



M. ADAMS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

July 8, 2011

Mr. James Okel
Precision Engineering, Inc.
8440 North Kerby Avenue
Portland, Oregon 97217

Re: Opinion pursuant to WAC 173-340-515(5) on Proposed Remedial Action for the following Hazardous Waste Site:

- **Site Name:** Precision Engineering
- **Site Address:** 1231 South Director Sreet, Seattle, WA 98108
- **Facility/Site No.:** 2056
- **VCP Project No.:** NW 1511

Dear Mr. Okel:

Thank you for submitting documents regarding your proposed remedial action for the Precision Engineering facility (Site) for review by the Washington State Department of Ecology (Ecology) under the Voluntary Cleanup Program (VCP). Ecology appreciates your initiative in pursuing this administrative option for cleaning up hazardous waste sites under the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

This letter constitutes an advisory opinion regarding a review of submitted documents/reports pursuant to requirements of MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing releases at the Site.

Ecology is providing this advisory opinion under the specific authority of RCW 70.105D.030(1)(i) and WAC 173-340-515(5).

This opinion does not resolve a person's liability to the state under MTCA or protect a person from contribution claims by third parties for matters addressed by the opinion. The state does not have the authority to settle with any person potentially liable under MTCA except in accordance with RCW 70.105D.040(4). The opinion is advisory only and not binding on Ecology.

Ecology's Toxics Cleanup Program has reviewed the following information regarding your proposed remedial action(s):

1. 2011, March 9, *Re: Supplemental Information requested by Ecology for the Former Precision Engineering Site, 1231 SE Director Street, Seattle, Washington*, letter from Meredith D'Andrea, Maul Foster Alongi to Russ Olsen, Washington Department of Ecology



Mr. James Okel
July 8, 2011
Page 2

2. 2011, March 3, *Final Feasibility Study, Former Precision Engineering, Inc. Site, 1231 SE Director Street, Seattle, Washington*, report by Maul Foster Alongi
3. 2010, April 21, *Feasibility Study, Former Precision Engineering, Inc. Site, 1231 SE Director Street, Seattle, Washington*, report by Maul Foster Alongi
3. 2009, September 21, *Re: Opinion Pursuant to WAC 173-340-515(5) on July 21, 2008, Final Remedial Investigation and Risk Assessment Report*, letter from Mark Adams, Ecology to Jim Okel, Precision Engineering Inc.

The reports and correspondence listed above will be kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. Appointments can be made by calling the NWRO resource contact, Sally Perkins, at 425 649-7190.

The Site is defined by the extent of contamination caused by the following release(s):

- Hexavalent and trivalent chromium, arsenic, cadmium, copper, lead, trichloroethene (TCE), polycyclic aromatic hydrocarbons (PAHs), and diesel- and oil-range petroleum hydrocarbons into the Soil
- Hexavalent and trivalent chromium, TCE, vinyl chloride, diesel- and oil-range petroleum hydrocarbons, and PAHs into the Ground Water
- TCE, cis-1,2-dichloroethene (DCE), and vinyl chloride into the Air

The Site is more particularly described in Enclosure A.

Based on a review of supporting documentation listed above, pursuant to **requirements contained in MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing release(s) at the Site, Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action based on the following:**

General Background

The documents submitted for this Site in 2011 respond to issues raised by Ecology in the September 21, 2009 opinion letter and in a meeting on November 3, 2010. Two main issues require resolution in order to move forward. One has to do with ground water classification and the other with site definition. Both of these issues are central to developing a cleanup action plan for this Site.

Site Definition

Historical ground water monitoring data has indicated that 1,2 dichloroethene, vinyl chloride, hex and trivalent chromium, and diesel- and oil-range hydrocarbons were moving off-Property in ground water (the most recent sampling in July 2010 detected only trivalent chromium and diesel- and oil-range hydrocarbons in wells at the Property edge, with only the hydrocarbons above Method A cleanup levels). A ground water model was used to estimate the extent and concentration of these contaminants down gradient towards the Duwamish River. Ecology accepted the modeling as a reasonably conservative predictor of ground water conditions. However, empirical down gradient ground water quality data was requested in the September 21, 2009 opinion letter to verify the modeling predictions.

