



Ventura County
Air Pollution
Control District

Air Toxics "Hot Spots" Information and Assessment Act of 1987

1999 ANNUAL REPORT

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I. Introduction

The Air Toxics "Hot Spots" Information and Assessment Act (the "Hot Spots" Act) was originally adopted in September 1987. Several additions and modifications to the "Hot Spots" Act have been adopted since 1987. This report describes the "Hot Spots" program as it is currently being implemented.

The primary purpose of the "Hot Spots" Act is to notify the public of facilities that have routine and predictable emissions of toxic air pollutants that may pose a significant health risk to nearby residents and workers. The Act also encourages those facilities to reduce the health risk below the level of significance.

II. Ventura County APCD "Hot Spots" Program

The District's "Hot Spots" program consists of several steps. The first step is to identify facilities that may have routine and predictable emissions of toxic air pollutants. Since adoption of the "Hot Spots" Act in 1987, several methods have been used to select the facilities subject to the program. Initially, facilities with emissions of more than 10 tons per year of the pollutants traditionally regulated by the District - organic gases, nitrogen oxides, sulfur oxides, and particulate matter - were subject to the "Hot Spots" program. Later, other facilities were included in the program based on specific processes used at the facility (e.g., chrome plating), the amounts of specific compounds emitted at the facility (e.g., >1000 pounds per year of styrene), or the Standard Industrial Classification (SIC) Code of the facility (e.g., 5511 - auto body shops).

These facilities are then required to prepare emission inventories using criteria and guidelines that have been developed by the California Air Resources Board. The completed emission inventories are reviewed and approved by District staff. Every four years, District staff review information submitted by each facility to determine if the emission inventory should be updated.

When an emission inventory is completed, District staff analyze the information and prioritize the facilities as having a high, intermediate or low probability of causing a health risk. During the prioritization analysis, a numerical score is calculated for each facility based on the amount of emissions from the facility, the toxic potency of the emitted compounds, and the distance from the emission point to a receptor. Additionally, for a facility that completed a health risk assessment based on an earlier inventory, the results of the previous health risk assessment may be used in determining the priority for the facility.

High priority facilities are required to prepare a health risk assessment. Intermediate priority facilities are exempt from further program requirements until the next four-year cycle begins. Low priority facilities are exempt from any further requirements unless new information becomes available that suggests the need to re-evaluate a facility.

Appendix A lists the facilities that are currently in the "Hot Spots" program and the current priority for each facility. Facilities that are listed with a "low" priority will be exempted from the program when the California Air Resources Board approves the District request to exempt them.

The high priority facilities must prepare the health risk assessments according to methods developed by the state Office of Environmental Health Hazard Assessment (OEHHA). The health risk assessments are reviewed and approved by both District staff and OEHHA staff.

If the health risk assessment indicates that the facility may pose a significant health risk, the facility must notify the affected public of the risk. If the health risk assessment indicates that the facility does not pose a significant health risk, the facility does not need to take any further action. The information may be used to re-prioritize the facility to reduce the future program requirements.

For Ventura County, a significant health risk for purposes of providing public notice under the “Hot Spots” program has been defined as a lifetime excess cancer risk of greater than or equal to 10 in a million or an acute or chronic noncancer total hazard index exceeding 1.

Appendix B lists the results of all health risk assessments that have been submitted to the District to date.

When public notice is required, the District prepares a letter describing the risk for distribution to affected residents and businesses. The facility may also prepare a letter of its own to include in the notification. Upon request of the letter recipients, the District and the facility will hold a public meeting to respond to public concerns.

Finally, facilities that may pose a significant health risk to nearby residents or workers are required to develop and implement a plan to reduce the health risk below the level of significance. All of the facilities in Ventura County that have been determined to create a significant risk through the “Hot Spots” program have made progress in reducing the risks, in most cases to below the significant risk level.

Appendix C lists the facilities that have been found to have a significant potential health risk. All the facilities on the list have provided public notice. In addition, Appendix C describes the progress of these significant risk facilities in reducing their risks.

III. Industrywide Facilities

In addition to the procedures described above that apply to individual facilities, the District staff are responsible for analyzing the potential health risk posed by certain classes of smaller facilities that are called “industrywide” facilities. Facilities that will be included in industrywide assessments by the District are autobody shops, retail gasoline stations, dry cleaners, and gasoline bulk plants.

Statewide efforts have been completed to develop guidelines for preparing industrywide air toxics inventories and health risk assessments for autobody shops (completed September, 1996) and retail gasoline stations (completed December, 1997). It is expected that much of the information in the gasoline station guidelines can be applied to gasoline bulk plants. The guidelines for dry cleaners are nearly complete.

Industrywide facilities are prioritized in a manner similar to that used for other facilities, using the statewide guidelines. The District has been prioritizing autobody shops and gasoline stations using these guidelines. These types of facilities can potentially cause significant risk. So far, 87 of 101 autobody shops and 101 of 200 gas stations have been determined to be low or intermediate priority. A more in depth review of the unprioritized facilities is in progress. One reason many autobody shops and gasoline stations in Ventura County are less than high priority

is due to existing District Rules. APCD Rule 74.18 requires most automotive painting to be performed in a paint spray booth, requires high transfer efficiency coating application methods to be used, and prohibits use of coatings containing lead or hexavalent chromium from being applied outside a spray booth. APCD Rule 70 requires gasoline stations to use Phase I and Phase II vapor recovery systems and requires that vent pipes on gasoline tanks to be equipped with pressure vacuum valves.

IV. Air Toxics Rules

No specific rules to control emissions of air toxics have been adopted by the District based on the Air Toxics "Hot Spots" data.

The California Air Resources Board uses the Air Toxics "Hot Spots" data in developing air toxic control measures (ATCM) under the Toxic Air Contaminant Identification and Control Program. The US Environmental Protection Agency is also using the toxics emission data in developing Maximum Achievable Control Technology (MACT) standards under Title III of the 1990 Clean Air Act Amendments.

The District is required under state law to implement and enforce both state ATCM's and federal MACT standards. ATCM's which have gone into effect recently include controls on degreasers using halogenated solvents and chrome plating facilities.

V. Background Health Risk Due to Air Toxics

In order to help put the potential health risks from the facilities subject to the "Hot Spots" program in perspective, the District staff analyzed the potential excess cancer health risk due to toxic compounds in the ambient air in a typical urban setting in Ventura County. Data from the District's Simi Valley monitoring station collected between 1990 and 1998 was used in the analysis because it is the only Ventura County APCD monitoring station with sufficient data available. Using the same methodology as used in the "Hot Spots" program health risk assessments, the total lifetime excess cancer health risk from urban ambient air was calculated to be 223 in a million.

The major contributors to the background excess cancer risk are benzene and 1,3-butadiene that together make up over half of the total cancer risk. These pollutants are strongly associated with mobile sources. See Appendix D for a more detailed discussion.

