Portland Air Toxics Solutions

Air Toxics Pollutant Summaries

State of Oregon
Department of Environmental Quality

Air Quality Division
811 SW 6th Avenue
Portland, OR 97204
Phone: (503) 229-5696
(800) 452-4011
Fax: (503) 229-6762
Contact: Sarah Armitage
www.oregon.gov/DEQ

DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

Alternative formats

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Overview

Every air toxic has a different story. DEQ is able to measure (monitor) some pollutants directly in the air. Some are present at levels too low for us to measure accurately or at all. For others we may be able to simulate (model) the amounts by computer programs. We know the health effects of some pollutants while scientists are investigating the health effects of others. *One thing we do know is that information about air toxics is evolving and we are learning more all the time.* For the air toxics listed below, this document provides summaries of the best information DEQ has at this time. As more information is available DEQ will provide updates.

This document contains a general description of the pollutant, human-caused sources, health effects, the Oregon ambient benchmark concentration and whether each pollutant in Portland is above or below the benchmark based on modeling projections for 2017. The benchmark is the concentration of an air toxic in outdoor air that would result in an excess lifetime cancer risk level of one in a million or a non-cancer hazard quotient of one as established by the Air Toxics Science Advisory Committee.

Each pollutant description includes a pie chart showing relative contributions from sources for each pollutant in the Portland area. The sources are divided into six categories:

- **Industry, or point sources,** for example steel foundries, glass bottle production and paper manufacturing.
- **Cars and trucks, or on-road mobile sources,** including gasoline and diesel powered vehicles.
- **Area wide** including small businesses like auto body shops and gas stations and home sources like paint, wood smoke and lawn mowers.
- **Off-road equipment** for example construction equipment, farm equipment, marine vessels and recreational boats.
- **Background** from naturally occurring sources or regional concentrations that influence our area
- **Secondary** from chemical reactions between precursor compounds that take place in the atmosphere

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By: Sarah Armitage
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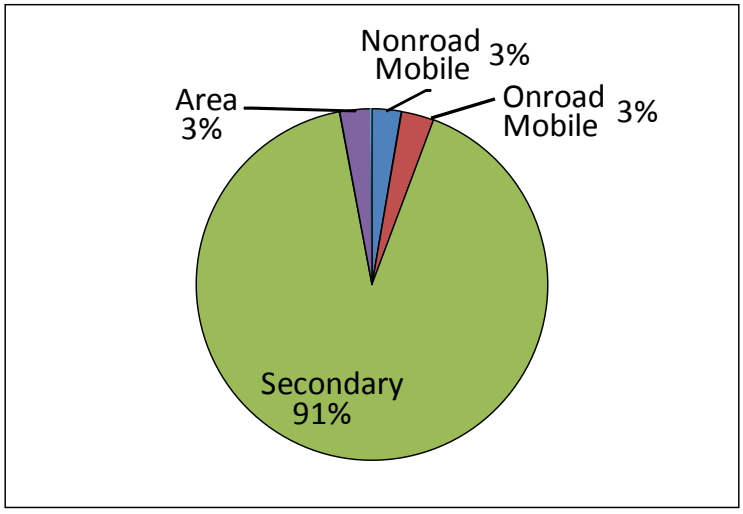
ACETALDEHYDE

What it is: Acetaldehyde is a colorless, flammable liquid that evaporates easily into the air. It is a product of incomplete combustion of fuels and wood, and is also used in the manufacture of other chemicals and products including perfumes and dyes.

Sources: The dominant source of acetaldehyde in the Portland area is secondary formation. It is also present in smoke from residential wood stoves and fireplaces, and gasoline powered engines.



Relative contribution of all acetaldehyde emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Animal studies have shown that acetaldehyde caused nasal and laryngeal tumors. EPA considers acetaldehyde to be a probable (Class B2) human carcinogen.

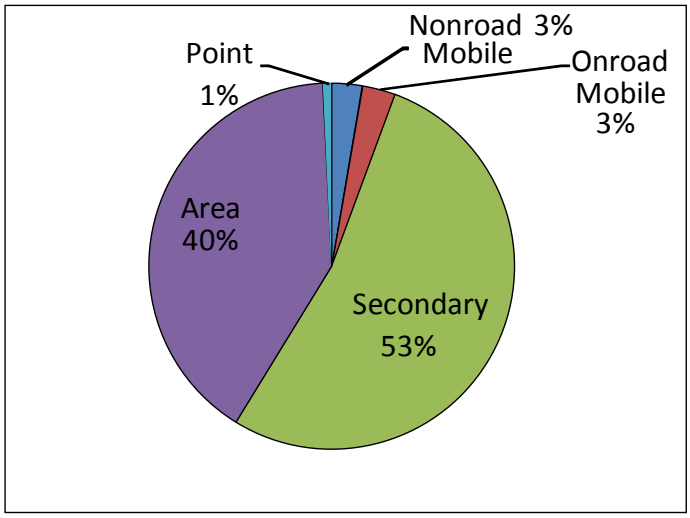
The Oregon ambient benchmark concentration for acetaldehyde is 0.45 µg/m^3. Monitoring and modeling show that Portland is above this benchmark.

