

Appendix A—Glossary

Adverse Health Effect

A change in body function or the structures of cells that can lead to disease or health problems.

ATSDR

The Agency for Toxic Substances and Disease Registry. ATSDR is a federal health agency based in Atlanta, Georgia, that deals with hazardous substance and waste site issues. ATSDR gives people information about harmful chemicals in their environment and tells people how to protect themselves from contact with chemicals.

Background Concentration

An average or expected amount of a chemical in a specific environment. Or, amounts of chemicals that occur naturally in a specific environment.

Cancer Risk

The potential for exposure to a contaminant to cause cancer in an individual or population is evaluated by estimating the probability of an individual developing cancer over a lifetime as the result of the exposure. This approach is based on the assumption that there are no absolutely “safe” toxicity values for carcinogens. USEPA has developed cancer slope factors for many carcinogens. A slope factor is an estimate of a chemical’s carcinogenic potency, or potential, for causing cancer. If adequate information about the level of exposure, frequency of exposure, and length of exposure to a particular carcinogen is available, an estimate of excess cancer risk associated with the exposure can be calculated using the slope factor for that carcinogen. Specifically, to obtain risk estimates, the estimated chronic exposure dose (which is averaged over a lifetime or 70 years) is multiplied by the slope factor for that carcinogen.

Cancer risk is the likelihood, or chance, of getting cancer. We say “excess cancer risk” because we have a “background risk” of about one in four chances of getting cancer. In other words, in a million people, it is expected that 250,000 individuals would get cancer from a variety of causes. If we say that there is a “one in a million” excess cancer risk from a given exposure to a contaminant, we mean that if one million people are exposed to a carcinogen at a certain concentration over their lifetime, then one cancer above the background chance, or the 250,000th cancer, may appear in those million persons from that particular exposure. In order to take into account the uncertainties in the science, the risk numbers used are plausible upper limits of the actual risk based on conservative assumptions. In actuality, the risk is probably somewhat lower than calculated, and in fact may be zero.

CERCLA

See Comprehensive Environmental Response, Compensation and Liability Act.

Completed Exposure Pathway

See Exposure Pathway.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA was put into place in 1980. It is also known as Superfund. This act concerns releases

of hazardous substances into the environment, and the clean up of these substances and hazardous waste sites. ATSDR was created by this act and is responsible for looking into the health issues related to hazardous waste sites.

Concern

A belief or worry that chemicals in the environment might cause harm to people.

Concentration

How much of a substance present in a certain amount of soil, water, air, or food.

Contaminant

See Environmental Contaminant.

Dermal Contact

A chemical getting onto your skin. (See Route of Exposure.)

Dose

The amount of a substance to which a person may be exposed, usually on a daily basis. Dose is often explained as the amount of substance(s) per body weight per day.

Dose/Response

The relationship between the amount of exposure (dose) and the change in body function or health that result.

Duration

The amount of time (days, months, years) that a person is exposed to a chemical.

Environmental Contaminant

A substance (chemical) that gets into a system (person, animal, or the environment) in amounts higher than that found in Background Concentration, or what would be expected.

Environmental Media

Usually refers to the air, water, and soil in which chemicals of interest are found. Sometimes refers to the plants and animals that are eaten by humans. Environmental Media is the second part of an Exposure Pathway.

Environmental Media Evaluation Guide (EMEG)

EMEGs are media-specific values developed by ATSDR to serve as an aid in selecting environmental contaminants that need to be further evaluated for potential health impacts. EMEGs are based on non-carcinogenic endpoints and do not consider carcinogenic effects. EMEGs are based on the MRLs.

Exposure

Coming into contact with a chemical substance. (For the three ways people can come in contact with substances, see Route of Exposure.)

Exposure Assessment

The process of finding the ways people come in contact with chemicals, how often and how long they come in contact with chemicals, and the amounts of chemicals with which they come in contact.

