

Site Inspection Report
Kekaha Sugar Company, LTD
Kekaha, Kauai, Hawaii

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Acronyms

ACA	ammoniacal copper arsenate
ACZA	ammoniacal copper-zinc arsenate
AOC	area of concern
ARAR	applicable or relevant and appropriate requirements
AST	above ground storage tank
bgs	below ground surface
CADRE	Computer Aided Data Review and Validation
CCA	chromated copper arsenate
CEI	Compliance Evaluation Inspection
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, also known as the Superfund
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CLASS	Contact Laboratory Analytical Services Support
CLPAS	Contract Laboratory Protocol Analytical Services
COPC	compound of potential concern
CRQL	contract required quantitation limit
DI	de-ionized
DLNR	Department of Land and Natural Resources
DNAPL	dense, non-aqueous phase liquids
DoD	Department of Defense
DOH	Hawaii Department of Health
DQO	data quality objectives
EPA PRG	Environmental Protection Agency Preliminary Remediation Goal
EPA	Environmental Protection Agency
ER-1	Equipment Rinsate Blank
GAL	groundwater action level
HAR	Hawaii Administrative Rules
HDOA	Hawaii Department of Agriculture
HEER	Hazard Evaluation and Emergency Response
HNO ₃	nitric acid
HRS	Hawaii Revised Statutes
HRS	Hazard Ranking System
IDW	investigated-derived waste
JfB	Juacas loamy fine sand
KSC	Kekaha Sugar Company, LTD. Mill
mL	millileter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OERR	Office of Emergency and Remedial Response
OVM	organic vapor monitor
PA	preliminary assessment
PAH	polynuclear aromatic hydrocarbon
PCP	pentachlorophenol
PCS	petroleum contaminated soil
PPE	personal protective equipment

SECTION 1

INTRODUCTION

The U.S. Environmental Protection Agency (EPA), Region IX, 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), tasked the State of Hawaii Department of Health (DOH) to conduct a site inspection (SI) of the Kekaha Sugar Company, Ltd.(the Site), in Kekaha, Kauai, Hawaii.

The Kekaha Sugar Company, Ltd. (KSC) site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) in November 6, 2000 (HID00875203). The Site was entered into the CERCLIS based on the suspected release of contaminants from the following sources of contaminations: a) Kekeha Sugar mill which includes the former carpentry paint shop and potential sunblast area, open yard area of the mill, former electric shop, former metal, machine and automotive shops, drum storage area, former and bagasse house; b) Seed dipping plant; and the c) Settling Ponds. A preliminary assessment (PA) was completed for the EPA by the Hawaii DOH on November 16, 2001. The purpose of the PA was 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 investigation under CERCLA/SARA is warranted.

After reviewing the PA, the EPA decided that further investigation of the KSC site would be necessary to completely evaluate the site using the EPA Hazard Ranking System (HRS) criteria. The HRS assesses the relative threat associated with actual or potential releases of hazardous substances at the site. The HRS has been adopted by the EPA to help set priorities for 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 EPA may conduct remedial response actions. This report summarizes the results of the SI for the KSC site. The DOH conducted this field sampling effort to gather data as part of SI under the CERCLA. The SI builds upon the body of information developed during the Preliminary Assessment (PA) by verifying and substantiating data collected during the PA, collecting additional data through a site reconnaissance visit, and collecting physical environmental samples to analyze for the presence of hazardous substances.

The following are potential sources of contamination brought about by sugarcane production:

1. **Settling Pond.** There was approximately 10 acres of land used as a settling pond. The settling pond is located north of the Kekeha Sugar Mill. Wastewater coming from the sugar mill is pump into the settling pond and the effluent was used for irrigation.
2. **Carpenter and Paint Shop.** The shops are located north of the Kekeha Sugar Mill adjacent to the settling pond. The shops are housed in the same building structure and share a concrete pad. A wood drying rack is located at the north –west corner of the carpentry shop while potential sand blasting area was found approximately 20 yards north-east of the carpenter shop. The area around the carpenter shop is potentially contaminated with pentachlorophenol and dioxin.

3. **Former Kekaha Herbicide Mixing Plant.** The former herbicide mixing plant is located adjacent to the administration building. This herbicide mixing plant was reported to be in operation from the 1800 to 1960 before the herbicide mixing operation was transferred to Waiawa Valley. Analyses results of soil samples collected from the former herbicide mixing plant showed elevated levels of dioxins/furans, PCP, arsenic and other pesticides.
4. **Kekaha Sugar Mill.** The sugar mill includes the cane washing area, boiler plant, storage warehouse, molasses storage tanks, electrical shop, metal shop, drum storage area, and machine shop. The mill's laboratory facility is located inside the lime storage area of the boiler house. Drums labeled "used oil", and transformers labeled "non-PCB certified oil" are stored inside the boiler area. There are stained soils present all over the mill area.
5. **Automotive Shop.** The automotive shop is located to the west of the boiler plant. It includes a field equipment shop and a grease rack. Heavy petroleum odor and stain is present in the ground surrounding the grease rack.
6. **Seed Dipping Plant.** The seed dipping plant is located east of the Kekaha Sugar Mill. It is approximately 0.35 mile from the Pacific Ocean with a ground elevation of 57 feet. The seed dipping plant was closed in July 1999. There was sludge and stagnant water inside the tank.
7. **Mill Ditch.** The mill ditch is located in between the seed dipping plant and the Kekaha Sugar Mill. Surface runoff from the mill and from the seed dipping plant drains into the Mill Ditch and empties into the Pacific Ocean.

1.1 APPARENT PROBLEM

The apparent problems at the site, which contributed to the determination that an SI was necessary, are as follows:

- Pesticide contamination in the Former Herbicide Mixing Plant formerly located adjacent to the main office across from the Kekaha Sugar Mill. Previous investigations conducted at former herbicide mixing plants in Hawaii have shown elevated levels of pesticides, i.e., atrazine, PCP, dioxins and arsenic.
- Metal contamination in the seed dipping plant. Seed dipping plant located east of the Kekaha Sugar Mill, may have been impacted from the reported use of phenyl mercury acetate, which was used as a fungicide in the seed dipping process (1).
- Metal and pesticide contamination in the wastewater settling ponds located northeast of the Kekaha Sugar Mill.
- Soil staining and petroleum odors present at the vehicle maintenance building, particularly in the area of the lubricant rack.
- Runoff of oil and solvents from Automotive Shop that may have contaminated soils next to the vehicle maintenance building.
- Lead contamination from lead based paint formerly used at the KSC that may have caused widespread contamination throughout the site.
- Runoff water coming from the Seed Dipping Plant and from the mill drains into the mill ditch located in between the seed dipping plant and the Kekaha Sugar Mill. The water from the Mill Ditch empties into the Pacific Ocean. The Pacific Ocean serves as a fishery where fish and other

seafood are harvested and used for human consumption. This area is known to be a habitat for federally endangered and threatened animals and birds including the Hawaiian duck (*Anas wyvilliana*), Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian gallinule (*Gallinula chloropus sandvicensis*), humpback whale (*Megaptera novaeangliae*), Hawaiian monk seal (*Monachus schauinslandi*), hawksbill turtle (*Eratmochlelys imbricata*), and green sea turtle (*Chelonia mydas*) (2).

SECTION 2

SITE DESCRIPTION

2.1 LOCATION

Kekaha, known as the gateway to the Grand Canyon of the Pacific is situated at Latitude: 159 Degrees, 43 Minutes, 37 Seconds West and Longitude: 21 Degrees, 59 Minutes, 43 Seconds North on the Island of Kauai. The KSC is located at 8315 Kekaha Road, approximately 24 miles west of the Lihue Airport (Figure 2-1). The former sugar plantation encompasses a total area of approximately 21.843 acres of agricultural land that includes the former Kekaha Sugar Mill and approximately 10 acres of settling pond located northeast of Kekaha Sugar Mill.

2.2 SITE DESCRIPTION

The KSC operation is located in the town of Kekaha, off Kekaha Road. KSC is situated at the intersection of Kekaha Road and Hukipo Road. The State Land Use Commission has zoned KSC as Agriculture-2, restricted. All structures in the KSC are still intact but have been idle since December 2000. Figure 2.2 is a site layout map of the KSC and depicts the areas of concern (AOCs) that were sampled in the current investigation. Figure 2-3 is an aerial photograph depicting KSC and surrounding AOCs that were sampled during this SI.

The Main Office of the KSC is located north of Kekaha Road and west of Hukipo Road. Adjacent to the Main Office to the east is the Former Herbicide Mixing Area. South of Kekaha Road is the former Kekaha Sugar Mill where most activities occurred. KSC Open Yard Area is defined as the areas of KSC that are not occupied by structures (mainly open soiled areas). Along the western perimeter are the Former Automotive Shop and Motor Pool where motor vehicles were repaired and stored. In the central portion of KSC, directly south and parallel to Kekaha Road, are the Electrical Shop, Metal Shop, and Machine Shop. These workshops were where welding and metalwork took place, and electrical products were stored and constructed for use at KSC or satellite areas. Perpendicular to the Machine Shop is the Boiler House, where most of the power to run KSC was generated. At the southeast corner of that structure is the Former Transformer Area. Approximately 200 feet to the west of the Former Transformer Area is the Bagasse House, formerly used for storing the organic solid waste following the removal of cane sugars. Approximately 150 feet east of the Former Transformer Area is the Drum Storage Area, located along the western embankment of the Mill Ditch. East of the Machine Shop is the Cane Cleaning Plant, where harvested cane was brought into the KSC and washed prior to being processed for sugar. Southeast of the Cane Cleaning Plant and east of the Kekaha Sugar Mill is the Former Seed Dipping Tank where seeds were treated and prepared for planting. The Mill Ditch runs in a western direction and goes underground between the Former Seed Dipping Tank and the Kekaha Sugar Mill. The mill ditch continues and empties into the Pacific Ocean. To the northeast of the Kekaha Sugar Mill, there is a 10-acre settling pond that was previously used to allow particulates to settle out of the wash water used to clean the harvested cane stalks.

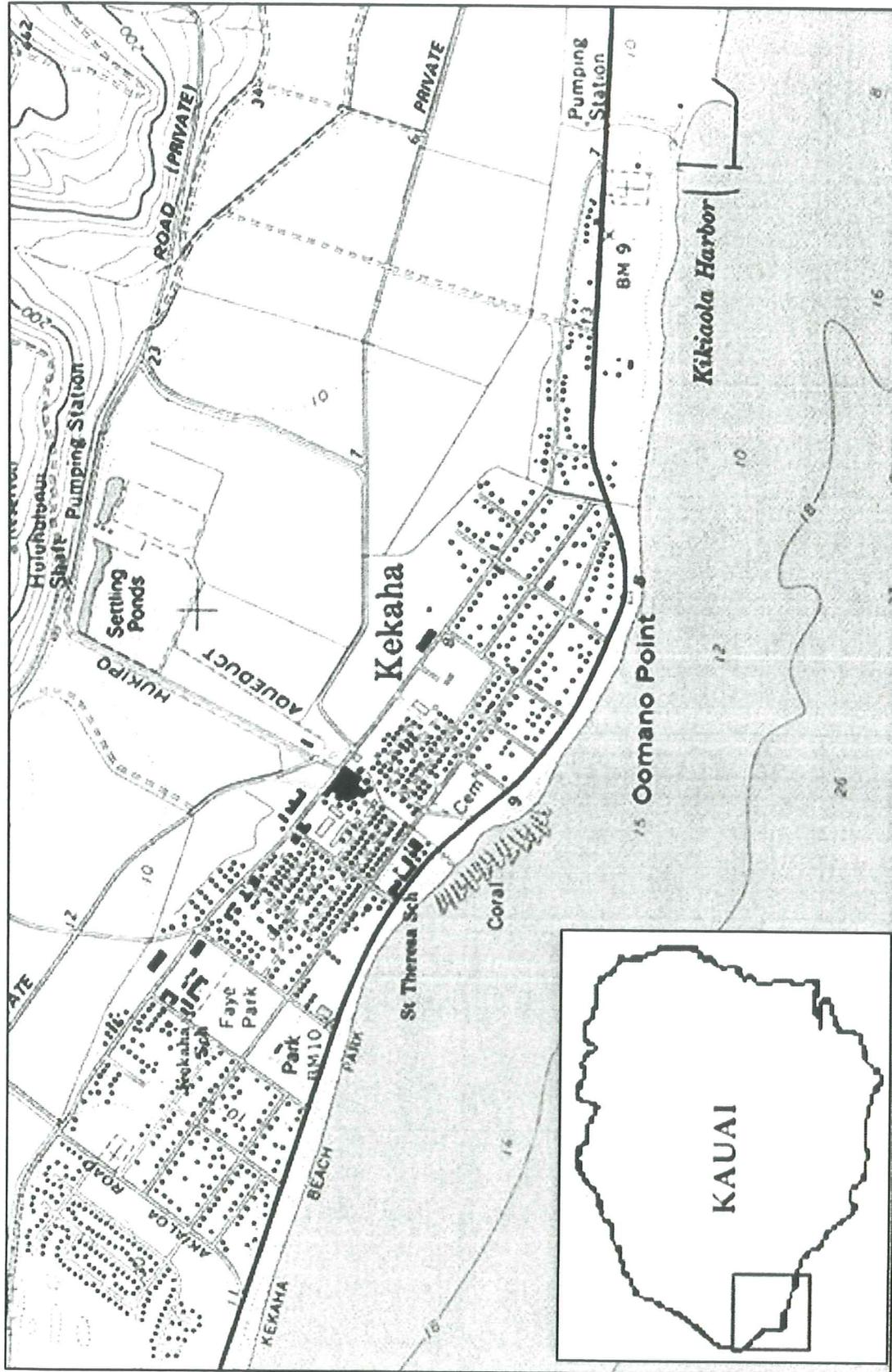


Figure 2-1
Regional Site Location Map
Kekaha Sugar Mill, Kauai

The KSC site is located at an elevation between 5 to 25 feet above mean sea level, atop the Juacas Series soil profile. The Juacas loamy fine sand (JfB) associated with KSC consists of excessively drained sandy soil associated with coastal plain areas such as Kekaha. The site is flat in the vicinity of the KSC and slopes gently to the northeast above Kekaha Road, towards the vicinity of the Settling Ponds. The sand is calcareous in nature, originating from coralline sands and shell fragments. The soil is highly erodible and unstable, remaining uncompacted and easily transported via surface water or wind-blown mechanisms. It generally is associated with low organic content, as well as low clay content and is not expected to adsorb chemicals readily. In addition, due to its high permeability, it is expected to be well washed throughout, thus mobile compounds released at the surface or shallow subsurface are expected to be transported to the shallow groundwater beneath the site. The typical pH of JfB is relatively high due to the calcareous nature of the sand and will typically effervesce when in contact with acid. Use of acidic preservatives may be expected to create bubbles in water samples, which may be a concern for volatile organic compounds (VOCs) preserved with hydrochloric acid. Generally, in areas of JfB, the same loamy sand can be observed from the ground surface to the shallow water table, especially in the coastal plain areas such as Kekaha, Kauai (3).

2.3 OPERATIONAL HISTORY

The KSC started its operation as early as 1898, until Amfac Sugar Hawaii bought it in 1975. JMB-Hawaii bought Kekeha Sugar Co, Ltd. from Amfac Sugar Hawaii, and consolidated it with Lihue Plantation, Co., Ltd. in 1994 (4). JMB-Hawaii retained the name Amfac Sugar Hawaii. These companies operated all the five areas of environmental concern, but the lands are of different owners. Amfac Sugar Hawaii/JMB-Hawaii owns the Kekeha Sugar Mill and the seed treatment plant lands. The Settling Pond, the Former Herbicide Mixing Plant (across the mill) and the agricultural lands are owned by State of Hawaii. Amfac Sugar Hawaii/JMB-Hawaii closed all Lihue Plantations and KSC operations on November 17,2000.

On October 19,1999 and January 5, 2000, a Hazardous Waste and Used Oil Compliance Evaluation Inspection (CEI) was conducted at Kekeha Sugar Co., Ltd by the representatives of the Hawaii Department of Health-Solid and Hazardous Waste Branch. The report describes conditions at the facility at the time of inspection and identifies areas of non-compliance with the state hazardous waste laws. Following inspections, DOH Solid and Hazardous Waste Branch issued an administrative enforcement action to Amfac/JMB Hawaii (owners of the Kekaha Sugar Co., Ltd.) on May 9, 2000. The action listed violations to Hawaii Revised Statutes (HRS) § 342J-30 and §§ 11-262-11, 11-262-34, and 11-270-1 of the Hawaii Administrative Rules (HAR) and included storage of hazardous waste without a permit; and failure to make a hazardous waste determination (5).

On December 1998, Amfac Sugar Hawaii hired Brewer Environmental Services (BES) to respond and address to environmental concerns identified by the HDOH during the October 1999 and the January 5, 2000 inspections (6).

From February 17, 2000 to March 24, 2000, BES collected a total of 77 drums of used and waste oil, grease, asbestos-containing material, non-PCB containing transformer oil, and creosote waste sludge from the Kekeha Sugar Mill. The drums were disposed offsite and copies of the manifest were submitted to HDOH.

According to a former employee, between 1930 and 1960, the KSC operated a centrally-located pesticide storage and mixing area across the street to the east of KSC, and a seed cane-dipping tank adjacent to the

southern portion of the Kekaha Sugar Mill (7). Prior to the introduction of Benlate in the mid 1970's, sugar mills in Hawaii used phenyl mercuric acetate as the fungicide for seed dipping. Benlate was the fungicide of choice until 1988, when it was replaced by Tilt (1).

Since the closure of the sugar processing facility, Amfac/JMB Hawaii, Inc. has ventured into diversified agriculture. Former Settling Ponds and sugarcane production fields to the northeast of the Kekaha Sugar Mill are now leased to independent farmers.

The environmental concerns associated with these areas are the ff: 1) accidental spills of pesticides during mixing and loading events at the former herbicide and mixing plant; 2) contamination brought about by the operational activities related to sugarcane production; 3) the reported use of phenyl mercuric acetate as a fungicide for seed dipping; 4) and the contaminated wastewater in the settling pond that may have contaminated the onsite soils and the surface water through runoff.

2.4 REGULATORY INVOLVEMENT

2.4.1 STATE OF HAWAII, DEPARTMENT OF HEALTH, SOLID AND HAZARDOUS WASTE BRANCH

Following the CEI by DOH on October 19, 1999 and January 5, 2000, the DOH Solid and Hazardous Waste Branch issued an administrative enforcement action to Amfac/JMB Hawaii (owners of the Kekaha Sugar Co., Ltd.) on May 9, 2000 (5). The action listed violations to Hawaii Revised Statutes (HRS) § 342J-30 and §§ 11-262-11, 11-262-34, and 11-270-1 of the Hawaii Administrative Rules (HAR) and included:

- storage of hazardous waste without a permit; and
- failure to make a hazardous waste determination.

A fine of \$67,848 was assessed for the violations.

2.4.2 STATE OF HAWAII, DEPARTMENT OF HEALTH, HAZARD EVALUATION AND EMERGENCY RESPONSE (HEER) OFFICE

On November 16, 2001 the DOH HEER office filed a Preliminary Assessment Consultation Memorandum with USEPA Region IX listing initial site and Hazard Ranking System (HRS) findings.

The apparent problems at the site included:

- pesticide/herbicide contamination in the Former Herbicide Mixing Plant brought about by sugarcane production and operations, including Ametryn, diuron, atrazine, 2,4-D, glyphosate, and arsenical and mercurial pesticides; and
- a suspected release of contaminants to the Pacific Ocean approximately 0.35 to 0.58 miles away from the mill via the Mill Ditch.

PRG	USEPA Region 9 Preliminary Remediation Goals, 2002
QA/QC	Quality Assurance/Quality Control
QAO	Quality Assurance Office
QAPP	Quality Analytical Program Plan
RAPS	Regional Analytical Program
RBCA	Risk Based Corrective Action
RQL	Reporting Quantitation Limit
RSCC	Regional Sample Control Center
SAP	Sampling Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SDWB	Safe Drinking Water Branch of the State of Hawaii Department of Health
SI	site inspection
SQL	Sample Quantitation Limit
SVOC	semi-volatile compound
TPH-D	Total Petroleum Hydrocarbons-Diesel
TPH-G	Total Petroleum Hydrocarbons-Gasoline
TPH-oil	Total Petroleum Hydrocarbons-Oil
USC	U.S. Code
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOA	volatile organic aromatic
VOC	volatile organic compound

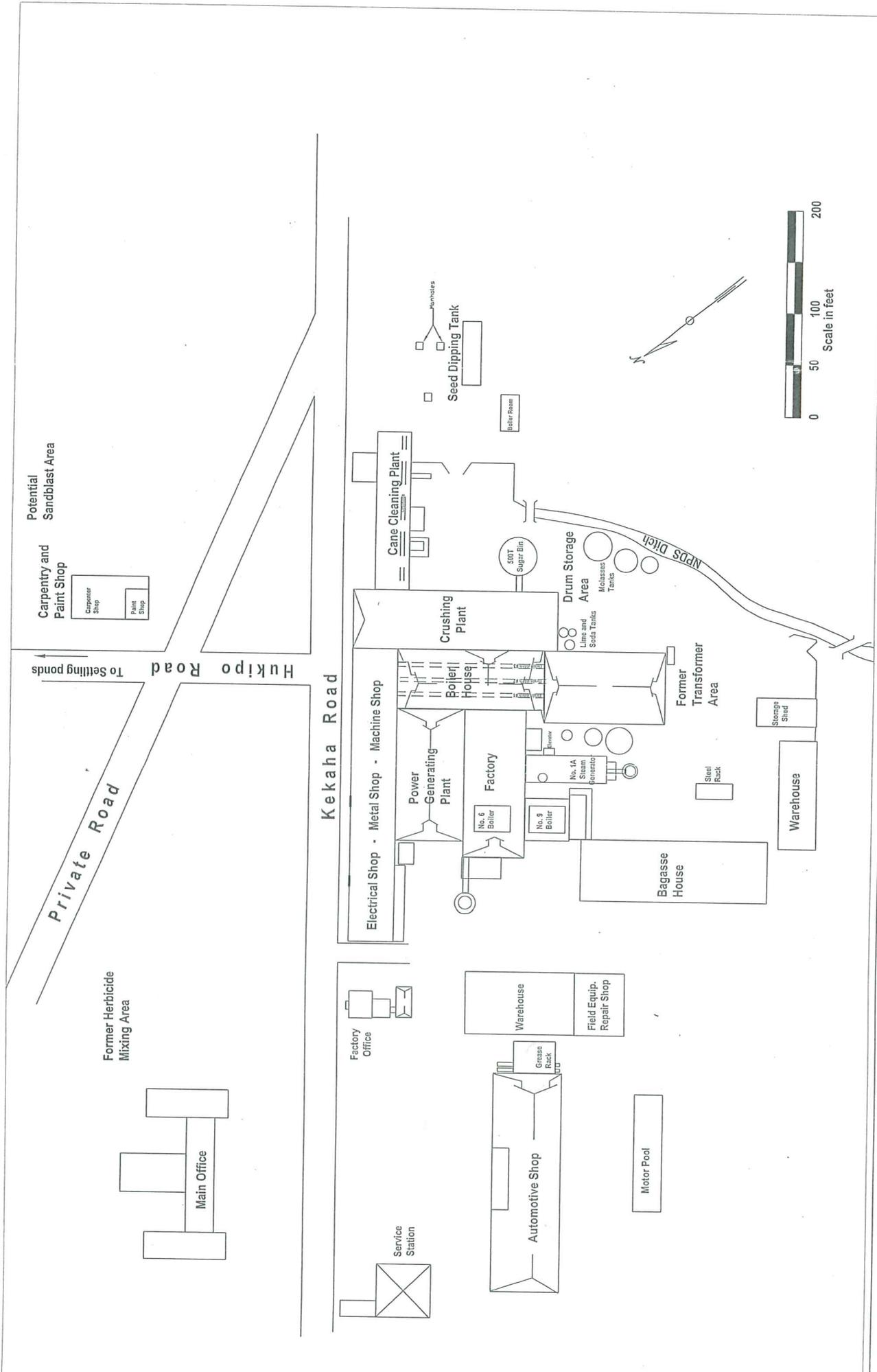


Figure 2-2
 Site Layout Map, Onsite Locations
 Kekaha Sugar Mill, Kauai



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SECTION 3

INVESTIGATIVE EFFORTS

3.1 PREVIOUS INVESTIGATIONS

According to document review, clean-up was scheduled to occur in January, 2000. Brewer Environmental Services (BES) presented a Supplemental Work Plan, dated January 13, 2000, which planned the cleanup activities, including installation of oil water separators; drum inventory, sampling, cleaning and disposal; underground storage tank (UST) and above ground storage tank (AST) cleaning and closure; soil sampling and site investigation, and petroleum contaminated soil (PCS) excavation and remediation (6).

3.1.1 SOIL SAMPLING

A limited number of soil samples had been collected at the KSC. However, as a result of the PA and similar investigations at other sugar mills throughout Hawaii, it was known that potential contamination by pesticides, herbicides, heavy metals, volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), and dioxins may exist in surface soils due to location-specific activities related to sugarcane production. Surface soil and subsurface soil samples were collected during the current SI to assess the existence of these contaminants in specific locations throughout the KSC.

3.1.2 GROUNDWATER SAMPLING

Groundwater sampling had not previously been performed at the KSC site. However, drinking water wells in Hawaii are sampled quarterly by the DOH Safe Drinking Water Branch (SDWB) and no target chemical of potential concerns (COPCs) were being detected at the time of sampling (8). Groundwater sampling was conducted as part of this field effort following installation of two monitoring wells in the vicinity of the Former Kekaha Sugar Mill. These wells were screened in the surface sedimentary aquifer, which is not considered useful for drinking. The underlying basal aquifer is a potential drinking water source. However, it is protected from contamination sources from ground surface because it is confined with an expected upward vertical gradient in the vicinity of the site.

3.1.3 SURFACE WATER SAMPLING

It was not clear whether surface water sampling had been conducted in the past; however, select samples were collected as part of this field effort.

3.1.4 SEDIMENT SAMPLING

It was not clear whether sediment sampling had been conducted in the past. A Mill Ditch located between the seed dipping plant and the Kekaha Sugar Mill empties into the Pacific Ocean. It is possible that surface runoff from the Kekaha Sugar mill that drains into the mill ditch may contain metals, VOCs, SVOCs, pesticides, and dioxins/furans. Sediment samples were collected from the Mill Ditch that runs between the seed dipping plant and the Kekaha Sugar Mill. Sediment samples were also collected from the drainage ditches inside the mill and outside of the mill adjacent to the Former Herbicide Mixing Plant.

The HRS is a scoring system used to assess the relative threat associated with actual or potential releases of hazardous substances from a site. It is the principal mechanism the EPA uses to place sites on the National Priorities List (NPL). The quality of the data obtained from sampling and analysis at a site must be sufficient to meet the criteria for usage in the HRS, in accordance with the data quality objectives

(DQO) documented in the Guidance for Data Usability in Site Assessment, Interim Final, January 1993, U.S. EPA Office of Emergency and Remedial Response.

3.2 SI OVERVIEW

Based on the PA investigation, It was determined that the following media had the potential to be impacted from a release at the KSC site:

- On-site shallow soil (0 to 6 inches below ground surface [bgs]). Potential sources of soil contamination include the Automotive Shop, which includes the lube oil dispensing station and garage/storage area; the Old Mill, which houses the Former Electric Shop, Metal Shop, Machine Shop, Drum Storage Area, and Open Yard Areas of KSC; the Bagasse House; the Former Seed Dipping Plant; the Former Herbicide Mixing Area; the Former Carpenter/Paint Shop and lumber storage area; and the Settling Ponds. Although pavement and buildings cover some of these areas, exposed soil exists where drainage and runoff flows. The soil beneath these areas might also be impacted through cracks in foundation concrete and pavement asphalt. Surface soils at the site may contain hazardous substances including metals, Total Petroleum Hydrocarbons in the Diesel range (TPH-D), Total Petroleum Hydrocarbons in the Oil range (TPH-oil), Total Petroleum Hydrocarbons in the Gasoline range (TPH-G), SVOCs, VOCs, dioxins/furans, chlorinated herbicides, and pesticides/PCBs that were previously handled in these areas. Previous investigations at former herbicide mixing plants on Oahu showed elevated levels of dioxins, PCP and arsenic. Arsenic in the form of sodium arsenite was reportedly used, as an herbicide in sugar production in the 1930s and 1940s and therefore it is possible that the surface soil in the area of the Former Herbicide Mixing Area is contaminated with arsenic. In addition, mercury was reportedly used as a fungicide for seed treatment and may be present in surface soils in the area of the Former Seed Dipping Plant. The site is located in a mixed agricultural and industrial area.
- Groundwater. Although not evident in nearby drinking water wells, groundwater contamination may exist in the area of the KSC due to leaching of contaminants into the groundwater aquifer.
- Sediment. Sediment contamination may have occurred in drainage ditches on site in the areas of the Former Motor Pool, the mill ditch, and drainage ditches in the Former Herbicide Mixing Plant, Former Cane Plant, Boiler House, and Transformer Storage Area
- Surface water. Surface water runoff from the KSC site drains into the Mill Ditch located in between the former mill and Seed Dipping Plant, which empty, into the Pacific Ocean.

3.3 SI SAMPLING

In June 2003, the HDOH-PA/SI (Preliminary Assessment and Site Inspection) Section with the help of the State Contractor, The Environmental Company Inc., under the Cooperative Agreement with EPA, conducted an SI sampling effort for KSC. The approved Sampling and Analyses Plan is presented in Appendix G. The complete validated analytical results for VOC are presented in Appendix D. The analytical data from EPA Contract Laboratory Program Analytical Services (CLPAS) are validated using CADRE. Sampling locations are shown in Figs. 3-1 and 3-2.

Analytical results are discussed in the Section 3.3.1 based on a comparison to background samples collected at the KSC site.

3.3.1 Background Sampling

As indicated in the attached Sampling and Analyses Plan, specific sample locations were chosen to represent the ambient conditions in each of the media evaluated. Background soil samples were collected

at SS-32 (located north of the Former Settling Ponds), SS-33, SS-34, and SS-35 (located in the residential areas west and south of the KSC). Results from these locations are representative of background levels in soil at the KSC site. The background groundwater sample was collected from MW1, located north of the Former Settling Pond. The background surface water sample was collected from SW1, located in the northwestern portion of the Kinekine Ditch. The background sediment sample analyzed for metal was collected along the Kinekine Ditch located upgradient of the site.

3.3.2 Background Soil Results

Soil samples were analyzed for CLPAS Metals, CLPAS SVOC, CLPAS VOC, Chlorinated Herbicides and dioxins and furans. Soil samples for metal analysis were analyzed using EPA CLPAS Method ILMO4.1. Soil samples for Pesticides/PCB were analyzed using CLPAS ILMO4.2. All soil samples for chlorinated herbicide were analyzed using EPA Regional Analytical Program (RAP) Method 8151. All soil samples for dioxin/furans were analyzed for dioxin/furans EPA RAP Method 8290.

VOC analyses showed non-detect in background samples (Table 3-1). Thirteen SVOCs were detected in background soil samples, including PAHs anthracene, fluoranthene, pyrene, benzo(a) anthracene, chrysene, benzo(b)fluoranthene, and indeno(1,2,3, -cd) pyrene (Table 3-2). All PAHs were detected below the respective Sample Quantitation Limit (SQL), also known as the Reporting Quantity Limit (RQL). Nine pesticides were detected in background samples, including lindane, heptachlor, aldrin, dieldrin, endrin, 4,4' -DDT, and methoxychlor (Table 3-3). Chlorinated herbicides were not detected in background soil samples (Table 3-4). All 17 dioxins and furans analyzed for were detected in one or more background samples with a maximum Toxicity Equivalent Quotient (TEQ) of $48.53 \times 10^{-3} \mu\text{g}/\text{kg}$ (Table 3-5). All 18 metals analyzed for were detected in background samples, with arsenic at 14.7 mg/kg, cadmium at 0.31 mg/kg, chromium at 179 mg/kg, and mercury at 0.05 mg/kg (Table 3-6).

3.3.3 Background Groundwater Results

VOCs were not analyzed in groundwater. No SVOCs were detected in background groundwater samples (Table 3-13). No pesticides or PCBs were detected in background groundwater samples (Table 3-14). No chlorinated herbicides were detected in background groundwater samples (Table 3-15). Sixteen of 18 metals were detected in background groundwater samples, including arsenic at 30.25 $\mu\text{g}/\text{L}$ and chromium at 45.7 $\mu\text{g}/\text{L}$, (Table 3-16). Neither chlorinated herbicides nor dioxins were analyzed in groundwater samples.

3.3.4 Background Surface Water Results

Neither VOCs, SVOCs, nor dioxins were analyzed in surface water samples. Very low concentrations of alpha, beta, and delta BHC were detected in SW1, which was designated the background sampling location for surface water (Table 3-17). These pesticides were not detected in surface water samples from the site. Chlorinated herbicides were not detected in either background or samples from the site. Twelve metals were detected in background sample SW1 (Table 3-19). Sample results for metals in surface water collected from the site were incomplete with many results not available for SW3, SW4, and SW5.

3.3.5 Background Sediment Sample for Metals

Sediment sample collected from Kinekine ditch (SED 16) was used as a background sample for metals. Arsenic was detected at 17.2 mg/kg, mercury at 0.05 mg/kg, and nickel at 69.4 mg/kg. Pesticides, VOC, SVOC and chlorinated herbicides were not analyzed in the background sediment sample, for the reason that the sediment samples in the drainage system were affected by the re-circulation of water and sediments. Analytical results of sediment samples for pesticides, VOCs, and SVOCs were compared with

the Threshold Effect Level (TEL) and Probable Effect Level (PEL) taken from NOAA Screening Quick Reference Tables.

3.3.6 Environmental Soil Results

Analytical results of soil samples collected showed non-detect for VOC. Acetone, MEK, and trichlorofluoromethane were detected at low levels, which may be considered laboratory contaminants (Table 3-1). Soil sample numbers SS07 and SS08 collected from the Former Carpentry and Paint Shop showed levels of benzo(a)anthracene, chrysene, benzo(k)fluoranthene, and indeno(1,2,3-CD)-pyrene greater than 3x above background. Soil samples collected from the former herbicide mixing plant (SS12) indicated elevated levels of phenanthrene, anthracene, fluoranthene, pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene that are 3x above background (Table 3-2). Soil sample number SS15 collected from the former herbicide mixing plant also showed levels of pentachlorophenol 3x above background. Analytical results of soil samples collected from electrical shop (SS23), automotive shop (SS25), drum storage area (SS 27, SS28, SS29) indicated elevated levels of PAHs 3x above background.

Alpha chlordane and aroclor-1254 were detected in samples collected from SS12 and SS15 (Former Herbicide Mixing Plant) at levels greater than 3x above background, although the alpha chlordane result was flagged as tentatively identified (NJ) (Table 3-3). Low levels of pesticides were detected in both background and site soil samples. Chlorinated herbicides 2,4-D, 2,4-DB, and MCPP were detected at greater than the background SQL in one or more samples (Table 3-4) collected from the settling pond and from the former herbicide mixing plant. Low levels of dioxins and furans were detected in soil samples collected from the former herbicide mixing plant (SS10 to SS16) (Table 3-5). In two samples collected from the former herbicide mixing plant (SS15 at $1690.95 \times 10^{-3} \mu\text{g}/\text{kg}$ and SS16 at $154.19 \times 10^{-3} \mu\text{g}/\text{kg}$), the TEQ was 3x greater than the maximum background concentration of $48.53 \times 10^{-3} \mu\text{g}/\text{kg}$.