For more information: http://www.epa.gov/ttn/atw/hlthef/acetalde.html
http://en.wikipedia.org/wiki/Acetaldehyde

ACROLEIN

What it is: Acrolein is a colorless or yellow liquid that evaporates quickly and burns easily. Acrolein has a strong, unpleasant odor. It reacts quickly when exposed to other substances.

Sources: Acrolein enters the air mainly from secondary formation, wood burning, structural (house and building) fires and construction. Tobacco smoke is another source of acrolein.



Relative contribution of all acrolein emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: The major effects from chronic (long-term) inhalation exposure to acrolein in humans and animals consist of general respiratory congestion and eye, nose, and throat irritation. Existing information based on cancer tests with animals is considered inadequate to make a determination whether acrolein causes cancer in humans.

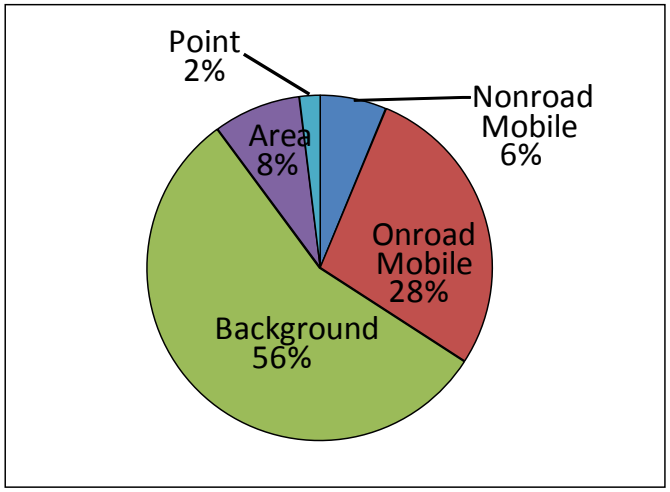
The Oregon ambient benchmark concentration for acrolein is 0.02 $\mu g/m^3$. Modeling shows that Portland is above this benchmark.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=102
http://en.wikipedia.org/wiki/Acrolein

ARSENIC

What it is: Pure inorganic arsenic is a naturally occuring gray-colored metal found throughout the environment. Inorganic arsenic is usually found combined with other elements such as oxygen, chlorine and sulfur. Arsenic in plants and animals combines with carbon and hydrogen. This is called organic arsenic and is generally less toxic than inorganic arsenic. Most arsenic compounds have no odor and dissolve in water.

Sources: Sources of arsenic are both human caused and natural. Our soils in the Pacific Northwest are naturally high in arsenic because of their volcanic origins. In Oregon, metal processing, agricultural pesticides, and soil dust are sources of arsenic. Oil and natural gas combustion and on-road and non-road engines are important sources of arsenic.



Relative contribution of all arsenic emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011

Health Effects: Breathing inorganic arsenic over a long period of time is associated with irritation of the skin and mucous membranes, and is strongly associated with lung cancer. EPA considers arsenic a known (Class A) human carcinogen.

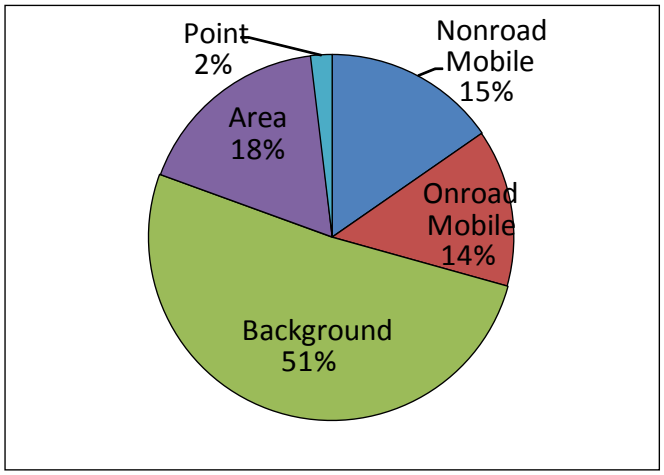
The Oregon ambient benchmark concentration for arsenic is 0.0002 µg/m^3. Monitoring and modeling show that Portland is above this benchmark.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=3
http://en.wikipedia.org/wiki/Arsenic

BENZENE

What it is: Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Sources: Benzene is found in background concentrations, emissions from cars and trucks, wood smoke, evaporation from gasoline, and industrial solvents. Tobacco smoke contains benzene.



Relative contribution of all benzene emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Long-term inhalation of benzene causes blood disorders. Benzene specifically affects bone marrow, the tissues that produce blood cells. Benzene may cause anemia (i.e., an insufficient number of healthy red blood cells), excessive bleeding, damage to the immune system and genetic damage. Increased incidence of leukemia (cancer of the tissues that form white blood cells) has been observed in people occupationally exposed to benzene. EPA has classified benzene as a known (Class A) human carcinogen.

