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Earth and Environmental Technologies

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J-3149-02

March 3, 1992

Mr. Chuck Hartung
TRA
215 Columbia
Seattle, Washington 98104-1551

Re: Soil Cleanup Report
Snohomish County PUD Headquarters
Everett, Washington

Dear Mr. Hartung:

Hart Crowser is pleased to submit this report that describes the removal and disposal of soil associated with two historical releases at the Snohomish County Public Utility District (PUD) headquarters in Everett, Washington. This work was performed in accordance with our work scope dated December 2, 1991, and the Contract Changes dated January 16, 1992, and February 6, 1992.

PROJECT BACKGROUND

The PUD plans to renovate its headquarters site in Everett, Washington (Figure 1). The renovation will include excavation of much of the site to accommodate construction of a new parking garage. To prepare for the excavation and disposal of the soil from that area, the PUD retained Hart Crowser to assess soil quality within the eventual boundary of the new parking garage. The results of that assessment were described in Hart Crowser's report titled *Status Report: Task 2, Parking Garage Area Characterization*, dated May 2, 1991. The assessment focused on identifying potential releases associated with historical industrial operations that existed at the

site prior to construction of the PUD headquarters. Soil borings installed for that assessment indicated the presence of isolated zones where the soil contained fuel hydrocarbons and/or lead at concentrations exceeding the cleanup levels defined by the Model Toxics Control Act (MTCA) Method A table.

The PUD also retained Hart Crowser to assess soil quality in the "Waste Oil Area" at the western boundary (Figure 1). An earlier site assessment indicated that this area may have been used in the past for disposal of waste oils. A test pit assessment was performed there in the summer of 1991. The results were presented in Hart Crowser's report titled *Waste Oil Disposal Area Assessment*, dated July 31, 1991. The results indicated the presence of fuel hydrocarbons at concentrations exceeding the MTCA Method A cleanup level of 200 mg/kg. Concentrations of metals and PCBs in the soil in that area were found to be less than the MTCA Method A cleanup levels.

Based on the results of those two assessments, the PUD developed specifications for the excavation of soil that contained chemical concentrations exceeding the MTCA Method A cleanup levels, and for backfilling the site following verification sampling. CeCon Corporation was awarded the contract to perform the remediation.

DESCRIPTION OF SOIL REMOVAL OPERATIONS

Test Pit Survey for Soil Disposal Characterization

Before commencing soil excavation, four test pits were excavated in the Parking Garage Area near the previous soil borings B-5, B-6, B-7, and B-14. The objective was to determine whether the concentrations of leachable lead in the soil at the Parking Garage Area exceeded the allowable limits for designation as a Hazardous Waste according to the Toxicity Characteristic Leaching Procedure (TCLP).

As shown in Table 1, the concentrations of TCLP lead in the composited samples from each test pit ranged from below detection limit to only 0.54 mg/L, which is less than the allowable Hazardous Waste limit of 5.0 mg/L under TCLP. However, the concentrations of total lead in the four test pit composite samples were less than the concentrations measured in soil boring grab samples at the same locations during Hart Crowser's original soil boring assessment. It therefore appears that isolated

zones of elevated lead concentration existed at the site (probably the result of waste disposal associated with the historical machine shop that existed prior to the PUD headquarters), but that the average lead concentration that would result from full-scale excavation and stockpiling of the soil would not be high enough to designate the soil as Hazardous Waste under TCLP.

The concentrations of fuel hydrocarbons and total lead measured in the test pit composite samples from B7-TP-1 and B5-TP-1 were less than the concentrations in the grab samples taken previously from soil borings B-7 and B-5, which were within a few feet of the respective test pits. As shown in Table 1, the concentrations in those composited test pit samples were less than the MTCA Method A cleanup levels. Based on those results, the PUD concluded that CeCon should not excavate soil in the vicinity of borings B-5 and B-7, as had originally been planned based on the earlier soil boring grab samples.

Excavation and Verification Sampling of Waste Oil Area

Excavation of the Waste Oil Area was performed between December 16 and 20, 1991. The final configuration of the excavation is shown on Figure 2, and the quantity of excavated material is listed in Table 2. The excavated soil was disposed of at the Rabanco sanitary landfill in Klickitat County, Washington. The lateral extent of the soil to be excavated was identified by pronounced soil staining and olfactory observations. The vertical limit of excavation was defined by a visibly apparent layer of silty soil underlying the stained soil.

