



## **EXHIBIT C**

### **PUBLIC PARTICIPATION PLAN**

### **NORTH BOEING FIELD/GEORGETOWN STEAM PLANT SITE**

### **SEATTLE, WASHINGTON**



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## **Introduction**

The Washington State Department of Ecology (Ecology) prepared this Public Participation Plan (Plan) according to the Model Toxics Control Act (MTCA). This plan is designed to promote meaningful community involvement during the Remedial Investigation/Feasibility Study at the North Boeing Field/Georgetown Steam Plant properties located at 7370 East E. Marginal Way South and 6700 13<sup>th</sup> Avenue South in Seattle, Washington. This plan outlines and describes the tools Ecology will use to inform the public about site activities, and it identifies opportunities for the community to become involved in this process.

Ecology and the Boeing Company, the city of Seattle, and King County have negotiated a legal agreement called an Agreed Order to conduct a Remedial Investigation/Feasibility Study at the site. The purpose of the Remedial Investigation (RI) is to determine the nature and extent of contamination on the site. An analysis of potential sources of contaminants into the stormwater system on the site will be included as part of the investigation. Stormwater from the site is an on-going source of contamination to sediments in Slip 4 of the Lower Duwamish Waterway that could cause a violation of sediment cleanup goals. The Feasibility Study (FS) will use the results of the RI to evaluate and select effective measures to prevent releases of contamination from the site, including any sources of contamination migrating from the site to the Lower Duwamish Waterway.

Cleanup actions might be identified during the RI that will eliminate or minimize current releases of contamination to Lower Duwamish Waterway sediments or that are necessary to prevent an imminent threat to human health or the environment. Ecology will consider implementing such cleanup actions as interim actions under the existing Agreed Order.

## **Location and Site Background**

The North Boeing Field/Georgetown Steam Plant properties are located at 7370 East E. Marginal Way South and 6700 13<sup>th</sup> Avenue South in Seattle, Washington on the east site of the Lower Duwamish Waterway. The Site is bordered to the northwest by Ellis Avenue South, the southwest by East Marginal Way South, and the east by King County International Airport (See figure on page 7 for the approximate site boundaries). Final site boundaries will be defined by the extent of contamination determined during the RI.

## **Site Background**

The Site includes the Georgetown Steam Plant (GTSP) and North Boeing Field (NBF) properties. The GTSP is located near the intersection of Warsaw and Ellis Avenue South near the northwest corner of King County International Airport. The GTSP property contains an old powerhouse that currently houses the Georgetown Power plant Museum. A condenser pit beneath the powerhouse is connected to an underground concrete tunnel that discharges into a flume (the GTSP flume). The GTSP flume extends for about 0.4 mile from the powerhouse into the head of Slip 4. The city of Seattle owns the 7.29-acre property that contains the powerhouse and property adjacent to the GTSP flume.

King County owns most of the land within NBF, which is bounded to the northwest by Ellis Avenue South, the southeast by the southern end of the Boeing Company's flight line and taxi ways, the northeast by the eastern edge of the Boeing Company's flight line and taxi ways, and the southwest by East Marginal Way South. The Boeing Company leases about 117 acres of NBF property from King County and owns the improvements it has constructed on the leased property. The Boeing Company also leases a few acres on either side of the GTSP flume from the City of Seattle and owns land containing one of their buildings and a parcel used for parking. The Boeing Company manages numerous research, testing, and manufacturing facilities on the property. A network of stormwater catch basins, drains, and pipes collect and convey stormwater from NBF to the head of Slip 4.

The GTSP was built by the Seattle Electric Company in 1906 to provide power during periods of high use. Use of the GTSP decreased after 1912 after Puget Power bought it. When built, the GTSP was next to the Duwamish River. Around 1916 the river was straightened to form the Duwamish Waterway. A 0.4 mile flume was built to carry cooling water to Slip 4. In 1951, the city of Seattle bought the GTSP from Puget Power and still owns the 7.29-acre property that contains the powerhouse and property next to the flume. The city of Seattle operated the GTSP on stand-by until they decommissioned it in 1973.

Boeing has operated at NBF since the 1940s for aircraft and aerospace manufacturing, maintenance, and research. Yet few records are available on site operations before the 1970s. Currently Boeing owns about 80 buildings on NBF. NBF's complicated storm drain system includes over 400 catch basins and 400 manholes, up to 16 oil water separators and

lift stations, parking lot ditches, and roof drains. The system is connected with seven to eight miles of piping that ranges from four to 48 inches in diameter. Storm water from the GTSP flume and from NBF flows into Slip 4, which is part of the Lower Duwamish Waterway (LDW) Superfund site.

