ENVIRONMENTAL OFFICE
NAVAL TRAINING CENTER
33502 DECATUR ROAD, SUITE 120
SAN DIEGO, CA 92133-1449

RESTORATION ADVISORY BOARD

AGENDA

DATE:	**Tuesday evening, 11 October 1994**
TIME:	**6:30 - 8:30 PM**
LOCATION:	**NAVAL TRAINING CENTER, SUPPORT CENTER, BUILDING #623** (Enter NTC Gate 1 at Lytton and Barnett; maps to Building #623 will be available from guard)
6:30 - 6:35	WELCOME AND INTRODUCTIONS BRIEF OVERVIEW - Agenda and Meetings Objectives MINUTES APPROVAL - September 27
6:35 - 7:35	PRESENTATION: OVERVIEW OF THE HUMAN HEALTH RISK ASSESSMENT PROCESS FOR HAZARDOUS MATERIALS SITES
7:35 - 8:00	FINALIZE COMMENTS ON DRAFT WORK PLAN FOR SITES 2, 7, 8, AND 9
8:00 - 8:15	RECEIVE DRAFT WORK PLAN FOR NEX GAS STATION AND DRAFT COMMUNITY RELATIONS PLAN FOR NTC
8:15 - 8:30	QUESTION AND ANSWER/PUBLIC COMMENT PERIOD

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Subject: RESTORATION ADVISORY BOARD MEETING MINUTES

The fifteenth Restoration Advisory Board (RAB) meeting was held on **Tuesday, October 11, 1994**, at the Naval Training Center (NTC) Support Center Training Room, Building #623, from 6:30 until 8:30 PM.

Mr. Phill Dyck, RAB Navy Co-Chair, called the meeting to order at 6:35 PM. He announced that CNN (Cable News Network) was present to film some of the meeting. He also introduced the evening's agenda. He explained that the topic of health risk assessment is a complex one that is often difficult to understand. The evening's presentation of health risk assessment would therefore be a basic, introductory one.

Business Items

Approval of Minutes - A motion was made, seconded, and carried to approve the minutes from the September 27, 1994 RAB meeting.

PRESENTATION ON HEALTH RISK ASSESSMENT

Mr. Dyck introduced Dr. David Liu, Principal Toxicologist with Bechtel National, Inc., who would speak on the human health risk assessment process for hazardous material sites. Dr. Liu spoke briefly on his educational background and experience as a toxicologist. His presentation was accompanied by overheads and handouts.

Dr. Liu discussed the regulatory framework and guidance for conducting risk assessments, and the purpose, characteristics, and types of risk assessments. The discussion then focused on one of three types of risk assessment: the baseline risk assessment, which is the most comprehensive type and which is applied to sites subject to remedial investigation/feasibility study (RI/FS). Dr. Liu's discussion included the following aspects of baseline risk assessment:

- the basic elements;
- the process of data evaluation and chemical selection;
- exposure assessment;
- selection of exposure scenarios;
- identification of exposure pathways and examples of the different pathways;
- a conceptual model for potential exposures;

- standard exposure routes for a residential scenario;
- toxicity assessment, including noncarcinogenic and carcinogenic effects;
- reference doses and cancer slope factors;
- exposure assessment general dose model;
- dose calculation with some standard assumptions for reasonable maximum residential exposure; and
- risk characterization.

A question-and-answer/discussion period followed Dr. Liu's presentation. A RAB member asked if weather can affect the speed of chemical movement or activity in the environment. Dr. Liu indicated that there may be a relationship. RAB member Ms. Laura Hunter brought up the subject of problems with the risk assessment process and handed out an article for meeting attendees dealing with this topic. She pointed out such things as variability of human response to various chemicals (e.g., children vs. adults), changing environmental conditions (e.g., rain affecting groundwater), and the reality that people who do risk assessments are from someplace else and do not have to live with the results. She said that a big concern is that a risk assessment may suggest that it is safe to leave some contaminants in place, while the community might prefer that a full cleanup be conducted. A RAB member asked who will be the chemist who will evaluate the chemicals at NTC. At this time it is unknown, but the person will be from the CLEAN II team.