Exposure Pathway

A description of the way that a chemical moves from its source (where it began) to where and how people can come into contact with (or get exposed to) the chemical. ATSDR defines an exposure pathway as having five parts:

1. Source of Contamination
2. Environmental Media and Transport Mechanism
3. Point of Exposure
4. Route of Exposure
5. Receptor Population

When all five parts of an exposure pathway are present, it is called a Completed Exposure Pathway.

Groundwater

Water beneath the Earth's surface that flows through soil and rock openings, and often serves as a source of drinking water.

Hazard Index

The hazard index is equal to the sum of the ratios of a Hazard Quotient (see below). The approach assumes that simultaneous subthreshold exposures to several chemicals could result in an adverse health effect. While any single chemical with an exposure level greater than the RfD will cause the hazard index to exceed 1, for multiple chemical exposures, the hazard index can also exceed 1 even if no single chemical exposure exceeds the RfD (e.g. the additive effect of toxicity may result in noncancer health effects).

Hazard Quotient

A hazard quotient assumes there is a level of exposure (i.e., RfD Dose) below which it is unlikely for even sensitive populations to experience adverse health effects. If the exposure dose (E) exceeds this threshold, i.e., if $E > \text{RfD}$, there may be concern for potential noncancer effects. As a rule, the greater the number E/RfD above unity, the greater the level of concern. If E/RfD is equal to one, the exposure is assumed to be at the level of the RfD. If E/RfD is below 1, the exposure is believed to be below the RfD.

Hazardous Waste

Substances that have been released or thrown away into the environment and, under certain conditions, could be harmful to people who come into contact with them.

Maximum Contaminant Level (MCL)

USEPA has issued drinking water standards, or MCLs, for more than 80 contaminants in drinking water. The MCLs are set based on known or anticipated adverse human health effects

(which also account for sensitive subgroups, such as, children, pregnant women, the elderly, etc.), the ability of various technologies to remove the contaminant, their effectiveness, and cost of treatment. For cancer risk, USEPA generally sets the MCLs at concentrations that will limit an individual risk of cancer from a contaminant to between 1 in 10,000 (low increased excess risk) to 1 in 1,000,000 (no apparent increased excess risk) over a lifetime. As for noncancer effects, USEPA estimates an exposure concentration below which no adverse health effects are expected to occur.

Noncancer Evaluation, ATSDR's Minimal Risk Level (MRL), and USEPA's Reference Dose (RfD) and Reference Concentration (RfC)

The MRL, RfD, and RfC are estimates of daily exposure to the human population (including sensitive subgroups), below which noncancer adverse health effects are unlikely to occur. The MRL, RfD, and RfC only consider noncancer effects. Because they are based only on information currently available, some uncertainty is always associated with the MRL, RfD, and RfC. "Safety" factors are used to account for the uncertainty in our knowledge about their danger. The greater the uncertainty, the greater the "safety" factor and the lower the MRL, RfD, or RfC.

When there is adequate information from animal or human studies, MRLs and RfDs are developed for the ingestion exposure pathway, whereas RfCs are developed for the inhalation exposure pathway. A MRL, RfD, or RfC is an estimate of daily human exposure to a substance that is likely to be without an appreciable risk of adverse (non-carcinogenic) health effects over a specified duration of exposure. No toxicity values exist for exposure by skin contact. Separate noncancer toxicity values are also developed for different durations of exposure. ATSDR develops MRLs for acute exposures (less than 14 days), intermediate exposures (from 15 to 364 days) and for chronic exposures (greater than 1 year). USEPA develops RfDs and RfCs for acute exposures (less than 14 days), subchronic exposures (from 2 weeks to 7 years) and chronic exposures (greater than 7 years). Both the MRL and RfD for ingestion are expressed in units of milligrams of contaminant per kilograms body weight per day (mg/kg/day). The RfC for inhalation is expressed in units of milligrams per cubic meter (mg/m³).

