STATE OF CALIFORNIA — ENVIRONMENTAL PROTECTION AGENCY

PETE WILSON, *Governor*

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

GION 2
.0 HEINZ AVE., SUITE 200
BERKELEY, CA 94710-2737

September 30, 1993

Commanding Officer
Western Division
Attn: Mr. Ernesto Galang, Code 1813
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, California 94066-0720

Dear Mr. Galang:

PRELIMINARY RISK ASSESSMENT FOR SITE 12, NAVAL STATION TREASURE ISLAND

The Department of Toxic Substances Control (DTSC), Office of Scientific Affairs has reviewed the final Preliminary Risk Assessment for Site 12. The enclosed comments are provided to assist the Navy in developing the draft risk assessment for the Remedial Investigation. The Preliminary Risk Assessment for Site 12 is a final document and changes to that document are not necessary, nor expected.

If you have any questions regarding these comments, please call me at (510) 540-3809.

Sincerely,

Thomas P. Lanphar
Project Manager
Site Mitigation Branch

Enclosures

cc: Ms. Gina Kathuria
San Francisco Bay Regional Water
Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612

Commander Officer
Attention: Eddie V. Sarmiento
Code 80
Naval Station Treasure Island
410 Palm Avenue
San Francisco, California 94130-0410

ADMIN RECORD (3 COPIES)

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State of California

Department of Toxic Substances Control

Memorandum

To :

Joseph Chou
Site Mitigation Branch
Region 2
700 Heinz Avenue, Building F
Second Floor
Berkeley, California 94710

Date:

August 5, 1993

From :

Office of Scientific Affairs
400 P Street, Fourth Floor
P. O. Box 806
Sacramento, California 95812-0806

Subject: Risk Assessment
Treasure Island Site 12
PCA 14650 Site 20023143

INTRODUCTION

A preliminary risk assessment was conducted on Site 12 of Treasure Island. The risk assessment is focused on "current land use only. Potential future land uses for the site are unknown but might include residential commercial, industrial or recreation uses. A more comprehensive, baseline risk assessment will be performed in conjunction with the RI/FS ... " (from bottom of page 26). My comments will focus on the adequacy of this evaluation to achieve this goal.

DOCUMENTS REVIEWED

Naval Station Treasure Island Site 12 San Francisco, California, Final Preliminary Risk Assessment, PRC Environmental Management, Inc., Sept 15, 1992.

GENERAL COMMENTS

2.1 Stage 1 - Data Collection and Evaluation

Because domestic water is supplied by the San Francisco Water Department via a pipeline, and ground water is not used for potable and domestic purposes, ground water samples were not collected. Ground water is reported to occur between three and six feet below the ground surface. Therefore, any mobile contaminant would be expected to occur primarily in the ground

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water and not in soil.

Laboratory analytical report for stage 1 sampling of soil indicate the presence of acetone, toluene, diesel fuel and gasoline. Given that these substance have often been found to contaminated ground water, a ground water investigation appears to be warranted to determine if these contaminant occur in substantial quantities on the site.

Table 2-1

Soil samples from soil borings were collected and analyzed for the presence of contaminants. Sample were collected at 1, 5 and 10 feet below the land surface. However, ground water is reported to occur at 3 to 6 feet below the land surface (3.1.4 page 25). Therefore, it is not clear why samples were collected and analyzed at depths below the reported ground water.

Comparison of Metal Concentrations to Background

Given that many contaminants occur naturally in the environment, it is essential that a evaluation determine if detected levels of toxicants are above background levels. No assessment of risk should proceed until this determination occurs. Any assessment of risk should focus only on areas where contamination is above background levels.

Unfortunately, given that Treasure Island was created from fill materials, no "undisturbed" areas can be identified which can be utilized to establish background levels. Reference levels of metals in soil were used for comparison. In addition, a metal was consider above background if the maximum determined concentration at any depth exceeded the reference value by a factor of two.