### **Contaminants of Concern**

Contamination at the site is due to industrial operation and maintenance. A general list of contaminants of concern includes the following:

- Polychlorinated biphenyls (PCBs)
- Total petroleum hydrocarbons (TPH)
- Polynuclear aromatic hydrocarbons (PAHs)
- Volatile organic compounds (VOCs)
- Semi-volatile organic compounds (SVOCs)
- Metals

There have been numerous environmental investigations and cleanups at the site. These investigations and cleanups have detected concentrations of polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH), polynuclear aromatic hydrocarbons (PAHs), antimony, arsenic, cadmium, chromium, copper, lead, mercury, and zinc in soil exceeding the applicable cleanup levels in various areas of the site. Concentrations of TPH, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), antimony, arsenic, chromium, and lead have also been detected in groundwater at the site exceeding applicable cleanup levels. PCBs, PAHs, SVOCs, arsenic, copper, lead, mercury, and zinc have been detected in sediment collected from the storm water drainage systems. PCBs and SVOCs have been identified as contaminants of concern in Slip 4 sediments. The potential for sediment recontamination from site storm water has delayed cleanup of sediments in Slip 4.

### **Current Activity**

The proposed actions to be conducted under the Agreed Order include the following:

- Review and summarize site history and existing environmental data.

- Identify data gaps.
- Investigate the site and fill data gaps.
- Analyze potential pathways of ongoing contamination to the Lower Duwamish Waterway sediments.
- Analyze feasible alternatives for source control and overall site cleanup.



**Site Map: North Boeing Field-Georgetown Steam Plant Site**

## **Community Profile**

For decades much of the land adjacent to the Lower Duwamish Waterway has been industrialized. Current commercial and industrial operations include cargo handling and storage, marine construction, boat manufacturing, marina operations, concrete manufacturing, paper and metals fabrication, food processing, metal forging and airplane parts manufacturing.

Although the Lower Duwamish Waterway is viewed mainly as an industrial corridor, two residential neighborhoods border the banks of the river: South Park and Georgetown. The South Park neighborhood is located on the western shore of the Duwamish Waterway, and the Georgetown neighborhood is located on the eastern shore of the Duwamish Waterway. The residents of the communities are well known for their commitment to neighborhood issues. This includes the ongoing site cleanups along the Lower Duwamish Waterway. A description of these communities is provided below.

### **South Park Community Description**

The South Park neighborhood is located in South Seattle, on the west bank of the Duwamish River. The first residents of South Park were Native Americans of the Duwamish tribe who lived on the shores of the Duwamish River for thousands of years. This area was once a small farming town composed of Italian and Japanese farmers who supplied fresh produce to Seattle's Pike Place Market. South Park became part of the city of Seattle in 1907.

By 1920 the Duwamish River was straightened out into a straight, deep channel that would accept ocean-going ships and barges. This change in the Duwamish greatly impacted South Park. The curving meanders had been straightened, which made it easier for industry to develop along the banks of the waterway.

In the mid 1960s, South Park was rezoned as industrial. Over 4,000 people complained and the city of Seattle changed the zoning to low-density residential. The city of Seattle built the South Park community center in 1989 which remains a vital resource within the community.

The South Park community center offers a wide variety of free and low cost programs and special events. Special events include free breakfasts and family events. The community

center provides before and after-school programs and school break camps for students. They also offer adult classes ranging from yoga to technology to English classes.

The Seattle Public Library opened the new South Park branch at 8604 Eighth Avenue South (at Cloverdale Street) in September 2006. This new branch is 5,019 square feet and has the capacity to hold 18,700 books and materials (about one-third of the collection is Spanish-language, including bilingual children's materials and Spanish Language fiction and non-fiction). The library also has bilingual staff on hand to answer questions and to help patrons.

The South Park neighborhood is comprised of about 3,717 people of various ethnicities: 37% Hispanic, 34% white, 14% Asian, 7 % Black, 5% multiracial, 2% American Indian, 1% Native Hawaiian/Pacific Islander. The average age is 31 years old and the average income is \$20,917 (based on records from 2005). A variety of retail and service businesses are located along 14th Avenue South. Data from the Seattle Office of Economic Development lists the primary categories of employment in South Park as wholesale trade, transportation and utilities; construction/resources; manufacturing; and services.