During the excavation, a 6-inch-thick subsurface layer of asphaltic concrete was encountered along the northern, eastern, and western sides of the excavation, at a uniform depth of about 3 feet below existing grade. The PUD concluded that this layer was a historical asphalt roadbed. Because the roadbed was intentionally placed, it is not considered an uncontrolled release that required remediation. Therefore, none of that roadbed material was excavated unless it was co-located with other visibly contaminated soil. A composite sample of the roadbed material was taken and analyzed for fuel hydrocarbons and total lead. The analytical results are shown in Table 3.

The lateral extent of the excavation was terminated by the PUD at the western property boundary (Figure 2). Visibly stained soil was encountered at the property boundary, and it appeared that the soil stainage extended beyond the boundary. Two composited soil samples (WOS-7 and WOS-12) were taken from the western side wall of the excavation. The analytical results for these samples are presented in Table 3.

Verification Sampling

Composited verification samples of the excavation side walls and bottom were taken after the visibly stained soil was removed. Analytical certificates are given in Appendix A. The chemical analyses were limited to fuel hydrocarbons, total lead and PCBs because Hart Crowser's previous test pit assessment of the affected area demonstrated that no other contaminants were present at concentrations exceeding regulatory limits. As shown in Table 3, the fuel hydrocarbon concentrations (measured by Method 8015 modified) in all verification samples other than those from the western side wall were less than the MTCA Method A level of 200 mg/kg. The fuel hydrocarbons were characterized by Method 8015 as being primarily heavy oil, with minor concentrations of a lighter diesel fraction. The concentrations of total lead in the samples taken from the completed excavation (excluding the western boundary) were generally less than the MTCA Method A cleanup level of 250 mg/kg. The only exception was a single bottom sample (WOS-8), which showed a total lead concentration of 340 mg/kg. The upper 95th percentile lead concentration for the combined samples was less than the 250 mg/kg cleanup level, so additional soil removal near WOS-8 was not required.

Three samples (WOS-2, WOS-3, and WOS-6) were analyzed for PCBs and showed no detectable concentrations.

As shown in Table 3, the samples taken from the western property boundary and from the historical roadbed material exhibited elevated concentrations of fuel hydrocarbons and total lead.

Excavation Backfilling

The excavation at the Waste Oil Area was backfilled with imported sandy soil on December 20, 1991. The backfill was placed in thin lifts and compacted to at least 92 percent of maximum compaction (as defined by the modified Proctor method, ASTM D 1557). Hart Crowser's field representative confirmed the compaction using a nuclear densimeter. Field data on the compaction tests are given in the field reports and notes in Appendix B.

Excavation and Verification Sampling of Parking Garage Area

Excavation and restoration of the Parking Garage Area was performed between January 6 and 21, 1992. The final configuration of the excavation is shown on Figure 3, and the quantities of soil excavated and backfilled are listed in Table 2.

Apparent Sources of Contamination

The sources of contamination were historical disposal of debris and waste oil associated with the industrial activities that occurred before the PUD headquarters was built. The excavation revealed isolated areas of industrial debris (e.g., wire, electric motor parts) and other areas displaying subsurface strata of fuel hydrocarbon staining.

One deteriorated canister that appeared to be a discarded transformer was excavated. A composite sample of soil from inside and around the canister (sample PB6-S-26) was analyzed for PCBs, fuel hydrocarbons, and lead. As shown in Table 4, the PCB concentration in that sample was below detection limit. Therefore, the canister was handled and disposed of as conventional solid waste.

The lateral extent of the excavation was limited by the existing concrete apron at the shop building on the south side and by the existing concrete loading dock at the warehouse on the west side. Debris was visible at the excavation side walls at both of these areas, and it is possible that the soil under those structures contains hydrocarbon and lead concentrations exceeding regulatory limits. The lateral extent of the excavation on the northern and eastern sides of the excavation was defined by removing soil visibly stained from fuel hydrocarbons.

The vertical extent of the excavation was defined by a visibly apparent silty soil layer underlying the emplaced debris and hydrocarbon-stained soil.

