



## HEALTH RISK ASSESSMENT

Boral Roofing LLC  
909 Railroad Street

Corona, CA 92882

Facility ID: 1073

*Prepared for:*

Boral Roofing LLC  
909 Railroad Street  
Corona, CA 92882

Alta Project: BORA-18-7629

June 26, 2018





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## List of Acronyms

AB	Assembly Bill
ADMRT	Air Dispersion Modeling and Risk Tool
ATIR	Air Toxics Inventory Report
CA	California
CARB	California Air Resources Board
DEHP	bis(2-ethylhexy)phthalate
ECHO	Enforcement and Compliance History Online
GLC	Ground Level Concentration
HARP	Hot Spots Analysis and Reporting Program
HCl	hydrogen chloride
HF	hydrogen fluoride
HI	Hazard Index
hr	hour
HRA	Health Risk Assessment
I-15	Interstate 15
KCNO	Chino Airport Weather Station
lb	pound
lb/hr	pound per hour
lb/yr	pound per year
LLC	Limited Liability Company
m	meters
MEIR	Maximum Exposed Individual Resident
MEIW	Maximum Exposed Individual Worker
MEK	methyl ethyl ketone
µg/m <sup>3</sup>	Microgram per cubic meter
MRLC	Multi-Resolution Land Characteristics Consortium
NED	National Elevation Dataset
NLDC	National Land Cover Database
OEHHA	Office of Environmental Health Hazard Assessments
PAHs	polycyclic aromatic hydrocarbons
PCE	tetrachloroethylene
PMI	Point of Maximum Impact
RECLAIM	REgional CLean Air Incentives Market
REL	Reference Exposure Level
RY	Reporting Year
SCAQMD:	South Coast Air Quality Management District
TACs	Toxic Air Contaminants
tpy	Tons per year
USEPA:	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
WAF	Worker Adjustment Factor
WGS	World Geodetic System

## Definitions

The definitions provided below were obtained from the Office of Environmental Health Hazard's (OEHHA's) Risk Assessment Guidelines (OEHHA, 2015).

### **Acute Health Impacts:**

An acute health impact is an adverse health effect in a human population, including sensitive subgroups, resulting from exposure to concentrations of one or more chemicals for approximately one hour.

### **8-Hour Chronic Health Impacts**

Eight-hour chronic health impacts are adverse health effects in a human population resulting from exposure to the general public that occur on recurrent basis, but only during a portion of the day (e.g. exposures that only occur while a receptor is clocked in at work.)

### **Chronic Health Impacts:**

Chronic health impacts are adverse health effects in a human population, including sensitive subgroups, resulting from exposure to concentrations of one or more chemicals over a long period of time (e.g. thirty years.) These health effects may not appear right away, but may develop over time.

### **Cancer Health Impacts:**

Cancer health impacts, also known as cancer risk, is the incremental increase in excess cancer incidences resulting from exposure to concentrations of one or more chemicals for a prolonged period of time. Cancer risks are often expressed in terms of "1 in a million," which indicates that exposure to a certain concentration of a chemical has the potential to result in one additional incidence of cancer in a million people.



## EXECUTIVE SUMMARY

Facility Name: Boral Roofing LLC  
Physical Address: 909 Railroad Street  
Corona, CA 92882  
Facility ID: 1073  
Mailing Address: Same as Physical Address  
Contact: Jan Kovacovsky  
Environmental Manager  
(951) 739-4603  
jan.kovacovsky@boral.com

**Business Description:** Structural Clay Tile Manufacturing

### 1.1 Facility Operations and Site Description

The Boral Roofing LLC (Boral) facility is a clay tile manufacturing facility located in Corona, California. The facility is located in Universal Transverse Mercator (UTM) Zone 11 at coordinates 446,700 meters East and 3,749,700 meters North, which is approximately 1.75 miles west of the Interstate 15 (I-15) and California Highway 91 junction. The facility is located in Riverside County, which has an urban modeling option population of 2,189,641 according to South Coast Air Quality Management District (SCAQMD) AERMOD Guidance (SCAQMD, 2018). The nearest school, Orange Grove High School, is located approximately 0.4 miles (~2,100 feet) south of the Boral facility at 300 S Buena Vista Avenue, Corona, CA 92882.

The facility is a Title V and RECLAIM facility, and consists of one main manufacturing building, a storage shed, parking lots, and product storage areas. Within the manufacturing building, raw clay is transported to mixers and extruders where water and additives are introduced into the process. The extruders produce formed product in the desired size and shape. The wet product is transferred to the ovens via conveyor belt where it is dried. The dry tiles are then transferred to the kilns via conveyor belt for curing. Once curing is complete, the tiles are arranged and packaged for storage and shipment. The sources of toxic air emissions (TACs) at the facility are the two natural-gas fired kilns and two natural-gas fired ovens. A facility plot plan is provided as Figure 1.

Facility emissions are summarized in Table 1, and multipathway substances and their associated pathways are provided in Table 2.

## 1.2 Overview of Dispersion Modeling and Exposure Assessment

Air dispersion modeling was performed to estimate ground level concentrations (GLCs) at and beyond the property boundary of the Facility. Modeling was performed using the United States Environmental Protection Agency's (USEPA's) AERMOD executable version 18081 via the BREEZE AERMOD software. The following options were used in running the AERMOD model based on SCAQMD modeling guidelines, titled "Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics 'Hot Spots' Information and Assessment Act" (SCAQMD, 2015).

- AERMOD was executed using the urban modeling option, which is SCAQMD policy for all air quality impact analyses in its jurisdiction.
- USEPA regulatory default options were implemented.
- The UTM, World Geodetic System (WGS) 1984 projection was implemented.

The Facility has a total area of approximately 15 acres. Per the SCAQMD guidelines, the maximum receptor spacing is 50 meters for facilities with total areas between 10 and 25 acres (SCAQMD, 2014). Fifty- (50-) meter spacing was used for fence-line receptors, and 50-meter spacing was used for receptors outside the property boundary.

The facility is mostly surrounded by commercial and industrial properties. A residential neighborhood exists to the south of the facility, across Railroad Street. Receptors located within this residential neighborhood were designated as residential receptors and assumed to be sensitive receptors. All other receptors were designated as non-residential or worker receptors. No discrete sensitive receptors were identified within the direct vicinity of the facility. Air dispersion modeling results in terms of period average and maximum one-hour concentration were exported as plot (.plt) files, and separate plot files were created for each source.

## 1.3 Overview of Dose-Response Assessment

Air dispersion modeling results (plot files) were imported into the California Air Resources Board's (CARB's) Hot Spots Analysis and Reporting Program (HARP) software. HARP2, Air Dispersion Modeling and Risk Tool (ADMRT) software version 17320 was utilized to the dose-response assessment. The dose-response assessment was performed in accordance with OEHHA's "Air Toxics Hot Spots Program, Risk Assessment Guidelines" (OEHHA, 2015) and SCAQMD's Supplemental Guidelines (SCAQMD, 2015). Dose for residential receptors was calculated assuming a 30-year exposure and the inhalation, soil ingestion, dermal absorption, mother's milk, and home-grown produce exposure pathways. Dose for worker receptors was calculated assuming a 25-year exposure and the inhalation, soil ingestion, and dermal absorption exposure pathways. Annual and hourly TAC emissions for each source were entered into HARP, and each pollutant's target organ system(s) for non-cancer health impacts are shown in Table 3.

HARP2 ADMRT was used to estimate the incremental increase in cancer risk, non-cancer chronic hazard index (HI), and non-cancer acute HI for all receptors. Using these results, the Point of Maximum Impact (PMI), Maximum Exposed Individual Resident (MEIR), and Maximum Exposed Individual Worker (MEIW) were identified, and their respective cancer risks, non-cancer chronic HIs, and non-cancer acute HIs were estimated. Risks for PMI purposes were estimated using residential exposure assumptions (residential exposure pathways, 30-year exposure, etc.).

## 1.4 Summary of Results

A summary of the HRA results is presented below. The HRA Summary Form is provided as Attachment 1.

### 1.4.1 Location

The PMI is located on the property fenceline along the north side of the facility. The MEIR is located across Railroad Street, and the MEIW is located at the facility to the north of the facility across the railway. UTM coordinates for the PMI, MEIR, and MEIW are provided below, and maps of their locations are provided in Figures 2 through 6.

Receptor	UTM X (m)	UTM Y (m)
PMI	446,659.5	3,749,812
MEIR	446,650	3,749,600
MEIW	446,700	3,749,850

### 1.4.2 Cancer Risk

The total potential multipathway cancer risks for the PMI, MEIR, and MEIW are approximately 103, 6.41, and 1.90 in one million, respectively. The cancer risk for the PMI and MEIR were calculated using the residential receptor exposure assumptions, which include the five exposure pathways addressed in Section 1.3 and a 30-year exposure scenario. The cancer risk for the MEIW was calculated using worker exposure assumptions, three exposure pathways (listed in Section 1.3) and a 25-year exposure scenario. The PMI is located on the facility boundary, and a residential receptor is not expected to reside there. Using the worker exposure scenario, the cancer risk at the PMI was estimated to be 4.33 in one million. Arsenic and Hexavalent Chromium appear to drive the cancer risk. Cancer risk contribution for each substance at the MEIR and MEIW are provided in Table 4. Cancer risk isopleths are provided in Figure 2 and Figure 3.

### 1.4.3 Non-Cancer Hazard

The non-cancer chronic HIs for the PMI, MEIR, and MEIW are 9.63, 0.57, and 2.72, respectively. Similarly, to cancer risk, the HI for the PMI presented in the previous sentence was estimated assuming the residential exposure scenario. When using the worker exposure, the non-cancer chronic HI for the PMI was estimated to be 6.24. Hydrogen chloride (HCl), arsenic, hydrogen fluoride (HF), and fluorides appear to drive the non-cancer chronic HI. The primary target organ for the non-cancer chronic HI is the respiratory system. Non-cancer chronic HI contribution by each substance at the MEIR and MEIW are provided in Table 5 and Table 6 respectively. Non-cancer chronic HI isopleths are provided in Figure 4 and Figure 5.

The non-cancer acute HIs for the PMI, MEIR, and MEIW are 0.51, 0.18, and 0.38 respectively. HF, fluorides, and HCl appear to drive the non-cancer acute HI, and the primary target organ systems are the eye and respiratory system. Non-cancer acute HI contribution by each substance at the PMI, MEIR and MEIW are provided in Table 7, Table 8 and Table 9 respectively. The non-cancer acute HI isopleth is provided as in Figure 6.

The non-cancer 8-hour chronic HIs for the PMI is 0.16. Manganese, arsenic, and mercury appear to drive the non-cancer 8-hour chronic HI, and the primary target organ is the central nervous system.

#### **1.4.4 Population Exposure**

The majority of the receptors with a cancer risk above 1 in a million and/or a hazard index above 1 are located directly adjacent to the facility. For worker receptors, the neighboring facility located north of the Boral facility across the railway is the only facility exposed to a cancer risk above 1 in a million and a hazard index above 1. For residential receptors, non-cancer hazard indexes are not above 1 and cancer risk under the 70-year exposure scenario drops below 1 in a million near the line demarcated by UTM Y coordinate 3,749,350. This area includes the residential neighborhood within a quarter-mile radius of the facility. According to USEPA Enforcement and Compliance History Online (ECHO), approximately 17,050 persons live within one mile of the facility. Conservative multiplying the cancer risk under the 70-year scenario at the MEIW ( $7.59 \times 10^{-6}$ ) by 17,050 results in a cancer burden of approximately 0.13.

#### **1.4.5 Notification/Risk Reduction**

The non-cancer chronic HI at the MEIW is greater than 1 and less than 3. Therefore, notification will be required for the facility north of the Boral facility across the railway. No other notification or risk reduction is required.

## **EXECUTIVE SUMMARY TABLES**

**Table 1**  
**Facility Emissions Summary**  
**Boral Roofing LLC, Corona, CA**

Substance Name	CAS	Annual Average Emissions	Maximum Hourly Emissions
		(lb/yr)	(lb/hr)
Fluorides (excluding HF)	1101	5,114.688	8.87E-01
Benzene	71432	0.873	2.77E-04
Chloromethane	74873	35.696	6.19E-03
Diethylphthalate	84662	12.787	2.22E-03
Naphthalene	91203	0.043	1.34E-05
1,4-dichlorobenzene	106467	2.557	4.44E-04
Acrolein	107028	0.391	1.21E-04
Bis(2-ethylhexy)phthalate (DEHP)	117817	106.556	1.85E-02
Lead	7439921	7.992	1.39E-03
Manganese	7439965	15.451	2.68E-03
Mercury	7439976	0.400	6.93E-05
Nickel	7440020	3.836	6.65E-04
Antimony	7440360	1.439	2.49E-04
Arsenic	7440382	0.789	1.37E-04
Beryllium	7440417	0.022	3.88E-06
Cadmium	7440439	0.217	3.77E-05
Hydrogen Chloride	7647010	23,442.320	4.07E+00
Hydrogen Fluoride	7664393	8,524.480	1.48E+00
Ammonia	7664417	463.208	1.43E-01
Selenium	7782492	12.254	2.13E-03
Chlorine	7782505	69.261	1.20E-02
Hexavalent Chromium	18540299	0.037	8.09E-06



**Table 3**  
**Target Organs for Each Substance**  
**Boral Roofing LLC, Corona, CA**

Substance Name	CAS	Chronic Hazard Target Organs	Acute Hazard Target Organs
Fluorides (excluding HF)	1101	Respiratory system, eyes	Respiratory system, eyes
Benzene	71432	Hematologic system, nervous system, development	Reproductive/ development, immune system, hematologic system
Chloromethane	74873	Developmental Toxicity, Male Reproductive Toxicity	-
Diethylphthalate	84662	-	-
Naphthalene	91203	Respiratory system	-
1,4-dichlorobenzene	106467	Nervous system, respiratory system, alimentary system (liver), kidney	-
Acrolein	107028	Respiratory System	Respiratory system and eyes
Bis(2-ethylhexy)phthalate (DEHP)	117817	Developmental Toxicity, Male Reproductive Toxicity	-
Lead	7439921	Developmental Toxicity, Male Reproductive Toxicity, Female Reproductive Toxicity	-
Manganese	7439965	Nervous system	-
Mercury	7439976	Inhalation and oral: Nervous system, kidney, development	Reproductive/ development
Nickel	7440020	Inhalation: Respiratory system, hematologic system. Oral: Development	Immune system
Antimony	7440360	liver histopathological changes	-
Arsenic	7440382	Reproductive/ development; cardiovascular system; nervous system; lung; skin	Reproductive/ development, cardiovascular system, nervous system
Beryllium	7440417	Inhalation: Respiratory system, immune system. Oral: Alimentary system (gastrointestinal tract)	-
Cadmium	7440439	Inhalation: Kidney, respiratory system. Oral: Kidney	-
Hydrogen Chloride	7647010	Respiratory system	Respiratory system, eyes
Hydrogen Fluoride	7664393	Inhalation: Bone and teeth, respiratory system. Oral: Bone and teeth	Respiratory system, eyes
Ammonia	7664417	Respiratory System	Respiratory system and eyes
Selenium	7782492	Inhalation and oral: Alimentary system (liver), cardiovascular system, nervous system	-
Chlorine	7782505	Respiratory system	Respiratory system, eyes
Hexavalent Chromium	18540299	Inhalation: Respiratory system. Oral: Hematologic system	-