Ten metals were observed at greater than 3x the background levels in one or more samples collected from the site (Table 3-6). One sample (SS06, 53.7mg/kg) out of the six samples collected from the settling ponds indicated arsenic levels 3x above background (14.7 mg/kg). Also, soil sample number SS 08 (47.8 mg/kg) collected from the former carpentry and paint shop indicated elevated levels of As. Cadmium and selenium were also detected greater than 3x above background in all soil samples collected from the settling pond.

Elevated levels of cadmium, mercury and selenium 3x above the background levels were detected in soil samples collected from the former transformer area, electrical shop, drum storage area, and machine shop.

3.3.7 Environmental Sediment Results

No VOCs (Table 3-7) or chlorinated herbicide (Table 3-10) chemicals of concern were detected in sediment samples. Sediment samples collected from the former transformer area (SED01 and SED02); sugarcane cleaning plant (SED03 and SED 04); boiler house (SED 05 and 06); motor pool/automotive (SED 07, and SED 08) indicated elevated levels of PAHs (phenanthrene, anthracene, fluoranthene, pyrene, benzo (a) pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and indeno(1,2,3 -cd)-pyrene) greater than the Probable Effect Levels (PEL) for freshwater sediment. Sediment samples collected from the former transformer area (SED1 and SED 02) showed elevated levels of 4,4'-DDD, endrin (endrin ketone and endrin aldehyde) and chlordane (alpha and gamma chlordane) above the Threshold Effect Level (TEL) (Table 3-9).

Dioxin/furans analytical results of sediment samples collected from the Cane Cleaning Plant SD03 (0.020 ug/kg) and SD04 (0.031 ug/kg); from the Seed Dipping Plant SED13 (0.013 ug/kg) and from the drainage

ditch SED14 (0.115 ug/kg) indicated levels of dioxins and furans below the TEL (34.1 ug/kg PEL (277 ug/kg).

Sediment samples collected along the mill ditch indicated elevated levels of mercury (SED17, 267 mg/kg Hg), (SED18, 163 mg/kg) (SED19, 153 mg/kg) greater than 3x above the background (SED16, 0.05 mg/kg). Analytical results for Ni in sediment samples collected from the mill ditch also show levels 3x above background (Table 3-12).

3.3.8 Environmental Groundwater Results

There are no COPCs detected for groundwater, although gamma chlordane at a trace concentration of 0.011 µg/L was detected above the background SQL of 0.01 µg/L (Table 3-13, Table 3-14, Table 30-15 and Table 3-16).

3.3.9 Environmental Surface Water Results

There are no COPCs detected for surface water, although endrin ketone at a trace concentration of 0.047 µg/L was detected above the background SQL of 0.02 µg/L (Table 3-17, Table 3-18, and Table 3-19).

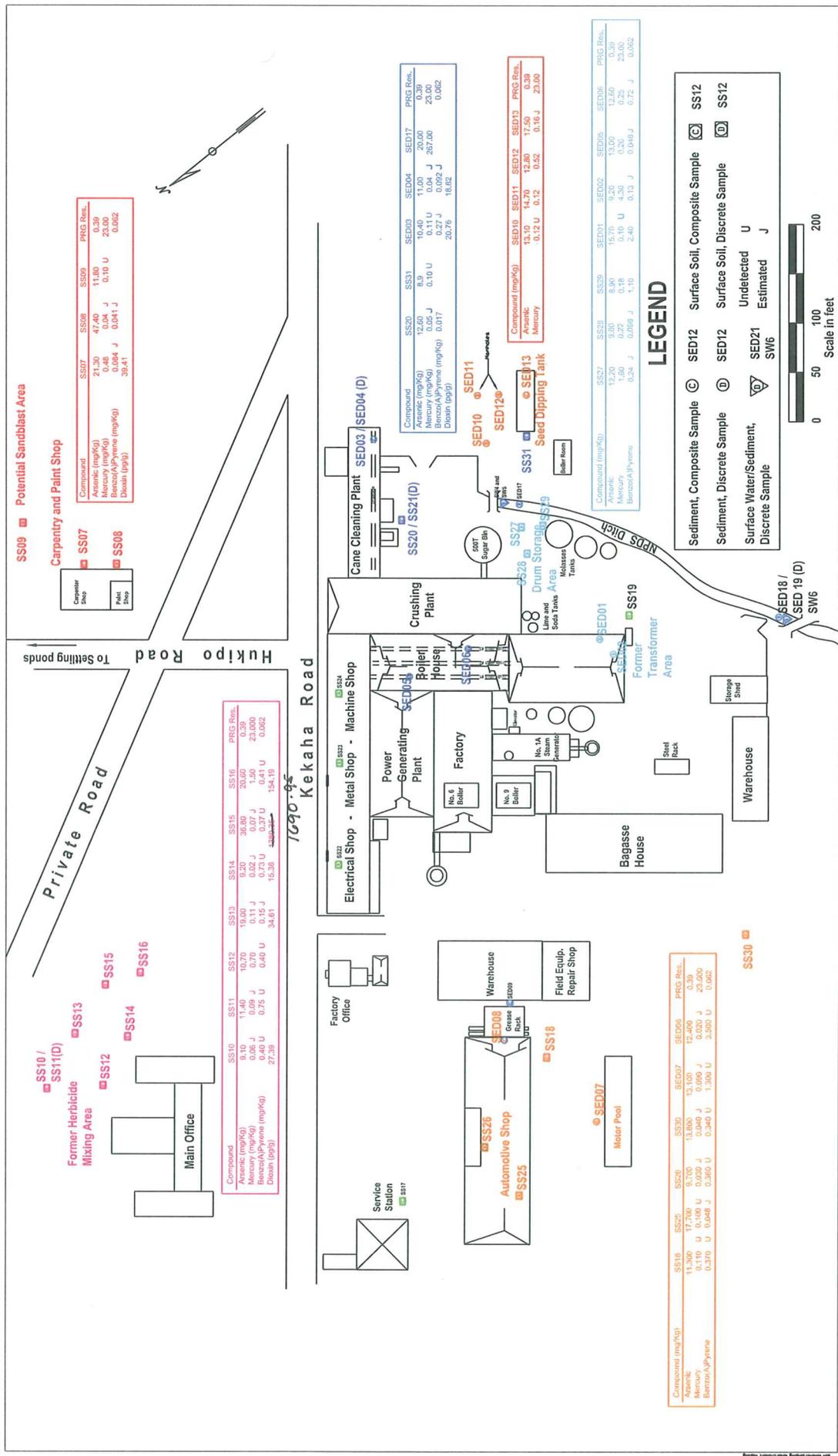


Figure 3-1
Compounds of Concern, Onsite
Kekaha Sugar Mill, Kauai

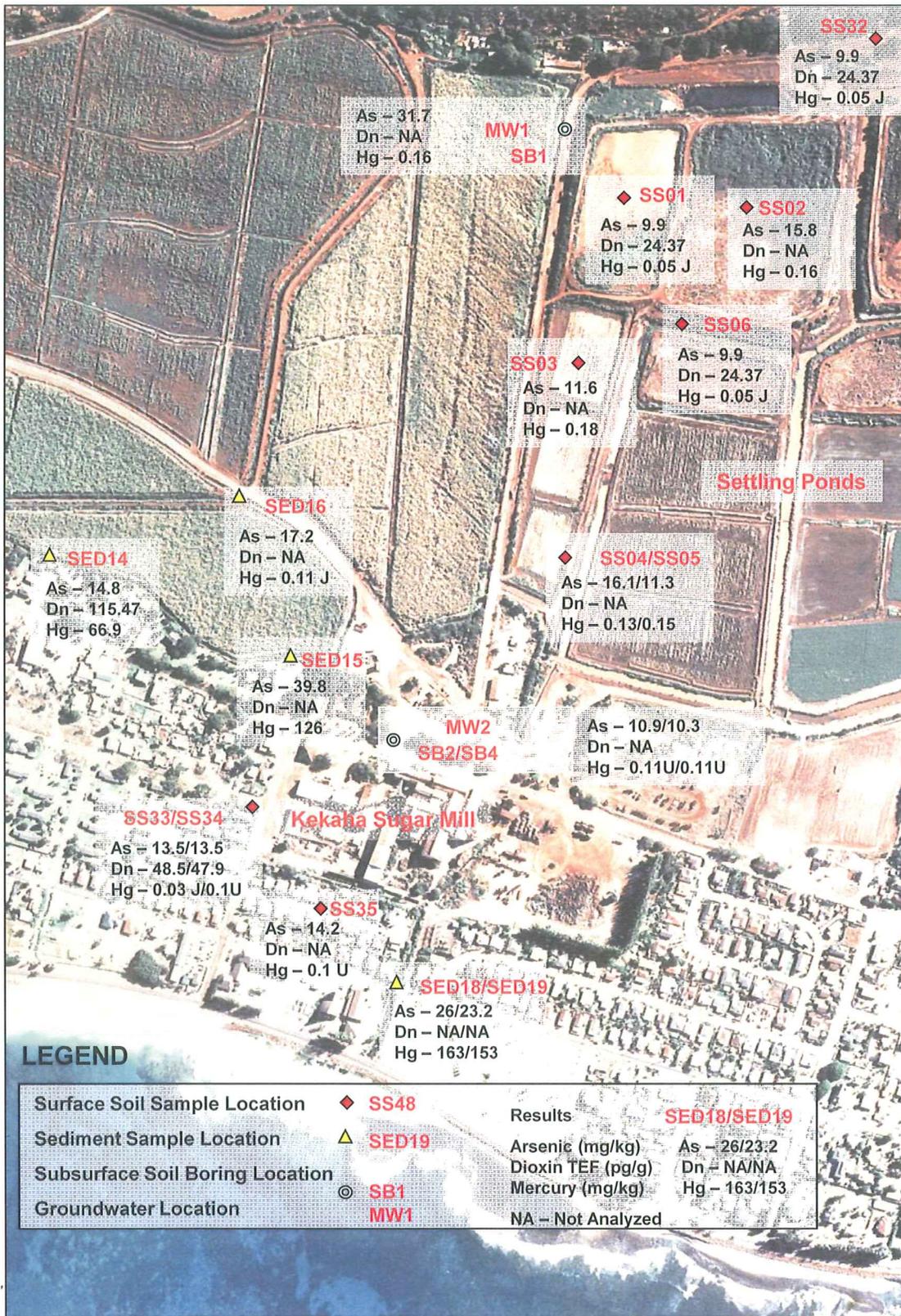


Figure 3-2
Compounds of Concern, Offsite
Kekaha Sugar Mill, Kauai

Table 3-1
 Project No: R03S65
 Site : KEKAHA SUGAR CO., LTD
 Lab : USEPA REGION 9 LABORATORY
 Analysis Type: Volatile Organic Compounds
 Matrix: Soil
 Units: mg/kg

Station Location : Sample ID : Collection Date : Dilution Factor :	CRQL	KSM-SO-SS17		KSM-SO-SS18		KSM-SO-SS19		KSM-SO-SS20		KSM-SO-SS25		KSM-SO-SS26		KSM-SO-SS27	
		SL17 7/15/03	Result	SL18 7/15/03	Result	SL19 7/15/03	Result	SL20 7/15/03	Result	SL25 7/16/03	Result	SL26 7/16/03	Result	SL27 7/15/03	Result
VOCs	Result	24	100	ND	ND	ND									
Acetone	13														
2-Butanone (MEK)	13	6.5	ND	ND											
Trichlorofluoromethane	2.7	ND	ND	3.7	7.1	2.6	3.3	1.4							

CRQL - Contract Reporting Quantitation Limit
 VOC results limited to detected compounds only. VOCs were not detected in surface water or groundwater.
 ND - Compound not detected.

Table 3-1
 Project No: R03S65
 Site : KEKAHA SUGAR CO., LTD
 Lab : USEPA REGION 9 LABORA
 Analysis Type: Volatile Organic C
 Matrix: Soil
 Units: mg/kg

Station Location : Sample ID : Collection Date : Dilution Factor :	KSM-SO-SS28 SL28 7/15/03	KSM-SO-SS29-S SL29 7/15/03	KSM-SO-SS30-S SL30 7/15/03	KSM-SO-SS33-S SL33 7/15/03	KSM-SO-SS34-S SL34 7/16/03	KSM-SO-SB1 SL65 7/16/03	KSM-SO-SB2 SL66 7/16/03	KSM-SO-SB4 SL68 7/16/03
VOCs	Result	Result	Result	Result	Result	Result	Result	Result
Acetone	ND	ND	ND	ND	ND	ND	ND	5.8
2-Butanone (MEK)	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	4.4	3.9	8.2	2.3	2.3	13	13	ND

CRQL - Contract Reporting Quantita
 VOC results limited to detected com
 ND - Compound not detected.

Table: 3-2
Case No. : 31934
Site : Kekaha Sugar Co. Ltd.
Lab : LIBERTY ANALYTICAL CORPORATION
Analysis: CLPAS Semivolatile Organic Compounds
Matrix: Soil
Units: µg/kg

Station Location	Maximum Background	SO-SS7 Y0Y06 7/15/2003 1.0	SO-SS8 Y0Y07 7/15/2003 1.0	SO-SS10 Y0Y09 7/16/2003 1	SO-SS11 Y0Y10 7/16/2003 2.0	SO-SS12 Y0Y11 7/16/2003 1	SO-SS13 Y0Y12 7/16/2003 2	SO-SS14 Y0Y13 7/16/2003 2
Sample ID	Collection Date	Dilution Factor	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val
PARAMETER		0	0					
BENZALDEHYDE		90 J	360	U	400	UJ	470	UJ
PHENOL		67 J	360	U	400	U	470	U
ACETOPHENONE		35 J	360	U	400	U	470	UJ
NAPHTHALENE		330 U	360	U	400	U	470	U
4-CHLORO-3-METHYLPHENOL		28 J	18	J	400	U	470	U
2-METHYLNAPHTHALENE		370 U	360	U	400	U	470	U
ACENAPHTHYLENE		370 U	27	J	400	U	470	U
ACENAPHTHENE		370 U	20	J	400	U	470	U
2,4-DINITROTOLUENE		370 U	18	J	400	U	470	U
DIETHYLPHTHALATE		370 U	360	U	400	U	470	U
FLUORENE		370 U	360	U	400	U	470	U
PENTACHLOROPHENOL		920 U	900	U	1000	U	1200	U
PHENANTHRENE		370 U	85	J	29	J	520	U
ANTHRACENE		8 J	20	J	400	U	750	U
CARBAZOLE		14 J	15	J	400	UJ	39	J
DI-N-BUTYLPHTHALATE		370 U	360	U	400	U	110	J
FLUORANTHENE		20 J	140	J	63	J	1000	J
PYRENE		17 J	150	J	53	J	860	J
BUTYLBENZYLPHTHALATE		370 U	360	U	400	U	470	U
3,3'-DICHLOROBENZIDINE		370 U	360	J	400	U	470	U
BENZO(A)ANTHRACENE		10 J	60	J	23	J	400	J
CHRYSENE		21 J	100	J	43	J	600	J
BIS(2-ETHYLHEXYL)PHTHALATE		31 J	59	J	400	UJ	470	UJ
DI-N-OCTYLPHTHALATE		370 U	91	J	400	U	470	U
BENZO(B)FLUORANTHENE		16 J	80	J	400	U	580	U
BENZO(K)FLUORANTHENE		370 U	88	J	400	U	460	J
BENZO(A)PYRENE		370 U	84	J	400	U	400	J
INDENO(1,2,3-CD)PYRENE		9 J	78	J	400	U	300	J
DIBENZO(A,H)ANTHRACENE		370 U	26	J	400	U	61	J
BENZO(G,H,I)PERYLENE		370 U	360	U	400	U	90	J
Percent Solids		95%	92%		83%		70%	
					88%		37%	
								91%

µg/kg - Units of micrograms per kilogram

NA - Not Applicable
"U" - Compound not detected, value is reporting limit.
"J" - Compound Value Estimated.
"UJ" - Compound not detected, reporting limit is estimated.
"NJ" = Compound estimated and value estimated.
"R" - Results are rejected due to QC criteria.
J - Value is detected.
- Value is greater than 3 X Background or greater or equal to Sample Quantitation Limit

Table: 3-2
Case No. : 01,034
Site : Kekaha Sugar Co. Ltd.
Lab : LIBERTY ANALYTICAL CORPORATION
Analysis: CLPAS Semivolatile Organic Compounds
Matrix: Soil
Units: µg/kg

Station Location Sample ID Collection Date Dilution Factor	Maximum Background	SO-SS15 Y0Y14 7/16/2003 1	SO-SS16 Y0Y15 7/16/2003 1	SO-SS17 Y0Y16 7/15/2003 1.0	SO-SS18 Y0Y17 7/15/2003 1.0	SO-SS19 Y0Y18 7/15/2003 1	SO-SS20 Y0Y19 7/15/2003 1	SO-SS21 Y0Y20 7/15/2003 1.0
PARAMETER	0	0	Results µg/kg	Results µg/kg	Result	Results µg/kg	Results µg/kg	Results µg/kg
BENZALDEHYDE	90 J	370	UJ	340	U	350	U	350
PHENOL	67 J	370	U	340	U	350	U	350
ACETOPHENONE	35 J	370	U	340	U	350	U	350
NAPHTHALENE	330 U	370	U	340	U	44	J	350
4-CHLORO-3-METHYLPHENOL	28 J	370	U	340	U	350	U	350
2-METHYLNAPHTHALENE	370 U	370	U	340	U	18	J	350
ACENAPHTHYLENE	370 U	370	U	340	U	13	J	350
ACENAPHTHENE	370 U	370	U	340	U	24	J	350
2,4-DINITROTOLUENE	370 U	370	U	340	U	350	U	350
DIETHYLPHTHALATE	370 U	370	U	860	U	350	U	350
FLUORENE	370 U	370	U	860	U	16	J	350
PENTACHLOROPHENOL	920 U	1300	J	860	U	870	U	890
PHENANTHRENE	370 U	370	U	410	U	380	U	19
ANTHRACENE	8 J	95	J	45	J	73	J	350
CARBAZOLE	14 J	14	J	410	UJ	81	U	350
DI-N-BUTYLPHTHALATE	370 U	370	U	340	U	350	U	350
FLUORANTHENE	20 J	370	U	340	U	660	J	38
PYRENE	17 J	370	U	12	J	500	J	41
BUTYLBENZYLPHTHALATE	370 U	370	U	340	U	350	U	350
3,3'-DICHLOROBENZIDINE	370 U	370	U	340	U	350	U	350
BENZO(A)ANTHRACENE	10 J	370	U	340	U	410	U	26
CHRYSENE	21 J	370	U	10	J	510	J	34
BIS(2-ETHYLHEXYL)PHTHALATE	31 J	370	UJ	340	U	350	UJ	350
DI-N-OCTYLPHTHALATE	370 U	370	U	340	U	350	U	350
BENZO(B)FLUORANTHENE	16 J	370	U	410	U	430	U	31
BENZO(K)FLUORANTHENE	370 U	370	U	410	U	470	U	24
BENZO(A)PYRENE	370 U	370	U	340	U	240	J	25
INDENO(1,2,3-CD)PYRENE	9 J	370	U	340	U	290	J	22
DIBENZO(A,H)ANTHRACENE	370 U	370	U	340	U	53	J	350
BENZO(G,H)PERYLENE	370 U	370	U	340	U	350	U	350
Percent Solids	95%	90%		95%	37000%	95%	93%	93%

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" - Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

J - Value is detected.

- Value is greater than 3 X Background or greater or equal to Sample Quantitation Limit

Table: 3-2
Case No. : 31344
Site : Kekaha Sugar Co. Ltd.
Lab : LIBERTY ANALYTICAL CORPORATION
Analysis: CLPAS Semivolatile Organic Compounds
Matrix: Soil
Units: µg/kg

Station Location Sample ID Collection Date Dilution Factor	Maximum Background	SO-SS23 YOY22 7/16/2003 1.0		SO-SS25 YOY24 7/16/2003 1		SO-SS26 YOY25 7/16/2003 1		SO-SS27 YOY26 7/15/2003 1.0		SO-SS28 YOY27 7/15/2003 1.0		SO-SS29 YOY28 7/15/2003 3.0		SO-SS30 YOY29 7/15/2003 1	
		Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val
PARAMETER	0	0													
BENZALDEHYDE	90 J	380	U	350	U	360	U	340	U	350	U	1000	U	340	U
PHENOL	67 J	380	U	350	U	360	U	340	U	350	U	1000	U	340	U
ACETOPHENONE	35 J	380	U	350	U	360	U	340	U	350	U	1000	U	340	U
NAPHTHALENE	330 U	380	U	350	U	360	U	340	U	350	U	1000	U	340	U
4-CHLORO-3-METHYLPHENOL	28 J	380	U	350	U	360	U	340	U	350	U	1000	U	23	J
2-METHYLNAPHTHALENE	370 U	380	U	11	J	360	U	340	U	350	U	1000	U	340	U
ACENAPHTHYLENE	370 U	380	U	12	J	360	U	22	J	350	U	1000	U	340	U
ACENAPHTHENE	370 U	380	U	350	U	360	U	340	U	350	U	44	J	340	U
2,4-DINITROTOLUENE	370 U	380	U	350	U	360	U	340	U	350	U	1000	U	340	U
DIETHYLPHTHALATE	370 U	380	U	19	J	360	U	340	U	350	U	1000	U	340	U
FLUORENE	370 U	380	U	350	U	360	U	340	U	350	U	38	J	340	U
PENTACHLOROPHENOL	920 U	940	U	890	U	910	U	860	U	880	U	2600	U	860	U
PHENANTHRENE	370 U	12	J	33	J	360	U	220	J	120	J	760	J	340	U
ANTHRACENE	8 J	380	U	8	J	360	U	48	J	9	J	110	J	340	U
CARBAZOLE	14 J	380	U	350	U	360	U	31	J	15	J	120	J	340	U
DI-N-BUTYLPHTHALATE	370 U	380	U	350	U	360	U	20	J	350	U	1000	U	340	U
FLUORANTHENE	20 J	16	J	40	J	10	J	550	J	240	J	1700	J	11	J
PYRENE	17 J	18	J	57	J	360	U	500	J	210	J	1600	J	16	J
BUTYLBENZYLPHTHALATE	370 U	380	U	350	U	360	U	340	U	350	U	1000	U	340	U
3,3'-DICHLOROBENZIDINE	370 U	380	U	350	U	360	U	340	U	350	U	1000	U	340	U
BENZO(A)ANTHRACENE	10 J	380	U	32	J	360	U	260	J	100	J	1100	J	340	U
CHRYSENE	21 J	15	J	52	J	10	J	300	J	120	J	1300	J	9	J
BIS(2-ETHYLHEXYL)PHTHALATE	31 J	120	J	39	J	39	J	90	J	22	J	1000	U	340	U
DI-N-OCTYLPHTHALATE	370 U	380	U	350	U	360	U	75	J	350	U	46	J	340	U
BENZO(B)FLUORANTHENE	16 J	380	U	41	J	360	U	290	J	100	J	1000	J	340	U
BENZO(K)FLUORANTHENE	370 U	380	U	48	J	360	U	260	J	110	J	1200	J	340	U
BENZO(A)PYRENE	370 U	10	J	48	J	360	U	240	J	98	J	1100	J	340	U
INDENO(1,2,3-CD)PYRENE	9 J	12	J	40	J	360	U	190	J	85	J	770	J	340	U
DIBENZO(A,H)ANTHRACENE	370 U	380	U	12	J	360	U	58	J	27	J	280	J	340	U
BENZO(G,H,I)PERYLENE	370 U	380	U	350	U	360	U	340	U	350	U	1000	U	340	U
Percent Solids	99%	88%		93%		91%		96%		94%		95%		97%	

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" - Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

J - Value is detected.

- Value is greater than 3 X Background or greater or equal to Sample Quantitation Limit

Table: 3-2

Case No. : 31834

Site : Kekaha Sugar Co. Ltd.

Lab : LIBERTY ANALYTICAL CORPORATION

Analysis : CLPAS Semivolatile Organic Compounds

Matrix: Soil

Units: µg/kg

Station Location Sample ID Collection Date Dilution Factor	Maximum Background	Soil/Sed Background Concentrations											
		SO-SS32 Y0Y31 7/14/2003 1		SO-SS33 Y0Y32 7/14/2003 1		SO-SS34 Y0Y33 7/14/2003 1		SO-SS35 Y0Y34 07/14/2003 1.0					
PARAMETER	0	0	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	
BENZALDEHYDE	90 J	370	UJ	UJ	340	UJ	340	UJ	340	UJ	90	J	
PHENOL	67 J	370	U	U	340	U	340	U	340	U	67	J	
ACETOPHENONE	35 J	370	U	U	340	U	340	U	340	U	35	J	
NAPHTHALENE	330 U	370	U	U	340	U	340	U	340	U	330	U	
4-CHLORO-3-METHYLPHENOL	28 J	14	J	J	28	J	15	J	15	J	17	J	
2-METHYLNAPHTHALENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
ACENAPHTHYLENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
ACENAPHTHENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
2,4-DINITROTOLUENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
DIETHYLPHTHALATE	370 U	370	U	U	340	U	340	U	340	U	330	U	
FLUORENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
PENTACHLOROPHENOL	920 U	920	U	U	860	U	860	U	860	U	840	U	
PHENANTHRENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
ANTHRACENE	8 J	370	U	U	340	U	340	U	8	J	330	U	
CARBAZOLE	14 J	370	U	U	13	J	14	J	14	J	330	UJ	
DI-N-BUTYLPHTHALATE	370 U	370	U	U	340	U	340	U	340	U	330	U	
FLUORANTHENE	20 J	370	U	U	19	J	20	J	20	J	330	U	
PYRENE	17 J	370	U	U	17	J	17	J	17	J	330	U	
BUTYLBENZYLPHTHALATE	370 U	370	U	U	340	U	340	U	340	U	330	U	
3,3'-DICHLOOROBENZIDINE	370 U	370	U	U	340	U	340	U	340	U	330	U	
BENZO(A)ANTHRACENE	10 J	370	U	U	10	J	10	J	10	J	330	U	
CHRYSENE	21 J	370	U	U	19	J	21	J	21	J	330	U	
BIS(2-ETHYLHEXYL)PHTHALATE	31 J	370	UJ	UJ	340	UJ	340	UJ	340	UJ	31	J	
DI-N-OCTYLPHTHALATE	370 U	370	U	U	340	U	340	U	340	U	330	U	
BENZO(B)FLUORANTHENE	16 J	370	U	U	15	J	16	J	16	J	330	U	
BENZO(K)FLUORANTHENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
BENZO(A)PYRENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
INDENO(1,2,3-CD)PYRENE	9 J	370	U	U	9	J	9	J	9	J	330	U	
DI(BENZO(A,H)-ANTHRACENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
BENZO(G,H,I)PERYLENE	370 U	370	U	U	340	U	340	U	340	U	330	U	
Percent Solids	99%	90%	96%	97%	96%	97%	97%	97%	97%	97%	99%	99%	

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Coumpound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

J - Value is detected.

- Value is greater than 3 X Background or

greater or equal to Sample Quantitation Limit

Table: 3-3
Case No. : 31934
Site : Kekaha Sugar Co. Ltd.
Lab : LIBERTY ANALYTICAL CORPORATION
Analysis: Pesticides/PCBs
Matrix: Soil
Units : µg/kg

Pesticides/PCBs	Station Location Sample ID Collection Date Dilution Factor	Maximum Background Val	SO-SS2 Y0Y01 07/14/2003 1.0		SO-SS6 Y0Y05 07/14/2003 1.0		SO-SS12 Y0Y11 07/16/2003 1.0		SO-SS15 Y0Y14 07/16/2003 1.0		SO-SS16 Y0Y15 07/16/2003 1.0		SO-SS19 Y0Y18 07/15/2003 1.0		SO-SS22 Y0Y21 07/16/2003 1.0		SO-SS30 Y0Y29 07/15/2003 1.0	
			Result µg/kg	Val	Result µg/kg	Val	Result µg/kg	Val	Result µg/kg	Val	Result µg/kg	Val	Result µg/kg	Val	Result µg/kg	Val	Result µg/kg	Val
BETA-BHC		1.9	U	2.1	U	2.4	U	2.1	NJ	1.1	NJ	1.8	U	1.9	U	1.8	U	
GAMMA-BHC (LINDANE)		9.5	U	2.1	U	2.4	U	1.9	U	2.1	U	1.8	U	0.58	U	1.8	U	
HEPTACHLOR		11	U	2.1	U	1.1	NJ	1.9	U	2.1	U	1.8	U	1.9	U	1.8	U	
ALDRIN		9.6	U	2.1	U	2.4	U	2.4	U	2.1	U	1.8	U	1.9	U	1.8	U	
HEPTACHLOR EPOXIDE		1.9	U	2.1	U	2.4	U	2.4	U	2.1	U	1.8	U	1.9	U	1.8	U	
DIELDRIN		20	U	4.1	U	4.7	U	4.7	U	4.1	U	3.5	U	3.8	U	3.4	U	
4,4'-DDE		4	U	1.2	J	4.7	U	4.7	U	3.9	NJ	2.3	NJ	5.2	U	3.6	U	
ENDRIN		22	U	4.1	U	4.7	U	4.7	U	4.1	U	3.5	U	3.8	U	3.4	U	
ENDOSULFAN II		3.7	U	4.1	U	4.7	U	4.7	U	1.3	NJ	4.1	U	3.8	U	3.4	U	
4,4'-DDT		20	U	1.2	J	4.7	U	4.7	U	13	J	8.9	J	3.5	U	3.4	U	
METHOXYCHLOR		19	U	2.1	U	10	NJ	19	U	21	U	18	U	19	U	18	U	
ALPHA-CHLORDANE		4.5	NJ	2.1	U	2.4	U	2.4	U	14	NJ	2.4	NJ	5	U	1.8	U	
GAMMA-CHLORDANE		3.9	U	2.1	U	2.4	U	2.4	U	11	J	1.9	J	1.7	NJ	1.8	U	
AROCOR-1254		37	U	4.1	U	140	U	37	U	41	U	35	U	38	U	34	U	
Percent Solids		0.99	89%		81%		70%		90%		81%		95%		88%		97%	

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"NJ" - Compound not detected, value is reporting limit, which is estimated.

"R" - Results are rejected due to QC criteria.

"J" - Compound was detected.

14 - Value is greater than 3 X Background or greater or equal to Sample Quantitation Limit

Table: 3-3

Case No. : 31934
 Site : Kekaha Sugar Co. Ltd.
 Lab : LIBERTY ANALYTICAL CORPOR
 Analysis: Pesticides/PCBs
 Matrix: Soil
 Units : µg/kg

Pesticides/PCBs	Soil/Sed Background Concentrations											
	SO-SS32		SO-SS33		SO-SS34		SO-SS35					
	Sample ID	Collection Date	Sample ID	Collection Date	Sample ID	Collection Date	Sample ID	Collection Date				
	YOY31	07/14/2003	YOY32	07/14/2003	YOY33	07/14/2003	YOY34	07/14/2003				
	1.0		1.0		1.0		1.0					
	Result	Val	Result	Val	Result	Val	Result	Val				
BETA-BHC	1.9	U	1.8	U	1.9	U	1.7	U				
GAMMA-BHC (LINDANE)	0.66	U	1.8	U	1.7	U	1.7	U				
HEPTACHLOR	1.9	U	1.8	U	1.7	U	1.7	U				
ALDRIN	1.9	U	1.8	U	1.7	U	1.7	U				
HEPTACHLOR EPOXIDE	1.9	U	1.8	U	1.7	U	1.7	U				
DIELDRIN	3.7	U	3.4	U	3.3	U	3.3	U				
4,4'-DDE	3.7	U	4	U	3.4	NJ	3.1	J				
ENDRIN	3.7	U	3.4	U	3.3	U	3.3	U				
ENDOSULFAN II	3.7	U	3.4	U	3.3	U	3.3	U				
4,4'-DDT	3.7	U	2.1	NJ	2.1	NJ	2.1	J				
METHOXYCHLOR	19	U	18	U	17	U	17	U				
ALPHA-CHLORDANE	0.62	NJ	4.5	NJ	3	NJ	0.3	NJ				
GAMMA-CHLORDANE	1.9	U	3.9	U	2.3	U	1.7	U				
AROCLOR-1254	37	U	34	U	33	U	33	U				
Percent Solids	90%		96%		97%		99%					

µg/kg - Units of micrograms per kilogram
 NA - Not Applicable
 "U" - Compound not detected, value is re
 "J" - Compound Value Estimated.
 "UJ" - Compound not detected, value is r
 "NJ" = Compound estimated and value e
 "R" - Results are rejected due to QC crit
 "J" - Compound was detected.
 14 - Value is greater than 3 X Bac
 greater or equal to Sample Q

Table 3-4
 Case No. : 31934
 Site : Kekaha Sugar Co., Ltd.
 Lab : Liberty Analytical Corporation
 Analytical Type: Chlorinated Herbicides
 Matrix: Soil
 Units: µg/kg

Station Location Sample ID Collection Date Dilution Factor	Background Samples														
	Maximum Background			SO-SS32-SL32 G144-02 07/14/03 1			SO-SS33-SL33 G144-08 07/14/03 1			SO-SS34-SL34 G144-01 07/14/03 1			SO-S35-SL35 G144-17 07/14/03 1		
	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL
Chlorinated Herbicides	ND	U	10	ND	U	11	ND	U	10	ND	U	10	ND	U	10
2,4-D	ND	U	10	ND	U	11	ND	U	10	ND	U	10	ND	U	10
2,4-DB	ND	U	10	ND	U	11	ND	U	10	ND	U	10	ND	U	10
MCPP	ND	U	2100	ND	U	2200	ND	U	2100	ND	U	2100	ND	U	2000

RQL - Reporting Quantitation Limit
 µg/kg - Units of micrograms per kilogram
 "U" - Compound not detected, value is reporting limit.
 "J" - Compound Value Estimated.
 - Compound detected.
 - Value is greater than 3X background or greater than the Sample Quantitation Limit

Table 3-4

Case No. : 31934

Site : Kekaha Sugar Co., Ltd.

Lab : Liberty Analytical Corporation

Analytical Type: Chlorinated Herbicides

Matrix: Soil

Units: µg/kg

Station Location	Sample ID	Collection Date	Dilution Factor	Maximum Background			SO-SS10-SL10			SO-SS14-SL14			SO-SS15-SL15DL			SO-SS18-SL18			SO-SS20-SL20									
				Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL							
2,4-D	G143-07	07/16/03	1	ND	U	10	ND	U	15	ND	U	11	ND	U	21	ND	U	20	U	11	ND	U	11	ND	U	2500	U	11
2,4-DB	G143-11	07/16/03	1	ND	U	10	ND	U	15	ND	U	11	ND	U	21	ND	U	20	U	11	ND	U	11	ND	U	2500	U	11
MCPP	G143-13	07/16/03	2	ND	U	2100	ND	U	2900	ND	U	2100	ND	U	4200	ND	U	2800	U	2200	ND	U	2200	ND	U	2500	U	2100

RQL - Reporting Quantitation Limit

µg/kg - Units of micrograms per kilogram

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

- Compound detected.