Noncancer and Cancer Evaluations USEPA's Preliminary Remediation Goals (PRGs)

PRGs are developed by USEPA Region IX to estimate contaminant concentrations in the environmental media (soil, air, and water), both in residential and industrial settings, that are protective of humans, including sensitive groups, over a lifetime. PRGs were developed for both industrial and residential settings because of the different exposure parameters, such as different exposure time frames (e.g., industrial setting: workers are exposed for 8 hours/day, 5 days/week vs. residential setting: families are exposed 24 hours/day, 7 days/week; and different "human" exposure points such as industrial setting: healthy adult males vs. residential setting: males, females, young children, and infants). Media concentrations less than the PRGs are unlikely to pose a health threat; whereas concentrations exceeding a PRG do not automatically determine that a health threat exists, but suggest that further evaluation is necessary.

NPL

The National Priorities List (which is part of Superfund). A list kept by the United States Environmental Protection Agency (USEPA) of the most serious, uncontrolled or abandoned

hazardous waste sites in the country. An NPL site needs to be cleaned up or is being looked at to see if people can be exposed to chemicals from the site.

PHA

Public Health Assessment. A report or document that looks at chemicals at a hazardous waste site and tells if people could be harmed from coming into contact with those chemicals. The PHA also tells if possible further public health actions are needed.

Plume

A line or column of air or water containing chemicals moving from the source to areas farther away. A plume can be a column or clouds of smoke from a chimney or contaminated underground water sources or contaminated surface water (such as lakes, ponds, and streams).

Point of Exposure

The place where someone can come into contact with a contaminated environmental medium (air, water, food, or soil). Examples: the area of a playground that has contaminated dirt, a contaminated spring used for drinking water, the location where fruits or vegetables are grown in contaminated soil, or the backyard area where someone might breathe contaminated air.

Population

A group of people living in a certain area or the number of people in a certain area.

PRP

Potentially Responsible Party. A company, government, or person that is responsible for causing the pollution at a hazardous waste site. PRPs are expected to help pay for the clean up of a site.

Public Health Assessment(s)

See PHA.

Public Health Hazard

The category is used in PHAs for sites that have certain physical features or evidence of chronic, site-related chemical exposure that could result in adverse health effects.

Public Health Hazard Criteria

PHA categories given to a site which tell whether people could be harmed by conditions present at the site. The categories are:

1. Urgent Public Health Hazard: Sites where short-term exposures (less than 1 year) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.
2. Public Health Hazard: Sites where long-term exposure (greater than 1 year) to hazardous substances or conditions could result in adverse health effects.
3. Indeterminate Public Health Hazard: Sites in which critical data are insufficient with regard to exposure and/or toxicological properties and thus the level of health hazard cannot be made because information critical to such a decision is lacking.
4. No Apparent Public Health Hazard: Sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause adverse health effects.

5. No Public Health Hazard: Sites because of the absence of exposure, do not pose a public health hazard.

Reference Exposure Level (REL)

Noncancer health comparison values developed by OEHHA (Office of Environmental Health Hazard Assessment). The REL is a level at which no adverse effects would be expected or associated with an exposure to a chemical.

Reference Dose Media Evaluation Guide (RMEG)

RMEGs are media-specific values developed by USEPA to serve as an aid in selecting environmental contaminants that need to be further evaluated for potential health impacts. RMEGs are based on non-carcinogenic endpoints and do not consider carcinogenic effects. RMEGs are based on USEPA's RfDs.

Route of Exposure

The way a chemical can get into a person's body. There are three exposure routes:

1. Breathing (also called inhalation)
2. Eating or drinking (also called ingestion)
3. Getting something on the skin (also called dermal contact)

Semi-volatile Organic Compound (SVOC)

A chemical compound that partially evaporates or changes from liquid to gas readily at room temperature.

Source (of Contamination)

The place from which a chemical comes, such as a landfill, pond, creek, incinerator, tank, or drum. Contaminant source is the first part of an Exposure Pathway.

Special Populations

People who may be more sensitive to chemical exposures because of certain factors such as age, a disease they already have, occupation, sex, or certain behaviors (like cigarette smoking). Children, pregnant women, and the elderly are often considered special populations.

Superfund Site

See NPL.

Toxic

Harmful. Any substance or chemical can be toxic at a certain dose (amount).

Toxicology

The study of the harmful effects of chemicals on humans or animals.

