Department Management Manual

OFFICIAL POLICY/PROCEDURE

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TITLE: Imminent and/or Substantial Endangerment Policy, Procedure and Guidelines

Effective Date: July 14, 1993

Expiration Date: N/A

Supersedes: OPP #87-8, dated March 19, 1990 and OPP #86-20, dated April 28, 1988

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DISTRIBUTION:

[ ]	**Volume 1**	**Introduction**
[ ]	**Volume 2**	**Permits**
[X]	**Volume 3**	**Site Mitigation**
[ ]	**Volume 4**	**Surveillance & Enforcement**
[ ]	**Volume 5**	**Health & Safety**
[ ]	**Volume 6**	**Planning & Environmental Analysis**

DESCRIPTION:

Establishes policy and procedure and provides guidance on the use of the Department's Imminent and/or Substantial Endangerment (I/SE) Authority.

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APPROVED BY: William F. Soo Hoo

August 30, 1993
Date

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SM #93-1

1. PURPOSE

This document establishes policy and procedure and provides guidance to Department of Toxic Substances Control (Department or DTSC) staff on utilizing our Imminent and/or Substantial Endangerment (I/SE) Determination and Order and Remedial Action Order (RAO) and Consent Order (CO) authority. It also discusses statutory authority and identifies DTSC organizational roles and responsibilities.

2. BACKGROUND and OVERVIEW

Management Memo #89-5, "Site Cleanup Enforcement Policy," dated June 8, 1989) stressed the use of enforcement as the primary method to encourage/compel cleanup of hazardous substance release sites by Responsible Parties (RPs). I/SE authority is one of the enforcement mechanisms which can be used by the Department as a tool to achieve RP-funded site cleanups at those sites which the RPs fail or refuse to cleanup. I/SE authority can also be used to enable the Department to expend state funds.

Management Memo #89-5 signaled a new direction for enforcement policy. Official Policy and Procedure #90-7, "Site Mitigation Enforcement Case Management," dated November 17, 1990, expanded enforcement policy further by establishing a case management approach for developing an enforcement strategy at sites where RPs do not voluntarily enter into enforceable agreements to provide appropriate response actions. The Case Management Team consisting of the project manager, senior and attorney is responsible for evaluating the site, developing an enforcement strategy, and selecting the most effective enforcement options for a particular site.

The Department may exercise I/SE authority in several different ways under the statutes summarized below. In brief, the Department may issue an administrative I/SE order (hereafter referred to as an Order) requiring the RP(s) to remove or remediate a release. The Department may also expend State funds on a removal or remedial action or initiate a civil action against the RPs in court through the Attorney General (AG), if the Department first

determines that an I/SE may exist because of a release or threatened release of a hazardous substance. The Department will generally formalize its finding that an I/SE may exist by issuing an I/SE Determination (hereafter referred to as a Determination) prior to expending State funds or making a referral to the AG.

3. STATUTORY AUTHORITY

Health and Safety Code (H&SC) Section 25355.5 (b)(3) authorizes the Department to fund removal or remedial actions at a site which the Director has determined are necessary because there may be an "imminent and substantial" endangerment to the public health or welfare or to the environment. State funds may be used for removal or remedial actions, under H&SC Section 25355.5 (b)(3), without going through the RAO and Determination of Noncompliance (DNC) process required under H&SC Section 25355.5 (a).

H&SC Section 25358.3 (a)(1) authorizes the Director to issue Orders to any RP to take appropriate removal or remedial action at those sites which the Director has determined may pose an imminent or substantial endangerment. Failure to comply with a Section 25358.3 (a)(1) Order can result in liability for civil penalties up to $25,000 per day (H&SC Section 25359.2 and 25367(c)), as well as the assessment of damages up to three times the amount of any costs (e.g., cleanup costs, administrative costs, legal costs, etc.) incurred by the State (H&SC Section 25359).

H&SC Section 25358.3 (a)(2) authorizes the Director to take removal or remedial action at sites which the Director has determined may pose an imminent or substantial endangerment.

NOTE: H&SC Section 25358.3 (a)(2) is worded in terms of imminent or substantial endangerment. However, H&SC Section 25355.5 (b)(3), which authorizes the expenditure of State funds for removal/remedial actions without going through the RAO and DNC process, is worded in terms of "imminent and substantial endangerment." In order to

assure that no conflict arises under the two provisions, the Department will generally make a finding of imminent and substantial endangerment, where appropriate, prior to taking removal or remedial action under the authority of H&SC Section 25358.3 (a)(2).

H&SC Section 25358.3 (a)(3) authorizes the Department to request the AG to seek relief in Superior Court to abate an imminent or substantial endangerment.

NOTE: Referral of a case to the AG for injunctive relief must be preceded by the Department's determination that an I/SE may exist. Additionally, an I/SE Determination or Order should be issued prior to referring a case to the AG. When preparing a referral to the AG, a Project Manager, in consultation with the Case Management Team, must complete a Statement of Facts (issued in August 1991).

H&SC Section 25358.8 The Department shall submit a report to the Joint Legislative Budget Committee within five (5) days after determining that there may be an imminent or substantial endangerment to the public health or welfare or to the environments, if the Department expends state funds pursuant to the exemptions from state contracting and procurement requirements allowed by H&SC Sections 25358.5 and 25358.6. The court has authority to grant injunctive relief pursuant to Subdivisions(e),(f), and (g) of H&SC Section 25358.3.

(See OPP #90-7 for explanation of all enforcement tools available).

4. ADMINISTRATIVE PENALTIES

A new law, SB 2057, became effective on January 1, 1993. This new law specifies that persons must notify the Department when a hazardous substance release occurs or face a penalty of up to $25,000 per day. Liability under section 25359.4 (b) and (c) may be imposed in a civil action or imposed administratively. The Office of Legal Counsel is drafting an administrative penalty policy to

provide guidance in assessing penalties for violations of Remedial Action Orders (RAOs), I/SE Orders, and for releasing hazardous substances into the environment without notifying the Department. This draft has been made available to the Site Mitigation Branch Chiefs.

5. POLICY

The Department's primary objective in establishing this policy is to obtain the cooperation of RPs to cleanup the hazardous substance release sites for which they are responsible. The Department has determined that exercise of its I/SE authority administratively will generally be the most effective tool to encourage/compel RP cooperation. Therefore, the Department will issue an I and SE Determination and Order whenever RPs are uncooperative, unless circumstances indicate that another action would be more effective.

If currently available information appears insufficient to support the use of I/SE authority, the site information should be reexamined. If the site information shows that a possible I/SE condition does not exist, the site priority should be reevaluated. Staff should not be working on such sites, except in unusual situations. The only exception to this policy is for sites in the Department's Walk-In program. In such cases, the Department will be entering into agreements with parties who are not necessarily RPs for the oversight of their cleanup activities. Refer to the Department's revised Walk-In Policy for further information expected to be released in 1993. If the site information shows that a possible I/SE condition exists, but the information is inadequate to plan the full remedial action, the Removal Actions and Operable Units sections in the order should include specific interim removal actions, as well as the more general Remedial Investigation/Feasibility Study (RI/FS) and Remedial Action Plan (RAP) requirements for development of the full remedial action. Refer to Official Policy SM #92-1, "Oversight of Investigations and Removal and Remedial Actions at Hazardous Substance Sites," issued in August 1992.

6. PROCEDURE AND GUIDELINES

6.1 Definition of Terms

a. "IMMINENT" refers to the imminence of risk of harm, not actual harm, and may be proven by showing that a chain of events that may result in harm has been set in motion. For example, a release has resulted in a contaminated plume which may be moving toward an as yet uncontaminated drinking water aquifer and the contaminants may eventually cause health damage. An emergency does not need to exist for an endangerment to be imminent. Even after the Department has been working on a site for an extended period, the risk of harm may still be imminent. For example, the endangerment may still be "imminent" after completion of a lengthy remedial investigation, interim remedial actions, or unsuccessful negotiations with the RP(s).

b. "SUBSTANTIAL" requires a showing that there is a reasonable cause for concern that the public or the environment may be exposed to a risk of harm by a release or threatened release of a hazardous substance. "Substantial" does not require quantification of the risk (e.g., predictions of "excess" deaths). A number of factors (e.g., the nature of the hazardous substances present at the facility, the quantities present, the potential for human or environmental exposure) may be considered in determining whether an endangerment is "substantial," but in any given case one or two factors may determine the issue. Because hazardous substances are by definition capable of causing serious harm, a substantial endangerment may exist whenever the public or the environment may be exposed to hazardous substances as the result of a release or threatened release. For substances which are toxic at low concentrations or are known or suspected carcinogens, a substantial endangerment may arise when even small amounts are released or threatened to be released. Further, the health effects advanced in support of a finding need not be universally accepted to be considered. This is particularly applicable where limited research results are available, such as when

toxic effects have been found in lab animals, but there are no proven human health effects to date.

c. "ENDANGERMENT" means a threatened or potential harm, and does not require a showing of a present, actual harm.

d. "PUBLIC HEALTH" means the physical well-being of the inhabitants of the area.

e. "PUBLIC WELFARE" means health, safety, recreational, aesthetic, environmental, and economic interests.

f. "ENVIRONMENT" is broadly defined in CERCLA section 101(8) to include navigable waters, any surface water, groundwater, drinking water supply, land surface or subsurface strata, or ambient air.

g. The words "MAY BE" create a standard of proof that does not require certainty -- the evidence available to DTSC need not demonstrate that an imminent and/or substantial endangerment definitely exists. At the same time, a purely speculative showing is not adequate. A determination can be supported if there is a sound reason to believe that such an endangerment may exist. A finding of risk may be based on suspected but incompletely substantiated relationships between facts, trends, theoretical projections, and preliminary data (i.e., there does not have to be a definitively proven cause-effect relationship between the release or threatened release of hazardous substances and the potential adverse public health or environmental consequences).

h. A "NUISANCE" is "[a]nything which is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property, or unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake or river, bay, stream, canal, or basin or any public park, course, street or highway" (Civil Code section 3479).

i. A "PUBLIC NUISANCE" is a nuisance ". . . which affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal" (Civil Code section 3480).

6.2 Factors to Consider in Evaluating Endangerment

In evaluating the imminence and substantiality of the endangerment posed by contamination, the Department considers whether it presents an imminent and/or substantial endangerment of: 1) exposure; 2) migration that may result in air, soil, or water contamination by hazardous substances; or 3) fire or explosion. The questions listed below are intended as a guide for use in evaluating whether one or more of the above types of I/S endangerments may exist. Not all of the adverse conditions indicated by these questions need be present for a possible I/SE to exist.

6.2.1 I/SE of Exposure - To determine whether there is an imminent/substantial endangerment of exposure, consider the following:

a. Is access to the site restricted, unrestricted, or incompletely restricted?

b. Are there hazardous substances in surface impoundments, unsealed or improper containers, piles, leaking tanks, or landfills with an inadequate cover depth?

c. Have the substances been spilled on the ground or other surfaces accessible to humans or animals?

d. Is the level of toxicity of the hazardous substances at the site such that it poses a significant public health or environmental endangerment?

e. What is the most immediate endangerment of exposure that the human population is potentially faced with?

f. How many people live or work around the site and what is the distance of that population from the site?

g. Is there a confirmed instance in which human or animal exposure to hazardous substances at a site has caused injury, illness, or death to humans or domestic or wild animals?

6.2.2 **I/SE of Further Migration of the Hazardous Substances** - To determine whether an action is necessary to prevent or reduce the potential for the migration or further migration of the hazardous substances from a site, consider the following:

a. Can it be reasonably inferred from the geology and hydrology of the site and surrounding area and the nature of the contaminants that there is the potential for offsite migration?

b. Is there evidence of offsite migration?

c. Are there active wells in the suspected pathway of migration?

d. Is there a potential for the contaminant to become airborne?

e. Can a reasonable inference be made that taking an immediate action could significantly reduce continued or potential hazardous substance migration from the site through air emissions, surface water runoff, groundwater migration, or subsurface gas migration?

6.2.3 **I/SE of Fire or Explosion** - To determine whether there is an imminent/substantial endangerment of fire or explosion, consider the following:

a. Has a State Fire Marshal or local fire official determined that the site may present a fire or explosion endangerment or is it reasonable to conclude that there is a fire and explosion threat based on field observations?

b. Are there any observed subsurface gas concentrations within explosive limits?

c. Are there waste materials at a site which, because of their ignitability, reactivity, corrosivity, and/or incompatibility, pose an endangerment of fire or explosion or other chemical reaction?

d. Could there be a release of toxic gases or fumes resulting from a fire or explosion or other chemical reaction?

e. Does the proximity of the site to the nearest human or animal population pose an endangerment?

f. Does the proximity of the site to the nearest critical habitat or other sensitive environment pose an endangerment?

g. Do other conditions exist where fire or explosion or other chemical reaction could cause significant damage to public health or the environment?

6.3 Public Information and Participation

Public Participation (PP) and Education and Information (EI) staff will coordinate and assist in public information and participation activities associated with the issuance of any I/SE Order and/or Determination. PP and EI activities may vary and will be developed on a site-by-site basis.

6.4 Documentation

A finding that a hazardous substance release site may present an imminent and/or substantial endangerment to the public health or welfare or the environment is ultimately a matter of professional judgment; however, the facts underlying an I/SE finding must be documented by evidence that substantiates the Department's conclusion. Evidence may include anything that tends to prove the truth of the facts asserted. Evidence may include an expert opinion, but the facts on which an expert opinion is based are subject to examination and must be documented. The site

file must include copies of all relevant documents. The Department must be able to show that it has made a reasonable effort to gather all necessary information.

The following list of site information items and possible documentation is intended as a guide to the type of evidence that might support an I/SE finding. Appendices III and IV are findings of fact from two federal court cases which show the nature of the factual information courts cite in their decisions pertaining to application of federal I/SE laws. It is recognized that it will not always be reasonably possible to obtain all the indicated information; however, the key is to make a reasonable effort.

a. Potentially responsible parties: identity, nature and dates of their involvement with the site, and corporate and financial status. Determine financial viability to the extent practicable. Refer to OPP #90-7, "Site Mitigation Enforcement Case Management," dated November 1990, Statement of Facts Form, questions 8. a) through j), dated August 1991, and "Site Mitigation Enforcement Guidelines," dated March 1991. Examples of evidence: Tax assessor records, deeds, leases, mortgages, contracts, business and other permits, title search documents, generator and transporter records, corporate documents certified by the Secretary of State, financial documents, etc.

b. Site location. Examples of evidence: Area maps, legal description, aerial photographs, etc.

c. Site history. Examples of evidence: Historical corporate documents, business and other permits, historical site plans, investigative reports, interviews, etc.

d. Hazardous substance(s) suspected to currently be (or historically have been) present at the site, including estimated volumes and concentrations. Examples of evidence: Sample results, manifests and other generator and transporter records, receipts for

purchases and sales, business and other permits, regulatory agency inspection reports, etc.

e. The hazardous substance processing, storage, disposal, and other management practices used at the site. Examples of evidence: Business and other permits, regulatory agency inspection reports, historical photos and site plans, contracts, leases, etc.

f. The chemical and physical characteristics of the suspected/known contaminants, the health and environmental effects of each (including acute and chronic toxicity levels), and the established health-based cleanup criteria (if any) for each. Examples of evidence: Toxicological and hazardous substance reference documents, Appendix 4 of the 1989 Bond Expenditure Plan (Health Effects of Selected Hazardous Substances), etc.

g. Potential migration and exposure pathway(s) of each contaminant. Examples of evidence: Sampling results, well maps and logs, soil borings, United States Geological Service and Soil Conservation Service documents, site investigation reports, etc.

h. Number, type and location of potentially affected population. Examples of evidence: Interview records, census documents, utility department population served, records, etc.

i. Site and regional characteristics as they relate to exposure and migration potential (geological, hydrogeological, and air/wind information). Examples of evidence: Sampling results, well maps and logs, soil borings, United States Geological Service and Soil Conservation Service documents, site investigation reports, climatalogical reports, etc.

j. Onsite and offsite monitoring and sampling results (air, soil, surface water and groundwater) and reasonable inferences. Examples of evidence: Sampling reports, sampling maps, Quality

Assurance/Quality Control (QA/QC) procedures, sampling program description and specifications, etc.

k. Surrounding land use; in particular, water uses. Examples of evidence: Regulatory agency inspection reports, site investigation reports, etc.

l. Other potential contamination sources in the surrounding area. Examples of evidence: Regulatory agency inspection reports, site investigation reports, etc.

m. Status of regulatory, enforcement, and remediation efforts at the site. Examples of evidence: Regulatory agency records, etc.

n. A specific showing that a release or threatened release of hazardous substance(s) has occurred at or from the site. Examples of evidence: Regulatory agency inspection reports, site investigation documents, e.g., Preliminary Endangerment Assessments, etc.

o. A specific showing that the requested action is necessary to abate the declared I/SE. Examples of evidence: RI/FS documents (if available), United States Environmental Protection Agency (U.S. EPA) regulations and guidance documents, etc.