Air Toxics "Hot Spots" Program (AB 2588)

Health Risk Assessment Priorities

Fac #	Facility Name	Location	Area	Inventory Year	Priority
00029	Imation Corporation	350 S. Lewis Rd.	Camarillo	1995	Intermediate
00083	Lander Company Inc.	1211 Flynn Road	Camarillo	1998	Low
01267	OLS Energy - Camarillo	1947 West Potrero Road	Camarillo	1997	Intermediate
00520	Siemens Solar Industries	4530 & 4650 Adohr Lane	Camarillo	1996	Intermediate
00851	Vitesse Semiconductor Corp.	741 Calle Plano	Camarillo	1998	Low
00990	Aera Energy LLC	Sespe Compressor Plant	Fillmore	1996	Intermediate
00363	Joro Inc.	Hopper Cyn Fld	Fillmore	1997	Intermediate
00984	Nuevo Energy Company	Bardsdale Field	Fillmore	1994	Intermediate
00370	Seneca Resources Corporation	Mel Blanc et al - Sespe Field	Fillmore	1997	Intermediate
00366	Seneca Resources Corporation	Rossi et al - Sespe Field	Fillmore	1998	Intermediate
00322	Vintage Petroleum Inc.	Sespe Field Leases	Fillmore	1997	Intermediate
00054	Vintage Petroleum Inc.	Shiells Cyn Gas Plant & Leases	Fillmore	1998	Intermediate
00036	Pacific Custom Materials Inc.	17410 E. Lockwood Valley Rd.	Frazier Park	1994	Intermediate
00464	American Products	10951 West Los Angeles Avenue	Moorpark	1995	Intermediate
01291	Conexant	2427 West Hillcrest Drive	Newbury Park	1997	High
00388	Seneca Resources Corporation	Hamp-Ferndale Ranch Leases	Ojai	1994	Low
00433	Anacapa Marine Services	3203 South Victoria Avenue	Oxnard	1995	Intermediate
01425	Cathedral Mortuary Associates	1810 Sunkist Circle - Room 7	Oxnard	1995	Intermediate
01391	Channel Islands Boat Yard	3615 Victoria Avenue	Oxnard	1996	Low
01169	Coastal Multichrome Inc.	1100 Mercantile Street	Oxnard	1995	High
00146	Cook Composites & Polymers Co	5980 Arcturus Avenue	Oxnard	1991	High
07243	Custom Printing	2245 Statham Blvd.	Oxnard	1998	Low
00214	E.F. Oxnard Inc.	550 Diaz Avenue	Oxnard	1995	Intermediate
00022	Halaco Engineering Company	6200 Perkins Road	Oxnard	1995	High
01210	Ogden Power Pacific	2501 N. Ventura Road	Oxnard	1998	Intermediate
01137	Oxnard Wastewater Plant	6001 South Perkins Road	Oxnard	1992	High
00129	Polycom Huntsman Oxnard Plant	1000 Factory Lane	Oxnard	1995	High
00838	Polymer Engineering Corporation	1630 Fiske Place	Oxnard	1996	Intermediate
00015	Procter & Gamble Paper Prods.	800 North Rice Avenue	Oxnard	1998	Intermediate
00065	Reliant Energy	6635 South Edison Drive	Oxnard	1994	Intermediate

Fac #	Facility Name	Location	Area	Inventory Year	Priority
00013	Reliant Energy	393 North Harbor Boulevard	Oxnard	1994	Intermediate
00977	Saba Petroleum Inc.	Vacca Tar Sand Unit-East Fifth	Oxnard	1997	Intermediate
00093	Southern Pacific Milling Co.	3555 Vineyard Avenue	Oxnard	1997	Intermediate
07074	TFP Data Systems	3451 Jupiter Court	Oxnard	1995	Intermediate
01426	Waterway Plastics	2200 E. Sturgis Road	Oxnard	1995	Intermediate
00157	Willamette Industries Inc.	5936 Perkins Road	Oxnard	1997	High
01147	I. T. G. Energy Corporation	Sloan Lease-Eureka Canyon	Piru	1997	Intermediate
00997	Naval Air Weapons Station	Surface Coating Operations	Point Mugu	1996	High
01040	California Air National Guard	100 Mulcahey Drive 146 AW/EM	Port Hueneme	1993	High
01300	PAC Foundries	705 Industrial Ave.	Port Hueneme	1994	Low
01006	U.S. Navy-NCBC	Building 815	Port Hueneme	1992	High
00042	Crimson Resource Management	Saticoy Field Leases	Santa Paula	1997	Intermediate
00056	Nuevo Energy Company	So. Mtn. & West Mtn. Fields	Santa Paula	1997	Intermediate
00171	Santa Clara Waste Water Co.	815 Mission Rock Road	Santa Paula	1998	Intermediate
01373	Santa Paula Wastewater Plant	905 Corporation Street	Santa Paula	1995	Intermediate
07196	Turtle Storage Ltd.	401 South Beckwith	Santa Paula	1998	Intermediate
00004	Vintage Petroleum Inc.	Ojai Oil Field Leases	Santa Paula	1998	Intermediate
00053	Vintage Petroleum Inc.	South Mountain Field Leases	Santa Paula	1995	Intermediate
00006	CalMat Co. Conrock Division	6029 Vineyard Avenue	Saticoy	1998	Intermediate
00271	Boeing North America	Energy Technology Eng. Center	Simi Valley	1997	Intermediate
00228	Boeing North America	Service Area I	Simi Valley	1997	Intermediate
00021	Canyon Rock Sand & Gravel	East End of Bennett Road	Simi Valley	1997	Low
01052	Enderle Fuel Injection Inc.	1830 North Voyager Avenue	Simi Valley	1998	Low
07205	Holden Color Inc.	3990 Royal Avenue	Simi Valley	1998	Low
00115	Natel Engineering Company Inc.	4550 Runway Street	Simi Valley	1995	Intermediate
00198	Paradise Sandblasting	2190 Shasta Way Unit B	Simi Valley	1996	Low
00712	Royal Coatings	3960 Royal Avenue	Simi Valley	1996	Intermediate
00287	Schlumberger Technologies	85 Moreland Road	Simi Valley	1995	Intermediate
00165	Simi Valley County Sanitation	600 West Los Angeles Avenue	Simi Valley	1995	Intermediate
00390	The Termo Company	South Mountain Leases	Somis	1997	Intermediate
00041	Aera Energy LLC	Ventura Avenue Field Leases	Ventura	1996	High
00253	Anchors Way Marine	1644 Anchors Way	Ventura	1995	Intermediate
00264	Applied Silicone Corporation	320 West Stanley Avenue	Ventura	1995	Intermediate

