STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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March 15, 2011

Julie Wukelic
Hart Crowser, Inc.
1700 Westlake Ave North
Suite 200
Seattle, WA 98019

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

- Name: Dry Cleaning Facility (a.k.a Former Fabricare Facility)
- Address: 2912 NW Bucklin Hill Road, Silverdale, Washington
- Facility/Site No.: 947 953 64
- VCP No.: NW 2328

Dear Ms. Wukelic:

Thank you for submitting documents regarding your proposed remedial action for the Dry Cleaning 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 release(s) 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. November 19, 2010, *Re: Proposed Scope of Work, Pizza Hut Property (former Fabricare Dry Cleaner) – 2912 NW Bucklin Hill Road, Silverdale, WA,* letter from Peter Ton, Wactor & Wick LLP

2. January 12, 2007, *Re: Summary of Findings, Additional Groundwater Sampling and Analyses, Former Fabricare Dry Cleaning Facility, Silverdale, Washington,* letter from Julie Wukelic, Hart Crowser, Inc.

3. September 11, 2006, *Vapor Migration Analysis, Former Dry Cleaner Facility, 2912 NW Bucklin Hill Road, Silverdale, Washington,* report by Environ

3. July 25, 2006, *Re: Summary of Findings and Proposed Work Plan, Catch Basins and Groundwater Quality, Pizza Hut Property, Silverdale, Washington,* letter from Julie Wukelic, Hart Crowser, Inc.

4. November 10, 2005, *Re: Supplemental Phase II Environmental Assessment, Former Dry Cleaner (Fabricare Cleaners), Silverdale Plaza, 2912 NW Bucklin Hill Road, Silverdale, WA 98393,* letter from Jessica Robertson, Hart Crowser, Inc.

5. June 16, 2003, *Groundwater Annual Monitoring Report, June 2003, Former Dry Cleaning Facility, Silverdale Plaza, Silverdale, Washington,* Krazan & Associates

   - July 12, 2003, *Groundwater Quarterly Monitoring Report, June 2003*
   - January 5, 2002, *Groundwater Quarterly Monitoring Report December 2001*
   - March 28, 2002, *Groundwater Quarterly Monitoring Report March 2002*
   - October 12, 2001, *Groundwater Quarterly Monitoring Report*

6. May 2, 2003, *In-Situ Remediation Performance Summary Letter, Former Dry Cleaning Facility, Silverdale Plaza, Silverdale, Washington,* letter from Donald Balmer, Krazan & Associates

   - September 30, 2002, *In-Situ Performance Monitoring Report – January to September, Year 2002*
   - January 14, 2002, *In-Situ Performance Monitoring Report – January to September, Year 2001*

7. August 31, 2001, *Interim Closure Report, Former Dry Cleaning Facility, Silverdale Plaza, Silverdale, Washington,* Krazan & Associates

8. August 1, 2001, *Groundwater Monitoring Wells Installation, Silverdale Dry Cleaning, 2950 NW Bucklin Hill Road, Silverdale, Washington,* Krazan &

Associates

9. September 29, 2000, *Groundwater Remedial Investigation, Former Dry Cleaning Facility, Silverdale Plaza, Silverdale, Washington,* Krazan & Associates

10. March 31, 2000, *Groundwater Remedial Investigation Work Plan, Former Dry Cleaning Facility, Silverdale, Washington,* Krazan & Associates

11. October 14, 1999, *Re: Subsurface Assessment, Former Dry Cleaner, Silverdale Plaza, Silverdale, Washington,* letter from William Abercrombie, Hart Crowser, Inc.

12. September 12, 1994, *Preliminary Environmental Assessment, Silverdale Plaza, Silverdale Way/ NW Bucklin Hill Road, Silverdale, Washington,* Hart Crowser, Inc.

The reports 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 425 649-9190.

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

- Tetrachloroethene (PCE) in Soil;
- PCE, trichloroethene (TCE), cis-1,2-dichloroethene (DCE), and vinyl chloride (VC) in Ground Water;
- PCE, TCE, DCE, and benzene in Soil Vapor.

The Site is more particularly described in Enclosure A to this letter, which includes a detailed Site diagram. The description of the Site is based solely on the information contained in the documents listed above.

