CITY RISK ASSESSMENT:

RECOGNIZING THE RISK EVEN WHEN IT IS LOW

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By

Ryan A. Thomas

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APPROVED

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Dr. David Cocker
Department of Chemical and Environmental Engineering, Bourns College of Engineering

_____
Dr. Richard Cardullo, Howard H Hays Jr. Chair and Faculty Director, University Honors
Interim Vice Provost, Undergraduate Education

Abstract

An evaluation study was done to assess the non-carcinogenic hazardous risk levels of the Southern California Air Basin, based on a claim from the South Coast Air Quality Management District's (AQMD's) Multiple Air Toxics Exposure Study IV (MATES IV) that there is no need to perform a non-carcinogenic assessment due to sufficiently low levels. Utilizing the list of known air toxic constituents and their measured concentrations from each air monitoring location compiled for the MATES IV study, a hazardous health risk assessment for non-carcinogenic health risk was performed in line with the procedures laid out by the U.S. Environmental Protection Agency (EPA) to fully understand the actual risk involved. For each monitoring station, the Average Daily Dose (ADD) of each air toxic was determined for 4 different age demographics including adults, teenagers, children, and babies. With reference concentrations from the EPA IRIS Database, the Hazard Quotient for each compound by age demographic and monitoring station was calculated, as well as the Hazard Index per age demographic. From these results, it was determined that every Hazard Index is well within the safe level of 1, with the highest observed Hazard Index equal to only 0.18. These results fall exactly in line with the expectations of the MATES IV report, but there were some key trends observed when reviewing the data of this study. The non-carcinogenic hazard risk across the entire Air Basin hinges mainly on five main compounds, manganese, acetaldehyde, 1,3 - butadiene, benzene, and naphthalene, with manganese being the main contributor across each monitoring station. It was also observed that much of the necessary reference information for this type of study does not exist, and for many of the compounds measured in the air, there is not enough information available to quantify their impact on the air quality. These findings, while not representative of the entire risk profile of the Southern California Air Basin, reasonably detail that there should be no concerns from breathing the air, but also that there is a lot of room for study and further development in this area of risk assessment.

Acknowledgments

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INTRODUCTION

Anytime anyone performs any type of action, there is a quantifiable probability that something adverse or negative will occur. This probability is known as risk and the science of studying, quantifying and controlling that risk is known as risk assessment [1]. From leaving one's house and driving to work to betting on the stock market to simply breathing air or drinking water, everything entails one or more kinds of risk, and everyone has to way the risks before they do anything. It is the job of those in the risk assessment field to study risk in all of its forms and provide a means to quantify it and management strategies in order to reduce it. Understanding the risk an action entails allows one to make the decisions with the greatest understanding of the potential consequences and it is the process of risk assessment that these decisions are made.

Risk assessment and management are especially important in the fields of environmental monitoring and engineering. Like all engineers, being an environmental engineer means upholding the Code of Ethics laid out by the National Society of Professional Engineers (NSPE) [2]. As a part of the fundamental canons that guide engineering practice, as public servants, engineers are expected to "hold paramount the safety, health and welfare of the public." {2]. No matter what, it is an engineer's duty to make sure the general public is not negatively impacted by engineering practice, first and foremost, and performing thorough risk assessments are a part of accomplishing that. To complete an environmental hazardous risk assessment with any reasonable amount of accuracy, there are several necessary steps: hazard identification, dose-response and exposure assessment, all of which contribute to risk characterization, and then risk management [1]. All of these have been laid out in detail by the

U.S. Environmental Protection Agency [3], with explicit procedures for calculating risk and accumulating data for testing.

The first step is hazard identification, and is one of the most pivotal steps as it dictates how the assessment proceeds. As has been previously established, any and every situation has some inherent risk. The hazard identification step identifies all of the major contributors of risk and how they cause hazards. The nature of this step is different for every situation being assessed. For environmental engineering, the nature of risk is usually toxicological, assessing how toxic compounds and chemicals affect humans, but there are also assessments dedicated to the environment's risk and others. Hazard identification in the human health case focuses on exposure pathways, primarily ingestion, absorption or inhalation of some toxic compound, and toxin processing, how quickly the toxin moves through the system and if it is filtered by or stored in the body. Most studies focus assessment on a single pathway under specific conditions, but every one of these can be taken into account to describe a very complete picture of incurred risk.

The next steps occur in tandem: dose-response and exposure assessments. These steps quantify the risk for every source, its exposure pathways and hazardous effect in an assessment. Dose-response assessments determine the amount of a risk source a person receives. Exposure assessments determine how regularly a person is exposed to a risk source. In the United States, the EPA has set up very clear standards for how these assessments are calculated [4]. These assessments utilize the concentration of the compound being assessed, the length of time that a person would be exposed to it and is adjusted for the exposure pathways, all averaged by the person's body weight and some averaging time. This is consistent for all risk assessments involving hazardous, toxic compounds, but a distinction must be made when taking into account one major consideration: carcinogenicity. When a compound has carcinogenic properties,

sometimes exposure to a small concentration for a short time in a single event can be enough to increase the cancer risk from safe levels to unsafe ones. This property is not shared is not shared by non-carcinogens, so there are two different methods of assessment that have developed for these compounds in order to properly describe their risk.

Carcinogens are assessed using a chronic daily intake (CDI) [1], utilizing the same exposure assessment process of all compounds but the averaging time is done over a person's lifetime in order to take into account the long term effects of carcinogens [5]. This CDI is then multiplied against a compound's unique potency factor, which indicates how powerful the compound's carcinogenic effects are, in order to determine the lifetime risk of exposure to this compound. In order for an assessment of a carcinogen to consider exposure safe, the lifetime risk cannot increase the chances of someone contracting cancer by more than 1 person in a million people. If there are multiple compounds in an assessment, then the assessment is done exactly the same way and the lifetime risks are summed. Regardless, the limit for an acceptable increased cancer risk is still only 1 person in a million.

For non-carcinogens, the primary measure is the Hazard Quotient system (HQ) [5]. Calculations to find the HQ involve first calculating the Average Daily Dose (ADD) experienced by a person and then comparing it against each compound's unique reference dose (RfD), which is the lowest possible concentration that a person can be exposed to before incurring some form of toxic risk [6]. The ratio of the ADD to the RfD determines the HQ. If this value is above 1, then the chances of a hazardous response to exposure to this particular compound is considered to be unacceptable, as the likelihood of an unhealthy reaction has significantly increased. If multiple compounds are involved, then the HQ's of all the compounds are calculated and summed in order to calculate the Hazard Index (HI) [6]. The HI determines the non-carcinogenic

risk for the whole cocktail of compounds and the limit for acceptable risk remains 1 for the entire cocktail.

All of these steps and calculations characterize the risk. The observations, scenario evaluations, exposure assessments and risk calculations all contribute to make a picture of the full extent of risk that a risk source creates. From this characterization come important trends and details that can be used to manage and control risk or potentially remediate it completely. Management solutions differ for every source of risk and for every scenario. Some only require more monitoring if the risk is not substantial, but for more serious sources of risk, management will involve reduction, elimination of exposure pathways and if the event takes the form of a single, exposure event, such as a chemical leak that is quickly stopped but not before contamination and exposure, then sometimes the only management is compensation for the exposure.

An example of a major risk assessment study is the South Coast Air Quality Management District's (AQMD's) Multiple Air Toxics Exposure Study IV (MATES IV) [7]. The MATES IV is the major Southern California Air Basin air quality risk assessment study performed every few years. The Air Basin consists of the air breathed by people in Los Angeles and Orange counties and a portion of San Bernardino and Riverside counties. The study focuses on carcinogenic risk incurred as a result of breathing in the air, using atmospheric data that they have measured as well as data from various air quality monitoring stations set up across the Air Basin and operated by the California Air Resources Board. From this, they have mapped the carcinogenic risk that a person living in the Air Basin would experience. They performed a very thorough study, but they did not perform a non-carcinogenic assessment. They justify this by saying, "the measured

concentrations of air toxics were all below the established chronic relative exposure levels (REL's)". [7] These REL's have the same function as the RfD's previous mentioned.

The purpose of this study is based on this statement. Even though it has been determined from this comparison that the non-carcinogenic risk is safe and acceptable, there is still a risk incurred. This study desires to characterize the risk that is incurred and explore the trends that may be revealed, furthering understanding of the current quality of the Air Basin and making sure that an engineer's due diligence is completed.

EXPERIMENTAL

The list of air toxic compounds identified and assessed by the MATES IV are compiled in Table ES-1 of the main report, visible below as **Table 1** [7]. These compounds will also be evaluated for this study.

Table 1 – Table ES-1 Substances Measured in MATES IV

Table ES-1 Substances Measured in MATES IV

Acetaldehyde	Dichloroethane	Organic Carbon (OC)
Acetone	Elemental Carbon (EC)	PAHs
Arsenic	Ethyl Benzene	Perchloroethylene
Benzene	Formaldehyde	$PM_{2.5}$
Black Carbon (BC)	Hexavalent Chromium	PM_{10}
1,3-Butadiene	Lead	Selenium
Cadmium	Manganese	Styrene
Carbon Tetrachloride	Methylene Chloride	Toluene
Chloroform	Methyl ethyl ketone	Trichloroethylene
Copper	MTBE	Ultrafine Particles (UFP)
Dibromoethane	Naphthalene	Vinyl Chloride
Dichlorobenzene	Nickel	Xylene
		Zinc

From this list, an EXCEL Spreadsheet was compiled with one sheet devoted to each monitoring station utilized in the MATES IV study. A map of these sites can be seen below in **Figure 2** using information available on the CA Air Resources Board website [8].

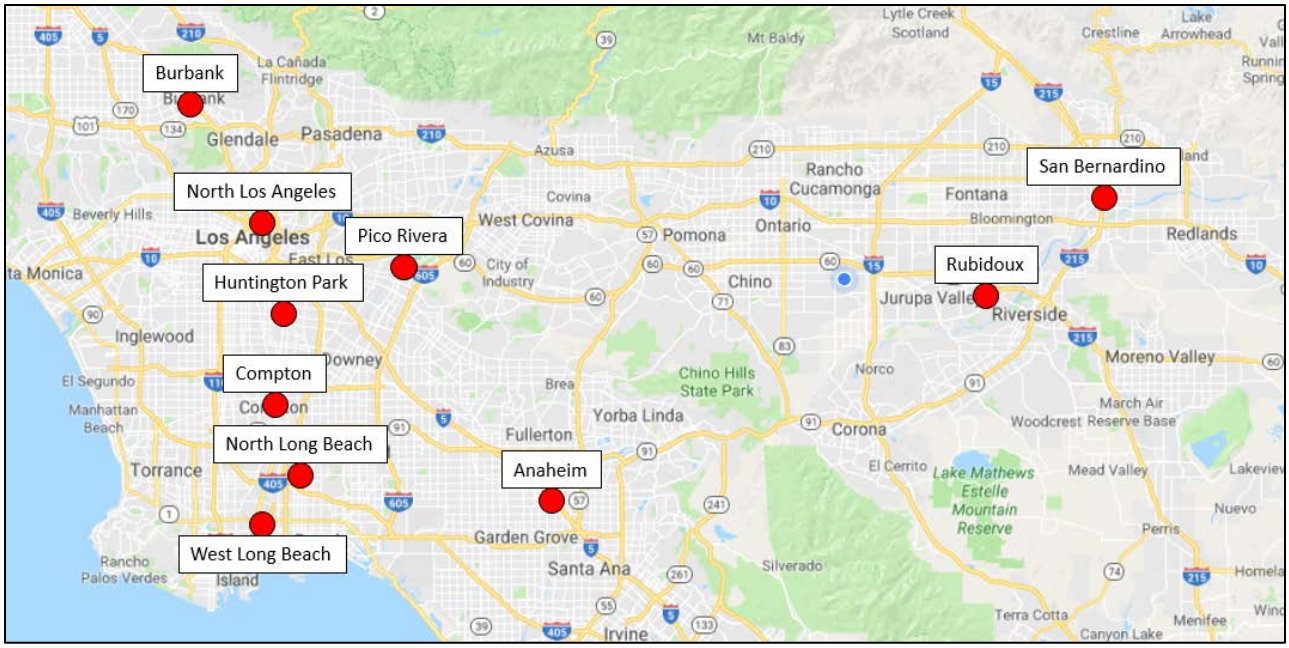

Figure 1 – Location of Air Quality Monitoring Sites in MATES IV study

For every air toxic, the average concentration in the units of micrograms of chemical per meter cubed of air (ug/m^3) was collected. This data be found in "Appendix 4: Summaries for the MATES IV Fixed Monitoring Sites" [9] of the MATES IV study. Average concentrations were utilized as they will provide the best picture of the air basin quality for the average person living in the Air Basin, more so than the minimum or maximum observed concentrations would provide. Some concentrations were provided in units of parts per billion and required conversion to the correct units [10]. Sample calculations for these conversions can be found in **Appendix B: Sample Calculations**.

With these air toxic concentrations, the Average Daily Dose (ADD) was calculated using the standard equation provided by the U.S. EPA's "GUIDELINES FOR EXPOSURE ASSESSMENT" as Equation 2-5 [4]:

$$ADD = \frac{C * IR * ET * EF * ED}{BW * AT}$$

In this equation, “ADD” stands for “Average Daily Dose”, “C” is the concentration of the air toxic, and “IR” is the inhalation rate of a person breathing in the air toxic. “ET” is the exposure time or the amount of time in a standard day a person is exposed to the air toxic, “EF” is the exposure frequency or the amount of days in a standard year a person is exposed to the air toxic, and “ED” is the exposure duration or the number of years a person is exposed to the air toxic. “BW” is the body weight of this experimental person, and “AT” is an averaging time, generally the number of years a person spends exposed to the air toxics. In this study, a person’s standard lifespan was used as the averaging time, assuming a person spends their life breathing air from the Air Basin. The values for inhalation rate, body weight and exposure factors can be found in the U.S. EPA’s Exposure Factors Handbook [11].

The ADD calculation was done for 4 different age ranges: adults of the age 21 and older, teenagers between the ages 21 and 11, children between the ages 11 and 1, and babies of age 1 and younger. This demographic breakdown was established because of the dependence of ADD on body weight and inhalation rate, factors which change over time, and in doing a single calculation for only the adult age would ignore the risk incurred by a large fraction of the population. The age brackets were determined based on the average body weight and inhalation rates listed in the U.S. EPA’s “Exposure Factors Handbook” [11] and brackets were set to contain ages with the most similar and consistent exposure values. A sample calculation for the ADD of adults can be found in **Appendix B: Sample Calculations** and all utilized exposure factors can be found in **Appendix A: Experimental Data, Charts, and Associated Figures**.

Reference concentrations (RfC’s) and Reference Doses (RfD’s) were collected from the U.S. EPA’s Integrated Risk Information System, or IRIS Database [12]. The IRIS Database contains risk information for a wide variety of chemicals, compounds, and elements, but

different entries are presented in different formats. Any air toxic whose risk information was provided as a RfC needed to be converted to a RfD, done using the process listed out by the U.S. EPA's "Technical Appendix A: Toxicity Weights for TRI Chemicals and Chemical Categories" [6]. Sample calculations for this conversion can be found in **Appendix B: Sample Calculations**.

Having calculated the ADD and RfD values, the Hazard Quotients (HQ's) can be determined by finding the ratio of the ADD to the RfD [1]. This was done for every air toxic and every age demographic at each monitoring station. A sample calculation can be found in **Appendix B: Sample Calculations.** The Hazard Indexes (HI's) were subsequently determined by summing all of the HQ's of all of the air toxics per age demographic.