Volatile Organic Compound (VOC)

A chemical compound that evaporates (volatilizes) or changes from liquid to gas readily at room temperature.

Appendix B—Tables

Table 1. Evaluation of Exposure Pathways for Casmalia Resources Superfund Site, Casmalia, California (21)

Pathway Name	Exposure Pathway Elements					Time	Pathway Analysis	Conclusion
	Source	Media	Point of Exposure	Route of Exposure	Potentially Exposed Population			
Drinking water exposure	Contaminants from landfill	Drinking water	Domestic water supply	Ingestion	Nearby residents	Past; Present	Eliminated	Groundwater contamination not spread to drinking wells; levels in media below level of health concern. No public health hazard.
Drinking water exposure	Contaminants from landfill	Drinking water	Domestic water supply	Ingestion	Nearby residents	Future	Potential	Potential exposure pathway based on remote chance that contaminants may one day impact the regional water basins supplying the community's drinking water. Recommend additional groundwater monitoring wells.
Surface water and sediment exposure	Contaminants from landfill	Stream and seep surface waters and stream sediment	Surface water and stream sediment	Skin contact	Nearby residents, ranchers, recreationists	Past; present; future	Potential	Potential exposure pathway; further testing recommended for site-related contaminants.

Table 1. Evaluation of Exposure Pathways for Casmalia Resources Superfund Site, Casmalia, California (21)

Pathway Name	Exposure Pathway Elements					Time	Pathway Analysis	Conclusion
	Source	Media	Point of Exposure	Route of Exposure	Potentially Exposed Population			
Vapors emanating from site when ponds received wastes and before cap	Contaminants from landfill	Air	In or near residences	Breathing	Nearby residents, ranchers	Past (up until 1989)	Completed	Historical levels were modeled and exposure estimates are above levels of health concern. Public health hazard in the past.
Vapors emanating from site after cap was installed	Contaminants from landfill	Air	In or near residences	Breathing	Nearby residents, ranchers	1999 to present; future	Potential	Current exposures are below level of health concern. Potential exposure pathway in future. Recommend additional air monitoring.
Surface soil exposure	Contaminants from landfill	Surface soil off site	Residences; recreational areas in vicinity of site	Skin contact	Nearby residents, ranchers, recreationists	Past; present; future	Potential	Potential exposure pathway; further testing recommended for site-related contaminants.

Table 2. Chemicals Detected in Municipal Well Systems, Casmalia Resources Superfund Site, Casmalia, California (21)

Chemical Detected	Public Area Served	Sample Source (Well Sample or Public Portal)	Well Number	Maximum Hit Detected (µg/L) and Date Collected	Drinking Water Standard or Health Comparison Value (µg/L)	Suspected / Identified Source
Benzene	Town of Casmalia	Well head sample	Casmite Corp. well	5.0 5-30-84	0.5 – MCL	Suspected laboratory contaminant
Di-2-ethyl-hexyl-phthalate (DEHP)	City of Santa Maria	Well head sample	10 S	30 5-15-87	6.0 – MCL	Localized industrial source or lab contaminant
Di-n-butyl-phthalate	City of Santa Maria	Well head sample	10 S	5.6 11-14-84	1,000 – RMEG	Localized industrial source or lab contaminant
Di-n-octyl-phthalate	City of Santa Maria	Well head sample	10 S	20.5 11-14-84	4,000 – EMEG	Localized industrial source or lab contaminant
Ethylbenzene	Town of Casmalia	Well head sample	Casmite Corp. well	1.2 6-3-86	300 – MCL	Suspected laboratory contaminant
Methyl ethyl ketone	Town of Casmalia	Well head sample	Casmite Corp. well	6.0 3-5-86	6,000 – RMEG Child	Suspected laboratory error
Methyl isobutyl ketone	Town of Casmalia	Well head sample	Casmite Corp. well	30 3-5-86	120 – CA State Action Level	Suspected laboratory error
Methylene chloride	Town of Casmalia	Well head sample	Casmite Corp. well	11.0 5-30-84	5 – MCL	Suspected laboratory error