- Value is greater than 3X background or greater than the Sample Quantitation Limit

Table 3-4

Case No. : 31934

Site : Kekaha Sugar Co., Ltd.

Lab : Liberty Analytical Corporation

Analytical Type: Chlorinated Herbicides

Matrix: Soil

Units: µg/kg

Station Location Sample ID Collection Date Dilution Factor	Maximum Background			SO-SS1-SL1 G144-18 07/14/03 1			SO-SS2-SL2 G144-07 07/14/03 1			SO-SS4-SL4 G144-06 07/14/03 1			SO-SS5-SL5 G143-15 07/16/03 1			SO-SS6-SL6 G144-11 07/14/03 1		
	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL
Chlorinated Herbicides	ND	U	10	ND	U	11	ND	U	13									
2,4-D	ND	U	10	ND	U	11	ND	U	13									
2,4-DB	ND	U	10	8.3	U	11	8.3	U	11	ND	U	11	ND	U	11	ND	U	13
MCPP	ND	U	2100	3000	U	2200	3000	U	2200	2400	U	2200	2400	U	2200	2400	U	2500

RQL - Reporting Quantitation Limit

µg/kg - Units of micrograms per kilogram

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

■ - Compound detected.

■ - Value is greater than 3X background or greater than the Sample Quantitation Limit

Table : 3-5
Case No. : 31934
Site : KEKAHA SUGAR CO., LTD
Lab : SGS ENVIRONMENTAL SERVICES
Analysis Type: Dioxins
Matrix: Soil
Unites pg/g

Dioxin	TEF	KSM-SO-SS7-SL7 7/15/2004			KSM-SO-SS10-SL10 7/16/2004			KSM-SO-SS12-SL12 7/16/2004			KSM-SO-SS13-SL13 7/16/2004		
		Result	Adjusted	Val	Result	Adjusted	Val	Result	Adjusted	Val	Result	Adjusted	Val
2,3,7,8-TCDD	1	ND	-	-	ND	-	-	ND	-	-	ND	-	-
1,2,3,7,8-PeCDD	0.5	8.43	4.215	-	ND	-	-	4.94	2.47	-	ND	-	-
1,2,3,4,7,8-HxCDD	0.1	9.98	0.998	-	12.1	1.21	-	8.44	0.844	-	11.3	1.13	-
1,2,3,4,7,8-HxCDD	0.1	52.5	5.25	-	29.8	2.98	-	27.3	2.73	-	39.8	3.98	-
1,2,3,7,8,9-HxCDD	0.1	24.5	2.45	-	30.9	3.09	-	17.3	1.73	-	21.8	2.18	-
1,2,3,4,6,7,8-HpCDD	0.01	1080	10.8	-	839	8.39	-	764	7.64	-	1140	11.4	-
OCDD	0.001	8510	8.51	-	7150	7.15	-	6550	6.55	-	10100	10.1	-
Furan													
2,3,7,8-TCDF	0.1	ND	-	-	ND	-	-	ND	-	-	ND	-	-
1,2,3,7,8-PeCDF	0.05	ND	-	-	ND	-	-	ND	-	-	ND	-	-
2,3,4,7,8-PeCDF	0.5	ND	-	-	ND	-	-	3.21	1.605	-	ND	-	-
1,2,3,4,7,8-HxCDF	0.1	7.25	0.725	-	ND	-	-	9.07	0.907	-	7.71	0.771	-
1,2,3,6,7,8-HxCDF	0.1	18.3	1.83	-	ND	-	-	8.65	0.865	-	8.03	0.803	-
2,3,4,6,7,8-HxCDF	0.1	14.9	1.49	-	16.4	1.64	-	12.2	1.22	-	11.9	1.19	-
1,2,3,7,8,9-HxCDF	0.1	ND	-	-	ND	-	-	ND	-	-	ND	-	-
1,2,3,4,6,7,8-HpCDF	0.01	255	2.55	-	232	2.32	-	248	2.48	-	235	2.35	-
1,2,3,4,7,8,9-HpCDF	0.01	19.5	0.195	-	14.7	0.147	-	14	0.14	-	16.8	0.168	-
OCDF	0.001	400	0.4	-	466	0.466	-	418	0.418	-	536	0.536	-
Total			39.41		27.39			29.60			34.61		
		Maximum Background			48.53								

pg/g - Units of picograms per gram
NA - Not Applicable
ND - Compound not detected.
"U" - Compound not detected, value is reporting limit.
"J" - Compound Value Estimated.
which is estimated.
"NJ" = Compound estimated and value estimated.
"R" - Results are rejected due to QC criteria.
1690.95 - Value is greater than 3 X Background.

Table : 3-5
Case No. : 31934
Site : KEKAHA SUGAR CO., LTD
Lab : SGS ENVIRONMENTAL SERVICES
Analysis Type: Dioxins
Matrix: Soil
Unites pg/g

Dioxin	TEF	KSM-SO-SS14-SL14 7/16/2004		KSM-SO-SS15-SL15 7/16/2004		KSM-SO-SS16-SL16 7/16/2004	
		Result	Adjusted	Result	Adjusted	Result	Adjusted
2,3,7,8-TCDD	1	ND	-	472	472	25.5	25.5
1,2,3,7,8-PeCDD	0.5	ND	-	49.1	24.55	29.4	14.7
1,2,3,4,7,8-HxCDD	0.1	ND	-	185	18.5	46.6	4.66
1,2,3,4,7,8-HxCDD	0.1	17.4	1.74	1350	135	116	11.6
1,2,3,7,8,9-HxCDD	0.1	9.77	0.977	445	44.5	68.2	6.82
1,2,3,4,6,7,8-HpCDD	0.01	483	4.83	31400	314	2830	28.3
OCDD	0.001	5230	5.23	428000	428	25300	25.3
Furan							
2,3,7,8-TCDF	0.1	ND	-	ND	-	4.59	0.459
1,2,3,7,8-PeCDF	0.05	ND	-	10.8	0.54	23	1.15
2,3,4,7,8-PeCDF	0.5	ND	-	25.9	12.95	25.4	12.7
1,2,3,4,7,8-HxCDF	0.1	2.37	0.237	264	26.4	38.4	3.84
1,2,3,6,7,8-HxCDF	0.1	2.91	0.291	280	28	43.8	4.38
2,3,4,6,7,8-HxCDF	0.1	5.85	0.585	359	35.9	33.4	3.34
1,2,3,7,8,9-HxCDF	0.1	ND	-	38.1	3.81	22.1	2.21
1,2,3,4,6,7,8-HpCDF	0.01	119	1.19	9940	99.4	716	7.16
1,2,3,4,7,8,9-HpCDF	0.01	8.72	0.0872	1060	10.6	74.4	0.744
OCDF	0.001	215	0.215	36800	36.8	1330	1.33
Total			15.38		1690.95		154.19

pg/g - Units of picograms per gram
NA - Not Applicable
ND - Compound not detected.
"U" - Compound not detected, value is reporting limit.
"J" - Compound Value Estimated.
which is estimated.
"NJ" = Compound estimated and value estimated.
"R" - Results are rejected due to QC criteria.
1690.95 - Value is greater than 3 X Background.

Table: 3-6

Case No. : 31934

Site : KEKAHA SUGAR CO., LTD

Lab : CHEMTECH CONSULTING GROUP INC.

Analysis Type: Total Metals

Matrix: Soil

Unites mg/kg

Metals	Maximum Background		KSM-SO-SS1 MYOY00 07/14/2003 1.0		KSM-SO-SS2 MYOY01 07/14/2003 1.0		KSM-SO-SS3 MYOY02 07/14/2003 1.0		KSM-SO-SS4 MYOY03 07/14/2003 1.0		KSM-SO-SS5 MYOY04 07/14/2003 1.0		KSM-SO-SS6 MYOY05 07/14/2003 1.0	
	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val
ALUMINUM	6580		13700		14200		11500		15300		11000		12500	
ANTIMONY	2.4	J	1.6	J	2	J	3.5	J	2.6	J	3.3	J	4.1	J
ARSENIC	14.7		17.7		15.8		11.6		16.1		11.3		53.7	
BARIIUM	22	J	58.1		59.6		54.2		62.8		62.7		48	J
BERYLLIUM	0.37	J	0.59	J	0.47	J	0.4	J	0.55	J	0.49	J	0.46	J
CADMIUM	0.31	J	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.3	U
CHROMIUM	179		248		279		296		314		241		278	
COBALT	43.5		55		60.8		70.6		68.6		69.8		52	
COPPER	23.8		39		53.8		39.7		55.9		49.6		51.3	
IRON	34800		53600		64700		63000		71900		54200		63200	
LEAD	56.1		0.45	J	0.75	J	1.6	J	2.3	U	2.3	U	2.6	
MANGANESE	691		1130		1920		2320		1650		1730		1100	
MERCURY	0.05	J	0.11	J	0.16		0.18		0.13		0.15		0.09	J
NICKEL	69.4		172		149		146		177		143		129	
POTASSIUM	932	J	1300	J	940	J	1440	J	1870	J	1460	J	1400	J
SELENIUM	0.8	J	8.1	U	7.9	U	8.1	U	8.1	U	8.1	U	9.1	U
VANADIUM	66.6		117		123		119		140		112		145	
ZINC	302	J	39.3		47.2		28		51.3		39.5		42.2	

mg/kg - Units of milligrams per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UU" - Compound not detected, value is reporting limit.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

13700 - Value is 3 x background.

Table: 3-6
Case No. : 31934
Site : KEKAHA SUGAR CO., LTD
Lab : CHEMTECH CONSULTING GROUP INC.
Analysis Type: Total Metals
Matrix: Soil
Unites mg/kg

Metals	Maximum Background		KSM-SO-SS7 MY0Y06 7/15/2003 1		KSM-SO-SS8 MY0Y07 7/15/2003 1		KSM-SO-SS11 MY0Y10 7/16/2003 1		KSM-SO-SS12 MY0Y11 7/16/2003 1		KSM-SO-SS13 MY0Y12 7/16/2003 1		KSM-SO-SS16 MY0Y15 07/16/2003 1	
	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val
ALUMINIUM	6580		3380		2560		11000		10200		8780		3180	
ANTIMONY	2.4	J	3.2	J	1	J	3.2	J	1.2	J	30	U	15	U
ARSENIC	14.7		21.3		47.4		11.4		10.7		19		20.6	
BARIIUM	22	J	36.2	J	32.1	J	71.6		82.9		58.1	J	21.4	J
BERYLLIUM	0.37	J	0.13	J	0.07	J	0.37	J	0.27	J	0.27	J	0.12	J
CADMIUM	0.31	J	1.1	U	0.15	J	1.2	U	0.95	J	2.5	U	0.15	J
CHROMIUM	179		36.7		35.5		169		137		191		49.8	
COBALT	43.5		11.1		6.6	J	48.8		33.1		62		10.8	J
COPPER	23.8		19.9		16.3		44.2		90.4		134		13.3	
IRON	34800		9850		8330		41900		48300		127000		10700	
LEAD	56.1		24.1		44		5.2		33		7.6		48.6	
MANGANESE	691		239		229		1360		1340		1610		360	
MERCURY	0.05	J	0.48		0.04	J	0.09	J	0.7		0.11	J	1.5	
NICKEL	69.4		62.9		37.2		148		85.8		165		44.7	
POTASSIUM	932	J	389	J	311	J	836	J	1060	J	2470	J	314	J
SELENIUM	0.8	J	7.4	U	1.3	J	8.5	U	9.9	U	17.5	U	1	J
VANADIUM	66.6		17.7		14.8		84.9		82.3		108		20.1	
ZINC	302	J	96.6		195		121		916		1400		66.5	

mg/kg - Units of milligrams per kilogram
NA - Not Applicable
"U" - Compound not detected, value is reporting limit.
"J" - Compound Value Estimated.
"UJ" - Compound not detected, value is reporting limit.
"NJ" = Compound estimated and value estimated.
"R" - Results are rejected due to QC criteria.
13700 - Value is 3 x background.

Table: 3-6

Case No. : 31934

Site : KEKAHA SUGAR CO., LTD

Lab : CHEMTECH CONSULTING GROUP INC.

Analysis Type: Total Metals

Matrix: Soil

Units mg/kg

Metals	Maximum Background		KSM-SO-SS19 MY0Y18 07/15/2003		KSM-SO-SS22 MY0Y21 07/16/2003		KSM-SO-SS27 MY0Y26 07/15/2003		KSM-SO-SS28 MY0Y27 07/15/2003		KSM-SO-SS29 MY0Y28 07/15/2003		KSM-SO-SS30 MY0Y29 07/15/2003	
	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val
ALUMINUM	6580		3830		3360		5110		2430		3310		1380	
ANTIMONY	2.4	J	10.5	J	1	J	2.7	J	3.3	J	4.8	J	12.1	U
ARSENIC	14.7		10.4		10.7		12.2		9.8		8.9		13.8	
BARIUM	22	J	26.8	J	62.9	J	30.5	J	16.8	J	25.2	J	10.8	J
BERYLLIUM	0.37	J	0.13	J	0.1	J	0.16	J	0.1	J	0.12	J	0.05	J
CADMIUM	0.31	J	0.3	J	1.1	U	1	U	1.1	U	1	U	0.2	J
CHROMIUM	179		50.5		23.8		84.7		30		66.7		19.2	
COBALT	43.5		15.1		5.8	J	23.6		7.37	J	12.9		3.4	J
COPPER	23.8		259		28.5		215		56.7		226		63.4	
IRON	34800		19400		18200		22300		8140		19000		4150	
LEAD	56.1		40.7		122		92.1		16.2		39.3		15.5	
MANGANESE	691		411		252		589		265		396		159	
MERCURY	0.05	J	1.3		0.13		1.6		0.22		0.18		0.04	J
NICKEL	69.4		75.6		37.6		92.9		35.2		58.9		74.8	
POTASSIUM	932	J	1060	J	312	J	1240	J	574	J	861	J	274	J
SELENIUM	0.8	J	7.3	U	0.85	J	1.1	J	1	J	7.3	U	7.1	U
VANADIUM	66.6		21.2		12.2		34.9		12.7		21.5		838	J
ZINC	302	J	203	J	125		115		40.6	J	102		31.8	

mg/kg - Units of milligrams per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, value is reporting limit,

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

13700 - Value is 3 x background.

Table: 3-6

Case No. : 31934

Site : KEKAHA SUGAR CO., LTD

Lab : CHEMTECH CONSULTING GROUP INC.

Analysis Type: Total Metals

Matrix: Soil

Unites mg/kg

Metals	Maximum Background		Soil/Sed Background Concentrations											
	Result	Val	KSM-SO-SS32 MY0Y31 07/14/2003 1			KSM-SO-SS33 MY0Y32 07/14/2003 1			KSM-SO-SS34 MY0Y33 07/14/2003 1			KSM-SO-SS35 MY0Y34 07/14/2003 1		
ALUMINUM	6580		6580		3150		3180		3180		1850			
ANTIMONY	2.4	J	2.4	J	12.2	U	0.97	J	0.97	J	12.4	U		
ARSENIC	14.7		9.9		13.5		13.5		13.5		14.7			
BARIUM	22	J	38.1	J	21.3	J	22	J	22	J	14.4	J		
BERYLLIUM	0.37	J	0.37	J	0.09	J	0.1	J	0.1	J	0.07	J		
CADMIUM	0.31	J	1.1	U	0.31	J	0.18	J	0.18	J	0.18	J		
CHROMIUM	179		179		42.8		46.9		46.9		26.2			
COBALT	43.5		43.5		8.9	J	11.6		11.6		5.7	J		
COPPER	23.8		23.4		23.8		21.9		21.9		6			
IRON	34800		34800		11100		11700		11700		6090			
LEAD	56.1		0.83	J	52.9		56.1		56.1		18.2			
MANGANESE	691		691		275		318		318		209			
MERCURY	0.05	J	0.05	J	0.03	J	0.1	U	0.1	U	0.1	U		
NICKEL	69.4		57.6		52.7		69.4		69.4		37.5			
POTASSIUM	932	J	932	J	413	J	465	J	465	J	192	J		
SELENIUM	0.8	J	7.7	U	0.8	J	7.3	U	7.3	U	7.2	U		
VANADIUM	66.6		66.6		22		22.5		22.5		9.9	U		
ZINC	302	J	16.3		72.8	J	75.6		75.6		302	J		

mg/kg - Units of milligrams per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, value is reporting limit.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

13700 - Value is 3 x background.

Table 3-7
 Project No: R03S65
 Site : KEKAHA SUGAR CO., LTD
 Lab : USEPA REGION 9 LABORATORY
 Analysis Type: Volatile Organic Compounds
 Matrix: Sediment
 Units: µg/kg

	Station Location : KSMSED1 SL36 Collection Date : 7/16/03 Dilution Factor :	KSMSED2 SL37 7/16/03	KSMSED3 SL38 7/16/03	KSMSED4 SL39 7/16/03	KSMSED5 SL40 7/16/03	KSMSED6 SL41 7/16/03	KSMSED7 SL42 7/16/03	KSMSED8 SL43 7/16/03	KSMSED9 SL44 7/16/2003
VOCs									
1, 1-Dichloroethane	ND	ND	ND	ND	ND	ND	7.4	ND	ND
2-Butanone (MEK)	28	ND	ND	ND	390	ND	38	44	100
2-Hexanone	ND	ND	ND	ND	330	ND	8.5	9.4	19
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	8.7	8.1
Acetone	180	ND	ND	ND	4200	ND	150	120	320
Carbon Disulfide	ND	ND	ND	ND	58	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	8.5	ND	ND
Dichloromethane (methylene chloride)	ND	ND	2.8	2.3	ND	8.6	ND	3.2	ND
Toluene	ND	ND	ND	ND	3	ND	2.9	ND	ND
Trichlorofluoromethane	ND	2.5	16	5.3	ND	12	ND	4.2	2.9

ND - Compound not detected above CRQL
 CRQL - Contract Reporting Quantitation Limit
 VOC results limited to detected compounds only. VOCs were not detected in surface water or groundwater.

Table: 3-8

Case No. : 31934

Site : Kekaha Sugar Co. Ltd.

Lab : LIBERTY ANALYTICAL CORPORATION

Analysis: CLPAS Semivolatile Organic Compounds

Matrix: Sediments

Units: µg/kg

Station Location	Background		SED-1 Y0Y35DL 07/16/2003 5.0		SED-1 Y0Y35 07/16/2003 2.0		SED-2 Y0Y36 07/16/2003 1.0		SED-3 Y0Y37 07/16/2003 1.0		SED-4 Y0Y38 07/16/2003 1.0	
	TEL	PEL	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val
PARAMETER												
BENZALDEHYDE			72	J	77	J	65	J	57	J	48	J
PHENOL			1700	U	51	J	340	U	410	U	390	U
ACETOPHENONE			1700	U	37	J	49	J	29	J	29	J
4-METHYLPHENOL			1700	U	33	J	340	U	410	U	390	U
2,4-DIMETHYLPHENOL			1700	U	22	J	340	U	410	U	390	U
NAPHTHALENE			48	J	48	J	340	U	410	U	390	U
4-CHLORO-3-METHYLPHENOL			74	J	38	J	30	J	410	U	390	U
2-METHYLNAPHTHALENE			1700	U	26	J	340	U	410	U	390	U
ACENAPHTHYLENE			47	J	53	J	340	U	410	U	390	U
ACENAPHTHENE			78	J	81	J	340	U	25	J	390	U
DIBENZOFURAN			39	J	39	J	340	U	11	J	390	U
FLUORENE			47	J	680	U	340	U	23	J	390	U
PHENANTHRENE	41.9	575	2800	J	2700	J	130	J	480	J	120	J
ANTHRACENE			380	J	390	J	34	J	37	J	14	J
CARBAZOLE			840	J	560	J	27	J	84	J	25	J
DI-N-BUTYLPHTHALATE			340	J	330	J	340	U	410	U	34	J
FLUORANTHENE			4900	J	4700	J	220	J	720	J	230	J
PYRENE	53	875	6000	J	5800E	J	290	J	600	J	190	J
BUTYLBENZYLPHTHALATE			200	J	180	J	170	J	410	U	390	U
BENZO(A)ANTHRACENE	31.7	385	2600	J	2700	J	110	J	270	J	89	J
CHRYSENE			4300	J	4200	J	200	J	430	J	160	J
BIS(2-ETHYLHEXYL)PHTHALATE			2300	J	1800	J	74	J	110	J	77	J
DI-N-OCTYLPHTHALATE			270	J	680	U	23	J	410	U	390	U
BENZO(B)FLUORANTHENE			2600	J	3700	J	150	J	360	J	140	J
BENZO(K)FLUORANTHENE			2800	J	1900	J	140	J	330	J	110	J
BENZO(A)PYRENE			2400	J	2400	J	130	J	270	J	92	J
INDENO(1,2,3-CD)-PYRENE	31.9	782	1500	J	1500	J	91	J	210	J	74	J
DIBENZO(A,H)-ANTHRACENE			450	J	460	J	19	J	38	J	21	J
BENZO(G,H,I)PERYLENE			1200	J	1200	J	340	U	52	J	390	U
Percent Solids	99%			97%		96%		81%		84%		76%

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

J - Value is detected.

Table: 3-8

Case No. : 31934

Site : Kekaha Sugar Co. Ltd.

Lab : LIBERTY ANALYTICAL CORPORATION

Analysis: CLPAS Semivolatile Organic Compounds

Matrix: Sediments

Units: µg/kg

Station Location	Background		SED-5		SED-6		SED-7		SED-8		SED-9	
	TEL	PEL	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val	Results µg/kg	Val
PARAMETER												
BENZALDEHYDE			430	J	130	J	91	3500	3500	350	350	U
PHENOL			520	U	1100	U	1300	U	3500	U	350	U
ACETOPHENONE			110	J	58	J	1300	U	3500	U	350	U
4-METHYLPHENOL			280	J	1100	U	1300	U	3500	U	350	U
2,4-DIMETHYLPHENOL			430	U	1100	U	1300	U	3500	U	350	U
NAPHTHALENE			430	U	1100	U	1300	U	3500	U	350	U
4-CHLORO-3-METHYLPHENOL			430	U	1100	U	1300	U	3500	U	350	U
2-METHYLNAPHTHALENE			430	U	1100	U	78	3500	3500	U	350	U
ACENAPHTHYLENE			430	U	1100	U	1300	U	3500	U	350	U
ACENAPHTHENE			430	U	1100	U	1300	U	3500	U	350	U
DIBENZOFURAN			430	U	1100	U	1300	U	3500	U	350	U
FLUORENE			430	U	1100	U	180	3500	3500	U	350	U
PHENANTHRENE	41.9	575	22	J	320	J	1000	160	3500	J	350	U
ANTHRACENE			430	U	64	J	1300	U	3500	U	350	U
CARBAZOLE			430	UJ	90	J	1300	U	3500	U	350	U
DI-N-BUTYLPHTHALATE			430	U	1100	U	1300	U	3500	U	350	U
FLUORANTHENE			69	J	1000	J	160	3500	3500	U	350	U
PYRENE	53	875	63	J	920	J	260	3500	3500	U	350	U
BUTYLBENZYLPHTHALATE			430	U	1100	U	1300	U	1700	J	350	U
BENZO(A)ANTHRACENE	31.7	385	51	J	630	J	41	3500	3500	U	350	U
CHRYSENE			63	J	880	J	90	3500	3500	U	350	U
BIS(2-ETHYLHEXYL)PHTHALATE			430	U	170	J	7200	23000	23000	U	350	U
DI-N-OCTYLPHTHALATE			430	U	650	J	1300	U	1700	J	350	U
BENZO(B)FLUORANTHENE			54	J	940	J	1300	U	3500	U	350	U
BENZO(K)FLUORANTHENE			56	J	800	J	1300	U	3500	U	350	U
BENZO(A)PYRENE			48	J	720	J	1300	U	3500	U	350	U
INDENO(1,2,3-CD)-PYRENE	31.9	782	35	J	580	J	1300	U	3500	U	350	U
DIBENZO(A,H)-ANTHRACENE			430	U	210	J	1300	U	3500	U	350	U
BENZO(G,H,I)PERYLENE			430	U	220	J	1300	U	3500	U	350	U
Percent Solids	99%			58%		77%		94%		93%		59%

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" - Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

J - Value is detected.

Table: 3-9

Case No. : 31934

Site : Kekaha Sugar Co. Ltd.

Lab : LIBERTY ANALYTICAL CORPORATION

Analysis: Pesticides/PCBs

Matrix: Sediment

Units : µg/kg

Pesticides/PCBs	Station Location		Sample ID		Collection Date		Dilution Factor		Benchmark		SED-1		SED-2		SED-3		SED-4		SED-5		SED-6			
	NOAA		Y0Y35		07/16/2003		1.0		TEL		PEL		µg/kg		Val		µg/kg		Val		µg/kg		Val	
	TEL	PEL	µg/kg	Val	µg/kg	Val	µg/kg	Val	µg/kg	Val	µg/kg	Val	µg/kg	Val	µg/kg	Val	µg/kg	Val	µg/kg	Val	µg/kg	Val	µg/kg	Val
BETA-BHC	NV	NV	0.55	NJ	1.5	NJ	3.2	NJ	2	U	1.3	U	2.9	U										
DELTA-BHC	NV	NV	1.8	U	1.3	NJ	2.1	U	2	U	2.2	U	2.9	U										
GAMMA-BHC (LINDANE)	0.94	1.36	1.8	U	1.8	U	2.1	U	2	U	2.2	U	3.3	NJ										
HEPTACHLOR	NV	NV	1.8	U	1.8	U	2.1	U	2	U	3.6	NJ	2.9	U										
HEPTACHLOR EPOXIDE	0.6	2.74	1.8	U	1.8	U	2.1	U	2	U	2	U	2.9	U										
ENDOSULFAN I	NV	NV	0.98	NJ	0.24	NJ	2.1	U	2	U	2.2	U	2.9	U										
DIELDRIN	2.85	6.67	0.82	NJ	3.4	U	4.1	U	3.9	U	4.3	U	5.7	U										
4,4'-DDE	1.42	6.75	3.4	U	3.4	U	4.1	U	3.9	U	4.3	U	5.7	U										
4,4'-DDD	3.54	8.51	27	J	3.4	U	4.1	U	3.9	U	4.3	U	5.7	U										
4,4'-DDT	NV	NV	3.4	U	2.9	J	4.1	U	3.9	U	4.3	U	5.7	U										
METHOXYCHLOR	NV	NV	8.9	NJ	0.81	NJ	4.1	U	3.9	U	4.3	U	5.7	U										
ENDRIN KETONE	NV	NV	18	NJ	18	U	21	U	20	U	22	U	29	U										
ENDRIN ALDEHYDE	2.67	62.4	3.4	NJ	3.4	U	4.1	U	3.9	U	4.3	U	5.7	U										
ALPHA-CHLORDANE	NV	NV	18	NJ	3.4	U	4.1	U	3.9	U	4.3	U	5.7	U										
GAMMA-CHLORDANE	4.5	8.9	11	NJ	3.3	NJ	2.1	U	0.28	NJ	2.2	U	1.4	NJ										
TOXAPHENE			8.5	NJ	3	NJ	2.1	U	0.54	NJ	2.2	U	5.4	J										
Percent Solids			180	U	180	U	210	U	200	U	220	U	290	U										
µg/kg - Units of micrograms per kilogram			0.99																					

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"JJ" - Compound not detected, value is reporting limit, which is estimated.

NJ - Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

- Compound detected.

Benchmark: National Oceanic Administration (NOAA) Screening Quick Reference Tables (SQUIRTs) - values are for fresh sediment. Threshold Effect Levels (TEL) and Probable Effect Levels (PEL) are used, unless otherwise noted. These values are for screening purposes only, they do not constitute criteria or clean-up levels.

NV - No value provided in SQUIRTs

Table: 3-9

Case No. : 31934
 Site : Kekaha Sugar Co. Ltd.
 Lab : LIBERTY ANALYTICAL CORPORATION
 Analysis: Pesticides/PCBs
 Matrix: Sediment
 Units : µg/kg

Pesticides/PCBs	Station Location Sample ID Collection Date Dilution Factor		Benchmark NOAA		SED-10 Y0Y44 08/05/2003 1.0		SED-11 Y0Y45 08/05/2003 1.0		SED-12 Y0Y46 08/05/2003 1.0		SED-14 Y0Y48 08/05/2003 1.0		SED-18 Y0Y52 08/05/2003 1.0		SED-19 Y0Y53 08/05/2003 1.0	
	TEL	PEL	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val
BETA-BHC	NV	NV	2.4	UJ	1.8	U	3.3	U	2.5	U	3.3	U	3.5	U	3.5	U
DELTA-BHC	NV	NV	2.4	UJ	1.8	U	3.3	U	2.5	U	3.3	U	1.8	NJ	3.5	U
GAMMA-BHC (LINDANE)	0.94	1.38	2.4	UJ	1.8	U	3.3	U	2.5	U	3.3	U	1.6	NJ	3.5	U
HEPTACHLOR	NV	NV	2.4	UJ	1.8	U	3.3	U	2.5	U	3.3	U	3.5	U	3.5	U
HEPTACHLOR EPOXIDE	0.6	2.74	2.4	UJ	1.8	U	3.3	U	2.5	U	3.3	U	3.5	U	3.5	U
ENDOSULFAN I	NV	NV	2.4	UJ	1.8	U	3.3	U	2.5	U	3.3	U	3.5	U	3.5	U
DIELDRIN	2.85	6.67	4.6	UJ	3.5	U	6.5	U	4.8	U	6.5	U	6.7	U	6.9	U
4,4'-DDE	1.42	6.75	0.7	NJ	1	NJ	36	U	1.4	NJ	36	U	4.1	NJ	4.7	NJ
4,4'-DDD	3.54	8.51	4.6	UJ	3.5	U	3.2	U	4.8	U	3.2	U	1.5	NJ	2.2	NJ
ENDOSULFAN SULFATE	NV	NV	4.6	UJ	3.5	U	6.5	U	4.8	U	6.5	U	6.7	U	6.9	U
4,4'-DDT	NV	NV	4.6	UJ	0.77	NJ	4.8	U	4.8	U	4.5	J	6.7	U	5.4	NJ
METHOXYCHLOR	NV	NV	24	UJ	18	U	33	U	25	U	33	U	35	U	35	U
ENDRIN KETONE	2.67	62.4	4.6	UJ	3.5	U	6.5	U	4.8	U	6.5	U	6.7	U	6.9	U
ENDRIN ALDEHYDE	NV	NV	4.6	UJ	3.5	U	6.5	U	4.8	U	6.5	U	6.7	U	6.9	U
ALPHA-CHLORDANE	4.5	8.9	2.4	UJ	1.8	U	1.6	NJ	2.5	U	1.6	NJ	2.1	NJ	5.1	NJ
GAMMA-CHLORDANE			2.4	UJ	1.8	U	3.3	U	2.5	U	3.3	U	3.5	U	2.2	NJ
TOXAPHENE			240	UJ	180	U	93%	U	250	U	330	U	350	U	350	U
Percent Solids			7.2%	U	93%	U	51%	U	69%	U	51%	U	49%	U	48%	U

µg/kg - Units of micrograms per kilogram

- NA - Not Applicable
- "U" - Compound not detected, value is reporting limit.
- "J" - Compound Value Estimated.
- "JJ" - Compound not detected, value is reporting limit, which is estimated
- NJ** - Compound estimated and value estimated.
- "R" - Results are rejected due to QC criteria.
- █ - Compound detected.

Benchmark: National Oceanic Atmospheric Administration (NOAA) Screening Threshold Effect Levels (TEL) and Probable Effect Levels (PEL) are used for screening purposes only, they do not constitute criteria or clean-up levels

NV - No value provided in SQUIRTs

Table 3-10

Case No. : 31934

Site : Kekaha Sugar Co., Ltd.

Lab : Liberty Analytical Corporation

Analytical Type: Chlorinated Herbicides

Matrix: Sediments

Units: µg/kg

Station Location Sample ID Collection Date Dilution Factor	SED-3-SL38 G143-09 07/16/03 1			SED-4-SL39 G144-04 07/16/03 1			KSM-SED10-SL45 H048-01 08/05/03 1			KSM-SED11-SL46 H048-02 08/05/03 1			KSM-SED12-SL47 H048-03 08/05/03 1			KSM-SED13-SL48 H048-04 08/05/03 1		
	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL
Chlorinated Herbicides																		
2,4,5-T	ND	U	12	ND	U	12	ND	U	13	ND	U	11	ND	U	17	ND	U	20
2,4,5-TP(SILVEX)	ND	U	12	ND	U	12	ND	U	13	ND	U	11	ND	U	17	ND	U	20
2,4-D	ND	U	12	ND	U	12	ND	U	13	ND	U	11	ND	U	17	ND	U	20
2,4-DB	ND	U	12	ND	U	12	ND	U	13	ND	U	11	ND	U	17	ND	U	20
DALAPON	ND	U	12	ND	U	12	ND	U	13	ND	U	11	ND	U	17	ND	U	20
DICAMBA	ND	U	12	ND	U	12	ND	U	13	ND	U	11	ND	U	17	ND	U	20
DICHLOROPROP	ND	U	12	ND	U	12	ND	U	13	ND	U	11	ND	U	17	ND	U	20
DINOSEB	ND	U	12	ND	U	12	ND	U	13	ND	U	11	ND	U	17	ND	U	20
MCPA	ND	U	2400	ND	U	2400	ND	U	2600	ND	U	2200	ND	U	3300	ND	U	4000
MCPP	ND	U	2400	ND	U	2400	ND	U	2600	ND	U	2200	ND	U	2000	ND	U	4000

RQL - Reporting Quantitation Limit

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

Table 3-10

Case No. : 31934

Site : Keikaha Sugar Co., Ltd.