### **Georgetown Community Description**

The Georgetown neighborhood is located in South Seattle, on the east bank of the Duwamish River across the river from the South Park community. Georgetown is Seattle's oldest neighborhood, settled by Luther Collins in 1851. It was incorporated as the city of Georgetown from 1904-1910.

According to records from 2005, just over 1,100 people live in Georgetown. The largest local employers in Georgetown are in the arts, entertainment, and recreation industries. The Georgetown community council is very active.

### **The Duwamish River Cleanup Coalition**

The Duwamish River Cleanup Coalition (DRCC) is an advisory group that works with the South Park and Georgetown neighborhoods. The DRCC has a goal of a Duwamish River cleanup that is accepted by and benefits the community and is protective of fish, wildlife and human health.

DRCC was formed by an alliance of community, environmental and small business groups affected by pollution and cleanup plans in the Duwamish River. The members include: Community Coalition for Environmental Justice, The Duwamish Tribe, The Green-Duwamish Watershed Alliance, The Environmental Coalition of South Seattle, Georgetown Community Council, People for Puget Sound, Puget Soundkeeper Alliance, Washington Toxics Coalition, and Waste Action Project.

DRCC is a formal "community advisory group" recognized by EPA and representing the interests of the community toward the cleanup work along the Lower Duwamish Waterway. DRCC receives public participation grant funding from Ecology. They also receive technical assistance grants from EPA for technical advisors to review all Lower Duwamish Superfund cleanup related studies and plans. They are involved in all aspects of the proposed Superfund cleanup and related MTCA cleanups. DRCC is working with Ecology to ensure that the cleanup and source control measures meet community standards.

### **Key Community Concerns and Issues**

Ecology and EPA conducted interviews with community members, environmental organizations, and community organizations in October 2002 for the Lower Duwamish Waterway Site Community Involvement Plan. The North Boeing Field/Georgetown Steam Plant site is located within the larger Lower Duwamish Waterway Site. Ecology conducted an abbreviated version community interviews in 2006 and determined that the concerns raised in 2002 were still pertinent. Ecology also met with the community in June 2007 to discuss the site and source control for Slip 4. Many of the same concerns were discussed at the meeting in 2007.

There is clear interest in this cleanup process. The following is representative of significant concerns and issues expressed during the community interviews. Ecology will work to respond to community concerns throughout the cleanup process and through coordination with EPA, other organizations, such as state and local health agencies, and the community advisory group that has been established for the site.

- **Health:** One person interviewed was confident that health risks will be addressed, but others are concerned that living close to the Duwamish Waterway could affect their health. People expressed concern about consumption of all bottom fish and parts of other

fish, as well as contamination from chemicals, bacteria and viruses. There is concern about exposure to contaminated sediments through contact at public access parks, employment at industries on the waterway, restoration work, and other cleanup work. Some said that there should be limited access to the river if there is a health risk. At the 2007 meeting, some in the community were concerned about the potential for contaminated dust, soils, water, and sediments moving from the site into the Georgetown neighborhood. The community is also concerned about exposure to contaminants as contaminated soils are trucked through the community.

- **Wildlife:** Not everyone interviewed believes that wildlife is being affected by contamination, but most expressed concern for fish and wildlife. Sea lions, salmon, bottomfish, crabs, mussels, clams, opossums, squirrels, ducks and other birds were mentioned, as well as concern about the disappearance of herons and for herons on Kellogg Island in the Duwamish Waterway.
- **Domestic Animals:** There is concern about dogs eating garbage from the river and horses being on a greenbelt above the river.
- **River and Groundwater Contamination:** There is concern that the river is dying and that it contains contaminants, including PCBs and mercury. There is concern about the effect of septic systems near the river; sewer overflows; surface water runoff, including oil, antifreeze and fertilizers; unreported spills and illegal dumping; and pumping of waste into the river or groundwater. There is concern that permits for discharges to the river are not being enforced or will be revised to be less strict. There is concern that sources of PCBs are not being addressed.
- **Economics:** Some people interviewed are concerned about contamination lowering property values. Others are concerned that businesses will leave the area due to the designation of the Lower Duwamish Waterway as a Superfund site.
- **Cleanup:** Some people are concerned that South Park and the businesses on the water will be affected by cleanup activities, such as increased truck or barge traffic and potential accidents. There are concerns about the costs of damages to natural resources and the possibility that parties responsible for contamination will do some early cleanup activities but nothing more.