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 the following release(s) at the Site, Ecology has determined:**

- Futher investigation is needed to determine if PCE contamination in soil extends north or further west of the dry cleaner building.

- The downgradient extent of the contaminant plume in ground water has not been determined, nor has it been determined whether ground water discharges into the storm drain. If ground water does discharge into the storm drain, it has not been determined where the storm drain itself discharges or which surface water body receives the outflow.

- Ground water quality data has not been collected since 2006 and needs to be updated.

- The analysis of the potential for soil vapor intrusion was initially inconclusive, and needs to be updated in accordance with current draft Ecology guidance. Current soil vapor data also needs to be obtained, and an evaluation made of whether PCE exists as a background condition in ambient air.

- Cleanup standards need to be developed and documented for all appropriate soil, ground water, air, and possibly surface water exposure pathways. The most stringent of the possible cleanup standards then needs to be identified and selected for the Site.

- The results of Site studies have never been synthesized into a comprehensive document. Similarly, there is no single document that addresses the development of a comprehensive set of cleanup standards. Both of these need to be done, preferably in one remedial investigation-type document.

- The work outlined in the November 19, 2010 letter from Wactor & Wick will not satisfactorily address all of the data gaps or analysis needs outlined above. It does not address the soil vapor issue or the need to define the extent of soil contamination, and has insufficient specificity with regard to the proposed ground water investigation.

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.
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 requirement.

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

Sincerely,

Mark Adams
NWRO Toxics Cleanup Program

MA:mc

Enclosures: A

ENCLOSURE A

Site Description

Site Description

Site: The Site comprises an area affected by releases of dry cleaning fluid containing tetrachloroethene (PCE) at the former Fabricare dry cleaner in the Silverdale Plaza (the Property or the shopping center). The Property and the Site are located in Silverdale, Washington and are shown on the attached Site Map.

Area Description: The Silverdale Plaza shopping center is situated between two major arterials, NW Bucklin Hill Road and Silverdale Way NW, within the Silverdale business district. Silverdale is an unincorporated settlement on the north shore of Dyes Inlet in Kitsap County, and has been one of fastest growing regions of the county in recent years. Much of the development is therefore fairly new. The only shopping mall in the county is located directly north of the Silverdale Plaza, and other business development is located to the west and east. To the south, across NW Bucklin Hill Road, are other commercial properties bordering Dyes Inlet. This inlet is a salt water arm of Puget Sound.

Property History and Current Use: The Property and surrounding area was mostly undeveloped farmland until commercial development began in the 1980s. The shopping center itself was constructed in 1981, and consists of individual tilt-up concrete buildings surrounded and separated by paved parking and driveway areas. The buildings contain multiple retail tenant spaces

Dry cleaners operated between 1981 and 1994 in one of the buildings near the middle of the Property. One of these dry cleaners, Fabricare Cleaners, reportedly used PCE as a dry cleaning fluid from 1985 to 1994. It is worth noting that one of the few unpaved areas in the shopping center adjoins the south side of the building in which the dry cleaner was located.

The dry cleaner tenant space was renovated in 1996, and leased to Pizza Hut. Pizza Hut is still the tenant as of 2011. During the 1996 renovation, the wall between the dry cleaner and the adjacent tenant space was moved, such that part of the dry cleaner space became part of a larger adjacent tenant space. This adjacent space was initially occupied by Mailboxes and is now a UPS store

Sources of Contamination: Potential contamination sources from dry cleaner operations consist of leaks and spills associated with storage and disposal of waste solids and fluids. Disposal of such fluids "out back" to the ground or into drains or sumps is always a possibility, although no drains or sumps are known to have been present. Disposal into the sanitary or storm drain system, and consequent leakage from underground piping, is also a possibility.

Physiographic Setting: The Site and surrounding area lie within a straight valley extending northward from Dyes Inlet. The valley bottom is close to sea level and is bordered by uplands rising 300 to 400 feet above sea level. The land surface at the Property slopes gently down to the south.

Surface/Storm Water System: The valley in which the Site is situated is drained by Clear Creek. The creek discharges into Dyes Inlet about 1,400 feet southeast of the Site. At its' closest point, the creek passes by the Site at a distance of about 1,100 feet. Storm water runoff at the Property and in surrounding areas is captured in drains which discharge either into the creek or the inlet.