Excavation and Interim Stockpiling

At the start of the excavation there was concern that some of the isolated areas could display leachable lead concentrations (by TCLP) that would be high enough to designate the excavated soil from those isolated areas as hazardous waste. Therefore, all of the excavated soil was temporarily stockpiled at the area shown on Figure 1, and composited samples of the excavated soil were analyzed for fuel hydrocarbons (Method 8015 modified) and total lead. Table 4 shows the results of soil analyses that were performed on either stockpiled soil samples or on samples from areas that were later excavated and disposed of.

The stockpiled soil that had been excavated from the zone corresponding to sidewall sample PB6-VS-14 was re-sampled and analyzed for TCLP lead, because PB6-VS-14 was shown to exhibit TCLP lead at concentrations exceeding hazardous waste limits (Table 4). As shown in Table 4, the TCLP lead concentrations in the three composited samples taken from the pile (designated 1-A, 1-B, and 1-C in Table 4) were well below the allowable limit of 5.0 mg/L. It is therefore concluded that the sidewall sample PB6-VS-14 was affected by a small, localized pocket of leachable lead associated with debris found there. The localized pocket was apparently small enough so that routine soil excavation and stockpiling blended the leachable lead to below TCLP limits.

Verification Sampling

Composite verification soil samples were collected from the excavation side walls and bottom at the locations shown on Figure 3. The results of the chemical analyses are listed in Table 5. The verification analyses were limited to fuel hydrocarbons (Method 8015 modified) and total lead, because the detailed soil boring survey that was performed earlier demonstrated that no other contaminants were present at concentrations exceeding regulatory limits.

Three of the verification soil samples were taken from the side walls next to existing structures that limited the excavation: PB6-VS-12 at the concrete apron of the shop

building at the south side of the excavation; and PB6-VS-31 and PB6-VS-34 at the concrete loading dock along the west side of the excavation. The concentrations of fuel hydrocarbons and total lead in those samples exceeded the MTCA Method A cleanup levels of 200 mg/kg and 250 mg/kg, respectively for those constituents. It appears that an unknown volume of soil under those structures contains fuel hydrocarbons and lead at concentrations exceeding regulatory limits. However, the residual contamination poses no significant risk because it is covered by permanent foundations.

As shown in Table 5, none of the remaining verification samples displayed fuel hydrocarbon or total lead concentrations exceeding the MTCA Method A cleanup levels. The fuel hydrocarbon concentrations ranged from below detection to a maximum of 190 mg/kg. The fuels were characterized by Method 8015 modified as primarily heavy oil with a minor diesel fraction. The total lead concentrations ranged from below detection to a maximum of 190 mg/kg.

Disposal of Excavated Soil and Excavation Backfilling

A total 1,701 tons of soil from the Parking Garage Area were shipped to the Rabanco sanitary landfill in Klickitat County.

The excavation was backfilled from January 20 to 21, 1992. About 1,759 tons of imported fill was placed in thin lifts and compacted to at least 90 percent of maximum compaction. Data on the field compaction tests are given in Appendix B.

The specification for the project did not include repaving of the backfilled excavation. Instead, a 6-inch layer of washed rock and crushed rock was placed at the top of the excavated area to prevent tracking of mud from the backfill.

LIMITATIONS

Work for this project was performed, and this letter report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of TRA for specific application to the referenced

property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

All MTCA cleanup levels included in this report are provided for comparison purposes only and are based on our understanding of cleanup levels required by Ecology for similar projects. They do not represent MTCA interpretations. By using them for comparison purposes, we are not implying that remedial actions at this site are required under MTCA. Specific MTCA interpretations may involve separate calculations and determinations upon which a range of cleanup standards may be established by Ecology.

Any questions regarding our work and this letter report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the undersigned.

We trust that this report meets your needs.

Sincerely,

HART CROWSER, INC.