COMMENTS ON DRAFT WORK PLAN FOR SITES 2, 7, 8, AND 9

Mr. Jim Durbin, RAB Community Co-Chair, led the discussion on finalizing comments on the Draft Work Plan. He indicated that he thought the comments he received were very good ones. He presented overheads and made handouts available representing a compilation of all comments received to date. Discussion ensued regarding the appropriateness of CERCLA at UST (underground storage tank) sites, and the extent of involvement of Cal/EPA DTSC and the Regional Water Quality Control Board versus San Diego County Environmental Health Services. Mr. Dyck stated that CERCLA is not applicable at NTC UST petroleum-contaminated sites and that under fast-track cleanup for NTC, Cal/EPA DTSC is the lead regulatory agency and part of the BRAC Cleanup Team. Other comments concerned remediation methods (thermal or bioremediation) and a "do nothing" approach, which Ms. Hunter did not agree with. A concern was voiced about the ultimate disposition of the RAB's comments, and what happened with the first set of comments on the Preliminary Assessment (PA) for Sites 4, 5, and 6. Those comments were given to the Navy and regulators, and the contractor will address them in the PA. Those comments not included in the PA will be addressed by the Navy in the near future.

FURTHER DISCUSSION

RAB member Dr. Z. Kripke raised discussion on health risk assessment. She expressed her unhappiness with the process and indicated that she feels it is a questionable "science". Ms.

Bonnie Arthur, USEPA, explained that there are federal guidelines for evaluating sites in terms of risks to human health and the environment. These are the steps followed in the baseline risk assessment, as presented earlier by Dr. Liu. Further discussion ensued regarding the need for risk assessments and whether sites could just be cleaned up without doing risk studies first. Mr. Dyck suggested putting this issue on the next RAB meeting agenda so discussion could be pursued further next time. The RAB agreed.

ANNOUNCEMENTS

Mr. Dyck announced that the next RAB meeting will be held on October 25 in the usual location, the PAO Auditorium (Building #201). The RAB will discuss comments on Draft Work Plan for NEX Gas Station and the Draft Community Relations Plan for NTC. Both of these documents were then distributed to the RAB.

The next two RAB meetings are scheduled for November 8 and 22; however, both dates may be inconvenient for some, as the 8th is election night and the 22nd falls right before Thanksgiving. Therefore, Mr. Dyck proposed holding one RAB meeting for the month of November, on the 15th, in the PAO Auditorium. This was agreed to by the RAB.

Mr. Dyck and Mr. Durbin opened up the meeting to questions and comments from members of the public attending the meeting. There were no issues raised or questions asked.

The meeting was adjourned at 8:12 PM by Mr. Dyck.

HUMAN HEALTH RISK ASSESSMENT PROCESS FOR HAZARDOUS MATERIAL SITES

(AN OVERVIEW)

David H. W. Liu, Ph.D.
Principal Toxicologist
Bechtel National, Inc.

DEFINITIONS

RISK

The probability of occurrence of an undesirable event.

What is the chance that you will get ill if you are exposed to chemicals?

RISK ASSESSMENT

The systematic process by which risk is estimated.

REGULATORY BACKGROUND

The Law

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA)

- **Public health and the environment must be protected from threats posed by uncontrolled releases of hazardous materials.**

Regulations implementing the law

NATIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN (NCP)

- **Set level of acceptable cancer risk at 10^{-6} (one chance in one million)**
- **Set cancer risk of 10^{-4} for mandatory cleanup action (one chance in 10,000)**

RISK ASSESSMENT GUIDANCE

U.S.EPA

Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Interim Final. 1989.

California EPA

Scientific and Technical Standards for Hazardous Waste Sites, 1990 with a 1992 supplement.

PURPOSE OF RISK ASSESSMENT

- Generate information (risk estimates) to allow regulatory agencies and other decision makers to identify the most appropriate action to take.

  -Do nothing, chemicals do not present a significant risk.

  -Gather more information and reassess risk.

  -Initiate cleanup.

- Justify removal action decision.

- Develop appropriate cleanup goals.

CHARACTERISTICS OF RISK ASSESSMENTS

- Risk estimates are based on "reasonably maximum" exposure conditions.

- Factors used in calculating reasonable maximum exposure levels are upper limits, each applicable to perhaps 5-10 percent of the exposed population and all together applicable to perhaps less than 1 percent of the exposed population.