It is hypothesized that at the end of this study, the air quality will within acceptable levels of risk, in line with the assessment of the MATES IV study.

RESULTS

The HI's for each age demographic, separated by monitoring location, are presented below in **Figure 3**.

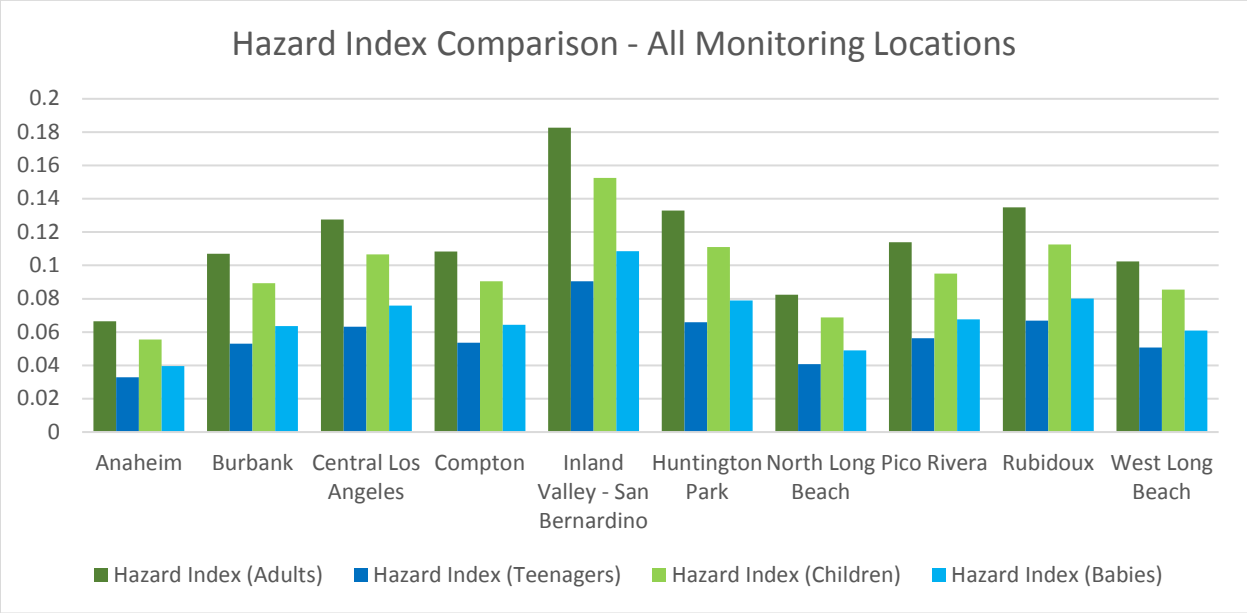

Figure 2 – Hazard Index Comparison – All Monitoring Locations

A summary of the top five air toxics that contribute the most to the risk can be found in below **Table 2**. These toxics make up about 85% of the total risk of each monitoring location.

Table 2 – Greatest Contributors of Risk for each Monitoring Location

Anaheim		Burbank		Central Los Angeles		Compton		Inland Valley – San Bernardino	
Air Toxic	%	Air Toxic	%	Air Toxic	%	Air Toxic	%	Air Toxic	%
Manganese	32	Manganese	36	Manganese	39	Manganese	44	Manganese	73
Acetaldehyde	23	Acetaldehyde	26	Acetaldehyde	19	Acetaldehyde	20	Acetaldehyde	14
1,3-Butadiene	17	1,3-Butadiene	15	Xylene	13	1,3-Butadiene	16	1,3-Butadiene	4
Benzene	7	Benzene	6	1,3-Butadiene	11	Benzene	6	Benzene	2
Naphthalene	7	Naphthalene	4	Trichloroethylene	5	Xylene	4	Naphthalene	2
TOTAL %	86	TOTAL %	87	TOTAL %	87	TOTAL %	90	TOTAL %	95
Huntington Park		North Long Beach		Pico Rivera		Rubidoux		West Long Beach	
Air Toxic	%	Air Toxic	%	Air Toxic	%	Air Toxic	%	Air Toxic	%
Manganese	44	Manganese	45	Manganese	48	Manganese	63	Manganese	54
Acetaldehyde	20	Acetaldehyde	21	Acetaldehyde	28	Acetaldehyde	16	Acetaldehyde	19
1,3-Butadiene	15	1,3-Butadiene	12	1,3-Butadiene	9	1,3-Butadiene	6	1,3-Butadiene	10
Benzene	5	Benzene	5	Benzene	4	Benzene	3	Benzene	5
Xylene	5	Naphthalene	5	Naphthalene	4	Naphthalene	3	Naphthalene	4
TOTAL %	89	TOTAL %	88	TOTAL %	93	TOTAL %	91	TOTAL %	92

A map similar to **Figure 2** has created using the charts of the relative percentage each air toxic has of the total HI in the given region, and each chart is scaled against each other so that the monitoring with the largest HI has the largest chart set over it.

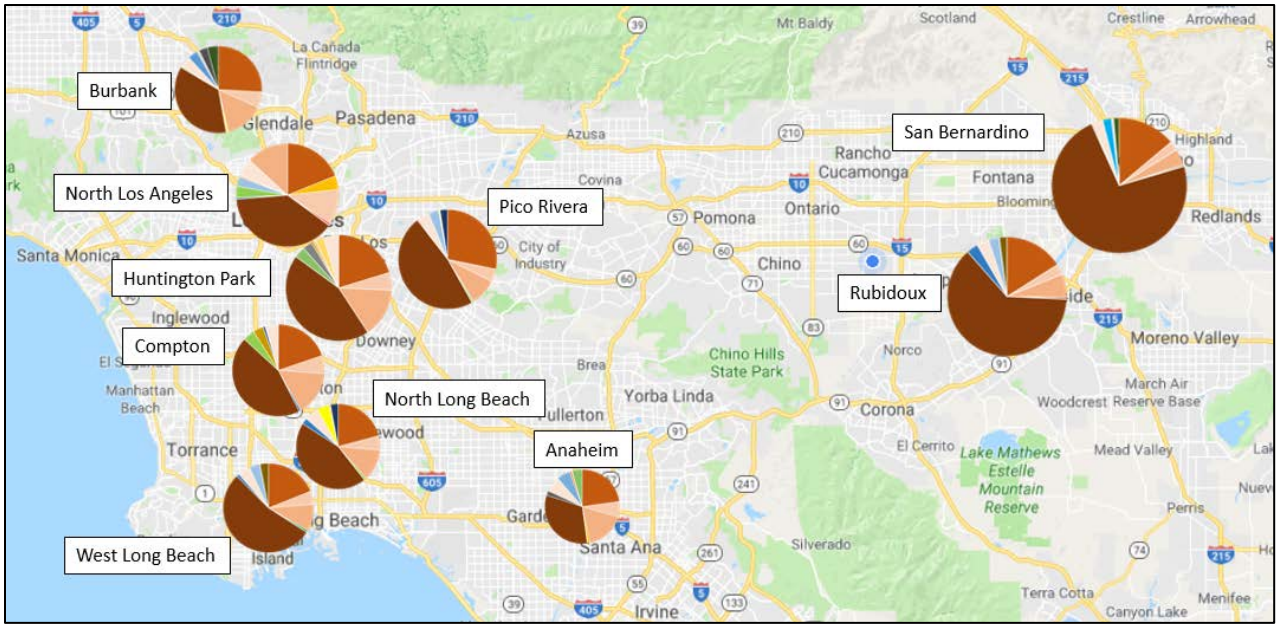

Figure 3 – Relative Risk for each Monitoring Station

All of the data collected during this study, as well as all of the figures, graphs and charts can be found at the end of this report in **Appendix A: Experimental Data, Charts and Associated Figures**.

DISCUSSION

Once again, the safety limit for Hazard Quotients and Hazard Indexes is 1, because above that value, the dose of air toxics in the air inhaled by people is greater than the reference dose which indicates when an unhealthy reaction should occur. As can be seen by **Figure 2**, the Hazard Indexes for all age demographics at all monitoring stations are all well below 1, with the maximum HI at Inland Valley – San Bernardino monitoring station with a value of 0.18. This means that, in accordance with the comments and expectations made in the MATES IV report and confirming this study's central hypothesis, the non-carcinogenic air quality risk of the Southern California Air Basin is satisfactory and the air is fine to breathe.

It should be stated that this study was done based on averages: average concentration, average body weight, average inhalation rate, etc. These results indicate what the average risk

would be for most people living within the Southern California Air Basin. People whose behavior or circumstances deviate from the norm would expect to see corresponding adjustments to their imposed risk. Someone who spends large amounts of time outdoors, performing physical activities like running or physical labor that would increase inhalation rate, or who happens to live close to a source of pollution should expect to incur a higher risk, however it is unlikely that it will reach unsafe levels. On the other hand, people who spend an above average time indoors or who live away from known sources would expect to see lower amounts of risk from the outdoor air, but then the risk shifts away from breathing in outdoor air to indoor air. Indoor air quality assessment is a growing area of study with its own advancements and controversies, and is still finding its foothold. Regardless, it is important to take into account all one's own behavior when interpreting these results and how they translate to the risk one incurs during their own day.

There were some interesting trends that came out of this study. Firstly, as can be seen in **Table 2**, the bulk of the non-carcinogenic risk in the Air Basin can be attributed to five specific air toxics: manganese as the single, greatest contributor across all stations, acetaldehyde as the consistent second, and then 1,3 – butadiene, benzene and naphthalene. In select monitoring locations, specifically in the Central Los Angeles and Huntington Park regions, xylene was observed as a serious contributor of risk. In the Central Los Angeles station, trichloroethylene was also observed as a significant contributor. These compounds made up at least 85% of the incurred risk in all regions and upwards of 95% in some regions. Normally, these air toxics are found in petrochemicals: plastics, synthetics and primarily fossil fuels [13]. The presence of these toxics in the air has historically been the result of the burning of fossil fuels, but new studies are indicating a shift in this source. Since stricter regulations and industrial practices came in, the

contribution of fossil fuels as a source of these chemicals as pollution in the air has significantly diminished. There are indications that a great deal of the current emissions are coming from volatile chemical products (VCP's) such as pesticides, coatings, cleaners and personal care products [14]. This shift in emission sources will continue to grow if society continues to shift away from fossil fuels, and warrants a further research in a future study.

Worthy of special attention is manganese, because, while still within acceptable levels, it contributed vastly greater amounts of risk than any other air toxic, as high as 73% of the total risk in the Inland Valley – San Bernardino monitoring region. Manganese has historically been a fuel additive to prevent engine knocking [13], and in a densely populated region such as Southern California with so high numbers of vehicles operating at all times, there is the potential for large quantities of manganese be emitted. That would logically mean that higher quantities would be located around densely populated areas with the most vehicle travel, an area like the major city Los Angeles, but that is not what was observed. The areas with the highest manganese concentration were actually on the far side of the basin in the San Bernardino-Riverside area. This is likely due, in part, to a natural collection zone in this area of the Air Basin, where all of the winds and air currents transport the air toxics into this zone from all over the Basin to an area locked in by the surrounding mountains where they cannot escape. There is also the fact that these mountains on the eastern edge of the state have historically been rich in deposits of manganese ore [17]. This means that large amounts of manganese laden dust naturally exists in the area, which could very easily become aerosolized as particulate matter and be breathed in by the local people. These reasons together could explain why the risk from manganese is high across the Basin and so much greater in the eastern regions of the Basin.

The other noticeable trend that can be seen in **Figure 2** is that in every monitoring location, adults received the highest amounts of risk across the Basin, followed by children, babies, and the receiver of the lowest amounts of risk was consistently teenagers. Adults have the greatest exposure time of the four demographics at nearly 5 hours of exposure time per day. They spend the most time outdoors, whether due to travel, work, or recreation, and so even though they have the largest body mass to dilute the dosage and their inhalation rate isn't the highest, this increased exposure still causes them to experience large amounts of risk. Children have a much lower exposure time which helps to limit their risk, but they have a much smaller body weight. Even as children start spending more of their free indoors, this small size makes the time they spend outdoors significant from an incurred risk perspective, and pushes their risk levels up. The same logic applies to babies. They have the lowest values for inhalation rates and exposure time which helps reduce their incurred risk, but because they have the smallest body weight of the age demographics, their risk remains comparatively large as the small amounts that they due intake are significant. Teenagers have physical characteristics that are very similar to adults, having comparable intake rates and slightly smaller body weights, but they spend the a much smaller amount of time outdoors, likely due to the increased time spent in school, completing schoolwork, and spending free time on indoor activities like social media, video games and movies. These combined reduce their exposure greatly and so they incur the lowest levels of risk, compared to the all of other age ranges. However, this is based on expected average behavior, and there is every reason to believe that the actual incurred risk for individuals could be different based on behavioral shifts from the norm, as previously discussed.

This study is not without fault and there is a serious issue with trying to gain a full understanding of the non-carcinogenic risk of the Air Basin. While collecting data and

researching the reference doses for the nearly 40 different air toxic pollutants, it was discovered that for at least 20 of them, there is no data available for the reference concentrations or doses to analyze. For some, this may be because determination of the reference value may be too difficult and is simply impractical to do. Air toxics like Black Carbon are released into the air as smoke from burnt fossil fuels [15] and is difficult to separate efficiently for testing, while other air toxics like Ultrafine Particles can be made up of a multitude of different kinds of chemicals and elements in varying compositions [16], making it almost impossible to quantify a single reference concentration. A known reason for at least certain compounds not having available data is politics, which is why the major, air quality Criteria Pollutants have not been evaluated. The Criteria Pollutants are NO, CO, O_3, SO_2, Pb and particulate matter and these six constituents are nationally regulated and it is required that states have control policies in place to manage these pollutants, but according to the EPA, the "RfC methodology will not be applied to the criteria air pollutants… due to legislative requirements in the Clean Air Act and major differences in the health data bases of these pollutants" [20]. These pollutants have been extensively researched already and control policies already exist because of the requirements by the Clean Air Act. The EPA has deemed it unnecessary to evaluate further for this method. This is unfortunate, but as this is not the only method for analyzing risk, the justification can be considered acceptable at this time, but this would be an excellent area to further research in a future study.

Moving forward, this study could benefit from a thorough analysis of the population dynamics of the people living in the Southern California Air Basin. Assessment of more specific age demographics broken down into smaller, concise groups could provide a clearer picture of how the risk changes through age in the Basin. Incorporation of more behaviors that increase exposure and dosage such as increased time spent outdoors, physical ailments like asthma that

could increase inhalation rate, and decreased body weight that would change an individual's level of risk would give a better understanding of how these different behaviors change risk beyond a simple statement of what would theoretically happen. The last factor that would greatly improve this study would be access to or the development of a larger pool of reference material to analyze air toxics from, specifically a greater amount of reference concentrations and dosages. As it stands, only half of the measured air toxic pollutants have been evaluated. It is unlikely to change the final result, but being able to evaluate these missing pollutants could unveil more trends in the non-carcinogenic risk and continue to develop the picture of air quality in the Southern California Air Basin. This however is much easier said than done, as the establishment of these reference concentrations takes large amounts of research, study and evaluation before they can be officially published.