Within the borders of the Site are two catch basins (north CB and south CB) and a connecting 12-inch

subsurface storm drain. These features are in a driveway west of the former dry cleaner space. Although the driveway slopes gently down to the south, the drain slopes to the north (drain line is 3.6 feet below ground surface (bgs) at the south CB, and 8.3 feet bgs at the north CB). The 12-inch line apparently drains into a larger 30-inch line at the north CB. Where flows go from this point has not been determined.

Ecological Setting: Wildlife habitat near the Site is largely restricted to the riparian corridor bordering Clear Creek and undeveloped areas of the Dyes Inlet shoreline. The edge of the riparian corridor is more than 700 feet from the Site, and the shoreline even further. Areas closer in are covered with buildings and pavement.

Geology: Uppermost geologic conditions at the Site consist of 4 to 8 feet of fill overlying 15 feet of glacial till, which, in turn, overlies finer-grained lacustrine deposits. The lacustrine deposits begin at a depth of about 25 feet and extend to the full depth explored at the Site, 33 feet. The fill consists of loose to dense silty sand and sandy gravel, and is similar to the till which consists of very dense silty sand with gravel. Only two borings penetrated the base of the till, so the character of the underlying lacustrine sediments is not as well known. At the boring locations, the lacustrine deposits consist of interbedded silty fine sand and fine sandy silt grading downward into hard silts with sand partings.

Ground Water: The uppermost ground water beneath the Site occurs as a thin water-bearing zone perched within the fill and the upper surface of the low-permeability till. The top of the water-bearing zone is generally 2 to 5 feet bgs, and the base is about 7 feet bgs. Thin water-bearing sand stringers also occur below the perched water within the till and in sand partings within the lacustrine deposits.

The wells constructed at the Site to monitor the perched zone are completed a various depths, some entirely within the fill and some entirely within the till. Although this could lead to problems of interpretation, the top of the sand pack in the deeper completions appears in most cases to extend to within the fill making results from the deeper wells somewhat comparable to those from the shallower completions.

Ground water flow in the perched water-bearing zone should be to the south in keeping with the slope of the land surface. However, it appears to be to the west and even northwest, suggesting capture in some kind of subsurface drain. The 12-inch storm drain which passes through this area and drains northward is the most likely candidate. The invert elevation (base) of the drain line appears to be at or below the perched water table, and PCE concentrations in ground water flowing westward toward the line disappear on the other side - The latest ground water sampling at the site in 2006 showed 160 ug/l PCE on the east side of the line (SP-1) and none detectable 50 feet away on the other side of the line (MW-10). These observations suggest shallow ground water discharges into the storm drain or the storm drain backfill. It should be noted that Krazan reached the same conclusion on Page 13 of their September 29, 2000 report – "The groundwater is believed to discharge into the storm sewer utility trench that passes north-south beneath the roadway west of the site."

Water Supply: Whether water supply wells exist in the area has not been researched. However, it is unlikely that the shallow contamination present at this Site (see paragraphs below) would impact water supply wells in the area, if any exist.

Release and Extent of Contamination - Soil: PCE releases did occur at the Property, although the specific nature or source of the release has never been identified. Maximum detected PCE concentrations ranged up to 38 mg/kg. The breakdown product TCE was also detected, but in only one soil sample. The contaminated area encompassed soils below the dry cleaner building, and outside the building 30+ feet southward and 20+ feet westward. Within this area, PCE migrated to depths ranging from 7 to 14 feet. It appears PCE was released at or near the surface and passed down through the fill rather quickly. The till then reduced further downward migration except in certain areas, where the PCE penetrated another 7 feet or so.

PCE was also detected in one boring drilled north of the building adjacent to a side sewer line. The sewer line apparently comes from the dry cleaners. The detection was below Method A cleanup levels; no further effort to define the extent of contamination was therefore made in this area, although it possibly represents a northward extension of the existing contamination beneath the building.

An interim action occurred in 2000 involving the excavation and removal of contaminated soils outside the dry cleaner building (see further description below). Contaminated soils were left in place beneath the building, and out in the driveway area west of the building. The extent of the contaminated soils beneath and in this outside area is not known.