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Chemical Detected	Public Area Served	Sample Source (Well Sample or Public Portal)	Well Number	Maximum Hit Detected (µg/L) and Date Collected	Drinking Water Standard or Health Comparison Value (µg/L)	Suspected / Identified Source
Tetrachloroethylene (PCE)	City of Santa Maria	Well head sample	4 H	1.6 2-26-85	5.0 – MCL	Suspected non-permitted release
Tetrachloroethylene (PCE)	Town of Casmalia	Public portal, type unknown	Casmite Corp. well	0.99 2-25-86	5.0 – MCL	Residual PCE from water holding tank
Toluene	Town of Casmalia	Well head sample	Casmite Corp. well	12.0 5-30-84	150 – MCL	Suspected laboratory contaminant
Trichloroethylene (TCE)	City of Santa Maria	Well head sample	2 AS	10.0 11-14-84	5.0 – MCL	Suspected non-permitted release, well abandoned
Trichloroflouromethane	City of Santa Maria	Well head sample	4 H	1.4 11-14-84	3,000 – RMEG Child	Suspected laboratory contaminant/artifact
Xylenes	Town of Casmalia	Well head sample	Casmite Corp. well	3.0 5-15-86	17.5 – MCL	Suspected laboratory contaminant

µg/L—microgram per liter

RMEG—Reference Dose Media Evaluation Guide

EMEG— Environmental Media Evaluation Guide

MCL—Maximum Contaminant Level

Table 3. Estimates of Community Exposure Derived from On-site Air Sampling, Casmalia Resources Superfund Site, Casmalia, California (11)

Chemical Name	On-site Maximum (ppbv)	On-site Average (ppbv)	Number of Detections / Number of Samples	Estimated Concentration in Casmalia (10X Dilution of Maximum)	Estimated Concentration in Casmalia (10X Dilution of Average)	Health Comparison Values (ppbv)	Hazard Quotient (Max)	Hazard Quotient (Average)
Acetone	460.0	134.90	7/7	46	13.4	13,000 – MRL	<0.00	<0.00
Acrolein	1.4	0.63	3/3	0.14	0.063	0.009 – RfC	16.1	4.15
Benzene	18.0	2.11	184/188	1.8	0.211	20.0 – REL	0.09	0.01
Bromodichloromethane	1.8	0.05	10/188	0.18	0.005	N/A		
Butane	16.0	1.43	74/141	1.6	0.143	N/A		
Carbon disulfide	8.4	0.39	157/167	0.84	0.039	300 – MRL	<0.00	<0.00
Carbon tetrachloride	4.5	0.58	126/171	0.45	0.058	3.0 – MRL	0.02	<0.00
Carbonyl sulfide	9.5	0.88	151/171	0.95	0.088	N/A		
Chlorobenzene	5.3	0.07	11/88	0.53	0.007	217 – REL	<0.00	<0.00
Chloroform	50.0	1.01	129/188	5	0.1	50.0 – REL	0.10	0.00
Dichlorobenzenes	3.5	1.86	5/5	0.35	0.186	100 – MRL	0.00	0.00
Dichlorodifluoromethane	460.0	4.79	128/188	46	0.48	42 – PRG	1.08	0.01
1,1-Dichloroethane (DCA)	56.0	1.89	77/188	5.6	0.189	128 – PRG	0.04	0.00
1,2-Dichloroethane (EDC)	2.0	0.16	67/188	0.2	0.016	600 – MRL	0.00	0.00
1,1-Dichloroethylene	6.1	0.08	1/188	0.61	0.008	20.0 – MRL	0.03	0.00
t-1,2-Dichloroethylene	1.1	0.07	2/188	0.11	0.007	200 – MRL	0.00	0.00
1,2-Dichloropropane	1.3	0.06	3/188	0.13	0.006	7 – MRL	0.02	0.00
c-1,3-Dichloropropylene	4.6	0.07	8/188	0.46	0.007	2 – MRL	0.23	0.00
t-1,3-Dichloropropylene	0.2	0.04	4/188	0.02	0.004	N/A		