- **Information:** Several people expressed concern about a lack of warning signs for fishermen and recreational users and suggested that such signs should be installed. People are concerned about whether adequate information reaches the Spanish-speaking and other non-English-speaking communities and whether the average person and immigrants understand the risks.
- **Image:** While some people described the Duwamish Waterway neighborhood as an industrial area, others are concerned that it is perceived as a dumping ground. At the 2007 meeting, residents were concerned that many of the businesses in the area that were inspected were not following regulatory requirements and needed corrective action.

Additional public concerns may be identified over the course of the cleanup through: public comment periods; further community interviews; surveys; meetings; and other contacts with individuals, community groups, or organizations.

Ecology will work to respond to community concerns through the cleanup process and will coordinate with other regulatory agencies and property owners as necessary.

## **Public Participation Activities and Responsibilities**

The purpose of this Public Participation Plan is to promote public understanding and participation in the MTCA activities planned for this site. This section of the plan addresses how Ecology will share information and receive public comments and community input on the site activities.

### **Public Involvement Activities**

Ecology uses a variety of activities to facilitate public participation in the investigation and cleanup of MTCA sites. Ecology will implement input provided by community residents, businesses, and other stakeholders whenever possible.

The following is a list of the public involvement activities that Ecology will use, their purposes, and descriptions of when and how they will be used during this site source control investigation.

#### ***Formal Public Comment Periods***

Comment periods are the primary method Ecology uses to get feedback from the public on proposed cleanup decisions. Comment periods usually last 30 days and are required at key points during the investigation and cleanup process before final decisions are made.

During a comment period, the public can comment in writing. Verbal comments are taken if a public hearing is held. After formal comment periods, Ecology reviews all comments received and may respond in a document called a Responsiveness Summary.

Ecology will consider the need for changes or revisions based on input from the public. If significant changes are made, then a second comment period may be held. If no significant changes are made, then the draft document(s) will be finalized.

Additional public comment periods will be held for any potential draft Remedial Investigation/Feasibility Studies (RI/FS), for any potential draft cleanup action plans that are developed for the site, and for any future legal agreements regarding this site.

### ***Public Meetings and Hearings***

Public meetings will be held at key points during the RI/FS. Ecology also may offer public meetings for actions expected to be of particular interest to the community. These meetings will be held at locations convenient to the community.

### ***Information Repositories***

Information repositories are places where the public may read and review site information, including documents that are the subject of public comment.

Ecology has established two repositories for the North Boeing Field/Georgetown Steam Plant remedial investigation/feasibility study project.

- Washington State Department of Ecology, 3190 160th Avenue SE, Bellevue, WA 98008, (425) 649-7190. Please call for an appointment.
- South Park Library, 8604 Eight Ave S. at Cloverdale St. Seattle, WA

Site information also will be posted on Ecology's web site at:

[http://www.ecy.wa.gov/programs/tcp/sites/lower\\_duwamish/sites/nBoeingGeorgeTnStmPlant/nBoeingGeorgetown.htm](http://www.ecy.wa.gov/programs/tcp/sites/lower_duwamish/sites/nBoeingGeorgeTnStmPlant/nBoeingGeorgetown.htm)

### ***Site Register***

Ecology's Toxics Cleanup Program uses its bimonthly *Site Register* to announce all of its public meetings and comment periods, as well as many other activities. To receive the *Site Register* in electronic or hard copy format, contact Linda Thompson at (360) 407-6069 or by e-mail at [Ltho461@ecy.wa.gov](mailto:Ltho461@ecy.wa.gov). It is also available on Ecology's web site at [http://www.ecy.wa.gov/programs/tcp/pub\\_inv/pub\\_inv2.html](http://www.ecy.wa.gov/programs/tcp/pub_inv/pub_inv2.html)

### ***Mailing List***

Ecology has compiled a mailing list for the site. The list includes individuals, groups, public agencies, elected officials, private businesses, business associations, potentially affected parties, and other known interested parties. The list will be maintained at Ecology's Northwest Regional Office and will be updated as needed.

To have your address added or deleted from this mailing list, please contact the Ecology's public involvement coordinator **Molly Morris at (425) 649-7135** or [momo461@ecy.wa.gov](mailto:momo461@ecy.wa.gov).

### ***Fact Sheets***

Ecology will mail fact sheets to persons, businesses, and organizations interested in the North Boeing Field/Georgetown Steam Plant RI/FS to inform them of public meetings and comment opportunities and important site activities. Ecology also may mail fact sheets about the progress of site activities.

