CALIFORNIA AIR TOXICS "HOT SPOTS" INFORMATION AND ASSESSMENT ACT (AB2588)

2003 Air Toxics "Hot Spots" Program Report for San Diego County

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SAN DIEGO COUNTY
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INTRODUCTION

The California Air Toxics "Hot Spots" Information and Assessment Act (AB2588) was enacted by the Legislature in 1987 to address public concern over the release of toxic air contaminants into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information to identify sources of toxic air contaminants, assess air toxic problems, locate resulting "hot spots," notify persons that may be exposed to significant risks, and develop effective strategies to reduce potential risks to the public.

A requirement of the Air Toxics "Hot Spots" Information and Assessment Act (Section 44363 of the Health and Safety Code) is for local air pollution control districts to provide the public with an annual progress report on the program. This report fulfills that requirement by providing information about emission inventories, approved health risk assessments, public notification procedures, and steps undertaken to reduce public health risks. State and local health officials use the report to establish priorities for developing and implementing air toxic control measures to protect public health.

This report summarizes the AB2588 program elements, the current status of the program in San Diego County, stationary and mobile emission estimates, results of local health risk assessments, current status of public notifications, and conclusions drawn from the program to date. Stationary source emission estimates, by facility, are also available on the Air Pollution Control District's (District) website (http://www.sdapcd.org) by selecting the Air Toxics button and then selecting Emission Inventory. In addition, stationary source emissions inventories are available upon request for those without Internet access.

Although toxic air contaminant emissions from stationary sources in San Diego County have been reduced by approximately 75%[1] since 1989, large amounts of toxic compounds are still emitted into the air from a wide variety of sources including motor vehicles, industrial facilities, household products, area sources, and natural processes. Prioritizing and reducing these emissions further will require a continued, cooperative effort by the public, industry, environmental groups, Air Resources Board (ARB), and the San Diego County Air Pollution Control District.

The District has continued to work with the regulated facilities to produce more comprehensive and accurate emission inventories. With the release of ARB's health risk assessment (HRA) software, the District began evaluating HRA issues for recent inventories. Additionally, the District has been extensively working with ARB on new and upcoming requirements which will control diesel particulate matter emissions from engines.

BACKGROUND

The San Diego County Air Pollution Control District is the implementing agency for approximately 1,800 San Diego facilities required to comply with the Air Toxics "Hot Spots"

[1] The 2002 annual program report showed an 80% reduction since 1989. The lower reduction now reported here is mainly due to increased emission estimates for perchloroethylene and glycol ethers and acetates. Additionally, the 2002 Report included emissions where no historical data was available as part of the San Diego County's total emissions. Not including these emissions as part of the reduction calculation provides a better comparison of how the County's emissions have changed. See Table 2.

Act. The law requires facilities to submit information that is used to achieve the objectives of the program. For larger industrial facilities, this information includes:

- **Emission Inventory Reports** - Facilities must submit the information needed by the District to prepare a toxic emissions inventory report. The District then prioritizes each facility to determine if a health risk assessment is necessary based upon the amount and toxicity of the reported emissions.

- **Health Risk Assessments** - Facilities required to submit health risk assessments must determine the level of public exposure to emitted compounds and potential adverse public health impacts. The State Office of Environmental Health Hazard Assessment (OEHHA) assists the District in reviewing each health risk assessment.

- **Public Notification** - If an adverse health impact exceeding public notification levels (specified in District Rule 1210) is identified, the facility must provide notice to all exposed persons regarding the results of the health risk assessment.

- **Risk Reduction Audits and Plans -** Facilities with emissions that pose a potentially significant public health risk must submit a risk reduction audit and plan to the District. This plan must demonstrate how the facility will reduce health risks below significant levels. The facility must implement the plan as approved by the District.

The Air Toxics "Hot Spots" program has been implemented in phases. Facilities are required to update their toxic inventories at least every four years depending on program status for each facility. The District has developed toxic emission inventory reporting procedures that streamline this process while meeting the requirements of the ARB Emissions Inventory Criteria and Guidelines regulation. For example, facilities are no longer required to perform emission calculations. Instead, the District provides customized inventory forms based upon site-specific equipment information and calculates facility emissions based on process information supplied by the facility operator. Additionally, the District has merged the Toxic Emission Reports with the Criteria Emission Reports to eliminate duplicate data requests. The District has evaluated at least three toxic emission inventories for most facilities in San Diego County. An estimate of current toxic air contaminant emissions from all sources, industrial and non-industrial, is presented in Table 1 of this report.

The District has also designed the local program to allow many small businesses to meet inventory requirements more cost-effectively by completing industry-specific reporting forms. The District has standardized and automated many computational and record keeping tasks. In collaboration with the ARB, OEHHA, and other air agencies, generic health risk assessments have been developed for gas stations, dry cleaners, and auto body shops to assess industry-wide impacts. These program enhancements save businesses time and money.

The District is required to review and approve the data submitted by facilities, compile an inventory of emissions, and publish periodic reports on the region's toxic air contaminant emissions, risk assessment results, and control measures effectiveness. These reports are used by health officials to develop strategies for protecting the public health.

Toxic air contaminant emissions should not necessarily be equated with a significant health risk (cancer or non-cancer) to any individual or the public. The quantity and toxicity of the compounds being emitted and the level of public exposure must be known before drawing conclusions about health risks. This report presents data on emissions from several hundred facilities. In some cases, data on public exposure is still being developed, updated, or reviewed. Health risk assessments have been completed for 63 local facilities.

However, exposure to the toxic compounds in question, in sufficient quantities, can cause health problems ranging from relatively mild, temporary conditions such as minor eye or throat irritation, shortness of breath or headaches, to permanent and serious conditions such as cancer, birth defects, or damage to lungs, nerves, the liver, the heart, or other organs.

The District has evaluated at least three toxic emission inventories for most facilities in San Diego County. An estimate of current toxic air contaminant emissions (for calendar years 1999-2003) from all sources, industrial and non-industrial, is presented in Table 1 of this report.

PROGRAM DESCRIPTION AND STATUS

The industrial source emission estimates provided in Table 1 are from District evaluations of several hundred individual stationary sources, including emission surveys of 398 auto body shops, 704 gasoline stations, and 291 dry cleaners. Detailed emission inventories for individual facilities are available on the District's website. Estimates of mobile, area, and natural source emissions prepared by the ARB are also presented in Table 1. Mobile, area, and natural source estimates come from several ARB emission reports. When multiple emission estimates were available, the most recent data was used for a category of source.

Table 1: Estimated Toxic Air Contaminant Emissions - All Sources

Toxic Air Contaminants	Most Recent Emissions from Industrial Sources Estimated for 1999 – 2003 (lbs/year)	Most Recent Total Mobile, Area, Natural Source Emissions from ARB (lbs/year)	Total San Diego County Emissions (lbs/year)
Toluene	234,633	5,474,718 (2)	5,709,351
Xylenes	204,573	4,044,958 (2)	4,249,531
Diesel Particulate Matter (1)	46,000 (5)	3,346,000 (3)	3,392,000
Propylene	647	3,045,028 (2)	3,045,675
Formaldehyde	72,433	2,898,000 (3)	2,970,433
Benzene	29,793	2,842,000 (3)	2,871,793
Glycol Ethers & Acetates	145,463	1,013,482 (2)	1,158,945
Acetaldehyde	10,739	1,088,000 (3)	1,098,739
Perchloroethylene	372,630	364,000 (3)	736,630
Methylene Chloride	58,516	620,000 (3)	678,516
1,3-Butadiene	1,008	526,000 (3)	527,008
Ammonia	28,432	425,286 (2)	453,718
Zinc (1)	4,138	447,532 (2)	451,670
Phosphorous (1)	12	426,033 (2)	426,045
Dichlorobenzene	361	300,000 (3)	300,361
Styrene	99,225	157,580 (4)	256,805
Methanol	23,390	219,297 (2)	242,687
Acrolein	929	145,640 (4)	147,569
Copper (1)	7,046	87,713 (2)	94,759

