sediment and two surface water samples will also be collected from a pond located outside of the area potentially influenced by the site to establish background concentrations of AOCs. Individual sediment and water samples will be co-located. The two background sediment/surface water samples will be collected near the point of exit from the background pond. If a point of exit cannot be identified, sampling locations will be determined during the sampling event. The co-located sediment and water sampling locations from the background pond are indicated in Figure 4-1. The samples are designated LD-BGP-S1/-W1 and LD-BGP-S2/-W2.

4.1.2 Groundwater Sampling

4.1.2.1 Site-Related Monitoring Wells

To establish whether a release to groundwater from the site has occurred, groundwater samples will be collected from the five site-related monitoring wells (MW 90-1, MW 91-1, MW 93-1, MW 93-2, and MW 94-1). Monitoring well locations are shown in Figure 4-1 as LD-MW-90-1, LD-MW-91-1, LD-MW-93-1, LD-MW-93-2, and LD-MW-94-1. A private drinking water well, located cross-gradient and outside of the area of influence from the site, will also be sampled to establish background levels of AOCs. The proposed location of this background well is indicated in Figure 4-1 as LD-PW-1.

4.1.2.2 Private and Municipal Drinking Water Wells

To establish whether a release to and actual contamination of drinking water wells has occurred, groundwater samples will be collected from five private drinking water wells located hydraulically downgradient of the site

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and from one municipal drinking water supply well located approximately 1.5 miles east of the site. Depending on the results of this PA/SI sampling event, additional private drinking water wells may be sampled at a later date. The proposed locations of the private drinking water wells and the location of the municipal well are indicated in Figure 4-1. The samples are designated LD-PW-2 , LD-PW-3 , LD-PW-4, LD-PW-5, LD-PW-6, and LD-PW-7. The background for these six wells will be the same as that used for the monitoring well sampling described in Section 4.1.2.1.

4.1.3 Surface Water Sampling of Cahto Creek

To establish whether a release to Cahto Creek, which supports a fishery, has occurred, surface water samples will be collected from the creek. There are three PPEs for stormwater runoff from the site to Cahto Creek. Two background surface water samples will be collected upstream of all PPEs. In addition, one surface water sample will be collected immediately downstream of each PPE. Surface water samples will be collected from just below the surface of the creek in slow moving water. The locations for these surface water samples are indicated in Figure 4-1. The samples are designated LD-CC-W1 through -W5.

4.2 Analytes of Concern

The AOCs for the Laytonville Dump site are metals (specifically arsenic, barium, zinc, and hexavalent chromium), VOCs (specifically acetone, chloroform, dichlorodifluoromethane, and 1,1-dichloroethane), SVOCs and PCBs. The criteria for selecting these AOCs is discussed in Section 1.3.

All samples (i.e., sediment, groundwater, and surface water samples) will be analyzed for total metals via USEPA CLPAS ILM04.1 (or equivalent) and for VOCs, SVOCs, and pesticides/PCBs via USEPA CLPAS OLM04.2 (or equivalent). In addition, sediment samples will be analyzed for hexavalent chromium via USEPA Method 7196 (or equivalent), coupled with USEPA Method 3060 (Alkaline Digestion for Hexavalent Chromium). Groundwater and surface water samples will also be analyzed for hexavalent chromium via USEPA Method 218.6 (or equivalent).

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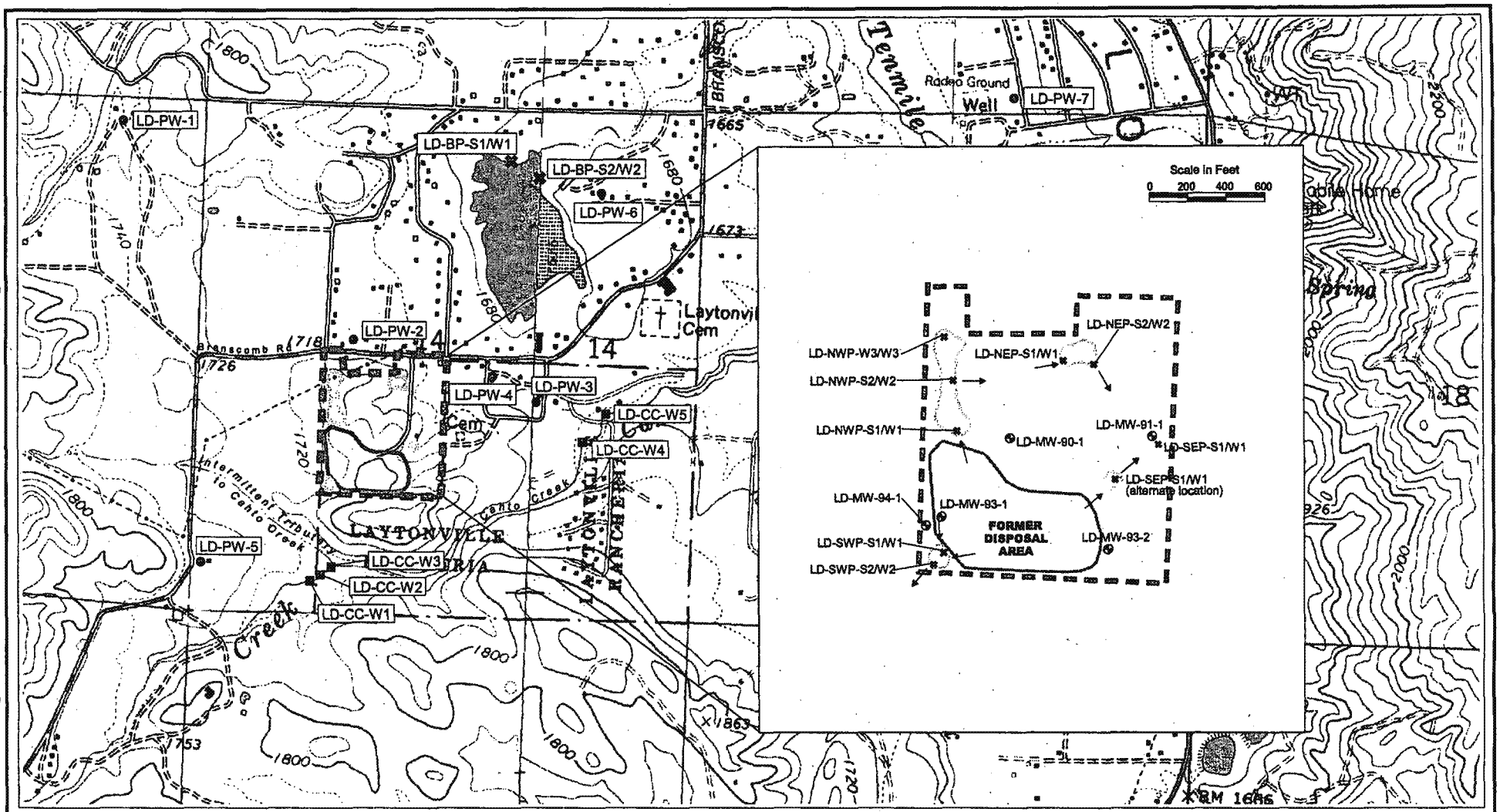

LEGEND:

- Co-Located Sediment and Water Sample
- Site-Related Monitoring Well
- Private Drinking Water Wells
- Cahto Creek Surface Water Sample
- Point of Entry
- Point of Exit
- Area depicted in detail to the right
- Former Disposal Area
- Sedimentation Pond
- Background Pond

SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangles: Cahto Peak, CA, 1967; Laytonville, CA, 1967, photorevised 1994.

DATE: 5/10/02

1000 0 1000 2000 Feet

Figure 4-1
Site Location Map
Laytonville Dump
Laytonville, Mendocino County, CA

5.0 REQUEST FOR ANALYSES

All laboratory services will be scheduled and arranged for by USEPA Region IX QAO. Samples will be analyzed for individual metals, VOCs, SVOCs, and pesticides/PCBs through USEPA's CLP. Samples will be analyzed for hexavalent chromium through a USEPA-approved laboratory to be determined by USEPA Region IX QAO. Sample containers, preservatives, holding times, and estimated number of field, confirmation, and QC samples are summarized in Tables 5-1, 5-2, and 5-3.

As shown in Figure 4-1, sediment samples will be collected at 10 locations. As shown in Table 5-1, additional sample volume for use as a laboratory QC sample will be collected at one location and one duplicate sediment sample will be collected at another location. A total of 11 sediment samples will be collected. Each sediment sample will be analyzed for total metals via CLPAS Method ILM04.1 (or equivalent); for VOCs, SVOCs, and pesticides/PCBs via CLPAS Method OLM04.2 (or equivalent); and for hexavalent chromium via USEPA Method 7196 coupled with USEPA Method 3060 (Alkaline Digestion for Hexavalent Chromium), or equivalent.

As shown in Figure 4-1, groundwater samples will be collected at 12 locations. As shown in Table 5-2, additional sample volume for use as a laboratory QC sample will be collected at one location and two duplicate groundwater samples will be collected at other locations. A total of 14 groundwater samples will be collected. Each groundwater sample will be analyzed for total metals via CLPAS Method ILM04.1 (or equivalent); for VOCs, SVOCs, and pesticides/PCBs via CLPAS Method OLM04.2 (or equivalent); and for hexavalent chromium via USEPA Method 218.6 (or equivalent).

As shown in Figure 4-1, surface water samples will be collected at 15 locations. As shown in Table 5-3, additional sample volume for use as a laboratory QC sample will be collected at one locations and two duplicate surface water samples will be collected at other locations. Field blanks are also included with this matrix; therefore, the total number of samples collected under this matrix is 21. Seventeen actual surface water samples will be collected. Each surface water sample will be analyzed for total metals via CLPAS Method ILM04.1 (or equivalent); for VOCs, SVOCs, and pesticides/PCBs via CLPAS Method OLM04.2 (or equivalent); and for hexavalent chromium via USEPA Method 218.6 (or equivalent).

Only dedicated disposable equipment will be used for this sampling event; therefore, no equipment blanks will be collected. In addition, one field blank will be collected per day of sampling. Field blanks will be analyzed in the same manner as the groundwater and surface water samples via CLPAS Method ILM04.1, CLPAS Method OLM04.2, and USEPA Method 218.6.

To provide analytical quality control for the analytical program, the following measures will be utilized:

- All sample analysis will be conducted by laboratories selected by USEPA QAO.
- Additional volume of sample will be collected for at least one sample per media per each analytical method, to be utilized for matrix spike/matrix spike duplicate analysis.
- A CLP-type data package will be required from the laboratories for all resultant data.