JAMES M. WILDER
Associate
Project Manager

DAVID G. WINTER, P.E.
Manager, Remediation Division

JMW\DGW:cen
SOILCLEA.LR

cc: Walt Saline, Snohomish PUD

Attachments:
Table 1 - Analytical Results for Parking Garage Area Test Pit Soil Samples
Table 2 - Summary of Excavation and Backfill Quantities
Table 3 - Analytical Results for Waste Oil Area Excavation Soil Verification Samples
Table 4 - Analytical Results for Soil Samples Excavated from Parking Garage Area
Table 5 - Analytical Results for Parking Garage Area Excavation Soil Verification Samples
Figure 1 - Soil Excavation Plan
Figure 2 - Waste Oil Area Verification Sampling Location Plan
Figure 3 - Parking Garage Area Verification Sampling Location Plan
Appendix A - Laboratory Analysis Certificates
Appendix B - Field Notes on Backfill Compaction Testing

Table 1 – Analytical Results for Parking Garage Area Test Pit Soil Samples

Sample Number	Location	8015 Fuel Conc. in mg/kg	Total Lead (Wet Wt.) in mg/kg	Total Lead (Dry Wt.) in mg/kg	TCLP Lead Extract in mg/L		Percent Moisture
B6-TP-1	Near Boring B-14	230	200	270	0.19		27
B6-TP-2	Near Boring B-6	170	640	780	0.54		18
B7-TP-1	Near Boring B-7	86	73	92	0.03	U	21
B5-TP-1	Near Boring B-5	38	45	58	0.03	U	22

Notes:
All samples were composited from test pit side walls.
U – Not detected at detection limit indicated.

Regulatory Limits
8015 Fuels – 200 mg/kg (MTCA Method A Cleanup Level)
Total Lead = 250 mg/kg Dry Weight Basis (MTCA Method A Cleanup Level)
TCLP Lead = 5.0 mg/L (40 CFR Part 61)

Table 2 – Summary of Excavation and Backfill Quantities

Site	Tons of Soil Shipped to Sanitary Landfill	Tons of Import Backfill
Waste Oil Area	799	776
Parking Garage Area	1,701	1,759

Table 3 - Analytical Results for Waste Oil Area Excavation Soil Verfication Samples

Sample Number	8015 Fuel Conc. in mg/kg	Total Lead Conc. in mg/kg	PCBs Conc. in mg/kg	Comments
Side Wall Samples				
WOS-3	12	5 U	0.2/0.5 U	
WOS-5	27	170		
WOS-7	2,046	510	0.2/0.5 U	W. property line
WOS-12	909	2,600		W. property line
WOS-13	140	130		
WOS-14	10 U	60		
WOS-15	30	12		
WOS-18	10 U			
WOS-19	10 U			
Bottom Samples				
WOS-1	10 U	5 U		
WOS-2	10 U	5 U	0.2/0.5 U	
WOS-6	19	20	0.2/0.5 U	
WOS-8	51	340		
WOS-9	10 U	35		
WOS-10	17	16		
"Roadbed" Samples				
WOS-16	1,300	2,100		Intentionally Placed Material
Samples Later Excavated				
WOS-4	1,228	66		
WOS-17	1,200	90		
MTCA Method A Cleanup Levels	200	250	1.0	

Notes:
U - Not detected at indicated detection limit.

Table 4 – Analytical Results for Soil Samples Excavated from Parking Garage Area

Sample Number	8015 Fuel Conc. in mg/kg	Total Lead Conc. in mg/kg	TCLP Lead in mg/L	PCBs Conc. in mg/kg
B6-TP-1	230	200	0.5	
B6-TP-2	170	640	0.54	
PB6-S-1	678	820		
PB6-S-2	210	450		
PB6-S-3	190	4,800		
PB6-S-4	2,047	26,000		
PB6-VS-5	500	1,000		
PB6-VS-6	593	160/1,900	0.3	
PB6-VS-14	626	2,300/6,300	22	
PB6-S-23	522	260		
PB6-S-24	379	370		
PB6-S-25	196	340		
PB6-S-26	420	210		0.2/0.5 U
PB6-S-27	670	1,400		
PB6-S-28	1,430	33		
PB6-S-29	428	260		
PB6-S-40	140	130		
PB6-S-41	153	160		
PB6-S-42	130	210		
PB6-S-43	770	69		
PB6-S-44	2,636	1,200		
PB6-S-45	260	200		
PB6-S-46	170	300		
PB6-S-47	210	1,400		
Stockpile				
1-A			0.4	
2-A			0.3	
3-A			0.2	
Regulatory Limits	200	250	5.0	1.0

