The History of Reducing Toxic Air Emissions and Exposures in California Through Proposition 65 Enforcement

by Michael Freund*

I. INTRODUCTION

Citizen enforcement actions[1] under Proposition 65 (the Safe Drinking Water and Toxic Enforcement Act of 1986)[2] have reduced toxic air emissions and exposures to millions of people throughout California. This article highlights cases that resulted in substantial emission reductions or outright elimination of toxic air contaminants emitted from a wide range of industrial operations. In the absence of Proposition 65 enforcement, the toxic air emissions were legally permissible under existing federal and state law and local air district regulations.

Proposition 65 was overwhelmingly approved by the voters in 1986. Prop 65 was predicated on the belief that hazardous chemicals pose a serious potential threat to the health and well-being of the people of California and that government had failed to provide the necessary protection from this threat.[3] Proposition 65 requires that a "clear and reasonable warning" be provided prior to knowingly and intentionally exposing persons to listed chemicals.[4] It also prohibits discharges of listed chemicals into drinking water.[5] This article discusses cases arising under the warning or "right to know" provision of the statute.[6]

The genius of Proposition 65 is that, unlike numerous federal and state command-and-control statutes that specify certain emission reductions or other particular requirements, it does not target any particular industry or business practice, nor mandate any specified emission level from any industry that uses Proposition 65-listed chemicals. Rather, the statute's warning provision applies to any business with 10 or more employees that fails to provide the requisite warning to exposed persons. The failure to warn renders the business liable for a civil penalty up to $2,500.00 per day for each violation in addition to any other penalty established by law.[7] The civil penalty provision provides the public interest enforcer with a powerful sword, that if utilized properly, can be used to obtain public benefits from a violator that are not contained within the statute's listed remedies. This equitable relief could include the installation of the best available emission control technology to reduce emissions or the elimination of the toxic chemical entirely in favor of a safer alternative.

Numerous companies in California have greatly increased cancer rates in the communities surrounding their facilities by emitting toxic air contaminants. These chemicals are emitted from a variety of sources, including medical and biotechnology, foundries, battery manufacturing, recycling, metal plating, electroplating, aerospace, military, film production, dry cleaners, diesel engines, and classroom portables.

The impact of Proposition 65 enforcement cases has been dramatic. By trading off civil penalties for measures to protect the public health, approximately 6,000 pounds of lead emissions,[8] 100,000 pounds of methylene chloride emissions[9] and 1.2 million pounds of perchloroethylene emissions[10] have been eliminated throughout California since the first successful air toxic case in 1989. Substantial quantities of highly toxic ethylene oxide,[11] hexavalent chromium,[12] asbestos,[13] chloroform[14] and diesel engine emissions[15] have also been reduced through Proposition 65 enforcement. Proposition 65 enforcement has also reduced cancer risks and health effects on school children in classroom portables from the off-gassing of formaldehyde[16] and from school bus diesel engine exhaust.

II. PROPOSITION 65 ENFORCEMENT ACTIONS HAVE PRODUCED SIGNIFICANT PUBLIC BENEFITS BY SUBSTANTIALLY REDUCING TOXIC AIR EMISSIONS AND EXPOSURES THROUGHOUT CALIFORNIA

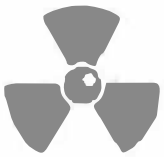
A. Early Proposition 65 Successful Air Cases[17]

The first air toxics case that resulted in a public benefit was filed by Citizens for a Better Environment ("CBE")[18] against Systron Donner Corporation, located in Concord. CEB alleged that this company was exposing residents in a trailer park about 30 feet from the property line to two carcinogens, chloroform and methylene chloride, without any warning. In a settlement approved by the Court on October 18, 1990, the company agreed to eliminate use of both chemicals.[19]

During this early period, CBE identified Bio-Rad Laboratories, a biotechnology company located in Richmond, as emitting more than 60,000 pounds of chloroform annually without an operating permit. CBE's

Notice prompted legal action by the Attorney General and Contra Costa County District Attorney, which led to the elimination of emissions.[20]

The California Attorney General's involvement in the air toxics arena can be best illustrated by its successes in the early 1990's against medical companies that used ethylene oxide to sterilize medical equipment. In one case, ethylene oxide emissions from a spice manufacturer created a cancer risk 278 times the warning threshold. [21] Numerous settlements compelled either elimination of the use of ethylene oxide or installation of state of the art equipment to reduce emissions. [22] These cases resulted in a forty percent decrease in these emissions in California[23] and the elimination of hundreds of thousands of exposures.[24]



Proposition 65 requires that a "clear and reasonable warning" be provided prior to knowingly and intentionally exposing persons to listed chemicals.

Other early successes included an aerospace company eliminating use of methylene chloride and installing a new thermal oxidizer to reduce hexavalent chromium emissions;[25] a laminating aluminum sheet manufacturer in Garden Grove eliminating use of methylene chloride by switching to a safer solvent;[26] a substantial reduction of asbestos exposures;[27] a significant reduction of the use of lead by a major aerospace company;[28]and a significant reduction of hexavalent chromium emissions by one of the largest aerospace companies in the world.[29]

B. Lead Exposure Cases

1. Health Effects from Exposure to Lead

Lead is listed as a Proposition 65 carcinogen and as a chemical known to cause developmental harm in the fetus and male and female reproductive toxicity. The maximum allowable dose level for lead is 0.5 ug/day, which is more stringent than any other reproductive toxicant listed. Lead is a hazardous air pollutant under Section 112 of the federal Clean Air Act,[30] and is designated as a toxic air contaminant in California.[31] Low lead levels have been associated with developmental delays and problems in children, including lower intelligence, short term memory, perception integration, visual motor functioning and behavior problems.[32] There is no recognized safe level of exposure to lead.

2. Cases Brought to Reduce Exposure to Lead

The reduction of lead emissions may be Proposition 65's biggest enforcement success. Most of the lead litigation has taken place in southern California with three important cases in arising in northern California.

The first public benefit involving lead emissions resulted from a case filed in 1992 by People United for a Better Oakland [33] ("PUEBLO") against American Brass and Iron Foundry ("AB&I"),[34] located in a low socio-economic area of Oakland where many people of color reside. Air dispersion modeling showed almost 200,000 persons exposed to levels of lead at or greater than .5 ug/day, with the people living closest to the facility exposed to several hundred micrograms per day of lead. In settling this case, AB&I agreed to construct a baghouse, collection hoods on the furnaces, and an enclosed baghouse dust transportation system to contain fugitive dust emissions.[35] These measures reduced annual lead emissions from 872 pounds to 60 pounds and eliminated thousands of exposures in the community.[36]

Astonishingly, in the early 1990's, substantial lead emissions were identified from activities not typically associated with such emissions – the recycling industry. In Corona, a metal scrap recycling and smelting operation emitted 495 pounds of lead in 1991.[37] Off-site exposures, especially to the neighborhood trailer park, resulted during melting operations where lead was mixed with other recyclable materials. Investigation revealed that homeless people had been placing lead weights inside cans, thereby increasing the weight of the cans as well as their earnings for returning cans to the recycling center. The recycling operator agreed to install an air knife system, designed to remove contaminants, including lead weights, from aluminum cans prior to melting operations, and all emissions were eliminated.[38]

In 1995, PUEBLO filed against Owens-Brockway Glass Container, an Oakland company that melted recycled glass in furnaces to produce new glass bottles. Lead emissions were 1,314 pounds per year because the company had no controls to restrict lead emissions.

Modeling revealed that 40,685 residents and 18,230 workers were exposed to levels exceeding .5 ug/day. The source of lead originated from recycled green cullet which contained crushed lead foils. As a result of this legal action, Owens-Brockway stopped using recycled green cullet in 1996. PUEBLO's case led to the elimination of about 59,000 exposures and over 1,100 pounds of emissions.[39]

Throughout the 1990's, California Earth Corps, Inc. ("CEC") litigated many lead cases against battery manufacturers and lead producers in southern California with tremendous results:[40]

■ Quenell Enterprises, in Commerce[41] with lead emissions of 1,321 pounds in 1992,[42] substantially reduced emissions by re-designing lids and seals on all oxide reactors, installing Honeywell computer controls on all reactor systems, and enclosing its truck loading facility and baghouses.[43]

■ GNB Battery Technologies agreed to install a capture and collection system at its battery recycling plant in Vernon[44] that led to a reduction of nearly 1,000 pounds in lead emissions.[45] GNB's manufacturing plant in Industry installed equipment to reduce lead emissions by 272 pounds.[46]

■ Ramcar Batteries, a manufacturer of commercial and marine lead acid batteries in Commerce[47] with 350 pounds of lead emissions in 1993,[48] retrofitted machinery to control lead dust, modified ducting to increase the capture of lead dust, purchased an additional vacuum and retrofitted lead pot hoods for higher efficiency. [49] These measures reduced annual emissions to approximately 50 pounds.

■ In the 1990's, Delco Remy was one of the largest battery manufacturers in the United States using lead to produce lead acid automobile and marine vessel batteries. At its Anaheim plant, in 1992, Delco processed 22,026 tons per year of pure lead and 3,284 tons of antimony lead alloy, resulting in 293 pounds of emissions.[50] With homes only about one-tenth mile away, 18,257 residents and 8,413 workers were exposed to lead at levels .5 ug/day or greater, covering 6.4 square-km.[51] Proposition 65 litigation convinced Delco to install state of the art filter bags at 99.993% efficiency at 10 baghouses,[52] resulting in lead reduction of about 200 pounds.

■ Concorde Battery Corporation manufactured lead-acid batteries for commercial and military aircraft, marine and medical applications and was located adjacent to a trailer park in West Covina where many retired persons, young families and children resided. CEC was aware of Concorde's report of 173 pounds of lead emissions for 1992[53] as well as blood test results from several trailer park residents showing elevated lead levels, CEC monitored the air surrounding the facility, and discovered that 6,564 residents and 4,471 workers were exposed to levels at or above .5 ug/day. [54] In response to this lawsuit, Concorde immediately replaced faulty filter bags with high efficiency bags, constructed physical barriers at the entrance to the facility, and installed a central vacuum system and an additional filter system (rated at 99.93% or greater efficiency), resulting in an annual reduction of approximately 147 pounds. This was the first Proposition 65 case to require monitoring around the facility and that designated a portion of the settlement ($155,000) for lead remediation to remove lead from homes and soil in Los Angeles County.[55]

■ One of the largest exposure cases involved Johnson Controls Battery Group, a manufacturer of automobile batteries in Fullerton.[56] The facility's lead smelter caused very high emissions to escape into the community several hundred meters away causing exposures to 115,572 residents and 82,572 workers above .5 ug/day.[57] This settlement required Johnson to provide additional emission controls, improve baghouse inspections, monitoring and calibration of plant instruments and to reduce fugitive emissions,[58] resulting in a dramatic decrease in lead emissions.[59]

■ U.S. Battery, a manufacturer of batteries for golf carts, aerial lifts, and farm, marine and military applications in Corona since 1928, is situated next to a low income Hispanic community. Emissions exposed 416 residences and 1,275 workers to lead above the threshold.[60] A settlement required installation of hand-operated vacuums throughout the battery assembly area ducted to a baghouse equipped with HEPA filter bags rated at 99% efficiency or greater. [61]

Proposition 65 enforcement reduced lead emissions in a variety of different industries. A manufacturer of ceramic glazes, hobby paints, plaster molds and kilns in Fresno closed the operation responsible for the majority of lead emissions. [62] A manufacturer of radiator cores in San Bernardino converted to a no-lead solder to eliminate all lead emissions. [63] A producer of components for electronic circuit board manufacturers, located approximately 125 meters from apartments in Sylmar, with lead emissions of 32 pounds for 1999-2000, installed a baghouse to control particulate emissions.[64]

