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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX

IN THE MATTER OF:	)
	) U.S. EPA Docket No. 9-2005-08
Oahu Sugar Company, LLC.	)
Respondent	) UNILATERAL ADMINISTRATIVE
	) ORDER FOR THE PERFORMANCE
	) OF A REMOVAL ACTION
Proceeding Under Section 106(a)	)
of the Comprehensive Environmental	)
Response, Compensation, and	)
Liability Act of 1980,	)
42 U.S.C. § 9606(a).	)
	)

I. AUTHORITY

This Unilateral Administrative Order ("Order") is issued pursuant to the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9606(a), as amended by the Superfund Amendments and Reauthorization Act of 1986, and the Small Business Liability Relief and Brownfields Revitalization Act of 2002 ("CERCLA"). The President delegated this authority to the Administrator of the United States Environmental Protection Agency ("EPA" or "Agency") by Executive Order 12580, January 23, 1987, 52 Fed. Reg. 2923, and further delegated it to the Assistant Administrator for Solid Waste and Emergency Response and the Regional Administrators by EPA Delegation Nos. 14-14-A and 14-14-B. This authority has been duly redelegated to the Branch Chief, Superfund Division, EPA Region 9 ("Branch Chief"), by delegations dated September 29, 1997, and November 16, 2001.

II. PARTIES BOUND

1. This Order shall apply to and be binding on the following: Oahu Sugar Company, LLC ("Oahu Sugar"), a Delaware corporation. This Order shall be binding on Oahu Sugar ("Respondent"), and its agents, successors and assigns. No change in ownership or operational status will alter Respondent's obligations under this Order. Notwithstanding the terms of any contract or agreement, Respondent is responsible for compliance with this Order and for ensuring that its employees, contractors, and agents comply with this Order. Respondent shall provide a copy of this Order to all contractors, subcontractors, and consultants that are retained by Respondent to perform the work required by this Order within three (3) days after the Effective Date of this Order or within three (3) days of retaining their services. whichever is later.

2. Respondent may not convey any title, easement, or other interest it may have, in any property comprising the Site, as the term "Site" is defined below, without a provision permitting the continuous implementation of the provisions of this Order. If Respondent wishes to transfer any title, easement, or other interest it may have in any property comprising the Site, Respondent shall provide a copy of this Order to any subsequent owner(s) or successor(s) before any ownership rights are transferred. In such case, Respondent shall advise EPA one (1) month in advance of any anticipated transfer of interest.

III. DEFINITIONS

3. Unless otherwise expressly provided herein, the terms used in this Order that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever the terms listed below

are used in this Order, or in the exhibits attached hereto and incorporated hereunder, the following definitions shall apply:

"Day" shall mean a calendar day unless expressly stated otherwise. "Working day" shall mean a day other than a Saturday, Sunday, or federal holiday. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and by the Small Business Liability Relief and Brownfields Revitalization Act of 2002, 42 U.S.C. § 9601 et seq.

"Unilateral Order" or "Order" shall mean this Unilateral Administrative Order, EPA docket number UAO 9-2005-08, and all exhibits attached hereto. In the event of a conflict between this Order and any exhibit, this Order shall control.

"EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

"Hawaii Department of Health" or "Hawaii DOH" shall mean the Hawaii pollution control agency or environmental protection agency and any successor departments or agencies of the State.

"National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300.

"Paragraph" shall mean a portion of this Order identified by an Arabic numeral.

"Response Action" shall be those specific work items Respondent is required to

perform at the Site pursuant to this Order, as set forth in Section IX of this Order.

"Respondent" shall mean Oahu Sugar Company, LLC (OSCO).

"Section" shall mean a portion of this Order identified by a Roman numeral, unless otherwise stated.

"Site" shall mean the former Oahu Sugar pesticide mixing plant, which is located on the Pearl Harbor Naval Complex Superfund Site. The OSCO Site is fenced and the area within the fence occupies approximately 3.5 acres. The OSCO Site is bounded by a former agricultural area on Waipio Peninsula and Walker Bay in West Loch Pearl Harbor to the west of the Site. The OSCO Site is geographically located at 21° 21' 44.7" north latitude and 157 ° 59' 23.7" west longitude, Waipio Peninsula, Waipahu, Hawaii.

"State" shall mean the State of Hawaii, and all of its political subdivisions, including the Hawaii Department of Health ("DOH").

"United States" shall mean the United States of America.

IV. FINDINGS OF FACT

4. The Site is OSCO's former pesticide mixing plant and occupies approximately 3.5 acres on the Waipio Peninsula near Waipahu, Oahu, Hawaii, within the Pearl Harbor Naval Complex Superfund Site. OSCO operated sugar cane fields and associated facilities in the area from approximately 1902 until the 1980's. OSCO used this Site for the storage, mixing and loading of pesticides and fertilizers. From around 1947 until approximately 1996, OSCO leased this Site and other land in this area from the United States Department of Defense, Department of the Navy, to grow sugarcane.

5. The 3.5 acres are adjacent to Walker Bay, off Pearl Harbor. An approximately 15- foot high cliff runs across the Site in an approximately north-south direction. OSCO had a

number of aboveground storage tanks (ASTs) along the top of the cliff. OSCO used the lower area to store, mix and load pesticides on crop dusting aircraft. An airstrip, quonset hut and a number of ASTs were formerly located in the lower area of the Site.

6. On May 20, 1997, the Hawaii Department of Health ("DOH") conducted surface soil sampling at and around the former pesticide mixing plant. The sampling results from the DOH effort indicated high concentrations of various dioxin congeners at the Site, including dioxin contamination as high as 1,530 parts per billion (ppb) for 2,3,7,8-tetrachlorodibenzo-para-dioxin (2,3,7,8 TCDD) toxicity equivalents ("TEQ").

7. Dioxin is a persistent, bioaccumulative and toxic pollutant that can build up in the food chain to levels harmful to human and ecosystem health. The TEQ is a method to describe total toxicity for dioxin congeners as if it were the most toxic dioxin, 2,3,7,8 TCDD. The method was developed by national and international workgroups culminating in the World Health Organization (WHO), with EPA participation, adopting the methodology. EPA applies the concept of toxic equivalency factors ("TEF") to facilitate the risk assessment of these compounds in specific mixtures. TEFs compare the potential toxicity of each dioxin-like compound comprising the mixture to the potency of 2,3,7,8-TCDD, the most toxic member of the group. The amount of each congener is multiplied by its TEF and the products are summed. The summed values yield a toxicity equivalence or TEQ, relative to 2,3,7,8 TCDD. In this manner, congeners in a mixture are normalized based on both concentration and potency relative to 2,3,7,8-TCDD. The summed value of congeners at the Site is expressed as 1,530 ppb TEQ.

8. The EPA Region 9 Preliminary Remediation Goal ("PRG") for dioxin is 0.016 ppb for industrial exposure and 0.0039 ppb for residential exposure. The EPA Office of Solid

Waste and Emergency Response ("OSWER") Directive 9200.4-26, *Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites, April 13, 1998,* recommends cleanup levels for dioxin at 1 ppb TEQ for residential exposure and 10 ppb TEQ for industrial exposure as a starting point.

9. Pentacholorophenol ("PCP") was also detected at the Site at levels between 8.4 -35 parts per million ("ppm"). Pentachlorophenol historically was widely used as a pesticide and wood preservative. EPA lists pentachlorophenol as a probable human carcinogen. The EPA PRG for pentachlorophenol in soil is 3 ppm for residential exposure and 9 ppm for industrial exposure. The federal Maximum Contaminant Level ("MCL") for PCP is 1 ppb.

10. In August 2002, BEI Environmental Services, on behalf of OSCO, conducted a remedial investigation and prepared a remedial investigation report for the former pesticide mixing area. The TEQ results of this soil sampling effort ranged from 10.55 ppb to 992 ppb for dioxin. PCP was detected in surface soils at levels between .037 ppm to 140 ppm.

11. The administrative record supporting this action is available for review at the EPA, Region 9 offices located at 75 Hawthorne Street, San Francisco, California.

V. CONCLUSIONS OF LAW

12. The Site is a "facility" as that term is defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

13. The Respondent, OSCO, is a "person" as that term is defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

14. Oahu Sugar, the operator of the facility at the time of disposal of hazardous substances, is "liable" within meaning of Section 107(a) of CERCLA, 42 U.S.C. § 9607(a)(2), and is

subject to this Order under Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

15. The contaminants found at the Site, as identified in Section IV of this Order, include "hazardous substances" as that term is defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

16. The conditions that existed and that currently exist at the OSCO Site, as described in Section IV of this Order, constitute an actual or threatened "release" of a hazardous substance from the facility as defined by Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

17. The actual or threatened release of hazardous substances from the Site constitutes an imminent and substantial endangerment to the public health or welfare or the environment, within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a), which includes, but is not limited to the following:

    a. actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants; and

    b. an actual or threat of release of hazardous substances, pollutants or contaminants in soils; and

    c. high levels of hazardous substances or pollutants or pollutants in soils largely at or near the surface, that may migrate.

VI. DETERMINATIONS

Based on the Findings of Fact and the Conclusions of Law stated herein, the Branch Chief has made the following determinations:

18. That an actual or threatened release of hazardous substances from the Site presents an imminent and substantial endangerment to the public health or welfare or the

environment.

19. That conditions at the Site constitute a threat to public health or welfare or the environment based on consideration of the factors stated in the NCP at 40 C.F.R. § 300.415(b), and that the actions required by this Order are necessary to protect the public health or welfare or the environment.

20. That the actions required by this Order, if properly performed, will be consistent with the NCP, and are appropriate to protect the public health or welfare or the environment.

VII. NOTICE TO THE STATE

21. Pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a), EPA has notified the State of the issuance of this Order by providing a copy of this Order.

VIII. EFFECTIVE DATE

22. This Order is deemed effective on receipt (the "Effective Date"), unless a conference is requested as provided herein. If such a conference is requested, this Order shall be effective the second (2nd) day following the day of such conference unless modified in writing by EPA. All times for performance of ordered activities shall be computed from this effective date.

IX. ORDER

23. Based on the Findings of Fact, Conclusions of Law, and Determinations, EPA hereby orders Respondent to perform the specific work set forth below under the direction of the EPA Remedial Project Manager ("RPM"), as designated in Section XII, and to comply with all requirements of this Order until EPA provides notice that the Response Action is complete.

24. Work to be Performed. The Respondent shall perform the following tasks, which shall

constitute the Response Action under this Order:

a. Respondent shall perform the work and make submittals and certifications as set forth below and in Attachment A within the time schedules specified in this Section and in Attachment A. Attachment A is an enforceable part of this Order.

b. Respondent shall submit monthly progress reports ("Progress Reports") to EPA. The first such Progress Report shall be due by the fifteenth (15th) day following the end of the first calendar month after the Effective Date (Section VIII) of this Order, and by the 15th day of each month thereafter until EPA notifies Respondent that the Response Action is complete.

c. Within fifteen (15) days after the Effective Date, Respondent shall submit for EPA review and comment a Health and Safety Plan that ensures the protection of the public health and safety during performance of on-Site work under this Order. This plan shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992). In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 C.F.R. Part 1910. If EPA determines that it is appropriate, the plan shall also include contingency planning. Respondent shall incorporate all changes to the plan recommended by EPA and shall implement the plan during the pendency of the removal action.

d. Respondent shall notify the EPA RPM at least forty-eight (48) hours prior to commencement of any on-Site work, and at least seventy-two (72) hours prior to disposal or other disposition of hazardous substances or wastes.

e. All sampling and analyses performed pursuant to this Order shall conform to EPA

direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures. Respondent shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with the appropriate EPA guidance. Respondent shall follow, as appropriate, "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (OSWER Directive No. 9360.4-01, April 1, 1990), as guidance for QA/QC and sampling. Respondent shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), and "EPA Requirements for Quality Management Plans (QA/R-2) (EPA/240/B-01/002, March 2001)," or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") as meeting the Quality System requirements.

1. Upon request by EPA, Respondent shall have such a laboratory analyze samples submitted by EPA for QA monitoring. Respondent shall provide to EPA the QA/QC procedures followed by all sampling teams and laboratories performing data collection and/or analysis.