The closest apparent down gradient property is itself a MTCA site (KASPAC/Chiyoda), with contaminants similar in nature to those found at the Precision Site. Ground water contaminant plumes from the two sites may be commingled, making it difficult, if not impossible, to differentiate between the two sites, and their impact on down gradient water quality.

It has also been stated that the KASPAC/Chiyoda site may be the source of some of the contamination (vinyl chloride, diesel) detected at the Site, based on higher ground water elevations at this property. Based on this, Ecology has concluded that the nature and extent of the Precision Site has not been fully determined, and that it is likely commingled with contaminants from the KASPAC/Chiyoda site. Further analysis of existing data or additional ground water investigations will be necessary to clarify ground water flow directions downgradient of the Precision property and the relationship between hazardous substance releases on the Precision property and those on the KASPAC/Chiyoda property.

Ground Water Potability

Ground water cleanup levels for protection of human health are established on the basis of highest beneficial use. The default in MTCA is use as a potable source. However MTCA provides an opportunity to demonstrate that a specific aquifer is not potable, and outlines three criteria that must be met for this to be true.

The first criterion is that the ground water not serve as a current source of drinking water (WAC 173-340-720 (2)(a)). This criterion has been met for the Site. Ecology's well database shows no water supply wells in the area, and Ecology's water rights database shows none claimed in the area. The City of Seattle provides potable water for the region, and has for many years.

The second criterion involves showing that the ground water would not be usable as a

drinking water in the future for various reasons related to lack of yield or quality (WAC 173-340-720 (2)(b)). An analysis of well yield was conducted and reported in the Final Feasibility Study report. The analysis calculated yield rates of between .025 and 0.11 gallons per minutes (gpm), well below the 0.5 gpm threshold value for potability. The analysis used gallon-per-foot of drawdown data obtained from well purging and an available drawdown value of 4 feet, in an aquifer averaging 6 feet thick, to calculate yield. Ecology accepts the analysis as a reasonable estimate of aquifer yield to a "well constructed in compliance with Chapter 173-160 WAC, and in accordance with normal domestic water well construction practices for the area.." (WAC 173-340-720 (2)(b)(i)).

The third criterion requires a demonstration that hazardous substances are not likely to be transported from a nonpotable aquifer to an area where the ground water is a current or potential future potable source (WAC 173-340-720(2)(c)). At this Site, the nearest area of potential potable ground water is the alluvial aquifer down gradient from the Property between it and the Duwamish River. The March 9, 2011 "Supplemental Information..." letter provides three lines of evidence that ground water down gradient of the Site is not a potential future source of drinking water.

- The first line of evidence has to do with hydrogeologic conditions in the Duwamish River valley. Geologic logs from the adjoining KASPAC/Chiyoda property are provided along with cross sections from Terminal 117 about 3,000 feet northeast of the Site. Ecology's opinion is that the information from Terminal 117 is too far down the valley to be directly applicable to the Site, and that the information from KASPAC/Chiyoda is too close. The area from which aquifer information is needed is the closest portion of the valley between the Property and the river. The Terminal 117 area may also not be downgradient of the Site, based on the new information provided in the March 9, 2011 document. If ground water elevations are higher on the KASPAC/Chiyoda property than at the Precision property boundary, then shallow ground water would first flow to the south, before eventually turning eastward towards the Duwamish Waterway.

Setting these issues aside for the moment, logs from the adjoining KASPAC/Chiyoda property show conditions similar to the Site with sediment of generally low permeability. Conditions at Terminal 117 as illustrated on cross sections purportedly show low-yield conditions. The cross sections show between 20 and 45 feet of saturated loose alluvial sands and silty sands overlying less permeable alluvium. It is likely the alluvial sands would be capable of yielding 0.5 gpm or more to a shallow water supply well, and no evidence to the contrary has been provided. Ground water at Terminal 117 is also noted as being undrinkable due to elevated salinity related to higher concentrations of inorganic constituents, but an explanation as to why the salinity is elevated is not provided (could be due to proximity to the brackish Duwamish Waterway, man-made fills such as cement kiln dust, or naturally brackish conditions).