- Therefore, risk assessments are believed to overestimate risk.

- Overestimation is deliberate, reflecting EPA's mandate to protect public health.

TYPES OF RISK ASSESSMENT

Baseline Risk Assessment

- Most comprehensive type.
- Applied to sites subjected to remedial investigation and feasibility studies (RI/FS)

Streamlined Risk Assessment

- Intermediate level
- Applied to non-time critical removal action sites either to:

  a. determine if action is really necessary
  b. justify the removal action

Screening Risk Assessment

- Usually the simplest.
- Applied after site inspections to determine if:

  a. the site may be removed from further consideration
  b. needs more study

BASELINE RISK ASSESSMENT

BASIC ELEMENTS

Selection of Chemicals of Potential Concern

Which chemicals should we evaluate?

Exposure Assessment

Who is likely to be exposed?
How could exposure occur?
How much exposure will occur?

Toxicity Assessment

What kinds of effects are the chemicals capable of producing?

How much exposure is necessary to cause a serious illness?

Risk Characterization

What is the chance that a person will become ill because of exposure?

BASELINE RISK ASSESSMENT

DATA EVALUATION AND CHEMICAL SELECTION

- Starts with list of all positively identified and quantified chemicals.
- Eliminates the following types:
  a. chemicals introduced into the samples after collection
  b. chemicals within background range (usually limited to metals)
  c. iron, sodium, potassium, magnesium, and calcium (essential nutrients)

BASELINE RISK ASSESSMENT

EXPOSURE ASSESSMENT

- Identifies the kinds of people who might be exposed (residents, office workers, construction workers, park users, etc.)
- Identifies how the people might be exposed
- Estimates exposure levels

BASELINE RISK ASSESSMENT
EXPOSURE ASSESSMENT

SELECTION OF EXPOSURE SCENARIOS

- Identify current and future onsite and offsite land use (residential, commercial, industrial, recreational, other)

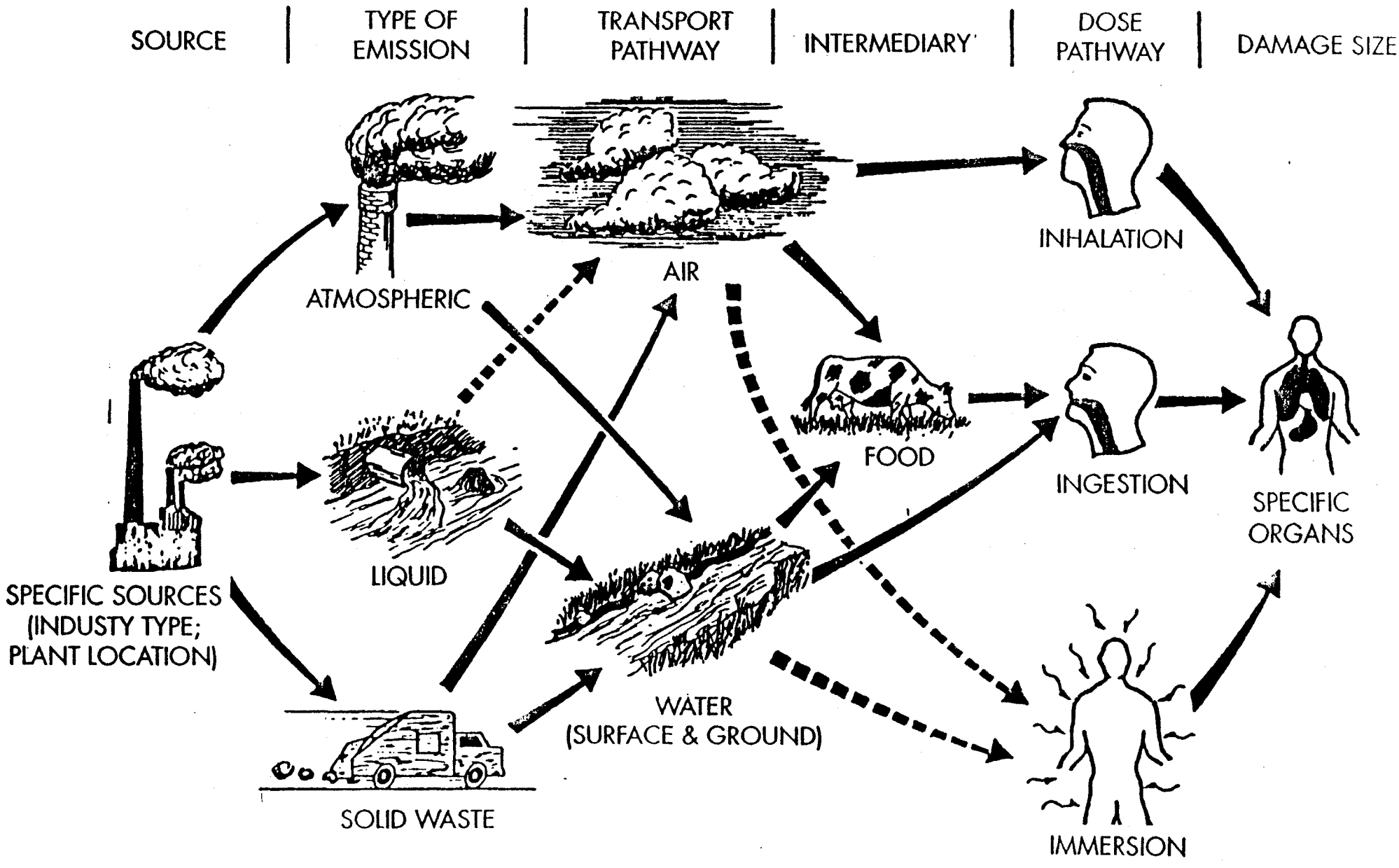
- Choose one or more use scenarios for the basis of risk estimates.