2. Upon request by EPA, Respondent shall allow EPA or its authorized representatives to take split and/or duplicate samples. Respondent shall notify EPA not less than 15 days in advance of any sample collection activity, unless shorter notice is agreed to by EPA. EPA shall have the

right to take any additional samples that EPA deems necessary. Upon request, EPA shall allow Respondent to take split or duplicate samples of any samples it takes as part of its oversight of Respondent's implementation of the Work.

f. Within thirty (30) days after completion of all actions required under this Order, the Respondent shall submit for EPA review and approval a Final Report summarizing the actions taken to comply with this Order. The Final Report shall conform, at a minimum, with the requirements set forth in Section 300.165 of the NCP. The Final Report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with this Order, a listing of quantities and types of materials removed off-site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated (e.g., manifests, invoices, bills, contracts, and permits). In addition, the Respondent shall certify that the Final Report is complete and accurate to the best of its collective knowledge.

25. Effect of Noncompliance with Work Performance and Schedule. Except as otherwise stated in this Order, and within EPA's sole discretion, any noncompliance with the actions to be performed or the schedules established as set forth in this Order and Attachment A shall be considered a violation of this Order.

26. Notices and Submissions. All documents, including technical reports, and other correspondence to be submitted by the Respondent pursuant to requirements of this

Order, shall be sent by overnight mail to the following addressee, or to such other addressees as EPA hereafter designates in writing, and shall be deemed submitted on the date received by EPA.

Lewis Mitani, Remedial Project Manager
US Environmental Protection Agency
75 Hawthorne Street, Mail Code SFD-8-3
San Francisco, CA 94105

Respondent shall submit two (2) copies of each document to EPA.

27. Approval of Submissions. EPA shall review, comment on, and approve or disapprove each plan, report, or other deliverable submitted by Respondent pursuant to the requirements of this Order and Attachment A. All EPA comments on draft deliverables shall be incorporated by the Respondent. EPA shall notify the Respondent in writing of EPA's approval or disapproval of a final deliverable. In the event of any disapproval, EPA shall specify the reasons for such disapproval, EPA's required modifications, and a time frame for submission of the revised report, document, or deliverable. If the modified report, document or deliverable is again disapproved by EPA, EPA shall first notify the Respondent of its disapproval of the resubmitted report, document, or deliverable, and then may draft its own report, document or deliverable and incorporate it as part of this Order, or may conduct the remaining work required by this Order.

28. For purposes of this Order, EPA's authorized representatives may include, but not be limited to, consultants and contractors hired by EPA to oversee the activities required by this Order.

29. Access to Property and Information. Respondent shall permit EPA and its authorized representatives, including the State, to have access at all times to the Site to monitor any

activity conducted pursuant to this Order and to conduct such tests or investigations as EPA deems necessary. Nothing in this Order shall be deemed a limit on EPA's authority under federal law to gain access to the Site.

a. If the Site, or any other property where access is needed to implement this Order, is owned or controlled by the Respondent, the Respondent shall, commencing on the Effective Date, provide EPA the State, and its representatives, including contractors, with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this Order.

b. Where any action under this Order is to be performed in areas owned by or in possession of someone other than Respondent, Respondent shall, within three (3) days after the Effective Date of this Order, obtain all necessary access for: EPA, its contractors, oversight officials, or other authorized representatives; state or tribal oversight officials and state or tribal contractors; and Respondent and its authorized representatives. Respondent shall immediately notify EPA if after using its best efforts Respondent is unable to obtain such access agreements. For purposes of this Paragraph, "best efforts" includes the payment of reasonable sums of money in consideration of access. Respondent shall describe in writing its efforts to obtain access. EPA may then assist Respondent in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as EPA deems appropriate. Respondent shall reimburse EPA for all costs and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XIII (Reimbursement of Response Costs).

c. Notwithstanding any provision of this Order, EPA retains all of its access authorities and rights, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

d. Respondent shall provide to EPA upon request, copies of all documents and information within its possession or control or that of its contractors or agents relating to activities at the Site or to the implementation of this Order, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondent shall also make available to EPA, for purposes of investigation, information gathering, or testimony, its employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

e. Respondent may assert business confidentiality claims covering part or all of the documents or information submitted to EPA under this Order to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to EPA, or if EPA has notified Respondent that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondent.

f. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Respondent asserts such a privilege in lieu of providing documents, it shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondent. However, no documents, reports or other information created or generated pursuant to the requirements of this Order shall be withheld on the grounds that they are privileged.

g. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

30. Record Retention, Documentation, Availability of Information

a. Until ten (10) years after Respondent's receipt of EPA's notification pursuant to Section XIX (Termination and Satisfaction), Respondent shall preserve and retain all non-identical copies of records and documents (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work or the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary. Until 10 years after

Respondent's receipt of EPA's notification pursuant to Section XIX (Termination and Satisfaction), Respondent shall also instruct its contractors and agents to preserve all documents, records, and information of whatever kind, nature or description relating to performance of the Work.

b. At the conclusion of this document retention period, Respondent shall notify EPA at least ninety (90) days prior to the destruction of any such records or documents, and, upon request by EPA, Respondent shall deliver any such records or documents to EPA. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondent asserts such a privilege, it shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or information; and 6) the privilege asserted by Respondent. However, no documents, reports or other information created or generated pursuant to the requirements of this Order shall be withheld on the grounds that they are privileged.

c. Respondent hereby certifies that to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by EPA or the State or the filing of suit against it regarding the

Site and that it has fully complied with any and all EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. §6927.

31. Off-site Shipments of Waste Material.

a. Respondent shall, prior to any off-site shipment of Waste Material from the Site to an out-of-state waste management facility, provide written notification of such shipment of Waste Material to the appropriate state environmental official in the receiving facility's state and to the EPA RPM. However, this notification requirement shall not apply to any off-site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

1. Respondent shall include in the written notification the following information: 1) the name and location of the facility to which the Waste Material is to be shipped; 2) the type and quantity of the Waste Material to be shipped; 3) the expected schedule for the shipment of the Waste Material; and 4) the method of transportation. Respondent shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

2. The identity of the receiving facility and state will be determined by Respondent following the award of the contract for the removal action. Respondent shall provide the information required by Paragraph 31(a) and 31(b) of this Section as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

b. Before shipping any hazardous substances, pollutants, or contaminants from the Site to an off-site location, Respondent shall obtain EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence.

32. Compliance with Other Laws. Respondent shall perform all actions required pursuant to this Order in accordance with all applicable local, state, and federal laws and regulations except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 6921(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-Site actions required pursuant to this Order shall, to the extent practicable, as determined by EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements ("ARARs") under federal environmental or state environmental or facility siting laws. Respondent shall identify ARARs in the Work Plan subject to EPA approval.

33. Emergency Response and Notification of Releases

a. If any incident or change in site conditions occurs during the actions conducted pursuant to this Order, which causes or threatens to cause an additional release of hazardous substances from the OSCO Site or an endangerment to the public health, welfare, or the environment, Respondent shall immediately take all appropriate action in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondent shall take these

actions in accordance with all applicable provisions of this Order, including, but not limited to the Health and Safety Plan. Respondent also shall immediately notify the RPM or, in the event of his unavailability, shall notify the alternate RPM designated in this Order. If neither the RPM nor alternate RPM is available, Respondent shall notify the EPA Emergency Response Unit, Region 9, of the incident or site conditions, by telephone at (415) 947-4400.

b. If Respondent fails to respond, EPA may respond to the release or endangerment, and Respondent shall reimburse EPA for all costs and attorneys' fees incurred responding to the threat or endangerment. Respondent shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XIII (Reimbursement of Response Costs).

c. In addition, in the event of any release of a hazardous substance from the OSCO Site, Respondent shall immediately notify EPA, Region IX at telephone number (800) 300-2193 and the National Response Center at telephone number (800) 424-8802. Respondent shall submit a written report to EPA within seven (7) days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the recurrence of such a release. This reporting requirement is in addition to, not in lieu of, reporting under CERCLA Section 103(c) and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. §11001 et seq.

d. Nothing in the preceding Paragraphs shall be deemed to limit any authority of the United States to take, direct, or order all appropriate action to protect human

health and the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances at or from the Site.

34. Notification of Unanticipated or Changed Circumstances

a. In the event of unanticipated or changed circumstances at the OSCO Site, Respondent shall notify the EPA RPM by telephone within twenty-four (24) hours of discovery of the unanticipated or changed circumstances. This verbal notification shall be followed by written notification postmarked no later than three (3) days after discovery of the unanticipated or changed circumstances.

b. The Branch Chief may determine that, in addition to tasks addressed in an approved work plan or otherwise addressed herein, additional work may be required to address the unanticipated or changed circumstances that, if unaddressed, will result in an actual or threatened endangerment to health or the environment. Respondent shall implement such additional work that the Branch Chief identifies if such work is related to the OSCO Site or any releases therefrom. Respondent shall complete the additional work that the Branch Chief determines will remove the endangerment according to the standards, specifications, and schedules set forth by the Branch Chief in any modifications to this Order.

35. NCP Compliance. All work Respondent properly performs to comply with this Order shall be consistent with the National Contingency Plan.

36. Within three (3) days of the Effective Date of this Order, Respondent shall provide EPA with documentation that adequately demonstrates its financial ability to complete the work to be performed pursuant to this Order. Examples of adequate financial

documentation that EPA may accept include, but are not limited to, a signed contract or guarantee on the part of the Respondent's contractor that it will complete the work to be performed, a letter of credit from a financial institution, or an escrow account for work to be performed. Respondent shall demonstrate financial assurance in an amount no less than $500,000.00.

37. Selection of Contractor(s) and Subcontractor(s). All work performed by or on behalf of Respondent pursuant to this Order shall be performed by qualified individuals or contractors with expertise in hazardous waste site investigation or remediation, unless agreed otherwise by EPA. Respondent shall, within three (3) days after the Effective Date of this Order, notify EPA in writing of the name, title and qualifications of the individual(s) who will be responsible for carrying out the terms of this Order, and the name(s) of any contractor(s) or subcontractor(s). The qualifications of the persons, contractors, and subcontractors undertaking the work for Respondent shall be subject to EPA review and approval.

38. If EPA disapproves of any person's or contractor's technical or work-experience qualifications, EPA will notify the Respondent in writing. Respondent shall, within five (5) working days of Respondent's receipt of EPA's written notice, notify EPA of the identity and qualifications of the replacement(s). Should EPA disapprove of the proposed replacement(s), Respondent shall be deemed to have failed to comply with the Order.

39. Respondent may propose to change the individual(s), contractor(s), or subcontractor(s) retained to direct and supervise the work required by this Order. If Respondent wishes to propose such a change, the Respondent shall notify EPA in writing of the name, title, and qualifications of the proposed individual(s), proposed contractor(s), or proposed

subcontractor(s), and such individual(s), contractor(s) or subcontractor(s) shall be subject to approval by EPA in accordance with the terms of Paragraphs 37 and 38, above. The naming of any replacement(s) by Respondent shall not extend any deadlines required by this Order nor relieve the Respondent of any of its obligations to perform the work required by this Order.

40. Respondent will notify EPA of its respective field activities at least forty-eight (48) hours before initiating them so that EPA may adequately schedule oversight tasks.

41. Respondent shall submit to EPA a certification that Respondent or its contractor(s) and subcontractor(s) have adequate insurance coverage or other ability, subject to approval of EPA, to compensate for liabilities for injuries or damages to persons or property that may result from the activities to be conducted by or on behalf of Respondent pursuant to this Order. Adequate insurance shall include comprehensive general liability insurance and automobile insurance with limits of one million dollars, combined single limit. If the Respondent demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then the Respondent need provide only that portion of the insurance described above that is not maintained by such contractor or subcontractor. Respondent shall ensure that such insurance or indemnification is maintained for the duration of performance of the work required by this Order. Respondent shall ensure that the United States is named as an additional insured on any such insurance policies.

42. General Provisions. All work required by this Order shall be conducted in accordance with: CERCLA; the NCP; EPA Region 9 "Guidance for Preparing Quality Assurance

Project Plans for Superfund Remedial Projects" (EPA, November 1992); any final amended or superseding versions of such documents provided by EPA; other applicable EPA guidance documents; any Work Plan or individual components approved pursuant to this Order; and any report, document or deliverable prepared by EPA because Respondent failed to comply with this Order.