Source: <https://oehha.ca.gov/chemicals>



**Table 4**  
**Cancer Risk Contribution by Substance**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Cancer Risk	
		MEIR	MEIW
1101	Fluorides (excluding HF)	--	--
71432	Benzene	0.006 in one million	0.002 in one million
74873	Chloromethane	--	--
84662	Diethylphthalate	--	--
91203	Naphthalene	0.0004 in one million	0.0001 in one million
106467	1,4-dichlorobenzene	0.005 in one million	0.003 in one million
107028	Acrolein	--	--
117817	Bis(2-ethylhexy)phthalate (DEHP)	0.211 in one million	0.025 in one million
7439921	Lead	0.167 in one million	0.052 in one million
7439965	Manganese	--	--
7439976	Mercury	--	--
7440020	Nickel	0.181 in one million	0.093 in one million
7440360	Antimony	--	--
7440382	Arsenic	3.995 in one million	1.141 in one million
7440417	Beryllium	0.010 in one million	0.005 in one million
7440439	Cadmium	0.169 in one million	0.087 in one million
7647010	Hydrogen Chloride	--	--
7664393	Hydrogen Fluoride	--	--
7664417	Ammonia	--	--
7782492	Selenium	--	--
7782505	Chlorine	--	--
18540299	Hexavalent Chromium	1.668 in one million	0.495 in one million
	<b>Total</b>	<b>6.41 in one million</b>	<b>1.90 in one million</b>

**Table 5**  
**Non-Cancer Chronic HI Contribution by Substance @ MEIR**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution														
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL	
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-02	0.0E+00	0.0E+00	1.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
71432	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-05	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.3E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	2.1E-07	0.0E+00	2.1E-07	2.1E-07	0.0E+00	2.1E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.9E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	1.1E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	3.3E-03	0.0E+00	3.3E-03	0.0E+00	3.3E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-04	1.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-02	0.0E+00	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	3.0E-01	3.0E-01	0.0E+00	0.0E+00	0.0E+00	3.0E-01	3.0E-01	3.0E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	2.1E-04	0.0E+00	8.7E-06	0.0E+00	2.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	1.4E-03	0.0E+00	0.0E+00	7.0E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-02	0.0E+00	0.0E+00	2.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	7.7E-03	7.7E-03	0.0E+00	0.0E+00	7.7E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-05	0.0E+00	0.0E+00	0.0E+00
<b>Total</b>		3.0E-01	3.2E-01	2.1E-04	4.7E-03	7.7E-03	3.0E-01	<b>5.7E-01</b>	3.0E-01	0.0E+00	3.8E-01	0.0E+00	1.8E-02	0.0E+00	0.0E+00	0.0E+00

**Table 6**  
**Non-Cancer Chronic HI Contribution by Substance @ MEIW**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution													
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-01	0.0E+00	0.0E+00	5.3E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
71432	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-04	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	1.5E-06	0.0E+00	1.5E-06	1.5E-06	0.0E+00	1.5E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	8.1E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	1.3E-02	0.0E+00	1.3E-02	0.0E+00	1.3E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.0E-04	1.3E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-01	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	7.1E-01	7.1E-01	0.0E+00	0.0E+00	0.0E+00	7.1E-01	7.1E-01	7.1E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	1.5E-03	0.0E+00	3.0E-05	0.0E+00	1.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	6.2E-03	0.0E+00	0.0E+00	5.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.9E-01	0.0E+00	0.0E+00	8.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	6.9E-03	6.9E-03	0.0E+00	0.0E+00	6.9E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.4E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.6E-06	0.0E+00	0.0E+00
<b>Total</b>		7.1E-01	8.1E-01	1.5E-03	2.0E-02	6.9E-03	7.2E-01	<b>2.7E+00</b>	7.1E-01	0.0E+00	1.4E+00	0.0E+00	1.3E-01	0.0E+00	0.0E+00

**Table 7**  
**Non-Cancer Acute HI Contribution by Substance @ PMI**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution													
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-01	0.0E+00	1.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
71432	Benzene	0.0E+00	0.0E+00	6.0E-04	0.0E+00	0.0E+00	6.0E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.0E-04	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-03	0.0E+00	2.7E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	5.0E-03	0.0E+00	0.0E+00	0.0E+00	5.0E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	1.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	2.9E-02	2.9E-02	0.0E+00	0.0E+00	0.0E+00	2.9E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.2E-02	0.0E+00	8.2E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.6E-01	0.0E+00	2.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-03	0.0E+00	2.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-03	0.0E+00	2.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
<b>Total</b>		2.9E-02	3.5E-02	1.4E-01	0.0E+00	0.0E+00	3.5E-02	<b>5.1E-01</b>	0.0E+00	<b>5.1E-01</b>	0.0E+00	0.0E+00	6.0E-04	0.0E+00	0.0E+00

**Table 8**  
**Non-Cancer Acute HI Contribution by Substance @ MEIR**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution													
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.4E-02	0.0E+00	5.4E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
71432	Benzene	0.0E+00	0.0E+00	2.1E-04	0.0E+00	0.0E+00	2.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.1E-04	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.3E-04	0.0E+00	9.3E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	1.7E-03	0.0E+00	0.0E+00	0.0E+00	1.7E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	4.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	1.0E-02	1.0E-02	0.0E+00	0.0E+00	0.0E+00	1.0E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-02	0.0E+00	2.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.0E-02	0.0E+00	9.0E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.6E-04	0.0E+00	8.6E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.3E-04	0.0E+00	8.3E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
<b>Total</b>		1.0E-02	1.2E-02	4.9E-02	0.0E+00	0.0E+00	1.2E-02	<b>1.7E-01</b>	0.0E+00	<b>1.7E-01</b>	0.0E+00	0.0E+00	2.1E-04	0.0E+00	0.0E+00

**Table 9**  
**Non-Cancer Acute HI Contribution by Substance @ MEIW**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution													
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-01	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
71432	Benzene	0.0E+00	0.0E+00	5.2E-04	0.0E+00	0.0E+00	5.2E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.2E-04	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-03	0.0E+00	2.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	3.8E-03	0.0E+00	0.0E+00	0.0E+00	3.8E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	1.1E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	2.2E-02	2.2E-02	0.0E+00	0.0E+00	0.0E+00	2.2E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.2E-02	0.0E+00	6.2E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-01	0.0E+00	2.0E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-03	0.0E+00	2.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-03	0.0E+00	1.8E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
<b>Total</b>		2.2E-02	2.6E-02	1.1E-01	0.0E+00	0.0E+00	2.6E-02	<b>3.8E-01</b>	0.0E+00	<b>3.8E-01</b>	0.0E+00	0.0E+00	5.2E-04	0.0E+00	0.0E+00

## **EXECUTIVE SUMMARY FIGURES**







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Prepared For:  
**Boral Roofing LLC**

909 Railroad St  
 Corona, CA 92882  
 Facility ID: 1073









**ALTA**  
 ENVIRONMENTAL

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 Long Beach, CA 90807  
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**FIGURE 1 - Site Plot Plan**


**Legend**

-  Facility Boundary
-  Building 1 - Tier 1
-  Building 1 -Tier 2
-  Shed
-  Source
-  Contours

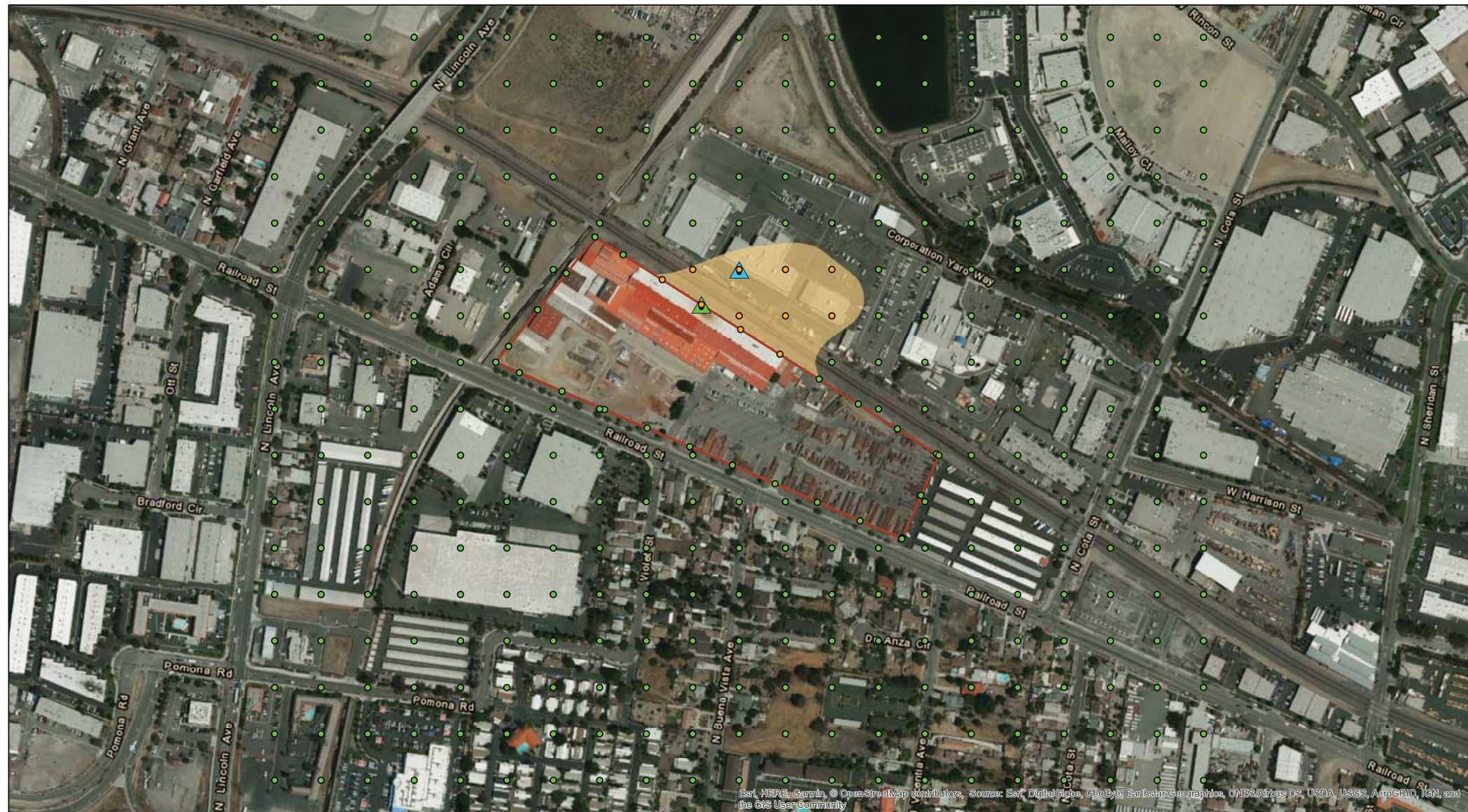
Datum: WGS 1984  
 Projection: UTM Zone 11N

0 40 80 Meters

0 210 420 630 Feet





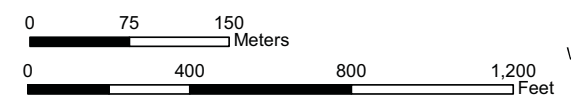


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**FIGURE 2 - Cancer Risk Isopleths:  
25-Year Worker Exposure Scenario**

Legend		Cancer Isopleths	Receptors
MEIW	Facility Boundary	$> 1 \times 10^{-6}$	$< 1 \times 10^{-6}$
PMI			$> 1 \times 10^{-6}$