Metal levels in the fill used to create Treasure Island particularly if bay dredging materials were used may be above reference levels. A geologist should be consulted to establish a reasonable method of establishing background for metals in soil on the Island. This is a critical issue because a risk assessment should not address toxicants which are not occurring at levels above background levels.

THE FOLLOWING COMMENTS ADDRESS VARIOUS ISSUES INVOLVING THE ASSESSMENT OF RISK. VARIOUS ASPECTS OF THE ASSESSMENT MAY BECOME MUTE DEPENDING OF THE DETERMINATION IF THE CONTAMINATION IS OCCURRING ABOVE BACKGROUND LEVELS.

2.2 Stage 2 - Data Collection and Evaluation

A second stage evaluation involved collecting soil samples in the top 6 inches of soil at locations established using a grid. In addition, samples were taken from playgrounds. This sampling was undertaken principally to evaluate exposure due to direct contact. Exposure due to migration of toxicant into vegetables raised in a garden was also evaluated. Given that the assessment was undertaken to evaluated existing exposure, the sampling should have focused on determining the levels of contaminants in shallow soils. Exposure due to direct contact would most likely occur to the upper few centimeters of soil. If contaminants were concentrated in shallow soils (e.g. lead) sampling the upper 6 inches would result in the dilution of contaminants. Soil samples collected to a depth of six inches are appropriate for determining the concentration of toxicants in the root zone of many plants and therefore can be used to evaluate plant uptake.

The large area of sampling in stage 2 does not represent an area of potential exposure. Given that young children are believe to be most a risk to exposure to contaminants in soil due to direct contact, the location of exposure would be expected to be much less than the entire neighborhood. A statistical analysis of samples collected throughout the neighborhood would not describe the concentration of toxicants in soil where the exposure is primarily occurring (which is within a residential lot). A mean level or a upper 95 % confidence level describes the concentration in the neighborhood, which is not useful in determining if young children are or might be impacted.

The area sampled is also not representative of a area that would contain a vegetable garden. Gardens would also be expected to occur within a residential lot.

Statistical Analysis of Data Distribution

The report presents an unusual definition of a hot spot. Evidence of a hot spot is the lack of a uniform distribution of metals in the samples. According to this definition, areas where clean fill was deposited would appear to be from a separate population and therefore be considered a hot spot. Probability plots of logarithm transformation of the data do appear to indicate that the data is lognormally distributed. However, similar analyses of untransformed data and other transformations (square root) should be presented.

Chemicals of Concern

Very few chemicals were detected in the soil samples. However, until a proper groundwater investigation is completed, it is unclear if the analysis should be restricted to the compounds identified in the report. Compounds that are not detected at concentrations above background should not be evaluated.

Analytical Considerations

Issues relating to detection limits, laboratory contaminants and QA/QC of the analytical results must be reviewed by a properly credentialed professional skilled in evaluating soil sampling and laboratory analyses. I am not such a person.

3.2.1 Environmental Fate and Transport of Site Contaminants

It's not clear why a discussion of environmental fate and transport is included in the report if exposure due to contact with groundwater is not evaluated and no groundwater investigation was undertaken. This section becomes important given that a groundwater investigation is warranted.

3.3 Quantification of Exposure

The evaluation uses the upper 95% confidence limit on the arithmetic average or the maximum detected soil concentration, whichever is lower. As mentioned before, the average or the upper 95% confidence limit of concentration of the entire area is not appropriate for evaluating exposures which will occur primarily within a residential property.

3.5 Summary of Exposure Assessment Results

Exposure to all toxicants was determined for children because they exhibit the highest intake to body weight. For carcinogens, adult exposure and not exposure of children should be evaluated. Studies evaluating carcinogenicity are based on long term exposures where average dose over a lifetime is used to establish the potency of the carcinogen.

4.2 Slope Factors

The CAL/EPA slope factor of $(1.5\ mg/kg/day)^{-1}$ for cadmium should be used in the evaluation. See attached memorandum.