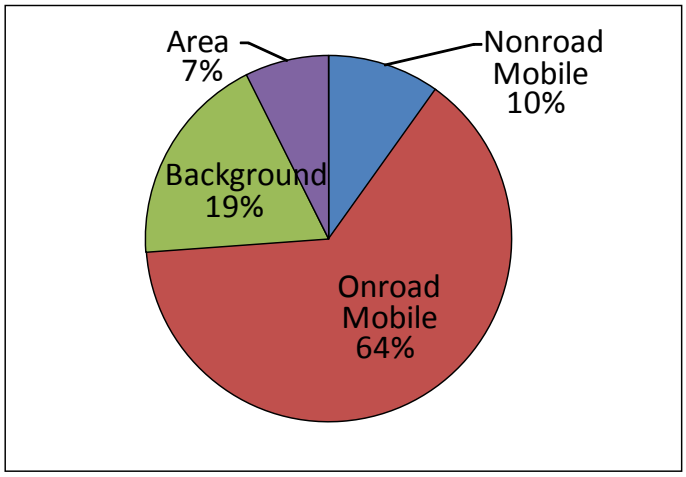
The Oregon ambient benchmark concentration for benzene is 0.13 $\mu g/m^3$. Monitoring and modeling show that Portland is above this benchmark.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=14
http://en.wikipedia.org/wiki/Benzene

1,3-BUTADIENE

What it is: 1,3-butadiene is a colorless gas with a mild gasoline-like odor.

Sources: 1,3-butadiene comes from incomplete combustion of fuels from cars and trucks, and off-road engines like lawn mowers and boats. Additional sources include background concentrations, petroleum refining, production of rubber and plastics, forest fires and cigarette smoke.



Relative contribution of all 1,3-butadiene emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: EPA classifies 1,3-butadiene as a probable human carcinogen. Studies have shown a possible association between 1, 3-butadiene exposure and heart diseases. Studies have also shown an increase of leukemia in workers in rubber plants.

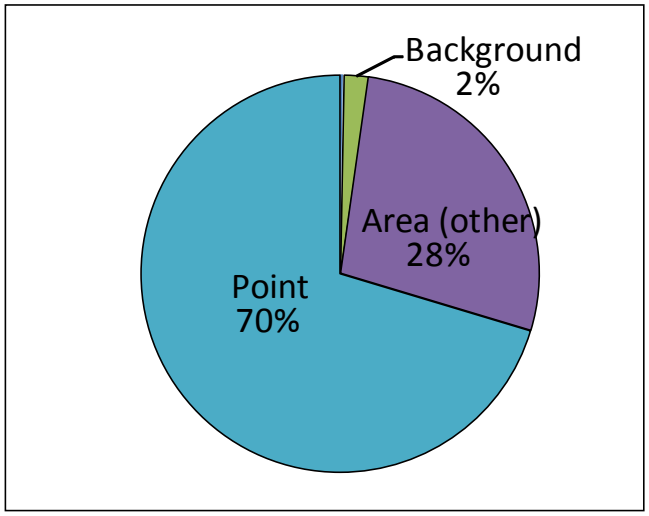
The Oregon ambient benchmark concentration for 1,3-butadiene is 0.03 µg/m^3. Modeling shows that Portland is above this benchmark.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=81
http://en.wikipedia.org/wiki/1,3-Butadiene

CADMIUM

What it is: Cadmium is a relatively abundant soft, bluish-white metal. It is usually found as a mineral combined with other elements.

Sources: Industrial use and burning natural gas are major sources of cadmium in Portland's air. Cadmium is also used to make batteries, pigments, metal coatings, and plastic.



Relative contribution of all human-caused cadmium emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Breathing cadmium over a long period of time leads to a build-up of cadmium in the kidneys that can cause kidney disease. An association between cadmium exposure and an increased risk of lung cancer has been reported. EPA has classified cadmium as a probable (Class B2) human carcinogen.

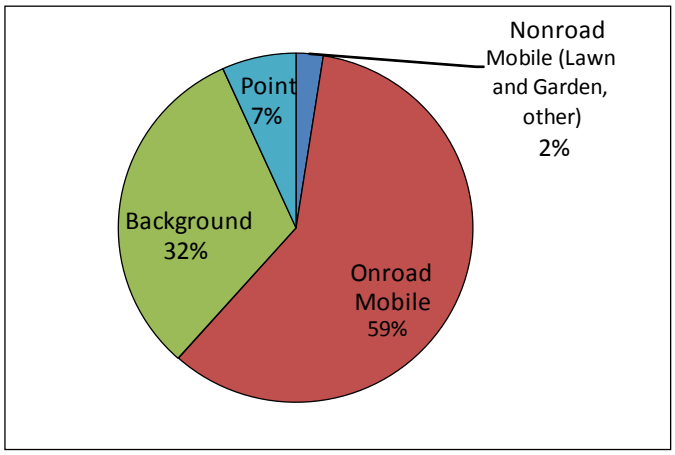
The Oregon ambient benchmark concentration for cadmium is 0.0006 $\mu g/m^3$. Monitoring and modeling show that Portland is above this benchmark.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=15
http://en.wikipedia.org/wiki/Cadmium

CHROMIUM VI

What it is: Chromium is a naturally occurring metal found in rocks, animals, plants, soil, and volcanic dust and gases. Because of its ability to react with other elements, it can produce hard coatings, which is why it is used in paints for cars, boats and airplanes. Chromium comes in several forms. Hexavalent Chromium - also called chromium VI - is a form of chromium that can occur naturally but is most commonly produced by industrial processes.

Sources: Chromium VI comes primarily from the burning of fossil fuels. It is also present in background concentrations and is released by metal plating and manufacturing, chemical manufacturing (paint dyes, rubber, and plastics), cement plants, and decomposition of brake linings.