6.5 Compliance with the California Environmental Quality Act (CEQA)

In most cases, a finding of I/SE will not constitute an emergency for purposes of exempting site cleanup activities from CEQA requirements under Section 21080(b)(4) of the Public Resources Code (PRC). (See the definition of "emergency" in PRC Section 21060.3.) The issuance of the I/SE Order, however, is exempt from CEQA requirements as an "enforcement action by regulatory agencies" (Title 14, California Code of Regulations (CCR), section 15321). Additionally, site investigation activities and preparation of a feasibility study would also typically be exempt from CEQA (under Title 14, CCR, sections 15306 and 15262, respectively). In general, however, the actual site

removal and/or remedial action will require compliance with CEQA requirements - preparation of an Initial Study and a Negative Declaration or Environmental Impact Report (typically as part of the approval process for the RAP and/or Remedial Design).

6.6 Routing Procedures and Signature Authority for I/SE Orders and Determinations

All I/SE Orders and Determinations must be accompanied by, and routed for sign-off in accordance with, an Imminent and/or Substantial Endangerment Sign-Off Sheet (Appendix I). Signature authority has been delegated to specific Branch Chiefs; however, on a site-specific basis, either the Deputy Director or Director may elect to sign.

7. ROLES AND RESPONSIBILITIES

7.1 Site Mitigation Planning and Management Branch

Health and Safety Code Section 25358.8 requires that the Department report to the Joint Legislative Budget Committee whenever the Department expends State funds pursuant to the exemptions from the State contracting and procurement procedures allowed under Health and Safety Code Sections 25358.5 and/or 25358.6. These exemptions apply to removal or remedial actions taken or contracted for pursuant to Health and Safety Code Section 25354 or 25358.3. The report must be made within five days after the Department: (a) has determined that there is an emergency pursuant to Health and Safety Code Section 25354, or (b) issues an I and SE Order/Determination or Determination pursuant to Health and Safety Code Sections 25355.5 (b)(3) and 25358.3 (a).

7.2 Office of Legal Counsel (OLC)

All I/SE Orders and Determinations must be reviewed and signed off on by the Office of Legal Counsel (OLC). (See Appendix I).

7.3 Regional Operations

Specific Regional Branch Chiefs have been delegated signature authority for all I/SE Orders and Determinations.

Regional Offices are responsible for concurrently routing copies of the signed Order/Determination or Determination to the Department's OLC, and Site Mitigation Program's Planning and Policy Unit.

Additionally, Branch Chiefs are responsible for informing the Planning and Policy Unit when it expends funds pursuant to the exemptions from the State contracting and procurement procedures allowed under Health and Safety Code Sections 25358.5 and/or 25358.6.

IMMINENT AND/OR SUBSTANTIAL ENDANGERMENT
SIGN-OFF SHEET

_____
Site Name

_____ Project Manager	_____ Date
_____ Senior Specialist/Engineer	_____ Date
_____ Office of Legal Counsel	_____ Date
_____ Site Mitigation Branch Chief	_____ Date
_____ Deputy Director/Director	_____ Date

(signature authority has been delegated to specific Branch Chiefs; however on a site-specific basis either the Deputy Director or Director may elect to sign)

Remarks: _____

_____

_____

_____

_____

INDEX OF SITE MITIGATION ENFORCEMENT (SME) FORMS

SME Form 01	Cover Letter to Responsible Party and SB 2056 Fact Sheet (Appendix IIA)
SME Form 02	Proof of Service (Appendix IIB)
SME Form 03	Model Order: Imminent and Substantial Endangerment Determination and Order - HSC Sections 25358.3(a) and 25355.5(b)(3) (Appendix IIC)
SME Form 04	Model Determination: Imminent and Substantial Endangerment Determination - HSC Sections 25355.5(b)(3) and 25358.3(a) (Appendix IID)

[*Name and Address of RP(s)*]

[*Certified Mail Receipt #*]

Dear Sir:

Re: [*Site Name*]

The Department of Toxic Substances Control has issued the enclosed *[Select either (a) Imminent and Substantial Endangerment Determination and Order or (b) Imminent or Substantial Endangerment Determination and Order and Remedial Action Order]* to you as a person responsible for cleaning up a release of hazardous substances at the site named above.

Please note that you may be liable for substantial penalties and punitive damages if you do not comply with the Order. You may also be subject to Security Exchange Commission (SEC) reporting requirements as a responsible party to whom an [*Select either (a) Imminent and Substantial Endangerment Determination and Order or (b) Imminent or Substantial Endangerment Determination and Order and Remedial Action Order]* has been issued. *[Guidance: This language has been added to the cover letter as a potential enforcement tool that a Project Manager may use where a I/SE Order has been issued and a noncomplying RP meets the conditions that trigger SEC reporting requirements. The primary purpose of the SEC reporting laws is to provide investors with necessary and accurate information. The Site Mitigation Program, in consultation with the Office of Legal Counsel, will ordinarily notify the SEC whenever a corporation subject to the SEC's reporting requirements is a responsible party to whom an I/SE Order has been issued (refer to Management Memo #91-10, Securities and Exchange Commission Notification)].*

This site may be listed pursuant to Health and Safety Code Section 25356. Pursuant to Section 25355 (d), the Department is required to notify the owners of the site property by certified mail within 30 days after listing a site pursuant to Section 25356, and at least 30 days before initiating a removal or remedial action. Notification is not required for actions taken pursuant to Section 25358.3 (b), or immediate corrective actions taken pursuant to Section 25354. *[Guidance: Sites listed pursuant to Section 25356 are designated as Annual Workplan (AWP) sites on the Department's CalSites database. The Project Manager can ensure that proper notification occurs by routinely sending a copy of this cover letter by certified mail to the property owner.*

If the owners of the site property are not RPs, they should be shown on the letter as receiving a carbon copy "cc"].

Pursuant to Section [*6.1*] of the Order, you are required to notify the Department in writing with the name, address, and telephone number of your Project Coordinator within *[10]* days of the effective date of this *[Select either (a) Imminent and Substantial Endangerment Determination and Order or (b) Imminent or Substantial Endangerment Determination and Order and Remedial Action Order]*. Respondent(s) failure to notify the Department pursuant to Section [*6.1*] will be construed as noncompliance with this Order. If you wish to discuss the Order, please contact [*Name of Contact*] at [*Phone Number of Contact*].

On January 1, 1993, a new law (Senate Bill 2056) became effective. This law provides incentives for cooperative responsible parties who have been issued an I/SE Order to pursue treble damages from noncooperative responsible parties. Refer to the enclosed Fact Sheet on Senate Bill 2056, "Financial Incentives to Clean Up Hazardous Substance Sites" for further details.

Sincerely,

[Name of Authorized Branch Chief]
Chief, Regional Operations
[Number of Region]
Site Mitigation Program

Enclosures
[*SB 2056 Fact Sheet*]

cc: Site Mitigation Program
Planning and Policy Unit

Office of Legal Counsel

[*Property Owner*]

California Environmental Protection Agency
Department of Toxic Substances Control
Site Mitigation Program

FACT SHEET

FINANCIAL INCENTIVES TO CLEAN UP HAZARDOUS SUBSTANCE SITES

New Legislation Passes

Senate Bill 2056, effective January 1, 1993, provides an incentive for all responsible parties (RPs) who either have entered an agreement or been named in an order requiring site cleanup to comply with the agreement or order. It does this by providing that RPs who either have entered into an agreement with or been issued an Order by the Department of Toxic Substances Control (Department), and who are in compliance, may pursue treble damages from RPs who do not comply.

Prior to passage of this new law, if one or more RPs complied with a cleanup order or entered with an agreement to respond to site contamination, there was no provision in state law to encourage remaining RPs to participate in the site remediation. They could simply stand by until such time as the complying RPs pursued contribution by filing a lawsuit. The potential that treble damages may be imposed provides an incentive for all named RPs to comply from the outset. Thus, SB 2056 has established a clear financial incentive to clean up hazardous substance release sites.

What Are The Major Elements Of The Bill?

These are the major elements of SB 2056:

1) Adds Health and Safety Code (H&SC) section 25359.3:

- RPs who have entered into an agreement with the Department or who are complying with an order issued by the Department and who are in compliance with that agreement or order, may seek treble damages from any noncomplying RP.
- RPs may not be assessed treble damages if a court determines that the RPs had sufficient cause for not complying with an order or agreement or is an innocent land owner or where the principles of "fundamental fairness" will be violated (as determined by a court).
- RPs seeking treble damages must show that the noncomplying RP was provided notice of the order/agreement by means of personal service or certified mail.
- One-half of any treble damages will be directed to future site cleanups overseen by the Department.
- Noncomplying RPs shall be deemed to have acted willfully with respect to their liability for purposes of the Insurance Code, so that their insurance companies will not be liable for treble damages.

2) Amends H&SC section 25363:

- Any person who has incurred removal/remedial action costs in accordance with this chapter or the federal act may seek contribution or indemnity from any person who is liable pursuant to this chapter, except that no claim may be asserted against a RP whose liability has been determined and which has been or is being fully discharged pursuant to H&SC section 25356.6 or is actively participating in an apportionment proceeding.

- Any person who seeks contribution or indemnity shall give written notice to the Director of the Department of Toxic Substances Control upon filing an action or cross complaint.

3) Amends H&SC section 25360:

- The amount of cost determined pursuant to this section shall be recoverable at the discretion of the Department, either in a separate action or by way of intervention as of right in an action for contribution or indemnity.

4) Amends H&SC section 25359 to be consistent with damages terminology:

- Establishes liability for treble damages for a person who fails to provide a removal/remedial action pursuant to an order issued under H&SC section 25358.3.

- Treble damages equal three times the amount of the defendant's contribution share.

- No treble damages shall be assessed to an innocent property owner.

What Procedures Do Qualifying RPs Have To Follow?

- RPs must notify the Director of the Department in writing that they are seeking contribution or indemnity pursuant to H&SC section 25359.3(a). The Department requests that this notification include a copy of the lawsuit and a copy of the order or agreement.

- The RP seeking treble damages must show that the contribution defendant received the order or agreement by personal service or certified mail.

What Is The Department's Role?

The Department will follow its standard policies and procedures for overseeing and supervising the investigation and removal/remedial actions taken at hazardous substance release sites, as required by H&SC section 25355.7 (Assembly Bill 189). (See Policy and Procedure #EO-92-002-PP (formerly SM #92-1), effective July 1, 1992).

- Beginning in January 1993, the Department's Project Managers will send copies of this Fact Sheet to all identified RPs at sites where Orders have already been issued.

- The Department will continue to send all Orders and agreements to RPs by certified mail and document such in order to meet the notice requirement of H&SC section 25359.3(a).

- As determined by the Department, the Department's Project Managers will amend Orders or issue Orders when new RPs are identified.

- This Fact Sheet will be enclosed with the Department's cover letter for all Orders.

- Regional Site Mitigation Offices will have copies of this Fact Sheet available for any interested party.

PROOF OF SERVICE

1. I served the following documents:

   a. _____
   _____
   _____
   _____

   b. On (Name): _____
   _____

   c. By serving: _____ Responsible Party

   _____ Other (Name and Title):
   _____
   _____

2. a. _____ By personally delivering copies to (address)
   _____
   _____

   at (time) _____ on (date)_____.

   b. _____ By mailing copies by first-class certified mail, Certified Mail Receipt No._____, return receipt requested, in a sealed envelope addressed to:

3. My name, business address, and telephone number are:
   _____
   _____
   _____
   _____

I declare under penalty of perjury that the foregoing is true and correct and that this declaration is executed on (date) _____ at (place) _____, California.

_____
(Signature)

STATE OF CALIFORNIA
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

In the Matter of:	)	Docket No. _____
	)	
[*Site Name and Address*]	)	IMMINENT AND SUBSTANTIAL
	)	ENDANGERMENT
	)	DETERMINATION AND CONSENT ORDER
Respondents:	)	
[*Name and address of each Respondent*]	)	Health and Safety Code
	)	Sections 25355.5(a)(1)(B) and (C),
_____	)	25358.3(a), 58009 and 58010

I. INTRODUCTION

1.1 Parties. The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) and [***Name of entity or individual, and business status of each Respondent, e.g., an individual; a California corporation; limited liability company; a Delaware corporation doing business in California; an individual doing business as . . ., etc.***] (Respondent(s)) hereby enter into this Consent Order (Order) and agree to its terms and conditions. DTSC and Respondent(s) are referred to collectively herein as the Parties.

1.2 Property/Site. This Order applies to the property located at [***Property Address, City, County***], California [***Zip Code***]. [***Alternate language for use if the property does not have an address and is identified by intersections or other descriptive phrases: "The Property consists of (narrative description of Site).***] The property consists of ____ acres and is identified by Assessor's Parcel number(s) _____. A map showing the Property is attached as Exhibit A. This Order applies to the property and the areal extent of contamination that resulted from activities on the property (hereinafter, the "Site").

1.3 Permitting Status. [***This section is to be used "only if applicable".***] Respondent(s) is the [***owner and/or operator***] of a hazardous waste facility located at [***address***] (Facility). The Facility ***[engages or engaged]*** in the management of hazardous waste pursuant to a [***permit or interim status document***] issued by [***DTSC, the Department of Health Services, which was DTSC's predecessor agency, or the United States Environmental Protection Agency (USEPA)***] on [***date***].

1.4 Jurisdiction. This Order is entered into by the parties pursuant to Health and Safety Code sections 25358.3(a) and 25355.5(a)(1)(B) and (C).

Health and Safety Code section 25358.3(a) authorizes DTSC to take various actions, including issuance of an Imminent or Substantial Endangerment Determination and Order, when DTSC determines that there may be an imminent or substantial endangerment to the public health or welfare or to the environment, because of a release or a threatened release of a hazardous substance.

Health and Safety Code section 25355.5(a)(1)(B) authorizes DTSC to issue an order establishing a schedule for removing or remedying a release of a hazardous substance at a site, or for correcting the conditions that threaten the release of a hazardous substance. The order may include, but is not limited to requiring specific dates by which the nature and extent of a release shall be determined and the site adequately characterized, a remedial action plan prepared and submitted to DTSC for approval, and a removal or remedial action completed.

Health and Safety Code section 25355.5(a)(1)(C) authorizes DTSC to enter into an enforceable agreement with a responsible party for the site which requires the party to take necessary corrective action to remove the threat of the release, or to determine the nature and extent of the release and adequately characterize the site, prepare a remedial action plan, and complete the necessary removal or remedial actions, as required in the approved remedial action plan.

Health and Safety Code section 58009 authorizes DTSC to commence and maintain all proper and necessary actions and proceedings to enforce its rules and regulations; to enjoin and abate nuisances related to matters within its jurisdiction which are dangerous to health; to compel the performance of any act specifically enjoined upon any person, officer, or board, by any law of this state relating to matters within its jurisdiction; and/or on matters within its jurisdiction, to protect and preserve the public health.

Health and Safety Code section 58010 authorizes DTSC to abate public nuisances related to matters within its jurisdiction.

II. FINDINGS OF FACT

DTSC hereby finds:

2.1 Liability of Respondent(s). Respondent(s) is a responsible party or liable person as defined in Health and Safety Code section 25323.5. [***For each Respondent, state the facts establishing liability, such as present or prior owners, lessees, or operators of the property where the hazardous substance is located, generators, or transporters of the hazardous substances at the Site. For example, a typical statement would be:***

"Joe Smith currently owns the Property and has owned the Property since _____."]

2.2 Physical Description of Site. [***Describe the physical features of the property, and the Site to the extent the areal extent of contamination has been determined, relevant to the need for response action. (Use separate subsections numbered 2.2.1, 2.2.2, etc., as needed). This section is optional if the Site's endangerment is adequately substantiated by either the "Site History" section or "Hazardous Substances Found at the Site" section or both. This section is used when there is some real physical attribute of the Site that relates to the endangerment such as: a fence that is not maintained and allows access to the Site***].