CONCLUSION

An evaluation study was done to assess the non-carcinogenic, hazardous risk levels of the Southern California Air Basin, based on the data, results and conclusions of the South Coast Air Quality Management District's (AQMD's) Multiple Air Toxics Exposure Study IV (MATES IV). Utilizing the list of known air toxic constituents and their measured concentrations from each air monitoring location utilized by the MATES IV study, a hazardous health risk assessment for non-carcinogenic health risk was performed, following the procedures supplied by the U.S. Environmental Protection Agency (EPA). At the end of the study, all results stated that the air quality of the Basin was well within acceptable limits for non-carcinogenic health risk. It also uncovered several trends in the risk profiles of people living in the area, pointing to a select group of compounds as the key contributors of risk in the Basin and to adults as the group incurring the most risk on average. Though far from a complete study due to a lack of necessary

reference data, it is confident in its result and hopes that the findings herein prove useful for others researching non-carcinogenic air quality and risk.

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APPENDIX A: EXPERIMENTAL DATA, CHARTS, AND ASSOCIATED FIGURES

All of the experimental data charts collected and utilized during this study are provided below. Data charts are divided by monitoring station utilized in the study. Figures associated with each data chart will be provided at the end of this section in the same order as the data charts.

Table 3A – Anaheim Monitoring Station - Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	0.59	1.06297055
Acetone	58.08	1.65	3.9195288
Arsenic	74.9216	- -	0.00023
Benzene	78.11	0.33	1.05425067
Black Carbon	12.01	- -	0.95
1,3 – Butadiene	54.0916	0.08	0.176987715
Cadmium	112.414	- -	0.00005
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.04	0.19530568
Copper	63.546	- -	0.01735
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0	0
1,2 Dichloroethane	98.96	0.01	0.04047464
Elemental Carbon	12.01	- -	1.17
Ethyl Benzene	106.17	0.12	0.52108236
Formaldehyde	30.031	1.19	1.461638801
Hexavalent Chromium	51.996	- -	0.00003
Lead	207.2	- -	0.00211
Manganese	54.938	- -	0.00832
Methylene Chloride	84.93	0.64	2.22312768
Methyl Ethyl Ketone	72.11	0.07	0.20645093
MTBE	88.15	0.001	0.003605335
Naphthalene (site avg.)	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.00174
Organic Carbon	12.01	- -	3.71
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.03	0.20347341
PM2.5	- -	- -	12.37
PM10	- -	- -	22.46
Selenium	78.96	- -	0.00044
Styrene	104.15	0.07	0.29818145
Toluene	92.14	0.87	3.27861762
Trichloroethylene	131.4	0	0
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	0.52	2.25781088
Zinc	65.38	- -	0.0434

Table 3B – Anaheim Monitoring Station – Average Daily Doses (ADD) (mg/kg*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	3.88925E-05	1.92602E-05	3.24797E-05	2.31196E-05
Acetone	0.00014341	7.10188E-05	0.000119763	8.52498E-05
Arsenic	8.41536E-09	4.16742E-09	7.02778E-09	5.0025E-09
Benzene	3.85735E-05	1.91022E-05	3.22132E-05	2.293E-05
Black Carbon	3.47591E-05	1.72133E-05	2.90278E-05	2.06625E-05
1,3 – Butadiene	6.47572E-06	3.20688E-06	5.40796E-06	3.84948E-06
Cadmium	1.82943E-09	9.05961E-10	1.52778E-09	1.0875E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	7.14595E-06	3.53879E-06	5.96767E-06	4.2479E-06
Copper	6.34811E-07	3.14368E-07	5.30139E-07	3.77363E-07
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	0	0	0	0
1,2 Dichloroethane	1.48091E-06	7.33369E-07	1.23673E-06	8.80323E-07
Elemental Carbon	4.28086E-05	2.11995E-05	0.00003575	2.54475E-05
Ethyl Benzene	1.90656E-05	9.4416E-06	1.5922E-05	1.13335E-05
Formaldehyde	5.34792E-05	2.64837E-05	4.46612E-05	3.17906E-05
Hexavalent Chromium	1.09766E-09	5.43576E-10	9.16667E-10	6.525E-10
Lead	7.72018E-08	3.82315E-08	6.44722E-08	4.58925E-08
Manganese	3.04417E-07	1.50752E-07	2.54222E-07	1.8096E-07
Methylene Chloride	8.1341E-05	4.02813E-05	6.79289E-05	4.8353E-05
Methyl Ethyl Ketone	7.55374E-06	3.74073E-06	6.30822E-06	4.49031E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene (site avg.)	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	6.36641E-08	3.15274E-08	5.31667E-08	3.7845E-08
Organic Carbon (OC)	0.000135743	6.72223E-05	0.000113361	8.06925E-05
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	7.4448E-06	3.68678E-06	6.21724E-06	4.42555E-06
PM2.5	0.0004526	0.000224135	0.000377972	0.000269048
PM10	0.000821779	0.000406958	0.000686278	0.000488505
Selenium	1.6099E-08	7.97245E-09	1.34444E-08	9.57E-09
Styrene	1.091E-05	5.40281E-06	9.1111E-06	6.48545E-06
Toluene	0.00011996	5.9406E-05	0.00010018	7.13099E-05
Trichloroethylene	0	0	0	0
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	8.261E-05	4.09098E-05	6.89887E-05	4.91074E-05
Zinc	1.58794E-06	7.86374E-07	1.32611E-06	9.4395E-07

Table 3C – Anaheim Monitoring Station – Reference Dose (RfD) and Hazard Quotients (HQ)

Air Toxic	RfD (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.015124878	0.007490074	0.012630977	0.008990959
Benzene	0.008571429	0.004500241	0.002228589	0.003758208	0.002675161
1,3 – Butadiene	0.000571429	0.011332514	0.005612037	0.009463926	0.006736595
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	0	0	0	0
Ethyl Benzene	0.285714286	6.67298E-05	3.30456E-05	5.57269E-05	3.96674E-05
Hexavalent Chromium	2.85714E-05	3.8418E-05	1.90252E-05	3.20833E-05	2.28375E-05
Manganese	1.42857E-05	0.021309167	0.01055263	0.017795556	0.0126672
Methylene Chloride	0.06	0.001355683	0.000671355	0.001132148	0.000805884
Methyl Ethyl Ketone	1.428571429	5.28762E-06	2.61851E-06	4.41576E-06	3.14322E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene (site avg.)	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.00065142	0.000322593	0.000544009	0.000387235
Styrene	0.285714286	3.81851E-05	1.89098E-05	3.18888E-05	2.26991E-05
Toluene	1.428571429	8.39719E-05	4.15842E-05	7.0126E-05	4.9917E-05
Trichloroethylene	0.000571429	0	0	0	0
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.00289135	0.001431841	0.002414603	0.001718759

Table 3D – Anaheim Monitoring Station – Hazard Indexes

Hazard Index (Adults)
0.066472293
Hazard Index (Teenagers)
0.03291811
Hazard Index (Children)
0.055511856
Hazard Index (Babies)
0.039514348

Table 4A – Burbank Monitoring Station – Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	1.08	1.9457766
Acetone	58.08	2.34	5.55860448
Arsenic	74.9216	- -	0.00044
Benzene	78.11	0.46	1.46956154
Black Carbon	12.01	- -	1.35
1,3 - Butadiene	54.0916	0.11	0.243358108
Cadmium	112.414	- -	0.00012
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.05	0.2441321
Copper	63.546	- -	0.03805
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0.01	0.06012709
1,2 Dichloroethane	98.96	0.01	0.04047464
Elemental Carbon	12.01	- -	1.74
Ethyl Benzene	106.17	0.18	0.78162354
Formaldehyde	30.031	2.58	3.168931182
Hexavalent Chromium	51.996	- -	0.00004
Lead	207.2	- -	0.00527
Manganese	54.938	- -	0.01521
Methylene Chloride	84.93	0.24	0.83367288
Methyl Ethyl Ketone	72.11	0.11	0.32442289
MTBE	88.15	0.001	0.003605335
Naphthalene	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.0039
Organic Carbon	12.01	- -	4.86
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.04	0.27129788
PM2.5	- -	- -	14.4
PM10	- -	- -	26.16
Selenium	78.96	- -	0.00054
Styrene	104.15	0.06	0.2555841
Toluene	92.14	1.32	4.97445432
Trichloroethylene	131.4	0.01	0.0537426
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	0.78	3.38671632
Zinc	65.38	- -	0.05374

Table 4B – Burbank Monitoring Station – Average Daily Doses (ADD) (mg/kg*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	7.11931E-05	3.52559E-05	5.94543E-05	4.23206E-05
Acetone	0.000203381	0.000100718	0.000169846	0.0001209
Arsenic	1.6099E-08	7.97245E-09	1.34444E-08	9.57E-09
Benzene	5.37691E-05	2.66273E-05	4.49033E-05	3.1963E-05
Black Carbon	4.93945E-05	2.44609E-05	0.00004125	2.93625E-05
1,3 - Butadiene	8.90412E-06	4.40946E-06	7.43594E-06	5.29304E-06
Cadmium	4.39063E-09	2.17431E-09	3.66667E-09	2.61E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	8.93244E-06	4.42348E-06	7.45959E-06	5.30987E-06
Copper	1.39219E-06	6.89436E-07	1.16264E-06	8.27588E-07
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	2.19996E-06	1.08946E-06	1.83722E-06	1.30776E-06
1,2 Dichloroethane	1.48091E-06	7.33369E-07	1.23673E-06	8.80323E-07
Elemental Carbon	6.36641E-05	3.15274E-05	5.31667E-05	0.000037845
Ethyl Benzene	2.85985E-05	1.41624E-05	2.38829E-05	1.70003E-05
Formaldehyde	0.000115947	5.74185E-05	9.68285E-05	6.89243E-05
Hexavalent Chromium	1.46354E-09	7.24769E-10	1.22222E-09	8.7E-10
Lead	1.92822E-07	9.54883E-08	1.61028E-07	1.14623E-07
Manganese	5.56512E-07	2.75593E-07	4.6475E-07	3.30818E-07
Methylene Chloride	3.05029E-05	1.51055E-05	2.54733E-05	1.81324E-05
Methyl Ethyl Ketone	1.18702E-05	5.87829E-06	9.91292E-06	7.0562E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	1.42695E-07	7.06649E-08	1.19167E-07	8.4825E-08
Organic Carbon	0.00017782	8.80594E-05	0.0001485	0.000105705
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	9.92639E-06	4.9157E-06	8.28966E-06	5.90073E-06
PM2.5	0.000526875	0.000260917	0.00044	0.0003132
PM10	0.000957156	0.000473999	0.000799333	0.00056898
Selenium	1.97578E-08	9.78438E-09	1.65E-08	1.1745E-08
Styrene	9.35145E-06	4.63098E-06	7.80951E-06	5.55895E-06
Toluene	0.000182008	9.01332E-05	0.000151997	0.000108194
Trichloroethylene	1.96636E-06	9.73774E-07	1.64214E-06	1.1689E-06
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	0.000123915	6.13646E-05	0.000103483	7.36611E-05
Zinc	1.96627E-06	9.73727E-07	1.64206E-06	1.16885E-06

Table 4C – Burbank Monitoring Station – Reference Dose (RfD) and Hazard Quotients (HQ)

Air Toxic	RfD (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.027686217	0.013710644	0.023121111	0.016458027
Benzene	0.008571429	0.006273063	0.003106518	0.005238715	0.003729012
1,3 - Butadiene	0.000571429	0.015582207	0.00771655	0.013012899	0.009262818
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	9.62484E-06	4.76637E-06	8.03782E-06	5.72147E-06
Ethyl Benzene	0.285714286	0.000100095	4.95684E-05	8.35903E-05	5.95011E-05
Hexavalent Chromium	2.85714E-05	5.1224E-05	2.53669E-05	4.27778E-05	0.00003045
Manganese	1.42857E-05	0.03895582	0.019291526	0.0325325	0.023157225
Methylene Chloride	0.06	0.000508381	0.000251758	0.000424556	0.000302206
Methyl Ethyl Ketone	1.428571429	8.30911E-06	4.1148E-06	6.93905E-06	4.93934E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.000868559	0.000430124	0.000725345	0.000516314
Styrene	0.285714286	3.27301E-05	1.62084E-05	2.73333E-05	1.94563E-05
Toluene	1.428571429	0.000127406	6.30932E-05	0.000106398	7.57361E-05
Trichloroethylene	0.000571429	0.003441136	0.001704104	0.002873736	0.002045578
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.004337025	0.002147762	0.003621905	0.002578138

Table 4D – Burbank Monitoring Site – Hazard Indexes (HI)

Hazard Index (Adults)
0.107056246
Hazard Index (Teenagers)
0.053015912
Hazard Index (Children)
0.08940403
Hazard Index (Babies)
0.063639414

Table 5A – Central Los Angeles Monitoring Station – Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	0.94	1.6935463
Acetone	58.08	1.91	4.53715152
Arsenic	74.9216	- -	0.00064
Benzene	78.11	0.4	1.2778796
Black Carbon	12.01	- -	1.55
1,3 - Butadiene	54.0916	0.1	0.221234644
Cadmium	112.414	- -	0.00025
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.04	0.19530568
Copper	63.546	- -	0.04218
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0.01	0.06012709
1,2 Dichloroethane	98.96	0.01	0.04047464
Elemental Carbon	12.01	- -	1.67
Ethyl Benzene	106.17	0.72	3.12649416
Formaldehyde	30.031	2.93	3.598824947
Hexavalent Chromium	51.996	- -	0.00007
Lead	207.2	- -	0.00734
Manganese	54.938	- -	0.0192
Methylene Chloride	84.93	0.32	1.11156384
Methyl Ethyl Ketone	72.11	0.08	0.23594392
MTBE	88.15	0.001	0.003605335
Naphthalene	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.00337
Organic Carbon	12.01	- -	4.44
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.03	0.20347341
PM2.5	- -	- -	14.14
PM10	- -	- -	27.3
Selenium	78.96	- -	0.00095
Styrene	104.15	0.03	0.12779205
Toluene	92.14	1.15	4.3338049
Trichloroethylene	131.4	0.02	0.1074852
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	3.02	13.11267088
Zinc	65.38	- -	0.07238

Table 5B – Central Los Angeles Monitoring Station – Average Daily Doses (ADD) (mg/kg*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	6.19644E-05	3.06857E-05	5.17472E-05	3.68346E-05
Acetone	0.000166008	8.22096E-05	0.000138635	9.8683E-05
Arsenic	2.34167E-08	1.15963E-08	1.95556E-08	1.392E-08
Benzene	4.67558E-05	2.31542E-05	3.90463E-05	2.77939E-05
Black Carbon	5.67122E-05	2.80848E-05	4.73611E-05	3.37125E-05
1,3 - Butadiene	8.09465E-06	4.0086E-06	6.75995E-06	4.81185E-06
Cadmium	9.14714E-09	4.5298E-09	7.63889E-09	5.4375E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	7.14595E-06	3.53879E-06	5.96767E-06	4.2479E-06
Copper	1.5433E-06	7.64268E-07	1.28883E-06	9.17415E-07
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	2.19996E-06	1.08946E-06	1.83722E-06	1.30776E-06
1,2 Dichloroethane	1.48091E-06	7.33369E-07	1.23673E-06	8.80323E-07
Elemental Carbon	6.11029E-05	3.02591E-05	5.10278E-05	3.63225E-05
Ethyl Benzene	0.000114394	5.66496E-05	9.55318E-05	6.80012E-05
Formaldehyde	0.000131676	6.52079E-05	0.000109964	7.82744E-05
Hexavalent Chromium	2.5612E-09	1.26834E-09	2.13889E-09	1.5225E-09
Lead	2.6856E-07	1.32995E-07	2.24278E-07	1.59645E-07
Manganese	7.025E-07	3.47889E-07	5.86667E-07	4.176E-07
Methylene Chloride	4.06705E-05	2.01407E-05	3.39645E-05	2.41765E-05
Methyl Ethyl Ketone	8.63284E-06	4.27512E-06	7.2094E-06	5.13178E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	1.23303E-07	6.10617E-08	1.02972E-07	7.32975E-08
Organic Carbon	0.000162453	8.04493E-05	0.000135667	0.00009657
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	7.4448E-06	3.68678E-06	6.21724E-06	4.42555E-06
PM2.5	0.000517362	0.000256206	0.000432056	0.000307545
PM10	0.000998867	0.000494655	0.000834167	0.000593775
Selenium	3.47591E-08	1.72133E-08	2.90278E-08	2.06625E-08
Styrene	4.67572E-06	2.31549E-06	3.90476E-06	2.77948E-06
Toluene	0.000158568	7.85251E-05	0.000132422	9.42603E-05
Trichloroethylene	3.93273E-06	1.94755E-06	3.28427E-06	2.3378E-06
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	0.000479774	0.000237591	0.000400665	0.000285201
Zinc	2.64828E-06	1.31147E-06	2.21161E-06	1.57427E-06