Datum: WGS 1984  
Projection: UTM Zone 11N

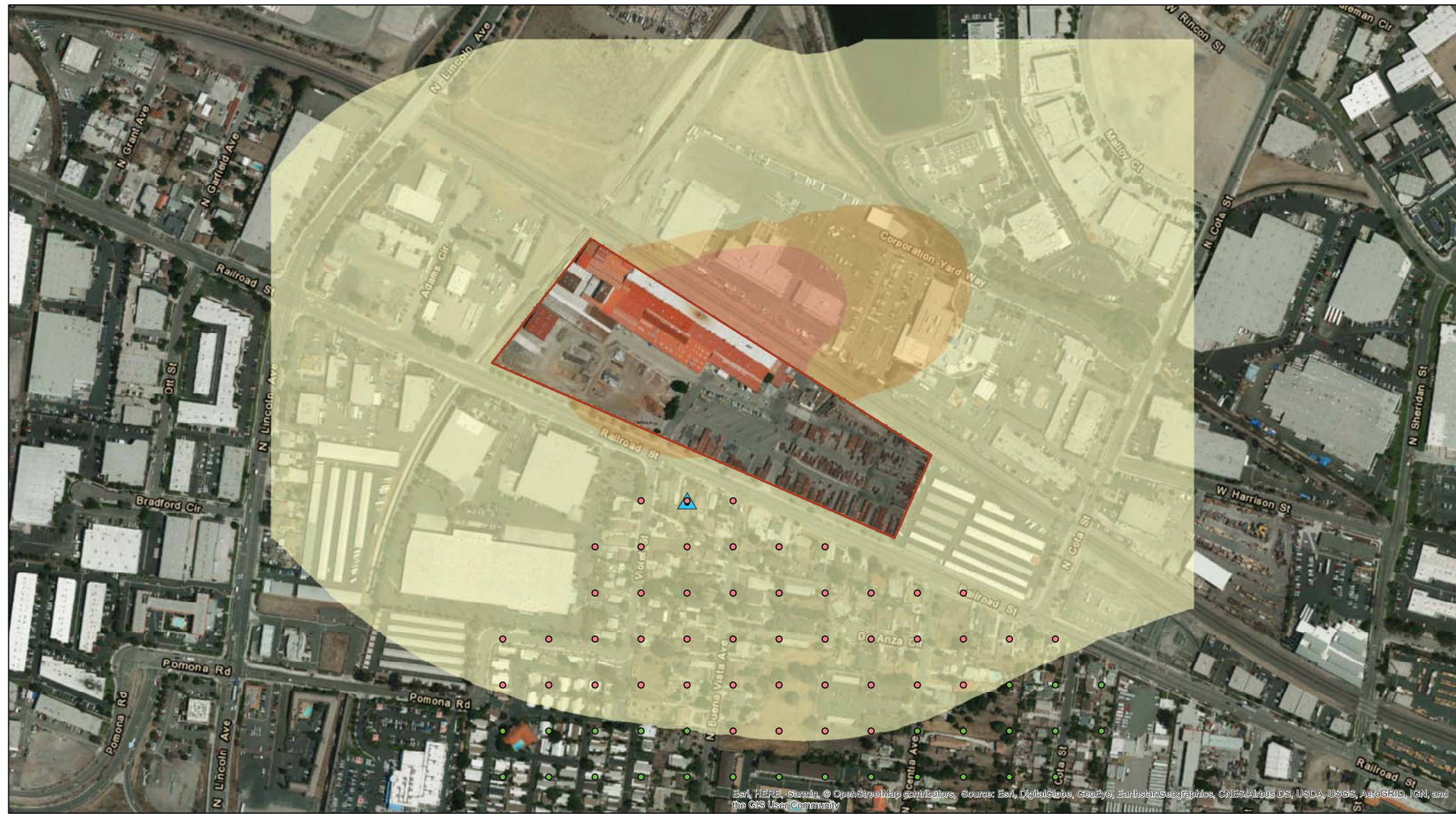


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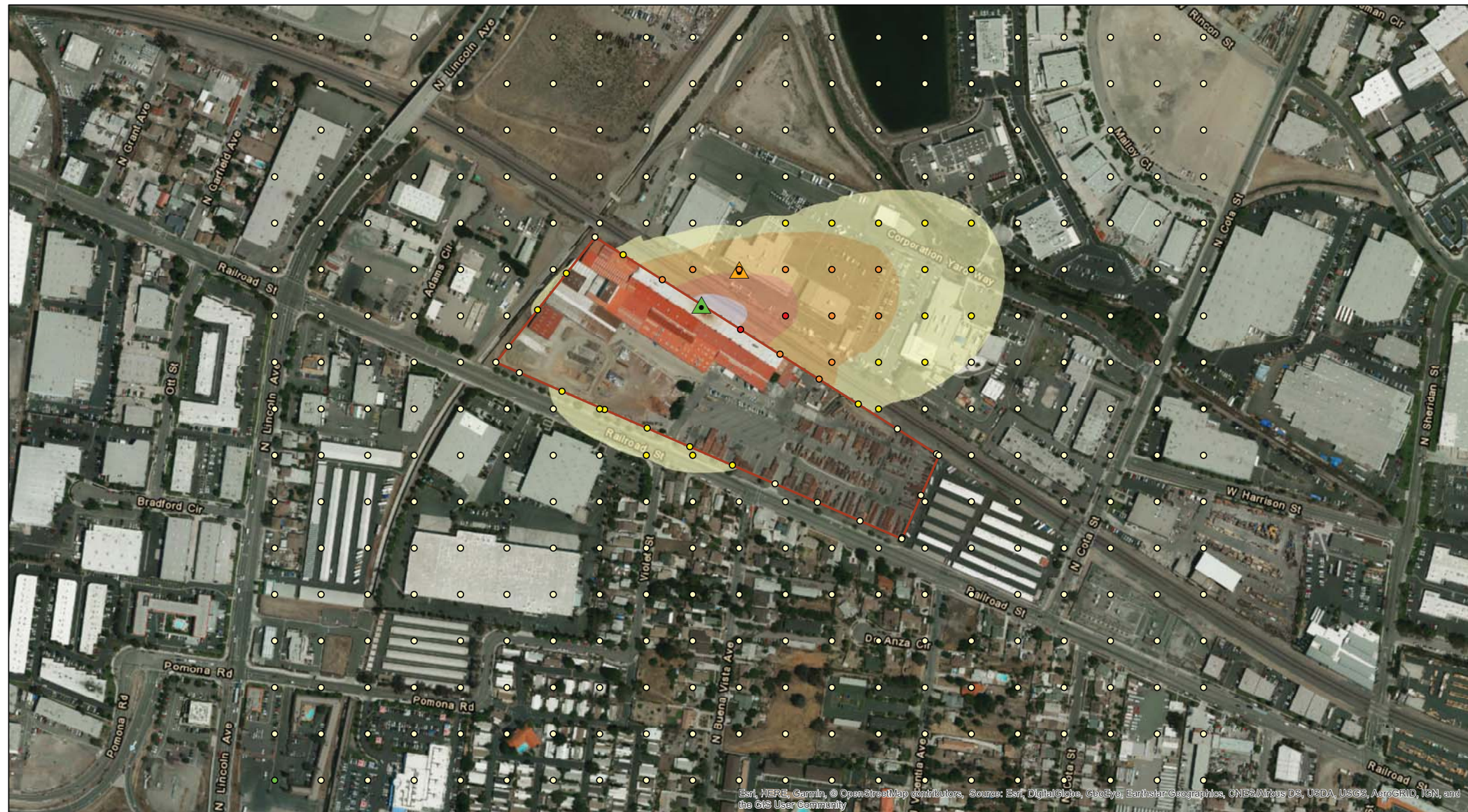




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Prepared For: <b>Boral Roofing LLC</b>		<p align="center"><b>FIGURE 3 - Cancer Risk Isopleths: 30-Year Residential Exposure Scenario</b></p> <p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="border: 1px solid red; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Facility Boundary</li> <li><span style="color: blue; font-size: 1.2em; margin-right: 5px;">▲</span> MEIR</li> </ul>	Datum: WGS 1984 Projection: UTM Zone 11N
909 Railroad St Corona, CA 92882 Facility ID: 1073	Alta Environmental 3777 Long Beach Blvd Annex Bldg Long Beach, CA 90807 562.495.5777 www.altaenviro.com		<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ffffcc; border: 1px solid black; margin-right: 5px;"></span> <math>&gt; 1 \times 10^{-6}</math></li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ffcc00; border: 1px solid black; margin-right: 5px;"></span> <math>&gt; 10 \times 10^{-6}</math></li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ff6600; border: 1px solid black; margin-right: 5px;"></span> <math>&gt; 2.5 \times 10^{-6}</math></li> </ul> <p><b>Residential Receptors</b></p> <ul style="list-style-type: none"> <li><span style="color: green; font-size: 1.2em; margin-right: 5px;">●</span> <math>&lt; 1 \times 10^{-6}</math></li> <li><span style="color: red; font-size: 1.2em; margin-right: 5px;">●</span> <math>&gt; 1 \times 10^{-6}</math></li> </ul>





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**FIGURE 4 - Non-Cancer Isopleths:  
 Non-Cancer Chronic Hazard Index Worker Scenario**

Legend	Non-Cancer Isopleths (HI)	Receptors
Facility Boundary	> 0.5	< 0.5
MEIW	> 3	0.5 - 1
PMI	> 1	1 - 3
	> 5	> 3

Datum: WGS 1984  
 Projection: UTM Zone 11N

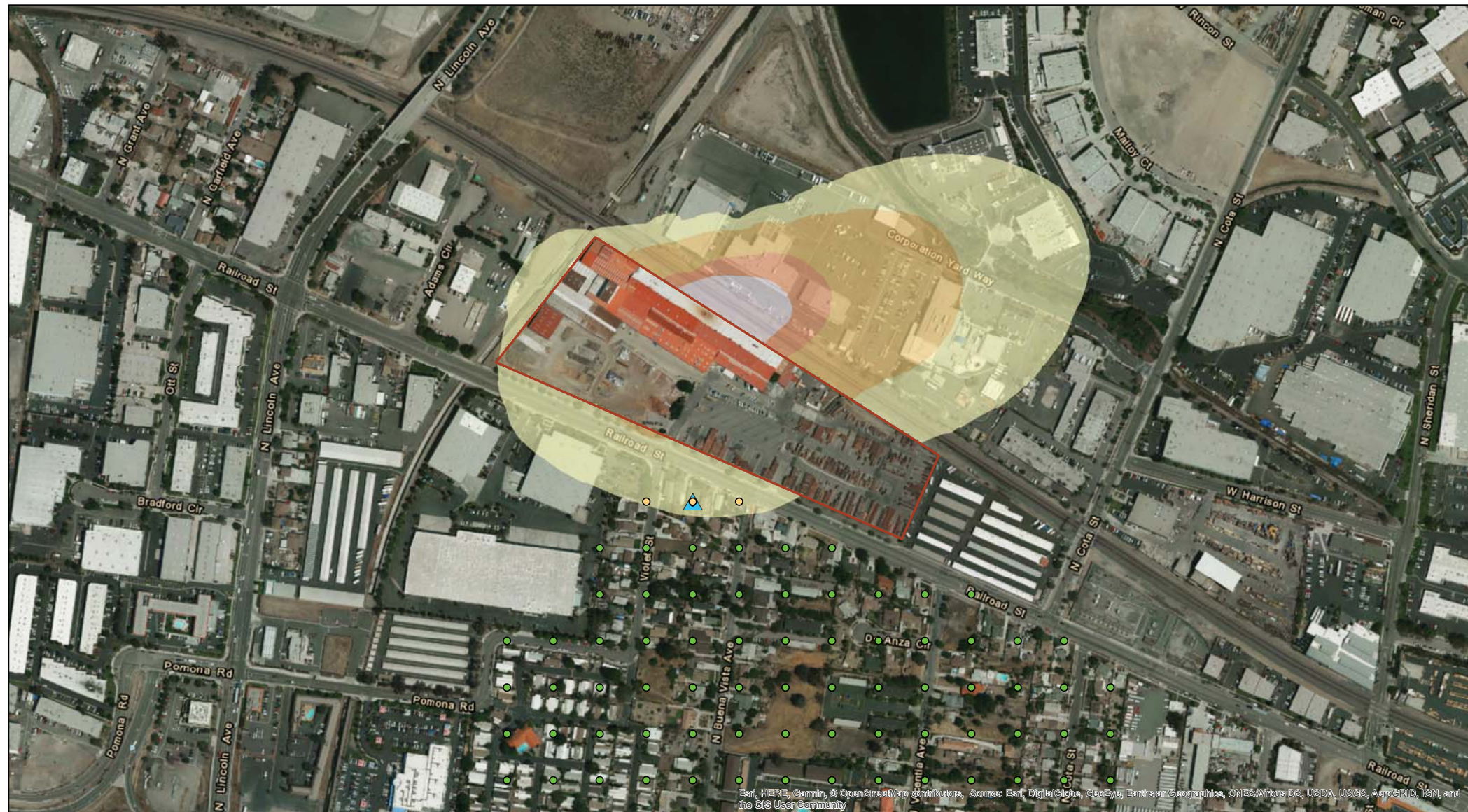
0 75 150  
 Meters

0 400 800 1,200  
 Feet









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**FIGURE 5 - Non-Cancer Isopleths:  
 Non-Cancer Chronic Hazard Index Residential Scenario**

Legend	Non-Cancer Isopleths (HI)	Residential Receptors
Facility Boundary	> 0.5	< 0.5
MEIR	> 1	> 0.5
	> 3	
	> 5	

Datum: WGS 1984  
 Projection: UTM Zone 11N

0 75 150 Meters

0 400 800 1,200 Feet







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**FIGURE 6 - Non-Cancer Isopleths:  
 Non-Cancer Acute Hazard Index Scenario**


 PMI	 Facility Boundary	The PMI is the only receptor with a Non-Cancer Acute HI above 0.5. Therefore, impact contours are not applicable.
 MEIR	 > 0.5	
 MEIW	 < 0.5	

Datum: WGS 1984  
 Projection: UTM Zone 11N

**MAP NOTES:**  
 Non-Cancer Acute Hazard Risk scenario is the same for residential and worker exposure scenarios.

0 75 150  
 Meters

0 400 800 1,200  
 Feet





## **2.0 BACKGROUND**

### **2.1 Regulatory Framework**

Assembly Bill (AB) 2588 is a California state-wide program that was enacted in order to collect emissions data, identify facilities with TAC emissions that may result in localized health impacts, notify nearby residents of potential significant risks, and reduce significant risks to acceptable levels. Facilities that are subject to the AB2588 program must submit an air toxics inventory to the local air district every four years.

The Corona Facility is subject to the AB2588 program and submitted its latest quadrennial toxics emissions inventory for Reporting Year (RY) 2015. Based on the emissions reported in this quadrennial emissions inventory, SCAQMD sent the Corona Facility a “Notice to Prepare Air Toxics Inventory Report,” dated March 30<sup>th</sup>, 2017.

Boral Roofing LLC (Boral) submitted an Air Toxics Inventory Report (ATIR) for on August 25, 2017. SCAQMD staff provided comments on October 25, 2017, which included a request for a revised ATIR. The revised ATIR was reviewed and approved on November 16, 2017. A subsequent Health Risk Assessment (HRA) pursuant to SCAQMD Rule 1402 was requested by SCAQMD in a letter dated March 27, 2018.

### **2.2 Facility Setting**

The Boral facility is located in UTM Zone 11 at coordinates 446,700 meters East and 3,749,700 meters North, which is approximately 1.75 miles west of the I-15 and California Highway 91 junction. The facility is located in Riverside County, which has an urban modeling option population of 2,189,641 according to SCAQMD AERMOD Guidance (SCAQMD, 2018). The nearest school, Orange Grove High School, is located approximately 0.4 miles (~2,100 feet) south of the Boral facility at 300 S Buena Vista Avenue, Corona, CA 92882.

### 3.0 HAZARD IDENTIFICATION

The sources of TACs at the facility are the two natural-gas fired kilns and two natural-gas fired ovens. Therefore, the processes that result in continuous, long-term releases of TACs include, combustion of natural gas, firing of clay within the kilns, and drying of clay within the ovens. The facility does not have any intermittent sources of TACs, and no diesel-fueled combustion sources were used during the reporting year (2015).