A worldwide producer of steel strapping and tools for the industrial packaging industry, located in Bay Point[65] emitted lead when strapping was placed in a 75,000 pound capacity vat of molten lead and then cured in a bake oven with inadequate control equipment.[66] The settlement required Acme to install 96 filter cartridges with 12 HEPA after filters rated at 99.97% at .3 micron size particles.[67]

Essex Group, a global manufacturer of wire and cable products, was situated only 40 meters from

a children's playground and 30 meters from other residences in Anaheim[68] Here, Essex retrofitted its mixing hopper lead handling system with a vacuum system utilizing a baghouse with state of the art filters,[69] resulting in 20.7 pounds (down from 234 pounds) of lead emissions to the South Coast AQMD.[70]

Ace Clearwater Enterprises, which manufactured components for the aerospace and power generation industries, poured hot lead into a mold without any emission control equipment near a low income housing project in Paramount.[71] Air monitoring detected 2.6 micrograms per cubic meter of lead - 104 times the daily lead level for Proposition 65. In this settlement, Ace Clearwater installed a new system to duct emissions from its lead pot furnace to a pre filter and HEPA filter designed at 99.97% efficiency.[72]

The most recent settlement involved Exide Technologies, the operator of a battery recycling plant in Los Angeles that for many years emitted more lead into the air than any other company in California. Exide reported lead emissions of 2,307 pounds for 2005-06; 3,996 pounds for 2006-07; and 1,024 pounds for 2007-08.[73] Modeling Exide's most recent emissions of 1,900 pounds,[74]resulted in an exposure area extending more than two miles from the plant! [75] Here, 26,830 residents and 27,523 workers were exposed to lead levels at or above 0.5 ug/day. The November 3, 2010 Consent Judgment requires Exide to install backup generators to use in case of a utility outage to prevent the escape of lead and other chemicals into the air.[76]

C. PCE Exposure Cases

1. Health Effects from Exposure to Perchloroethylene

Perchloroethylene (PCE) has been widely used as a degreaser to clean metal parts in many kinds of industrial activities, including in aerospace and military applications. PCE is also used as a cleaning solvent in the dry cleaning and film industries. PCE poses significant risks to human health (both cancer and non-cancer health effects) and to the environment. It is listed by the United States EPA and by the California EPA's Office of Environmental Health Hazard Assessment as a potential human carcinogen, and listed as a probable human carcinogen by the International Agency for Research on Cancer ("IARC") – considered by many to be the most prestigious international agency involved with cancer assessment in the world. The chemical has also been identified as a hazardous air pollutant under section 112 of the federal Clean Air Act and as a toxic air contaminant under Health and Safety Code section 39657.

Most PCE exposures occur via inhalation, although exposures also occur through drinking contaminated water or through dermal absorption. Sufficient inhalation exposure to this chemical can cause central nervous system depression, headache, slurred speech, drowsiness, dizziness, nausea, loss of coordination and equilibrium, and irritation to eyes, nose and throat. Workers exposed to large amounts of this chemical in the air have experienced memory loss and confusion. Breathing PCE over longer periods can also cause liver and kidney damage.[77]

2. Cases Brought to Reduce PCE Exposures

a. PCE Used in Degreasing Operations to Clean Metal Parts in Various Manufacturing Facilities

For decades, PCE was automatically approved by all the air districts in California as a degreaser to clean metal parts.

Kwikset Corporation, located near a large Anaheim residential community, has been a leading U.S. manufacturer of hardware for doors, including lock assemblies, latches, door knobs and dead bolts. During the 1995-96 period, Kwikset reported a whopping 142,900 pounds of emissions.[78] As a result, CEC hired a consultant to conduct ambient monitoring in the vicinity, and samples showed concentrations to be as high as 82.07 nanograms per cubic meter, resulting in an excess cancer risk of about 44 per 100,000, and covering a very large area of exposure.[79] This enforcement action led to the elimination of the use of this chemical - the second largest elimination of PCE emissions in a Proposition 65 case. The company installed a new aqueous-based degreasing system [80] and also saved a considerable amount of annual fees paid to the Air District.[81]

Punch Press Products engages precision metal stamping, welding and automated assembly activities at its Vernon facility, near a low income housing area and two schools. Air modeling showed 2,176 residents and 684 workers exposed above the Proposition 65 warning threshold.[82] In its settlement, Punch Press agreed to stop using PCE, installed a new water-based washing system to clean metal parts[83] at a cost of $1.1 million, and eliminated 42,000 pounds of emissions.[84]

The case against Mag Instruments, a large U.S. manufacturer of flashlights, resulted in the most dramatic reduction of PCE emissions of all Proposition 65 cases. Mag is located near homes and vineyards in Ontario. Mag's 1998-1999 report to the South Coast AQMD disclosed a staggering 159,097 pounds of emissions. Modeling demonstrated that 9,130 residents and 491 workers in the area were exposed above the Proposition 65 warning threshold with residential cancer risks of 2,310 per million at a distance of 50 meters

from the facility.[85] A tremendous public benefit resulted when Mag discontinued its use of PCE and installed an aqueous-based degreasing system at a cost of approximately $1 million.[86]

Palace Plating conducted plating activities in an old and dilapidated Los Angeles building constructed primarily of corrugated metal. Open doors and windows allowed PCE to escape. During a site inspection, CCHA staff observed a strong smell of the chemical in the air in front of the facility. Children were playing outside at a school directly across the street, and two other schools were nearby. The nearest home touched the building of Palace Plating. The Hispanic family who lived there complained of eye irritation and headaches. Others experienced similar health symptoms in nearby homes.[87]

The area was 75% Hispanic and 18% African American, with more than one-third of the population at income levels below the poverty line.[88] An enormous public benefit was achieved when Palace Plating agreed to eliminate all use of PCE at the facility. [89]

Proposition 65 enforcement resulted in many other companies converting to aqueous cleaning systems and eliminating PCE entirely. Kaynar Technologies, a manufacturer of aerospace and airplane fasteners in Fullerton, eliminated 18,520 pounds of fugitive emissions and 81,268 pounds of stack emissions.[90] Grover Products Company, a manufacturer of air horns for trucks and aluminum softball bats, situated 40 yards from a low income Hispanic community in Los Angeles, eliminated 38,556 pounds of emissions and exposures to 3,456 residents and 884 persons offsite.[91] Frederick Ramond, a manufacturer of lighting fixtures in Cerritos with residences across the street eliminated 16,801 pounds and 526 residential and 123 worker exposures.[92] Many other companies eliminated PCE in Proposition 65 settlements as well.[93]

Proposition 65 enforcement compelled many other companies to install improved technology to control emissions. Examples include Coronet Manufacturing Company, a lamp manufacturer situated adjacent to a school in Gardena, installing a refrigerated condensing unit and cover, decreasing emissions by almost 9,000 pounds.[94] AC Products, a manufacturer of protective coatings in Placentia, near a Head Start school installed an emissions capture system to control 90% of emissions at a cost of approximately $600,000.00[95] Technical Metal Finishing Company, an aluminum anodizing job-shop in Burbank, near an elementary school and close to two public parks, agreed to use less PCE, improve the efficiency of its vapor degreaser, and install a refrigerated coil, a convection oven, a sensor and flow monitor,[96] reducing emissions by 1,864 pounds.[97]

b. PCE Used to Clean Metal Parts for Aerospace and Military Applications

Aerochem, Inc., located across the street from a residential area in Orange, chemically mills aerospace parts for commercial and military applications. In 1997, the company reported emissions of 54,275 pounds of PCE.[98] These emissions were causing exposures above the Proposition 65 level as far away as 3,000 feet.[99] In a settlement, Aerochem agreed to switch to a chemical not listed pursuant to Proposition 65 that led to a dramatic reduction of emissions as indicated by Aerochem's 2000 report of 2,841 pounds.[100]

Lefiell Manufacturing, located in Santa Fe Springs, is a leading manufacturer of sophisticated parts for the aerospace industry. When established in 1930, there were no residents within a mile of the premises. By 1997, the company was emitting 52,710 pounds of PCE and the residential community had encroached much closer to the facility.[101] Modeling this emission figure resulted in an exposure to 542 residents and 828 workers above the warning threshold for Proposition 65.[102] In this settlement, Lefiell agreed to install an airless vacuum solvent cleaning/drying system to clean its parts,[103] resulting in no PCE emissions.[104]

Lockhart Industries has manufactured aluminum-brazed cooling components for the military and electronics industry since 1964. A substantial residential area is located near the facility. Lockhart reported emissions of 18,508 pounds for calendar year 1997 that exposed 2,127 residents and 314 workers at or above the no significant risk level.[105] In settlement, Lockhart agreed to install an aqueous wash system to clean most metal parts at the facility,[106] which reduced PCE use by about 70%.

Thompson Industries operates a facility in Hawthorne that manufactures precision machined and brazed assemblies to cool electronic components utilized in aerospace, computer and semiconductor applications. Thompson used PCE to clean parts manufactured prior to assembly and reported 14,840 pounds of emissions to the South Coast AQMD for 1997-1998. Modeling demonstrated that 1,689 residents and 129 workers were exposed above the Proposition 65 warning threshold.[107] Thompson is situated near homes and two schools. In response to CEH's legal action, Thompson installed an aqueous cleaning system to degrease metal parts, reducing emissions by 20%.[108]

Marvin Engineering manufactures missile launchers, ejector racks, test equipment, and other hardware for military customers and companies in the aerospace and defense industries in Inglewood.[109] Apartments and the Rogers Park Community Center (with a pre-school and baseball field) are located across the street. Marvin Engineering reported 3,044 pounds of emissions for

the 2005-2006 period to the South Coast AQMD, which created a residential cancer risk up to 107 cancers per million. The cancer risk for 518 residents was greater than 10 per million at distances up to 200 meters from the facility.[110] Approximately three months after CEH's Notice of Violation, the company had replaced PCE with a non-toxic cleaning solvent, "Simple Green." The settlement prohibited further use of PCE.[111]

c. PCE Used in the Motion Picture Industry

Deluxe Laboratories, founded in 1915, is a major Hollywood motion picture film processing laboratory. The company, which processes negative film and prints positive copies of motion pictures for distribution to movie theaters, located near homes and a children's learning center.

Deluxe used so much PCE to clean film and in the printing process that the company's reported emissions of 103,127 pounds for 1996-97 were the highest in California at the time.[112] Modeling showed an excess cancer risk of 33,851 residents and 1,415 workers in and around Hollywood.[113] In settlement, Deluxe phased out PCE and installed new machinery to incorporate a non-ozone depleting, non-Proposition 65 solvent in the film cleaning process.[114] As a result, emissions were reduced to 3,147 pounds for 2000.[115]

Technicolor is the world's largest film processor. The company used PCE to clean film and to process film at its North Hollywood facility, and during 1998-1999 reported 54,715 pounds of emissions. Near the laboratory is Toluca Estates, an upscale housing development..