2.3 Site History. [***Describe the major developments in the historical use of the Site that are relevant to the need for response action. This information may be included under the "Liability of Respondent", section 2.1, if appropriate, rather than including a separate section on "Site History." (Use separate sections numbered 2.3.1, 2.3.2, etc., as needed)***]

2.4 Hazardous Substances Found at the Site. [***Identify and describe the amounts, levels, and locations of hazardous substances found at the Site. Describe any investigations, conducted by DTSC or other parties and the dates of those investigations, and any sampling results from those investigations. Attach sampling data as exhibits, if appropriate. Describe how each contaminant meets the definition of "hazardous substance set forth in HSC §25316." Use separate subsections numbered 2.4.1, 2.4.2, etc., as needed.***]

2.5 Health Effects. [***Describe the health effects of each hazardous substance found at the Site (At this time, the Merck Index, 11th edition, 1989, as amended appears to be the best source). Use separate subsections numbered 2.5.1, 2.5.2, etc., as needed***]

2.6 Routes of Exposure. [***Describe the potential routes of exposure. It is appropriate to include the biota that are impacted. (Use separate subsections numbered 2.6.1, 2.6.2, etc., as needed)***]

2.7 Public Health and/or Environmental Risk. [***Describe the threat to public health and/or the environment. Give specific information regarding direct human contact or exposure and/or direct exposure of endangered/threatened species or threatened environment; include estimated numbers and specific locations***]

III. CONCLUSIONS OF LAW

3.1 Respondent(s), is a responsible party as defined by Health and Safety Code section 25323.5.

3.2 Each of the substances listed in Section 2.4 is a "hazardous substance" as defined in Health and Safety Code section 25316.

3.3 There has been a "release" and/or there is a "threatened release" of a hazardous substances listed in Section 2.4 at the Site, as defined in Health and Safety Code section 25320.

3.4 The actual and threatened release of hazardous substances at the Site may present an imminent and substantial endangerment to the public health or welfare or to the environment.

3.5 Response action is necessary to abate a public nuisance and/or to protect and preserve the public health.

IV. DETERMINATION

4.1 Based on the foregoing findings of fact and conclusions of law, DTSC hereby determines that response action is necessary at the Site because there has been a release and/or there is a threatened release of a hazardous substance.

4.2 Based on the foregoing findings of fact and conclusions of law, DTSC hereby determines that there may be an imminent and/or substantial endangerment to the public health or welfare or to the environment because of the release and/or the threatened release of the hazardous substances at the Site.

V. CONSENT ORDER

Based on the foregoing, IT IS HEREBY AGREED AND ORDERED THAT Respondent(s) conduct the following response actions in the manner specified herein, and in accordance with a schedule specified by DTSC as follows:

5.1 All response actions taken pursuant to this order shall be consistent with the requirements of Chapter 6.8 (commencing with section 25300), Division 20 of the Health and Safety Code and any other applicable state or federal statutes and regulations.

5.1.1 Site Remediation Strategy. ***(Optional Section)*** The purpose of this Order is to require for the Site: implementation of any appropriate removal actions, completion of a Remedial Investigation/Feasibility Study (RI/FS), preparation of a Remedial Action Plan (RAP), preparation of California Environmental Quality Act (CEQA) documents, and Design and Implementation of the remedial actions approved in the RAP. An overall Site investigation and remediation strategy shall be developed by the Respondent(s) in conjunction with the DTSC which reflects program goals, objectives, and requirements. Current knowledge of the Site contamination sources, exposure pathways, and receptors shall be used in developing this strategy.

An objective of the Site investigations shall be to identify immediate or potential risks to public health and the environment and prioritize and implement response actions using removal actions and operable units, if appropriate, based on the relative risks at the Site. Respondent(s) and DTSC shall develop and possibly modify Site priorities throughout the course of the investigations. If necessary for the protection of public health and the environment, DTSC will

require additional response actions not specified in the Order to be performed as removal actions or separate operable units. Removal actions shall be implemented in accordance with a workplan and implementation schedule submitted by Respondent(s) and approved by DTSC.

For operable unit remedial actions, DTSC will specify the separate and focused remedial phase activities to be conducted as RI/FS, RAP, Design, and Implementation. The focused activities shall be conducted in accordance with the corresponding remedial phase requirements specified in the Order, but shall only address the area or problem of the operable unit.

5.1.2 Remedial Action Objectives. ***(Optional Section)*** Based on available information, DTSC has preliminarily determined that the remedial action objectives for the Site shall include:

[***This section should include important objectives and legal requirements and other promulgated standards which the DTSC is certain will be relevant for the Site. To the extent possible, the Project Manager should define specific objectives for each environmental medium, for example:***

> ***(a) Existing and potential beneficial uses of groundwater shall be protected. The Regional Water Quality Control Board Basin Plan identifies public water supply as a beneficial use of this aquifer. Therefore, drinking water standards or more conservative values determined by a Risk Assessment shall be remedial action objectives for this Site.***
>
> ***(b) The reasonably forseeable future land use of the Site is residential. Therefore, remedial action objectives for contaminated media shall be developed which are protective of adults and children in a residential exposure scenario***].

5.1.3 Removal Actions. Respondent(s) shall undertake removal actions if, during the course of the RI or FS, DTSC determines that they are necessary to mitigate the release of hazardous substances at or emanating from the Site. DTSC may require Respondent(s) to submit a removal action workplan that includes a schedule for implementing the workplan for DTSC's approval. Either DTSC or Respondent(s) may identify the need for removal actions. Respondent(s) shall implement the following removal actions. ***(Optional - Guidance: add specific directions on workplans to be submitted.)***Workplans for implementing the following removal actions shall be submitted by the specified dates:

[***The NCP lists removal actions to consider [Section 300.415(d)***].

(a) Fence and Post. [***Most Sites should be fenced and posted. OPP #89-1, Draft #2 provides guidance on issuing Fence and Post Orders and is relevant to the Fence and Post section of this Order. Exhibit 4 of OPP 89-1, Draft 2 has alternative specifications for fencing, and Exhibit 5 has specifications for warning signs.***]

1) Within [***30-60***] days of the effective date of this Order, Respondent(s) shall install

a fence in accordance with the specifications attached as Exhibit _. The fence shall secure, at a minimum, the areas specified on the Site map (Exhibit _).

2) Within [*30-60*] days of the effective date of this Order, Respondent(s) shall install signs which are visible from the area surrounding the contaminated Site and posted at each route of entry into the Site, including those routes likely to be used by unauthorized persons. Such routes of entry include: access roads leading to the Site, and facing rivers, creeks, lakes or other waterways which may provide a route of access to the Site. The signs shall be in accordance with the specifications attached as Exhibit __.

3) The fence and signs shall be constructed of materials able to withstand the elements and shall be continuously maintained for as long as DTSC determines it to be necessary in order to protect public health and safety and the environment.

(b) Drainage Control.

(c) Stabilization of Structures.

(d) Interim Capping. The following areas shall be capped with impermeable materials to limit direct human contact with contaminated soil and limit infiltration of rainwater.

(e) Chemical Stabilization. [***This Section describes the required use of chemicals or other materials that would reduce the spread of the release. Examples include a polymer coating to stop dust migration and stabilization chemicals to stop the migration of the chemical from soil to groundwater. These actions may be an alternative to capping***].

(f) Contaminated Soil Removal.

(g) Containerized Waste Removal.

(h) Alternative Water Supply.

(i) Interim Groundwater Extraction.

5.1.4 Operable Units. ***(Optional Section)*** [***Guidance: Operable units are defined in the NCP and may be identified based on the priority of remedial actions at the Site or because of the different time schedules for the RI/FS for different media. At the outset, it is appropriate to consider whether certain areas of the Site representing the most significant threat should be put on an expedited schedule. Dividing a site into separate operable units is action oriented, fosters earlier implementation of priority removal actions, and focuses investigation activities on solvable problems. Later in the RI/FS process, it may be apparent that remedial action on one or more elements of the Site can proceed while the RI/FS process***

***continues on other elements. For example, a RAP on soils can proceed while RI/FS continues on groundwater. A focused RI/FS is an abbreviated version of a RI/FS which focuses generally on one medium (air, water, or soil) and/or one area of a site. For example, with a groundwater problem, groundwater sampling and monitoring, as well as treatability studies would generally be conducted as a focused RI/FS before performing a groundwater cleanup action. The results of a focused RI/FS are used to evaluate whether and what type of removal action is needed*].** Respondent(s) shall conduct separate and focused RI/FS investigations and subsequent response actions for the following operable units in accordance with the schedules contained within this Order.

5.1.5 Groundwater Monitoring. ***(Optional Section).*** Respondent(s) shall immediately [***begin or continue***] interim groundwater monitoring in accordance with DTSC's letter [***or other directive; include date of letter and attach as an Exhibit***] attached as Exhibit __. Groundwater level measurements shall be conducted monthly, commencing [***e.g. the first Monday of a specified month***]. Groundwater sampling shall be conducted on a quarterly basis commencing [***insert time***]. Subsequent monitoring shall be conducted until DTSC determines it is appropriate to terminate monitoring.

5.1.6 Surface Water Monitoring. ***(Optional Section)*** Respondent(s) shall immediately [***begin or continue***] interim monitoring of [***name of stream***] in accordance with the DTSC's letter [***or other directive; include date of letter and attach as an exhibit***] attached as Exhibit ___. Stream level measurements shall be conducted monthly, commencing [***e.g., the first Monday of a specified month***]. Stream sampling shall be conducted on a quarterly basis commencing [***e.g., the first week of a specified month***]. Subsequent monitoring shall be conducted until the DTSC determines it is appropriate to terminate sampling.

[*Note:* ***The Order contains optional sections on Groundwater and Surface Water Monitoring. The Project Manager may want to add Air Monitoring as a separate section***].

5.1.7 Site Remediation Strategy Meeting. ***(Optional Section)*** Respondent(s), including the Project Coordinator (Section 6.1) and Project Engineer/Geologist (Section 6.2), shall meet with the DTSC within [20] days from the effective date (and concurrent with the development of the RI/FS workplan) of this Order to discuss the Site remediation strategy. These discussions will include Site risks and priorities; project planning, phasing and scheduling, remedial action objectives, remedial technologies, data quality objectives, and the RI/FS workplan. Results of the discussions will be included in the Scoping Document, Section 5.2.2(b) of this Order.

5.2 Remedial Investigation/Feasibility Study (RI/FS). A RI/FS shall be conducted for the Site. The RI/FS may be performed as a series of focused RI/FSs, if appropriate, based on Site priorities [***refer to Section 5.1.4, Operable Units***]. The RI/FS shall be prepared consistent with the U.S. Environmental Protection Agency's "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," October 1988. The purpose of the RI/FS is to assess Site conditions and to evaluate alternatives to the extent necessary to select a remedy appropriate for the Site. RI and FS activities shall be conducted concurrently and iteratively so

that the investigations can be completed expeditiously. Because of the unknown nature of the Site and iterative nature of the RI/FS, additional data requirements and analyses may be identified throughout the process. Respondent(s) shall fulfill additional data and analysis needs identified by DTSC; these additional data and analysis requests will be consistent with the general scope and objectives of the Order.

The following elements of the RI/FS process and those defined by DTSC in Section 5.1.4 of this Order shall be preliminarily defined in the initial Site scoping and refined and modified as additional information is gathered throughout the RI/FS process.

(a) Conceptual Site Model identifying contamination sources, exposure pathways, and receptors;

(b) Federal, State and local remedial action objectives including applicable or relevant and appropriate requirements (ARARs);

(c) Project phasing including the identification of removal actions and operable units;

(d) General response actions and associated remedial technology types; and

(e) The need for treatability studies.

5.2.1 RI/FS Objectives. The objectives of the RI/FS are to:

(a) Determine the nature and full extent of hazardous substance contamination of air, soil, surface water and groundwater at the Site;

(b) Identify all actual and potential exposure pathways and routes through environmental media;

(c) Determine the magnitude and probability of actual or potential harm to public health, safety or welfare or to the environment posed by the threatened or actual release of hazardous substances at or from the Site;

(d) Identify and evaluate appropriate response actions to prevent or minimize future releases and mitigate any releases which have already occurred; and

(e) Collect and evaluate the information necessary to prepare a RAP.

5.2.2 RI/FS Workplan. Within [30] days from the effective date of the Order, Respondent(s) shall prepare and submit to DTSC for review and approval a detailed RI/FS Workplan and implementation schedule which covers all the activities necessary to conduct a complete RI/FS of the Site.

The RI/FS Workplan shall include a detailed description of the tasks to be performed, information or data needed for each task, and the deliverables which will be submitted to DTSC. Either Respondent(s) or DTSC may identify the need for additional work.

These RI/FS Workplan deliverables are discussed in the remainder of this Section, with a schedule for implementation, and monthly reports. The RI/FS Workplan shall include all the sections and address each component listed below.

(a) Project Management Plan. The Project Management Plan shall define relationships and responsibilities for major tasks and project management items by Respondent(s), its contractors, subcontractors, and consultants. The plan shall include an organization chart with the names and titles of key personnel and a description of their individual responsibilities.

(b) Scoping Document. [***Guidance: Much of the information required by Section 5.2.2(b) (Scoping Document) should have been collected during the PEA and is needed to develop the site strategy. Only information that is not available or updates existing information should be requested by the Order. Additionally, the Project Manager, in consultation with the remainder of the Case Management Team, and consistent with the site strategy, may modify the boilerplate, to require several focused RI/FSs instead of one overall RI/FS. Consequently, some aspects of the overall RI/FS Workplan may not be appropriate for a specific focused RI/FS. Finally, as data is gathered, the Project Manager needs to identify data gaps and request additional data collection to fill specific gaps.***] The Scoping Document shall incorporate program goals, program management principles, and expectations contained in the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Part 300), as amended. It shall include:

(1) An analysis and summary of the Site background and the physical setting. At a minimum, the following information is required:

(A) A map of the Site, and if they exist, aerial photographs and blueprints showing buildings and structures;

(B) A description of past disposal practices;

(C) A list of all hazardous substances which were disposed, discharged, spilled, treated, stored, transferred, transported, handled or used at the Site, and a description of their estimated volumes, concentrations, and characteristics; and

(D) A description of the characteristics of the hazardous substances at the Site; and

(E) If applicable, a description of all current and past manufacturing processes which are or were related to each hazardous substance.

(2) An analysis and summary of previous response actions including a summary of all existing data including air, soil, surface water, and groundwater data and the Quality Assurance/Quality Control (QA/QC) procedures which were followed;

(3) Presentation of the Conceptual Site Model;

(4) The scope and objectives of RI/FS activities; and

(5) Preliminary identification of possible response actions and the data needed for the evaluation of alternatives. Removal actions shall be proposed if needed based on the initial evaluation of threats to public health and the environment. If remedial actions involving treatment can be identified, treatability studies shall be conducted during the characterization phase, unless Respondent(s) and DTSC agree that such studies are unnecessary as set forth in Section 5.4;

(6) If applicable, initial presentation of the Site Remediation Strategy.

(c) Field Sampling Plan. The Field Sampling Plan shall include:

(1) Sampling objectives, including a brief description of data gaps and how the field sampling plan will address these gaps;

(2) Sample locations, including a map showing these locations, and proposed frequency;

(3) Sample designation or numbering system;

(4) Detailed specification of sampling equipment and procedures;

(5) Sample handling and analysis including preservation methods, shipping requirements and holding times; and

(6) Management plan for wastes generated.

(d) Quality Assurance Project Plan. The plan shall include:

(1) Project organization and responsibilities with respect to sampling and analysis;

(2) Quality assurance objectives for measurement including accuracy, precision, and method detection limits. In selecting analytical methods, the Respondent(s) shall consider obtaining detection limits at or below potential ARARs, such as Maximum Contaminant Levels (MCLs) or Maximum Contaminant Level Goals (MCLGs);

(3) Sampling procedures;

(4) Sample custody procedures and documentation;

(5) Field and laboratory calibration procedures;

(6) Analytical procedures;

(7) Laboratory to be used certified pursuant to Health and Safety Code section 25198;

(8) Specific routine procedures used to assess data (precision, accuracy and completeness) and response actions;

(9) Reporting procedure for measurement of system performance and data quality;

(10) Data management, data reduction, validation and reporting. Information shall be accessible to downloading into DTSC's system; and

(11) Internal quality control.