The following TACs are emitted at the facility and were evaluated for cancer risk and/or non-cancer health impacts:

CAS	Pollutant Name
1101	Fluorides (excluding HF)
71432	Benzene
74873	Chloromethane
84662	Diethylphthalate
91203	Naphthalene
106467	1,4-dichlorobenzene
107028	Acrolein
117817	Bis(2-ethylhexy)phthalate (DEHP)
7439921	Lead
7439965	Manganese
7439976	Mercury
7440020	Nickel
7440360	Antimony
7440382	Arsenic
7440417	Beryllium
7440439	Cadmium
7647010	Hydrogen Chloride
7664393	Hydrogen Fluoride
7664417	Ammonia
7782492	Selenium
7782505	Chlorine
18540299	Hexavalent Chromium

The facility emits additional TACs in quantities below the de minimis thresholds for inclusion in an HRA. As determined during the ATIR, the following substances are emitted from the facility but not evaluated for cancer risk or non-cancer health impacts because they are emitted in quantities below the de minimis thresholds:

CAS	Pollutant Name
50000	Formaldehyde
71556	1,1,1-trichloroethane
74884	Iodomethane
75003	Chloroethane
75070	Acetaldehyde
75150	Carbon Disulfide
78933	2-butanone (MEK)
84742	Di-n-butylphthalate
85687	Butylbenzylphthalate
91576	PAHs (Total Except Naphthalene)
100414	Ethylbenzene
100425	Styrene
108883	Toluene
108952	Phenol
110543	Hexane
127184	Tetrachloroethene (PCE)
1330207	Xylene
7440484	Cobalt

## 4.0 EXPOSURE ASSESSMENT

### 4.1 Site Description and Facility Operations

Facility Name: Boral Roofing LLC  
Physical Address: 909 Railroad Street  
Corona, CA 92882  
Facility ID: 1073

The Boral Roofing LLC facility is a clay tile manufacturing facility located in Corona, California. The facility is a Title V and RECLAIM facility. The facility consists of one main manufacturing building, a storage shed, parking lots, and product storage areas. Within the manufacturing building, raw clay is transported to mixers and extruders where additives are introduced into the process. The extruders produce formed product in the desired size and shape. The wet product is transferred to the ovens via conveyor belt where they are dried. The dry tiles are then transferred to the kilns via conveyor belt for curing. Once curing is complete, the tiles are arranged and packaged for storage and shipment. The facility operates 24 hours a day, seven days a week. The sources of TACs at the facility are the two natural-gas fired kilns and two natural-gas fired ovens. A facility plot plan is provided as Figure 1.

The facility does not have any extraordinary features that would result in any site/route dependent exposure pathways besides the default exposure pathways.

### 4.2 Emissions Estimates

Source release parameters were obtained from source test results, as-built drawing, and facility personnel's knowledge of the facility. Source parameters, such as name, location, release height, etc. are provided in Table 10 Annual emissions in pounds per year (lb/yr) and hourly emissions in pounds per hour (lb/hr), and hourly emissions in grams per second (g/s) for each source are provided in Table 11, 12, and 13, respectively. Please note that only pollutants above the de minimis thresholds are included in Tables 11 through 13. Total facility emissions in lb/yr and lb/hr are summarized in Table 1.

### 4.3 Air Dispersion Modeling

Air dispersion modeling was performed to estimate GLCs at and beyond the property boundary of the Facility. USEPA's AERMOD executable version 18081 via the BREEZE AERMOD software. AERMOD input (.ami) and output (.amz) files are provided as part of this HRA.

#### 4.3.1 Meteorological Data

AERMOD-ready meteorological data were obtained from SCAQMD. Data from the Chino Airport (KCNO) meteorological station were selected as the Chino Airport station is the closest to the Boral Facility. Data at KCNO are available for years 2012 through 2016. There are no intervening terrain features between KCNO and the Boral facility. The surface (.sfc) and profile (.pfl) files are provided electronically as part of this HRA.



#### 4.3.2 Terrain Data

Surface elevations for the various modeling objects in the modeling domain were imported from National Elevation Dataset (NED) files developed by the United States Geological Survey (USGS). NED files are available in 1-arc second resolution. A NED file obtained from the Multi-Resolution Land Characteristics Consortium (MRLC) National Land Cover Database (NLDC) was used in the air dispersion modeling.

#### 4.3.3 Model Options

The following options were used in running the AERMOD model based on SCAQMD modeling guidelines.

- AERMOD was executed using the urban modeling option, which is SCAQMD policy for all air quality impact analyses in its jurisdiction. The default population for Riverside County, 2,189,641, was selected.
- USEPA regulatory default options were implemented.
- The UTM, WGS 1984 projection was implemented.
- The pollutant was set to "Other"
- Regulatory default concentration only, was used, and no depletion options were selected.

#### 4.3.4 Receptors

The Facility has a total area of approximately 15 acres. Per the SCAQMD guidelines, the maximum receptor spacing is 50 meters for facilities with total areas between 10 and 25 acres (SCAQMD, 2018). Fifty- (50-) meter spacing was used for fence-line receptors, and 50-meter spacing was used for receptors outside the property boundary. All receptors were set to a flagpole height of zero (0) meters to represent ground-level concentrations. The majority of the receptors in the vicinity of the Boral facility are non-residential (worker) receptors, except for the residential neighborhood located to the south of the facility across Railroad Street. All residential receptors were identified as sensitive receptors in AERMOD. Table 14 lists the location in UTM coordinates for all of the receptors. Table 15 lists the location of only the residential receptors.

The period average concentration for each substance at the PMI, MEIR, and MEIW are provided in Table 16.

The maximum one-hour concentration for each substance at the PMI, MEIR, and MEIW are provided in Table 17.

## 5.0 RISK CHARACTERIZATION

Air dispersion modeling results (plot [.plt] files) were imported into CARB's HARP software. HARP2 ADMRT software version 17320 was utilized to perform the dose-response assessment and calculate the potential cancer risk non-cancer health impacts for the various receptors surrounding the Boral facility. The dose-response assessment and risk calculations were performed in accordance with OEHHA's Risk Assessment Guidelines (OEHHA, 2015) and SCAQMD's Supplemental Guidelines (SCAQMD, 2015).

### 5.1 Exposure Assessment

#### 5.1.1 Identification of Potentially Exposed Populations

The facility is mostly surrounded by commercial and industrial properties. A residential neighborhood exists to the south of the facility, across Railroad Street. Receptors located within this residential neighborhood were designated as residential receptors and assumed to be sensitive receptors. All other receptors were designated as non-residential or worker receptors. No discrete sensitive receptors were identified within the direct vicinity of the Boral facility. Table 14 lists the location in UTM coordinates for all receptors. Table 15 lists the location of the residential receptors.

#### 5.1.2 Exposure Pathways

##### 5.1.2.1 Residents

The residential neighborhood located to the south of the Boral facility is a typical suburban residential community. Therefore, the following default residential exposure pathways were included in this HRA:

- Inhalation
- Soil ingestion
- Dermal absorption
- Mother's Milk
- Home Grown Produce

No site- or receptor-specific exposure pathways were identified within the residential neighborhood.

##### 5.1.2.2 Off-Site Workers

As stated above, the facility is mostly surrounded by commercial and industrial properties. The following default worker exposure pathways were included in this HRA:

- Inhalation
- Soil ingestion
- Dermal absorption

#### 5.1.3 HARP Exposure Analysis Methods and Assumptions

Cancer and noncancer health impacts may be evaluated in HARP. Cancer risk is expressed as a theoretical probability of an individual person developing cancer as a result of exposure to

carcinogenic substances. Noncancer risk is expressed with a hazard index number (HI) for pollutant-targeted organ systems: the cardiovascular system, central nervous system, immune system, kidneys, gastrointestinal tract and liver, reproductive/developmental system, respiratory system, skin, eyes, skeletal system, endocrine system, hematological system, physiological response to odors, and general toxicity (CARB, 2018). Calculations built into HARP2 ADMRT are based on the dose and risk calculation methodologies and pollutant risk factors contained within the OEHHA Risk Assessment Guidelines.

According to the OEHHA and SCAQMD guidelines, different exposure scenarios should be used for residential and worker receptors. Exposure scenarios and assumptions for residential and worker receptors are identified in the following sections.

#### 5.1.3.1 Resident

For notification and risk reduction purposes, a 30-year exposure scenario is used for residential receptors. The following additional parameters were selected in HARP:

- Receptor Type: Individual Resident
- Intake Rate Percentile: OEHHA Derived Method (when applicable)
- Exposure Frequency: 350 days per year
- Deposition Rate: 0.02 meters per second

For population-based exposure and cancer burden calculation purposes, a 70-year exposure scenario was used for residential receptors. All other parameters remained the same.

#### 5.1.3.2 Off-Site Workers

For notification and risk reduction purposes, a 25-year exposure scenario is used for residential receptors. The following additional parameters were selected in HARP:

- Receptor Type: Worker
- Intake Rate Percentile: OEHHA Derived Method (when applicable)
- Exposure Frequency: 250 days per year
- Deposition Rate: 0.02 meters per second

The Boral facility is operational 24 hours per day, 7 days per week. Therefore, the Worker Adjustment Factor (WAF) is 1.0.

## 5.2 Dose-Response Assessment

According to OEHHA, dose-response assessment describes the quantitative relationship between the amount of exposure to a substance (the dose) and the incidence or occurrence of an adverse health impact (the response). Dose-response information for noncancer health effects is used to determine Reference Exposure Levels (RELs). Dose-response information for cancer risks are based on cancer potency factors (OEHHA, 2015). Chronic RELs, 8-hour Chronic RELs, Acute RELs, and cancer potency factors for each pollutant are listed in the OEHHA Guidelines and built into HARP2. These values are periodically updated, and new versions of HARP2 incorporate the changes.

### 5.3 Risk Characterization Methodology

Risks are characterized using calculations and methodology contained in the OEHHA Guidelines and built into HARP2. Risk is calculated based on dose, dose-response values (RELs or cancer potency factors), and exposure duration and frequency. For this HRA, all risks were calculated using a Tier 1 approach using OEHHA and SCAQMD default values.

#### 5.3.1 Carcinogenic Risks

For notification and risk reduction purposes, a 30-year exposure scenario is used for residential receptors and a 25-year exposure scenario is used for worker receptors. For population-based exposure, a 70-year exposure scenario was used. The additional assumptions used for residential and worker receptor risk characterization are provided in Section 5.1.3. This HRA is a Tier 1 assessment where OEHHA and SCAQMD defaults were used. Carcinogenic risks are calculated for each receptor by calculating the dose of each pollutant at that receptor then following the calculation methodology in Section 8 of the OEHHA Guidelines. Multipathway risks are accounted for within HARP2 and follow the methodology in the guidelines.

#### 5.3.2 Chronic Non-cancer Hazards

For notification and risk reduction purposes, a 30-year exposure scenario is used for residential receptors and a 25-year exposure scenario is used for worker receptors. For notification and risk reduction purposes, a 30-year exposure scenario is used for residential receptors and a 25-year exposure scenario is used for worker receptors. Chronic hazards are calculated using the period average ground level concentration of each pollutant compared to the chronic REL for each pollutant. The sum of the HIs for each pollutant is the total chronic HI for each receptor.

#### 5.3.3 Acute Non-cancer Hazards

Acute non-cancer hazards are identical for residential and non-residential (worker) receptors. Therefore, only one set of methodology was utilized for acute non-cancer hazard index calculation. Acute hazards are calculated using the maximum 1-hour ground level concentration of each pollutant compared to the acute REL for each pollutant. The sum of the HIs for each pollutant is the total acute HI.

### 5.4 Risk Characterization Results

#### 5.4.1 Cancer Risks

The following table summarizes the potential cancer risks at the PMI, MEIR, and MEIW.

Receptor	UTM X (m)	UTM Y (m)	Cancer Risk
PMI	446,659.5	3,749,812	103 in one million <sup>1</sup>
MEIR	446,650	3,749,600	6.41 in one million
MEIW	446,700	3,749,850	1.90 in one million

1. The cancer risk at the PMI presented above assumes the residential receptor exposure scenario. The PMI is located on the facility fenceline where residential receptors do not exist. Under the worker receptor exposure scenario, the cancer risk at the PMI is 4.33 in one million.

Arsenic and Hexavalent Chromium appear to drive the cancer risk. Cancer risk contribution for each substance at the MEIR and MEIW are provided in Table 4. Cancer risk contribution by each source at the MEIR and MEIW are provided in Table 18 and Table 19, respectively. Cancer risk isopleths are provided as Figure 2 and Figure 3.

#### 5.4.2 Non-Cancer Chronic Health Index

The following table summarizes the potential non-cancer chronic HI at the PMI, MEIR, and MEIW.

Receptor	UTM X (m)	UTM Y (m)	Non-Cancer Chronic HI	Target Organ
PMI	446,659.5	3,749,812	9.63 <sup>1</sup>	RESP
MEIR	446,650	3,749,600	0.57	RESP
MEIW	446,700	3,749,850	2.72	RESP

1. The non-cancer chronic HI at the PMI presented above assumes the residential receptor exposure scenario. The PMI is located on the facility fenceline where residential receptors do not exist. Under the worker receptor exposure scenario, the non-cancer chronic HI at the PMI is 6.24.

Hydrogen chloride (HCl), arsenic, hydrogen fluoride (HF), and fluorides appear to drive the non-cancer chronic HI. The primary target organ for the non-cancer chronic HI is the respiratory system. Non-cancer chronic HI contribution by each substance at the MEIR and MEIW are provided in Table 5 and Table 6, respectively. Non-cancer chronic HI contribution by each source at the MEIR and MEIW are provided in Table 20 and Table 21, respectively. Non-cancer chronic HI isopleths are provided as Figure 4 and Figure 5.

The non-cancer 8-hour chronic HIs for the PMI is 0.163. Manganese, arsenic, and mercury appear to drive the non-cancer 8-hour chronic HI, and the primary target organ is the central nervous system.

#### 5.4.3 Non-Cancer Acute Health Index

The following table summarizes the potential non-cancer acute HI at the PMI, MEIR, and MEIW.

Receptor	UTM X (m)	UTM Y (m)	Non-Cancer Acute HI	Target Organ
PMI	446,659.5	3,749,812	0.51	Eye
MEIR	446,650	3,749,600	0.18	Eye
MEIW	446,700	3,749,850	0.38	Eye

HF, fluorides, and HCl appear to drive the non-cancer acute HI, and the primary target organ systems are the eye and respiratory system. Non-cancer acute HI contribution by each substance at the PMI, MEIR and MEIW are provided in Table 7, Table 8, and Table 9, respectively. Non-cancer acute HI contribution by source at the PMI, MEIR and MEIW are provided in Table 22, Table 23, and Table 24, respectively. The non-cancer acute HI isopleth are provided as Figure 6.