Relative contribution of all human-caused chromiumVI emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Long term inhalation of chromium VI results in damage to the respiratory tract, including nasal damage, bronchitis, decreased lung function, pneumonia and asthma. Chromium VI (unlike other forms of chromium) is a known (Class A) human carcinogen, so its inhalation could result in an increased risk of lung cancer. Studies also suggest that exposure to chromium VI may result in complications during pregnancy and childbirth. Another form of chromium, chromium III is not known to cause cancer and is less toxic. It is estimated that less than 5% of total chromium in the air is in the form of chromium VI.

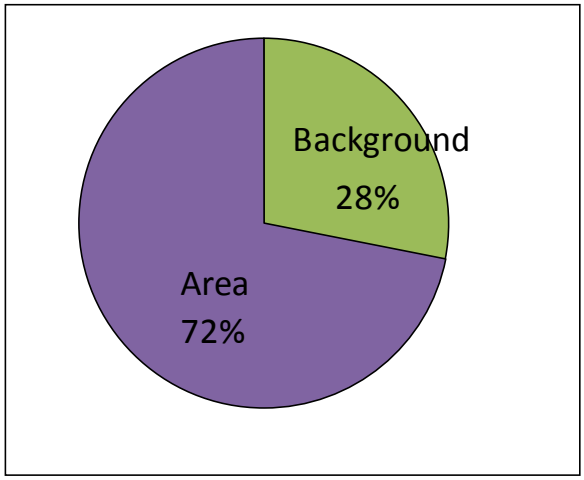
The Oregon ambient benchmark concentration for chromium is 0.00008 $\mu g/m^3$. Modeling shows that Portland is above this benchmark.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=17
http://en.wikipedia.org/wiki/Hexavalent_chromium

1,4-DICHLOROBENZENE

What it is: 1,4-Dichlorobenzene, also called para-dichlorobenzene, is a colorless solid with a strong, distinctive smell.

Sources: 1,4-Dichlorobenzene is used as a fumigant to control moths, molds and mildew. It is also used as a disinfectant in waste containers and restrooms and is the characteristic smell associated with urinal cakes.



Relative contribution of all human-caused 1,4-dichlorobenzene emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Breathing 1, 4-dichlorobenzene over a long period of time can result in liver, skin, and central nervous system problems. No information is available on the cancer-causing effects of 1,4-dichlorobenzene in humans and there are no adequate animal cancer studies available on exposure to 1,4-dichlorobenzene via inhalation. EPA classifies 1, 4-dichlorobenzene as a possible (Group C) human carcinogen.

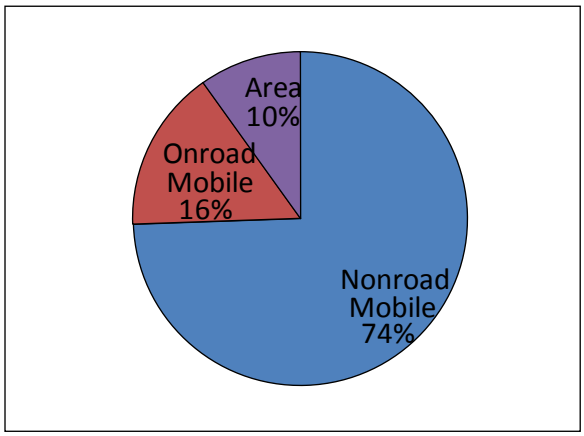
The Oregon ambient benchmark concentration for 1,4-dichlorobenzene is 0.09 µg/m^3. Modeling shows that Portland is above this benchmark.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=126
http://en.wikipedia.org/wiki/1,4-Dichlorobenzene

DIESEL PARTICULATE MATTER

What it is: Diesel particulate matter is not a specific chemical but rather a complex mixture of particles and various chemical compounds in, on, or around the particles. Diesel particulate is a pollutant that is defined by its size and source and not by its chemical constituency.

Sources: Diesel particulate matter comes mainly from on and off road diesel engines, including cars and trucks, construction equipment, ships, and rail sources.



Relative contribution of all human-caused diesel particulate emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: The health effects associated with exposure to diesel particulate matter could be due to the particles themselves, any chemicals on or in the particles, or gaseous chemical emissions associated with the particle emissions. Because of their small size, inhaled diesel particles easily penetrate deep into the lungs. Chemicals, primarily polycyclic aromatic hydrocarbons (PAHs), many of which are known carcinogens, can get into or on these particles and thereby be drawn into the lungs via inhalation. A large number of studies show that breathing diesel exhaust is associated with increased lung cancer. Non-cancer health effects include breathing and heart problems and premature death.

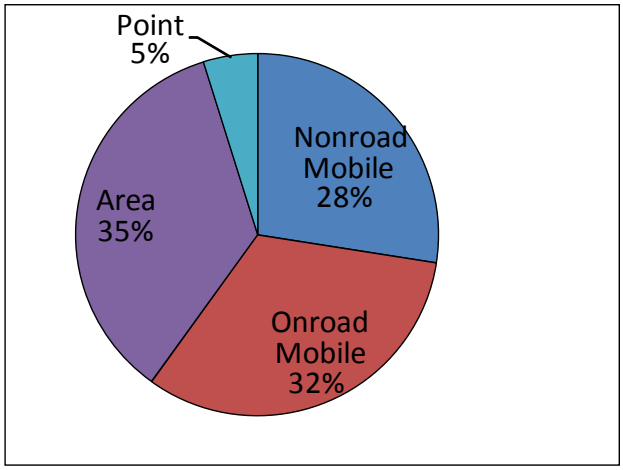
The Oregon ambient benchmark concentration for diesel particulate matter is 0.1 µg/m^3. Modeling shows that Portland is above this benchmark.