Table 5C – Central Los Angeles Monitoring Station – Reference Dose (RfD) and Hazard Quotients (HQ)

Air Toxic	RfD (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.024097263	0.011933338	0.02012393	0.014324579
Benzene	0.008571429	0.005454838	0.00270132	0.004555404	0.003242619
1,3 - Butadiene	0.000571429	0.014165643	0.007015046	0.011829908	0.008420744
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	9.62484E-06	4.76637E-06	8.03782E-06	5.72147E-06
Ethyl Benzene	0.285714286	0.000400379	0.000198274	0.000334361	0.000238004
Hexavalent Chromium	2.85714E-05	8.96419E-05	4.43921E-05	7.48611E-05	5.32875E-05
Manganese	1.42857E-05	0.049175	0.024352222	0.041066667	0.029232
Methylene Chloride	0.06	0.000677842	0.000335678	0.000566074	0.000402942
Methyl Ethyl Ketone	1.428571429	6.04299E-06	2.99258E-06	5.04658E-06	3.59225E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.00065142	0.000322593	0.000544009	0.000387235
Styrene	0.285714286	1.6365E-05	8.10422E-06	1.36666E-05	9.72817E-06
Toluene	1.428571429	0.000110997	5.49676E-05	9.26953E-05	6.59822E-05
Trichloroethylene	0.000571429	0.006882272	0.003408208	0.005747473	0.004091155
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.016792073	0.008315695	0.014023273	0.009982021

Table 5D – Central Los Angeles Monitoring Station – Hazard Indexes (HI)

Hazard Index (Adults)
0.127603847
Hazard Index (Teenagers)
0.063191403
Hazard Index (Children)
0.106563593
Hazard Index (Babies)
0.075853903

Table 6A – Compton Monitoring Station – Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	0.83	1.49536535
Acetone	58.08	1.62	3.84826464
Arsenic	74.9216	- -	0.0005
Benzene	78.11	0.5	1.5973495
Black Carbon	12.01	- -	1.1
1,3 - Butadiene	54.0916	0.12	0.265481573
Cadmium	112.414	- -	0.00015
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.03	0.14647926
Copper	63.546	- -	0.02962
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0.01	0.06012709
1,2 Dichloroethane	98.96	0.02	0.08094928
Elemental Carbon	12.01	- -	1.5
Ethyl Benzene	106.17	0.2	0.8684706
Formaldehyde	30.031	2.05	2.517949195
Hexavalent Chromium	51.996	- -	0.00011
Lead	207.2	- -	0.00624
Manganese	54.938	- -	0.01862
Methylene Chloride	84.93	0.17	0.59051829
Methyl Ethyl Ketone	72.11	0.08	0.23594392
MTBE	88.15	0.001	0.003605335
Naphthalene	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.00406
Organic Carbon	12.01	- -	4.44
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.04	0.27129788
PM2.5	- -	- -	12.91
PM10	- -	- -	26.26
Selenium	78.96	- -	0.0008
Styrene	104.15	0.08	0.3407788
Toluene	92.14	1.42	5.35130692
Trichloroethylene	131.4	0	0
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	0.86	3.73407184
Zinc	65.38	- -	0.05411

Table 6B – Compton Monitoring Station – Average Daily Doses (ADD) (mg/kg*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	5.47132E-05	2.70948E-05	4.56917E-05	3.25242E-05
Acetone	0.000140802	6.97275E-05	0.000117586	8.36998E-05
Arsenic	1.82943E-08	9.05961E-09	1.52778E-08	1.0875E-08
Benzene	5.84447E-05	2.89427E-05	4.88079E-05	3.47424E-05
Black Carbon	4.02474E-05	1.99311E-05	3.36111E-05	0.000023925
1,3 - Butadiene	9.71358E-06	4.81032E-06	8.11194E-06	5.77422E-06
Cadmium	5.48828E-09	2.71788E-09	4.58333E-09	3.2625E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	5.35946E-06	2.65409E-06	4.47576E-06	3.18592E-06
Copper	1.08375E-06	5.36691E-07	9.05056E-07	6.44235E-07
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	2.19996E-06	1.08946E-06	1.83722E-06	1.30776E-06
1,2 Dichloroethane	2.96182E-06	1.46674E-06	2.47345E-06	1.76065E-06
Elemental Carbon	5.48828E-05	2.71788E-05	4.58333E-05	0.000032625
Ethyl Benzene	3.17761E-05	1.5736E-05	2.65366E-05	1.88892E-05
Formaldehyde	9.21281E-05	4.56233E-05	7.69373E-05	5.47654E-05
Hexavalent Chromium	4.02474E-09	1.99311E-09	3.36111E-09	2.3925E-09
Lead	2.28313E-07	1.13064E-07	1.90667E-07	1.3572E-07
Manganese	6.81279E-07	3.3738E-07	5.68944E-07	4.04985E-07
Methylene Chloride	2.16062E-05	1.06997E-05	1.80436E-05	1.28438E-05
Methyl Ethyl Ketone	8.63284E-06	4.27512E-06	7.2094E-06	5.13178E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	1.48549E-07	7.3564E-08	1.24056E-07	8.8305E-08
Organic Carbon	0.000162453	8.04493E-05	0.000135667	0.00009657
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	9.92639E-06	4.9157E-06	8.28966E-06	5.90073E-06
PM2.5	0.000472358	0.000233919	0.000394472	0.000280793
PM10	0.000960815	0.000475811	0.000802389	0.000571155
Selenium	2.92708E-08	1.44954E-08	2.44444E-08	1.74E-08
Styrene	1.24686E-05	6.17464E-06	1.04127E-05	7.41194E-06
Toluene	0.000195797	9.69615E-05	0.000163512	0.000116391
Trichloroethylene	0	0	0	0
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	0.000136624	6.76584E-05	0.000114097	8.12161E-05
Zinc	1.97981E-06	9.80431E-07	1.65336E-06	1.17689E-06

Table 6C–Compton Monitoring Station–Reference Dose (RfD) and Hazard Quotients (HQ)

Air Toxic	Reference Dose (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.02127737	0.010536883	0.017769002	0.012648299
Benzene	0.008571429	0.006818547	0.00337665	0.005694255	0.004053274
1,3 – Butadiene	0.000571429	0.016998771	0.008418055	0.01419589	0.010104892
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Copper					
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	9.62484E-06	4.76637E-06	8.03782E-06	5.72147E-06
Ethyl Benzene	0.285714286	0.000111216	5.5076E-05	9.28781E-05	6.61123E-05
Hexavalent Chromium	2.85714E-05	0.000140866	6.9759E-05	0.000117639	8.37375E-05
Manganese	1.42857E-05	0.047689505	0.023616582	0.039826111	0.02834895
Methylene Chloride	0.06	0.000360103	0.000178329	0.000300727	0.000214063
Methyl Ethyl Ketone	1.428571429	6.04299E-06	2.99258E-06	5.04658E-06	3.59225E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.000868559	0.000430124	0.000725345	0.000516314
Styrene	0.285714286	4.36401E-05	2.16113E-05	3.64444E-05	2.59418E-05
Toluene	1.428571429	0.000137058	6.7873E-05	0.000114459	8.14736E-05
Trichloroethylene	0.000571429	0	0	0	0
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.004781849	0.002368046	0.003993382	0.002842562

Table 6D – Compton Monitoring Station – Hazard Indexes (HI)

Hazard Index (Adults)
0.108317601
Hazard Index (Teenagers)
0.053640555
Hazard Index (Children)
0.090457403
Hazard Index (Babies)
0.064389224

Table 7A – Inland Valley – San Bernardino Monitoring Station – Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	0.99	1.78362855
Acetone	58.08	1.43	3.39692496
Arsenic	74.9216	- -	0.00091
Benzene	78.11	0.29	0.92646271
Black Carbon	12.01	- -	1.75
1,3 - Butadiene	54.0916	0.05	0.110617322
Cadmium	112.414	- -	0.00028
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.04	0.19530568
Copper	63.546	- -	0.04248
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0	0
1,2 Dichloroethane	98.96	0.02	0.08094928
Elemental Carbon	12.01	- -	1.74
Ethyl Benzene	106.17	0.11	0.47765883
Formaldehyde	30.031	2.63	3.230344577
Hexavalent Chromium	51.996	- -	0.00004
Lead	207.2	- -	0.0098
Manganese	54.938	- -	0.05197
Methylene Chloride	84.93	0.28	0.97261836
Methyl Ethyl Ketone	72.11	0.09	0.26543691
MTBE	88.15	0.001	0.003605335
Naphthalene	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.00405
Organic Carbon	12.01	- -	5.32
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.04	0.27129788
PM2.5	- -	- -	14.33
PM10	- -	- -	35.64
Selenium	78.96	- -	0.00075
Styrene	104.15	0.01	0.04259735
Toluene	92.14	0.84	3.16556184
Trichloroethylene	131.4	0	0
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	0.44	1.91045536
Zinc	65.38	- -	0.10969

Table 7B – Inland Valley – San Bernardino Monitoring Station – Average Daily Doses (ADD) (mg/kg*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	6.52604E-05	3.23179E-05	5.44998E-05	3.87939E-05
Acetone	0.000124289	6.15496E-05	0.000103795	7.38831E-05
Arsenic	3.32956E-08	1.64885E-08	2.78056E-08	1.97925E-08
Benzene	3.38979E-05	1.67868E-05	2.83086E-05	2.01506E-05
Black Carbon	6.40299E-05	3.17086E-05	5.34722E-05	3.80625E-05
1,3 - Butadiene	4.04733E-06	2.0043E-06	3.37997E-06	2.40593E-06
Cadmium	1.02448E-08	5.07338E-09	8.55556E-09	6.09E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	7.14595E-06	3.53879E-06	5.96767E-06	4.2479E-06
Copper	1.55428E-06	7.69704E-07	0.000001298	9.2394E-07
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	0	0	0	0
1,2 Dichloroethane	2.96182E-06	1.46674E-06	2.47345E-06	1.76065E-06
Elemental Carbon	6.36641E-05	3.15274E-05	5.31667E-05	0.000037845
Ethyl Benzene	1.74768E-05	8.6548E-06	1.45951E-05	1.03891E-05
Formaldehyde	0.000118194	5.85313E-05	9.8705E-05	7.026E-05
Hexavalent Chromium	1.46354E-09	7.24769E-10	1.22222E-09	8.7E-10
Lead	3.58568E-07	1.77568E-07	2.99444E-07	2.1315E-07
Manganese	1.90151E-06	9.41655E-07	1.58797E-06	1.13035E-06
Methylene Chloride	3.55867E-05	1.76231E-05	2.97189E-05	2.11544E-05
Methyl Ethyl Ketone	9.71195E-06	4.80951E-06	8.11057E-06	5.77325E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	1.48184E-07	7.33828E-08	1.2375E-07	8.80875E-08
Organic Carbon	0.000194651	9.63942E-05	0.000162556	0.00011571
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	9.92639E-06	4.9157E-06	8.28966E-06	5.90073E-06
PM2.5	0.000524314	0.000259648	0.000437861	0.000311678
PM10	0.001304016	0.000645769	0.001089	0.00077517
Selenium	2.74414E-08	1.35894E-08	2.29167E-08	1.63125E-08
Styrene	1.55857E-06	7.7183E-07	1.30159E-06	9.26492E-07
Toluene	0.000115823	5.73575E-05	9.67255E-05	6.8851E-05
Trichloroethylene	0	0	0	0
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	6.99008E-05	3.46159E-05	5.8375E-05	4.15524E-05
Zinc	4.0134E-06	1.9875E-06	3.35164E-06	2.38576E-06

Table 7C – Inland Valley – San Bernardino Monitoring Station – Reference Dose (RfD) and Hazard Quotients (HQ)

Air Toxic	Reference Dose (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.025379032	0.01256809	0.021194352	0.015086525
Benzene	0.008571429	0.003954757	0.001958457	0.003302668	0.002350899
1,3 - Butadiene	0.000571429	0.007082821	0.003507523	0.005914954	0.004210372
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	0	0	0	0
Ethyl Benzene	0.285714286	6.11689E-05	3.02918E-05	5.1083E-05	3.63618E-05
Hexavalent Chromium	2.85714E-05	5.1224E-05	2.53669E-05	4.27778E-05	0.00003045
Manganese	1.42857E-05	0.133105456	0.065915885	0.111158056	0.079124325
Methylene Chloride	0.06	0.000593111	0.000293718	0.000495315	0.000352574
Methyl Ethyl Ketone	1.428571429	6.79836E-06	3.36666E-06	5.6774E-06	4.04128E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.000868559	0.000430124	0.000725345	0.000516314
Styrene	0.285714286	5.45501E-06	2.70141E-06	4.55555E-06	3.24272E-06
Toluene	1.428571429	8.10763E-05	4.01502E-05	6.77079E-05	4.81957E-05
Trichloroethylene	0.000571429	0	0	0	0
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.002446527	0.001211558	0.002043126	0.001454334

Table 7D – Inland Valley – San Bernardino Monitoring Station – Hazard Indexes (HI)

Hazard Index (Adults)
0.182710435
Hazard Index (Teenagers)
0.09048104
Hazard Index (Children)
0.152583803
Hazard Index (Babies)
0.108611926

Table 8A – Huntington Park Monitoring Station – Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	1.04	1.8737108
Acetone	58.08	2.59	6.15247248
Arsenic	74.9216	- -	0.00056
Benzene	78.11	0.52	1.66124348
Black Carbon	12.01	- -	1.25
1,3 - Butadiene	54.0916	0.14	0.309728502
Cadmium	112.414	- -	0.00017
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.03	0.14647926
Copper	63.546	- -	0.04969
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0.01	0.06012709
1,2 Dichloroethane	98.96	0.01	0.04047464
Elemental Carbon	12.01	- -	1.65
Ethyl Benzene	106.17	0.24	1.04216472
Formaldehyde	30.031	2.73	3.353171367
Hexavalent Chromium	51.996	- -	0.0001
Lead	207.2	- -	0.00946
Manganese	54.938	- -	0.02273
Methylene Chloride	84.93	0.24	0.83367288
Methyl Ethyl Ketone	72.11	0.11	0.32442289
MTBE	88.15	0.001	0.003605335
Naphthalene	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.0054
Organic Carbon	12.01	- -	4.54
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.04	0.27129788
PM2.5	- -	- -	14.4
PM10	- -	- -	27.37
Selenium	78.96	- -	0.00167
Styrene	104.15	1.61	6.85817335
Toluene	92.14	0.84	3.16556184
Trichloroethylene	131.4	0.01	0.0537426
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	1.09	4.73271896
Zinc	65.38	- -	0.07411