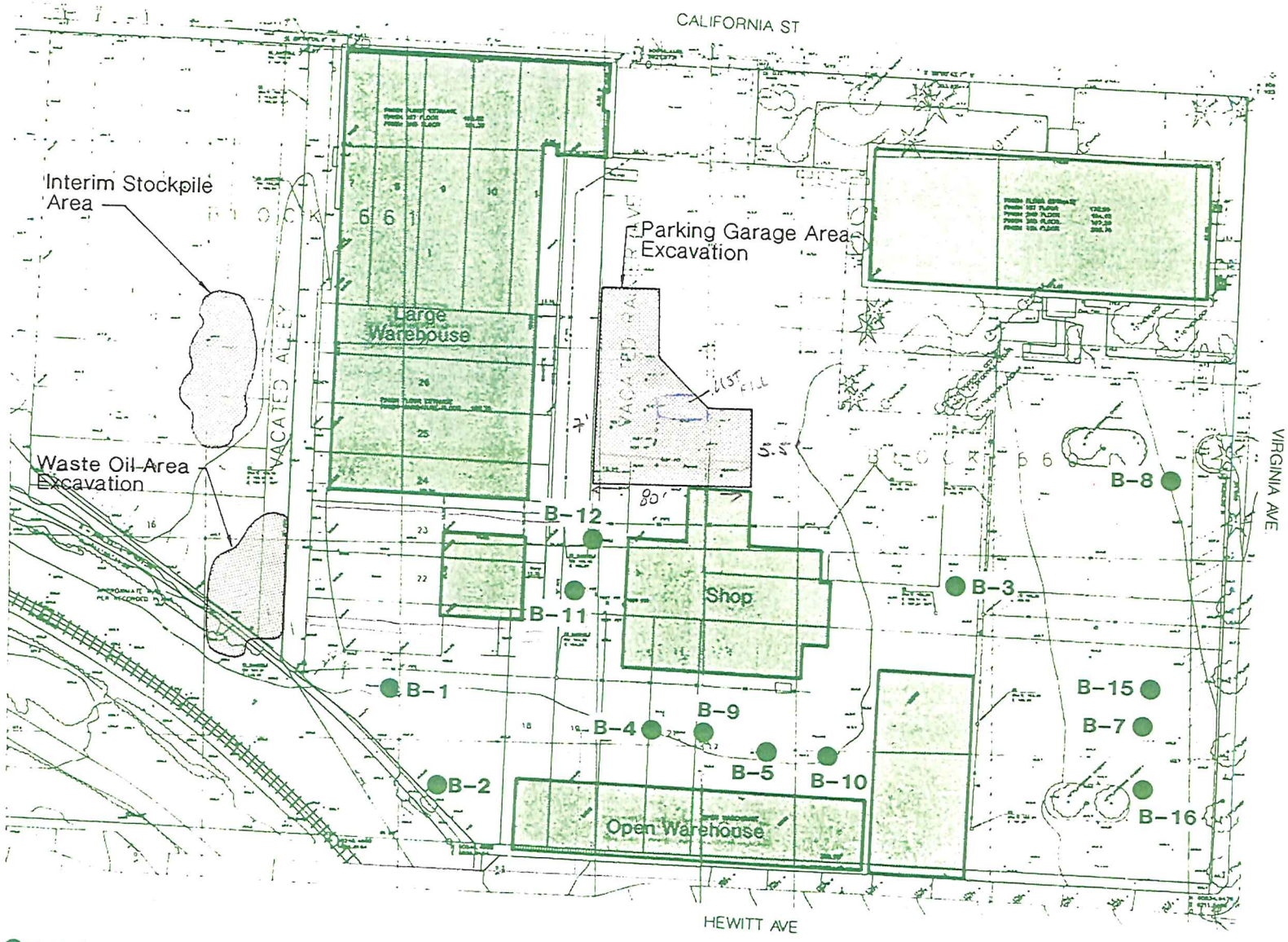
Notes:
All samples were composites.
U – Not detected at indicated detection limit.

Table 5 - Analytical Results for Parking Garage Area Excavation Soil Verification Samples

Sample Number	8015 Fuel Conc. in mg/kg	Total Lead Conc. in mg/kg	Comments
Side Wall Samples			
PB6-VS-12	740	1900	Under concrete apron.
PB6-VS-13	99	190	
PB6-VS-15	34	11	
PB6-VS-20	170	120	
PB6-VS-22	10 U	130	
PB6-VS-31	1,580	290	Under concrete loading dock.
PB6-VS-34	950	1,100	Next to concrete apron.
PB6-VS-48	135	75	
PB6-VS-49	190	60	
PB6-VS-51	81	35	
PB6-VS-52	10 U	47	
PB6-VS-54	10 U	11	
Bottom Samples			
PB6-VS-16	10 U	19	
PB6-VS-19	10 U	13	
PB6-VS-30	17	10	
PB6-VS-50	84	47	
PB6-VS-53	10 U	5 U	
MTCA Method A Cleanup Levels	200	250	

Notes:
All samples were composites.
U - Not detected at indicated detection limit.

