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LAKE WASHINGTON APARTMENTS
AKA SEWARD PARK ESTATES.
KING / SEATTLE

INDEPENDENT REMEDIAL ACTION REPORT

Seward Park Estates
Underground Storage Tank Removal

Prepared for

Lake Washington Limited Partnership

April 1997

HERRERA
ENVIRONMENTAL
CONSULTANTS

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Underground Storage Tank Removal

Prepared for

Lake Washington Limited Partnership
2000 Crow Canyon Place, Suite 130
San Ramon, California 94583-1367

Prepared by

Herrera Environmental Consultants, Inc.
2200 Sixth Avenue, Suite 601
Seattle, Washington 98121
Telephone: 206/441-9080

April 16, 1997

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EXECUTIVE SUMMARY

The Seward Park Estates housing development currently is undergoing renovation to enhance living conditions in 34 buildings consisting of 366 apartments on 16.5 acres in the Rainier Valley neighborhood of Seattle. The renovation project involves new ownership of the property through a joint venture of A.F. Evans Company, Inc. and SouthEast Effective Development (SEED), a local nonprofit corporation. The Seattle Department of Housing & Human Services and Washington State Housing Trust Fund also provided input to the process. Part of the renovation process included removal of heating oil underground storage tank systems at nine locations across the development. The tanks have not been in use for many years. During the course of tank removal, petroleum product was discovered to have been released, to a certain extent, at all nine locations.

Following tank removal, contaminated soil was excavated at each location based on visual evidence. Samples then were collected to verify removal of contaminated soil to meet the Model Toxics Control Act (MTCA) method A cleanup level for total petroleum hydrocarbons (TPH), identified as diesel and heavier-than-diesel fractions. Contamination was observed as a black oily product in a shallow fill layer beneath most buildings. Soil associated with this product was removed to the extent feasible at each tank location. Other contaminated soil was removed at each of the nine tank locations until the method A cleanup level of 200 milligrams per kilogram was achieved, except in circumstances when either buildings or buried pipes were in danger of being undermined or other structural hazards were found. Table 1 provides a summary of material removed from each of the nine tank locations.

It is estimated that approximately 15 percent (180 cubic yards) of contaminated soil remains in place at the site. Of this, approximately 90 percent is located under buildings where it is protected from rainfall infiltration, which acts as a mechanism for facilitated transport.

Site work was performed during the 1996 and 1997 winter months, when precipitation was abundant. Pipe leaks in the extensive network of water and sewer pipes throughout the housing complex also contributed to generally wet soil conditions. Although ground water may have been encountered during excavation activities, no consistent water-bearing zone was identified. If ground water was encountered, the impact of petroleum product release at the site was minimal. No ground water monitoring wells were installed as part of this project.

Table 1. Summary of remedial action performed at Seward Park Estates site.

Tank Location	Tanks Removed	Contaminated Soil Removed (cubic yards)	Estimated Contaminated Soil Remaining (cubic yards)
1	55-gallon 300-gallon 1,800-gallon	100	20
2	55-gallon 300-gallon 1,800-gallon	100	5
3	55-gallon 300-gallon 1,800-gallon	120	20
4	55-gallon 300-gallon 1,800-gallon	110	50
5	55-gallon 300-gallon 1,800-gallon	120	25
6	55-gallon 300-gallon 1,800-gallon	330	50
7	55-gallon 300-gallon 1,800-gallon	25	0
8	300-gallon 1,800-gallon	90	0
9	300-gallon 1,800-gallon	70	10
Total		1,065	180

SITE DESCRIPTION

Site Name:	Seward Park Estates (renamed Lake Washington Apartments)
Street Address:	9061 Seward Park Avenue South, Seattle, Washington 98118
Mailing Address:	9061 Seward Park Avenue South, Seattle, Washington 98118
Telephone:	(206) 723-0366
Township and Range:	NW1/4 of SW1/4 of Section 35, T24N, R4E of Willamette Meridian
Coordinates:	Latitude 47° 31' 19"
	Longitude 122° 15' 55"

SITE HISTORY AND LAND USE

The Seward Park Estates is a low income housing development first constructed in 1948. The development is located at 9061 Seward Park Avenue South, Seattle, King County, Washington (Figure 1). The site covers approximately 16.5 acres and includes 34 buildings with 366 residential apartments (Figure 2). The property currently is undergoing complete renovation conducted by a joint venture consisting of A.F. Evans Company, Inc. and SouthEast Effective Development (SEED), a local nonprofit corporation. Once renovated, the property will continue use as a low income residential complex, to be renamed the Lake Washington Apartments. The property is managed by Evans Property Management, Inc., represented by:

Mike Fluke, Vice President
2000 Crow Canyon Place, Suite 130
San Ramon, CA 94583-1367
(510) 244-1600

David Herring, General Manager
9061 Seward Park Avenue South
Seattle, WA 98118
(206) 723-0366

As part of the renovation, A.F. Evans Co. and SEED contracted to remove 18 underground storage tanks that previously had been used to store diesel heating oil (300-gallon capacity) and PS300 heating oil (1,800-gallon capacity). The 18 tanks were positioned in pairs at each of nine locations, adjacent to boiler rooms that supplied hot water radiant heat for the entire complex. Diesel oil was used to prime the boilers, and heavier oil was used once the systems were warmed up. During the tank removal process, buried drums (55-gallon capacity) containing diesel and water were found at seven of the locations. It is unknown what these drums were used for. During the course of tank removal, evidence of soil contamination was found. This report documents process of removing the tanks and contaminated soil.

TOPOGRAPHY AND GEOLOGY

The east boundary of the Seward Park Estates complex is located approximately 200 feet west of Lake Washington. The site is nearly flat at an elevation of 25 feet above sea level. The surface of Lake Washington is at 21 feet above sea level.

Geotechnical Boring Soil Types

A geotechnical study was performed by Terra Associates in June 1996 to support design of new utility systems and additional structures (Appendix A). Five test borings were advanced to depths ranging from 20 to 44 feet below the existing grades (Figure 2). This information was used to plan tank removal site conditions.

Geotechnical test borings indicate that the near-surface site geology generally consists of a fill-peat-clay-sand sequence, as seen at four of five locations (borings B-1, B-3, B-4, and B-5). Near-surface soil consists of very loose to medium dense silty sand at depths ranging from 2.5 to 9.5 feet below grade. Very soft to soft peat underlies the fill at all boring locations except B-2, where the fill is underlain by native sandy silt to silty fine sand to a depth of at least 22.5 feet (bottom of boring). Peat layer thickness was 9.5 feet at B-1, nonexistent at B-2, 19.5 feet at B-3, 13.0 feet at B-4, and 7.0 feet at B-5. Very soft to very stiff clay was found beneath the peat at borings B-1, B-4, and B-5. Dense to very dense till-like soils consisting of silty fine to medium grained sand with gravel was found at the bottom of all borings.

Ground water was encountered in three of the borings, at 12.5 feet in B-1, at 17.0 feet in B-2, and at 32.0 feet in B-4. No water was encountered at borings B-3 and B-5, with total depths of 33 and 20 feet, respectively. Ground water was not associated with a consistent soil series or depth across the site.

Excavation Soil Types

During the course of this project, nine tank excavations were performed associated with the nine boiler room locations (Figure 2). During the course of removing underground storage tanks and associated contamination, soil was excavated to depths of up to 15 feet. Excavations were made near geotechnical borings B-1, B-2, and B-4. In general, the series of soil layers identified during the geotechnical study was corroborated.

An imported fill material, consisting of varying amounts of clay, silt, sand, and gravel, was found overlying native soils. This fill layer ranged in thickness from 2.5 to 6.0 feet. Beneath the fill, native soils generally consisted of dark brown peat underlain by blue-gray clay. At some locations, the clay layer was overlain by a tan silty peat. Depth to the peat-clay interface ranged from 8 to 15 feet below ground surface.

Water entered many of the excavations during the tank and soil removal process, due to precipitation and broken water and sewer lines. Ground water also may have entered excavations; however, relative amounts could not be determined. A consistent water-bearing zone was not evident across the site at the shallow depths excavated. Some perched water may have been encountered sporadically, but no impact to ground water is believed to have occurred at any of the tank release locations. Dewatering was performed at various excavations, with testing, prior to discharge to the King County sewer system.

PREVIOUS INVESTIGATIONS

A Phase I environmental site assessment was performed by GeoEngineer in 1995 to evaluate potential environmental liability associated with property transfer (Appendix B). No evidence of release of hazardous substances was identified as a result of the investigation. A geotechnical study was performed by Terra Associates in 1996 to support design for further construction at the site (Appendix A). Information from both reports was used to develop plans and specifications for removal of the underground storage tanks. Relevant information also has been used to support the writing of this report.

NATURE AND EXTENT OF CONTAMINATION

GENERAL RELEASE INFORMATION

The Seward Park Estates originally was developed as a residential complex in the late 1940s. Nine boilers were installed to provide hot water to heat the 34 buildings. Tank locations are shown on Figure 2 with associated location numbers. Underground tanks were situated immediately adjacent to the boiler rooms so that fuel system piping extended up from beneath the buildings. A network of hot water pipes led from each boiler to a number of separate buildings through concrete block chases.

The boilers were fueled by heavy oil, such as PS300 or bunker C. Diesel fuel oil was used to initiate the heating cycle, and then the heavier oil was used as the boiler warmed up. Fifty-five gallon drums were found at seven locations, with some diesel fuel remaining in five of them. Why these drums were used is unknown. It is unknown when the boilers were last used, but it has been many years.

Underground storage tanks were planned for removal as part of site renovation activities. During the removal process, soil contamination due to diesel and heavier-than-diesel heating fuel mixtures was found at all tank locations. Most contaminated soil was excavated and removed from the site. Due to the proximity of tanks to buildings and various utilities, some contamination at concentrations above the Washington Model Toxics Control Act (MTCA) method A cleanup level of 200 milligrams per kilogram (mg/kg) was left in place.

Following removal of the tanks, petroleum product was observed in the surface fill layer beneath some buildings. This residual product appears to have originated from pipes connecting tanks to the boilers.

GENERAL SITE CONDITIONS

Tank and contaminated soil removal activities were conducted between October 1996 and February 1997. Field conditions were extremely wet, as precipitation (rainfall and snowfall) during this period was heavy (11.2 and 7.1 inches in December and January, respectively). Water entered excavations at various locations due to pre-existing wet soil conditions, flooding beneath buildings, and broken utility lines.

At every location, tanks were situated within a couple of feet of the building and associated boiler chimney. The concrete building foundations were supported on wood pilings set on 12-foot centers, driven 18 feet below grade. An additional piling was driven adjacent to each 1,800-gallon tank on the side opposite the building. A timber was bolted to each piling parallel with the tank. Steel cables were run from the timber, underneath the tank, and bolted to the building foundation.

At five locations (4, 6, 7, 8, and 9), fuel was delivered through vertical pipes directly into the tanks; at four locations (1, 2, 3, and 5), remote fill pipes between 75 and 100 feet long were used. Piping from the tanks to the boilers consisted of black steel from the 55-gallon drums and 1,800-gallon tanks, with copper tubing from the 300-gallon tanks. Tank vents were made of black steel. All tanks were backfilled with gravelly sands that included various amounts of silt and clay.

The Seward Park Estates project structural engineer was called to the site during excavation activities to evaluate limitations posed by soil and building foundation characteristics pertinent to the removal process. From a structural point of view, it was determined that soil could be removed from between the pilings over a limited area without affecting stability of the buildings; however, the possibility of striking the exposed pilings with equipment was determined to pose a hazard. Contaminated soils were excavated from beneath each building to the extent deemed appropriate in the field, based on building integrity, safety, and accessibility.

As contaminated soil was excavated at various tank locations, buried water and sewer pipes were encountered. These pipes consisted of carbon steel, plastic, or concrete. Pipes that had delivered hot water from the boilers to other buildings were encased in concrete block chases. At various times during contaminated soil removal, water-bearing pipes broke and discharged to the excavations. Water lines leading under and into the buildings also leaked, allowing water to collect in pools under the buildings prior to filling tank excavations as they were dug. At each location where this occurred, the water was pumped to a holding tank and then discharged to the King County sewer system. The discharge permit obtained for this purpose is included as Appendix C. To comply with the permit, a water sample was characterized for fats, oils, and grease; benzene, toluene, and ethylbenzene; and sulfide, prior to the initial discharge (Table 2). The sample was collected based on visual evidence of significant fuel oil and sewage contamination, which was assumed to represent a worst-case condition. Because concentrations of the contaminants of concern were well within King County discharge requirements (Appendix C), no other samples were collected during the course of the project. Flow discharged to the sewer was limited to less than 75 gallons per minute, allowed only during dry weather, in accordance with permit limitations. A total of 53,500 gallons was discharged over the course of the project.

Table 2. Excavation water concentrations prior to discharge at Seward Park Estates (mg/L).

Sample No.	FOG[a]	Benzene[b]	Toluene[b]	Ethylbenzene[b]	Soluble Sulfide[b]
Permit Requirement	*100*	*0.13*	*1.5*	*1.4*	*0.1*
W1030-1	1.7	ND	ND	ND	0.006

[a] Fats, oils, and grease, EPA method 413.1
[b] EPA method 602
[c] EPA method 376.2
mg/L milligrams per liter
ND not detected

All liquid was pumped from each tank prior to tank removal. Half of the tanks contained pure petroleum product and half contained a mixture of product and water (according to Coastal Tank Cleaning records). A total of 8,450 gallons of liquid was removed from the 18 tanks (Appendix H).

EXTENT OF CONTAMINATION

This project was initiated as a tank removal job without prior knowledge of petroleum product releases. Site characterization was accomplished during the removal process as contaminated soil was encountered. All sampling and analytical work is described in the sampling and analysis section that follows the description of remedial actions.

Diesel-range and heavy fuel oil-range petroleum contamination was found near and around the tanks at all nine locations. With the exception of the 300-gallon tank at location 6 and the 55-gallon drums at locations 1 and 2, the tanks appeared to be in good condition, with no visible corrosion holes. Most contamination at the site appeared to have originated from piping. In most cases, the lateral spread of contamination was confined to within 10 feet of the tanks and no deeper than 9 feet below grade. The least contamination was found at tank location 7, where approximately 25 cubic yards of soil was removed. Lateral migration was greatest (greater than 25 feet from the tanks) at tank location 6. Vertical migration was greatest (greater than 15 feet below grade) at tank location 4.

SELECTION OF CLEANUP STANDARDS

Cleanup at the Seward Park Estates was based on Model Toxics Control Act method A cleanup levels for diesel and heavier-than-diesel total petroleum hydrocarbon (TPH) fractions in soil (200 mg/kg). Cleanup to these levels was achieved at most tank locations, except for contamination left in place adjacent to and beneath buildings or beneath limited pipe runs. Soil samples from site excavations were analyzed using the WTPH-D extended method, with separate quantitation of diesel and heavier-than-diesel range petroleum hydrocarbons. Additional preparation was performed for selected samples based on the pressure of peat which was found to introduce an organic rich matrix interference to petroleum hydrocarbon quantitation.

REMEDIAL ACTIONS

The tanks were removed at all nine locations in October 1996, prior to extensive excavation of contaminated soil. Following removal of some contaminated soils at locations 3, 4, and 6, a set of consistent conditions and physical limitations was identified: specifically, the presence of visible petroleum product in near-surface earthfill beneath the buildings, and the tendency of water and sewer pipes located adjacent to and within each excavation to break. Based on these conditions, the following excavation approach was adopted:

- Excavations were limited laterally from the tanks by adjacent buildings. The structures will act as a cover, or cap, to prevent facilitated transport of contamination by water from precipitation. Residual contamination under the buildings will include some pure product, but little product mass. Residual petroleum product is not volatile and should not affect air quality for residents (no problems have been reported in the past).

- Contamination was followed downward and outward away from buildings until concentrations approached the regulatory cleanup level (although the target level of 200 mg/kg was preferable, a higher concentration was allowable). The excavation limit was a field decision based on the relative concentration level, the change in concentration over distance, and the presence of cover by pavement.

- To prevent undermining damage to utilities, piping not associated with the tanks was preserved by carefully clearing contaminated soil away from contact points. If piping failure was probable, a minimal amount of contaminated soil was left in place below the pipe (for bridging), to preserve pipe integrity. Some soil was left in place exceeding the 200-mg/kg TPH target cleanup level along limited pipe runs.

Although some contamination was left in place, most of it was covered by either buildings or pavement. An estimated 85 percent of contaminated soil was removed from the site, with little residual contamination available for downward transport toward ground water. A significant amount of peat, which is high in organic matter, occurs at the site. This will aid in retarding vertical transport of petroleum products. Also, the clay layer that appears to exist across most of the site will help to block downward movement.

Water accumulated in a number of excavations due to releases from broken water supply and sewer pipes, as well as from precipitation. It is possible that water also entered excavations from surrounding soils; however, no obvious saturated formations were encountered.

The geotechnical report identified water seepage during drilling at three locations across the site. At three boring completions, water levels were measured at 12.5, 17, and 32 feet below ground surface. At two other locations, no ground water was encountered within the boring depths of 20

and 33 feet, respectively. Tank excavations typically reached only 10 feet. An exception, the excavation at tank location 4 was advanced to 15 feet; however, no water was encountered.

The peat layer encountered in four of five geotechnical borings was reported as wet or moist (Appendix A). Peat also was encountered in all tank excavations. The moisture contents of samples analyzed from the peat material consistently exceeded 80 percent by weight. It is probable that some moisture was released into open pits from this formation; however, no significant water was observed to drain from peat stockpiled following removal.

Based on both field observations of shallow tank excavations and interpreted results of the deeper geotechnical borings, ground water does not appear to be contaminated at the site, and no monitoring is recommended.

INSTITUTIONAL CONTROLS

Soils with TPH concentrations above MTCA method A cleanup levels have been left in place at the site beneath buildings, as well as beneath some piping. To provide continued protection to human health and the environment, a restrictive covenant will be placed on the deed to the property (Appendix D). This language will provide notification to future property owners of remaining contamination and the potential need to address the contamination if site conditions or property uses change.

Other/physical controls will be enacted during the course of site development, including the sloping of soil up to building foundations to direct rainfall runoff away from areas of residual contamination, placement of sidewalks and pavement over some areas, connection of downspouts to the stormwater conveyance system, and repair of water and sewer distribution systems to minimize leakage. These are all activities to be conducted for general rehabilitation of the housing development and have not been planned to coincide specifically with areas of residual contamination.

SAMPLING AND ANALYSIS

Soil samples were collected at each tank location and analyzed according to protocols described in *Guidance for Remediation of Petroleum Contaminated Soils* (Washington Department of Ecology, 1994). Soil excavation was directed by International Fire Code Institute (IFCI)-certified site assessors. The bulk of soil was removed based on visual evidence of contamination, with confirmation samples collected from apparently clean soil. In some cases, additional excavation was required, so that samples were collected from both intermediate and final locations. Exploratory excavations were advanced to search for 55-gallon drums or to pothole behind pipe runs in search of contaminated soil. Laboratory analysis was performed by OnSite Environmental, Inc. in Redmond, Washington.

SAMPLING PROCEDURES

Soil samples were collected by hand from side walls and bottoms of excavations when safety conditions allowed (i.e., excavations less than 4 feet deep or with side walls sloped back to less than 1:1). Otherwise, samples were collected from the backhoe bucket. In all cases, soil samples were placed into clean stainless steel bowls using clean stainless steel spoons; the samples were then homogenized and placed into pre-cleaned glass jars supplied by the laboratory. Samples were stored in coolers with blue ice and transported directly to the laboratory under standard chain-of-custody procedures.

ANALYTICAL PROCEDURES

Soil samples were analyzed for petroleum hydrocarbons using the WTPH-D extended method, with separate quantitation of diesel and heavier-than-diesel fractions. During the course of site characterization, numerous samples included a significant amount of peat. Additional silica-gel and acid cleanup procedures were performed as part of sample preparation in the laboratory to remove nonpetroleum organic compounds contributed by this organic-rich peat material. A description and explanation of the process are provided by the laboratory in Appendix E. Based on 10 samples that were reanalyzed following acid cleanup, diesel fraction hydrocarbon concentrations dropped an average of 10 percent, and heavier-than-diesel concentrations dropped an average of 50 percent.

The water sample collected to comply with the temporary discharge permit was analyzed for fats, oils, and grease according to U.S. Environmental Protection Agency (EPA) method 413.1; benzene, toluene, and ethylbenzene were analyzed according to EPA method 602; and sulfide was analyzed according to EPA method 376.2, all as defined by EPA in *Test Methods for Evaluating Solid Waste, SW-846*, 3rd edition (1986).

FINAL SITE CONDITIONS

A total of 115 soil samples were collected at the nine tank removal locations across the site. Samples generally were collected moving radially away from each tank until cleanup criteria were met. Potential contamination was chased based on visual evidence or as indicated by pipe runs. A description of removal and sampling activities at each tank location is provided below, with a figure that depicts intermediate (when applicable) and final soil removal dimensions, with sample locations, soil descriptions, and analytical results included. The figures are presented in plan view. Sampling locations designated with multiple labels occur when a series of samples were collected from different depths following over-excavation. Site photographs are provided in Appendix F.

An estimate of contaminated soil left in place at each tank location was made based on visual evidence of product or stained soil, soil layering, amount of soil removed from beneath buildings and utilities, and the assumption that most contamination migrated along piping toward the tanks. An estimated 180 cubic yards of contaminated soil remaining beneath buildings and utilities could not be removed without possible compromise of structural integrity (in some locations access was physically restricted). The estimates of contaminated soil volumes are accurate to within approximately 50 percent. Extensive sampling beneath buildings would be required to further delineate contamination boundaries.

Tank Location 1

Three tanks were removed from location 1, including a 55-gallon drum, a 300-gallon diesel tank, and a 1,800-gallon heavy fuel oil tank (Figure 3). In addition, approximately 100 linear feet of 2-inch-diameter steel remote fill pipe was removed. This pipe served both large tanks at locations 1 and 2 (Figure 4). The drum was in poor condition, with signs of corrosion over most of its exterior and holes evident across its upper portion. Both tanks were in fair condition, with very little corrosion and no apparent holes.

Soils at location 1 consist of topsoil to a depth of 1 foot below ground surface, underlain by silty sand and clayey sand fill with some gravel and cobbles. The fill extends to approximately 4 feet below ground surface, where it is underlain by dark brown peat. A clay layer was encountered within the 1,800-gallon tank excavation at a depth of 8 feet below ground surface.

Approximately 100 cubic yards of contaminated soil was removed at location 1. Analytical results of confirmation samples indicate that remaining soil petroleum hydrocarbon concentrations are at or below the method A cleanup level; however, based on visual evidence, it is estimated that up to 20 cubic yards of moderately contaminated soil may remain beneath the building next to the 1,800-gallon tank.

Approximately 3 cubic yards of contaminated soil was removed at the fill pipe stickup. A confirmation sample collected following excavation of visibly stained soil indicated that all contamination was removed.

Tank Location 2

Three tanks were removed from location 2, including a 55-gallon drum, a 300-gallon diesel tank, and a 1,800-gallon heavy fuel oil tank (Figure 5). In addition, 2-inch-diameter steel remote fill piping was removed, as described above for location 1. This piping served both 1,800-gallon tanks at locations 1 and 2 (Figure 4). The drum was in poor condition, with corrosion sites on its exterior. It was approximately half full with diesel and water. Both tanks were in fair condition, with very little corrosion and no apparent holes.

Soils at location 2 consist of topsoil to a depth of 1 foot below ground surface, underlain by silty sand and clayey sand fill with some gravels and cobbles. The fill extends 3 to 5 feet below ground surface and is underlain by dark brown peat to a depth of 10 feet. The peat overlies a clay layer of unknown thickness.

Approximately 100 cubic yards of contaminated soil was removed at location 2. Analytical results of confirmation samples collected following initial excavation (EXC-2-4, EXC-2-7, and EXC-2-10) indicate that soils beneath all the tanks were contaminated above the cleanup level. Further excavation with collection and analyses of confirmation samples (EXC-2-5 and EXC-2-13) indicated that all contaminated soil around the 1,800-gallon tank has been removed, and approximately 5 cubic yards of low-level contaminated soil remains beneath the building in the vicinity of the 300-gallon tank. Further removal of contaminated soil from beneath the building was limited by lack of access space and by the building foundation pilings.

Tank Location 3

Three tanks were removed from location 3, including a 55-gallon drum, a 300-gallon diesel tank, and a 1,800-gallon heavy fuel oil tank (Figure 6). In addition, approximately 85 linear feet of 2-inch-diameter steel remote fill pipe was cleaned and abandoned in place (Figure 7). The drum, which was in fair condition with no apparent holes, was approximately 90 percent full of water and diesel. Both tanks were in fair condition with little corrosion and no apparent holes.

Soils at location 3 consist of topsoil to a depth of 1.5 feet below ground surface, underlain by clayey sand fill with some gravel and cobbles. The fill extends 4 to 6 feet below ground surface and is underlain by dark brown peat to a depth of 9 to 10 feet. The peat overlies a clayey sand layer of unknown thickness.

Approximately 90 cubic yards of contaminated soil was removed from location 3. Numerous utility lines limited excavation to the north and west, and the building obstructed excavation to the east. The major excavation was advanced to the buried pipes based on visual evidence of contamination. Four exploratory pits were developed beyond the north, east, and southeast borders of the main excavation on the opposite side of the sewer pipe and adjacent to the water pipe (both of which broke numerous times during the removal process). Analytical results confirm that contamination was not present outside the primary excavation. However, there may be up to 10 cubic yards of low-level contaminated soil along the western side wall of the excavation, beneath the concrete sewer pipe. Collection and analysis of additional confirmation

samples indicate that there may be another 10 cubic yards of soil containing 500 to 700 mg/kg hydrocarbons beneath the building and adjacent to both former tank footprints.

Approximately 30 cubic yards of contaminated soil was removed at the fill pipe stickup. Removal of soil was complicated by the presence of numerous underground utilities, a concrete slab, and a power pole located near the curb. Confirmation sampling at the excavation indicates that most contamination was removed. Three samples were collected from along the fill pipe run. Samples RFP-3-A and RFP-3-B appeared clean and were not analyzed. Sample RFP-3-1 was analyzed based on its proximity to the tank excavation. The pipe was cut off beneath the ground surface at both ends.

Tank Location 4

Three tanks were removed from location 4, including a 55-gallon drum, a 300-gallon diesel tank, and a 1,800-gallon heavy fuel oil tank (Figure 8). The drum was in fair condition with no apparent holes and was full of water and diesel. Both tanks were in fair condition, with little corrosion and no apparent holes.

Soils at location 4 consist of topsoil to a depth of 0.5 feet below ground surface underlain by sandy silt fill with gravels. The fill extends 4 to 6 feet below ground surface and is underlain by peat to a depth of 9 or 10 feet. The peat at this location contains varying amounts of silt and sand. Although this excavation was advanced to 15 feet below ground surface, no clay layer was encountered.

Approximately 110 cubic yards of contaminated soils were removed from location 4. During excavation activities, it was discovered that approximately 0.5 cubic yards of black viscous petroleum had collected on top of the fill within the crawl space beneath the boiler room, immediately north of the 1,800-gallon tank (see Appendix F, photo 4-3). The north side wall of the excavation was sloped back, allowing the product to drain into the excavation, where it was excavated along with other contaminated soils. A concrete sewer pipe obstructed excavation to the west and south, a water supply pipe limited excavation to the east, and the building prevented further excavation to the north. Deep excavation also was limited due to concerns for structural stability of the building.

Confirmation sample results from the initial excavations around both tanks indicate that contaminated soils remained. The 1,800-gallon tank pit was advanced to 15 feet in depth until side wall stability as well as the building and piping were determined to be at risk. Hydrocarbon concentrations at EXC-4-15 through EXC-4-20 indicate that the lateral limits of contamination were excavated within a few feet of the tank footprint. Most of the remaining contamination was located near or beneath the building. The highest concentrations were associated with heavy oil hydrocarbons, which typically are the least mobile and the least toxic. It is estimated that an additional 50 cubic yards of moderately contaminated soils may remain beneath the building and at the bottom of both the 1,800-gallon tank and the 300-gallon tank excavations.

Tank Location 5

Three tanks were removed from location 5, including a 55-gallon drum, a 300-gallon diesel tank, and a 1,800-gallon heavy fuel oil tank (Figure 9). In addition, approximately 100 linear feet of 2-inch-diameter steel remote fill pipe was cleaned and abandoned in place (Figure 10). The drum was in fair condition with no apparent holes and was half full of water and diesel. Both tanks were in fair condition with little corrosion and no apparent holes.

Soils at location 5 consist of topsoil to a depth of 0.5 feet below ground surface, underlain by silty sand fill with gravels. The fill extends 3 to 4 feet below ground surface and is underlain by peat to a depth of at least 8 feet. The peat also was found to contain varying amounts of silt. The clay layer identified in other excavations was not encountered at this location.

Approximately 120 cubic yards of contaminated soils were removed from location 5. Excavation of soils near the 300-gallon tank and the 55-gallon drum took place in stages, as visibly stained soil was removed and overexcavations were tested. Initial excavations below the tank to 7 feet (characterized by samples EXC-5-6 through EXC-5-9) and beneath the drum to 4 feet (samples EXC-5-10 and EXC-5-13) were deepened to 8 and then 9 feet across the entire area. At the large tank, samples collected at 8 feet below ground surface indicated heavy oil slightly above the cleanup level. Based on the low concentrations of diesel hydrocarbons and relatively low concentrations of less mobile and less toxic heavy oil found at 8 feet beneath both tanks, an additional 1 foot of soil was excavated across the entire area. Additional confirmation samples were not collected./It is estimated that an additional 20 cubic yards of contaminated soils with concentrations below 500 mg/kg remain adjacent to the 1,800-gallon tank beneath the building, and an additional 5 cubic yards exist near the drum location beneath the building/

No soil was removed from the fill pipe run. Heavy oil hydrocarbons were identified at 300 mg/kg directly below the pipe stickup (sample FP-1), but the contaminated soil was left in place because of the relatively low concentration, the expected limited distribution, and limited access posed by the adjacent building and fence (heavy machinery could not be used). Soil surrounding the fill pipe was extremely hard, as if the oil had caused some cementation. The pipe was cleaned and plugged at both ends with low-density, closed-cell, petroleum-resistant polyurethane foam.