Around the time of this case, Technicolor had taken several measures to reduce emissions. Technicolor committed to further investigation of equipment and methods to reduce PCE use.[116] Toxic emission forms submitted to the South Coast AQMD demonstrated that Technicolor continued to reduce emissions after the settlement.[117]

Consolidated Film Industries, LLC was the leading film laboratory in the Los Angeles area for decades specializing in the processing of negatives and marketing of prints for motion pictures and television. The company had been the largest purchaser of motion picture film in the world and was acquired by Technicolor, Inc. in 2000.[118] The company reported emissions of 14,939 pounds for 1997-1998 and 11,691 pounds for 1998-1999.[119]

Consolidated is located in Hollywood near homes and a school. Modeling showed 2,160 residents and 210 workers exposed to an excess cancer risk of 10 per million and 175 residents exposed at an excess cancer risk of 100 per million or greater.[120] During this period, Consolidated had been actively seeking methods to reduce emissions and CEH acted as a catalyst for the company to continue implementing control measures. These measures included installing a state-of-the art carbon adsorption system; purchasing a distillation unit to be installed within three months; adding film cleaner exhausts to increase capture efficiency of fugitive emissions; reducing purchases of PCE and looking for alternatives for film cleaning.[121] By 2002, emissions were reduced to 4,482 pounds.[122]

d. PCE Used in the Dry Cleaning Industry

Most dry cleaning operations in the United States have for many decades used PCE as a cleaning solvent in their operations. In 2002, about 85% of the approximate 35,000 dry cleaners in the United States used this solvent.[123] People exposed to PCE via inhalation include workers at dry cleaning facilities, people living and working in the same building or nearby, and people who bring home and wear dry-cleaned garments (due to off-gassing of the PCE)l.[124]

Exposures are most pronounced to workers at dry cleaners who breathe fumes from the dry cleaning solvent and also receive exposures through their skin. Studies by the National Cancer Institute and by other researchers have documented excess bladder, esophageal, and cervical cancer deaths of dry cleaning workers. The National Institute for Occupational Safety and Health (NIOSH) has also confirmed these increased

cancer risks. [125]

In urban areas throughout the United States, dry cleaners are situated near residences, retail businesses, offices and restaurants. Fugitive emissions from a dry cleaner can contaminate indoor air in these environments. [126] PCE levels in buildings with a dry cleaner or nearby a dry cleaner have been found as high as 55,000 micrograms per cubic meter.[127] In a study of 65 apartments located in 24 buildings in New York City where dry cleaners used PCE on site during 2001-2003, the New York State Department of Health found high levels in the apartments, with a maximum level of 5,000 micrograms per cubic meter. The study also found indoor air levels of this chemical in minority neighborhoods four times higher than in non-minority neighborhoods and 10 times higher in low-income neighborhoods than in higher income neighborhoods.[128]

Data from the South Coast AQMD in 2000 revealed that an estimated 850 tons of PCE were released annually into the air in southern California from the dry cleaning industry alone.[129] Most of the emissions emanated from the operation of older "third generation" dry cleaning machines which posed substantially higher cancer risks.[130]

Exposure to PCE is not only present through air emissions from the dry cleaner itself, but also from the dry-cleaned garments brought home. The United States EPA long ago determined that such clothes cause PCE levels to rise, especially in the rooms where the garments are kept.[131]

PCE emissions from dry cleaners may be responsible for higher cancer risks than emissions from any other chemical, due to the close proximity of so many people to dry cleaning establishments. Unlike power plants or other large industrial sources that are often separated from a residential community by distances of one-half mile or greater, dry cleaners are typically located within a few feet of other businesses or within several hundred feet of residences. Workers at adjacent businesses and residents at nearby homes are often subject to exposures from this chemical throughout the work day.

Due to the many problems associated with PCE use, in 2007 the Air Resources Board ("ARB") adopted regulatory amendments banning the use of this chemical in dry cleaning operations by January 1, 2023. As of January 1, 2008, no new machines using the chemical were permitted to be installed in California. Dry cleaners with machines that are 15 years or older had to remove them by July, 2010. While the PCE phase-out should be commended, many exposures will continue for a substantial period of time. In the interim, there will be a gradual phase out of PCE along with economic incentives for the conversion to safer alternatives.[132]

Proposition 65 has had a profound impact in requiring dry cleaners with ten or more employees to eliminate PCE or to substantially reduce use and emissions of the solvent. While many of these cases involved lower levels of emissions than other industrial facilities, the risks are still significant because of the close proximity of residents and other businesses to the emissions.

Royal Airline Linen operates a dry cleaning facility near homes in Inglewood, providing services for airlines. Prior to this legal action, Royal reported PCE emissions to the South Coast AQMD of 12,456 pounds for 1997-98. Air modeling showed 1,521 residents and 167 workers exposed to an excess cancer risk of 10 per million or greater and 288 residents exposed to an excess cancer risk of 100 per million or greater.[133] Under its settlement, the company agreed to install two "Fifth Generation" dry cleaning machines, the state of the art technology at the time to replace its dry cleaning machines.[134] After the installation, Royal reported 5,407 pounds of PCE emissions for 2003.[135]

Fazio Cleaners was a major operator of dry cleaning and laundry services with seven outlets in the Los Angeles area. Fazio's facility on San Vicente Blvd., near apartments, emitted 27,303 pounds of PCE in 1996- one of the largest amounts for a dry cleaner in the state. Modeling revealed that a very large swath of the community was being exposed to high cancer risks from this neighborhood operation.[136] In settlement, Fazio agreed to install a PCE sensor on its dry cleaning system to limit fugitive emissions. The company agreed not to use dry cleaning machines using PCE at any new store location in California and agreed to replace its older machines with machines that do not use the solvent.[137] Fazio switched to petroleum machines in 2003 thereby eliminating use of PCE.[138]

The Gary's Group operates a huge industrial dry cleaning facility in Van Nuys, adjacent to a densely populated residential area, with the majority of residents of Hispanic descent. Gary's reported to the South Coast AQMD 13,453 pounds for 1997-98 which exposed 1,177 residents and 175 workers above the 10 per million risk and 105 residents above the 100 per million risk.[139] As a result of this settlement, Gary's agreed to replace one of its two remaining tandem PCE dry cleaning machines with at least one petroleum machine to reduce emissions below 3,000 pounds per year,[140] and Gary's installed two petroleum based machines [141]

Hollyway Cleaners on Santa Monica Blvd. in Los Angeles is surrounded by numerous apartment complexes. Hollyway had reported 12,628 pounds of emissions for 1998-99 to the South Coast AQMD. During a site inspection, the director of CEH smelled PCE at the adjacent apartment building. The dry cleaner was

located only several feet from the apartment complex with several outdoor patios virtually in the face of the facility. The residents had concerns about the health effects from the chemical. [142] Three tenants had already vacated due to the daily exposure to this chemical. The landlord also had concerns and wanted the dry cleaner to relocate. PCE monitoring confirmed dangerous levels inside the apartment building.[143] Hollyway replaced both of its dry cleaning machines with two non-PCE machines,,[144] with the Green Earth Cleaning system. [145]

Sterling Westwood, located in a densely populated area in Westwood, reported 9,596 pounds of air emissions to the South Coast AQMD for 1998-1999. Air modeling showed 1,515 residents and 137 workers exposed above the level requiring a warning. Of this total, 132 residents were exposed to an excess cancer risk more than ten times above the Proposition 65 warning level.[146] Sterling agreed to eliminate use of PCE and replaced it with a safer dry cleaning solvent.[147]

H & K Imperial Cleaners is located 15 feet from homes and 30 feet from and businesses in the Koreatown section of Los Angeles. This dry cleaner reported 6,269 pounds of emissions to the South Coast AQMD for 2000-01 that exposed 1,159 residents and 87 workers to an excess cancer risk of 10 per million or greater and 73 residents and 26 workers to an excess cancer risk of 100 per million or greater.[148] This case resulted in the complete elimination of the use of PCE and exposures in this area.[149]

In several dry cleaner cases, companies agreed not to purchase any further PCE machines and to replace existing ones with a non-perchloroethylene machine.[150] Pico Cleaners, agreed to replace both of its dry cleaning machines in Los Angeles either with cleaning machines that do not use PCE, or with "Fifth generation" cleaning machines.[151] Shadkor, Inc. in downtown Burbank, with net emissions of 8,276 pounds prior to As You Sow's action, agreed to replace both of its dry cleaning machines with hydrocarbon dry cleaning systems.[152] Bryan's Cleaners, located five meters from apartments in Pasadena, reduced annual emissions by almost 6,000 pounds[153] by installing gas-fired chillers to increase the recovery rate of the chemical and lower fugitive emissions.[154] Debonair Cleaners, situated five meters from a pre-school and 20 meters from the nearest residences in Manhattan Beach, substituted to a non-PCE machine and agreed never to use the chemical again.[155] Four Seasons, located 10 meters from residences and near a school in West Hollywood, reduced its 2000-01 emissions of 3,534 pounds by replacing one of its two PCE machines with a petroleum machine.[156] M & M Cleaners, with residences about 20 meters away in Hawaiian Gardens, eliminated PCE by installing a petroleum machine.[157]

In several northern California cases, other facilities took steps to reduce emissions. Dollar Cleaners, in San Lorenzo, about 25 meters from its neighbors, agreed to reduce emissions 25% below allowable limits under their Air District permit.[158] Brite 1- Hour Cleaners, about 30 meters from the nearest near homes in Alameda with 2001-02 emissions of 5,700 pounds,[159] replaced its oldest and most inefficient dry cleaning machine with a petroleum machine.[160] Vogue Cleaners, operating in a small shopping mall in Pleasant Hill, with residents about five meters away and workers a few feet away reduced its emissions by replacing its PCE dry cleaning machine with a newer more efficient machine within four months of receiving CEH's Notice of Violation.[161] Virginia Cleaners, situated only five meters from the closest homes and businesses and near a local elementary school in Berkeley,[162] agreed to replace its PCE machine and installed a petroleum machine.[163] Finally, Selix Formalwear, a well known tuxedo rental store, situated 20 meters from the nearest residences and several feet from other businesses in Hayward, eliminated 4,100 pounds of emissions by converted its PCE machines to hydrocarbon machines. [164]

D. Hexavalent Chromium Exposure Cases

1. Health Effects from Exposure To Hexavalent Chromium

Hexavalent chromium is one of the most potent carcinogens listed under Proposition 65. Emissions as low as one-tenth of a pound may pose a significant risk of cancer. Hexavalent chromium is a man-made toxic form of the element chromium used in a variety of industrial settings. Exposure to this chemical occurs mainly among workers who handle pigments containing dry chromate, spray paints and coatings containing chromate, operate chrome plating baths, and weld or cut metals containing chromium, such as stainless steel.[165] While the literature focuses primarily on health effects on workers exposed to hexavalent chromium, exposures are also increasing the risk of cancer to people living near these industrial operations.