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Table 5-1
Request for Analytical Services
Matrix - Sediment

Analysis:	Inorganic	VOCs, SVOCs, and Pesticides/PCBs	Hexavalent Chromium
Method:	USEPA CLPAS ILM04.1 (or equivalent)	USEPA CLPAS OLM04.2 (or equivalent)	USEPA 7196, with USEPA 3060 (or equivalent)
Sample Container:	1 8-oz. glass jar	2 4-oz. glass jars(VOCs) 1 8-oz. glass jar (SVOCs) 1 8-oz glass jar (Pest./PCBs)	1 8-oz. glass jar
Preservation:	Cool to 4°C or less immediately after collection	Cool to 4°C or less immediately after collection	Cool to 4°C or less immediately after collection
Technical Holding Time:	6 months (26 days for Hg)	14 days (VOCs) 14 days (SVOCs) 14 days (Pesticides/PCBs)	30 days (until digestion via USEPA Method 3060); 24 hours (after digestion, until extract analysis via USEPA Method 1796)

Number of Sample Designations:

	Field Samples	Field Duplicates	Equipment Blank	Field Blanks	Trip Blanks	Total
	10	1	N/A[1]	N/A[2]	N/A[3]	11

Sample Information:

Sample Number	Location	Depth (bgs)	Special Designation	Number of Containers
LD-BGP-S1	Background Pond	0.5-2 feet	Background	4 X 8-oz. jars 2 X 4-oz. jars
LD-BGP-S2	Background Pond	0.5-2 feet	Background	4 X 8-oz. jars 2 X 4-oz. jars
LD-NWP-S1	Northwest Sedimentation Pond	0.5-2 feet	Laboratory QC	10 X 8-oz. jars 6 X 4-oz. jars
LD-NWP-S2	Northwest Sedimentation Pond	0.5-2 feet		4 X 8-oz. jars 2 X 4-oz. jars
LD-NWP-S3	Northwest Sedimentation Pond	0.5-2 feet		4 X 8-oz. jars 2 X 4-oz. jars
LD-NEP-S1	Northeast Sedimentation Pond	0.5-2 feet		4 X 8-oz. jars 2 X 4-oz. jars
LD-NEP-S2	Northeast Sedimentation Pond	0.5-2 feet		4 X 8-oz. jars 2 X 4-oz. jars
LD-SEP-S1	Southeast Sedimentation Pond	0.5-2 feet		4 X 8-oz. jars 2 X 4-oz. jars
LD-SWP-S1	Southwest Sedimentation Pond	0.5-2 feet		4 X 8-oz. jars 2 X 4-oz. jars

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	Sample Number	Location	Depth (bgs)	Special Designation	Number of Containers
	LD-SWP-S1-2	Southwest Sedimentation Pond	0.5-2 feet	Duplicate of LD-SWP-S1	4 X 8-oz. jars 2 X 4-oz. jars
	LD-SWP-S2	Southwest Sedimentation Pond	0.5-2 feet		4 X 8-oz. jars 2 X 4-oz. jars

[1] = No equipment blanks will be collected because only dedicated disposable sampling equipment will be used.

[2] = One field blank will be collected per day of sampling; see Table 5-3.

[3] = Trip blanks will not be prepared because high levels of VOCs are not suspected and cross contamination is unlikely.

Table 5-2
Request for Analytical Services
Matrix - Groundwater

Analysis:	Inorganic	VOCs, SVOCs, and Pesticides/PCBs	Hexavalent Chromium
Method:	USEPA CLPAS ILM04.1 (or equivalent)	USEPA CLPAS OLM04.2 (or equivalent)	USEPA 218.6 (or equivalent)
Sample Container:	1 1-L polyethylene bottle	3 40-mL glass bottles (VOCs) 2 1-L amber bottles (SVOCs) 2 1-L amber bottles (Pesticides/PCBs)	1 125-mL polyethylene bottle
Preservation:	Acidify to pH < 2 with HNO_3; Cool to 4°C or less immediately after collection	Preserve to a pH of 2 (VOCs) with HCl; Cool to 4°C or less immediately after collection (VOCs, SVOCs, Pesticides/PCBs)	Cool to 4°C or less immediately after collection
Technical Holding Time:	6 months (26 days for Hg)	14 days (VOCs) 7 days (SVOCs) 7 days (Pesticides/PCBs)	24 hours

Number of Sample Designations:

	Field Samples	Field Duplicates	Equipment Blank	Field Blanks	Trip Blanks	Total
	12	2	N/A[1]	N/A[2]	N/A[3]	14

Sample Information:

Sample Number	Location	Depth (bgs)	Special Designation	Number of Containers
LD-MW-90-1	Site-Related Monitoring Well	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-MW-91-1	Site-Related Monitoring Well	TBD	Laboratory QC	2 X 1-L poly. 9 X 40-mL glass 12 X 1-L amber 2 X 125-mL poly.
LD-MW-93-1	Site-Related Monitoring Well	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-MW-93-1-2	Site-Related Monitoring Well	TBD	Duplicate of LD-MW-93-1	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-MW-93-2	Site-Related Monitoring Well	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.

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	Sample Number	Location	Depth (bgs)	Special Designation	Number of Containers
	LD-MW-94-1	Site-Related Monitoring Well	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-PW-1	Private Drinking Water Well located cross-gradient of site	TBD	Background	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-PW-2	French Well	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-PW-2-2	French Well	TBD	Duplicate of LD-PW-2	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-PW-3	Rancheria Well	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-PW-4	Rancheria Well	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-PW-5	Silva Well	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-PW-6	Well in separate aquifer	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-PW-7	Laytonville Public Supply Well	TBD		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.

[1] = No equipment blanks will be collected because only dedicated disposable sampling equipment will be used.

[2] = One field blank will be collected per day of sampling; see Table 5-3.

[3] = Trip blanks will not be prepared because high levels of VOCs are not suspected and cross contamination is unlikely.

Table 5-3
Request for Analytical Services
Matrix - Surface Water

Analysis:	Inorganic	VOCs, SVOCs, and Pesticides/PCBs	Hexavalent Chromium
Method:	USEPA CLPAS ILM04.1 (or equivalent)	USEPA CLPAS OLM04.2 (or equivalent)	USEPA 218.6 (or equivalent)
Sample Container:	1 1-L polyethylene bottle	3 40-mL glass bottles (VOCs) 2 1-L amber bottles (SVOCs) 2 1-L amber bottles (Pesticides/PCBs)	1 125-mL polyethylene bottle
Preservation:	Acidify to pH < 2 with HNO_3; Cool to 4°C or less immediately after collection	Preserve to a pH of 2 (VOCs); Cool to 4°C or less immediately after collection (VOCs, SVOCs, Pesticides/PCBs)	Cool to 4°C or less immediately after collection
Technical Holding Time:	6 months (26 days for Hg)	14 days (VOCs) 7 days (SVOCs) 7 days (Pesticides/PCBs)	24 hours

Number of Sample Designations:

	Field Samples	Field Duplicates	Equipment Blank	Field Blanks	Trip Blanks	Total
	15	2	N/A[1]	4	N/A[3]	21

Sample Information:

Sample Number	Location	Depth (bws)[4]	Special Designation	Number of Containers
LD-BGP-W1	Background Pond	6-12 inches	Background	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-BGP-W2	Background Pond	6-12 inches	Background	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-NWP-W1	Northwest Sedimentation Pond (point-of-entry)	6-12 inches	Laboratory QC	2 X 1-L poly. 9 X 40-mL glass 12 X 1-L amber 2 X 125-mL poly.
LD-NWP-W2	Northwest Sedimentation Pond (north end)	6-12 inches		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-NWP-W3	Northwest Sedimentation Pond (point-of-exit)	6-12 inches		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.

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Sample Number	Location	Depth (bws)[4]	Special Designation	Number of Containers
LD-NEP-W1	Northeast Sedimentation Pond (point-of-entry)	6-12 inches		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-NEP-W2	Northeast Sedimentation Pond (point-of-exit)	6-12 inches		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-SEP-W1	Confluence OR Southeast Sedimentation Pond (point-of-exit)	6-12 inches		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-SWP-W1	Southwest Sedimentation Pond (point-of-entry)	6-12 inches		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-SWP-W1-2	Southwest Sedimentation Pond (point-of-entry)	6-12 inches	Duplicate of LD-SWP-W1	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-SWP-W2	Southwest Sedimentation Pond (point-of-exit)	6-12 inches		1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-CC-W1	Cahto Creek	6-12 inches	Background	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-CC-W2	Cahto Creek	6-12 inches	Background	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-CC-W3	Cahto Creek	6-12 inches	PPE-1	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-CC-W3-2	Cahto Creek	6-12 inches	Duplicate of LD-CC-W4 at PPE-1	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-CC-W4	Cahto Creek	6-12 inches	PPE-2	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
LD-CC-W5	Cahto Creek	6-12 inches	PPE-3	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.

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	Sample Number	Location	Depth (bws)[4]	Special Designation	Number of Containers
	LD-W-1	N/A	N/A	Field Blank (Day 1)	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-W-2	N/A	N/A	Field Blank (Day 2)	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-W-3	N/A	N/A	Field Blank (Day 3)	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.
	LD-W-4	N/A	N/A	Field Blank (Day 4)	1 X 1-L poly. 3 X 40-mL glass 4 X 1-L amber 1 X 125-mL poly.

[1] = No equipment blanks will be collected because only dedicated disposable sampling equipment will be used.
[2] = One field blank will be collected per day of sampling.
[3] = Trip blanks will not be prepared because high levels of VOCs are not suspected and cross contamination is unlikely.
[4] = BWS: Below Water Surface

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6.0 METHODS AND PROCEDURES

6.1 Field Equipment

6.1.1 Sampling Equipment

The following equipment will be used to obtain environmental samples from the respective media:

Matrix: Sediment			
Equipment		Fabrication	Dedicated
Hand Trowel	Plastic		Yes
Gloves	Nitrile		Yes
Sample mixing buckets	Paper		Yes

Matrix: Groundwater			
Equipment		Fabrication	Dedicated
Permanent well pump	N/A		Yes
Gloves	Nitrile		Yes

Matrix: Surface Water			
Equipment		Fabrication	Dedicated
Gloves	Nitrile		Yes

6.1.2 Inspection/Acceptance Requirements for Supplies and Consumables

There are no project-specific inspection/acceptance criteria for supplies and consumables. It is standard operating procedure that: personnel will not use broken or defective materials; items will not be used past their expiration date; supplies and consumables will be checked against order and packing slips to verify the correct items were received; and the supplier will be notified of any missing or damaged items.

6.2 Sampling Procedures

6.2.1 Sediment Sampling

Sediment samples will be collected at 10 locations to determine whether any of the AOCs for this site are present in the site-related sedimentation ponds and are available for off-site migration. Sediment sampling locations are indicated in Figure 4-1 as samples LD-NWP-S1through -S3, LD-NEP-S1 and -S2, LD-SEP-S1, LD-SWP-S1 and -S2, and LD-BGP-S1 and -S2.