Lab : Liberty Analytical Corporation

Analytical Type: Chlorinated Herbicides

Matrix: Sediments

Units: µg/kg

Station Location Sample ID Collection Date Dilution Factor	KSM-SED14-SL49 H048-05 08/05/03			KSM-SED15-SL50 H048-06 08/05/03			SED-16-SL51 G143-08 07/16/03			KSM-SED17-SL52 H048-07 08/05/03			KSM-SED18-SL53 H048-08 08/05/03			KSM-SED19-SL54 H048-09 08/05/03		
	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL	Result µg/kg	Val	RQL
Chlorinated Herbicides	ND	U	29	ND	U	12	ND	U	14	ND	U	21	ND	U	20	ND	U	20
2,4,5-T	ND	U	29	ND	U	12	ND	U	14	ND	U	21	ND	U	20	ND	U	20
2,4,5-TP(SILVEX)	ND	U	29	ND	U	12	ND	U	14	ND	U	21	ND	U	20	ND	U	20
2,4-D	ND	U	29	ND	U	12	ND	U	14	ND	U	21	ND	U	20	ND	U	20
2,4-DB	ND	U	29	ND	U	12	ND	U	14	ND	U	21	ND	U	20	ND	U	20
DALAPON	ND	U	29	ND	U	12	ND	U	14	ND	U	21	ND	U	20	ND	U	20
DICAMBA	ND	U	29	ND	U	12	ND	U	14	ND	U	21	ND	U	20	ND	U	20
DICHLOROPROP	ND	U	29	ND	U	12	ND	U	14	ND	U	21	ND	U	20	ND	U	20
DINOSEB	ND	U	29	ND	U	12	ND	U	14	ND	U	21	ND	U	20	ND	U	20
MCPA	ND	U	5700	ND	U	2400	ND	U	2900	ND	U	4200	ND	U	3900	ND	U	4000
MCPP	ND	U	5700	ND	U	2400	ND	U	2900	ND	U	4200	ND	U	3900	ND	U	4000

RQL - Reporting Quantitation Limit

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

Table : 3-11

Case No. : 31934

Site : KEKAHA SUGAR CO., LTD

Lab : SGS ENVIRONMENTAL SERVICES

Analysis Type: Dioxins

Matrix: Sediment

Unit: pg/g

Dioxin	Background		KSM-SED-3-SL38 7/16/2004		KSM-SED-4-SL39 7/16/2004		KSM-SED-13-SL48 8/5/2004		KSM-SED-14-SL49 7/17/2004		
	TEF	PEL	Result	Adjusted	Val	Result	Adjusted	Val	Result	Adjusted	Val
2,3,7,8-TCDD	1		ND	-		ND	-		ND	-	
1,2,3,7,8-PeCDD	0.5		ND	-		ND	-		26.1	-	13.05
1,2,3,4,7,8-HxCDD	0.1		6.3	0.63		5.7	0.57		4.41	0.441	5.51
1,2,3,4,7,8-HxCDD	0.1		25.4	2.54		22.5	2.25		15.9	1.59	14.9
1,2,3,7,8,9-HxCDD	0.1		15.2	1.52		14.1	1.41		10.1	1.01	10.2
1,2,3,4,6,7,8-HpCDD	0.01		694	6.94		577	5.77		419	4.19	27.4
OCDD	0.001		5650	5.65		5050	5.05		3270	3.27	191.00
Furan											
2,3,7,8-TCDF	0.1		ND	-		ND	-		ND	-	
1,2,3,7,8-PeCDF	0.05		ND	-		ND	-		ND	-	
2,3,4,7,8-PeCDF	0.5		ND	-		ND	-		9.46	4.73	
1,2,3,4,7,8-HxCDF	0.1		4.82	0.482		3.67	0.367		3.18	0.318	2.77
1,2,3,6,7,8-HxCDF	0.1		5.28	0.528		11	1.1		4.45	0.445	4.49
2,3,4,6,7,8-HxCDF	0.1		4.99	0.499		6.08	0.608		8.02	0.802	4.99
1,2,3,7,8,9-HxCDF	0.1		ND	-		ND	-		ND	-	2.57
1,2,3,4,6,7,8-HpCDF	0.01		154	1.54		134	1.34		104	1.04	6.52
1,2,3,4,7,8,9-HpCDF	0.01		11	0.11		8.53	0.0854		7.88	0.0788	0.548
OCDF	0.001		318	0.318		266	0.266		184	0.184	1000
Total		277.00		20.76			31.51				115.47

pg/g - Units of picograms per gram

NA - Not Applicable

ND - Compound not detected.

"J" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

which is estimated.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

See Table 3-5.

Table: 3-12

Case No. : 31934

Site : KEKAHA SUGAR CO., LTD

Lab : CHEMTECH CONSULTING GROUP INC.

Analysis Type: Total Metals

Matrix: Sediments

Units: mg/kg

Metals	Background SED 16		KSM-SED-1 MY0Y35 07/16/2003		KSM-SED-2-SL37 MY0Y36 07/16/2003		KSM-SED3-SL38 MY0Y37 07/16/2003		KSM-SED-4 MY0Y38 07/16/2003		KSM-SED-5 MY0Y39 07/16/2003	
	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val
Arsenic	17.2		15.7		9.2							13
ALUMINUM			5510		5610		5790		6060		5760	
ANTIMONY	2.4	J	6	J	5	J	2	J	3	J	4.5	J
BARIUM	22	J	32.3	J	44.3		41.4	J	42.9	J	18.5	J
COPPER	23.8		170		283		24.8		23.6		229	
MERCURY	0.05	J	0.1	U	4.3		0.11	U	0.04	J	0.26	
NICKEL	69.4		124		237		76.6		98.5		144	
POTASSIUM	932	J	6420	J	1080	J	502	J	484	J	16500	J
THALLIUM	5.5	U	5.2	U	5.2	U	5.8	U	5.9	U	6.3	U
VANADIUM	66.6		29		49.9		49.1		53.1		46	
ZINC	302	J	539		358		186		246		198	

mg/kg - Units of milligrams per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, value

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

Table: 3-12

Case No. : 31934

Site : KEKAHA SUGAR CO., LTD

Lab : CHEMTECH CONSULTING GROUP INC.

Analysis Type: Total Metals

Matrix: Sediments

Units mg/kg

Metals	Background SED 16		KSM-SED-6 MYOY40 07/16/2003		KSM-SED-7-SL42 MYOY41 07/16/2003		KSM-SED-8 MYOY42 07/16/2003		KSM-SED-9 MYOY43 07/16/2003		SED10-SL45 MYOY44 08/05/2003	
	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val
Arsenic	17.2		12.6		13.1		12.4		11.8		13.1	
ALUMINUM			9500		6480		4160		2490		14100	
ANTIMONY	2.4	J	7.2	J	15.2	U	3	J	12.8	U	14.5	U
BARIUM	22	J	130		43.9	J	26.6	J	13.9	J	57.1	
COPPER	23.8		572		80.3		51.1		13.6		48.2	
MERCURY	0.05	J	0.25		0.09	J	0.02	J	0.11	U	0.12	U
NICKEL	69.4		93		80.4		52.4		32.2		151	
POTASSIUM	932	J	801	J	755	J	808	J	505	J	1300	J
THALLIUM	5.5	U	8.9	U	6.4	U	5.1	U	5.3	U	6	U
VANADIUM	66.6		69.1		43.8		27		13.5		104	
ZINC	302	J	9730		104		1170		136		841	

mg/kg - Units of milligrams per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, value

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

Table: 3-12

Case No. : 31934

Site : KEKAHA SUGAR CO.,LTD

Lab : CHEMTECH CONSULTING GROUP INC.

Analysis Type: Total Metals

Matrix: Sediments

Unites mg/kg

Metals	Background SED 16		SED11-SL46 MY0Y45 08/05/2003 1		SED12-SL47 MY0Y46 08/05/2003 1		SED13-SL48 MY0Y47 08/05/2003 1		SED14-SL49 MY0Y48 08/05/2003 1		SED15-SL50 MY0Y49 08/05/2003 1	
	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val
Arsenic	17.2		14.7		12.8		17.5		9.2		36.8	
ALUMINUM			15600		17000		15300		8340		15700	
ANTIMONY	2.4	J	1.7	J	1.6	J	3.1	J	2.5	J	1.9	J
BARIUM	22	J	61.6		85.3		35.7	J	17.4	J	42.3	J
COPPER	23.8		67.6		148		157		44		52.1	
MERCURY	0.05	J	0.12		0.52		0.16	J	66.9		126	
NICKEL	69.4		157		154		181		455	J	1210	J
POTASSIUM	932	J	999	J	1040	J	3110	J	14.1	U	1.1	J
THALLIUM	5.5	U	5.2	U	7	U	10.3	U	87.5		127	
VANADIUM	66.6		118		137		184		74.8		60.5	
ZINC	302	J	265		1750		1870					

mg/kg - Units of milligrams per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, value

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

Table: 3-12

Case No. : 31934

Site : KEKAHA SUGAR CO., LTD

Lab : CHEMTECH CONSULTING GROUP INC.

Analysis Type: Total Metals

Matrix: Sediments

Units mg/kg

Metals	Background SED 16		SED16-SL51 MY0Y50 07/16/2003		SED17-SL52 MY0Y51 08/05/2003		SED18-SL53 MY0Y52 08/05/2003		SED19-SL54 MY0Y53	
	Result	Val	Result	Val	Result	Val	Result	Val	Result	Val
Arsenic	17.2		20.6							23.2
ALUMINUM			12500		24100		21000		17200	
ANTIMONY	2.4	J	3.5	J	2.7	J	1.9	J	1.8	J
BARIUM	22	J	42.3	J	41.7	J	41.3	J	63.9	J
COPPER	23.8		39.9		84.7		115		105	
MERCURY	0.05	J	0.11	J	267		163		153	
NICKEL	69.4		101		394	J	668	J	657	J
POTASSIUM	932	J	851	J	16.1	U	12.9	U	12.5	U
THALLIUM	5.5	U	7.2	U	197		146		122	
VANADIUM	66.6		105		95.1		237		213	
ZINC	302	J	26.5							

mg/kg - Units of milligrams per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, value

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

Table: 3--13

Case No. : 31934

Site : Kekaha Sugar Co. Ltd.

Lab : SHEALY ENVIRONMENTAL SERVICES, INC.

Analysis: CLPAS Semivolatile Organic Compounds

Matrix: Water

Units: µg/l

Semivolatile Compound	Station Location :		Sample ID :		Collection Date :		Dilution Factor :	
	Result	CRQL	Resu	Val	Resu	Val	Resu	Val
4-Methylphenol	5.0		1.7J	J	5.0U	U	1.9J	J

µg/kg - Units of micrograms per kilogram

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

█ - Compound is detected.

Table: 3-14

Case No. : 31934

Site : Kekaha Sugar Co. Ltd.

Lab : SHEALY ENVIRONMENTAL SERVICES, INC.

Analysis : Pesticides/PCBs

Matrix: Groundwater

Units : µg/l

Pesticide/PCB Compound	Station Location :		GW1-SL61		GW3-SL63		GW4-SL64			
	Sample ID :	Collection Date :	Y0XZ8RE	08/05/2003	Y0XZ9RE	08/05/2003	Y0XZ0RE	08/05/2003		
Dilution Factor :	CRQL	Result	µg/L	Val	Result	µg/L	Val	Result	µg/L	Val
alpha-BHC	0.01	0.01	U	U	0.01	U	U	0.01	U	U
beta-BHC	0.01	0.01	U	U	0.01	U	U	0.01	U	U
delta-BHC	0.01	0.01	U	U	0.01	U	U	0.01	U	U
gamma-BHC (Lindane)	0.01	0.01	UJ	UJ	0.01	UJ	UJ	0.01	UJ	UJ
Heptachlor	0.01	0.01	U	U	0.01	U	U	0.01	U	U
Aldrin	0.01	0.01	U	U	0.01	U	U	0.01	U	U
Heptachlor epoxide	0.01	0.01	U	U	0.01	UJ	UJ	0.01	U	U
Endosulfan I	0.01	0.01	U	U	0.01	UJ	UJ	0.01	U	U
Dieldrin	0.02	0.02	U	U	0.02	UJ	UJ	0.02	U	U
4,4'-DDE	0.02	0.02	U	U	0.02	UJ	UJ	0.02	U	U
Endrin	0.02	0.02	U	U	0.02	UJ	UJ	0.02	U	U
Endosulfan II	0.02	0.02	U	U	0.02	UJ	UJ	0.02	U	U
4,4'-DDD	0.02	0.02	UJ	UJ	0.02	UJ	UJ	0.02	UJ	UJ
Endosulfan sulfate	0.02	0.02	U	U	0.02	UJ	UJ	0.02	U	U
4,4'-DDT	0.02	0.02	UJ	UJ	0.02	UJ	UJ	0.02	UJ	UJ
Methoxychlor	0.1	0.1	UJ	UJ	0.1	UJ	UJ	0.1	UJ	UJ
Endrin ketone	0.02	0.02	U	U	0.02	UJ	UJ	0.02	U	U
Endrin aldehyde	0.02	0.02	U	U	0.02	UJ	UJ	0.02	U	U
alpha-Chlordane	0.01	0.01	U	U	0.01	UJ	UJ	0.01	U	U
gamma-Chlordane	0.01	0.01	U	U	0.011	J	J	0.01	U	U
Toxaphene	1	1.0U	U	U	1.0U	UJ	UJ	1.0U	U	U
Aroclor-1016	0.2	0.2	U	U	0.2	UJ	UJ	0.2	U	U
Aroclor-1221	0.4	0.4	U	U	0.4	UJ	UJ	0.4	U	U
Aroclor-1232	0.20	0.2	U	U	0.2	UJ	UJ	0.2	U	U
Aroclor-1242	0.20	0.2	U	U	0.2	UJ	UJ	0.2	U	U
Aroclor-1248	0.20	0.2	U	U	0.2	UJ	UJ	0.2	U	U
Aroclor-1254	0.20	0.2	U	U	0.2	UJ	UJ	0.2	U	U
Aroclor-1260	0.20	0.2	U	U	0.2	UJ	UJ	0.2	U	U

µg/l- Units of micrograms per liter

NA - Not Applicable

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, value is reporting limit, which is estimated.

"NJ" - Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

J - Compound detected.

Table 3-15

Case No. : 31934

Site : Kekaha Sugar Co., Ltd.

Lab : Liberty Analytical Corporation

Analytical Type: Chlorinated Herbicides

Matrix: Groundwater

Units: µg/l

Station Location	GW1-SL61		GW3-SL63		GW4-SL64	
	Sample ID	Collection Date	Sample ID	Collection Date	Sample ID	Collection Date
	H048-11	08/05/03	H048-12	08/05/03	H048-13	08/05/03
	1	1	1	1	1	1
Chlorinated Herbicides	Result µg/l	Val	RQL	Result µg/l	Val	RQL
2,4,5-T	ND	U	0.4	ND	U	0.4
2,4,5-TP(SILVEX)	ND	U	0.4	ND	U	0.4
2,4-D	ND	U	0.4	ND	U	0.4
2,4-DB	ND	U	0.4	ND	U	0.4
DALAPON	ND	U	0.4	ND	U	0.4
DICAMBA	ND	U	0.4	ND	U	0.4
DICHLOROPROP	ND	U	0.4	ND	U	0.4
DINoseb	ND	U	0.4	ND	U	0.4
MCPA	ND	U	50	ND	U	50
MCPP	ND	U	50	ND	U	50

RQL - Reporting Quantitation Limit

µg/l - Units of micrograms per liter

ND - Compound Not Detected

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

Table 3-15

Case No. : 31934

Site : Kekaha Sugar Co., Ltd.

Lab : Liberty Analytical Corporation

Analytical Type: Chlorinated Herbicides

Matrix: Groundwater

Units: µg/l

Station Location Sample ID Collection Date Dilution Factor	GW1-SL61 H048-11 08/05/03 1			GW3-SL63 H048-12 08/05/03 1			GW4-SL64 H048-13 08/05/03 1		
	Result µg/l	Val	RQL	Result µg/l	Val	RQL	Result µg/l	Val	RQL
Chlorinated Herbicides									
2,4,5-T	ND	U	0.4	ND	U	0.4	ND	U	0.4
2,4,5-TP(SILVEX)	ND	U	0.4	ND	U	0.4	ND	U	0.4
2,4-D	ND	U	0.4	ND	U	0.4	ND	U	0.4
2,4-DB	ND	U	0.4	ND	U	0.4	ND	U	0.4
DALAPON	ND	U	0.4	ND	U	0.4	ND	U	0.4
DICAMBA	ND	U	0.4	ND	U	0.4	ND	U	0.4
DICHLOROPROP	ND	U	0.4	ND	U	0.4	ND	U	0.4
DINOSEB	ND	U	0.4	ND	U	0.4	ND	U	0.4
MCPA	ND	U	50	ND	U	50	ND	U	50
MCPP	ND	U	50	ND	U	50	ND	U	50

RQL - Reporting Quantitation Limit

µg/l - Units of micrograms per liter

ND - Compound Not Detected

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

Table: 3-16
 Case No. : 31934
 Site : KEKAHA SUGAR CO., LTD
 Lab : LIBERTY ANALYTICAL CORPORATION
 Analysis Type: Total Metals
 Matrix: Water
 Units µg/L

Station Location Sample ID Collection Date Dilution Factor	Average Background		GW1-SL61 MY0XZ8 08/05/2003 1.0		GW3-SL63 MY0XZ9 08/05/2003 1.0		GW4-SL64 MY0XZ0 08/05/2003 1.0	
	Result	Val	Result	Val	Result	Val	Result	Val
RAMETER								
ALUMINUM	7170		27300		5750		8590	
ANTIMONY	0.27		0.37	J	0.25	J	0.29	J
ARSENIC	30.25		134		28.6		31.9	
BARIUM	27.75		62.3		26.5		29	
BERYLLIUM	1	U	0.27	J	1	U	1	U
CADMIUM	0.11		0.34	J	0.09	J	0.13	J
CHROMIUM	45.7		210		38.1		53.3	
COBALT	7.55		25.9		6.6		8.5	
COPPER	13.4		57.4		12.2		14.6	
LEAD	11.5		11		10.3		12.7	
MANGANESE	332		997		295		369	
MERCURY	0.05		0.29		0.03	J	0.07	J
NICKEL	50.35		107		42.8		57.9	
SELENIUM	2.05		0.71	J	2	J	2.1	J
SILVER	1		0.09	J	1	U	1	U
THALLIUM	0.575	U	1	U	1	U	0.15	J
VANADIUM	22.95		87.5		18.9		27	
ZINC	36.45		61.4		33.9		39	

µg/l - Units of micrograms per liter
 NA - Not Applicable
 "U" - Compound not detected, value is reporting limit.
 "J" - Compound Value Estimated.
 "UJ" - Compound not detected, value is reporting limit, which is estimated.
 "NJ" = Compound estimated and value estimated.
 "R" - Results are rejected due to QC criteria.
 87.5 is greater than 3 X Background

Table: 3-17
 Case No. : 31934
 Site : Kekaha Sugar Co. Ltd.
 Lab : SHEALY ENVIRONMENTAL SERVICES, INC.
 Analysis: Pesticides/PCBs
 Matrix: Surface Water
 Units : µg/l

Pesticide/PCB Compound	Station Location : Sample ID : Collection Date : Dilution Factor :	CRQL	SW1-SL55		SW3-SL57		SW4-SL58		SW5-SL59		SW6-SL60		SW6-SL60	
			Result µg/L	Val										
alpha-BHC	Y0XZ1RE 08/05/2003 1.0	0.01	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.01	U	0.01	U
beta-BHC		0.01	0.048	UJ	0.01	U								
delta-BHC		0.01	0.016	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.01	U	0.01	U
Endrin ketone		0.02	0.02	UJ	0.021U	UJ	0.02	UJ	0.02	UJ	0.047	J	0.02	U

µg/l - Units of micrograms per liter
 NA - Not Applicable
 "U" - Compound not detected, value is reporting limit.
 "J" - Compound Value Estimated.
 "UJ" - Compound not detected, value is reporting limit, which is estimated.
 "NJ" = Compound estimated and value estimated.
 "R" - Results are rejected due to QC criteria.
 [Red Box] - Compound is detected.

Table: 3-19
Case No. : 31934
Site : KEKAHA SUGAR CO., LTD
Lab : LIBERTY ANALYTICAL CORPORATION
Analysis Type: Total Metals
Matrix: Surface Water
Units µg/L

Station Location	Background		SW1-SL55		SW3-SL57		SW4-SL58		SW5-SL59		SW6-SL60	
	Sample ID	Collection Date	Result	Val								
PARAMETER	MY0XZ1	08/05/2003			MY0XZ3		MY0XZ4		MY0XZ5		MY0XZ6	
	1.0	1.0			1.0		1.0		1.0		1.0	
ALUMINUM	292		NA	NA	NA	NA	NA	NA	NA	NA	359	
ANTIMONY	2	U	2	NA	2	U	2	U	2	U	2	U
ARSENIC	15.8		NA	NA	NA	NA	NA	NA	NA	NA	6.7	
BARIUM	44.3		NA	NA	NA	NA	NA	NA	NA	NA	7.4	J
BERYLLIUM	1	U	1	U	1	U	1	U	1	U	1	U
CADMIUM	1	U	1	U	1	U	1	U	1	U	1	U
CHROMIUM	3		NA	NA	NA	NA	NA	NA	NA	NA	2.9	
COBALT	5.9		NA	NA	NA	NA	NA	NA	NA	NA	0.64	
COPPER	2.8		NA	U	NA	NA	NA	NA	NA	NA	1.7	J
LEAD	0.63		J	NA	NA	NA	NA	NA	NA	NA	0.78	J
MANGANESE	489		U	NA	NA	NA	NA	NA	NA	NA	78.1	
MERCURY	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
NICKEL	4.6		NA	NA	NA	NA	NA	NA	NA	NA	3.3	
SELENIUM	0.95	J	NA	U	NA	U	5	U	5	U	5	U
SILVER	1	U	1	U	1	U	1	U	1	U	1	U
THALLIUM	1	U	1	U	1	U	1	U	1	U	1	U
VANADIUM	4.5		NA	NA	NA	NA	NA	NA	NA	NA	8	J
ZINC	30.2		NA	NA	NA	NA	NA	NA	NA	NA	6.6	

µg/l - Units of micrograms per liter
NA - Not Available
"U" - Compound not detected, value is reporting limit.
"J" - Compound Value Estimated.
"UJ" - Compound not detected, value is reporting limit,
"NJ" = Compound estimated and value estimated.
"R" - Results are rejected due to QC criteria.
Value is detected

Table 3-18

Case No. : 31934

Site : Kekaha Sugar Co., Ltd.

Lab : Liberty Analytical Corporation

Analytical Type: Chlorinated Herbicides

Matrix: Surface Water

Units: µg/kg

Station Location Sample ID Collection Date Dilution Factor	SW1-SL55 H048-14 08/05/03			SW03-SL57 G143-01 07/16/03			SW04-SL58 G143-02 07/16/03			SW05-SL59 G143-03 07/16/03			SW6-SL60 H048-10 08/05/03		
	Result µg/l	Val	RQL	Result µg/l	Val	RQL	Result µg/l	Val	RQL	Result µg/l	Val	RQL	Result µg/l	Val	RQL
Chlorinated Herbicides															
2,4,5-T	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4
2,4,5-TP(SILVEX)	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4
2,4-D	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4
2,4-DB	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4
DALAPON	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4
DICAMBA	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4
DICHLOROPROP	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4
DINOSEB	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4	ND	U	0.4
MCPA	ND	U	50	ND	U	50	ND	U	50	ND	U	50	ND	U	50
MCPP	ND	U	50	ND	U	50	ND	U	50	ND	U	50	ND	U	50

RQL - Reporting Quantitation Limit

µg/l - Units of micrograms per liter

ND - Compound Not Detected

"U" - Compound not detected, value is reporting limit.

"J" - Compound Value Estimated.

"UJ" - Compound not detected, reporting limit is estimated.

"NJ" = Compound estimated and value estimated.

"R" - Results are rejected due to QC criteria.

SECTION 4

HAZARD RANKING SYSTEM FACTORS

4.1 SOURCES OF CONTAMINATION

Hazardous substance sources associated with the site include, but may not be limited to:

- Contaminated soils – As shown in Tables 3-1 to 3-6, results of the June 2003 sampling event indicate an observe release of contaminants in the Carpentry Shop and Paint Shop, Electrical Shop, Automotive Shop, Drum Storage Area, and former Herbicide Mixing Plant. Two samples collected from the former Carpentry Shop show levels of benzo(a)anthracene, and indeno(1,2,3-CD)-pyrene greater than 3x above background. One sample out of seven samples collected from the Former Herbicide Mixing Plant shows level of anthracene, carbazole, pyrene, flourantene, greater than 3x above background. Alpha-chlordane was also detected significantly above the background level in one of the samples collected from the Former Herbicide Mixing Plant. Cadmium, selenium, arsenic, copper, barium, and mercury are metals of potential concerns that are detected 3x above background levels in most of the samples collected from the Settling Ponds. The highest levels of arsenic detected were from soil samples collected from the Former Herbicide Mixing Plant (As, 30 mg/kg), Settling Pond (As, 53.7 mg/kg) and Carpentry Shop (As, 47.4mg/kg). Possible sources of arsenic in sugarcane production are the ff: a) use of inorganic arsenical wood preservatives commonly used in wood treating facilities, like chromated copper arsenate (CCA), ammoniacal copper arsenate (ACA), and ammoniacal copper-zinc arsenate (ACZA)(2); and b) use of sodium arsenite as herbicide. Dioxins/furans were detected in 5 out of 7 soil samples collected from the Former Herbicide Mixing Plant, with the highest value of 1690 ug/kg.
- Sediment samples – As shown in Table 3-7 to Table 3-12, results of the June 2003 sampling event indicate a release of contaminants in the sediments collected from the ditches along the sugar mill. All sediment samples collected from the former Transformer Area indicate elevated levels of PAHs significantly above the benchmark used. One sample collected from the former Transformer Area indicates levels of endrin, and chlordane above the TEL. No pesticides were detected in sediment samples collected from the Seed Dipping Plant, Cane Cleaning Plant, Boiler House and Mill Ditch. Copper, mercury and nickel were detected significantly 3x above background in sediment samples collected from the Transformer Area, Boiler House, and from the Mill Ditch. The highest level of mercury was detected in sediment samples collected from the Mill Ditch (SED17, 267 mg/kg) (SED18, 163 mg/kg) (SED19, 153mg/kg), approximately 1000x greater than the background level (SED16, 0.05mg/kg). Barium, copper and mercury were also detected at values greater than 3x above background from sediment samples collected from the Boiler Area (SED 06). Elevated levels of zinc greater than 3x above background (SED 16, 302 mg/kg) were also detected in soil samples collected from the boiler house (SED 06, 9730 mg/kg) and from the automotive shop (SED 08, 1170).

4.2 GROUNDWATER PATHWAY

4.2.1 Hydrogeological Setting

Kauai lies in the north - western portion of the major Hawaiian Island Chain, at about 159 degrees longitude and 22 degrees latitude. In its current configuration, Kauai has an area of approximately 550 square miles and is roughly circular with a diameter of 33 miles. Its conical shape is believed to be the result of a single unbuttressed volcano, which developed between 2.5 to 5 million years ago. The main mountain building stage produced the tholeiitic basalts that are commonly observed. Kauai experienced a period of relative quiescence for the last 2.5 million years, in which erosional processes developed the large valleys and waterways. Mt. Waiaalele on Kauai has one of the highest precipitation rates, with an average yearly rainfall of 396 inches from 1968 to the present (9).

The Site is located along the south western coastline of Kauai, located within the Kekaha Aquifer System of the Waimea Aquifer Sector. The average annual rainfall in the sector is approximately 33 inches per year, the driest system on Kauai. Surface drainage is characterized by small non-perennial streams that empty into the Mana Plain, which was a swamp prior to being drained for agricultural development. The region is part of the southwest flank of the volcano, where the Napali lavas terminate against the Mana Plain, which is a mile-wide coastal plain of terrestrial and marine sediments. Although high level dikes confine fresh groundwater inland near Waimea Canyon, the Mana Plain is characterized by a lower basal aquifer within the flank volcanics that is confined by the overlying caprock. The caprock consists of marine and terrestrial sediments. Wells that are screened in the lower aquifer produce artesian flow in many instances. The basal aquifer is used for irrigation throughout the Mana Plain. Drinking water systems are located inland, hydraulically upgradient from the site, where the basal aquifer is not confined by caprock. These drinking water wells are not expected to be impacted from activities at the Project Site. In addition, the upward vertical gradient in the confined portion of the aquifer (below the Mana Plain) results in leakage of fresh water into the surface aquifer sediments, resulting in a near-surface water system that is saline to brackish from the interaction with the marine sediments and coastal surface waters. The upward gradient acts to protect the lower freshwater system from surface contaminant sources other than dense, non-aqueous phase liquids (DNAPL).

The horizontal groundwater gradient of both the basal water aquifer and the caprock water zone is directed toward the coast line, inducing the groundwater to flow from the inland areas to empty into the ocean. Systems of agricultural ditches run throughout the Mana Plain which intersect the shallow caprock water zone and hasten the drainage of the zone into the Pacific Ocean.

4.2.2 Groundwater Targets

According to the State Department of Land and Natural Resources (DLNR), five drinking water wells are located within a four-mile radius from the Site. All wells are located hydraulically upgradient from the Site. Well Kikiaola, (5841-01) is described as a domestic drinking water source and is located approximately 2 miles east of the KSC.

The Kauai Department of Water Supply operates a blended drinking water system that consists of five wells that collect water from the basal aquifer classified as the Waimea Sector, Kekaha System, unconfined by caprock. Four of those wells (5942-01, 5943-02, 5840-01, and 5841-02) are within 4 miles of the Project Site. This system serves a population of approximately 5,000 people in the Kekaha area and is strictly groundwater (8). The pumping rates for each well were not available at this time; therefore the percentage of water that serves the system from each well is not currently available. The Aquifer System status is currently used, drinking water source, fresh, irreplaceable, with high vulnerability to

contamination (10). As discussed, these wells are all located hydraulically upgradient from the project site, and therefore are not expected to be impacted by activities at the site.

The basal water system directly under the Site is confined by the overlying caprock, which defines the Mana Plain. The status code for the basal water system under the Site is different from the portion of the system currently used for drinking. Its status code is [21223] defined as a potential drinking water resource of low salinity (250 – 1,000 mg/l chloride) that is replaceable and has low vulnerability to surface contamination due to its artesian properties (10).

4.2.3 Groundwater Pathway Conclusion

Groundwater samples were collected from two wells screened within the surface aquifer at the site, which is not a drinking water source. The underlying drinking aquifer is protected by an upward vertical gradient in the location of these wells (10). Groundwater in the basal aquifer below the site is used for irrigation, but not currently used for drinking. Based on the two wells installed and sampled at the Project Site, there is evidence of a release to groundwater based on the definition provided below. For HRS purposes, a release to groundwater is established 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 hazardous substance is detected in the contaminated sample, when not detected in the background samples or (2) the hazardous substance is detected in the contaminated sample at a concentration equal to or greater than three times the maximum background level, when detected in the background samples.

As indicated in Figure 3-2, MW1 is located inland from the active areas of the Site but still within the influence of the Former Settling Ponds and MW2 is located downgradient from MW1 in the vicinity of the KSC. As shown in Tables 3-13 through 3-16, only trace concentrations of two organic compounds (SVOC 4-methyphenol and pesticide gamma chlordane) were observed in groundwater samples. Metal constituents were observed in the MW1 well (MW1 corresponding to GW1-SL61) at higher concentrations than in the downgradient well (MW3 corresponding to GW3-SL63 and GW4-SL-64). Specifically, arsenic and mercury were observed at greater than 3 times the downgradient well concentration. Groundwater flow is inferred by the topography in the area, and generally is expected to flow toward the Pacific Ocean. Elevations were not surveyed so actual gradients were not measured.

The population affected by the release is zero because:

1. Drinking water supply wells which support the Kekaha population are upgradient from the site, screened in the unconfined portion of the basal aquifer; and
2. The caprock aquifer, which is the site of the release, is isolated from the underlying basal aquifer via a confining layer of caprock, and by an artesian upward vertical hydraulic gradient in the basal aquifer.

4.3 SURFACE WATER PATHWAY

4.3.1 Hydrological Setting

Surface water runoff from the Seed Dipping Plant and inside the Kekeha Mill drains into the mill ditch, and emptied into the Pacific Ocean. Water from the former Seed Dipping area was discharged via piping directly to the ditch, however, prior to 1987, runoff was discharged to soil near the Seed Dipping Plant. The Mill Ditch is estimated to be a surface water because, based on site observations at two separate occasions, water is perennially present in the ditch. Water from the above-ground portion of the Kekaha

Sugar mill that starts near the seed dipping plant flows approximately 1000 feet and then discharges to the Pacific Ocean where there are tidal and shallow coastal ocean waters. Surface runoff from the settling pond also flows into the mill ditch that empties into the Pacific Ocean (8).

4.3.2 Surface Water Targets

There are no surface water drinking water intakes within the 15-mile target distance limit. The ocean is a major water recreation area. There is a substantial fishery in the Pacific Ocean in the area of Kekaha. A catch total of 505,995 pounds for the area was reported for Year 2001 for the Makahuena Pt.-Kekaha area (11). Numerous sensitive environments are located within the target distance limit in the watershed including areas designated under the Coastal Zone Management Act and habitats that are known to be used by Federal and State designated threatened or endangered species including the Hawaiian monk seal and the green sea turtle (12). Wetlands are not known to be present in the target area.

4.3.3 Surface Water Pathway Conclusion

A release from the Seed Dipping Plant and the Kekeha Sugar Mill to the Mill Ditch is established based on results of the 2003 sampling effort. For HRS purposes, a release to surface water is established when a hazardous substance is detected in the watershed 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 hazardous substance is detected in the contaminated sample, when not detected in the background samples or (2) the hazardous substance is detected in the contaminated sample at a concentration equal to or greater than three times the maximum background level, when detected in the background samples.

As shown in Table 3-12, sediment samples collected from the Mill Ditch showed elevated levels of mercury SED17 (267 mg/kg), SED18 (163 mg/kg) and SED19 (153mg/kg) greater than 100 times background concentrations of mercury (SED16, 0.05 mg/kg). These significant increases are attributed in part to the site because, prior to the introduction of benlate as a seed-treating compound in the mid 1970s, mercuric phenyl acetate may have been used as the fungicide in the dipping operation; and the mill ditch empties into the Pacific Ocean, which is approximately 1000 ft. downstream of the site.

The Pacific Ocean serves as a fishery where fish and other seafood are harvested and used for human consumption. This area is known to be a habitat for federally endangered and threatened animals and birds including the Hawaiian duck (*Anas wyvilliana*), Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian gallinule (*Gallinula chloropus sandvicensis*), and humpback whale (*Megaptera novaeangliae*), Hawaiian monk seal (*Monachus schauinslandi*), hawksbill turtle (*Eratmochlelys imbricata*), green sea turtle (*Chelonia mydas*) (2,13).

Results from the September 2003 SI surface water and sediment-sampling event are presented in Table 3-7 through 3-12 and 3-17 through 3-19, respectively. Sediment sampling results are shown in Figure 3-1 and 3-2.

4.4 SOIL EXPOSURE AND AIR PATHWAY

4.4.1 Physical Conditions

The site is located within approximately 1,000 feet of the coastline. Surrounding the KSC site on three sides is dense residential development. On the other side are the former Settling Ponds and open fields

that were once sugarcane fields. The Settling Ponds are now dry and are currently being used for crops or for soil borrow or disposal areas. Ponds without crops have little vegetation. The portion of the KSC site south of Kekaha Road is the only part fenced, however during investigation activities, gates into the fenced area were found to be open.

4.4.2 Soil and Air Targets

There are no resident individuals or no sensitive environments in areas of observed contamination. There are 4 to 5 workers using the former settling ponds. Beginning just outside the Kekaha site boundary and out to a distance of one mile from the site boundary, there are an estimated 2,300 residents, based on a house count and a Kauai County average of 2.86 individuals per household (13).

Sensitive areas within 1 mile include the coast area designated under the Coastal Zone Management Act and habitat known- to-be used by Federal and State designated threatened or endangered species including the Hawaiian monk seal and the green sea turtle. A Hawaiian koloa duck sighting has been documented for the open water pond just to the north of the former settling ponds.

4.4.3 Soil Exposure and Air Pathway Conclusions

Elevated concentrations of arsenic, mercury and dioxins compared to background concentrations have been observed in surface soil based on SI sampling in 2003. These COPCs are known have been used in the sugar cane industry in the past. For HRS purposes, an area of observed soil contamination is established when a hazardous substance is detected in site soils 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 hazardous substance is detected in the contaminated sample, when not detected in the background samples or (2) the hazardous substance is detected in the contaminated sample at a concentration equal to or greater than three times the maximum background level, when detected in the background samples.