Fac #	Facility Name	Location	Area	Inventory Year	Priority
00797	Aqua Creations	1607 #D Los Angeles Avenue	Ventura	1998	Intermediate
01368	Bell Powder Coating	2897 Palma Drive	Ventura	1995	Intermediate
07270	Clark's Printing Co., Inc.	222 North Ventura Avenue	Ventura	1998	Low
00121	Ivy Lawn Cemetery	5400 Valentine Road	Ventura	1995	Intermediate
00033	La Conchita Oil & Gas Plant	7459 W. Pacific Coast Highway	Ventura	1998	Intermediate
00003	Rincon Island Ltd Partnership	Rincon Island Leases	Ventura	1996	Intermediate
00061	Southern California Gas Co.	1555 North Olive Street	Ventura	1991	High
00082	Tosco Refining Company	1200 Spinnaker Drive	Ventura	1997	Intermediate
00143	Ventura Co. Medical Center	3291 Loma Vista Road	Ventura	1991	Intermediate
01202	Ventura Crematory - Ted Mayr's	3150 Loma Vista Drive	Ventura	1995	Intermediate
01083	Ventura Harbor Boatyard Inc.	1415 Spinnaker Drive	Ventura	1997	Intermediate
01139	Ventura Port District	1603 Anchors Way Drive	Ventura	1994	Intermediate
01377	Ventura Wastewater Plant	1400 Spinnaker Drive	Ventura	1995	Intermediate
00008	Vintage Petroleum Inc.	Rincon Area Leases	Ventura	1995	Intermediate
01266	Manson Construct & Engineer Co	Portable Dredge	Ventura County	1998	Intermediate

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Health Risk Assessment Results

Approved Health Risk Assessments

Fac #	Facility Name	Location	Area	Year	Cancer Risk	Chronic HI	Acute HI
00029	3M (Now Owned by Imation Corporation)	350 S. Lewis Rd.	Camarillo	1989	0.3	0.3	
00366	Seneca Resources Corporation	Rossi et al - Sespe Field	Fillmore	1989	1	0.07	0.1
00984	Unocal Corp. (Now Owned by Nuevo Energy Company)	Bardsdale Field	Fillmore	1989	2	0.01	0.02
00464	American Products	10951 West Los Angeles Avenue	Moorpark	1991	5	0.01	0.005
01340	PTI Technologies Inc	950 Rancho Conejo Blvd.	Newbury Park	1989	1	0.2	0.3
01425	Cathedral Mortuary Associates	1810 Sunkist Circle - Room 7	Oxnard	1995	4	0.05	0.1
00011	Chase Production	East 5th St. & Del Norte Rd.	Oxnard	1989	3	0.04	0.4
01169	Coastal Multichrome Inc.	1100 Mercantile Street	Oxnard	1991	133	0.6	0.4
00214	E.F. Oxnard Inc.	550 Diaz Avenue	Oxnard	1995	0.009	0.01	0.0006
00129	GE Plastics (Now Owned by Polycom Huntsman Oxnard Plant)	1000 Factory Lane	Oxnard	1991	99	0.3	0
00022	Halaco Engineering Company	6200 Perkins Road	Oxnard	1990	5	0.3	0.5
01137	Oxnard Wastewater Plant	6001 South Perkins Road	Oxnard	1990	8	0.8	1
01210	Pacific Energy (Now Owned by Ogden Power Pacific)	2501 N. Ventura Road	Oxnard	1989	2	0.02	0.01
00146	Reichhold Chemicals (Now Owned by Cook Composites & Polymers Co.)	5980 Arcturus Avenue	Oxnard	1989	350	0.03	7
00013	SCE-Mandalay Gen Station (Now Owned by Reliant Energy)	393 North Harbor Boulevard	Oxnard	1989	1	0.003	0.2
00065	SCE-Ormond Beach Gen Station (Now Owned by Reliant Energy)	6635 South Edison Drive	Oxnard	1989	2	0.0004	0.1
00997	Naval Air Weapons Station	Surface Coating Operations	Point Mugu	1990	11	0.07	0.07
01006	U.S. Navy-NCBC	Building 815	Port Hueneme	1990	123	0.8	0.3

Fac #	Facility Name	Location	Area	Year	Cancer Risk	Chronic HI	Acute HI
00004	Arco Oil & Gas Co. (Now Owned by Vintage Petroleum Inc.)	Ojai Oil Field Leases	Santa Paula	1989	2	0.03	0.006
00053	Texaco (Now Owned by Vintage Petroleum Inc.)	South Mountain Field Leases	Santa Paula	1991	3	0.03	0.03
00053	Texaco (Now Owned by Vintage Petroleum Inc.)	South Mountain Field Leases	Santa Paula	1989	1	0.01	0.02
00004	Vintage Petroleum Inc.	Ojai Oil Field Leases	Santa Paula	1991	4	0.1	0.04
00006	CalMat Co. Conrock Division	6029 Vineyard Avenue	Saticoy	1989	7	0.008	0.01
01288	Wambold Fine Furniture	6800 Smith Road	Simi Valley	1991	0.5	0.006	0.007
00008	Conoco (Now Owned by Vintage Petroleum Inc.)	Rincon Area Leases	Ventura	1989	8	0.09	0.2
00033	Philips Petroleum Co. (Now Owned by La Conchita Oil & Gas Plant)	7459 W. Pacific Coast Highway	Ventura	1989	5	0.1	0.3
00347	Santa Fe Energy (Now Owned by Vintage Petroleum)	Hobson B & C Leases - Rincon	Ventura	1989	55	0.03	0.002
00041	Shell Western E&P (Now Owned by Aera Energy LLC)	Ventura Avenue Field Leases	Ventura	1989	2	0.01	0.4
00061	Southern California Gas Co.	1555 North Olive Street	Ventura	1989	4	0.07	0.01
00020	Texaco (Now Owned by Aera Energy LLC)	Ventura Avenue Field Leases	Ventura	1991	6	0.08	
00020	Texaco (Now Owned by Aera Energy LLC)	Ventura Avenue Field Leases	Ventura	1989	3	0.1	0.03
00143	Ventura Co. Medical Center	3291 Loma Vista Road	Ventura	1991	0.6	0.003	0.2
01202	Ventura Crematory - Ted Mayr's	3150 Loma Vista Drive	Ventura	1991	0.3	0.01	0.006

Health Risk Assessments In Progress or Under Review

Fac #	Facility Name	Location	Area	Year	Cancer Risk	Chronic HI	Acute HI
01291	Conexant	2427 West Hillcrest Drive	Newbury Park	1997			
01169	Coastal Multichrome Inc.	1100 Mercantile Street	Oxnard	1995			
00022	Halaco Engineering Company	6200 Perkins Road	Oxnard	1995			
01137	Oxnard Wastewater Plant	6001 South Perkins Road	Oxnard	1992	7	0.7	2

Fac #	Facilty Name	Location	Area	Year	Cancer Risk	Chronic HI	Acute HI
00146	Reichhold Chemicals (Now Owned by Cook Composites & Polymers Co.)	5980 Arcturus Avenue	Oxnard	1991	0	0.08	1
00157	Willamette Industries Inc.	5936 Perkins Road	Oxnard	1997	0.09	0.05	0.007
00997	Naval Air Weapons Station	Surface Coating Operations	Point Mugu	1996	18	0.07	0.4
01040	California Air National Guard	100 Mulcahey Drive 146 AW/E	Port Hueneme	1993	19		52
01006	U.S. Navy-NCBC	Building 815	Port Hueneme	1992	7	0.2	0.5
00041	Aera Energy LLC	Ventura Avenue Field Leases	Ventura	1996	6	1	0.3
00061	Southern California Gas Co.	1555 North Olive Street	Ventura	1991	31	3	0.8

Cancer Risk is expressed as lifetime excess cancer risk in chances per million.