43. All plans, schedules, and other reports that require EPA's approval and are required to be submitted by the Respondent pursuant to this Order shall, after approval by EPA, be automatically incorporated into and enforceable under this Order.

44. EPA will oversee Respondent's activities as specified in Section 104(a)(1) of CERCLA, 42 U.S.C. § 9604(a)(1). Respondent will support EPA's initiation and implementation of activities needed to carry out its oversight responsibilities. Respondent also shall cooperate and coordinate the performance of all work required to be performed under this Order with all other work being performed at the Site, including work performed by EPA, the State, or any other party performing work at the Site with the approval of EPA.

45. Respondent shall undertake all actions required by this Order in accordance with the requirements of all applicable local, state, and federal laws and regulations unless an exemption from such requirements is specifically provided under CERCLA or unless the Respondent obtains a variance or exemption from the appropriate governmental authority.

X. NOTICE OF INTENT TO COMPLY

46. Respondent shall, within one (1) working day of the Effective Date of this Order, provide written notice to EPA of Respondent's' irrevocable intent to comply with this Order. Failure to respond, or failure to agree to comply with this Order, shall be deemed a refusal to comply with this Order.

XI. OPPORTUNITY TO CONFER

47. Respondent may, within one (1) day of receipt of this Order, request a conference with the Section Chief, Federal Facility Section, or whomever the Section Chief may designate. If requested, the conference shall occur within three (3) days of the request, unless extended by mutual agreement of the Parties, at EPA's Regional Office, 75 Hawthorne Street, San Francisco, California.

48. At any conference held pursuant to Respondent's request, the Respondent may appear in person, or be represented by an attorney or other representative. If Respondent desires such a conference, the Respondent shall contact Letitia Moore, EPA Assistant Regional Counsel, at (415) 972-3928.

49. The purpose and scope of any such conference held pursuant to this Order shall be limited to issues involving the implementation of the Response Action required by this Order and the extent to which Respondent intends to comply with this Order. If such a conference is held, the Respondent may present any evidence, arguments or comments regarding this Order, its applicability, any factual determinations on which the Order is based, the appropriateness of any action that the Respondent is ordered to take, or any other relevant and material issue. Any such evidence, arguments or comments should be reduced to writing and submitted to EPA within three (3) days following the conference. This conference is not an evidentiary hearing, and does not constitute a proceeding to challenge this Order. It does not give Respondent a right to seek review of this Order, or to seek resolution of potential liability, and no official record of the conference will be made. If no conference is requested, any such evidence, arguments or comments must be

submitted in writing within three (3) days following the Effective Date of this Order. Any such writing should be directed to Letitia Moore, at the following address:

Environmental Protection Agency
75 Hawthorne Street, ORC-3
San Francisco, CA 94105

50. Respondent is hereby placed on notice that EPA will take any action that may be necessary in the opinion of EPA for the protection of public health and welfare and the environment, and Respondent may be liable for the costs of those actions under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

XII. DESIGNATED PROJECT MANAGERS

51. EPA designates Lewis Mitani, an employee of EPA Region 9, as its primary RPM and designated representative at the Site, who shall have the authorities, duties, and responsibilities vested by the NCP. This includes, but is not limited to, the authority to halt, modify, conduct, or direct any tasks required by this Order or undertake the Response Action (or portions of the Response Action) when conditions at the Site present or may present a threat to public health or welfare or the environment as set forth in the NCP. Within three (3) days of the Effective Date of this Order, Respondent shall designate a Project Coordinator who shall be responsible for overseeing Respondent's implementation of this Order. To the maximum extent possible, all oral communications between Respondent and EPA concerning the activities performed pursuant to this Order shall be directed through EPA's RPM and Respondent's Project Coordinator. All documents, including progress and technical reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be delivered in accordance with Paragraph 26, above.

52. EPA and Respondent may change their respective RPM and Project Coordinator. Notification of such a change shall be made by notifying the other party in writing at least five (5) days prior to the change, except in the case of an emergency, in which case notification shall be made orally followed by written notification as soon as possible.

53. Consistent with the provisions of this Order, the EPA designates John Chesnutt as an alternate RPM, in the event Lewis Mitani is not present or is otherwise unavailable. During such times, John Chesnutt shall have the authority vested in the RPM by the NCP, as set forth in Paragraph 51 above.

54. The absence of the EPA RPM from the Site shall not be cause for the stoppage of work. Nothing in this Order shall limit the authority of the EPA RPM under federal law.

XIII. REIMBURSEMENT OF OVERSIGHT COSTS

55. Respondent shall reimburse EPA, on written demand, for all response costs incurred by the United States in overseeing Respondent's implementation of the requirements of this Order, unless otherwise exempted from this requirement by federal law. EPA may submit to Respondent on a periodic basis a bill for all response costs incurred by the United States with respect to this Order. Respondent shall, within thirty (30) days of receipt of the bill, remit by cashier's or certified check for the amount of those costs made payable to the "Hazardous Substance Superfund," to the following address:

Hazardous Substance Superfund
U.S. Environmental Protection Agency
Cincinnati Accounting Operations
Attention: Region 9 Superfund Receivables
P.O. Box 371099M
Pittsburgh, PA 15251

Respondent shall send a cover letter with any check and the letter shall identify the Pearl

Harbor Naval Complex–Oahu Sugar Site, Site No. 091S, and make reference to this Order, including the EPA docket number stated above. Respondent shall send simultaneously to the EPA RPM notification of any amount paid, including a photocopy of the check.

56. Interest at the rate established under Section 107(a) of CERCLA shall begin to accrue on the unpaid balance from the day of the original demand notwithstanding any dispute or objection to any portion of the costs.

XIV. DELAY IN PERFORMANCE

57. Any delay in the performance of any requirement of this Order that, in the EPA's sole judgment and discretion, is not properly justified by Respondent under the terms of this Section shall be considered a violation of this Order. Any delay in performance of any requirement of this Order shall not affect any other obligation of Respondent under the terms and conditions of this Order.

58. Respondent shall notify EPA of any delay or anticipated delay in performing any requirement of this Order. Such notification shall be made by telephone to EPA's primary RPM within twenty-four (24) hours after Respondent first knew or should have known that a delay might occur. The Respondent shall adopt all reasonable measures to avoid or minimize any such delay. Within three (3) days after notifying EPA by telephone, the Respondent shall provide written notification fully describing the nature of the delay, any justification for delay, any reason why the Respondent should not be held strictly accountable for failing to comply with any relevant requirements of this Order, the measures planned and taken to minimize the delay, and a schedule for implementing the measures that will be taken to mitigate the effect of the delay. Increased costs or

expenses associated with implementation of the activities called for in this Order are not justifications for any delay in performance.

59. If Respondent is unable to perform any activity or submit any document within the time required under this Order, the Respondent may, prior to the expiration of the time, request an extension of time in writing. The extension request shall include a justification for the delay. The submission of an extension request shall not itself affect or extend the time to perform any of Respondent's obligations under this Order.

60. If EPA determines that good cause exists for an extension of time, it may grant a request made by Respondent pursuant to Paragraph 59 above, and specify in writing to the Respondent the new schedule for completion of the activity or submission of the document for which the extension was requested.

XV. ENFORCEMENT AND RESERVATIONS

61. EPA reserves the right to bring an action against Respondent under Section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of any response costs incurred by the United States related to this Order or otherwise incurred at the Site and not reimbursed by Respondent. This reservation shall include but not be limited to past costs, direct costs, indirect costs, the costs of oversight, the costs of compiling the cost documentation to support oversight costs, as well as accrued interest as provided in Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

62. Notwithstanding any other provision of this Order, at any time during the Response Action, EPA may perform its own studies, complete the Response Action (or any portion of the Response Action) and seek reimbursement from Respondent for its costs, or seek any other appropriate relief.

63. Nothing in this Order shall preclude EPA from taking any additional enforcement action, including modification of this Order or issuance of additional Orders, or additional remedial or removal actions as EPA may deem necessary, or from requiring Respondent in the future to perform additional activities pursuant to CERCLA, 42 U.S.C. § 9607(a), et seq., or any other applicable law. Respondent may be liable under CERCLA Section 107(a) for the costs of any such additional actions.

64. Notwithstanding any provision of this Order, the United States hereby retains all of its information gathering, inspection and enforcement authorities and rights under CERCLA, the Resource Conservation and Recovery Act, or any other applicable statutes or regulations.

65. Notwithstanding compliance with the terms of this Order, including the completion of the EPA-approved Response Action, Respondent is not released from liability, if any, for any enforcement actions beyond the terms of this Order taken by EPA.

66. EPA reserves the right to take any enforcement action pursuant to CERCLA or any other legal authority, including the right to seek injunctive relief, monetary penalties, reimbursement of response costs, and punitive damages for any violation of law or this Order.

67. EPA expressly reserves all rights and defenses that it may have, including the EPA's right both to disapprove of work performed by Respondent and to request the Respondent to perform tasks in addition to those detailed in Section IX of this Order.

68. This Order does not release Respondent from any claim, cause of action or demand in law or equity, including, but not limited to, any claim, cause of action, or demand that lawfully may be asserted by representatives of the United States, or the State.

69. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules, and any other writing submitted by Respondent will be construed as relieving Respondent of its obligation to obtain such formal approval as may be required by this Order.

XVI. SEVERABILITY

70. If any provision or authority of this Order or the application of this Order to any circumstance is held by a court to be invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby, and the remainder of this Order shall remain in force.

XVII. DISCLAIMER

71. The United States, by issuance of this Order, assumes no liability for any injuries or damages to persons or property resulting from acts or omissions by Respondent, or its employees, agents, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order. Neither EPA nor the United States shall be held as a party to any contract entered into by Respondent, or its employees, agents, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order. This Order does not constitute a pre-authorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2).

XVIII. PENALTIES FOR NONCOMPLIANCE

72. Respondent is advised pursuant to Section 106(b) of CERCLA, 42 U.S.C.§ 9606(b), that violation of this Order or subsequent failure or refusal to comply with this Order, or any portion thereof, may subject Respondent to a civil penalty of up to $32,500 per day for each day in which such violation occurs, or such failure to comply continues. Failure to

comply with this Order, or any portion thereof, also may subject Respondent to liability for punitive damages in an amount three times the amount of any cost incurred by the government as a result of the failure of Respondent to take proper action, pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3).

XIX. TERMINATION AND SATISFACTION

73. The provisions of this Order shall be deemed satisfied on Respondent's receipt of written notice from EPA that Respondent has demonstrated, to the satisfaction of EPA, that all of the terms of this Order, including any additional tasks that EPA has determined to be necessary, have been completed.

IT IS SO ORDERED:

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

By: Kathleen H. Johnson

Date: 3-28-05

Kathleen Johnson
Chief, Federal Facility and Site Assessment Branch
EPA, Region 9

EPA Region 9 Contacts:

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EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105
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SCHEDULE
Oahu Sugar Site Removal Action

Within 21 days of Effective Date of UAO	Submit to EPA the Removal Action Work Plan (RAWP) & Quality Assurance Project Plan(QAPP)
Within 14 days of receipt of EPA comments on RAWP and QAPP	Submit to EPA the revised RAWP & QAPP with response to comments. RAWP is not final until approved by EPA
Within 14 days of receiving notice to proceed from EPA	Begin field work required by RAWP
48 hours prior to beginning field work	Written notification to EPA of start date for field work
Within 18 days of beginning field work	Complete all field work
Within 24 hours of completion of field work	Notify EPA of completion of field work
Within 21 days after completion of field work	Written notification to EPA whether a step-out is necessary. Notification shall include proposed schedule and sampling plan for next round of sampling. No additional sampling to be conducted until sampling plan approved by EPA.
Within 7 days of receiving EPA Comments on Step-Out Notice	Submit to EPA written response to Step-Out Notice comments and revised sampling plan.
Within 14 days of final EPA approval of Step-Out sampling plan	Begin Step-Out field work
48 hours prior to beginning Step-Out field work	Written notification to EPA of start date for Step-Out field work
Within 24 hours of completion of Step-Out field work	Notify EPA of completion of Step-Out field work

WORK PLAN OUTLINE
in support of an
Interim Remedy for the Oahu Sugar Site
on the
Pearl Harbor Naval Complex, Oahu, Hawaii

Prepared by TechLaw Inc.
for the
United States Environmental Protection Agency, Region 9

23 February 2005

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1.0 INTRODUCTION FOR THE REMOVAL ACTION AND INTERIM COVER

This Revised Work Plan Outline describes the requirements necessary to implement a Removal Action (RA) at the Oahu Sugar Site on the Waipio Peninsula, Oahu, Hawai'i. A limited investigation will be conducted to define the lateral extent of contamination greater than industrial screening levels. Once the extent of contamination has been defined, contaminated soils above the cliff in the eastern portion of the site will be excavated and spread over the western portion of the site (below the cliff). An interim remedy (interim cover) will then be constructed over the contaminated area in the western portion of the site. The interim cover is intended to prevent exposure of trespassers or ecological receptors to site contaminants by direct contact with surface soils. It does not address contaminants that may have already reached Walker Bay via surface water runoff, sediment migration and deposition, or groundwater migration. The interim cover is expected to have a life span of approximately 5 years.