(e) Health and Safety Plan. A site-specific Health and Safety Plan shall be prepared in accordance with federal (29 CFR 1910.120) and state (Title 8 CCR Section 5192) regulations and shall describe the following:

(1) Field activities including work tasks, objectives, and personnel requirements and a description of hazardous substances on the Site;

(2) Respondent(s) key personnel and responsibilities;

(3) Potential hazards to workers including chemical hazards, physical hazards, confined spaces and climatic conditions;

(4) Potential risks arising from the work being performed including the impact to workers, the community and the environment;

(5) Exposure monitoring plan;

(6) Personal protective equipment and engineering controls;

(7) Site controls including work zones and security measures;

(8) Decontamination procedures;

(9) General safe work practices;

(10) Sanitation facilities;

(11) Standard operating procedures;

(12) Emergency response plan covering workers addressing potential hazardous material releases;

(13) Training requirements;

(14) Medical surveillance program; and

(15) Record keeping.

(f) Other Activities. A description of any other significant activities which are appropriate to complete the RI/FS shall be included.

(g) Schedule. A schedule which provides specific time frames and dates for completion of each activity and report conducted or submitted under the RI/FS Workplan including the schedules for removal actions and operable unit activities.

5.2.3 RI/FS Workplan Implementation. Respondent(s) shall implement the approved RI/FS Workplan.

5.2.4 RI/FS Workplan Revisions. If Respondent(s) proposes to modify any methods or initiates new activities for which no Field Sampling Plan, Health and Safety Plan, Quality Assurance Project Plan or other necessary procedures/plans have been established, Respondent(s) shall prepare an addendum to the approved plan(s) for DTSC review and approval prior to modifying the method or initiating new activities.

5.3 Interim Screening and Evaluation of Remedial Technologies. At the request of DTSC, Respondent(s) shall submit an interim document which identifies and evaluates potentially suitable remedial technologies and recommendations for treatability studies.

5.4 Treatability Studies. Treatability testing will be performed by Respondent(s) to develop data for the detailed remedial alternatives. Treatability testing is required to demonstrate the implementability and effectiveness of technologies, unless Respondent(s) can show DTSC that similar data or documentation or information exists. The required deliverables are: a workplan, a sampling and analysis plan, and a treatability evaluation report. To the extent practicable, treatability studies will be proposed and implemented during the latter part of Site characterization.

5.5 Remedial Investigation (RI) Report. The RI Report shall be prepared and submitted byRespondent(s) to DTSC for review and approval in accordance with the approved RI/FS workplan schedule. The purpose of the RI is to collect data necessary to adequately characterize the Site for the purposes of defining risks to public health and the environment and developing and evaluating effective remedial alternatives. Site characterization may be conducted in one or

more phases to focus sampling efforts and increase the efficiency of the investigation. Respondent(s) shall identify the sources of contamination and define the nature, extent, and volume of the contamination. Using this information, the contaminant fate and transport shall be evaluated. The RI Report shall contain:

(a) Site Physical Characteristics. Data on the physical characteristics of the Site and surrounding area shall be collected to the extent necessary to define potential transport pathways and receptor populations and to provide sufficient engineering data for development and screening of remedial action alternatives.

(b) Sources of Contamination. Contamination sources (including heavily contaminated media) shall be defined. The data shall include the source locations, type of contaminant, waste characteristics, and Site features related to contaminant migration and human exposure.

(c) Nature and Extent of Contamination. Contaminants shall be identified and the horizontal and vertical extent of contamination shall be defined in soil, groundwater, surface water, sediment, air, and biota. Spatial and temporal trends and the fate and transport of contamination shall be evaluated.

5.6 Baseline Health and Ecological Risk Assessment. Respondent(s) shall perform health and ecological risk assessments for the Site that meet the requirements of Health and Safety Code §25356.1.5(b). Respondent(s) shall submit a Baseline Health and Ecological Risk Assessment Report [***within 30 days or as required by the DTSC***] from the submittal of the RI Report. The report shall be prepared consistent with U.S. EPA and DTSC guidance and regulations, including as a minimum: Risk Assessment Guidance for Superfund, Volume 1; Human Health Evaluation Manual, December 1989; Superfund Exposure Assessment Manual, April 1988; Risk Assessment Guidance for Superfund, Volume 2, Environmental Evaluation Manual, March 1989; and all other related or relevant policies, practices and guidelines of the California Environmental Protection Agency and policies, practices and guidelines developed by U.S.EPA pursuant to 40 CFR 300.400 et seq. The Baseline Health and Ecological Risk Assessment Report shall include the following components:

(a) Contaminant Identification. Characterization data shall identify contaminants of concern for the risk assessment process.

(b) Environmental Evaluation. An ecological assessment consisting of:

(1) Identification of sensitive environments and rare, threatened, or endangered species and their habitats; and

(2) As appropriate, ecological investigations to assess the actual or potential effects on the environment and/or develop remediation criteria.

(c) Exposure Assessment. The objectives of an exposure assessment are to identify actual or potential exposure pathways, to characterize the potentially exposed populations, and to determine the extent of the exposure. Exposed populations may include industrial workers, residents, and subgroups that comprise a meaningful portion of the general population, including, but not limited to, infants, children, pregnant women, the elderly, individuals with a history of serious illness, or other subpopulations, that are identifiable as being at greater risk of adverse health effects due to exposure to hazardous substances than the general population.

(d) Toxicity Assessment. Respondent(s) shall evaluate the types of adverse health or environmental effects associated with individual and multiple chemical exposures; the relationship between magnitude of exposures and adverse effects; and related uncertainties such as the weight of evidence for a chemical's potential carcinogenicity in humans.

(e) Risk Characterization. Risk characterization shall includes the potential risks of adverse health or environmental effects for each of the exposure scenarios derived in the exposure assessment.

5.7 Feasibility Study (FS) Report. The FS Report shall be prepared and submitted by Respondent(s) to DTSC for review and approval, no later than [30-60] days from submittal of the RI Report. The FS Report shall summarize the results of the FS including the following:

(a) Documentation of all treatability studies conducted.

(b) Development of medium specific or operable unit specific remedial action objectives, including legal requirements and other promulgated standards that are relevant.

(c) Identification and screening of general response actions, remedial technologies, and process options on a medium and/or operable unit specific basis.

(d) Evaluation of alternatives based on the criteria contained in the NCP including:

Threshold Criteria:

(1) Overall protection of human health and the environment.

(2) Compliance with legal requirements and other promulgated standards that are relevant.

Primary Balancing Criteria:

(1) Long-term effectiveness and permanence.

(2) Reduction of toxicity, mobility, or volume through treatment.

(3) Short-term effectiveness.

(4) Implementability based on technical and administrative feasibility.

(5) Cost.

Modifying Criteria:

(1) State and local agency acceptance.

(2) Community acceptance.

(e) Proposed remedial actions [***optional***].

5.8 Public Participation Plan (Community Relations). [***Project Managers shall keep Public Participation staff informed if any changes are made to the boilerplate language of this Order***] Respondent(s) shall work cooperatively with DTSC in providing an opportunity for meaningful public participation in response actions. Any such public participation activities shall be conducted in accordance with H&SC §§ 25356.1 and 25358.7, DTSC's most current Public Participation Policy and Guidance Manual, and shall be subject to DTSC's review and approval.

Respondent(s), in coordination with DTSC, shall conduct a baseline community survey and develop a Public Participation Plan (PPP) which describes how, under the Order, the public and adjoining community will be kept informed of activities conducted at the Site and how the Respondent(s) will be responding to inquiries from concerned citizens. [***Optional: The PPP must be developed in accordance with Exhibit [X], excerpted from the Public Participation Policy and Guidance Manual***]. Major steps in developing a PPP are as follows:

(a) Develop proposed list of interviewees;

(b) Schedule and conduct community interviews; and

(c) Analyze interview notes, and develop objectives.

Respondent(s) shall conduct the baseline community survey and submit the PPP for DTSC's review within [40] days of the effective date of this Order.

Respondent(s) shall implement any of the public participation support activities identified in the PPP, at the request of DTSC. DTSC retains the right to implement any of these activities independently. These activities include, but are not limited to, development and distribution of fact sheets; public meeting preparations; and development and placement of public notices.

5.9 California Environmental Quality Act (CEQA). DTSC must comply with CEQA insofar as activities required by this order are projects requiring CEQA compliance. Upon DTSC request, Respondent(s) shall submit any information deemed necessary by DTSC to facilitate compliance with CEQA. The costs incurred by DTSC in complying with CEQA are response costs and Respondent(s) shall reimburse DTSC for such costs pursuant to Section 6.19.

5.10 Remedial Action Plan. No later than [30] days after DTSC approval of the FS Report, Respondent(s) shall prepare and submit to DTSC a draft RAP. The draft RAP shall be consistent with the NCP and Health and Safety Code section 25356.1. The draft RAP public review process may be combined with that of any other documents required by CEQA. The draft RAP shall be based on and summarize the approved RI/FS Reports, and shall clearly set forth:

(a) Health and safety risks posed by the conditions at the Site.

(b) The effect of contamination or pollution levels upon present, future, and probable beneficial uses of contaminated, polluted, or threatened resources.

(c) The effect of alternative remedial action measures on the reasonable availability of groundwater resources for present, future, and probable beneficial uses.

(d) Site specific characteristics, including the potential for offsite migration of hazardous substances, the surface or subsurface soil, and the hydro geologic conditions, as well as preexisting background contamination levels.

(e) Cost-effectiveness of alternative remedial action measures. Land disposal shall not be deemed the most cost-effective measure merely on the basis of lower short-term cost.

(f) The potential environmental impacts of alternative remedial action measures, including, but not limited to, land disposal of the untreated hazardous substances as opposed to treatment of the hazardous substances to remove or reduce its volume, toxicity, or mobility prior to disposal.

(g) A statement of reasons setting forth the basis for the removal and remedial actions selected. The statement shall include an evaluation of each proposed alternative submitted and evaluate the consistency of the removal and remedial actions proposed by the plan with the NCP.

(h) A schedule for implementation of all proposed removal and remedial actions.

In conjunction with DTSC,Respondent(s) shall implement the public review process specified in DTSC's Public Participation Policy and Guidance Manual. Within 10 days of closure of the public comment period, Respondent(s) shall submit a written Responsiveness Summary of all written and oral comments presented and received during the public comment period.

Following DTSC's review and finalization of the Responsiveness Summary, DTSC will specify any changes to be made in the RAP. Respondent(s) shall modify the document in accordance with DTSC's specifications and submit a final RAP within [15] days of receipt of DTSC's comments.

5.11 Remedial Design[RD]. Within [60] days after DTSC approval of the final RAP, Respondent(s) shall submit to DTSC for review and approval a RD describing in detail the technical and operational plans for implementation of the final RAP which includes the following elements, as applicable:

(a) Design criteria, process unit and pipe sizing calculations, process diagrams, and final plans and specifications for facilities to be constructed.

(b) Description of equipment used to excavate, handle, and transport contaminated material.

(c) A field sampling and laboratory analysis plan addressing sampling during implementation and to confirm achievement of the performance objectives of the RAP.

(d) A transportation plan identifying routes of travel and final destination of wastes generated and disposed.

(e) For groundwater extraction systems: aquifer test results, capture zone calculations, specifications for extraction and performance monitoring wells, and a plan to demonstrate that capture is achieved.

(f) An updated health and safety plan addressing the implementation activities.

(g) Identification of any necessary permits and agreements.

(h) An operation and maintenance plan including any required monitoring.

(I) A detailed schedule for implementation of the remedial action consistent with the schedule contained in the approved RAP including procurement, mobilization, construction phasing, sampling, facility startup, and testing.

5.12 Deed Restrictions. If the approved remedy in the Final RAP includes deed restrictions, the current owner(s) of the Site shall sign and record deed restrictions approved by DTSC within [90] days of DTSC's approval of the final RAP. **[*Guidance: It is mandatory that deed restrictions are recorded prior to certification*].**

5.13 Implementation of Final RAP. Upon DTSC approval of the (RD), Respondent(s) shall implement the final RAP in accordance with the approved schedule in the RD. Within [30]

days of completion of field activities, Respondent(s) shall submit an Implementation Report documenting the implementation of the Final RAP and RD.

5.14 Operation and Maintenance (O&M). Respondent(s) shall comply with all O&M requirements in accordance with the final RAP and approved RD. Within [30] days of the date of DTSC's request, Respondent(s) shall prepare and submit to DTSC for approval an O&M workplan that includes an implementation schedule. Respondent(s) shall implement the workplan in accordance with the approved schedule.

5.15 Five-Year Review. Respondent shall review and reevaluate the remedial action after a period of [***specify the period of time which may not be more than 5 years; e.g., 3 years***] years from the completion of construction and startup, and every [?] year(s) thereafter. The review and reevaluation shall be conducted to determine if human health and the environment are being protected by the remedial action. Within thirty (30) calendar days before the end of the time period approved by DTSC to review and reevaluate the remedial action, Respondent(s) shall submit a remedial action review workplan to DTSC for review and approval. Within sixty (60) days of DTSC's approval of the workplan, Respondent(s) shall implement the workplan and shall submit a comprehensive report of the results of the remedial action review. The report shall describe the results of all sample analyses, tests and other data generated or received by Respondent(s) and evaluate the adequacy of the implemented remedy in protecting public health, safety and the environment. As a result of any review performed under this section, Respondent(s) may be required to perform additional Work or to modify Work previously performed.

5.16 Changes During Implementation of the Final RAP. During the implementation of the final RAP and RD, DTSC may specify such additions, modifications, and revisions to the RD as deemed necessary to protect public health and safety or the environment or to implement the RAP.

5.17 Stop Work Order. In the event that DTSC determines that any activity (whether or not pursued in compliance with this Order) may pose an imminent or substantial endangerment to the health or safety of people on the Site or in the surrounding area or to the environment, DTSC may order Respondent(s) to stop further implementation of this Order for such period of time needed to abate the endangerment. In the event that DTSC determines that any site activities (whether or not pursued in compliance with this Order) are proceeding without DTSC authorization, DTSC may order Respondent(s) to stop further implementation of this Order or activity for such period of time needed to obtain DTSC authorization, if such authorization is appropriate. Any deadline in this Order directly affected by a Stop Work Order, under this section, shall be extended for the term of the Stop Work Order.

5.18 Emergency Response Action/Notification. In the event of any action or occurrence (such as a fire, earthquake, explosion, or human exposure to hazardous substances caused by the release or threatened release of a hazardous substance) during the course of this Order, Respondent(s) shall immediately take all appropriate action to prevent, abate, or minimize such

emergency, release, or immediate threat of release and shall immediately notify the Project Manager. Respondent(s) shall take such action in consultation with the Project Manager and in accordance with all applicable provisions of this Order. Within seven days of the onset of such an event, Respondent(s) shall furnish a report to DTSC, signed by Respondent(s)' Project Coordinator, setting forth the events which occurred and the measures taken in the response thereto. In the event that Respondent(s) fail to take appropriate response and DTSC takes the action instead, Respondent(s) shall be liable to DTSC for all costs of the response action. Nothing in this section shall be deemed to limit any other notification requirement to which Respondent(s) may be subject.

5.19 Discontinuation of Remedial Technology. Any remedial technology employed in implementation of the final RAP shall be left in place and operated by Respondent(s) until and except to the extent that DTSC authorizes Respondent(s) in writing to discontinue, move or modify some or all of the remedial technology because Respondent(s) has met the criteria specified in the final RAP for its discontinuance, or because the modifications would better achieve the goals of the final RAP.

5.20 Financial Assurance. [***To ensure that operation and maintenance requirements are successfully implemented, HSC section 25355.2 requires the demonstration and maintenance of one or more of the financial assurance mechanisms that are set forth in 22 CCR section 66265.143 (a) through (e), unless Respondent(s) requests a waiver. It is mandatory that financial assurance for O&M be secured prior to certification.***] Respondent(s) shall demonstrate to DTSC and maintain financial assurance for operation and maintenance and monitoring. Respondent(s) shall demonstrate financial assurance prior to the time that operation and maintenance activities are initiated and shall maintain it throughout the period of time necessary to complete all required operation and maintenance activities. The financial assurance mechanisms shall meet the requirements of H&SC Section 25355.2. All financial assurance mechanisms are subject to the review and approval of DTSC.

VI. GENERAL PROVISIONS

6.1 Project Coordinator. Within [10] days from the date the Order is signed by DTSC, Respondent(s) shall submit to DTSC in writing the name, address, and telephone number of a Project Coordinator whose responsibilities will be to receive all notices, comments, approvals, and other communications from the DTSC. Respondent(s) shall promptly notify DTSC of any change in the identity of the Project Coordinator. Respondent(s) shall obtain approval from DTSC before the new project coordinator performs any work under this Order.