Extent of Contamination – Ground Water: Ground water in the perched water-bearing zone is contaminated with PCE and the breakdown products TCE, DCE, and VC. Maximum PCE concentrations detected during the early phases of investigation in 1999 were up to 33,000 ug/l next to the building (MW-3), and up to 2,200 ug/L downgradient to the west (MW-7). These high concentrations suggested the possible presence of NAPL at that time. The apparent extent of contamination in 1999 was a 30 foot wide plume extending along the southern edge of the building westward a distance of 70 feet and terminating at the storm drain line. However, the eastern, northern, and western edges of the plume were poorly defined.

All of the wells showing some contamination were removed in 2000 during an interim action (see below), and two new "downgradient" wells were installed to monitor ground water quality (MW-9, -10) Both were installed on the west side of the storm drain line, and no PCE was ever detected in either. In 2006 Ecology requested that a sample of ground water be obtained from a more likely location downgradient of the source area and upgradient of the storm drain. A grab sample was obtained (SP-1) and showed 160 ug/l PCE. This data suggests the contaminant plume still existed at the time, and extended westerly and northwesterly from beneath the dry cleaner building. However it should be noted that grab sample results can sometimes be skewed high by incorporating contaminated soil in the analytical results.

The available data at this Site overall suggests contaminated ground water was, and may still be, discharging into the storm drain system. Any contaminant entering the storm drain would likely discharge directly into Clear Creek or Dyes Inlet, given their proximity to the Site.

Extent of Contamination – Air

PCE and its' breakdown products are volatile. They therefore pose a risk to indoor air. Both subsurface soil vapor sampling and indoor air sampling have detected PCE. A considerable number of soil vapor

samples have been obtained from a venting system below the building; the last was obtained in 2002 and showed up to 170 ug/m^3 (Table 4, Krazan 9/30/02 report, values listed as ug/l). Indoor concentrations have only been measured once in 2005 and PCE was detected at 6.3 to 6.6 ug/m^3. Subsurface PCE soil vapor concentrations outside the building were also measured in 2005 at between 1.2 and 7.5 ug/m^3. All of these values are well above the current Method B air cleanup level of 0.42 ug/m^3. It should be noted that background PCE concentrations in urban areas can also sometimes be above the Method B cleanup level.