Tank Location 6

Three tanks were removed from location 6, including a 55-gallon drum, a 300-gallon diesel tank, and a 1,800-gallon heavy fuel oil tank (Figure 11). The drum was in fair condition with no apparent holes and contained a small amount of water and diesel. The 300-gallon tank was found to have pitting, pin-holes, and a few 1/4-inch-sized holes. No liquid was found in the tank. The 1,800-gallon tank was in fair condition with no observable holes.

Soils at location 6 consist of topsoil to a depth of 0.5 feet below ground surface, underlain by silty sand fill with gravels. An interbedded layer consisting of wood debris also was encountered below the building and around the tanks. The fill extends 3 to 4 feet below ground surface and is

underlain by peat and silty peat to a depth of at least 8 feet. The peat is underlain by clay at an approximate depth of 10 feet below ground surface.

Approximately 330 cubic yards of contaminated soil was removed from location 6. Following removal of stained soils, sampling and analysis indicated that contamination extended beneath the building to the north, following the pipe chase to the west and the 12-inch sewer pipe south of the tanks. The excavation was widened to further remove contaminated soils to the south and northeast. The main excavation was completed into the clay layer over most of the area indicated in Figure 11 within the intermediate excavation limits. All samples collected from the bottom clay layer had TPH concentrations below the method A cleanup level. Final sampling confirmed that soils west of the steam pipe chase are clean down to the clay; however, approximately 10 cubic yards of petroleum-contaminated soils with concentrations between 200 and 500 mg/kg remain beneath the pipe chase and the 12-inch sewer pipe. It is estimated that an additional 40 cubic yards of petroleum-contaminated soils with concentrations above the cleanup level remain beneath the building.

Tank Location 7

Three tanks were removed from location 7, including a 55-gallon drum, a 300-gallon diesel tank, and a 1,800-gallon heavy fuel oil tank (Figure 12). All three tanks were in fair condition, with minor corrosion and no observable holes. The drum was half full of water and diesel.

The soils at location 7 consist of topsoil to a depth of 1 foot below ground surface, underlain by silty sand fill with gravels. The fill extends 3 to 4 feet below ground surface and is underlain by peat and silty peat to a depth of approximately 10 feet. The peat is underlain by clay at an approximate depth of 10 feet.

Approximately 25 cubic yards of contaminated soil was removed from location 7. Following tank removal, a small amount of visibly stained soil was excavated. Soil samples collected from the side walls and bottoms of the tank excavations contained petroleum hydrocarbons below the cleanup level. No evidence of contamination in the fill layer beneath the building was observed.

Tank Location 8

Two underground storage tanks were removed from location 8, including a 300-gallon diesel tank and a 1,800-gallon heavy fuel oil tank (Figure 13). No 55-gallon drum was found during exploratory excavations. Both tanks were in fair condition with no observable holes.

Soils at location 8 consist of topsoil to a depth of 0.5 feet below ground surface, underlain by silty sand fill with gravels. The fill extends 4.5 to 6 feet below ground surface and is underlain by peat and silty peat. The peat extends below the 10-foot excavation depth. The clay layer identified in other excavations was not encountered at this location.

Approximately 90 cubic yards of contaminated soil was removed from location 8. Contamination slightly above the cleanup level was found in the sample collected from the

bottom of the excavation at a depth 7 feet below ground surface (sample EXC-8-1). Additional soil was excavated to a depth of 10 feet. Soil samples then collected from the side walls and bottom of the excavation indicated very low diesel concentrations and heavy oil just below the method A cleanup level. Sampling indicates that no contamination above the cleanup level remains in shallow soil beneath the building adjacent to either tank.

Tank Location 9

Two underground storage tanks were removed from location 9, including a 300-gallon diesel tank and a 1,800-gallon heavy fuel oil tank (Figure 14). No 55-gallon drum was found during exploratory excavations. The two tanks were in fair condition, with no observable holes.

Soils at location 9 consist of topsoil to a depth of 0.5 feet below ground surface, underlain by silty sand fill with gravels. The fill extends 4 to 6 feet below ground surface and is underlain by peat and silty peat. The peat extends past the bottom of the 10-foot-deep excavation. The clay layer identified in other excavations was not encountered at this location.

Approximately 70 cubic yards of contaminated soil was removed from location 9. Soil samples collected from the side walls and bottom of the excavation indicate that side wall soils beneath the building and soils between the former tank locations contained petroleum hydrocarbons above the method A cleanup level. In addition, a limited area had visible product at a depth of approximately 3 feet below ground surface near the northeast corner of the building. Further excavation removed the contaminated soil near the building corner and between the former tank locations. Subsequent confirmatory sampling and analysis indicated that soil in these areas contained less than the 200 mg/kg criterion for diesel and heavy-oil petroleum hydrocarbons. However, it is estimated that up to 10 cubic yards of soil with 500 mg/kg or more may remain beneath the building, adjacent to the 1,800-gallon tank footprint.

CONTAMINATED SOIL MANAGEMENT

Soil removed from each excavation was stockpiled either on asphalt or on a plastic liner with straw bails to contain runoff and prevent sediment transport. Soil was covered with plastic sheeting for protection from rainfall. Stockpiles generally were sampled from three to five locations prior to transport offsite (Table 3). The stockpile at location 1 was removed after only 10 cubic yards of soil had accumulated, so only one characterization sample was collected. Concentrations above the MTCA method A cleanup level were found in 25 of 29 samples collected from stockpiles at all tank locations. All excavated soil was considered contaminated and removed from the site.

Table 3. Soil stockpile hydrocarbon analytical results for Seward Park Estates (mg/kg).

Tank Location	Diesel Range	Heavy Oil Range
Stock-1-1	290	59
Stock-2-1 (10/22/96)	620	110
Stock-2-1 (11/18/96)	140	300
Stock-2-2	230	820
Stock-2-3	180	340
Stock-3-1	220	130
Stock-3-2	350	260
Stock-3-3	170	85
Stock-4-1	4,700	4,600
Stock-4-2	1,100	770
Stock-4-3	3,700	4,800
Stock-4-4	2,400	2,100
Stock-5-1	370	110
Stock-5-2	820	200
Stock-5-3	48	100
Stock-6-1	4,500	4,300
Stock-6-2	2,100	2,400
Stock-6-3	6,800	4,300
Stock-7-1	98	75
Stock-7-2	55	ND
Stock-7-3	310	120
Stock-8-1	2,600	150
Stock-8-2	1,100	290
Stock-8-3	880	720
Stock-9-1	660	270
Stock-9-2	500	140
Stock-9-3	800	760
Stock-9-4	400	380
Stock-9-5	300	390

mg/kg milligrams per kilogram
ND not detected

CONTAMINATED MATERIAL DISPOSAL

Tanks and Piping

Tanks and piping removed from the site were transported to Coastal Tank Cleaning, Inc. located in Seattle, Washington. Each tank was stripped and rinsed with soapy water prior to inerting. All tanks were inspected by a certified marine chemist and disposed of as scrap. Tank strip and rinse records are provided in Appendix H.

Soil

Approximately 1,050 cubic yards of contaminated soil was removed from excavations at nine tank locations across the Seward Park Estates site. All soil was transported to the Taneum Recovery Corp. petroleum contaminated soil remediation and recycling facility in Ellensburg, Washington. Forty-seven truck and trailer loads containing 1,600 tons of soil were delivered between October 29, 1996 and February 24, 1997. All soil was thermally desorbed and recycled for other uses. The load ticket record is provided in Appendix I.

CONCLUSION AND RECOMMENDATION

During the course of removal of 18 heating oil underground storage tanks plus seven associated 55-gallon drums, over 1,000 cubic yards of fuel oil contaminated soil was excavated and transported offsite to an approved facility. It is estimated that approximately 180 cubic yards of contaminated soil remains onsite, primarily beneath buildings, pavement, and pipe runs. Three remote fill pipes of between 75 to 100 feet in length also remain in place, following cleaning and either burial or plugging of each end. Tank excavations reached up to 10 feet deep at all locations except one, which extended 15 feet below grade.

Based on borehole descriptions provided by a geotechnical investigation and field observations made during tank removal, no consistent water-bearing zone was encountered and significant ground water did not appear to be affected by the relatively shallow distribution of fuel oil contamination. No monitoring wells are considered necessary at this site.

The majority of contamination has been removed from the property. Contamination that remains is almost entirely covered by buildings or pavement, which will block most contact with infiltrating precipitation. It is recommended that Ecology consider no further action at this site.

FIGURES

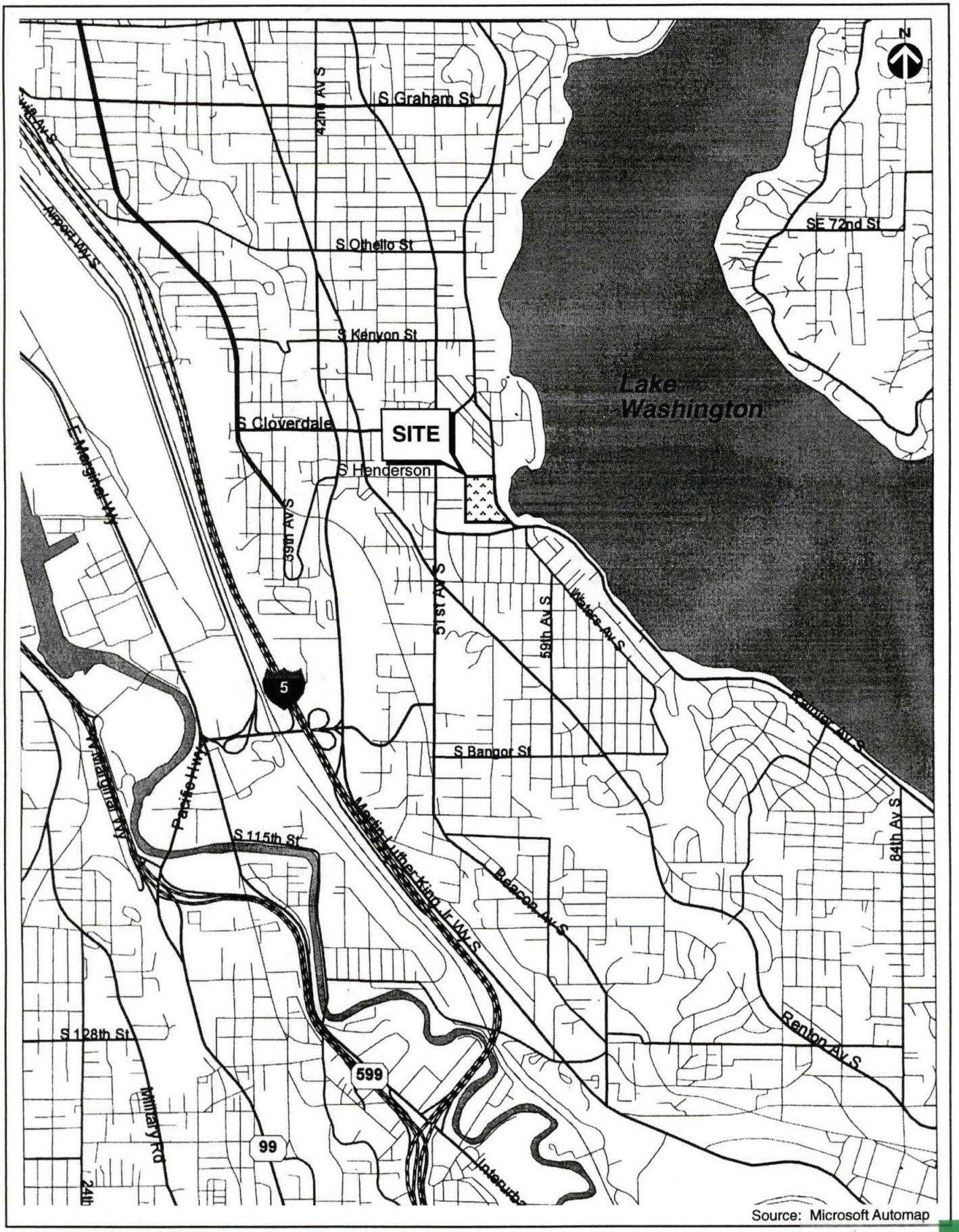


Figure 1. Seward Park Estates vicinity map, Seattle, Washington.

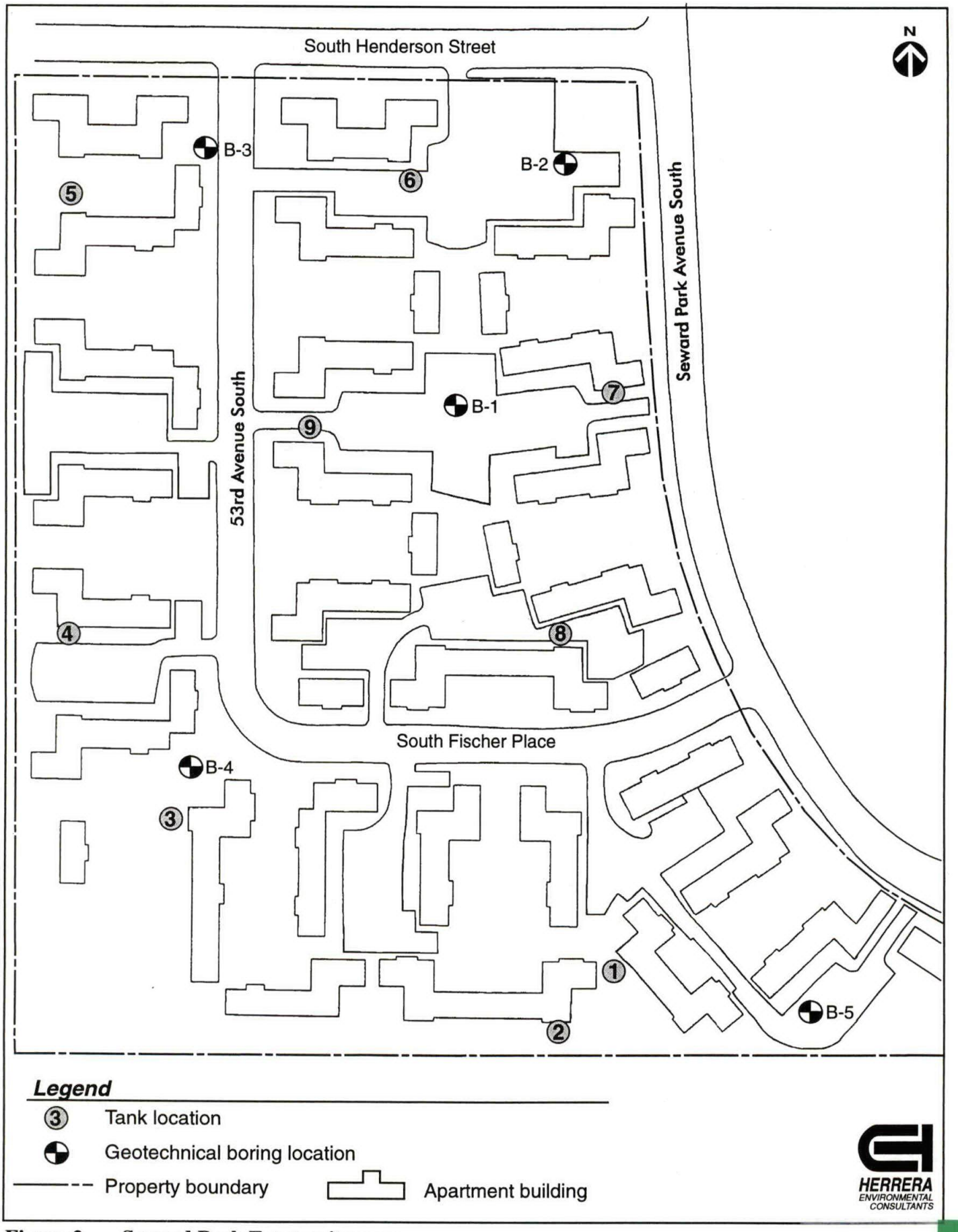
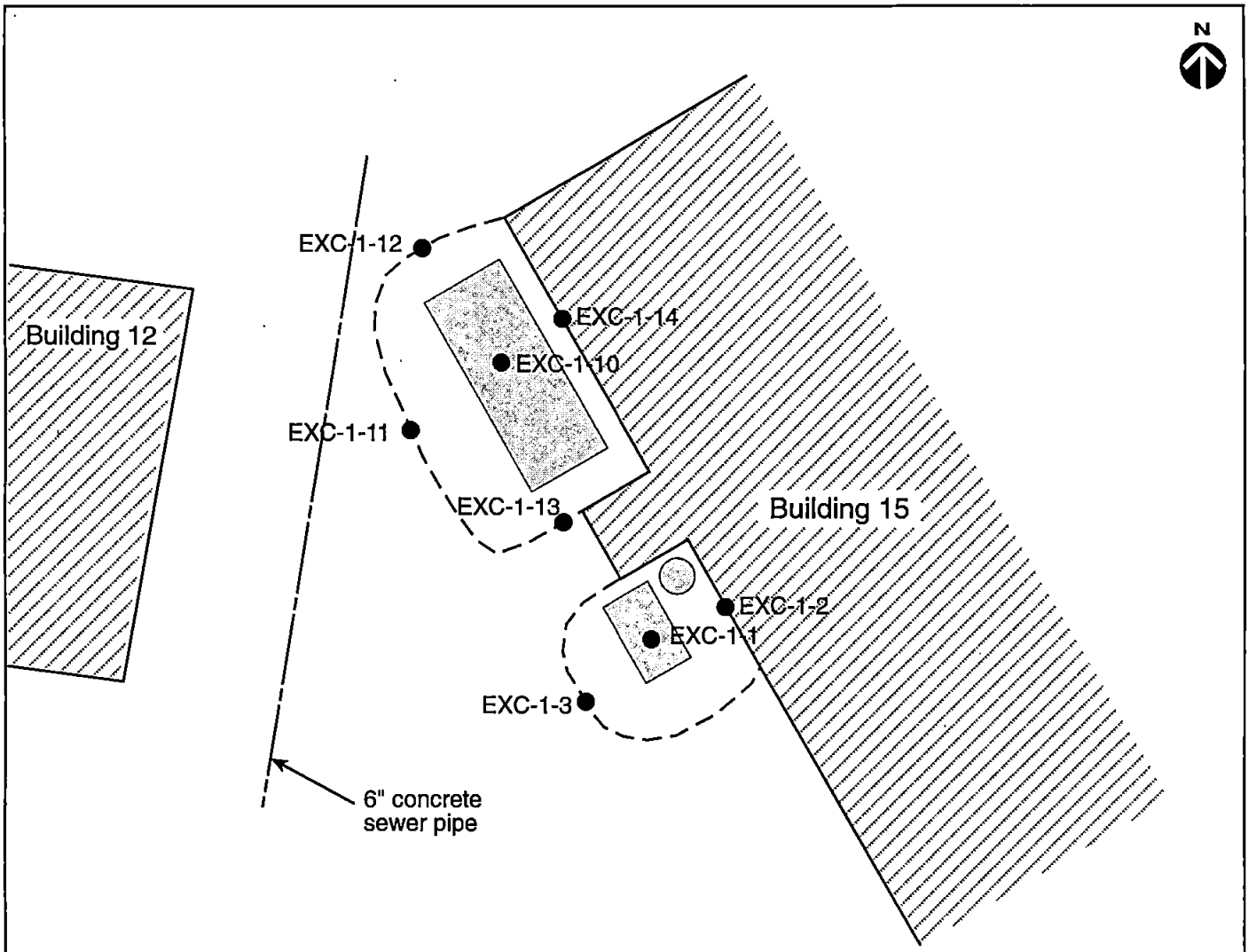


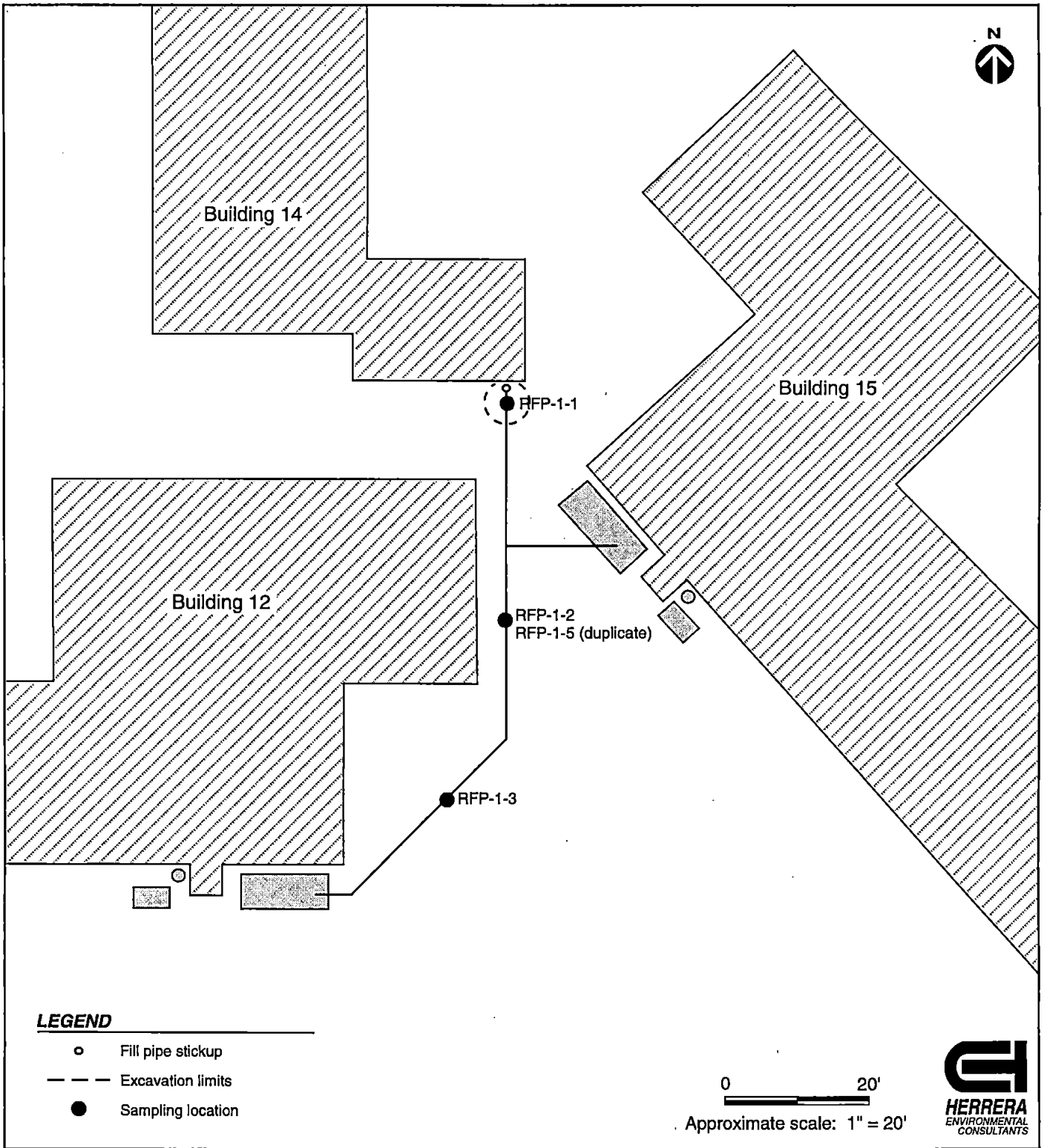
Figure 2. Seward Park Estates site map.



Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
EXC-1-1	7	Peat	36[a]	100[a]
EXC-1-2	3	Silty clayey sand	ND	ND
EXC-1-3	4	Silty clayey sand	ND	ND
EXC-1-10	10	Peat	ND	190
EXC-1-11	8	Clay, some peat	130[a]	200[a]
EXC-1-12	8	Clay, some peat	38	95
EXC-1-13	8	Clay, some peat	55[a]	190[a]
EXC-1-14	8	Clay, some peat	160	90

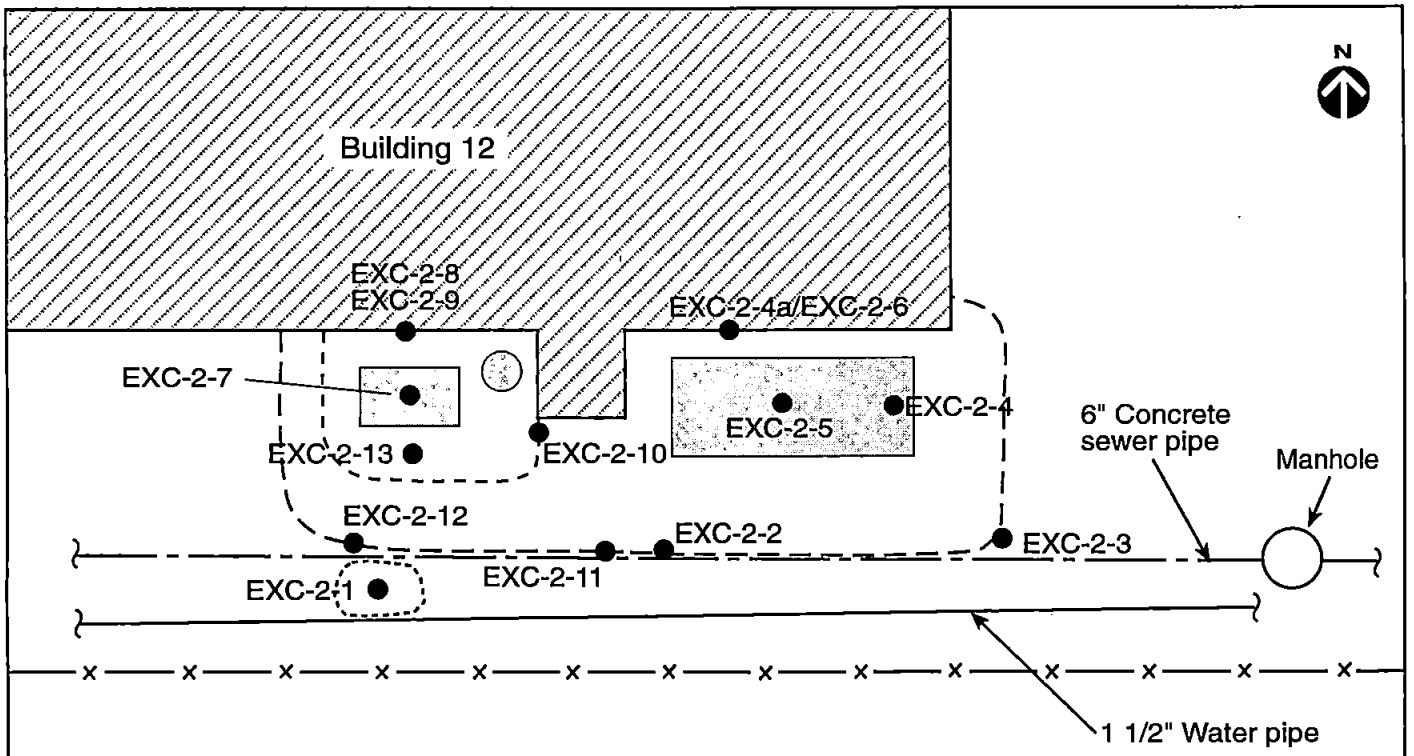
[a] Reported concentration following acid/silica gel cleanup of sample.

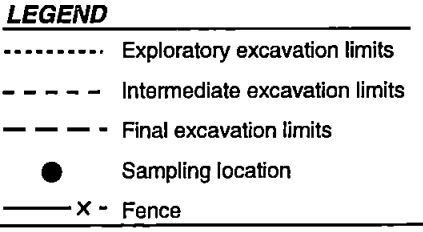
Figure 3. Tank location 1 sampling locations and TPH results.



Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
RFP-1-1	2	Gravelly sandy silt	ND	ND
RFP-1-2	2	Gravelly sandy silt	50	160
RFP-1-3	2	Gravelly sandy silt	ND	ND
RFP-1-5	2	Gravelly sandy silt	51	140

Figure 4. Fill pipe sampling locations and TPH results for tank locations 1 and 2.