Table 1: Estimated Toxic Air Contaminant Emissions - All Sources - Continued

Toxic Air Contaminants	Most Recent Emissions from Industrial Sources Estimated for 1999 – 2003 (lbs/year)	Most Recent Total Mobile, Area, Natural Source Emissions from ARB (lbs/year)	Total San Diego County Emissions (lbs/year)
Polycyclic Aromatic Hydrocarbons (PAH), Unspecified [1]	527	79,580	80,107
Naphthalene [1]	1,231	58,780 [2]	60,011
Chlorobenzene	212	7,753 [2]	7,965
Manganese [1]	1,844	1,690 [4]	3,534
Lead [1]	154	1,290 [4]	1,444
Nickel [1]	679	281 [4]	960
Arsenic [1]	85	800 [4]	885
Selenium [1]	39	717 [2]	756
Chromium, Hexavalent [1]	22	400 [3]	422
Cadmium [1]	26	81 [4]	107
Mercury [1]	49	6 [4]	55
Methyl Tert Butyl Ether	570,064	no available data	Unknown
Isopropyl Alcohol	281,716	no available data	Unknown
Silica, Crystalline [1]	279,163	no available data	Unknown
Butanol	175,759	no available data	Unknown
Hexane	157,087	no available data	Unknown
Methyl Ethyl Ketone	133,320	no available data	Unknown
Hydrochlorofluorocarbons	110,212	no available data	Unknown
Methyl Isobutyl Ketone	85,289	no available data	Unknown
Hydrogen Chloride	56,086	no available data	Unknown
Ethyl Benzene	53,421	no available data	Unknown
2,2,4-Trimethylpentane	34,514	no available data	Unknown
1,2,4-Trimethylbenzene	32,842	no available data	Unknown
Aluminum [1]	22,580	no available data	Unknown
Hydrogen Sulfide	14,385	no available data	Unknown
Phenol	6,354	no available data	Unknown
Propylene Oxide	6,078	no available data	Unknown
Ethylene Glycol	5,839	no available data	Unknown
Trichloroethylene	5,032	no available data	Unknown
Dimethyl Sulfide	3,633	no available data	Unknown
Methyl Methacrylate	3,480	no available data	Unknown
Vinyl Chloride	3,454	no available data	Unknown
Chlorofluorocarbons	3,150	no available data	Unknown
1,1,1-Trichloroethane	3,098	no available data	Unknown
Ethylene Dichloride	2,541	no available data	Unknown
Acrylonitrile	2,509	no available data	Unknown
Barium [1]	2,288	no available data	Unknown
Dioxane,1,4-	2,221	no available data	Unknown
Hydrogen Fluoride	2,124	no available data	Unknown
Nitric Acid	1,941	no available data	Unknown
Sodium Hydroxide	1,591	no available data	Unknown
Chloroform	1,091	no available data	Unknown
Sulfuric Acid	884	no available data	Unknown
Carbon Disulfide	800	no available data	Unknown
Chlorine	678	no available data	Unknown
Dibutyl Phthalate	480	no available data	Unknown
Quinone	477	no available data	Unknown

Table 1: Estimated Toxic Air Contaminant Emissions - All Sources - Continued

Toxic Air Contaminants	Most Recent Emissions from Industrial Sources Estimated for 1999 – 2003 (lbs/year)	Most Recent Total Mobile, Area, Natural Source Emissions from ARB (lbs/year)	Total San Diego County Emissions (lbs/year)
Vinyl Acetate	430	no available data	Unknown
Carbon Tetrachloride	234	no available data	Unknown
Carbonyl Sulfide	220	no available data	Unknown
Vinylidene Chloride	139	no available data	Unknown
Methylene Diphenyl Diisocyanate	100	no available data	Unknown
Thallium (1)	77	no available data	Unknown
Silver (1)	23	no available data	Unknown
Cobalt (1)	23	no available data	Unknown
Ethylene Oxide	14	no available data	Unknown
Benzyl Chloride	13	no available data	Unknown
Crotonaldehyde	11	no available data	Unknown
Isocyanates	6	no available data	Unknown
Cyanide	5	no available data	Unknown
Beryllium	4	no available data	Unknown
Totals:	3,412,000	27,623,000	31,035,000 (6)

1. This compound is emitted as a particulate.
2. Emission data obtained from ARB's 1990 Report.
3. Emission data obtained from ARB's 2002 Almanac, Table 5-55, Emissions Inventory 2001.
4. Emission data obtained from ARB's 1996 California Toxics Inventory revised August 28, 2000.
5. Estimate of diesel particulate matter emissions from stationary internal combustion engines only. Individual toxins of diesel particulate matter (i.e., arsenic, cadmium, copper, hexavalent chromium, lead, nickel, selenium, and zinc) are also reported on the table.
6. Total of most recent available estimates for industrial, mobile, area and natural sources.

A comparison of baseline (1989-1991) emission estimates to current (1999-2003) estimates is presented in Table 2. Overall local emissions of toxic air contaminants from industrial sources have decreased by approximately 75 % since 1989. The most significant reductions include a variety of chlorinated solvents and heavy metals. Emission increases are primarily the result of increased usage of non-chlorinated replacement solvents and reformulated paints. Emission estimates for some compounds have increased although the actual emission levels may not have changed. This is due to changes in combustion-related emission factors and newly listed toxic air contaminants not included in initial inventories.

Many improved emission speciation profiles, calculation methodologies, and emission factors have been used to estimate the toxic air contaminants (TAC's) released since the baseline inventory. More accurate facility recordkeeping and material usage reporting have also refined site-specific emission estimates. In some cases, estimated emissions have significantly decreased from amounts reported in the baseline inventory. In other instances, additional compounds have been identified and emissions of some toxic air contaminants have increased. A number of TAC's were added to the program after the baseline period (1989 - 1991). Since there are no historical emission estimates for these compounds, they increase the apparent emission totals for more recent inventories but, in reality, are compounds that were also being emitted but not inventoried during the baseline period. Detailed site-specific emission results are provided on the District's website.

Table 2: Comparison of Historical and Current Toxic Air Contaminant Emissions -Industrial Sources