Breathing hexavalent chromium for many years may increase the risk of developing lung cancer. IARC has concluded that chromium VI compounds are carcinogenic to humans. The National Toxicology Program 11th Report on Carcinogens also classifies chromium VI compounds as known human carcinogens. The most notable health effects documented in workers exposed to this chemical involve the respiratory tract, namely irritation or damage to the nose, throat and lungs. Irritation and damage to the eyes and skin can also result from exposure to high concentrations for a prolonged period.[166]

2. Cases to Reduce Hexavalent Chromium Exposures

■ Aerospace Facility

Valley-Todeco, Inc. manufactured fasteners and bearings for the aerospace industry and power transmission equipment in Sylmar.[167] Parts were machined, cleaned with degreasers, electroplated, and heat treated.[168] Valley-Todeco operated chrome plating tanks and spray booths which accounted for most of the 2.72 pounds of hexavalent chromium emissions.[169] The settlement required the company to reduce emissions by installing a new and more efficient foam sealant, "Fumetrol 140," on its chrome plating bath. [170]

■ Manufacturing/Electroplating Facility

Anadite, Inc. conducts electroplating, plating, polishing and anodizing activities at its manufacturing facility in South Gate. With homes nearby, one pound of hexavalent chromium was emitted during the treatment of metal parts for airplanes using spray paints and finishing tanks.[171] After receiving a Notice of Violation, Anadite filed an application with the South Coast AQMD for permits to construct/operate a three-stage mist eliminator to control emissions from the paint spray booths and a HEPA filter system to control emissions from its chromic anodizing lines.[172]

■ Metal Plating Facility

Dixon Hard Chrome engages in chromium, cadmium and nickel plating in Sun Valley. Dixon specializes in aluminum plating for NASA's space shuttle, aircraft landing gears, computer components, and entertainment and amusement applications. [173] Hexavalent chromium was produced through plating activities and PCE was used to clean metal parts. Dixon's emissions of .171 pounds per year of hexavalent chromium and 7,965 pounds of PCE resulted in 156 residents and 16 workers exposed to hexavalent chromium at a cancer risk of 10 per million or greater and, for PCE, 307 residents and 39 workers exposed at a cancer risk of 10 per million or greater.[174] Dixon agreed to install HEPA filters for its chromium tank operations designed to capture 99.997% of hexavalent chromium emissions and to eliminate use of PCE by converting to an aqueous degreasing cleaning system. [175]

E. Methylene Chloride Exposure Cases

1. Health Effects from Exposure to Methylene Chloride

Methylene chloride (dichloromethane) is a volatile colorless liquid with a mild sweet odor similar to chloroform. The chemical has been used in various industrial processes such as metal cleaning, degreasing and paint stripping. Methylene chloride is classified as a Proposition 65 carcinogen, a hazardous air pollutant pursuant to the federal Clean Air Act, and a toxic air contaminant in California. OSHA considers methylene chloride to be a potential occupational carcinogen.[176] The central nervous system is the primary area affected. Sufficient exposure can cause significant adverse health effects, including headaches, dizziness, nausea, memory loss, tingling in the hands and feet, and loss of consciousness.[177]

2. Cases to reduce Exposure to Methylene Chloride

■ Manufacturing Facilities

Jasco Chemical Corporation manufactures chemicals and paints near homes in Santa Ana. For 1997, Jasco reported methylene chloride emissions of 25,787 pounds to the U.S. EPA. Jasco agreed to install a vapor recovery unit[178] which led to a significant decrease of emissions, to 3,512 pounds.[179]

Paragon Laboratories produces nutritional supplements and skin care products near homes, a church, and a school in Torrance. Paragaon was using methylene chloride as part of a coating process of certain vitamin tablets! Based on this use, Paragaon reported 15,000 pounds of methylene chloride emissions during the 1999-2000 period to the South Coast AQMD. Almost immediately after receiving a Notice of Violation, Paragaon began using a water-based process to coat the vitamin tablets that had previously been coated with methylene chloride. In this settlement, Paragon agreed to permanently refrain from using the chemical. [180]

American Fabrication Corporation manufactures, fabricates and assembles molded polyurethane automotive body styling parts and components at its Anaheim plant near a residential area. The company reported emissions of 42,889 pounds for 1998-1999. The company immediately eliminated use of methylene chloride after receiving CEH's Notice of Violation.[181]

■ Refinishing and Reupholstering Facility

Professional Refinishing Organization conducts wood refinishing electrostatic metal painting, polyurethane metal refinishing and reupholstering services in Los Angeles.[182] The company used methylene chloride to strip paint from furniture. During these activities, workers from other companies on both sides of the facility and across the street were also being exposed to the chemical. The company reported 9,338 pounds of emissions for 2001-2002. Shortly after receiving a Notice of Violation from CEH, Professional Refinishing Organization immediately replaced methylene chloride with a safer solvent.[183]

F. Indoor Air Pollution in Portable Classrooms – Health Effects of Exposure to Volatile Organic Compounds Including Formaldehyde

1. Health Effects of Portable Classroom Chemicals

A report by the Environmental Working Group noted that more than two million students attend school in portable classrooms throughout California that can expose them to toxic chemicals.[184] The report reveals that manufactured buildings emit a wide range of toxic chemicals, including those that cause cancer, birth defects, brain and nerve damage, asthma and other health effects. The chemicals of greatest concern are the volatile organic compounds – (VOC's) formaldehyde, benzene and toluene which are emitted from particleboard, plywood, fiberglass, carpets, glues and other materials found in portables. These emissions, combined with tighter construction, fewer windows, and inadequate ventilation can cause a significantly higher level of indoor air pollution than outside. While the average American spends 90% of his or her day inside, concentrations of pollutants are often two to five times higher and often hundreds of times higher inside than outside. The problem is further compounded because children are more vulnerable and at greater risk from exposure to toxic chemicals than adults.

A report by the ARB and Department of Health Services regarding the environmental health conditions in portable classrooms[185] also has raised health concerns. The agencies investigated classrooms in kindergarten through 12th grade public schools and studied two portable classrooms and one traditional classroom at several hundred schools throughout California. The report concluded that in 4% of the classrooms, formaldehyde concentrations in the air exceeded the guideline level for preventing acute eye, nose and throat irritation. Mostly all classrooms exceeded formaldehyde guidelines for preventing long-term health effects, including cancer.[186]

Many building materials used to construct and finish the interiors of manufactured buildings emit VOC's that can contaminate indoor air. Formaldehyde has been used with other chemicals in construction glues and is present in cabinets, flooring, walls and furniture in such buildings. The primary source of formaldehyde has been linked to manufactured wood products such as particleboard and plywood bonded with urea-formaldehyde resin.

Testing conducted in newly-constructed houses in Colorado has shown formaldehyde concentrations increasing five months after occupancy.[187] In a study conducted by Lawrence Berkeley National Laboratory, measurements taken inside new mobile homes showed VOC levels more than three times the indoor air quality standards set by the State of Washington and eight times the range recommended by European experts.[188]

In addition to its listing as a Proposition 65 carcinogen, the U.S. EPA classifies formaldehyde as a probable human carcinogen based on studies of laboratory animals exposed to high levels of the chemical.[189] The ARB classifies formaldehyde as a toxic air contaminant, based on its potential to cause cancer and other adverse health effects,[190] and has concluded that based on workplace exposures, the chemical can cause nasopharyngeal cancer (cancer of the nose and throat). In 2006, IARC designated formaldehyde as Category 1, carcinogenic to humans, and in 2009, IARC concluded that there was sufficient evidence to link formaldehyde exposure to leukemia.

Formaldehyde has also been shown to cause other health effects at relatively low levels. Indoor exposure to formaldehyde can cause headaches, nausea, burning or itching of the eyes or nose, sore throat and upper respiratory tract irritation.[191] Research has shown that formaldehyde can cause asthma in very low concentrations – levels much lower than regulatory thresholds.[192]

2. Portable Classroom Exposure Cases [193]

Between 1999 and 2001, As You Sow served Notices of Violation on the largest manufacturers of classrooms in the country alleging that these companies had violated Proposition 65 by failing to warn students, teachers, and other persons of exposure in classrooms to Proposition 65 chemicals known to cause cancer, birth defects or other reproductive harm.

In a historic settlement, 20 companies agreed to take measures to reduce exposure, especially to formaldehyde. The manufacturers agreed to replace particleboard as flooring underlayment with cementitious underlayment such as hardibacker board or phenol-formaldehyde plywood or other material which is at least equivalently low in formaldehyde emissions as phenol-formaldehyde plywood. This represented a giant shift in the industry away from urea-formaldehyde, which had higher formaldehyde emissions. The settlement required ventilation in the subroof area of the classroom. The settlement required that any plywood used to construct the roof decks and underlayment of the building be only phenol-formaldehyde plywood or other alternative which is at least equivalently low in formaldehyde emissions as phenol-formaldehyde playwood. Plywood using urea-formaldehyde resins was prohibited to be used for any roof decks or underlayment. Any carpeting installation containing a backing with "SBR" would require that customers be advised in writing not to occupy the building for a minimum of 72 hours of airing-out time under well-ventilated conditions. Finally, the use of

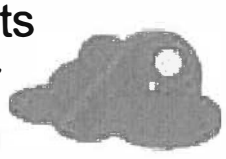
formaldehyde adhesives in interior areas of buildings was prohibited.[194]

G. Diesel Engine Exhaust Exposure Cases[195]

1. Health Effects from Diesel Engine Exhaust

Diesel engine exhaust is composed of thousands of gases and fine particles emitted by an internal combustion engine run by diesel fuel. The gaseous portion contains nitrogen, oxygen, carbon dioxide, and water vapor with pollutants like carbon monoxide (CO), sulfur oxides (SO_x), nitrogen oxides (NO_x), volatile hydrocarbons, and polycyclic aromatic hydrocarbons (PAH) and their derivatives. Many of the PAHs and their derivatives are potent mutagens and carcinogens. Diesel exhaust contains more than 40 substances that are listed by the U.S. EPA as hazardous air pollutants and by the ARB as toxic air contaminants. Some of the gaseous components contain highly toxic chemicals such as benzene, formaldehyde, 1,3-butadiene, arsenic and nickel that are suspected or known to cause cancer in humans.[196]

Emissions of toxic air contaminants have increased the risk of cancer to many people in California.



In 1988, the National Institute of Occupational Health and Safety (NIOSH) first recommended that whole diesel exhaust be considered a potential occupational carcinogen based on animal and human evidence. In 1989, IARC concluded that there was sufficient evidence for carcinogenicity of diesel engine exhaust in experimental animals and limited evidence for carcinogenicity in humans. Based on these findings, IARC determined that diesel engine exhaust is probably carcinogenic to humans.[197] Based upon IARC's study, diesel engine exhaust was listed as a carcinogen pursuant to Proposition 65. In 1998, a draft U.S. EPA document also found diesel exhaust to be classified as a "probable" human carcinogen via inhalation. This conclusion stemmed from positive and "limited" evidence in human studies, a "sufficient" level of evidence in bioassays, and other mutagenicity and genotoxicity data.[198] In 2002, the U.S. EPA's National Center for Environmental Assessment published the Health Assessment Document for Diesel Engine Exhaust, which was an in depth study of the health impacts from diesel engine exhaust exposure. The study determined that long-term inhalation exposure is likely to cause damage to human lungs and cause lung cancer and that short term exposure can cause irritation and short-term inflammation in the lungs. The assessment also revealed accumulating evidence demonstrating that exposure to diesel exhaust can exacerbate allergies and asthma symptoms.[199]

OEHHA has estimated that while diesel vehicles account for only 2% of on-road motor vehicles in California, they produce 30% of the nitrogen oxides and 60% of the particulate matter of the particulate matter emitted from its vehicles. Virtually all of the diesel exhaust particle mass is composed of fine particles 10 microns or less in diameter. Approximately 98% of the mass of these fine particles are less than 10 microns in diameter, 94% less than 2.5 microns in diameter, and 92% less than 1 micron in diameter. Based on this extremely small size, these particles can easily be inhaled and trapped into the bronchial and alveolar areas of the lung where they contribute to respiratory disease. The particulate matter in diesel exhaust has been identified as a toxic air contaminant by ARB and linked to lung cancer.[200]

OEHHA has concluded that long-term exposure to particles in diesel exhaust creates the highest cancer risk of any toxic air contaminant evaluated by the agency. ARB estimated that 70% of the cancer risk from inhaling toxic air pollutants is from diesel exhaust particles. [201]

The ARB and OEHHA report studying diesel exhaust as a toxic air contaminant, based on a 1995 emissions inventory, estimated that approximately 27,000 tons of diesel exhaust PM_{10} (particulate matter equal to or less than 10 microns in diameter) and 26,000 tons of diesel exhaust $PM_{2.5}$ (particulate matter equal to or less than 2.5 microns in diameter) from various mobile sources are emitted into the air in California annually. Based on the 1995 emissions inventory, ARB and OEHHA estimated emissions from other diesel exhaust pollutants: These include 415,000 tons per year (tpy) of diesel exhaust NO_x, 28,000 tpy of So_x, 41,000 tpy of ROG, and 188,000 tpy of CO are emitted in the air in California annually.[202]