Before the responsible party(ies) prepares a work plan for this RA, an Action Memorandum will be required. The Action Memorandum will include all required information outlined in EPA guidance OSWER directive 9360.3-01 (EPA, 1990). The Removal Action Work Plan (RAWP) submitted by the responsible party(ies) will include a Sampling and Analysis Plan (SAP) and a Health and Safety Plan (H&S Plan). Required tasks to be included in the SAP are outlined in the following sections. Requirements for a site-specific H&S Plan are not discussed in this Revised Work Plan Outline; however, an H&S Plan is required. Upon completion of this limited investigation, a design document will be issued describing the interim cover (see Section 3.4).

2.0 BACKGROUND

The Oahu Sugar site occupies approximately 3.5 acres on the Waipio Peninsula near Waipahu, Oahu, Hawai'i (Figures 1 and 1A). The site was leased by the Oahu Sugar Company from the U.S. Navy. The site was used until approximately 1979 to mix pesticides and fertilizer solutions, which were then loaded into backpacks, trucks, or airplanes for application into the surrounding sugar cane fields.

The western portion of the site, approximately 90 percent of the area, is about 5 feet above mean sea level. This portion of the site is cut by an approximately 4 foot deep unlined drainage ditch that runs north/south through the site. The eastern 10 percent of the site rises to approximately 20 feet above mean sea level, above the limestone (calcareous reef deposits) cliff shown on Figure 2. The soils in the western part of the site consist of alluvial soils (Mamala stony silty clay loam), with some reported additions of dredged sediment and fill, including debris, trash, and off-site soils. The soils on top of the cliff developed in basaltic alluvium on top of coral limestone.

Groundwater is present between 3.5 and 7.5 feet below ground surface (bgs), on the lower portion of the site. It is tidally influenced, and the western portion of the site is reportedly inundated at high tide. During the RI, the groundwater flow direction was found to be southerly

at a gradient of 0.02. It is likely that groundwater flow direction is variable due to flat gradients and tidal fluctuation.

Surface water, which was not discussed in the previous investigation, appears to flow generally to the west and south. The slope of the ground surface appears to be less than 1 percent, based on the surface elevations of only two wells (MW-1 and MW-3). The drainage ditch, which has a berm along its eastern edge appears to interrupt the westerly flow of surface water. Silt curls were observed against the berm by the northern portion of the ditch (near sampling location 24 on Figure 2), indicating ponding and sediment deposition. The ditch itself flows north to south. It was apparently built to drain the former runway, so at least a portion of the area west of the ditch drains to the east into the ditch, but the areas closest to Walker Bay are assumed to drain into the bay.

The primary release mechanism is believed to be spillage onto surface soils during pesticide and fertilizer mixing and loading, and possibly spillage from former aboveground storage tanks (ASTs). These spills then percolated through surface soils into subsurface soils and groundwater, primarily in the vicinity of the ASTs. Secondary releases from surface water and sediment runoff and from airborne dust transport are also assumed to occur.

A preliminary Remedial Investigation (RI) was conducted at the site in response to Hawai'i State Department of Health (DOH) Administrative Order Number CH 98-001 (issued on January 27, 1998). The RI Report prepared for the site by BEI Environmental Services (BES) (BES, 2002) on behalf of the Oahu Sugar Company has been used as the primary source of information for this Revised Work Plan Outline. The RI Report focused on a comparison of the data with industrial screening levels. For soils, 10 parts per billion (ppb) 2,3,7,8-tetrachloro-dibenzo-*p*-dioxin toxicity equivalent (TEQ) was used for dioxins/furans; for other contaminants in soil, the industrial screening levels were DOH Tier 1 Action Levels (for a site with drinking water not threatened and less than 200 centimeters annual rainfall) and Region IX Industrial Preliminary Remediation Goals (PRGs; EPA, 2000). For groundwater, the industrial screening levels were the Hawai'i State Contingency Plan Saltwater Water Quality Standards (acute and chronic).

During the RI, samples of soil, groundwater, and sediment were collected for analysis (Figure 2). The samples were analyzed for dioxins/furans, semi-volatile organic compounds (SVOCs), organochlorine (OC) pesticides, metals, and chlorinated herbicides, although not all analytes were run for all of the samples collected.

The conceptual site model (CSM) includes complete exposure pathways to human trespassers and ecological receptors (Figure 3). Although a seven-foot high fence surrounds the site, repaired holes in the fence and evidence of human traffic inside the fence (bicycle tire tracks) were observed during a site visit on September 30, 2003. In addition, there is some uncertainty on the lateral extent of contamination, which may extend outside the fence. The primary exposure pathway is direct contact with surface soils, and the site currently is also susceptible to

surface runoff and runoff via a drainage ditch that bisects the site, with transport of contaminated sediment into Walker Bay.

Concentrations of diesel-range petroleum hydrocarbons and volatile organic compounds were non-detect or below action levels. As a result inhalation of vapors is not considered a significant exposure route. The primary contaminants are semi-volatile and non-volatile compounds that generally have a high affinity for soils and soil organic matter and low solubility in water (pentachlorophenol [PCP] is sparingly soluble, about 14 milligrams per liter). The largest lateral extent is shown by dioxins/furans in surface soils. The dioxins/furans were likely spilled directly (as an impurity in PCP) or moved on the surface by foot and vehicle traffic and sediment detachment, migration and deposition. The PCP and other pesticides, polynuclear aromatic hydrocarbons (PAHs), and one metal, lead, at the site have much more limited extent above screening levels than dioxins/furans and are generally contained within the lateral extent of dioxins/furans above screening levels. (The exception is sampling location 9, which has dioxins/furans below screening levels and PAHs above screening levels). The subsurface detections of contaminants above screening levels are limited to three sampling locations (12, 19 and 21). Contaminants were detected in groundwater samples from monitoring well MW-3 completed near sampling location 19, but not in two other monitoring wells (MW-1 and MW-2, Figure 2). However, the presumed east to west direction of groundwater flow used to determine the location for "downgradient" well MW-1 was contradicted by a southerly groundwater flow direction during the first sampling event at these wells. This distribution of contaminants is consistent with a CSM of surface releases and slowly mobile contaminants. The extent of contamination has not been well defined and requires additional characterization.

The discharge point(s) from the drainage ditch bisecting the Oahu Sugar site and the areas potentially impacted by sheet flow from the site have not yet been identified, but contamination in Walker Bay has been identified. Three sediment samples were collected as part of the Pearl Harbor Sediment Study in Walker Bay at areas potentially within complete migration pathways from the Oahu Sugar facility (Earth Tech, 2004). Dioxins and pesticides were detected at these three locations. The highest concentrations of DDTs in Walker Bay sediments were detected in sample location 3kz, in shallow water near the Oahu Sugar facility. Similarly, the highest concentrations of dioxins/furans (particularly total 2,3,7,8-tetrachloro-dibenzo-*p*-dioxin [2,3,7,8-TCDD] and total dioxins) were also detected at this location. The highest concentrations of total DDTs in Walker Bay sediments ranged from 8 micrograms per kilogram (μg/kg) at sample location 3kx to 107.5 μg/kg at sample location 3kz, in shallow water near the Oahu Sugar facility. Similarly, the total 2,3,7,8-TCDD toxicity equivalent (TEQ) in sediment ranged from11.7 μg/kg at location 3ky, to162 μg/kg at location 3kz.

3.0 SCOPE AND OBJECTIVES FOR THE REMOVAL ACTION AND INTERIM COVER

This Revised Work Plan Outline presents a framework for a full RAWP, but elements of the

RAWP will need to be specified by the party (or parties) performing the work. The interim remedy for this RA is an interim cover, and several options are presented in Section 3.4 for covering the site. A sampling plan to identify the area that will be covered by the interim remedy is presented in Section 3.1. The ultimate objective of the limited investigation and interim cover are to provide a cost-effective method of reducing risk to human and ecological receptors at the Oahu Sugar site, pending implementation of a final remedy (in approximately 5 years) under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

3.1 Field Work Plan Elements for the Removal Action and Interim Cover

The RAWP for Oahu Sugar site will include two field tasks to complete the objective of the RA. These tasks are a topographic survey and soil sampling and analysis. These requirements will be described in detail in the RAWP issued by the responsible party, and will follow EPA guidance (EPA, 2000b).

The topographic survey will be performed to confirm and refine the CSM. The topographic survey will identify areas currently contributing surface water runoff to the drainage ditch, and areas contributing surface water runoff directly to Walker Bay. The topographic survey will also support an assessment of the communication between shallow groundwater and the drainage ditch, help identify where the interim cover will be located, and support the design of the final remedy.

Soil sampling and analysis is required to better define the lateral extent of contamination in the western portion of the site. The vertical extent of contamination in this area has not been fully defined, but is not necessary to determine the lateral boundaries of the interim cover. The vertical extent of contamination will be defined during a complete RI. Soil sampling and analysis will also be conducted above the cliff, which consists of approximately 10% of the site. Surface and subsurface contamination above the cliff was previously identified in the RI Report (BES, 2002). The lateral extent of contamination needs to be defined in this area to determine how much soil must be excavated and moved down to the western portion of the site to be included under the interim cover. During the RI, subsurface soil samples were collected and based on those results, soil will be removed to at least 4 feet bgs. (Sample location 12/12A contained pentachlorophenol at concentrations greater than industrial screening levels in the deepest sample collected from this location at 2.5-3 feet bgs. Sample location 13 did not report SVOCs greater than industrial screening levels in the deepest sample collected from this location at 3-3.5 feet bgs.) Once the extent above the cliff has been defined and the contaminated soil has been excavated, confirmation soil samples will be collected to verify that all contaminants with concentrations exceeding industrial screening levels has been excavated, moved to the western portion of the site, and included under the interim cover.

Thirteen surface soil sample locations are needed. Eight samples are recommended in the western portion of the site and four above the cliff to define the lateral extent of contamination. One sample is also recommended downstream in the drainage ditch, south of the fence (only one

sample was previously collected in this ditch). Table 1 presents the rationale for each proposed sample location. Figure 4 presents the proposed sample locations and the preliminary extent of soil contamination greater than industrial screening levels. This area was estimated using data from the previous RI Report (BES, 2002).

In addition, all soil samples will be analyzed for atrazine, simazine, paraquat and diquat. The analytical method used by BES in the previous RI to evaluate herbicides would not detect these contaminants of potential concern (COPCs), which were known to have been used in the cultivation of sugarcane. Atrazine is reported to have accounted for up to 50% of all the herbicides used on sugar cane fields in Hawaii (see http://www.environment-hawaii.org/696atra.htm).

Step-out samples may be required in the western portion of the site if the initial samples shown on Figure 4 contain concentrations of contaminants greater than industrial screening levels. Step-out samples will be collected until the extent of contamination has been defined in all directions to less than industrial screening levels. This is to ensure that all contaminants greater than industrial screening levels are included under the interim cover. In addition, lateral step-out and vertical step-down samples may be required from above the cliff to ensure that all contamination greater than industrial screening levels is excavated and moved to the western portion of the site.

3.1.1 Data Quality Objectives

The following sections outline the data quality objectives (DQOs) used to prepare the sampling plan for the limited investigation of the site. The DQOs were prepared according to the most recent guidance (EPA, 2000a, 2000b).

3.1.2 Problem Statement

Concentrations of dioxins/furans, SVOCs, organochlorine pesticides, and metals in soil have been reported greater than industrial screening levels at the Oahu Sugar site. An interim cover has been proposed for this site to protect surface water and prevent contact with human and ecological receptors. However, the lateral extent of the soil contamination needs to be better defined to determine the optimal placement of the interim cover, and to determine how much soil needs to be excavated from above the cliff.