HERRERA ENVIRONMENTAL CONSULTANTS

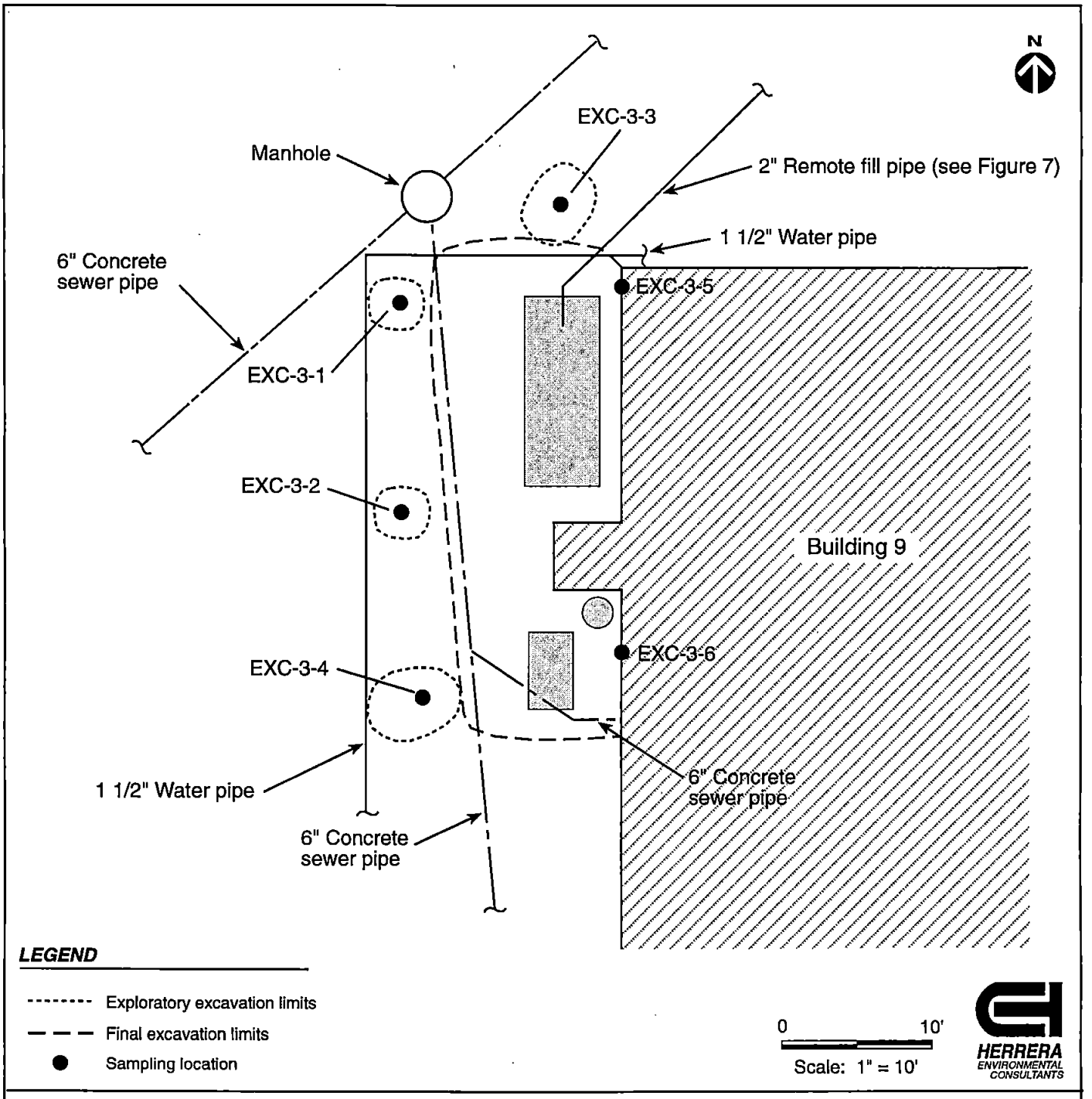
0 10'

Scale: 1" = 10'

Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
EXC-2-1	10	Clay	40	150
EXC-2-2	5	Gravelly sandy silt	ND	ND
EXC-2-3	5	Gravelly sandy silt	ND	ND
EXC-2-4	8	Peat	170 [a]	590 [a]
EXC-2-4a	7	Duplicate of EXC-2-6	41 [a]	180 [a]
EXC-2-5	9	Peat	97 [a]	ND [a]
EXC-2-6	7	Peat	36 [a]	ND [a]
EXC-2-7	7	Peat	120 [a]	270 [a]
EXC-2-8	2.5	Gravelly sandy silt	3,100	170
EXC-2-9	3	Peat, silty peat	86 [a]	91 [a]
EXC-2-10	3	Gravelly sandy silt	910	ND
EXC-2-11	3	Gravelly sandy silt	ND	ND
EXC-2-12	4.5	Gravelly sandy silt	ND	ND
EXC-2-13	8	Peat	63 [a]	ND [a]

[a] Reported concentration following acid/silica gel cleanup of sample.

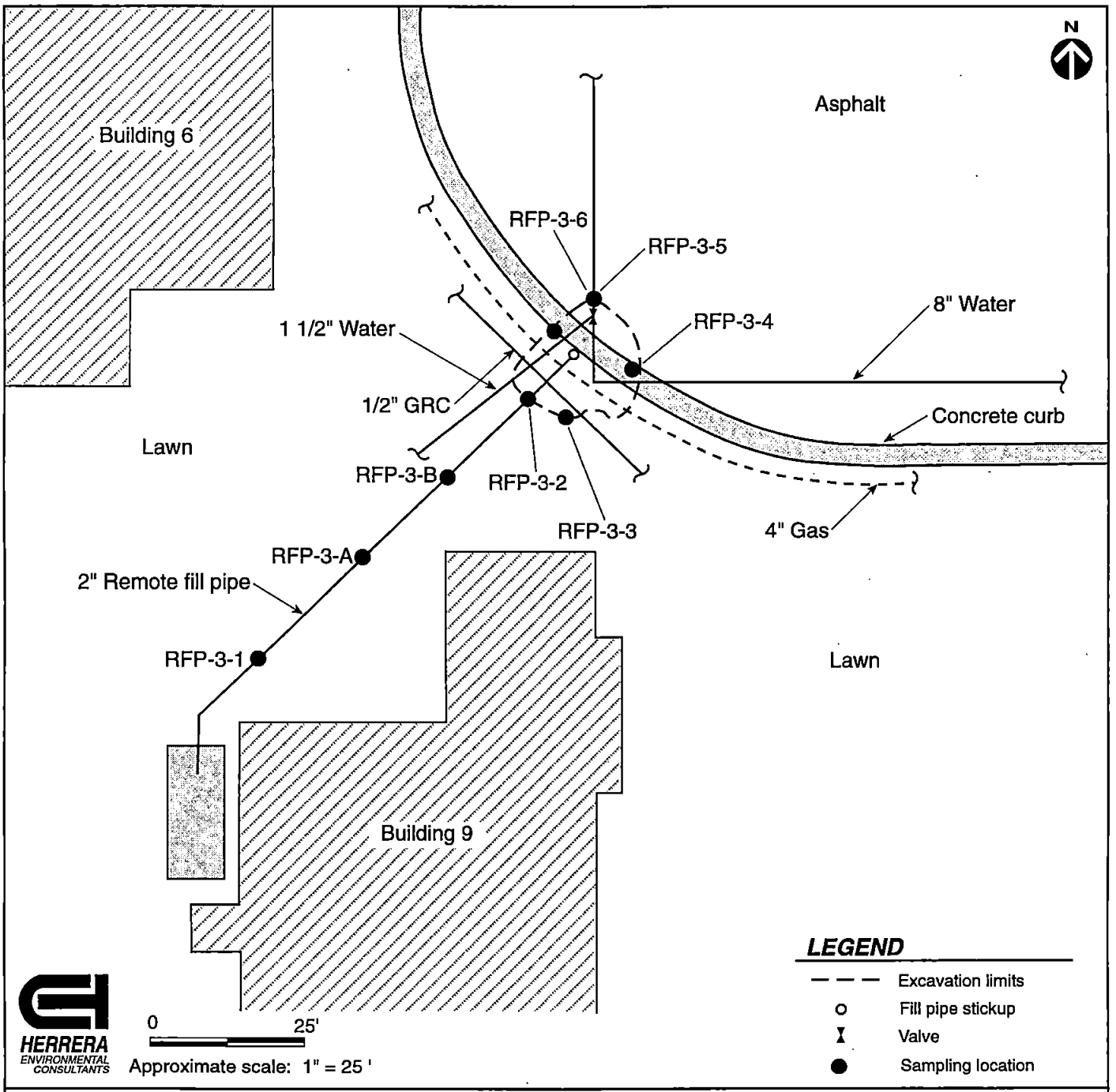
Figure 5. Tank location 2 sampling locations and TPH results.



Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
EXC-3-1	9.5	Clayey sand	ND	ND
EXC-3-2	9.5	Clayey sand	ND	ND
EXC-3-3	10.5	Clayey sand	ND	ND
EXC-3-4	10.5	Clayey sand	ND	ND
EXC-3-5	2-8 (composite)	Peat, gravelly sand, silt	ND	ND
EXC-3-6	2-5 (composite)	Peat, gravelly sand, silt	670 [a]	530 [a]

[a] Reported concentration following acid/silica gel cleanup of sample.

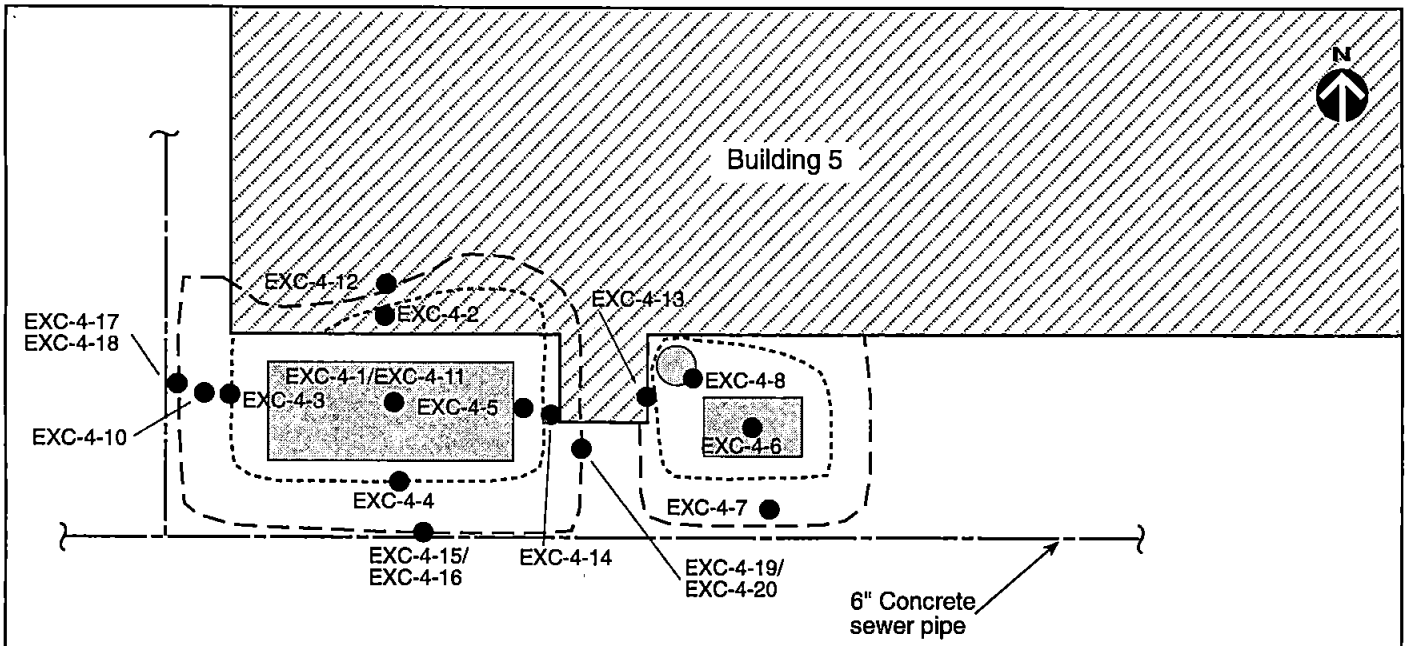
Figure 6. Tank location 3 sampling locations and TPH results.



Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
RFP-3-1	2	Gravelly sands	ND	ND
RFP-3-2	2	Gravelly sands	ND	ND
RFP-3-3	3	Gravelly silty clayey sand	ND	ND
RFP-3-4	3	Gravelly silty clayey sand	ND	ND
RFP-3-5	3	Gravelly silty clayey sand	160	99
RFP-3-6	4	Silty peat	64 [a]	ND [a]
RFP-3-A	2	Gravelly sands	not analyzed	
RFP-3-B	2	Gravelly sands	not analyzed	

[a] Reported concentration following acid/silica gel cleanup of sample.

Figure 7. Fill pipe sampling locations and TPH results for tank location 3.



HERRERA ENVIRONMENTAL CONSULTANTS

0 10'

Scale: 1" = 10'

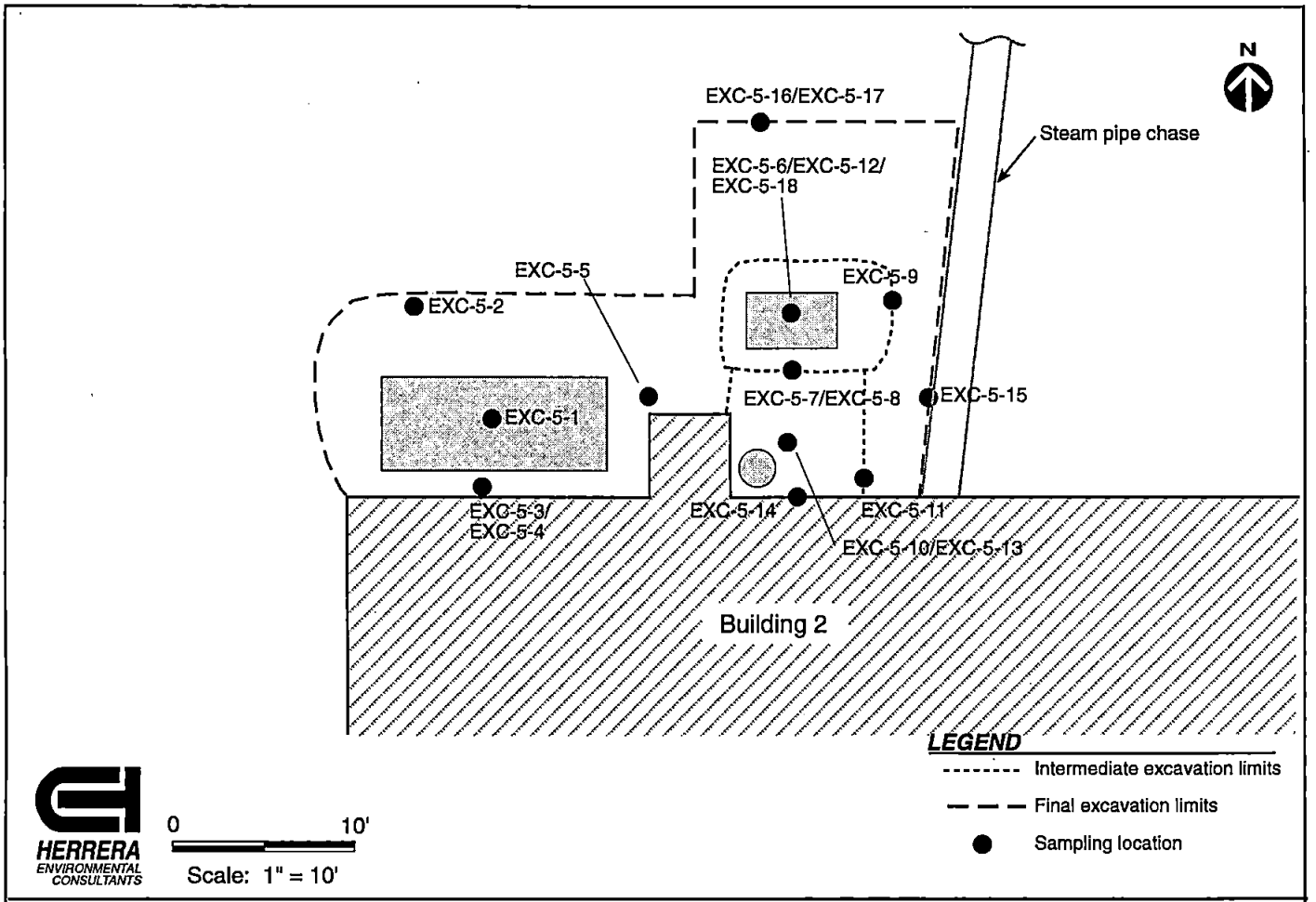
LEGEND

- Intermediate excavation limits
- Final excavation limits
- Sampling location

Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
EXC-4-1	10	Peat w/clay and sand	110	790
EXC-4-2	6	Sandy silt w/peat	2,000	2,600
EXC-4-3	8	Peat w/silt and sand	1,100	1,400
EXC-4-4	8	Peat	44	280
EXC-4-5	8	Sandy silt w/peat	190	890
EXC-4-6	6	Sandy silt w/peat	120	350
EXC-4-7	4	Sandy silt w/peat	ND	67
EXC-4-8	4	Sandy silt w/peat	4,700	290
EXC-4-10	7	Peat w/silt	120	700
EXC-4-11	15	Peat	660	1,300
EXC-4-12	8	Sandy silt w/peat	54	700
EXC-4-13	6	Sandy silt w/peat	31	130
EXC-4-14	7	Peat	110	1,300
EXC-4-15	5	Gravelly sandy silt/clay	ND	ND
EXC-4-16	10	Silty peat	ND[a]	ND[a]
EXC-4-17	5	Gravelly sandy silt/clay	ND	ND
EXC-4-18	13	Silty peat	ND[a]	ND[a]
EXC-4-19	8	Silty sand	ND	ND
EXC-4-20	13.5	Silty peat	ND[a]	ND[a]

[a] Reported concentration following acid/silica gel cleanup of sample.

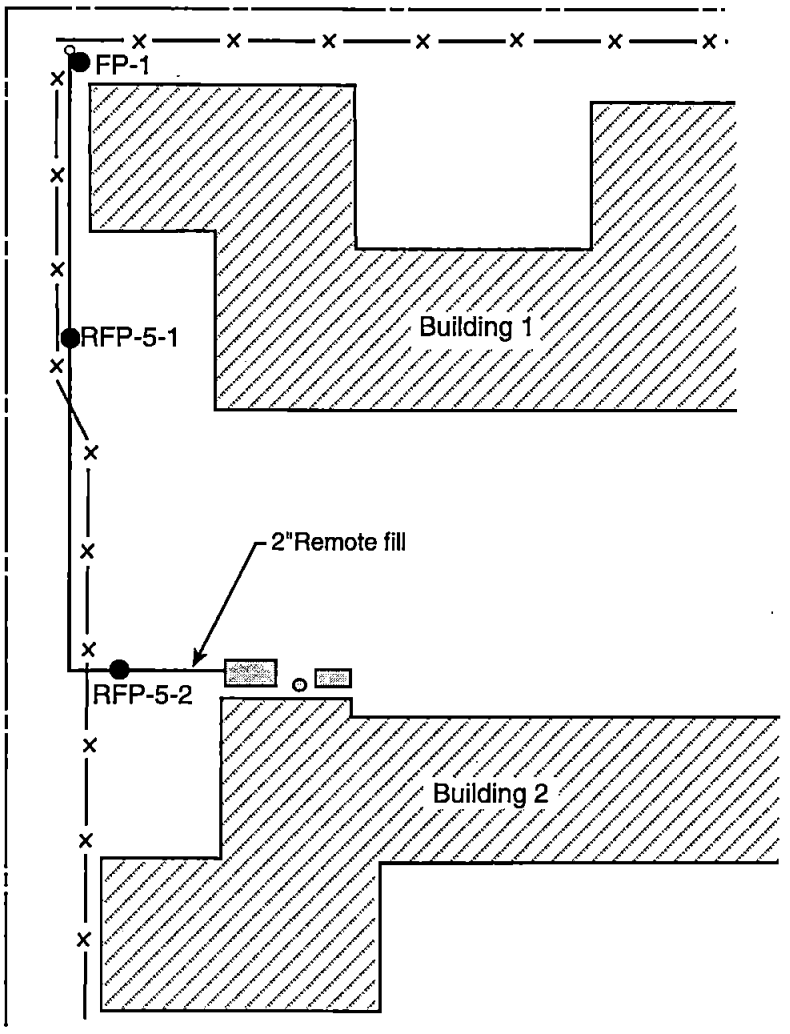
Figure 8. Tank location 4 sampling locations and TPH results.



Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
EXC-5-1	9	Silty peat	39	290
EXC-5-2	8	Silty peat	55	290
EXC-5-3	8	Peat	36[a]	200[a]
EXC-5-4	2	Gravelly silty sand	490	140
EXC-5-5	8	Silty peat	ND	ND
EXC-5-6	7	Peat	53	420
EXC-5-7	7	Silty peat	68	490
EXC-5-8	7	duplicate of EXC-5-7	49	470
EXC-5-9	7	Peat	86	720
EXC-5-10	4	Silty peat	27	240
EXC-5-11	3	Gravelly silty sand	2,700	290
EXC-5-12	8	Peat	37[a]	180[a]
EXC-5-13	7	Silty peat	57[a]	290[a]
EXC-5-14	2	Gravelly silty sand	ND	ND
EXC-5-15	4	Silty peat	31[a]	130[a]
EXC-5-16	3	Gravelly silty sand	29	ND
EXC-5-17	4	Silty peat	16[a]	110[a]
EXC-5-18	8	duplicate of EXC-5-12	39[a]	190[a]

[a] Reported concentration following acid/silica gel cleanup of sample.

Figure 9. Tank location 5 sampling locations and TPH results.



LEGEND

- Property line
- Fence
- Fill pipe stickup
- Sampling location

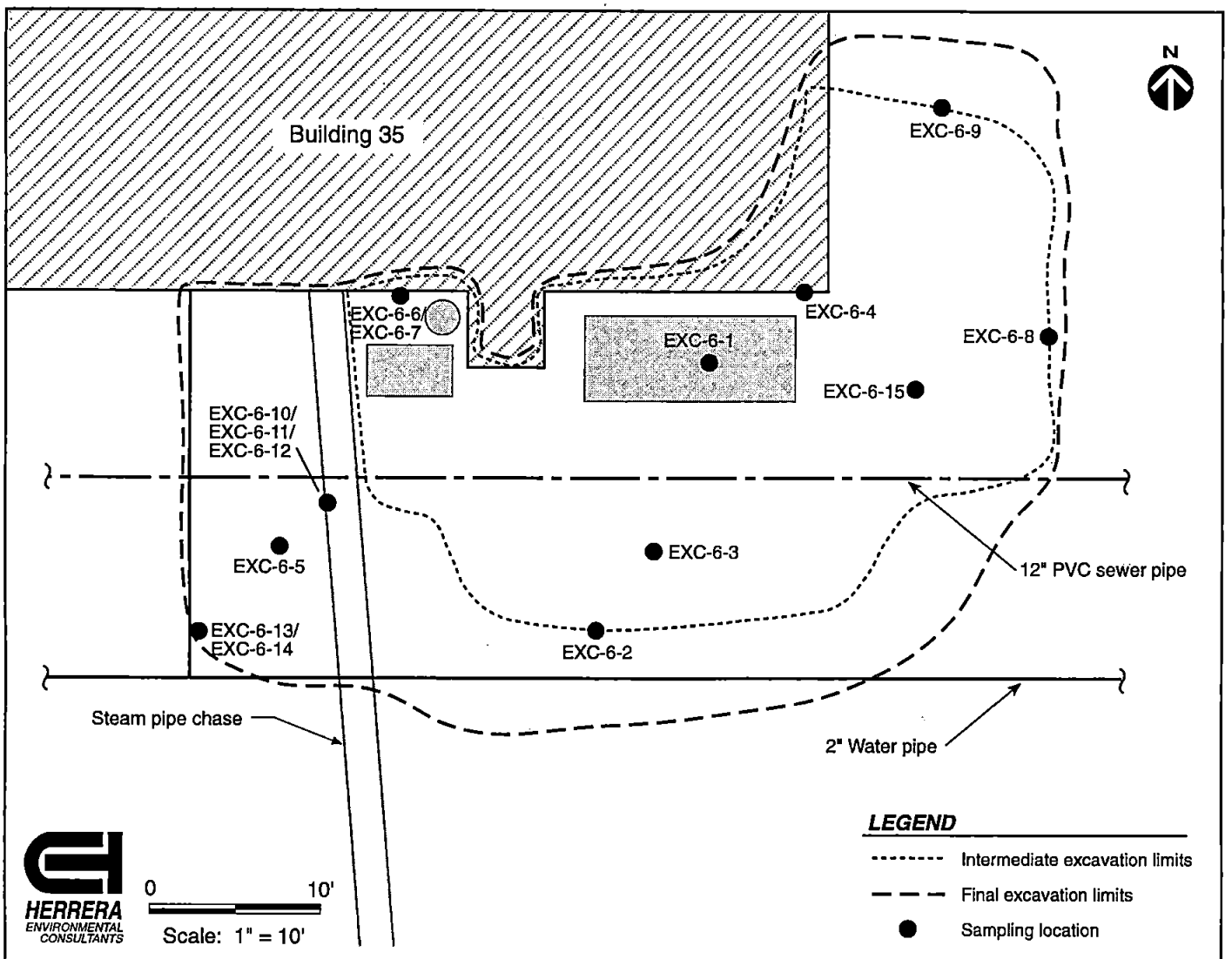
0 40'

Scale: 1" = 40'

HERRERA ENVIRONMENTAL CONSULTANTS

Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
RFP-5-1	3.5	Gravelly sandy silt	ND	ND
RFP-5-2	2	Silty clay	ND	ND
FP-1	4	Gravelly sandy silt	120	300

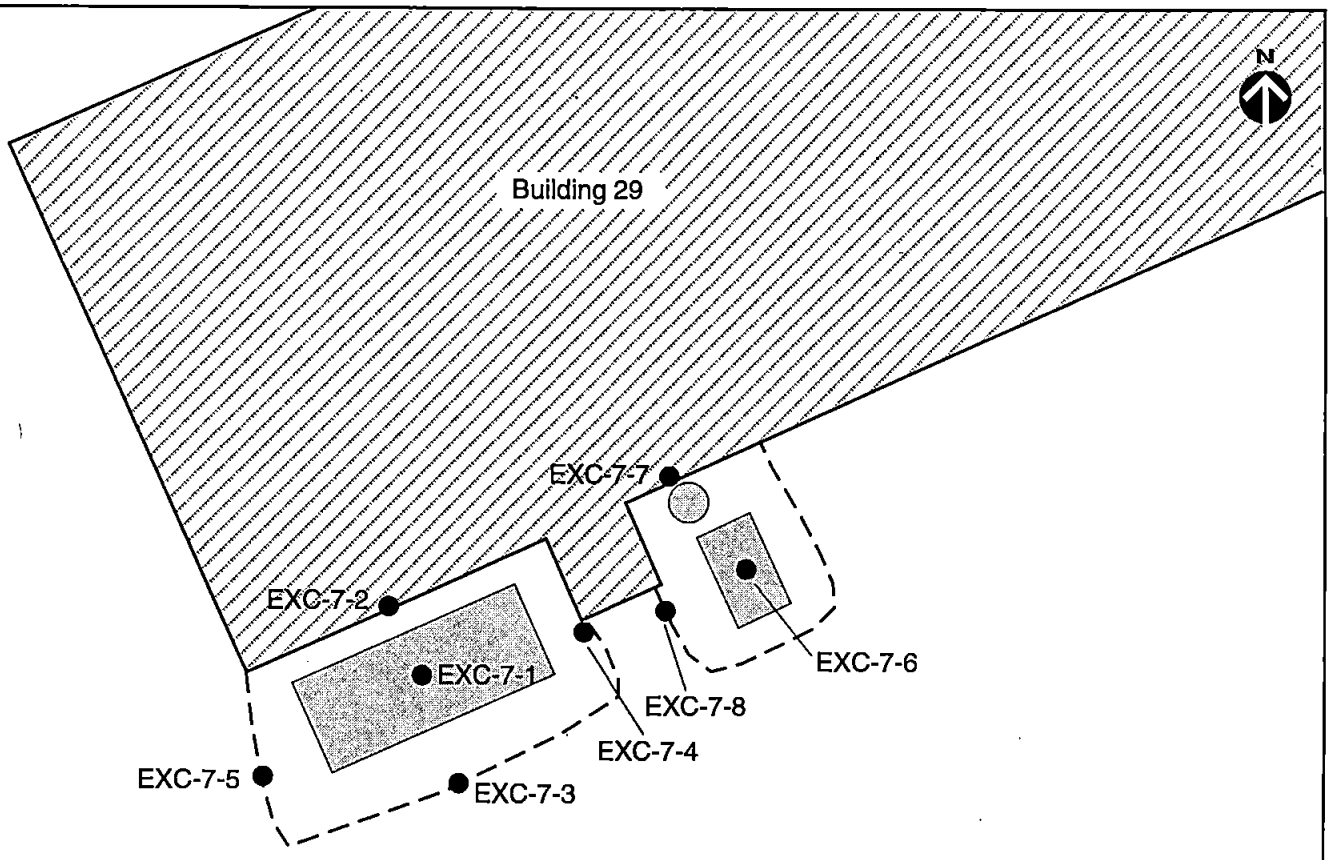
Figure 10. Fill pipe sampling locations and TPH results for tank location 5.



Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
EXC-6-1	9	Clay	170	150
EXC-6-2	6	Peat	27	130
EXC-6-3	7	Peat	81	460
EXC-6-4	7	Gravelly sandy silt/clay	6,500	6,600
EXC-6-5	11	Clay	ND	ND
EXC-6-6	8.5	Silty peat	28	160
EXC-6-7	4	Gravelly sandy silt/clay	5,300	2,100
EXC-6-8	8	Clay	ND	ND
EXC-6-9	5	Silty peat	420	450
EXC-6-10	4.5	Gravelly sand silt/clay	ND	ND
EXC-6-11	5.5	Silty peat	17[a]	ND[a]
EXC-6-12	5.5	duplicate of EXC-6-11	18[a]	ND[a]
EXC-6-13	3.5	Gravelly sandy silt/clay	ND	ND
EXC-6-14	4.4	Silty peat	ND[a]	ND[a]
EXC-6-15	10	Clay	ND	ND

[a] Reported concentration following acid/silica gel cleanup of sample.

Figure 11. Tank location 6 sampling locations and TPH results.