Toxic Air Contaminants	Most Recent Emissions from Industrial Sources Estimated for 1999 – 2003 (lbs/year)	Historical Industrial Source Emissions (lbs/year) Baseline (1989-1991)	Difference (lbs/year) Baseline to Current
1,1,1-Trichloroethane	3,098	2,727,662	-2,724,564
Chlorofluorocarbons	3,150	1,967,653	-1,964,503
Isopropyl Alcohol (1)	281,716	1,995,151	-1,713,435
Methylene Chloride	58,516	1,318,102	-1,259,586
Perchloroethylene	372,630	1,188,914	-816,284
Propylene Oxide	6,078	587,686	-581,608
Silica, Crystalline	279,163	668,957	-389,794
Styrene	99,225	299,252	-200,027
Methanol	23,390	203,359	-179,969
Sodium Hydroxide	1,591	145,152	-143,561
Dioxane,1,4-	2,221	62,774	-60,553
Xylenes	204,573	243,196	-38,623
Hydrogen Sulfide	14,385	46,391	-32,006
Toluene	234,633	266,164	-31,531
Trichloroethylene	5,032	29,175	-24,143
Hexane	157,087	181,000	-23,913
Ammonia	28,432	49,492	-21,060
Propylene	647	14,860	-14,213
Zinc	4,138	17,517	-13,379
Ethylene Oxide	14	7,612	-7,598
Methyl Methacrylate	3,480	10,882	-7,402
Nickel	679	6,647	-5,968
Phenol	6,354	11,873	-5,519
Carbon Tetrachloride	234	4,655	-4,421
Lead	154	4,076	-3,922
Sulfuric Acid	884	3,600	-2,716
Manganese	1,844	4,546	-2,702
Arsenic	85	2,198	-2,113
Vinyl Chloride	3,454	5,434	-1,980
Selenium	39	1,582	-1,543
Mercury	49	1,187	-1,138
Hydrogen Fluoride	2,124	3,078	-954
Chloroform	1,091	1,958	-867
Naphthalene	1,231	1,615	-384
Isocyanates	6	355	-349
Chromium, Hexavalent	22	245	-223
Cadmium	26	226	-200
1,3-Butadiene	1,008	1,206	-198
Beryllium	4	118	-114
Phosphorous	12	30	-18
Acrolein (1)	929	no available data	Unknown
Acrylonitrile (1)	2,509	no available data	Unknown
Benzyl Chloride (1)	13	no available data	Unknown
Carbon Disulfide (1)	800	no available data	Unknown
Carbonyl Sulfide (1)	220	no available data	Unknown
Chlorine (1)	678	no available data	Unknown
Cobalt (1)	23	no available data	Unknown

Table 2: Comparison of Historical and Current Toxic Air Contaminant Emissions - Industrial Sources - Continued

Toxic Air Contaminants	Most Recent Emissions from Industrial Sources Estimated for 1999 – 2003 (lbs/year)	Historical Industrial Source Emissions (lbs/year) Baseline (1989-1991)	Difference (lbs/year) Baseline to Current
Crotonaldehyde [1]	11	no available data	Unknown
Cyanide [1]	5	no available data	Unknown
Dibutyl Phthalate [1]	480	no available data	Unknown
Dichlorobenzene [1]	361	no available data	Unknown
Diesel Particulate from engines	46,000	no available data	Unknown
Dimethyl Sulfide [1]	3,633	no available data	Unknown
Ethylene Glycol [1]	5,839	no available data	Unknown
Hydrochlorofluorocarbons [1]	110,212	no available data	Unknown
Methylene Diphenyl Diisocyanate [1]	100	no available data	Unknown
Nitric Acid [1]	1,941	no available data	Unknown
Quinone [1]	477	no available data	Unknown
Silver [1]	23	no available data	Unknown
Thallium [1]	77	no available data	Unknown
1,2,4-Trimethylbenzene [1]	32,842	no available data	Unknown
Vinyl Acetate [1]	430	no available data	Unknown
Vinylidene Chloride [1]	139	no available data	Unknown
Chlorobenzene	212	170	42
PAH, Unspecified	527	165	362
Copper	7,046	6,230	816
Ethylene Dichloride	2,541	1,536	1,005
Barium	2,288	1,000	1,288
Benzene	29,793	26,805	2,988
Aluminum	22,580	16,000	6,580
Acetaldehyde	10,739	28	10,711
Methyl Ethyl Ketone	133,320	119,000	14,320
Glycol Ethers & Acetates	145,463	126,333	19,130
2,2,4-Trimethylpentane	34,514	8,067	26,447
Hydrogen Chloride	56,086	21,443	34,643
Ethyl Benzene	53,421	16,000	37,421
Methyl Isobutyl Ketone	85,239	42,000	43,239
Formaldehyde	72,433	26,408	46,025
Butanol	175,759	116,000	59,759
Methyl Tert Butyl Ether [1], [2]	570,064	0	570,064
Totals:	3,412,266	12,612,765	-9,408,241

1. This compound was added to the "Hot Spots" list after initial emission estimates were made for the baseline period (1989 – 1991).
2. Though methyl tert butyl ether (MTBE) was added to the "Hot Spots" list after initial emission estimates were made, it is considered an adequate assumption that MTBE emissions during the baseline years of 1989-1991 were zero. MTBE emissions are mainly from reformulated gasoline.

In 1990, ARB prepared a toxic emissions inventory report for non-industrial sources (mobile, area, and natural sources) in San Diego County. Total non-industrial source emissions are presented in Table 1. Emissions for the mobile, area, and natural source subcategories are provided in Table 3. Mobile sources include on-road vehicles, off-road vehicles, trains, mobile equipment, and utility equipment. Area sources include residential and commercial non-point sources such as fuel combustion, entrained road dust, waste burning, solvent use, pesticide application, and construction and demolition. Natural sources include wildfires and windblown dust from agricultural operations and unpaved areas.

More recent emissions data for some mobile, area, and natural source contaminants has been provided by ARB. The most recent data available for each toxin was included in this report. Data derived from ARB's 2002 Almanac, Table 5-55, Emissions Inventory 2001 may be found at http://www.arb.ca.gov/aqd/almanac/almanac02/chap502.htm. ARB's 1996 California Toxics Inventory revised August 28, 2000, may be found at http://www.arb.ca.gov/toxics/cti/cti1996082800.pdf. Currently, ARB does not have complete information for all toxins for a given year. The District will incorporate updated area, mobile, and natural emission data when it is generated by ARB.

Table 3: ARB Estimated Toxic Air Contaminant Emissions - Non-Industrial Sources

Toxic Air Contaminants	Mobile Source Emissions (lbs/year)	Area Source Emissions (lbs/year)	Natural Source Emissions (lbs/year)	Total Non-Industrial Source Emissions (lbs/year)
Toluene [1]	4,954,347	520,371	0	5,474,718
Xylenes [1]	3,415,658	629,300	0	4,044,958
Diesel Particulate Matter [2]	3,346,000	0	0	3,346,000
Propylene [1]	2,361,534	89,261	594,233	3,045,028
Formaldehyde [2]	2,656,000	242,000	0	2,898,000
Benzene [2]	2,776,000	66,000	0	2,842,000
Acetaldehyde [2]	876,000	212,000	0	1,088,000
Glycol Ethers & Acetates [1]	0	1,013,482	0	1,013,482
Methylene Chloride [2]	0	620,000	0	620,000
1,3-Butadiene [2]	502,000	8,000	16,000	526,000
Zinc [1]	174,533	271,226	1,773	447,532
Phosphorous [1]	729	422,185	3,119	426,033
Ammonia [1]	19,692	35,914	369,680	425,286
Perchloroethylene [2]	0	364,000	0	364,000
Dichlorobenzene [2]	0	300,000	0	300,000
Methanol [1]	0	219,297	0	219,297
Styrene [3]	150,930	6,650	0	157,580
Acrolein [3]	136,420	9,220	0	145,640
Copper [1]	542	86,739	432	87,713
PAH, Unspecified [1]	0	79,580	0	79,580
Naphthalene [1]	4,858	53,922	0	58,780
Chlorobenzene [1]	5,511	2,242	0	7,753
Manganese [3]	190	370	1,130	1,690
Lead [3]	380	190	720	1,290
Arsenic [3]	360	60	380	800
Selenium [1]	24	611	82	717
Chromium Hexavalent [2]	360	< 20	< 20	400
Nickel [3]	230	50	< 1	281
Cadmium [3]	40	40	1	81
Mercury [3]	0	5	< 1	6
Totals:	21,382,338	5,252,725	987,561	27,622,624

1. Emission data obtained from ARB's 1990 Report.
2. Emission data obtained from ARB's 2002 Almanac, Table 5-55, Emissions Inventory 2001.
3. Emission data obtained from ARB's 1996 California Toxics Inventory revised August 28, 2000.