Areas with an observed release based on SI sample results include the Former Settling Ponds, the Former Herbicide Mixing Area, the Drum Storage Area, and other areas within the open mill yard. Results for these areas exceed three times the concentrations measured in background samples. Results from the September 2003 SI soil sampling event are presented in Table 3-1 through 3-6 and sampling locations are shown in Figures 3-1 and 3-2. Soil samples collected from the Carpentry shop showed elevated levels of benzo(a)anthracene, and crysene greater than 3x above background. Soil samples collected from the Former Herbicide Mixing Plant, the Drum Storage Area, Former Transformer Area showed elevated levels of pentachlorophenol, anthracene, crysene, flourantene, and pyrene greater than 3x above background. Dioxin/furans were also detected with one sample (SS15, 1690.95 ug/kg) above the EPA clean-up level of 1 ppb.

The contaminated soil as a result of the activities related to sugarcane production is still present on the site. Although the mill site is fence, the former herbicide mixing plant and the settling plant are accessible to people, there is a potential fro transient people (example agricultural workers) to be exposed to the contamination. However, there are no permanent residences, schools, daycare centers, or regularly occupied workplaces currently on site. The site appears to have no public recreation use.

There has been no observed release to air established because no air samples have been collected, but there is potential to release gases (e.g. mercury vapors) and soil particulates containing contaminants. In particular, the Former Settling Ponds have large areas of soil, sometimes barren, which can release soil particulates to the air.

SECTION 5

EMERGENCY RESPONSE CONSIDERATIONS

The National Contingency Plan [40 CFR 300.415 (b) (2)] authorizes the EPA 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 Office does not appear to be necessary:

- The KSC has not been operational since 1999. There are no schools or child day care centers within 200 feet of the site.
- Mercury was observed in the mill ditch sediment samples at concentrations greater than 3x the background concentrations, indicating a release has occurred.
- Elevated levels of mercury with concentrations greater than 3x above background (SED16, 0.11mg/kg) were detected in the sediment samples collected from the mill ditch; SED17 (267 mg/kg) and duplicates SED18 (163 mg/kg) and SED19 (153 mg/kg). It should be noted that the sample location of SED18/SED19 is the nearest point sampled to the Pacific Ocean discharge, which is approximately 0.38 mile downstream. According to the NOAA Screening Quick Reference Table (SQUIRT, 1999) the effects thresholds for fresh and saltwater organisms range between 0.130 and 0.710 mg/kg, which is approximately 300 to 1000 times smaller than what is observed in the mill ditch sediments. The mill ditch is directly connected to the Pacific Ocean, which is an important fishery of the United States (Figure1). Additional sampling is recommended to evaluate the impact to the environment from mercury in sediments within the mill Ditch.
- The mill sampling area is in close proximity to Kekaha residences on the east, west and south of the Site. The Mill Ditch runs through the residential area to the south, downstream from the Seed Dipping Plant, and locations where preliminary samples contained elevated mercury south of the site are potentially accessible to residents. Values from a single sample location less than 200 feet from residents (SED18 and Duplicate SED19) show mercury at 163 mg/kg and 153 mg/kg, respectively, compared to the residential Soil PRG of 23 mg/kg (Figure 3-2). Additional sampling is recommended to evaluate the impact to the residential population from mercury in sediments within the Mill Ditch.
- Mercury was observed in samples collected from the Former Settling Ponds located in the northern portion of the Site. The greatest concentration observed was at SS03 (0.18 mg/kg), and is significantly less than the residential Soil PRG of 23 mg/kg. Because of the large area associated with these Former Settling Ponds, and the limited number of samples collected, it is recommended that additional samples be collected to more accurately estimate the release quantity in these settling ponds (Figure 1). Soil from these ponds may be migrating to the Pacific Ocean suspended in surface water run off via onsite ditches.
- Dioxins were observed at greater than 3 x background conditions in two samples associated with the Former Herbicide Mixing Area. Only one of these samples, SS15 at 1690.95 pg/g (1.69095 µg/kg) was above the current EPA Action Level for cleanup of 1 µg/kg (OSWER Directive 9200.4-26, April 13, 1998) (Figure 3-1). It is recommended that additional sampling be conducted to further assess the impact to human health and the environment.

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SECTION 6

SUMMARY

KSC is located at 8315 Kekaha Road, approximately 24 miles west of the Lihue Airport. The former sugar plantation encompasses a total area of approximately 21.843 acres of agricultural land that includes the former sugar mill and a 10-acre settling pond located northeast of KSC. The site includes the Former Herbicide Mixing Area, Open Yard Area, Automotive Shop/Motor Pool, Electrical Shop, Machine Shop, Metal Shop, Boiler House, Former Transformer Area, Drum Storage Area, Mill Ditch, Former Seed Dipping plant, Cane Cleaning Plant, and former Settling Ponds.

The KSC was in operation between 1899 and 1999, during which all manner of activities related to sugar cane horticulture, harvesting, and initial refining from stock to syrup took place. Activities included pesticide, herbicide and fungicide use, carpentry and wood treatment activities, storage of fuels and solvents for operation and maintenance of equipment, burning of chlorinated compounds during harvesting and cleaning of burned materials into ditches and water systems, and recycling water into settling ponds for reuse as cooling and cleaning water.

On May 9, 2000, the DOH Solid and Hazardous Waste Branch issued an administrative enforcement action to Amfac/JMB Hawaii (owners of the KSC). Violations included storage of hazardous waste without a permit; and failure to make a hazardous waste determination. A fine of \$67,848 was assessed for the violations. On November 16, 2001 the DOH HEER office filed a Preliminary Assessment Consultation Memorandum with USEPA Region IX listing initial site and Hazard Ranking System findings, which included potential pesticide/herbicide contamination brought about by sugarcane production and operations, and a suspected release of contaminants to the Pacific Ocean approximately 0.35 to 0.58 miles away via the mill ditch, which runs adjacent to the site. In July and August of 2004, the current Site Investigation was conducted by the DOH HEER office to collect samples of potentially impacted media in order to further evaluate the potential concerns at the site through the Hazard Ranking System scoring.

The groundwater pathway was evaluated by installing and sampling two monitoring wells into the near-surface aquifer, which is not currently used. This surface aquifer is composed of marine and terrestrial sediments that make up a confining layer, known as caprock, over the underlying basal aquifer. Groundwater from the basal aquifer leaks upward into the caprock, thus protecting the basal aquifer from surface contamination. The confined basal aquifer is used for irrigation within 4 miles of the site but not for drinking. Four drinking water wells are located in the unconfined portion of the basal aquifer within 4 miles of the site, in hydraulically upgradient locations, not expected to be impacted by site activities.

The surface water pathway was evaluated by collecting sediment and surface water samples in the Mill Ditch located in the southern portion of the Kekaha Sugar Mill.

The soil pathway was evaluated based on surface soil samples collected throughout the KSC. Onsite workers harvest agriculture from the Former Settling Ponds. Although there are no resident individuals, it is estimated that 2,300 residents live within 1 mile from the site. The coastline is within 1,000 feet of the site and considered sensitive area under the Coastal Zone Management Act and as a habitat to threatened and endangered species, including the Hawaiian monk seal and green sea turtle.

The air migration pathway was not sampled and evaluations are based on results from other associated media, including surface soils associated with the KSC and Former Settling Ponds that are barren of ground cover and can contribute particulates to the air pathway.

The following pertinent Hazard Ranking System (HRS) factors are associated with the site.

Groundwater Migration Pathway

- A release from the Former Settling Ponds to groundwater has been established. Results of the 2003 SI indicated the sample from MW1 had concentrations of several metals, including mercury and arsenic that were greater than 3 times ambient levels observed in MW2 located in the vicinity of the KSC. (Table 3-16). These wells are screened in the upper aquifer that is not currently used. The underlying aquifer is used for irrigation in the vicinity of the site, but is not expected to be impacted by site activities due to the upward gradient that causes the lower basal aquifer water to leak into the upper surface aquifer via artesian flow.
- Mercury is attributed to the site because, prior to the introduction of benlate as a seed treating compound in the mid 1970s, mercuric acetate may have been used as the fungicide in the dipping operation.
- Existing drinking water wells located within 4 miles of the site are all hydraulically upgradient from the Site and not expected to be impacted by site activities.

Surface Water Migration Pathway

- A release from the KSC area to the Mill Ditch has been established. Results of the 2003 SI indicated that sediment samples at these locations had elevated concentrations of mercury compared to background soil samples (greater than 3 times and up to 1,000 times ambient concentrations). See Table 3-12 for results. No background sediment samples were evaluated for pesticides, SVOCs, VOCs and Chlorinated herbicides, as it was determined that all sediment samples from this system of ditches were affected by re-circulation of water and sediments.
- Mercury is attributed to the site because, prior to the introduction of benlate as a seed treating compound in the mid 1970s, phenyl mercuric acetate may have been used as the fungicide in the dipping operation.
- The Mill Ditch empties into the Pacific Ocean, which is a recreational area, commercial fishery, and sensitive habitat of the Hawaiian monk seal and green sea turtle and designated so as part of the Coastal Zone Management Act.

Soil Exposure Pathway

- Releases were established to the surface soil at the Former Settling Ponds, Former Herbicide Mixing Area, and Drum Storage Area based on the results of the 2003 SI sampling. Mercury, dioxins and arsenic was observed at greater than 3 times background concentrations in these locations (see Table 3-6 and Figures 3-3 and 3-4).
- There are no residents in the impacted locations, however onsite workers grow crops in the Former Settling Pond locations, approximately 2,300 residence live within 1 mile of the site, and the Pacific Ocean coastline lies within 1,000 feet of the site. The Pacific Ocean coastline is a recreational area, commercial fishery, and sensitive habitat of the Hawaiian monk seal and green sea turtle and designated so as part of the Coastal Zone Management Act.

Air Migration and Exposure Pathway

- No release has been established to the site air pathway since no samples of onsite air were collected or analyzed during the 2003 SI.

- There is potential to release gases (e.g. mercury vapors) and soil particulates containing mercury, arsenic and dioxins from site surface soil.
- The Former Settling Ponds and locations within the KSC Yard are barren soil and can potentially contribute to the air exposure pathway.
- There are no residents in the impacted locations, however onsite workers grow crops in the Former Settling Pond locations. Approximately 2,300 residents live within 1 mile of the site, and the Pacific Ocean coastline lies within 1,000 feet of the site. Pacific Ocean coastline is a recreational area, commercial fishery, and sensitive habitat of the Hawaiian monk seal and green sea turtle and designated so as part of the Coastal Zone Management Act.

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SECTION 7

REFERENCES

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10. Mink, John F. and Stephen Lau. Aquifer Identification and Classification of Oahu: Groundwater Protection Strategy for Hawaii, Water Resources Research Center, and The University of Hawaii at Manoa, Honolulu. 1990.
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Appendix A
Chain of Custody/Traffic Reports



United States Environmental Protection Agency
Contract Laboratory Program

Organic Ti Report
& Chain of Custody Record
(For Organic CLP Analysis)

Case No. **3190**

1. Project Code: _____

2. Region No.: **12** Sampling Co.: **IND**

3. Purpose**
 SF PRP ST FED BZ
 IA PA REM RI SI ESI
 Long-Term Action: RIFS RD RA O&M

4. Date Shipped: **7-17-03** Carrier: **FEDEX**

5. Ship To: **Liberty** Airbill Number: **8401-7264-2630**

6. Matrix (Enter in Column A)
 1. Surface Water
 2. Ground Water
 3. Leachate
 4. Field QC
 5. Soil/Sediment
 6. PE-water
 7. PE-soil
 8. Other (specify in Column A)

7. Preservative (Enter in Column D)
 1. HCl
 2. HNO3
 3. NaHSO4
 4. H2SO4
 5. Ice only
 6. CH3OH
 7. Other (specify in Column D)
 N. Not Preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 6)	B Conc.: Low Med	C Sample Type: Comp./Grab	D Preservative (from Box 7)	E RAS Analysis			F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Field QC Qualifier
					TA (circle one) PR* 7, 14, 21	TA (circle one) PR* 7, 14, 21	TA (circle one) PR* 7, 14, 21						
(KSM) 80-5511	5		C	S	SVUS			SS11	7/16/03 1340	Y0Y10	K		
80-5512	5		C	S	SVUS			SL37	7/16/03 1030	Y0Y36	K		
80-5513	5		C	S	SVUS			SL43	7/16/03 1130	Y0Y31	K		
80-5514	5		C	S	SVUS			SL65	7/16/03 1340	Y0Y64	K	MS/MSD	
80-5515	5		C	S	SVUS			SL38	7/16/03 0925	Y0Y37	K		
80-5516	5		C	S	SVUS			SL10	7/16/03 1345	Y0Y09	K		
80-5517	5		C	S	SVUS			SL13	7/16/03 1420	Y0Y12	K		
80-5518	5		C	S	SVUS			SL14	7/16/03 1145	Y0Y13	K	R	
80-5519	5		C	S	SVUS			SL65	7/17/03 0800	M40X17	K		

Additional Sampler Signatures: **Shieh Cox**

Chain of Custody Seal Number(s): _____

Page **4** of **4**

VOA MS/MSD Required? Y/N Sample #: **SL65**

BNA MS/MSD Required? Y/N Sample #: **SL65**

Pest/PCB MS/MSD Required? Y/N Sample #: _____

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Shieh Cox	7/17/03		

Remarks: Is custody seal intact? Y/N/none



United States Environmental Protection Agency
Contract Laboratory Program

**Organic T. Report
& Chain of Custody Record**
(For Organic Chlorine Analysis)

Case No. **3190**

1. Project Code		2. Region No. 8		3. Sampling Co. TEC INC		4. Date Shipped 7-17-03		Carrier FEDEX		7. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. Ice only 6. CH3OH 7. Other (specify in Column D) N. Not Preserved			
Account Code		Sampler (Name) Marchand Keyes		Airbill Number 8401-7264-2630		5. Ship To: Liberty Analytical, 501 Madison Ave Cary, NC		6. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. PE-water 7. PE-soil 8. Other (specify in Column A)		J. Sampler Initials			
Site Name Koraha Superfund		3. Purpose** Lead: <input type="checkbox"/> SF <input type="checkbox"/> PRP <input type="checkbox"/> FED <input type="checkbox"/> BZ Early Action: <input type="checkbox"/> IA <input type="checkbox"/> PA <input type="checkbox"/> REM <input type="checkbox"/> RI <input type="checkbox"/> SI <input type="checkbox"/> ES Long-Term Action: <input type="checkbox"/> RIFS <input type="checkbox"/> RD <input type="checkbox"/> RA <input type="checkbox"/> O&M		ATTN: Alice Evans		F. Regional Specific Tracking Number or Tag Numbers		G. Station Location Identifier		H. Mo/Day/Year/Time Sample Collection		K. Field QC Qualifier B = Blank S = Field Spike D = Field Duplicate R = Rinsate PE = Perform Eval.	
City, State		Site Spill ID		Op Unit		E. RAS Analysis		I. Corresponding CLP Inorganic Sample No.		Chain of Custody Seal Number(s)			
A. Matrix (from Box 6) Other:		B. Conc.: Sample Type: Low Med		C. Sample Type: Comp./Grab		D. Preservative (from Box 7) Other:		VOA		BNA		TA (circle one) PR* 7 14 21	
CLP Sample Numbers (from labels)		Conc.: Low Med		Type: Comp./Grab		Preservative (from Box 7) Other:		VOA		BNA		TA (circle one) PR* 7 14 21	
SED-1		5		5		5		5		5		5	
SD-SS21		5		5		5		5		5		5	
SD-SS27		5		5		5		5		5		5	
SD-SS30		5		5		5		5		5		5	
SD-SS20		5		5		5		5		5		5	
SD-SS18		5		5		5		5		5		5	
SD-SS7		5		5		5		5		5		5	
SD-SS8		5		5		5		5		5		5	
SD-SS12		5		5		5		5		5		5	
SD-SS17		5		5		5		5		5		5	
Shipment for Case Complete? (Y/N)		Page 3 of 4		VOA/MS/MSD Required? <input checked="" type="checkbox"/> Y/N		Sample #: 528		Additional Sampler Signatures Stoleh Cox		Date / Time		Received by: (Signature)	

Chain of Custody Record

*PR provides 7-day data turnaround in addition to preliminary results. Requests for preliminary results will increase analytical costs.

Relinquished by: (Signature) Stoleh Cox	Date / Time 7-17-03	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time

Remarks: Is custody seal intact? Y/N/None



United States Environmental Protection Agency
Contract Laboratory Program

Organic T Report
& Chain of Custody Record
(For Organic CL... analysis)

Case No. **3190**

1. Project Code		2. Region No.		Sampling Co.		Date Shipped		Carrier		7. Preservative			
Account Code		Sampler (Name)		Airbill Number		8401-7264-2630		SEP-PA		(Enter in Column D) 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. Ice only 6. CH3OH 7. Other (specify in Column D) N. Not Preserved			
Site Name		Sampler Signature		5. Ship To:		Identity		See pg 1		(Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. PE-water 7. PE-soil 8. Other (specify in Column A)			
City, State		Site Spill ID		Op Unit		3. Purpose**		ATTN:		(Enter in Column D) B = Blank S = Field Spike D = Field Duplicate R = Rinsate PE = Perform Eval.			
CLP Sample Numbers (from labels)		A Matrix (from Box 6)		B Conc. (Low Med)		C Sample Type (Comp./Grab)		D Preservative (from Box 7)		E RAS Analysis			
(KSM)- 30-5529 30-5528 30-5527 30-5526 30-5525 30-5524 30-5523 30-5522 30-5521		5 5 5 5 5 5 5 5 5		5 5 5 5 5 5 5 5		5 5 5 5 5 5 5 5		5 5 5 5 5 5 5 5		5 5 5 5 5 5 5 5		5 5 5 5 5 5 5 5	
Shipment for Case Complete? (Y/N)		Page 2 of 4		VOA MSMSD Required?		BNA MSMSD Required?		Pest/PCB MSMSD Required?		Y/N Sample #: 3299			
Chain of Custody Seal Number(s)		Additional Sampler Signatures <i>Michael Cox</i>											

*PR provides 7-day data turnaround in addition to preliminary results. Requests for preliminary results will increase analytical costs.

Chain of Custody Record		Date / Time	Received by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)					
Relinquished by: (Signature)					
Relinquished by: (Signature)					

See Reverse for Additional Standard Instructions
**See Reverse for Purpose Code Definitions
CLASS-99-001

EPA Form 9110-2 (2/99)

404996

Case No. **31934**

1. Project Code: _____ Account Code: _____

2. Region No. **4** Date Shipped **7/17/03** Carrier **FEDEX**

3. Purpose**
 SF PRP ST FED BZ
 IA PA REM RI SSI
 TA (circle one) PR* 7 14 21 PR* 7 14 21 PR* 7 14 21

4. Date Shipped **7/17/03** Carrier **FEDEX**

5. Ship To: **ATTOR EVM
 Liberty Analytical
 501 Madison Ave
 Cary, NC 27513
 ALICE EVANS**

6. Matrix (Enter in Column A)
 1. Surface Water
 2. Ground Water
 3. Leachate
 4. Field QC
 5. Soil/Sediment
 6. PE-water
 7. PE-soil
 8. Other (specify in Column A)

7. Preservative (Enter in Column D)
 1. HCl
 2. HNO3
 3. NaHSO4
 4. H2SO4
 5. Ice only
 6. CH3OH
 7. Other (specify in Column D)
 N. Not Preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 6)	B Conc. (Low Med)	C Sample Type: (from Box 7)	D Preservative (from Box 7)	E RAS Analysis			F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Field QC Qualifier
					TA (circle one)	TA (circle one)	TA (circle one)						
(KSM)					VOA	BNA							
SD-SS19	5		C	5			SVDS	SL19	7/15/03 1600	Y0Y18	K		
SD-SB2	5		C	5			SVDS	SL66	7/16/03 1450	Y0Y65	K		
SD-SB4	5		C	5			SVDS	SL68	7/16/03 1205	Y0Y67	K		
SD-SS35	5		C	5			SVDS	SL35	7/14/03 1630	Y0Y30	K		
SD-SS32	5		C	5			SVDS	SL32	7/14/03 1545	Y0Y31	K		
SD-SS33	5		C	5			SVDS	SL33	7/14/03 1605	Y0Y32	K		
SD-SS34	5		C	5			SVDS	SL34	7/14/03 1610	Y0Y33	K		
SD-SS25	5		C	5			SVDS	SL25	7/16/03 1050	Y0Y24	K		
SD-SS23	5		C	5			SVDS	SL23	7/16/03 1030	Y0Y22	K		

Additional Sampler Signatures: **Sholeh Cox**

Chain of Custody Seal Number(s): _____

Chain of Custody Record

Shipments for Case Complete? (Y/N) **1** of **4**

VOA MS/MSD Required? **Y/N** Sample #: **SL26**
 BNA MS/MSD Required? **Y/N** Sample #: _____
 Pest/PCB MS/MSD Required? **Y/N** Sample #: _____

*PR provides 7-day data turnaround in addition to preliminary results. Requests for preliminary results will increase analytical costs.

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Sholeh Cox	7/17/03		

Remarks: Is custody seal intact? **Y/N/none**



United States Environmental Protection Agency
Contract Laboratory Program

**Inorganic Traffic Report
& Chain of Custody Record**
(For Inorganic CLP Analysis)

Case No. 31934

1. Project Code		2. Account Code		3. Region No. Sampling Co.		5. Date Shipped		Carrier		7. Matrix (Enter in Column A)		8. Preservative (Enter in Column D)	
Regional Information		Sampler (Name)		Airbill Number		17703		HDCX		1. Surface Water 2. Ground Water 3. Leachate 4. Field 5. Soil/Sediment 6. Oil (High only) 7. Waste (High only) 8. Other (specify in Column A)		1. HCl 2. HNO3 3. NaOH 4. H2SO4 5. K2CR2O7 6. Ice only 7. Other (specify in Column D) N. Not Preserved	
Non-Superfund Program		Sampler Signature		Ship To:		6. Ship To:		CHEMTELA CONS. GRP					
Site Name		City, State		Site Spill ID		4. Purpose*		RBA SHEFFIELD ST. MOUNTAINSIDE, NJ 07092					
KANKAHA SUGAR MILL		KANKAHA, NJ				Lead		ATTN: SUNNY PATEL					
CLP Sample Numbers (from labels)		A Matrix (from Box 7) Other:		B Conc.: Low Med High		C Sample Type: (from Box 8) Other:		D Preservative (from Box 8) Other:		E - RAS Analysis		H Mo/Day/Year/Time Sample Collection	
(KSM)										F Regional Specific Tracking Number or Tag Numbers		I Corresponding CLP Organic Sample No.	
30-5514		5		C		C		C		SL14		M40Y13	
50-5522		5		C		C		C		SL40		M40Y39	
50-5526		5		C		C		C		SL44		M40Y43	
50-5515		5		C		C		C		SL22		M40Y21	
50-5524		5		C		C		C		SL15		M40Y14	
50-5522		5		C		C		C		SL26		M40Y25	
50-5529		5		C		C		C		SL39		M40Y38	
50-5532		5		C		C		C		SL2		M40Y01	
50-5532		5		C		C		C		SL44		M40Y01	
50-5532		5		C		C		C		SL32		M40Y21	
Shipment for Case Complete? (Y/N)		Page 1 of 6		Sample(s) to be Used for Laboratory QC		Additional Sampler Signatures		SUNNY PATEL		Chain of Custody Seal Number(s)			
				5532, 5529, 5528									

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Shelly Cox	7/16/03		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time

A21-012-13 REV



United States Environmental Protection Agency
Contract Laboratory Program

**In. ic Traffic Report
& Cha f Custody Record**
(For Inorganic CLP Analysis)

Case No. **31934**

6. Date Received -- Received by:

2. Region No. **9** | Sampling Co. **TEC INC** | Carrier **FED-EX**

Airbill Number

5. Ship To **QHEMTECH CONSULTING CORP.**

2804 SHEFFIELD STREET

MOUNTAINSIDE, NJ 07092

(908) 789-8900

ATTN: SUNNY PATEL

3. Purpose* SF PRP ST FED

3. Purpose* PA REM SI ESI

3. Purpose* CLEM RD RA O&M NPLD

3. Purpose* High only Conduct. pH

3. Purpose* Low only Fluoride NO₂/NO₃

3. Purpose* Cyanide Total Metals Diss. Metals

3. Purpose* Preservative (from Box 2) Other:

3. Purpose* Conc. Low Med High Sample Type: (from Grab) Other:

3. Purpose* Matrix (from Box 1) Other:

3. Purpose* CLP Sample Numbers (from labels)

3. Purpose* H Mo/Day/Year/Time Sample Collection

3. Purpose* G Station Location Identifier

3. Purpose* F Regional Specific Tracking Number or Tag Numbers

3. Purpose* I Corresponding CLP Organic Sample No.

3. Purpose* J Sampler Initials

3. Purpose* K High Phases

3. Purpose* Solids

3. Purpose* Water-Miscible Lq.

3. Purpose* Water-Liq.

3. Purpose* Chain of Custody Seal Number(s)

3. Purpose* Additional Sampler Signatures

3. Purpose* Sample(s) to be Used for Laboratory QC

3. Purpose* Page **3** of **10**

3. Purpose* Shipments for Case Complete? (Y/N)

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
<i>[Signature]</i>	7/17/03	<i>[Signature]</i>	
<i>[Signature]</i>		<i>[Signature]</i>	
<i>[Signature]</i>		<i>[Signature]</i>	

Received by: (Signature)

Date / Time

Received by: (Signature)

Date / Time

Received by: (Signature)

Date / Time

Remarks: Is custody seal intact? Y/N/none

DISTRIBUTION: Green - Region Copy | White - Lab Copy for Return to Region

Pink - CLASS Copy | Yellow - Lab Copy for Return to SMO

EPA Form 9110-1 (2/98)

SEE REVERSE FOR ADDITIONAL STANDARD INSTRUCTIONS
SEE REVERSE FOR PURPOSE CODE DEFINITIONS

384028

A21-012-14 REV



United States Environmental Protection Agency
Contract Laboratory Program

**Inorganic Traffic Report
& Chain of Custody Record**
(For Inorganic CLP Analysis)

Case No. **31934**

1. Project Code		2. Account Code		3. Region No. 9 Sampling Co. TEC INC		5. Date Shipped 7/17/02		Carrier FED EX		7. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field 5. Soil/Sediment 6. Oil (High only) 7. Waste (High only) 8. Other (Specify in Column A)		8. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NaOH 4. H2SO4 5. K2CR2O7 6. Ice only 7. Other (Specify in Column D) N. Not Preserved	
Regional Information				Sampler (Name) ARIE REYES				Airbill Number					
Non-Superfund Program				Sampler Signature <i>[Signature]</i>				6. Ship To: CHEMATECH CONSULTING GRP. 204 SHEFFIELD ST. MOUNTAINSIDE, NJ 07092 ATTN: SUNNY PATEL					
Site Name KEKANA SUGAR MILL		Site Spill ID		4. Purpose* SF <input type="checkbox"/> PRP <input type="checkbox"/> ST <input type="checkbox"/> FED <input type="checkbox"/>		Early Action CLEM <input type="checkbox"/> PA <input type="checkbox"/> REM <input type="checkbox"/> RI <input type="checkbox"/> SI <input type="checkbox"/> ESI <input type="checkbox"/>		Lobby/Item Action FS <input type="checkbox"/> RD <input type="checkbox"/> RA <input type="checkbox"/> OSM <input type="checkbox"/> NPLD <input type="checkbox"/>		F		H	
City/State KEKANA, NJ		E - RAS Analysis		Regional Specific Tracking Number or Tag Numbers		G		H		I		J	
CLP Sample Numbers (from labels) KSM-		D Preservative (from Box B) Other:		Conduct		Station Location Identifier		Mo/Day/Year/Time Sample Collection		Corresponding CLP Organic Sample No.		Sampler Initials	
50-5528 5		C Sample Type: (from Box B) Other:		pH		SL28		7/15/03 1520		MYOY27		A	
50-5510 5		B Conc.: Low Med High		Fluoride		SL10		7/16/03 1340		MYOY09		A	
50-5514 5		A Matrix (from Box 7) Other:		NO2/NO3		SL19		7/15/03 1600		MYOY18		A	
50-5511 5		Total Metals		Cyanide		SL05		7/16/03 1340		MYOY54		A	
		Dis. Metals		Lead									
		Other:		SF									
		Other:		PRP									
		Other:		ST									
		Other:		FED									
Shipments for Case Complete? (Y/N)		Page 4 of 6		Sample(s) to be Used for Laboratory QC 5522, 5529, 558		Additional Sampler Signatures <i>[Signature]</i>		Chain of Custody Seal Number(s)					

Chain of Custody Record

Relinquished by: (Signature) <i>[Signature]</i>	Date / Time 7/17/02	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time

A21-012-13 REV



United States Environmental Protection Agency
Contract Laboratory Program

**Organic Traffic Report
& Chain of Custody Record**
(For Inorganic CLP Analysis)

Case No. **31934**

1. Matrix (Enter in Column A)
 1. Surface Water
 2. Ground Water
 3. Leachate
 4. Field QC
 5. Soil/Sediment
 6. Oil (High only)
 7. Waste (High only)
 8. Other (specify in Column A)

2. Preservative (Enter in Column D)
 1. HCl
 2. HNO3
 3. NaOH
 4. H2SO4
 5. K2CR2O7
 6. Ice only
 7. Other (specify in Column D)
 N. Not preserved

3. Purpose*
 Lead SF PRP ST FED
 Early Action PA REM RI SI ESI
 Long-Term Action FS RD RA O&M NPLD

4. Date Shipped **7/17/03** Carrier **FED EX**
 Airbill Number

5. Ship To
CHEMTECH CONS. CORP
884 SHEFFIELD ST.
MOUNTAINVIEW, NJ 07092
ATTN: BRUNY PATEL

6. Date Received -- Received by:
 Laboratory Contract Number Unit Price

7. Transfer to:
 Received by
 Contract Number Price

CLP Sample Numbers (from labels)	A Matrix (from Box 1) Other:	B Conc. Low Med High	C Sample Type: (from Grab) (from Box 2) Other:	E - RAS Analysis				F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K High Phases				
				Diss. Metals	Total Metals	Cyanide	NO ₃ -N						Fluoride	pH	Conduct	Water-Miscible Liq.	Solids
KSM --																	
50-5525			C						5L-25	7/16/03 1050	MY0224	A					
50-5526			C						5L-38	7/16/03 0925	MY0237	A					
50-5527			C						5L-42	7/16/03 1120	MY0241	A					
50-5528			C						5L-11	7/16/03 1340	MY0210	K					
50-5529			C						5L-37	7/16/03 1020	MY0236	K					
50-5530			C						5L-66	7/16/03 1450	MY0265	K					
50-5531			C						5L-68	7/16/03 1205	MY0267	K					
50-5532			C						5L-17	7/15/03 1700	MY0216	K					
50-5533			C						5L-29	7/15/03 1530	MY0228	K					
50-5534			C						5L-31	7/15/03 1446	MY0230	K					

Sample(s) to be Used for Laboratory QC

Additional Sampler Signatures *[Signature]*

Chain of Custody Seal Number(s)

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time	Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
<i>[Signature]</i>	7-17-03						

Remarks: Is custody seal intact? Y/N/none

21-012-14 REV



United States Environmental Protection Agency
Contract Laboratory Program

Report
& Chain of Custody Record
(For Organic CLP Analysis)

Case No. **31934**

1. Project Code		2. Region No. TRC		3. Sampling Co. TRC, INC		4. Date Shipped 7/11/03		5. Carrier FED EX		6. Matrix (Enter in Column A)		7. Preservative (Enter in Column D)	
Account Code		Sampler (Name) AGIE REYES		Sampler Signature <i>[Signature]</i>		Airbill Number		Ship To: SHEALY 106 VANTAGE POINT DR. CAYCE, SC 29033		1. Surface Water		1. HCl	
Site Name KEVANA SUGAR		3. Purpose**		Long-Term Action		Regional Specific Tracking Number or Tag Numbers		Station Location Identifier		Corresponding CLP Inorganic Sample No.		2. HNO3	
City, State KEVANA, VA		Site Spill ID		Op Unit		E Analysis		G		H		3. NaHSO4	
CLP Sample Numbers (from labels)		A Matrix (from Box 6)		B Conc.: Sample Type:		C Sample Type:		D Preservative (from Box 7)		F		4. H2SO4	
SW3		1		Low		TA (circle one)		VOA		I		5. Ice only	
SW4		1		Med		PR* 7 14 21 PR* 7 14 21		BNA		J		6. CH3OH	
SW5		1		Med		TA (circle one)		Pest/PCB		K		7. Other (specify in Column D)	
ERI 8		8		Med		PR* 7 14 21 PR* 7 14 21		Pest/PCB		K		N. Not Preserved	
						TA (circle one)							
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						PR* 7 14 21 PR* 7 14 21							
						TA (circle one)							

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS	REMARKS
SAMPLERS: (Signature) <i>Shirley Cox</i>		KRYWAN SIGARS BULK, KRYWAN			
DATE	TIME	MATRIX	COMP	GRAB	SAMPLE IDENTIFICATION
7/10/84	1100	SO	✓	✓	KSM-50-5517-5121
7/10/84	1256	SO	✓	✓	KSM-50-5518-5120
7/10/84	1600	SO	✓	✓	KSM-50-5519-5121
7/10/84	1745	SO	✓	✓	KSM-50-5520-5120
7/10/84	1800	SO	✓	✓	KSM-50-5521-5121
7/10/84	1830	SO	✓	✓	KSM-50-5522-5127
7/10/84	1830	SO	✓	✓	KSM-50-5523-5128
7/10/84	1830	SO	✓	✓	KSM-50-5524-5129
7/10/84	1830	SO	✓	✓	KSM-50-5525-5130
7/10/84	1830	SO	✓	✓	KSM-50-5527-5127
7/10/84	1900	SO	✓	✓	KSM-50-5532-5132
7/10/84	1945	SO	✓	✓	KSM-50-5533-5133
7/10/84	1945	SO	✓	✓	KSM-50-5534-5134
7/10/84	1945	SO	✓	✓	KSM-50-5535-5135
Relinquished by: (Signature) <i>Shirley Cox</i> Received by: (Signature) <i>Fedex</i> Date / Time: 7/10/84 1100 Date / Time: 7/10/84 1100					
Relinquished by: (Signature) Received by: (Signature) Date / Time: Date / Time:					
Received for Laboratory by: (Signature) Seals Intact (Y/N) Date / Time: Temp.					
Condition / Remarks					

CHAIN OF CUSTODY RECORD

10/23

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS	REMARKS
SAMPLERS: (Signature)		KERRAHA SUGAR MILL			
DATE	TIME	MATRIX	COMP	GRAB	SAMPLE IDENTIFICATION
7/16/02	1910	VI		X	SW3-SL57
7/16/02	1915	VI		X	SW4-SL58
7/16/02	1206	VI		X	SW5-SL59
7/16/02	0800	VI		X	SW-ER-1
7/16/02	1340	SO	X		SO-SB1-SL65
7/16/02	1255	SO	X		SO-SB4-SL68
7/16/02	1345	SO	X		SO-SS10-SL10
7/16/02	1910	SED	X		SED-16-SL51
7/16/02	1425	SEP	X		SED-3-SL38
7/16/02	1450	SO	X		SO-SB2-SL65
7/16/02	1445	SO	X		SO-SS14-SL14
7/16/02	1130	SO	X		SO-SS16-SL16
7/16/02	1240	SO	X		SO-SS15-SL15
7/16/02	1420	SO	X		SO-SS13-SL13
7/16/02	1575	SO	X		SO-SS5-SL5
Relinquished by: (Signature)		Date / Time		Received by: (Signature)	Date / Time
J. Cochran		7-17-02 1100			
Relinquished by: (Signature)		Date / Time		Received by: (Signature)	Date / Time
Received for Laboratory by: (Signature)		Date / Time		Temp.	Seals Intact (Y/N)
Condition / Remarks					