Nitrogen oxides have been shown to cause damage to lung tissue, lower the body's resistance to respiratory infection and exacerbate chronic lung diseases, like asthma. Ozone is formed when nitrogen oxides combine with hydrocarbons in the atmosphere. Ozone is the major component of smog. Ozone is a strong eye and respiratory tract irritant. Lastly, carbon monoxide impedes the blood's ability to transport oxygen to body tissues and worsens cardiac or respiratory diseases.[203]

2. Cases to Reduce Exposure to Diesel Exhaust

In some of the most ingenious Proposition 65 actions, plaintiffs sought to protect school children from diesel engine exhaust from school buses. In a settlement reached with Laidlaw, the company agreed to invest a minimum of $4.7 million over five years to continue retrofitting buses in its California fleet more than five years old with control devices to reduce diesel engine exhaust. Laidlaw also agreed to vastly improve its fleet by spending $23.6 million over the course of seven years by either retrofitting additional buses or purchasing new buses meeting the most stringent air pollution standards.[204]

In the settlement with Durham School Services, the company agreed to replace all buses in its existing fleet in California made before 1978 with buses that meet applicable ARB and EPA emission standards for engines certified for the year of delivery of that school bus engine and fuel type by January 1, 2009. The company also agreed to replace and retrofit older buses with approved updated emission controls.[205]

There were other settlements in which bus companies agreed to retrofit or replace their existing fleets.[206]

III. CONCLUSION

Emissions of toxic air contaminants have increased the risk of cancer and reproductive toxicity to many people in California. Despite the existence of numerous local, state and federal agencies with varying oversight and regulatory control over toxic air emissions, large quantities of emissions from numerous facilities continued unabated for many years. These chemicals unnecessarily exposed numerous persons in their homes and work environments throughout the State. Proposition 65 enforcement has led to enormous reductions of toxic emissions through settlements requiring the installation of updated control technology and process changes in businesses emitting lead, hexavalent chromium, ethylene oxide and other chemicals. These cases have eliminated large amounts of methylene chloride emissions and more than 1 million pounds of PCE emissions through the conversion to water-based cleaning solvents and the installation of modern control technology. Proposition 65 has also had a dramatic effect in reducing exposures to school children from formaldehyde in classroom portables through the elimination of urea-formaldehyde and use of safer building materials and from diesel engine exhaust through retrofitting busses. As a result, numerous toxic exposures throughout California have been averted and cancer and reproductive toxicity risks have been substantially reduced.

ENDNOTES

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1 Unless otherwise stated, the cases discussed were filed by the author as legal counsel for various environmental groups seeking the elimination of toxic chemical exposures to people (including school children and teachers in classroom portables) living and working around various industrial sources.

2 See CAL. HEALTH & SAFETY CODE Sections 25249.5-25249.13 (approved by the California electorate as an initiative measure in the November 4, 1986 general election) [referred throughout this article as Proposition 65].

3 See CAL. HEALTH & SAFETY CODE Section 25249.5.

4 Id.

5 Id. Section 25249.6.

6 The Office of Environmental Health Hazard Assessment (OEHHA) of the California Environmental Protection Agency is the lead agency for the implementation of Proposition 65. OEHHA continues to develop safe harbor levels for listed chemicals. For carcinogens, these are expressed as no significant risk levels (NSRLs) and for chemicals that cause reproductive toxicity, expressed as maximum allowable dose levels (MADLs) OEHHA defines the NSRL as the daily intake level calculated to result in one excess case of cancer per 100,000 people, assuming lifetime exposure (70 years) at the level in question. OEHHA defines the MADL as the level at which the chemical would have no observable adverse reproductive effect assuming exposure at 1,000 times that level. See Proposition 65 Status Report Safe Harbor Levels: No Significant Risk Levels for Carcinogens and Maximum Dose Levels for Chemicals Causing Reproductive Toxicity, November 2010, Reproductive and Cancer Hazard Branch, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency.

7 Id. Section 254249.7 (b) (1).

8 Lead was listed as a reproductive toxicant on February 27, 1987 and as a carcinogen on October 1, 1992. See State of California, Environmental

Protection Agency, Office of Environmental Health Hazard Assessment, Safe Drinking Water and Toxic Enforcement Act of 1986, Chemicals Known to the State of California to Cause Cancer or Reproductive Toxicity. ("Proposition 65 List"). The MADL for lead is 0.5 micrograms ("ug.")/day. CAL. CODE REGS. Tit. 27 Section 25805. The NSRL for lead is 15 ug/ day (oral). Id. at Section 25705 (b) (1).

9 Methylene chloride or dichloromethane was placed on the Proposition 65 List as a carcinogen on April 1, 1988. The NSRL for methylene chloride is 200 ug/ day for inhalation. Id.. at Section 25705 (b) (1).

10 Perchloroethylene or tetrachloroethylene was placed on the Proposition 65 List as a carcinogen on April 1, 1988. The NSRL for the chemical is 14 ug/day. CAL. CODE REGS. Tit. 27 Section 25705 (c) (2).

11 Ethylene oxide was placed on the Proposition 65 List as a carcinogen on July 1, 1987 and as a chemical causing reproductive toxicity for females on February 27, 1987 and males on August 7, 2009. The MADL for ethylene oxide is 20 ug/day. CAL. CODE REGS. Tit.27 Section 25805.

12 Hexavalent chromium was placed on the Proposition 65 List on October 1, 1987. The NSRL for hexavalent chromium is .001 ug./day. CAL. CODE REGS. Tit.27 Section 25705 (b) (1). Hexavalent chromium was listed as a chemical causing reproductive toxicity (developmental, female and male) on December 19, 2008.

13 Asbestos was placed on the Proposition 65 List as a carcinogen on February 27, 1987.

14 Chloroform was placed on the Proposition 65 List as a carcinogen on October 1, 1987. The NSRL for chloroform is 40 ug/day for inhalation. CAL.CODE REGS. Tit. 27 Section 25705 (c) (2). Chloroform was listed as a chemical causing reproductive toxicity (developmental) on August 17, 2009.

15 Diesel engine exhaust was placed on the Proposition 65 List as a carcinogen on October 1, 1990.

16 Formaldehyde was placed on the Proposition 65 List as a carcinogen on January 1, 1988. The NSRL for formaldehyde is 40 ug/day. CAL.CODE REGS. Tit 27 Section 25705 (c) (2).

17 The early cases are fully described in an article by the author titled "Proposition 65 Enforcement: Reducing Lead Emissions in California," Tulane Environmental Law Journal, Volume 10, Summer 1997, Issue 2.

18 Citizens for a Better Environment since changed its name to Communities for a Better Environment.

19 See Citizens for a Better Environment. v. Systron Donner Corp., No. C 90-04539 (Cal. Super. Ct. Contra Costa Co. October 18, 1990) (Consent Judgment).

20 See People v. Bio-Rad Laboratories, Inc., No. C90-05401 (Cal. Super. Ct. Contra Costa Co. December 12, 1990) (Consent Judgment). The Consent Judgment also required Bio-Rad to pay civil penalties and costs of $550,000, $187,000 to be used by the Attorney General for further Proposition 65 enforcement action and $150,000 to the Bay Area Air Quality Management District for violation of its rules and regulations.

21 William S. Pease, "Chemical Hazards and the Public's Right to Know: How Effective is California's Proposition 65?," 33 ENVIRONMENT 12, 18 (1991).

22 See People v. McGhan Medical, No. 178922 (Cal. Super. Ct. Santa Barbara Co. October 26, 1990) (Consent Judgment); People v. Mentor Corp., No. 178922 (Cal. Super. Ct. Santa Barbara Co. October 24, 1990) (Consent Judgment); People v. Santa Maria Chili, No. SM64010 (Cal. Super. Ct. Santa Barbara Co. April 10, 1991) (Consent Judgment); People v. Griffith Micro Science, No. BC006063 (Cal. Super. Ct. L.A. Co. May 1, 1991) (Stipulated Judgment); People v. Baxter Healthcare Corporation, No. BC006061 (Cal. Super. Ct. L.A. Co. October, 1991) (Stipulated Judgment); People v. Bentley Labs and Baxter Healthcare Corporation, No. 630727 (Cal. Super. Ct. Orange Co. September 2, 1991) (Stipulated Judgment); People v. Botanicals International, Inc., No. BC006060 (Cal. Super. Ct. L.A. Co. March 6, 1991 (Consent Judgment); People v. Sterilization Services and Vacudyne, No. 630728 (Cal. Super. Ct. Orange Co. October 21, 1991) (Stipulated Judgment).

23 See Pease, Chemical Hazards, supra note 25, at 18-19.

24 Phone conversation with Robert Sears, October 25, 1996, the consultant for the Attorney General who conducted the air dispersion modeling analysis to determine health risks on the ethylene oxide cases.

25 This was a confidential settlement agreement so the name of the company cannot be disclosed.

26 See California Earth Corps v. Laminating Company of America, No. 706725 (Cal. Super. Ct. Orange Co. August 19, 1993 (Consent Judgment). This company was ranked 8th highest in terms of cancer risk by the South Coast AQMD in the 1991 Annual Report on AB 2588 Air Toxics Hot Spot Risk Assessments Report.

27 See Alviso Community Org. v. Maciel, No. 723808 (Cal. Super. Ct. Santa Clara Co. Oct. 5, 1994) (court

approval of settlement). The complaint alleged asbestos exposure from trucks and construction activities raising asbestos laden dust. The settlement restricted these activities and provided substantial funds for medical monitoring. James Wheaton handled the case for the plaintiffs. Asbestos was placed on the Proposition 65 List on February 27, 1987. The NSRL for asbestos is 100 fibers inhaled per day. CAL.CODE REGS. Tit. 27 Section 25705 (b) (1).

28 See California Earth Corps v. Allied Signal Inc. No. BC 115204 (Cal. Super. Ct. L.A. Co. February 13, 1996) (Final Judgment). Allied Signal agreed to limit use of its lead pot used to melt lead for use in manufacturing dyes and to maintain a timing device of the lead pot to ensure compliance.

29 See People of the State of California v. McDonnell Douglas Corp., No. BC055494 (Cal. Super. Ct. L.A. Co. Aug. 23, 1994 (Consent Judgment). The settlement required the company to install HEPA filter systems on two paint booths at the Long Beach site and a HEPA system on one paint booth at the Huntington Beach site. The 60-Day Notice in this case was initiated by California Earth Corps.

30 42 U.S.C. Section 7412 (b).

31 Health & Safety Code Section 39657.

32 Bellinger et al., Early sensory-motor development and prenatal exposure to lead. Neurobehav. Toxicol. Teratol 6:387-402 (1984); Bellinger et al., A follow-up study of the academic attainment and classroom behavior of children with elevate dentine lead levels. Biol. Trace Elem. Res. 6:207-223 (1984); McMichael et al. Tooth lead levels and IQ in school-age children: The Port Pirie cohort study. Am. J Epidemiol. 140(6):489-499 (1994); Needleman et al. Bone lead levels and delinquent behavior. JAMA 275(5): 363-369 (1996).

33 PUEBLO had worked extensively to reduce lead exposures in Alameda County by helping pass the first county ordinance on the west coast requiring the county to provide blood testing for those persons who were exposed or who might be exposed to lead.

34 See People United for a Better Oakland v. American Brass & Iron Foundry, No. 708543 (Cal. Super. Ct. Alameda Co. November 17, 1992(Complaint for Injunctive Relief and Civil Penalties). The Attorney General intervened on March 2, 1993 which was the first time the State intervened in a Proposition 65 case.