5.0 Risk Characterization

This section of the preliminary risk assessment was not reviewed. The sampling did not provide data that was suitable for an evaluation of risk.

CONCLUSION

While the objective of the preliminary risk assessment was to assess the risk to public health associated with current land use, the site characterization does not allow this determination. Without adequate data derived from the site characterization process, human exposure to toxicants could not be determined. Without estimates of exposure, the impact of the site could not be characterized. Proper site characterization must precede attempts to assess risk associated with the site.

Richard Sedman, Ph.D.
Staff Toxicologist
Human and Ecological Risk
Section

Reviewed by

Deborah Oudiz, Ph.D.
Senior Toxicologist
Human and Ecological Risk Section

CC: Cheng Liao
Calvin Wilhite
Michael Wade

Attachments

MEMORANDUM

To: Cal/EPA Departments, Boards, and Offices

From: Standards and Criteria Work Group

Date: June 18, 1992

Subject: California Cancer Potency Factors

The attached list is a compilation of cancer potency factors developed or approved by the Office of Environmental Health Hazard Assessment (OEHHA), the Department of Toxic Substances Control (DTSC), and the Department of Pesticide Regulation (DPR) of the California Environmental Protection Agency. These cancer potency factors have been used as a basis for regulatory actions such as the establishment of Maximum Contaminants Levels for drinking water, identification of Toxic Air Contaminants, and the setting of No Significant Risk Levels for purposes of the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). The numbers on this list are use in a variety of risk assessment scenarios, including but not limited to, risk assessments conducted for CERCLA/RCRA programs and risk assessments conducted for the Air Toxics Hot Spots Information and Assessment Program.

The impetus for compiling this list grew from efforts to promote consistency in risk assessment across the state and efforts to streamline regulatory requirements in the State of California. The Standards and Criteria Work Group (SCWG), originally convened by OEHHA and DTSC while part of the Department of Health Services, has been working towards increased consistency in risk assessment in the various state programs. This list is one of the products of the SCWG. The list provides information on chemicals which may come up for some regulatory review in a specified program of a department within the California Environmental Protection Agency (Cal/EPA). It is hoped that this list will reduce duplication of effort on the part of State agencies who must review the same chemicals for varied programs.

The sources of the potency values, written in the right hand column next to the number, are OEHHA's Reproductive and Cancer Hazard Assessment Section (RCHAS), the Air Toxicology and Epidemiology Section (ATES), and the Pesticide and Environmental Toxicology Section (PETS) and DPR's Medical Toxicology Branch (MTB). RCHAS generates cancer potency factors for OEHHA's

implementation of Proposition 65. ATES develops unit risk factors for use in the Toxic Air Contaminant program and the Air Toxics Hot Spots Information and Assessment program of the Air Resources Board. PETS develops cancer potency factors for use in setting Maximum Contaminant Level by the Department of Health Services' Office of Drinking Water. MTB develops cancer potency factors for use in DPR's Birth Defect Prevention Program. The majority of these potency values has undergone peer review and in many cases rigorous regulatory review. For more information on a specific potency value, please contact the appropriate program listed.

This list will be revised semiannually as more cancer potency factors are generated. It is planned, in the near future, to prepare an attachment to this list that will give a specific reference to the documentation for the value and the regulatory citation for the standard based on the value. In addition, basic information on the data and some assumptions used to develop the specific values listed will be given to assist interested parties in determining the correct use of these cancer potency factors.

For more information contact Dr. David Siegel, of OEHHA's Hazardous Waste Toxicology Section, at (916) 322-5624.