HI is the hazard index, which is the ratio of the concentration to the reference exposure level.

Approved health risk assessments have been approved by the District. These results were reviewed by the Cal EPA Office of Environmental Health Hazard Assessment, as applicable.

Results for Health Risk Assessments that are under review are based on results submitted by the facility operator and have not been approved by the District.

Air Toxics “Hot Spots” Program (AB 2588)

Risk Reductions by Significant Risk Facilities

Fac #	Facility Name	Location	Area	Year	Cancer Risk	Chronic HI	Acute HI
01169	Coastal Multichrome Public Notice completed. Risk was driven by perchloroethylene degreasing solvent and hexavalent chromium from plating. Use of perchloroethylene has been eliminated. Application was submitted for relocation and additional controls on the chrome plating.	1100 Mercantile Street	Oxnard	1991	133	0.6	0.4
00129	GE Plastics (currently owned by Polycom Huntsman) Public Notice completed. Community meeting scheduled. Risk was driven by acrylonitrile emissions from resin transfer. Facility has discontinued use of resin. Application submitted to change processes, eliminating resin transfer.	1000 Factory Lane	Oxnard	1991	161	0.4	0
01137	Oxnard Wastewater Plant Public Notice completed. Risk driven by acrolein and formaldehyde from gas fired engines, and hydrogen sulfide from the headworks. Reconfigured stacks on the engines to improve dispersion and reduce risk to below significance level.	6001 South Perkins Road	Oxnard	1990	8	0.8	1
00146	Reichhold Chemicals (currently owned by Cook Composites and Polymers) Public Notice completed. Risk was driven by methylene chloride emissions from fire retardant resin bromination. Product and use of methylene chloride eliminated.	5980 Arcturus Avenue	Oxnard	1989	350	0.3	7
00997	US Navy-NAWS Public Notice completed. Community meeting held. Risk driven by hexavalent chromium in paints used in the auto hobby shop. Source has stated that chromate paints are no longer allowed in the auto hobby shop.	NAWS Pt Mugu	Point Mugu	1990	11	0.07	0.07
01006	US Navy-NCBC Public Notice completed. Community meeting held. Risk was driven by hexavalent chromium from unconfined abrasive blasting. The abrasive blasting operation was enclosed and controlled.	NCBC	Port Hueneme	1990	123	0.8	1
00347	Santa Fe Energy (currently owned by Vintage Petroleum-part of consolidated Rincon facility) Public Notice completed. Risk was driven by benzene emissions from a centrifuge used to treat tank bottoms. The centrifuge was permanently removed from the facility.	Hobson B & C Leases- Rincon	Ventura	1989	55	0.03	0.002

Health Risk Due to Exposure to Ambient Air

Results

The health risk due to exposure to ambient air was calculated based on California Air Resources Board (CARB) data from the Simi Valley monitoring station.

The excess cancer risk due to 70 years of exposure at the levels measured by CARB was calculated to be 223 in a million, based on the average concentrations. The major contributions to the total risk were from benzene and 1,3-butadiene. Benzene sources include stationary and mobile combustion and evaporative sources. 1,3-butadiene is strongly associated with mobile source emissions.

Average ambient concentrations were also compared to the reference exposure levels for chronic non cancer risks. The hazard index for each compound was calculated for each appropriate endpoint. The hazard index is equal to the actual exposure level divided by the reference exposure level. The reference exposure level is defined as a concentration level or dose at which no adverse health effects are anticipated. RELs are designed to protect the most sensitive individuals in the population by the inclusion of margins of safety. Exceeding the REL does not automatically indicate a health impact. No individual compound hazard index exceeded one, indicating that ambient levels of individual compounds were not measured at levels exceeding their acceptable exposure levels. However, according to the AB 2588 Health Risk Assessment Guidelines, hazard indices for compounds which act on the same organ or organ system should be summed to determine a total hazard index for each end point. The total hazard index for the respiratory irritation endpoint was 1.15, slightly exceeding the level at which no adverse health effects would be anticipated.

Concentration and health risk assessment data for cancer is summarized in Tables D-1 and D-2, respectively. Figure D-1 shows the contribution of each compound to the overall average cancer risk. Noncancer health effects data is shown in Table D-3.

Raw data from CARB is available upon request.

Trends

Figure D-2 shows the risk on an annual basis for the years 1991-1998, for both total risk and on a compound specific basis for the top 5 compounds. Figure D-2 clearly shows a decrease with time in overall background risk, led by the decrease in benzene emissions. The decline in benzene concentrations is likely due to the use of reformulated gasoline.

It is also interesting to compare Figure D-1 with Figure A-I-2 from the 1993 AB 2588 Annual Report. Figure A-I-2 was created using data from 1988 or 1990 through 1992. In both figures, benzene, 1,3-butadiene, and carbon tetrachloride are the major contributors to background risk. In the 1993 report, the next major contribution was from perchloroethylene, which has now dropped to 8th place. The

average perchloroethylene concentration for the period 1990 through mid-98 was 0.86 $\mu\text{g}/\text{m}^3$, compared to 3.0 $\mu\text{g}/\text{m}^3$ for mid 1988 through mid-1992. A large source of perchloroethylene emissions is dry cleaning. Improvements in dry cleaning machine technology and implementation of the statewide Air Toxic Control Measure (ATCM) for perchloroethylene dry cleaning have substantially reduced perchloroethylene emissions from dry cleaning.

Comparing ambient concentrations of hexavalent chromium from 1986-89 to data for 1991-99 shows an apparent increase, despite implementation of several measures to control emissions of hexavalent chromium from stationary sources. However, this may not represent a real increase in concentration. According to CARB (Michael Redgrave, December 16, 1996, e-mail), the earlier (1986-89) hexavalent chromium had a sampling problem that made the reported values low by an unknown amount. CARB stated that the earlier hexavalent chromium data should not be used

In Figure XX, formaldehyde concentrations appear to have increased between 1991 and 1995. This again may not represent a real increase over this period. According to CARB (Michael Redgrave, July 29, 1999, e-mail) 1995 and earlier formaldehyde and acetaldehyde data may not be comparable to later data. The method for producing formaldehyde and acetaldehyde measurements changed as of January 1, 1996. The old method allowed an unknown proportion of ambient formaldehyde and acetaldehyde to be lost.

Methodology

Nine years of raw ambient monitoring data was obtained from CARB covering 1990 through 1998. Less than nine years of data was available for some compounds, but at least four years of data was available for all compounds included in the analysis.

To determine average values from the raw data for use in the risk assessment, it was assumed that samples below the detection limit were present at one half the detection limit.

Calculations were not made for compounds that were present at above the detection limit in fewer than 5% of the samples. There were eight compounds that were excluded from further analysis on this basis: chlorobenzene, ethylene dichloride, meta-dichlorobenzene, dibenz(a,h)anthracene, cobalt, mercury, antimony, and uranium. The top three compounds responsible for a combined 70% of the calculated risk were present at above the detection limit in at least 70% of the samples.

Ambient concentration data is summarized in Table D-1.

