

Health Consultation

Inland Empire Plating
Spokane, Spokane County, Washington

November 24, 1999

Prepared by

**The Washington State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry**



FOREWORD

The Washington State Department of Health has prepared this health consultation under cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), an agency of the U.S. Public Health Service. The goal of Washington State Department of Health and ATSDR is to identify and mitigate adverse human health effects resulting from exposure to hazardous substances in the environment. This report was prepared in accordance with methodologies and guidelines developed by ATSDR.

Health Consultations are conducted to better characterize past, current, and potential future human exposures to hazardous substances in the environment and to more thoroughly evaluate existing and potential health effects related to those exposures. Three primary methods are used to collect information during a health consultation: (1) Biomedical testing, such as the collection of blood or urine samples, to provide information on current (and sometimes past) exposures to a contaminant, (2) Environmental testing, such as the collection of soil, water, air, or dust, to help determine possible exposure sources, and (3) Exposure-dose reconstruction which utilizes environmental sampling information and computer models to estimate the contaminant levels that people may have been exposed to in the past or may be exposed to in the future.

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BACKGROUND AND STATEMENT OF ISSUES

The Washington State Department of Health (DOH) has prepared this health consultation at the request of the Washington State Department of Ecology (Ecology) to evaluate potential health hazards posed to residents living at or near the former Inland Empire Plating Site.

The site is located in Spokane, in the southwest quarter of Section 18, Township 25 North, Range 43 East of the Willamette Meridian (Figure 1). The site is approximately one acre in size and is currently a vacant lot with a few piles of coarse gravel, excavations, and areas covered with plastic tarps. The site topography is generally flat, on an elevated terrace of sand, gravel, and basalt above the northern bank of the Spokane River in the southwestern portion of the Spokane Valley.² Groundwater is approximately 70 feet below ground surface, however, this aquifer does not appear to be connected to the main Rathdrum Prairie Aquifer, used for drinking water. The nearest surface water is the Spokane River, located approximately 800 feet down gradient to the south.¹

The surrounding area is mixed residential and local government use, with some light industrial and commercial use. The site is zoned to allow mixed residential use. The Spokane County Health Department and a vacant county office/warehouse are to the east, and vacant land along Ide Avenue borders the property to the south. Another vacant lot borders the west side. The site has been owned by several businesses since 1947, including Inland Empire Plating, which occupied a building on a portion of the property and was in business from 1974 to 1979 (Figure 2). Spokane County purchased the property in 1980 and sold it to a private company (the current owner) in 1996; however, Spokane County continued to lease the building for road maintenance equipment. In March of 1998, the building was demolished and removed from the site.

Operations at Inland Empire Plating consisted of electroplating and metal polishing which required tanks of electrolytic solution (plating tanks) into which metal parts were immersed. Following the plating process, excess electrolytes were removed by several rinses. Typically the plating baths and accumulated sludges contain high concentrations of metals and sometimes cyanide. Ecology discharge permit records indicates that wastewater contained various acids (including hydrochloric, sulphuric, nitric, and chromic acids), copper cyanide, sodium cyanide, nickel sulphates and caustic soda.²

In 1990 and 1991, soil was determined to be contaminated with elevated levels of heavy metals and cyanide, and sludge in a settling tank was contaminated with cyanide wastes.¹ Cleanup actions included soil excavation and removal of the settling tank, tank liner, and associated PVC piping. Soil analysis beneath the settling tank following excavation still indicated elevated levels of lead and cadmium. Cyanide levels were below Ecology Cleanup levels.¹

In 1997, soil samples were collected from depths of 0-6 inches and 9-18 inches and analyzed for metals, cyanide, and PAHs. Results indicated that some soil samples exceeded cleanup levels for cadmium, chromium, lead, and PAHs. Based on these results, additional excavation was conducted. Confirmation sampling indicated that cadmium still exceeded Ecology MTCA Method A Cleanup Levels.² Additional excavation and sampling was conducted to a depth of 15 feet and analytical results indicated that three areas totaling 400 square feet contained soil that still exceeded the Ecology clean up levels for cadmium. The highest level of cadmium was 9.4 ppm. Although this exceeded Ecology clean up levels, Ecology recommended leaving the remaining contaminated soil in place and applying a restrictive covenant.

Over 8-9 years, approximately 2,500 cubic yards of soil contaminated with heavy metals and cyanide was removed from the Inland Empire Plating site. A possible exposure to fugitive dust could have occurred to area residents; however, no data exists to determine actual exposure.

DISCUSSION

The constituents of concern for the former Inland Empire Plating site were originally identified as cyanide and metals, including cadmium, chromium, lead, nickel, and zinc. Soil is the primary environmental medium of concern since groundwater beneath the site is confined and does not appear to be connected to any drinking water aquifers.