In summary, the information provided does not support low-yield or poor quality conditions in an area where ground water from the shallow aquifer at the Site is likely to be transported.

- The second line of evidence has to do with the Duwamish Hydrogeologic Pathways study. The conclusions of this report and the May 1, 2000 "acceptance letter" from the Department of Ecology have been brought up in numerous Precision site documents as proof that Ecology has determined ground water in the Duwamish valley to be nonpotable. A close reading of the May 1, 2000 letter shows that Ecology appreciates the characterization information presented in the study, and recognizes that it will be helpful to Ecology site managers in reaching conclusions. It does not explicitly endorse or accept the contention that the highest beneficial use of the shallow aquifer in the Duwamish River valley is discharge to surface water. Conclusions regarding highest beneficial use and potability remain subject to the criteria outlined in MTCA.
- The third line of evidence relates to existing institutional controls preventing ground water use. The argument here is that existing King County, Seattle, and King County Board of Health regulations control the installation or use of new private water supply wells. Ecology does not accept that these institutional-type controls prevent ground water use both now and in the future. Regulations can change, and practices that are not currently acceptable may become so in the future. Furthermore, MTCA does not list land use regulation as a criterion for establishing whether an aquifer is potable or not.

In conclusion, none of the evidence provided to date proves that ground water down gradient of the Site is not a future potential source of drinking water. Unless additional evidence is provided as described above, Ecology concludes Site ground water is potable for purposes of establishing cleanup standards.

This opinion does not represent a determination by Ecology that a proposed remedial action will be sufficient to characterize and address the specified contamination at the Site or that no further remedial action will be required at the Site upon completion of the proposed remedial action. To obtain either of these opinions, you must submit appropriate documentation to Ecology and request such an opinion under the VCP. This letter also does not provide an opinion regarding the sufficiency of any other remedial action proposed for or conducted at the Site.

Please note that this opinion is based solely on the information contained in the documents listed above. Therefore, if any of the information contained in those documents is materially false or misleading, then this opinion will automatically be rendered null and void.

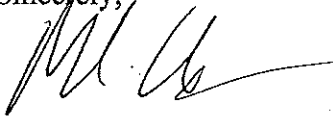
Mr. James Okel
July 8, 2011
Page 6

The state, Ecology, and its officers and employees make no guarantees or assurances by providing this opinion, and no cause of action against the state, Ecology, its officers or employees may arise from any act or omission in providing this opinion.

Again, Ecology appreciates your initiative in conducting independent remedial action and requesting technical consultation under the VCP. As the cleanup of the Site progresses, you may request additional consultative services under the VCP, including assistance in identifying applicable regulatory requirements and opinions regarding whether remedial actions proposed for or conducted at the Site meet those requirements.

If you have any questions regarding this opinion, please contact me at 425 649-7107.

Sincerely,



Mark Adams
NWRO Toxics Cleanup Program

ma/kp

Enclosures (1): A – Site Description

cc: Merideth Gibson, Maul Foster Alongi
Tom Newlon, Stoel Rives LLP
Russ Olsen, Washington State Department of Ecology

Mr. James Okel
July 8, 2011
Page 7

ENCLOSURE A

SITE DESCRIPTION

Site Description

This enclosure provides Ecology's understanding and interpretation of site conditions and forms part of the basis for the opinions expressed in the body of the letter.

Site Definition and Area Description

The Site comprises part of a former Precision Engineering facility (Precision property or Property) and off-Property areas to the south and east. The Precision property is located at 1231 South Director Street in the South Park area of Seattle. The Site includes a portion of a drainage ditch impacted by runoff from the Precision property, and may include areas to the east, specifically the KASPAC/Chiyoda property. This adjoining property reportedly has contaminants similar in nature to those detected at the Precision property, and contaminated ground water associated with releases at the two properties may be commingled.