Example: if the site is currently used to manufacture widgets and will be redeveloped for residential use in the future, a residential and an industrial scenario would be used in the assessment. Separate risk estimates would be developed for each scenario.

Note: The residential scenario is almost always included even though there are no homes on the site or in adjacent areas and the exposed person is assumed to live on the site.

Exposure conditions for residents are assumed to be worse than for other types of people.

EXPOSURE PATHWAYS



BASELINE RISK ASSESSMENT
EXPOSURE ASSESSMENT

IDENTIFICATION OF EXPOSURE PATHWAYS

- How were the chemicals released (spilled, buried, placed in lagoons?)
- Where are they now (soil, groundwater, surface water, air?)
- Where could they go?

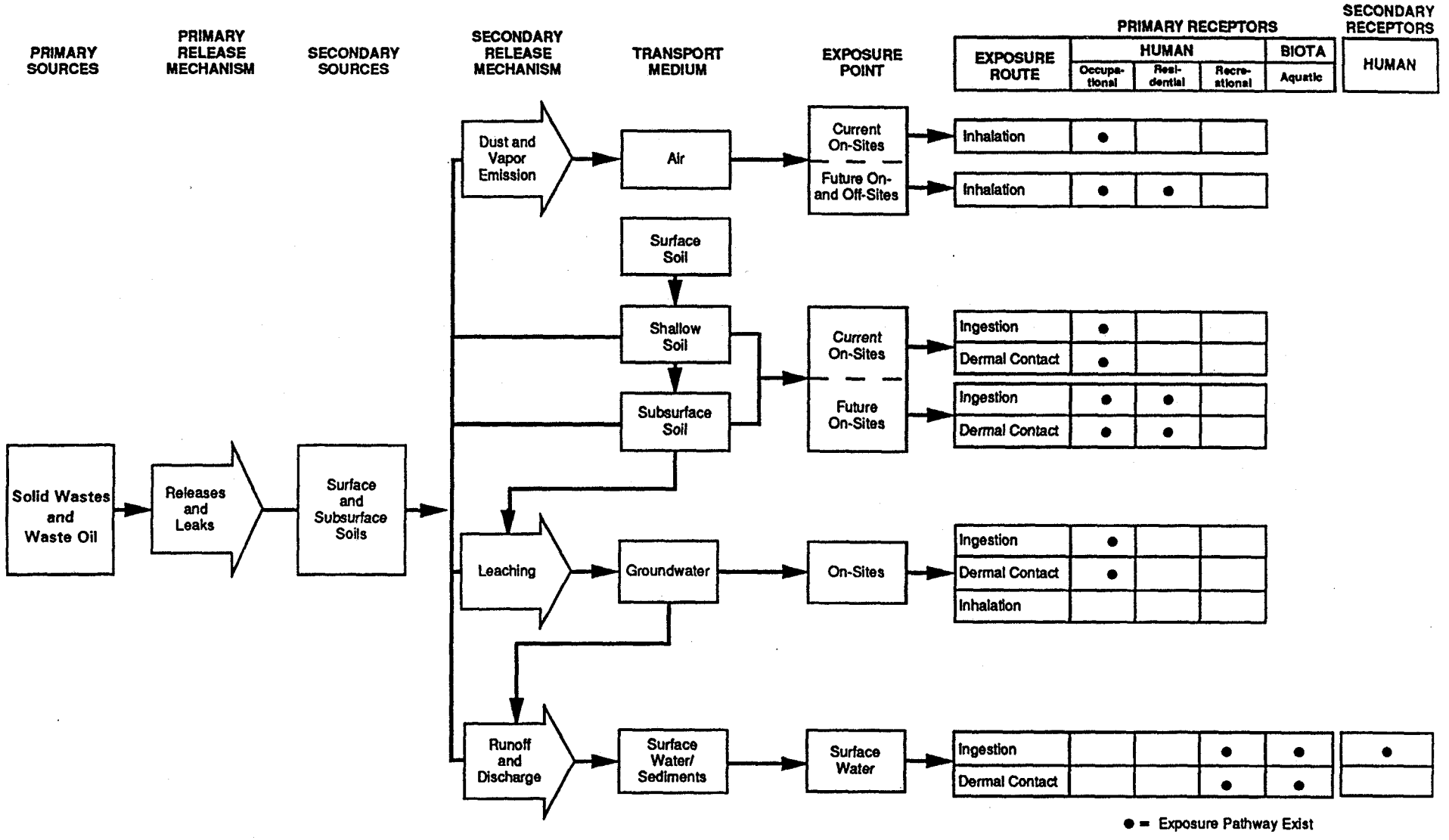


Figure 7-1

Bechtel Corporation

CONCEPTUAL SITE MODEL FOR POTENTIAL EXPOSURE
Human Receptors
Site 6A

BASELINE RISK ASSESSMENT

STANDARD EXPOSURE ROUTES RESIDENTIAL SCENARIO

Exposure Pathway	Exposure Route
Soil (surface only)	Ingestion of soil Contact with skin Inhalation of volatiles Inhalation of dust
Tapwater	Ingestion Inhalation of volatiles
Air (direct releases only)	Inhalation of volatile & particulate emissions