California Environmental Protection Agency Criteria for Carcinogens

This list of cancer potency factors was compiled by the Standards and Criteria Work Group (SCWG), which is composed of staff from the Office of Environmental Health Hazard Assessment (OEHHA), the Department of Toxic Substances Control (DTSC), and the Department of Pesticide Regulation (DPR) of the California Environmental Protection Agency. These cancer potency factors have been used as a basis for regulatory actions or standards. The listed numbers are use in a variety of risk assessment scenarios, including but not limited to, risk assessments conducted for CERCLA/RCRA programs and risk assessments conducted for the Air Toxics Hot Spots Information and Assessment Program.

This list will be revised semiannually as more cancer potency factors are generated. It is planned, in the near future, to prepare an attachment to this list that will give a specific reference to the documentation for the value and the regulatory citation for the standard based on the value. In addition, basic information on the data and some assumptions used to develop the specific values listed will be given to assist interested parties in determining the correct use of these cancer potency factors.

Chemical-Carcinogens	Inhalation $(mg/kg \cdot day)^{-1}$	Source	Oral $(mg/kg \cdot day)^{-1}$	Source
Acetaldehyde	7.7 E-03 [1]	RCHAS (510) 540-2084	7.7 E-03 [1]	RCHAS (510) 540-2084
Acrylamide	4.5 E+00 [1]	RCHAS (510) 540-2084	4.5 E+00 [1]	RCHAS (510) 540-2084
Acrylonitrile	1.0 E+00	RCHAS (510) 540-2084	1.0 E+00	RCHAS (510) 540-2084
Aflatoxin B1	4.6 E+01	RCHAS (510) 540-2084	4.6 E+01	RCHAS (510) 540-2084
Aldrin	1.7 E+01	RCHAS (510) 540-2084	1.7 E+01	RCHAS (510) 540-2084
Allyl chloride	2.1 E-02 [1]	RCHAS (510) 540-2084	2.1 E-02 [1]	RCHAS (510) 540-2084

Chemical-Carcinogens	Inhalation (mg/kg • day)$^{-1}$	Source	Oral (mg/kg • day)$^{-1}$	Source
Aniline	5.7 E-03 [1]	RCHAS (510) 540-2084	5.7 E-03 [1]	RCHAS (510) 540-2084
Arsenic, inorganic	1.2 E+01	ATES (510) 540-3324	Pending	PETS (510) 540-3063
Asbestos (100 PCM fibers/m^3)$^{-1}$	1.9 E-04	ATES (510) 540-3324	[5]	
Azobenzene	1.1 E-03 [1]	RCHAS (510) 540-2084	1.1 E-03 [1]	RCHAS (510) 540-2084
Benzene	1.0 E-01	ATES (510) 540-3324	1.0 E-01	ATES (510) 540-3324
Benzidine	5.0 E+02	RCHAS (510) 540-2084	5.0 E+02	RCHAS (510) 540-2084
Benzo(a)pyrene (BaP)	1.2 E+01 [1]	RCHAS (510) 540-2084	1.2 E+01 [1]	RCHAS (510) 540-2084
Benzyl chloride	1.7 E-01 [1]	RCHAS (510) 540-2084	1.7 E-01 [1]	RCHAS (510) 540-2084
Beryllium oxide	7.0 E+00 [1]	RCHAS (510) 540-2084	7.0 E+00 [1]	RCHAS (510) 540-2084
Beryllium sulfate	3.0 E+03 [1]	RCHAS (510) 540-2084	3.0 E+03 [1]	RCHAS (510) 540-2084
Bis(2-chloroethyl) ether	2.5 E+00	RCHAS (510) 540-2084	2.5 E+00	RCHAS (510) 540-2084
Bis(chloromethyl) ether	4.6 E+01	RCHAS (510) 540-2084	4.6 E+01	RCHAS (510) 540-2084
Bromodichloromethane	1.3 E-01 [1]	RCHAS (510) 540-2084	1.3 E-01 [1]	RCHAS (510) 540-2084
1,3-Butadiene	1.8 E+00 [1]	RCHAS (510) 540-2084	1.8 E+00 [1]	RCHAS (510) 540-2084
Butylated hydroxyanisole	2.0 E-04	RCHAS (510) 540-2084	2.0 E-04	RCHAS (510) 540-2084
Cadmium	1.5 E+01	ATES (510) 540-3324	[5]	
Carbon tetrachloride (CCl4)	1.5 E-01	ATES (510) 540-3324	1.5 E-01	ATES (510) 540-3324