Table 8B – Huntington Park Monitoring Station – Average Daily Doses (ADD) (mg/kg*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	6.85563E-05	3.39502E-05	5.72523E-05	4.07532E-05
Acetone	0.00022511	0.000111478	0.000187992	0.000133816
Arsenic	2.04896E-08	1.01468E-08	1.71111E-08	1.218E-08
Benzene	6.07825E-05	3.01004E-05	5.07602E-05	3.6132E-05
Black Carbon	4.57357E-05	2.2649E-05	3.81944E-05	2.71875E-05
1,3 - Butadiene	1.13325E-05	5.61204E-06	9.46393E-06	6.73659E-06
Cadmium	6.22005E-09	3.08027E-09	5.19444E-09	3.6975E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	5.35946E-06	2.65409E-06	4.47576E-06	3.18592E-06
Copper	1.81808E-06	9.00344E-07	1.51831E-06	1.08076E-06
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	2.19996E-06	1.08946E-06	1.83722E-06	1.30776E-06
1,2 Dichloroethane	1.48091E-06	7.33369E-07	1.23673E-06	8.80323E-07
Elemental Carbon	6.03711E-05	2.98967E-05	5.04167E-05	3.58875E-05
Ethyl Benzene	3.81313E-05	1.88832E-05	3.18439E-05	2.26671E-05
Formaldehyde	0.000122688	6.07568E-05	0.000102458	7.29315E-05
Hexavalent Chromium	3.65885E-09	1.81192E-09	3.05556E-09	2.175E-09
Lead	3.46128E-07	1.71408E-07	2.89056E-07	2.05755E-07
Manganese	8.31658E-07	4.1185E-07	6.94528E-07	4.94378E-07
Methylene Chloride	3.05029E-05	1.51055E-05	2.54733E-05	1.81324E-05
Methyl Ethyl Ketone	1.18702E-05	5.87829E-06	9.91292E-06	7.0562E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	1.97578E-07	9.78438E-08	0.000000165	1.1745E-07
Organic Carbon	0.000166112	8.22612E-05	0.000138722	0.000098745
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	9.92639E-06	4.9157E-06	8.28966E-06	5.90073E-06
PM2.5	0.000526875	0.000260917	0.00044	0.0003132
PM10	0.001001428	0.000495923	0.000836306	0.000595298
Selenium	6.11029E-08	3.02591E-08	5.10278E-08	3.63225E-08
Styrene	0.000250931	0.000124265	0.000209555	0.000149165
Toluene	0.000115823	5.73575E-05	9.67255E-05	6.8851E-05
Trichloroethylene	1.96636E-06	9.73774E-07	1.64214E-06	1.1689E-06
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	0.000173163	8.57531E-05	0.000144611	0.000102937
Zinc	2.71158E-06	1.34281E-06	2.26447E-06	1.61189E-06

Table 8C – Huntington Park Monitoring Station – Reference Dose (RfD) and Hazard Quotients (HQ)

Air Toxic	Reference Dose (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.026660801	0.013202842	0.022264773	0.015848471
Benzene	0.008571429	0.007091289	0.003511716	0.005922025	0.004215405
1,3 - Butadiene	0.000571429	0.0198319	0.009821064	0.016561871	0.011789041
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	9.62484E-06	4.76637E-06	8.03782E-06	5.72147E-06
Ethyl Benzene	0.285714286	0.00013346	6.60912E-05	0.000111454	7.93348E-05
Hexavalent Chromium	2.85714E-05	0.00012806	6.34172E-05	0.000106944	0.000076125
Manganese	1.42857E-05	0.058216029	0.02882948	0.048616944	0.034606425
Methylene Chloride	0.06	0.000508381	0.000251758	0.000424556	0.000302206
Methyl Ethyl Ketone	1.428571429	8.30911E-06	4.1148E-06	6.93905E-06	4.93934E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.000868559	0.000430124	0.000725345	0.000516314
Styrene	0.285714286	0.000878257	0.000434926	0.000733444	0.000522078
Toluene	1.428571429	8.10763E-05	4.01502E-05	6.77079E-05	4.81957E-05
Trichloroethylene	0.000571429	0.003441136	0.001704104	0.002873736	0.002045578
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.006060715	0.00300136	0.00506138	0.003602782

Table 8D – Huntington Park Monitoring Station – Hazard Indexes (HI)

Hazard Index (Adults)
0.132992045
Hazard Index (Teenagers)
0.065859722
Hazard Index (Children)
0.111063345
Hazard Index (Babies)
0.079056908

Table 9A – North Long Beach Monitoring Station – Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	0.67	1.20710215
Acetone	58.08	1.17	2.77930224
Arsenic	74.9216	- -	0.00039
Benzene	78.11	0.33	1.05425067
Black Carbon	12.01	- -	0.9
1,3 - Butadiene	54.0916	0.07	0.154864251
Cadmium	112.414	- -	0.00021
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.03	0.14647926
Copper	63.546	- -	0.03198
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0	0
1,2 Dichloroethane	98.96	0.01	0.04047464
Elemental Carbon	12.01	- -	1.29
Ethyl Benzene	106.17	0.11	0.47765883
Formaldehyde	30.031	1.86	2.284578294
Hexavalent Chromium	51.996	- -	0.00004
Lead	207.2	- -	0.00439
Manganese	54.938	- -	0.01437
Methylene Chloride	84.93	0.91	3.16100967
Methyl Ethyl Ketone	72.11	0.06	0.17695794
MTBE	88.15	0.001	0.003605335
Naphthalene	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.00359
Organic Carbon	12.01	- -	3.64
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.02	0.13564894
PM2.5	- -	- -	12.95
PM10	- -	- -	22.4
Selenium	78.96	- -	0.00076
Styrene	104.15	0.03	0.12779205
Toluene	92.14	0.74	2.78870924
Trichloroethylene	131.4	0	0
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	0.43	1.86703592
Zinc	65.38	- -	0.06105

Table 9B – North Long Beach Monitoring Station – Average Daily Doses (ADD) (mg/kd*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	4.41661E-05	2.18717E-05	3.68837E-05	2.62545E-05
Acetone	0.000101691	5.03588E-05	8.49231E-05	6.04498E-05
Arsenic	1.42695E-08	7.06649E-09	1.19167E-08	8.4825E-09
Benzene	3.85735E-05	1.91022E-05	3.22132E-05	2.293E-05
Black Carbon	3.29297E-05	1.63073E-05	0.0000275	0.000019575
1,3 - Butadiene	5.66626E-06	2.80602E-06	4.73196E-06	3.3683E-06
Cadmium	7.68359E-09	3.80503E-09	6.41667E-09	4.5675E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	5.35946E-06	2.65409E-06	4.47576E-06	3.18592E-06
Copper	1.1701E-06	5.79452E-07	9.77167E-07	6.95565E-07
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	0	0	0	0
1,2 Dichloroethane	1.48091E-06	7.33369E-07	1.23673E-06	8.80323E-07
Elemental Carbon	4.71992E-05	2.33738E-05	3.94167E-05	2.80575E-05
Ethyl Benzene	1.74768E-05	8.6548E-06	1.45951E-05	1.03891E-05
Formaldehyde	8.35894E-05	4.13948E-05	6.98066E-05	4.96896E-05
Hexavalent Chromium	1.46354E-09	7.24769E-10	1.22222E-09	8.7E-10
Lead	1.60624E-07	7.95433E-08	1.34139E-07	9.54825E-08
Manganese	5.25777E-07	2.60373E-07	4.39083E-07	3.12548E-07
Methylene Chloride	0.000115657	5.7275E-05	9.65864E-05	6.8752E-05
Methyl Ethyl Ketone	6.47463E-06	3.20634E-06	5.40705E-06	3.84884E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	1.31353E-07	6.5048E-08	1.09694E-07	7.80825E-08
Organic Carbon	0.000133182	6.59539E-05	0.000111222	0.00007917
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	4.9632E-06	2.45785E-06	4.14483E-06	2.95036E-06
PM2.5	0.000473822	0.000234644	0.000395694	0.000281663
PM10	0.000819583	0.00040587	0.000684444	0.0004872
Selenium	2.78073E-08	1.37706E-08	2.32222E-08	1.653E-08
Styrene	4.67572E-06	2.31549E-06	3.90476E-06	2.77948E-06
Toluene	0.000102035	5.05292E-05	8.52106E-05	6.06544E-05
Trichloroethylene	0	0	0	0
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	6.83121E-05	3.38292E-05	5.70483E-05	4.0608E-05
Zinc	2.23373E-06	1.10618E-06	1.86542E-06	1.32784E-06

Table 9C – North Long Beach Monitoring Station – Reference Dose (RfD) and Hazard Quotients (HQ)

Air Toxic	Reference Dose (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.017175708	0.008505677	0.014343652	0.010210072
Benzene	0.008571429	0.004500241	0.002228589	0.003758208	0.002675161
1,3 - Butadiene	0.000571429	0.00991595	0.004910532	0.008280936	0.005894521
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	0	0	0	0
Ethyl Benzene	0.285714286	6.11689E-05	3.02918E-05	5.1083E-05	3.63618E-05
Hexavalent Chromium	2.85714E-05	5.1224E-05	2.53669E-05	4.27778E-05	0.00003045
Manganese	1.42857E-05	0.036804414	0.018226116	0.030735833	0.021878325
Methylene Chloride	0.06	0.001927612	0.000954583	0.001609773	0.001145866
Methyl Ethyl Ketone	1.428571429	4.53224E-06	2.24444E-06	3.78493E-06	2.69418E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.00043428	0.000215062	0.000362673	0.000258157
Styrene	0.285714286	1.6365E-05	8.10422E-06	1.36666E-05	9.72817E-06
Toluene	1.428571429	7.14244E-05	3.53705E-05	5.96474E-05	4.24581E-05
Trichloroethylene	0.000571429	0	0	0	0
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.002390924	0.001184023	0.001996691	0.001421281

Table 9D – North Long Beach Monitoring Station – Hazard Indexes (HI)

Hazard Index (Adults)
0.082428292
Hazard Index (Teenagers)
0.040819768
Hazard Index (Children)
0.068836913
Hazard Index (Babies)
0.048999366

Table 10A – Pico Rivera Monitoring Station – Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	1.25	2.25205625
Acetone	58.08	1.92	4.56090624
Arsenic	74.9216	- -	0.00056
Benzene	78.11	0.35	1.11814465
Black Carbon	12.01	- -	1.25
1,3 - Butadiene	54.0916	0.07	0.154864251
Cadmium	112.414	- -	0.00011
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.04	0.19530568
Copper	63.546	- -	0.04686
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0	0
1,2 Dichloroethane	98.96	0.02	0.08094928
Elemental Carbon	12.01	- -	1.87
Ethyl Benzene	106.17	0.12	0.52108236
Formaldehyde	30.031	2.81	3.451432799
Hexavalent Chromium	51.996	- -	0.00005
Lead	207.2	- -	0.00589
Manganese	54.938	- -	0.02116
Methylene Chloride	84.93	0.17	0.59051829
Methyl Ethyl Ketone	72.11	0.15	0.44239485
MTBE	88.15	0.001	0.003605335
Naphthalene	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.00447
Organic Carbon	12.01	- -	4.82
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.02	0.13564894
PM2.5	- -	- -	14.21
PM10	- -	- -	27.32
Selenium	78.96	- -	0.00098
Styrene	104.15	0.03	0.12779205
Toluene	92.14	0.97	3.65547022
Trichloroethylene	131.4	0	0
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	0.5	2.170972
Zinc	65.38	- -	0.07301

Table 10B – Pico Rivera Monitoring Station – Average Daily Dose (ADD) (mg/kg*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	8.23995E-05	4.08055E-05	6.88128E-05	4.89822E-05
Acetone	0.000166877	8.264E-05	0.000139361	9.91997E-05
Arsenic	2.04896E-08	1.01468E-08	1.71111E-08	1.218E-08
Benzene	4.09113E-05	2.02599E-05	3.41655E-05	2.43196E-05
Black Carbon	4.57357E-05	2.2649E-05	3.81944E-05	2.71875E-05
1,3 - Butadiene	5.66626E-06	2.80602E-06	4.73196E-06	3.3683E-06
Cadmium	4.02474E-09	1.99311E-09	3.36111E-09	2.3925E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	7.14595E-06	3.53879E-06	5.96767E-06	4.2479E-06
Copper	1.71454E-06	8.49066E-07	1.43183E-06	1.01921E-06
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	0	0	0	0
1,2 Dichloroethane	2.96182E-06	1.46674E-06	2.47345E-06	1.76065E-06
Elemental Carbon	6.84206E-05	3.38829E-05	5.71389E-05	4.06725E-05
Ethyl Benzene	1.90656E-05	9.4416E-06	1.5922E-05	1.13335E-05
Formaldehyde	0.000126283	6.25372E-05	0.00010546	7.50687E-05
Hexavalent Chromium	1.82943E-09	9.05961E-10	1.52778E-09	1.0875E-09
Lead	2.15507E-07	1.06722E-07	1.79972E-07	1.28108E-07
Manganese	7.74214E-07	3.83403E-07	6.46556E-07	4.6023E-07
Methylene Chloride	2.16062E-05	1.06997E-05	1.80436E-05	1.28438E-05
Methyl Ethyl Ketone	1.61866E-05	8.01585E-06	1.35176E-05	9.62209E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	1.63551E-07	8.09929E-08	1.36583E-07	9.72225E-08
Organic Carbon	0.000176357	8.73346E-05	0.000147278	0.000104835
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	4.9632E-06	2.45785E-06	4.14483E-06	2.95036E-06
PM2.5	0.000519923	0.000257474	0.000434194	0.000309068
PM10	0.000999599	0.000495017	0.000834778	0.00059421
Selenium	3.58568E-08	1.77568E-08	2.99444E-08	2.1315E-08
Styrene	4.67572E-06	2.31549E-06	3.90476E-06	2.77948E-06
Toluene	0.000133748	6.62342E-05	0.000111695	7.95065E-05
Trichloroethylene	0	0	0	0
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	7.94327E-05	3.93363E-05	6.63353E-05	4.72186E-05
Zinc	2.67133E-06	1.32288E-06	2.23086E-06	1.58797E-06

Table 10C – Pico Rivera Monitoring Station – Reference Dose (RfD) and Hazard Quotient (HQ)

Air Toxic	Reference Dose (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.032044232	0.0158688	0.026760545	0.019048642
Benzene	0.008571429	0.004772983	0.002363655	0.003985979	0.002837292
1,3 - Butadiene	0.000571429	0.00991595	0.004910532	0.008280936	0.005894521
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	0	0	0	0
Ethyl Benzene	0.285714286	6.67298E-05	3.30456E-05	5.57269E-05	3.96674E-05
Hexavalent Chromium	2.85714E-05	6.40299E-05	3.17086E-05	5.34722E-05	3.80625E-05
Manganese	1.42857E-05	0.054194948	0.026838178	0.045258889	0.0322161
Methylene Chloride	0.06	0.000360103	0.000178329	0.000300727	0.000214063
Methyl Ethyl Ketone	1.428571429	1.13306E-05	5.61109E-06	9.46233E-06	6.73546E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.00043428	0.000215062	0.000362673	0.000258157
Styrene	0.285714286	1.6365E-05	8.10422E-06	1.36666E-05	9.72817E-06
Toluene	1.428571429	9.36238E-05	4.6364E-05	7.81864E-05	5.56545E-05
Trichloroethylene	0.000571429	0	0	0	0
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.002780144	0.001376771	0.002321734	0.001652652

Table 10D – Pico Rivera Monitoring Station – Hazard Index (HI)