3.1.3 Decision to be Made

Where do the contaminant concentrations exceed industrial screening levels?

3.1.4 Inputs to the Decision

Inputs to the decision are:

- Results from samples collected during the previous RI (BES, 2002);
- Topographic survey;
- Industrial screening levels (2004 Industrial PRGs [EPA, 2004] for SVOCs, pesticides, herbicides, and metals, and OSWER directive 9200.0-26: 10 parts per billion [ppb] starting point for cleanup levels at CERCLA sites for 2,3,7,8-tetrachloro-dibenzo-*p*-dioxin toxicity equivalent [TEQ]; clarification and justification for using the TEQ can be found in Section 6.2 of the RI Report [BES, 2002]);
- Analytical results from this investigation; and
- Geologic results from the RI and from this investigation.

3.1.5 Boundaries of the Study

The horizontal extent (boundary) of contamination above screening levels is the only boundary being investigated. The vertical extent is not needed for the construction of an interim cover. However, subsurface soil samples (step-down samples) may be required above the cliff to define all areas where contaminants exceed industrial screening levels. The lateral and vertical extent is needed to ensure that all contamination greater than industrial screening levels is excavated and moved to the western portion of site. The horizontal extent depends on the contaminants encountered during sampling.

- For SVOCs, metals, herbicides, and pesticides: The boundary is the periphery estimated from points at which all detectable concentrations are less than 2004 Industrial PRGs.
- For dioxin/furans: The boundary is the periphery estimated from points at which the total TEQ for each sample is less than 10 ppb.

3.1.6 Decision Rules

The following decision rule is used to determine whether the surface contamination is adequately characterized in the western portion of the site.

- If the lateral definition of the contaminants is less than 2004 Industrial PRGs for each SVOC, metal, herbicide, and organochlorine pesticide, and a TEQ less than 10 ppb, then the site has been adequately characterized. If this criterion has not been met, then additional sampling (step-out location) is needed.

The following decision rule is used to determine whether the contamination is adequately

characterized above the cliff.

- If the lateral and vertical definition of the contaminants is less than industrial screening levels in the initial samples collected, then the area above the cliff has been adequately characterized. If this criterion has not been met, then additional sampling (lateral step-out and vertical step-down) is needed.
- If the lateral and vertical definition of contaminants is less than industrial screening levels in confirmation samples collected after excavation, then no further excavation is needed. If this criterion has not been met, then additional excavation will be required and additional confirmation samples will be collected.

3.1.7 Tolerable Limits on Decision Errors

Analytical data obtained from this investigation must meet specifications for precision, accuracy, representativeness, comparability, and completeness, as defined in a site-specific Quality Assurance Project Plan (QAPP), to be developed by the responsible party.

- Null Hypothesis: the concentrations of contaminants in soil do not exceed the decision criteria (e.g., PRGs, dioxin TEQ, etc.) in the DQOs.

- *False Positive (Rejection) Error* - the concentrations of contaminants in soil are determined to be less than the decision criteria when they are actually higher than these values.

- *Consequence of False Positive Error* - contaminants in soil left uncovered may lead to an unrecognized increase in risk to human health and/or the environment.

- *Tolerable False Positive* - 10% (per U.S. EPA DQO guidance).

- *False Negative (Acceptance) Error* - the concentrations of contaminants in soil are determined to be greater than the decision criteria when they are actually lower than these values.

- *Consequence of False Negative Error* - unnecessary additional investigation would be performed or additional area of interim cover constructed, resulting in greater cost and additional time.

- *Tolerable False Negative Error Rate* - 10% (i.e., the same as the False Positive Error Rate).

3.1.8 Optimize Design for Obtaining Data

A judgmental sampling strategy is employed for the Oahu Sugar site. Previous sampling results

were used to the extent possible in the strategy to decide on sampling locations, number of samples, and analytical methods. Initial sampling locations in this sampling plan will be proposed based on the above decision rules and review of previous data. However, lateral step-out and vertical step-down sampling may be required, pending results from the initial sampling locations.

The following approach will be used:

- Place sample locations outside of the preliminary extent of soil contamination greater than industrial screening levels as shown on Figure 4.

- If results from the locations shown on Figure 4 exceed screening levels in the western portion of the site, collect step-out soil samples outward from locations where contaminants exceed decision rules. A nominal step-out distance of 30 feet is proposed for these analytes, although this will be a location-specific decision.

- If results from the locations shown on Figure 4 from above the cliff exceed screening levels, collect step-out and step-down samples outward from locations where contaminants exceed decision rules. A nominal step-out distance of 30 feet is proposed and a vertical distance of 2 feet is proposed.

- After the initial excavation of contaminated soils from above the cliff, confirmation samples will be collected from the bottom and sidewalls of the excavation in accordance with the site-specific QAPP. If results of the confirmation samples exceed screening levels in sidewall samples, an additional 15 feet laterally in the direction of the exceedance will be excavated. If results exceed screening levels in confirmation samples from the bottom of the excavation, an additional 6 inches will be excavated. Confirmation samples will again be collected. This process will be repeated until all contaminant concentrations are less than screening levels.

- No mobile laboratory or field analyses are proposed. However, an effort will be made to coordinate laboratory turnaround time and site sampling such that the sampling crew can return to the site for step-out samples, if indicated by the initial sampling results, while the field work is still proceeding.

3.2 Analytical Matrix

Table 2 summarizes the analytical methods that will be used during execution of this sampling plan. The analytical methods were chosen because they have the proper target analyte list and reporting limits for this investigation. All methods and reporting limit requirements will be presented in the site-specific QAPP. Lower reporting limits are desirable for risk assessment purposes for certain chemicals. Target reporting limits are summarized in Tables 3 and 4 and are

based on ecological risk screening criteria. Inorganic criteria were obtained from sources such as U.S. EPA, Consensus Threshold Effect Concentrations (TEC), NOAA, National Ambient Water Quality Criteria, Tier II Secondary Chronic Value Surface Water Screening Benchmarks, Oak Ridge National Laboratory, and U.S. EPA Region 6. Organic criteria were obtained from sources such as Oak Ridge National Laboratory, OSWER, NOAA, U.S. EPA, National Ambient Water Quality Criteria, Tier II Secondary Chronic Value, and Dutch Target Values. Actual method detection limits may be less sensitive depending on available analytical techniques. The responsible party may choose analytical methods with detection limits that differ from the target reporting limits summarized in Tables 3 and 4; however, agreement between U.S. EPA and the responsible party(ies) is needed regarding ecological risk screening criteria and detection limits. Ecological risk screening criteria will exceed method detection limits. Quality assurance/quality control (QA/QC) samples will be collected in accordance with QAPP criteria. Requirements of a site-specific QAPP are not outlined in this Revised Work Plan Outline. However, the site-specific QAPP submitted by the responsible party will follow the EPA Guidance for Quality Assurance Project Plans (EPA, 2002).

3.3 Field Methods, Procedures, and Documentation

The field methods will be presented in a site-specific FSP to be prepared by the responsible party and approved by regulatory agencies prior to the start of field work. A site-specific Health and Safety Plan will also be prepared, but is not outlined in this Revised Work Plan Outline.

The responsible party will stay in regular contact with EPA, including the submission of daily field reports as the field work is progressing. The responsible party will also submit copies of preliminary analytical data used to make decisions regarding the extent of contamination to EPA. EPA will determine if the extent of contamination has been defined and if all contamination above the cliff has been excavated.

Once all contaminated soil has been defined and excavated from above the cliff, the responsible party will issue a design document for the interim cover. The design document will include project staffing, personnel coordination, and a project schedule that describes field activities and reports to support the interim cover. The design document will require EPA's approval before construction of the cover can begin.

3.4 Conceptual Design and Cost Estimate

3.4.1 Conceptual Design

This Revised Work Plan Outline examined seven (7) potential temporary covers for the Oahu Sugar site. The covers were selected based on the threshold criteria that they must be able to prevent incidental direct human contact with the surface soils at the site. The other criteria that were used to evaluate the various covers were:

- Permeability,
- Cost,
- Ease of maintenance,
- Public Acceptance, and
- Waste generation (residuals at the end of the design life).

In addition, two of the potential final covers, which are equivalent to Subtitle D Landfill Prescriptive final covers, may be acceptable as final remedies for the site and the Biosolids cover might be suitable for incorporation into a final isolation remedy.

The remedies examined in this Revised Work Plan Outline are:

- Subtitle D Landfill Prescriptive final cover consisting of a foundation layer, two-feet of low permeability soil (native material amended with imported bentonite), a high density polyethylene (HDPE) geomembrane, and a vegetative soil layer.
- Dust Barrier, consisting of a non-woven geotextile covered with six inches of gravel.
- Asphalt - this would be standard asphalt, though there are proprietary asphalt materials that would provide much more reliable barriers to infiltration.
- Geocomposite Clay Liner 1 (GCL1) - bentonite, to reduce infiltration, bonded to geotextile covered with six inches of gravel.
- Geocomposite Clay Liner 2 (GCL2) - bentonite bonded to a geomembrane (GundSeal) covered with a vegetative soil layer. This cover is equivalent to the Subtitle D Landfill Prescriptive Cover and much less expensive.
- HDPE Geomembrane Cover - Consists of a geotextile cushion between the native materials and the geomembrane with six inches of gravel over the geomembrane. The gravel is used for protection from ultraviolet radiation, which would otherwise degrade the HDPE liner over time. In a permanent installation, there would probably be a cushion geotextile above the membrane. For a temporary installation, this wasn't considered necessary.
- Biosolids Cover - Biosolids are sanitary sewer treatment plant solids. They have a high organic carbon content and would hence tend to bind tightly to the organic contaminants in the Oahu Sugar Site surface soils and reduce their mobility.

This Revised Work Plan Outline does not examine monolithic covers (usually five to six feet of soil), capillary break covers, or geosynthetic covers from any material other than HDPE (e.g., polyvinyl chloride [PVC], low-density polyethylene [LDPE], visqueen, et cetera). It was felt that the monolithic cover was unsuitable for a temporary cover and the capillary break cover was unsuitable for tropical climates. PVC and LDPE are generally less expensive than HDPE and might be suitable for this application. However, for the purposes of this Revised Work Plan Outline, it did not seem cost effective to examine different materials as it was not felt that the properties of the different materials would impact the decision process. At the detailed design stage, should the temporary cover incorporate a geosynthetic, the designer, presumably familiar

with local conditions and the state of practice in the area, may choose to use one of these materials.

3.4.2 Cost Estimate

The costs presented in Table 5 are not meant to reflect total costs in that they do not include many costs that are common to all of the potential covers (design, permitting, mobilization/demobilization, clearing/grubbing, disposal of vegetation, et cetera). Design and maintenance costs are assumed to be about the same for all alternatives except the Subtitle D Prescriptive final cover and GundSeal (GCL2) covers. Design and maintenance costs for these remedies are assumed higher as they might serve as final remedies, and hence the additional cost would be warranted.

3.4.3 Assumptions

1. The additional cost of the Subtitle D Landfill Prescriptive final cover design was assumed to amount to 30% of the materials and installation cost. Maintenance of the Subtitle D landfill for 5 years was assumed to be $3,500 per year for five years (present worth of $16,000)
2. It was assumed that the Subtitle D Landfill Prescriptive final cover and GCL2 remedies, if built, would be permanent. Hence, there is no disposal cost included in the Subtitle D cover.
3. All costs include a 20% contingency.
4. HDPE seams assumed lapped rather than welded (for the small area to be covered, mobilizing a specialty contractor from the mainland was assumed to be cost prohibitive). A standard geomembrane roll is about 10,000 square feet. Overlapping the membranes by 5 feet effectively reduces the area each roll can cover by about 15%.
5. Area to be covered is 3.5 acres, assuming the entire area within the fence will be covered. A smaller area may be justified by the limited investigation.
6. Costs include disposal of cover materials as Subtitle D waste at $50/ton. It was assumed that the separation layers between the soil and gravel ultraviolet (UV) protection would keep the gravel from becoming contaminated. The GCLs were assumed to require disposal at $50 per ton.
7. Present worth of disposal costs not discounted as it is assumed that disposal costs will rise at the same rate as the applicable discount rate.
8. Subtitle D low-permeability soil layer incorporates 5% imported bentonite.
9. Gravel selected for UV protection because it would be easier to remove than soil (without damaging underlying geosynthetics)
10. The only cost of biosolids is transport and handling, assumed to be $5/yd^3. Without disposal charges, the cost of the biosolids cover is only $38,000. Even if the biosolids could be separated from the contaminated soil, using a geotextile for example, which would somewhat reduce their contaminant fixing properties, it is unlikely that a beneficial reuse for the material could be found given its provenance. Biosolids might make a good

foundation layer for a cover system given their high organic carbon content.