HERRERA ENVIRONMENTAL CONSULTANTS

0 10'

Scale: 1" = 10'

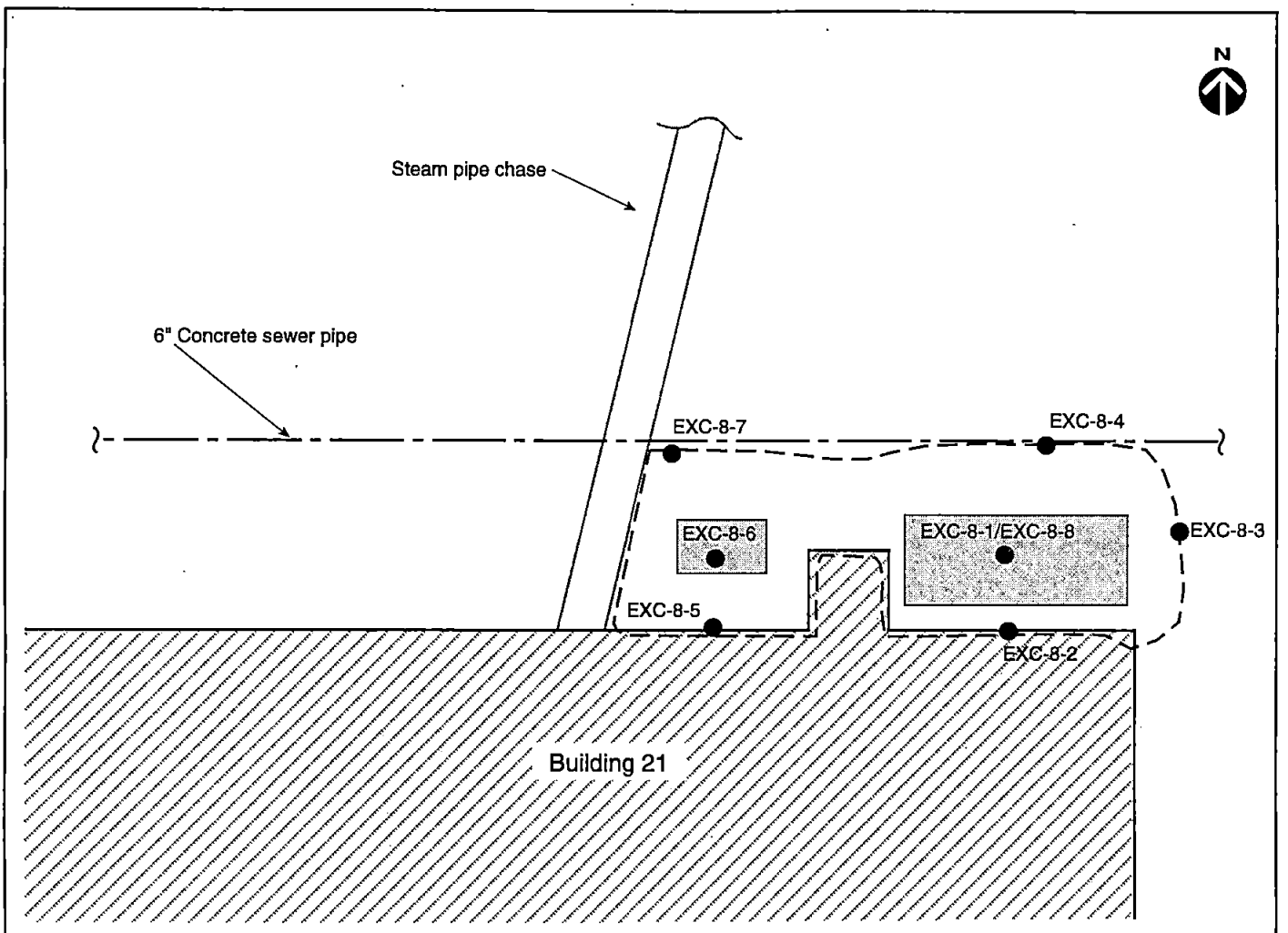
LEGEND

— — — Excavation limits

● Sampling location

Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
EXC-7-1	10	Clay w/peat	65	110
EXC-7-2	8	Silty peat	29	89
EXC-7-3	9	Silty peat	ND	ND
EXC-7-4	9	Silty peat	ND	84
EXC-7-5	9	Silty peat	ND	52
EXC-7-6	4	Fill	ND	89
EXC-7-7	3	Fill	95	ND
EXC-7-8	3	Fill	ND	ND

Figure 12. Tank location 7 sampling locations and TPH results.



HERRERA ENVIRONMENTAL CONSULTANTS

0 10'

Scale: 1" = 10'

LEGEND

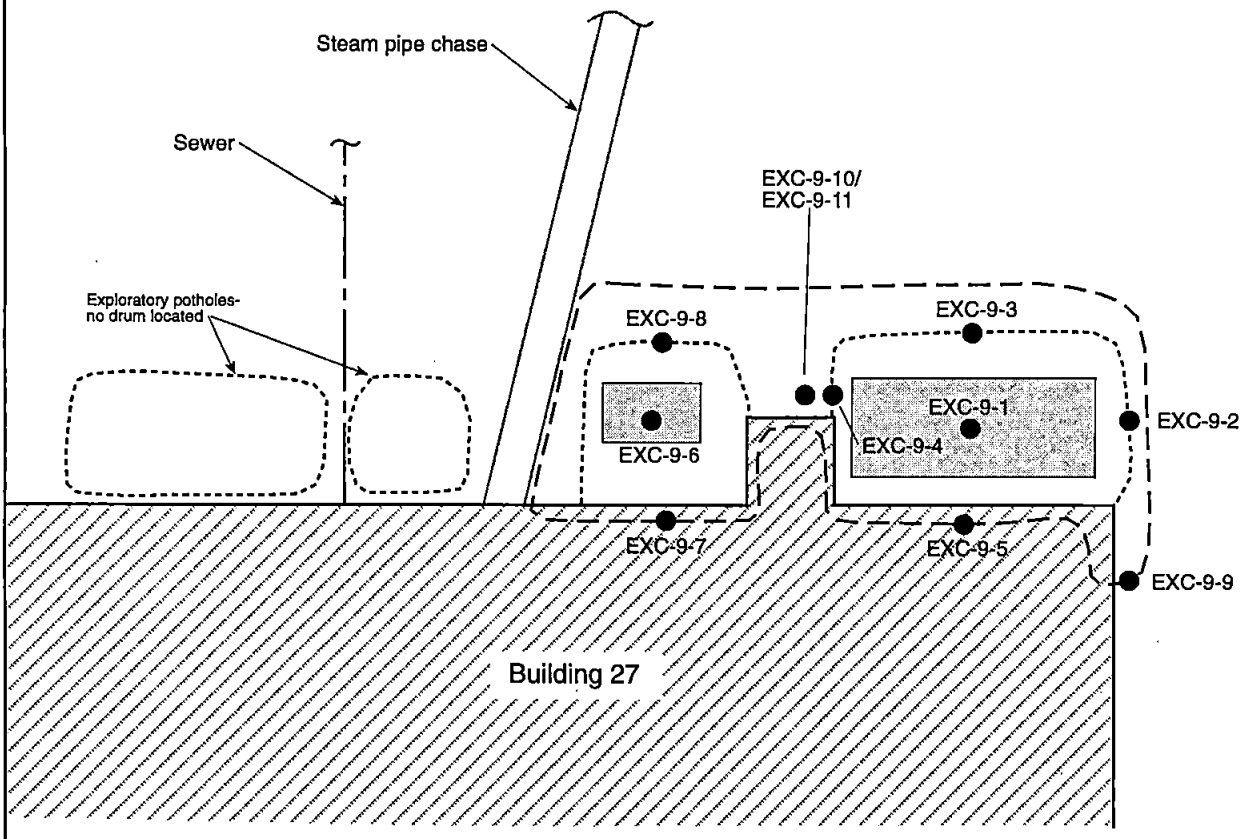
Excavation limits

Sampling location

Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
EXC-8-1	7	Peat	ND[a]	260[a]
EXC-8-2	5	Peat	ND	ND
EXC-8-3	5	Silty sand	ND	ND
EXC-8-4	6	Gravelly silty sand	ND	ND
EXC-8-5	7	Silty peat	30	71
EXC-8-6	8.5	Silty peat	ND[a]	190[a]
EXC-8-7	7	Silty peat	39	110
EXC-8-8	10	Peat	46[a]	190[a]

[a] Reported concentration following acid/silica gel cleanup of sample.

Figure 13. Tank location 8 sampling locations and TPH results.



HERRERA ENVIRONMENTAL CONSULTANTS

0 10'

Scale: 1" = 10'

LEGEND

- Intermediate excavation limits
- Final excavation limits
- Sampling location

Sample Number	Depth (feet)	Soil Description	Diesel Range (mg/kg)	Heavy Oil Range (mg/kg)
EXC-9-1	10	Peat/silt	ND[a]	ND[a]
EXC-9-2	6	Sand w/peat	ND	180
EXC-9-3	6	Sand w/peat	36	ND
EXC-9-4	6	Sand w/peat	86[a]	270[a]
EXC-9-5	6	Sand w/peat	400[a]	280[a]
EXC-9-6	5	Gravelly silty sand	110[a]	190[a]
EXC-9-7	4	Gravelly silty sand	84[a]	ND[a]
EXC-9-8	4	Gravelly silty sand	ND	ND
EXC-9-9	3	Gravelly silty sand	ND	ND
EXC-9-10	6	Gravelly silty sand	ND	ND
EXC-9-11	6	duplicate of EXC-9-10	ND	ND

[a] Reported concentration following acid/silica gel cleanup of sample.

Figure 14. Tank location 9 sampling locations and TPH results.

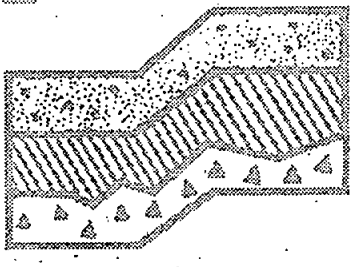
APPENDIX A

Geotechnical Report
(Terra Associates, Inc. 1996)

GEOTECHNICAL REPORT

Seward Park Estates
Seattle, Washington

Project No. T-2911



Terra Associates, Inc.

Prepared for:

AF Evans Company, Inc.
Alamo, California

August 6, 1996

TERRA ASSOCIATES, Inc.

Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

August 6, 1996
Project No. T-2911

Mr. Art Evans
AF Evans Company, Inc.
3236 Stone Valley Road West, Suite 210
Alamo, California 94507

Subject: Geotechnical Report
Seward Park Estates
Seattle, Washington

Dear Mr. Evans:

As requested, we have completed our geotechnical investigation at the Seward Park Estates site. The attached report presents our findings and provides geotechnical engineering recommendations for the project.

The results of our subsurface investigation show that an approximately two to nine-foot thick layer of fill soil was placed over a peat deposit when the site was initially developed. Compression of the peat layer under the weight of the fill has resulted in damaged sidewalks, pavements, and stairways adjacent to buildings. In addition, poor surface water drainage is indicated by water ponding in depressions and low areas that have developed across the site.

It will be necessary to support any new buildings on piles, since unacceptable levels of differential settlements would occur using a standard spread footing foundation. To mitigate potential settlements that may impact proposed utilities, it will be necessary to either backfill utility trenches with lightweight materials or support utility structures on pile foundations. Our settlement analysis shows that if soil is used to backfill utilities placed within the peat, total settlements between four to six inches would be expected over a 50 year time period. The use of lightweight backfill materials should reduce these settlements to tolerable levels.

Detailed engineering recommendations regarding these issues as well as other geotechnical design concerns are outlined in the attached report.

We trust this information is sufficient for your current needs. If you have any questions or need additional information, please call.

Sincerely yours,

TERRA ASSOCIATES, INC.

Kevin P. Roberts, P.E.
Project Engineer

Theodore J. Schepper, P.E.
Principal Engineer

KPR/TJS:tm

EXPIRES 6/18/97

cc: Mr. Robert Kovalenko, Kovalenko Architects

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Geotechnical Report
Seward Park Estates
Seattle, Washington

1.0 PROJECT DESCRIPTION

The approximately 25 acre site is located between South Henderson Street and Rainier Avenue South in Seattle, Washington. The approximate location of the site is shown on the Vicinity Map, Figure 1.

The project will involve renovations to the existing 365 unit Seward Park Estates housing complex. Project renovations will mainly consist of improvements to utilities and pavements. The project will also include constructing three small single-story structures near the intersection of South Fisher Place and 53rd Avenue South. We understand that the housing complex was constructed in the mid to late 1940s and that the existing buildings are all supported on pile foundations.

Currently, storm and sanitary sewer systems are combined into a single pipe delivery system. Utility improvements will consist of constructing a new separate sanitary sewer system, with the existing system remaining as the site's storm sewer. Additional catch basins will be added to improve stormwater drainage. New sewer lines will be 12 to 30-inch diameter PVC pipes placed with their inverts approximately three to nine feet below existing site grades.

Several new sanitary sewer pump stations and manholes will be constructed throughout the site. The pump stations will consist of five to six-foot diameter pre-cast culverts placed with inverts seven to eight feet below grades. City of Seattle Type A and Type B manholes will also be placed to facilitate servicing of the system.

The recommendations contained in the following sections of this report are based on the above anticipated design features. If actual features vary from those listed or if changes are made, we should be informed in order to make any necessary modifications to our recommendations. We should review final design drawings to verify that our recommendations have been properly interpreted and incorporated into the project design.

2.0 SCOPE OF WORK

On June 7 and 10, 1996, we observed the drilling of five test borings to depths ranging from 20 to 44 feet below existing site grades. Using the information obtained from the subsurface exploration, we performed analyses to develop geotechnical recommendations for project design and construction.

Specifically, this report addresses the following:

- Soil and groundwater conditions
- Foundation support alternatives for new structures
- Site excavations
- Utility support
- Backfill and structural fill recommendations
- Pavement design and construction

Our report also includes a discussion regarding the risk of potential settlements beneath the improvements and alternatives for mitigating this risk.

We previously completed a preliminary geotechnical evaluation at the site and presented our findings in a report dated June 13, 1995. A detailed description of the site's surface conditions and preliminary conclusions regarding potential impacts of the site's soil and groundwater conditions to the project are presented in the letter.

3.0 SITE CONDITIONS

3.1 Surface

The project site consists of approximately 25 relatively level acres containing several two-story, wood-framed apartment buildings and parking areas. The site is bounded on the north and east by South Henderson Street and Seward Park Avenue, respectively. Commercial businesses bound the site's southern and western margins. The site is surrounded by a chainlink fence. South Fisher Place and 53rd Avenue South provide access into the site from Seward Park Avenue.

Varying degrees of soil settlement are evident at the site. Exposure of foundation grade beams and the presence of gaps between floors and the ground surface indicate up to 12 inches of settlement adjacent to the structures has occurred at some locations. Undulations and cracking of sidewalks were observed throughout the site. The asphaltic concrete (AC) pavement comprising the site's access roadways and parking areas showed occasional longitudinal and transverse cracking. Localized depressions and areas of "alligator" cracking were also observed in drive and parking areas.

Catch basins are located in parking areas and along South Fisher Place and 53rd Avenue South. We noted a yard drain located within a lawn area at the site's southwest corner. No significant standing water was noted during our site visits. However, we understand that drainage throughout the site is generally poor and that areas of ponded water develop throughout the site during the wet winter months.

A more detailed description of the site's surface conditions is presented in our report dated June 13, 1995.

3.2 Subsurface

As interpreted from our test borings, the soil conditions at the site generally consisted of fill comprised of very loose to medium dense silty sand with gravel and sandy silt to depths ranging from 2.5 to 9.5 feet below existing grades. Standard Penetration Test values (N values) obtained during sampling of the fill indicate its relative density is very loose to medium dense.

Very soft to soft peat underlies the fill at each test boring location, except Boring B-2. At this location (northeast corner of the site), the fill was underlain by native, sandy silt to silty fine sand that was dense to hard. The sandy silt was observed to the total depth of Boring B-2. The peat was found to depths ranging from 10.5 feet at the site's southeast corner (Boring B-5) to 28.5 feet at the northwest corner of the site (Boring B-3).

Very soft to very stiff silty clay and clayey silt underlies the peat at the locations of Borings B-1, B-4, and B-5. The very soft horizon of these soils occurs within the top two to three feet of the layer. Laboratory results show that these soils exhibit low to medium plasticity characteristics. The silty clay or clayey silt is underlain to the total depths of these test borings by dense to very dense till-like soils consisting of silty fine to medium-grained sand with gravel.

The soils in the site vicinity are shown on the *Generalized Geologic Map of Seattle of Suburban Areas* (1991 by R.W. Galster and W.T. Laprade) as consisting of "modified land, mainly fill." The fill soils encountered at the site correlate with the mapping of the soils in the site's vicinity.

The Boring Logs in Appendix A present more detailed descriptions of the subsurface conditions encountered in the test borings. The locations of the test borings are shown on Figure 2.

3.3 Groundwater

Groundwater seepage was observed during drilling of the test borings at depths ranging from 12.5 feet in Boring B-1 to 32 feet in Boring B-4. Groundwater was not encountered within Borings B-3 and B-5.

Groundwater levels typically fluctuate with seasonal variations in rainfall. Our subsurface investigation was conducted during the drier summer months. We expect that groundwater seepage elevations will be higher during the winter months than those indicated on the Boring Logs.

3.4 Seismic Considerations

The Puget Sound area falls within Seismic Zone 3 as classified by the Uniform Building Code (UBC). Based on the soil conditions encountered and the local geology, Table 16-J of the 1994 UBC indicates a site coefficient of 1.5 should be used in design of the project's single-story structures.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 General

The results of our subsurface investigation show that an approximately two to nine-foot thick layer of fill soil was placed over a peat deposit as part of earlier development of the site. The weight of the fill has compressed the underlying peat, causing varying amounts of settlement throughout the site. Surface observations verify that differential settlements have impacted sidewalks and paved areas, concrete stoops adjacent to buildings, and have led to improper drainage of stormwater through the creation of depressions and low areas across the site. The main structures at the site are pile-supported and appear relatively unaffected by the surrounding settlements.

Under present grades, primary settlements and most secondary settlements have occurred, with compression of the peat likely continuing at a gradual rate. Our settlement analysis shows that if soil backfill materials are used for installation of the proposed utility structures placed within the peat, additional total settlements of between four and six inches would be expected at utility locations over a 50 year period. The use of lightweight backfill materials will reduce these settlements to tolerable levels. A suitable alternative for mitigating settlements under utilities is to support pipes and related structures on piles.

Test borings drilled at the eastern portion of the site showed that the peat is absent (Boring B-2) or extends to a relatively shallow depth. At these and nearby locations, it will be feasible to excavate through the peat (if present) to competent soil and backfill the utility excavations using granular soil fills. To provide stability during construction, shoring of excavations within the site's peat and soft clays and silts will be required.

Surface water drainage may be improved adjacent to existing structures by establishing surface gradients that are directed away from buildings to yard drains or catch basins. This may be accomplished by terracing or sloping lightweight fill placed along building perimeters. Fill placement on an impermeable liner will reduce the potential for surface water infiltration and collection under the existing structures. It is important to realize that any grading at the site that includes placement of ordinary soil fill will induce stress changes within the underlying peat. Peat is particularly susceptible to both vertical and lateral movements when influenced by changes in external stresses.

It will be necessary to support the proposed single-story buildings on pile foundations. Compression of the peat layer under loads imposed by standard spread footing foundations would result in unacceptable levels of differential settlement and damage to the structures. Alternatives for design using driven steel pipe piles and augercast piles are presented in the following sections.

4.2 Trench Excavation

Stabilization of excavations for utility placement within inorganic soils may be achieved by sloping the excavation walls to a safe angle. Space constraints, economics, or other factors may preclude the use of open cuts at some locations. For such conditions, using digging trench boxes or other methods of temporary trench support will probably be required to conserve space and to provide for worker safety. Regardless of space or economic considerations, we recommend that excavation walls within the peat and underlying soils be shored using a ditchbox or other means of bracing.

Trench excavations must be completed in accordance with local, state, or federal requirements. Based on current Occupational Safety and Health Administration (OSHA) regulations, the loose fill and loose sandy silt at the site would generally be classified as a Group C soil. The side slopes excavated within the loose fill and loose sandy silt should be sloped to a gradient no steeper than 1.5:1 (Horizontal:Vertical). The dense to hard sandy silt observed in Boring B-2 would be categorized as a Group A soil. Excavations into this soil may be sloped to an inclination of 0.75:1 or flatter.

If required, trench boxes may be used to support the lower portion of the excavation wall, and the upper unsupported excavation may be sloped back. If trench boxes are used to support the sides of the excavation, the outer walls of the box should be flush with the adjacent walls of the excavation. Stacking trench boxes up to two levels may be permitted on the condition that the inner walls of the two boxes are aligned and there are no gaps between the trench boxes.

Based on our subsurface investigation and proposed utility elevations, groundwater seepage should not have a significant impact on utility installation. Various locations at the site, particularly during the wet winter months, may encounter groundwater during excavation. Flatter cut slopes or temporary bracing will be required where groundwater seepage persists. The contractor must be prepared to dewater the excavations as necessary. Surface water should be prevented from entering open excavations.

In areas where the utility trenches cross existing roadways, the pavement removal and restoration width should be in accordance with current Seattle Engineering Department "Street and Sidewalk Pavement Opening and Restoration Rules."

The above information is provided solely for the benefit of the owner and other design consultants and should not be construed to imply that Terra Associates, Inc. assumes responsibility for job site safety. It is understood that job site safety is the sole responsibility of the project contractor.

4.3 Utility Support

Our analysis indicates settlements of utility structures and backfill would occur where utility trenches are excavated within peat and backfilled with compacted soil. This is due to the net increase in load imposed by the soil backfill column on the underlying peat. Under these circumstances, we expect primary settlements at individual pump station and manhole locations to be two to three inches. Primary settlements of three to four inches should be expected at utility trench locations excavated within the peat to depths of up to nine feet.

Secondary consolidation would continue at utility locations for several years following utility placement. During secondary consolidation, additional settlements of 1 to 1.5 inches should be expected at the pump station and manhole locations, with trenches experiencing an additional settlement of about one inch. These values represent expected settlements over a 50 year period.

At some locations at the site, utilities may be placed at shallow enough depths that peat is not reached during trench excavation. At these locations, we anticipate only a small net increase in load imposed on the underlying peat resulting from the replacement of existing fill with slightly heavier gravel bedding and compacted backfill. Total settlements of up to 1.5 inches should be expected at utility locations in this case.

If conventional soil backfill is used and utility structures are unable to tolerate the above settlements, we recommend that manholes, pump stations, and pipes be supported on piles. The piles may consist of steel pipe piles or augercast piles placed as described in the Building Piles section. Since support of the pipe by piles is provided at point locations, it will be necessary to select pipe strong enough to withstand bending from the weight of the overlying fill column.

4.4 Trench Backfill

Lightweight Fill Option

As an alternative to supporting utilities using piles, settlements of utilities may be mitigated by backfilling trenches with a lightweight fill material. The use of lightweight backfill results in reduced weight imposed on the compressible peat. With less weight on the peat than is currently imposed by the existing fill, we expect settlements from utility installation to be within acceptable limits.

Proprietary foam products are available that are specifically designed for use in geotechnical applications. In addition, hog fuel (wood chips) may be used as a lightweight fill material. With the use of lightweight fills, it will be necessary to place geotextile subgrade reinforcing fabric such as Mirafi 500X or equivalent at the base and top of the lightweight fill zone. In structural areas, we recommend placing a minimum one foot thickness of angular crushed rock cover over the lightweight fill and geotextile fabric. Sidewalk and pavement sections may then be placed on the crushed rock base (CRB).

Soil Backfill

For backfill placement in areas where no peat is encountered, we recommend using on-site or imported granular soils. Some of the on-site silty sand fill may be reused as structural backfill within trenches. These soils contain a significant amount of fines and are moisture-sensitive. Unless their moisture content is relatively near optimum at the time of construction, these soils will be difficult to compact adequately as a structural fill. With this consideration, we recommend undertaking backfill operations during the drier summer months. The on-site peat and clays will not be suitable for use as trench backfill.

Soils observed during logging of our borings indicate above-optimum moisture contents. Where the soil's moisture content is above optimum, you can consider drying by aeration or using a cement or lime additive to accelerate the drying process and stabilize the soils.

If utility excavations proceed during wet weather conditions, or if they begin in dry weather conditions and extend into wet weather, the owner should be prepared to import wet weather structural fill. Material for this purpose should consist of an inorganic free-draining granular material that meets the following grading requirements:

Maximum Aggregate Size	3 inches
Minimum Retained on the No. 4 Sieve	25 percent
Maximum Passing the No. 200 Sieve	5 percent*

*Based on the minus 3/4 inch fraction

Structural fill should be placed in uniform loose layers not exceeding 12 inches and compacted to a minimum of 95 percent of the soil's maximum density, as determined by ASTM Test Designation D-698 (Standard Proctor). The moisture content of the soil at the time of compaction should be within about two percent of its optimum, as determined by this same ASTM standard. All utility bedding and backfill placement should be in accordance with American Public Works Association (APWA)/City of Seattle specifications.

Regardless of the backfill option chosen, we recommend bedding pipes on a minimum six-inch thick layer of pea gravel or 5/8 inch minus crushed rock. Where utility placement occurs within peat, we recommend that a minimum of one foot below pipe invert be overexcavated followed by the placement of a subgrade reinforcement geotextile fabric on the bottom of the excavation. Angular crushed rock should then be placed on the geotextile fabric to the utility structure invert elevation.

4.5 Building Piles

We recommend that building loads imposed by the proposed single-story structures be transferred to bearing soil using a pile foundation. A structural floor should be designed for the buildings, since a slab-on-grade floor would experience unacceptable levels of differential settlement and cracking. Two options for pile placement and support of the buildings are presented in the following sections.

Augercast Piles

Augercast piles can be considered for transferring building loads below the consolidating layers at the site. Boring B-4, drilled in the area of the proposed buildings, shows suitable bearing soil consisting of very stiff clay or very dense silty sand at a depth of about 40 feet below existing surface grades. For individual 14-inch diameter piles with minimum tip elevations at -16 feet, an allowable axial load of 20 tons is available for design.

Full axial capacity can be used provided the piles are spaced at a minimum of three pile diameters. Closer spacing in pile groups will require a reduction in the single pile capacity. This reduction will depend on the number of piles in the pile group and the spacing used. For resistance to lateral loading, a lateral pile capacity of one ton can be used.

Augercast piles are formed by the pressure injection of grout through a hollow stem auger which is slowly retracted from the ground after advancement to the recommended tip elevation. The grout pressure used will compress the soils within the immediate vicinity of the pile, thereby increasing to some extent the pile diameter and the amount of grout required to construct the pile. For planning purposes, we suggest considering a 50 percent increase in the amount of grout necessary to form the pile.

In construction of augercast piling, a higher than normal reliance on quality workmanship is required for successful installations. It is extremely important that the grout pressure is consistent and uniform during the installation and that retraction of the auger occurs at a slow uniform pace beneath a sufficient head of grout in the pile column. The contractor should have adequate means for verifying grout pressure and estimating the volume of grout used in the construction of the piles.

Due to the compression effects and the possible influence on adjacent pile construction, the installation sequence should be based on a minimum pile spacing of five pile diameters. Once the grout column has achieved its initial 24 hour set, pile construction in between these spacings can be completed.

Four Inch Pipe Piles

Steel pipe piles may also be considered for transferring building loads to bearing soil. We recommend using four-inch diameter steel piles if this option is chosen. Pipe piles should be galvanized or coated to provide resistance to corrosion. The pipe piles should be driven to refusal using a minimum 850 foot-pound impact hammer. Refusal is defined as less than one inch of pile penetration during 15 seconds of driving.

Four-inch diameter pipe piles driven to refusal will develop an allowable axial bearing capacity of ten tons per pile. For resistance to lateral loading, a lateral pile capacity of 1/4 ton can be used for vertically placed piles. Pipe piles may be battered to increase their ability to resist lateral loads.

4.6 Drainage Improvements

More favorable drainage adjacent to existing buildings may be established by placing sloping landscaping fill against the structures. It is extremely important that the material consist of lightweight fill that is placed to a height of no more than 18 inches above existing grades. Extensive placement of ordinary landscaping fill may induce stress changes which result in vertical and lateral movements of the underlying peat.

We recommend using wood chips or bark to raise grades adjacent to buildings. The wood chip fill should be graded such that it slopes away from the building at an angle sufficient to provide positive drainage. An impermeable plastic membrane should be placed over the wood chips to prevent infiltration of stormwater and collection under the structures. A layer of topsoil with appropriate vegetation may then be placed on the plastic cover. Consideration should also be given to installing additional yard drains in areas typically exhibiting poor drainage.

4.7 Concrete Stoops

Concrete stoops leading to some of the existing structure's entryways are exhibiting signs of settlement. The stoops have rotated away from the building and settled vertically as much as two inches. It is proposed to add an additional layer of concrete to the top of the stoops as a measure of repair.

We believe that the stoops have settled with the surficial fill in response to the fill's compression of the underlying peat layer. As mentioned earlier, this compression continues at a very gradual rate. Consequently, patching the stoops should be considered a temporary fix.

If desired, the stoops may be supported with respect to additional settlement by driving two inch diameter steel pipe piles next to them and attaching brackets from the pile tops to the base of the stoops. Refusal criteria for two-inch diameter piles is defined as less than one inch of pile penetration per 60 seconds of continuous driving with a 90 pound pneumatic hammer.

4.8 Pavement Design

A suitable pavement section was determined based on information obtained from our test borings and assuming that new pavements will receive traffic loads primarily consisting of passenger vehicles and occasional service trucks. We used the 1986 AASHTO Pavement Analysis Program which is based on design procedures outlined in their *Guide for Design of Pavement Structures.*

City of Seattle restoration rules require that asphalt roadways in residential areas be restored with a minimum thickness of three inches of Class A asphalt or to match the thickness of existing roadway. Our analysis indicates that the pavement section should consist of two inches of AC underlain by six inches of compacted CRB.

In rebuilding the roadway section, salvaging the existing AC and base course materials and reusing them as a base course for the new pavement section can be considered. The AC should be crushed to a maximum size of 1.5 inches for this purpose. Once the existing pavement section is removed, including the gravel base, the exposed subgrade should be scarified for a minimum depth of 12 inches and recompacted to a minimum of 95 percent of the soil's maximum dry density as determined by ASTM Test Designation D-698 (Standard Proctor). All current City of Seattle restoration rules would apply at the time of construction.

Soft and yielding areas should be overexcavated and replaced with suitable structural fill. If excessive yielding is observed, you should consider placing a geotextile fabric such as Mirafi 500X or equivalent on the subgrade in conjunction with the structural fill. We expect that some of the existing surficial fill may be reused as compacted granular subbase material; however, its moisture content and grain size distribution should be evaluated by the geotechnical engineer prior to use. If the material is unsuitable, wet weather granular fill soil conforming to the gradation given in the Trench Backfill section should be imported to the site for use as subbase material.

4.9 Methane Ventilation

The presence of peat near the ground surface indicates a potential for generation of methane and/or hydrogen sulfide gases resulting from organic decay of these materials. Existing buildings at the site are ventilated with crawl space vents located approximately 18 inches above outside grades. We recommend that all structures at the site associated with confined spaces be provided with methane ventilation that meets Seattle Building Code requirements.