Table 3. Estimates of Community Exposure Derived from On-site Air Sampling, Casmalia Resources Superfund Site, Casmalia, California (11)

Chemical Name	On-site Maximum (ppbv)	On-site Average (ppbv)	Number of Detections / Number of Samples	Estimated Concentration in Casmalia (10X Dilution of Maximum)	Estimated Concentration in Casmalia (10X Dilution of Average)	Health Comparison Values (ppbv)	Hazard Quotient (Max)	Hazard Quotient (Average)
Dimethyl disulfide	0.5	0.31	3/3	0.05	0.031	N/A		
Dioxane	18.0	9.05	2/2	1.8	0.905	800 – MRL	0.00	0.00
Ethyl chloride	0.4	0.09	3/188	0.04	0.009	NA		
Ethylbenzene	48.0	2.16	153/188	4.8	0.21	1,000 – MRL	0.00	0.00
Freon 113	230.0	4.87	173/188	23	0.487	4,045 – PRG	0.01	0.00
Heptanes	2.9	0.98	9/9	0.29	0.098	N/A		
Hexane	125.2	6.19	171/178	12.5	0.619	2,000 – REL	0.01	0.00
Hydrogen Sulfide	14,000.0	312.00	150/198	1,400	31.2	1.4 – RfC	979	21.82
Methyl acetate	6.6	3.80	2/2	0.66	0.38	1,221 – PRG	0.00	0.00
Methyl bromide	0.6	0.05	2/188	0.06	0.005	1.3 – PRG	0.05	0.00
Methyl chloride	81.0	6.78	122/188	8.1	0.678	50 – MRL	0.16	0.01
Methyl cyclohexane	16.0	5.90	6/6	1.6	0.59	771 – PRG	0.00	0.00
Methyl cyclopentane	10.0	5.00	3/3	1	0.5	N/A		
Methyl ethyl ketone (MEK)	2,400.0	48.46	138/146	240	4.84	339 – PRG	0.71	0.01
Methyl isobutyl ketone	49.0	11.30	7/7	4.9	1.13	N/A		
Methylene chloride	340.0	22.20	146/188	34	2.2	100	0.34	0.02
Naphthalene	0.4	0.40	2/2	0.04	0.04	2.0 – REL	0.02	0.02
Pentane	35.0	1.27	92/141	3.5	0.13	N/A		

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Chemical Name	On-site Maximum (ppbv)	On-site Average (ppbv)	Number of Detections / Number of Samples	Estimated Concentration in Casmalia (10X Dilution of Maximum)	Estimated Concentration in Casmalia (10X Dilution of Average)	Health Comparison Values (ppbv)	Hazard Quotient (Max)	Hazard Quotient (Average)
Phenol	1.1	0.65	2/2	0.11	0.065	50.0 – REL	0.00	0.00
Propane	130.0	3.82	37/141	13	0.38	N/A		
Styrene	14.0	0.29	17/158	1.4	0.029	200 – REL	0.01	0.00
1,1,2,2-Tetrachloroethane	5.2	0.07	7/188	0.52	0.007	400 – MRL	0.00	0.00
Tetrachloroethylene (PCE)	58.0	1.93	130/188	5.8	0.19	5.2 – REL	1.12	0.04
Tetrahydrofuran (THF)	1.7	1.03	3/3	0.17	0.103	0.34 – PRG	0.51	0.31
Toluene	170.0	7.27	217/188	17	0.73	80.0 – MRL	0.21	0.01
1,1,1-Trichloroethane (TCA)	130.0	5.40	173/188	13	0.54	700 – MRL	0.02	0.00
1,1,2-Trichloroethane (TCA)	0.9	0.06	10/188	0.09	0.06	N/A		
Trichloroethylene (TCE)	23.0	0.79	81/188	2.3	0.079	100 – MRL	0.02	0.00
Trichlorofluoromethane	95.0	4.30	173/188	9.5	0.43	129 – PRG	0.07	0.00
Xylenes	180.0	9.72	170/188	18	0.97	200 – REL	0.09	0.00
Total Hazard Index							1,000	26.44
Total Hazard Index Without Hydrogen Sulfide							21.08	4.63