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME			NO. OF CONTAINERS	REMARKS	
SAMPLERS: (Signature)		Kokaha Sugar Mill					
DATE	TIME	MATRIX	COMP	GRAB	SAMPLE IDENTIFICATION		
11/16/03	11:10	SO	X		SO-5534-SL34	1 X	
11/16/03	14:15	SO	X		SO-5532-SL32	3 X	
11/16/03	17:00	SO	X		SO-5517-SL17	1 X	
11/16/03	12:05	SO	X		SO-4-SL39	1 X	
11/16/03	14:00	SO	X		SO-5512-SL12	1 X	
11/16/03	15:15	SO	X		SO-564-SL4	1 X	
11/16/03	14:05	SO	X		SO-552-SL2	1 X	
11/16/03	16:05	SO	X		SO-5533-SL33	1 X	
11/16/03	14:20	SO	X		SO-553-SL3	1 X	
11/16/03	15:15	SO	X		SO-555-SL5	1 X	
11/16/03	14:55	SO	X		SO-556-SL6	1 X	
11/16/03	13:55	SO	X		SO-5518-SL18	1 X	
11/16/03	14:20	SO	X		SO-5530-SL30	1 X	
11/16/03	16:00	SO	X		SO-5519-SL19	1 X	
11/16/03	14:10	SO	X		SO-5531-SL31	1 X	
Relinquished by: (Signature)		Date / Time			Received by: (Signature)	Date / Time	Received by: (Signature)
Shobh Cox 11/17/03 11:00							
Relinquished by: (Signature)		Date / Time			Received by: (Signature)	Date / Time	Received by: (Signature)
Received for Laboratory by: (Signature)		Date / Time			Temp.	Seals Intact (Y/N)	Condition / Remarks

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS	REMARKS
SAMPLERS: (Signature)		SAMPLE IDENTIFICATION			
DATE	TIME	MATRIX	COMP	GRAB	
11/10/03	1545	SO	✓	✓	X
11/10/03	1605	SO	✓	✓	X
11/10/03	1610	SO	✓	✓	X
11/10/03	1720	SO	✓	✓	X
11/10/03	0925	SED	✓	✓	X
11/10/03	1315	SO	✓	✓	X
11/10/03	1115	SO	✓	✓	X
11/10/03	1420	SO	✓	✓	X
11/10/03	1205	SED	✓	✓	X
11/10/03	1115	SO	✓	✓	X
11/10/03	1210	SO	✓	✓	X
11/10/03	1130	SO	✓	✓	X
11/10/03	1140	SED	✓	✓	X
11/10/03	1205	SED	✓	✓	X
11/10/03	1230	SED	✓	✓	X
Relinquished by: (Signature)					Relinquished by: (Signature)
Date / Time					Date / Time
Received by: (Signature)					Received by: (Signature)
Date / Time					Date / Time
Relinquished by: (Signature)					Relinquished by: (Signature)
Date / Time					Date / Time
Received for Laboratory by: (Signature)					Received for Laboratory by: (Signature)
Date / Time					Date / Time
Temp.					Seals Intact (Y/N)
Condition / Remarks					



Project Code: **KEKATHA, HI**

Account Code: **KEKATHA SM**

Site Name: **KEKATHA, HI**

City, State: **KEKATHA, HI**

Region No.: **9** | Sampling Co.: **TECUMSC**

Sampler-(Name): **AMATE ROYES**

Sampler Signature: *[Signature]*

Carrier: **FedEx**

Date Shipped: **8/6/03**

Airbill Number: **8401 7264 2478**

Ship To: **SHEALY 106 VANTAGE POINT DR. CAYCE, SC 29033**

ATTN: **DAN WRIGHT**

Purpose: SF PRP ST FED IBZ

Early Action: PA REM RI SI ESI

Long-Term Action: RIFS RD RA O&M

Matrix (Enter in Column A):
 1. Surface Water
 2. Ground Water
 3. Leachate
 4. Field QC
 5. Soil/Sediment
 6. PE-water
 7. PE-soil
 8. Other (specify in Column A)

Prese (Enter in Column):
 1. HC
 2. HP
 3. NZ
 4. HZ
 5. ICE
 6. CA
 7. Oil
 in
 N. No

CLP Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med	C Sample Type: Comp./Grab	D Preservative (from Box 7) Other:	E RAS Analysis			F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	Fk Qi
					TA (circle one) PR* 7 14 21	TA (circle one) PR* 7 14 21	TA (circle one) PR* 7 14 21						
Y0XZ1	1	L	G	5				SL55	8/5/03 1145	MY0XZ1	K		
Y0XZ6	1	L	G	5				SL60	8/5/03 1400	MY0XZ6	K	MS	
Y0XZ0	2	L	G	5				SL64	8/6/03 1205	MY0XZ0	A		

VOA MS/MSD Required? Y/N

BNA MS/MSD Required? Y/N

Pest/PCB MS/MSD Required? Y/N

Sample #: **Y0XZ6**

Additional Sampler Signatures: *[Signature]*

Chain of Custody Seal Number(s):

PR provides 7-day data turnaround in addition to preliminary results. Requests for preliminary results will increase analytical costs.

Chain of Custody Record	
Relinquished by: <i>[Signature]</i>	Received by: (Signature) _____
Relinquished by: (Signature) _____	Received by: (Signature) _____
Relinquished by: (Signature) _____	Received by: (Signature) _____

Remarks: Is custody seal intact? Y/N/none



United States Environmental Protection Agency
Contract Laboratory Program

**Organic Traffic Report
of Custody Record**
(Organic CLP Analysis)

Case No. 21934

1. Project Code: **KEK** 2. Region No. **9** 3. Date Shipped **8/6/03** 4. Carrier **FADEX**

Account Code: **SM** 5. Ship To: **Shealy 106 Vantage Point Dr. Cayce, SC 29033**

Site Name: **KEK** 6. Matrix (Enter in Column A):
 1. Surface Water
 2. Ground Water
 3. Leachate
 4. Field QC
 5. Soil/Sediment
 6. PE-water
 7. PE-soil
 8. Other (specify in Column A)

7. Preset (Enter in Column A):
 1. HC
 2. HH
 3. NE
 4. HZ
 5. IC
 6. CF
 7. OT
 N, NC

CLP Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc.: Type: Low Med High	C Sample Type: Comp/Grab	D Preservative (from Box 7) Other:	E RAS Analysis			F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Chain of Custody Seal Number(s)
					TA (circle one) PR* 7 14 21	TA (circle one) PR* 7 14 21	TA (circle one) PR* 7 14 21						
Y0XZ8	2	L	G	5	X			SL 61	8/6/03 1130	MYOXZ8	MS		
Y0XZ9	2	L	G	5	X			SL 63	8/5/03 1230	MYOXZ9			
Y0XZ0	2	L	G	5	X			SL 64	8/5/03 1230	MYOXZ0			

3. Purpose: SF PRP ST FED BZ

4. Long-Term Action: PA REM RI SI ESI

5. Additional Sampler Signatures: *Robert Whithie*

6. Shipment for Case Complete? (Y/N): **Y** VOA MS/MSD Required? **Y** Y/N Sample #: **Y0XZ8**

7. BNA MS/MSD Required? **Y** Y/N Sample #: **Y0XZ8**

8. Pest/PCB MS/MSD Required? **Y** Y/N Sample #: **Y0XZ8**

*PR provides 7-day data turnaround in addition to preliminary results. Requests for preliminary results will increase analytical costs.

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
<i>John Wright</i>	8/6/03 1100		

Remarks: Is custody seal intact? **Y/N/None**



United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report
Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. **3193**

1. Project Code		Account Code		2. Region No. Sampling Co.		4. Date Shipped Carrier		6. Matrix (Enter in Column A)		7. Preservative (Enter in Column D)	
Regional Information		Sampler (Name)		8/6/03		FEDEX		1. Surface Water		1. HCl	
Non-Superfund Program		Sampler Signature		Airbill Number		8401-7264-2537		2. Ground Water		2. HNO3	
Site Name		3. Purpose		5. Ship To		LIBERTY ANALYTICAL		3. Leachate		3. NaOH	
City, State		Lead		ATTN: ALICE EVANS		CARY, NC 27513		4. Field QC		4. H2SO4	
CLP Sample Numbers (from labels)		SF		Regional Specific Tracking Number of Tag Numbers		F		5. Soil/Sediment		5. K2CR2O7	
A Matrix (from Box 6)		PRP		G Station Location Identifier		G		6. Oil (High only)		6. Ice only	
B Conc. Low Med High		ST		SLES		SLES		7. Waste (High only)		7. Other (specify in Column D)	
C Sample Type: Comp./Grab		FED		SLE6		SLE6		8. Other (specify in Column A)		N. Not preserved	
D Preservative (from Box 7)		Other:		SLE6		SLE6		H Mo/Day/Year/Time Sample Collection		J Sampler Initials	
E - RAS Analysis		ESI		SLE6		SLE6		I Corresponding CLP Organic Sample No.		K Field QC Qualifier	
F Diss. Metals		SI		SLE6		SLE6		H Mo/Day/Year/Time Sample Collection		B = Blank S = Spike	
G Total Metals		RI		SLE6		SLE6		I Corresponding CLP Organic Sample No.		D = Duplicate	
H NO ₂ /NO ₃		SI		SLE6		SLE6		H Mo/Day/Year/Time Sample Collection		R = Refuse	
I Fluoride		SI		SLE6		SLE6		I Corresponding CLP Organic Sample No.		PE = Perform. Eval.	
J Conduct.		SI		SLE6		SLE6		H Mo/Day/Year/Time Sample Collection		= Not a QC Sample	
K PH		SI		SLE6		SLE6		I Corresponding CLP Organic Sample No.			
L Shipment for Case Complete? (Y/N)		Other:		SLE6		SLE6		H Mo/Day/Year/Time Sample Collection			
Page 1 of 1		Other:		SLE6		SLE6		I Corresponding CLP Organic Sample No.			
Sample(s) to be Used for Laboratory QC		Other:		SLE6		SLE6		H Mo/Day/Year/Time Sample Collection			
MYOXZ6, MYOXZ8		Other:		SLE6		SLE6		I Corresponding CLP Organic Sample No.			
Additional Sampler Signatures		Other:		SLE6		SLE6		H Mo/Day/Year/Time Sample Collection			
Robert A. White		Other:		SLE6		SLE6		I Corresponding CLP Organic Sample No.			

Relinquished by: (Signature)		Date / Time		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time	
[Signature]		8/6/03 1100		[Signature]		[Signature]		[Signature]		[Signature]	
Relinquished by: (Signature)		Date / Time		Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time	
[Signature]		[Signature]		[Signature]		[Signature]		[Signature]		[Signature]	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks		Is custody seal intact? Y/N/none	
[Signature]		[Signature]		[Signature]		[Signature]		[Signature]		[Signature]	

CHAIN OF CUSTODY RECORD

DISTRIBUTION: Green - Region Copy White - Lab Copy for Return to Region Yellow - Lab Copy for Return to CLASS EPA Form 9110-1 (2/98)

SEE REVERSE FOR ADDITIONAL STANDARD INSTRUCTIONS
SEE REVERSE FOR PURPOSE CODE DEFINITIONS

384026

EPA-101-13 REV



United States Environmental Protection Agency
Contract Laboratory Program

Janic Traffic Report
&
Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. **31934**

1. Project Code		Account Code		2. Region No. / Sampling Co.		4. Date Shipped / Carrier		6. Matrix (Enter in Column A)		7. Preservative (Enter in Column D)	
Regional Information		Sampler (Name)		8/6/03 / FEDEX		Airbill Number		1. Surface Water		1. HCl	
Perfund Program		SAMPLER SIGNATURE		8401-7264-2526		5. Ship To		2. Ground Water		2. HNO3	
Name		SAMPLER SIGNATURE		CHEMTECH CONSULTING		Regional Specific Tracking Number or Tag Numbers		3. Leachate		3. NaOH	
City, State		SAMPLER SIGNATURE		284 Sheffield St		Mo/Day/Year/Time Sample Collection		4. Field QC		4. H2SO4	
KEKATA, HI		SAMPLER SIGNATURE		Mountainside, NJ		Station Location Identifier		5. Soil/Sediment		5. K2CR2O7	
KEKATA, HI		SAMPLER SIGNATURE		ATTN: Sunny Patel		Regional Specific Tracking Number or Tag Numbers		6. Oil (High only)		6. Ice only	
CLP Sample Numbers (from labels)		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		7. Waste (High only)		7. Other (Specify in Column D)	
A Matrix (from Box 6) Other:		D Preservative Type: (from Box 7) Other:		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		8. Other (Specify in Column A)		N. Not preserved	
B Conc. Low Med High		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		1. Surface Water			
C Sample Type: (from Box 7) Grab		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		2. Ground Water			
MY0Y44		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		3. Leachate			
MY0Y45		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		4. Field QC			
MY0Y46		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		5. Soil/Sediment			
MY0Y47		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		6. Oil (High only)			
MY0Y48		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		7. Waste (High only)			
MY0Y49		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		8. Other (Specify in Column A)			
MY0Y51		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		1. Surface Water			
MY0Y52		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		2. Ground Water			
MY0Y53		E - RAS Analysis		+ Mercury (Hg)		Regional Specific Tracking Number or Tag Numbers		3. Leachate			
Shipment for Case Complete? (Y/N)		Sample(s) to be Used for Laboratory QC		Additional Sampler Signatures		Chain of Custody Seal Number(s)					
1 of 1		MY0Y48		Robert G. Whitham							

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
<i>[Signature]</i>	8/6/03 11:00		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time

21-012-13 REV

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS		REMARKS
KOKAHA SUGAR MILL						
SAMPLERS: (Signature) <i>[Signature]</i>						
DATE	TIME	MATRIX	CONC	GRAB	SAMPLE IDENTIFICATION	
8/5/03	1530	SED	X	X	KSM-SED10 - SL45	X
8/5/03	1545	SED	X	X	KSM-SED11 - SL46	X
8/5/03	1600	SED	X	X	KSM-SED12 - SL47	X
8/5/03	1620	SED	X	X	KSM-SED13 - SL48	X
8/5/03	1145	SED	X	X	KSM-SED14 - SL49	X
8/5/03	1115	SED	X	X	KSM-SED15 - SL50	X
8/5/03	1640	SED	X	X	KSM-SED17 - SL52	X
8/5/03	1345	SED	X	X	KSM-SED18 - SL53	X
8/5/03	1205	SED	X	X	KSM-SED19 - SL54	X
8/5/03	1400	SWF	X	X	SW6 - SL60	3
8/5/03	1130	SWF	X	X	SW1 - SL61	3
Relinquished by: (Signature) <i>[Signature]</i> Date / Time 8/6/03 1100 Received by: (Signature)						
Relinquished by: (Signature) Date / Time Received by: (Signature)						
Received for Laboratory by: (Signature) Date / Time Temp. Seals Intact (Y/N)						

CASE # 11-2251-67.0

MS/MSD

D

MS/MSD

MS/MSD



United States Environmental Protection Agency
Contract Laboratory Program

Organic Tr. Report
& Chain of Custody Record
(For Organic CLP Analysis)

Case No. **31934**

1. Project Code: _____

2. Region No. **9** Sampling Co. **TEC** Date Shipped **7-1** Carrier **FedEx**

Account Code: _____

3. Purpose**
 SF PRP ST FED BZ
 IA PA REM RI SI ESI
 Long-Term Action: RIFS RD RA OBM

4. Ship To: **Liberty Analytical**
501 Madison Avenue
Cary, NC 27513

5. Shipper Signature: **Artie Reyes** ATTN: **Alice Evans**

6. Matrix (Enter in Column A)
 1. Surface Water
 2. Ground Water
 3. Leachate
 4. Field QC
 5. Soil/Sediment
 6. PE-water
 7. PE-soil
 8. Other (Specify in Column A)

7. Preservative (Enter in Column D)
 1. HCl
 2. HNO3
 3. NaHSO4
 4. H2SO4
 5. Ice only
 6. CH3OH
 7. Other (Specify in Column D)
 N. Not Preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc.: Sample Type: (from Box 7) Low Med	C Preservative (from Box 7) Other:	E RAS Analysis			F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Field QC Qualifier
				TA (circle one) PR* 7 14 21	TA (circle one) PR* 7 14 21	TA (circle one) PR* 7 14 21						
SD-6	S	0	S	PR* 7	BNA	SL41	7/16/03 1210	Y0Y40	K			
SD-1	S	0	S	PR* 7	BNA	SL36	7/16/03 1020	Y0Y35	K			
SD-534	S	0	S	PR* 7	BNA	SL34	7/14/03 1610	Y0Y33	K			
SD-3	S	0	S	PR* 7	BNA	SL38	7/16/03 0925	Y0Y37	K			
SD-531	S	0	S	PR* 7	BNA	SL31	7/15/03 1446	Y0Y70	K			
SD-16	S	0	S	PR* 7	BNA	SL51	7/16/03 1910	Y0Y50	K			
SD-554	S	0	S	PR* 7	BNA	SL4	7/14/03 1515	Y0Y09	K			
SD-5520	S	0	S	PR* 7	BNA	SL20	7/15/03 1445	Y0Y19	K			
SD-2	S	0	S	PR* 7	BNA	SL37	7/16/03 1030	Y0Y36	K			
SD-532	S	0	S	PR* 7	BNA	SL66	7/16/03 1450	Y0Y65	K			

Chain of Custody Seal Number(s): _____

Additional Sampler Signatures: **Sholch Cox**

*PR provides 7-day data turnaround in addition to preliminary results. Requests for preliminary results will increase analytical costs.

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Sholch Cox	7-16-03		

Remarks: Is custody seal intact? Y/N/None

1. Project Code		2. Region / No. Sampling Co. TEC		3. Date Shipped		Carrier		Case No. 3193	
Account Code		Sampler (Name) ACHIE REYES		Airbill Number		Carrier		6. Matrix (Enter in Column A) 1. Surface Water 2. Ground Water 3. Leachate 4. Field QC 5. Soil/Sediment 6. PE-water 7. PE-soil 8. Other (specify in Column A)	
Site Name KARABA SOYAN MILL		Sampler Signature <i>[Signature]</i>		5. Ship To: Liberty Analytical 501 Madison Avenue. Cary, NC 27513		7. Preservative (Enter in Column D) 1. HCl 2. HNO3 3. NaHSO4 4. H2SO4 5. Ice only 6. CH3OH 7. Other (specify in Column D) N. Not Preserved			
City, State KARABA, NC		Site Spill ID		Op Unit		ATTN: ALICE EVANS			
A. Matrix (from Box 6) Other:		B. Conc.: Low Med		C. Sample Type: Comp./ Grab		D. Preservative (from Box 7) Other:		E. RAS Analysis TA (circle one) PR* 7 14 21 PR* 7 14 21 PR* 7 14 21 TA (circle one) TA Res/ PCB	
CLP Sample Numbers (from labels)		F. Regional Specific Tracking Number or Tag Numbers		G. Station Location Identifier		H. Mo/Day/Year/Time Sample Collection		I. Corresponding CLP Inorganic Sample No.	
J. Additional Sampler Signatures <i>[Signature]</i>		K. Chain of Custody Seal Number(s)		L. Field QC Qualifier		M. Sampler Initials		N. Other (specify in Column D)	
Shipments for Case Complete? (Y/N)		Page 2 of 4		VOA MS/MSD Required? <input checked="" type="checkbox"/> Y/N		Sample #: SL65			
BNA MS/MSD Required? <input checked="" type="checkbox"/> Y/N		Sample #: SL65		Pest/PCB MS/MSD Required? <input checked="" type="checkbox"/> Y/N		Sample #:			

Chain of Custody Record

*PR provides 7-day data turnaround in addition to preliminary results. Requests for preliminary results will increase analytical costs.

Relinquished by: (Signature) <i>[Signature]</i>	Date / Time	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time

Remarks: Is custody seal intact? Y/N/none



United States Environmental Protection Agency
Contract Laboratory Program

**Organic T Report
& Chain of Custody Record**
(For Organic CLP Analysis)

Case No. *3141*

1. Project Code
Account Code
Site Name: *Kanabes Suya Mill*
City, State: *Liberty Analytical*
501 Madison Avenue
Cary, NC 27513
ATTN: *ALICE EVANS*

2. Region No. *11203* Sampling Co. *TEC* Carrier *FED EX*
Sampler (Name) *Active Reyes*
Sampler Signature *[Signature]*
3. Purpose**
Lead: SF PRP ST FED BZ
Early Action: IA PA REM RI SI ESI
Long-Term Action: RIFS RD RA O&M

CLP Sample Numbers (from labels)	A Matrix (from Box 6)	B Conc. (Low Med)	C Sample Type (Comp./Grab)	D Preservative (from Box 7)	E RAS Analysis (TA, VOA, BNA, PCB)	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Inorganic Sample No.	J Sampler Initials	K Field QC Qualifier
<i>80-5531</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL32</i>	<i>SL32</i>	<i>7/14/03 1605</i>	<i>Y0Y31</i>	<i>A</i>	<i>MIS/MSD</i>
<i>80-5532</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL5</i>	<i>SL5</i>	<i>7/14/03 1575</i>	<i>Y0Y04</i>	<i>A</i>	<i>D</i>
<i>80-5533</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL2</i>	<i>SL2</i>	<i>7/14/03 1405</i>	<i>Y0Y01</i>	<i>A</i>	
<i>80-5534</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL4b</i>	<i>SL4b</i>	<i>7/16/03 1220</i>	<i>Y0Y39</i>	<i>A</i>	
<i>80-5535</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL6</i>	<i>SL6</i>	<i>7/14/03 1455</i>	<i>Y0Y05</i>	<i>A</i>	
<i>80-5536</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL3</i>	<i>SL3</i>	<i>7/14/03 1120</i>	<i>Y0Y02</i>	<i>A</i>	
<i>80-5537</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL22</i>	<i>SL22</i>	<i>7/16/03 1600</i>	<i>Y0Y21</i>	<i>A</i>	
<i>80-5514</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL14</i>	<i>SL14</i>	<i>7/16/03 1145</i>	<i>Y0Y13</i>	<i>A</i>	
<i>80-5515</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL15</i>	<i>SL15</i>	<i>7/16/03 1240</i>	<i>Y0Y14</i>	<i>A</i>	
<i>80-5516</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>TA (circle one) PR* 7, 14, 21, PR* 7, 14, 21, TA (circle one)</i>	<i>SL16</i>	<i>SL16</i>	<i>7/16/03 1130</i>	<i>Y0Y15</i>	<i>A</i>	

7. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaHSO4
4. H2SO4
5. Ice only
6. CH3OH
7. Other (specify in Column D)
N. Not Preserved

Shipment for Case Complete? (Y/N)	Page of	VOA MS/MSD Required? Y/N	BNA MS/MSD Required? Y/N	Pest/PCB MS/MSD Required? Y/N	Sample #	Sample #	Sample #	Additional Sampler Signatures	Chain of Custody Seal Number(s)
<i>3</i>	<i>4</i>	<i>Y</i>	<i>Y</i>	<i>Y</i>	<i>SL32</i>			<i>[Signature]</i>	

*PR provides 7-day data turnaround in addition to preliminary results. Requests for preliminary results will increase analytical costs.

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
<i>[Signature]</i>	<i>7/16/03</i>		

Remarks: Is custody seal intact? *Y*/N/None

Distribution: Blue - Region Copy
White - Lab Copy for Return to SMO
Pink - SMO Copy
Yellow - Lab Copy for Return to Region

EPA Form 9110-2 (2/99)

See Reverse for Additional Standard Instructions
**See Reverse for Purpose Code Definitions

CLASS-99-001

404994



United States Environmental Protection Agency
Contract Laboratory Program

**Inorganic Traffic Report
& Chain of Custody Record**
(For Inorganic CLP Analysis)

Case No. 31934

1. Project Code		2. Account Code		3. Region No. Sampling Co.		5. Date Shipped		Carrier		7. Matrix (Enter in Column A)		8. Preservative (Enter in Column D)					
Regional Information		Sampler (Name)		TEC INC		7/17/03		FED EX		Surface Water		1. HCl					
Non-Superfund Program		Sampler Signature		Alicia Reyes		Airbill Number		LIBERTY ANALYTICAL		Ground Water		2. HNO3					
Site Name		4. Purpose*		Long-Term Action		6. Ship To:		501 MADISON AVENUE		Leachate		3. NaOH					
City, State		Lead		CLEM PA		LIBERTY ANALYTICAL		CARY, NC 27513		Field		4. H2SO4					
Kekaha, HI		SF PRP ST FED		PA REM RI SI ESI		ATTN: ALICE EVANS				Soil/Sediment		5. K2CR2O7					
Site Spill ID		E - RAS Analysis		FS RD RA OSM NPLD						Oil (High only)		6. Ice only					
CLP Sample Numbers (from labels)		D Preservative (from Box 7) Other:		Conduct		F Regional Specific Tracking Number or Tag Numbers		G Station Location Identifier		H Mo/Day/Year/Time Sample Collection		I Corresponding CLP Organic Sample No.		J Sampler Initials		K Field QC Qualifier	
SWB		A Matrix (from Box 7) Other:		High Only		5657		7/16/03 1410		MYDXZ3		K		B = Blank S = Spike		D = Duplicate	
SWA		C Sample Type: (from Box 8) Other:		Low Only		568		7/16/03 1345		MYDXZ4		K		R = Perform Eval.		PE = Not a QC Sample	
SWS		D Preservative (from Box 7) Other:		Fluoride		569		7/16/03 1205		MYDXZ5		K					
ERI		E - RAS Analysis		NO3		565		7/17/03 080		MYDXZ7		K					
		F Regional Specific Tracking Number or Tag Numbers		Total Metals													
		G Station Location Identifier		Dis. Metals													
		H Mo/Day/Year/Time Sample Collection		Lead													
		I Corresponding CLP Organic Sample No.		PRP													
		J Sampler Initials		ST													
		K Field QC Qualifier		FED													
Shipment for Case Complete? (Y/N)		Page 4 of 4		Sample(s) to be Used for Laboratory QC		Additional Sampler Signatures		Chain of Custody Seal Number(s)									
				ER1		Alice Reyes											

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time

Remarks: Is custody seal intact? Y/N/none

A21-012-13 REV

Appendix B
Contact Log

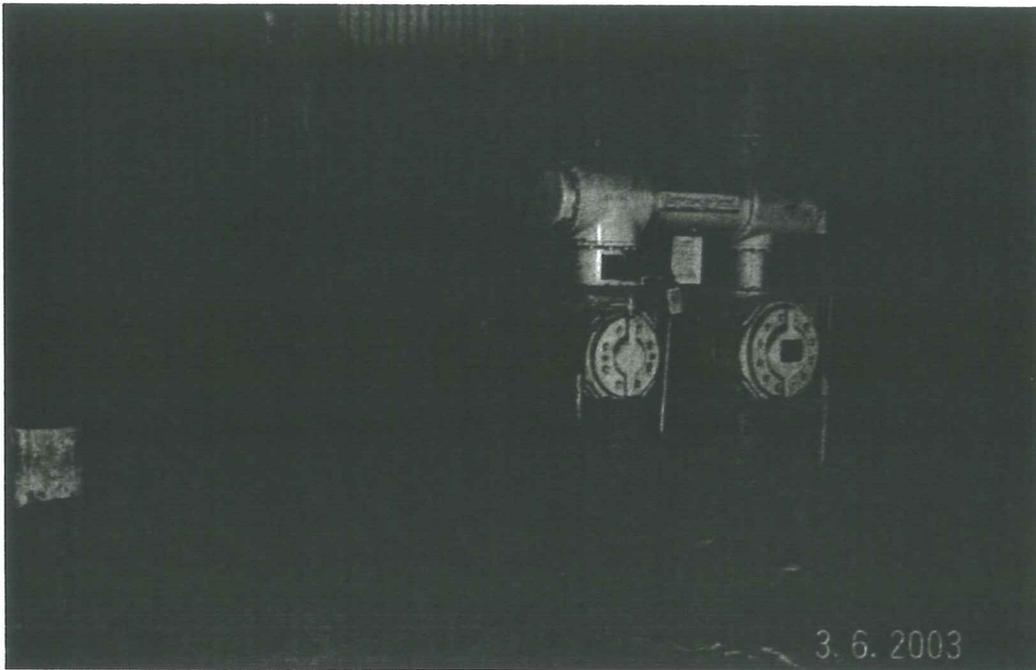
CONTACT REPORT
(No. 1)

AGENCY/AFFILIATION: Hawaii Department of Health;		
DEPARTMENT: Safe Drinking Water Branch		
ADDRESS: 919 Ala Moana Blvd.		CITY: Honolulu
COUNTY: Honolulu	STATE: HI	ZIP: 96814
CONTACT	TITLE	PHONE
William Wong	Chief	(808) 586-4258
PERSON MAKING CONTACT: Jeff Scott Hart, RG (TEC)		DATE: 08/11/04
SUBJECT: Sampling locations		
SITE NAME: Kekaha Sugar Co., Ltd.		EPA ID: HID000875203 -Kekaha

DISCUSSION:

Mr. Wong confirmed the existence of water wells in the Kekaha area of Kauai and provided maps with well locations and ownership in the area.

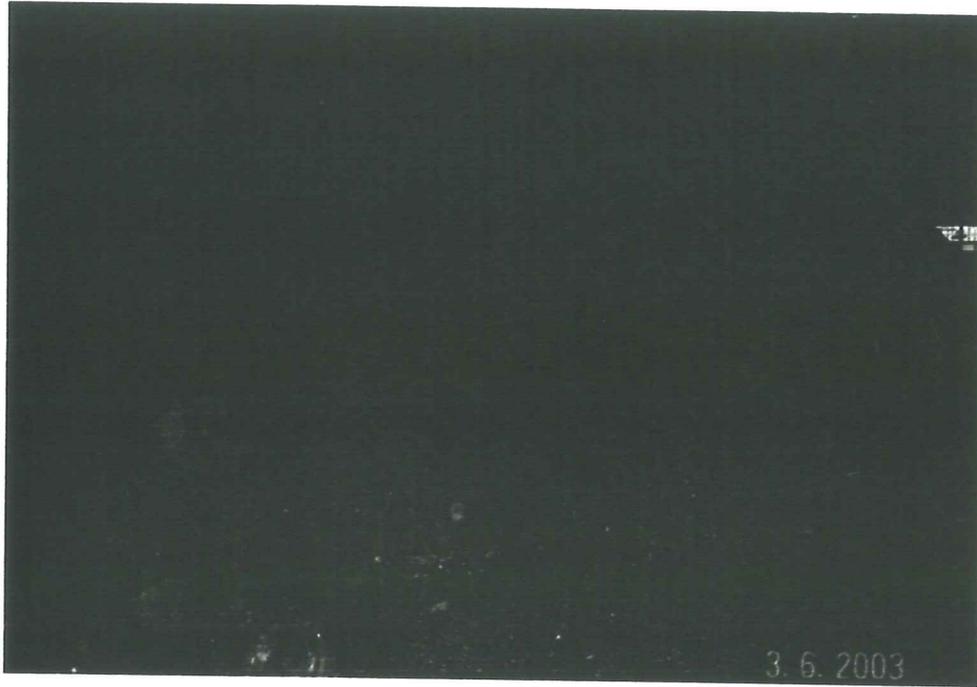
Appendix C
Photo Documentation



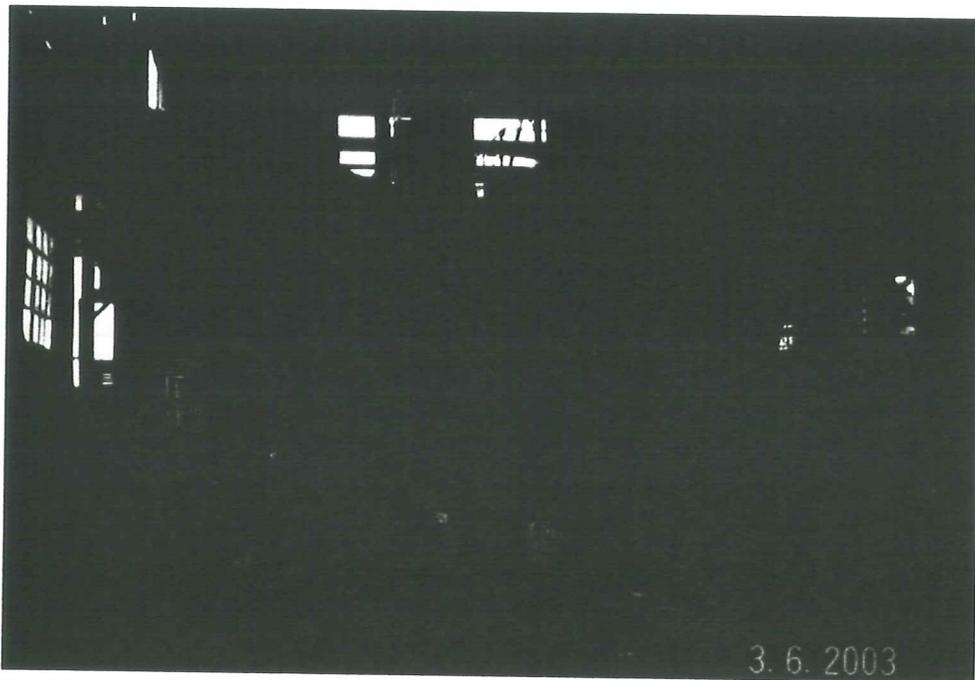
Oil stains near the high pressure air compressor located at the metal shop.



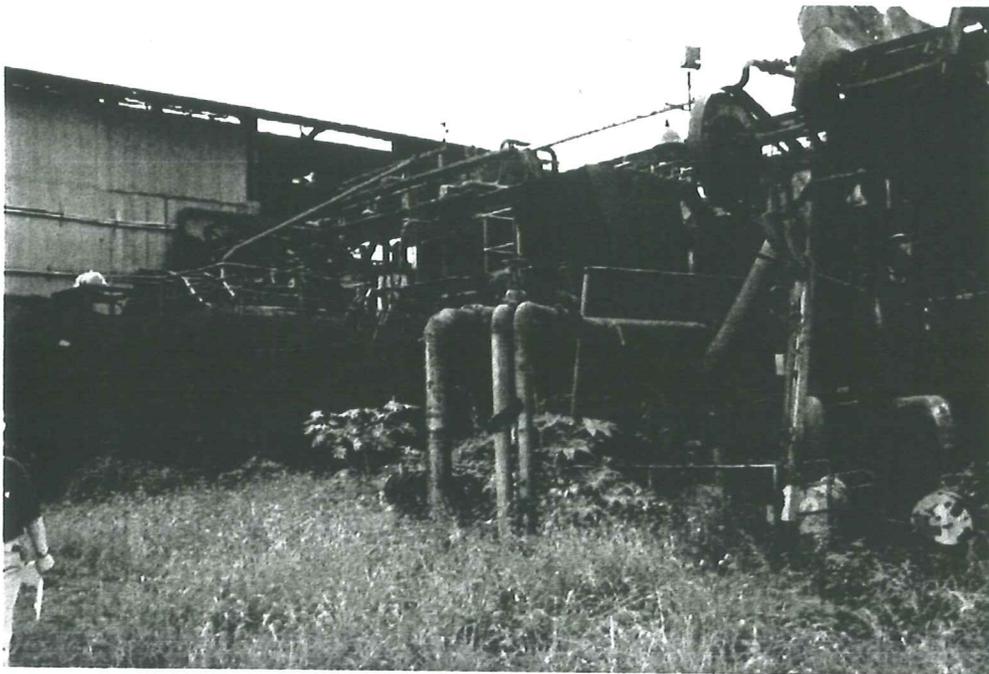
An area in the metal shop marked with oil stain and littered with scrap metal.