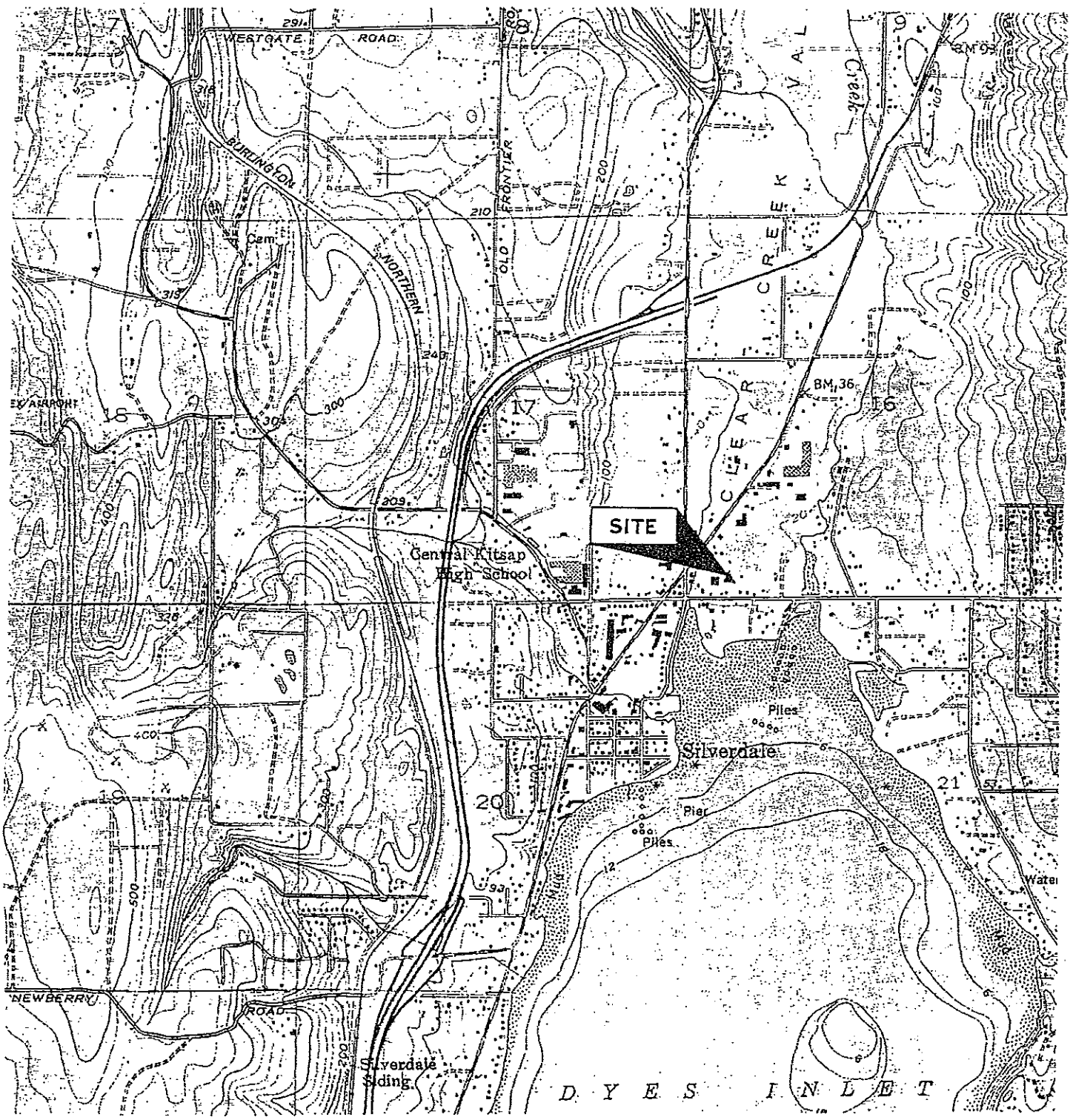
The extent of impact to subsurface soil vapor is unknown, as is the area of potential impact to ambient air above ground surface. However, it should be limited to the building, a small area around it, and the area over the plume of contaminated ground water extending to the northwest.

In an attempt to determine whether PCE in soil vapor migration into the building could account for the observed indoor air detections, the Johnson Ettinger model was run using a PCE concentration of 85 ug/l in ground water. The results indicated there would be an exceedance of the Method B indoor air cleanup level. However, Ecology re-ran the model using the maximum detected soil vapor concentration of 170 ug/m^3, instead of the ground water concentration; the predicted result was less than the Method B cleanup level. It therefore remains unclear whether soil vapor is contributing to indoor air quality impacts.

Interim Actions at the Site

Contaminated soil was excavated from along the southern and western edges of the dry cleaner building in 2000. The excavation ranged from 7 to 14 feet deep, and extended 20 and 30 feet out from the west and south edges of the building, respectively. Confirmation soil samples obtained from the base and sides of the excavation indicated that PCE concentrations remained above cleanup levels in soil beneath the building and in the north edge of the excavation (the cleanup level used at the time was .5 mg/kg). Hydrogen Release Compound (HRC) was placed against the soil in the areas with residual contamination at the edge of the excavation to facilitate further degradation of the PCE.

A rather elaborate soil vapor extraction/air sparging system was later installed beneath the building. The system included sixteen 25 to 30 foot vent pipes installed at three horizons below land surface. The three horizons were at depths of 4, 7, and 11 feet. The system was designed to be effective in low-permeability soils.



Note: Map adapted from USGS 7.5 Poulsbo, WA. Quadrangle dated 1953 and revised 1981.