6.1.1 Communication and Coordination Plan (CCP). [***Optional: if more than 1 Respondent***] Within thirty (30) days from the date the Order is signed by DTSC, Respondent(s) shall submit a CCP which specifies the requirements and procedures by which the Respondent(s) will communicate and coordinate with one another in carrying out the requirements of this Order, to DTSC for its approval.

6.2 Project Engineer/Geologist. The work performed pursuant to this Order shall be under the direction and supervision of a qualified professional engineer or a registered geologist in the State of California, with expertise in hazardous substance site cleanups. Within [15] calendar days from the date the Order is signed by DTSC, Respondent(s) must submit: a) The name and address of the project engineer or geologist chosen by Respondent(s); and b) in order to demonstrate expertise in or hazardous substance cleanup, the resumé of the engineer or geologist, and the statement of qualifications of the consulting firm responsible for the work. Respondent(s) shall promptly notify DTSC of any change in the identity of the Project Engineer/Geologist. Respondent(s) shall obtain approval from DTSC before the new Project Engineer/Geologist performs any work under this Order.

6.3 Monthly Summary Reports. Within [30] days from the date the Order is signed by DTSC, and on a monthly basis thereafter, Respondent(s) shall submit a Monthly Summary Report of its activities under the provisions of this Order. The report shall be received by DTSC by the [15th] day of each month and shall describe:

(a) Specific actions taken by or on behalf of Respondent(s) during the previous calendar month;

(b) Actions expected to be undertaken during the current calendar month;

(c) All planned activities for the next month;

(d) Any requirements under this Order that were not completed;

(e) Any problems or anticipated problems in complying with this Order; and

(f) All results of sample analyses, tests, and other data generated under the Order during the previous calendar month, and any significant findings from these data.

6.4 Quality Control/Quality Assurance (QC/QA). All sampling and analysis conducted by Respondent(s) under this Order shall be performed in accordance with QC/QA procedures submitted by Respondent(s) and approved by DTSC pursuant to this Order.

6.5 Submittals. All submittals and notifications from Respondent(s) required by this Order shall be sent simultaneously to:

[***Name***]
Regional Branch Chief
Attention: Project Manager [two copies]
Site Mitigation Branch
DTSC of Toxic Substances Control
[***Address***]

U.S. EPA, Region IX [***Only for NPL or proposed NPL Sites***]
Attn: Superfund Program Manager
75 Hawthorne Street
San Francisco, CA 94105

All submittals from Respondent(s) required by this Order shall be accompanied by the following certification:

6.6 Communications. All approvals and decisions of DTSC made regarding submittals and notifications will be communicated to Respondent(s) in writing by the Site Mitigation Branch Chief, DTSC of Toxic Substances Control, or his/her designee. No informal advice, guidance, suggestions or comments by DTSC regarding reports, plans, specifications, schedules or any other writings by Respondent(s) shall be construed to relieve Respondent(s) of the obligation to obtain such formal approvals as may be required.

6.7 DTSC Review and Approval. (a) All response actions taken pursuant to this Order shall be subject to the approval of DTSC. Respondent(s) shall submit all deliverables required by this Order to DTSC. Once the deliverables are approved by DTSC, they shall be deemed incorporated into, and where applicable, enforceable under this Order.

(b) If DTSC determines that any report, plan, schedule or other document submitted for approval pursuant to this Order fails to comply with this Order or fails to protect public health or safety or the environment, DTSC may:

(1) Modify the document as deemed necessary and approve the document as modified; or

(2) Return comments to Respondent(s) with recommended changes and a date by which Respondent(s) must submit to DTSC a revised document incorporating the recommended changes.

(c) Any modifications, comments or other directive issued pursuant to (b) above, are incorporated into this Order. Any noncompliance with these modifications or directives shall be deemed a failure or refusal to comply with this Order.

6.8 Compliance with Applicable Laws. Nothing in this Order shall relieve Respondent(s) from complying with all other applicable laws and regulations, including but not limited to compliance with all applicable waste discharge requirements issued by the State Water Resources Control Board or a California Regional Water Quality Control Board. Respondent(s) shall conform all actions required by this Order with all applicable federal, state and local laws and regulations.

6.9 Respondent Liabilities. Nothing in this Order shall constitute or be construed as a satisfaction or release from liability for any conditions or claims arising as a result of past, current or future operations of Respondent(s). Nothing in this Order is intended or shall be

construed to limit the rights of any of the parties with respect to claims arising out of or relating to the deposit or disposal at any other location of substances removed from the Site. Nothing in this Order is intended or shall be construed to limit or preclude DTSC from taking any action authorized by law to protect public health or safety or the environment and recovering the cost thereof. Notwithstanding compliance with the terms of this Order, Respondent(s) may be required to take further actions as are necessary to protect public health and the environment.

6.10 Site Access. Access to the Site and laboratories used for analyses of samples under this Order shall be provided at all reasonable times to employees, contractors, and consultants of DTSC. Nothing in this section is intended or shall be construed to limit in any way the right of entry or inspection that DTSC or any other agency may otherwise have by operation of any law. DTSC and its authorized representatives shall have the authority to enter and move freely about all property at the Site at all reasonable times for purposes including, but not limited to: inspecting records, operating logs, sampling and analytic data, and contracts relating to this Site; reviewing the progress of Respondent(s) in carrying out the terms of this Order; conducting such tests as DTSC may deem necessary; and verifying the data submitted to DTSC by Respondent(s).

To the extent the Site or any other property to which access is required for the implementation of this Order is owned or controlled by persons other than Respondent(s), Respondent(s) shall use best efforts to secure from such persons access for Respondent(s), as well as DTSC, its representatives, and contractors, as necessary to effectuate this Order. To the extent that any portion of the Site is controlled by tenants of Respondent(s), Respondent(s) shall use best efforts to secure from such tenants, access for Respondent(s), as well as for DTSC, its representatives, and contractors, as necessary to effectuate this Order. For purposes of this Section, "best efforts" includes the payment of reasonable sums of money in consideration of access. If any access required to complete the Work is not obtained within forty-five (45) days of the effective date of this Order, or within forty-five (45) days of the date DTSC notifies the Respondent(s) in writing that additional access beyond that previously secured is necessary, Respondent(s) shall promptly notify DTSC, and shall include in that notification a summary of the steps Respondent(s) has taken to attempt to obtain access. DTSC may, as it deems appropriate, assist Respondent(s) in obtaining access. Respondent(s) shall reimburse DTSC in obtaining access, including, but not limited to, attorneys fees and the amount of just compensation.

6.11 Site Access for Respondents. ***(Optional Section)*** ***[This Section could be used in the case of a multiple RP Site where one RP is the Site owner]***. The Site owner Respondent(s) shall grant access to [other Respondent(s)] who are in compliance with this Order for the purpose of conducting activities pursuant to this Order or for activities deemed necessary by the DTSC to meet the objectives of this Order.

6.12 Sampling, Data and Document Availability. Respondent(s) shall permit DTSC and its authorized representatives to inspect and copy all sampling, testing, monitoring or other data generated by Respondent(s) or on Respondent(s) behalf in any way pertaining to work undertaken pursuant to this Order. Respondent(s) shall submit all such data upon the request of

the DTSC. Copies shall be provided within [7] days of receipt of the DTSC's written request. Respondent(s) shall inform DTSC at least [7] days in advance of all field sampling under this Order, and shall allow DTSC and its authorized representatives to take duplicates of any samples collected by Respondent(s) pursuant to this Order. Respondent(s) shall maintain a central depository of the data, reports, and other documents prepared pursuant to this Order.

6.13 Record Retention. All such data, reports and other documents shall be preserved by Respondent(s) for a minimum of ten years after the conclusion of all activities under this Order. If DTSC requests that some or all of these documents be preserved for a longer period of time, Respondent(s) shall either comply with that request or deliver the documents to DTSC, or permit DTSC to copy the documents prior to destruction. Respondent(s) shall notify the DTSC in writing, at least six months prior to destroying any documents prepared pursuant to this Order.

6.14 Government Liabilities. The State of California shall not be liable for any injuries or damages to persons or property resulting from acts or omissions by Respondent(s), or related parties specified in Section 6.26, Parties Bound, in carrying out activities pursuant to this Order, nor shall the State of California be held as party to any contract entered into by Respondent(s) or its agents in carrying out activities pursuant to this Order.

6.15 Additional Actions. By issuance of this Order, DTSC does not waive the right to take any further actions authorized by law.

6.16 Extension Requests. If Respondent(s) is unable to perform any activity or submit any document within the time required under this Order, Respondent(s) may, prior to expiration of the time, request an extension of the time in writing. The extension request shall include a justification for the delay. All such requests shall be in advance of the date on which the activity or document is due.

6.17 Extension Approvals. If DTSC determines that good cause exists for an extension, it will grant the request and specify a new schedule in writing. Respondent(s) shall comply with the new schedule incorporated in this Order.

6.18 Liability for Costs. Respondent(s) is liable for all of DTSC's costs that have been incurred in taking response actions at the Site (including costs of overseeing response actions performed by the Respondent(s)) and costs to be incurred in the future.

6.19 Payment of Costs. DTSC may bill Respondent(s) for costs incurred in taking response actions at the Site prior to the effective date of this Order. DTSC will bill Respondent(s) quarterly for its response costs incurred after the effective date of this Order.. Respondent(s) shall pay DTSC within sixty (60) days of receipt of any DTSC billing. Any billing not paid within sixty (60) days is subject to interest calculated from the date of the billing pursuant to Health and Safety Code section 25360.1. All payments made by Respondent(s) pursuant to this Order shall be by cashier's or certified check made payable to the "DTSC," and

shall bear on the face the project code of the Site (Site_____) and the Docket number of the Order. Payments shall be sent to:

Department of Toxic Substances Control
Accounting/Cashier
400 P Street, 4th Floor
P.O. Box 806
Sacramento, California 95812-0806

A photocopy of all payment checks shall also be sent to the person designated by DTSC to receive submittals under this Order.

6.20 Severability. The requirements of this Order are severable, and Respondent(s) shall comply with each and every provision hereof, notwithstanding the effectiveness of any other provision.

6.21 Incorporation of Plans, Schedules and Reports. All plans, schedules, reports, specifications and other documents that are submitted by Respondent(s) pursuant to this Order are incorporated in this Order upon DTSC's approval or as modified pursuant to Section 6.7, DTSC Review and Approval, and shall be implemented by Respondent(s). Any noncompliance with the documents incorporated in this Order, shall be deemed a failure or refusal to comply with this Order.

6.22 Modifications. DTSC reserves the right to unilaterally modify this Order. Any modification to this Order shall be effective upon the date the modification is signed by DTSC and shall be deemed incorporated in this Order.

6.23 Time Periods. Unless otherwise specified, time periods begin from the effective date of this Order and "days" means calendar days.

6.24 Termination and Satisfaction. Except for Respondent(s) obligations under Sections 5.14 Operation and Maintenance (O&M), 5.15 Five-Year Review, 5.20 Financial Assurance, 6.13 Record Retention, 6.18 Liability for Costs, and 6.19 Payment of Costs, Respondent(s) obligations under this Order shall terminate and be deemed satisfied upon Respondent(s) receipt of written notice from DTSC that Respondent(s) has complied with all the terms of this Order.

6.25 Calendar of Tasks and Schedules. This Section is merely for the convenience of listing in one location the submittals required by this Order. If there is a conflict between the date for a scheduled submittal within this section and the date within the section describing the specific requirement, the latter shall govern. ***[Include all scheduled submittals within the Order]***.

Calendar of Tasks and Schedules

	TASK	SCHEDULE
1.	Identify Project Coordinator; Section 6.1;	Within [10] days from the date the Order is signed by DTSC.
2.	Identify Project Engineer/Geologist; Section 6.2;	Within [15] days from the date the Order is signed by DTSC.
3.	Submit Monthly Summary Reports; Section 6.3;	Within [30] days from the date the Order is signed by DTSC.
4.	Attend Site Remediation Strategy Meeting; Section 5.1.7; ***[optional]***	Within [20] days from the date the Order is signed by DTSC.
5.	Submit groundwater level measurements;	First Monday of specified month.
	Groundwater sampling results; Section 5.1.5; ***[optional]***	Quarterly basis.
6.	Submit RI/FS Workplan; Section 5.2.2;	Within [30] days of the effective date.
7.	Submit interim screening and evaluation document; Section 5.3;	As requested by DTSC.
8.	Submit Treatability Studies; Section 5.4;	As required during Site characterization or as requested by DTSC.
9.	Submit RI Report; Section 5.5;	Per approved RI/FS Workplan Schedule.
10.	Submit Baseline Risk Assessment; Section 5.6;	Within [30 days or as required] from submittal of RI Report.
11.	Submit FS Report; Section 5.7;	Within [30-60] days from submittal of RI Report.
12.	Submit Public Participation Plan; Section 5.8;	Within [40] days from the date the Order is signed by DTSC.

	Submit and distribute Fact Sheets;	For projected or completed key milestones, as specified in Public Participation Plan or when requested by DTSC.
13.	Submit Initial Study and Checklist; Section 5.9;	Within [30] days after approval of FS Report.
14.	Submit Draft RAP; Section 5.10;	Within [30] days after approval of FS Report.
	Submit Responsiveness Summary;	Within [10] days of closure of public comment period.
	Submit Final RAP; comments.	Within [15] days of receipt of DTSC's
15.	Submit Remedial Design; Section 5.11;	Within [60] days after DTSC's approval of the Final RAP.
16.	Deed Restrictions; Section 5.12; [***optional***]	Within [90] days of approval of Final RAP.
17.	Submit Implementation Report; Section 5.13;	Within [30] days of completion of field activities.
18.	Submit O&M Workplan Section 5.14;	Within [30] days of DTSC's request.
19.	Submit Remedial Action Review Workplan; Section 5.15; [***optional***]	Within [30] days before end of five-year period.
20.	Submit Emergency Response Action Report; Section 5.18;	Within 7 days of an emergency response action.
21.	Provide copies of sampling, data, and documentation; Section 6.12;	Within [7] days of receipt of DTSC's request.
	Provide prior notice before conducting field sampling;	Inform DTSC [7] days in advance of sampling.
22.	Maintain central depository of data, reports, documentation; and	Maintain central depository for a minimum of ten years after conclusion of all activities conducted pursuant to the Order.

23.	Provide prior written notice to the DTSC before destroying any documentation prepared pursuant to the Order; Section 6.13.	At least six months prior to destroying any any documents.

6.26 Parties Bound. This Order applies to and is binding upon Respondent(s), and its officers, directors, agents, employees, contractors, consultants, receivers, trustees, successors and assignees, including but not limited to, individuals, partners, and subsidiary and parent corporations. Respondent(s) shall provide a copy of this Order to all contractors, subcontractors, laboratories, and consultants which are retained to conduct any work performed under this Order, within [15] days after the effective date of this Order or the date of retaining their services, whichever is later. Respondent(s) shall condition any such contracts upon satisfactory compliance with this Order. Notwithstanding the terms of any contract, Respondent(s) is responsible for compliance with this Order and for ensuring that its subsidiaries, employees, contractors, consultants, subcontractors, agents and attorneys comply with this Order.

6.27 Change in Ownership. No change in ownership or corporate or partnership status relating to the Site shall in any way alter Respondent's responsibility under this Order. No conveyance of title, easement, or other interest in the Site, or a portion of the Site, shall affect Respondent's obligations under this Order. Unless DTSC agrees that such obligations may be transferred to a third party, Respondent(s) shall be responsible for and liable for any failure to carry out all activities required of Respondent(s) by the terms and conditions of this Order, regardless of Respondent's use of employees, agents, contractors, or consultants to perform any such tasks. Respondent(s) shall provide a copy of this Order to any subsequent owners or successors before ownership rights or stock or assets in an corporate acquisition are transferred.

[***Dispute Resolution: If the Respondent requests that the Order contain a dispute resolution provision the following provision may be inserted into the Consent Order if determined to be appropriate:***]

6.28. Dispute Resolution. The parties agree to use their best efforts to resolve all disputes informally. The parties agree that the procedures contained in this section are the required administrative procedures for resolving disputes arising under this Order. If Respondent(s) fails to follow the procedures contained in this section, it shall have waived its right to further contest the disputed issue. Respondent(s) reserves its legal rights to contest or defend against any final decision rendered by DTSC under this paragraph. Disputes regarding DTSC billings shall follow the procedures set forth in 6.28.3.

