

Hillsboro Air & Water

Airborne Lead and Hillsboro Airport The Impact on our health and what can be done

The Hillsboro Airport is the single largest industrial emitter of airborne lead in Oregon. This was reported by Environmental Protection Agency (EPA) 2014 National Emissions Inventory (NEI) released in February 2018, the most recent year that NEI data is available. According to the EPA, the Hillsboro Airport releases 1,211 pounds of lead annually into the air at 3355 NE Cornell Road in Hillsboro.

To put airborne lead pollution from Hillsboro Airport in perspective, of all the foundries, lead smelters, steel mills, battery manufacturers, airports, mines, chemical plants, and military bases in the United States, Hillsboro Airport ranks 65th worst out of 35,804 sources of airborne industrial lead pollution watched by the EPA.

Lead, whether inhaled or ingested, is dangerous. The Agency for Toxic Substances & Disease Registry (ATSDR) of the US Department of Health and H Services reports on its website that "

the US Department of Health and Human Services reports on its website that "lead can affect almost every organ and system in your body." ATSDR warns that lead targets the nervous system in adults and children, can damage the brain and kidneys, and can cause miscarriages; "children are more sensitive to the health effects of lead than adults. No safe blood lead level in children has been determined."

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The Center for Disease Control and Prevention (CDC) warns that "children are more vulnerable to lead poisoning than adults... Even at much lower levels of exposure, lead can affect a child's mental and physical growth... Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in

> the infant, learning difficulties, and reduced growth in young children."

The US Department of Health and Human Services Public Health Statement reports lead exposure is caused by either breathing in lead or swallowing it. According to the ATSDR, shortly after lead enters the body: "... it travels in the blood to the 'soft tissues' and organs (such as the liver, kidneys, lungs, brain, spleen, muscles, and heart). After several weeks, most of the lead moves into your

bones and teeth. In adults, about 94% of the total amount of lead in the body is contained in the bones and teeth. About 73% of the lead in children's bodies is stored in their bones. Some of the lead can stay in your bones for decades; however, some lead can leave your bones and reenter your blood and organs under certain circumstances (e.g., during pregnancy and periods of breast feeding, after a bone is broken, and during advancing age)."

Hillsboro Air & Water • A project of Portland Clean Air • media contact (503) 953-3943 www.HillsboroAirWater.org • To volunteer contact greg@HillsboroAirWater.org Even low levels of lead cause major health problems. The CDC published laboratory reported blood lead levels from 1987 to 2013 using data from 41 states. The CDC concluded "evidence indicates that lead exposure at low doses can lead to adverse cardiovascular and kidney effects, cognitive dysfunction, and adverse reproductive outcomes."

Due to the danger to human health, lead was phased out of automotive gas in the US beginning in 1973. It was banned in California in 1992. The Clean Air Act banned leaded gas nationwide in the US in 1996. The entire European Union started phasing out leaded gas in the 1980s and banned it in the late 90s. Lead Education and Abatement Design Group, an international nonprofit

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Health Perspectives, reported that children living 1,500 feet from an airport that used avgas had blood lead levels 2.1% higher than children who didn't live by an airport. Kids living within 500 meters of an airport where avgas is used had blood lead levels 4.4% higher than kids living away from an airport.

> According to research published by the Natural Resources Defense Council, "At least 3,200 students who attend schools near the Hillsboro Airport are at risk. A Montessori preschool is located across the street from the airport's entrance, and a day care center is situated just 800 yards from the end of the main runway."

The flights that cause this dangerous air pollution in Hillsboro are largely for

recreation and flight training using small planes and helicopters. According to the Environmental Protection Agency:

"Local operations are those activities performed by aircraft operating in the local traffic pattern or within sight of the airport... in a designated practice area located within a 20-mile radius of the airport... This includes applications such as recreational, proficiency and instructional flying... Emissions during local flying are more likely to influence air and soil concentrations of lead in the vicinity of the airport because they occur near the airport."

Each year there are three times as many "local" flights at the Hillsboro Airport as there are flights used for transportation according to Federal Aviation Administration (FAA) records. It is the local flights - those that are not being used for transportation - using small aircraft fueled by avgas. Airborne lead pollution from airports is preventable — it is not caused by commercial passenger or freight flights. Hillsboro Airport's

working to prevent lead poisoning and contamination, reported in 2011 that the only countries that still allow leaded automotive gas are Afghanistan, Myanmar, North Korea, Algeria, Iraq, and Yemen.

However, tetraethyl lead (TEL) is still added to Avgas for spark ignition piston-engines used in aircraft. TEL is converted to lead and lead oxides through the combustion process, then emitted into the air on flights over the community and consequently can be inhaled or ingested.

It is not just workers at lead mines and battery factories who risk getting dangerous levels of lead into their blood. A 2011 study of blood lead levels of 125,197 children, including 13,478 children living near airports, indicates that "living within 1,000 meters of an airport where avgas is used may have a significant effect on blood lead levels in children." The three researchers Miranda, Anthopolos, and Hastings, whose study was published in Environmental



unusual problem with lead is largely due to discretionary flight training and recreation flights using small piston-engine planes and helicopters. These small aircraft are using avgas which contains amounts of lead similar to the leaded gas used in cars back in the 1970s.

For example, Hillsboro Aero Academy flies more than 68,000 miles per year with most flights just circling the Hillsboro airport. Each plane burns four gallons of avgas per mile. A gallon of 100LL avgas contains two grams of lead. That totals 1,199 pounds of lead per year in Hillsboro Aero Academy's fuel. Some of that lead concentrates in the engine oil, most goes airborne.