RfC—Reference Concentration taken from USEPA IRIS database (www.epa.gov)

REL—Recommended Exposure Limit from Office of Environmental Health Hazard Assessment (OEHHA) (www.oehha.ca.gov)

MRL—Minimal Risk Level from ATSDR (www.atsdr.cdc.mrls.html)

PRG—Preliminary Remediation Goals (USEPA) (<http://www.epa.gov/region09/waste/sfund/prg/index.htm>)

ppbv—parts per billion volume

Table 4. Estimated Lifetime Excess Cancer Risk for Casmalia Community Based on Extrapolation of On-site Air Data, Casmalia Resources Superfund Site, Casmalia, California (32)

Carcinogenic Agent	Dose (max) mg/kg/day	Dose (average) mg/kg/day	Slope Factor (mg/kg/day⁻¹)	Risk Max	Risk Average
Benzene	0.0034	0.0004	0.1	3.37 in 10,000	3.95 in 100,000
Chloroform	0.01	0.0003	0.019	2.72 in 10,000	5.49 in 1,000,000
1,2-Dichloroethane	0.01	0.0004	0.0057	7.58 in 100,000	2.56 in 1,000,000
Methylene Chloride	0.07	0.005	0.0035	2.43 in 10,000	1.58 in 100,000
1,1,2,2-Tetrachloroethane	0.0003	0.000004	0.2	6.10 in 100,000	9.21 in 10,000,000
Tetrachloroethylene (PCE)	0.02	0.0008	0.021	4.85 in 100,000	1.61 in 100,000
Trichloroethylene	0.007	0.0002	0.007	5.08 in 100,000	1.74 in 1,000,000
Total Risk Assuming Individual Site				1.53 in 1,000	8.21 in 100,000
Total Risk Assuming 10X Dilution				1.53 in 10,000	8.21 in 1,000,000

Cancer risk derived from dose calculations taken from modeled estimates of concentrations in town from July 1985 to September 1986 air sampling data, using a 10-fold dilution factor. Cancer risk calculations assume a worst-case meteorological conditions that would be continuous over a 30-year period. Cancer risk estimates are a tool to help determine if further action is needed and should not be interpreted as an accurate prediction of the exact number of cancer cases that actually occur. The actual risk is unknown and may be as low as zero (35)

mg/kg/day—milligrams per kilogram per day

Cancer Risk = dose x slope factor

Intake Dose = (concentration of contaminant) x (Inhalation Rate) x (days/yr) x (hr/day) x 0.001 / (25,550 x 70)

Cancer risk = (intake dose) x (slope factor)

Risk assumptions = 350 days/year, 24 hours/day, 20 averaging time, 70-kilogram person

Table 5. Examples of Off-site Detections in Groundwater of Chemicals Known to Exist On Site, Casmalia Resources Superfund Site, Casmalia, California (10)

Chemical Name	Highest Concentration in On-Site (ppb) Monitoring Wells	Date	Monitoring Well	Highest Concentration in Off-Site Monitoring Wells (ppb)	Date	Well	Number of On-site Detects from Monitoring Wells in May 2001
Acetone	3,200,000	6/9/98	Gallery Well	40	10/27/98	RP-100A	2
Bis 2-ethylhexyl phthalate	32	2/19/97	RP-3B	22	4/29/99	B3M	10
Freon 113	33,000	6/9/98	Gallery Well	5.1	7/10/00	SW-47	20
Methylene chloride	100	5/07/01	RG-8B	6.4	9/13/97	RP-59B	6
Phenols	50,000	7/18/00	Gallery Well	34	10/30/98	MW-7D	3
Trichloroethylene	6,300	9/26/97	PSCT-4	7.2	7/2/98	MW-7C	18
Vinyl chloride	1,800	11/23/99	RD-Sump	0.17	12/6/99	B3M	13

ppb—parts per billion

Data in table is a subset of the total groundwater sampling results from the Semi-Annual Monitoring Report, May 2001.