Sediment samples will be collected from the four sedimentation ponds, as well as the background pond. Sediment samples will be co-located with surface water samples in the sedimentation ponds and will be collected after the surface water samples are collected. The sediment samples will be collected with dedicated disposable hand trowels as far in from the edge of the sedimentation ponds as is reasonable to reach by foot. The sediment samples to be analyzed for non-volatile compounds will be transferred directly to a dedicated disposable paper bucket for homogenization by the dedicated disposable trowel. Material in

the bucket will be transferred by trowel to the sample containers appropriate for each group of non-volatile analytes (i.e., individual 8-oz. wide-mouth glass jars for total metals, pesticides/PCBs, and hexavalent chromium). Sample containers will be filled to the top, taking care to prevent soil from remaining in the lid threads prior to being closed to prevent potential contaminant migration to or from the sample. The sediment samples intended for analysis of volatile and semi-volatile organic compounds will not be homogenized, but rather will be collected by a dedicated disposable trowel with minimal disturbance to the sediment and deposited directly to the appropriate sample container (i.e., 2 4-oz. glass jars for VOCs, 8-oz. glass jar for SVOCs). All sample containers will be closed as soon as they are filled, immediately chilled to 4°C, and processed for shipment to the laboratory.

6.2.2 Groundwater Sampling

Groundwater samples will be collected from twelve locations (i.e., five site-related monitoring wells, six private drinking water wells, and one municipal drinking water supply well) to establish whether a release to groundwater has occurred and whether a release to and actual contamination of drinking water wells has occurred. The groundwater sampling locations are indicated in Figure 4-1.

6.2.2.1 Water-Level Measurements

All field meters will be calibrated according to manufacturer's guidelines and specifications before and after every day of field use. Field meter probes will be decontaminated before and after use at each well.

If well heads are accessible, all wells will be sounded for depth to water from top of casing and total well depth prior to purging. An electronic sounder, accurate to the nearest +/- 0.01 feet, will be used to measure depth to water in each well. When using an electronic sounder, the probe is lowered down the casing to the top of the water column, the graduated markings on the probe wire or tape are used to measure the depth to water from the surveyed point on the rim of the well casing. Typically, the measuring device emits a constant tone when the probe is submerged in standing water and most electronic water level sounders have a visual indicator consisting of a small light bulb or diode that turns on when the probe encounters water. Total well depth will be sounded from the surveyed top of casing by lowering the weighted probe to the bottom of the well. The weighted probe will sink into silt, if present, at the bottom of the well screen. Total well depths will be measured by lowering the weighted probe to the bottom of the well and recording the depth to the nearest 0.1 feet.

Water-level sounding equipment will be decontaminated before and after use in each well. Water levels will be measured in wells which have the least amount of known contamination first. Wells with known or suspected contamination will be measured last.

6.2.2.2. Purging

All wells will be purged prior to sampling. The date of this sampling event may coincide with Mendocino County Solid Waste Division's 2nd Quarter 2002 monitoring event, after which the County will also analyze groundwater samples collected from the site-related monitoring wells. Although the County follows USEPA guidelines for well purging, the protocols used by the County during sample collection do not meet USEPA guidelines (e.g., the County does not decontaminate the water level meter probe between measuring the water level at each well). Therefore, WESTON will collect and submit for laboratory analyses separate groundwater samples from the monitoring wells, for HRS purposes, after the County has purged the wells. WESTON will purge the private drinking water wells according to the following procedure. If the date of this sampling event does not coincide with Mendocino County Solid Waste Division's 2nd Quarter 2002 monitoring event, WESTON will also purge the site-related monitoring wells according to the following procedure. The five site-related monitoring wells and the seven drinking water wells are equipped with permanent dedicated pumps. If the well casing volume is known in each well, a minimum of three casing volumes of water will be purged using the dedicated pump.

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Water will be collected into a measured bucket to record the purge volume. Casing volumes will be calculated based on total well depth, standing water level, and casing diameter. One casing volume will be calculated as:

$$V = \pi d^2 h/77.01$$

where:

V is the volume of one well casing of water (1 ft^3 = 7.48 gallons);
d is the inner diameter of the well casing (in inches);
h is the total depth of water in the well (in feet).

It is most important to obtain a representative sample from the well. Stable water quality parameter (temperature, pH and specific conductance) measurements indicate representative sampling is obtainable. Water quality is considered stable if for three consecutive readings:

- temperature range is no more than ±1 °C;
- pH varies by no more than 0.2 pH units;
- specific conductance readings are within 10% of the average.

The water in which measurements were taken will not be used to fill sample bottles.

If the well casing volume is known, measurements will be taken before the start of purging, in the middle of purging, and at the end of purging each casing volume. If the well casing volume is not known, measurements will be taken every 2.5 minutes after flow starts. If water quality parameters are not stable after 5 casing volumes or 30 minutes, purging will cease, which will be noted in the logbook, and groundwater samples will be taken. The depth to water, water quality measurements and purge volumes will be entered in the logbook.

If a well dewaters during purging and three casing volumes are not purged, that well will be allowed to recharge up to 80% of the static water column and dewatered once more. After water levels have recharged to 80% of the static water column, groundwater samples will be collected.

6.2.2.3 Well Sampling

At each sampling location, all bottles designated for a particular analysis (e.g., VOCs) will be filled sequentially before bottles designated for the next analysis are filled (e.g., SVOCs). If a duplicate sample is to be collected at this location, all bottles designated for a particular analysis for both sample designations will be filled sequentially before bottles for another analysis are filled. In the filling sequence for duplicate samples, bottles with the two different sample designations will alternate (e.g., volatile organic compounds designation LD-MW-91-1, volatile organic compounds designation LD-MW-91-1-2 (duplicate of LD-MW-91-1), metals designation LD-MW-91-1, metals designation LD-MW-91-1 (duplicate of LD-MW-91-1). Groundwater samples will be transferred from the tap directly into the appropriate sample containers with preservative, if required, chilled, and processed for shipment to the laboratory. When transferring samples, care will be taken not to touch the tap to the sample container.

Samples for VOC analyses will be collected using the permanent dedicated pump at each well location. Each permanent dedicated pump will be used at a low flow rate (i.e., between 100 to 500 mL/min). Vials for volatile organic compound analysis will be filled first to minimize the effect of aeration on the water sample. A test vial will be filled with sample, preserved with hydrochloric acid (HCl) and tested with pH paper to determine the amount of preservative needed to lower the pH to less than 2. The appropriate amount of HCl will then be added to the sample vials prior to the addition of the sample. The vials will be filled directly from

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the tap and capped. The vial will be inverted and checked for air bubbles to ensure zero headspace. If a bubble appears, the vial will be discarded and a new sample will be collected.

6.2.3 Surface Water

Surface water samples will be collected at 15 locations to determine whether any of the AOCs for this site are present in the sedimentation ponds and are, therefore, available for off-site migration, and to establish whether a release to and actual contamination of Cahto Creek has occurred. The surface water sampling locations are indicated in Figure 4-1.

Water samples collected from the sedimentation ponds will be co-located with the sediment samples and will be collected prior to collection of the sediment samples. Water samples will be collected from the four sedimentation ponds, from the background pond, and from Cahto Creek. With a gloved hand, a dedicated sample bottle will be plunged into the water mouth-down and filled at approximately 6 to 12 inches below the water surface. The bottle cap will be protected from contamination while the bottle is being filled. Sample containers appropriate for each group of analytes will be used at each sampling location (i.e., 2 1-liter polyethylene bottles for total metals; 3 40-mL glass bottles for VOCs; 2 1-L amber bottles for SVOCs; 2 1-L amber bottles for PCBs; and 1 125-mL polyethylene bottle for hexavalent chromium). For VOC analysis, a test vial will be filled with sample, preserved with hydrochloric acid (HCl) and tested with pH paper to determine the amount of preservative needed to lower the pH to less than 2. The sample containers will then be filled with surface water as described above, and preserved with the appropriate amount of HCl. The sample container will be inverted and checked for air bubbles to ensure zero headspace. If a bubble appears, the sample container will be discarded and a new sample will be collected.

6.3 Decontamination Procedures

The decontamination procedures that will be followed are in accordance with approved procedures. Decontamination of sampling equipment must be conducted consistently to assure the quality of samples collected. All non-dedicated equipment that comes into contact with potentially contaminated soil or water will be decontaminated. Disposable equipment intended for one-time use will not be decontaminated, but will be packaged for appropriate disposal. Decontamination will occur prior to and after each use of a piece of non-dedicated equipment. All non-dedicated sampling devices used will be decontaminated according to EPA Region 9 recommended procedures.

The following, to be carried out in sequence, is an EPA Region IX recommended procedure for the decontamination of sampling equipment:

- Non-phosphate detergent and tap water wash, using a brush if necessary
- Tap-water rinse
- 0.1 N nitric acid rinse
- Deionized/distilled water rinse
- Pesticide-grade solvent (reagent grade hexane) rinse in a decontamination bucket
- Deionized/distilled water rinse (twice)

Equipment will be decontaminated in a predesignated area on pallets or plastic sheeting, and clean bulky equipment will be stored on plastic sheeting in uncontaminated areas. Cleaned small equipment will be stored in plastic bags. Materials to be stored more than a few hours will also be covered.

A water-level sounder and water quality parameter instruments are the only non-dedicated equipment that will be used during this sampling event. These equipment will be decontaminated according to the above procedure after each use.

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7.0 DISPOSAL OF INVESTIGATION-DERIVED WASTE

In the process of collecting environmental samples at the Laytonville Dump site, several different types of potentially contaminated investigation-derived wastes (IDW) will be generated, including the following:

- Used personal protective equipment (PPE);
- Disposable sampling equipment;
- Decontamination fluids; and
- Purged groundwater and excess groundwater collected to fill sample containers.

The USEPA's National Contingency Plan (NCP) requires that management of IDW generated during sampling comply with all relevant and appropriate requirements to the extent practicable. This sampling plan will follow the *Office of Emergency and Remedial Response (OERR) Directive* 9345.3-02 (May 1991) which provides the guidance for management of IDW. In addition, other legal and practical considerations that may affect the handling of IDW will be considered. Listed below are the procedures that will be followed for handling IDW. The procedures are flexible enough to allow the sampling team to use its professional judgement on the proper method for the disposal of each type of IDW generated at each sampling location.

- Used PPE and disposable sampling equipment will be double bagged in plastic trash bags and disposed of in a municipal refuse dumpster. These wastes are not considered hazardous and can be sent to a municipal landfill. Any PPE or dedicated equipment that is to be disposed of that can still be reused will be rendered inoperable before disposal.
- Decontamination fluids that will be generated in the sampling event will consist of dilute nitric acid, pesticide-grade solvent, deionized water, residual contaminants, and water with non-phosphate detergent. The volume and concentration of the decontamination fluid will be sufficiently low to allow disposal at the site or sampling area. The water (and water with detergent) will be discharged to the ground. Pesticide-grade solvents will be allowed to evaporate from the decontamination bucket. The nitric acid will be diluted and/or neutralized with sodium hydroxide and tested with pH paper before pouring onto the ground or into a storm drain.
- Purge water and excess groundwater will be discharged to the ground. This is in accordance with Mendocino County Solid Waste Division's well sampling procedures. Groundwater collected from the drinking water wells is consumed by residents and is currently not considered hazardous.