6.28.1. The Respondent(s) shall first seek resolution with DTSC's assigned project manager and unit chief. If the issue is not resolved after review by the unit chief, the Respondent(s) shall seek resolution with the DTSC branch chief by presenting in a letter the issues in dispute, the legal or other basis for Respondent(s) position, and the remedy sought. The

branch chief shall issue a written decision with an explanation for the decision within thirty (30) business days after receipt of the letter from the Respondent(s).

6.28.2. If Respondent(s) disagrees with the branch chief's decision, Respondent(s) may appeal to the Statewide Cleanup Operations Division Chief. To appeal to the division chief, Respondent(s) must prepare a letter stating the reasons why the branch chief's decision is not acceptable. Attached to the letter shall be (a) Respondent(s)'s original statement of dispute, (2) supporting documents, and (3) copies of any responses prepared by the project manager, unit chief, and branch chief. This letter and attachments shall be sent to the division chief within ten (10) business days from the date of Respondent(s) receipt of the branch chief's response. The division chief or designee shall review the Respondent(s') letter, supporting documents, consider the issues raised and render a written decision to Respondent(s) within thirty (30) business days of receipt of Respondent(s) letter. The decision of the division chief , or designee, shall constitute DTSC's administrative decision on the issues in dispute.

6.28.3. If Respondent(s) dispute a DTSC billing, or any part thereof, Respondent(s) shall notify the DTSC's assigned project manager and attempt to informally resolve the dispute with DTSC's project manager and branch chief. If Respondent(s) desires to formally request dispute resolution with regard to the billing, Respondent(s) shall file a request for dispute resolution in writing within 45 days of the date of the billing in dispute. The written request shall describe all issues in dispute and shall set forth the reasons for the dispute, both factual and legal. If the dispute pertains only to a portion of the costs included in the invoice, Respondent(s) shall pay all costs which are undisputed in accordance with Section 6.19. The filing of a notice of dispute pursuant to this Section shall not stay the accrual of interest on any unpaid costs pending resolution of the dispute. The written request shall be sent to:

Special Assistant for Cost Recovery and Reimbursement Policy
Department of Toxic Substances Control
P.O. Box 806
Sacramento, CA 95812-0806

A copy of the written request for dispute resolution shall also be sent to the person designated by DTSC to receive submittals under this Order. A decision on the billing dispute will be rendered by the Special Assistant for Cost Recovery and Reimbursement Policy or other DTSC designee.

6.28.4. The existence of a dispute shall not excuse, stay, or suspend any other compliance obligation or deadline required pursuant to this Order.]

VII. EFFECTIVE DATE

7. The effective date of this Consent Order shall be the date on which theis Consent Order is signed by the Parties.

VIII.. PENALTIES FOR NONCOMPLIANCE

8. Each Respondent may be liable for penalties of up to $25,000 for each day out of compliance with any term or condition set forth in this Order and for punitive damages up to three times the amount of any costs incurred by DTSC as a result of Respondent's(s') failure to comply, pursuant to Health and Safety Code sections 25359, 25359.2, 25359.4, and 25367(c). Health and Safety Code section 25359.3 provides that a responsible party who complies with this order, or with another order or agreement concerning the same response actions required by this order, may seek treble damages from Respondent(s) who fail or refuse to comply with this order without sufficient cause.

IX. SIGNATORIES

9. Each undersigned representative of the parties to this Order certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to execute and legally bind the Parties to this Order.

9.1 This Order may be executed and delivered in any number of counterparts, each of which whent executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document.

IT IS HEREBY AGREED AND ORDERED.

DATE:_____ _____
[Respondent]

DATE:_____ _____
[*Name*]
Regional Branch Chief
Department of Toxic Substances Control

[***Signature authority has been delegated to specific Branch Chiefs to sign all orders and determinations for releases or threatened releases. However, on a site-specific basis, the Division Chief, Deputy Director or Director may elect to sign***]

cc: Site Mitigation Program
Headquarters, Planning & Policy
Office of Legal Counsel

STATE OF CALIFORNIA
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

In the Matter of:	Docket No. *[Insert Docket Number]*
[Site name and address]	*[Choose type of Determination from Determination Guidance below]*
	Health and Safety Code Sections *[identify code sections from Option #1 or Option #2 from Determination Guidance]*

DETERMINATION GUIDANCE: In selecting the type of Determination, the Project Manager with consultation from the Case Management Team will consider the following:

Option #1. Imminent and Substantial Endangerment Determination (H&SC Sections 25358.3 (a) and 25355.5 (b)(3))

The Department will make an Imminent and Substantial Endangerment Determination when an I/SE Order is not appropriate and (a) the Department determines that it is necessary to spend state funds at the site; and/or (b) the Department wants to pursue civil action to obtain an injunctive order requiring the RP(s) to conduct a response action or other court-ordered relief. (Use of this option requires that conditions at the site indicate that an imminent and substantial endangerment may exist).

Option #2. Imminent or Substantial Endangerment Determination (H&SC Section 25358.3 (a))

The Department will make an Imminent or Substantial Endangerment Determination when site conditions indicate that only an imminent or substantial endangerment may exist (and an I/SE Order is not appropriate), and the Department wants to pursue civil action to obtain an injunctive order requiring the RP(s) to conduct a response action or other court ordered relief. (Use of this option requires that conditions at the site indicate that an imminent or substantial endangerment may exist).

I. INTRODUCTION

1.1 Site. This *[Use imminent and substantial endangerment if Option #1 was selected or use imminent or substantial endangerment if Option #2 was selected. Refer to*

definition of terms] Determination applies to the site located at *[Location of the Site, including the County. Sometimes an address does not adequately describe a site, if that is the case, a legal description or map is required, the following language should be inserted in this section:*

"A legal description of the Site is attached as Exhibit___."
"A map showing the site is attached as Exhibit___."

These options might be useful in a rural area where there is no street address, the property lines are not clear, or the site is less than the whole property].

1.2 Jurisdiction. *[The Project Manager, with consultation from the Case Management Team, will select appropriate citation(s) from the Health and Safety Code (shown below). Select citation(s) from Option #1 or #2]*

Option #1. Section 25355.5(b)(3) of the Health and Safety Code *authorizes the Department to expend funds from the Hazardous Substance Account and the Hazardous Substance Cleanup Fund without first taking the actions specified in Health and Safety Code Section 25355.5(a), if the Department determines that removal or remedial action is necessary at a site because there may be an imminent and substantial endangerment to the public health or welfare or to the environment, because of a release or a threatened release of a hazardous substance.*

Section 25358.3(a) of the Health and Safety Code *authorizes the Department to take various actions when the Department determines that there may be an imminent or substantial endangerment to the public health or welfare or to the environment, because of a release or a threatened release of a hazardous substance.*

Option #2. Section 25358.3(a) of the Health and Safety Code *authorizes the Department to take various actions when the Department determines that there may be an imminent or substantial endangerment to the public health or welfare or to the environment, because of a release or a threatened release of a hazardous substance.*

II. FINDINGS OF FACT

The Department hereby finds:

2.1 Physical Description of Site: *[Describe the physical features of the Site relevant to the endangerment. This section is optional if the site's endangerment is adequately substantiated by either the "Site History" (Section 2.2) or "Substances Found at the Site" (Section 2.3) or both. This section is used when there is some real physical attribute of the Site that relates to the endangerment such as: a fence that is not maintained*

and allows access to property. (Use separate subsections numbered 2.1.1, 2.1.2, etc., as needed)]

2.2 Site History. *[Describe the major developments in the historical use of the Site that are relevant to the endangerment. (Use separate subsections numbered 2.2.1, 2.2.2, etc., as needed)]*

2.3 Substances Found at the Site. The following substances have been found at the Site: *[Identify and describe the amounts, levels, and/or locations of hazardous substances found at the Site. Describe any investigations conducted by the Department or other parties (city, respondents, etc.) and the dates of those investigations, and any sampling results from those investigations. Attach sampling data as exhibits, if appropriate. Describe how each substance meets the definition of "hazardous substance" set forth in Health and Safety Code Section 25316 (40 C.F.R., Section 302.4 contains the hazardous substances listed pursuant to Section 102 of CERCLA). Each Project Manager should have a copy of this list. (Use separate subsections numbered 2.3.1, 2.3.2, etc., as needed)]*

2.4 Health Effects. *[Describe the health effects of each hazardous substance found at the Site. (Use separate subsections numbered 2.4.1, 2.4.2, etc., as needed)]*

2.5 Routes of Exposure. *[Describe the potential routes of exposure. (Use separate subsections numbered 2.5.1, 2.5.2, etc., as needed)]*

2.6. Population at Risk. *[Describe the threat to public health and/or the environment. (i.e., specific information regarding direct human contact or exposure and/or direct exposure of endangered/threatened species or threatened environment; include estimated numbers and specific locations. Use separate subsections numbered 2.6.1, 2.6.2, etc., as needed)]*

III. CONCLUSIONS OF LAW

3.1 Each of the substances listed in Section 2.3 is a "hazardous substance," as defined by Health and Safety Code Section 25316, and has been found at the Site.

3.2 A "release" or threatened release of the hazardous substances listed in Section 2.3 has occurred at or from the Site, as defined by Health and Safety Code Section 25320.

3.3 The actual and/or threatened release of hazardous substances at the Site may present an *imminent [and/or] substantial endangerment [Use imminent and substantial endangerment if Option #1 was selected, or*

use imminent or substantial endangerment if Option #2 was selected. Refer to definition of terms] to the public health or welfare or to the environment.

IV. DETERMINATION

4.1 Based on the foregoing findings of fact and conclusions of law, the Department hereby determines that removal or remedial action is necessary at the Site because there may be an *[Use imminent and substantial endangerment if Option #1 was selected, or use imminent or substantial determination if Option #2 was selected. Refer to definition of terms.]* to the public health or welfare or to the environment.

DATED: _____

_____
[13]

[Signature authority has been delegated to specific Branch Chiefs to sign all Orders and Determinations for releases or threatened releases. However, on a site-specific basis, the Deputy Director or the Director may elect to sign]

cc: Site Mitigation Program
Headquarters, Planning & Policy

Office of Legal Counsel

ADPC&E or EPA until too late in the year to start the work. Some erosion of the cap has resulted. The parties agree that repair of the erosion and placement of topsoil and grass is desirable. In addition, installation of clay intercept walls at the north and east boundaries of the Reasor-Hill Landfill Area has now been approved by EPA and ADPC&E and is viewed as desirable by Hercules and Vertac.

The final area of concern on site in this proceeding involves the placement of monitoring wells. Several wells have already been dug and some samples reported. EPA and ADPC&E desire additional wells and samples. However, ADPC&E has taken the position that these additional wells are not necessary so far as the relief sought by the preliminary injunction is concerned.

The evidence regarding dioxin levels off the plant site contrasts sharply with the evidence regarding samples taken on site. The evidence indicates that there is no dioxin in the water in Rocky Branch Creek, Bayou Meto, or the effluent from the Jacksonville sewage treatment plant. There is evidence that dioxin is present in the low parts per trillion ("ppt") level in sediment in Rocky Branch Creek and Bayou Meto, and in sludge in the Jacksonville sewage treatment plant. This evidence is consistent with the expert testimony that dioxin is highly insoluble in water and binds tightly to clay. There is also evidence that some fish and other aquatic life in Bayou Meto have bioaccumulated dioxin to levels up to 600 parts per trillion.

The parties vigorously dispute the significance of the dioxin levels observed off site, as well as the issue of where the dioxin originated. The government parties presented expert witnesses who theorized about means by which the dioxin found off site could have been transported from the Vertac site, namely by storm water run off, airborne dust particles, and volatilization. The main thrust of this testimony was to suggest that all dioxin presently found on the Vertac plant site was likely to escape into the environment rapidly if action was not taken immediately.

FINDINGS OF FACT

1. The location at issue in this case ("Vertac site") is an approximately 82-acre site located in Jacksonville, Arkansas. On the site is a plant which has been used for the manufacture of chemicals since approximately 1948.

2. Prior to 1946, the Vertac site was used as a munitions factory by the United States Government. In 1946, Reasor-Hill Corporation acquired the Vertac site. Reasor-Hill manufactured and formulated various pesticides and herbicides, and in approximately 1956 began to manufacture 2,4,5–T.

3. In late 1961, Hercules, Incorporated ("Hercules") acquired the Vertac site and remained in possession of it until October 1, 1971. Hercules manufactured herbicides including 2,4–D and 2,4,5–T, but did not manufacture or formulate insecticides.

4. As of October 1, 1971, Hercules leased the Vertac site to Transvaal, Incorporated ("Transvaal") and certain individuals under an agreement marked as Defendant Hercules' Exhibit No. 1. This lease provided in part:

> 16. This Lease is made on the express condition that the leased premises shall be used only for maintaining and operating a plant and facilities for the manufacture of phenoxy herbicides and in full accordance with all applicable laws or regulations concerning the operation of the plant, including the disposal of wastes therefrom, and the sale, delivery and use of products made therein.

5. Hercules has not been in possession or control of the Vertac site since October 1, 1971.

6. Transvaal, through a series of corporate reorganizations, has become defendant Vertac Chemical Corporation ("Vertac"), and, pursuant to stipulation, Vertac and Transvaal are considered the same corporation.

7. On October 1, 1976, Transvaal purchased the Vertac site from Hercules, and Vertac, Transvaal's successor, is the present titleholder.

8. Vertac (or Transvaal) has had control of and operated all facilities at the Vertac site from October 1, 1971, to the present, and has manufactured and formulated herbicides, including 2,4–D and 2,4,5–T.

9. Dioxin is formed during an intermediate stage in the manufacture of 2,4,5–T. It is a highly toxic chemical which, given sufficient dosage and sufficient exposure, causes various health problems in laboratory animals and in human beings. In fact, Dioxin is the most toxic man-made molecule known.

10. Dioxin is persistent in the environment.

11. Dioxin bioaccumulates in the tissues of plants and animals.

12. Dioxin has low solubility in water, but an affinity for soil and lipids.

13. Dioxin is volatile in air in the presence of particulate matter.

14. Dioxin has been shown to be carcinogenic, teratogenic, fetotoxic and mutagenic in animals in concentrations in the parts per trillion (ppt) range. It is suspected but not proven to be a carcinogen and teratogen in humans.

15. There is presently no known safe detectable level of dioxin in the environment, using currently available methods of detection, but a 1979 EPA Science Advisory Panel Report states that there are no observable effects (NOEL) with 0.001 micrograms per kilogram of body weight.

16. Samples show that quantities of dioxin, herbicides, phenols and other manufacturing wastes are present on the Vertac site.

17. Dioxin and other manufacturing wastes can and have been transported off the Vertac site on dust, by the action of surface water, the infiltration of groundwater into the landfill areas and equalization basin area and when people and equipment move to and from the Vertac site.

18. Samples show that dioxin has been transported off the Vertac site into fish and sediment in Bayou Meto, and also into the Jacksonville sewage treatment plant.

19. Although some measures have been taken to decontaminate the site, the following exposed areas still provide a source whereby dioxin and other wastes escape off site:

a) Reaser-Hill Landfill Area;

b) Hercules-Transvaal landfill area and "old barrel storage area";

c) The equalization basin itself and discharges therefrom.

20. While it has been known for some time that dioxin was fairly toxic, it has only been during the last few years that the extreme toxicity of dioxin has been known.

21. Considering the toxicity alone of a chemical such as dioxin, it is not sufficient to determine whether it is a health hazard. The dosage and whether there is actual exposure to that chemical and the extent of the exposure must also be considered.

22. Levels of dioxin as high as 111 parts per million ("ppm") have been found in the toluene still bottoms on the Vertac site. The toluene is a solvent used in the manufacture of trichlorophenol on the Vertac site. The still bottoms are either stored in monitored barrels or are buried beneath the ground.

23. The soil in the area where Vertac stored barrels of toluene still bottoms above ground contains various levels of dioxin up to 559 parts per billion ("ppb"). This dioxin most probably came from the substance stored in the barrels leaking onto the ground.

24. The EPA Science Advisory Panel believes that the "no observable effect level" (NOEL) for dioxin is 0.001 micrograms per kilogram (ug/kg) of body weight per day.

25. Although dioxin has been found in the sediment of the cooling pond, test results of the water being discharged from the cooling pond contained no detectable dioxin.