For more information:
http://www.epa.gov/region1/eco/airtox/diesel.html
http://www.arb.ca.gov/research/diesel/diesel_health_effects_summary_7-5-05-1.pdf
http://en.wikipedia.org/wiki/Diesel_particulate_matter

ETHYL BENZENE

What it is: Ethyl benzene is a colorless, flammable liquid that smells like gasoline. It is naturally found in coal tar and petroleum and is also found in manufactured products such as inks, pesticides, and paints.

Sources: The main sources of ethyl benzene in the Portland area are gasoline engines, gasoline evaporation and painting operations. Ethyl benzene is also used in the production of styrene (used to make polystyrene plastic).



Relative contribution of all human-caused ethylbenzene emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Chronic (long-term) exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood. In animals, chronic exposure studies have reported effects on the blood, liver, and kidneys. Limited information is available on the carcinogenic effects of ethylbenzene in humans; however, the International Agency for Research on Cancer (IARC) has determined that ethylbenzene is a possible human carcinogen.

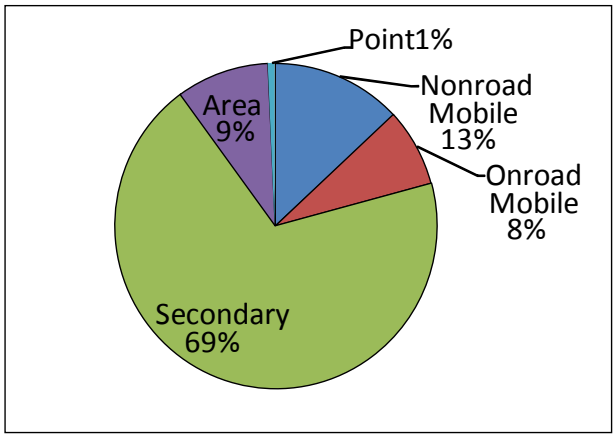
The Oregon ambient benchmark concentration for ethylbenzene is 0.4 µg/m^3. Modeling shows that Portland is above this proposed benchmark.

For more information:
http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=66
http://en.wikipedia.org/wiki/Ethylbenzene

FORMALDEHYDE

What it is: Formaldehyde is a colorless gas with a pungent, suffocating odor at room temperature. It is produced by human activities and also occurs naturally.

Sources: Formaldehyde comes from secondary formation, incomplete fuel combustion from on and off-road engines, construction equipment, diesel fuel combustion, railroads, as well as from wood burning. It is used as a concrete and plaster additive, as a disinfectant, and as a wood preservative. The highest levels of airborne formaldehyde have been detected in indoor air, where it is released from various consumer products including paneling and carpets. Tobacco smoke is another important source of formaldehyde.



Relative contribution of all human-caused formaldehyde emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Breathing formaldehyde is associated with respiratory problems and eye, nose and throat irritation. Limited human studies have reported associations between work-related exposure to formaldehyde and increased incidence of lung and nasal cancer. EPA considers formaldehyde to be a probable (Class B1) human carcinogen and is currently proposing revisions to its toxicity values.

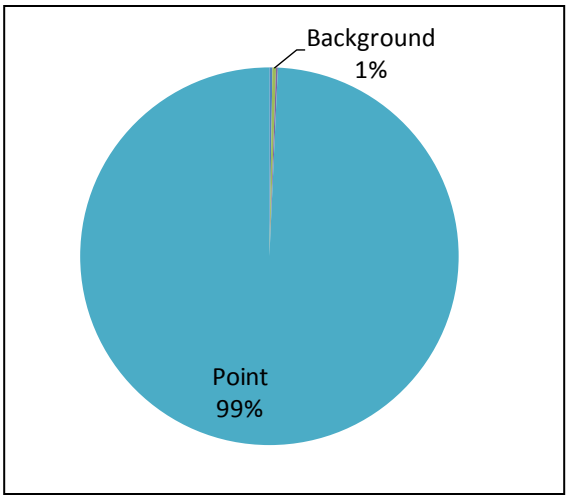
The Oregon ambient benchmark concentration for formaldehyde is 3 $\mu g/m^3$. The current EPA IRIS value for formaldehyde is .077 $\mu g/m^3$. Modeling shows that Portland is above both levels.

For more information:
http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=39
http://www.cancer.gov/cancertopics/factsheet/Risk/formaldehyde
http://en.wikipedia.org/wiki/Formaldehyde

LEAD

What it is: Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Much of it enters the air from human activities including burning fossil fuels, mining, and manufacturing.

Sources: Lead's primary use is in the manufacture of batteries and in the production of metal products, such as sheet lead, solder (but no longer in food cans), and pipes, and in ceramic glazes, paint, ammunition, cable covering, and other products. Because of health concerns, lead in gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.



Relative contribution of all human-caused lead emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in the body. The main target for lead toxicity is the nervous system, both in adults and children. Children are particularly sensitive to the chronic effects of lead, with slowed cognitive development, reduced growth and other effects. There are also many reproductive effects associated with high lead exposure. Human studies are inconclusive regarding lead exposure and cancer.