OEHHA approved carcinogenic unit risk factors from Air Toxics Hot Spots Program Risk Assessment Guidelines-Part II-Technical Support Document for Describing Available Cancer Potency Factors, Cal-EPA Office of Environmental Health Hazard Assessment, April 1999 were used to quantify cancer risks. Chronic noncancer acceptable exposure level data from Table III-8 of the CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, California Air Pollution Control Officers Association, October 1993 and USEPA Chronic Reference Exposure Levels recommended for use by OEHHA were used to quantify risks.

It should be noted that risks were assessed only for the inhalation pathway. A number of the compounds addressed are "multipathway" pollutants. Exposure to multipathway pollutants may occur through pathways other than inhalation, such as skin contact and ingestion, increasing the health risk from these pollutants.

Limits on Use of Data

The monitoring data from Simi Valley is often used to characterize the county-wide background risk from air toxics exposure. However, it should only be used as an example to give some perspective to other, similar risks. It should not be assumed to represent any individual's actual risk due to exposure to air toxics. CARB offers the following comments on use of their ambient air toxics data:

Toxics samples are collected every 12 days at approximately 20 sites throughout California. As such, there are a maximum of 31 values for a given toxics substance at a given site each year. Stated another way, if all goes well with the sample collection and subsequent laboratory analysis, there are only 2 or 3 values each month for a given substance at a given site. Since there are occasionally problems with the collection or the analysis, it is not unusual for there to be the occasional month or so missing from the data record for a given substance at a given site.

The toxics sampling network was designed to produce a statewide annual average. because the occasional isolated missing month of data at a site is relatively unimportant when averaged over the entire network, the production of a statewide annual average is an appropriate use of the data. The network was not designed to produce statistics representing smaller geographical areas or shorter time periods.

When we calculate an annual average, we prefer to use 36 continuous months of data. A common use of the toxics annual average is to estimate health risk based on long term exposure. Using 36 months of data tends to compensate for any variation in the data that may be present from year to year. Occasionally, however, 36 continuous months of data are not present and 24 or even 12 months must be used.

Where fewer than 12 continuous months of data are present, we believe that it is seldom appropriate to calculate an annual average. Most of the toxics substances show some seasonal variation, and some substances differ by as much as two orders of magnitude between the high and low periods of the year. In addition, the data for some substances vary widely from sample to sample, creating non-systematic variations from month to month. In either case, if a month's data are missing, the calculated average could be radically different from the real average, the average that would have been calculated had the missing month's data been available.

Since the sampling program was designed to produce statewide annual averages, it is important that the data from a single site not be used too broadly. We have observed that data from sites that are as little as 20 miles from each other can differ drastically. In addition, our knowledge of emission sources leads us to believe that in some instances the area that may

be characterized by a sampling site could be as little as a mile or less from that site. As a result, we believe that it is not appropriate to use the data from one sampling site to characterize the annual average of a location beyond the general area of the sampling site.