Facility Prioritization

The purpose of facility prioritization is to identify facilities which emit toxic air contaminants in amounts that warrant a detailed evaluation of potential public health risks through preparation of a site-specific health risk assessment. Prioritization procedures consider the magnitude of toxic air contaminant emissions from facilities and the toxicity of those emissions, but do not consider the dilution characteristics of a specific facility's exhaust stacks or the expected health risks posed by the emissions. Requiring a facility to prepare a risk assessment does not mean the facility poses a significant risk to public health.

The District's first prioritization procedures were prepared in 1990 and were based upon the Air Toxics "Hot Spots" Program Facility Prioritization Guidelines (July 1990) prepared by a committee of the California Air Pollution Control Officers Association (CAPCOA). In 1992, it was found that facilities with a prioritization score less than 100 would not be subject to public notification requirements. Therefore, the District revised the procedures by increasing the carcinogenic score that would require a health risk assessment from 10 to 100. The prioritization procedures were revised again in 1996 to incorporate a receptor proximity adjustment factor. The receptor proximity adjustment factor decreases prioritization scores for facilities that do not have nearby receptors within 50 meters.

Using the District's prioritization procedures, facilities are placed into three categories: Category A for facilities that either volunteered or are required to prepare and submit a health risk assessment; Category B for facilities that may be required to conduct a health risk assessment at a future date; and Category C for facilities not likely to be required to perform health risk assessments. All facilities are reprioritized based on their most recent approved toxic emissions inventory report. Prioritization procedures can be found on the District's website under Air Toxics.

Health Risk Assessments

A health risk assessment (HRA) is a study of the possible public health risks that may be posed by emissions of toxic compounds. Each facility that has been placed in Category A must prepare and submit a health risk assessment to the District.

The assessment incorporates conservative pollutant dispersion estimates, human exposure assumptions, and health effects information to ensure that the final risk assessments are not underestimated. Accordingly, the results of a risk assessment may overstate actual health risks but are useful in comparing the relative risks of sources and pollutants and setting priorities for mitigation. For example, a risk assessment typically will estimate the increased cancer risk for a hypothetical individual who would remain at the one location with the greatest potential for exposure to toxic air contaminant emissions from the facility for 24 hours a day, 365 days per year, over 70 years.

While the health risk assessment procedures are generally considered to be conservative, some factors that may tend to underestimate impacts are difficult to evaluate. For example, a HRA is based on emission estimates for the indicated inventory year. These emissions are assumed to occur for 70 years to obtain a "lifetime" cancer risk. Years other than the inventory year, in particular for years before this program, may have higher (or lower) emissions. Additionally, the

cumulative effect of emissions from other nearby mobile, area, and stationary sources and the potential for complex mixtures of toxic air contaminants to create an additional health problem by their combined reaction to each other cannot be estimated. Also, some facility emission estimates are based on average factors for individual types of equipment and actual emissions may be higher or lower. Finally, the health risk assessment results only include potential impacts from compounds with OEHHA-approved health values. Compounds without OEHHA-approved health values are not included.

ARB lists more than 700 compounds to be assessed under the Air Toxics "Hot Spots" program. The list includes potentially carcinogenic substances as well as compounds that may cause health problems such as respiratory irritation or central nervous system depression. The toxicity varies from compounds that pose concern if more than a few grams are emitted per day, to those that may pose no significant health risks if many pounds are emitted per day. OEHHA reviews and updates the toxicity of the listed compounds. This updated information is then distributed to all groups involved in the program for use in identifying facilities required to prepare risk assessments and in preparing the assessments.

Each health risk assessment is reviewed by the District and OEHHA to identify deficiencies requiring correction. The District then approves, modifies, or returns the health risk assessment for corrections. The results of all risk assessments prepared under this program are available for public review.

Health risk assessments have been conducted for 63 facilities in San Diego County since 1991 (54 large Phase I, 4 intermediate Phase II, and 5 smaller Phase III sites). Twenty-six of the Phase I facilities updated their 1989 evaluations for 1993 to quantify the effects of added control equipment, process material changes, modified manufacturing operations, refined emission estimation techniques, improved emission factors, and revised toxic potencies. In accordance with District Rule 1210, these updated Phase I health risk assessments were used to determine site-specific public notification and risk reduction requirements.

Nine intermediate (Phase II) and small (Phase III) facilities were required to prepare health risk assessments based upon their approved 1994 and 1995 emission inventories. Eight of these health risk assessments are complete and have been reviewed by OEHHA and approved by the District. The most current health risk assessment results for each of the 63 facilities are summarized in Table 4.

The District provides facilities required to conduct a health risk assessment with a protocol and guidelines on how the health risk assessment should be done. New guidelines developed by OEHHA and ARB entitled *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (Volume 5) and *Interim Risk Management Policy for Inhalation-Based Cancer Risk* are approved. These new guidelines will provide the basis for the next health risk assessments and updates prepared under this program.

The District is currently prioritizing facilities based on the most recent approved toxic emissions inventories to determine where new health risk assessments are required. The District is preparing screening risk assessments for some facilities to clarify whether formal health risk assessments will be required. Approximately ten new health risk assessments are expected to be required for facilities based on their emission inventories for calendar years 2002 and 2003.

The District will try to perform screening or generic health risk assessments for small businesses (such as industry-wide survey sources) that are not required to submit full plans and reports.