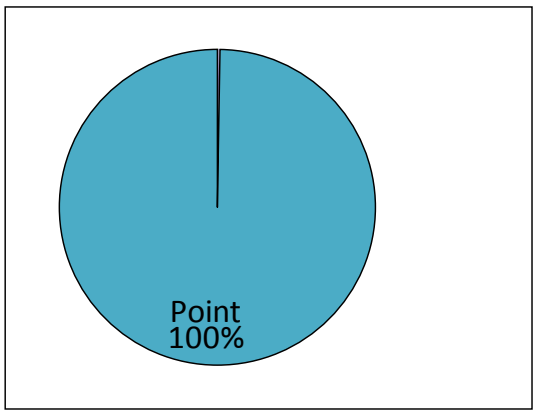
The proposed Oregon ambient benchmark concentration for lead is 0.15 µg/m^3. Modeling shows that some very isolated local lead levels may be above this benchmark.

For more information:
http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=22
http://www.epa.gov/lead/
http://en.wikipedia.org/wiki/Lead

MANGANESE

What it is: Manganese is a naturally occurring element found in small amounts in the Earth's crust. Manganese is a metal used primarily in steel production to improve hardness, stiffness, and strength. Manganese dioxide is used in the production of dry-cell batteries, matches, fireworks, and the production of other manganese compounds.

Sources: The main source of manganese pollution in Portland comes from the smelting of steel and iron. Manganese is also emitted from power plants, coke ovens and dust from mining operations. It is also a component of some pesticides and is used as a fuel additive in some gasoline.



Relative contribution of all human-caused manganese emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Chronic exposure to high levels of manganese by inhalation in humans may result in central nervous system problems. Visual reaction time, hand steadiness, and eye-hand coordination can be affected in chronically-exposed workers. A syndrome called manganism - which involves impotence and loss of libido in males - may result from chronic exposure to higher levels. Breathing problems have also been noted in workers chronically exposed by inhalation.

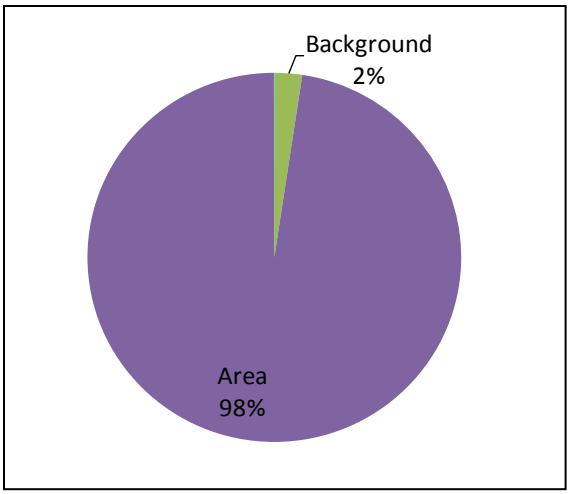
The Oregon ambient benchmark concentration for manganese is 0.09 µg/m^3. Modeling shows that some local manganese levels may be above this benchmark.

For more information:
http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=23
http://en.wikipedia.org/wiki/Manganese

METHYLENE CHLORIDE

What it is: Methylene chloride, also called dichloromethane, is a colorless liquid with a mild, sweet odor. Methylene chloride does not occur naturally in the environment.

Sources: Methylene chloride is used mainly as a solvent in paint strippers and removers. It is also used in the manufacturing of drugs and film coatings and in other industrial processes including metal cleaning. Methylene chloride can also be found in some aerosol products including paints, automotive products and insect sprays.



Relative contribution of all human-caused methylene chloride emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Long-term exposure to methylene chloride can damage the central nervous system. EPA considers methylene chloride to be a probable (Class B1) human carcinogen.

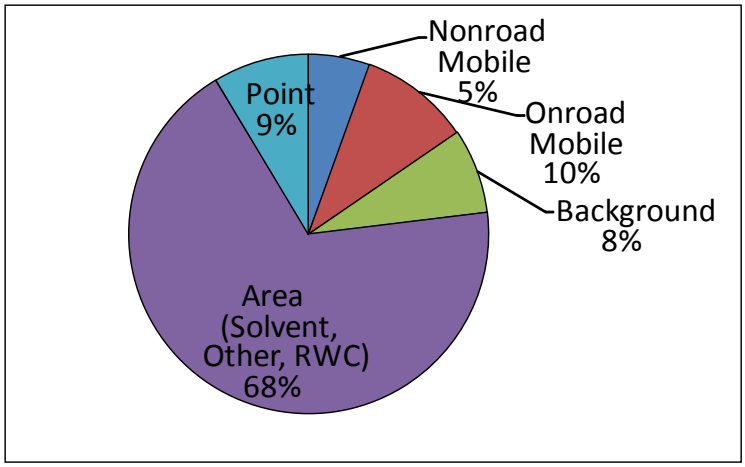
The Oregon ambient benchmark concentration for methylene chloride is 0.09 µg/m^3. Modeling shows that Portland is above this benchmark but emission estimates are uncertain and may be decreased.