11. Soil unit weight: 120 pounds per cubic foot (pcf); asphalt unit weight: 140 pcf; biosolids unit weight: 110 pcf

3.4.4 Unit Costs

Unit costs used in preparing the cost estimates are shown in Table 6. Costs are installed costs. Spreadsheets showing how the costs were calculated are available on request.

3.5 Removal Action Completion Report

The responsible party will submit a Removal Action Completion Report (RACR) upon completion of the installation of the cover, including results of the limited investigation and as-built specifications for the cover. The RACR will follow EPA Close Out Procedures for National Priorities List Sites (EPA, 2000d).

4.0 REFERENCES

BEI Environmental Services (BES), 2002. Remedial Investigation Report, Former Pesticide Mixing Plant, Waipio Peninsula, Waipahu, Hawaii. October 25.

Earth Tech Inc. (Earth Tech), 2004. Draft, Step 7 Baseline Ecological Risk Assessment Pearl Harbor Sediment Remedial Investigation, Pearl Harbor, Hawaii. June 2004.

United States Environmental Protection Agency (EPA), 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, 540/G-89/004 OSWER Directive 9355.3-01, October.

EPA, 2000a. Data Quality Objectives Process for Hazardous Waste Site Investigations, EPA QA/G-4HW, Final. EPA/600/R-00/007. January.

EPA, 2000b. Sampling and Analysis Plan Guidance and Template, Version 2, Private Analytical Services Used, EPA R9QA/002.1. 2000

EPA, 2000c. Guidance for the Data Quality Objectives Process, EPA QA/G-4. EPA/600/R-96/055. August.

EPA 2000d. Close Out Procedures for National Priorities List Sites, EPA 540-R-98-016. January

EPA 2002. Guidance for Quality Assurance Project Plans, EPA QA/G-5. December.

EPA, 2004. Region 9 Preliminary Remediation Goals (PRGs) Table 2004 Update. October.

Table 1. Rationale for Proposed Sample Locations for the Removal Action and Interim Cover				
Boring Number	**Approximate Location**	**Sample Depths**	**COCs[1]**	**Rationale**
SS25	West of SS06, near fence	surface	Dioxins/Furans	Define western extent of dioxin/furan surface soil contamination
SS26	Approximately 120 feet northwest of SS09, south of SS05	surface	Dioxin/Furans and SVOCs	Define the western extent of dioxin/furan and SVOC surface soil contamination
SS27	Approximately 50 feet east of SS05, between SS05 and SS24	surface	Dioxin/Furans	Identify western edge of dioxin/furan contamination west of the dirt road
SS28	Approximately 60 feet north of SS24, just inside the fence	surface	Dioxin/Furans and Metals	Define the northern extent of dioxin/furan and lead surface soil contamination
SS29	Base of cliff, approximately 90 feet north of SS14	surface	Dioxin/Furans and Pesticides	Define the northern extent of the dioxin/furan and pesticide surface soil contamination near the base of the cliff
SS30	Approximately 60 feet north of SS11, between the cliff and the dirt road	surface	Dioxin/Furans and Pesticides	Define northern extent of dioxin/furan and pesticide contamination on the cliff
SS31	Approximately 60 feet northeast of SS12, just outside fence	surface	SVOCs	Define the eastern extent of SVOC surface soil contamination
SS32	Approximately 40 feet east of SS13, just outside fence	surface	Dioxin/Furan, Metals and SVOCs	Define the eastern extent of dioxin/furan soil contamination and the southeastern extent of the lead and SVOC contamination

Table 1. Rationale for Proposed Sample Locations for the Removal Action and Interim Cover				
Boring Number	**Approximate Location**	**Sample Depths**	**COCs[1]**	**Rationale**
SS33	Approximately 40 feet south of SS13, on cliff, just outside the fence	surface	Dioxin/Furans and SVOCs	Define the southern extent of dioxin/furan and SVOC surface soil contamination.
SS34	Approximately 120 feet south of MW3, at the base of the cliff, just outside the fence	surface	Dioxin/Furans and SVOCs	Define the southern extent of the dioxin/furan and SVOC soil contamination and provide groundwater data downgradient of the site
SS35	Approximately 60 feet southwest of MW-02, just outside the fence	surface	Dioxin/Furans	Define the southern extent of the dioxin/furan surface soil contamination
SS36	Approximately 60 feet south of SS06, outside the fence	surface	Dioxin/Furans	Define the southern extent of the dioxin/furan surface soil contamination
SS37	South of the site, in drainage ditch, south of the fence.	surface soil/ sediment	Dioxin/Furans, SVOCs, metals, pesticides	Define the surface soil/sediment contamination in the drainage ditch and determine if contaminated sediment is moving downstream in the ditch.

[1] The analytical method used by BES to evaluate herbicides would not detect atrazine, simazine, paraquat or diquat, all herbicides known to have been used in the cultivation of sugarcane. Atrazine is reported to have accounted for up to 50% of all the herbicides used on sugar cane fields in Hawaii (see http://www.environment-hawaii.org/696atra.htm). Therefore, all soil samples collected will be analyzed for these contaminants of potential concern.

bgs = below ground surface
COCs = contaminants of concern
SS = surface sample
SVOCs = semi-volatile organic compounds

Table 2. Analytical Methods for the Removal Action			
Matrix	**COCs**	**Analysis**	**Number of Analyses[1]**
Soil and Sediment	Dioxin/Furans	EPA 8290	13
	SVOCs	EPA 8270C	6
	Metals	EPA 6010	3
	Organochlorine pesticides	EPA 8081A	3
	Diquat/Paraquat[2]	EPA 549.2	13
	Atrazine Family[2]	EPA 8141A	13

[1] Does not include duplicate samples or quality control samples. Does not include step-out samples or1 confirmation samples to be collected from the cliff. Confirmation samples from the cliff will be analyzed for all COCs.

[2] The analytical method used by BES to evaluate herbicides would not detect atrazine, simazine, paraquat or diquat, all herbicides known to have been used in the cultivation of sugarcane. Atrazine is reported to have accounted for up to 50% of all the herbicides used on sugar cane fields in Hawaii (see http://www.environment-hawaii.org/696atra.htm). Therefore, all samples will be analyzed for these potential contaminants of concern.

COCs = contaminants of concern
SVOCs = semi-volatile organic compounds

Table 3. Target Reporting Limits for Inorganics

Chemical	Upland Soil (mg/kg)	Freshwater Sediment (mg/kg)	Marine Sediment (mg/kg)	Groundwater and Surface Water (μg/L)
Antimony	21	2	2	30
Arsenic	37	9.79	8.2	36
Beryllium	10	NA	NA	0.66
Cadmium	29	0.99	1.2	0.25
Chromium	5	43.4	81	74
Copper	61	31.6	34	3.1
Lead	50	35.8	46.7	2.5
Mercury	0.1	0.18	0.15	0.77
Nickel	30	22.7	20.9	8.2
Selenium	1	NA	NA	0.005
Silver	2	1	1	0.00036
Thallium	1	NA	NA	0.01
Zinc	50	121	150	0.12

NA = benchmark not available

Table 4. Target Reporting Limits for Organics					
	Chemical	**Soil (mg/kg)**	**Freshwater Sediment (mg/kg)**	**Marine Sediment (mg/kg)**	**Groundwater and Surface Water (mg/L)**
Dioxins/Furans					
	2,3,7,8-TCDD	NA	8.8E-06	3.6E-06	1.E-08
Organochlorine Pesticides					
	alpha-BHC	0.0025	0.006	0.006	0.0022
	gamma-BHC (lindane)	0.00005	0.00237	0.0037	NA
	total chlordane	0.00003	0.00324	0.0005	4.30E-06
	Total DDT	0.0025	0.00528	0.00158	0.000001
	Total Endosulfan ($\alpha + \beta$)	0.00001	NA	0.0054	0.000056
	Dieldrin	0.01	0.0019	0.00002	0.000056
Chlorinated Herbicides					
	2,4-D	NA	NA	NA	NA
	2,4-DB	NA	NA	NA	NA
	2,4,5-TP (Silvex)	NA	NA	NA	NA
	Dalapon	NA	NA	NA	NA
	Dinoseb	NA	NA	NA	NA
Semivolatile Organic Chemicals					
	Acenaphthene	20	0.33	0.04	NA
	Acenaphthalyene	NA	0.33	0.01	NA
	Anthracene	0.1	0.05	0.08	0.00073
	Benzo(a)anthracene	NA	NA	NA	NA

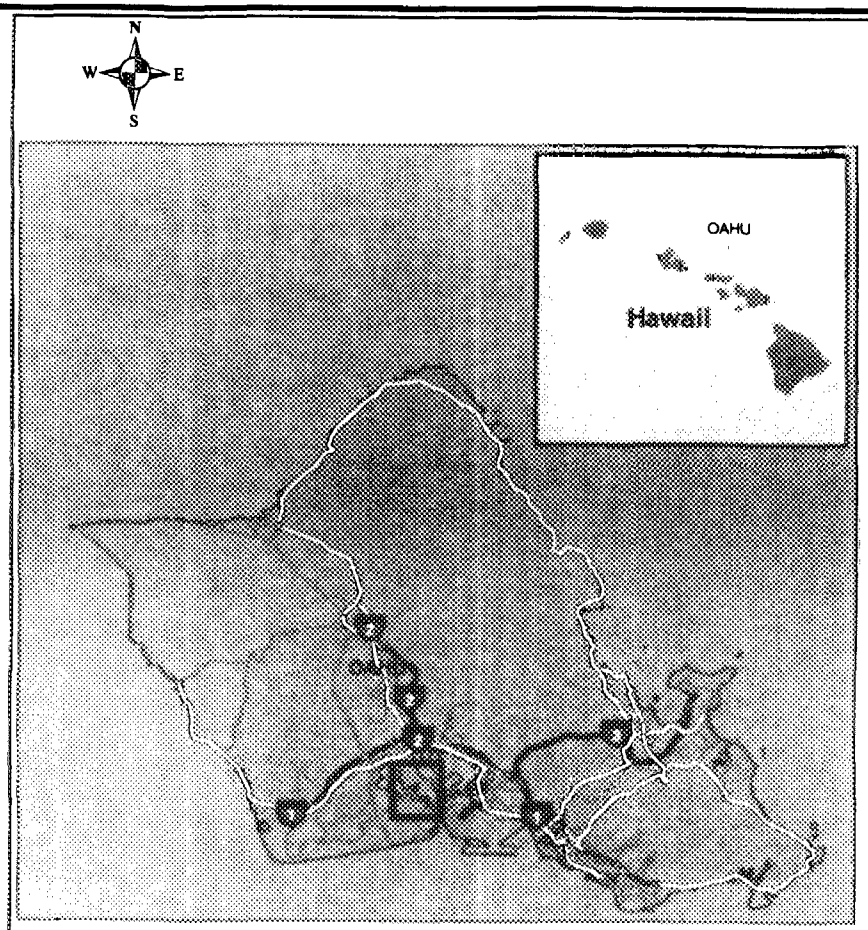
Table 4. Target Reporting Limits for Organics					
	Chemical	**Soil (mg/kg)**	**Freshwater Sediment (mg/kg)**	**Marine Sediment (mg/kg)**	**Groundwater and Surface Water (mg/L)**
	Benzo(b)fluoranthene	NA	0.02	NA	NA
	Benzo(ghi)perylene	NA	0.29	31	NA
	Benzo(a)pyrene	0.1	0.15	0.43	0.000014
	Carbazole	NA	NA	NA	NA
	4-Chloroaniline	0.005	NA	NA	NA
	Chrysene	NA	0.16	0.38	NA
	Dibenz(a,h)anthracene	NA	0.03	0.06	NA
	Dibenzofuran	NA	NA	15	0.0037
	Di-n-butyl phthalate	200	NA	61	0.03
	Fluoranthene	0.1	0.42	0.6	NA
	Fluorene	30	0.07	0.01	0.0039
	Hexachlorobenzene	0.0025	0.02	0.38	NA
	Indeno(1,2,3-cd)pyrene	NA	0.07	34	NA
	Naphthalene	0.1	0.17	0.16	0.01
	Pentachlorophenol	3	NA	0.36	0.01
	Phenanthrene	0.1	0.2	0.24	NA
	Pyrene	0.1	0.19	0.66	NA
	Other Herbicides				
	Atrazine	0.33			
	Simazine	0.33			
	Paraquat	5			
	Diquat	5			
NA	= benchmark not available				