Table 4: Health Risk Assessment (HRA) Results

HRA Evaluation Period	Facility		Max. Lifetime Cancer Risk per million (2)	Lifetime Cancer Burden (3)	Chronic THI (4)	Acute THI (5)
1989	General Dynamics / Pacific Hwy (7)	San Diego	1,000	37	3.8	1.0
1995	Palomar Plating (9)	Escondido	364	< 0.1	1.2	N/a
1995	Campbell Marine (7)	San Diego	154	< 0.1	0.83	17
1994	Hues Metal Finishing (9)	San Marcos	85	< 0.1	0.66	12
1989	Otay Landfill (6)	San Diego	42	0.16	< 0.1	< 0.1
1995	Escon Tool and Manufacturing	San Marcos	41	0.25	0.80	3.1
1995	Flame Spray Inc. (9)	San Diego	40	< 0.1	0.14	30
1989	Powerine Oil Co. (7)	San Diego	32	< 0.1	0.10	0
1993	USN Point Loma Naval Complex (1)	San Diego	28	< 0.1	0.18	0.47
1993	National Steel & Shipbuilding (1)	San Diego	27	< 0.1	0.3	3.5
1993	Chem-tronics, Inc. (1, 9)	El Cajon	26	0.12	0.36	20
1993	USMC Miramar / USN Miramar (1)	San Diego	24	0.2	0.13	0.81
1989	Sycamore Landfill (6)	San Diego	19	< 0.1	< 0.1	< 0.1
1993/1998	USN Air Station/North Island (1, 9, 10)	Coronado	15	<0.1	0.20	0.8
1993	USN Navy Station, 32nd St. (1)	San Diego	15	0.2	0.11	3
1993	Santa Fe Pacific Pipeline (1)	San Diego	8	< 0.1	< 0.1	< 0.1
1994	Continental Maritime	San Diego	7.7	< 0.1	< 0.1	0.44
1993	BF Goodrich / Rohr Industries (1)	Chula Vista	7.7	< 0.1	< 0.1	< 0.1
1993	Southwest Marine (1)	San Diego	7.7	< 0.1	< 0.1	2.1
1989	San Marcos Landfill	San Marcos	7.4	< 0.1	< 0.1	< 0.1
1993	Solar Turbines / Ruffin Rd (1)	San Diego	7.3	< 0.1	< 0.1	2.1
1989	S.D. City Pt. Loma Waste Water Treatment. Plant	San Diego	7.3	< 0.1	0.30	1.1
1989	General Dynamics / Kearny Villa Rd (7)	San Diego	6.5	0.53	0.05	0.3
1993	Solar Turbines / Pacific Hwy (1)	San Diego	6.1	< 0.1	< 0.1	3.3
1989	Kelco/Div. Merck & Co. Inc.	San Diego	6.0	0.10	0.40	0.2
1993	Superior Ready Mix / Canyon Rock (1)	San Diego	5.6	< 0.1	< 0.1	0.47
1993	USN Amphibious Base (1, 9)	Coronado	5.3	< 0.1	< 0.1	1.3
1993	Signet Armorlite (1, 9)	San Marcos	4.6	< 0.1	< 0.1	0.47
1994	Senior Flexonics, Ketema Division (9)	El Cajon	4.5	< 0.1	0.02	4.24
1989	Sony	San Diego	4.5	< 0.1	0.09	0.1
1993	Hanson Aggregates/Nelson & Sloan/7th & Main (1)	Chula Vista	4.2	< 0.1	< 0.1	< 0.1
1989	Vulcan / CALMAT Co. / Hwy 76	Pala	4.2	< 0.1	0.10	< 0.1
1989	ARCO	San Diego	4.0	< 0.1	< 0.1	0
1993	Hanson Aggregates / Sim J. Harris (1)	San Diego	3.9	< 0.1	< 0.1	< 0.1
1989	Palomar Airport Landfill	Carlsbad	3.9	< 0.1	< 0.1	< 0.1
1993	Hanson Aggregates/H.G. Fenton/East County Mtls (1)	El Cajon	3.7	< 0.1	< 0.1	0.1
1989	Bonsall Landfill	Vista	3.7	< 0.1	< 0.1	< 0.1
1993	Wyroc (1)	Vista	3.6	< 0.1	< 0.1	0.13
1989	Equillon Enterprises / Shell Oil Co / Mission Rd	San Diego	3.3	< 0.1	< 0.1	0
1989	Vulcan / CALMAT Co. / Friars Rd	San Diego	3.3	< 0.1	0.14	0.3
1993	Hanson Aggregates / Nelson & Sloan / Tri Way (1)	Lakeside	3.1	< 0.1	< 0.1	0.1
1989	Knight & Carver Inc. / Hancock St (7)	San Diego	2.8	< 0.1	< 0.1	0.5
1993	Hanson Aggregates / H.G. Fenton / Carrol Cyn. (1)	San Diego	2.6	< 0.1	< 0.1	< 0.1
1989	Southern California Edison Co.	San Onofre	2.2	< 0.1	< 0.1	< 0.1

Table 4: Health Risk Assessment (HRA) Results - Continued

HRA Evaluation Period	Facility		Max. Lifetime Cancer Risk per million (2)	Lifetime Cancer Burden (3)	Chronic THI (4)	Acute THI (5)
1993	Hanson Aggregates/Nelson & Sloan/Birch Quarry (1)	Chula Vista	2.1	< 0.1	< 0.1	0.1
1989	Duke Energy / SDG&E / South Bay Plant	Chula Vista	2.1	< 0.1	< 0.1	0.34
1993	Frazee Paint (1)	San Diego	1.8	< 0.1	0.5	0.5
1989	UCSD Campus	San Diego	1.8	< 0.1	< 0.1	0.4
1989	USMC Base/Camp Pendleton	Pendleton	1.7	< 0.1	0.14	0.64
1993	Asphalt Inc. (1)	Lakeside	1.3	< 0.1	< 0.1	< 0.1
1989	Vulcan / CALMAT Co. / Black Mountain Rd	San Diego	1.3	< 0.1	0.20	0.4
1994	Ogden Power Pacific	Chula Vista	1.0	< 0.1	0.92	0.21
1989	Cabrillo Power / SDG&E / Encina Plant	Carlsbad	0.9	< 0.1	< 0.1	0.1
1989	Cabrillo Power / SDG&E / 32nd St. Naval Station	San Diego	0.8	< 0.1	< 0.1	< 0.1
1989	Texaco Refining & Marketing, Inc.	San Diego	0.8	< 0.1	< 0.1	0
1993	Teledyne Ryan Aeronautical (1, 7)	San Diego	0.79	< 0.1	< 0.1	0.12
1993	Hanson Aggregates / South Coast Materials (1)	Carlsbad	0.7	< 0.1	< 0.1	< 0.1
1989	Chevron USA Inc.	San Diego	0.60	< 0.1	< 0.1	0
1993	Deutsch Co. (1)	Oceanside	0.4	< 0.1	< 0.1	< 0.1
1989	Cabrillo Power / SDG&E / Naval Training Center	San Diego	0.2	< 0.1	< 0.1	< 0.1
1989	San Diego State University	San Diego	0.1	< 0.1	< 0.1	0.5
1989	Cabrillo Power/SDG&E Company/USN North Island	Coronado	0.05	< 0.1	< 0.1	< 0.1
1995	Chromalloy San Diego (8)	El Cajon	15	-	0.07	20

1. Indicates this facility updated a 1989 health risk assessment in accordance with District Rule 1210.
2. This column reports the maximum lifetime excess cancer risk estimate reported by the facility or corrected by the District. The maximum estimated risk generally is possible at only one location. All other locations show lower risks. Moreover, this estimate assumes that a person resides at the location of maximum impact 24 hours per day, 365 days per year, for 70 years of exposure. Actual cancer risks will likely be less.
3. Excess cancer burden is an estimate of the increased number of cancer cases in a population (i.e. all census tracts within or partially within the one in one million isopleth) as a result of exposure to emitted substances.
4. Chronic total health hazard index (THI) is the sum of the ratios of the average annual exposure level of each compound to the compound's reference exposure level (REL).
5. Acute total health hazard index (THI) is the sum of the ratios of the maximum one-hour exposure level of each compound to the compound's reference exposure level (REL).
6. Cancer risk was < 10 in one million at all residential, occupational, and commercial locations.
7. This facility has ceased operations.
8. The above HRA results are from an HRA conducted by Chromalloy. The methodology of Chromalloy's HRA has been approved by OEHHA however, the emissions used in Chromalloy's HRA are lower than the District-approved emissions. If the District approved-emissions were used in the HRA, the HRA results are estimated to be: cancer risk = 50 in a million, chronic risk = 0.191 and acute risk = 19. However, this HRA has not been approved by the District.
9. This facility successfully implemented a risk reduction program (see Table 6).
10. The cancer and chronic HRA results are based on 1993 HRA. The acute result is based on an updated 1998 acute HRA.

Public Notification and Risk Reduction

The Air Toxics "Hot Spots" program requires significant risk facilities to prepare and implement a plan to reduce risk to below significant risk levels. Facilities found to pose a significant public health risk are required to conduct an airborne risk reduction audit and develop a plan to implement risk reduction measures within six months of the District's determination of significant risk. ARB and CAPCOA collaborated in developing Implementation Guidelines for SB1731,

which were released in July 1993. The District's risk reduction requirements are generally consistent with these guidelines.

Once a risk assessment has been reviewed and approved, the District must determine whether the facility poses a significant risk to public health. Any facility that, in the District's judgment, poses a significant health risk, must notify the affected public of that risk. The California Health and Safety Code does not define "significant health risk." The District, in consultation with interested parties, established public notification and significant risk levels (as well as notification procedures) in District Rule 1210. These levels are presented in Table 5.