ambrisk 99

Ambient Risk by Compound

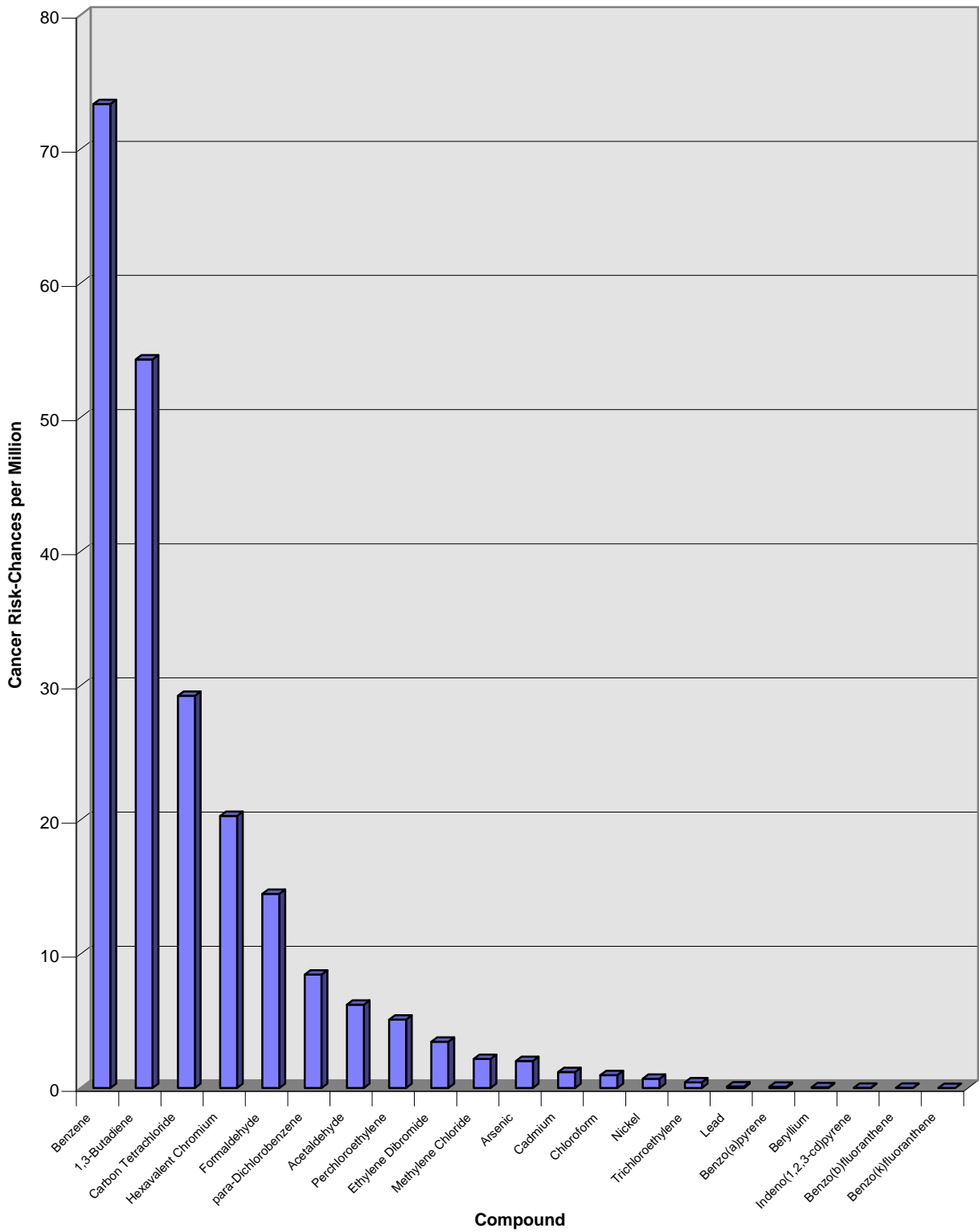


Figure D-1

Ambient Air Risk, 1991-1998 - Top 6 Compounds

Based on data from the Simi Valley Monitoring Station

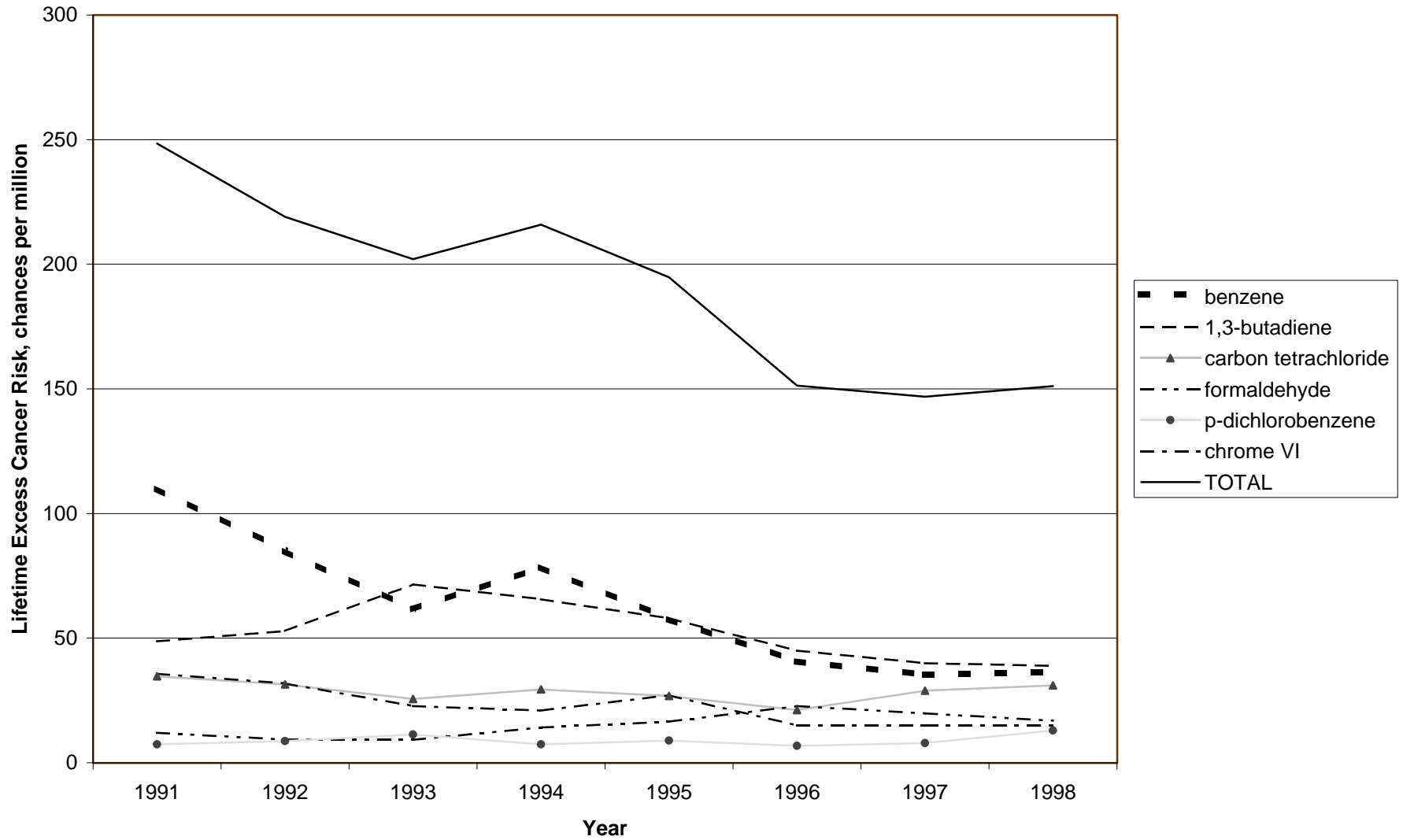


Figure D-2

sampling summary

Substance Name	Number of samples	# samples >dl	Sampling Period		Percent >dl	Average conc,ppb	Average conc,ng/m3	Molecular Weight	Average conc,ug/m3
1,3-Butadiene	264	235	1/17/90	11/19/98	89.0%	0.1419697		54.09	0.319431818
Acetaldehyde	257	245	1/17/90	1/30/99	95.3%	1.2564202		44.05	2.302217607
Benzene	260	189	1/17/90	11/19/98	72.7%	0.7784615		78.11	2.529352361
Carbon Tetrachloride	217	217	1/17/90	7/10/98	100.0%	0.1088018		153.84	0.696259383
Chlorobenzene	113	5	6/10/90	3/28/95	4.4%	0.0530973			
Chloroform	249	196	1/17/90	7/10/98	78.7%	0.0362651		119.39	0.180103392
Ethyl Benzene	229	15	6/10/90	7/10/98	6.6%	0.3305677		106.16	1.459778099
Ethylene Dibromide	129	18	1/17/90	3/28/95	14.0%	0.0062403		187.8	0.048749178
Ethylene Dichloride	73	0	1/17/90	3/28/95	0.0%	0.1			
Formaldehyde	258	251	1/17/90	1/30/99	97.3%	1.9319767		30.03	2.413363628
meta-Dichlorobenzene	113	2	6/10/90	3/28/95	1.8%	0.1044248			
meta-Xylene	117	72	6/10/90	9/17/94	61.5%	0.791453		106.16	3.49503534
meta/para-Xylene	116	47	10/4/94	7/10/98	40.5%	0.6353448		106.16	2.805665844
Methyl Chloroform	247	247	1/17/90	7/10/98	100.0%	0.7674494		133.42	4.259280282
Methyl Ethyl Ketone	211	147	7/25/91	1/30/99	69.7%	0.4208531		72.1	1.262209114
Methyl tertiary-Butyl Ether	34	34	10/9/97	11/19/98	100.0%	1.5058824		88.15	5.52177743
Methylene Chloride	249	26	1/17/90	7/10/98	10.4%	0.6140562		84.94	2.169631271
ortho-Dichlorobenzene	230	44	6/10/90	6/5/98	19.1%	0.0756522		147.01	0.462630037
ortho-Xylene	232	194	6/10/90	6/28/98	83.6%	0.35		106.16	1.545590682
para-Dichlorobenzene	230	24	6/10/90	6/5/98	10.4%	0.1256522		147.01	0.768391268
para-Xylene	113	24	6/10/90	9/17/94	21.2%	0.3553097		106.16	1.569038328
Perchloroethylene	250	249	1/17/90	7/10/98	99.6%	0.12526		165.85	0.864158527
Styrene	233	85	6/10/90	6/28/98	36.5%	0.1090129		104.14	0.472237972
Toluene	234	228	6/10/90	7/10/98	97.4%	2.4222222		92.13	9.282834165
Trichloroethylene	249	128	1/17/90	7/10/98	51.4%	0.0381928		131.4	0.208757493
Benzo(a)pyrene	217	91	1/11/90	12/25/98	41.9%	0.08447	0.0989862		9.89862E-05
Benzo(b)fluoranthene	217	137	1/11/90	12/25/98	63.1%	0.1357143	0.1449309		0.000144931
Benzo(g,h,i)perylene	201	177	9/2/90	12/25/98	88.1%	0.3133831	0.3163682		0.000316368
Benzo(k)fluoranthene	217	68	1/11/90	12/25/98	31.3%	0.0592396	0.0764055		7.64055E-05
Dibenz(a,h)anthracene	201	9	9/2/90	12/25/98	4.5%	0.0291542			
Indeno(1,2,3-cd)pyrene	201	152	9/2/90	12/25/98	75.6%	0.1821642	0.1882587		0.000188259
Aluminum	249	249	7/4/90	2/23/99	100.0%		1462.8032		1.462803213
Antimony	193	5	9/3/92	2/23/99	2.6%		2.6217617		
Arsenic	162	136	1/19/90	6/26/96	84.0%		0.612963		0.000612963
Barium	249	103	7/4/90	2/23/99	41.4%		26.449799		0.026449799
Beryllium	83	54	1/19/90	12/27/93	65.1%		0.0250602		2.50602E-05
Bromine	249	225	7/4/90	2/23/99	90.4%		7.1405622		0.007140562
Cadmium	162	151	1/19/90	6/26/96	93.2%		0.2851852		0.000285185
Calcium	249	249	7/4/90	2/23/99	100.0%		892.48193		0.892481928
Chlorine	249	249	7/4/90	2/23/99	100.0%		503.5502		0.503550201
Chromium	267	157	1/11/90	2/23/99	58.8%		2.6217228		0.002621723
Cobalt	249	0	7/4/90	2/23/99	0.0%		8		
Copper	249	249	7/4/90	2/23/99	100.0%		30.811245		0.030811245
Hexavalent Chromium	233	55	2/17/91	4/24/99	23.6%		0.1351931		0.000135193
Iron	249	249	7/4/90	2/23/99	100.0%		936.59438		0.936594378
Lead	267	205	1/11/90	2/23/99	76.8%		9.8913858		0.009891386
Manganese	267	260	1/11/90	2/23/99	97.4%		16.76779		0.01676779
Mercury	249	5	7/4/90	2/23/99	2.0%		1.5421687		
Molybdenum	249	25	7/4/90	2/23/99	10.0%		2.3614458		0.002361446
Nickel	267	160	1/11/90	2/23/99	59.9%		2.6985019		0.002698502
Phosphorus	196	151	7/4/90	2/23/99	77.0%		38.045918		0.038045918
Potassium	249	249	7/4/90	2/23/99	100.0%		545.29317		0.545293173
Rubidium	249	116	7/4/90	2/23/99	46.6%		2.2248996		0.0022249
Selenium	249	24	7/4/90	2/23/99	9.6%		1.1686747		0.001168675
Silicon	248	248	7/4/90	2/23/99	100.0%		3971.9153		3.971915323