Chemical-Carcinogens	Inhalation (mg/kg • day)$^{-1}$	Source	Oral (mg/kg • day)$^{-1}$	Source
Chlordane	1.2 E+00 [2]	PETS (510) 540-3063	1.2 E+00 [2]	PETS (510) 540-3063
Chloroform	1.9 E-02 [2]	ATES (510) 540-3324	3.1 E-02 [2]	PETS (510) 540-3063
Chromium, hexavalent (Chromium VI)	5.1 E+02	ATES (510) 540-3324	4.2 E-01 [4]	RCHAS (510) 540-2084
Coke oven emissions	2.2 E+00 [1]	RCHAS (510) 540-2084	[5]	
DDD	2.4 E-01	RCHAS (510) 540-2084	2.4 E-01	RCHAS (510) 540-2084
DDE	3.4 E-01	RCHAS (510) 540-2084	3.4 E-01	RCHAS (510) 540-2084
DDT	3.4 E-01	RCHAS (510) 540-2084	3.4 E-01	RCHAS (510) 540-2084
Dibromochloro-propane (DBCP)	7.0 E+00	PETS (510) 540-3063	7.0 E+00	PETS (510) 540-3063
Dibromoethane (Ethylene dibromide, EDB)	2.5 E-01	ATES (510) 540-3324	3.5 E+00	PETS (510) 540-3063
1,4-Dichlorobenzene	4.0 E-02	PETS (510) 540-3063	4.0 E-02	PETS (510) 540-3063
3,3'-Dichlorobenzidine	1.2 E+00	RCHAS (510) 540-2084	1.2 E+00	RCHAS (510) 540-2084
1,2-Dichloroethane	7.0 E-02	RCHAS (510) 540-2084	7.0 E-02	RCHAS (510) 540-2084
1,2-Dichloropropane	6.3 E-02	PETS (510) 540-3063	6.3 E-02	PETS (510) 540-3063
1,3-Dichloropropene (Telone)	4.3 E-02 [3]	MTB (916) 654-1285	1.8 E-01	PETS (510) 540-3063
Dichlorvos (DDVP)	2.9 E-01 [1]	RCHAS (510) 540-2084	4.1 E-01 Proposed [2,3]	MTB (916) 654-1285
Dieldrin	1.6 E+01	RCHAS (510) 540-2084	1.6 E+01	RCHAS (510) 540-2084
Diethylhexyl phthalate	8.4 E-03	PETS (510) 540-3063	8.4 E-03	PETS (510) 540-3063