The Site is at the southern edge of the South Park residential area, within a broader region known as the Duwamish industrial area. Land use in the immediate area is mixed; residential housing to the north and west, industrial/commercial property to the east, and Highway 99 ramps to the south. The Precision property itself is zoned industrial, as are areas to the east and south. Immediately adjoining businesses include a refrigerator sales and repair operation (west), and a towing and limousine service (east). The property to the east was reportedly used as a paint shop in the 1970s and a fiberglass boat manufacturing facility before that.

Property History

The Precision property currently has a large manufacturing building on it surrounded by asphalt parking. Part of the building was constructed in 1966, and part in 1979. The Property was apparently undeveloped prior to that. Precision operated continuously between 1966 and 2005, specializing in the manufacture and repair of large hydraulic cylinders and metal rolls, large marine items such as propellers, and special blade assemblies. Services included grinding, polishing, honing, hard-chrome plating, milling, welding, and coating. Chromic acid was used extensively along with the degreaser, trichloroethene (TCE).

Physiographic Setting

The Site is situated in the Duwamish River valley, with the river about 1,800 east of the Precision property line. The land surface in the valley is generally flat-lying. However, there are a few small hills within the valley, and the Precision property has been cut into one of them (termed "South Park hill" for purposes of this letter). The northern and western edges of the property consist of steep cut slopes ranging up to about 40 feet high. The rest of the property

slopes gently down to the east and south, merging with the level valley floor.

Surface Water Conditions

Surface water drainage in the area is generally towards and into the Duwamish Waterway. However, Highway 99 has disrupted the drainage creating a complex series of interconnected ditches, buried pipes, and ponds immediately south of the Property. Surface water at the Precision property drains into one of the highway ditches along the southern border of the property. Part of the drainage is through overland flow; part is through collection in catch basins and discharge via culvert. Surface water from the adjoining property to the east also reportedly drains into the highway ditch through a buried culvert. The outlet for this pipe is no longer visible. Flow in the highway ditch enters into a 24-inch culvert immediately south of the southern Precision property line.

Ecological Conditions

The Property and surrounding area is developed, and little terrestrial habitat exists nearby except for residential yard areas and vegetation around storm water pond and drainage features associated with Highway 99. A large vegetated area associated with a former school is located about 500 feet northwest of the Property on top of the South Park hill.

Geologic Conditions

The Precision property is located, as mentioned above, at the edge of the South Park hill within the Duwamish River valley. Consequently the Property sits astride a boundary between geologic deposits. The western two-thirds of the Property is underlain by dense glacial till. The till appears to grade downward at a depth of about 30 feet into more permeable outwash deposits. On the eastern third of the Property, recent Duwamish River floodplain sediments form a wedge lapping onto the underlying till. The wedge is about 7 to 12 feet thick at the eastern Property line, and is composed of relatively fine-grained silty sands, silts, and clayey silts. On the adjoining property (KASPAC/Chiyoda), organic-rich silty clays are also present. The alluvial sediment wedge thickens eastward towards the center of the Duwamish River valley. At the Property, the alluvial sediments are overlain by up to 7 feet of fill, a mixture of silt, sand and gravel.

Ground Water Conditions

Shallow ground water occurs within the alluvial sediments under unconfined (water table) conditions, and as permeable zones within the till. The depth to the water table in the till/alluvial aquifer is typically five feet or less. Most of the shallow ground water directly beneath the Precision building occurs in the till.

Flow directions in the till/alluvial aquifer are necessarily to the east towards the Duwamish Waterway, and the aquifer ultimately discharges to the waterway either directly or indirectly through the surface water drainage system. Ground water flow at the Site within the till/alluvial aquifer was originally thought to be due east based on elevation data from the Property. However, ground water elevations measured immediately east of the Site (at KASPC/Chiyoda)

are apparently higher suggesting a depression or trough in the water table at the Precision property line. The trough would open out to the south (i.e., ground water would flow southerly along the axis of the trough).

Flow directions in the underlying outwash aquifer are not known. However, the hydraulic head in the outwash aquifer is above land surface on the western part of the Property and below the water table on the eastern portion suggesting rapid discharge into the alluvial aquifer at some location to the east closer to the river.