8.0 SAMPLE IDENTIFICATION, DOCUMENTATION, AND SHIPMENT

8.1 Field Notes

8.1.1 Field Logbooks

Field logbooks will document where, when, how, and from whom any vital project information was obtained. Logbook entries will be complete and accurate enough to permit reconstruction of field activities. A separate logbook will be maintained for each project. Logbooks are bound with consecutively numbered pages. Each page will be dated and the time of entry noted in military time. All entries will be legible, written in ink, and signed by the individual making the entries. Language will be factual, objective, and free of personal opinions. At a minimum, the following information will be recorded, if applicable, during the collection of each sample;

- Sample location and description
- Sampler's name(s)
- Date and time of sample collection
- Type of sample (e.g., sediment)
- Field instrument readings and calibration

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- Field observations and details related to analysis or integrity of samples (e.g., weather conditions, noticeable odors, colors, etc.)
- Preliminary sample descriptions
- Sample preservation

In addition to sampling information, the following specific information may also be recorded in the field logbook for each day of sampling:

- Team members and their responsibilities
- Time of arrival on site and time of departure
- Other personnel on site
- A summary of any meetings or discussions with any potentially responsible parties, or representatives of any federal, state, or other regulatory agency
- Deviations from sampling plans, site safety plans, and SAP procedures
- Changes in personnel and responsibilities as well as reasons for the change
- Levels of safety protection
- Calibration information for equipment used on site
- Record of photographs

8.1.2 Photographs

Photographs will be taken at the sampling locations and at other areas of interest related to the site. They will serve to verify information entered in the field logbook. When a photograph is taken, the following information will be written in the logbook or will be recorded in a separate field photography log:

- Time, date, and location
- Description of the subject photographed
- Name of person taking the photograph

8.2 Sample Nomenclature

As shown in Tables 5-1, 5-2, and 5-3, a unique, identifiable name will be assigned to each sample. The prefix "LD" will be used to identify the Laytonville Dump site. The abbreviations P, MW, PW, CC, and W will be used to identify samples collected from the ponds (i.e., sedimentation ponds associated with the site and the background pond), monitoring wells, private and public drinking water supply wells, Cahto Creek, and field and equipment blanks (W), respectively. The abbreviations BG, NW, NE, SE, and SW will also be used to differentiate between samples collected from the background pond, northwest sedimentation pond, northeast sedimentation pond, southeast sedimentation pond/confluence point, and southwest sedimentation pond, respectively. A numbered suffix preceded by an "S" for sediment or "W" for water will identify sediment and water samples, respectively, collected from the ponds. Thus, "LD-BGP-S1" will refer to the first sediment sample collected from the background pond, while "LD-BGP-W1" will refer to the first water sample collected from the background pond. Individual monitoring wells will be identified by the well numbers used by Mendocino County (i.e., 90-1, 91-1, 93-1, 93-2, and 94-1). Individual drinking water wells will be identified by assigned numbers. Surface water samples collected from Cahto Creek will be numbered one (1) through five (5) in succession from upstream to downstream.

8.3 Container, Preservation, and Holding Time Requirements

All sample containers used will have been delivered to WESTON in a pre-cleaned condition. Container, preservation, and technical holding time requirements are summarized in Tables 5-1, 5-2, and 5-3.

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8.4 Sample Labeling, Packaging and Shipping

All samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. Sample labels will be affixed to the sample containers and secured with clear tape. Samples will have preassigned, identifiable and unique numbers in accordance with Section 8.2. The sample labels will contain the following information where appropriate:

- Sample number
- Sample location
- Date and time of collection
- Site name
- Analytical parameter and method of preservation
- CLP Case Number (if applicable)

Samples will be stored on ice in a secure location pending shipment to the contract laboratory. Sample coolers will be retained in the custody of site personnel at all times or secured so as to deny access to anyone else. The procedures for shipping samples are as follows:

- Ice will be packed in double zip-lock plastic bags.
- The drain plug of the cooler will be taped shut to prevent leakage.
- The bottom of the cooler will be lined with bubble wrap to prevent breakage during shipment.
- Screw caps will be checked for tightness.
- Containers will have custody seals affixed so as to prevent opening of the container without breaking the seal.
- All glass sample containers will be wrapped in bubble wrap.
- All containers will be sealed in zip-lock plastic bags.

All samples will be placed in coolers with the appropriate chain-of-custody forms. All forms will be enclosed in plastic bags and affixed to the underside of the cooler lid. Bags of ice will be placed on top of and around samples. Empty space in the cooler will be filled with bubble wrap or styrofoam peanuts to prevent movement and breakage during shipment. Each ice chest will be securely taped shut with strapping tape, and custody seals will be affixed to the front, right, and back of each cooler.

Samples will be shipped for immediate delivery to the contracted laboratory. The QAO's Region IX Sample Control Coordinator (Carl Brickner, [415] 972-3814) will be notified daily of the sample shipment schedule and will be provided with the following information:

- Sampling contractor's name
- The name of the site
- Case number
- Shipment date and expected delivery date
- Total number of samples by matrix, and relative level of contamination (i.e., low, medium, or high)
- Carrier, air bill number(s), and method of shipment (e.g., FedEx)
- Irregularities or anticipated problems associated with the samples
- Whether additional samples will be sent, if this is the last shipment

8.5 Chain of Custody Forms and QA/QC Summary Forms

A chain of custody form will be maintained for all samples to be submitted for analysis, from the time the sample is collected until its final deposition. Every transfer of custody must be noted and signed for; a copy of this record is kept by each individual who has signed. Corrections on sample paperwork will be made by drawing a single line through the mistake and initialing and dating the change. The correct information will be entered above, below, or after the mistake. When samples are not under the direct control of the individual

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responsible for them, they must be stored in a locked container sealed with a custody seal. The chain of custody must include the following:

- Sample identification numbers
- Site name
- Sample date
- Number and volume of sample containers
- Required analyses
- Signature and name of samplers
- Signature(s) of any individual(s) with control over samples
- Airbill number
- Note(s) indicating special holding times and/or detection limits

For samples that will be sent through the CLP Analytical Services Program, inorganic and organic traffic reports will be used to document sample collection and shipment to a laboratory for analysis. One form will be completed and sent with the samples for each laboratory and each shipment. If multiple coolers are sent to a single laboratory on a single day, only one form will be completed. If all sample information cannot be entered in one form, then multiple forms will be used. The top copy of the form will be sent to the EPA QAO, the second copy will be sent to Contract Laboratory Analytical Services Support, and the remaining copies will accompany the samples to the laboratory. A photocopy of the original will be made for WESTON's master file.

A QA/QC summary form will be completed for each laboratory and each matrix of the sampling event. The sample number for all blanks, reference samples, laboratory QC samples (MS/MSDs), and duplicates will be documented on this form. This form is not sent to the laboratory. The original form will be sent to the EPA QAO; a photocopy of the original will be made for WESTON's master file.

The document titled "*Instructions for Sample Shipping and Documentation*," Quality Assurance Management Section, USEPA Region IX, November 1997, will be taken to the field as a reference. This document is included in Appendix C.

9.0 QUALITY ASSURANCE AND CONTROL (QA/QC)

9.1 Field Quality Control Samples

The QA/QC samples described in the following subsections, which are also listed in Tables 5-1, 5-2, and 5-3 will be collected during this investigation.

9.1.1 Assessment of Field Contamination (Blanks)

9.1.1.1 Equipment Blanks

No equipment blanks will be collected because only dedicated disposable sampling equipment will be used.

9.1.1.2 Field Blanks

Field blanks will be collected to evaluate whether contaminants have been introduced into the samples during sample collection, preservation, and/or shipment, as well as in the laboratory. One field blank will be collected per each day of sampling. Field blank samples will be obtained by pouring deionized water into a sampling container at the sampling point. The field blanks that are collected will be analyzed for total metals via CLPAS Method ILM04.1; for VOCs, SVOCs, and pesticides/PCBs via CLPAS Method OLM04.2; and for hexavalent chromium via USEPA Method 218.6.

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The field blanks will be pre[illegible]ed, packaged, and sealed in the manner [illegible]scribed for the surface water samples in Section 6.2.3. A separate sample number will be assigned to each sample and it will be submitted blind to the laboratory.

9.1.1.3 Trip Blanks

Trip blanks will not be prepared because high levels of VOCs are not suspected and cross contamination is unlikely.

9.1.1.4 Temperature Blanks

For each cooler that is shipped or transported to an analytical laboratory, a 40-mL vial of deionized water will be included that is marked "temperature blank." This blank will be used by the sample custodian to check the temperature of samples upon receipt.

9.1.2 Assessment of Sample Variability (Field Duplicate or Co-located Samples)

Duplicate sediment samples will be collected at the sample locations indicated in Tables 5-1, 5-2, and 5-3. These locations have been selected because they are expected to have detectable concentrations of AOCs, based on the site history.

Duplicate samples will be preserved, packaged, and sealed in the same manner as other samples of the same matrix. A separate sample number will be assigned to each duplicate, and it will be submitted blind to the laboratory.

9.2 Background Samples

Background sediment, groundwater, and surface water samples will be collected to differentiate between on-site and off-site contributions to contamination. Background samples listed in Tables 5-1, 5-2, and 5-3 will be collected from the locations shown in Figure 4-1.

The background sediment samples will be submitted blind to the laboratory for total metals analysis via CLPAS ILM04.1; for VOC, SVOC, and pesticide/PCB analysis via CLPAS OLM04.2; and for hexavalent chromium analysis via USEPA Method 7196. The background groundwater and surface water samples will be submitted blind to the laboratory for total metals analysis via CLPAS ILM04.1; for VOC, SVOC, and pesticide/PCB analysis via CLPAS OLM04.2, and for hexavalent chromium analysis via USEPA Method 218.6.

9.3 Laboratory Quality Control Samples

A laboratory QC sample, called an MS/MD for inorganic analysis and an MS/MSD for organic analysis, is not an extra sample; rather, it is a sample that requires additional QC analyses. Double volumes of sediment, groundwater, and surface water samples will be collected at one assigned location for each matrix type for total metals and hexavalent chromium analyses to ensure sufficient volume is collected for both routine sample analysis and additional laboratory QC analysis. Triple volumes of groundwater and surface water samples will be collected at one assigned location for each matrix type for VOC, SVOC, and pesticide/PCB analysis to ensure sufficient volume for both routine sample analysis and additional laboratory QC analysis. Triple volumes of a soil sample collected at one location will be collected for VOC and SVOC analysis to ensure sufficient volume for both routine sample analysis and additional laboratory QC analysis. Additional sample volume is not necessary for sediment samples requiring pesticide/PCB analysis.