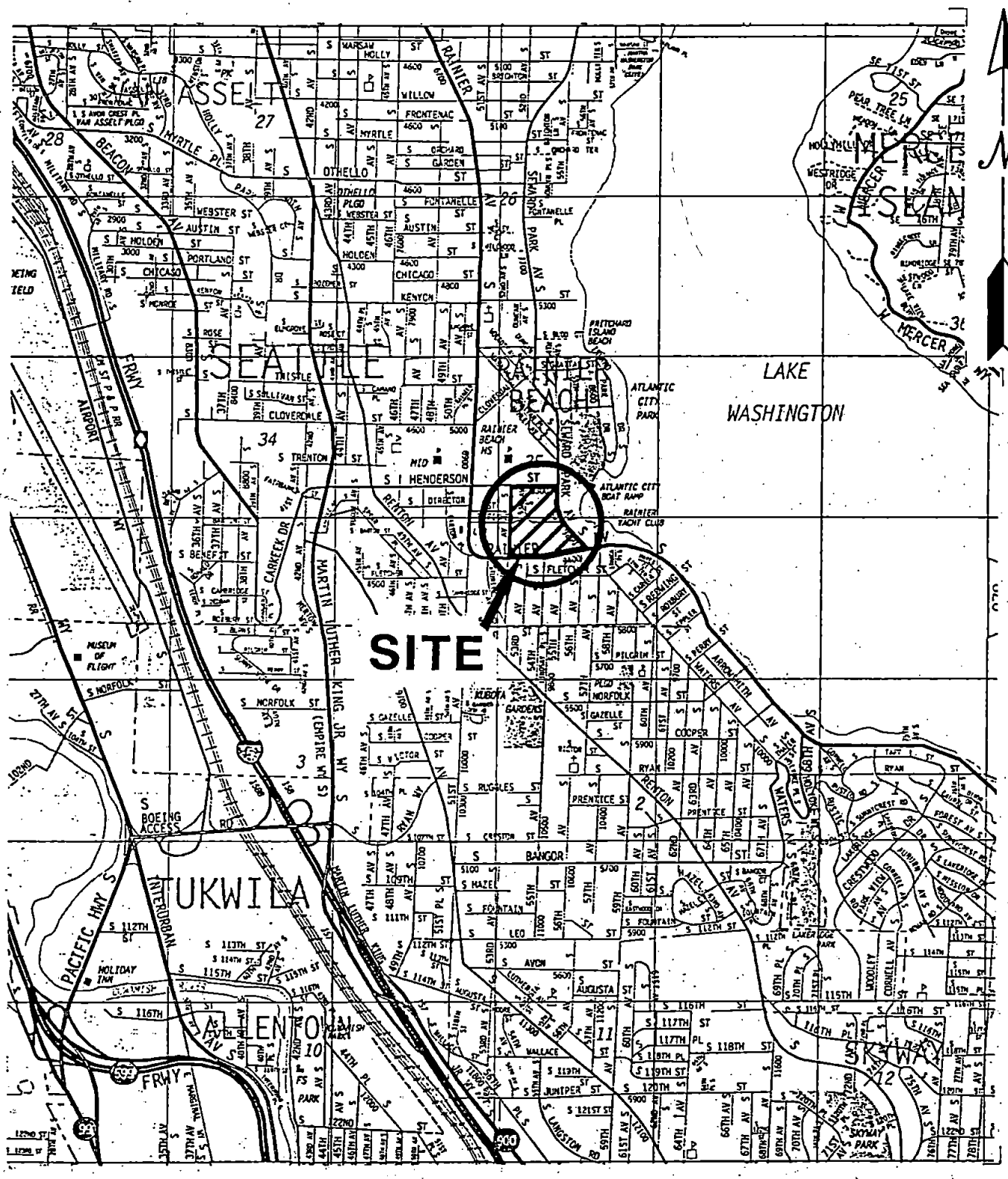
5.0 ADDITIONAL SERVICES

Terra Associates, Inc. should review the final design and specifications to verify that earthwork and drainage recommendations have been properly interpreted and implemented in project design. We should also provide geotechnical services during construction in order to observe compliance with the design concepts, specifications, and recommendations. This will allow design changes if subsurface conditions differ from those anticipated prior to the start of construction.

6.0 LIMITATIONS

We prepared this report in accordance with generally accepted geotechnical engineering practices. This report is the property of Terra Associates, Inc. and is intended for specific application to the Seward Park Estates project. This report is for the exclusive use of AF Evans Company, Inc. and their authorized representatives. No other warranty, expressed or implied, is made.

The analyses and recommendations presented in this report are based upon data obtained from the borings advanced on-site. Variations in soil conditions can occur, the nature and extent of which may not become evident until construction. If variations appear evident, we should reevaluate the recommendations in this report prior to proceeding with construction.

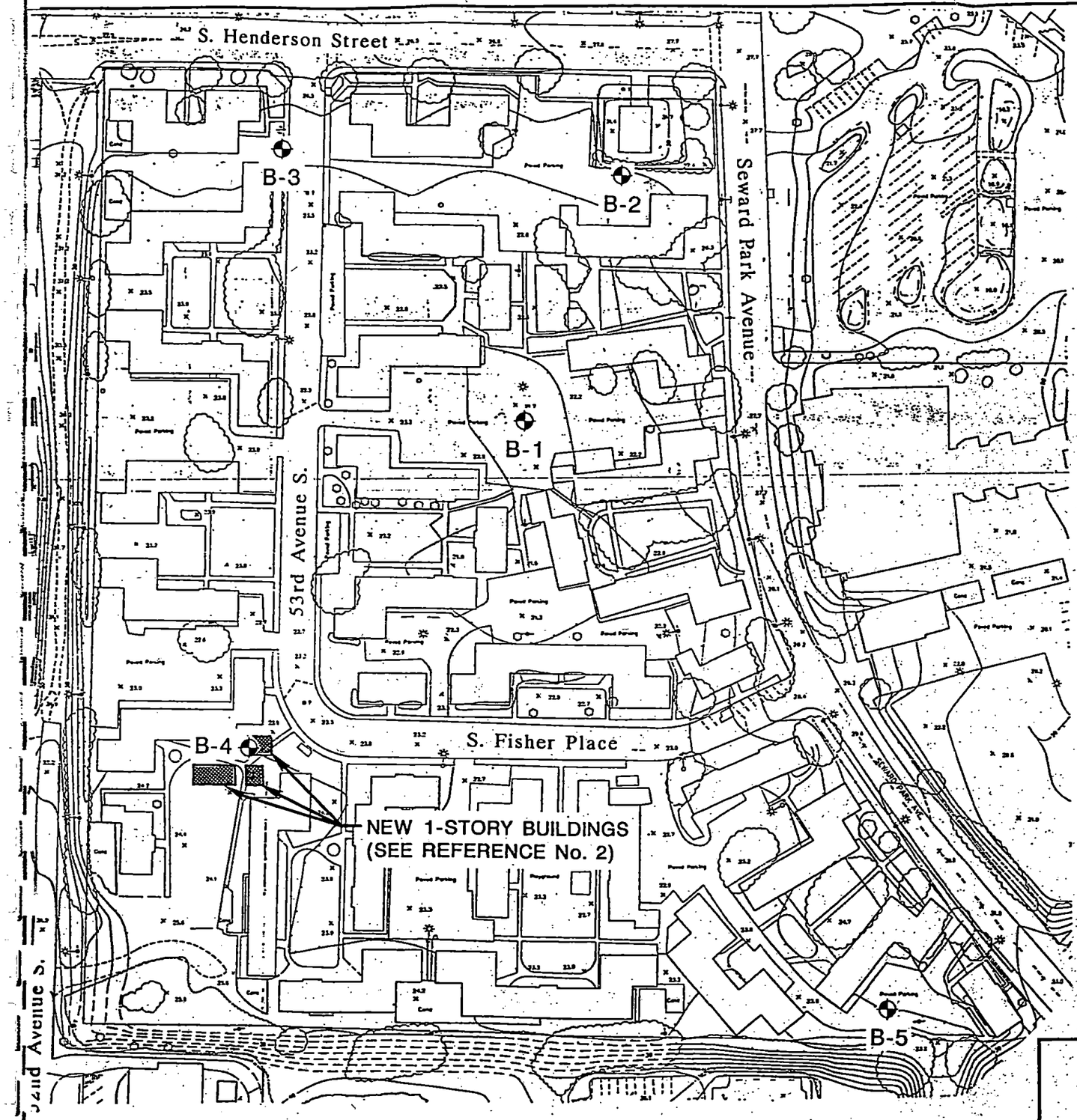


REFERENCE: THE THOMAS GUIDE, KING COUNTY, WASHINGTON, PAGE 625, 1996 EDITION.

TERRA ASSOCIATES
Geotechnical Consultants

VICINITY MAP
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. 2911	Date 7/96	Figure 1



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APPROXIMATE SCALE

120 0 120 240 feet

LEGEND:

⊕ APPROXIMATE BORING LOCATION

REFERENCE:

1. UNTITLED SITE PLAN PREPARED AND PROVIDED BY SvR DESIGN COMPANY, PROJECT No. 95029, SHEET 3.1, DATED MAY 24, 1996.
2. NEW 1-STORY BUILDING LOCATIONS ARE PER SITE PLAN DRAWING, SvR FILE No. 95029, DATED MAY 31, 1996.

TERRA ASSOCIATES
Geotechnical Consultants

EXPLORATION LOCATION PLAN
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. 2911	Date 7/96	Figure 2

APPENDIX A
FIELD EXPLORATION AND LABORATORY TESTING

Seward Park Estates
Seattle, Washington

On June 7 and 10, 1996, we performed our field exploration using a truck-mounted hollow stem auger drill rig. We explored subsurface soil and groundwater conditions at the site by drilling five hollow stem auger test borings to depths ranging from 20 to 44 feet below existing site grades. The test boring locations are shown on Figure 2. Test hole elevations were interpreted from the provided topographic survey. The Boring Logs are presented on Figures A-2 through A-6.

Our representative maintained a log of each test hole as it was drilled, classified the soil conditions encountered, and obtained representative soil samples. All soil samples were visually classified in accordance with the Unified Soil Classification System shown on Figure A-1.

Representative soil samples were obtained from the test borings using sampling procedures outlined in ASTM Test Designation D-1586. The samples were placed in jars or tubes (ring samples) and taken to our laboratory for further examination and testing. The moisture content of each sample was measured and is reported on the Boring Logs.

Plasticity characteristics of the fine-grained soils were determined by conducting Atterberg limits tests. The results of the Atterberg limits tests are shown on Figure A-7. Grain size analyses were performed on four of the samples. The results of the grain size analyses are presented as Figures A-8 and A-9. Consolidation tests were performed on two samples of the peat obtained from Borings B-4 and B-5. The consolidation curves developed from the tests are given in Figures A-10 and A-11.

MAJOR DIVISIONS			LETTER SYMBOL	GRAPH SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS: More than 50% material larger than No. 200 sieve size.	GRAVELS: More than 50% of coarse fraction is larger than No. 4 sieve.	Clean Gravels (less than 5% fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP		Poorly-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GM		Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC		Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS: More than 50% of coarse fraction is smaller than No. 4 sieve.	Clean Sands (less than 5% fines)	SW		Well-graded sands, gravelly sands, little or no fines.
			SP		Poorly-graded sands or gravelly sands, little or no fines.
		Sands with fines	SM		Silty sands, sand-silt mixtures, non-plastic fines.
			SC		Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS: More than 50% material smaller than No. 200 sieve size.	SILTS AND CLAYS: Liquid limit is less than 50%		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL		Organic silts and organic clays of low plasticity.
	SILTS AND CLAYS: Liquid limit is greater than 50%		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic.
			CH		Inorganic clays of high plasticity, fat clays.
			OH		Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			PT		Peat and other highly organic soils.

DEFINITION OF TERMS AND SYMBOLS

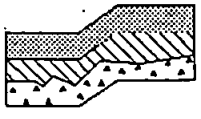
SAND or GRAVEL

Density	Standard Penetration Resistance in Blows/Foot
Very loose	0-4
Loose	4-10
Medium dense	10-30
Dense	30-50
Very dense	>50

SILT or CLAY

Consistency	Standard Penetration Resistance in Blows/Foot
Very soft	0-2
Soft	2-4
Medium stiff	4-8
Stiff	8-16
Very stiff	16-32
Hard	>32

I	2" OUTSIDE DIAMETER SPLIT SPOON SAMPLER
I	2.4" INSIDE DIAMETER RING SAMPLER OR SHELBY TUBE SAMPLER
P	SAMPLER PUSHED
*	SAMPLE NOT RECOVERED
▽	WATER LEVEL (DATE)
	WATER OBSERVATION STANDPIPE
C	TORVANE READINGS, tsf
q_u	PENETROMETER READING, tsf
W	MOISTURE, percent of dry weight
pcf	DRY DENSITY, pounds per cubic foot
LL	LIQUID LIMIT, percent
PI	PLASTIC INDEX
N	STANDARD PENETRATION, blows per foot



TERRA ASSOCIATES
Geotechnical Consultants

SOIL CLASSIFICATION SYSTEM
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. T-2911	Date 7/96	Figure A-1

Boring No. B-1

Logged by: DKW

Date: 6/7/96

Approximate Elev. 22

Graph/ USCS	Soil Description	Relative Density	Depth (ft.)	Sample	(N) Blows/ foot	Water Content (%)
SM	(3.5 inches asphaltic concrete) 4 inches brown silty sand with angular gravel (1.5 to 3 inches) (FILL)	Loose			6	35.4
SM	Blue-grey gravelly silty sand, moist to damp. (FILL)		5		1	24.2
SM	Grey gravelly silty sand with CLAY, moist. (FILL)	Very Loose			3	198.6
PT	Dark brown PEAT, wet.	Very Soft				
PT	Lost sample, use spt retrieve for peat.		10		1	
PT	Brown PEAT, wet.	Very Soft			2	387.0
PT	Brown PEAT.	Very Soft	15		1	
ML CL	Grey clayey SILT to silty CLAY, damp to wet.	Very Soft				
SM	Blue/grey silty fine SAND with trace organics, wet.	Loose	20		5	23.5
SM	Grey silty fine to medium SAND with trace organics, wet.	Medium Dense	25		13	23.3
SM SP	Grey slightly silty to clean SAND with occasional gravel, wet	Medium Dense				
SM	Grey gravelly silty SAND, moist. (TILL)	Very Dense	30		52	19.5

Boring terminated at 33.5 feet.
Backfill with drill spoil.
Upper seal: 1 bag bentonite chips at 4 feet and 2.5 bags concrete/pea gravel 4 feet to surface.
Water level at end of drilling measured at 20.5 feet.
Groundwater encountered at 12.5 feet.
*Water level after pull out at 2.5 feet below surface.
Suspect high due to hole caving.

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Geotechnical Consultants

BORING LOG
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. T-2911 | Date 7/96 | Figure A-2

Boring No. B-2

Logged by: DKW

Date: 6/7/96

Approximate Elev. 24

Graph/ USCS	Soil Description	Relative Density	Depth (ft.)	Sample	(N) Blows/ foot	Water Content (%)
SM	2 inches asphaltic concrete. 2.5 inches crushed rock base. Grey gravelly silty sand, wet. (FILL)					
ML	Grey clayey fine sandy silt wet. (FILL)	Loose			9	
	Grey silty sand, wet. (FILL)	Loose				
	Brown fine sandy SILT, moist.	Dense	5		49	14.6
ML	Brown fine sandy SILT with occasional gravel, moist.	Very Dense			94/11"	14.9
ML/SM	Brown fine sandy SILT grades to silty sand with occasional gravel, moist.	Very Dense	10		70	16.8
	Brown to tan fine sandy SILT, moist.	Hard			50/5"	16.8
ML			15	▼		
					50/4"	16.8
ML	Blue grey fine sandy SILT, moist.	Hard				
			20			
SM	Blue/grey silty fine SAND, moist.	Very Dense			50/5.5"	12.7

Boring terminated at 22.5 feet.
Groundwater at 17 feet.

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Geotechnical Consultants

BORING LOG
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. T-2911	Date 7/96	Figure A-3

Boring No. B-3

Logged by: DKW

Date: 6/10/96

Approximate Elev. 26

Graph/ USCS	Soil Description	Relative Density	Depth (ft.)	Sample	(N) Blows/ foot	Water Content (%)		
	Brown gravelly silty sand. (FILL)					5.2		
	Lost ring. Redrive SPT.							
SM	Blue/grey silty sand with gravel, moist. (FILL)	Medium Dense			13			
	Blue/grey silty sand with gravel, wet.	Medium Dense	5		22	10.9		
ML	Blue/grey gravelly sandy silt with clay, moist. (FILL)	Medium Dense			16	10.9		
	Brown PEAT.	Very Soft	10		2	401.9		
	Brown PEAT, wet.	Soft						
		Soft	15		2	426.5		
PT	Brown PEAT, wet.	Very Soft			1	369.1		
	Brown PEAT with trace clay, wet.	Very Soft	20					
					2			
	Brown PEAT with some SAND, wet.	Very Soft	25					
					7	27.4		
SM	Grey silty SAND with clay and gravel, wet.	Loose	30					
ML / SM	Grey sandy SILT with gravel to gravelly silty SAND, moist. (Till)	Very Dense			50/2"	15.1		

Boring terminated at 33 feet.
Seal with 3 bags bentonite chips and 1 bag pea gravel at top.
Backfill with soil drill spoil.
Water table/seepage not observed at termination.

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Geotechnical Consultants

BORING LOG
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. T-2911	Date 7/96	Figure A-4

Boring No. B-4

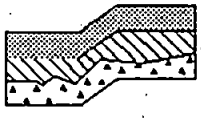
Logged by: DKW

Date: 6/10/96

Approximate Elev. 24

Graph/ USCS	Soil Description	Relative Density	Depth (ft.)	Sample	(N) Blows/ foot	Water Content (%)
SM	Grey silty sand with gravel. (FILL)					
PT	Brown PEAT, wet.	Medium Stiff			9	128.9
	Brown PEAT and WOOD, wet.	Soft	5		1	258.0
	Brown PEAT, wet.	Very Soft			1	634.5
	Brown PEAT some SAND, wet.	Very Soft	10		1	349.4
	Brown PEAT, wet, sand in shoe	Very Soft			1	430.5
CL	Grey silty CLAY, wet.	Very Soft	15		1	46.4
ML	Blue grey elastic SILT with fine SAND.	Stiff			11	34.9
CH	Tan silty CLAY, moist. qu=1.0 to 1.25 tsf	Stiff	20		14	48.0
	Brown to blue grey silty CLAY, moist.	Medium Stiff	25		8	45.0
	Grey silty CLAY, moist.	Medium Stiff	30 ▼		7	30.8
	Grey silty CLAY with fine sand lenses. qu=1.5tsf	Very Stiff	35		26	38.8
SM	Grey silty SAND with clay, wet. (Till-like)	Very Dense	40		82	15.5

Boring terminated at 44 feet.
Water level at 32 feet at termination. Hole caved at pull out.
Backfill hole with 3 bags bentonite chips and 1 bag pea gravel and replace sod.



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BORING LOG
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. T-2911	Date 7/96	Figure A-5

Boring No. B-5

Logged by: DKW

Date: 6/10/96

Approximate Elev. 24

Graph/ USCS	Soil Description	Relative Density	Depth (ft.)	Sample	(N) Blows/ foot	Water Content (%)		
SM	Grey silty sand with gravel, wet, peat in shoe. (FILL)	Loose			4	21.0		
PT	Brown PEAT, wet.	Very Soft	5		1	406.7		
PT	Brown PEAT with wood chips, wet.	Very Soft			1	315.0		
MH	Blue/grey elastic clayey SILT.	Very Stiff	10		19	31.9		
SM	Brown silty fine to medium SAND, moist.	Dense			41	13.9		
SM	Brown gravelly silty SAND, moist.	Very Dense	15		51	11.5		
SM	On cobbles rock; chips in shoe.	Very Dense			50/2"			

Boring terminated at 20 feet.
Dry hole.
Patch and bentonite chips pea gravel.

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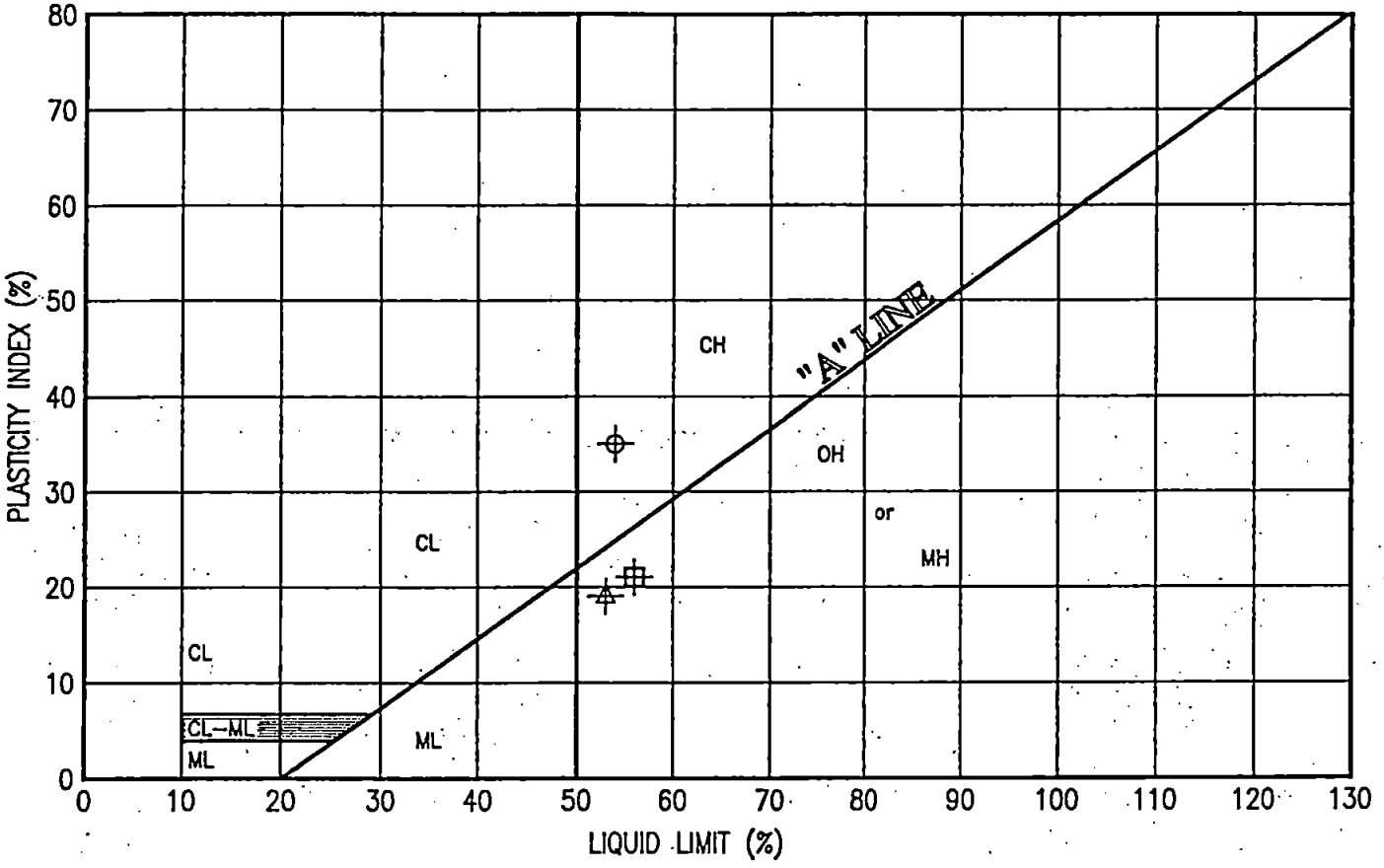
BORING LOG
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. T-2911 | Date 7/96 | Figure A-6

PLASTICITY CHART



PLASTICITY DATA

KEY SYMBOL	HOLE NUMBER	DEPTH (feet)	NATURAL WATER CONTENT W(%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $\left(\frac{W - PL}{LL - PL}\right)$	UNIFIED SOIL CLASSIFICATION SYMBOL
⊿	B-4	17.5	34.9	53	34	19	0.05	MH
⊕	B-4	27.5	45.0	54	19	35	0.74	CH
⊞	B-5	10.0	31.9	56	35	21	-0.15	MH

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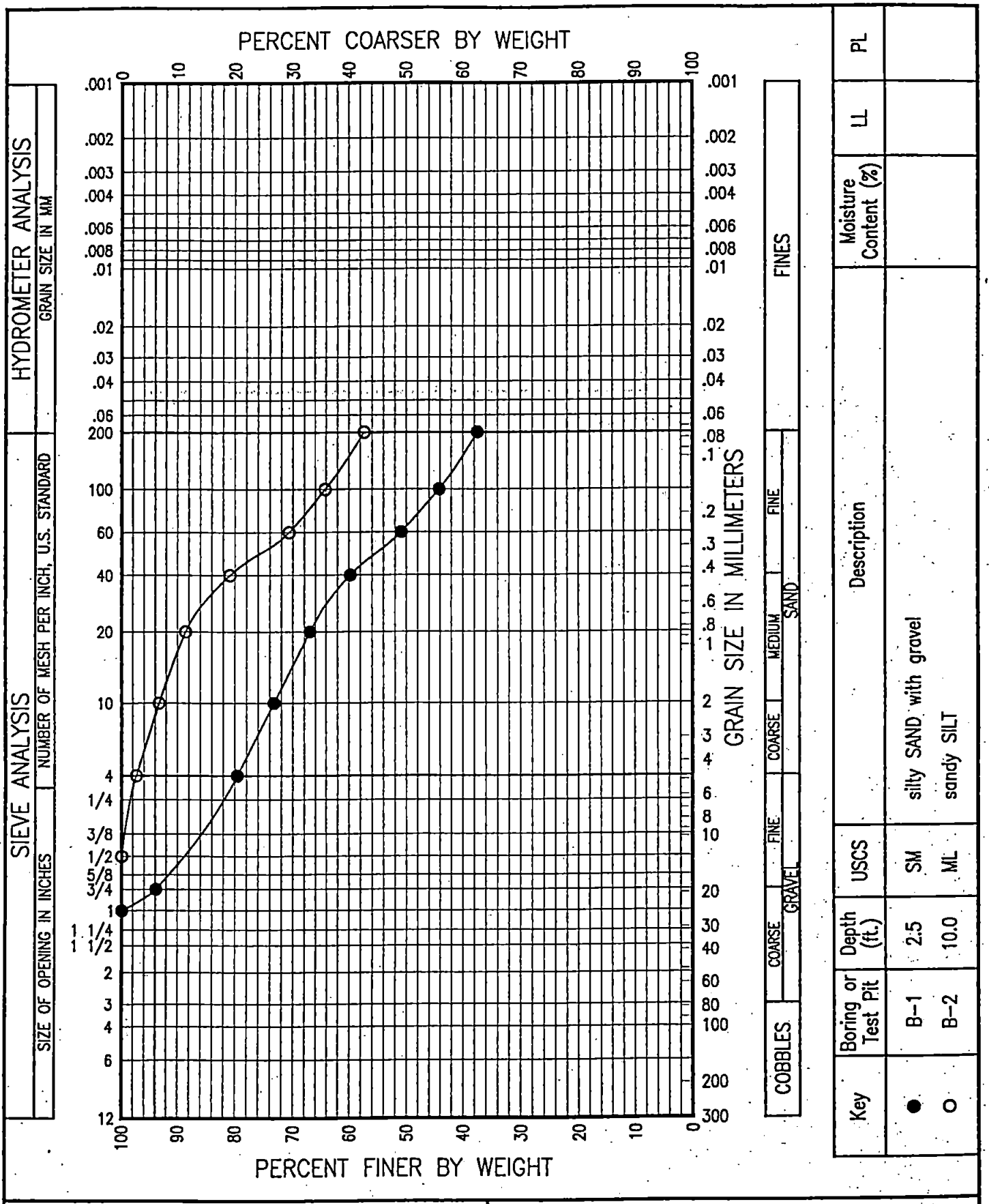
PLASTICITY CHART
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. 2911	Date 7/96	Figure A-7



Key	Boring or Test Pit	Depth (ft.)	USCS	Description	LL	PL	Moisture Content (%)
●	B-1	2.5	SM	silty SAND with gravel			
○	B-2	10.0	ML	sandy SILT			

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GRAIN SIZE ANALYSIS
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. 2911 | Date 7/96 | Figure A-8