#### 5.4.4 Population Exposure

The majority of the receptors with a cancer risk above 1 in a million and/or a hazard index above 1 are located directly adjacent to the facility. For worker receptors, the neighbor facility located north of the Boral facility across the railway is the only facility exposed to a cancer risk above 1 in a million and a hazard index above 1. For residential receptors, non-cancer hazard indexes are

not above 1 and cancer risk under the 70-year exposure scenario drops below 1 in one million near the line demarcated by UTM Y coordinate 3,749,350 meters. This area includes the residential neighborhood within a quarter-mile radius of the facility. According to USEPA Enforcement and Compliance History Online (ECHO), approximately 17,050 persons live within one mile of the facility. Conservative multiplying the cancer risk under the 70-year scenario at the MEIR ( $7.59 \times 10^{-6}$ ) by 17,050 results in a cancer burden of 0.13. Assuming the population within one quarter mile of the facility is approximately one eighth the population within one mile, the total population exposed to a cancer risk at or above 1 in one million is estimated to be approximately 2,100 people. Population-based exposure is summarized in the tables below.

Cancer Risk

Exposed to Cancer Risk Greater Than...	Workers	Residents
100 in one million	0	0
10 in one million	0	0
1 in one million	1 Facility	~2,100

Non-Cancer Health Index

Exposed to Non-Cancer Health Index Greater Than...	Workers	Residents
5.0	0	0
3.0	0	0
1.0	1 Facility	0
0.5	3 Facilities	~20

## **6.0 CONCLUSIONS**

The non-cancer chronic HI at the MEIW is greater than 1 and less than 3. Therefore, notification will be required for the facility north of the Boral facility across the railway. The primary drivers for this non-cancer chronic HI is arsenic, HCl, and HF from Source 154. The cancer risk is below 10 in one million at the MEIR and MEIW, the non-cancer acute HI is less than 1 at the PMI, MEIR, and MEIW, and the non-cancer chronic HI is less than 1 at the MEIR. Therefore, no other notification or risk reduction is required.

## 7.0 REFERENCES

1. California Air Resources Board (CARB), 2018. Hotspots Analysis and Reporting Program (HARP).” June 11. Available online at: <https://www.arb.ca.gov/toxics/harp/harp.htm>.
2. Office of Environmental Health Hazard Assessment (OEHHA), 2015. “Air Toxics Hot Spots Program. Risk Assessment Guidelines. Guidance Manual for Preparation of Risk Assessments.” February. Available online at: <https://oehha.ca.gov/air/crrr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0>
3. South Coast Air Quality Management District (SCAQMD), 2015. “Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics “Hot Spots” Information and Assessment Act.” June 5. Available online at: [http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588\\_guidelines.pdf?sfvrsn=2](http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588_guidelines.pdf?sfvrsn=2).
4. South Coast Air Quality Management District (SCAQMD), 2018. “SCAQMD Modeling Guidance for AERMOD.” Available online at: [www.aqmd.gov/home/air-quality/air-quality-data-studies/meteorological-data/modeling-guidance#AERMOD](http://www.aqmd.gov/home/air-quality/air-quality-data-studies/meteorological-data/modeling-guidance#AERMOD).



## Tables

**Table 1**  
**Facility Emissions Summary**  
**Boral Roofing LLC, Corona, CA**

Substance Name	CAS	Annual Average Emissions	Maximum Hourly Emissions
		(lb/yr)	(lb/hr)
Fluorides (excluding HF)	1101	5,114.688	8.87E-01
Benzene	71432	0.873	2.77E-04
Chloromethane	74873	35.696	6.19E-03
Diethylphthalate	84662	12.787	2.22E-03
Naphthalene	91203	0.043	1.34E-05
1,4-dichlorobenzene	106467	2.557	4.44E-04
Acrolein	107028	0.391	1.21E-04
Bis(2-ethylhexy)phthalate (DEHP)	117817	106.556	1.85E-02
Lead	7439921	7.992	1.39E-03
Manganese	7439965	15.451	2.68E-03
Mercury	7439976	0.400	6.93E-05
Nickel	7440020	3.836	6.65E-04
Antimony	7440360	1.439	2.49E-04
Arsenic	7440382	0.789	1.37E-04
Beryllium	7440417	0.022	3.88E-06
Cadmium	7440439	0.217	3.77E-05
Hydrogen Chloride	7647010	23,442.320	4.07E+00
Hydrogen Fluoride	7664393	8,524.480	1.48E+00
Ammonia	7664417	463.208	1.43E-01
Selenium	7782492	12.254	2.13E-03
Chlorine	7782505	69.261	1.20E-02
Hexavalent Chromium	18540299	0.037	8.09E-06



**Table 3**  
**Target Organs for Each Substance**  
**Boral Roofing LLC, Corona, CA**

Substance Name	CAS	Chronic Hazard Target Organs	Acute Hazard Target Organs
Fluorides (excluding HF)	1101	Respiratory system, eyes	Respiratory system, eyes
Benzene	71432	Hematologic system, nervous system, development	Reproductive/ development, immune system, hematologic system
Chloromethane	74873	Developmental Toxicity, Male Reproductive Toxicity	-
Diethylphthalate	84662	-	-
Naphthalene	91203	Respiratory system	-
1,4-dichlorobenzene	106467	Nervous system, respiratory system, alimentary system (liver), kidney	-
Acrolein	107028	Respiratory System	Respiratory system and eyes
Bis(2-ethylhexy)phthalate (DEHP)	117817	Developmental Toxicity, Male Reproductive Toxicity	-
Lead	7439921	Developmental Toxicity, Male Reproductive Toxicity, Female Reproductive Toxicity	-
Manganese	7439965	Nervous system	-
Mercury	7439976	Inhalation and oral: Nervous system, kidney, development	Reproductive/ development
Nickel	7440020	Inhalation: Respiratory system, hematologic system. Oral: Development	Immune system
Antimony	7440360	liver histopathological changes	-
Arsenic	7440382	Reproductive/ development; cardiovascular system; nervous system; lung; skin	Reproductive/ development, cardiovascular system, nervous system
Beryllium	7440417	Inhalation: Respiratory system, immune system. Oral: Alimentary system (gastrointestinal tract)	-
Cadmium	7440439	Inhalation: Kidney, respiratory system. Oral: Kidney	-
Hydrogen Chloride	7647010	Respiratory system	Respiratory system, eyes
Hydrogen Fluoride	7664393	Inhalation: Bone and teeth, respiratory system. Oral: Bone and teeth	Respiratory system, eyes
Ammonia	7664417	Respiratory System	Respiratory system and eyes
Selenium	7782492	Inhalation and oral: Alimentary system (liver), cardiovascular system, nervous system	-
Chlorine	7782505	Respiratory system	Respiratory system, eyes
Hexavalent Chromium	18540299	Inhalation: Respiratory system. Oral: Hematologic system	-

Source: <https://oehha.ca.gov/chemicals>

**Table 4**  
**Cancer Risk Contribution by Substance**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Cancer Risk	
		MEIR	MEIW
1101	Fluorides (excluding HF)	--	--
71432	Benzene	0.006 in one million	0.002 in one million
74873	Chloromethane	--	--
84662	Diethylphthalate	--	--
91203	Naphthalene	0.0004 in one million	0.0001 in one million
106467	1,4-dichlorobenzene	0.005 in one million	0.003 in one million
107028	Acrolein	--	--
117817	Bis(2-ethylhexy)phthalate (DEHP)	0.211 in one million	0.025 in one million
7439921	Lead	0.167 in one million	0.052 in one million
7439965	Manganese	--	--
7439976	Mercury	--	--
7440020	Nickel	0.181 in one million	0.093 in one million
7440360	Antimony	--	--
7440382	Arsenic	3.995 in one million	1.141 in one million
7440417	Beryllium	0.010 in one million	0.005 in one million
7440439	Cadmium	0.169 in one million	0.087 in one million
7647010	Hydrogen Chloride	--	--
7664393	Hydrogen Fluoride	--	--
7664417	Ammonia	--	--
7782492	Selenium	--	--
7782505	Chlorine	--	--
18540299	Hexavalent Chromium	1.668 in one million	0.495 in one million
	<b>Total</b>	<b>6.41 in one million</b>	<b>1.90 in one million</b>

**Table 5**  
**Non-Cancer Chronic HI Contribution by Substance @ MEIR**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution														
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL	
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-02	0.0E+00	0.0E+00	1.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
71432	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-05	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.3E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	2.1E-07	0.0E+00	2.1E-07	2.1E-07	0.0E+00	2.1E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.9E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	1.1E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	3.3E-03	0.0E+00	3.3E-03	0.0E+00	3.3E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-04	1.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-02	0.0E+00	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	3.0E-01	3.0E-01	0.0E+00	0.0E+00	0.0E+00	3.0E-01	3.0E-01	3.0E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	2.1E-04	0.0E+00	8.7E-06	0.0E+00	2.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	1.4E-03	0.0E+00	0.0E+00	7.0E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-02	0.0E+00	0.0E+00	2.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	7.7E-03	7.7E-03	0.0E+00	0.0E+00	7.7E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-05	0.0E+00	0.0E+00	0.0E+00
<b>Total</b>		3.0E-01	3.2E-01	2.1E-04	4.7E-03	7.7E-03	3.0E-01	<b>5.7E-01</b>	3.0E-01	0.0E+00	3.8E-01	0.0E+00	1.8E-02	0.0E+00	0.0E+00	0.0E+00

**Table 6**  
**Non-Cancer Chronic HI Contribution by Substance @ MEIW**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution													
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-01	0.0E+00	0.0E+00	5.3E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
71432	Benzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-04	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	1.5E-06	0.0E+00	1.5E-06	1.5E-06	0.0E+00	1.5E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	8.1E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	1.3E-02	0.0E+00	1.3E-02	0.0E+00	1.3E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.0E-04	1.3E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-01	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	7.1E-01	7.1E-01	0.0E+00	0.0E+00	0.0E+00	7.1E-01	7.1E-01	7.1E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	1.5E-03	0.0E+00	3.0E-05	0.0E+00	1.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	6.2E-03	0.0E+00	0.0E+00	5.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.9E-01	0.0E+00	0.0E+00	8.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	6.9E-03	6.9E-03	0.0E+00	0.0E+00	6.9E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.4E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.6E-06	0.0E+00	0.0E+00
<b>Total</b>		7.1E-01	8.1E-01	1.5E-03	2.0E-02	6.9E-03	7.2E-01	<b>2.7E+00</b>	7.1E-01	0.0E+00	1.4E+00	0.0E+00	1.3E-01	0.0E+00	0.0E+00

**Table 7**  
**Non-Cancer Acute HI Contribution by Substance @ PMI**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution													
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-01	0.0E+00	1.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
71432	Benzene	0.0E+00	0.0E+00	6.0E-04	0.0E+00	0.0E+00	6.0E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.0E-04	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-03	0.0E+00	2.7E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	5.0E-03	0.0E+00	0.0E+00	0.0E+00	5.0E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	1.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	2.9E-02	2.9E-02	0.0E+00	0.0E+00	0.0E+00	2.9E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.2E-02	0.0E+00	8.2E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.6E-01	0.0E+00	2.6E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-03	0.0E+00	2.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-03	0.0E+00	2.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
<b>Total</b>		2.9E-02	3.5E-02	1.4E-01	0.0E+00	0.0E+00	3.5E-02	<b>5.1E-01</b>	0.0E+00	<b>5.1E-01</b>	0.0E+00	0.0E+00	6.0E-04	0.0E+00	0.0E+00



**Table 8**  
**Non-Cancer Acute HI Contribution by Substance @ MEIR**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution													
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.4E-02	0.0E+00	5.4E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
71432	Benzene	0.0E+00	0.0E+00	2.1E-04	0.0E+00	0.0E+00	2.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.1E-04	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.3E-04	0.0E+00	9.3E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	1.7E-03	0.0E+00	0.0E+00	0.0E+00	1.7E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	4.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	1.0E-02	1.0E-02	0.0E+00	0.0E+00	0.0E+00	1.0E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-02	0.0E+00	2.8E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.0E-02	0.0E+00	9.0E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.6E-04	0.0E+00	8.6E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.3E-04	0.0E+00	8.3E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
<b>Total</b>		1.0E-02	1.2E-02	4.9E-02	0.0E+00	0.0E+00	1.2E-02	<b>1.7E-01</b>	0.0E+00	<b>1.7E-01</b>	0.0E+00	0.0E+00	2.1E-04	0.0E+00	0.0E+00

**Table 9**  
**Non-Cancer Acute HI Contribution by Substance @ MEIW**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Non-Cancer Acute HI Contribution													
		CV	CNS	IMMUN	KIDNEY	GILV	EPRO/DEVE	RESP	SKIN	EYE	BONE/TEETH	ENDO	BLOOD	ODOR	GENERAL
1101	Fluorides (excluding HF)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-01	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
71432	Benzene	0.0E+00	0.0E+00	5.2E-04	0.0E+00	0.0E+00	5.2E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.2E-04	0.0E+00	0.0E+00
74873	Chloromethane	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84662	Diethylphthalate	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
91203	Naphthalene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
106467	1,4-dichlorobenzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
107028	Acrolein	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-03	0.0E+00	2.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
117817	Bis(2-ethylhexyl)phthalate (DEHP)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439921	Lead	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439965	Manganese	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7439976	Mercury	0.0E+00	3.8E-03	0.0E+00	0.0E+00	0.0E+00	3.8E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440020	Nickel	0.0E+00	0.0E+00	1.1E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440360	Antimony	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440382	Arsenic	2.2E-02	2.2E-02	0.0E+00	0.0E+00	0.0E+00	2.2E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440417	Beryllium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7440439	Cadmium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7647010	Hydrogen Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.2E-02	0.0E+00	6.2E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664393	Hydrogen Fluoride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-01	0.0E+00	2.0E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7664417	Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-03	0.0E+00	2.2E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782492	Selenium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
7782505	Chlorine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-03	0.0E+00	1.8E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
18540299	Hexavalent Chromium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
<b>Total</b>		2.2E-02	2.6E-02	1.1E-01	0.0E+00	0.0E+00	2.6E-02	<b>3.8E-01</b>	0.0E+00	<b>3.8E-01</b>	0.0E+00	0.0E+00	5.2E-04	0.0E+00	0.0E+00



**Table 11**  
**Annual Emissions By Source and Substance, In Pounds per Year (lbs/yr)**  
**Boral Roofing LLC**  
**Corona, CA**