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At a minimum, one laboratory QC sample is required per 14 days of sampling or one per 20 samples (including blanks and duplicates), whichever is greater. If the sample event lasts longer than 14 days or involves collection of more than 20 samples per matrix, additional QC samples will be designated.

For this sampling event, samples collected at the locations indicated in Tables 5-1, 5-2, and 5-3 will be the designated laboratory QC samples. These locations were chosen because they were expected to contain detectable levels of contamination, based on the site history. The chain-of-custody records for these samples will identify them as laboratory QC samples.

9.4 Analytical and Data Package Requirements

It is required that all samples be analyzed in accordance with the methods listed in Tables 5-1, 5-2, and 5-3. The laboratory is required to supply documentation to demonstrate that their data meet the requirements specified in the method.

The data validation package shall include all original documentation generated in support of this project. In addition, the laboratory will provide original documentation to support that all requirements of the methods have been met. This includes, but is not limited to, sample tags, custody records, shipping information, sample preparation/extraction records, and instrument printouts such as mass spectra. Copies of information and documentation required in this document are acceptable. The following deliverables are required. Note that the following data requirements are included to specify and emphasize general documentation requirements and are not intended to supersede or change requirements of each method.

- Copy of the chain of custody, sample log-in records, and a Case Narrative describing the analyses and methods used and discussing the presence or any interferences, the criteria used to identify tentatively identified compounds (TICs), and the failure of the lab to meet any of the requirements or re-analyses.
- Analytical data (results) up to 3 significant figures for all samples, method blanks, MS/MSD, Laboratory Control Samples (LCS), duplicates, and field QC samples.
- QC summary sheets: USEPA CLP forms that summarize the following
  1. MS/MSD/LCS recovery summary
  2. Method/preparation blank summary
  3. Initial and continuing calibration summary (including retention time windows)
  4. Sample holding time and analytical sequence (i.e., extraction and analysis)
  5. Calibration curves and correlation coefficients
  6. Duplicate summary
  7. Detection limit information
- Analyst bench records describing dilution, weighing of samples, percent moisture (solids), sample size, sample extraction and cleanup, final extract volumes and amount injected.
- Detailed explanation of the quantitation and identification procedure used for specific analyses, giving examples of calculations from the raw data.
- The final deliverable report will consist of sequentially numbered pages.
- Internal/surrogate recoveries
- Gas Chromatograph/Mass Spectrometer (GC/MS) tuning conditions.
- Reconstructed ion current chromatogram and quantitation reports for all sample standards, blanks, MS/MSD, and PE samples.
- For every compound identified and each field sample, provide raw versus enhanced spectra and enhanced versus reference spectra.
- For target analytes, the reference spectrum shall be the check standard for that sample. For TICs, the reference mass spectrum shall be the best fit spectrum from a search of the spectral library.
- Confirmation analysis data - second column confirmation required for all TICs. Provide all associated raw data and summary sheets for the confirmation analyses.

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9.5 Data Validation

Data validation of analytical data generated by the CLP may be performed at the USEPA SAM's request after review of the data. If data validation is requested by the USEPA SAM, the USEPA QAO will perform Tier 3 validation in accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review.* Tier 3 validation will be performed because the data will be used for the HRS and to determine whether the site will be added to the National Priorities List. Upon completion of validation, data will be classified as one of the following: acceptable for use without qualifications, acceptable for use with qualifications, or unacceptable for use.

9.6 Field Variances

As conditions in the field may vary, it may become necessary to implement minor modifications to this plan. When appropriate, the USEPA QAO will be notified of the modifications and a verbal approval will be obtained before implementing the modifications. Modifications to the original plan will be documented in the final report.

9.7 Assessment of Project Activities

9.7.1 WESTON Assessment Activities

The following assessment activities will be performed by WESTON:

- All project deliverables (SAP, Data Summaries, Data Validation Reports, Investigation Report) will be peer reviewed prior to release to the USEPA. In time-critical situations, the peer review may be concurrent with the release of a draft document to the USEPA. Errors discovered in the peer review process will be reported by the reviewer to the originator of the document, who will be responsible for corrective action.
- The WESTON PM will review project documentation (logbooks, chain of custody forms, etc.) to ensure the SAP was followed and that sampling activities were adequately documented. The PM will document deficiencies and will be responsible for corrective actions.

9.7.2 USEPA Assessment Activities

USEPA assessment activities, which can include surveillance, management system reviews, readiness reviews, technical system audits, performance evaluation, and audits and assessments of data quality, have not been formally identified to WESTON by the USEPA at the time of completion of the SAP.

9.7.3 Project Status Reports to Management

It is standard procedure for the WESTON PM to report to the USEPA SAM any issues, as they occur, that arise during the course of the project that could affect data quality, data use objectives, the project objectives, or project schedules.

9.7.4 Reconciliation of Data with DQOs

Assessment of data quality is an ongoing activity throughout all phases of a project. The following outlines the methods to be used by WESTON for evaluating the results obtained from the project.

- Review of the DQO outputs and the sampling design will be conducted by the WESTON PM and the USEPA QAO prior to sampling activities. The reviewer will submit comments to the WESTON PM for action, comment, or clarification. This process will be iterative.

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- A preliminary data review will be conducted by WESTON. The purpose of this review is to look for problems or anomalies in the implementation of the sample collection and analysis procedures and to examine QC data for information to verify assumptions underlying the DQOs and the SAP. When appropriate to sample design, basic statistical quantities will be calculated and the data will be graphically represented.
- When appropriate to the sample design and if specifically tasked to do so by the USEPA SAM, WESTON will select a statistical hypothesis test and identify assumptions underlying the test.
- When appropriate to the sample design and if specifically tasked to do so by the USEPA SAM, WESTON will examine the underlying assumptions of the statistical hypothesis test in light of the environmental data. This will be accomplished by determining the approach for verifying assumptions, performing tests for assumptions, and determining corrective actions.

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10.0 REFERENCES

1. Michael Brandman Associates, Laytonville Landfill Closure Project, September 30, 1996.

2. Cayler, Paul, Mendocino County Solid Waste Division, Memorandum to Members of the Board of Supervisors, January 26, 2001.

3. Barnett, Sandra, Cahto Tribe, Letter to Raho Ortiz, EPA Region IX, September 14, 2001.

4. Walker, Scott, California Integrated Waste Management Board, Letter to Paul Caylor, Mendocino County Solid Waste Division, March 22, 2001.

5. Cayler, Paul, Mendocino County Solid Waste Division, Laytonville Solid Waste Disposal Facility, Leak Detection, Quarterly Monitoring Report, 4th Quarter (October through December), 2000.

6. Cayler, Paul, Mendocino County Solid Waste Division, Laytonville Solid Waste Disposal Facility, Leak Detection, Quarterly Monitoring Report, 1st Quarter (January through March), 2001.

7. Abajian, Paula, Roy F. Weston, Inc., Inter-Agency Site Reconnaissance Interview and Observations Report, Laytonville Dump, December 10 and 11, 2001.

8. Cayler, Paul, Mendocino County Solid Waste Division, Laytonville Solid Waste Disposal Facility, Leak Detection, Quarterly Monitoring Reports, 1st Quarter 1990 through 4th Quarter 2000.

9. SHN Consulting Engineers & Geologists, Laytonville Solid Waste Disposal Site, Report of Waste Discharge, November, 1991.

10. Cayler, Paul, Mendocino County Solid Waste Division, Letter (with attachments) to Mr. and Mrs. Shields, September 8, 1997.

11. Cayler, Paul, Mendocino County Solid Waste Division, Facsimile of analytical data for domestic drinking water wells to Paula Abajian, Roy F. Weston, Inc., July 26, 2001.

12. U.S. Environmental Protection Agency, Letter to Tom Unsell, California Integrated Waste Management Board (CIWMB), November 9, 1993.

13. Rivera, Luis G., California Regional Water Quality Control Board (RWQCB), North Coast Region, Letter to Bill and Florence Bowler, September 17, 1993.

14. U.S. Geologial Survey, Cahto Peak Quadrangle, California, 7.5 Minute Series (topographic), Photorevised 1988, Edited 1988.

15. Cayler, Paul, Mendocino County Solid Waste Division, Notice to agencies of Closure of the Laytonville Landfill, September 29, 1993.

16. Anderson, Robert, California Integrated Waste Management Board (CIWMB), Closure and Remediation Branch, Site Assessment Data Form (with attachment), October 6, 1993.

17. Wolbach, C. D., County of Mendocino Air Quality Management District, Memorandum, Subject: Investigation for VOC emissions at Laytonville Landfill 6/8 and 6/14/00.

18. Gasch, Jerrie W., et. al., Gasch & Associates, Letter to Mr. Umbrello and Ms. Barnett (Cahto Tribe, Laytonville Rancheria) Re: Groundwater Geophysical Exploration at the Laytonville Rancheria, May 15, 2000.

ED_013162_00000569-00455

19. CLS Labs, Analytical Results Summary, May 31, 2001.

20. U.S. Environmental Protection Agency, Superfund Chemical Data Matrix (SCDM), Publication 9345.1-21, June 1996.

21. Smucker, S. J., U.S. Environmental Protection Agency, Region IX, Preliminary Remediation Goals, November 1, 2000.

22. Gable, Scott, SECOR International, Inc., Sampling results received electronically, December 7, 2001.

23. Taylor, David, U.S. Environmental Protection Agency, Region IX, Quality Assurance Office, Telephone conversation recorded on Contact Report by Paula Abajian, Roy F. Weston, Inc., December 27, 2001.

24. Cayler, Paul, Mendocino County Solid Waste Division, Facsimile regarding Mendocino county's quarterly monitoring events to Paula Abajian, Roy F. Weston, Inc., January 4, 2002.

25. Barnett, Sandra, Cahto Tribe, Laytonville Rancheria, electronic mail to Paula Abajian, Roy F. Weston, Inc., January 26, 2002.

26. White, David, Laytonville Water District, District Manager, Telephone conversation recorded on Contact Report by Paula Abajian, Roy F. Weston, Inc., August 28, 2001.

27. Cayler, Paul, Mendocino County Solid Waste Division, Memorandum to Jeff Inglis, U.S. Environmental Protection Agency, June 10, 2002.