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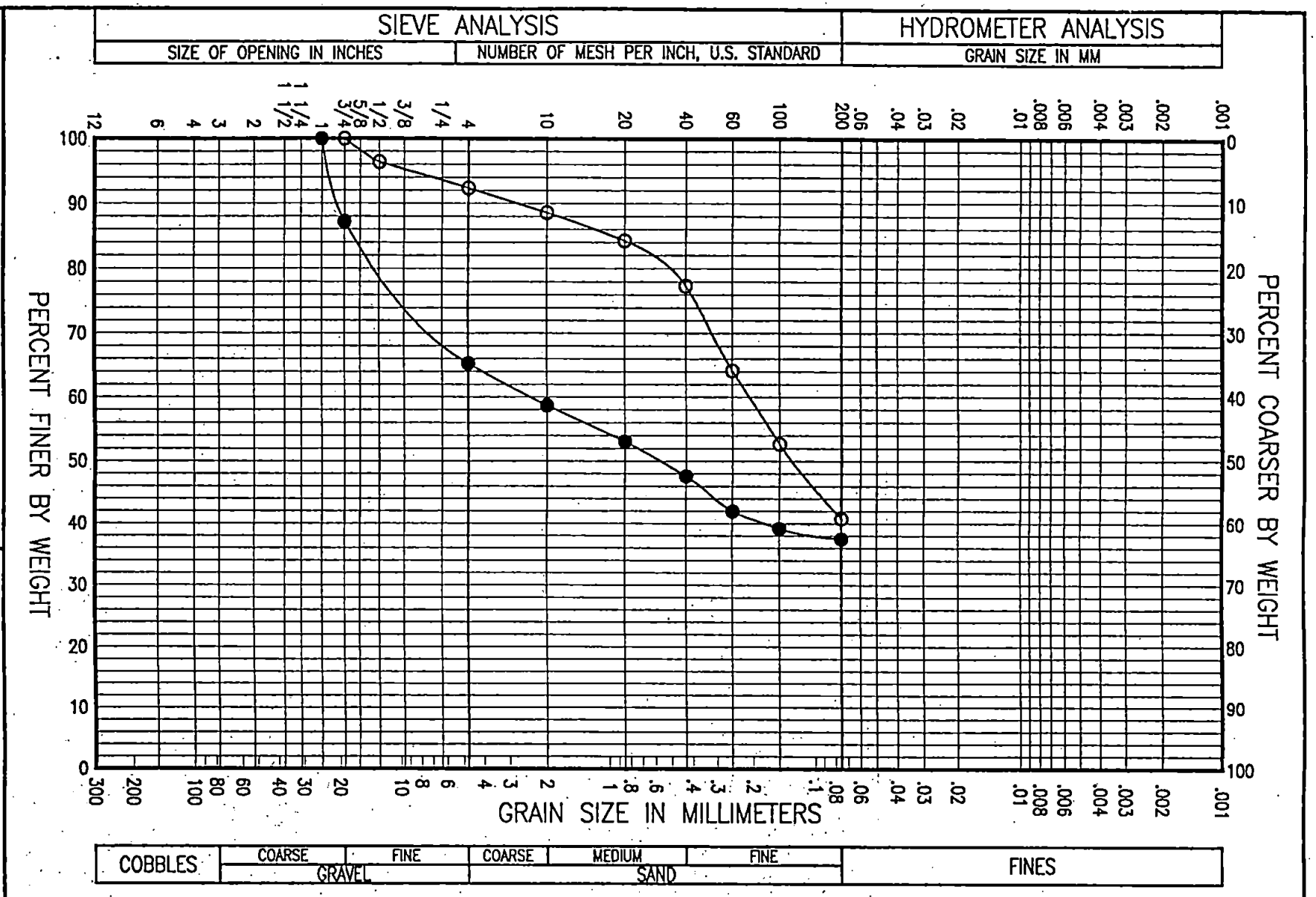
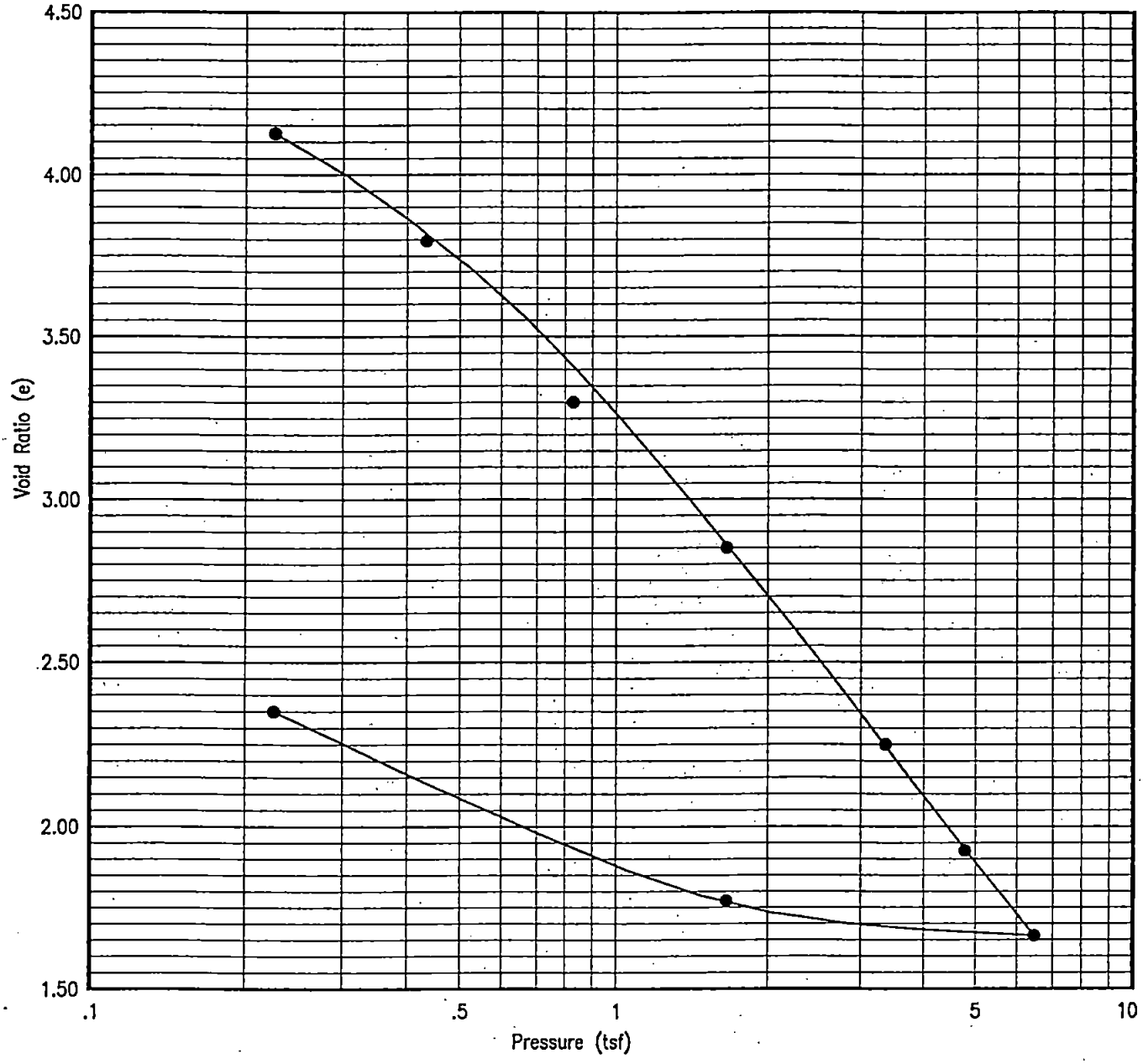
GRAIN SIZE ANALYSIS
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No.2911 | Date 7/96 | Figure A-9



Key	Boring or Test Pit	Depth (ft.)	USCS	Description	Moisture Content (%)	LL	PL
●	B-3	7.5	SM	silty gravelly SAND			
○	B-5	12.5	SM	silty SAND with some gravel			



Key	Boring No.	Depth (ft.)	USCS	Soil Description	C_c	C_α	e_o	Moisture Content, W% Before	Moisture Content, W% After	Dry Density (pcf)
●	B-4	5.0	PT	Brown PEAT	3.08	0.012	4.46	258	156	18.2

C_c = Virgin Compression Index
C_α = Coefficient of Secondary Compression (at 0.22 tsf)
e_o = Inplace Void Ratio

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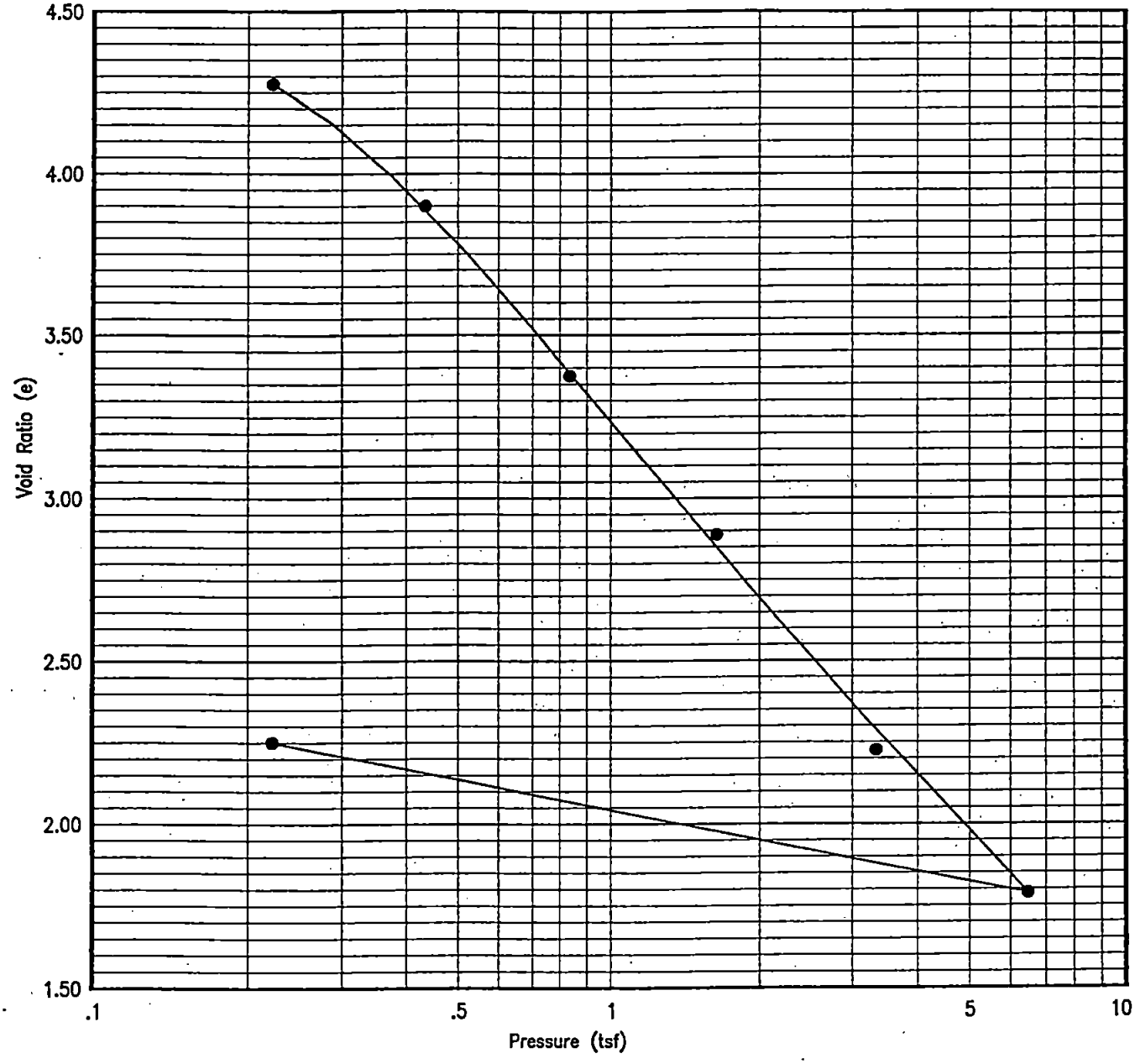
CONSOLIDATION TEST DATA
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. 2911 | Date 7/96 | Figure A-10



Key	Boring No.	Depth (ft.)	USCS	Soil Description	C_c	C_α	e_o	Moisture Content, W% Before	Moisture Content, W% After	Dry Density (pcf)
●	B-5	7.5	PT	Brown PEAT	2.39	0.020	5.07	315	187	16.5

C_c = Virgin Compression Index
C_α = Coefficient of Secondary Compression (at 0.43 tsf)
e_o = Inplace Void Ratio

TERRA ASSOCIATES
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CONSOLIDATION TEST DATA
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Proj. No. 2911	Date 7/96	Figure A-11

APPENDIX B

Phase I Environmental Site Assessment (GeoEngineers 1995)

Phase I Environmental Site Assessment
Seward Park Estates
9061 Seward Park Avenue South
Seattle, Washington

March 20, 1995

For

A.F. Evans Company, Inc.

GeoEngineers

March 20, 1995

Geotechnical,
Geoenvironmental and
Geologic Services

A.F. Evans Company
3236 Stone Valley Road West, Suite 210
Alamo, California 94507

Attention: Mr. Arthur Evans

We are submitting ten copies of our Phase I Environmental Site Assessment for the Seward Park Estates property located at 9061 Seward Park Avenue South in Seattle, Washington. Our services were authorized by Mr. Arthur Evans on March 10, 1995.

Please contact us if you require additional information or an interpretation of the information presented in this report.

Yours very truly,

GeoEngineers, Inc.

Robert G. Breynaert
Associate

DEW:RGB:cms
Document ID: 4251001.R

File No. 4251-001-R52

GeoEngineers, Inc.
8410 154th Avenue N.E.
Redmond, WA 98052
Telephone (206) 861-6000
Fax (206) 861-6050

CONTENTS

TABLES

CONTENTS (continued)

PHASE I ENVIRONMENTAL SITE ASSESSMENT
SEWARD PARK ESTATES
9061 SEWARD PARK AVENUE SOUTH
SEATTLE, WASHINGTON
FOR
A.F. EVANS COMPANY, INC.

1.0 INTRODUCTION

This report summarizes the results of our Phase I ESA (environmental site assessment) of the Seward Park Estates property, located at 9061 Seward Park Avenue South, in Seattle, Washington. The subject property presently contains 34 buildings containing 364 apartments, driveways and parking areas. The general location of the site is shown in the Vicinity Map, Figure 1.

1.1 PURPOSE

The purpose of this Phase I ESA is to identify the presence or likely presence of hazardous substances, including petroleum products, that may have resulted or could result in a release of hazardous substances into site structures or into the site surface or subsurface. The specific scope of services completed for the Phase I ESA is described in section 1.3.

1.2 INVOLVED PARTIES

GeoEngineers, Inc.'s services were performed for A.F. Evans Company Inc., who we understand is considering purchase of the subject property. Our services were performed in accordance with the scope of services present in our Confirming Agreement, Phase I Environmental Site Assessment, Seward Park Estates, dated March 1, 1995.

1.3 SCOPE OF SERVICES

Our scope of services is in general accordance with the following:

- Phase I ESA scope identified in ASTM (American Society for Testing and Materials) Standard E 1527-94, Standard Practice for Phase I ESAs.
- Bank of America Scope of Work and Report Outline for Phase I ESAs performed by consultants on behalf of credit taker.

Our scope of services also included examining building plans to evaluate the potential number, size and locations of heating oil USTs (underground storage tanks) present beneath the site and a survey to evaluate the presence of ACMs (asbestos containing materials) in the apartment buildings. Our specific scope of services completed for this Phase I ESA is as follows:

1. Review readily available geotechnical reports, environmental reports or other relevant documents pertaining to environmental conditions at the subject site.
2. Review federal, state and local environmental databases for listings of known or suspected environmental problems at the subject site or nearby properties. The specific databases and minimum search distances we reviewed were as follows:

EPA (U.S. Environmental Protection Agency) Lists	Minimum Search Distance
NPL (National Priorities List)	1 mile
CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System)	0.5 mile
RCRA (Resource Conservation and Recovery Act) List TSD (treatment, storage and disposal) Facilities	1 mile
RCRA List, Generators and Transporters	Site and Adjoining Properties
ERNS (Emergency Response Notification System) List	Site
Ecology (Washington State Department of Ecology) and Local Health Department Lists	
Toxics Cleanup Program Confirmed and Suspected Contaminated Sites List and MTCA Site Register	1 mile
Registered UST (underground storage tank) Sites	Site and Adjoining Properties
Leaking UST Sites List	0.5 mile
Active and Abandoned Landfills or Solid Waste Disposal Facilities	0.5 mile

3. Review regulatory agency files regarding listed sites of potential environmental concern.
4. Interview a representative of the local fire department, health department and/or Ecology, as available, regarding the history of the subject site and surrounding properties relative to the likely presence of hazardous substances.
5. Review historical aerial photographs, fire insurance maps, USGS (United States Geological Survey) maps, city business directories, and county tax assessors records, as available and appropriate, to identify past development history on and adjacent to the site relative to the possible use, generation, storage, release or disposal of hazardous materials. We will attempt to identify uses of the site from the present to the time that records show no apparent development of the site or back to 1940, whichever is earlier.
6. Review building plans to evaluate the potential number, size and locations of heating oil USTs
7. Obtain and review a property history chain-of-title report summarizing recorded real estate transactions involving the property.
8. Interview current and past property owners, or others familiar with past and present uses of the site and its vicinity.

9. Review current USGS topographic map(s) to identify the physical setting of the property.
10. Identify the source(s) of potable water for the site and the type and age of the sewage disposal system(s) used at the site, if any.
11. Conduct an asbestos survey of the on-site buildings. The scope and results of the ACM survey are summarized in Appendix A.
12. Provide a written opinion regarding the possible presence of hazardous substances that could impact the site, based on the results of our ESA.

Our completed scope of services did not include an environmental compliance audit or an evaluation for the presence of radon gas or lead-based paint. Specific contamination evaluation procedures, such as soil or ground water sampling and chemical analysis also are not included in this scope of services.

2.0 GENERAL SITE CHARACTERISTICS

2.1 LOCATION

The property address is 9061 Seward Park Avenue South, in Seattle, Washington. The site vicinity is shown in Figure 1. Each building has a separate address. Figure 2, Site Plan, shows the building addresses.

2.2 ADJACENT PROPERTIES

The subject site is bounded on the north by South Henderson Street, on the east by Seward Park Avenue South, on the west by a city right of way, and on the south by small businesses including a convenience store/service station and a dry cleaners. In general, land use on nearby properties is primarily residential and commercial.

2.3 SITE DESCRIPTION

The site is approximately 16.5 acres in size, roughly square in shape and flat. The fenced site contains 34 buildings containing 364 residential apartments. Boiler rooms are present in nine of the buildings. A number of buildings have laundry rooms. A maintenance/storage area is located within the basement of the office/model apartment building. Access to buildings within the interior of the property is gained from 53rd Avenue South and South Fisher Place, city of Seattle streets that are located entirely within the subject site. Parking areas, common areas and driveways are located between the buildings. The general layout of the site is shown in Figure 2. Photographs of the site are shown in Figure 3.

3.0 ENVIRONMENTAL SETTING

3.1 REGIONAL PHYSIOGRAPHIC CONDITIONS

The site is located approximately 500 feet west of Lake Washington. The approximate ground surface elevation of the site is 25 feet above mean sea level. The elevation of Lake Washington is 21 feet above mean sea level. The topography of the site and immediately surrounding properties is relatively flat.

3.2 GEOLOGIC CONDITIONS

Our understanding of the general geology and hydrogeology of the site and vicinity is based on a review of the USGS geological map of the Seattle Washington quadrangle. Based on our review of the map, the site lies on a relatively shallow layer of fill that overlies native alluvial soils. The native alluvial soils likely consist of sand with silt or silty sand. There is a high probability of naturally occurring organics in the soils. We have no site specific information regarding the depth to ground water and ground water flow direction beneath the site. However, based on our prior experience, shallow ground beneath the site is likely located within 5 to 10 feet of the ground surface. The direction of shallow ground water flow at the site is likely to the east based on site topography and the proximity to Lake Washington.

4.0 RESULTS OF INVESTIGATION

4.1 SITE RECONNAISSANCE OBSERVATIONS

4.1.1 General

A representative from GeoEngineers performed a visual reconnaissance of the site and surrounding properties on March 10, 1995. The site contains 34 wood-frame buildings. Within these buildings are nine former boiler rooms. The boiler room heating system is no longer in use. Six of the boiler rooms still contain the original boilers and associated piping. Building materials containing asbestos (ACMs) that are present in these boiler rooms are described in Appendix A.

Each boiler system included two USTs (underground storage tanks) located outside of the boiler rooms. We understand that one of the USTs was used to store bunker crude oil and the second to store heating oil (fuel oil). Several of the UST fill pipes and vent pipes connected to these tanks are still visible outside of the boiler rooms (photographs of these are shown in Figure 4). We estimate that 18 USTs are present beneath the site. Based on the location of fill and vent pipes, the inferred UST locations are shown in Figure 2. A weighted tape was lowered into all accessible fill pipes to assess contents and UST volumes. Several of the tanks contained residual product, sludge and/or water. We estimate the UST volumes range from approximately 500 gallons to 2,000 gallons.

Overhead power lines and 15 pole-mounted transformers were observed on the site. We contacted Seattle City Light regarding the possibility of PCBs (polychlorinated biphenols) in the transformers. All 15 pole-mounted transformers were purchased by Seattle City Light in 1979 and 1980. The transformers have not been tested for PCBs. Therefore, federal regulations require Seattle City Light to manage them as PCB transformers until proven otherwise.

Stormwater is managed on-site by a storm sewer system. We observed several storm sewer catch basins in the roadways and parking areas of the site. There were no visual indications of hazardous substance dumping on the site including within the catch basins. Site drainage is fair, with standing water visible on many of the grass areas. We observed ponded water under one of the buildings. No evidence of the disposal of hazardous substances was observed during the site reconnaissance. In addition, no ASTs (aboveground storage tanks) or storage drums were observed at the site during our reconnaissance.

We also made observations regarding the potential presence of PCB light ballasts in fluorescent light fixtures. A total of five light ballasts located in the maintenance area and four laundry rooms were visually examined to assess the likelihood that PCBs are present in the light ballast dielectric fluid. Fluorescent light fixtures were not observed in the apartment units. The ballast labels were examined to assess whether a label stating "No PCBs" was present. We understand that the "No PCBs" label indicates that PCBs are not present in the light ballast. The ballasts in each of the light fixtures contained labels that stated "No PCBs."

4.1.2 Visual Survey for Suspect ACMs

Information regarding suspect ACMs is contained in Appendix A, which describes the asbestos survey results.

4.2 ADJACENT PROPERTIES

The site is bordered to the north by South Henderson Street. Across South Henderson Street is Rainier Beach High School. The site is bordered to the east by Seward Park Avenue South. Across Seward Park Avenue is a park and an apartment building. The site is bordered on the south by small commercial properties including a convenience store/service station that contains USTs and a fuel dispensing island, and two dry cleaners. The site is bordered to the west by a city right of way across from which is a commercial area occupied by two grocery stores, fast food restaurants and a dry cleaners. Land use on adjacent properties is also summarized in Section 2.2.

4.3 RESULTS OF REGULATORY AGENCY LIST REVIEW AND FILE RESEARCH

4.3.1 EPA Lists

We reviewed EPA lists for information on properties with environmental concerns located within the minimum search distance identified in the "Scope of Services" section of this report. The following is a summary of the lists reviewed and their contents. The approximately locations

of listed sites identified are shown in Figure 6. The listed sites are presented in Table 1. We did not attempt to resolve inconsistencies between lists.

- NPL dated January 18, 1994. This list includes sites that have been officially designated as priority cleanup sites. No sites located within a 1-mile radius of the subject site appear on this list.
- CERCLIS list dated January 5, 1995. This list includes sites where hazardous substances are known or suspected to have been released and where assessment and remediation under EPA's CERCLA program may be in progress. No CERCLIS sites are listed as being located within 1/2 mile of the site.
- RCRA notification system dated February 3, 1995. This list identifies facilities that are classified by the EPA as hazardous waste generators or transporters or as TSD (treatment, storage, or disposal) facilities. A facility appearing on this list does not imply that releases of hazardous materials have occurred at the facility. No RCRA TSD facilities are listed within 1 mile of the site. There are four listed RCRA generators or transporters at addresses of adjacent properties (Table 1).
- ERNS (Emergency Response Notification System) list through June 30, 1993. The ERNS database contains a listing of releases of oil and hazardous substances reported to various federal agencies since October 1990. The site address is not included on this list.

4.3.2 Ecology and Health Department Lists

We reviewed Ecology and Health Department lists for information on properties with environmental concerns located within the minimum search distances identified in the "Scope of Services" section of this report. The following is a summary of the lists reviewed and their contents. The approximate locations of the listed sites identified are shown in Figure 3. The listed sites are presented in Table 1. The following is a summary of the lists reviewed.

- Toxics Cleanup Program C&SCS (Confirmed and Suspected Contaminated Sites) List dated November 7, 1994. The C&SCS identifies potentially contaminated sites for which Ecology has conducted an initial investigation. If the investigation shows that further action is needed, the site appears on this list. Three sites within a 1-mile radius of the subject site appears on this list (Table 1).
- MTCA Site Register, April 26 through January 17, 1995. The site register also identifies potentially contaminated sites recently brought to the attention of Ecology. There are two sites within a 1-mile radius of the subject site that appear on the site registers we reviewed (Table 1).
- Registered UST site list dated March 21, 1994 of USTs registered with Ecology. The on-site heating oil and bunker fuel USTs are not registered with Ecology. There are three registered UST sites located in the site vicinity (Table 1).
- Leaking UST site list dated October 3,1994 of leaking USTs reported to Ecology. Four leaking UST sites were identified within a 1/2-mile radius of the subject site (Table 1).

- Seattle-King County Health Department documents on landfills including the compliance report for Washington municipal solid waste landfills dated April 1993 and a list of area landfills dated October 1990. There are no known active or abandoned landfills within 1/2 mile of the subject site based on our review of the landfill register.

4.3.3 Ecology File Review

We reviewed the Ecology files for the listed LUST sites summarized below. Table 1 summarizes the site locations. Figure 6 shows the locations of these sites relative to the subject site:

South Shore Texaco: The Ecology file contained a report dated July, 1989 documenting a gasoline leak near the gasoline service island. The report states that the contaminated soil was excavated and remediation was completed. No information was available regarding whether ground water was impacted by the release.

Rossoe Energy Systems: The Ecology file describes this business as a retail fuel and heating equipment sales and service company. The site is on the Ecology LUST list due to a leaking 200-gallon heating oil UST. A report dated September, 1989 described free phase product discovered just beneath the asphalt. "Ground water contamination is a possibility" according to the report. The report recommended soil excavation and remediation.

Rainier Beach Automotive: We reviewed a report dated January, 1991 that describes the removal of three USTs and the excavation of approximately 30 cubic yards of contaminated soil. The excavation was backfilled with "clean backfill." No further information was included in the file. The Ecology LUST list classifies the site status as "completed."

Southland Corporation (7-11): The Ecology file was missing for this site. A note dated July 1991, said "there appears to be 2-4 monitoring wells on the site." The LUST list indicates soil and ground water contamination. The status is indicated as "in progress." Ecology has requested a copy of the report from the Southland Corporation.

4.4 RESULTS OF SITE HISTORY/LAND USE REVIEW

4.4.1 Aerial Photographs

We reviewed historical aerial photographs of the site and surrounding properties for the years 1938, 1956, 1960, 1969, 1974, 1985, 1990 and 1993. The aerial photographs were obtained from Walker and Associates, Inc. The following is a summary of our interpretation of land use on the site and adjacent properties based on our review of the aerial photographs and our knowledge of the site.

1938 Photograph: The site consisted of farm land. No buildings were present on-site. The adjacent properties appear to be mostly undeveloped with some residential building present approximately 500 feet west of the site.

1956 Photograph: The site is fully developed as it is today. All of the apartment buildings and streets have been constructed. The surrounding properties are essentially unchanged from the 1938 photograph.

1960 Photograph: The site appears to be unchanged from the 1956 photograph. A large commercial building is visible adjacent to the northwest corner of the site. The building is currently occupied by Stock Market Foods. The remainder of the surrounding properties are essentially unchanged from the 1956 photograph.

1969 Photograph The site is unchanged from the previous photograph. Rainier Beach High School is now visible 200 feet north of the site. The area to the south of the site is developed with what appears to be small commercial buildings that remain in use today. The area adjacent to southwest corner of the site has been graded in preparation for development.

1974 Photograph: The site is essentially the same as in previous photographs. The surrounding properties are now fully developed, with a large commercial building visible to the southwest of the site. The large building is surrounded by smaller commercial structures that are currently occupied by fast food restaurants, a dry cleaners and a drug store. The large building is currently occupied by a Safeway supermarket.

1985, 1990 and 1993 Photographs: The site and surrounding properties are essentially unchange from the 1974 photograph.

4.4.2 Interviews

Property Manager

We interviewed Ms. Lori Hamilton, site manager of Seward Park Estates on March 15, 1995. Ms. Hamilton indicated she has been the manager of the subject property for approximately 2.5 years. She said the property is connected to City of Seattle water, sewer and electricity. Ms. Hamilton indicated that the facilities are approximately 45 years old and that to the best of her knowledge no industrial tenants have ever used the site. Ms. Hamilton stated that none of the apartment units contain florescent light fixtures, and to the best of her knowledge no hazardous substances have ever used or stored on the site.

Ms. Hamilton was not aware of any sumps or drywells on the subject site. She became aware of the boiler room USTs after a maintenance person observed a petroleum sheen while investigating water ponded under the building at 9040 53rd Avenue South (building #27). Ms. Hamilton stated that stained soil was also noticed under the structure. Building #27 houses boiler room #9 with two adjacent USTs.

Fire Department

We interviewed Ms. Diana Furtedo of the Seattle Fire Department on March 16, 1995 regarding the site and its vicinity. The fire department representative did not indicate any knowledge of hazardous substance releases in the immediate site vicinity.

4.4.3 Historical City Directories

We reviewed city directories covering the site vicinity dated 1938, 1943, 1955, 1951, 1960, 1968, 1975, 1983 and 1990. A listing of businesses which may have used or stored hazardous substances is outlined below.

Business	Address	Years Listed	Location Relative to the site
One Hour Martinizing	9180 Rainier Ave S.	1975 - 1995	500 feet west
Chevron Service Station	/9227 Rainier Ave S/	1951 - 1955	500 feet southwest
Elsey's Flying A	9253 Rainier Ave S.	1955	500 feet south
Taylor's Texaco	9275 Rainier Ave S.	1955 - 1968	500 feet south
Rainier Beach Auto Service	9305 Rainier Ave S.	1975 - 1983	500 feet south
Rainier Beach Cleaners	9432 Rainier Ave S.	1968 - 1983	500 feet southeast

4.4.4 Fire Insurance Maps

We reviewed historical Sanborn fire insurance maps for the years 1917, 1929 and 1950. The subject property appeared as vacant land on the 1917 and 1929 maps. The 1950 map showed the site developed as it is today. The maps contained no information regarding the on-site USTs or USTs on adjacent properties. No businesses of environmental concern to the subject property appeared on any of the available maps.

4.4.5 Review of City Permits

A representative of GeoEngineers reviewed the subject property file at the city of Seattle Department of Construction and Land Use. The file contained no applicable information regarding environmental site conditions.

4.4.6 Review of Building Plans

A representative of GeoEngineers reviewed copies of the original building plans made available by the current property manager. The plans show the site connected to the METRO

(Municipality of Metropolitan Seattle) sanitary sewer pump station located adjacent to the north east corner of the subject property. In addition, the plans show the site connected to the city water supply.

The plans showed the boiler room locations and the boiler room/UST configurations. The plans called for a "40 barrel fuel oil tank" to be located outside each boiler room and connected by pipes to the boiler.