UL94 unleaded avgas is the readily available alternative to leaded gas for piston aircraft across the US. UL94 is costcompetitive with 100LL. UL94 does not fully

replace leaded 100LL, however 110,000 piston aircraft, which is 2/3rds of the US fleet, are already fully FAA certified to use this fuel. UL94 unleaded avgas is an all-hydrocarbon composition with a minimum 94 Motor Octane rating that meets ASTM D7547 standards for aviation gasoline – it's basically 100LL avgas without lead.

Swift Fuels is the only company in the US providing this fuel and is awaiting a final FAA decision on their 100+ octane unleaded replacement, expected by 2024. Using UL94 allows pilots to extend their oil change interval from 25 hours to 100 hours because UL94 does not foul spark plugs or contaminate the engine oil with lead. Of the 134 airplanes using 100LL leaded avgas at Hillsboro Aero Academy, 111 could switch to UL94 Unleaded Avgas according to FAA Registry data. Of those eligible to use unleaded avgas, 84 can use it immediately with no additional paperwork required; 27 of their planes require a Supplemental Type Certificate,

available through a quick and easy application.

Lead pollution from commercial use of small aircraft at Hillsboro Airport harms human health, especially children. Alternative unleaded fuel is readily available however political change often requires citizen action. Neighborhood citizen action has resulted in eight Portland factories voluntarily purchasing pollution control devices in the past three years since the Bullseye Glass scandal at a cost of \$70,000 to \$20 million per industry.

Hillsboro Air & Water is a nonprofit organization working with 38 Portland Neighborhood Associations, 24 Portland area churches and synagogues, and two Washington County Citizen Participation Organizations to require small aircraft at Hillsboro Airport to immediately switch to an unleaded fuel. This includes flight training for Portland Community College's Aviation Science Program, Hillsboro Aero Academy, and recreational pilots. Please contact us to volunteer, donate, or for more information on this effort.



What You Can Do



Contact Hillsboro Aero Academy and Portland Community College Aviation Science and ask them what they are doing to switch to unleaded fuel.

Hillsboro Aero Academy 1 (503) 489-1142

Portland Community College Aviation Science 1 (503) 722-6031 or 1 (503) 722-7256

Call the Federal Aviation Administration and ask what they are doing to reduce lead from Hillsboro Airport.

Federal Aviation Administration 1 (866) 835-5322



Write a Letter to the Editor of local newspapers explaining why unleaded gas should be required at Hillsboro Airport. Please send published Letters to Hillsboro Air & Water.

Volunteer

Send an email to greg@HillsboroAirWater.org



Works Cited

Agency for Toxic Substances & Disease Registry. 2015. ToxFAQs[™] for Lead. Available online at www.atsdr.cdc.gov/toxfaqs/tf.asp?id=93&tid=22 2015. Public Health Statement for Lead. www.atsdr.cdc.gov/phs/phs.asp?id=92&tid=22

Barnes, Miki. 2014. Washington County Airports and Toxic Emissions. www.oregonaviationwatch.org/articles/OAW-AirportsAndToxicEmissions.php

Behar, Michael. 2013. Something in the Air: Lead Poisoning from Aircraft Fuel. peaceworker.org/2013/09/something-inthe-air-lead-poisoning-from-aircraftfuel/#sthash.WO8kNnu5.dpbs

Center for Disease Control and Prevention. 2015. Adult Blood Lead Epidemiology & Surveillance Available online at www.cdc.gov/niosh/topics/ables/description.html

- 2013. Very High Blood Lead Levels Among Adults, 2002–11. www.cdc.gov/mmwr/preview/mmwrhtml/mm6247a6.htm
- Environmental Protection Agency. 2018. 2014 National Emissions Inventory. Two data sets of all lead emitters in the US. Obtained by information request. One posted at: portlandcleanair.org/files/data/emis_sum_fac_7439.xlsx
- 2010. Calculating Piston-Engine Aircraft Airport Inventories for Lead for the 2008 National Emissions Inventory. Pg. 17. nepis.epa.gov/Exe/ZyPDF.cgi/P100LFGL.PDF?Dockey=P10 0LFGL.PDF
- **Federal Aviation Administration**. 2018. FAA Registry data for Hillsboro Aero Academy and Hillsboro Aviation. Spreadsheets obtained at a meeting.
- Hastings, Douglas et al. 2011. A Geospatial Analysis of the Effects of Aviation Gasoline on Childhood Blood Lead Levels. *Environmental Health Perspectives* ncbi.nlm.nih.gov/pmc/articles/PMC3230438/

Lead Education and Abatement Design Group. 2011. Six Countries Still Use Leaded Petrol. Why?. www.lead.org.au/lanv11n4/lanv11n4-5.html

Peterson, Todd L. 2016. Why Install an Auto Fuel SSC? www.autofuelstc.com/

Swift Fuels. 2018. FAQ. swiftfuels.com/faq/

Texas Commission on Environmental Quality. 2019. Air Pollution from Lead. tceq.texas.gov/airquality/sip/criteria-pollutants/sip-lead

University of California Los Angeles Department of Pediatrics. 2010. Santa Monica Airport Health Impact Assessment. hiaguide.org/sites/default/files/SM_Airport_Health_Impact _Assessment.pdf

Wash, Ananth Manickam. 2018. Review of Alternative Fuel Initiatives for Leaded Aviation Gasoline (AVGAS) Replacement. *Chemical Engineering Transactions.* https://pdfs.semanticscholar.org/1156/c7bcabcae62133ac7c2 bd77d6d0e3c91ff97.pdf