Chemical-Carcinogens	Inhalation (mg/kg • day)$^{-1}$	Source	Oral (mg/kg • day)$^{-1}$	Source
2,4-Dinitrotoluene	3.1 E-01 [1]	RCHAS (510) 540-2084	3.1 E-01 [1]	RCHAS (510) 540-2084
1,4-Dioxane	2.7 E-02	RCHAS (510) 540-2084	2.7 E-02	RCHAS (510) 540-2084
Epichlorohydrin	8.0 E-02	RCHAS (510) 540-2084	8.0 E-02	RCHAS (510) 540-2084
Ethylene oxide	3.1 E-01	RCHAS (510) 540-2084	3.1 E-01	RCHAS (510) 540-2084
Formaldehyde	1.8 E-02 [2]	ATES (510) 540-3324	1.8 E-02 [2]	ATES (510) 540-3324
Furmecyclox	3.0 E-02 [1]	RCHAS (510) 540-2084	3.0 E-02 [1]	RCHAS (510) 540-2084
Heptachlor	5.7 E+00 [2]	PETS (510) 540-3063	5.7 E+00 [2]	PETS (510) 540-3063
Heptachlor epoxide	1.3 E+01 [2]	PETS (510) 540-3063	1.3 E+01 [2]	PETS (510) 540-3063
Hexachlorobenzene	1.8 E+00	RCHAS (510) 540-2084	1.8 E+00	RCHAS (510) 540-2084
Hexachlorocyclo-hexane (Tech. grade)	4.0 E+00 [1]	RCHAS (510) 540-2084	4.0 E+00 [1]	RCHAS (510) 540-2084
2,3,7,8-Hexachloro-dibenzo-p-dioxin	3.3 E+03 Proposed	RCHAS (510) 540-2084	3.3 E+03 Proposed	RCHAS (510) 540-2084
Hydrazine	1.7 E+01 [1]	RCHAS (510) 540-2084	1.7 E+01 [1]	RCHAS (510) 540-2084
Hydrazine sulfate	3.0 E+00 [1]	RCHAS (510) 540-2084	3.0 E+00 [1]	RCHAS (510) 540-2084
Lindane (gamma-BHC)	1.1 E+00 [1]	RCHAS (510) 540-2084	1.1 E+00 [1]	RCHAS (510) 540-2084
4,4'-Methylene bis (N,N'-dimethyl)aniline	4.6 E-02 [1]	RCHAS (510) 540-2084	4.6 E-02 [1]	RCHAS (510) 540-2084
Methylene chloride	3.5 E-03	ATES (510) 540-3324	1.4 E-02 [1]	RCHAS (510) 540-2084
Nickel and Nickel compounds	9.1 E-01	ATES (510) 540-3324	[5]	

Chemical-Carcinogens	Inhalation (mg/kg • day)$^{-1}$	Source	Oral (mg/kg • day)$^{-1}$	Source
Nickel subsulfide	1.7 E+00 [1]	RCHAS (510) 540-2084	1.7 E+00 [1]	RCHAS (510) 540-2084
N-Nitrosodi-n-butylamine	1.1 E+01	RCHAS (510) 540-2084	1.1 E+01	RCHAS (510) 540-2084
N-Nitrosodiethanolamine	2.8 E+00 [1]	RCHAS (510) 540-2084	2.8 E+00 [1]	RCHAS (510) 540-2084
N-Nitrosodiethylamine	3.6 E+01	RCHAS (510) 540-2084	3.6 E+01	RCHAS (510) 540-2084
N-Nitrosodimethylamine	1.6 E+01	RCHAS (510) 540-2084	1.6 E+01	RCHAS (510) 540-2084
N-Nitrosodiphenylamine	9.0 E-03 [1]	RCHAS (510) 540-2084	9.0 E-03 [1]	RCHAS (510) 540-2084
N-Nitrosodi-n-propylamine	7.0 E+00	RCHAS (510) 540-2084	7.0 E+00	RCHAS (510) 540-2084
N-Nitroso-N-ethylurea	2.7 E+01	RCHAS (510) 540-2084	2.7 E+01	RCHAS (510) 540-2084
N-Nitroso-N-methyl-ethylamine	2.2 E+01	RCHAS (510) 540-2084	2.2 E+01	RCHAS (510) 540-2084
N-Nitroso-N-methylurea	1.2 E+02	RCHAS (510) 540-2084	1.2 E+02	RCHAS (510) 540-2084
N-Nitrosopyrrolidine	2.1 E+00	RCHAS (510) 540-2084	2.1 E+00	RCHAS (510) 540-2084
Pentachlorophenol (PCP)	1.8 E-02 [6]	RCHAS (510) 540-2084	1.8 E-02 [6]	RCHAS (510) 540-2084
Polybrominated biphenyls	3.0 E+01	RCHAS (510) 540-2084	3.0 E+01	RCHAS (510) 540-2084
Polychlorinated biphenyls	7.7 E+00 [1]	RCHAS (510) 540-2084	7.7 E+00 [1]	RCHAS (510) 540-2084
2,3,7,8-Tetrachlorodi-benzo-p-dioxin and related compounds (TCDD)	1.3 E+05	ATES (510) 540-3324	1.3 E+05	ATES (510) 540-3324
Tetrachloroethylene (PCE, PERC)	5.1 E-02 [1]	RCHAS (510) 540-2084	5.1 E-02 [1]	RCHAS (510) 540-2084
Toxaphene	1.2 E+00	RCHAS (510) 540-2084	1.2 E+00	RCHAS (510) 540-2084