sampling summary

Substance Name	Number of samples	# samples >dl	Sampling Period		Percent >dl	Average conc,ppb	Average conc,ng/m3	Molecular Weight	Average conc,ug/m3
Strontium	249	227	7/4/90	2/23/99	91.2%		8.8554217		0.008855422
Sulfur	249	249	7/4/90	2/23/99	100.0%		982.32129		0.982321285
Tin	193	25	9/3/92	2/23/99	13.0%		2.5181347		0.002518135
Titanium	249	245	7/4/90	2/23/99	98.4%		111.43775		0.111437751
Uranium	249	4	7/4/90	2/23/99	1.6%		1.0240964		
Vanadium	249	67	7/4/90	2/23/99	26.9%		7.3333333		0.007333333
Yttrium	249	43	7/4/90	2/23/99	17.3%		1.2369478		0.001236948
Zinc	249	249	7/4/90	2/23/99	100.0%		31.008032		0.031008032
Zirconium	249	161	7/4/90	2/23/99	64.7%		3.0803213		0.003080321

cancer risk

Substance Name	Average conc,ug/m3	Unit Risk Factor chances/ug/m3	Cancer Risk chances/million	%total
1,3-Butadiene	0.319431818	1.70E-04	54.30	24.39%
Acetaldehyde	2.302217607	2.70E-06	6.22	2.79%
Benzene	2.529352361	2.90E-05	73.35	32.94%
Carbon Tetrachloride	0.696259383	4.20E-05	29.24	13.13%
Chlorobenzene				
Chloroform	0.180103392	5.30E-06	0.95	0.43%
Ethyl Benzene	1.459778099	N/A	N/A	N/A
Ethylene Dibromide	0.048749178	7.10E-05	3.46	1.55%
Ethylene Dichloride				
Formaldehyde	2.413363628	6.00E-06	14.48	6.50%
meta-Dichlorobenzene				
meta-Xylene	3.49503534	N/A	N/A	N/A
meta/para-Xylene	2.805665844	N/A	N/A	N/A
Methyl Chloroform	4.259280282	N/A	N/A	N/A
Methyl Ethyl Ketone	1.262209114	N/A	N/A	N/A
Methyl tertiary-Butyl Ether	5.52177743	N/A	N/A	N/A
Methylene Chloride	2.169631271	1.00E-06	2.17	0.97%
ortho-Dichlorobenzene	0.462630037	N/A	N/A	N/A
ortho-Xylene	1.545590682	N/A	N/A	N/A
para-Dichlorobenzene	0.768391268	1.10E-05	8.45	3.80%
para-Xylene	1.569038328	N/A	N/A	N/A
Perchloroethylene	0.864158527	5.90E-06	5.10	2.29%
Styrene	0.472237972	N/A	N/A	N/A
Toluene	9.282834165	N/A	N/A	N/A
Trichloroethylene	0.208757493	2.00E-06	0.42	0.19%
Benzo(a)pyrene	9.89862E-05	1.10E-03	0.11	0.05%
Benzo(b)fluoranthene	0.000144931	1.10E-04	0.02	0.01%
Benzo(g,h,i)perylene	0.000316368	N/A	N/A	N/A
Benzo(k)fluoranthene	7.64055E-05	1.10E-04	0.01	0.00%
Dibenz(a,h)anthracene				
Indeno(1,2,3-cd)pyrene	0.000188259	1.10E-04	0.02	0.01%
Aluminum	1.462803213	N/A	N/A	N/A
Antimony				
Arsenic	0.000612963	3.30E-03	2.02	0.91%
Barium	0.026449799	N/A	N/A	N/A
Beryllium	2.50602E-05	2.40E-03	0.06	0.03%
Bromine	0.007140562	N/A	N/A	N/A
Cadmium	0.000285185	4.20E-03	1.20	0.54%
Calcium	0.892481928	N/A	N/A	N/A
Chlorine	0.503550201	N/A	N/A	N/A
Chromium	0.002621723	N/A	N/A	N/A
Cobalt				
Copper	0.030811245	N/A	N/A	N/A
Hexavalent Chromium	0.000135193	1.50E-01	20.28	9.11%
Iron	0.936594378	N/A	N/A	N/A
Lead	0.009891386	1.20E-05	0.12	0.05%
Manganese	0.01676779	N/A	N/A	N/A
Mercury				
Molybdenum	0.002361446	N/A	N/A	N/A
Nickel	0.002698502	2.60E-04	0.70	0.32%
Phosphorus	0.038045918	N/A	N/A	N/A
Potassium	0.545293173	N/A	N/A	N/A
Rubidium	0.0022249	N/A	N/A	N/A
Selenium	0.001168675	N/A	N/A	N/A
Silicon	3.971915323	N/A	N/A	N/A

cancer risk

Substance Name	Average conc,ug/m3	Unit Risk Factor chances/ug/m3	Cancer Risk chances/million	%total
Strontium	0.008855422	N/A	N/A	N/A
Sulfur	0.982321285	N/A	N/A	N/A
Tin	0.002518135	N/A	N/A	N/A
Titanium	0.111437751	N/A	N/A	N/A
Uranium				
Vanadium	0.007333333	N/A	N/A	N/A
Yttrium	0.001236948	N/A	N/A	N/A
Zinc	0.031008032	N/A	N/A	N/A
Zirconium	0.003080321	N/A	N/A	N/A
TOTAL			223	100.00%