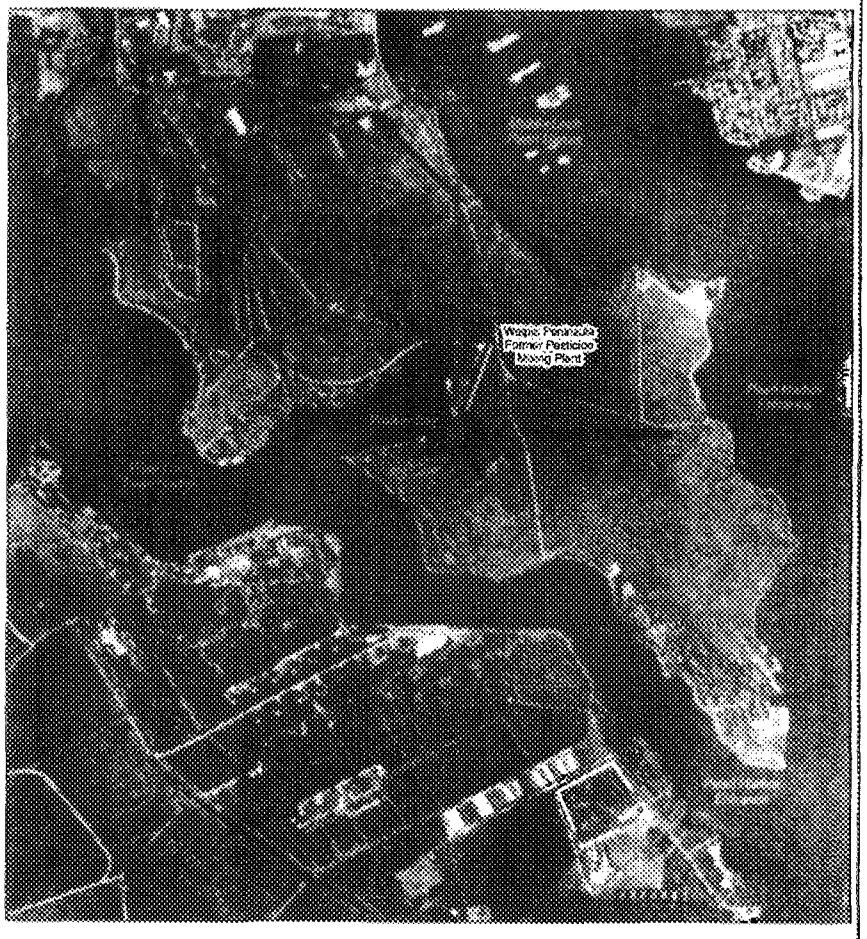
Table 5. Interim Cover Cost Estimates					
COVER ALTERNATIVE	**Pervious**	**Mainten-ance Cost**	**Lifecycle Cost (1000s)**	**Advantages**	**Disadvantages**
Subtitle D - 2 feet of clay with a geomembrane and vegetative layer - assumes 850 tons of bentonite imported to Hawaii for soil amendment	No	High	$810	High public acceptance, may serve as final remedy	Expensive, high maintenance, will probably result in additional contaminated material requiring disposal
Dust Barrier - Geotextile separator with 6 inches of gravel	Yes	Low	$77	Inexpensive	Pervious to water; might not be acceptable to public
Asphalt- 3 inch thick standard asphaltic concrete	No	Low	$510		Expensive; will produce approximately 3700 tons of waste that may be contaminated; not as impervious as the GCL or HDPE membrane alternatives
Geocomposite Liner - Geotextile with bentonite	No	Low	$160	Inexpensive.	Once the bentonite becomes saturated, it may be difficult to remove it
Geocomposite Liner - Geomembrane with bentonite, one-foot vegetative layer - essentially a Subtitle D equivalent	No	Low	$380	May serve as final remedy	Once the bentonite becomes saturated, it may be difficult to remove it

Table 5. Interim Cover Cost Estimates					
COVER ALTERNATIVE	Pervious	Mainten-ance Cost	Lifecycle Cost (1000s)	Advantages	Disadvantages
High Density Polyethylene Membrane- HDPE membrane overlies 16 oz cushion geotexile with 6 inches of gravel for ultraviolet protection	No	Low	$200		
Biosolids - 12 inches of sewage treatment plant solids - - see assumption 10	Yes	High	$540	High organic carbon content may fix contaminants	Greatly increased disposal costs; the biosolids would probably not pass a paint filter test, which may be an issue

Table 6. Unit Costs	
Item	**Unit Cost**
Non Woven Geotextile (8 oz)	$0.20/ft^2
Non Woven Geotextile (16 oz)	$0.25/ft^2
GCL (bentonite geotextile)	$0.55/ft^2
GCL (bentonite geomembrane)	$0.80/ft^2
HDPE Geomembrane	$0.50/ft^2
Gravel	$12/yd^3
Asphalt	$65/ton
Soil (general fill)	$10/yd^3
Bentonite (includes shipping @ $30/ton)	$180/ton

Source: RS Means Cost Estimating, the cost estimate prepared by Friesen and Associates for the New South Hilo Landfill (included in the October 2003 Environmental Impact Statement for the Hawaii County Sorting Station), and judgement where necessary.





10 5 0 10 Kilometers

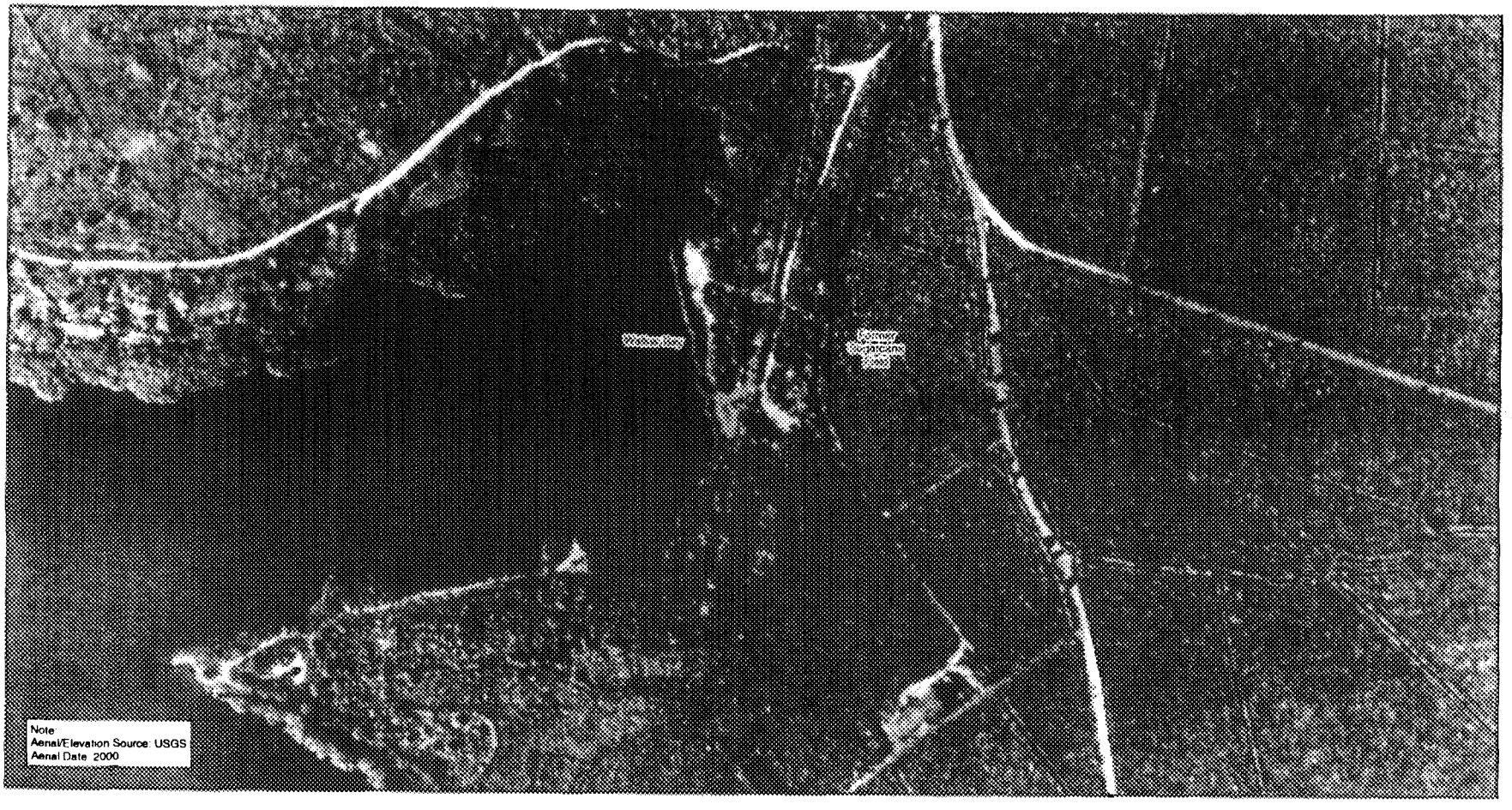
10 5 0 10 Miles

Figure 1
Site Location
Oahu Sugar Site, Waipio Peninsula
Waipahu, Oahu, Hawaii

0.5 0.25 0 0.5 Kilometers

0.5 0.25 0 0.5 Miles

TechLaw



150 75 0 150 Meters

400 200 0 400 Feet

Figure 1A
Site Location Aerial Photograph
Oahu Sugar Site, Waipio Peninsula
Waipahu, Oahu, Hawaii

N
W E
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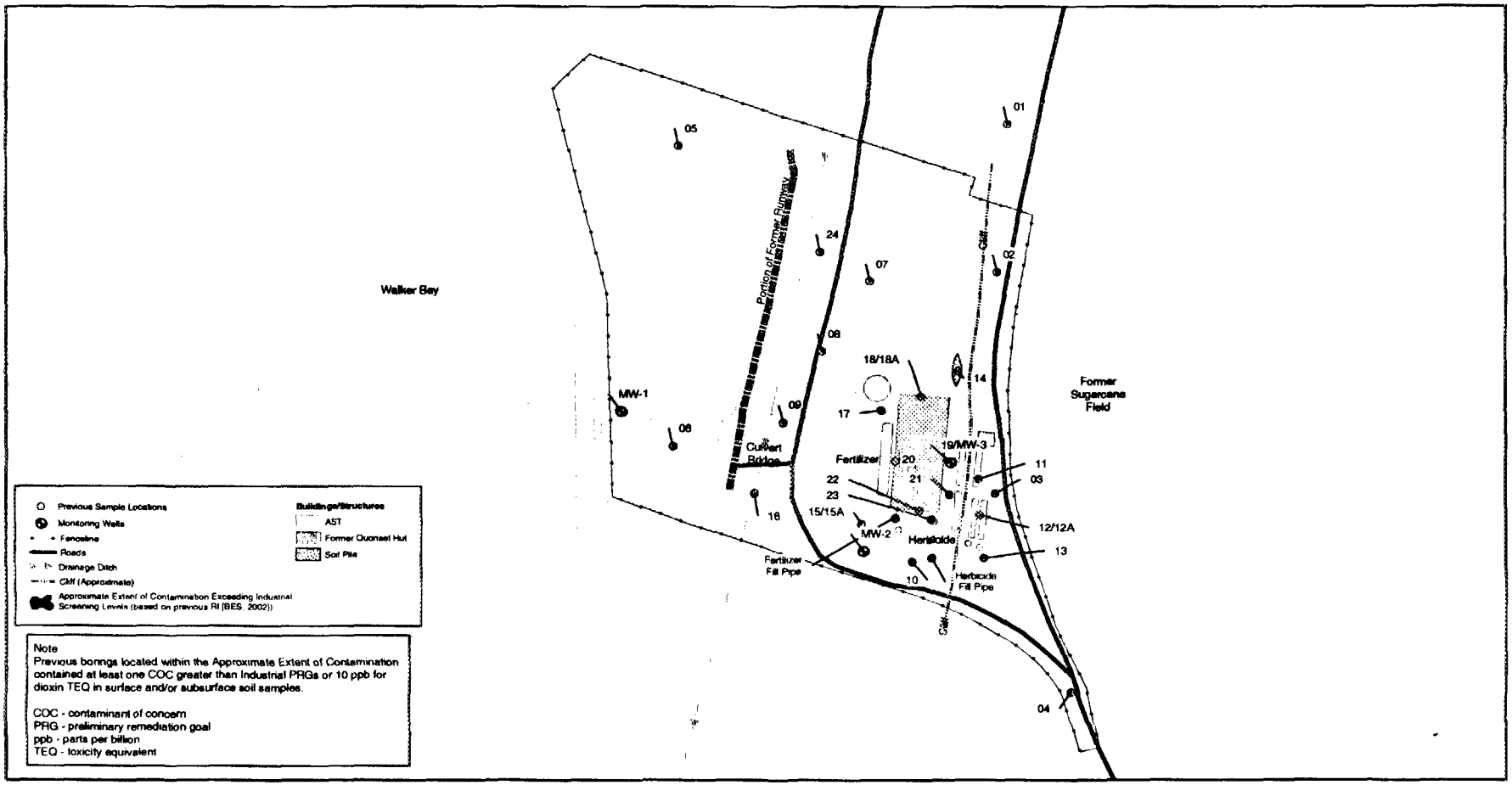
TechLaw