26. The highest concentration of dioxin found in the sediment of Rocky Branch creek on the plant site is 1,090 ppt.

27. Dioxin is found further downstream in Rocky Branch Creek at levels up to 554 ppt.

28. With the exception of one finding of 1800 ppt, the levels of dioxin in the sediment of Bayou Meto range only up to 70 ppt.

29. There are significant levels of dioxin found in the sediment in the equalization basin and Jacksonville Sewage Treatment Plant.

30. Dioxin has very little, if any, solubility in water. Although little is known about the vapor pressure of dioxin, the evidence indicates that it has low volatility.

31. Most if not all of the buried dioxin in the Hercules-Transvaal Landfill area is in toluene still bottoms which generally have a consistency like tar, pitch, or a rubber ball.

32. On June 15, 1979, following meetings between representatives of Vertac, EPA, Hercules and the Arkansas Department of Pollution Control & Ecology, the State agency issued an administrative Order directing that certain procedures be taken on the plant site as an interim measure to prevent further discharge of contaminants into the environment. Vertac agreed to the terms of the Order, which were substantially (1) that the wastes contained in the above-ground barrel storage area would be inventoried, redrummed where necessary to prevent leakage, and removed to a roofed, secured storage area pending final disposition; (2) that the area used for the above-ground barrel storage area would, after removal of the barrels to the new storage area, be delineated, the highly contaminated wastewater and soils removed and the remaining surface of the ground covered to prevent surface runoff; (3) that sampling and analytical activities were to be undertaken on and off of the property, and engineering studies done of the plant site; (4) that the underground burial areas were to be delineated, dikes constructed to divert surface water away from those areas, and the areas were to be capped by an impermeable covering to prevent infiltration. Vertac was also to maintain and provide the State agency and EPA with certain records regarding its activities in complying with this Order and medical records regarding its activities in complying with this Order and medical records of employees, and upgrade employee equipment and safety measures. Certain timetables were established for the completion of each portion of the Order. Vertac contends, the State agency agrees, and the Court finds that Vertac has substantially complied with the terms and provisions of the Order.

33. The use of 2,4-D is of great importance to the production of rice in Arkansas and elsewhere.

34. Vertac manufactures a substantial portion of the American production of 2,4-D. Its importation into the United States from foreign sources is permitted.

CONCLUSIONS OF LAW

[1] We need look no further than our own Court of Appeals to find the guidelines for the issuance of a preliminary injunction in this case. *Reserve Mining Co. v. Environmental Protection Agency*, 514 F.2d 492 (8th Cir. 1975) is one of the most significant decisions in the field of environmental law. In that case the court en banc reversed some aspects of a preliminary injunction issued by Judge Miles Lord closing Reserve's plant located on the shores of Lake Superior, because of the discharge of taconite "tailings" into the lake and ambient air. "The trial court, not having any proof of actual harm, was faced with a consideration of 1) the probabilities of any health harm and 2) the consequence, if any, should the harm actually occur." *Id.* at 519. Just as in *Reserve* there exists in the present case no proof of actual harm sustained from the escape of dioxin from the premises of Vertac. There is proof that a number of Vertac employees did develop chloracne a skin pathology, after a "blowout" at the plant several years ago. It has been conceded that Vertac has installed modifications to prevent a recurrence of such an event in the future. The question presented here is whether dioxin is now escaping from the Vertac premises in sufficient quantities to justify a preliminary injunction. On the record, the best that can be said is that the existence of dioxin in the

dumping that occurred at landfill during 1971 and 1972, did state cause of action against landfill owners and present owners of land under Safe Drinking Water Act, Public Health Service Act, § 1431, 42 U.S.C.A. § 300i.

17. Federal Civil Procedure ⇐=206

Traditional rule is that one tort-feasor may not compel joinder of other alleged tort-feasors. Fed.Rules Civ.Proc. Rule 19, 28 U.S.C.A.

18. Health and Environment ⇐=25.15(4)

In United States' action seeking injunctive relief to remedy hazards posed by chemical dumping that occurred at landfill during 1971 and 1972, defendant tort-feasor could not join other alleged joint tort-feasors. Fed.Rules Civ.Proc. Rule 19, 28 U.S.C.A.

William W. Robertson, U.S. Atty., by Charles J. Walsh, First Asst. U.S. Atty., Michael V. Gilberti, Sp. Asst. U.S. Atty., Newark, N.J., for plaintiff.

John L. Miller, Jr., Miller & Daniels, Cherry Hill, N.J., and Robert E. Gladden, Gladden, Brierley & Paglione, Camden, N.J., for Price defendants.

John P. Hauch, Jr., Archer, Greiner & Read, Haddonfield, N.J., for A.G.A. defendants.

BROTMAN, District Judge.

For fundamental and deeply rooted psychological reasons, as well as more mundane utilitarian considerations, it is characteristic of man to bury that which he fears and wishes to rid himself of. In the past, this engrained pattern of behavior has generally proven harmless and, indeed, has often led man to restore to the earth the substances he had removed from it. In today's industrialized society, however, the routine practice of burying highly toxic chemical wastes has resulted in serious threats to the environment and to public health. *See* Note, *An Analysis of Common Law and Statutory Remedies For Hazardous Waste Injuries*, 12 Rut.L.J. 117, 117-22 (1980). The dangers are especially acute when buried chemical wastes threaten to contaminate the underground aquifers, upon which half of the nation relies for its supply of drinking water. *Id.* at 121.

The United States brought the instant action for injunctive relief to remedy the hazards posed by chemical dumping that occurred at Price's Landfill in Pleasantville, New Jersey during 1971 and 1972. The action was brought pursuant to section 1431 of the Safe Drinking Water Act ("SDWA"), 42 U.S.C. § 300i, section 7003 of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6973, and the federal common law of nuisance. Defendants are the present owners of the now dormant landfill and the persons who owned and managed the landfill in the early 1970's when it was in operation. Currently being considered by the court are the government's motion for a preliminary injunction and defendants' motions for summary judgment and to compel the joinder of additional defendants. In accord with Rule 65, Fed.R.Civ.P., the court now renders the following findings of fact and conclusions of law.[1]

FINDINGS OF FACT

1. *The Parties and Their Relation to the Litigation*

1. Plaintiff is the United States of America, acting on behalf of the Administrator of the Environmental Protection Agency (E.P.A.).

2. The Atlantic City Municipal Utilities Authority (ACMUA) has intervened as a plaintiff. The ACMUA owns the Atlantic City Water Department, which supplies water to approximately 10,600 domestic, commercial and public users in Atlantic City. The system contains approximately 10,000 connections and relies upon both sur-

1. The court wishes to thank the attorneys for the government for the thorough proposed findings that they submitted. These were typical of the exemplary fashion in which the government has prosecuted this case.

flow and well water. All raw water is treated at the ACMUA's treatment plant in Pleasantville, New Jersey.

3. Defendants are Charles Price, individually and d/b/a Price's Trucking Company, Virginia Price, and Carl Price (Collectively referred to as the Price defendants); and Bernard Abramoff, Lee Gorell, and Frank Abramoff, individually and d/b/a A.G.A. Partnership (Collectively referred to as the A.G.A. defendants).

4. Charles Price and his wife, Virginia Price, are residents of Atlantic County, New Jersey. Price Trucking Company is a sole proprietorship owned and operated by Charles Price, which was formed in or about 1967.

5. From January 18, 1960 to January 19, 1978, Charles and Virginia Price owned a twenty-two acre lot situated on the border of the City of Pleasantville and the Township of Egg Harbor, commonly referred to as Price's Landfill Number 1 (Price's Landfill). That property is the subject of this litigation.

6. Carl Price, the brother of Charles Price, resides in Atlantic County, New Jersey. From 1960 until 1976, Carl Price managed, supervised, and operated Price's Landfill on behalf of his brother.

7. Bernard Abramoff, Lee Gorell, and Frank Abramoff comprise a general partnership known as A.G.A. Partnership. Each of the partners resides in or maintains a residence in Atlantic County, New Jersey.

8. A.G.A. Partnership is a New Jersey general partnership, which was formed for the purpose of purchasing and reselling for profit real estate in the Atlantic County area.

9. On November 13, 1978, Lee Gorell, on behalf of A.G.A. Partnership, entered into a purchase agreement with Charles and Virginia Price to purchase Price's Landfill, and, on January 19, 1979, A.G.A. purchased the property.

10. During the negotiation period, Charles Price advised Gorell that the property had been used as a landfill. Further, he requested that A.G.A. formally acknowledge that the property had been used as a landfill and assume responsibility for the property. Price did not specifically advise Gorell that chemical wastes had been dumped on the property.

11. At the closing, on January 19, 1979, Gorell, for A.G.A. Partnership, signed an acknowledgment stating that:

> Buyer hereby acknowledges that the property [Price's Landfill # 1] was used as a landfill and accepts it as is, with no responsibility from seller.

12. Under the laws of New Jersey, a licensed broker has an obligation to inquire of a seller about any conditions on his property that may materially affect the value of the property. At least as of 1978, both Lee Gorell and Bernard Abramoff, two of the partners in A.G.A., were brokers licensed by the State of New Jersey.

13. The presence of the chemicals and toxic wastes buried at the landfill was a condition that affected the value of the landfill, but Gorell made no inquiry to determine whether such wastes were present.

14. No one from or acting on behalf of A.G.A. visited the property before A.G.A. purchased it. The surface condition of the property would not have revealed that toxic wastes were buried there, although several monitoring wells were present and visible. A.G.A. made no inquiry of Price as to when the landfill was properly closed, and there was no requirement in the deed or contract of sale prepared by A.G.A., or any representation from Charles Price, that the landfill had been properly closed.

15. At the time of purchase, A.G.A. was aware that building on former landfills required special construction techniques. Before taking title, however, A.G.A. made no inspection of the property and made no effort to determine what was buried at the landfill.

16. In the summer of 1979, Gorell and his partners became aware from newspaper accounts that toxic chemicals had been buried at the landfill.

17. In November and December of 1979, A.G.A. received additional information

which confirmed that hazardous chemicals were buried beneath Price's Landfill.

18. At no time has A.G.A. actively disposed of any wastes at the landfill or actively contributed to the migration of contaminants from the site. Nor, however, has A.G.A. taken any steps to prevent the flow of chemical wastes from the landfill or any other action to remedy the condition present there.

19. A.G.A. purchased the property, in an arm's length transaction, for $70,000.00. This price was substantially less than the fair market value of such a property, had it not been used as a landfill, but was a reasonable price given the prior use of the property.

II. *State Action Will Not Be Effective*

20. On two occasions, once in 1974 and again in 1976, the New Jersey Department of Environmental Protection (D.E.P.) commenced actions to remedy the potential hazard posed by Price's Landfill. Those actions proved ineffective.

21. In mid-1979, E.P.A. initiated a program designed to identify, investigate, and remedy problems caused by the improper disposal of hazardous wastes. In an attempt to avoid duplication of effort and to make the best use of available resources, E.P.A. and D.E.P. met on several occasions and agreed to divide between them responsibility for existing waste disposal sites in New Jersey.

22. At that time, Price's Landfill was identified as a source of groundwater pollution, and it was agreed that E.P.A. would have primary responsibility for investigating that site and pursuing appropriate corrective action.

23. In November of 1979, E.P.A. began a site review of the landfill and began to investigate the geohydrology of the area in an attempt to determine the extent of groundwater contamination that had occurred as a result of chemical dumping at the landfill and to evaluate the likely effect of that contamination on public and private wells located nearby.

24. Since November of 1979, E.P.A. has actively studied the extent of the problem posed by Price's Landfill. Based on this study, the United States instituted this action on December 22, 1980.

III. *The Location and History of Price's Landfill*

25. Price's Landfill occupies approximately twenty-two acres extending across the boundary of Egg Harbor Township and the Town of Pleasantville, New Jersey. The landfill is roughly rectangular in shape with its longitudinal axis running north and south along the west side of Mill Road. Spruce Street runs east and west along the north side of the property. The legal description of Price's Landfill is Block 36A, Lots 3 and 6 of Egg Harbor Township, and Block 190, Lot 3 of the Town of Pleasantville.

26. On January 18, 1960, Charles and Virginia Price purchased the property known as Price's Landfill from Richard and Betty Simon.

27. From the purchase in 1960 until approximately 1967, Charles Price excavated sand and gravel from the property for use in his road contracting business.

28. In about 1968, when the pit was excavated to within approximately two feet of the water table, people from the surrounding area began to dump trash into it. Price permitted this and he had a worker periodically collect the trash in one corner of the pit and cover it.

29. In 1969, Price began to operate the property as a landfill on a commercial basis.

30. From 1969 until the landfill was closed in 1976, Carl Price worked at the site and conducted the daily operations of the landfill. He supervised the other workers, directed the disposal of wastes, including chemicals, and reported daily to Charles Price on the operation of the landfill.

31. On June 11, 1970, Charles Price, d/b/a Price Trucking Company, applied to D.E.P. for a license to conduct a sanitary landfill operation at Price's Landfill. The application listed the materials that Price

intended to accept at the landfill. Price's application specifically excluded "Chemicals (Liquid or Solid)," because Price did not, at that time, intend to dispose of chemical wastes.

32. Based on the June 11, 1970 application, D.E.P. issued a certificate permitting Price to operate Price's Landfill as a solid waste disposal facility. The certificate, which took effect on June 30, 1970, remained valid until June 30, 1971. During that time, the New Jersey State Sanitary Code required each landfill operator to submit a sanitary landfill design, which was to include a plot plan, topographical, geological and hydrological maps of the site and surrounding areas, drilling procedures, proposed final elevation of the fill, and detailed drawings of any dikes, dams, or other pollution protection devices that might be necessary. Charles Price was aware of this requirement.

33. Several bureaus within D.E.P., including the Bureau of Solid Waste Management, would review each application for certification and the accompanying engineering plan to determine whether the wastes that the operator had noted on the application would pose a threat to health or the environment, given the method of disposal and other factors indicated on the plan.

34. It was not until approximately September 29, 1971 that Price submitted an engineering plan to the D.E.P. The plan, which had been prepared by his son Ronald Price, a professional engineer, did not include any provision for the disposal of chemicals, despite the fact that the landfill was, at that time, accepting and disposing of chemical wastes. Charles Price never advised his son that the landfill was or would be accepting chemical wastes.

35. In May of 1971, Charles and Carl Price began to accept and dispose of chemical wastes at the landfill. The disposal of these wastes during 1971 occurred on a sporadic basis.

36. On June 30, 1971, Charles Price's permit to conduct a landfill operation at Price's Landfill expired. He did not file an application to renew his permit until February 11, 1972, and he never received a permit to operate for the period of June 30, 1971 to June 30, 1972. Price's February application was prompted by a D.E.P. letter of January 28, 1972, which notified Price that he had not submitted an application to renew his permit and threatened legal action if he did not promptly file such an application.

37. In his February 11, 1972 application, Price, for the first time, sought permission to accept and dispose of liquid and chemical wastes at the landfill. During this period, Price was accepting increased quantities of chemical wastes.

38. In response to Price's application, on June 30, 1972, D.E.P. granted Charles Price a certificate subject to the conditions that:

No liquid or soluble industrial wastes, petrochemicals, waste oils, sewage sludge, or septic tank wastes shall be received for disposal at this site.

Observation well(s) shall be constructed for monitoring ground water conditions no later than six (6) months from the date of issuance of the Certificate of Registration. Said observation well(s) shall be constructed according to standards established by the Department of Environmental Protection.

39. Despite the above limitations, Charles and Carl Price continued to accept and dispose of significant quantities of chemical and liquid wastes at the landfill until November, 1972.

40. These wastes were disposed of with minimal precautions. Frequently, wastes would be poured into the refuse from an open spigot on a tank truck. At other times, drums of chemicals would simply be buried under the refuse at the landfill.

41. On July 21, 1972, only three weeks after the permit prohibiting liquid wastes was issued, Alan Kaszevski, the D.E.P. inspector responsible for the region containing Price's Landfill, inspected the landfill and cited it for accepting chemical wastes. By letter dated August 4, 1972, D.E.P. formally advised Price of the violation. Nonetheless, Price continued to accept and dis-

pose of chemical wastes in significant quantities until November, 1972.

42. Mr. Kacmorski visited the landfill approximately every six weeks during 1970 and 1971 and somewhat more frequently during 1972. In each instance, he would walk around the site and prepare a report detailing the operation of the landfill, noting any remarkable conditions and citing any violations he observed.