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Substance Name	Average ug/m3	REL ug/m3	Hazard index	central			Endpoints				respiratory	skin	
				cardiovascular	nervous system	immune	kidney	gastrointestinal	repro/develop				
Acetaldehyde	2.30222	9.0E+00	0.2558	0	0	0	0	0	0	0	X	0.26	0
Benzene	2.52935	7.1E+01	0.03562	0	X	0.04	0	0	0	0	0	0	0
1,3-Butadiene	0.31943	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Chlorobenzene		N/A	N/A	0	0	0	0	0	0	0	0	0	0
Carbon Tetrachloride	0.69626	2.4E+00	0.29011	0	0	0	0	X	0.29	0	0	0	0
Chloroform	0.1801	3.5E+01	0.00515	0	0	0	0	X	0.01	0	0	0	0
Methylene Chloride	2.16963	3.0E+03	0.00072	0	X	0	0	X	0	0	0	0	0
Ethyl Benzene	1.45978	1.0E+03	0.00146	0	0	0	X	X	X	0	0	0	0
Ethylene Dibromide	0.04875	4.6E+00	0.0106	0	0	0	0	0	X	0.01	X	0.01	0
Ethylene Dichloride		9.5E+01	0	0	0	X	X	X	0	0	0	0	0
Formaldehyde	2.41336	3.6E+00	0.67038	0	0	0	0	0	0	X	0.67	0	0
meta-Dichlorobenzene		N/A	N/A	0	0	0	0	0	0	0	0	0	0
Methyl Ethyl Ketone	1.26221	1.0E+03	0.00126	0	0	0	0	0	X	0	0	0	0
meta/para-Xylene	2.80567	3.0E+02	0.00935	0	0	0	0	0	0	X	0.01	0	0
meta-Xylene	3.49504	3.0E+02	0.01165	0	0	0	0	0	0	X	0.01	0	0
ortho-Dichlorobenzene	0.46263	N/A	N/A	0	0	0	0	0	0	0	0	0	0
ortho-Xylene	1.54559	3.0E+02	0.00515	0	0	0	0	0	0	X	0.01	0	0
para-Dichlorobenzene	0.76839	8.0E+02	0.00096	0	X	0	X	X	0	X	0	0	0
Perchloroethylene	0.86416	3.5E+01	0.02469	0	0	0	X	0.02	X	0.02	0	0	0
para-Xylene	1.56904	3.0E+02	0.00523	0	0	0	0	0	0	X	0.01	0	0
Styrene	0.47224	1.0E+03	0.00047	0	X	0	0	0	0	0	0	0	0
Trichloroethylene	0.20876	6.4E+02	0.00033	0	X	0	0	X	0	0	0	0	0
Methyl Chloroform	4.25928	3.2E+02	0.01331	0	X	0.01	0	X	0.01	X	0.01	0	0
Toluene	9.28283	4.0E+02	0.02321	0	X	0.02	0	X	0.02	X	0.02	0	0
Benzo(a)pyrene	9.9E-05	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Benzo(b)fluoranthene	0.00014	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Benzo(g,h,i)perylene	0.00032	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Benzo(k)fluoranthene	7.6E-05	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Dibenz(a,h)anthracene	0	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Indeno(1,2,3-cd)pyrene	0.00018	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Aluminum	1.4628	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Arsenic	0.00061	5.0E-01	0.00123	0	X	0	0	0	0	0	X	0	X
Barium	0.02645	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Beryllium	2.5E-05	4.8E-03	0.00522	0	0	0	0	0	0	0	X	0.01	0
Bromine	0.00714	1.7E+00	0.0042	0	0	0	0	0	0	0	X	0	0
Calcium	0.89248	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Cadmium	0.00029	3.5E+00	8.1E-05	0	0	0	X	0	0	0	X	0	0
Chlorine	0.50355	7.1E+00	0.07092	0	0	0	0	0	0	0	X	0.07	0
Cobalt	0	N/A	N/A	0	0	0	0	0	0	0	0	0	0
Chromium	0.00262	N/A	N/A	0	0	0	0	0	0	0	0	0	0

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Substance Name	Average ug/m3	REL ug/m3	Hazard index	Endpoints															
				cardiovascula	central nervous syste	immune	kidney	gastrointestina	repro/develop	respiratory	skin								
Hexavalent Chromium	0.00014	2.0E-03	0.0676		0		0		0	X	0.07	X	0.07		0	X	0.07		0
Copper	0.03081	2.4E+00	0.01284		0		0		0		0		0		0	X	0.01		0
Iron	936594	N/A	N/A		0		0		0		0		0		0		0		0
Mercury	0	3.0E-01	0		0	X	0		0		0		0		0		0		0
Potassium	0.54529	N/A	N/A		0		0		0		0		0		0		0		0
Manganese	0.01677	5.0E-02	0.33536		0	X	0.34		0		0		0		0		0		0
Molybdenum	0.00236	N/A	N/A		0		0		0		0		0		0		0		0
Nickel	0.0027	2.4E-01	0.01124		0		0	X	0.01	X	0.01		0		0	X	0.01		0
Phosphorus	0.03805	N/A	N/A		0		0		0		0		0		0		0		0
Lead	0.00989	1.5E+00	0.00659	X	0.01	X	0.01	X	0.01	X	0.01		0	X	0.01		0		0
Rubidium	0.00222	N/A	N/A		0		0		0		0		0		0		0		0
Sulfur	0.98232	N/A	N/A		0		0		0		0		0		0		0		0
Antimony	0	N/A	N/A		0		0		0		0		0		0		0		0
Selenium	0.00117	5.0E-01	0.00234		0		0		0		0		0		0	X	0		0
Silicon	3.97192	N/A	N/A		0		0		0		0		0		0		0		0
Tin	0.00252	N/A	N/A		0		0		0		0		0		0		0		0
Strontium	0.00886	N/A	N/A		0		0		0		0		0		0		0		0
Titanium	0.11144	N/A	N/A		0		0		0		0		0		0		0		0
Uranium	0	N/A	N/A		0		0		0		0		0		0		0		0
Vanadium	0.00733	N/A	N/A		0		0		0		0		0		0		0		0
Yttrium	0.00124	N/A	N/A		0		0		0		0		0		0		0		0
Zinc	0.03101	3.5E+01	0.00089	X	0		0		0		0		0		0	X	0		0
Zirconium	0.00308	N/A	N/A		0		0		0		0		0		0		0		0
TOTAL					0.01		0.42		0.02		0.11		0.43		0.06		1.15		0