Hazard Index (Adults)
0.113829168
Hazard Index (Teenagers)
0.056369968
Hazard Index (Children)
0.095060183
Hazard Index (Babies)
0.067665567

Table 11A – Rubidoux Monitoring Station – Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	0.84	1.5133818
Acetone	58.08	1.14	2.70803808
Arsenic	74.9216	- -	0.00076
Benzene	78.11	0.28	0.89451572
Black Carbon	12.01	- -	1.4
1,3 - Butadiene	54.0916	0.06	0.132740786
Cadmium	112.414	- -	0.00011
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.04	0.19530568
Copper	63.546	- -	0.03345
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0	0
1,2 Dichloroethane	98.96	0.01	0.04047464
Elemental Carbon	12.01	- -	1.48
Ethyl Benzene	106.17	0.15	0.65135295
Formaldehyde	30.031	2	2.4565358
Hexavalent Chromium	51.996	- -	0.00004
Lead	207.2	- -	0.00621
Manganese	54.938	- -	0.03299
Methylene Chloride	84.93	2	6.947274
Methyl Ethyl Ketone	72.11	0.07	0.20645093
MTBE	88.15	0.001	0.003605335
Naphthalene	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.00335
Organic Carbon	12.01	- -	5.29
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.01	0.06782447
PM2.5	- -	- -	13.83
PM10	- -	- -	33.45
Selenium	78.96	- -	0.00073
Styrene	104.15	0.04	0.1703894
Toluene	92.14	0.81	3.05250606
Trichloroethylene	131.4	0	0
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	0.5	2.170972
Zinc	65.38	- -	0.06427

Table 11B – Rubidoux Monitoring Station – Average Daily Doses (ADD) (mg/kg*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	5.53724E-05	2.74213E-05	4.62422E-05	3.29161E-05
Acetone	9.90832E-05	4.90675E-05	8.27456E-05	5.88998E-05
Arsenic	2.78073E-08	1.37706E-08	2.32222E-08	1.653E-08
Benzene	3.2729E-05	1.62079E-05	2.73324E-05	1.94557E-05
Black Carbon	5.1224E-05	2.53669E-05	4.27778E-05	0.00003045
1,3 - Butadiene	4.85679E-06	2.40516E-06	4.05597E-06	2.88711E-06
Cadmium	4.02474E-09	1.99311E-09	3.36111E-09	2.3925E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	7.14595E-06	3.53879E-06	5.96767E-06	4.2479E-06
Copper	1.22389E-06	6.06088E-07	1.02208E-06	7.27538E-07
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	0	0	0	0
1,2 Dichloroethane	1.48091E-06	7.33369E-07	1.23673E-06	8.80323E-07
Elemental Carbon	5.4151E-05	2.68164E-05	4.52222E-05	0.00003219
Ethyl Benzene	2.38321E-05	1.1802E-05	1.99025E-05	1.41669E-05
Formaldehyde	8.98811E-05	4.45105E-05	7.50608E-05	5.34297E-05
Hexavalent Chromium	1.46354E-09	7.24769E-10	1.22222E-09	8.7E-10
Lead	2.27215E-07	1.1252E-07	1.8975E-07	1.35068E-07
Manganese	1.20706E-06	5.97753E-07	1.00803E-06	7.17533E-07
Methylene Chloride	0.000254191	0.000125879	0.000212278	0.000151103
Methyl Ethyl Ketone	7.55374E-06	3.74073E-06	6.30822E-06	4.49031E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	1.22572E-07	6.06994E-08	1.02361E-07	7.28625E-08
Organic Carbon	0.000193553	9.58506E-05	0.000161639	0.000115058
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	2.4816E-06	1.22893E-06	2.07241E-06	1.47518E-06
PM2.5	0.00050602	0.000250589	0.000422583	0.000300803
PM10	0.001223887	0.000606088	0.001022083	0.000727538
Selenium	2.67096E-08	1.3227E-08	2.23056E-08	1.58775E-08
Styrene	6.2343E-06	3.08732E-06	5.20634E-06	3.70597E-06
Toluene	0.000111687	5.5309E-05	9.3271E-05	6.6392E-05
Trichloroethylene	0	0	0	0
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	7.94327E-05	3.93363E-05	6.63353E-05	4.72186E-05
Zinc	2.35155E-06	1.16452E-06	1.96381E-06	1.39787E-06

Table 11C – Rubidoux Monitoring Station – Reference Dose (RfD) and Hazard Quotients (HQ)

Air Toxic	Reference Dose (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.021533724	0.010663834	0.017983086	0.012800688
Benzene	0.008571429	0.003818386	0.001890924	0.003188783	0.002269834
1,3 - Butadiene	0.000571429	0.008499386	0.004209028	0.007097945	0.005052446
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	0	0	0	0
Ethyl Benzene	0.285714286	8.34122E-05	4.1307E-05	6.96586E-05	4.95842E-05
Hexavalent Chromium	2.85714E-05	5.1224E-05	2.53669E-05	4.27778E-05	0.00003045
Manganese	1.42857E-05	0.084493919	0.041842698	0.070561944	0.050227275
Methylene Chloride	0.06	0.00423651	0.002097986	0.003537964	0.002518387
Methyl Ethyl Ketone	1.428571429	5.28762E-06	2.61851E-06	4.41576E-06	3.14322E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.00021714	0.000107531	0.000181336	0.000129078
Styrene	0.285714286	2.182E-05	1.08056E-05	1.82222E-05	1.29709E-05
Toluene	1.428571429	7.81807E-05	3.87163E-05	6.52897E-05	4.64744E-05
Trichloroethylene	0.000571429	0	0	0	0
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.002780144	0.001376771	0.002321734	0.001652652

Table 11D – Rubidoux Monitoring Station – Hazard Indexes (HI)

Hazard Index (Adults)
0.134893583
Hazard Index (Teenagers)
0.066801393
Hazard Index (Children)
0.112651343
Hazard Index (Babies)
0.080187274

Table 12A – West Long Beach Monitoring Station – Concentrations

Air Toxic	Molecular Weight (g/mol)	Concentration (ppb)	Concentration (ug/m3)
Acetaldehyde	44.05	0.75	1.35123375
Acetone	58.08	1.23	2.92183056
Arsenic	74.9216	- -	0.0005
Benzene	78.11	0.36	1.15009164
Black Carbon	12.01	- -	1.5
1,3 - Butadiene	54.0916	0.07	0.154864251
Cadmium	112.414	- -	0.00011
Carbon Tetrachloride	153.81	0.08	0.50326632
Chloroform	119.38	0.03	0.14647926
Copper	63.546	- -	0.03165
Dibromoethane	187.86	0.001	0.007683474
1,4 Dichlorobenzene	147.01	0	0
1,2 Dichloroethane	98.96	0.01	0.04047464
Elemental Carbon	12.01	- -	1.78
Ethyl Benzene	106.17	0.13	0.56450589
Formaldehyde	30.031	1.55	1.903815245
Hexavalent Chromium	51.996	- -	0.00003
Lead	207.2	- -	0.00583
Manganese	54.938	- -	0.02128
Methylene Chloride	84.93	0.48	1.66734576
Methyl Ethyl Ketone	72.11	0.07	0.20645093
MTBE	88.15	0.001	0.003605335
Naphthalene	128.1705	0.02	0.104843469
Nickel	58.6934	- -	0.00373
Organic Carbon	12.01	- -	4.45
PAH's	- -	- -	0.09
Perchloroethylene	165.83	0.02	0.13564894
PM2.5	- -	- -	13.21
PM10	- -	- -	30.02
Selenium	78.96	- -	0.00063
Styrene	104.15	0.07	0.29818145
Toluene	92.14	0.89	3.35398814
Trichloroethylene	131.4	0	0
Ultrafine Particles		17100 particles/cm3	
Vinyl Chloride	62.498	0.001	0.002556168
Xylene	106.16	0.55	2.3880692
Zinc	65.38	- -	0.07174

Table 12B – West Long Beach Monitoring Station – Average Daily Doses (ADD) (mg/kg*d)

Air Toxic	ADD (Adult)	ADD (Teenager)	ADD (Children)	ADD (Babies)
Acetaldehyde	4.94397E-05	2.44833E-05	4.12877E-05	2.93893E-05
Acetone	0.000106906	5.29413E-05	8.92782E-05	6.35498E-05
Arsenic	1.82943E-08	9.05961E-09	1.52778E-08	1.0875E-08
Benzene	4.20802E-05	2.08388E-05	3.51417E-05	2.50145E-05
Black Carbon	5.48828E-05	2.71788E-05	4.58333E-05	0.000032625
1,3 - Butadiene	5.66626E-06	2.80602E-06	4.73196E-06	3.3683E-06
Cadmium	4.02474E-09	1.99311E-09	3.36111E-09	2.3925E-09
Carbon Tetrachloride	1.84138E-05	9.11879E-06	1.53776E-05	1.0946E-05
Chloroform	5.35946E-06	2.65409E-06	4.47576E-06	3.18592E-06
Copper	1.15803E-06	5.73473E-07	9.67083E-07	6.88388E-07
Dibromoethane	2.81127E-07	1.39219E-07	2.34773E-07	1.67116E-07
1,4 Dichlorobenzene	0	0	0	0
1,2 Dichloroethane	1.48091E-06	7.33369E-07	1.23673E-06	8.80323E-07
Elemental Carbon	6.51276E-05	3.22522E-05	5.43889E-05	0.000038715
Ethyl Benzene	2.06544E-05	1.02284E-05	1.72488E-05	1.2278E-05
Formaldehyde	6.96578E-05	3.44956E-05	5.81721E-05	4.1408E-05
Hexavalent Chromium	1.09766E-09	5.43576E-10	9.16667E-10	6.525E-10
Lead	2.13311E-07	1.05635E-07	1.78139E-07	1.26803E-07
Manganese	7.78604E-07	3.85577E-07	6.50222E-07	4.6284E-07
Methylene Chloride	6.10057E-05	3.0211E-05	5.09467E-05	3.62648E-05
Methyl Ethyl Ketone	7.55374E-06	3.74073E-06	6.30822E-06	4.49031E-06
MTBE	1.31914E-07	6.53258E-08	1.10163E-07	7.8416E-08
Naphthalene	3.83607E-06	1.89968E-06	3.20355E-06	2.28035E-06
Nickel	1.36475E-07	6.75847E-08	1.13972E-07	8.11275E-08
Organic Carbon	0.000162819	8.06305E-05	0.000135972	9.67875E-05
PAH's	3.29297E-06	1.63073E-06	0.00000275	1.9575E-06
Perchloroethylene	4.9632E-06	2.45785E-06	4.14483E-06	2.95036E-06
PM2.5	0.000483335	0.000239355	0.000403639	0.000287318
PM10	0.001098388	0.000543939	0.000917278	0.000652935
Selenium	2.30508E-08	1.14151E-08	1.925E-08	1.37025E-08
Styrene	1.091E-05	5.40281E-06	9.1111E-06	6.48545E-06
Toluene	0.000122718	6.07716E-05	0.000102483	7.29492E-05
Trichloroethylene	0	0	0	0
Ultrafine Particles	0	0	0	0
Vinyl Chloride	9.35265E-08	4.63158E-08	7.81051E-08	5.55967E-08
Xylene	8.7376E-05	4.32699E-05	7.29688E-05	5.19405E-05
Zinc	2.62486E-06	1.29987E-06	2.19206E-06	1.56035E-06

Table 12C – West Long Beach Monitoring Station – Reference Dose (RfD) and Hazard Quotients (HQ)

Air Toxic	Reference Dose (mg/kg*d)	HQ (Adults)	HQ (Teenager)	HQ (Children)	HQ (Babies)
Acetaldehyde	0.002571429	0.019226539	0.00952128	0.016056327	0.011429185
Benzene	0.008571429	0.004909354	0.002431188	0.004099864	0.002918358
1,3 - Butadiene	0.000571429	0.00991595	0.004910532	0.008280936	0.005894521
Carbon Tetrachloride	0.028571429	0.000644482	0.000319158	0.000538215	0.000383111
Dibromoethane	0.002571429	0.000109327	5.41405E-05	9.13005E-05	6.49894E-05
1,4 Dichlorobenzene	0.228571429	0	0	0	0
Ethyl Benzene	0.285714286	7.22906E-05	3.57994E-05	6.03708E-05	4.2973E-05
Hexavalent Chromium	2.85714E-05	3.8418E-05	1.90252E-05	3.20833E-05	2.28375E-05
Manganese	1.42857E-05	0.054502292	0.02699038	0.045515556	0.0323988
Methylene Chloride	0.06	0.001016762	0.000503517	0.000849111	0.000604413
Methyl Ethyl Ketone	1.428571429	5.28762E-06	2.61851E-06	4.41576E-06	3.14322E-06
MTBE	0.857142857	1.539E-07	7.62135E-08	1.28524E-07	9.14854E-08
Naphthalene	0.000857143	0.004475415	0.002216295	0.003737476	0.002660403
PAH's	0.000857143	0.003841797	0.001902517	0.003208333	0.00228375
Perchloroethylene	0.011428571	0.00043428	0.000215062	0.000362673	0.000258157
Styrene	0.285714286	3.81851E-05	1.89098E-05	3.18888E-05	2.26991E-05
Toluene	1.428571429	8.59023E-05	4.25401E-05	7.17381E-05	5.10645E-05
Trichloroethylene	0.000571429	0	0	0	0
Vinyl Chloride	0.028571429	3.27343E-06	1.62105E-06	2.73368E-06	1.94588E-06
Xylene	0.028571429	0.003058159	0.001514448	0.002553907	0.001817918

Table 12D – West Long Beach Monitoring Station – Hazard Indexes (HI)

Hazard Index (Adults)
0.102377868
Hazard Index (Teenagers)
0.050699107
Hazard Index (Children)
0.085497057
Hazard Index (Babies)
0.060858359