4.4.7 Chain of Title Review

We have ordered a chain of title document for the subject property. The document did arrive before completion of this report. We will submit an addendum letter summarizing the results of the chain of title document.

4.5 REVIEW OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS

We understand that no previous environmental or geotechnical reports are available for the subject site.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on our Phase I ESA research and observations, we have identified the 18 on-site USTs, located adjacent to the nine boiler rooms to be potential sources of subsurface petroleum hydrocarbon contamination. The boiler rooms and inferred UST locations are shown in Figure 2. We conclude that there is a risk of subsurface contamination beneath the site associated with the on-site USTs. All accessible USTs contained residual product and some USTs contained varying amounts of water. The water may indicate a breach in the UST allowing ground water to collect in the tank. In addition, we understand that a petroleum hydrocarbon sheen on ponded water and hydrocarbon stained soil was observed in the crawl space under building # 27 (adjacent to UST) by maintenance personnel.

We identified the following off-site properties that have documented subsurface contamination that have the potential to impact shallow ground water beneath the subject site.

- The Rossoe Energy Systems property, located 500 feet south of the site. The site is on the Ecology LUST list. This site is upgradient of the subject site based on the inferred ground water flow direction. Therefore, this site presents a potential risk of subsurface ground water contamination to the subject property.
- A 7-11 (Southland) convenience store located immediately south of the subject property is listed on the Ecology LUST list. As of October 1994, this site cleanup was listed as "in progress" by Ecology for soil and ground water contamination. This site is upgradient of the subject site based on the inferred ground water flow direction. The 7-11 site presents potential risk to subsurface ground water beneath the property.

We recommend that the 18 USTs located beneath the subject site be removed. If subsurface soil contamination is encountered in the vicinity of the USTs, the contamination must be reported to Ecology within 24 hrs of discovery. The presence of subsurface contamination in the vicinity of the USTs would result in placement of the site on the Ecology LUST (leaking underground storage tank) list. Assessment and remediation of the impacted soil and ground water may be required as outlined in the State of Washington MTCA (Model Toxics Control Act) regulations.

6.0 LIMITATIONS

This Phase I ESA report has been prepared for use by the A.F. Evans Company. This report may be made available to the site owner, prospective lenders and to regulatory agencies. The report is not intended for use by others and the information contained herein is not applicable to other sites.

The information presented in this report is based on the above-described research and a single recent site visit. GeoEngineers has relied upon information provided by others in our description of historical conditions. The available data do not provide definitive information with regard to all past uses, operations or incidents at the site. There is always a potential that areas with contamination that were not identified during this Phase I ESA exist at the site. Further evaluation of such potential would require additional subsurface exploration, sampling and testing.

Our interpretation of shallow ground water flow direction is based solely on surface topography. The actual direction of ground water flow may be different from the direction discussed in this report. Ground water monitoring would be required to evaluate the actual depth and direction of ground water flow at the site.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices for ESAs in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

We look forward to being of continued service to the A.F. Evans Company on this project. Please call if you have any questions.

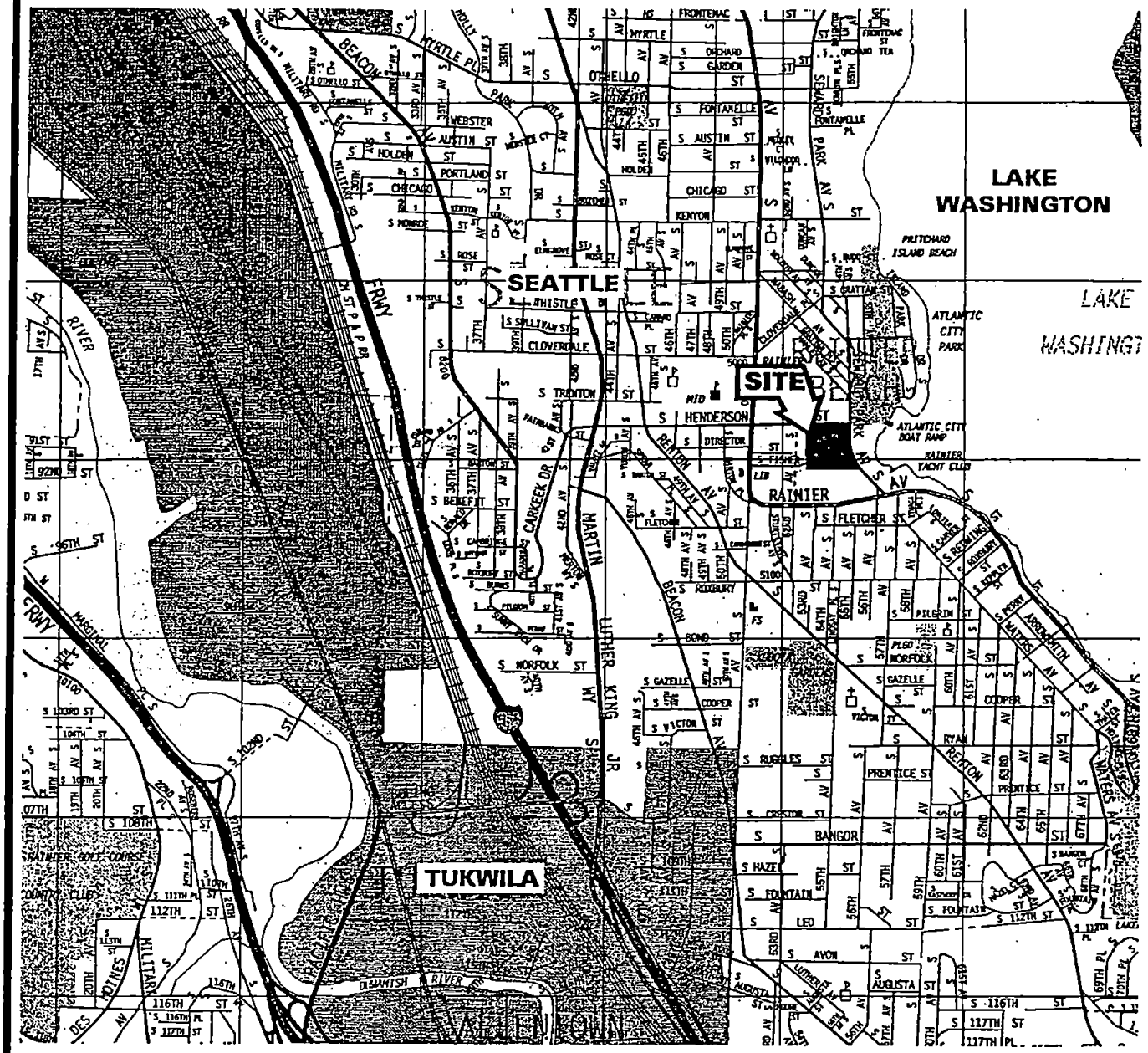
Respectfully submitted,

GeoEngineers, Inc.

Donald E. Wyll
Staff Scientist

Robert G. Breynaert
Associate

DEW:RGB:wd



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VICINITY MAP

FIGURE 1

TABLE 1
SUMMARY OF SITES ON EPA AND/OR ECOLOGY LISTS[1]
SEWARD PARK ESTATES
SEATTLE, WASHINGTON

Location ID	Site Name	Approximate Distance from Site[2]	Site Address	Source List[3]
1	South Shore Texaco	1/2 mile west, upgradient	9001 Renton Avenue South	LUST
2	Rossoe Energy Systems, Inc.	500 feet south, upgradient	9367 Rainier Avenue South	UST, LUST, Site Register, RCRA G&T
3	The Southland Corp. 2323-17381	Adjacent, south, upgradient	9436 Rainier Avenue South	UST, LUST, RCRA G&T
4	Rainier Beach Automotive	500 feet southeast, crossgradient	9474 Rainier Avenue South	LUST
5	Dickerson Property	3/4 mile southwest, crossgradien	9637 Martin Luther King Way South	Site Register
6	S. Henderson Street Pump Station	Adjacent, north, crossgradient	5314 South Henderson Street	UST
7	Khy and Li Property	1 mile west, crossgradient	9056 37th Avenue South	C&SCS
8	Martin Property	1/2 mile northwest, crossgradient	Northeast corner Cloverdale/Empire Way	C&SCS
9	Sam's Auto Repair	3/4 mile north, crossgradient	7722½ Rainier Avenue South	C&SCS
10	Rainier Beach High School	200 feet north, crossgradient	8815 Seward Park Avenue South	RCRA G&T
11	Washington One-Hour Cleaners	500 feet southwest, upgradient	9180 Rainier Avenue South	RCRA G&T

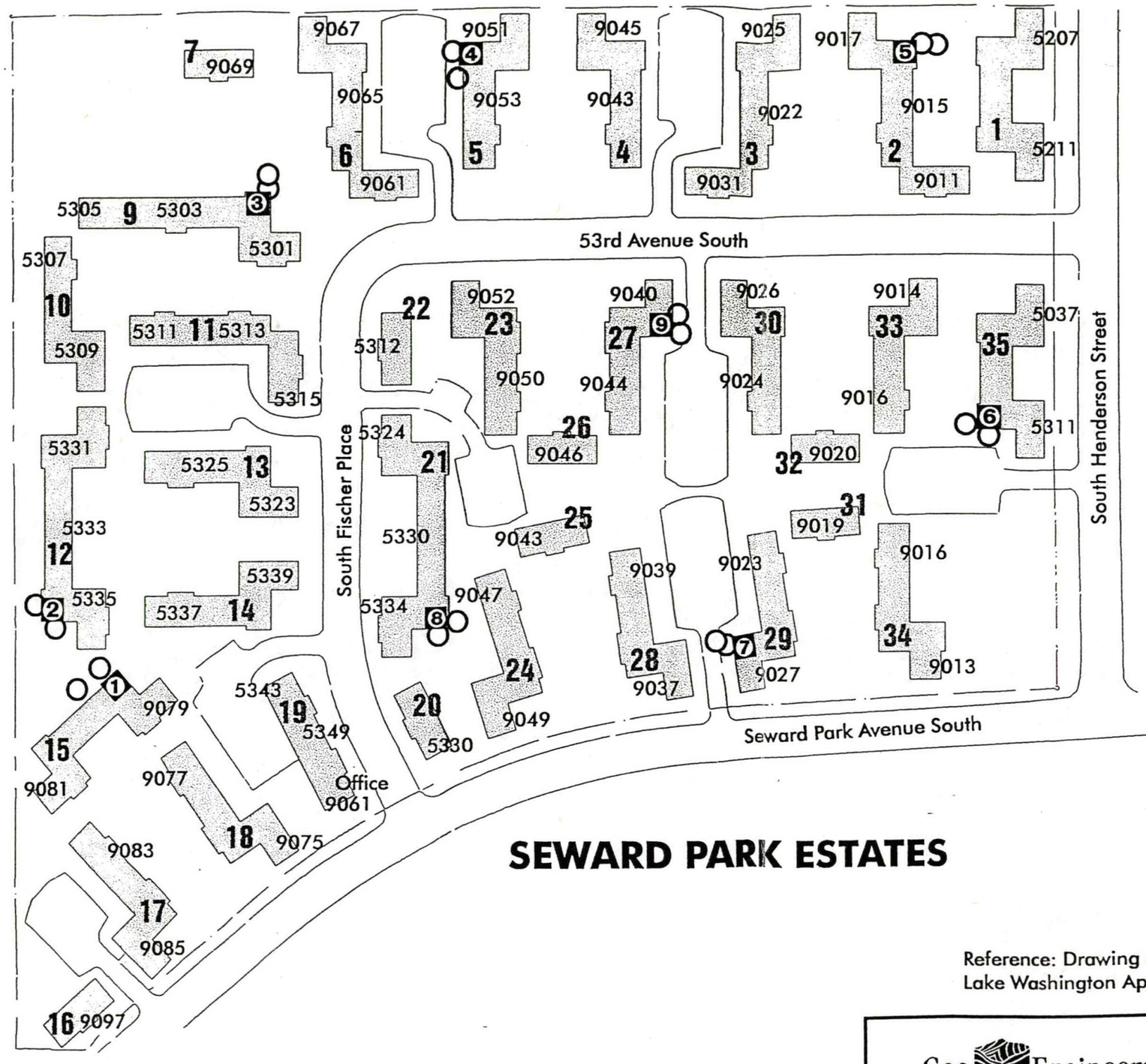
Notes:

[1]Data based on records by the U.S. Environmental Protection Agency and the Northwest Regional Office of the Washington State Department of Ecology. The location ID numbers corresponds to the numbers shown in Figure 1.

[2]Inferred location of listed site relative to direction of ground water is based on site topography. No site-specific ground water flow direction information was available.

[3]UST = Underground Storage Tank List dated March 21, 1994.
LUST = Leaking Underground Storage Tank List dated April 14, 1994.
Site Register = MTCA Site Register List dated 4/26/94 through 8/18/94.
C&SCS = Confirmed and Suspected Contaminated Sites List dated November 4, 1994.
RCRA G&T = RCRA Generators and Transporters List dated August 5, 1994.

Document ID: 425101T1.WK1



N

APPROXIMATE SCALE: 1"=80'

EXPLANATION:

34 BUILDING NUMBER

5332 STREET ADDRESS

[1] BOILER ROOM NUMBER

○ INFERRED UST LOCATIONS
(UST - UNDERGROUND STORAGE TANK)

Reference: Drawing entitled "Unit disposition plan and unit court, Lake Washington Apartments, 9061 Seward Park Avenue S." undated.

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SITE PLAN

FIGURE 2

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Exterior view of subject site, photo taken 03/14/95.

Exterior view of subject site, photo taken 03/14/95.

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SELECTED PHOTOGRAPHS
SEWARD PARK ESTATES

FIGURE 3

View of fuel oil fill pipes outside boiler room #2,
Photo date 03/10/95.

View of fuel oil fill pipe outside boiler room #8,
photo date 03/10/95.

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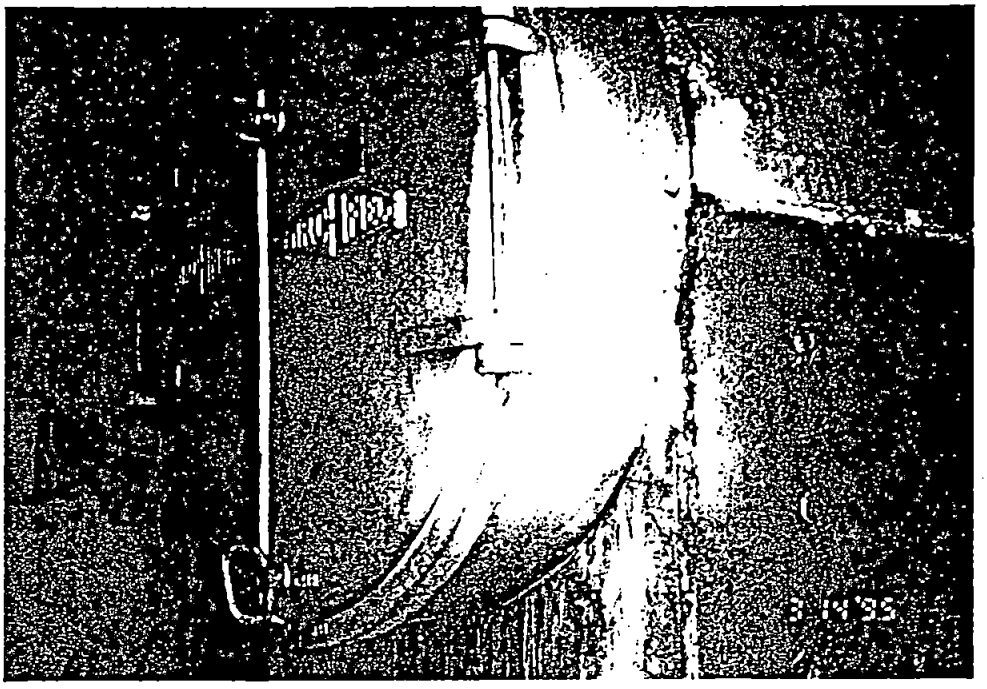
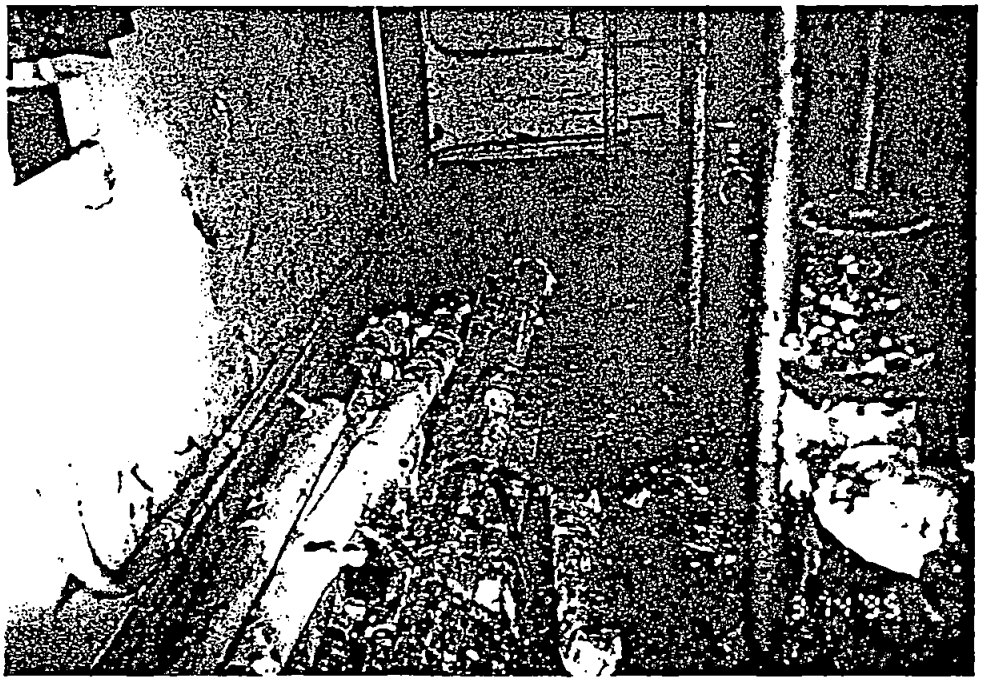
SELECTED PHOTOGRAPHS
SEWARD PARK ESTATES

FIGURE 4



Boiler and asbestos containing material in boiler room #1, photo taken 03/14/95.



Asbestos containing material in boiler room #1, photo taken 03/14/95.

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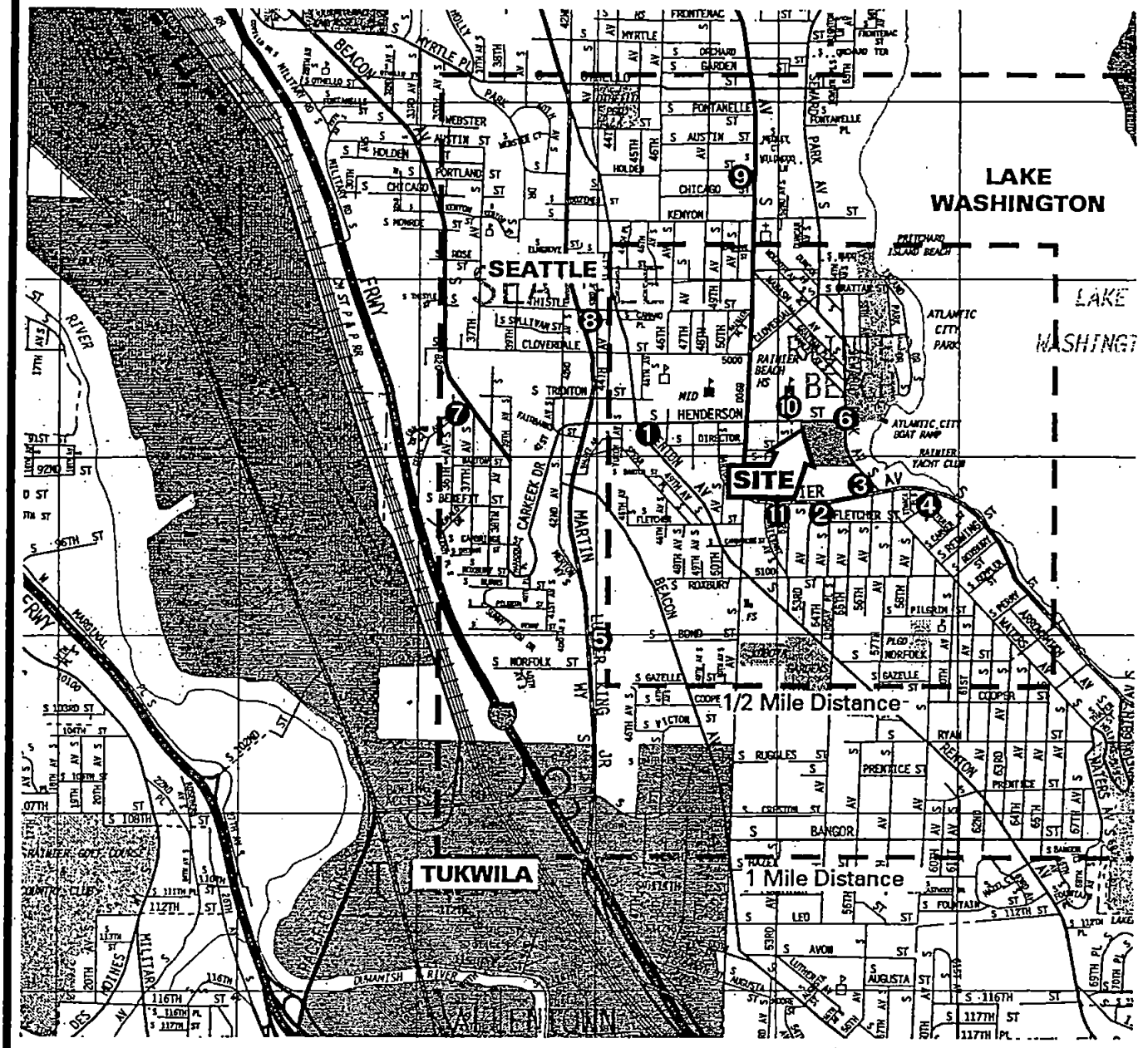
SELECTED PHOTOGRAPHS
SEWARD PARK ESTATES

FIGURE 5



EXPLANATION:

❶ EPA OR ECOLOGY SITE

NOTES: 1. The locations of sites shown are approximate.
2. The site numbers shown correspond to numbers in TABLE 1.

N

0 2400 4800

SCALE IN FEET

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EPA AND ECOLOGY LISTED SITES

FIGURE 6

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APPENDIX A

APPENDIX A
ASBESTOS-CONTAINING MATERIALS SURVEY
SEWARD PARK ESTATES PROPERTY
SEATTLE, WASHINGTON

1.0 SCOPE OF SERVICES

This report summarizes the results of our ACM (asbestos-containing materials) survey of the Seward Park Estates Property in Seattle, Washington. The ACM survey included (1) a review of available building plans to obtain information regarding building ages and (2) nondestructive sampling and analysis within accessible and unoccupied portions of the buildings to assess the potential presence of building materials containing regulated asbestos concentrations (greater than 1 percent). The areas of the property where building materials were obtained for asbestos analysis are summarized below:

- unoccupied apartment units 367, 264, 142
- office and model apartment unit in building 19
- building 14 laundry room
- building 14 roof
- crawl space beneath building 18
- maintenance/storage area in building 19
- boiler room number 1 (each of the boiler rooms were visually surveyed.

The locations of the buildings, 1 through 35 and boiler rooms 1 through 9 are shown in Figure 2 in the main body of this report. Our specific scope of services included the following:

1. Examine building plans to obtain information available regarding the building ages;
2. Complete a preliminary walk-through of the buildings to locate suspect ACM.
3. Develop a suspect ACM sampling strategy based on our observations during the preliminary walk-through.
4. Obtain 37 bulk samples of suspect ACM from the on-site buildings.
5. Submit the 37 bulk samples to an analytical laboratory for analysis of asbestos content using PLM (polarized light microscopy).
6. Provide you with a written report summarizing the survey results, containing our conclusions regarding the presence of and estimated quantity of ACM within the buildings, recommendations for asbestos abatement, and budgetary estimates for removal of identified ACM.

The scope of the ACM survey was performed as part of our Phase I ESA (environmental site assessment) of the property. The scope of the ACM survey is not in compliance with the requirements for a "good faith survey" as outlined in WAC 296-62-07707. A good faith building materials survey is required under state law prior to renovation, remodeling, repair or demolition activities which may result in the disturbance of ACM. A good faith survey includes destructive

sampling to evaluate the potential presence of ACM in concealed areas such as under tacked or glued carpets, between walls and inside of roofs and doors. Such destructive sampling was not performed.

2.0 BUILDING DESCRIPTION

The site includes 34 two-story, wood-framed apartment structures. A total of 364 apartment units are present. Some of the buildings have laundry rooms. The structures vary in size and floor plan. Outlines and locations of buildings are shown in Figure 2 in the main body of this report. Based on information provided by the property manager, our review of original building plans and a building inspection report titled "Lakeshore Village Apartments" dated September 19, 1989 prepared by Ward W. Stevens III consulting materials engineer, we understand that the buildings were constructed between 1948 and 1950.

The 1989 report also contained the following information regarding construction of the on-site buildings. The apartment buildings have steeply pitched hip and gable roofs covered by asphalt composition shingles. Sides of the buildings are covered with beveled horizontal cedar board siding, shiplap cedar siding and vertical shiplap plywood panel siding. Buildings containing more than four apartments were later upgraded with new horizontal casement windows or single hung thermal insulating glass aluminum framed windows and additional blown in wall and attic insulation. Old awning-style steel windows with original window putty remain around all bathroom windows and around all windows within the four-unit apartment buildings.

The original heating system was contained within the nine boiler rooms. Figure 2 in the main report shows the boiler room locations. Presently, the buildings are heated by electric baseboard heaters. The boilers and steam pipes are still present in six of the nine boiler rooms. The boilers and steam pipes are covered by asbestos insulation that is in significantly damaged condition. Heating pipes containing asbestos insulation are still present within the crawl spaces of each building. The building crawl spaces are not accessible, expect in building 18 where an access door has been constructed. The asbestos insulation observed in the building 18 crawl space was also significantly damaged. Additional information regarding the asbestos insulation is contained in the attached letter prepared by Pacific Rim Environmental.

3.0 INVESTIGATIVE METHODS

3.1 SAMPLING PROCEDURES

A GeoEngineers AHERA (Asbestos Hazard Emergency Response Act) accredited staff member performed the ACM survey on March 14, 1995. The ACM survey included a preliminary walk-through of the buildings to assess the types of building materials that could contain regulated concentrations of asbestos (greater than 1 percent) and the distribution of each building material type throughout a particular area. A sampling strategy for each area was developed based on the results of the preliminary walk-through.

A total of 37 bulk samples of suspect ACM were obtained from the areas of the buildings outlined in section 1.0. The samples obtained from the building included friable and nonfriable building materials. A friable building material is one that will crumble, pulverize or otherwise release dust when hand pressure is applied. Samples obtained from the buildings were classified in the miscellaneous surfacing and thermal system insulation building material categories.

3.2 LABORATORY ANALYTICAL METHODS

The bulk samples were submitted to Hazcon (Hazcon, Inc.) of Seattle, Washington, for analysis of asbestos content. Hazcon participates in the NIST/NVLAP (National Institute of Standards and Technology/National Voluntary Laboratory Accreditation Program) for sample analysis. Each bulk sample was analyzed for percent asbestos content using PLM coupled with dispersion staining (EPA Interim Method 600/M4-82-020).

4.0 SURVEY RESULTS

Regulated concentrations of asbestos were detected in 15 of the 37 bulk samples. The identified ACMs include window putty, boiler insulation, pipe insulation, sheet vinyl, floor tile, and cement asbestos board. Table A-1 summarizes the sample material descriptions, sample locations, material categories, friability, hazard ranking and analytical results for each sample. The laboratory report and chain-of-custody forms are attached.

The building areas and rooms where the ACMs were observed and the approximate quantity observed in each area are listed below. Locations of the buildings and boiler rooms are shown in Figure 2 in the main body of the report.

Building Location	Building Material	Approximate Quantity
Building 19		
Maintenance Area:	Floor tile	340 square feet
	Sheet vinyl	60 square feet
Building 18		
Crawl Space Entry	Cement asbestos board	36 square feet
Apartments - All Buildings		
Bathroom Exterior Windows	Window putty	364 windows
Apartment Kitchens, Bathrooms and Storage Areas:	Sheet vinyl	NQ[1]
	Floor tile	NQ[1]
Building Crawl Spaces		
Heating System Pipes	Pipe Insulation (2- to 3-inch OD)	26,000 lineal feet[2]
Soil Beneath Pipes	Soil surface	159,000 square feet

Building Location	Building Material	Approximate Quantity
Boiler Rooms 1, 2, 3, 5, 7 and 8		
	Insulated Fittings	222 fittings
	Pipe Insulation	888 lineal feet
	Header Insulation	150 square feet
	Boiler Insulation	996 square feet
	Floor Surface	1,080 square feet

[1]We could not accurately estimate the quantity of ACM sheet vinyl and floor tile materials because (1) we were able to gain access only to a limited number of unoccupied apartments, and (2) the flooring history for the bathroom, storage and kitchen areas is complex due to the age of the buildings. Using floor plans supplied by the apartment manager, we estimate that approximately 36,000 square feet of bathroom, kitchen and storage areas are present in the buildings. Based on our observations within the buildings, we estimate that only a portion of flooring materials in these areas are ACM flooring materials.

[2]The quantity of pipe insulation present in the crawl space areas was based entirely on information presented on the original building plans that were examined as part of the survey. The plans showed the configuration of heat piping extending from the nine boiler rooms to each of the buildings. We were unable to visually evaluate the quantity of insulation present because the crawl spaces are not accessible. The actual volume of insulation present in the crawl space areas will vary from the estimates contained in this report. Additional ACM pipe insulation is also likely present between building walls.