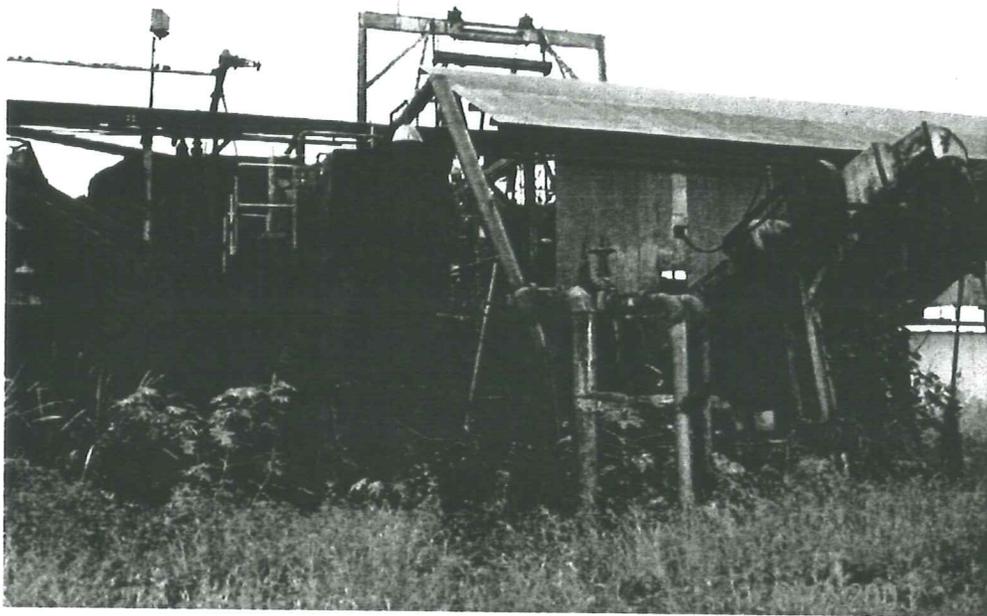
On old heavy-duty lathe machine located at the at the machine shop.



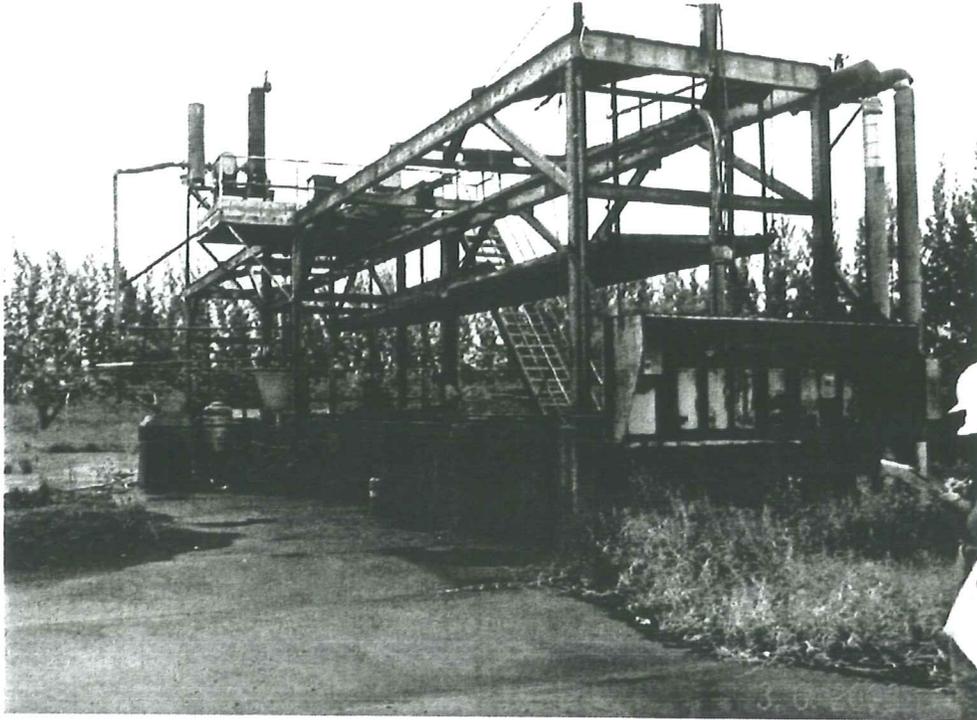
The machine shop was littered with scrap metals including oil drums.



Cane cleaning section of the sugar mill.



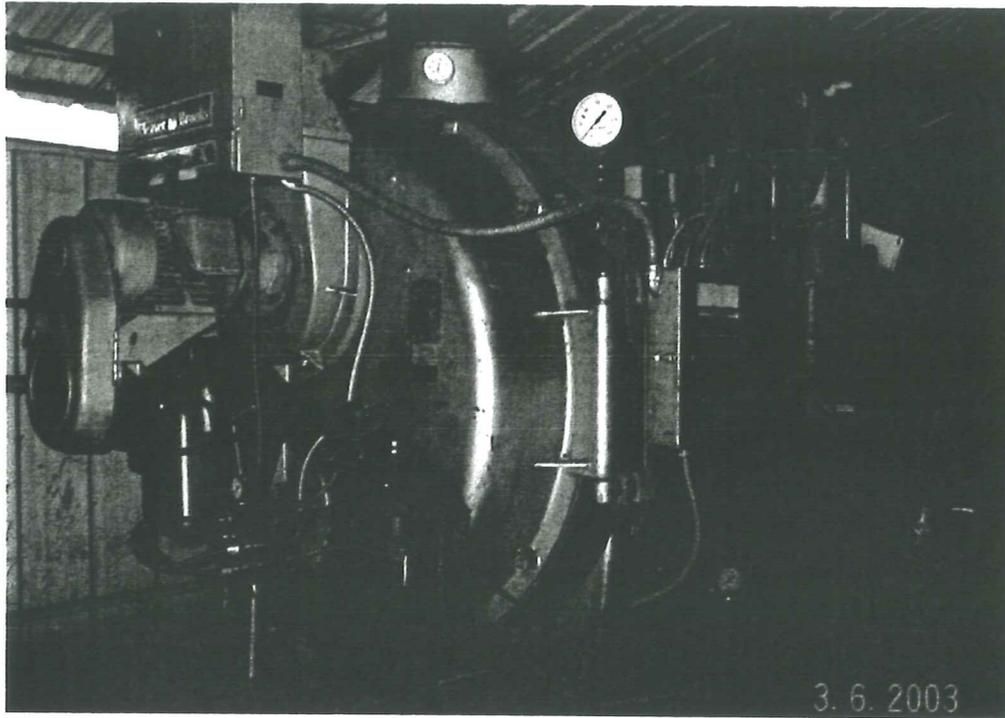
Cane washer with the loader in the background.



Former seed dipping tank.



Inside view of the seed dipping tank.



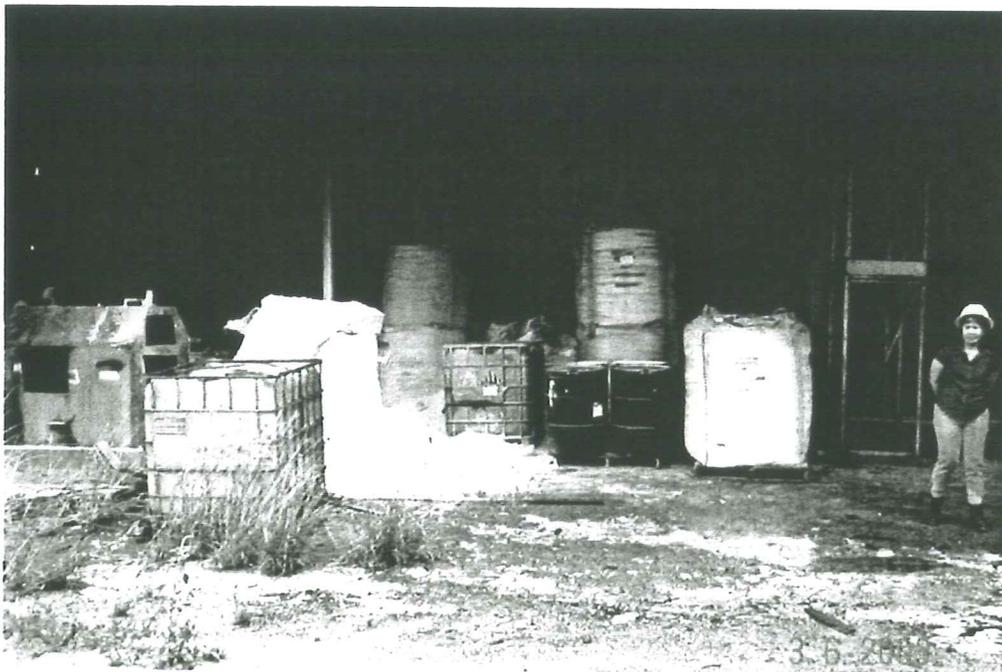
Boiler located adjacent to the former seed dipping tank.



NPDES ditch with a sump pump adjacent and to the west of the former seed dipping tank.



Drum storage area near the NPDES ditch east of the sugar mill.

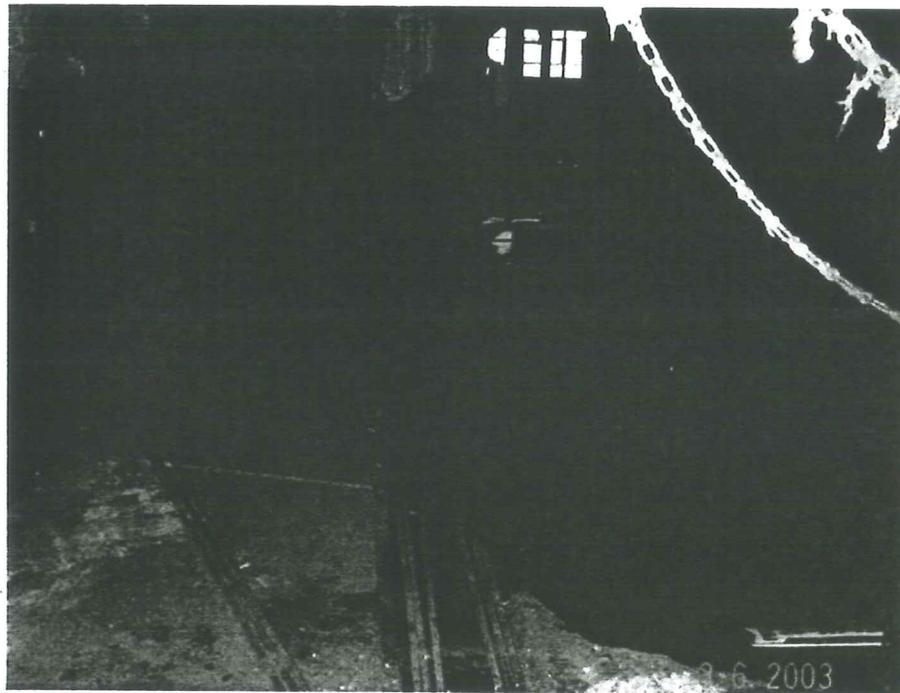


Lime storage area south-west corner of the boiler house.



One of the 2 furnace in the sugar mill.

A drainage canal inside the boiler house.



A drainage canal south-end of the boiler house adjacent to the transformer storage area.



Transformer storage area south-end of the boiler house.





Former motor pool.



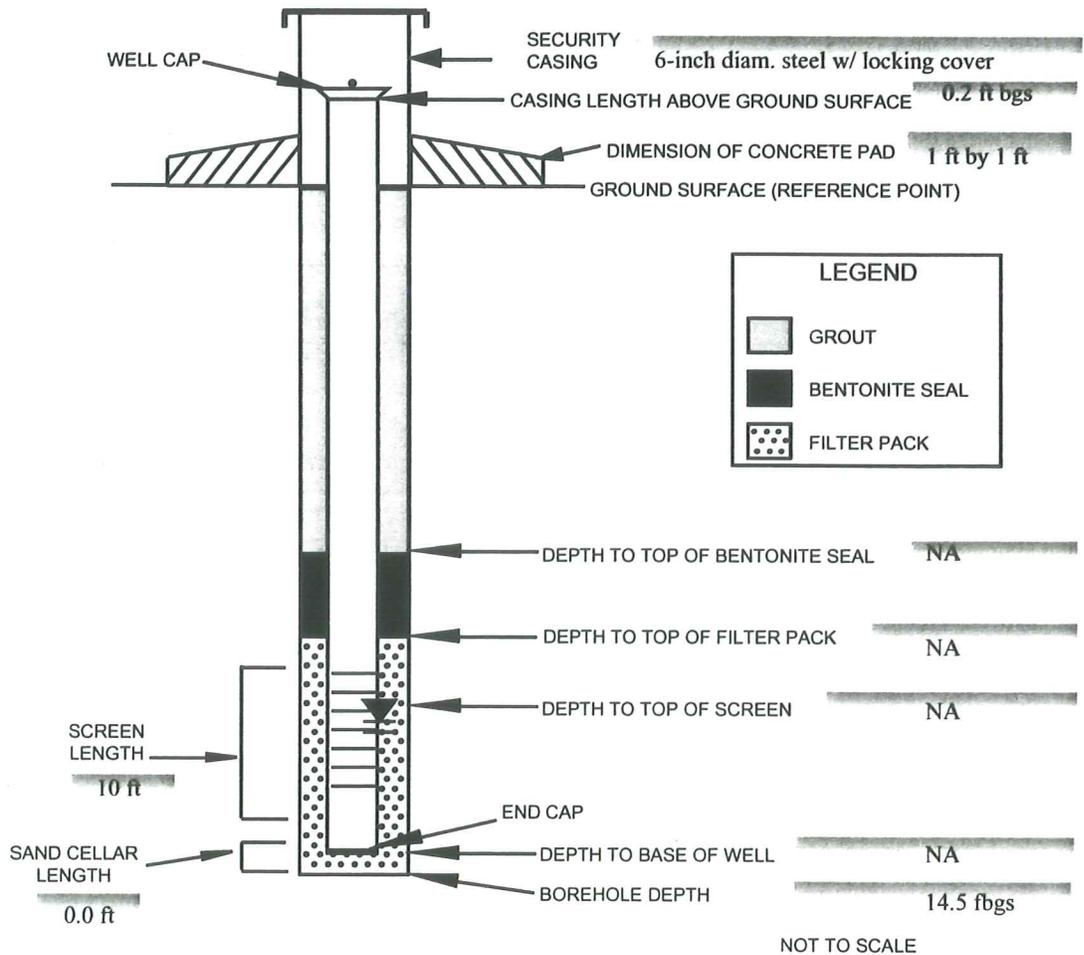
Former automotive shop.

Appendix E
Well Construction Details and Bore Logs

WELL CONSTRUCTION DETAILS

BOREHOLE ID: MW-1	WELL CONSTRUCTION START DATE: 16 July 2003	
	WELL CONSTRUCTION COMPLETION DATE: 16 July 2003	
FIELD REPRESENTATIVE: Robert Whittier., TEC	TYPE OF FILTER PACK: None	
DRILLING CONTRACTOR: ESN Pacific	GRADIATION: NA	
DRILLING TECHNIQUE: Direct Push	AMOUNT OF FILTER PACK USED: NA	
AUGER SIZE AND TYPE: 3-inch OD	TYPE OF BENTONITE USED: None	
BOREHOLE DIAMETER: 3-inch	AMOUNT OF BENTONITE USED: NA	
WELL IDENTIFICATION: MW-1	TYPE OF CEMENT USED: Quickrete, Ready-to-Use	
SCREEN MATERIAL: Schedule 80 PVC	GROUT MATERIALS USED: None	
SCREEN DIAMETER: 1-inch	SECURITY CASING DIMENSION: 6-inch diam. X 0 ft ht.	
SCREEN INTERVAL (FT): 4.5 to 14.5 ft bgs	TYPE OF CAP: PVC Slip-on Cap	
CASING MATERIAL: Schedule 80 PVC	TYPE OF END CAP: 4-inch Flush Threaded	
CASING DIAMETER: 1-inch	COMMENTS: Surface monument consists of flush mounted traffic box. TOC notched on north of PVC casing (0 ft stickup) for water level datum.	

SPECIAL CONDITIONS
(describe and draw)



INSTALLED BY: Jason Jotras of ESN Pacific
DISCREPANCIES: No filter pack or seal

INSTALLATION OBSERVED BY: Robert Whittier,
 TEC Geologist

GEOLOGIC BOREHOLE LOG

Borehole (Location) ID: KSM MW-1

Page 1 of 1

AFIID		SiteID		Location Type		Monitoring Well				
Location Description Kekaha, Kauai North of Kekaha Sugar Mill at NE corner of settling pond										
Establishing Company The Environmental Co., Inc			Geologist R. Whittier		Drilling Company ESN Pacific					
Drilling Foreman J. Jostras			Ground Surface Elevation (ft)		Datum MSL					
Sampling Device 2" x 18" Split Spoon			Borehole Diameter (inches) 2-1/4		Total Depth (Feet) 14.5					
Date/Time Drilling Started: 7/17/2003 13:34					Date/Time Total Depth Reached: 7/16/2003 14:43					
Depth (feet)	Sampling				USCS	ASTM CODE	Lithologic Codes	Lithology Description SOIL TYPE, modifiers/grain size, sorting, color, cement/lithification, moisture content, porosity, permeability/fracturing	Strat-order	Remarks: Drilling Problems, Equipment, Water levels, Weather, Time, Samples
	% Recov	Sample Depth	Blow Counts	PID						
5	95%				SC		0-9' Sand & Silt - Coral sand (light tan) with silt (brownish red)		7/17/2003 13:34 Partly cloudy, very warm, mod. - high humidity Samples collected in 1.0" Stainless Steel Sleeves	
10		9.5-11 11.5-13					9-13' Clay - Very Dark Gray Dense organ clay, lagoonal deposits	▼		
15										
20										
Remarks										

Appendix F
Sampling Methods and Deviations

Site Inspection Report
Kekaha Sugar Company, LTD
Kekaha, Kauai, Hawaii
Appendix F
Deviations From SAP

EPA ID No.: HID000875203

December 21, 2004

Prepared for:

U.S. Environmental Protection Agency
Region IX

Prepared by:

The Environmental Company, Inc for
State of Hawaii Department of Health,
Hazard Evaluation and Emergency Response Office

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SECTION 1

INTRODUCTION

1.1 SAMPLING

The sampling dates for this field effort were July 14 through July 16, 2003 (soil, sediments and surface water) and August 5, 2003 (groundwater and surface water). Figure 1 depicts sampling locations that were within KCSM area. Figure 2 depicts sampling locations associated with AOCs located outside the central Mill proximity. Soil samples were designated as composite or distinct depending on the sampling location. Some sampling locations were moved or adjusted depending on the difficulty encountered during actual sampling.

This section describes the methods and procedures that were used to collect samples. All samples were handled in accordance with approved Quality Analytical Program Plan (QAPP) procedures and the chain-of-custody guidelines and transferred into pre-cleaned containers. The containers were labeled custody sealed, and placed in coolers for transport to the laboratory. Samples were collected in containers and. Samplers donned disposable Tyvek™, latex gloves, safety shoes, booties, and respirator, as needed at each sampling location. Appendix A provides the Chain of Custody/Traffic Reports for this project. Appendix B provides the EPA Region 9 Laboratory Analytical Reports for Volatile Organic Compounds.

1.1.1 SURFACE SOIL SAMPLING

Soil sampling was conducted in accordance with the Sample and Analyses Plan (SAP), with the exception of the following variances:

1. Surface soil sample (SS24) was abandoned due to extreme difficulty encountered during concrete coring; and
2. Surface soil sample (SS30) was relocated to the east of the former Bagasse house, as the ground at the former Bagasse house is highly compacted and was difficult to dig.

A total of 35 surface soil samples were collected for analysis, including four duplicate samples (SS04, SS11, SS21, and SS33). Of these samples, two triple volume soil samples were collected and identified for use as laboratory QC samples for Matrix Spike/Matrix Spike Duplicate MS/MSD analysis (SS08 and SS32).

1.1.1.1 Surface Soil Analytical Protocol

The following laboratories analyzed the soil samples by the following methods:

- sixteen surface soil samples were analyzed for CLPAS VOCs by EPA Region 9 laboratory;
- twenty-five surface soil samples were analyzed for CLPAS SVOCs by Liberty Analytical Corporation;
- twenty surface soil samples were analyzed for CLPAS pesticides/PCBs by Liberty Analytical Corporation; and
- thirty-three surface soil samples were analyzed for CLPAS metals by Chemtech Consulting Group, Inc.

The EPA contracted a Regional Analytical Program (RAP) laboratory to conduct the following RAP analyses:

- twenty-two surface soil samples were analyzed for RAP chlorinated herbicides by EPA Method 8151 by Liberty Analytical Corporation.

The DOH held the dioxin samples frozen until a certified laboratory was available:

- ten surface soil samples were analyzed for RAP dioxins/furans by EPA Method 8290 by SGS Environmental Services.

1.1.1.2 Surface Soil Sampling Procedures

Samples were collected in the proposed locations described in Section 3.0 of the SAP for the project, with few exceptions. Deviations from the proposed locations or rejected collection locations were noted in the field logbook, as well as in the location descriptions above.

Deviations from the SAP included the rejection of efforts to collect discrete samples in two locations during surface soil sampling (necessitating the substitution of composite samples in those locations), collection refusal from the machine shop area due to concrete thickness and dry conditions preventing the collection of a surface water sample from the proposed SW2 (site adjacent) location. Also, proposed locations of sample numbers SED 18 and SED19 (sediment sample and duplicate) and co-located surface water sample SW6 were moved to the west in order to obtain data at the outer boundaries of the site. Sample SS30 was moved from inside the Bagasse House to a location outside and directly adjacent to the building to facilitate sampling.

Soil sample locations were entered into the logbook as sampling was completed. Surface soil samples from KSCM were collected as discrete and composite samples depending on the locations, at a depth of 6-inch bgs. Samples collected at the Former Herbicide Mixing Area were collected at 10-inches bgs (beneath the new topsoil) in Juacas sand. Compositing surface soil samples were collected using dedicated disposable spatulas. Soil samples to be analyzed for CLPAS pesticides/PCB, CLPAS metals, RAP dioxins/furans, and CLPAS SVOCs were placed in a sample-dedicated disposable pail and homogenized with a dedicated sampling spoon. The pail was composed of inert materials so as not to introduce any bias to sample results. Material in the pail was transferred with the dedicated spoon from the pail to the appropriate sample containers. Sample containers were 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. Sample containers were closed as soon as they were filled, chilled to 4°C where appropriate, and processed for shipment to the laboratory. Sample aliquots for RAPS dioxins/furans were frozen and remained frozen during transit to the analytical laboratory. Samples collected for CLPAS, VOCs and RAP TPH-G were not composited as the process drives off volatile compounds. Aliquots for each analysis were collected directly into dedicated Encore samplers per location, capped and placed in a single dedicated labeled Encore bag per sample and immediately frozen using Dry Ice or similar, and then processed for shipment to the laboratory.

1.1.2 SUBSURFACE SOIL SAMPLING

The proposed monitoring well within KSCM could not be installed because the permit to drill was not provided by the owner; therefore, no subsurface soil borings were collected at this proposed location. Geologic Bore logs are provided in Appendix C.

Three subsurface soil samples, two from soil boring location KSM-MW1 and one from soil boring location KSM-MW2 were collected. Sample depths were based on field observations, including PID headspace readings. The subsurface soil samples from SB01 were collected in the northeastern section of

the site, north of the Settling Ponds. This location is up gradient of the potentially contaminated portions of the site and was the location of the background subsurface sample and background well.

The second boring/monitoring well (SB02/KSM-MW2) was installed along Kekaha Road across the Former Factory office. This location is down gradient from KSM-MW1 and was designed to characterize the groundwater quality in the area. The last of the three proposed monitoring wells within the KSM did not materialize as no permit was granted to install one at the site.

1.1.2.1 Subsurface Soil Analytical Protocol

A total of three subsurface soil samples were collected for analysis, including one duplicate (SB4). Of these samples, one triple volume soil sample was collected and identified for use as laboratory QC samples for MS/MSD analysis (SB1).

The following laboratories analyzed the soil samples by the following methods:

- three subsurface soil samples were analyzed for CLPAS VOCs by EPA Region 9 laboratory;
- three subsurface soil samples were analyzed for CLPAS SVOCs by Liberty Analytical Corporation; and
- three subsurface soil samples were analyzed for CLPAS pesticides/PCBs by Liberty Analytical Corporation; and
- three subsurface soil samples were analyzed for CLPAS metals by Chemtech Consulting Group, Inc.; and

The EPA contracted a RAP laboratory to conduct the following RAP analyses:

- three subsurface soil samples were analyzed for RAP chlorinated herbicides by EPA Method 8151 by Liberty Analytical Corporation.

1.1.2.2 Subsurface Soil Sampling Procedures

Exact soil sampling locations were determined in the field based on accessibility, visible signs of potential contamination (e.g. stained soils), and topographical features that indicated locations of hazardous substance disposal (e.g. depressions that seemed to indicate a historic excavation). Soil sample locations were recorded in the field logbook as sampling was completed. Subsurface soil samples were collected as discrete samples at the capillary fringe in the two monitoring wells that were installed. The location of the highest head space concentration was chosen for laboratory analysis in each soil boring. Subsurface soil samples were collected by boring to the desired depth interval using a Megaprobe™ drilling system and collecting samples using direct push technology.

Soil samples analyzed for CLPAS pesticides/PCB, CLPAS metals, RAP dioxins/furans, and CLPAS SVOCs were placed in a sample-dedicated disposable pail. The pail selected was composed of inert materials so as not to introduce any bias to sample results. Material in the pail was transferred with the dedicated spoon from the pail to the appropriate sample containers. Sample containers were 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. Sample containers were closed as soon as they are filled, chilled to 4°C if appropriate, and processed for shipment to the laboratory. Sample aliquots for RAPS dioxins/furans were frozen and remained frozen during transit to the analytical laboratory. Samples collected for CLPAS VOCs and RAP TPH-G were not composited as the process drives off volatile compounds. Aliquots for each analysis were collected directly into three dedicated Encore samplers per location, capped and placed in a single dedicated labeled Encore bag per sample and immediately frozen

using Dry Ice or similar, and then processed for shipment to the laboratory. The Megaprobe direct push system was decontaminated prior to collection of each sample from the boreholes, and split spoon samplers were decontaminated prior to each successive sample collection.

1.1.3 GROUNDWATER SAMPLING

Groundwater monitoring wells KSM-MW1 and KSM-MW2 were developed immediately following installation, and sampled approximately two weeks after installation. The subsurface soil and groundwater samples from SB01 and MW01 were collected in the northeastern section of the site, north of the Settling Ponds. This location is up gradient of the potentially contaminated portions of the site and was the location of the background subsurface sample and background well.

The second boring/monitoring well (SB02/KSM-MW2) was installed along Kekaha Road across the Former Factory office. This location is down gradient from KSM-MW1 and was designed to characterize the groundwater quality in the area. The last of the three proposed monitoring wells within the KSM did not materialize as no permit was granted to install one at the site. Well construction details are provided in Appendix C.

1.1.3.1 Groundwater Analytical Protocol

A total of three groundwater samples were collected for analysis, including one duplicate (GW4). One triple volume water sample collected at the following sample locations was identified for use as laboratory QC samples for MS/MSD analysis (GW1).

The following laboratory conducted the following CLPAS analyses:

- three groundwater samples were analyzed for CLPAS SVOC by Shealy Environmental Services;
- three groundwater samples were analyzed for CLPAS pesticides/PCBs by Shealy Environmental Services; and
- three groundwater samples were analyzed for CLPAS metals by Liberty Analytical Corporation.

The EPA contracted a RAP laboratory to conduct the following RAP analyses:

- three groundwater samples were analyzed for RAP chlorinated herbicides by Liberty Analytical Corporation.

3.3.3.2 Monitoring Well Installation

Two monitoring wells were installed as part of the Kekaha Sugar Mill environmental investigation. The first well, MW1, was located to monitor that groundwater not affected by past activities at the Kekaha Sugar Mill. The second well, MW2 was located down the hydraulic gradient from a former pesticide mixing area.

The boreholes for these wells were drilled using direct push technology. Because of its robust capabilities, the Megaprobe™ hydraulic drive point system was chosen to bore the holes required for these wells. This system can drive an assortment of sampling devices to fifty feet or deeper in many soil formations. A two-inch hole was bored for each well down to the capillary zone, then a split spoon sampler with one-inch stainless steel sleeves were used to extract samples from the borehole. The samples retrieved were screened based on proximity to the capillary zone (as indicated by an increase in moisture content), odor, and appearance to select the portion of the retrieved soil sample to be submitted for laboratory analysis.

In borehole SB1 (MW1) a sample was retrieved from a depth interval of 9.5 to 11.5 fbs. In borehole SB2 (MW2) a sample was retrieved from a depth interval of 3 to 5.5 fbs. These samples were analyzed for VOCs, SVOCs, chlorinated herbicides, pesticides, PCBs and metals. Approximately 5 grams of soil was extracted from the sleeves for VOC analysis using an Encore™ sampler. This sample was frozen using dry ice and shipped frozen to the analyzing laboratory. The samples for the remaining analysis were distributed among 8 oz. soil sample jars and placed in a cooler packed with ice.

Once the total depth of the borehole was reached, the well screen and casing were inserted into the borehole. Formation instability required that a two-inch temporary casing be inserted into the borehole to a depth approximately five-feet shallower than the total depth of the borehole. The hole was then re-punched to the desired total depth, and the drive point system was then removed. The well screen and casing, consisting of one-inch schedule 80 PVC, was inserted into the borehole. It required pressing down with the hydraulic ram to get the bottom of the screen to the desired depth. Due to the instability of the formation, no sand pack or bentonite was placed in the borehole around the well screen and casing. A sufficient length of screen was used in the well construction to ensure that the screen extended above the elevation of the groundwater level. The well was completed by excavating a hole about one-foot deep and one-foot in diameter around the well casing. The well casing was then cut to an elevation slightly below the ground surface. A flush mounted traffic box was installed around the well casing and secured to the ground surface with cement.

1.1.3.2 Monitoring Well Development

After the wells were installed and the mounting cement was sufficiently cured, the wells were developed to remove sediment in the well bore and to remove as much fine material as possible that was in the proximity of the well screen. The wells were developed by purging the wells with a peristaltic pump and disposable plastic tubing. During purging, pH, specific conductivity, and oxidation/reduction potential were monitored using a QED FC4000™ water quality analyzer. Water levels and total depth measurements were taken prior to and after well development using a steel tape measure and Kolor Kut™ water indicating paste. When developing MW2, the well screen was also surged with a metal rod with ¾ inch flat washers mounted on the end. The well was surged by pulling up sharply on the rod, then letting it fall again to the bottom of the well. The well was surged twice for about 5-minutes. A small obstruction in the well bore of MW1 prevented this well from being surged.

Water purged from these monitoring wells was very cloudy, of low to moderate electrical conductivity, and near neutral pH. The cloudiness of water extracted from MW1 was generally darker than that from MW2 reflecting the dark organic clays where the screened interval of MW1 was installed. The formation surrounding the screen for MW2 consisted of coral sand and silt and produced a light-gray cloudiness. Being further from the coast, the specific electrical conductivity of MW1 was about 500 microsiemens compared to a conductivity of 1200 microsiemens in the water extracted from MW2. The pH in both wells was near with neutral, with MW1 having a pH of 7.6 and MW2 having a pH of 7.2.

1.1.3.3 Groundwater Sampling

Wells MW1 and MW2 were sampled approximately two weeks after their installation. Immediately upon opening the wells, water level and total well depth measurements were taken. Prior to sampling, each well was purged to ensure the water submitted for analysis was representative of water in the formation. Water was purged from the wells until at least three well volumes had been removed from the wells and the water quality parameters had stabilized. Stabilization of water quality parameters was the limiting condition and thus the actual amount of water purged was significantly greater than three well volumes. The purge water was monitored for pH, electrical conductivity, temperature, and dissolved oxygen.

Purging and sampling was done with ¾ inch disposable bailers. Once purging was complete, a new bailer was used for sampling.

While sampling, the aliquots except those for metal analysis were decanted directly from the bailers to the sample containers. The aliquot collected for metals analysis was filtered through a 0.45 micron filter using a disposable syringe and disposable plastic tubing. The metals samples were also preserved with sufficient nitric acid to reduce the pH to less than 2. Samples collected were analyzed for VOCs, SVOCs, metals, pesticides and PCBs, and chlorinated herbicides. All samples were immediately placed in an ice filled cooler to reduce the sample temperature to 4° C.

1.1.4 SEDIMENT SAMPLING

Sediment sampling was conducted in accordance with the SAP, with the exception of the following variances:

1. SED18 and SED19 were collected further south of the NPDES ditch due to inaccessibility of the original sampling location; and
2. Sediment samples located at the Seed Dipping Tank (SED10, SED11, SED12, and SED13) were collected during the second round of sampling.

1.1.4.1 Sediment Analytical Protocol

A total of 19 sediment samples were collected for analysis, including two duplicate samples (SED3 and SED19). Of these samples, two triple volume sediment samples were collected and identified for use as laboratory QC samples for MS/MSD analysis (SED9 and SED14).

The following laboratories analyzed the sediment samples by the following methods:

- nine sediment samples were analyzed for CLPAS VOCs by EPA Region 9 laboratory;
- ten sediment samples were analyzed for CLPAS SVOCs by Liberty Analytical Corporation;
- sixteen sediment samples were analyzed for CLPAS pesticides/PCBs by Liberty Analytical Corporation; and
- nineteen sediment samples were analyzed for CLPAS metals Chemtech Consulting Group, Inc.

The EPA contracted a RAP laboratory to conduct the following RAP analyses:

- twelve sediment samples were analyzed for RAP chlorinated herbicides by EPA Method 8151 by Liberty Analytical Corporation.

The DOH held the dioxin samples frozen until a certified laboratory was available:

- four sediment samples were analyzed for RAP dioxins/furans by EPA Method 8290 by SGS Environmental Services.

1.1.4.2 Sediment Sampling

Samples were collected in the locations proposed in the SAP with the exception of SED18 and SED19, which were relocated to the western/southwestern boundaries of the site in the NPDES ditch. As described in Section 4.0, the sampling locations were within drain culverts, interior drainage channels, and in Kinekine Ditch and NPDES Ditch.