Soil Excavation Plan



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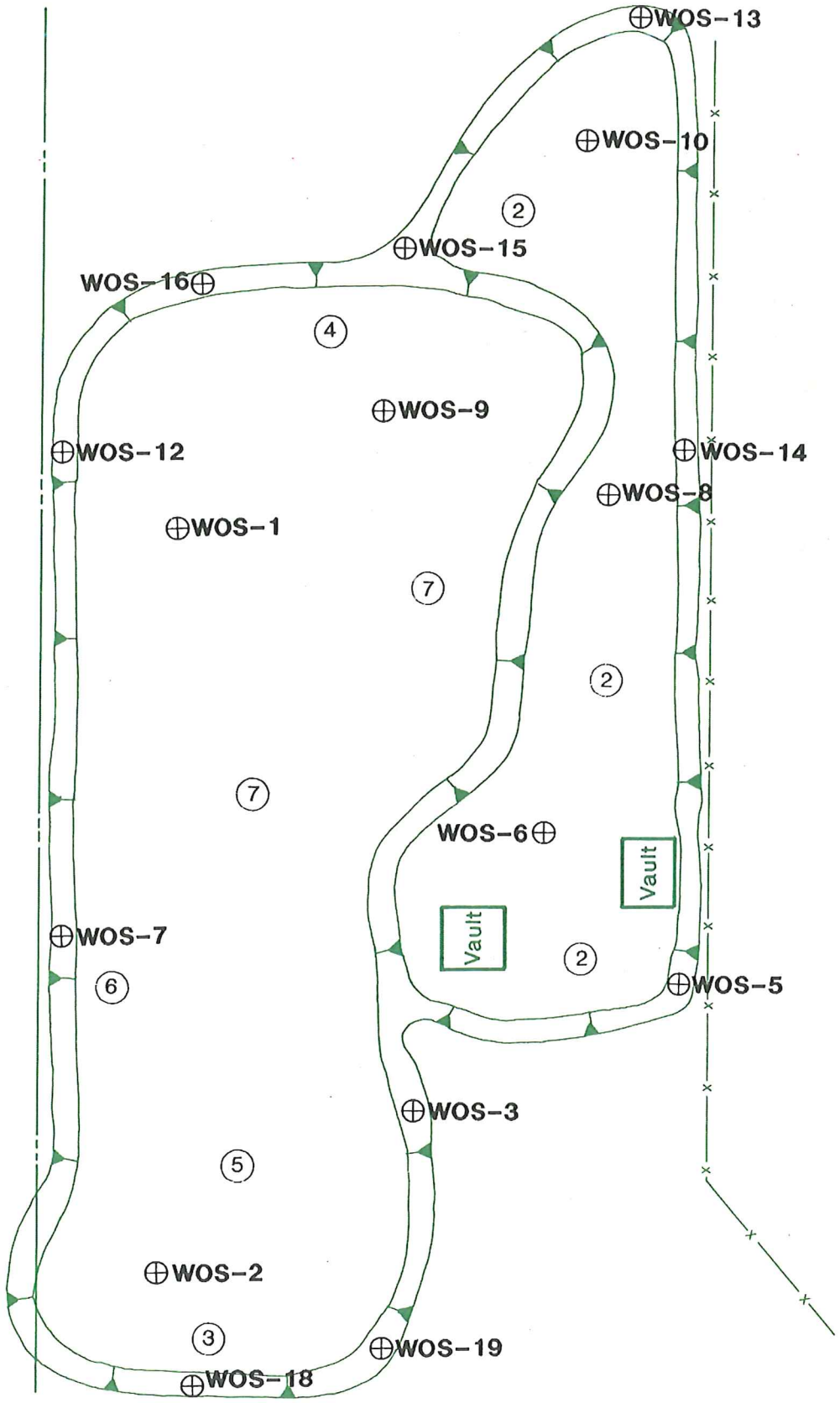
J-3149-02 2/92
Figure 1