Table 5: Public Notification and Risk Mitigation Levels

	Public Notification Level	**Significant Risk Level**
Maximum Incremental Cancer Risk	10	100
Cancer Burden	1.0	1.0
Total Acute Noncancer Health Hazard Index	1.0*	1.0*
Total Chronic Noncancer Health Hazard Index	1.0*	1.0*
* A value greater than 1.0 but less than 5.0 would not trigger public notification or risk reduction requirements if the Air Pollution Control Officer determines, after consultation with OEHHA, that adverse public health effects are unlikely to occur at the levels of exposure estimated in the approved public health risk assessment.		

In establishing public notification procedures, the District considered input from CAPCOA's *Air Toxics "Hot Spots" Program Public Notification Guidelines* (October 1992), ARB guidance, other regulatory precedents, public workshops, and a local public notification committee consisting of representatives from the District, local industry and industry groups, academic institutions, and environmental organizations. The procedures are generally consistent with procedures adopted by other California air districts.[2] The status of each facility subject to the public notification and risk reduction requirements of District Rule 1210 is summarized in Table 6.

Facilities required to perform public notification must distribute notices to each household and business that may be exposed to potential risks exceeding the District's public notification level. Notifications must be issued biennially until the facility demonstrates to the District that it has reduced the potential health risk below the notification thresholds.

Of the first group of 54 facilities required to perform HRAs, nine facilities with estimated risks above public notification levels were required to inform the public of their health risk assessment results. These facilities are noted in Table 6. Based on the response from the public, four facilities were required to hold public meetings to provide further information regarding their emissions and their health risk assessment results.

[2] The South Coast Air Quality Management District has revised its cancer risk mitigation threshold to 25 in one million.

Of the nine intermediate (Phase II) and small (Phase III) facilities that were required to conduct HRAs, six had risks above public notification levels and have performed public notification. Three facilities (Flame Spray Inc., Palomar Plating, and Senior Flexonics, Ketema Division) have conducted public meetings based on public response to the notification.

Public notification is required biennially based on the most recent approved health risk assessment until it is demonstrated that potential health risks have been reduced below public notification levels. NASSCO, USN North Island, USN Point Loma Naval Complex, USMC Miramar, and USN Navy Station, 32nd St. are required to repeat public notifications biennially.

Under Rule 1210, facilities with potentially significant public health risks must reduce these risks below significant risk levels within five years. Of the 63 facilities that have prepared public health risk assessments under the "Hot Spots" program, nine had estimated risks above the significant risk mitigation levels. These facilities, shown in Table 6, each prepared and implemented risk reduction plans. All but one facility (USN Air Station, North Island) successfully reduced their toxic emissions below public notification levels. The USN Air Station has reduced their acute risks substantially but must continue biennial public notification because of residual cancer risks.

Table 6: Public Notification and Risk Reduction Status

HRA Evaluation Period	Facilities Required to Perform Public Notification	
1995	Escon Tool and Mfg., Inc. – San Marcos	This facility performed a Public Notification in 2001 and discontinued use of coatings containing heavy metals. Additional biennial public notifications are no longer required.
1993	USN Point Loma Naval Complex – San Diego	This facility performed a Public Notification in 1997, 1999, 2002, and 2003. Biennial public notifications are required.
1993	National Steel & Shipbuilding – San Diego	This facility performed a Public Notification in 1997, 1999, and 2002. Biennial public notifications are required.
1993	USMC Miramar – San Diego	This facility performed a Public Notification in 1997, 1999, 2002, and 2003. Biennial public notifications are required.
1993	USN Navy Station, 32nd St. – San Diego	This facility performed a Public Notification in 1997, 1999, 2001, and 2003. Biennial public notifications are required.
1993	Santa Fe Pacific Pipeline – San Diego	This facility performed a Public Notification on 5/14/97 based on 1989 HRA results. This facility also held a Public Meeting. Risks have since been demonstrated to be below public notification levels.
HRA Evaluation Period	**Facilities Required to Perform Both Public Notification and Risk Reduction**	
1995	Palomar Plating – Escondido	This facility performed a Public Notification in 2001, held a Public Meeting and successfully implemented a risk reduction program. Public notifications are no longer required.
1995	Campbell Marine – San Diego	This facility performed a Public Notification in 2001 and has since discontinued operations. Public notifications are no longer required.
1994	Hues Metal Finishing – San Marcos	This facility performed a Public Notification in 2000 and successfully implemented a risk reduction program. Additional biennial public notifications are no longer required.

Table 6: Public Notification and Risk Reduction Status - Continued

HRA Evaluation Period	Facilities Required to Perform Both Public Notification and Risk Reduction	
1995	Flame Spray Inc. – San Diego	This facility performed a Public Notification in 2000, held a Public Meeting and successfully implemented a risk reduction program. Public notifications are no longer required.
1993/ 1998	USN Air Station/North Island – Coronado	This facility performed a Public Notification in 1997, 2001, and 2003, held a Public Meeting and successfully implemented reduction of acute health risk. Biennial public notifications of potential cancer risk are required.
1993	Chem-tronics, Inc. – El Cajon	This facility performed a Public Notification in 1997, held a Public Meeting and successfully implemented a risk reduction program. Public notifications are no longer required.
1993	USN Amphibious Base – Coronado	This facility performed a Public Notification in 1997 and successfully implemented a risk reduction program. Public notifications are no longer required.
1993	Signet Armorlite – San Marcos	This facility performed a Public Notification and Public Meeting prior to the adoption of District Rule 1210. This facility completed a risk reduction effort and demonstrated attainment of Rule 1210 objectives with their updated 1993 HRA.
1994	Senior Flexonics, Ketema Aerospace and Electronics Division – El Cajon	This facility performed a Public Notification in 2001, held a Public Meeting, and implemented a risk reduction plan. Public notifications are no longer required.

Recent And Expected Changes To The Program

The Air Toxics "Hot Spots" Act requires that OEHHA develop risk assessment guidelines for the Air Toxics "Hot Spots" Program, including a "likelihood of risks" approach to risk assessment. OEHHA has developed and published a series of Technical Support Documents for the determination of: (1) Acute Toxicity Exposure Levels, (2) Cancer Potency Factors, (3) Chronic Toxicity Exposure Levels, (4) Exposure Assessment and Stochastic Analysis, and (5) *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. To supplement OEHHA's guidelines, ARB has provided *Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk*.

The new OEHHA guidelines introduce numerous changes to the risk assessment process including incorporating new compounds and health values, preparing tiered analyses, performing stochastic risk analysis, evaluating alternate exposure scenarios, and significant changes to inhalation pathway calculations. These changes make preparation of health risk assessments using current tools impractical. ARB has developed a computer program that will enable the District to incorporate the numerous changes resulting from adoption of the new guidelines. The program, called HARP (Hotspots Analysis Reporting Program), includes emissions inventory, air dispersion modeling, risk assessment, and graphic display modules. The District reviewed a preliminary version of the software and reported its findings to ARB in May 2002. ARB released a working version of the software on December 31, 2003, and several additional revisions throughout early 2004. District staff is currently involved in providing corrections and improvements on the most recent version of the HARP software. The District intends to assist affected facilities with HRA requirements.

QUALITY OF THE EMISSIONS INVENTORY DATA

The District's website contains approved emissions estimates for each facility inventoried. These emissions were determined using several different techniques, depending on the specific processes being evaluated.

Uniform and comprehensive toxic air contaminant guidelines do not exist for many types of processes. In these cases, emissions are estimated by conducting source tests, reviewing previous evaluations of similar operations, comparing materials used, or applying engineering judgment. Accordingly, the quality of emission estimates varies and a direct comparison of relative emissions between facilities may be inappropriate.