35 The Consent Judgment was entered on November 12, 1993.

36 BAY AREA AIR QUALITY MANAGEMENT DISTRICT 1996 ANNUAL REPORT.

37 Thakar Aluminum FACILITY EMISSION SUMMARY FORM to South Coast AQMD.

38 See California Earth Corps, Inc. vs. Thakar Aluminum Corporation and Imco Recycling of California, Inc., No. 254720 (Cal. Super. Ct. Riverside Co., August 30, 1994) (Final Judgment).

39 See BAY AREA AIR QUALITY MANAGEMENT DISTRICT TOXIC AIR CONTAMINANTS, 2002 Annual Report showing 180 pounds of lead emissions for the Owen-Brockway, Oakland facility.

40 CEC was the only environmental group in southern California during this period bringing enforcement actions against companies emitting lead, pursuant to Proposition 65.

41 See California Earth Corps, Inc. vs. Quenell Enterprises, Inc. No. BC086292 (Cal. Super. Ct. L.A. Co. filed July, 1993.

42 Quenell submitted Facility Emission Summary Forms to the South Coast AQMD. By the end of 1992, Quenell started the installation of HEPA filter to reduce emissions.

43 The Consent Judgment was filed on August 13, 1993.

44 See California Earth Corps, Inc. v. GNB Battery Tech., Inc., Nos. BC0079211 & BC0079212 (Cal. Super. Ct. L.A. Co. August 5, 1994) (Final Judgment).

45 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT TAC DATA 1999-2000. GNB reported lead emissions for 1999-2000 of 403 pounds for the Vernon facility.

46 See California Earth Corps, Inc. vs. GNB Batteries, Inc., No. BC0079212 (L.A. Super. Ct. April 19, 1993) (Complaint for Injunctive Relief and Civil Penalties; People v GNB Batteries, Inc. No. BC079211 (L.A. Super. Ct. April 19, 1993) (Complaint for Injunctive Relief and Civil Penalties). The Los Angeles County District Attorney worked on the case jointly with CEC. The California Department of Toxic Substances Control was also prosecuting GNB for hazardous waste violations regarding lead. See AIR TOXICS EMISSIONS DATA SYSTEM SUMMARY, CALIFORNIA AIR RESOURCES BOARD (July19, 1994) providing emissions data for 1989. The Industry facility reported 319 pounds of lead emissions. By 1994, emissions had decreased to 47 pounds.

47 See California Earth Corps, Inc. v. Ramcar Batteries, Inc. No. BC109210 (Cal. Super. Ct. L.A. Co. July 22, 1994). (Complaint for Injunctive Relief and Civil Penalties).

48 See Ramcar Batteries, Inc. Facility Emission Summary Forms submitted to the South Coast AQMD and AB 2588 Air Toxics Risk Assessment prepared by Fero Environmental Engineering, Inc. Curiously, Ramcar contended that its emissions were between 23 and 35 pounds per year subsequent to CEC's filing.

49 See California Earth Corps, Inc. v. Ramcar Batteries, Inc. No. BC109210 (Cal.Super.Ct. L.A. Co. May 10, 1995 (Final Judgment).

50 Facility Emission Summary submitted to South Coast AQMD, General Motors Corp., Delco Remy Div., 1993.

51 Delco-Remy, 24-Hour Average Lead Exposure Isopleths, Robert Sears, April 10, 1994.

52 See California Earth Corps, Inc. v. Delco Remy, Inc. No. CV-94-2203 (E.D. Cal. May 15, 1995) (Stipulation to Consent Judgment and Order Thereon).

53 Interspace/Concorde Battery Corporation Compliance Plan Report (1992 lead emissions).

54 Concorde Battery residential and worker lead exposures based on 1994 emissions, prepared by Robert Sears, September 23, 1995. The model showed 550 residents and 485 workers were exposed to 5.0 ug/day or greater.

55 See California Earth Corps, Inc. v. Interspace Battery, Inc. and Concorde Battery Corporation BC 115205 (Cal. Super. Ct. L.A. Co. November 6, 1995) (Settlement Agreement).

56 After submitting the Compliance Plan, Johnson's plant improvements lowered emissions to .398 pounds per day by the end of 1993- still a high number. Nevertheless, based on continued high emissions, CEC served a Notice of Violation in August of 1994.

57 With daily lead emissions at 3.78 pounds, 37,991 residents and 38,925 workers were exposed at 1.0 ug/day or greater; and 754 residents and 7,936 workers were exposed at 5.0 ug/day or greater. CEC was provided with emission figures provided by Johnson's consultant at 3.36 pounds per day. Johnson Controls Eight & 24-Hour Average Lead Exposure Isopleths for 1993 Emissions, prepared by Robert Sears, July 21, 1995.

58 See California Earth Corps, Inc. v. Johnson Controls Battery Group, No. 737816 (Cal. Super. Ct. Orange Co. May 14, 1996 (Consent Judgment). Johnson was required to either remove two tricasters from operation or upgrade the tricaster to be vented to a baghouse.

59 SOUTH COAST AQMD FACILITY EMISSION DETAIL Johnson Controls Battery Group, 2000 lead emissions reported at 361 pounds.

60 U.S Battery Manufacturing Co. Lead Exposure Isopleths, prepared by Robert Sears, November 15, 1996.

61 Id. April 23, 1998, Stipulation Re Consent Judgment and Order Thereon.

62 See California Community Health Advocates v. Duncan Enterprises, Inc., No. 591850-3 (Cal. Super. Ct. Fresno Co. June 30, 1997) (Final Judgment).

63 See California Community Health Advocates v. Go/ Dan Industries, No. SCVSS 60179 (Cal. Super. Ct. San Bernardino Co., September 1, 1999) (Final Judgment).

64 See Center for Environmental Health v. Johanson Dielectrics, Inc., No. BC261491 (Cal. Super. Ct. L.A. Co. May 14, 2002) (Final Judgment).

65 California EPA showed Acme's 1995 lead emissions as 121 pounds.

66 Company operations exposed 10,565 residents and 1,165 workers to .5 ug/day or greater; 6,278 residents and 461 workers to 1.0 ug/day or greater; and 620 residents and 36 workers to 5.0 ug/day or greater. Robert Sears, Acme Packaging Residential and Worker Lead Exposures, February 24, 1996.

67 See Communities for a Better Environment v. Acme Packaging Corporation, dba Acme Steel Packaging Corporation (Contra Costa Super. Ct., Case No. C96-02505, Consent Judgment February 23, 1998. This author collaborated with the law firm of Chapman, Popik & White. Mark White took on the major role from the firm.

68 With 234 pounds of emissions for 1999-2000 (South Coast AQMD website at Facility Information Emissions indicating 20.7 pounds of lead emissions for 2002) 1,202 residents and 1,042 workers were exposed at or above the .5 microgram per day level. Essex Group Proposition 65 Lead Exposures, prepared by Camille Sears, August 31, 2001. The model also showed 492 residents and 409 workers exposed at or above 1.0 micrograms per day; and 51 residents and 42 workers exposed at or above 5.0 micrograms per day.

69 See Center for Environmental Health v. Essex Group, Inc. (Cal. Super. Ct. Orange Co. June 11, 2002) (Final Judgment).

70 South Coast AQMD, FACILITY EMISSION DETAILI, 2002 AER.

71 This company reported lead emissions of 40 pounds per year for 1999-2000 and modeling showed 1,437 residents and 901 workers exposed at or above .5 micrograms per day. Ace Clearwater Enterprises Proposition 65 Lead Exposures, prepared by Camille Sears, March 14, 2001. The model also showed 79 residents and 39 workers exposed at or above 5.0 micrograms per day.

72 Id. Final Judgment March 25, 2002.

73 Exide Technologies FACILITY INFORMATION DETAIL emission filings to the South Coast AQMD. In 2009, Exide agreed to an extensive list of lead reduction control measures with the South Coast AQMD.

74 Emissions information was provided to CEH's consultant by Exide's consultant Environ.

75 Exide Technologies Los Angeles Proposition 65 Lead Exposures; Modeling Analysis Using AERMOD and Central Los Angeles Meteorological Data" prepared by Camille Sears, August 7, 2009.

76 See Center for Environmental Health v. Exide Technologies, No. BC 444682 (L.A. Super. Ct., November 3, 2010) (Consent Judgment). Prior to the Consent Judgment, Exide agreed to lead reduction measures with South Coast AQMD.

77 Chemicals in the Environment: Perchloroethylene (CAS No. 127-18-4) prepared by Office of Pollution Prevention and Toxics, U.S. EPA, August 1994. See also New Jersey Department of Health and Senior Services.

78 Kwikset Corporation, Form TAC – Toxic Air Contaminants 1995-96 Annual Emissions Report

79 Monitoring of Airborne Hexavalent Chromium and Perchloroethylene Concentrations from Kwikset Corporation for the California Earth Corps, prepared by Cliff Scholle, SEA Consultants, November 1996. The monitoring also showed concentrations of hexavalent chromium as high as 12.67 nanogram as per cubic meter, resulting in an excess cancer risk of about 177 per 100,00, assuming that the monitoring is characteristic of the long-term average concentration at the monitored location.

80 See California Earth Corps, Inc. v. Kwikset Corporation, No. 781637 (Cal. Super. Ct. Orange Co. March 16, 1998) (Final Judgment).

81 Kwikset paid the South Coast AQMD $30,009 for the 1995-96 period due to such large emissions.

82 Punch Press Products Proposition 65 Perchloroethyene Excess Cancer Risks, report prepared by Camille Sears, December 30, 1998.

83 Declaration of Robert Dierickx, Director of Operations at Punch Press Products, February 21, 2000.

84 Letter from Lawrence J. Straw, Jr., counsel for Punch Press Products, to Michael Freund, April 12, 1999.

85 The residential cancer risk at a distance of 100 meters from Mag, 1,280 per million; at 500 meters from Mag, 138 per million; and at 700 meters from Mag, 80 per million. The 10 per million risk for residences extended up to 2,500 meters from the facility. Analysis of Health Risks Associated with Emissions of Perchloroethylene, Mag Instruments, Ontario, California, January 21, 2000, prepared by Air Permitting Specialist, Ray Kapahi. 1,205 residents and 501 workers exposed at a cancer risk of 20 per million; 388 residents and 196 workers exposed at a risk of 50 per million; and 202 residents and 45 workers exposed at a risk of 100 per million.

86 See California Community Health Advocates v. MAG Instruments, Inc., No. RCV 052037 (Cal. Super. Ct. San Bernardino Co. December 20, 2000) (Final Judgment).

87 The company reported 20,786 pounds of emissions during 1996-97. An air dispersion risk study showed that 2,140 individuals were exposed to risks above 10 cancers per million up to 450 meters from the facility; 150 individuals were exposed to risk levels above 100 cancers per million; individuals within 20 meters of the facility were exposed to risk levels at 637 cancers per million; and individuals within 50 meters were exposed to risk levels at 325 cancers per million.

88 Air Permitting Specialist, Technical Memorandum, Health Risks Associated with Perchloroethylene Emissions, Palace Plating, Ray Kapahi, November 17, 1998.

89 California Community Health Advocates v. Palace Plating, Inc., BC 210352 (Cal. Super. Ct., L.A. Co. November 1, 1999 (Final Judgment).

90 California Community Health Advocates v. Kaynar Technologies, Inc., No. 795586 (Cal. Super. Ct. Orange Co. March 22, 1999) (Final Judgment). Letter from Kaynar's attorney Patricia M. O'Toole.