Soil Contamination

Contaminants were released at the Property primarily into the soils directly beneath the Precision building. Most of the contamination appears to be associated with an area of historical trench drains and tank vaults in the "chrome shop" and "grinding shop". Elevated concentrations of TCE and chromium (both hexavalent and trivalent) are present in this area. Diesel- and oil-range petroleum hydrocarbons (TPHd, TPHo) are also present below the southeastern corner of the building associated with the former boiler room and steam cleaning area. PAHs were also present at low concentrations associated mostly with the petroleum hydrocarbon contamination, but also within the TCE/chrome area.

Some contaminants also appear to have been released outside the Precision building and carried off-Property via overland surface water flow into the highway drainage ditch. The contaminated area measured about 40 feet in width along about 80 feet of ditch, and contained elevated arsenic, cadmium, chromium, copper, lead, PAHs, and oil-range hydrocarbons. The type and distribution of contaminants suggested contribution from not only the Precision property, but also from highway runoff, and perhaps from the property to the east.

Ground Water Contamination

Shallow ground water has been contaminated at the Property with TCE and its breakdown products cis-1,2-dichloroethene (DCE) and vinyl chloride (VC), hexavalent and trivalent chromium, diesel- and oil-range petroleum hydrocarbons, and PAHs. Arsenic is also present in both the alluvial and outwash aquifers at concentrations above cleanup levels. However, it appears to be present at area background, not associated with releases from Precision.

The area of ground water contamination occurs beneath the Precision building and originally extended eastward and southward to the property line. Recent sampling of wells at the property line in July 2010, showed no detectable hexavalent chromium, TCE, DCE, VC or PAHs. The only consistent detections were of trivalent chromium and TPHd, with sporadic TPHo, selenium, and copper. The detections indicate diesel-range hydrocarbons and trivalent chromium are continuing to migrate off-Property, with only TPHd at concentrations above Method A cleanup levels.

Ground water modeling was undertaken to predict the extent of ground water contamination off-Property to the east (assuming uniform ground water flow towards the Duwamish

Mr. James Okel
July 8, 2011
Page 11

WaterwayRiver). The modeling indicated that most contaminants would be undetectable within 300 to 700 feet of the Property line. Vinyl chloride was an exception, with the model predicting it would be detectable almost to the Duwamish River. The model results were conservative and detectable ground water contamination probably does not extend very far beyond the Property line.

Soil Vapor

TCE and its breakdown products are continuing to volatilize from contaminated soil and ground water. Consequently these contaminants are present in soil vapor beneath the Precision building, and specifically below the former chrome and grinding shops. The TCE concentrations in soil vapor below the building slab are well above the current air cleanup level. TCE was also detected in indoor air within the building, but at concentrations below the cleanup level and close to concentrations found in air outside the building.

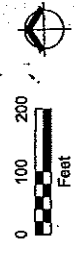
Interim Actions

Two interim cleanup actions have been completed at the Site. The first interim action occurred in 1993, and involved the excavation and removal of chromium- and TCE-contaminated soil from beneath the Precision building floor slab. Washington State Dangerous Waste criteria then in existence were used to guide the excavation, resulting in soil being left in place that contained contaminants at concentrations greater than MTCA cleanup levels.

In 2007 and 2008, the area of soil contamination associated with a highway ditch at the south end of the Property was cleaned up. Approximately 100 cubic yards of soil were removed from this area and disposed offsite. Confirmation samples collected from the sides and base of the excavation showed that the volume of soil containing lead, chromium, cadmium, arsenic, chrysene, and diesel/oil-range hydrocarbons above cleanup levels had been removed.