In the early stages of the program, hundreds of California facilities undertook similar inventory efforts concurrently, placing a tremendous demand on consultants and source testing firms. At the time, few people had extensive experience inventorying and testing air toxics. For some compounds and processes, test methods had not yet been developed and alternative techniques for estimation had to be used. Where source testing was used, results were sometimes inconsistent between facilities or between several tests of the same exhaust stack. Some test results conflicted with known process information, e.g., stack emissions of trace metals versus fuel composition data.

Some of these problems were related to the initial program startup and have been minimized as experience has been gained. Other problems are inherent to measuring very small quantities of trace compounds and applying emissions results from tests conducted over relatively few hours to a whole year of operation. Also, where the District had reason to suspect actual emissions of a toxic air contaminant reported as non-detectable, the District used the ARB-recommended practice of estimating the emission based on one-half the detection limit. Accordingly, consideration should be given to these issues when comparing emission estimates and any inferred health risks. The accuracy of the reported values can vary widely and current emission estimates may differ greatly from previously reported values.

AIR TOXICS CONTROL MEASURES

The objectives of the Air Toxics "Hot Spots" program are to develop a complete inventory of toxic air contaminant emission sources in California, to assess the potential public health risks associated with those emissions, and to require facilities with significant risks to reduce these risks to levels below the significant risk level. At the same time, existing and new programs at the local, state, and federal levels also reduce air toxics emissions.

At the state level, ARB continues to implement an ongoing program to identify toxic air contaminants, assess their public health risks, and develop air toxics control measures to reduce toxic emissions from specific source categories statewide. Under this program known as AB1807, or the Tanner program, ARB in cooperation with OEHHA develops priorities for identification of toxic compounds, investigates and documents the adverse health risks posed by such compounds, identifies statewide sources of emissions, evaluates public health risks and available control technologies, and approves statewide emission control measures. Local air districts then must implement the state-approved emission reduction measures.

At the federal level, the 1990 Clean Air Act Amendments greatly expanded the Environmental Protection Agency (EPA) program to develop nationwide control measures for air toxics. The Clean Air Act now lists 188 substances as hazardous air pollutants and requires EPA to develop control measures for significant sources of these pollutants. Many of these substances are included in the emissions being inventoried under the Air Toxics "Hot Spots" program. In addition, state and local permitting agencies are implementing National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for many large and small sources of hazardous air pollutants. Under revised state law, newly adopted federal NESHAPs regulations become state Airborne Toxic Control Measures (ATCMs) automatically unless the state elects to adopt a separate regulation. The following is a table of recent and proposed state ATCMs and federal NESHAPs.

Table 7: Recent and Proposed ATCMs and NESHAPs Applicable in San Diego County

ATCM / NESHAP	Primary Pollutant	Current Status	Estimated Number of Affected Facilities in San Diego County
ATCM for Asbestos for Construction, Grading, Quarrying, and Surface Mining Operations	Asbestos	Adopted July 26, 2001	0
ATCM for Motor Vehicle and Mobile Equipment Coatings	Hexavalent Chromium and Cadmium	Adopted September 20, 2001	Approximately 150
ATCM for Residential Waste Burning	Dioxins	Adopted February 3, 2003	Countywide
ATCM for School Bus Idling	Diesel Particulate Matter	Effective July 16, 2003	Countywide
ATCM for Stationary Internal Compression Ignition Engines	Diesel Particulate Matter	Adopted February 26, 2004	Approximately 700
ATCM for Portable Diesel-Fueled Engines	Diesel Particulate Matter	Adopted February 26, 2004	Approximately 800
ATCM to Limit Idling from Heavy Duty Diesel Vehicles	Diesel Particulate Matter	Proposed June 4, 2004	Countywide
ATCM for Thermal Spraying	Hexavalent Chromium and Nickel	ARB drafting regulation	6
NESHAP for Municipal Solid Waste Landfills	All HAP's (most significant are: vinyl chloride, benzene, arsenic, acrylonitrile, hydrogen chloride, hydrogen sulfide)	Promulgated January 16, 2003	8
NESHAP for Site Remediation	All HAP's (most common are: bezene, toluene, ethyl benzene and xylenes)	Promulgated October 8, 2003	2

Additionally, ARB is reviewing the existing ATCM for chrome plating and chromic acid anodizing. As part of its study, ARB plans to evaluate remaining potential health risks, improvements in operations and maintenance practices, and additional emission control technologies.

TOXIC AIR CONTAMINANTS AMBIENT MONITORING

The District started sampling for toxic air contaminants at the El Cajon and Chula Vista monitoring stations in the mid-1980s. This work, which is carried out in collaboration with ARB, provides information on ambient levels of a number of organic and inorganic toxic compounds. Integrated 24-hour air samples are performed once every twelve days by the District. Staff of ARB analyze the samples and validate the data. The State Air Resources Board publishes detailed toxic sampling results from all California monitoring sites on its website (http://www.arb.ca.gov/adam/toxics/sitesubstance.html). A summary of the ARB-approved results for the two San Diego County air toxic monitoring stations is provided in Figure 1.

Excluding diesel particulates, the ambient incremental cancer risk based on toxic air contaminant levels measured at both the Chula Vista and El Cajon monitoring stations has decreased by 65% since 1989 as shown in Figure 1. The estimated risk was 170 in one million for Chula Vista and 186 in one million for El Cajon in 2003.

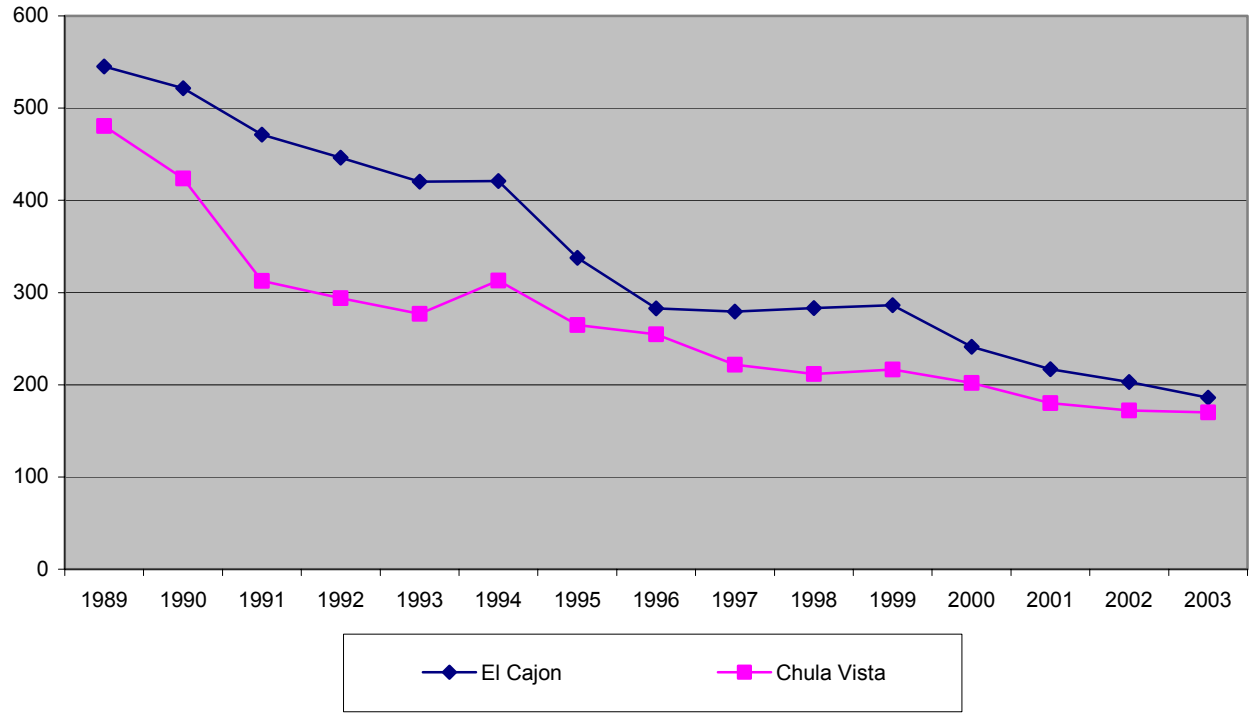
Diesel particulates also contributes significantly to ambient risk levels. Although a method does not exist to directly monitor diesel particulate concentrations, ARB has suggested methods that can be used to estimate diesel concentrations. Based on ARB estimates, diesel particulate emissions could add an additional 420 in one million to the ambient risk levels, in San Diego County. ARB estimates that risk from diesel particulate has decreased by about 50 percent from 870 in one million since 1990.