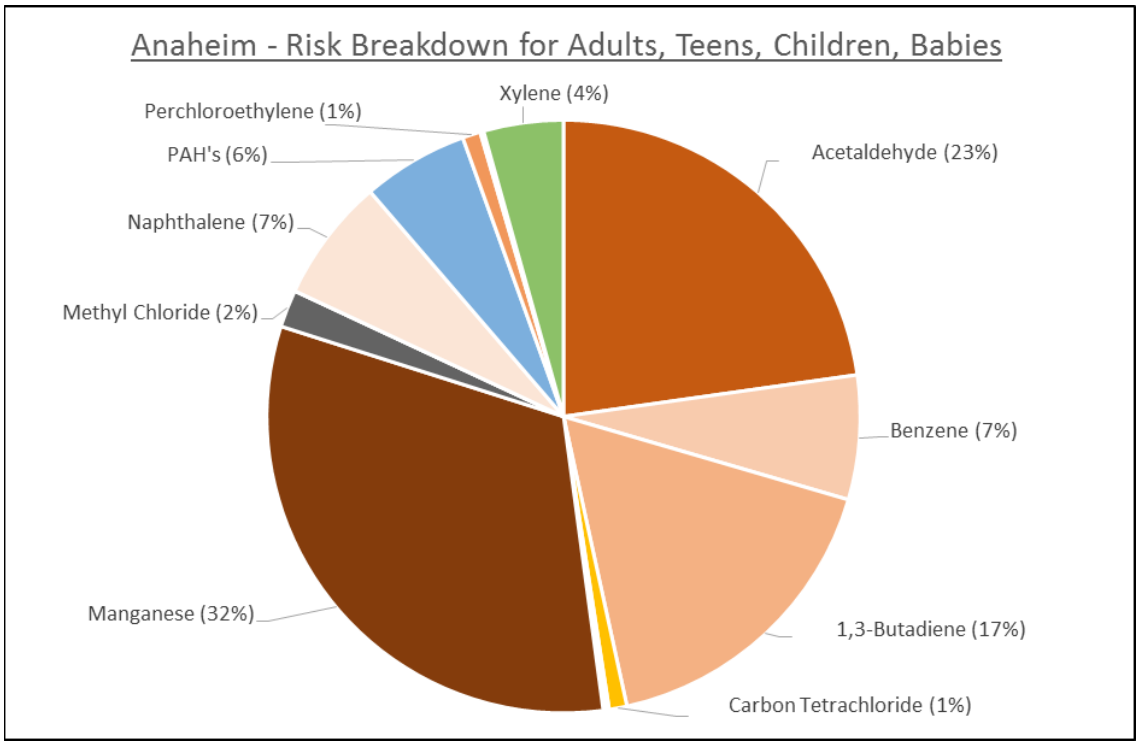

Figure 4 – Anaheim Monitoring Station - Relative Risk Contributions

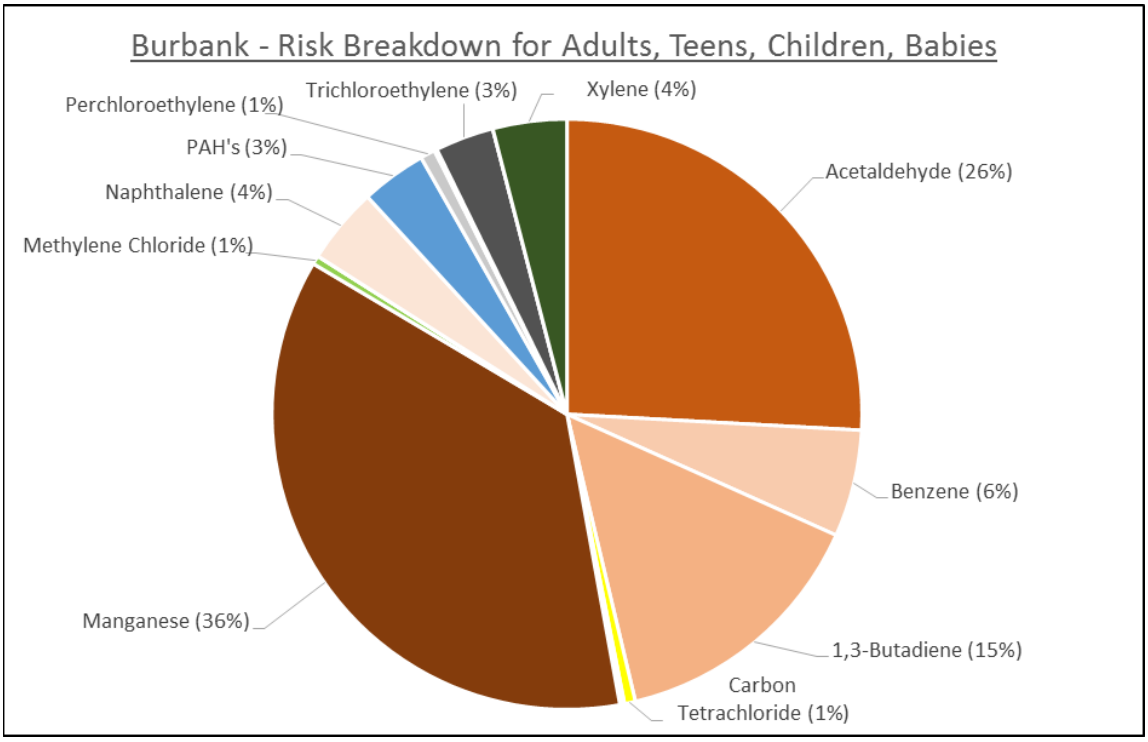

Figure 5 – Burbank Monitoring Station - Relative Risk Contributions

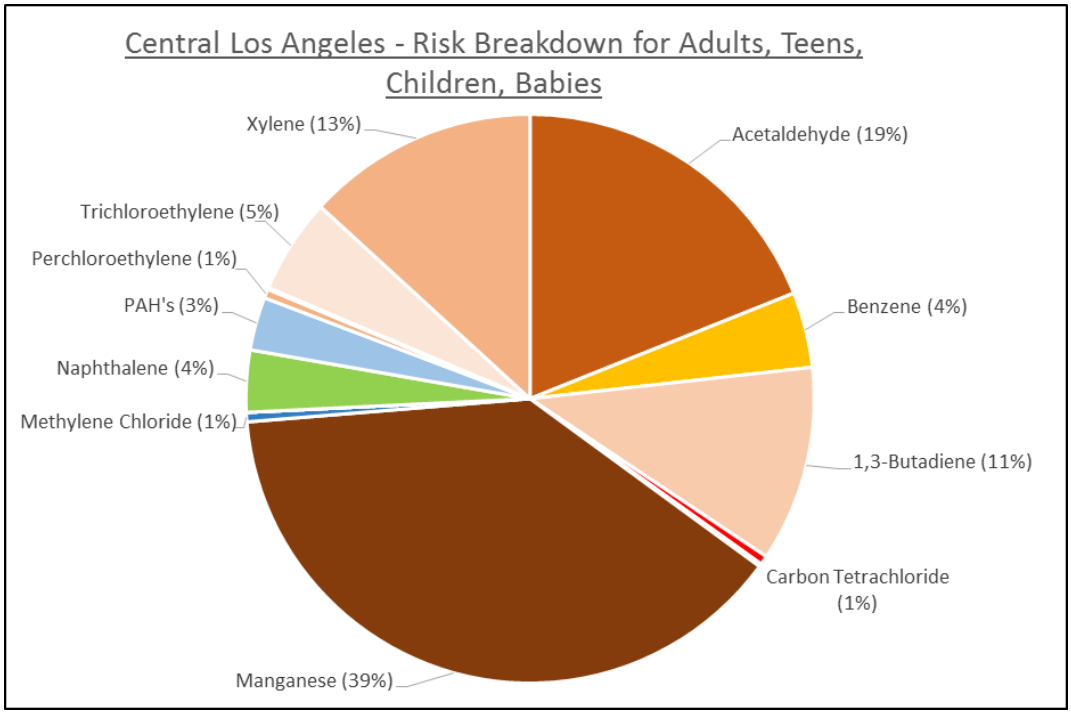

Figure 6 – Central Los Angeles Monitoring Station - Relative Risk Contributions

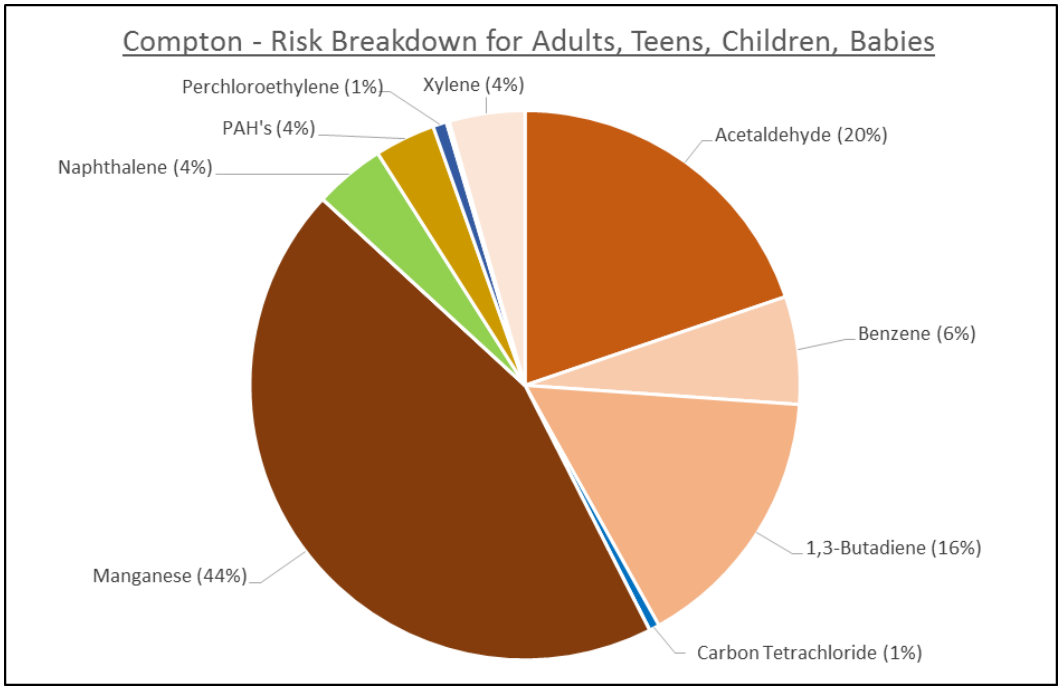

Figure 7 – Compton Monitoring Station - Relative Risk Contributions

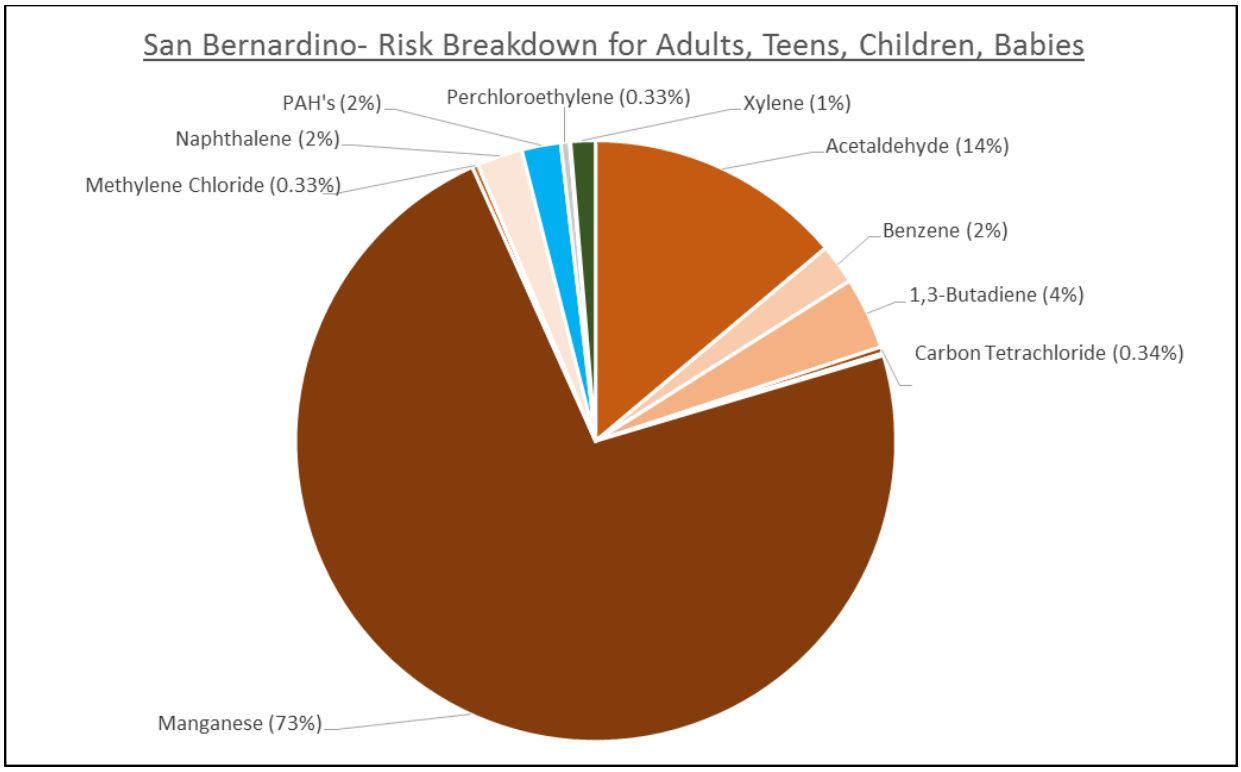

Figure 8 – Inland Valley-San Bernardino Monitoring Station - Relative Risk Contributions