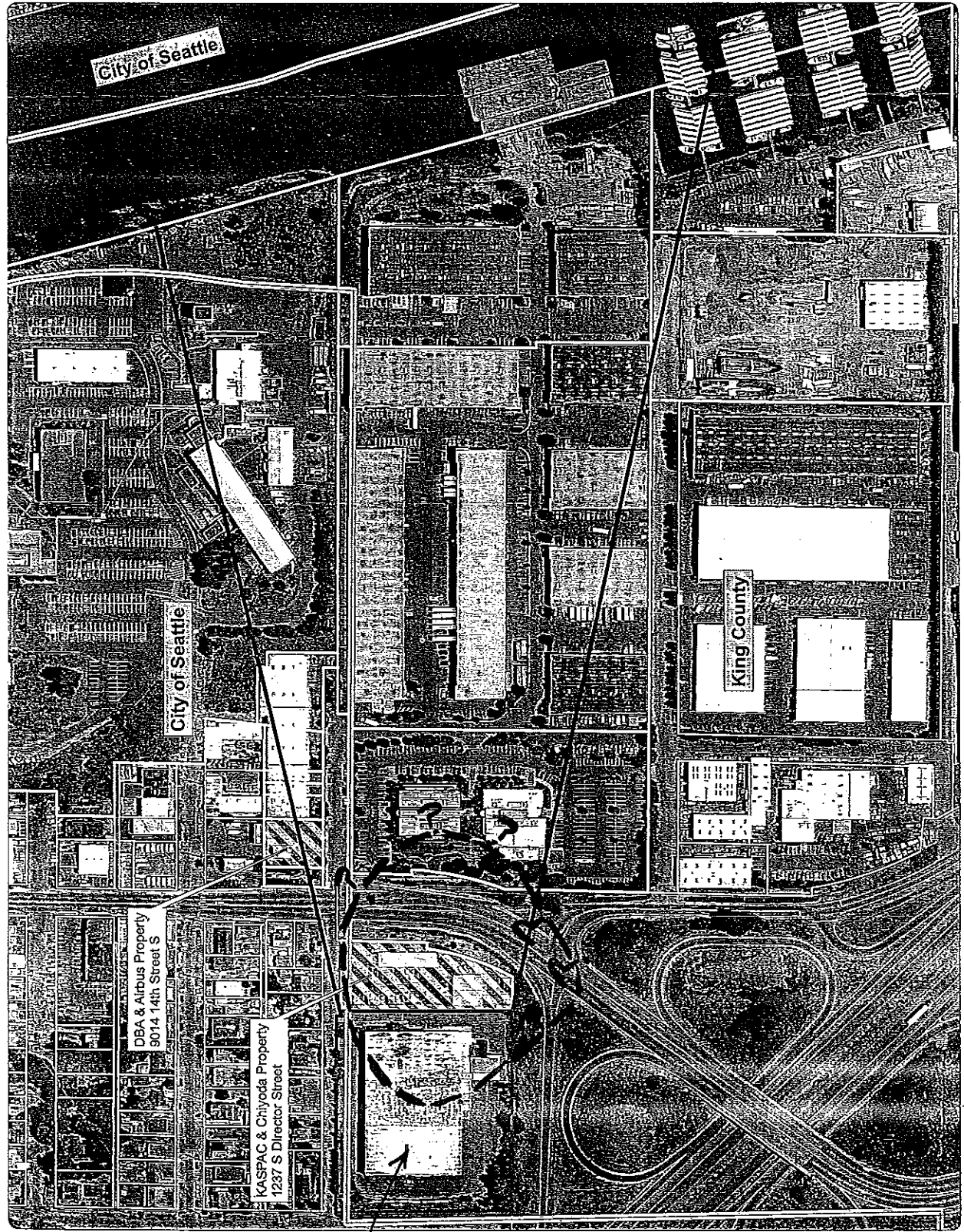
Figure 8
Downgradient Properties
 Precision Engineering, Inc.
 Seattle, Washington

- Legend**
- Study Area
 - Tax Lots
 - Tax Lots - Study Area
 - Property of Interest
 - Precision Equipment
 - City of Seattle - King County Border



Source: Aerial photograph obtained from ESRI, Inc. ArcGIS Online/Microsoft Virtual Earth; tax lots obtained from King County; city boundary obtained from Washington Department of Transportation

MAUL FOSTER ALONGI
 p. 360 894 2691 | www.maulfoer.com



SITE MAP
 Mark Adams
 Ecology
 7/8/11

--- APPROXIMATE BOUNDARY OF SITE

PRECISION PROPERTY