For more information:
http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=42
http://www.epa.gov/ttnatw01/hlthef/methylen.html
http://en.wikipedia.org/wiki/Dichloromethane

NAPHTHALENE

What it is: Naphthalene is a white solid that evaporates easily. Fuels such as petroleum and coal contain naphthalene. It is also called white tar, and tar camphor, and has been used in mothballs and moth flakes. Burning tobacco or wood produces naphthalene. It has a strong, but not unpleasant smell. The major *commercial* use of naphthalene is in the manufacture of polyvinyl chloride (PVC) plastics. Its major *consumer* use is in moth repellents.

Sources: Naphthalene is released to the air from the burning of oil and from the use of mothballs. Some naphthalene is also produced by residential wood combustion (RWC).



Relative contribution of all human-caused naphthalene emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Chronic exposure of workers and rodents to naphthalene has been reported to cause cataracts and damage to the retina. As of 1998, Available data were not, in EPA's opinion, adequate to establish a causal association between exposure to naphthalene and cancer in humans. It was classified as a possible (Group C) carcinogen at that time and remains so at present.

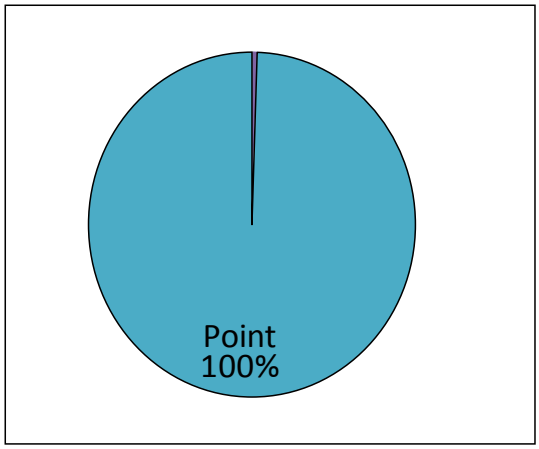
The Oregon ambient benchmark concentration for naphthalene is 0.03 µg/m^3. Modeling shows that Portland is above this benchmark.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=43
http://www.epa.gov/ttnatw01/hlthef/naphthal.html
http://www.epa.gov/iris/toxreviews/0436tr.pdf
http://en.wikipedia.org/wiki/Naphthalene

NICKEL COMPOUNDS

Description: Nickel is an abundant natural element found in soil and emitted from volcanoes. It can combine with other metals to form alloys for heat exchangers, along with other items. Nickel is most often used to make stainless steel and nickel compounds are used for nickel plating, to make some batteries, and as catalysts.

Sources: Nickel is released into the air by industries that make or use nickel or nickel compounds. It is also released by oil-burning power plants and trash incinerators.



Relative contribution of all human-caused nickel emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Only two insoluble forms on nickel - refinery dust and the subsulfide from smelters - are considered to be known (Class A) human carcinogens. Soluble forms of nickel are more toxic to the respiratory track than less soluble forms but are not carcinogenic. Serious health effects from exposure to nickel, such as chronic bronchitis, reduced lung function, and cancer of the lung and nasal sinus, have occurred in people who have breathed dust containing certain nickel compounds while working in nickel refineries or nickel-processing plants. The levels of nickel in these workplaces are much higher than usual levels in the environment.

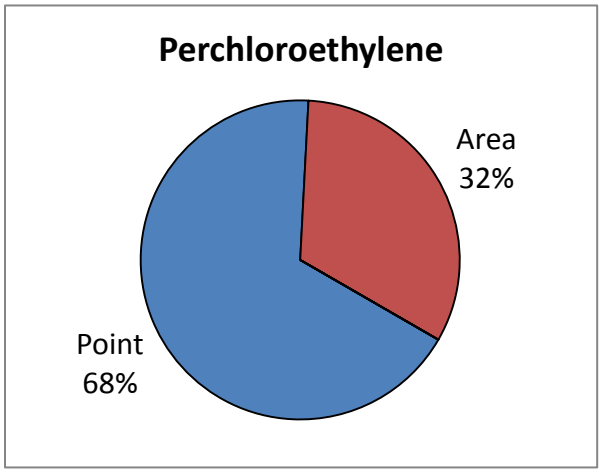
Oregon has 3 ambient benchmark concentrations for nickel compounds: (1) 0.004 $\mu g/m^3$ for nickel refinery dust; (2) 0.002 $\mu g/m^3$ for nickel sub-sulfide; (3) 0.05 μ^g/m^3 for soluble nickel compounds. DEQ has performed monitoring and modeling only for soluble nickel compounds and modeling shows that some local areas of Portland may be above the benchmark for these compounds. There are no nickel smelters or refineries in the Portland area.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=44
http://www.epa.gov/ttnatw01/hlthef/nickel.html
http://en.wikipedia.org/wiki/Nickel

PERCHLOROETHYLENE

Description: Perchloroethylene (PERC, PCE) - also known as tetrachloroethylene - is a nonflammable colorless liquid with a sharp sweet odor. It evaporates very easily in the air and has an odor at very low concentrations.

Sources: The majority of perchloroethylene in the Portland area comes from dry cleaning operations. It is also used for metal degreasing. Smaller quantities are emitted by consumer products such as automotive brake cleaners.



Relative contribution of all human-caused perchloroethylene emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: PERC affects the kidneys, liver and nervous system. Results from studies of dry-cleaners occupationally exposed to PERC suggest increased risks for several types of cancer. In 2010, EPA proposed that PERC be classified as likely to be a human carcinogen under its 2005 classification scheme. EPA is currently considering comments on this proposal.