### ***Newspaper Display Ads***

Ecology will place ads in the *Seattle Times* and *Seattle Post Intelligencer*, to announce public comment periods and public meetings or hearings for the site.

### ***Enhanced Public Participation***

Ecology will work with EPA and stakeholders according to the enhanced public participation efforts that occur for the Lower Duwamish Waterway Superfund site. Ecology site managers and community involvement coordinators may participate in community meetings and events as needed. Ecology will coordinate with DRCC throughout the public involvement process. This may include such activities as coordination for public meetings and sharing drafts of documents with DRCC for review, as appropriate.

### **Public Participation Plan Update**

This public participation plan may be updated as the project proceeds. If an update is necessary, the revised plan will be submitted to the public for comment.

## **Points of Contact**

If you have questions or need more information about this plan or the North Boeing Field/Georgetown Steam Plant site, please contact the following:

Mark Edens, Site Manager  
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3190 160th Avenue SE  
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3190 160th Avenue SE  
Bellevue, WA 98008  
Tel: (425) 649-7135  
E-mail: momo461@ecy.wa.gov

## **Glossary**

**Agreed Order:** A legal document issued by Ecology which formalizes an agreement between the department and potentially liable persons (PLPs) for cleanup actions needed at a site. Orders are subject to public comment. If an order is substantially changed, an additional comment period may occur.

**Antimony:** Antimony is a silvery-white metal that is found in the earth's crust. Antimony isn't used alone because it breaks easily, but when mixed into alloys, it is used in lead storage batteries, solder, sheet and pipe metal, bearings, castings, and pewter. Antimony oxide is added to textiles and plastics to prevent them from catching fire. It is also used in paints, ceramics, and fireworks, and as enamels for plastics, metal, and glass. Breathing high levels for a long time can irritate your eyes and lungs and can cause heart and lung problems, stomach pain, diarrhea, vomiting, and stomach ulcers. Ingesting large doses of antimony can cause vomiting.

**Arsenic:** A metallic element that forms a number of poisonous compounds, arsenic is found in nature at low levels mostly in compounds with oxygen, chlorine, and sulfur.

**Cadmium:** A metallic element whose salts are toxic and cause cancer.

**Chromium:** Chromium is a naturally occurring element found in rocks, animals, plants, soil, and in volcanic dust and gases. Chromium (III) is an essential nutrient that helps the body use sugar, protein, and fat. Chromium (VI) at high levels can damage the nose and can cause cancer. Ingesting large amounts of chromium (VI) can cause stomach upsets and ulcers, convulsions, kidney and liver damage, and even death.

**Cleanup:** Actions taken to deal with a release, or threatened release of hazardous substances that could affect public health and/or the environment. The term "cleanup" is often used broadly to describe various response actions or phases of remedial responses such as the remedial investigation/feasibility study.

**Comment Period:** A time period during which the public can review and comment on various documents and proposed actions. For example, a comment period may be provided

to allow community members to review and comment on proposed cleanup action alternatives and proposed plans.

**Copper:** A ductile, malleable, reddish-brown metallic element that is an excellent conductor of heat and electricity and is widely used for electrical wiring, water piping, and corrosion-resistant parts, either pure or in alloys such as brass and bronze. Copper is toxic in its unbound form.

**Contaminant:** Any hazardous substance that does not occur naturally or occurs at greater than natural background levels

**Feasibility Study:** A study to evaluate alternative cleanup actions for a site. A comment period on the draft report is required. Ecology selects the preferred alternative after reviewing those documents.

**Groundwater:** Water found beneath the earth's surface that fills pores between materials such as sand, soil, or gravel. In some aquifers, ground water occurs in sufficient quantities that it can be used for drinking water, irrigation and other purposes.

**Hazardous Substance:** Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.

**Information Repository:** A file containing current information, technical reports, and reference documents available for public review. The information repository is usually located in a public building that is convenient for local residents such as a public school, city hall, or library.

**Lead:** A bluish-white soft malleable ductile plastic but inelastic heavy metallic element found mostly in combination and used especially in pipes, cable sheaths, batteries, solder, and shields against radioactivity. Lead may cause irreversible neurological damage as well as renal disease, cardiovascular effects, and reproductive toxicity.

**Mercury:** A silvery-white poisonous metallic element, liquid at room temperature and used in thermometers, barometers, vapor lamps, and batteries and in the preparation of

chemical pesticides. Mercury damages the central nervous system, endocrine system, kidneys, and other organs, and adversely affects the mouth, gums, and teeth.