91 California Community Health Advocates v. Grover Products Company, Inc., BC238675 (Cal.Super. Ct. L.A. Co. December 13, 2000) (Consent Judgment).

92 Fredrick Ramond, Inc. Proposition 65 Perchloroethylene Excess Cancer Risks, prepared by Camille Sears, 1999.

93 See California Community Health Advocates v. Arrowhead Products Corporation, No. 811229 (Cal. Super. Ct. Orange Co. November 12, 1999) (Final Judgment);

94 See California Community Health Advocates v. Orange County Plating, Inc., No. 818589 (Cal. Super. Ct. Orange Co. December 27, 1999) (Final Judgment); California Community Health Advocates v. Coronet Manufacturing Company, No. BC206332 (Cal. Super. Ct. L.A. Co. March 28, 2000) (Final Judgment); Center for Environmental Health v. Mayoni Enterprises, Inc., No. 217070 (Cal. Super. Ct. L.A. Co., July 3, 2000) (Final Judgment); Center for Environmental Health v. Artistic Plating and Metal Finishing, Inc., No. 00C09867 (Cal.Super. Ct. Orange Co. September 25, 2000) (Final Judgment); California Community Health Advocates v. J & H Deburring, Inc., No. 00CC01902 (Cal. Super. Ct. Orange Co., February 22, 2000) (Final Judgment); Center for Environmental Health v. Dolphin Engineering, Inc., No. BC254293 (Cal. Super. Ct. L.A. Co. September 23, 2002) (Final Judgment); California Community Health Advocates v. Speedway Metal Finishing, Inc., No. 01CC08517 (Cal. Super. Ct. Orange Co. January 2, 2002) (Final Judgment); California Community Health Advocates v. Tru-Cut, Inc., No. BC261228 (Cal.Super. Ct. L.A. Co. July 25, 2001) (Final Judgment); Center for Environmental Health v. Kanstul Musical Instruments, Inc. No. 01CC02729 (Cal. Super. Ct. Orange County January 7, 2002) (Final Judgment).; California Community Health Advocates v. Arrowhead Brass Products, Inc., No. BC244314 (Cal. Super. Ct. L.A. Co. January 9, 2002) (Final Judgment). California Community Health Advocates v. Coronet Manufacturing Company, No. BC206332 (Cal. Super. Ct. L.A. Co. March 28, 2000) (Final Judgment).

95 See California Community Health Advocates v. AC Products, Inc., No. 814669, (Cal. Super. Ct. Orange Co. December 1, 2000) (Final Judgment).

96 See As You Sow v. Technical Metal Finishing Company, Inc., No. BC 225759 (Cal. Super. Ct. L.A. Co. December 12, 2000) (Final Judgment).

97 As reflected in Technical Metal's 1999-2000 emissions report to the South Coast AQMD.

98 Aerochem Toxic Chemical Release Inventory Reporting Form, Form R, 1997.

99 Aerochem, Inc., Perchloroethylene Excess Cancer Risks, Camille Sears, 1998.

100 Aerochem Toxic CHEMICAL RELEASE INVENTORY REPORTING FORM, FORM R, 1999.

101 Letter from Lefiell's attorney Robert E. Mitchell to Michael Freund, August 5, 1998. Lefiell had previously reported 63,058 pounds of perchloroethylene emissions for 1996-97 to the South Coast AQMD in Form TAC, Annual Emissions Report.

102 Lefiell (Santa Fe Springs Facility) Proposition 65 Perchloroethylene Excess Cancer Risks, Camille Sears, April 6, 1999.

103 Id., (Final Judgment August 5, 1999). The new equipment cost approximately $600,000.00 to purchase and install.

104 SOUTH COAST AQMD FACILITY INFORMATION DETAIL for Lefiell for calendar year 2000.

105 Lockhart Industries, Inc., Perchloroethylene Excess Cancer Risks, prepared by Camille Sears, 1999.

106 See California Community Health Advocates v. Lockhart Industries, Inc., Case No. BC223681 (Cal. Super. Ct. L.A. Co. January 26, 2000) (Final Judgment).

107 Thompson Industries Proposition 65 Perchloroethylene Excess Cancer Risks, Camille Sears, May 18, 1999. The mode also showed 773 residents and 63 workers exposed to levels two or more times the warning threshold; 325 residents and 6 workers exposed to levels five or more times the warning threshold; and 145 residents exposed to levels ten or more times the Proposition 65 threshold.

108 See Center for Environmental Health v. Thompson Industries Ltd., Inc., No. BC212165 (Cal. Super. Ct. L.A. Co. July 28, 2000) (Final Judgment).

109 The company's customers include branches of the U.S. military, major U.S. defense contractors, Australia, Canada and Israel. Marvin Engineering Company Profile, Hoovers.

110 The maximum residential cancer risk was 45.4 per million at 75 meters; 30.8 per million at 100 meters and 10.8 per million at 200 meters. An ethnicity analysis, showed exposures to 67 white people; 358 African Americans; 4 American Indian/Alaskan Natives; 17 Asians; 108 Hispanic or Latino's; 59 persons of other races and 13 persons of two or more races. Air Permitting Specialists, "Analysis of Health Risks Associated with Emissions of Perchloroethylene" Ray Kapahi. October 27, 2006.

111 See Center for Environmental Health v. Marvin Engineering, No. BC 360876 (Cal. Super. Ct. L.A. Co. May 10, 2007 (Final Judgment). .

112 Deluxe Laboratory paid the South Coast AQMD $21,656 in order to maintain these emissions.

113 Deluxe Laboratories, Inc. Perchloroethylene Excess Cancer Risks, prepared by Camille Sears, December 30, 1998.

114 See California Community Health Advocates v. Deluxe Laboratories, Inc., No. BC206399 (Cal. Super. Ct. L.A. Co. February 23, 2000) (Final Judgment).

115 SOUTH COAST AQMD FACILITY INFORMATION DETAIL, report of Deluxe Laboratories, 2000.

116 See California Community Health Advocates v. Technicolor, Inc. , No. BC228407 (Cal. Super. Ct. L.A. Co.April 21, 2000) (Final Judgment). Technicolor agreed to provide an initial Proposition 65 warning in the form of a postcard mailed to those individuals exposed to perchloroethylene with subsequent warnings by postcard or newspaper warnings. Technicolor also agreed to post warnings at each entrance at its facility.

117 SOUTH COAST AQMD FACILITY INFORMATION DETAIL show emissions were reduced to 8,536 pounds in 2001.

118 Wikipedia.

119 Emissions reports submitted by Consolidated Film Industries to the South Coast AQMD.

120 Consolidated Film Industries, Proposition 65 Perchloroethylene Excess Cancer Risks Analysis, Camille Sears, May 31, 1999.

121 See Center for Environmental Health v. Consolidated Film Industries, LLC, No. BC 234486 (Cal. Super. Ct. L.A. Co. November 9, 2000) (Final Judgment).

122 SOUTH COAST AQMD FACILITY INFORMATION DETAIL, for Consolidated Film Industries for 2002.

123 See Report entitled "Hung Out to Dry," published by the Coalition for Clean Air, Todd Campbell, MES, MPP and Liori Low, M.Ed., October 2002.

124 Consumers Union documented significant amounts of perchloroethylene emitted from freshly dry cleaned garments by attaching a monitoring device to the lapel. The analysis projected an increased cancer risk of 150 per million for persons wearing heavily dry cleaned garments at least one time per week. Wallace et al. 1996. In a 1991 study, EPA calculated perchloroethylene levels in a home from dry cleaned garments. The study found levels of 2,900 parts per billion (ppb) in the closet, 195 ppb in the bedroom and 83 ppb in an adjacent den. Cantin, 1992.

125 A 1996 NIOSH study examined 1,708 men and women who worked in dry cleaning shops in various cities including New York City, Detroit, Chicago, Oakland and San Francisco. Workers were divided into two groups. Group one contained 625 workers from dry cleaning shops which used only perchloroethylene as a cleaning solvent. The second group included 1,083 workers who worked in a dry cleaning shop that used perchloroethylene and another dry cleaning solvent. In group one, deaths from cancer of the tongue were statistically increased. Workers who were exposed to perchloroethylene for five or more years and who had 20 years or more since first being exposed also had a statiscally significant increased risk for cancer of the esophagous. In the overall group who worked with perchloroethylene for five or more years, a statistically higher risk of bladder, esophageal and cervical cancer was found, although most of these workers also had exposure to other dry cleaning solvents.

126 See Schreiber et al. 1993, 2002; Wallace et al. 1995.

127 See Altmann et al. 1995, Schreiber et al 1993, 2002, Wallace et al. 1995.

128 The study found lower levels of PCE compared with levels documented before 1997 with the mean apartment PCE level as 34 microgams per cubic meter. However, PCE levels in 17 apartments exceeded the city residential air guideline of 100 micrograms per cubic meter and PCE levels in 4 apartments exceeded 1,000 micrograms per cubic meter. The mean indoor air per levels in minority neighborhoods was 75 micrograms per cubic meter compared with 19 micrograms per cubic meter in non-minority neighborhoods and were 256 micrograms per cubic meter in low-income neighborhoods compared with 23 micrograms per cubic meter in higher income neighborhoods. Environmental Health Perspectives, October 10, 2005, Tetrachloroethylene (PCE, Perchloroethylene) Levels in Residential Dry Cleaner Building in Diverse Communities in New York City, Michael J. McDermott et al.

129 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, 2000. Multiple Air Toxics Exposure Study in the South Coast Air Basin – II. Diamond Bar, CA. March, p. 2-2.

130 See DeRosa, Dave. 2002. Out of Fashion: Moving Beyond Toxic Cleaners in the Fabric Care Industry. Greenpeace. Washington, DC. July, p. 8.

131 See Cantin, J. 1992. Overview of Exposure Pathways. Proceedings from the International Roundtable on Pollution Prevention and Control in the Dry Cleaning Industry. Washington, DC; US EPA Office of Pollution Prevention and Toxics, EPA/774/R-92/002.

132 By July 1, 2010, existing PCE machines that share a wall with or are located in the same building with

a residence had to be rendered inoperable. As of July 1, 2010, first generation PCE machines or those operating more than 15 years had to cease to operate. Remaining PCE machines will not be allowed to operate upon reaching 15 years old.

133 Royal Airline Linen Proposition 65 Perchloroethylene Excess Cancer Risks, prepared by Camille Sears, June 20, 1999.

134 See California Community Health Advocates v. Royal Airline Linen, No. BC233386 (Cal. Super. Ct. L.A. Co. July 14, 2000) (Final Judgment).

135 See SOUTH COAST AQMD, FACILITY INFORMATION DETAIL, Royal Airline Linen emissions, AER 2002 and 2003.

136 4,643 residents and 996 workers exposed at levels resulting in an excess cancer risk of 10 per million or greater; 2,683 residents and 555 workers exposed at levels resulting in an excess cancer risk of 20 per million or greater; 1,346 residents and 186 workers exposed at levels resulting in an excess cancer risk of 50 per million or greater; and 710 residents exposed at levels resulting in an excess cancer risk of 100 per million or greater Flair Cleaners Proposition 65 Perchloroethylene Excess Cancer Risks, prepared by Camille Sears, June 20, 1999.

137 See Center for Environmental Health v. Flair, Inc., dba Fazio Cleaners, No. BC213082 (Cal. Super. Ct. L.A. Co. August 28, 2000) (Settlement Agreement and Release).