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4727

LAYTONVILLE DUMP CAD000[redacted]5532

Latitude: 39 40 21 Longitude: 123 30 24, LAYTONVILLE

EPA Region 9 GIS Center

PRODUCED BY: USEPA Region 9 GIS Center

DATE: May 23, 2003

SOURCES:

Population Density:
PL94-171, Bureau of the Census, 2000 Census

Drinking Water Supply:
California Dept. of Health, 1998

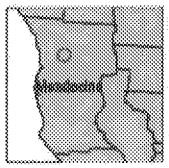
Endangered/Threatened Species:
Natural Diversity Database, Ca. Dept. of Fish & Game, 2002

▲ Drinking Water Supply Wells

● Threatened and Endangered Species

Population Density per Square Mile by Census Block

- 0
- < 1000
- 1001-5000
- 5001-15,000
- 15,001-30,000
- > 30,000



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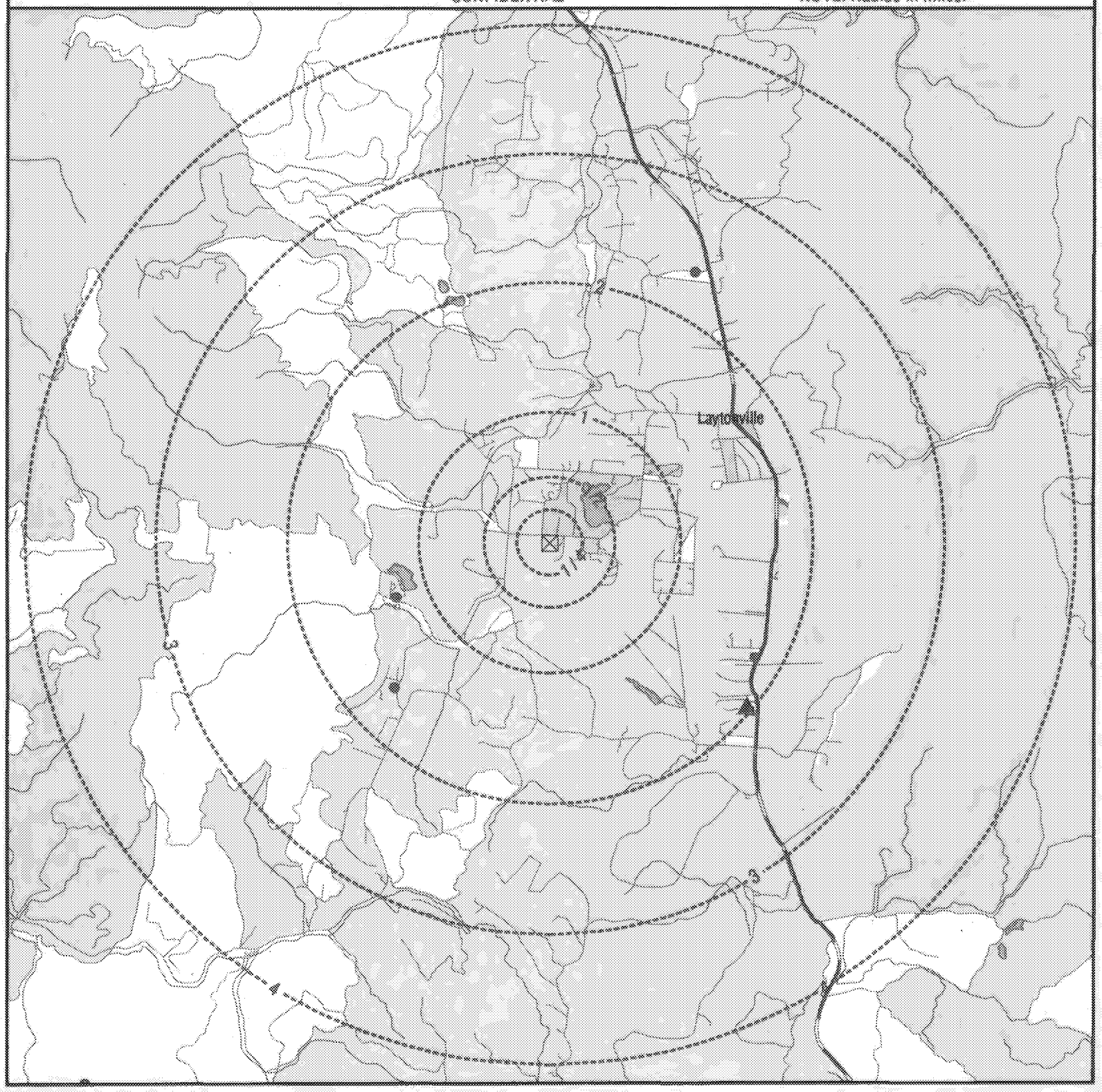
NOTE: Radius in Miles.



SITE REPORT FOR STATE OF CALIFORNIA
May 23, 2003

Site Name: LAYTONVILLE DUMP 'CAD000065532'

LAYTONVILLE
Latitude: 39 40 21 Longitude: 123 30 24

Sources:

Population Density: PL94-171, US Bureau of the Census (2000 Census)
Endangered Species: Natural Diversity Database, California Dept. of Fish & Game 2002
(CONFIDENTIAL) Drinking Water Supply Wells: Water Quality Monitoring Database, California Dept. of Health Services, 1998

****
SITE POPULATION SUMMARY:
****

RADIUS DISTANCE FROM SOURCE	CUMULATIVE POPULATION
1/4 Mile	71
1/2 Mile	350
1 Mile	869
2 Mile	1534
3 Mile	1866
4 Mile	2044
5 Mile	2151
10 Mile	2811
15 Mile	4149

****
DRINKING WATER WELLS:
****

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WELL NO. WELL NAME OWNER-USER LATITUDE LONGITUDE
.....
- WATER SOURCE POPULATION SERVED WELL TYPE WELL STATUS

1/4 Mile Radius from Site

1/4 to 1/2 Mile Radius from Site

1/2 to 1 Mile Radius from Site
---

1 to 2 Mile Radius from Site

2300707001,WELL 01,OUTPOST MOTEL,393922 1232837
- Groundwater 0, WELL/AMBNT/MUN/INTAKE,ACTIVE RAW

2 to 3 Mile Radius from Site

---

3 to 4 Mile Radius from Site

---

4 to 5 Mile Radius from Site

---

5 to 10 Mile Radius from Site

---

10 to 15 Mile Radius from Site

****

ENDANGERED SPECIES:

****

SPECIES COUNT	LAST OBSERVATION DATE	COMMON NAME	SCIENTIFIC NAME

1/4 Mile Radius from Site

1/4 to 1/2 Mile Radius from Site

1/2 to 1 Mile Radius from Site

---

1 to 2 Mile Radius from Site

NONE

1	1984	'BAKER''S MEADOWFOAM'	limnanthes bakeri
1	0	NARROW-LEAVED WATER-PLANTAIN	alisma gramineum
1	1900	NORTH COAST SEMAPHORE GRASS	pleuropogon hooverianus
1	1980	'NUTTALL''S PONDWEED'	potamogeton epihydrus ssp nuttallii

---

2 to 3 Mile Radius from Site

NONE

1	1991	'BAKER''S MEADOWFOAM'	limnanthes bakeri

---

3 to 4 Mile Radius from Site

---

4 to 5 Mile Radius from Site

---

5 to 10 Mile Radius from Site

```
THREATENED
  10  1990 NORTHERN SPOTTED OWL                                strix occidentalis
caurina

NONE
   9  1997 SOUTHERN TORRENT (=SEEP) SALAMANDER                rhyacotriton
variegatus
   2  1994 TAILED FROG                                        ascaphus truei
   6  1985 FOOTHILL YELLOW-LEGGED FROG                        rana boylii
   1  1977 NORTHERN GOSHAWK                                   accipiter gentilis
  11  1996 RED TREE VOLE                                      arborimus pomo
   2  1988 NORTHWESTERN POND TURTLE                           clemmys marmorata
marmorata
   1  1989 NORTH CENTRAL COAST FALL-RUN STEELHEAD STREAM north central coast
fall-run steelhead stream
   1  1981 UPLAND DOUGLAS FIR FOREST                          upland douglas fir
forest
   1  2001 HUMBOLDT MILK-VETCH                                astragalus agnicidus
   1  1899 'BAKER''S NAVARRETIA'                              navarretia
leucocephala ssp bakeri
   1  1957 THIN-LOBED HORKELIA                                horkelia tenuiloba
   1  1999 NORTH COAST SEMAPHORE GRASS                        pleuropogon
hooverianus
```

---

10 to 15 Mile Radius from Site

```
THREATENED
  23  1991 NORTHERN SPOTTED OWL                                strix occidentalis
caurina

NONE
   7  1998 SOUTHERN TORRENT (=SEEP) SALAMANDER                rhyacotriton
variegatus
   3  1994 TAILED FROG                                        ascaphus truei
   3  1999 FOOTHILL YELLOW-LEGGED FROG                        rana boylii
  10  1997 RED TREE VOLE                                      arborimus pomo
   1     0 NORTHWESTERN POND TURTLE                           clemmys marmorata
marmorata
   1  1981 UPLAND DOUGLAS FIR FOREST                          upland douglas fir
forest
   1  2001 LONG-BEARD LICHEN                                  usnea longissima
   5  2001 HUMBOLDT MILK-VETCH                                astragalus agnicidus
   1  1986 'MILO BAKER''S LUPINE'                             lupinus milo-bakeri
   2  2001 MAPLE-LEAVED CHECKERBLOOM                          sidalcea malachroides
```

3	2001	LEAFY-STEMMED MITREWORT	mitella caulescens
1	1980	MENDOCINO COAST INDIAN PAINTBRUSH	castilleja mendocinensis
1	0	NARROW-LEAVED WATER-PLANTAIN	alisma gramineum

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***** PREDECISIONAL DOCUMENT *****

SUMMARY SCORESHEET FOR COMPUTING PROJECTED HRS SCORE

SITE NAME: Laytonville Dump
CITY: Laytonville **COUNTY:** Mendocino
EPA ID #: CAD000065532 **EVALUATOR:** Paula Jean Abajian
PROGRAM ACCOUNT #: **DATE:** May 1, 2003
LAT/LONG: 39°40'21" / 123°40'21"
THIS SCORESHEET IS FOR A **PA:** **SI:**
OTHER: PA/SI

RCRA STATUS (check all that apply):

- ____ Generator
- ____ Transporter
- ____ TSDF
- X Not Listed in RCRA Database as of (Date): 8/30/2001

STATE SUPERFUND STATUS:

- ____ DTSC CalSites (AWP, BKLG, ERAP, or VCP) (Date):
- ____ WQARF (Date):
- X No State Superfund Status (Date): FY 00-01

	S Pathway	S^2 Pathway
Groundwater Migration Pathway Score (Sgw)	4.47	19.96
Surface Water Migration Pathway Score (Ssw)	*	*
Soil Exposure Pathway Score (Ss)	*	*
Air Migration Pathway Score (Sa)	*	*
$(S_{gw}^2 + S_{sw}^2 + S_{ss}^2 + S_{am}^2)$		19.96
$(S_{gw}^2 + S_{sw}^2 + S_{ss}^2 + S_{am}^2) / 4$		4.99
$\sqrt{(S_{gw}^2 + S_{sw}^2 + S_{ss}^2 + S_{am}^2) / 4}$		2.23

* Pathway evaluated, but not assigned a score (explain):

Surface Water Migration: Surface runoff from the site enters Cahto Creek, which is approximately 800 feet to the south of the site. Cahto Creek does not flow perennially and Laytonville receives more than 20 inches of annual rainfall.