Chemical Name	CAS No.	AN#: 459794	AN#: 458088	AN#: 451861	AN#: 451861	AN#: 451861	AN#: 458091	Total Emissions (lbs/yr)
		D154	D159	D135	D135	D135	D151	
		ES104	ES102	ES101	ES101	ES101	ES103	
		Italforni Kiln – D154	Mini-Italforni Kiln – D159	Ceratec Dryer – D135-1	Ceratec Dryer – D135-2	Ceratec Dryer – D135-3	Italforni Dryer – D151	
Fluorides (excluding HF)	1101	5.08E+03	3.48E+01	--	--	--	--	5.11E+03
Benzene	71432	5.53E-01	2.95E-02	6.67E-02	6.67E-02	6.67E-02	9.33E-02	8.76E-01
Chloromethane	74873	3.55E+01	2.43E-01	--	--	--	--	3.57E+01
Diethylphthalate	84662	1.27E+01	8.71E-02	--	--	--	--	1.28E+01
Naphthalene	91203	2.86E-02	1.11E-03	3.33E-03	3.33E-03	3.33E-03	3.50E-03	4.32E-02
1,4-dichlorobenzene	106467	2.54E+00	1.74E-02	--	--	--	--	2.56E+00
Acrolein	107028	2.58E-01	9.96E-03	3.06E-02	3.06E-02	3.06E-02	3.15E-02	3.91E-01
Di(2-ethylhexyl) phthalate	117817	1.06E+02	7.26E-01	--	--	--	--	1.07E+02
Lead	7439921	7.94E+00	5.45E-02	--	--	--	--	7.99E+00
Manganese	7439965	1.53E+01	1.05E-01	--	--	--	--	1.55E+01
Mercury	7439976	3.97E-01	2.72E-03	--	--	--	--	4.00E-01
Nickel	7440020	3.81E+00	2.61E-02	--	--	--	--	3.84E+00
Antimony	7440360	1.43E+00	9.80E-03	--	--	--	--	1.44E+00
Arsenic	7440382	7.83E-01	5.37E-03	--	--	--	--	7.89E-01
Beryllium	7440417	2.22E-02	1.52E-04	--	--	--	--	2.24E-02
Cadmium	7440439	2.16E-01	1.48E-03	--	--	--	--	2.17E-01
Hydrogen Chloride	7647010	2.33E+04	1.60E+02	--	--	--	--	2.34E+04
Hydrogen Fluoride	7664393	8.47E+03	5.81E+01	--	--	--	--	8.52E+03
Ammonia	7664417	3.05E+02	1.18E+01	3.63E+01	3.63E+01	3.63E+01	3.73E+01	4.63E+02
Selenium	7782492	1.22E+01	8.35E-02	--	--	--	--	1.23E+01
Chlorine	7782505	6.88E+01	4.72E-01	--	--	--	--	6.93E+01
Hexavalent Chromium	18540299	3.04E-02	2.09E-04	3.33E-03	3.33E-03	3.33E-03	2.01E-04	4.08E-02

**Table 12**  
**Maximum Hourly Emissions By Source and Substance, In Pounds per Hour (lbs/hr)**  
**Boral Roofing LLC**  
**Corona, CA**

Chemical Name	CAS No.	AN#: 459794	AN#: 458088	AN#: 451861	AN#: 451861	AN#: 451861	AN#: 458091	Total Emissions (lbs/hr)
		D154	D159	D135	D135	D135	D151	
		ES104	ES102	ES101	ES101	ES101	ES103	
		Italforni Kiln – D154	Mini-Italforni Kiln – D159	Ceratec Dryer – D135-1	Ceratec Dryer – D135-2	Ceratec Dryer – D135-3	Italforni Dryer – D151	
Fluorides (excluding HF)	1101	4.13E-04	2.30E-02	--	--	--	--	2.35E-02
Benzene	71432	1.94E-04	1.60E-05	2.36E-05	2.36E-05	2.36E-05	4.96E-05	3.31E-04
Chloromethane	74873	6.03E-03	1.61E-04	--	--	--	--	6.19E-03
Diethylphthalate	84662	2.16E-03	5.76E-05	--	--	--	--	2.22E-03
Naphthalene	91203	7.29E-06	5.99E-07	1.22E-06	1.22E-06	1.22E-06	1.86E-06	1.34E-05
1,4-dichlorobenzene	106467	4.32E-04	1.15E-05	--	--	--	--	4.44E-04
Acrolein	107028	6.56E-05	5.39E-06	1.10E-05	1.10E-05	1.10E-05	1.67E-05	1.21E-04
Di(2-ethylhexyl) phthalate	117817	1.80E-02	4.80E-04	--	--	--	--	1.85E-02
Lead	7439921	1.35E-03	3.60E-05	--	--	--	--	1.39E-03
Manganese	7439965	2.61E-03	6.96E-05	--	--	--	--	2.68E-03
Mercury	7439976	8.64E-04	1.80E-06	--	--	--	--	8.66E-04
Nickel	7440020	6.48E-04	1.73E-05	--	--	--	--	6.65E-04
Antimony	7440360	2.43E-04	6.48E-06	--	--	--	--	2.49E-04
Arsenic	7440382	1.33E-04	3.55E-06	--	--	--	--	1.37E-04
Beryllium	7440417	3.78E-06	1.01E-07	--	--	--	--	3.88E-06
Cadmium	7440439	3.67E-05	9.79E-07	--	--	--	--	3.77E-05
Hydrogen Chloride	7647010	3.96E+00	1.06E-01	--	--	--	--	4.07E+00
Hydrogen Fluoride	7664393	1.44E+00	3.84E-02	--	--	--	--	1.48E+00
Ammonia	7664417	7.77E-02	6.39E-03	1.30E-02	1.30E-02	1.30E-02	1.98E-02	1.43E-01
Selenium	7782492	2.07E-03	5.52E-05	--	--	--	--	2.13E-03
Chlorine	7782505	1.17E-02	3.12E-04	--	--	--	--	1.20E-02
Hexavalent Chromium	18540299	5.01E-06	1.38E-07	4.62E-07	4.62E-07	4.62E-07	1.39E-06	7.92E-06

**Table 13**  
**Annual Emissions By Source and Substance, In Grams per Second (g/s)**  
**Boral Roofing LLC**  
**Corona, CA**

Chemical Name	CAS No.	AN#: 459794	AN#: 458088	AN#: 451861	AN#: 451861	AN#: 451861	AN#: 458091	Total Emissions (g/s)
		D154	D159	D135	D135	D135	D151	
		ES104	ES102	ES101	ES101	ES101	ES103	
		Italforni Kiln – D154	Mini-Italforni Kiln – D159	Ceratec Dryer – D135-1	Ceratec Dryer – D135-2	Ceratec Dryer – D135-3	Italforni Dryer – D151	
Fluorides (excluding HF)	1101	5.20E-05	2.90E-03	--	--	--	--	2.96E-03
Benzene	71432	2.45E-05	2.01E-06	2.98E-06	2.98E-06	2.98E-06	6.25E-06	4.17E-05
Chloromethane	74873	7.60E-04	2.03E-05	--	--	--	--	7.80E-04
Diethylphthalate	84662	2.72E-04	7.26E-06	--	--	--	--	2.79E-04
Naphthalene	91203	9.18E-07	7.55E-08	1.54E-07	1.54E-07	1.54E-07	2.34E-07	1.69E-06
1,4-dichlorobenzene	106467	5.44E-05	1.45E-06	--	--	--	--	5.59E-05
Acrolein	107028	8.26E-06	6.79E-07	1.39E-06	1.39E-06	1.39E-06	2.11E-06	1.52E-05
Di(2-ethylhexyl) phthalate	117817	2.27E-03	6.05E-05	--	--	--	--	2.33E-03
Lead	7439921	1.70E-04	4.54E-06	--	--	--	--	1.75E-04
Manganese	7439965	3.29E-04	8.77E-06	--	--	--	--	3.38E-04
Mercury	7439976	1.09E-04	2.27E-07	--	--	--	--	1.09E-04
Nickel	7440020	8.16E-05	2.18E-06	--	--	--	--	8.38E-05
Antimony	7440360	3.06E-05	8.16E-07	--	--	--	--	3.14E-05
Arsenic	7440382	1.68E-05	4.48E-07	--	--	--	--	1.72E-05
Beryllium	7440417	4.76E-07	1.27E-08	--	--	--	--	4.89E-07
Cadmium	7440439	4.63E-06	1.23E-07	--	--	--	--	4.75E-06
Hydrogen Chloride	7647010	4.99E-01	1.33E-02	--	--	--	--	5.12E-01
Hydrogen Fluoride	7664393	1.81E-01	4.84E-03	--	--	--	--	1.86E-01
Ammonia	7664417	9.79E-03	8.05E-04	1.64E-03	1.64E-03	1.64E-03	2.50E-03	1.80E-02
Selenium	7782492	2.61E-04	6.96E-06	--	--	--	--	2.68E-04
Chlorine	7782505	1.47E-03	3.93E-05	--	--	--	--	1.51E-03
Hexavalent Chromium	18540299	6.32E-07	1.74E-08	5.82E-08	5.82E-08	5.82E-08	1.75E-07	9.98E-07

**Table 14**  
**List and Locations of Receptors**  
**Boral Roofing LLC, Corona, CA**

HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
1	446250	3749300	Grid - Non-Resident	No
2	446300	3749300	Grid - Non-Resident	No
3	446350	3749300	Grid - Non-Resident	No
4	446400	3749300	Grid - Non-Resident	No
5	446450	3749300	Grid - Resident	Yes
6	446500	3749300	Grid - Resident	Yes
7	446550	3749300	Grid - Resident	Yes
8	446600	3749300	Grid - Resident	Yes
9	446650	3749300	Grid - Resident	Yes
10	446700	3749300	Grid - Resident	Yes
11	446750	3749300	Grid - Resident	Yes
12	446800	3749300	Grid - Resident	Yes
13	446850	3749300	Grid - Resident	Yes
14	446900	3749300	Grid - Resident	Yes
15	446950	3749300	Grid - Resident	Yes
16	447000	3749300	Grid - Resident	Yes
17	447050	3749300	Grid - Resident	Yes
18	447100	3749300	Grid - Resident	Yes
19	447150	3749300	Grid - Non-Resident	No
20	447200	3749300	Grid - Non-Resident	No
21	446200	3749350	Grid - Non-Resident	No
22	446250	3749350	Grid - Non-Resident	No
23	446300	3749350	Grid - Non-Resident	No
24	446350	3749350	Grid - Non-Resident	No
25	446400	3749350	Grid - Non-Resident	No
26	446450	3749350	Grid - Resident	Yes
27	446500	3749350	Grid - Resident	Yes
28	446550	3749350	Grid - Resident	Yes
29	446600	3749350	Grid - Resident	Yes
30	446650	3749350	Grid - Resident	Yes
31	446700	3749350	Grid - Resident	Yes
32	446750	3749350	Grid - Resident	Yes
33	446800	3749350	Grid - Resident	Yes
34	446850	3749350	Grid - Resident	Yes
35	446900	3749350	Grid - Resident	Yes
36	446950	3749350	Grid - Resident	Yes
37	447000	3749350	Grid - Resident	Yes
38	447050	3749350	Grid - Resident	Yes
39	447100	3749350	Grid - Resident	Yes
40	447150	3749350	Grid - Non-Resident	No
41	447200	3749350	Grid - Non-Resident	No
42	446200	3749400	Grid - Non-Resident	No

HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
43	446250	3749400	Grid - Non-Resident	No
44	446300	3749400	Grid - Non-Resident	No
45	446350	3749400	Grid - Non-Resident	No
46	446400	3749400	Grid - Non-Resident	No
47	446450	3749400	Grid - Resident	Yes
48	446500	3749400	Grid - Resident	Yes
49	446550	3749400	Grid - Resident	Yes
50	446600	3749400	Grid - Resident	Yes
51	446650	3749400	Grid - Resident	Yes
52	446700	3749400	Grid - Resident	Yes
53	446750	3749400	Grid - Resident	Yes
54	446800	3749400	Grid - Resident	Yes
55	446850	3749400	Grid - Resident	Yes
56	446900	3749400	Grid - Resident	Yes
57	446950	3749400	Grid - Resident	Yes
58	447000	3749400	Grid - Resident	Yes
59	447050	3749400	Grid - Resident	Yes
60	447100	3749400	Grid - Resident	Yes
61	447150	3749400	Grid - Non-Resident	No
62	447200	3749400	Grid - Non-Resident	No
63	446200	3749450	Grid - Non-Resident	No
64	446250	3749450	Grid - Non-Resident	No
65	446300	3749450	Grid - Non-Resident	No
66	446350	3749450	Grid - Non-Resident	No
67	446400	3749450	Grid - Non-Resident	No
68	446450	3749450	Grid - Resident	Yes
69	446500	3749450	Grid - Resident	Yes
70	446550	3749450	Grid - Resident	Yes
71	446600	3749450	Grid - Resident	Yes
72	446650	3749450	Grid - Resident	Yes
73	446700	3749450	Grid - Resident	Yes
74	446750	3749450	Grid - Resident	Yes
75	446800	3749450	Grid - Resident	Yes
76	446850	3749450	Grid - Resident	Yes
77	446900	3749450	Grid - Resident	Yes
78	446950	3749450	Grid - Resident	Yes
79	447000	3749450	Grid - Resident	Yes
80	447050	3749450	Grid - Resident	Yes
81	447100	3749450	Grid - Non-Resident	No
82	447150	3749450	Grid - Non-Resident	No
83	447200	3749450	Grid - Non-Resident	No
84	446200	3749500	Grid - Non-Resident	No
85	446250	3749500	Grid - Non-Resident	No
86	446300	3749500	Grid - Non-Resident	No
87	446350	3749500	Grid - Non-Resident	No
88	446400	3749500	Grid - Non-Resident	No



HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
89	446450	3749500	Grid - Non-Resident	No
90	446500	3749500	Grid - Non-Resident	No
91	446550	3749500	Grid - Resident	Yes
92	446600	3749500	Grid - Resident	Yes
93	446650	3749500	Grid - Resident	Yes
94	446700	3749500	Grid - Resident	Yes
95	446750	3749500	Grid - Resident	Yes
96	446800	3749500	Grid - Resident	Yes
97	446850	3749500	Grid - Resident	Yes
98	446900	3749500	Grid - Resident	Yes
99	446950	3749500	Grid - Resident	Yes
100	447000	3749500	Grid - Non-Resident	No
101	447050	3749500	Grid - Non-Resident	No
102	447100	3749500	Grid - Non-Resident	No
103	447150	3749500	Grid - Non-Resident	No
104	447200	3749500	Grid - Non-Resident	No
105	446200	3749550	Grid - Non-Resident	No
106	446250	3749550	Grid - Non-Resident	No
107	446300	3749550	Grid - Non-Resident	No
108	446350	3749550	Grid - Non-Resident	No
109	446400	3749550	Grid - Non-Resident	No
110	446450	3749550	Grid - Non-Resident	No
111	446500	3749550	Grid - Non-Resident	No
112	446550	3749550	Grid - Resident	Yes
113	446600	3749550	Grid - Resident	Yes
114	446650	3749550	Grid - Resident	Yes
115	446700	3749550	Grid - Resident	Yes
116	446750	3749550	Grid - Resident	Yes
117	446800	3749550	Grid - Resident	Yes
118	446850	3749550	Grid - Non-Resident	No
119	446900	3749550	Grid - Non-Resident	No
120	446950	3749550	Grid - Non-Resident	No
121	447000	3749550	Grid - Non-Resident	No
122	447050	3749550	Grid - Non-Resident	No
123	447100	3749550	Grid - Non-Resident	No
124	447150	3749550	Grid - Non-Resident	No
125	447200	3749550	Grid - Non-Resident	No
126	446200	3749600	Grid - Non-Resident	No
127	446250	3749600	Grid - Non-Resident	No
128	446300	3749600	Grid - Non-Resident	No
129	446350	3749600	Grid - Non-Resident	No
130	446400	3749600	Grid - Non-Resident	No
131	446450	3749600	Grid - Non-Resident	No
132	446500	3749600	Grid - Non-Resident	No
133	446550	3749600	Grid - Non-Resident	No
134	446600	3749600	Grid - Resident	Yes

HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
135	446650	3749600	Grid - Resident	Yes
136	446700	3749600	Grid - Resident	Yes
137	446750	3749600	Grid - Non-Resident	No
138	446900	3749600	Grid - Non-Resident	No
139	446950	3749600	Grid - Non-Resident	No
140	447000	3749600	Grid - Non-Resident	No
141	447050	3749600	Grid - Non-Resident	No
142	447100	3749600	Grid - Non-Resident	No
143	447150	3749600	Grid - Non-Resident	No
144	447200	3749600	Grid - Non-Resident	No
145	446200	3749650	Grid - Non-Resident	No
146	446250	3749650	Grid - Non-Resident	No
147	446300	3749650	Grid - Non-Resident	No
148	446350	3749650	Grid - Non-Resident	No
149	446400	3749650	Grid - Non-Resident	No
150	446450	3749650	Grid - Non-Resident	No
151	446500	3749650	Grid - Non-Resident	No
152	446550	3749650	Grid - Non-Resident	No
153	446600	3749650	Grid - Non-Resident	No
154	446650	3749650	Grid - Non-Resident	No
155	446950	3749650	Grid - Non-Resident	No
156	447000	3749650	Grid - Non-Resident	No
157	447050	3749650	Grid - Non-Resident	No
158	447100	3749650	Grid - Non-Resident	No
159	447150	3749650	Grid - Non-Resident	No
160	447200	3749650	Grid - Non-Resident	No
161	446200	3749700	Grid - Non-Resident	No
162	446250	3749700	Grid - Non-Resident	No
163	446300	3749700	Grid - Non-Resident	No
164	446350	3749700	Grid - Non-Resident	No
165	446400	3749700	Grid - Non-Resident	No
166	446450	3749700	Grid - Non-Resident	No
167	446500	3749700	Grid - Non-Resident	No
168	446550	3749700	Grid - Non-Resident	No
169	446850	3749700	Grid - Non-Resident	No
170	446900	3749700	Grid - Non-Resident	No
171	446950	3749700	Grid - Non-Resident	No
172	447000	3749700	Grid - Non-Resident	No
173	447050	3749700	Grid - Non-Resident	No
174	447100	3749700	Grid - Non-Resident	No
175	447150	3749700	Grid - Non-Resident	No
176	447200	3749700	Grid - Non-Resident	No
177	446200	3749750	Grid - Non-Resident	No
178	446250	3749750	Grid - Non-Resident	No
179	446300	3749750	Grid - Non-Resident	No
180	446350	3749750	Grid - Non-Resident	No

HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
181	446400	3749750	Grid - Non-Resident	No
182	446800	3749750	Grid - Non-Resident	No
183	446850	3749750	Grid - Non-Resident	No
184	446900	3749750	Grid - Non-Resident	No
185	446950	3749750	Grid - Non-Resident	No
186	447000	3749750	Grid - Non-Resident	No
187	447050	3749750	Grid - Non-Resident	No
188	447100	3749750	Grid - Non-Resident	No
189	447150	3749750	Grid - Non-Resident	No
190	447200	3749750	Grid - Non-Resident	No
191	446200	3749800	Grid - Non-Resident	No
192	446250	3749800	Grid - Non-Resident	No
193	446300	3749800	Grid - Non-Resident	No
194	446350	3749800	Grid - Non-Resident	No
195	446400	3749800	Grid - Non-Resident	No
196	446450	3749800	Grid - Non-Resident	No
197	446700	3749800	Grid - Non-Resident	No
198	446750	3749800	Grid - Non-Resident	No
199	446800	3749800	Grid - Non-Resident	No
200	446850	3749800	Grid - Non-Resident	No
201	446900	3749800	Grid - Non-Resident	No
202	446950	3749800	Grid - Non-Resident	No
203	447000	3749800	Grid - Non-Resident	No
204	447050	3749800	Grid - Non-Resident	No
205	447100	3749800	Grid - Non-Resident	No
206	447150	3749800	Grid - Non-Resident	No
207	447200	3749800	Grid - Non-Resident	No
208	446200	3749850	Grid - Non-Resident	No
209	446250	3749850	Grid - Non-Resident	No
210	446300	3749850	Grid - Non-Resident	No
211	446350	3749850	Grid - Non-Resident	No
212	446400	3749850	Grid - Non-Resident	No
213	446450	3749850	Grid - Non-Resident	No
214	446500	3749850	Grid - Non-Resident	No
215	446650	3749850	Grid - Non-Resident	No
216	446700	3749850	Grid - Non-Resident	No
217	446750	3749850	Grid - Non-Resident	No
218	446800	3749850	Grid - Non-Resident	No
219	446850	3749850	Grid - Non-Resident	No
220	446900	3749850	Grid - Non-Resident	No
221	446950	3749850	Grid - Non-Resident	No
222	447000	3749850	Grid - Non-Resident	No
223	447050	3749850	Grid - Non-Resident	No
224	447100	3749850	Grid - Non-Resident	No
225	447150	3749850	Grid - Non-Resident	No
226	447200	3749850	Grid - Non-Resident	No

HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
227	446200	3749900	Grid - Non-Resident	No
228	446250	3749900	Grid - Non-Resident	No
229	446300	3749900	Grid - Non-Resident	No
230	446350	3749900	Grid - Non-Resident	No
231	446400	3749900	Grid - Non-Resident	No
232	446450	3749900	Grid - Non-Resident	No
233	446500	3749900	Grid - Non-Resident	No
234	446550	3749900	Grid - Non-Resident	No
235	446600	3749900	Grid - Non-Resident	No
236	446650	3749900	Grid - Non-Resident	No
237	446700	3749900	Grid - Non-Resident	No
238	446750	3749900	Grid - Non-Resident	No
239	446800	3749900	Grid - Non-Resident	No
240	446850	3749900	Grid - Non-Resident	No
241	446900	3749900	Grid - Non-Resident	No
242	446950	3749900	Grid - Non-Resident	No
243	447000	3749900	Grid - Non-Resident	No
244	447050	3749900	Grid - Non-Resident	No
245	447100	3749900	Grid - Non-Resident	No
246	447150	3749900	Grid - Non-Resident	No
247	447200	3749900	Grid - Non-Resident	No
248	446200	3749950	Grid - Non-Resident	No
249	446250	3749950	Grid - Non-Resident	No
250	446300	3749950	Grid - Non-Resident	No
251	446350	3749950	Grid - Non-Resident	No
252	446400	3749950	Grid - Non-Resident	No
253	446450	3749950	Grid - Non-Resident	No
254	446500	3749950	Grid - Non-Resident	No
255	446550	3749950	Grid - Non-Resident	No
256	446600	3749950	Grid - Non-Resident	No
257	446650	3749950	Grid - Non-Resident	No
258	446700	3749950	Grid - Non-Resident	No
259	446750	3749950	Grid - Non-Resident	No
260	446800	3749950	Grid - Non-Resident	No
261	446850	3749950	Grid - Non-Resident	No
262	446900	3749950	Grid - Non-Resident	No
263	446950	3749950	Grid - Non-Resident	No
264	447000	3749950	Grid - Non-Resident	No
265	447050	3749950	Grid - Non-Resident	No
266	447100	3749950	Grid - Non-Resident	No
267	447150	3749950	Grid - Non-Resident	No
268	447200	3749950	Grid - Non-Resident	No
269	446200	3750000	Grid - Non-Resident	No
270	446250	3750000	Grid - Non-Resident	No
271	446300	3750000	Grid - Non-Resident	No
272	446350	3750000	Grid - Non-Resident	No

HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
273	446400	3750000	Grid - Non-Resident	No
274	446450	3750000	Grid - Non-Resident	No
275	446500	3750000	Grid - Non-Resident	No
276	446550	3750000	Grid - Non-Resident	No
277	446600	3750000	Grid - Non-Resident	No
278	446650	3750000	Grid - Non-Resident	No
279	446700	3750000	Grid - Non-Resident	No
280	446750	3750000	Grid - Non-Resident	No
281	446800	3750000	Grid - Non-Resident	No
282	446850	3750000	Grid - Non-Resident	No
283	446900	3750000	Grid - Non-Resident	No
284	446950	3750000	Grid - Non-Resident	No
285	447000	3750000	Grid - Non-Resident	No
286	447050	3750000	Grid - Non-Resident	No
287	447100	3750000	Grid - Non-Resident	No
288	447150	3750000	Grid - Non-Resident	No
289	447200	3750000	Grid - Non-Resident	No
290	446200	3750050	Grid - Non-Resident	No
291	446250	3750050	Grid - Non-Resident	No
292	446300	3750050	Grid - Non-Resident	No
293	446350	3750050	Grid - Non-Resident	No
294	446400	3750050	Grid - Non-Resident	No
295	446450	3750050	Grid - Non-Resident	No
296	446500	3750050	Grid - Non-Resident	No
297	446550	3750050	Grid - Non-Resident	No
298	446600	3750050	Grid - Non-Resident	No
299	446650	3750050	Grid - Non-Resident	No
300	446700	3750050	Grid - Non-Resident	No
301	446750	3750050	Grid - Non-Resident	No
302	446800	3750050	Grid - Non-Resident	No
303	446850	3750050	Grid - Non-Resident	No
304	446900	3750050	Grid - Non-Resident	No
305	446950	3750050	Grid - Non-Resident	No
306	447000	3750050	Grid - Non-Resident	No
307	447050	3750050	Grid - Non-Resident	No
308	447100	3750050	Grid - Non-Resident	No
309	447150	3750050	Grid - Non-Resident	No
310	447200	3750050	Grid - Non-Resident	No
311	446200	3750100	Grid - Non-Resident	No
312	446250	3750100	Grid - Non-Resident	No
313	446300	3750100	Grid - Non-Resident	No
314	446350	3750100	Grid - Non-Resident	No
315	446400	3750100	Grid - Non-Resident	No
316	446450	3750100	Grid - Non-Resident	No
317	446500	3750100	Grid - Non-Resident	No
318	446550	3750100	Grid - Non-Resident	No

HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
319	446600	3750100	Grid - Non-Resident	No
320	446650	3750100	Grid - Non-Resident	No
321	446700	3750100	Grid - Non-Resident	No
322	446750	3750100	Grid - Non-Resident	No
323	446800	3750100	Grid - Non-Resident	No
324	446850	3750100	Grid - Non-Resident	No
325	446900	3750100	Grid - Non-Resident	No
326	446950	3750100	Grid - Non-Resident	No
327	447000	3750100	Grid - Non-Resident	No
328	447050	3750100	Grid - Non-Resident	No
329	447100	3750100	Grid - Non-Resident	No
330	447150	3750100	Grid - Non-Resident	No
331	447200	3750100	Grid - Non-Resident	No
332	446200	3749300	Grid - Non-Resident	No
333	446545	3749885	Boundary	No
334	446513.9	3749845.8	Boundary	No
335	446482.9	3749806.6	Boundary	No
336	446451.8	3749767.4	Boundary	No
337	446438	3749750	Boundary	No
338	446463.4	3749738.9	Boundary	No
339	446509.3	3749719	Boundary	No
340	446555.1	3749699.1	Boundary	No
341	446601	3749679.1	Boundary	No
342	446646.9	3749659.2	Boundary	No
343	446692.7	3749639.3	Boundary	No
344	446738.6	3749619.3	Boundary	No
345	446784.4	3749599.4	Boundary	No
346	446830.3	3749579.4	Boundary	No
347	446875	3749560	Boundary	No
348	446875.5	3749561.1	Boundary	No
349	446895.8	3749606.8	Boundary	No
350	446915	3749650	Boundary	No
351	446912.7	3749651.5	Boundary	No
352	446870.5	3749678.3	Boundary	No
353	446828.3	3749705.1	Boundary	No
354	446786.1	3749731.9	Boundary	No
355	446743.9	3749758.7	Boundary	No
356	446701.7	3749785.5	Boundary	No
357	446659.5	3749812.3	Boundary	No
358	446617.2	3749839.1	Boundary	No
359	446575	3749865.9	Boundary	No