Waste Oil Area Verification Sampling Location Plan



⊕WOS-1 Composited Verification Sample Location

(2) Excavation Depth in Feet

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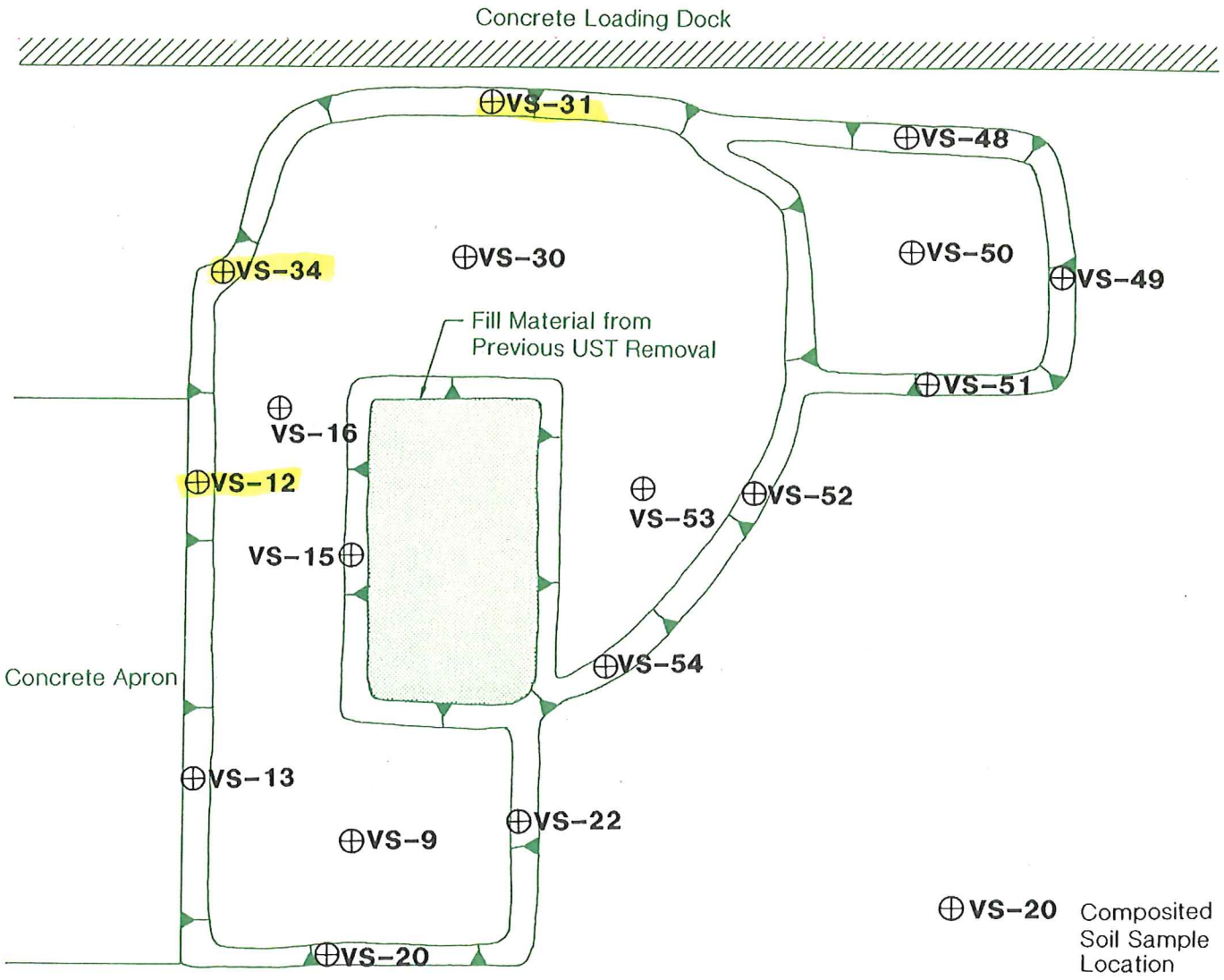
J-3149-02 2/92

Figure 2

Parking Garage Area Verification Sampling Location Plan



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J-3149-02 2/92

Figure 3