Soil Exposure and Air Migration: A locked gate bars road access to the site and the former disposal area is surrounded by a maintained chain-link fence. In addition, a Type-D engineered cover was constructed over the 7-acre disposal area in 1997. There are no residences, schools, daycare centers, or terrestrial sensitive environments on the site.

GROUNDWATER MIGRATION PATHWAY SCORESHEET

Likelihood of Release	Maximum Value	Score	Rationale	Data Quality
1. Observed Release	550	550	1	H
2. Potential to Release				
2a. Containment	10			
2b. Net Precipitation Value	10			
2c. Depth to Aquifer Value	5			
2d. Travel Time	35			
2e. Potential to Release [lines 2a x (2b+2c+2d)]	500			
3. Likelihood of Release (line 1 or 2e)	550	550		
Waste Characteristics				
4. Toxicity/Mobility	(a)	100	2	H
5. Hazardous Waste Quantity	(a)	10	3	M
6. Waste Characteristics (lines 4 x 5, then use Table 2-7)	100	6		
Targets				
7. Nearest Well Value	50	20	4	H
8. Population				
8a. Level I Concentrations	(b,c)	0	5	H
8b. Level II Concentrations	(b,c)	0	5	H
8c. Potential Contamination	(b,c)	82	6	H
8d. Population (lines 8a+8b+8c)	(b)	82		
9. Resources	5	5	7	E
10. Wellhead Protection Area	20	5	8	H
11. Targets (lines 7+8d+9+10)	(b)	112		
Aquifer Score				
12. Aquifer Score [(lines 3 x 6 x 11)/82500, Subject to a Maximum of 100]	100	4.47		

GROUNDWATER MIGRATION PATHWAY SCORE

13. Pathway Score (Sgw) (Highest score from line 12 for all aquifers evaluated, subject to a maximum of 100)	100	4.47

(a) Maximum value applies to waste characteristics category.
(b) Maximum value not applicable.
(c) Value computed on attached calculation sheet.

AQUIFER EVALUATED Interconnected aquifers

GROUNDWATER PATHWAY CALCULATIONS FOR POPULATION

ACTUAL CONTAMINATION

Well Identifier	Contaminant Detected	Contaminant Concentration (Note Units)	Benchmark (Note Units)	Level Multiplier* (A)	Apportioned Population Well Serves (B)	Actual Contamination Factor (A x B)
						0
					SUM LEVEL I CONCENTRATIONS	0
					SUM LEVEL II CONCENTRATIONS	0

*** Level Multipliers:**
Level I = 10.
Level II = 1.

POTENTIAL CONTAMINATION

Distance Ring (Miles)	Number of Wells Within Distance Ring	Population Served by Wells Within Distance Ring	Distance Weighted Population Values (Table 3-12)
0.00 to 0.25	7	16	17
>0.25 to 0.50	25	59	33
>0.50 to 1.00	5	12	5
>1.00 to 2.00	4	2,007	294
>2.00 to 3.00	0		
>3.00 to 4.00	0		
		SUM	349
		POTENTIAL CONTAMINATION: SUM/10	81.7

AQUIFER EVALUATED Interconnected Aquifers

****CONFIDENTIAL****
****PREDECISIONAL DOCUMENT****

HRS RATIONALE

Laytonville Dump Site
EPA ID #CAD000065532

1. The Laytonville Dump site is located near Laytonville in Mendocino County, California. The site is owned by the Mendocino County Solid Waste Division and consists of a 7-acre former disposal area. Associated with the site are four sedimentation ponds, a leachate collection system, and five groundwater monitoring wells.

The landfill operated under a Class II permit from 1967 until 1993. During operations, the Laytonville Dump facility was permitted to only accept non-hazardous municipal waste; however, there are allegations that materials containing hazardous substances, such as PCBs, hexavalent chromium, and photographic chemicals, were illegally disposed of at the site. An engineered cover was constructed over the landfill in 1997. It appears that there were flaws in the construction and leachate containing volatile organic compounds (VOCs) was identified at the landfill. During heavy precipitation, the four site-related sedimentation ponds overflow and drain through the adjacent Laytonville Rancheria and toward Cahto Creek. Cahto Creek flows through the adjacent Laytonville Rancheria and serves as a fishery to residents of the Rancheria.

There are several active private drinking water wells near the site and a municipal drinking water supply well approximately 1.5 miles east of the site. Residents in the vicinity of the site, including the adjacent Laytonville Rancheria, have raised concerns about the potential migration of contaminants from the landfill to drinking water wells and surface water.

Validated analytical results from the November 2002 Preliminary Assessment/Site Inspection (PA/SI) sampling effort indicate that a release of VOCs from the site to groundwater has occurred. These selected results are shown in Table 1.

Table 1
Sampling Results Establishing a Release of VOCs to Groundwater
(results significantly above background are bolded and underlined)

Well ID	Sample Date	Groundwater Level (feet amsl)	Chloromethane (ug/L)	Dichlorodifluoromethane (ug/L)	1,1-Dichloroethene (ug/L)
Background Wells					
LD-SWP-W1	11/6/02	NA	ND	ND	ND

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LD-SEP-W1	11/6/02	NA	ND	ND	ND
LD-PW-4	11/6/02	NA	ND	ND	ND
Hydraulically Downgradient Site-Related Monitoring Wells					
LD-MW-90-1	11/5/02	1738.85	ND	ND	ND
LD-MW-91-1	11/5/02	1697.2	ND	ND	**0.1J**
LD-MW-93-1	11/5/02	1727.3	**0.3J**	**0.2J**	ND
LD-MW-93-2	11/5/02	1738.65	ND	ND	ND
LD-MW-94-1	11/5/02	1723.81	ND	ND	ND
Health-based Benchmarks:			80	7,300	6
			EPA MCL	SCDM RDSC	CDHS MCL

amsl = above mean sea level
ug/L = micrograms per liter (parts per billion)
NA = not available
ND = not detected

EPA MCL = EPA Maximum Contaminant Level
SCDM RDSC = Superfund Chemical Data Matrix Reference Dose Screen Concentration
CDHS MCL = California Department of Health Services Maximum Contaminant Level

References:

Michael Brandman Associates, Laytonville Landfill Closure Project, September 30, 1996.

Cayler, Paul, Mendocino County Solid Waste Division, Memorandum to Members of the Board of Supervisors, January 26, 2001.

Barnett, Sandra, Cahto Tribe, Letter to Raho Ortiz, EPA Region IX, September 14, 2001.

Walker, Scott, California Integrated Waste Management Board, Letter to Paul Caylor, Mendocino County Solid Waste Division, March 22, 2001.

Cayler, Paul, Mendocino County Solid Waste Division, Laytonville Solid Waste Disposal Facility, Leak Detection, Quarterly Monitoring Report, 4th Quarter (October through December), 2000.

Cayler, Paul, Mendocino County Solid Waste Division, Laytonville Solid Waste Disposal Facility, Leak Detection, Quarterly Monitoring Report, 1st Quarter (January through March), 2001.

Abajian, Paula, Roy F. Weston, Inc., Inter-Agency Site Reconnaissance Interview and Observations Report, Laytonville Dump, December 10 and 11, 2001.

SHN Consulting Engineers & Geologists, Laytonville Solid Waste Disposal Site, Report of Waste Discharge, November, 1991.

White, David, Laytonville Water District, District Manager, Telephone conversation recorded on Contact Report by Paula Abajian, Roy F. Weston, Inc., August 28, 2001.

Barnett, Sandra, Cahto Tribe, Laytonville Rancheria, electronic mail to Paula Abajian, Roy F. Weston, Inc., January 26, 2002.

U.S. Environmental Protection Agency, Letter to Tom Unsell, California Integrated Waste Management Board (CIWMB), November 9, 1993.

Rivera, Luis G., California Regional Water Quality Control Board (RWQCB), North Coast Region, Letter to Bill and Florence Bowler, September 17, 1993.

2. Results from the November 2002 PA/SI sampling effort indicate that significant concentrations of chloromethane, dichlorodifluoromethane, and 1,1-dichloroethene are present in hydraulically downgradient, site-related monitoring wells. Table 2 presents the toxicity and mobility values associated with each of these hazardous substances. A toxicity/mobility factor value of 100 is assigned based on the presence of 1,1-dichloroethene in groundwater.

Table 2
Toxicity/Mobility Factor Values

Hazardous Substance	Toxicity	Mobility	Toxicity/Mobility
Chloromethane	10	1	10
Dichlorodifluoromethane	10	1	10
1,1-Dichloroethene	100	1	100

References:

U.S. Environmental Protection Agency, Superfund Chemical Data Matrix (SCDM), Publication 9345.1-21, June 1996.

3. In accordance with HRS Section 2.4.2.2, a minimum waste quantity value of 10 is assigned because no Level I nor Level II concentrations are documented and the hazardous constituent quantity is not adequately determined.

4. No Level I nor Level II concentrations are documented and the nearest drinking water well is located less than 0.25 mile from the site. In accordance with HRS Section 3.3.1 and HRS Table 3-11, a nearest well factor value of 20 is assigned.

5. During the November 2002 PA/SI sampling effort, analytes attributable to the site were not detected at concentrations significantly above background in drinking water wells located hydraulically downgradient of the site. The only analytes that were detected at concentrations significantly above background, and are attributable to the site, are those detected in three of the site-related monitoring wells and indicated in Table 1. These analytes do not exceed health-based benchmarks.

References

U.S. Environmental Protection Agency, Superfund Chemical Data Matrix (SCDM), Publication 9345.1-21, June 1996.

6. There may be up to 40 residences operating private drinking water wells in the vicinity of the site. The county multiplier is 2.34. Ten private drinking water wells were sampled during the November 2002 PA/SI sampling effort. Based on the locations of residences near the site, and with regards to being environmentally conservative, it is estimated that there are 7 drinking wells located 0 - 0.25 mile from the site, 25 drinking wells located 0.25 - 0.5 mile

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from the site, 5 drinking wells located 0.5 - 1 mile from the site, and 3 drinking wells located 1- 2 miles from the site.

The Laytonville Water District operates one drinking water supply well that serves approximately 2,000 people. Currently, the Laytonville Water District obtains all of its drinking water from this one groundwater well. This well is located approximately 1.25 miles east of the site.

According to HRS Table 3-12, the Distance-Weighted Population value is 82.

References:

White, David, Laytonville Water District, Telephone conversations recorded on Contact Report by Paula Abajian, Weston Solutions, Inc., dated 8/28/01, 11/14/01, 11/28/01, and 5/20/01.