Chemical-Carcinogens	Inhalation (mg/kg • day)$^{-1}$	Source	Oral (mg/kg • day)$^{-1}$	Source
Trichloroethylene (TCE)	1.0 E-02	ATES (510) 540-3324	1.5 E-02 Proposed	RCHAS (510) 540-2084
2,4,6-Trichlorophenol	7.0 E-02	RCHAS (510) 540-2084	7.0 E-02	RCHAS (510) 540-2084
Urethane (Ethyl carbamate)	1.0 E+00	RCHAS (510) 540-2084	1.0 E+00	RCHAS (510) 540-2084
Vinyl chloride	2.7 E-01	ATES (510) 540-3324	2.7 E-01	ATES (510) 540-3324

1 : This value was used as the basis of the No Significant Risk Level that was adopted in Title 22, California Code of Regulations, Section 12711, for purposes of the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). It is based on a U.S. EPA risk assessment. RCHAS staff will provide background information on the value.

2 : For purposes of Proposition 65, another cancer potency value, that is the basis of the No Significant Risk Level currently in regulation, may be used. These values are listed below and can be used for both inhalation and oral exposure routes unless otherwise noted. Please see footnote 1 which also applies to these values.

Chlordane	1.3 E+00
Chloroform	8.1 E-02
Dichlorvos (DDVP)	2.9 E-01
Formaldehyde	4.6 E-02
Heptachlor	4.5 E+00
Heptachlor epoxide	9.1 E+00

3 : In the derivation of this value, an animal-to-human scaling factor of body weight to the 0.75 power was used. For most of the other values listed in the table a scaling factor of body weight to the 0.67 power was used to account for body surface area scaling. The actual difference in the calculated potency that these two methods produce is not large. However, there is an ongoing program in the California Environmental Protection Agency to develop a consistent methodology.

4 : The oral potency slope for chromium VI was developed by the Standards and Criteria Work Group based on the need by several programs for this criteria. This value has not yet been used as the basis for a regulatory standard.

5 : Not applicable or not available. There is no potency value listed either because it is not an appropriate route of exposure for the chemical to pose a carcinogenic risk or because a potency value has not been derived by a

state program. If a potency value is needed, check the U.S. Environmental Protection Agency's Integrated Risk Information System (IRIS) or their Health Effects Assessment Summary Tables.

6 : This value was used as the basis of the No Significant Risk Level that was adopted in Title 22, California Code of Regulations, Section 12711, for purposes of Proposition 65. It is based on a risk assessment by the Human and Ecological Risk Section of the Department of Toxic Substances Control. RCHAS staff will provide background information on the value. In the derivation of this value, the compound was considered equally potent in animals and humans; doses were considered equivalent on a mg/kg weight basis across species without any additional animal-to-human scaling factor adjustment. Please see footnote 3.

ATES: Air Toxicology and Epidemiology Section, Office of Environmental Health Hazard Assessment (OEHHA)
MTB: Medical Toxicology Branch, Department of Pesticide Regulations
PETS: Pesticide and Environmental Toxicology Section, OEHHA
RCHAS: Reproductive and Cancer Hazard Assessment Section, OEHHA

PCM: Phase Contrast Microscopy
Proposed: Proposed values have been peer reviewed and/or accepted, but no regulatory action has been taken on the standard they support.