**Table 15**  
**List and Locations of Residential Receptors**  
**Boral Roofing LLC, Corona, CA**

HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
5	446450	3749300	Grid - Resident	Yes
6	446500	3749300	Grid - Resident	Yes
7	446550	3749300	Grid - Resident	Yes
8	446600	3749300	Grid - Resident	Yes
9	446650	3749300	Grid - Resident	Yes
10	446700	3749300	Grid - Resident	Yes
11	446750	3749300	Grid - Resident	Yes
12	446800	3749300	Grid - Resident	Yes
13	446850	3749300	Grid - Resident	Yes
14	446900	3749300	Grid - Resident	Yes
15	446950	3749300	Grid - Resident	Yes
16	447000	3749300	Grid - Resident	Yes
17	447050	3749300	Grid - Resident	Yes
18	447100	3749300	Grid - Resident	Yes
26	446450	3749350	Grid - Resident	Yes
27	446500	3749350	Grid - Resident	Yes
28	446550	3749350	Grid - Resident	Yes
29	446600	3749350	Grid - Resident	Yes
30	446650	3749350	Grid - Resident	Yes
31	446700	3749350	Grid - Resident	Yes
32	446750	3749350	Grid - Resident	Yes
33	446800	3749350	Grid - Resident	Yes
34	446850	3749350	Grid - Resident	Yes
35	446900	3749350	Grid - Resident	Yes
36	446950	3749350	Grid - Resident	Yes
37	447000	3749350	Grid - Resident	Yes
38	447050	3749350	Grid - Resident	Yes
39	447100	3749350	Grid - Resident	Yes
47	446450	3749400	Grid - Resident	Yes
48	446500	3749400	Grid - Resident	Yes
49	446550	3749400	Grid - Resident	Yes
50	446600	3749400	Grid - Resident	Yes
51	446650	3749400	Grid - Resident	Yes
52	446700	3749400	Grid - Resident	Yes
53	446750	3749400	Grid - Resident	Yes
54	446800	3749400	Grid - Resident	Yes
55	446850	3749400	Grid - Resident	Yes
56	446900	3749400	Grid - Resident	Yes
57	446950	3749400	Grid - Resident	Yes
58	447000	3749400	Grid - Resident	Yes
59	447050	3749400	Grid - Resident	Yes
60	447100	3749400	Grid - Resident	Yes

HARP Rec ID	UTM X (m)	UTM (y)	Type	Sensitive
68	446450	3749450	Grid - Resident	Yes
69	446500	3749450	Grid - Resident	Yes
70	446550	3749450	Grid - Resident	Yes
71	446600	3749450	Grid - Resident	Yes
72	446650	3749450	Grid - Resident	Yes
73	446700	3749450	Grid - Resident	Yes
74	446750	3749450	Grid - Resident	Yes
75	446800	3749450	Grid - Resident	Yes
76	446850	3749450	Grid - Resident	Yes
77	446900	3749450	Grid - Resident	Yes
78	446950	3749450	Grid - Resident	Yes
79	447000	3749450	Grid - Resident	Yes
80	447050	3749450	Grid - Resident	Yes
91	446550	3749500	Grid - Resident	Yes
92	446600	3749500	Grid - Resident	Yes
93	446650	3749500	Grid - Resident	Yes
94	446700	3749500	Grid - Resident	Yes
95	446750	3749500	Grid - Resident	Yes
96	446800	3749500	Grid - Resident	Yes
97	446850	3749500	Grid - Resident	Yes
98	446900	3749500	Grid - Resident	Yes
99	446950	3749500	Grid - Resident	Yes
112	446550	3749550	Grid - Resident	Yes
113	446600	3749550	Grid - Resident	Yes
114	446650	3749550	Grid - Resident	Yes
115	446700	3749550	Grid - Resident	Yes
116	446750	3749550	Grid - Resident	Yes
117	446800	3749550	Grid - Resident	Yes
134	446600	3749600	Grid - Resident	Yes
135	446650	3749600	Grid - Resident	Yes
136	446700	3749600	Grid - Resident	Yes



**Table 16**  
**Period Average Concentration @ the PMI, MEIR, and MEIW**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Periodic Concentration ( $\mu\text{g}/\text{m}^3$ )		
		PMI	MEIR	MEIW
1101	Fluorides (excluding HF)	5.56E+00	3.29E-01	2.43E+00
71432	Benzene	8.55E-04	8.00E-05	4.02E-04
74873	Chloromethane	3.88E-02	2.30E-03	1.69E-02
84662	Diethylphthalate	1.39E-02	6.44E-04	6.07E-03
91203	Naphthalene	3.78E+01	1.29E+01	2.84E+01
106467	1,4-dichlorobenzene	2.78E-03	1.65E-04	1.21E-03
107028	Acrolein	3.83E-04	3.45E-05	1.79E-04
117817	Bis(2-ethylhexy)phthalate (DEHP)	1.16E-01	6.86E-03	5.05E-02
7439921	Lead	8.69E-03	5.15E-04	3.79E-03
7439965	Manganese	1.68E-02	9.95E-04	7.33E-03
7439976	Mercury	4.34E-04	2.57E-05	1.90E-04
7440020	Nickel	4.17E-03	2.47E-04	1.82E-03
7440360	Antimony	4.17E-03	2.47E-04	1.82E-03
7440382	Arsenic	8.57E-04	5.08E-05	3.74E-04
7440417	Beryllium	2.43E-05	1.44E-06	1.06E-05
7440439	Cadmium	2.36E-04	1.40E-05	1.03E-04
7647010	Hydrogen Chloride	2.55E+01	1.51E+00	1.11E+01
7664393	Hydrogen Fluoride	9.27E+00	5.49E-01	4.04E+00
7664417	Ammonia	4.54E-01	4.09E-02	2.12E-01
7782492	Selenium	1.33E-02	1.25E-03	5.81E-03
7782505	Chlorine	7.53E-02	4.46E-03	3.29E-02
18540299	Hexavalent Chromium	3.77E-05	2.71E-06	1.69E-05

**Table 17**  
**Maximum One-Hour Concentration @ the PMI, MEIR, and MEIW**  
**Boral Roofing LLC, Corona, CA**

CAS	Pollutant Name	Maximum 1-Hour Concentration ( $\mu\text{g}/\text{m}^3$ )		
		PMI	MEIR	MEIW
1101	Fluorides (excluding HF)	3.78E+01	1.29E+01	2.84E+01
71432	Benzene	1.62E-02	5.58E-03	1.39E-02
74873	Chloromethane	2.64E-01	9.03E-02	1.99E-01
84662	Diethylphthalate	9.46E-02	3.24E-02	7.11E-02
91203	Naphthalene	8.24E-04	2.76E-04	7.11E-04
106467	1,4-dichlorobenzene	1.90E-02	6.49E-03	1.43E-02
107028	Acrolein	6.77E-03	2.33E-03	5.98E-03
117817	Bis(2-ethylhexy)phthalate (DEHP)	7.87E-01	2.70E-01	5.93E-01
7439921	Lead	5.91E-02	2.02E-02	4.44E-02
7439965	Manganese	1.14E-01	3.91E-02	8.60E-02
7439976	Mercury	3.01E-03	1.03E-03	2.26E-03
7440020	Nickel	2.83E-02	9.69E-03	2.13E-02
7440360	Antimony	1.05E-02	3.62E-03	7.94E-03
7440382	Arsenic	5.90E-03	2.01E-03	4.43E-03
7440417	Beryllium	1.56E-04	5.54E-05	1.19E-04
7440439	Cadmium	1.62E-03	5.55E-04	1.22E-03
7647010	Hydrogen Chloride	1.73E+02	5.93E+01	1.30E+02
7664393	Hydrogen Fluoride	6.30E+01	2.16E+01	4.74E+01
7664417	Ammonia	8.07E+00	2.77E+00	7.11E+00
7782492	Selenium	9.05E-02	3.10E-02	6.81E-02
7782505	Chlorine	5.12E-01	1.75E-01	3.85E-01
18540299	Hexavalent Chromium	3.49E-04	1.27E-04	3.02E-04

**Table 18**  
**Cancer Risk by Source - MEIR**  
**Boral Roofing LLC, Corona, CA**  
**MEIR @ 446,650; 3,749,600**

<b>Permit Device #</b>	<b>HRA Source ID</b>	<b>Device Name</b>	<b>Cancer Risk</b>
D135	135	Ceratec Dryer – Zone 1	0.149 in one million
D135	1352	Ceratec Dryer – Zone 2	0.108 in one million
D135	1353	Ceratec Dryer – Zone 3	0.180 in one million
D151	151	Italforni Dryer – D151	0.018 in one million
D154	154	Italforni Kiln – D154	5.780 in one million
D159	159	Mini-Italforni Kiln – D159	0.167 in one million

**Table T19**  
**Cancer Risk by Source - MEIW**  
**Boral Roofing LLC, Corona, CA**  
**MEIW @ 446,700; 3,749,850**

<b>Permit Device #</b>	<b>HRA Source ID</b>	<b>Device Name</b>	<b>Cancer Risk</b>
D135	135	Ceratec Dryer – Zone 1	0.037 in one million
D135	1352	Ceratec Dryer – Zone 2	0.012 in one million
D135	1353	Ceratec Dryer – Zone 3	0.017 in one million
D151	151	Italforni Dryer – D151	0.002 in one million
D154	154	Italforni Kiln – D154	1.808 in one million
D159	159	Mini-Italforni Kiln – D159	0.026 in one million

**Table 20**  
**Non-Cancer Chronic HI by Source - MEIR**  
**Boral Roofing LLC, Corona, CA**  
**MEIR @ 446,650; 3,749,600**

Permit Device #	HRA Source ID	Device Name	Non-C Chronic HI
D135	135	Ceratec Dryer – Zone 1	3.46E-05
D135	1352	Ceratec Dryer – Zone 2	2.51E-05
D135	1353	Ceratec Dryer – Zone 3	4.19E-05
D151	151	Italforni Dryer – D151	3.88E-05
D154	154	Italforni Kiln – D154	5.54E-01
D159	159	Mini-Italforni Kiln – D159	1.68E-02

**Table 21**  
**Non-Cancer Chronic HI by Source - MEIW**  
**Boral Roofing LLC, Corona, CA**  
**MEIW @ 446,700; 3,749,850**

Permit Device #	HRA Source ID	Device Name	Non-C Chronic HI
D135	135	Ceratec Dryer – Zone 1	1.81E-04
D135	1352	Ceratec Dryer – Zone 2	6.06E-05
D135	1353	Ceratec Dryer – Zone 3	8.26E-05
D151	151	Italforni Dryer – D151	1.07E-04
D154	154	Italforni Kiln – D154	2.68E+00
D159	159	Mini-Italforni Kiln – D159	3.87E-02

**Table 22**  
**Non-Cancer Acute HI by Source - PMI**  
**Boral Roofing LLC, Corona, CA**  
**PMI @ 446,659.5; 3,749,812**

Permit Device #	HRA Source ID	Device Name	Non-C Acute HI
D135	135	Ceratec Dryer – Zone 1	5.37E-04
D135	1352	Ceratec Dryer – Zone 2	5.34E-04
D135	1353	Ceratec Dryer – Zone 3	7.63E-04
D151	151	Italforni Dryer – D151	7.09E-04
D154	154	Italforni Kiln – D154	4.52E-01
D159	159	Mini-Italforni Kiln – D159	5.55E-02

**Table 23**  
**Non-Cancer Acute HI by Source - MEIR**  
**Boral Roofing LLC, Corona, CA**  
**MEIR @ 446,650; 3,749,600**

Permit Device #	HRA Source ID	Device Name	Non-C Acute HI
D135	135	Ceratec Dryer – Zone 1	2.04E-04
D135	1352	Ceratec Dryer – Zone 2	1.53E-04
D135	1353	Ceratec Dryer – Zone 3	2.21E-04
D151	151	Italforni Dryer – D151	3.47E-04
D154	154	Italforni Kiln – D154	1.60E-01
D159	159	Mini-Italforni Kiln – D159	1.33E-02

**Table 24**  
**Non-Cancer Acute HI by Source - MEIW**  
**Boral Roofing LLC, Corona, CA**  
**MEIW @ 446,700; 3,749,850**

Permit Device #	HRA Source ID	Device Name	Non-C Acute HI
D135	135	Ceratec Dryer – Zone 1	5.50E-04
D135	1352	Ceratec Dryer – Zone 2	6.59E-04
D135	1353	Ceratec Dryer – Zone 3	9.54E-04
D151	151	Italforni Dryer – D151	4.66E-04
D154	154	Italforni Kiln – D154	3.45E-01
D159	159	Mini-Italforni Kiln – D159	3.73E-02

## **Figures**

*See Executive Summary Figures*

## **Attachment 1:**

HRA Summary Form



# South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4182

(909) 396-2000 • www.aqmd.gov

## HEALTH RISK ASSESSMENT SUMMARY FORM

(Required in Executive Summary of HRA)

Facility Name : Boral Roofing LLC  
 Facility Address: 909 Railroad St  
Corona, CA 92882  
 Type of Business: Structural Clay Tile Manufacturing  
 SCAQMD ID No.: 1073

### A. Cancer Risk

*(One in a million means one chance in a million of getting cancer from being constantly exposed to a certain level of a chemical over a period of time)*

- Inventory Reporting Year : 2015
- Maximum Cancer Risk to Receptors : *(Offsite and residence = 30-year exposure, worker = 25-year exposure)*
  - Offsite 103 in a million Location: UTM Zone 11; X = 446,659.5, Y = 3,749,812 (m)
  - Residence 6.41 in a million Location: UTM Zone 11; X = 446,650, Y = 3,749,600
  - Worker 1.90 in a million Location: UTM Zone 11; X = 446,700, Y = 3,749,850
- Substances Accounting for 90% of Cancer Risk: Arsenic, Chromium (IV)  
 Processes Accounting for 90% of Cancer Risk: 154 - Firing of Clay
- Cancer Burden for a 70-yr exposure: *(Cancer Burden = [cancer risk] x [# of people exposed to specific cancer risk])*
  - Cancer Burden 0.13
  - Number of people exposed to >1 per million cancer risk for a 70-yr exposure 2,100
  - Maximum distance to edge of 70-year, 1 x 10<sup>-6</sup> cancer risk isopleth (meters) 400

### B. Hazard Indices

*[Long Term Effects (chronic) and Short Term Effects (acute)]  
(non-carcinogenic impacts are estimated by comparing calculated concentration to identified Reference Exposure Levels, and expressing this comparison in terms of a "Hazard Index")*

- Maximum Chronic Hazard Indices:
  - Residence HI: 0.57 Location: MEIR from A toxicological endpoint: Respiratory
  - Worker HI : 2.72 Location: MEW from A toxicological endpoint: Respiratory
- Substances Accounting for 90% of Chronic Hazard Index: HCl, Arsenic, HF, and Fluorides
- Maximum 8-hour Chronic Hazard Index:
 

8-Hour Chronic HI: 0.16 Location: PMI from A toxicological endpoint: Central Nervous System
- Substances Accounting for 90% of 8-hour Chronic Hazard Index: Manganese, Arsenic, Mercury
- Maximum Acute Hazard Index:
 

PMI: 0.51 Location: PMI from A toxicological endpoint: Eye
- Substances Accounting for 90% of Acute Hazard Index: HF, Fluorides, HCl

### C. Public Notification and Risk Reduction

- Public Notification Required?  Yes  No
  - If 'Yes', estimated population exposed to risks > 10 in a million for a 30-year exposure, or an HI >1  
1 Facility
- Risk Reduction Required?  Yes  No