U.S. Census Bureau, Population, Housing Units, Area, and Density: 2000, http://factfinder.census.gov, data extracted May 21, 2003.

U.S. Environmental Protection Agency, Region IX Geographical Information Systems (GIS) Center, June 22, 2001.

7. The site is located in a rural area and it is very likely that neighboring properties use groundwater for commercial livestock watering.

8. The Laytonville Water District's municipal supply well is identified as a Wellhead Protection Area. No other Wellhead Protection Areas in the area are identified. A Wellhead Protection factor value of 5 is assigned.

Reference:

Department of Health Services, Drinking Water Source Assessment and Protection, Assessments by County Received Through Friday, May 16, 2003, accessed at http://www.dhs.ca.gov/ps/ddwem/ on May 22, 2003.

LAYTONVILLE DUMP CAD00[redacted]65532

Latitude: 39 40 21 Longitude: 123 30 24, LAYTONVILLE

EPA Region 9 GIS Center

PRODUCED BY: USEPA Region 9 GIS Center

DATE: May 23, 2003

SOURCES:

Population Density:
PL94-171, Bureau of the Census, 2000 Census

Drinking Water Supply:
California Dept. of Health, 1998

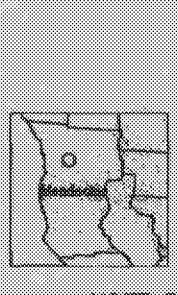
Endangered/Threatened Species:
Natural Diversity Database, Ca. Dept. of Fish & Game, 2002

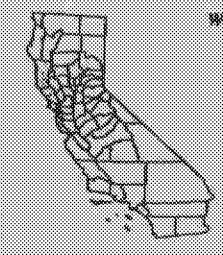
▲ Drinking Water Supply Wells

● Threatened and Endangered Species

Population Density per Square Mile by Census Block

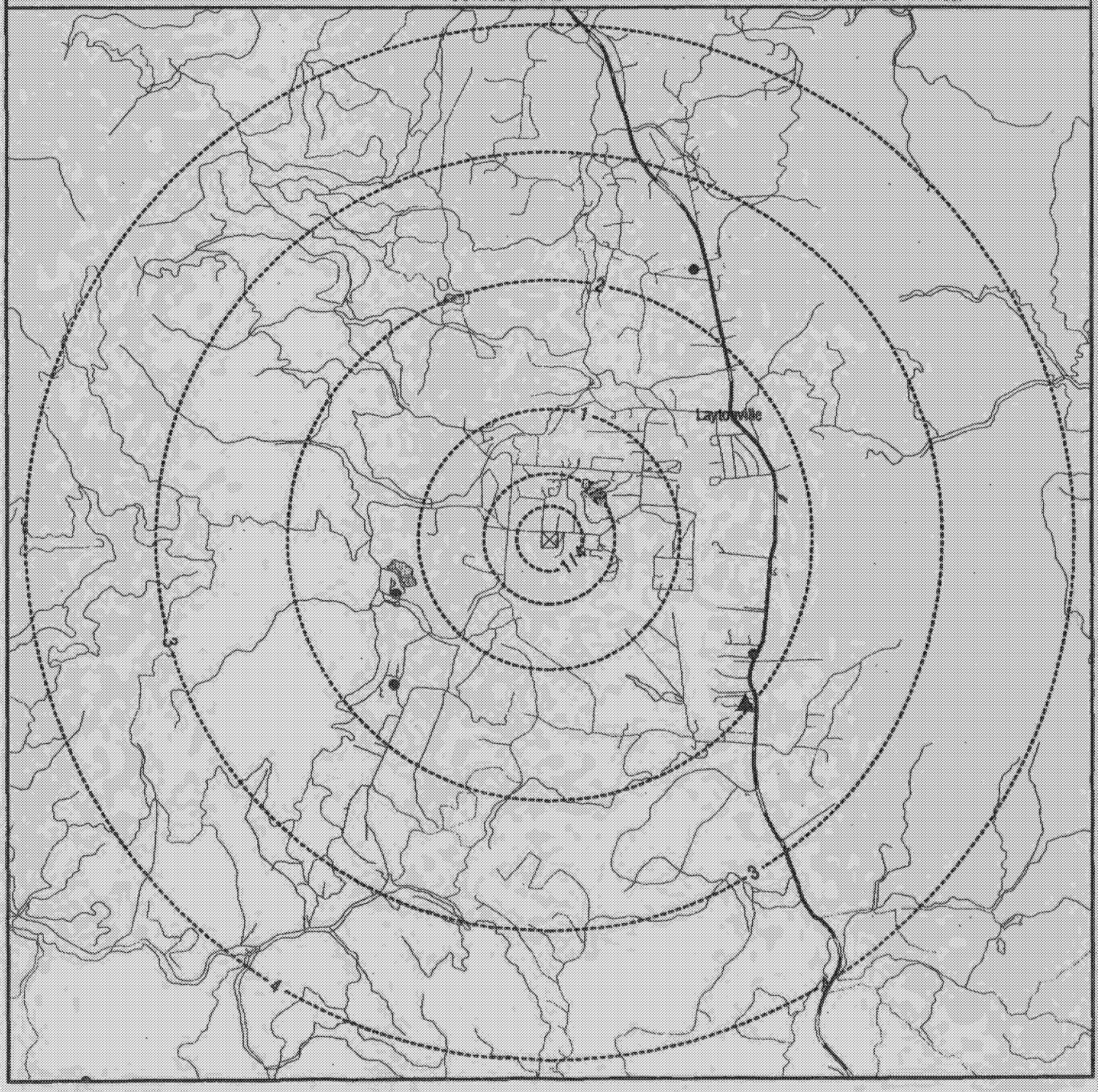
- 0
- < 1000
- 1001-5000
- 5001-15,000
- 15,001-30,000
- > 30,000





CONFIDENTIAL

NOTE: Radius in Miles.



SITE REPORT FOR STATE OF CALIFORNIA
May 23, 2003

Site Name: LAYTONVILLE DUMP 'CAD00065532'

LAYTONVILLE
Latitude: 39 40 21 Longitude: 123 30 24

Sources:

Population Density: PL94-171, US Bureau of the Census (2000 Census)
Endangered Species: Natural Diversity Database, California Dept. of Fish & Game 2002
(CONFIDENTIAL) Drinking Water Supply Wells: Water Quality Monitoring Database, California Dept. of Health Services, 1998

****
SITE POPULATION SUMMARY:
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RADIUS DISTANCE FROM SOURCE	CUMULATIVE POPULATION
1/4 Mile	71
1/2 Mile	350
1 Mile	869
2 Mile	1534
3 Mile	1866
4 Mile	2044
5 Mile	2151
10 Mile	2811
15 Mile	4149

****
DRINKING WATER WELLS:
****

CONFIDENTIAL
WELL NO. WELL NAME OWNER-USER LATITUDE LONGITUDE
.....
- WATER SOURCE POPULATION SERVED WELL TYPE WELL STATUS

1/4 Mile Radius from Site

1/4 to 1/2 Mile Radius from Site

1/2 to 1 Mile Radius from Site
---

1 to 2 Mile Radius from Site

2300707001,WELL 01,OUTPOST MOTEL,393922 1232837
- Groundwater 0, WELL/AMBNT/MUN/INTAKE,ACTIVE RAW

2 to 3 Mile Radius from Site

3 to 4 Mile Radius from Site

4 to 5 Mile Radius from Site

5 to 10 Mile Radius from Site

10 to 15 Mile Radius from Site

****

ENDANGERED SPECIES:

****

SPECIES COUNT	LAST OBSERVATION DATE	COMMON NAME	SCIENTIFIC NAME

1/4 Mile Radius from Site

1/4 to 1/2 Mile Radius from Site

1/2 to 1 Mile Radius from Site

1 to 2 Mile Radius from Site

NONE

1	1984	'BAKER''S MEADOWFOAM'	limnanthes bakeri
1	0	NARROW-LEAVED WATER-PLANTAIN	alisma gramineum
1	1900	NORTH COAST SEMAPHORE GRASS	pleuropogon hooverianus
1	1980	'NUTTALL''S PONDWEED'	potamogeton epihydrus ssp nuttallii

2 to 3 Mile Radius from Site

NONE

1	1991	'BAKER''S MEADOWFOAM'	limnanthes bakeri

3 to 4 Mile Radius from Site

4 to 5 Mile Radius from Site

5 to 10 Mile Radius from Site

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THREATENED
  10  1990 NORTHERN SPOTTED OWL                                  strix occidentalis
caurina

NONE
   9  1997 SOUTHERN TORRENT (=SEEP) SALAMANDER                   rhyacotriton
variegatus
   2  1994 TAILED FROG                                           ascaphus truei
   6  1985 FOOTHILL YELLOW-LEGGED FROG                           rana boylii
   1  1977 NORTHERN GOSHAWK                                      accipiter gentilis
  11  1996 RED TREE VOLE                                         arborimus pomo
   2  1988 NORTHWESTERN POND TURTLE                              clemmys marmorata
marmorata
   1  1989 NORTH CENTRAL COAST FALL-RUN STEELHEAD STREAM         north central coast
fall-run steelhead stream
   1  1981 UPLAND DOUGLAS FIR FOREST                             upland douglas fir
forest
   1  2001 HUMBOLDT MILK-VETCH                                   astragalus agnicidus
   1  1899 'BAKER''S NAVARRETIA'                                 navarretia
leucocephala ssp bakeri
   1  1957 THIN-LOBED HORKELIA                                   horkelia tenuiloba
   1  1999 NORTH COAST SEMAPHORE GRASS                           pleuropogon
hooverianus
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10 to 15 Mile Radius from Site

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THREATENED
  23  1991 NORTHERN SPOTTED OWL                                  strix occidentalis
caurina

NONE
   7  1998 SOUTHERN TORRENT (=SEEP) SALAMANDER                   rhyacotriton
variegatus
   3  1994 TAILED FROG                                           ascaphus truei
   3  1999 FOOTHILL YELLOW-LEGGED FROG                           rana boylii
  10  1997 RED TREE VOLE                                         arborimus pomo
   1     0 NORTHWESTERN POND TURTLE                              clemmys marmorata
marmorata
   1  1981 UPLAND DOUGLAS FIR FOREST                             upland douglas fir
forest
   1  2001 LONG-BEARD LICHEN                                     usnea longissima
   5  2001 HUMBOLDT MILK-VETCH                                   astragalus agnicidus
   1  1986 'MILO BAKER''S LUPINE'                                lupinus milo-bakeri
   2  2001 MAPLE-LEAVED CHECKERBLOOM                             sidalcea malachroides
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3	2001	LEAFY-STEMMED MITREWORT	mitella caulescens
1	1980	MENDOCINO COAST INDIAN PAINTBRUSH	castilleja mendocinensis
1	0	NARROW-LEAVED WATER-PLANTAIN	alisma gramineum