43. Kacmorski first observed chemical dumping at the landfill on February 15, 1972. He observed such dumping, as well as the signs of chemical dumping, on numerous occasions thereafter until November of 1972.

44. Kacmorski never authorized Price to accept chemical wastes. Nor did any other official of D.E.P. ever authorize the disposal of chemical wastes at the landfill.

45. On one occasion, Kacmorski pointed out to Carl Price that a driver was using an unsafe method to unload chemical drums, and he instructed Price to have the driver use a safer method. Other than that occasion, neither Kacmorski nor any other D.E.P. official ever instructed Charles or Carl Price as to where or how to dispose of chemical wastes.

46. Kacmorski was not directly responsible for permit violations and often would not be familiar with the terms of a landfill's permit. He was aware, however, that the July 30, 1972 permit issued to Price prohibited chemical dumping at the Landfill.

47. Kacmorski regularly reported his observation of chemical dumping at the landfill to his superiors in the Bureau of Solid Waste Management at D.E.P. D.E.P. took no action to stop the disposal of chemical wastes at the landfill.

48. After November of 1972, no chemical wastes were disposed of at the landfill, although it continued in operation.

49. In 1976, Charles Price terminated the landfill operation and covered the site with fill material.

50. The property has been unused since 1976. Neither Price nor A.G.A. has conducted or permitted any dumping at the property since that time.

IV. *The Nature of the Toxic Wastes Migrating from the Landfill*

51. During the period from May, 1971 to mid-November, 1972, Charles and Carl Price accepted and disposed of approximately 9 million gallons of toxic and flammable chemical and liquid wastes in drums and directly into the ground, including acetone; acids (glycolic, nitric and sulfuric) and spent acid wastes; acryloid, acryloid monomer and poly acryloid; caulking and spent caulking solvent; caustics and spent caustic wastes; cesspool waste; chemical resins and other waste chemicals; chloroform; cleaning solvents; ether and spent ether wastes; ethyl acetate; ethylene dichloride; fatty acids; glue wastes; grease and spent grease solvents; heptane; hexane; inks and waste ink residues; isopropanol; isopropyl alcohol; isopropyl ether; lacquer thinner; manganese dioxide; methanol; methyl ethyl ketone; methyl isobutyl ketone; methyl vinyl ketone; miscellaneous chemical laboratory wastes; mineral spirits; oil and waste oil products (No. 6 waste oil); paint, paint sludge, paint thinner and spent paint wastes; perfume wastes; phenols, phenolics and phenolic solvents; resins; septic waste and sludge; still bottoms; styrene and styrene wastes; tar; titanium wastes; toluene; xylene and xylol.

52. Between 1972 and the present, 12 observation wells have been installed on or in the vicinity of Price's Landfill. In addition, there are approximately 25 private wells in the vicinity of the landfill.

53. On December 6, 1979; April 9–10, 1980; August 26, 1980; October 28, 1980; November 6, 1980; December 10–11, 1980; January 21, 1981; and January 26, 1981, employees of E.P.A. and members of the Field Investigative Team (FIT) (employees of Fred C. Hart Associates) collected water samples from monitoring wells located on and around Price's Landfill, and from public and private water wells in the vicinity of the landfill. These samples were collected using standard and generally-accepted procedures. Standard Chain of Custody, Field

Data, and Request for Analysis forms were prepared for each sample. Subsequently, the samples were transported to the E.P.A. Laboratory in Edison, New Jersey or to one of the FIT contract laboratories where they were analyzed using standard E.P.A. procedures outlined in *Methods for Chemical Analysis of Water and Wastes* and *Sampling and Analysis Procedure for Screening of Industrial Effluents for Priority Pollutants* for the 127 priority and consent decree pollutants.

54. The analysis of these samples has revealed significant contamination of the water drawn from wells on the landfill as well as the water drawn from wells in the surrounding area. The toxicological significance of this contamination will be discussed below. It is useful, however, to measure the level of contamination in terms of Water Quality Criteria (WQC) promulgated by the E.P.A. The most recent publication of these standards appeared in the Federal Register on November 28, 1980.

Testing of some of the monitoring wells and private wells has revealed the following contaminants, among others, present in the groundwater:

1. D.E.P. Well # 2 (at eastern boundary of the landfill) (Sampled on April 9-10, 1980)
   - Arsenic ..... 1,200 times WQC
   - Vinyl Chloride .... 440 times WQC
   - 1,2 dichloroethane .... 24,000 times WQC
   - Lead ..... 24 times WQC
2. E.P.A. Well # 6 (1,500 feet east of the landfill) (Sampled on December 11, 1980)
   - Chloroform ..... 20 times WQC
   - Tetrachloroethylene .... 7 times WQC
   - 1,2 dichloroethane .... 200 times WQC
3. Berry Well (# 41) (1,000 feet north of northwest corner of landfill) (Sampled on November 6, 1980)
   - Benzene ..... 77 times WQC
   - Methylene chloride .... 20 times WQC
   - Arsenic ..... 400 times WQC
4. Ogle White Well (# 15) (1,400 feet north-northeast of landfill) (Sampled on November 6, 1980)
   - Benzene ..... 40 times WQC
   - Methylene chloride .... 20 times WQC
   - Arsenic ..... 400 times WQC

At each of the above sites, many other contaminants were also found. In addition, many of the other sites tested also revealed significant levels of the above compounds as well as a variety of other metals, chlorinated hydrocarbons, and other chemical contaminants, many of which were present in amounts greatly in excess of the Water Quality Criteria.

V. *Toxicological Significance of These Contaminants*

55. In recent years, numerous chemical compounds have been identified as possible toxicants. These compounds can be categorized as organic and inorganic compounds.

Inorganic compounds include arsenic, cadmium, chromium, lead, nickel, zinc, and mercury. These metals have been widely used in industry since the 1930's. Research and experience with these compounds have led to an awareness that exposure to even low concentrations can result in adverse health effects. In addition to being toxic, some of these compounds are carcinogenic and possibly mutagenic. These metals are poorly degraded by natural processes and tend to persist in the environment.

Certain organic compounds, such as toluene, benzene, phenol, chloroform, methylene chloride, vinyl chloride, and dichloroethane have been commonly used in industry since the 1950's. The chlorinated hydrocarbons, in particular, are poorly degraded by natural processes and, therefore, tend to persist in the environment. Many of these organic compounds are capable of causing adverse health effects even at low concentrations. They are frequently hepatotoxic, nephrotoxic, and neurotoxic. Many of these compounds are also carcinogenic, teratogenic, and mutagenic.

56. Of the large number of chemical compounds in common use, relatively few are known or suspected to be capable of causing cancer. Carcinogens have been identified either by observation of tumors occurring in human populations or by controlled experiments using test animals or other organisms. These techniques, and comparable methods to determine teratogenicity and mutagenicity, have demonstrated that many of the contaminants found in the groundwater under and in the vicinity of the landfill are hazardous to the

environment and to human health. For example,

(a) arsenic is a highly toxic metal and an established human carcinogen;

(b) cadmium is a highly toxic metal and a suspected carcinogen in man, and is known to be teratogenic in animals;

(c) lead is a toxic metal and suspected of being carcinogenic and teratogenic in humans;

(d) benzene is a petroleum derived hydrocarbon, which is highly toxic as well as a potent carcinogen and teratogen;

(e) trichloromethane (chloroform) is highly toxic and a recognized carcinogen and teratogen;

(f) vinyl chloride is a toxic halogenated hydrocarbon, which is carcinogenic and suspected of being mutagenic;

(g) 1,2 dichloroethane is a toxic chlorinated hydrocarbon, which is suspected of being carcinogenic and teratogenic.

All of the above compounds have been designated as hazardous wastes and hazardous waste constituents under published E.P.A. regulations, 40 C.F.R. §§ 261.11, 261.33 and Appendix VIII, and are contaminants within the meaning of 42 U.S.C. § 300f(6). Many of the other chemical wastes emanating from the landfill are known to be toxic and are known or suspected carcinogens and teratogens.

57. Given the many contaminants that have been identified in the groundwaters surrounding Price's Landfill and the extent of contamination found, the use of wells in the immediate area of the landfill is likely to create grave hazards to human health. The presence of a significant number of these contaminants in public drinking water supplies in a quantity exceeding E.P.A. Water Quality Criteria would present an extremely serious public health problem. Indeed, the presence of any one of these contaminants in an amount significantly in excess of the relevant criterion would be a serious situation.

VI. *Geohydrological Findings*

58. Groundwater hydrology or geohydrology is the study of the character, source, and movement of underground waters. An important aspect of this science is the study of the distribution and characteristics of earth materials—such as sand, clay, and solid rock—and the effect of these materials on the quality and movement of groundwater. Geohydrology also involves the study of the relationship between groundwaters and surface waters, such as streams and lakes.

59. Contamination from improperly designed landfills can pose a major problem to public drinking water supplies and has, in the past, resulted in damage to such supplies.

60. Price's Landfill was improperly located as a landfill site in that it was placed in a geographically sensitive area—*i. e.*, an abandoned sand and gravel quarry. In general, landfills should not be located near water supply sources, should not be placed in areas underlaid by sandy soil, should not be located where the water table is less than 10 feet from the surface, and should not be situated where the ground water flows in the direction of public water supplies. Price's Landfill violates all of these site selection criteria. Landfills that are permitted to accept hazardous chemical wastes pose a particular danger and, therefore, should be located in conformity with the above site selection criteria.

61. On the surface of the earth, there is an area containing air, water, and earth materials through which the surface water moves downward. This region is called the "unsaturated zone." Below the unsaturated zone, there is a region filled with water called the "saturated zone." The boundary between the unsaturated and saturated zones is referred to as the "water table."

62. Saturated geologic deposits can be broadly divided into water yielding and water saturated but unyielding deposits, which are referred to respectively as aquifers and confining beds. Aquifers, which may cover large areas, are characterized by the free movement of waters through the

geologic deposit. This movement occurs because all aquifers have small void spaces in the deposits, referred to as pores. These pores are interconnected, enabling water to move through the deposit. The freedom of movement is described quantitatively by the hydraulic conductivity (permeability). Confining beds, by contrast, restrict the movement of groundwater. The distribution of these distinct types of deposits in an area controls the regional movement of groundwater, determines its accessibility to wells, and, where contaminants are present, affects the likelihood and movement of groundwater contamination.

63. "Head" is the elevation of groundwater—*i. e.*, the depth of the water table relative to a common reference point, normally sea level. A comparison of the elevation of the water level at three points in a region reveals the change in head, also called the slope or hydraulic gradient, of that area. The slope of the surface determined in this manner defines the direction in which underground liquids, including groundwater, will flow. Because groundwater obeys the law of conservation of energy, it will move in the direction of the maximum slope of the water table.

64. E.P.A. officials and contractors took extensive water level measurements in the area of Price's Landfill. These measurements reveal that the hydraulic gradient in the area of the landfill slopes generally east and east-northeast from the landfill.

65. The groundwater in the area, and contaminants in that groundwater, will therefore tend to flow east and east-northeast.

66. Darcy's Law allows one to determine the amount and rate of water flow from the change in pressure between various points, accounting for the hydraulic conductivity (permeability) and porosity (space between individual grains of the earth material) of the material through which the water is flowing.

67. Based upon the available geological data for the area surrounding Price's Landfill, the porosity of the landfill and of the ground between it and the ACMUA wells probably ranges between .3 and .4.

68. The hydraulic conductivity of the landfill area probably ranges between 60-70 feet per day.

69. Dissolved substances move with the groundwater as it flows along the hydraulic gradient, but not at the same velocity as the groundwater. Leachate and liquids deposited in a landfill move down through the groundwater and away from the landfill, forming a region or plume of contamination that emanates out into the aquifer. The plume follows the direction of groundwater flow and has a concentration similar to but somewhat more diluted than that at the landfill. The leading edge of the plume is dispersed and contains only trace amounts of the substances that will follow at a later time. The further and longer the plume moves, the wider the dispersed front becomes.

70. A leachate plume has been defined in the area of Price's Landfill, although the precise contours of the plume have not been determined. The plume clearly emanates from Price's Landfill and is the result of the chemical dumping that occurred there in 1971 and 1972. There are no other sources of pollution in the area that have significantly contributed to this plume of contaminants.

71. The contaminants in the groundwater have followed and are likely to continue to follow the hydraulic gradient east and east-northeast from the landfill toward the ACMUA wells. The velocity of the leachate from the landfill toward the ACMUA wells will probably range between .70 and .85 feet per day. This rate will vary somewhat with respect to different contaminants. Certain pollutants, such as 1,2 dichloroethane, have a low retardation factor and move more rapidly within the groundwater than other contaminants.

72. The movement of the contaminants toward the ACMUA wells is confirmed by water samples taken from monitoring wells E.P.A. # 1A, located 1,200 feet east of the landfill, and E.P.A. # 6, located 2,000 feet east of the landfill, and private well # 28.

located 2,400 feet east of the landfill. Each of these wells show significant, though diluted, amounts of the contaminant 1,2 dichloroethane. The extent of the leachate plume has not been precisely delineated by the tests done to date. The resistivity test that has been done is of limited utility because of its inability to ascertain the presence of chlorinated hydrocarbons, which are often not conductive and, therefore, difficult to detect using resistivity. Because certain of these chlorinated hydrocarbons, such as 1,2 dichloroethane, move more rapidly than other contaminants, significant pollution can be present well in advance of the time it is detectable using resistivity.

72. The contaminants emanating from the landfill should take approximately 13–15 years from the date of their disposal to reach the ACMUA wellfield, the closest well of which is located 2,400 feet east of the landfill. This calculation, however, does not take into account the effect of the ACMUA wells on the movement of the contaminants.

74. Pumping associated with a large public water supply, such as Atlantic City's, significantly affects the hydraulic gradient in the area around the wells. The pumping of large quantities of water creates cones of depression around the wells, which increase the velocity of groundwater (and pollutants contained in that water) moving toward those wells. The speed of the contaminants will tend to increase dramatically as they approach the pumping wells. The cone of depression created by the pumping ACMUA wells may extend as far west as E.P.A. well # 3, which is 2,500 feet east of the landfill.

75. Between the landfill and the ACMUA wells, there is no indication of a geologic confining barrier in the upper 100 feet of the Cohansey Aquifer. Thus, there is nothing to impede the flow of contaminants toward those ACMUA wells that draw water from depths less than 100 feet.

76. There is evidence of a clay confining bed under Price's Landfill at a depth of approximately 120 feet (100 feet mean sea level). That clay layer is approximately 40 feet thick. It is possible that this clay layer extends continuously between the landfill and the ACMUA wells, but this cannot be determined with assurance without further testing. If there is such a continuous clay layer, wells drawing water from the Cohansey Aquifer below that layer would likely not be contaminated by leachate from the landfill.

77. The limited testing that has been done does not reveal any contamination of the groundwaters in the 150–200 foot level of the aquifer.

VII. *The Likely Effect of the Contamination on Water Supplies*

78. Approximately 35 homes are located on the northeast border of the landfill. These homes have been using private wells for their water supply, drawing water from the Cohansey Aquifer at depths generally under 100 feet.

79. Private wells to the east and northeast of the landfill are very likely to encounter strongly contaminated water if they are screened at depths of 40 to 60 feet below the water table and somewhat less polluted water if screened at higher or lower depths.

80. Many of the private wells in this area are presently contaminated by the leachate from the landfill. Individuals who drink water from these wells expose themselves to significantly increased risks of developing toxic conditions, cancer, and birth defects. Other uses of water from these wells, such as bathing, may also lead to health problems, depending on the degree of contamination.

81. The Atlantic City water system is comprised of fifteen wells and a reservoir. Wells # 2, 3, 4, 7, 8, 9, 10, 11, 12, and 13 are operating wells, which draw water from the Cohansey Aquifer. Wells # 14 and 15 draw water from the Kirkwood strata and are screened at a depth of approximately 675 feet. Wells # 1, 5, and 6 are not in service and are presently inoperable.

82. The geohydrological data indicate that the dispersed front of the plume is somewhere beyond monitoring well E.P.A.

TO: Site Mitigation Program
ATTN: Planning and Policy Unit
400 P Street, 4th Floor
P.O. Box 806
Sacramento, California 95812-0806

FROM: [Insert your name]

SUBJECT: Changes and/or Corrections to Model I/SE Determination and Order (SM #93-1)

In using the model I/SE Determination and Order boilerplate, I noticed that the following changes and/or corrections should be made:

Page(s): _____

Section #'s: _____

Change/Correct to read: _____

_____

_____

_____

(Attach additional pages if necessary)