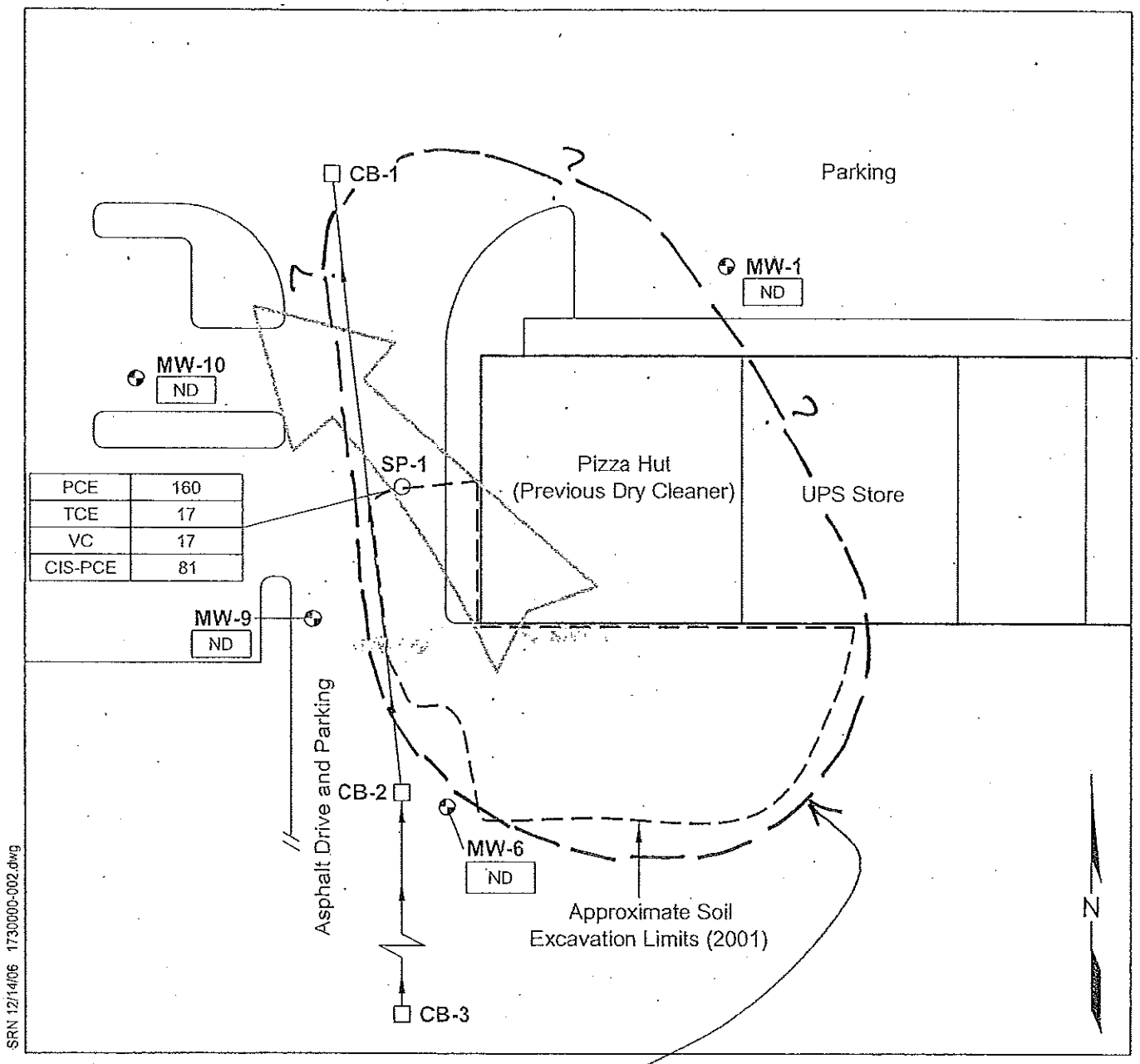
KRAZAN & ASSOCIATES, INC.
383 EQUESTRIAN DRIVE
POULSBO, WA 98370
360-598-2126

FIGURE 1-VICINITY MAP

Location: Silverdale, Washington
Job No. : 064-99280
Client: Wesbild Shopping Center
Date: 5-2-00

Site Plan

Summary of Groundwater (SP-1 & MW-1, MW-6, MW-9, MW-10) Results



Exploration Location and Number

Former Monitoring Well

MW-6 Existing Monitoring Well

SP-1 Grab Groundwater Sample

Inferred Groundwater Flow Direction

Constituent | Concentration in µg/L

PCE | 160

ND Non-detect

0 30 60

Scale in Feet

APPROXIMATE BOUNDARY OF SITE

MARK ADAMS
ECOLOGY
2/17/11

HARTCROWSER

17300-01 1/07

Figure 1