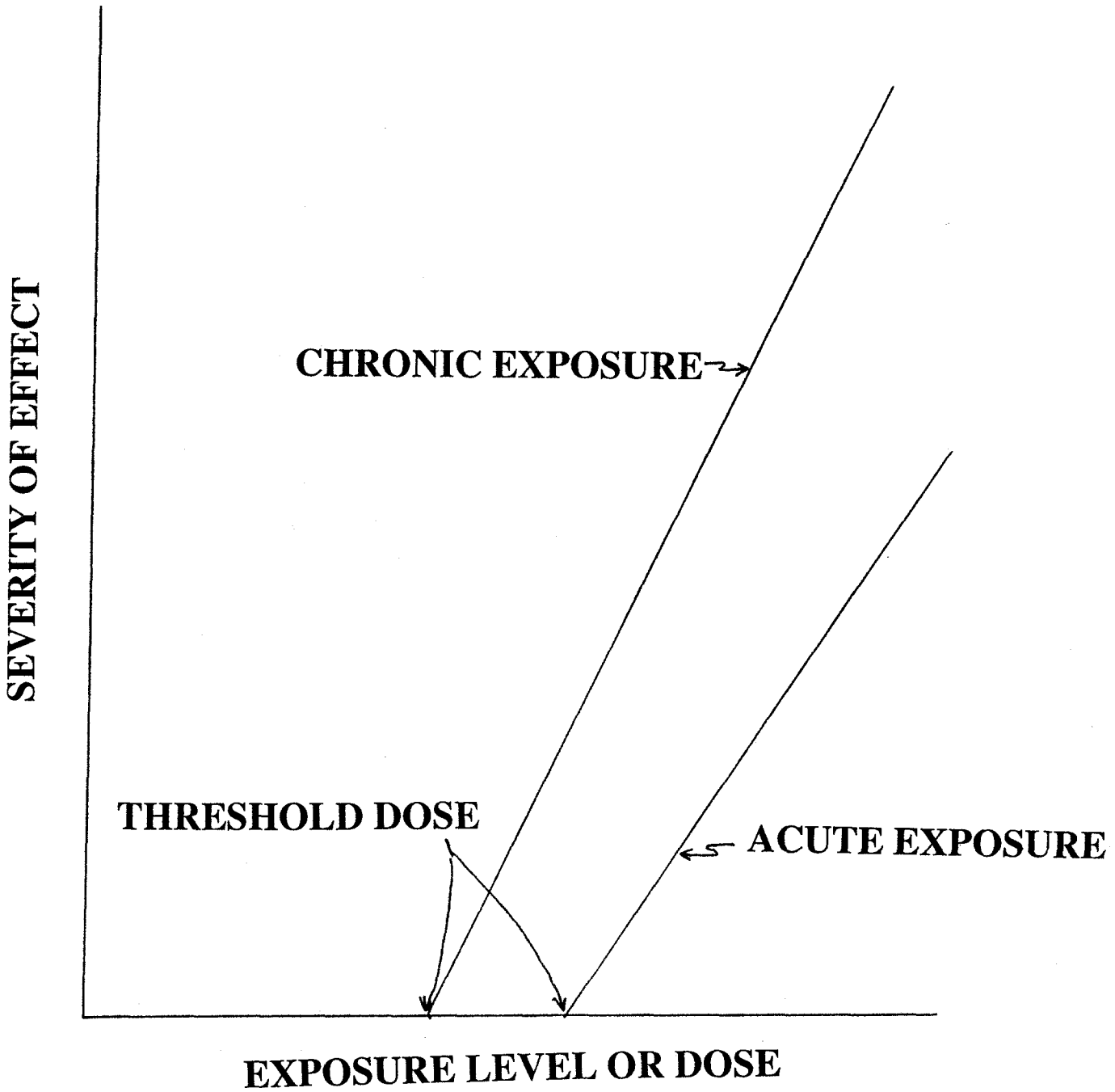
BASELINE RISK ASSESSMENT

TOXICITY ASSESSMENT

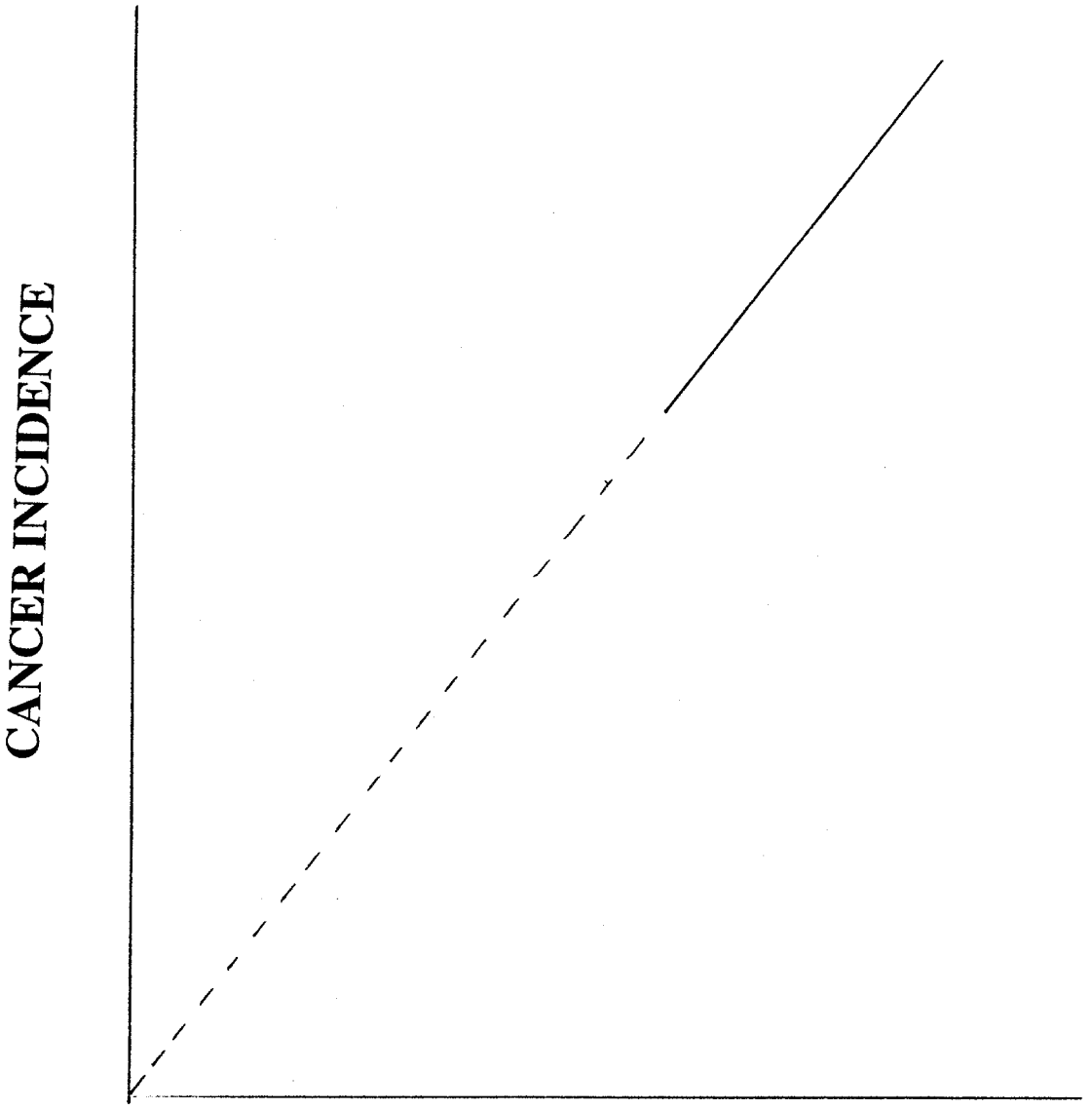
- Identify the kinds of effects each chemical is capable of producing (cancer, other effects)

- Determine how much exposure is needed to cause serious illness (dose-effect analysis)

NONCARCINOGENIC EFFECTS



CARCINOGENIC EFFECTS



BASELINE RISK ASSESSMENT
TOXICITY ASSESSMENT

REFERENCE DOSES AND CANCER SLOPE FACTORS

Noncarcinogenic Effects

Reference dose: an estimate of the dose that will not produce a serious effect during a lifetime of exposure.

Carcinogenic Effects

Cancer slope factor: cancer risk associated with a unit dose of 1.0 mg/kg-day

BASELINE RISK ASSESSMENT

EXPOSURE ASSESSMENT GENERAL DOSE MODEL

$$DOSE = (C \times IR \times ER)/(BW \times AT)$$

where:

C = measured chemical concentration in soil, water, etc.

IR = intake rate of soil, water, etc.

ER = exposure regimen (time, frequency duration)

BW = body weight

AT = averaging time

BASELINE RISK ASSESSMENT

DOSE CALCULATION SOME STANDARD ASSUMPTIONS REASONABLE MAXIMUM RESIDENTIAL EXPOSURE

Parameter	Assumption
Exposure time (inhalation)	24 hours/day
Exposure frequency	350 days/year
Exposure duration	30 years
Exposure concentration	Constant over duration
Water ingestion rate	2 liters/day (adult)
	1 liter/day (child)
Soil ingestion rate	100 mg/day (adult)
	200 mg/day (child)

BASELINE RISK ASSESSMENT

RISK CHARACTERIZATION

Noncarcinogenic Effects

Hazard quotient = Dose/RfD

Hazard index = Sum (hazard quotient)

HQ or HI > 1.0 indicates noncarcinogenic effects could occur

Carcinogenic Effects

Cancer risk = Dose x CSF

Total risk = Sum (cancer risk)