**Model Toxics Control Act (MTCA):** Legislation passed by citizens of the State of Washington through an initiative in 1988. Its purpose is to identify, investigate, and clean up facilities where hazardous substances have been released. It defines the role of Ecology and encourages public involvement in the decision making process. MTCA regulations are administered by the Washington State Department of Ecology.

**PAH (Polynuclear Aromatic Hydrocarbons):** PAHs are a group of chemicals that are formed during the incomplete burning of coal, oil, gas, wood, garbage, or other organic substances, such as tobacco and charbroiled meat. There are more than 100 different PAHs.

**PCBs (polychlorinated biphenyls):** A group of toxic, persistent chemicals. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including transformers and capacitors for insulating purposes, and in gas pipeline systems as a lubricant. PCBs are a serious threat to public health because they have been proven to cause cancer in animals. In 1977 they were made illegal to produce, yet large amounts still remain in the environment.

**Potentially Liable Person:** Any individual(s) or company(s) potentially responsible for, or contributing to, the contamination problems at a site. Whenever possible, Ecology requires these PLPs, through administrative and legal actions, to clean up sites.

**Public Participation Plan:** A plan prepared under the authority of WAC 173-340-600 to encourage coordinated and effective public involvement tailored to the public's needs at a particular site.

**Remedial Investigation:** A study to define the extent of problems at a site. A comment period on the draft report is required.

**Remedial Investigation/Feasibility Study:** Two distinct but related studies. They are usually performed at the same time, and together referred to as the "RI/FS." They are intended to:

- Gather the data necessary to determine the type and extent of contamination;
- Establish criteria for cleaning up the site;
- Identify and screen cleanup alternatives for remedial action; and
- Analyze in detail the technology and costs of the alternatives.

**Responsiveness Summary:** A summary of oral and/or written public comments received by Ecology during a comment period on key documents, and Ecology's responses to those comments. The responsiveness summary is especially valuable during the Cleanup Action Plan phase at a site when it highlights community concerns.

**Site:** Any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, vessel, or aircraft; or any site or area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located.

**Site Register:** Publication issued every two weeks of major activities conducted statewide related to the study and cleanup of hazardous waste sites under the Model Toxics Control Act. To receive this publication, please call (360) 407-7200.

**Superfund:** The federal government's program to clean up the nation's uncontrolled hazardous waste sites.

**SVOCs (semi-volatile organic compounds):** This group includes a variety of chemicals that have boiling points higher than water and that may become a gas at temperatures above room temperature. Most of these substances are used as industrial chemicals. They include phenols, polynuclear aromatic hydrocarbons (PAHs), and phthalates. Sites where these potentially toxic chemicals may be found include burn pits, chemical manufacturing plants and disposal areas, electroplating/metal finishing shops, firefighting training areas,

hangars/aircraft maintenance areas, solvent degreasing areas, vehicle maintenance areas, and wood preserving pits. These compounds generally evaporate slowly at room temperature. Their water solubility and environmental persistence is highly variable, and they are commonly found as contaminants in soil and water.

**TPHs (total petroleum hydrocarbons):** Describes a large family of several hundred chemical compounds that originally come from crude oil. Crude oil is used to make petroleum products, which can contaminate the environment. TPH is a mixture of chemicals, but they are all made mainly from hydrogen and carbon, called hydrocarbons. Scientists divide TPH into groups of petroleum hydrocarbons that act alike in soil or water. These groups are called petroleum hydrocarbon fractions. Each fraction contains many individual chemicals.

**Toxicity:** The degree to which a substance at a particular concentration is capable of causing harm to living organisms, including people, plants and animals.

**VOCs (volatile organic compounds):** include a variety of chemicals that become a gas at room temperature. Most such substances are industrial chemicals and solvents. They include light alcohols, acetone, trichloroethylene, perchloroethylene, dichloroethylene, benzene, vinyl chloride, toluene, and methylene chloride. These potentially toxic chemicals are used as solvents, degreasers, paints, thinners, and fuels. Because of their volatile nature, they readily evaporate into the air, increasing the potential exposure to humans. Due to their low water solubility, environmental persistence, and widespread industrial use, they are commonly found in soil and water.

**Zinc:** Zinc is a metallic chemical element; it has a white color with a bluish tinge. It has a high resistance to atmospheric corrosion. A major use is as a protective coating for iron and steel sheet and wire. Excess zinc in the body interferes with the metabolism of other minerals in the body.