138 South Coast AQMD permit to operate petroleum machines granted May 9, 2003.

139 The Gary's Company, Proposition 65 Perchloroethylene Excess Cancer Risks, prepared by Camille Sears, June 19, 1999.

140 See As You Sow v. The Gary's Group LLC et al., BC229213 (Cal.Super. Ct. L.A. Co. May 4, 2000) (Final Judgment).

141 Declaration of Jonathan Hill, Chief Financial Officer for the Gary's Group, LLC, August 27, 2000.

142 The Director of the Center for Environmental Health, Michael Green, interviewed a tenant who was pregnant and had serious concerns about the health impacts on the fetus from the chemical exposure.

143 The concentrations in apartment #7 were 318 times above the warning threshold and the concentrations in apartment #7 were 283 times above the warning threshold. Report from Environmental Analytical Service, Inc. May 10, 1999.

144 See Center for Environmental Health v. Valetor Inc., dba Hollyway Cleaners, No. BC212164 (Cal. Super. Ct. L.A. Co. July 20, 2000) (Final Judgment).

145 Declaration from Fatehali Amersi, President, Valetor, Inc., March 23, 2001. The Green Earth Cleaning system was advertised to be nontoxic , with no volatile organic compounds. Information packet from Green Earth Cleaning, LLC, Kansas City, MO.

146 Sterling Westwood, Inc. Proposition 65 Perchloroethylene Excess Cancer Risks, prepared by Camille Sears, 2001.

147 See Center for Environmental Health v. Sterling Westwood, Inc., No. BC245219 (Cal. Super. Ct. L.A. Co. October 11, 2001 (Final Judgment).

148 H & K Imperial Cleaners Proposition 65 Perchloroethylene Excess Cancer Risks, prepared by Camille Sears, December 5, 2002.

149 See Center for Environmental Health v. H & K Imperial Cleaners, No. BC327818 (Cal. Super. Ct. L.A. Co. December 15, 2006) (Final Judgment).

150 See As You Sow v. Camaro Cleaners Corporation dba Startbright Cleaners & Launderers, No. CV 813406 (Santa Clara Super. Ct. December 17, 2003) (Final Judgment); As You Sow v. Kenneth M. Yamamoto, Inc., dba Fashion Express Cleaner, No. CV 813405 (Santa Clara Super. Ct., May 29, 2004) (Final Judgment); As You Sow v. S & H, Inc. dba Blu-White Cleaners, No. CIV 427894 (Cal. Super. Ct. San Mateo Co. December 17, 2003) (Final Judgment).

151 See Mateel Environmental Justice Foundation v. Pico Cleaners, No. 308803 (Cal. Super. Ct. San Francisco Co. January 14, 2000) (Consent Judgment). This case was brought by the Law Offices of Shawn Khorrami and William Verick from the Klamath Environmental Law Foundation.

152 See As You Sow v. Shadkor, Inc., dba Milt & Michaels Cleaners, No. BC233389 (Cal. Super. Ct. L.A. Co. July 26, 2000) (Final Judgment).

153 Bryan's Cleaners emission report of 676 pounds for 2005. SOUTH COAST AQMD FACILITY INFORMATION DETAIL.

154 See California Community Health Advocates v. Bryan's Cleaners & Laundry, Inc., No. BC246356 (Cal. Super. Ct. L.A. Co. March 20, 2002) (Final Judgment).

155 See Center for Environmental Health v. Super Fine Dry Cleaners, Inc. dba Debonair Cleaners, No. BC289232 (Cal. Super. Ct. L.A. Co., July 25, 2003) (Final Judgment).

156 See Center for Environmental Health v. Four Seasons, Inc., No. BC288758 (Cal.Super. Ct. L.A. Co. January 8, 2004) (Final Judgment)..

157 See Communities for a Better Environment v. M & M Cleaners, No. BC325787 (Cal.Super. Ct. L.A. Co., May 29, 2005) (Final Judgment).

158 See Center for Environmental Health v. Dollar Cleaners, Inc., No. 2002076078 (Cal.Super. Ct. Alameda Co. October 17, 2003) (Final Judgment).

159 Cancer Risk Analysis for Brite 1- Hour Cleaners, prepared by Schuyler Fishman, April 25, 2003. Modeling showed 104 residents and 34 workers exposed above Proposition 65 levels with nearby persons exposed to very high risk levels.

160 See Center for Environmental Health v. Dry Clean Time of America, Inc. dba Brite 1- Hour Cleaners, No. RG03-116011 (Cal.Super. Ct. Alameda Co. June 7, 2004) (Final Judgment).

161 CEH's Notice of Violation was dated November 26, 2003 and the company installed the Columbia 80 pound Secondary Control Machine in March, 2004. See Center for Environmental Health v. Dry Cleaning Systems, Inc., dba Vogue Cleaners, No. C-04-01047 (Cal. Super. Ct. Contra Costa Co. January 10, 2005) (Final Judgment).

162 During this investigation, residents in the next door apartment discussed with staff from CEH that they had to close their windows to limit the chemical from entering their home.

163 See Center for Environmental Health v. Virginia Cleaners, Inc., No. 200207609 (Cal. Super. Ct. Alameda Co. June 10, 2004) (Final Judgment). The installation was confirmed by Scott Lutz of the Bay Area Air Quality Management District, November 10, 2009.

164 See Center for Environmental Health v. Dick Bruhn, Inc., dba Selix Formalwear, No. RG04146143 (Cal. Super. Ct. Alameda Co. May 27, 2005) (Final Judgment). Invoice from Selix Formalwear, April 24, 2006.

165 See UNITED STATES DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION, HEXAVALENT CHROMIUM RECOGNITION, updated May 23, 2008.

166 See AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, DEPARTMENT OF HEALTH AND HUMAN SERVICES, PUBLIC HEALTH STATEMENT FOR CHROMIUM, September 2008.

167 South Coast AQMD indicates that Valley-Todeco is out of business.

168 Pacific Environmental Services, Inc. Report, Executive Summary, 1-1, 1993.

169 Valley Todeco's 1993 AB2588 Health Risk Assessment Emissions Summary.

170 See California Earth Corps, Inc. v. Valley-Todeco, Inc., No. BC 177534 (Cal. Super. Ct. L.A. Co. October 7, 1997) (Final Judgment).

171 SOUTH COAST AQMD FORM TAC ANNUAL EMISSIONS REPORT, July 1996-June 1997.

172 The company maintained that it obtained proposals for these improvements in April and May 1998.

173 Customers of Dixon Hard Chrome include Disneyland, and aircraft manufacturers such as Boeing, McDonnell Douglas and Lockheed Martin. Dixon Hard Chrome website.

174 Dixon Hard Chrome Proposition 65 perchloroethylene and hexavalent chromium excess cancer risks, Camille Sears, October 19, 2000.

175 See As You Sow v. Florence International Companies, Inc., dba Dixon Hard Chrome, No. BC 235965 L.A. Co. May 25, 2001) (Final Judgment).

176 UNITED STATES DEPT. OF LABOR, OSHA, SAFETY & HEALTH TOPICS, July 19, 2007.

177 Agency for Toxic Substances and Disease Registry, Dept. of Health & Human Services, Toxicological Profile for methylene chloride, 2000.

178 See California Community Health Advocates v. Jasco Chemical Corporation , No. 817334 Cal. Super. Ct. Orange Co. December 21, 1999) (Final Judgment).

179 SOUTHCOAST AQMD, FACILITY INFORMATION DETAIL, Jasco Chemical Corp., methylene chloride emissions for 2000.

180 See California Community Health Advocates v. Natural Life Eco-Vite Laboratories, Inc., dba Paragon Laboratories, No. BC 254288 (Cal. Super. Ct. L.A. Co. October 22, 2001) (Final Judgment).

181 See Center for Environmental Health v. American Fabrication Corporation , No. 01CC01849 (Cal. Super. Ct. Orange Co., April 4, 2001) (Final Judgment). The company switched to the AFX Flushing Solvent comprised of ethyl 3-ethoxypropionate and dibasic ester.

182 See company website at www.p-r-o.com.

183 See Center for Environmental Health v. Professional Refinishing Organization, No. 312175 (Cal. Super. Ct. L.A. Co. October 4, 2004) (Final Judgment).

184 See Environmental Working Group report "Reading Writing and Risk, Air Pollution Inside California's Portable Classrooms, May 1999.

185 This was required pursuant to California legislation (AB 2872, Shelly, 2000).

186 CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, AIR RESOURCES BOARD, "Environmental Health Conditions in California's Portable Classrooms," November 2004.

187 See Lindstrom et al., 1995.

188 See Hodgson, A.T. et al, 1998. Characterization of the Sources and Concentrations of Formaldehyde and Volatile Organic Compounds in Four New Manufactured Houses. Lawrence Berkeley National Laboratory, LBNL-42392.

189 U.S. EPA, 1994.

190 The Air Resources Board identified formaldehyde as a toxic air contaminant under California's air toxics program (AB 1807) in 1992.

191 Gupta et al., 1982; Liu et al., 1991. See CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, AIR RESOURCES BOARD, INDOOR AIR QUALITY GUIDELINES, "Formaldehyde in the Home." August, 2004.

192 Bakke, 1993.

193 As You Sow was represented by Andrew Packard and Michael Freund in these cases.

194 See As You Sow v. American Modular Systems, Inc. et al., Case No. 313466 (San Francisco Super. Ct. May 18, 2001) (Consent Judgment).

195 These cases were brought by attorneys Marc Joseph and Richard Drury for Adams, Broadwell Joseph & Cardozo; James Wheaton and Lynne Saxton of the Environmental Law Foundation; Michael Costa from Our Children's Earth Foundation and Adrienne Bloch and Shana Lazerow from Communities for a Better Environment.

196 See Executive Summary, "Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant," prepared by the Staff of the Air Resources Board and the Office of Environmental Health Hazard Assessment as approved by the Scientific Review Panel on April 22, 1998.

197 INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) SUMMARIES & EVALUATIONS, "Diesel and Gasoline Engine Exhausts" (1989).

198 EXECUTIVE SUMMARY FOR THE "PROPOSED IDENTIFICATION OF DIESEL EXHAUST AS A TOXIC AIR CONTAMINANT,"OEHHA AND ARB, approved by the Scientific Review Panel, April 22, 1998.

199 HEALTH ASSESSMENT DOCUMENT FOR DIESEL ENGINE EXHAUST. U.S. EPA, OFFICE OF RESEARCH AND DEVELOPMENT, NATIONAL CENTER FOR ENVIRONMENTAL ASSESSMENT, WASHINGTON, D.C., EPA/600/8 90/057F,2002.

200 See id.

201 OEHHA, FUELS AND YOUR HEALTH, a fact sheet by CAL/EPA'S OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT AND THE AMERICAN LUNG ASSOCIATION, 2003.

202 See id.

203 See id.

204 See Environmental Law Foundation, Our Children's Earth Foundation, & Communities for a Better Environment v. Laidlaw Transit Inc. dba Laidlaw Education Services; Laidlaw Transit Services, Inc; No. CGC-06-451832 (Cal. Super. Ct. San Francisco Co. September 22, 2008) (Stipulated Judgment).

205 See Environmental Law Foundation, Our Children's Earth Foundation, & Communities for a Better Environment v. Durham School Services, L.P. No. CGC-06-451832 (Cal. Super. Ct. San Francisco Co., October 18, 2007) (Amended Stipulated Judgment).

206 See Environmental Law Foundation, Our Children's Earth Foundation, & Communities for a Better Environment v. Atlantic Express of L.A. Inc. et al. (Cal. Super. Ct. L.A. Co. May 7, 2009) (Stipulated Judgment with Merced Transportation Co.; Michaels Transportation, Inc.; Atlantic Express of L.A., Inc.; Atlantic Express of California, Inc.; Student Transportation of America, Inc.; Santa Barbara Transportation Corp.; Storer Transportation Service; and Michael's Transportation Service, Inc.)