Note
Previous borings located within the Approximate Extent of Contamination contained at least one COC greater than Industrial PRGs or 10 ppb for dioxin TEQ in surface and/or subsurface soil samples.

COC - contaminant of concern
PRG - preliminary remediation goal
ppb - parts per billion
TEQ - toxicity equivalent

25 12.5 0 25 Meters

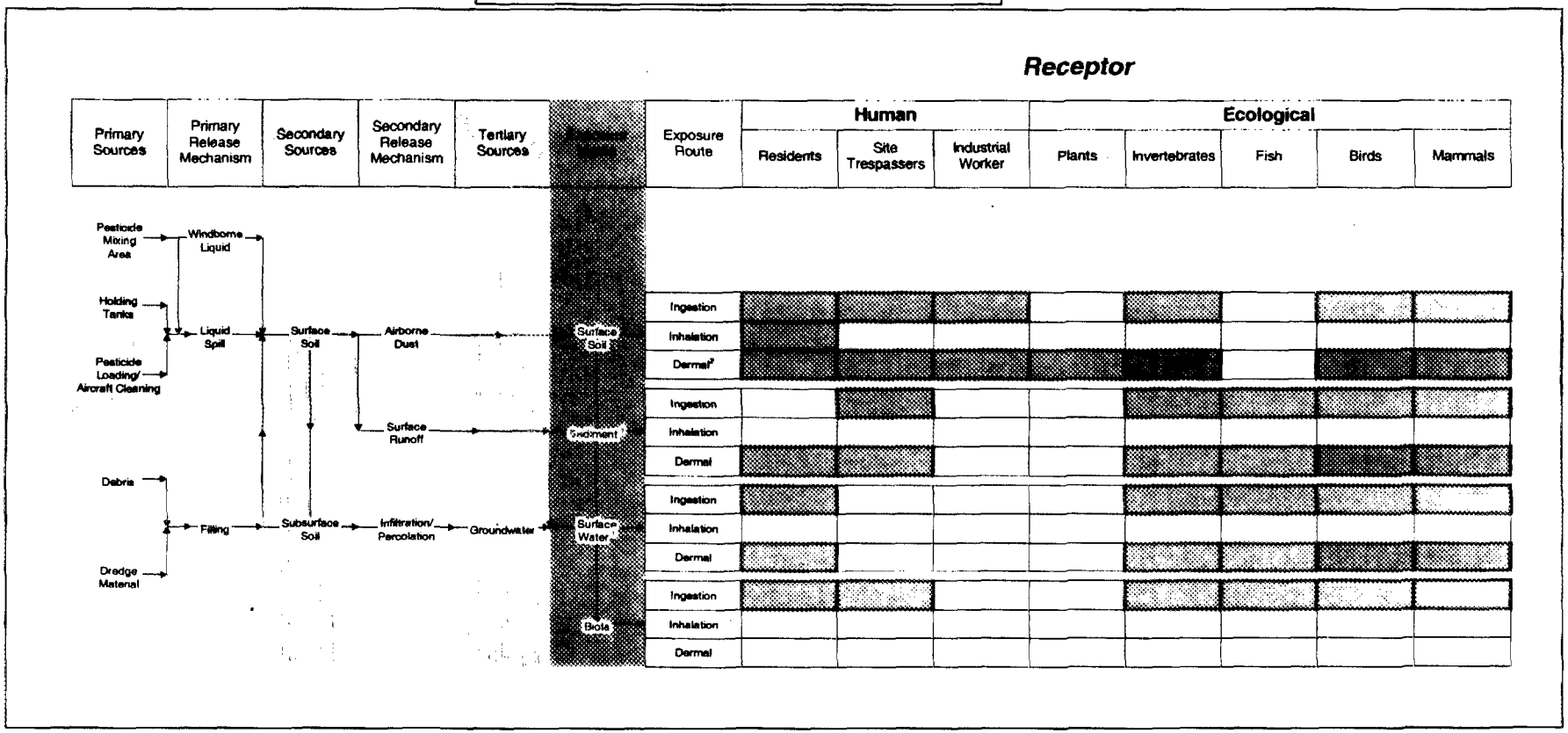
100 50 0 100 Feet

Figure 2
Site Features and Previous Sample Locations
Oahu Sugar Site, Waipio Peninsula
Waipahu, Oahu, Hawaii

N W E S

TechLaw

Figure 3
Conceptual Site Model for Human Health and Ecological Risk
Oahu Sugar Site, Waipio Peninsula
Waipahu, Oahu, Hawaii



Footnote:
1. Sediment and surface water in both the drainage channel and Pearl Harbor are exposure media. However each should be considered separately for exposure and remedies.
2. In the case of plants, "Dermal" refers to root uptake

Sources
Mechanisms
Exposure Media
Exposure Route
Human Receptor
Ecological Receptor
Completed exposure pathway to be evaluated quantitatively
Potentially completed exposure pathway to be evaluated qualitatively

TechLaw

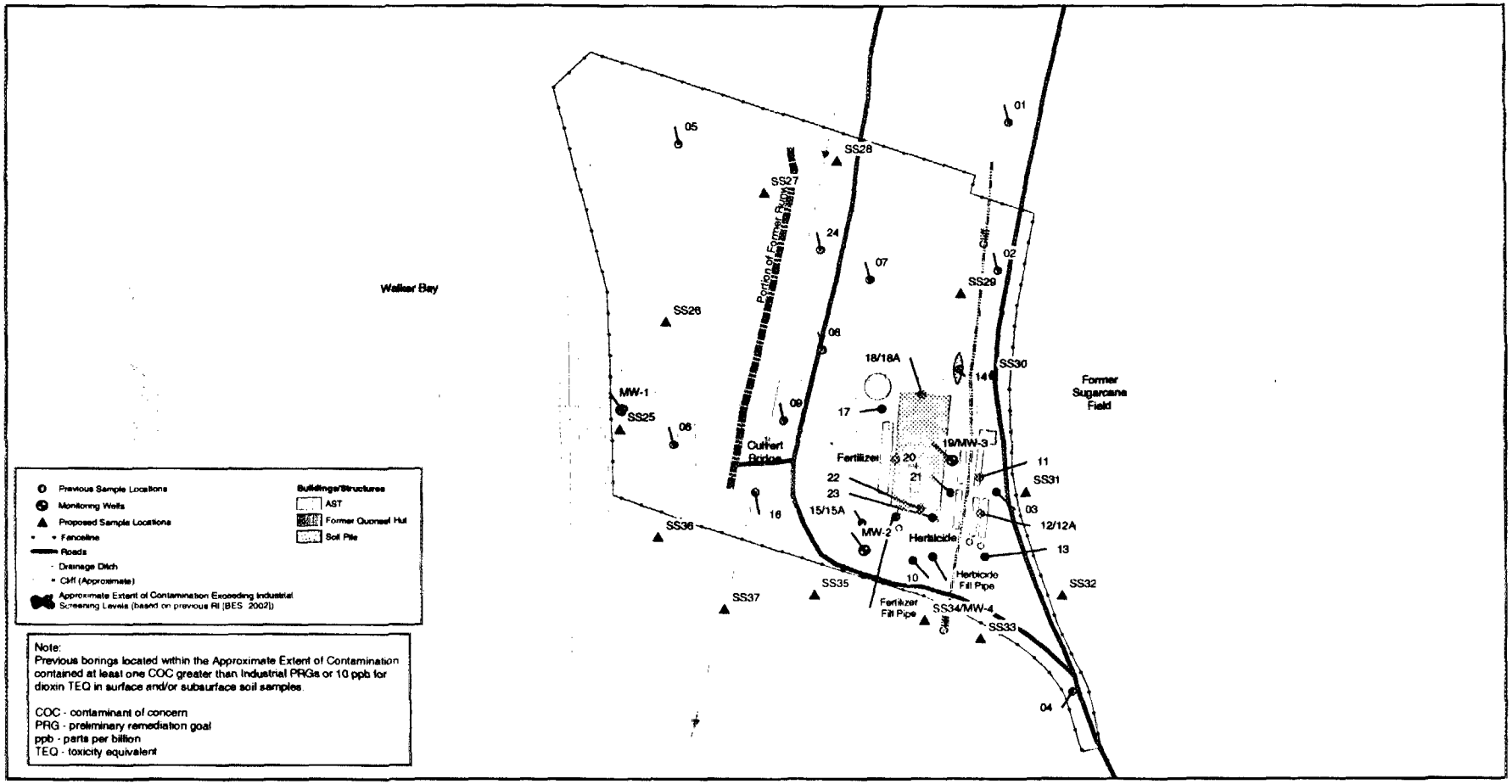


Figure 4
Proposed Sample Locations
Oahu Sugar Site, Waipio Peninsula
Waipahu, Oahu, Hawaii

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

March 28, 2005

Via Overnight Mail

Lisa Woods Munger, Esq.
Goodsill Anderson Quinn & Stifel
1099 Alakea Street, Suite 1800
Honolulu, HI 96813

Re: Oahu Sugar Company, LLC
Unilateral Administrative Order
USEPA Docket No. 9-2005-08

Dear Ms. Munger:

Enclosed is a Unilateral Administrative Order issued by the United States Environmental Protection Agency ("EPA") to the Oahu Sugar Company, LLC (OSCO), pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9606(a). The Order is sent to you as legal counsel for the Oahu Sugar Company, LLC.

As this Order indicates, EPA has determined that conditions at the site of the pesticide mixing plant formerly operated by OSCO on the Waipio Peninsula within the Pearl Harbor Naval Complex Superfund Site, in Honolulu, Hawaii (the "Site") constitute a threat to public health or welfare or the environment, and that the actions required by this Order are necessary to protect the public health or welfare or the environment. The Order requires that OSCO conduct a removal action at the Site involving characterization of the footprint of the dioxin contamination in surface soil and placement of an interim cap over the area of contamination at the Site.

As set for in the Order, the Order is effective upon your receipt, unless OSCO requests a conference with EPA within one (1) day of your receipt of the Order. If you have any legal inquiries or wish to schedule a conference with EPA on this matter, please contact Larry Bradfish at 415-972-3934. As appropriate, technical questions may be directed to Lewis Mitani at 415-972-3032.

Sincerely,

Kathleen H. Johnson

Kathleen H. Johnson
Chief, Federal Facility and Site Cleanup Branch
Superfund Division

Enclosures

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cc: Capt. Richard E. Cellon, DOD DON PACDIV NFEC
Keith Kawaoka, Hawaii DOH HEER
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