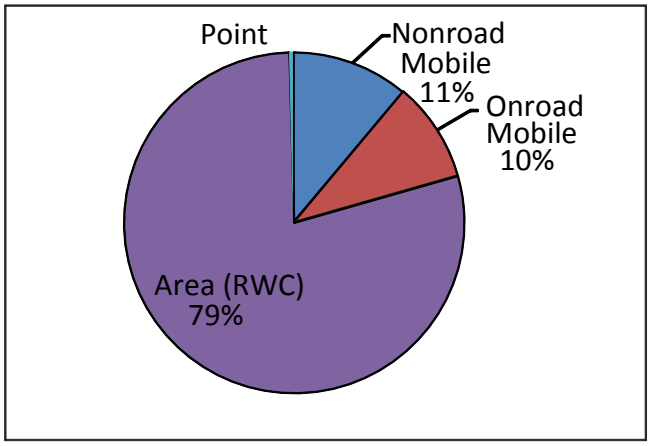
The Oregon ambient benchmark concentration for perchloroethylene is 35 µg/m^3. Monitoring and modeling show that Portland is below this benchmark.

For more information:
http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=48
http://www.epa.gov/ttn/atw/hlthef/tet-ethy.html
http://en.wikipedia.org/wiki/Tetrachloroethylene
http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12863

POLYCYCLIC AROMATIC HYDROCARBONS

Description: Polycyclic aromatic hydrocarbons, also called PAHs, are a group of chemicals that are formed during the incomplete burning of carbon-containing substances: wood, coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs, which are 4,000 or more individual chemical compounds, are usually found as a mixture containing two or more of these compounds.

Sources: The majority of PAHs in the Portland area come from residential wood combustion (RWC) and petroleum fuels.



Relative contribution of all human-caused 15 PAH emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: PAHs toxicity is very structurally dependent - varying from nontoxic to extremely toxic. PAHs have been shown to cause reproductive difficulties and birth defects in mice; it is not known whether these effects occur in people. Of greatest concern is their ability to cause cancer. One PAH compound, benzo[a]pyrene, is notable for being the first chemical carcinogen to be discovered. The EPA has classified seven PAH compounds as probable (Class B2) human carcinogens.

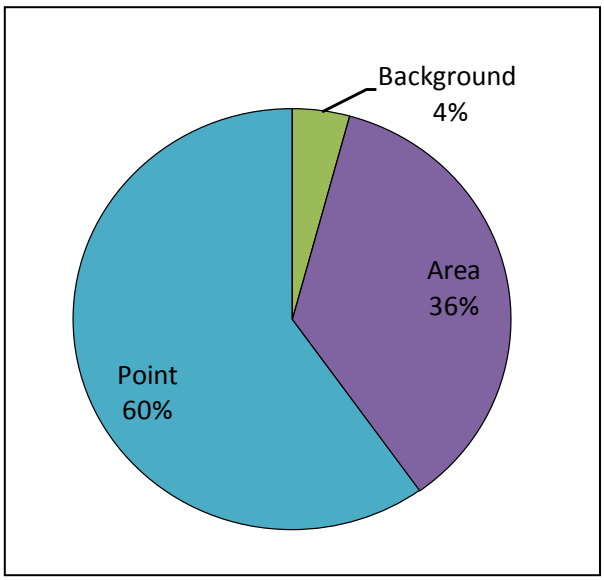
The Oregon ambient benchmark concentration for the sum of 33 individual PAHs is 0.0009 µg/m^3. Monitoring and modeling, which address only the 15 PAHs typically considered by EPA, show that Portland is above this benchmark.

For more information:
http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=25
http://www.epa.gov/ttnatw01/hlthef/polycycl.html
http://en.wikipedia.org/wiki/Polycyclic_aromatic_hydrocarbon

TRICHLOROETHYLENE

Description: Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste.

Sources: Trichloroethylene's main use is in degreasing of metal parts. Trichloroethylene is also used as an extraction solvent for greases, oils, fats, waxes, and tars, and is used in the production of other chemicals. Trichloroethylene is also used in consumer products such as typewriter correction fluids, paint removers/strippers, adhesives, spot removers, and rug-cleaning fluids.



Relative contribution of all human-caused trichloroethylene emissions in Portland from DEQ's 2017 modeling projections, revised 2/2011.

Health Effects: Chronic (long-term) inhalation exposure to trichloroethylene can affect the human central nervous system, with symptoms such as dizziness, headaches, confusion, euphoria, facial numbness, and weakness. Liver, kidney, immunological, endocrine, and developmental effects have also been reported in humans. A recent analysis of available epidemiological studies reports trichloroethylene exposure to be associated with several types of cancers in humans, especially the kidney, liver, cervix, and the lymphatic system. Animal studies have reported increases in lung, liver, kidney, and testicular tumors and lymphoma. In its 9th Report on Carcinogens, the National Toxicology Program determined that trichloroethylene is "reasonably anticipated to be a human carcinogen." EPA is presently reevaluating the carcinogenicity of TCE.

The Oregon ambient benchmark concentration for trichloroethylene is 0.5 µg/m^3. Modeling shows that Portland is below this benchmark.

For more information: http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=30
http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=215006
http://en.wikipedia.org/wiki/Trichloroethylene