At the request of a number of Valley Center residents, the District collected 24-hour integrated air samples for several days in June 2002 at three Valley Center sites. These samples were analyzed for 55 volatile organic compounds (VOC), including styrene. The VOC levels at these Valley Center sites were compared with the VOC levels recorded at other areas of San Diego County, namely El Cajon and Kearny Mesa. Nearly all VOC levels in Valley Center, including styrene, were lower than the VOC levels measured at either of the other two sites. Most of the compounds detected were consistent with emissions expected from motor vehicle exhaust and home heating fuel combustion. The study detected no unusual, unknown, or significant sources of VOC in Valley Center.

At the request of City Councilwoman Donna Frye, County Supervisor Greg Cox asked the District to perform relevant emission tests that might assist in properly examining the Mission Bay Landfill area. The District collected 24-hour air samples directly over the landfill surface at three different locations on April 14, April 18, and May 3, 2004. Trace concentrations of gaseous toxic compounds, including several common industrial solvents detected at the three landfill gas surface emission sampling sites, were very low suggesting the absence of any localized hot spots on the landfill surface. The average levels of these compounds were similar to the ambient levels found in El Cajon and Kearny Mesa showing the absence of any additional emissions produced by the former disposal site. The concentrations of some compounds measured at the surface of the Mission Bay landfill were actually lower than the levels of the

same compounds measured in the ambient air of Kearny Mesa and El Cajon. This suggests the trace concentrations of air pollutants detected at the Mission Bay Landfill sampling locations are representative of normal background ambient air levels for this area of the County. These test results show no measurable levels of landfill gas are being emitted from the former disposal site.

Figure 1 – Toxic Air Contaminant Incremental Cancer Risk



CONCLUSIONS

Industrial, commercial, and governmental facilities still emit large quantities of toxic air contaminants although emissions from industrial and commercial sources have been reduced by approximately 75% since 1989. Based on the most recent estimates, those sites inventoried emit more than three million pounds of toxic air contaminants annually (down from 4.5 million pounds in 1998). Motor vehicles and area and natural sources are also key contributors of toxic air contaminants, emitting more than 27 million pounds. Tables 1, 2, and 3 provide the current inventories of toxic pollutants for stationary, mobile, area, and natural sources. The majority of local facilities are in compliance with current District emission standards, which now focus on both criteria air pollutants (e.g., VOC, oxides of nitrogen, particulate matter) and toxic air contaminants. Estimated emissions of toxic air contaminants from industrial sources have decreased by approximately 9 million pounds per year since 1989.

Current and future air quality programs at the local, state, and federal levels will further reduce toxic air contaminants emissions. Measures to reduce vehicle trips and miles traveled will reduce toxic emissions which result from the burning of gasoline. Measures to reduce emissions of VOC as ozone precursors will also decrease emissions of toxic VOC.

State air toxics control measures are reducing emissions of perchloroethylene from dry cleaning operations, hexavalent chromium from plating operations, and toxic metals from metal melting operations. Federal emission control programs have produced dramatic emission reductions of chlorofluorocarbons (CFC) and methyl chloroform. The District also requires best available control technology for many new and modified sources of toxic air contaminants.

Over 9 million pounds of industrial emission reductions have been quantified in San Diego County between 1989 and 2003. The most significant emission reductions are listed below.

	Emission Reductions (lbs/year)
1,1,1-Trichloroethane:	2,724,564
Chlorofluorocarbons (CFCs)*	1,964,503
Isopropyl Alcohol	1,713,435
Methylene Chloride	1,259,586
Perchloroethylene	816,284
Propylene Oxide	581,608
Silica, crystalline	389,789
Styrene	200,027
Methanol	179,969

* CFCs are stratospheric ozone depletors and are targeted for reduction and eventual elimination by Title VI of the 1990 Clean Air Act Amendments. Facilities were required to stop production and import of these chemicals by the turn of the century.

Most of the above reductions resulted from material substitutions, installing emission control equipment, and changes to a variety of manufacturing processes. For example, industrial emissions of perchloroethylene, a commercial dry cleaning and industrial degreasing solvent, have been reduced by more than 68% as a result of emission control technologies and material substitutions. Many solvent-intensive products and manufacturing operations have been modified to use acetone and hydrochlorofluorocarbons (HCFC). These solvents are not toxic air contaminants under the Air Toxics "Hot Spots" program. Federal and state agencies have made the determination that acetone and HCFCs are neither photochemically reactive nor ozone depletors. The District continues to quantify these compounds to ensure an accurate assessment of facility emissions and to monitor general industry material usage trends.

Some industrial source emission increases have occurred since 1989. The most significant increases are:

	Emission Increases (lbs/year)
Methyl Tert Butyl Ether	558,242
Butanol	59,759
Formaldehyde	46,025
Methyl Isobutyl Ketone	43,239
Ethyl Benzene	37,421
Hydrogen Chloride	34,643
1,2,4-Trimethylbenzene	32,842
2,2,4-Trimethylpentane	26,447
Glycol Ethers	19,130
Methyl Ethyl Ketone	14,320

Methyl tertiary butyl ether (MTBE) emission increases reported above are mainly due to the use of this compound as a gasoline additive during the inventory year of 2000. The above estimate represents industrial sources and gasoline stations only. ARB area and mobile source emission estimates have not been updated to account for this substance. Therefore, total countywide MTBE emissions may be significantly higher for the inventory years (1999 – 2003) evaluated for this report. However, starting in 2004, California phased out the use of MTBE as a gasoline additive. The District will inventory gas stations for calendar year 2004 which will show MTBE reduction in subsequent reports. The elimination of MTBE will likely result in some increases of other substitute additives such as ethanol. Ethanol is not a toxic air contaminant under the "Hot Spots" program but is a VOC.

Formaldehyde and hydrogen chloride emission increases are associated with updated fuel combustion emission factors, installed NOx emission control equipment, increased landfill gas combustion, and more complete evaluations of chemical processing tanks. Countywide emission estimates of these materials for time periods prior to 1997 may be understated.

Although accurate estimates of emission increases are not available, it appears that methyl isobutyl ketone, ethyl benzene, methyl ethyl ketone, ethyl benzene, glycol ethers, and a variety of alcohols are being used more frequently as solvents and thinners in surface coating and painting operations. Many coatings which previously contained chlorinated solvents have been reformulated with these substances. New and modified coating and solvent application operations requiring District permits and using these materials are reviewed to ensure no adverse public health impacts of concern.

Ongoing implementation of toxic air contaminant control programs such as the Air Toxics "Hot Spots" Program, District Rules 1200 (Toxic Air Contaminants - New Source Review) and 1210 (Toxic Air Contaminant Public Health Risks - Public Notification and Risk Reduction) will continue to reduce local public health risks associated with emissions of toxic air contaminants. Those efforts will improve information on levels of exposure and risk as well as identifying compounds, processes, and facilities that are potentially causing significant risks.

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