Sediment samples were collected from a depth of 0 to 1 foot below the surface using dedicated disposable sampling spatulas. This depth interval was chosen because it is suspected that there was roughly 1 foot or

less of sediment accumulated at the sampling locations, and a significant amount of sediment is needed to fill several sample containers per location. For each sub-sample, the material in the spatula (from the 0-1 foot bgs depth interval) was transferred directly into a wide-mouth sampling jar for portions to be analyzed by CLPAS Metals, CLPAS Pesticides/PCBs, and CLPAS SVOCs. Aliquots for RAP chlorinated herbicides; RAP dioxins/furans; and RAP TPH-D, and oil were placed in separate 4-ounce wide mouth jars to be sent to their individual laboratories. The aliquots for RAP dioxins/furans were frozen and remained frozen while in transit to the laboratory. Sample portions to be analyzed for CLPAS VOCs and TPH-G were placed directly from the sampling spatula into the Encore samplers and treated as described above for soil Encore sampling. Sample containers were filled to the top and measures were taken to prevent sediment from remaining in the lid grooves prior to being sealed, in order to prevent potential contamination migration to or from the sample containers. Sample containers were then chilled where appropriate and processed for shipment to the laboratory.

1.1.5 SURFACE WATER SAMPLING PROGRAM

Surface water samples were collected according to the SAP except for the following modifications:

1. SW2 located at the Kinekine ditch behind the main office was not available during the sampling event; and
2. SW6 was collected further south of the NPDES ditch due to inaccessibility of the original sampling location.

1.1.5.1 Surface Water Analytical Protocol

A total of five surface water samples were collected for analysis, including one duplicate (SW4). Of these samples, two triple volume surface water samples were collected and identified for use as laboratory QC samples for MS/MSD analysis (SW1 and SW6).

The following laboratories analyzed the soil samples by the following methods:

- five surface water samples were analyzed for CLPAS pesticides/PCBs by Shealy Environmental Services; and
- five surface water samples were analyzed for CLPAS metals by Liberty Analytical Corporation.

The EPA contracted a RAP laboratory to conduct the following RAP analyses:

- five surface water samples were analyzed for RAP chlorinated herbicides by EPA Method 8151 by Liberty Analytical Corporation.

1.1.5.2 Surface Water Sampling Procedures

Surface water samples were co-located with sediment samples in the Kinekine and NPDES Ditches. Surface water samples were collected at the furthest downstream location first, and then collected successively upstream to reduce the potential of downstream interference from sampling procedures. Surface water samples were collected prior to sediment samples in each location to limit addition of sediment particles in the water due to sediment sampling procedures. Surface water samples were collected using laboratory-certified clean sample containers. One 1-liter amber container (sampler) was used to collect sample aliquots for all other sample containers and sample water was poured from the sampler into each of the other containers. Once all other containers were filled, the sampler was filled, sealed, labeled and stored in a chilled container as an aliquot of the sample. Sample aliquots for metals were filtered using a hand pump-operated field filter system with dedicated disposable reservoirs and filters. Filters were high-volume (600 cm²) and are designed to filter up to 0.45 micron-sized particles.

1.1.6 EQUIPMENT RINSATE BLANK SAMPLING PROGRAM

Samples were collected with dedicated disposable sampling equipment to ensure no cross-contamination occurs between samples. These included both sampling spoons and compositing bowls, as well as dedicated disposable groundwater sampling bailers. A single Equipment Rinsate Blank (ER-1) was collected from representative sampling items by placing these items in the bowl and pouring de-ionized (DI) water over them, then transferring the DI water to the appropriate sampling containers. The Equipment Rinsate Blank was analyzed using CLPAS pesticides/PCB, CLPAS Metals, CLPAS VOCs, CLPAS SVOCs, RAP Method 8151 for chlorinated herbicides and RAP Method 8015 modified for diesel, gasoline and oil. A single Equipment Rinsate Blank was analyzed for the four day field sampling effort.

1.2 DECONTAMINATION PROCEDURES

Decontamination procedures were followed in accordance with approved QAPP procedures. Decontamination of sampling equipment was conducted consistently, as to assure the quality of samples collected. All equipment that came into contact with potentially contaminated soil, sediment or water was decontaminated. Disposable equipment intended for one-time use was not decontaminated but was packaged for appropriate disposal. Decontamination occurred prior to and after each use of a piece of equipment. All sampling devices used, including trowels and augers, were decontaminated according to EPA Region IX recommended procedures.

The following, carried out in sequence, is the EPA Region IX recommended procedure for decontamination of sampling equipment:

- non-phosphate detergent and tap water wash, using a brush, if necessary;
- tap-water rinse;
- HNO₃ rinse;
- de-ionized/distilled water rinse;
- pesticide-grade solvent (reagent grade hexane) rinse in a decontamination bucket;
- de-ionized/distilled water rinse (twice); and
- organic-free water rinse (HPLC) grade.

Equipment was decontaminated in a pre-designated area on pallets or plastic sheeting, and clean bulky equipment was stored on plastic sheeting in uncontaminated areas. Cleaned small equipment was stored in plastic bags. Materials stored more than a few hours were covered to ensure that contamination was not introduced.

1.3 DISPOSAL OF RESIDUAL MATERIALS

In the process of collecting soil samples at the KSCM site during the SI, the DOH site team generated different types of potentially contaminated investigated-derived waste (IDW) that includes the following:

- used personal protective equipment (PPE);
- disposable sampling equipment; and
- decontamination fluids.

The EPA's National Contingency Plan (NCP) requires that management of IDW generated during SIs comply with all applicable or relevant and appropriate requirements (ARARs) to the extent practicable. The sampling plan followed the Office of Emergency and Remedial Response (OERR) Directive 9345.3

02 (May 1991) that provides the guidance for the management of IDW during SIs. In addition, other legal and practical considerations that may affect the handling of IDW were considered.

Listed below are the procedures that were followed for handling the IDW. These procedures are based on the low levels of contamination anticipated at the site from data gathered during previous investigations. The procedures had enough flexibility to allow the site investigation team to use its professional judgment on the proper method for the disposal of each type of IDW generated at each sampling location.

Used PPE and disposable sampling equipment was double bagged, labeled as waste and placed in a municipal refuse dumpster on site. The wastes were not considered hazardous and could be sent to a municipal landfill. PPE and disposable equipment that was reusable was rendered inoperable before disposal in the refuse dumpster.

Decontamination fluids that were generated during the course of the SI consisted of dilute HNO₃, HPLC or de-ionized water, residual contaminants, and water with non phosphate detergent. The HNO₃ was diluted and/or neutralized with sodium hydroxide. The HNO₃ and water (including water with detergent) was of sufficiently low volume to allow disposal at the site. In addition, previous investigation results indicate that hazardous constituents, if any, were present at low concentrations. The small amounts of water generated were poured onto the ground or into a nearby storm drain. As direct push methods were used for soil borings, there were no cuttings or residual soils generated during these activities.

Groundwater generated during purging and well development was in the range of two to three gallons per well and was not considered hazardous. Professional judgment dictated that the water could be poured onto the ground nearby.

1.4 SAMPLE DOCUMENTATION AND SHIPMENT

1.4.1 FIELD LOGBOOKS

The field logbook documented all vital project information obtained in the field. Logbook entries were completed and accurate enough to permit reconstruction of field activities. A separate logbook was maintained for each project. Logbooks for the project were bound, with consecutively numbered pages. Each page was dated and the time of entry noted in military time. All entries were written in black ink and signed by the individual making the entries. Language attempted to be factual, objective, and free of personal opinions or other terminology that might prove inappropriate.

The following information was recorded during the collection of each sample where possible:

- sample location and description;
- site sketch showing sample location and measured distances;
- sampler's name(s);
- date and time of sample collection;
- designation of sample as composite or discrete;
- type of sample (i.e., matrix);
- type of sampling equipment used;
- on-site measurement data (e.g., temperature, pH, conductivity, etc.);
- field observations and details important to analysis or integrity of samples (e.g., heavy rains, odors, colors, etc.);

- preliminary sample descriptions (e.g., for soils, clay loam, very wet, etc. and for groundwater, clear water with strong ammonia like odor, etc.);
- type(s) of preservation used;
- instrument readings (e.g., Organic Vapor Monitor (OVM), HNU, etc.);
- lot numbers of the sample containers, sample tag numbers, chain-of-custody form numbers, and chain-of-custody seal numbers;
- shipping arrangements (overnight air bill number); and
- recipient laboratories.

In addition to the sampling information, the following specifics were also recorded in the field logbook for each day of sampling where possible:

- team members and their responsibilities;
- time of site arrival/entry on site and time of site departure;
- other personnel on site;
- a summary of any meetings or discussions with any potentially responsible parties (PRPs), representatives of PRPs, or federal, state, or other regulatory agencies;
- changes in personnel and responsibilities as well as reasons for the changes;
- deviations from sampling plans, site safety plans, and QAPP procedures;
- levels of safety protection; and
- calibration readings for any equipment used and equipment model and serial number.

1.5 BOTTLES, CONTAINERS AND PRESERVATIVES

The number of sample containers, volumes, and materials are listed in Section 4.0, Request for Analyses tables. The containers are pre-cleaned and were not rinsed prior to sample collection. Containers for samples were ordered with pre-measured amounts of preservatives directly from the analytical laboratory, therefore no preservatives were added in the field. All non-VOC aliquots were chilled to 4 °C immediately after collection. VOC soil and sediment samples were immediately frozen using dry ice and remained frozen until they reach the analytical laboratory.

1.5.1 SOIL SAMPLE CONTAINERS

CLPAS Pesticides/PCBs, CLPAS SVOCs, and CLPAS Metals. Discrete samples were placed directly in 4-ounce, wide-mouth jars using dedicated disposable spoons. Composite samples consisted of a predetermined set of discrete sub-samples that was combined and homogenized in a sample-dedicated container, then transferred into 4 ounce, wide mouth glass jars using the dedicated disposable sampling spoon. For each sample, one 4-ounce glass jar was collected for the CLPAS laboratory. The samples were chilled to 4 °C immediately upon collection.

CLPAS VOC. Discrete soil samples were collected using Encore samplers. The samples were collected in accordance with EPA Method 5035, using an Encore sampling device. The Encore sampler was driven into the soil and immediately capped. The Encore samples were stored overnight at 0 °C and transported the following day via an overnight carrier for arrival at the laboratory within 48 hours of sample collection. The samples were stored at 0 °C at all times to ensure that they arrived at the required temperature. The laboratory was required to maintain these sample aliquots at 0 °C until analyzed, which

must have occurred within seven days of sample collection. Soil samples for moisture determination were collected in a 4-oz jar from each soil sample location.

RAP Chlorinated Herbicides. Discrete samples were placed directly in 4-ounce, wide-mouth jars using dedicated, disposable spoons. Composite samples consisted of a predetermined set of discrete sub-samples that were combined and homogenized in a sample-dedicated container, then transferred into 4-ounce, wide-mouth glass jars, using the dedicated trowel or disposable sampling spoon. For each sample, one 4-ounce glass jar was collected for laboratory analyses.

RAP Dioxins/Furans. Discrete samples were placed directly into 4-ounce, wide-mouth jars using dedicated disposable spoons. Composite samples consisted of a predetermined set of discrete sub-samples that were combined and homogenized in a sample-dedicated container, then transferred into 4 ounce, wide mouth glass jars using the dedicated disposable sampling spoon. For each sample, one 4-ounce glass jar was collected for laboratory. The samples were frozen and remained frozen until an EPA contracted laboratory is available to analyze these samples (up to six months).

RAP TPH-D and TPH-oil. Discrete samples were placed directly in 4-ounce, wide-mouth jars using dedicated disposable spoons. Composite samples consisted of a predetermined set of discrete sub-samples, combined and homogenized in a sample-dedicated container, then transferred into 4 ounce, wide mouth glass jars using the dedicated disposable sampling spoon. For each sample, one 4-ounce glass jar was collected for the RAP laboratory. The samples were chilled to 4 °C immediately upon collection.

RAP TPH-G. Discrete soil samples were collected using Encore samplers. The samples were collected in accordance with EPA Method 5035, using an Encore sampling device. The Encore sampler was driven into the soil and immediately capped. The Encore samples were stored overnight at 0 °C and transported the following day via an overnight carrier for arrival at the laboratory within 48 hours of sample collection. The samples were stored at 0 °C at all times to ensure that they arrived at the required temperature. The laboratory was required to maintain these sample aliquots at 0 °C until analyzed, which must have occurred within seven days of sample collection. Soil samples for moisture determination were collected in a 4-oz jar from each soil sample location.

1.5.2 SEDIMENT SAMPLES

CLPAS Pesticides/PCBs, CLPAS SVOCs, and CLPAS Metals. Discrete samples were placed directly in 4-ounce, wide-mouth jars using dedicated disposable spoons. Composite samples consisted of a predetermined set of discrete sub-samples that were combined and homogenized in a sample-dedicated container, then transferred into 4 ounce, wide mouth glass jars using the dedicated disposable sampling spoon. For each sample, one 4-ounce glass jar was collected for the CLPAS laboratory. The samples were chilled to 4 °C immediately upon collection.

CLPAS VOC. Discrete soil samples were collected using Encore samplers. The samples were collected in accordance with EPA Method 5035, using an Encore sampling device. The Encore sampler was driven into the soil and immediately capped. The Encore samples were stored overnight at 0 °C and transported the following day via an overnight carrier for arrival at the laboratory within 48 hours of sample collection. The samples were stored at 0 °C at all times to ensure that they arrived at the required temperature. The CLPAS laboratory was required to maintain these sample aliquots at 0 °C until analyzed, which must have occurred within seven days of sample collection. Soil samples for moisture determination were collected in a 4-oz jar from each soil sample location.

RAP Chlorinated Herbicide. Discrete samples were placed directly in 4-ounce, wide-mouth jars using dedicated disposable spoons. Composite samples consisted of a predetermined set of discrete sub-

samples that were combined and homogenized in a sample-dedicated container, then transferred into 4 ounce, wide mouth glass jars using the dedicated disposable sampling spoon. For each sample, one 4-ounce glass jar was collected for the CLPAS laboratory.

RAP Dioxins/Furans. Discrete samples were placed directly in 4-ounce, wide-mouth jars using dedicated disposable spoons. Composite samples consisted of a predetermined set of discrete sub-samples that were combined and homogenized in a sample-dedicated container, then transferred into 4 ounce, wide mouth glass jars using the dedicated disposable sampling spoon. For each sample, one 4-ounce glass jar was collected for the laboratory. The samples were frozen and remained frozen until an EPA contracted laboratory is available to analyze these samples (up to six months).

RAP TPH-D and TPH-oil. Discrete samples were placed directly in 4-ounce, wide-mouth jars using dedicated disposable spoons. Composite samples consisted of a predetermined set of discrete sub-samples that were combined and homogenized in a sample-dedicated container, then transferred into 4 ounce, wide mouth glass jars using the dedicated disposable sampling spoon. For each sample, one 4-ounce glass jar was collected for the RAP laboratory. The samples were chilled to 4 °C immediately upon collection.

RAP TPH-G. Discrete soil samples were collected using Encore samplers. The samples were collected in accordance with EPA Method 5035, using Encore sampling devices. Encore samplers were driven into the soil and immediately capped. The Encore samples were stored overnight at 0 °C and transported the following day via an overnight carrier for arrival at the laboratory within 48 hours of sample collection. The samples were stored at 0 °C at all times to ensure that they arrived at the required temperature. The CLPAS laboratory was required to maintain these sample aliquots at 0 °C until analyzed, which must have occurred within seven days of sample collection. Soil samples for moisture determination were collected in a 4-oz jar from each soil sample location.

1.5.3 SURFACE WATER, GROUNDWATER AND EQUIPMENT RINSATE BLANK SAMPLES

CLPAS Pesticides/PCBs, CLPAS SVOCs, RAP Chlorinated Herbicides by EPA Method 8151 Modified; and TPH- D and TPH-oil: Low concentration water samples were collected in 1-liter amber glass bottles. No preservative is required for these analyses. These sample containers were chilled to 4°C immediately upon collection. Table 4-3 describes the number and types of sample containers required for each analysis.

CLPAS VOCs, RAP TPH-G by EPA Method 8015 Modified: Low concentration water samples analyzed for CLPAS VOCs and RAP TPH-G were collected in three 40 milliliter (mL) glass vials per analysis with pre-measured amounts of hydrochloric acid (HCl), measured in the laboratory to ensure that the sample pH was less than 2. The pH of each aliquot was not measured in the field, nor was HCl added in the field. Vials were filled so that no headspace occurred. The samples were chilled to 4°C immediately upon collection.

CLPAS Metals: Low concentration water samples were collected for total metals analysis in 500 ml polyethylene bottles with pre-measured amounts of nitric acid (HNO₃) in each container, measured in the laboratory to ensure that the sample pH was less than 2. The pH of each aliquot was not measured in the field, nor was HNO₃ added in the field. The samples were chilled to 4°C immediately upon collection. One bottle of each water sample was required for the CLPAS laboratory.

1.5.4 SAMPLE TRAFFIC REPORT AND CHAIN-OF-CUSTODY RECORDS, RAP PACKING LISTS, AND QA/QC SUMMARY FORMS

Organic and inorganic traffic reports, chain-of-custody records, and RAP packing lists are used to document sample collection and shipment to the laboratory for analysis. A traffic report and chain-of-custody record accompanied all sample shipments for CLPAS analyses. All sample shipments for RAP analyses were also accompanied by a packing list. Form(s) were completed and sent with the samples for each laboratory and each shipment (i.e., each day). When multiple coolers were sent to a single laboratory on a single day, a form or forms was/were completed and sent with the samples for each cooler.

The traffic report and chain-of-custody record or RAP packing list identified the contents of each shipment and maintained the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is can be accessed only by authorized personnel. Until the samples were shipped, the custody of the samples was the responsibility of DOH. The site leader or designee signed the traffic reports and chain-of-custody records or RAP packing lists. The site leader or designee signed the "relinquished by" box and noted date, time, and air bill number.

For samples submitted for CLPAS inorganic analysis, the traffic report and chain-of-custody record was disbursed in the following manner: the green (original) copy was returned to the EPA Region IX Quality Assurance Office (QAO), the pink (second) copy was sent to the Contact Laboratory Analytical Services Support (CLASS) office, and the white (third) and yellow (fourth) copies accompanied the samples to the laboratory. A copy of the original was made for the DOH master files.

For samples submitted for CLPAS organic analyses, the traffic report and chain-of-custody record was disbursed in the following manner: the blue (original) copy was returned to the EPA Region IX QAO, the pink (second) copy was sent to the CLASS, and the white (third) and yellow (fourth) copies accompanied the samples to the laboratory. A copy of the original was made for the DOH master files.

For samples submitted for RAP analyses, the white (original) copy of the RAP packing list was sent to the EPA Region IX Laboratory, and the pink (second) copy went to the Regional Sample Control Coordinator at the QAO. A copy of the original was made for the DOH master files.

A Quality Assurance/Quality Control (QA/QC) summary form was completed for each laboratory and each matrix of the sampling event. The sample numbers for all rinsate samples, reference samples, laboratory QC samples, and duplicates was documented on this form. The original form was sent to QAO and a photocopy was made for the DOH master files. This form was not sent to the laboratory.

A self-adhesive custody seal was placed across the lid of each sample. For VOC samples, the seal was wrapped around the cap. The shipping containers in which samples were stored (sturdy picnic coolers or ice chests) were sealed with self-adhesive custody seals any time they were not in someone's possession or view before shipping. All custody seals were signed and dated.

The CLP Paperwork Instructions to the guidelines on Preparation of a U.S. EPA Region IX Sample Plan for EPA Lead Superfund Projects, was taken to the field as a reference. Corrections on sample paperwork were made by placing a single line through the mistake and initialing and dating the change. The correct information was entered above, below, or after the mistake.

1.6 PHOTOGRAPHS

Photographs were taken at each sample location and at other areas of interest on site. They serve to verify information entered in the field logbook. When a photograph was taken, the following information was written in the logbook or was recorded in a separate field photography log:

- time, date, location, and, if appropriate, weather conditions;
- description of the subject photographed; and
- name of person taking the photograph.

1.7 LABELING, PACKAGING, AND SHIPMENT

All samples collected were labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. The CLP samples had pre-assigned, identifiable, and unique numbers. At a minimum, the sample labels contained the following information: CLP Case or RAP Number, station location, date and time of collection, analytical parameter(s), method of preservation and expected concentration of samples (medium conc. ≥ 10 mg/kg). Every sample, including samples collected from a single location but going to separate laboratories, was assigned a unique sample number.

- All sample containers were placed in a strong shipping container (a steel-belted cooler). The following outlines the packaging procedures that were followed for low concentration samples.
- When ice was used, the drain plug of the cooler was secured with fiberglass tape to prevent melting ice from leaking out of the cooler.
- The bottom of the cooler was lined with bubble wrap to prevent breakage during shipment.
- Screw caps were checked for tightness and, if not full, the sample volume level of liquid samples was marked on the outside of their sample bottles with indelible ink.
- Bottle/container tops were secured with clear tape and custody seal all container tops.
- Sample labels were affixed onto the containers with clear tape.
- All glass sample containers were wrapped in bubble wrap to prevent breakage.
- All sample containers were sealed in heavy-duty plastic bags. Sample numbers were written on the outside of the plastic bags with indelible ink.

All samples were placed in coolers with the appropriate traffic report and chain of custody forms or RAP packing list. All forms were enclosed in a Ziploc bag and affixed to the underside of the cooler lid. Empty space in the cooler was filled with bubble wrap or Styrofoam peanuts to prevent movement and breakage during shipment. Ice used to cool samples was double sealed in two zip lock plastic bags and placed on top and around the samples to chill them to the correct temperature. Each ice chest was securely taped shut with nylon strapping tape and custody seals were affixed to the front, right, and back of each cooler.

All samples for CLP VOC analysis were shipped overnight to EPA Region IX Laboratory via FedEx, before 4:00 pm no later than the day after sampling occurred, and all arrived the following day (by overnight shipping). The EPA Region IX Regional Sample Control Center (RSCC) was notified daily (phone 415 972 3814) of the sample shipment schedule

1.8 QUALITY CONTROL

1.8.1 EQUIPMENT RINSATE BLANKS

Equipment rinsate blanks are typically prepared to evaluate field sampling and decontamination procedures. All soil sampling equipment, including sampling sleeves used during soil sampling, were disposable and dedicated to one-time use. Because sampling equipment was disposable and dedicated to one-time use, the equipment rinsate blanks were used to confirm the cleanliness of the sampling equipment used in this field effort. One equipment rinsate blank was collected for each matrix for the field effort.

The rinsate blank was preserved, packaged, and sealed as appropriate for water samples. A separate CLP sample number and station number was assigned to each blank, and it was submitted blind to the laboratory. By "blind" it is meant that the laboratory will know neither the identity of the sample, nor its purpose, and the laboratory will treat it as a routine sample.

1.8.2 BACKGROUND (REFERENCE) SAMPLES

The background (reference) samples were collected in areas that were unlikely to have received contaminants. Background samples were intended to be representative of conditions that existed in the site vicinity before sugarcane operations occurred. Background samples were collected in similar geological strata to the other sample locations and at similar depths.

Background soil samples were collected from sample locations SL32 (SS32), SL33 (SS33), SL34 (SS34) and SL35 (SS35). However, because of the system employed to re-circulate mill water to upgradient locations in the ditch system, all sediment and surface water sampling locations sampled may have been under the influence of site activities. Similarly, the upgradient groundwater sample location (MW1) may be under the influence of compounds leaching from the settling ponds, as indicated by elevated metals concentrations. Reference samples for sediments were determined to be those samples that did not appear to be impacted by site activities. For dioxins, sediment reference samples were SL38 (SED3), SL39 (SED4), and SL48 (SED13). Reference groundwater samples were chosen to be the one with lower concentrations for metals, MW2. Although this location is downgradient, it does not reflect elevated metals that may be influenced by the settling ponds.

Background samples were preserved, packaged, and sealed in the same manner as other samples of the same matrix. A separate CLP sample number and station number were assigned to each background sample, and each was submitted blind to the laboratory.

1.8.3 DUPLICATE SAMPLES

Duplicate samples are collected simultaneously with a standard sample from the same source under identical conditions and placed into separate sample containers. A duplicate sample is treated independently of its counterpart in order to assess laboratory performance through comparison of the results. At least 10 percent of samples collected per event were duplicates. At least one duplicate was collected for each sample matrix. Every analytical group for which a standard sample was analyzed was tested for in one or more duplicate samples. Duplicate samples were collected from areas of known or suspected contamination.

Duplicate soil samples were collected at sample locations SL5 (samples SS04(D) and SS05), SL10 (samples SS10 and SS11 (D)), SL20 (samples SS20 and SS21 (D)), and SL34 (samples SS33 (D) and SS34). Duplicate sediment samples were collected from sediment sample locations SL39 (samples SED3 (D) and SED4), SL53 (samples SED18 and SED19 (D)). One duplicate sample was collected from

surface water sampling location SL57 (samples SW3 and SW4 (D)). One duplicate sample was collected from groundwater sampling location SL63 (samples GW3 and GW4 (D)) and one duplicate subsurface sample was collected from SL68 (samples SB2 and SB4 (D), both at MW2). These duplicate samples were collected from these locations based on information from previous studies that they were potential candidates for moderate concentrations of COPCs. Duplicate samples were collected like ordinary composite samples and shipped as separate samples.

1.8.4 LABORATORY CONTROL

Laboratory QC samples are analyzed by the EPA contract as part of the CLP standard laboratory QC protocols. The laboratory monitors the precision and accuracy of the results of their analytical procedures through analysis of QC samples. In part, laboratory QC samples consist of MS/MSD samples. The term "matrix" refers to use of the actual media collected in the field (i.e., routine soil and water samples). Laboratory QC samples are an aliquot (subset) of the field sample. They are not a separate sample but a special designation of an existing sample. A routinely collected soil sample (a full 8 oz. sample jar) contains sufficient volume for both routine sample analysis and additional laboratory QC analyses. Therefore a separate soil sample for laboratory QC purposes was not collected.

For laboratory QC purposes, soil and sediment samples for volatile organic compound (VOC) analyses were obtained by collecting double the number of equivalent VOA and EnCore samples from a collocated location in the same way as the original samples, assigned a unique sample numbers and sent blind to the laboratory.

At a minimum, one laboratory QC sample is required per 14 days or one per 20 samples (including blanks and duplicates) whichever is greater. If a sampling event lasts longer than 14 days or involves collection of more than 20 samples per matrix, additional QC samples are designated. For this sampling event, samples collected at the following locations were the designated laboratory QC samples:

- For surface soil, the QC sample locations are SL8 (SS08) and SL32 (SS32);
- For sediment, the QC sample location is SL44 (SED9) and SL49 (SED14);
- For surface water, the QC sample locations are SL55 (SW1) and SL60 (SW6);
- For subsurface soil, the QC sample location is SL65 (SB1); and
- For groundwater, the QC sample location is SL61 (GW1).

These sample locations were chosen as the QA/QC sample location because they were in the vicinity of similar matrices but not likely to be heavily impacted, thus masking the laboratory spiked analytes.

1.8.5 TEMPERATURE BLANKS

One temperature blank consisting of a 40-mL glass vial of distilled water was included in each cooler shipped to the analytical laboratory. The purpose of the temperature blank was to allow the analytical laboratory to obtain a representative measurement of the temperature of samples enclosed in a cooler without disturbing the actual samples. The field team packaged and labeled the temperature blank like a regular water sample; however, the analytical laboratory only measured the temperature of the blank. The temperature blank was not analyzed for hazardous substances.

1.9 FIELD VARIANCE

As conditions in the field varied, it became necessary to implement minor modifications to sampling, as presented in this plan. When required, QAO was notified of the modifications and a verbal approval was

obtained before implementing the modifications. Modifications to the approved plan are also listed in section 5.0 above.

1.10 DATA REVIEW

The EPA Region IX QAO conducted the analytical data validation in accordance with the EPA CLP National Functional Guidelines (U.S. EPA 1988 and U.S. EPA 1991) or their equivalent once the samples had been analyzed by CLP or RAP laboratory.

The CLP data validation procedure consisted of determining whether the results of the laboratory QC procedures meet CLP acceptance criteria and whether the data contains any bias. For this site, the DOH requested that EPA provide Level 2 validations using the Computer Aided Data Review and Validation (CADRE) procedures. CADRE usually screens results to identify problems or outliers that merit closer investigation. Depending on the type of problems seen and the impact on data quality and decision-making, DOH may or may not request that full validation (Level 3) be performed on 10 percent to 100 percent of the data. Where CADRE detects no problems, further validation might not be necessary. The DOH has contacted the QAO to discuss and agree upon which data (if any) required full validation.

Data that is unusable or only usable under certain circumstances was assigned a qualifier (e.g., "R" or "J", respectively) by QAO before the validated package was sent to DOH. It was understood that if the QAO is unable to perform validation procedures on the analytical data for this site, the DOH would contract with an outside vendor to complete the validation. DOH has a list of vendors currently used by the QAO; therefore, these vendors have proven proficiency in performing data validation. Typical validation checks include instrument calibration, blanks, duplicates, matrix spikes and matrix spike duplicates, surrogates, holding times, detection and quantization limits, and target compound identification. It was understood that the QAO and contractor would R-qualify data if significant performance requirements were not met during sample collection and analysis. The QAO and contractor assign a "J" qualifier to sampling data when uncertainty, in the form of bias, was introduced into the analysis.

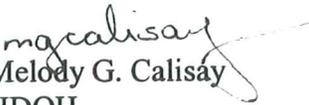
The QAO's evaluation was provided to the DOH. The DOH determines whether or not the data is acceptable given its intended purpose, comparing the results and comments from validation to the criteria established in Table 4.1 (i.e., to determine whether a release of hazardous substances had occurred). Unqualified results indicate that adequate QC was maintained during all sampling and analytical activities, and may be used without further inquiry. If any data was R-qualified, DOH consulted with the data validator to determine data usability. J-qualified data may be used to establish a release of hazardous substances or observed contamination based on the quality of the data and quantity detected.

Appendix I
Site Reconnaissance Report
Kekaha Sugar Co. Ltd
June 4, 2003

ERRATA for the Site Reconnaissance Interview and Observation Report:

1. Item # 1. Settling Pond = There was approximately 8-10 acres of land used for settling pond. The statement should be "There was approximately 10 acres of land used for settling pond.
2. Item #3. Former Kekaha Herbicide Mixing Area. The statement " Since soil sampling and removal of contaminated soil in these areas was previously conducted by Brewer Environmental as part of their Phase II Site Investigation in February 2000, soil samples will be used to verify that contamination no longer exists in the area. Portion of the Kinekine ditch passes north-west of the former herbicide mixing area and was believed to have been used as a waste disposal for the mixing plant. It was assumed that the area was contaminated with dioxin and will be treated accordingly". The correct statement should be "Soil sampling to determine the presence and absence of contaminants in the former herbicide mixing plant located across the mill was never conducted. Results of previous investigations conducted in former herbicide mixing plant in Oahu indicated elevated levels of dioxin/furans. It was assumed that the area was contaminated with dioxin and will be treated accordingly."
3. Item #6. Seed Dipping Tank. The statement "Sediments from several manholes in the area of the seed dipping tank will be tested for contaminants including the National Pollutant Discharge Elimination System (NPDES) ditch that runs between the mill and the seed dipping tank and runoff from the mill. Both sediment and water samples will be taken from the ditch adjacent to the seed dipping tank and also at the effluent of the NPDES ditch outside the mill to determine how much contaminant is reaching the ocean if there is any". The correct statement should be " Sediments from several manholes in the area of the seed dipping tank will be tested including the mill ditch that runs between the sugar mill and the seed dipping tank. Both sediment and water samples will be taken from the ditch adjacent to the seed dipping tank and also at the effluent of the mill ditch to determine how much contaminant is reaching the Pacific Ocean, if there is any".
4. Item #8. Kinekine Ditch. It should be the "Mill Ditch". The statement "The Kinekine ditch which drains to the Pacific Ocean also known to be....." The statement should be "The Mill Ditch which drains to the Pacific Ocean known to be....".

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3. **Former Kekaha Herbicide Mixing Area** – The former herbicides mixing area is located adjacent to the current administration building. The area is now vacant and being used as a parking lot. The area was compacted and will require a geoprobe (direct push) to sample. Since soil sampling and removal of contaminated soil in these areas was previously conducted by Brewer Environmental as part of their Phase II Site Investigation in February 2000, soil samples will be used to verify that contamination no longer exists in the area. Portion of the Kinekine ditch passes north-west of the former herbicide mixing area and was believed to have been used as a waste disposal for the mixing plant. It was assumed that the area was contaminated with dioxin and will be treated accordingly.
4. **Kekaha Sugar Mill/Factory** – The sugar mill includes the cane washing area, boiler plant, storage warehouse, molasses storage tanks, electrical shop, metal shop, and machine shop. The laboratory facility is also located inside the Lime Storage area of the boiler house. Drums labeled used oil and transformers that are labeled non-PCB certified oil are stored inside the boiler area. There are stained soils present all over the mill area. All shops have concrete floors and would require concrete coring to sample the soil underneath them. Several drain ditches runs through the boiler plant and the cane washing area. These ditches including those located near the automotive shop will be sampled to determine possible contaminants present in the area. Several unlabeled drums were found near the molasses tank with heavy stained surface soil. These and other spots in the vicinity of the mill were selected and flagged for soil sampling.
5. **Motor Pool/Automotive Shop** – The motor pool is located to the west of the boiler plant and includes a field equipment shop, a grease rack, and an automotive shop. Heavy petroleum odor and stain were present in the ground surrounding the grease rack and will be sampled for VOC. The drainage ditch fronting the motor pool will also be sampled due to possibility of oil and solvent from the concrete area of the motor pool may have runoff into the drainage ditch. Concrete coring will be used to sample underneath the automotive shop.
6. **Seed Dipping Tank** - Located to the east and adjacent to the Kekaha Mill. It is approximately 0.5 mile from St. Theresa elementary school, and approximately 0.35 miles from Pacific Ocean with a ground elevation of 57 ft. The seed treatment tank was closed in July 1999. There were sludge and stagnant water inside the seed dipping tank. Melody Calisay mentioned that according to Mr. Tabata of Amfac Sugar, the fungicides in the seed dipping tank were mixed directly into the tank and the water coming from the cane cleaning, boiler, and seed dipping plant was all trap into the mill ditch and pump to the settling pond. Sediments from several manholes located in the area of the seed dipping tank will be tested for contaminants including the National Pollutant Discharge Elimination System (NPDES) ditch that runs between the mill and the seed dipping plant.
7. **NPDES ditch** – The NPDES ditch located between the seed dipping tank and the mill drains to the Pacific Ocean and is known to be a habitat for federally endangered species. The ditch is highly susceptible to contaminants coming from the seed dipping tank and

runoff from the mill. Both sediment and water samples will be taken from the ditch adjacent to the seed dipping tank and also at the effluent of the NPDES ditch outside the mill to determine how much contaminant is reaching the ocean if there is any.

8. ***Kinekine ditch*** – The Kinekine ditch which drains to the Pacific Ocean also known to be a habitat for federally endangered species, will be characterized to determine the extent of possible contamination coming from the former herbicide mixing area. Both sediments and water samples will be taken upstream prior to the herbicide mixing area, adjacent to the former herbicide mixing area where runoff from the herbicide mixing area entered the ditch and downstream of the runoff entry.
9. ***Background Sample*** – Locations of the background samples were determined relative to the sugar mill and the settling pond. All background samples will be taken around the residential area approximately 50 yards from the mill. Additional background sample will also be taken north of the settling ponds and served as a baseline sample.