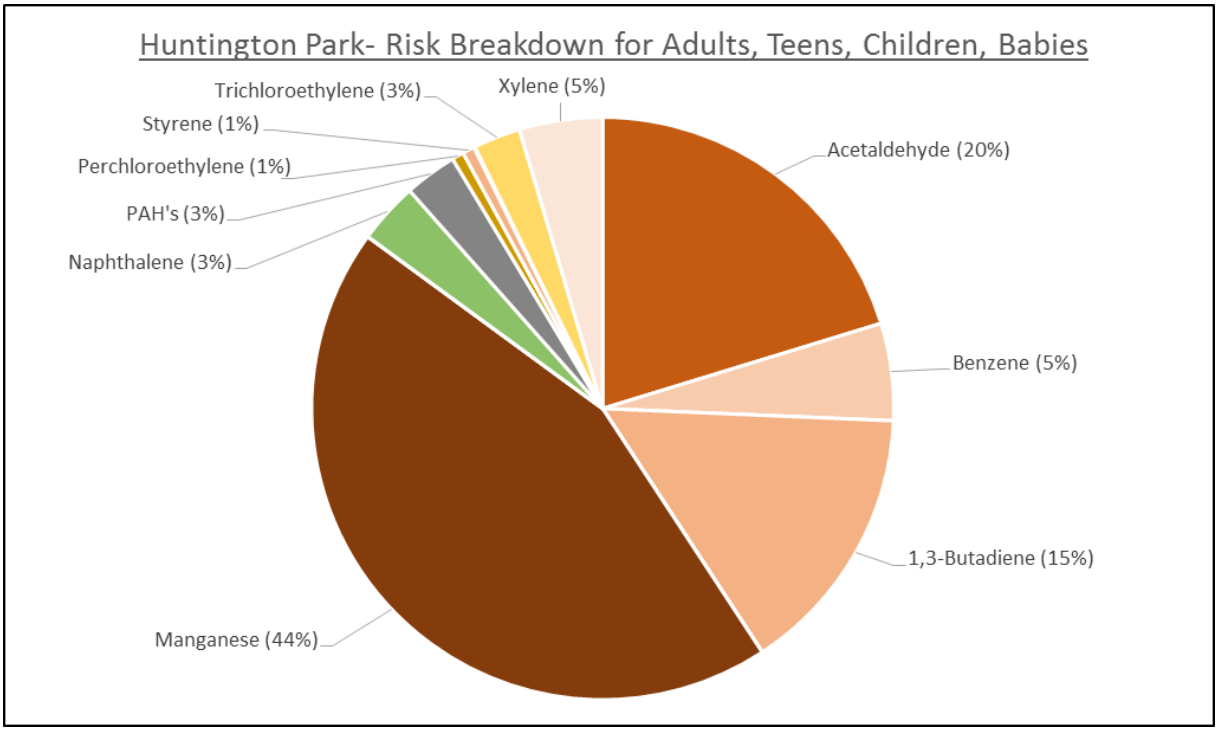

Figure 9 – Huntington Park Monitoring Station - Relative Risk Contributions

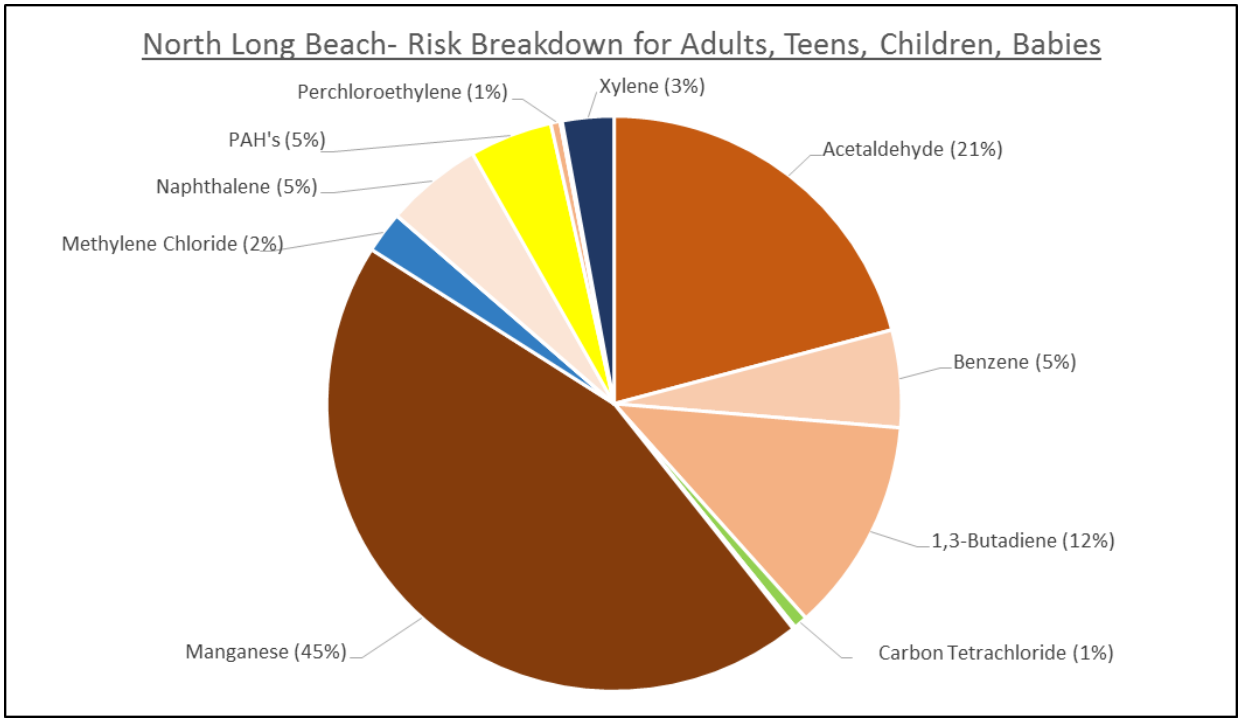

Figure 10 – North Long Beach Monitoring Station - Relative Risk Contributions

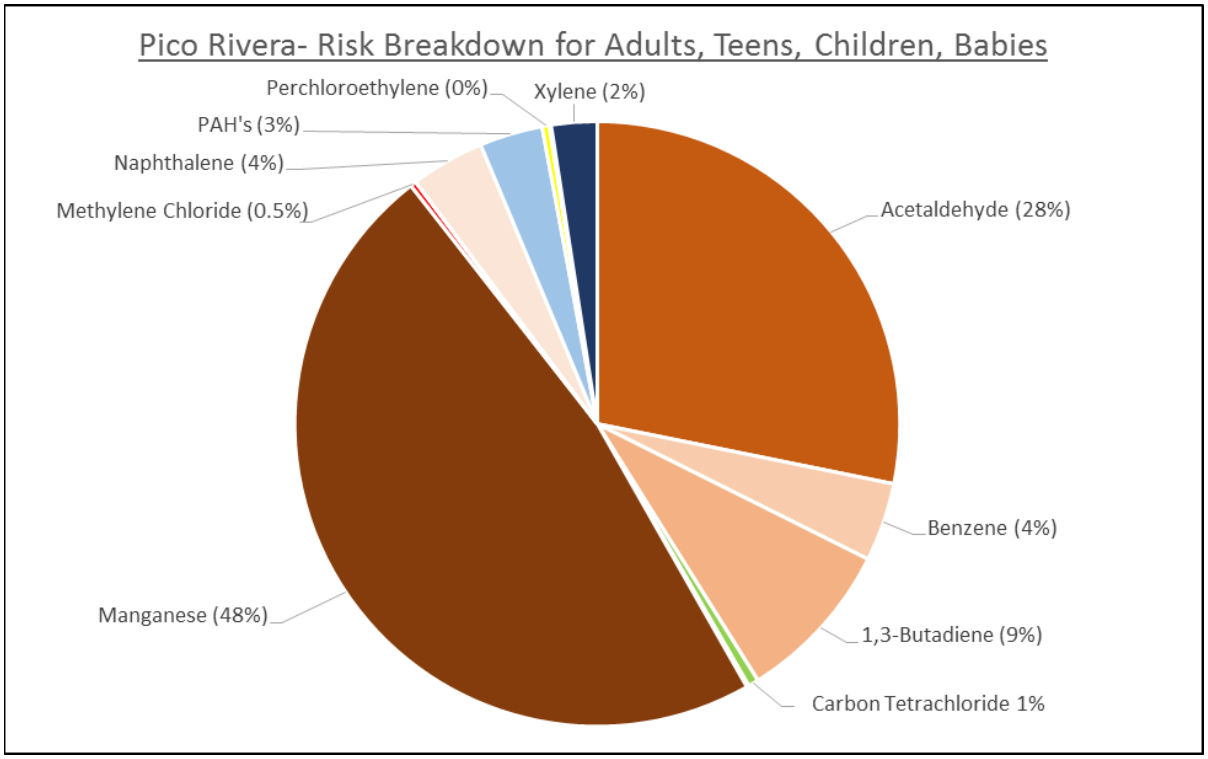

Figure 11 – Pico Rivera Monitoring Station - Relative Risk Contributions

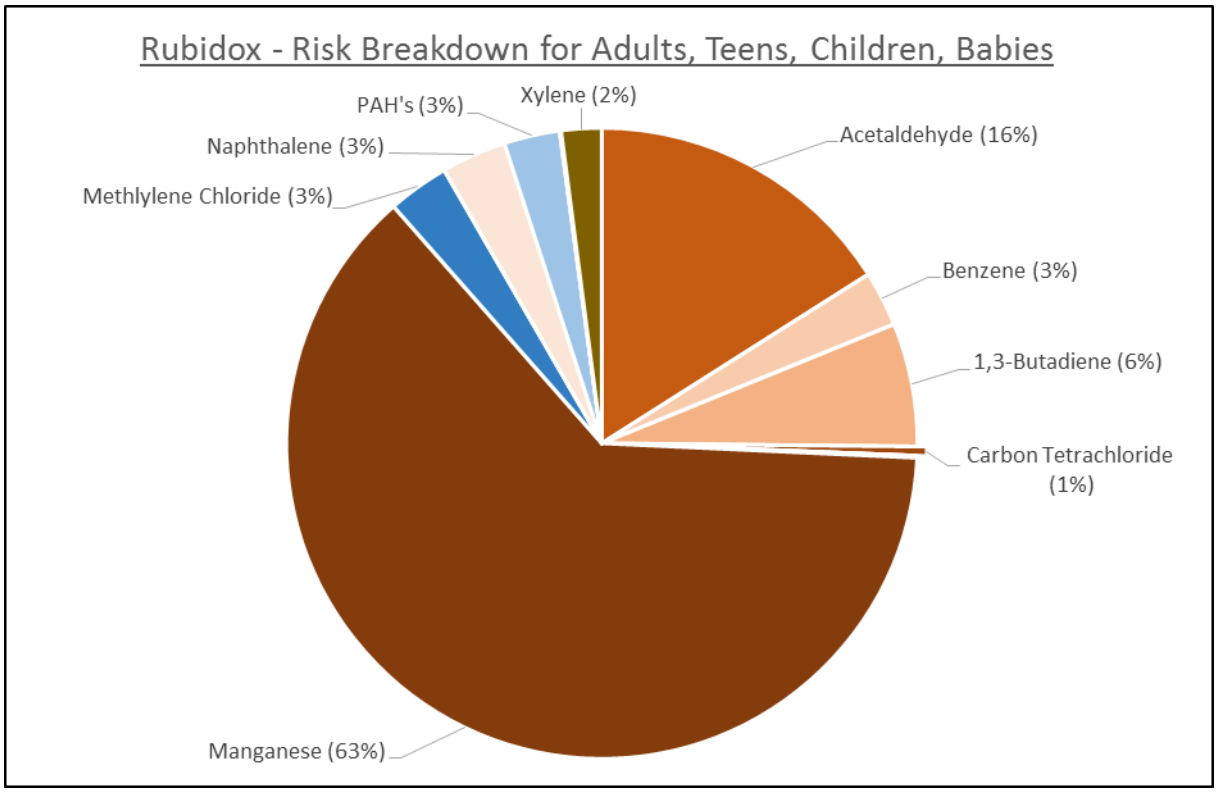

Figure 12 – Rubidoux Monitoring Station - Relative Risk Contributions

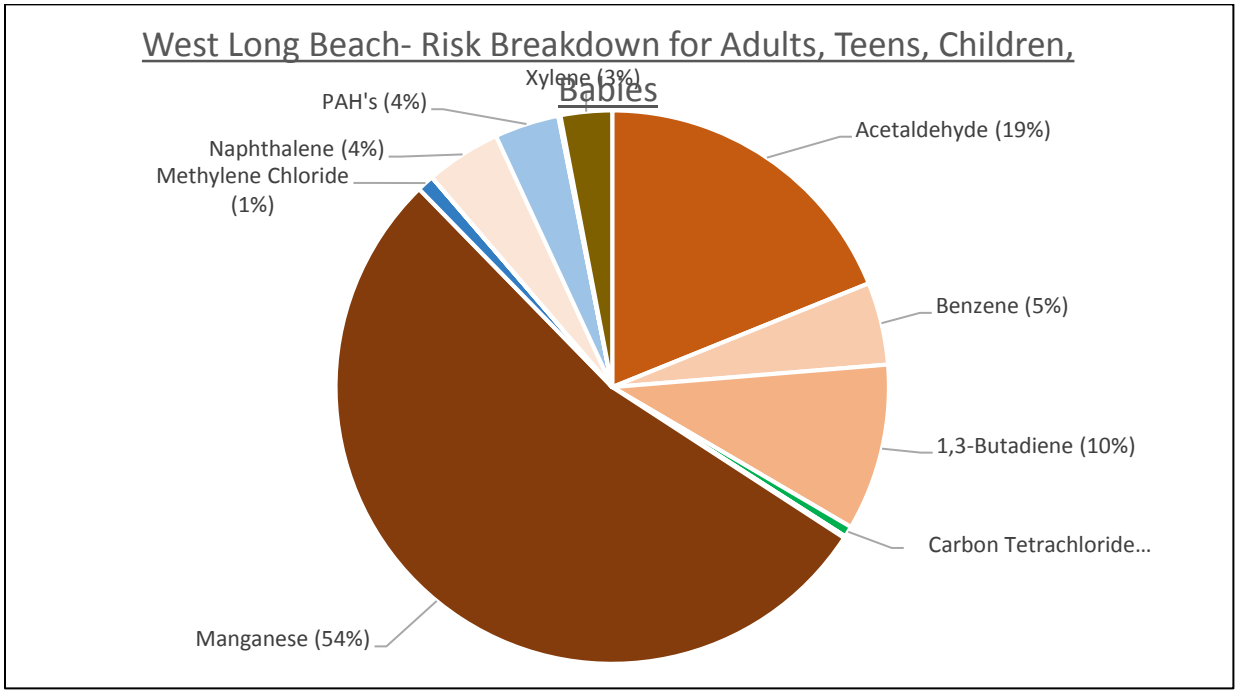

Figure 13 – West Long Beach Monitoring Station – Relative Risk Contributions

Table 13 – Exposure Factors for Average Daily Dose Calculations

Adult (>21)			
Body Weight (kg) =	80	Exposure Time (min/day) =	281
Inhalation Rate (m3/d) =	15	Exposure Frequency (day/year) =	365
		Exposure Duration (years) =	78
Teenager (11<21)			
Body Weight (kg) =	60	Exposure Time (min/day) =	101
Inhalation Rate (m3/d) =	15.5	Exposure Frequency (day/year) =	365
		Exposure Duration (years) =	78
Children (1<11)			
Body Weight (kg) =	20	Exposure Time (min/day) =	88
Inhalation Rate (m3/d) =	10	Exposure Frequency (day/year) =	365
		Exposure Duration (years) =	78
Babies (<1)			
Body Weight (kg) =	10	Exposure Time (min/day) =	58
Inhalation Rate (m3/d) =	5.4	Exposure Frequency (day/year) =	365
		Exposure Duration (years) =	78
Lifetime (years) =		78	

APPENDIX B: SAMPLE CALCULATIONS

1. Concentration Conversion: ppb to ug/m^3

Due to the process of performing a non-carcinogenic risk assessment, concentrations require the units of micrograms per cubic meter and must be converted if presented otherwise.

Sample air toxic: Acetaldehyde from Anaheim monitoring station

$$Concentration\ \left(\frac{\mu g}{m^3}\right) = 0.0409 * Concentration\ (ppb) * Molecular\ Weight$$

$$Concentraion\ \left(\frac{\mu g}{m^3}\right) = 0.0409 * 0.59\ ppb * 44.05 \frac{g}{mol} = 1.063\ \frac{\mu g}{m^3}$$

2. Average Daily Dose (ADD) (mg/kg*d)

Calculation of the average daily dose utilizes the exposure factors found in **Table 13** and using the concentration data collected from the monitoring stations, converted when necessary in the manner above. A detailed breakdown of the ADD equation can

Sample air toxic: Acetaldehyde for Adults from Anaheim Monitoring Station

$$ADD\ \left(\frac{mg}{kg * d}\right) = \frac{Concentration * Inhalation\ Rate * Time * Frequency * Duration}{Body\ Weight * Averaging\ Time}$$

$$ADD\ \left(\frac{mg}{kg * d}\right) = \frac{1.063\left(\frac{ug}{m^3}\right) * \left(\frac{1\ mg}{1000\ ug}\right) * 15\left(\frac{m^3}{d}\right) * 281\ \left(\frac{min}{day}\right) * 365\left(\frac{day}{year}\right) * 78\ year}{80\ kg * 1440\left(\frac{min}{day}\right) * 78\ years * 365\left(\frac{day}{year}\right)}$$

$$= 3.89\ x\ 10^{-5}\left(\frac{mg}{kg * d}\right)$$

3. Conversion Calculation: Reference Concentration to Reference Dose

In order to complete a non-carcinogenic risk assessment, the ratio of the Average Daily Dose over the reference dose must be calculated, determining the Hazard Quotient. The reference dose, however, is often presented as a reference concentration which must be converted.

Sample air toxic: Acetaldehyde for Adults from Anaheim Monitoring Station

$$Reference\ Dose\ \left(\frac{mg}{kg * d}\right) = Reference\ Concentration\ \left(\frac{mg}{m^3}\right) * \left(\frac{1}{70\ kg}\right) * \left(20\frac{m^3}{d}\right)$$

$$Reference\ Dose\ \left(\frac{mg}{kg * d}\right) = 0.009\left(\frac{mg}{m^3}\right) * \left(\frac{1}{70\ kg}\right) * \left(20\frac{m^3}{d}\right) = 0.00257\left(\frac{mg}{kg * d}\right)$$

4. Hazard Quotient

The primary quantifier of non-carcinogenic risk. The Hazard Quotient is the ratio of the Average Daily Dose over the Reference Dose.

Sample air toxic: Acetaldehyde for Adults from Anaheim Monitoring Station

$$Hazard\ Quotient = \frac{ADD}{RfD} = \frac{3.89\ x\ 10^{-5}\left(\frac{mg}{kg * d}\right)}{0.00257\left(\frac{mg}{kg * d}\right)} = 0.0151$$