Soil with cadmium exceeding Ecology clean up levels remains in a 400 square foot area at a depth of 15.5 feet below ground surface. Therefore, there are no completed pathways since residential homes are on city water and the depth of soil contamination is below ground.

The site is located in an area of primarily commercial and semi-industrial uses; however some residences are located nearby (within 500 feet), and the site is zoned to allow mixed residential use. The size of the residential area is several square miles comprising of the area north of downtown Spokane. However, there appears to be no completed pathways as residential homes are on city water and the depth of soil contamination is approximately 15 feet below ground surface. In addition, the concentration of cadmium, 9.4 ppm, is below the child Environmental Media Evaluation Guide (EMEG) comparison value (of 10 ppm) for cadmium in soil.

EXPOSURE PATHWAY AND CHILDREN

The potential for exposure and subsequent adverse health effects are often increased for young children as opposed to older children or adults. Since this is a residential area and the site is not fenced, children are likely to venture onto the site to play. Children are far more likely to engage in activities that involve getting dirty. Playing in dirt combined with frequent hand-to-mouth activity, provides toddlers and young children with an increased chance of exposure to contaminants by way of ingestion, inhalation, and skin contact. In addition to the potential for higher exposures of young children, the risk of adverse health effects is also increased. ATSDR and DOH recognize that children are susceptible to developmental toxicity that can occur at levels much lower than those causing other types of toxicity.

However, with this site, children are highly unlikely to be exposed to cadmium since it is 15.5 feet below ground surface. Since this evaluation is expected to be protective of children, who are more sensitive, it is protective for adults as well.

CONCLUSIONS

- Approximately 2500 cubic yards of soil contaminated with heavy metals and cyanide was removed from the Inland Empire Plating site. Residents may have been exposed to contaminated dust, however, no data exists to determine actual exposure.
- No pathways are completed for exposure to contaminants of concern.
- No public health hazard exists from exposure to the maximum concentration of cadmium in soil.

RECOMMENDATIONS

There are no recommendations.

REFERENCES

1. Memorandum to F. Goldstein from P. Carter, March 23, 1999.
2. Voluntary Cleanup--Former Inland Empire Plating Site, Landau Associates, May 29, 1998.
3. Letter to F. Goldstein from S. Miller, March 24, 1999.
4. Letter to P. Carter from S. Miller, December 18 1997.
5. Letter to S. Spencer from S. Miller, February 12, 1996.
6. Worksheet 1, Summary Score Sheet, Inland Empire Plating, May 31, 1991.
7. Site Hazard Assessment Data Collection Summary Sheets, Washington Ranking Method, Inland Empire Plating, August 30, 1990.

Glossary

Aquifer	An underground formation composed of materials such as sand, soil, or gravel that can store and/or supply groundwater to wells and springs.
Agency for Toxic Substances and Disease Registry (ATSDR)	The principal federal public health agency involved with hazardous waste issues, responsible for preventing or reducing the harmful effects of exposure to hazardous substances on human health and quality of life. ATSDR is part of the U.S. Department of Health and Human Services.
Comparison value	A concentration of a chemical in soil, air or water that, if exceeded, requires further evaluation as a contaminant of potential health concern. The terms comparison value and screening level are often used synonymously.
Contaminant	Any chemical that exists in the environment or living organisms that is not normally found there.
Dose	A dose is the amount of a substance that gets into the body through ingestion, skin absorption or inhalation. It is calculated per kilogram of body weight per day.
Environmental Media Evaluation Guide (EMEG)	A concentration in air, soil, or water below which adverse non-cancer health effects are not expected to occur. The EMEG is a <i>comparison value</i> used to select contaminants of potential health concern and is based on ATSDR's <i>minimal risk level</i> (MRL).
Exposure	Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin or eyes). Exposure may be short term (acute) or long term (chronic).
Groundwater	Water found underground that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater often occurs in quantities where 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.
Model Toxics Control Act (MTCA) Media	The hazardous waste cleanup law for Washington State. Soil, water, air, plants, animals, or any other part of the environment that can contain contaminants.

No public health hazard	Sites for which data indicate no current or past exposure or no potential for exposure and therefore no health hazard.
Parts per billion (ppb)/Parts per million (ppm)	Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 million ounces of water is 1 ppm. 1 ounce of TCE in 1 billion ounces of water is 1 ppb. If one drop of TCE is mixed in a competition size swimming pool, the water will contain about 1 ppb of TCE.
Risk	The probability that something will cause injury, linked with the potential severity of that injury. Risk is usually indicated by how many extra cancers may appear in a group of people who are exposed to a particular substance at a given concentration, in a particular pathway, and for a specified period of time. For example, a 1%, or 1 in 100 risk indicates that for 100 people who may be exposed, 1 person may experience cancer as a result of the exposure.
Route of exposure	The way in which a person may contact a chemical substance that includes ingestion, skin contact and breathing.