5.0 ASSESSMENT

5.1 CONDITION OF FRIABLE AND NONFRIABLE ACMs

The ACM boiler and piping insulation that is present in six of the nine boiler rooms is significantly damaged and friable. Figure 5 in the main report contains photographs taken of these materials in boiler room number 1. Each of the boiler rooms are nailed closed. However, access to the boiler rooms can be gained if the nails are removed. Personnel entering the boiler rooms may be exposed to asbestos because of the significantly damaged condition of the ACMs.

The ACM insulation present in the building crawl spaces also is damaged and in some areas is significantly damaged. Asbestos-containing insulation has fallen off of the pipes on to the exposed soil surface in the building 18 crawl space, which is accessible and where the observations were made. All of the remaining crawl spaces are not accessible.

Each of the other identified ACMs are nonfriable but could release asbestos fibers if damaged or removed during renovation or building demolition. The ACM floor tiles present in the maintenance area are damaged. Some of the floor tiles are missing. The ACM sheet vinyl present in the apartment units and maintenance area is in relatively good condition but could release asbestos fibers if the backing is disturbed.

The window putty and the cement asbestos board at the building 18 crawl space entry are in relatively good condition.

5.2 ABATEMENT COST ESTIMATES

Friable ACMs: Our cost estimates for removal of friable ACMs are based on information supplied by Pacific Rim Environmental Inc., a GeoEngineers subconsultant. A summary of their observations and cost estimates is attached. The friable ACMs consist of pipe insulation and boiler insulation present in the boiler rooms and crawl spaces and asbestos-contaminated soil present in the crawl spaces.

Crawl Spaces, All Apartment Buildings		
Pipe Lagging (3-inch and 2-inch OD)	26,000 lineal feet	
Soil Surface	159,000 square feet	
		$565,000
Six boiler Rooms		
Insulated Fittings	222 fittings	
Pipe Insulation	888 lineal feet	
Header Insulation	150 square feet	
Boiler Insulation	996 square feet	
Floor Surface	1,080 square feet	
		$ 35,000
Additional Costs		
Asbestos Abatement Monitoring		$ 28,000
Total Cost for Removal of Friable ACM		$628,000

Nonfriable ACMs: Our cost estimate for removal of nonfriable ACMs is based on unit cost removal estimates for floor tiles, sheet vinyl, cement asbestos board and window putty.

Building Material	Unit Cost	Estimated Quantity	Removal Cost Estimate
Maintenance Areas, Building 19			
Brown Floor tile	$2.50/sq. ft.	340 sq. ft.	$ 850
Tan Sheet vinyl	$8.00/sq. ft	60 sq. ft.	480
Crawl Space Skirting, Building 18			
Gray Cement Board	$1.50/sq. ft.	40 sq. ft.	60

Apartments- Kitchen, Bathroom and Storage Areas, Various Buildings			
Window Putty	$100/ea	364 windows	$ 36,400
Sheet vinyl	$8.00/sq. ft	NQ[1]	NQ
Floor Tile	$2.50/sq. ft	NQ[1]	NQ
Additional Costs			
Asbestos Abatement Monitoring			3,500
			$ 41,290

[1]The approximate cost for removal of sheet vinyl and floor tile within the apartment units has not been estimated because (1) we were able to gain access only to a limited number of unoccupied apartments and (2) the flooring history for the bathroom, storage and kitchen areas is complex due to the age of the buildings.

5.3 REPLACEMENT OF ACM

We do not recommend replacement of the friable ACM present in the boiler rooms and crawl spaces because the heating system is no longer in operation. Replacement of the cement asbestos board crawl space skirting is also not recommended. Replacement of the floor tiles and sheet vinyl in the maintenance area is also not necessary because this area is primarily used for storage.

The remaining ACMs (sheet vinyl, floor tiles and window putty in the apartment units) are in relatively good condition and do not require removal at this time. Removal of these ACMs may be performed during the building renovations that we understand will be performed in the future. We understand that replacement costs would be included in the building renovation budget.

6.0 RECOMMENDATIONS

We recommend that the following ACMs be removed because they either are damaged or have the potential to be damaged and release asbestos fibers:

- Boiler room insulation
- Floor tiles in maintenance area
- Cement asbestos board skirting, building 18 crawl space access

Because the crawl spaces are not accessible and in part due to the relative high cost of abatement, we recommend that the crawl spaces be sealed off rather than undertaking abatement of the friable ACM insulation and ACM-contaminated soil. An asbestos maintenance and operations program will be required to manage the ACMs that are left in place. If maintenance work is required in these areas, workers will be required to use proper protective equipment and be certified for asbestos work. The operations and maintenance plan should include periodic air monitoring outside of crawl space vents to assess whether asbestos fibers are being released from the crawl spaces through the vents.

We recommend that the operations and maintenance program also include management of the nonfriable ACMs identified in the apartment units (sheet vinyl and floor tile). The program should include periodic inspection of the ACM flooring materials and appropriate procedures for cleaning and repairing the materials. We estimate that the cost to implement an operations and maintenance program should range between $2,500 and $3,500 during the first year. The cost during subsequent years should range between $1,500 and $2,500 (in 1995 dollars).

Our estimate of the approximate cost of the recommended asbestos abatement and for the operations and maintenance programs is as follows:

Boiler room abatement (with tax and bond)	$ 46,500
Flooring materials in maintenance area	1,350
Cement asbestos board	60
Air Compliance Monitoring	3,200
Operations and Maintenance Program (1st year)	3,500
Total	$ 54,610

7.0 LIMITATIONS

Our proposed scope of services did not include an evaluation of the potential presence of soil and ground water contamination or evaluation of other potential hazards within the building. Our services also did not evaluate compliance by building tenants with environmental and community right-to-know regulations and did not include development of remedial action or abatement plans. The scope of our ACM survey did not include destructive sampling, including removal of building roofs, walls, floors and extensive areas of carpeting to examine all of the building materials concealed in these areas. Therefore, we recommend that the selected asbestos abatement contractor evaluate the potential presence of suspect ACMs if renovation is performed in these areas. If additional ACMs are identified, they should be removed and disposed of in accordance with applicable regulations.

The ACM survey was planned, developed and implemented based on our previous experience with the project requirements and objectives. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices for a building materials survey in this area at the time this report was prepared. GeoEngineers uses qualified professionals and laboratories to perform such surveys and analyses.

The information presented in this report is based on the above-described data and a recent site visit. GeoEngineers has relied upon information provided by others in our description of site and building materials conditions. The available data do not provide definitive information with regard to all past uses, operations or incidents at the site. There is always a potential that asbestos not identified during our services may exist at the site. Further evaluation of such potential would require appropriate sampling and testing.

We appreciate the opportunity to provide these services to you. Please call if you have questions concerning our report.

Yours very truly,

GeoEngineers, Inc.

W. Stephen Lewis
AHERA Building Inspector

Robert G. Breynaert
Associate

WSL:RGB:wd

TABLE A-1 (Page 1 of 3)
ASBESTOS-CONTAINING MATERIALS ANALYTICAL RESULTS
SEWARD PARK ESTATES PROPERTY
SEATTLE, WASHINGTON

Sample ID Number	Material Description	Sampling Location: Room	Material Category[1]	Friability[2]	Hazard Ranking[3]	Percent Asbestos/ Asbestos Type
Building 14						
SP-1	Black composition shigles	Laundry room roof - lower layer	Misc.	NF	1	ND
SP-2	White composition shingles	Laundry room roof - upper layer	Misc.	NF	1	ND
SP-3	Roofing felt	Building 14 roof	Misc.	NF	1	ND
SP-4	White composition shingles	Building 14 roof	Misc.	NF	1	ND
SP-5	Window putty	Exterior bathroom window	Misc.	NF	2	1/chrysotile
SP-32	Sheetrock and joint compound	Laundry room ceiling	Misc.	NF	1	<1/chrysotile
Building 15, Boiler Room No. 1						
SP-6	Boiler insulation	Boiler room No. 1	TSI	F	6	20/chrysotile 15/amosite
SP-7	Pipe insulation - lower	Boiler room No. 1	TSI	F	6	45/chrysotile
SP-8	Pipe insulation - upper	Boiler room No. 1	TSI	F	6	10/chrysotile
SP-37	Firebrick Mortar	Boiler room No. 1	TSI	NF	1	ND
Building 9, Apartment 367						
SP-9	Sheet vinyl - layer 1	2-bedroom unit - kitchen	Misc.	NF	2	20/chrysotile
SP-9	Sheet vinyl - layer 2	2-bedroom unit - kitchen	Misc.	NF	2	22/chrysotile
SP-10	Sheet vinyl	2-bedroom unit - lower layer	Misc.	NF	1	ND
SP-10	Brown mastic	2-bedroom unit - lower layer	Misc.	NF	1	ND
SP-11	Wall spackling putty	Kitchen wall	Misc.	NF	1	ND
SP-12	Paint - layer 1	Kitchen wall	Surf	NF	1	ND
SP-12	Plaster - layer 2	Kitchen wall	Surf	NF	1	ND
SP-13	Floor tile and mastic	2-bedroom unit - bathroom	Misc.	NF	1	ND
SP-14	Yellow sheet vinyl and mastic	Bathroom - lower layer	Misc.	NF	2	20/Chrysotile
SP-14	Leveling compound	Bathroom - lower layer	Misc.	NF	1	ND
SP-14	White sheet vinyl	Bathroom - lower layer	Misc.	NF	1	ND
SP-14	Brown sheet vinyl mastic	Bathroom - lower layer	Misc.	NF	1	ND
SP-15	Yellow/gray insulation	Above hallway	Misc.	F	1	ND

Notes appear on page 3 of 3.

TABLE A-1 (Page 2 of 3)

Sample ID Number	Material Description	Sampling Location: Room	Material Category[1]	Friability[2]	Hazard Ranking[3]	Percent Asbestos/ Asbestos Type
Building 9, Apartment 367 (Continued)						
SP-16	Yellow sheet vinyl and mastic	1-bedroom unit - bathroom	Misc.	NF	2	20/Chrysotile
SP-16	White floor tile	1-bedroom unit - bathroom	Misc.	NF	2	4/Chrysotile
SP-16	Black floor tile mastic	1-bedroom unit - bathroom	Misc.	NF	1	ND
SP-17	Yellow sheet vinyl and mastic	1-bedroom unit - kitchen	Misc.	NF	2	20/Chrysotile
SP-17	Beige floor tile	1-bedroom unit - kitchen	Misc.	NF	1	ND
SP-19	Sheetrock/joint compound	1-bedroom unit - ceiling	Misc.	NF	1	<1/Chrysotile
Building 18 Crawl Space						
SP-18	Soil	Beneath pipe insulation	Misc.	F	1	ND
SP-35	Cement asbestos board	Crawl space opening	Misc.	NF	4	8/Chrysotile
Building 20, Apartment 264						
SP-20	Window putty	Living room window	Misc.	NF	1	ND
WP-21	Tan sheet vinyl	Kitchen	Misc.	NF	1	ND
SP-21	Yellow sheet vinyl and mastic	Kitchen	Misc.	NF	1	ND
SP-22	Off-white sheet vinyl	Bathroom	Misc.	NF	1	ND
SP-22	Leveling compound and mastic	Bathroom	Misc.	NF	1	ND
SP-23	Sheetrock	Dining room wall	Misc.	NF	1	ND
SP-23	Plaster	Dining room wall	Surf	NF	1	ND
Building 14, Apartment 142						
SP-24	Off-white sheet vinyl and mastic	Kitchen	Misc.	NF	1	ND
SP-25	Yellow cove base mastic	Kitchen	Misc.	NF	1	ND
SP-26	White floor tile and mastic	Bathroom	Misc.	NF	1	ND
SP-27	Plaster	Hallway wall	Surf	NF	1	ND
Building 19, Maintenance Area						
SP-28	Beige sheet vinyl	Partially used roll	Misc.	NF	1	ND
SP-29	Tan sheet vinyl and mastic	Rest room	Misc.	NF	4	30/Chrysotile
SP-30	Brown floor tile	Utility room	Misc.	NF	4	5/Chrysotile
SP-30	Black floor tile mastic	Utility room	Misc.	NF	1	ND
SP-31	Light brown floor tile	Office area	Misc.	NF	4	6/Chrysotile
SP-31	Black floor tile mastic	Office area	Misc.	NF	1	ND

Notes appear on page 3 of 3.

TABLE A-1 (Page 3 of 3)

Sample ID Number	Material Description	Sampling Location: Room	Material Category[1]	Friability[2]	Hazard Ranking[3]	Percent Asbestos/ Asbestos Type
Building 21 - Exterior						
SP-33	Felt	Beneath horizontal siding	Misc.	NF	1	ND
SP-34	Felt	Beneath vertical siding	Misc.	NF	1	ND
Building 19, Model Apartment						
SP-36	White/brown sheet vinyl	Storage area	Misc.	NF	2	30/Chrysotile

Notes:

[1]Material category: Misc. = miscellaneous material, Surf. = surfacing material, TSI = thermal system insulation.

[2]Friability: F = friable, NF = nonfriable.

[3]Hazard ranking:

1 = Material is not damaged, does not have potential for damage or is non-ACM.

2 = Potential for damage.

3 = Potential for significant damage.

4 = Damaged.

5 = Damaged and potential for further damage.

6 = Damaged and potential for significant damage.

7 = Significantly damaged.

ND = asbestos not detected.

Shading indicates that regulated concentration of asbestos (greater than 1 percent) detected in bulk sample.

Locations of building are shown in Figure 2.

Samples were analyzed by Hazcon, Inc.

Document ID: 415201A1.WK1

HEALTH HAZARD CONTROL SERVICES
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(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour B
Project #:
Number of Samples: 4 2

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

SAMPLE #: SP-1
LAB #: 13958.1
SOURCE: Roofing Material
LOCATION: Lanudry room, building 14

MATERIAL DESCRIPTION: HOMOGENEOUS
Black asphaltic cracked layer on black fibrous material

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	40
Synthetic	10

OTHER MATERIALS	%
Asphalt Filler & Binder	50

Note:

SAMPLE #: SP-2
LAB #: 13958.2
SOURCE: Roofing Material
LOCATION: Lanudry room, building 14, upper

MATERIAL DESCRIPTION: HOMOGENEOUS
White mineral granules with black fibrous asphaltic chunk

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	30
Synthetic	10
Glass Fiber	5

OTHER MATERIALS	%
Asphalt Filler & Binder	40
Mineral Granules	15

Note:

SAMPLE #: SP-3
LAB #: 13958.3
SOURCE: Roofing Material
LOCATION: Building 14

MATERIAL DESCRIPTION: HOMOGENEOUS
Wet fibrous papery asphaltic material

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	45
Synthetic	15

OTHER MATERIALS	%
Asphalt Filler & Binder	40

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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HAZCON INC.
4636 E. Marginal Way So. Suite 215
Seattle, WA 98134
(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Job Location: Seward Park

Contact: Steve Lewis
Job / PO# 4152-001-R52

SAMPLE #: SP-4
LAB #: 13958.4
SOURCE: Roofing Material
LOCATION: Building 14

MATERIAL DESCRIPTION: HOMOGENEOUS
White mineral granules on black asphaltic fibrous material

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	30
Synthetic	10

OTHER MATERIALS	%
Mineral Granules	10
Asphalt Filler & Binder	50

Note:

SAMPLE #: SP-5
LAB #: 13958.5
SOURCE: Window Putty
LOCATION: Building 14

MATERIAL DESCRIPTION: HOMOGENEOUS
Wet gray hard molded chunk with paint

RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	1

OTHER FIBERS	%
Cellulose	2

OTHER MATERIALS	%
Calcite Filler & Binder	92
Paint	5

Note:

SAMPLE #: SP-6
LAB #: 13958.6
SOURCE: Boiler Insulation
LOCATION: Boiler #1

MATERIAL DESCRIPTION: HOMOGENEOUS
White fibrous powdery material

RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	20
Amosite	15

OTHER FIBERS	%
Mineral Wool	20

OTHER MATERIALS	%
Filler & Binder	40
Diatoms	5

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour B
Project #:
Number of Samples: 4 2

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

SAMPLE #: SP-7
LAB #: 13958.7
SOURCE: Pipe Insulation
LOCATION: Boiler #1

MATERIAL DESCRIPTION: HOMOGENEOUS
Dirty white fibrous papery material

RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	45

OTHER FIBERS	%
Cellulose	30

OTHER MATERIALS	%
Filler & Binder	25

Note:

SAMPLE #: SP-8
LAB #: 13958.8
SOURCE: Pipe Insulation
LOCATION: Boiler #1

MATERIAL DESCRIPTION: HOMOGENEOUS
White/gray fibrous powdery material

RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	10

OTHER FIBERS	%
Cellulose	3
Mineral Wool	40

OTHER MATERIALS	%
Filler & Binder	47

Note:

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately.

SAMPLE #: SP-9
LAB #: 13958.9A
SOURCE: Sheet Vinyl
LOCATION: Unit 367, kitchen, 2 BB Portion

MATERIAL DESCRIPTION:
Yellow, brown and white vinyl with gray fibrous backing

LAYER 1 RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	20

OTHER FIBERS	%
Cellulose	10

OTHER MATERIALS	%
Vinyl Filler and Binder	60
Filler & Binder	10

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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HAZCON INC.
4636 E. Marginal Way So. Suite 215
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(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour B
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

SAMPLE #: SP-9
LAB #: 13958.9B
SOURCE: Sheet Vinyl
LOCATION: Unit 367, kitchen, 2 BB Portion

MATERIAL DESCRIPTION:
Yellow vinyl with gray fibrous backing and gold brittle mastic

LAYER 2 RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	22

OTHER FIBERS	%
Cellulose	10

OTHER MATERIALS	%
Vinyl Filler and Binder	58
Filler & Binder	10

Note: Unable to separate mastic from backing

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately.

SAMPLE #: SP-10
LAB #: 13958.10A
SOURCE: Leveling Compound
LOCATION: Unit 367, kitchen, 2 BB Portion

MATERIAL DESCRIPTION:
Yellow pliable material with black asphaltic fibrous backing

LAYER 1 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	30
Synthetic	10

OTHER MATERIALS	%
Vinyl Filler and Binder	50
Asphalt Filler & Binder	10

Note: Sample appears to be sheet vinyl

SAMPLE #: SP-10
LAB #: 13958.10B
SOURCE: Mastic
LOCATION: Unit 367, kitchen, 2 BB Portion

MATERIAL DESCRIPTION:
Brown brittle mastic

LAYER 2 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%

OTHER MATERIALS	%
Filler & Binder	100

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour I
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

SAMPLE #: SP-11
LAB #: 13958.11
SOURCE: Spackling Putty
LOCATION: Kitchen #367, wall

MATERIAL DESCRIPTION: HOMOGENEOUS
Yellow paint on white airy soft material

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	3

OTHER MATERIALS	%
Paint	45
Perlite	52

Note:

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately

SAMPLE #: SP-12
LAB #: 13958.12A
SOURCE: Paint
LOCATION: Kitchen #367, wall

MATERIAL DESCRIPTION:
Tan thick paint

LAYER 1 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	3

OTHER MATERIALS	%
Paint	97

Note:

SAMPLE #: SP-12
LAB #: 13958.12B
SOURCE: Plaster
LOCATION: Kitchen #367, wall

MATERIAL DESCRIPTION:
White coarse powdery material

LAYER 2 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%

OTHER MATERIALS	%
Mineral Filler & Binder	70
Sand	30

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

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Laboratory Manager - NVLAP Approved Signatory

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HAZCON INC.
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(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour I
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

SAMPLE #: SP-13
LAB #: 13958.13
SOURCE: Floor Tile
LOCATION: Bathroom, 2BR, #367

MATERIAL DESCRIPTION: HOMOGENEOUS
Off-white flooring with streaks

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	5
Synthetic	2

OTHER MATERIALS	%
Vinyl Filler and Binder	93

Note:

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately

SAMPLE #: SP-14
LAB #: 13958.14A
SOURCE: Sheet Vinyl
LOCATION: Bathroom, 2BR, #367

MATERIAL DESCRIPTION:
Yellow sheet vinyl with beige fibrous backing and gold brittle mastic

LAYER 1 RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	20

OTHER FIBERS	%
Cellulose	10

OTHER MATERIALS	%
Vinyl Filler and Binder	60
Filler & Binder	10

Note: Unable to separate mastic from backing

SAMPLE #: SP-14
LAB #: 13958.14B
SOURCE: Leveling Compound
LOCATION: Bathroom, 2BR, #367

MATERIAL DESCRIPTION:
White compressed powder

LAYER 2 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	3

OTHER MATERIALS	%
Clay Filler & Binder	97

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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HAZCON INC.
4636 E. Marginal Way So. Suite 215
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(206) 762-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour T
Project #:
Number of Samples: 4 2

Client Name: GeoEngineers, Inc.
Job Location: Seward Park

Contact: Steve Lewis
Job / PO# 4152-001-R52

SAMPLE #: SP-14
LAB #: 13958.14C
SOURCE: Sheet Vinyl
LOCATION: Bathroom, 2BR, #367

MATERIAL DESCRIPTION:
White sheet vinyl with dark gray fibrous backing

LAYER 3 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	30
Synthetic	10

OTHER MATERIALS	%
Vinyl Filler and Binder	55
Filler & Binder	5

Note:

SAMPLE #: SP-14
LAB #: 13958.14D
SOURCE: Mastic
LOCATION: Bathroom, 2BR, .#367

MATERIAL DESCRIPTION:
Brown brittle mastic

LAYER 4 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	2

OTHER MATERIALS	%
Filler & Binder	98

Note:

SAMPLE #: SP-15
LAB #: 13958.15
SOURCE: Insulation
LOCATION: Above hallway between 1 BR and 2BR, #367

MATERIAL DESCRIPTION: HOMOGENEOUS
Yellow and gray fibrous soft material

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Glass Fiber	98

OTHER MATERIALS	%
Filler & Binder	2

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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HAZCON INC.
4636 E. Marginal Way So. Suite 215
Seattle, WA 98134
(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour B
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately.

SAMPLE #: SP-16
LAB #: 13958.16A
SOURCE: Sheet Vinyl
LOCATION: 1 BR, bathroom floor, #367

MATERIAL DESCRIPTION:
Yellow sheet vinyl with gray fibrous backing

LAYER 1 RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	20

OTHER FIBERS	%
Cellulose	10

OTHER MATERIALS	%
Vinyl Filler and Binder	65
Filler & Binder	5

Note:

SAMPLE #: SP-16
LAB #: 13958.16B
SOURCE: Mastic
LOCATION: 1 BR, bathroom floor, #367

MATERIAL DESCRIPTION:
Small amount of black asphaltic mastic on wood

LAYER 2 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	90

OTHER MATERIALS	%
Asphalt Filler & Binder	10

Note:

SAMPLE #: SP-16
LAB #: 13958.16C
SOURCE: Floor Tile
LOCATION: 1 BR, bathroom floor, #367

MATERIAL DESCRIPTION:
White flooring with streaks

LAYER 3 RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	4

OTHER FIBERS	%
Cellulose	3

OTHER MATERIALS	%
Vinyl Filler and Binder	93

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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Seattle, WA 98134
(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately

SAMPLE #: SP-17
LAB #: 13958.17A
SOURCE: Floor Covering
LOCATION: 1 BR, kitchen, #367

MATERIAL DESCRIPTION:
Beige flooring with red streaks

LAYER 1 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	20

OTHER MATERIALS	%
Vinyl Filler and Binder	80

Note:

SAMPLE #: SP-17
LAB #: 13958.17B
SOURCE: Sheet Vinyl
LOCATION: 1 BR, kitchen, #367

MATERIAL DESCRIPTION:
Yellow sheet vinyl with beige fibrous backing

LAYER 2 RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	20

OTHER FIBERS	%
Cellulose	10

OTHER MATERIALS	%
Vinyl Filler and Binder	65
Filler & Binder	5

Note:

SAMPLE #: SP-18
LAB #: 13958.18
SOURCE: Soil
LOCATION: Crawl space under 9075

MATERIAL DESCRIPTION: HOMOGENEOUS
Brown powdery fibrous material

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	30
Glass Fiber	5

OTHER MATERIALS	%
Insect Parts	5
Miscellaneous Particles	10
Mineral Filler & Binder	50

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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HAZCON INC.
4636 E. Marginal Way So. Suite 215
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(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour B
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

LAYERED SAMPLE: NESHAP and AHERA regulations allow these layers to be composited together.

SAMPLE #: SP-19
LAB #: 13958.19
SOURCE: Sheetrock/Joint Compound
LOCATION: #367 living room ceiling, 1 BR

MATERIAL DESCRIPTION:
White chalky material with paper backing & thin off-white & white compacted powdery layers with light yellow paint

RESULTS:

No Regulated Asbestos

ASBESTOS TYPE	PERCENT
Chrysotile	Less than 1

OTHER FIBERS	%
Cellulose	10

OTHER MATERIALS	%
Gypsum Filler & Binder	89
Paint	1

Note:

SAMPLE #: SP-20
LAB #: 13958.20
SOURCE: Window Putty
LOCATION: #264, living room window

MATERIAL DESCRIPTION: HOMOGENEOUS.
Gray soft molded material with .blue paint

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%

OTHER MATERIALS	%
Non-Fibrous Tremolite	1
Paint	3
Calcite/Clay Filler & Binder	96

Note:

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately.

SAMPLE #: SP-21
LAB #: 13958.21A
SOURCE: Sheet Vinyl
LOCATION: #264, kitchen

MATERIAL DESCRIPTION:
Tan & beige pebble-patterned vinyl with light gray fibrous backing

LAYER 1 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	10
Synthetic	2
Glass Fiber	1

OTHER MATERIALS	%
Wollastonite	1
Diatoms	1
Filler & Binder	20
Vinyl Filler and Binder	65

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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HAZCON INC.
4636 E. Marginal Way So. Suite 215
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(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
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NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour I
Project #:
Number of Samples: 4 2

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately

SAMPLE #: SP-23
LAB #: 13958.23A
SOURCE: Sheetrock
LOCATION: #264, dining room, by window

MATERIAL DESCRIPTION:
White chalky material with paper backing & paint layers

LAYER 1 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	45

OTHER MATERIALS	%
Gypsum Filler & Binder	45
Paint	10

Note:

SAMPLE #: SP-23
LAB #: 13958.23B
SOURCE: Plaster
LOCATION: #264, dining room, by window

MATERIAL DESCRIPTION:
White coarse sandy crumbly material

LAYER 2 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%

OTHER MATERIALS	%
Sand	65
Gypsum Filler & Binder	35

Note:

SAMPLE #: SP-24
LAB #: 13958.24
SOURCE: Sheet Vinyl
LOCATION: Unit 142, kitchen

MATERIAL DESCRIPTION: LAYERED
White & beige patterned vinyl with off-white fibrous backing & stiff gold mastic

RESULTS:

Layers Homogenized for Analysis
No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	10
Glass Fiber	3

OTHER MATERIALS	%
Calcite Filler & Binder	12
Vinyl Filler and Binder	70
Filler & Binder	5

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

HEALTH HAZARD CONTROL SERVICES
HAZCON INC.
4636 E. Marginal Way So. Suite 215
Seattle, WA 98134
(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour T
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Job Location: Seward Park

Contact: Steve Lewis
Job / PO# 4152-001-R52

SAMPLE #: SP-25
LAB #: 13958.25
SOURCE: Cove Base Mastic
LOCATION: #142, kitchen

MATERIAL DESCRIPTION: HOMOGENEOUS
Yellowish tan stiff material with off-white paint

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	Tra

OTHER MATERIALS	%
Calcite Filler & Binder	90
Paint	10

Note:

SAMPLE #: SP-26
LAB #: 13958.26
SOURCE: Floor Tile
LOCATION: #142, bathroom

MATERIAL DESCRIPTION: LAYERED
White & beige patterned vinyl with off-white fibrous backing & gold stiff mastic on wood

RESULTS:

Layers Homogenized for Analysis
No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	10
Glass Fiber	2

OTHER MATERIALS	%
Calcite Filler & Binder	17
Filler & Binder	1
Vinyl Filler and Binder	70

Note:

LAYERED SAMPLE: NESHAP and AHERA regulations allow these layers to be composited together.

SAMPLE #: SP-27
LAB #: 13958.27A
SOURCE: Sheetrock/Joint Compound
LOCATION: #142, hallway

MATERIAL DESCRIPTION:
White chalky material with paper backing & off-white compacted powdery layer with paint layers

LAYER 1 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	30

OTHER MATERIALS	%
Calcite Filler & Binder	5
Gypsum Filler & Binder	35
Paint	30

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

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4636 E. Marginal Way So. Suite 215
Seattle, WA 98134
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ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour B
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

SAMPLE #: SP-27
LAB #: 13958.27B
SOURCE: Plaster
LOCATION: #142, hallway

MATERIAL DESCRIPTION:
Off-white coarse sandy crumbly material

LAYER 2 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%

OTHER MATERIALS	%
Sand	40
Gypsum Filler & Binder	60

Note:

SAMPLE #: SP-28
LAB #: 13958.28
SOURCE: Sheet Vinyl
LOCATION: Maintenance area, new vinyl

MATERIAL DESCRIPTION: LAYERED
White vinyl with beige speckles & white fibrous backing

RESULTS:

Layers Homogenized for Analysis
No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	8
Glass Fiber	2

OTHER MATERIALS	%
Calcite Filler & Binder	10
Vinyl Filler and Binder	80

Note:

SAMPLE #: SP-29
LAB #: 13958.29
SOURCE: Sheet Vinyl
LOCATION: Maintenance area, restroom

MATERIAL DESCRIPTION: LAYERED
Tan pebble-patterned vinyl with light gray fibrous backing & gold mastic

RESULTS:

Layers Homogenized for Analysis
Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	3.0

OTHER FIBERS	%
Cellulose	1

OTHER MATERIALS	%
Filler & Binder	3
Vinyl Filler and Binder	66

Note: Asbestos is in fibrous backing

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

HAZCON INC.
HEALTH HAZARD CONTROL SERVICES
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Seattle, WA 98134
(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour B
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately

SAMPLE #: SP-30
LAB #: 13958.30A
SOURCE: 9X9" Floor Tile
LOCATION: Maintenance area, utility room

MATERIAL DESCRIPTION:
Dark brown tile with gold streaks

LAYER 1 RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	5

OTHER FIBERS	%

OTHER MATERIALS	%
Vinyl Filler and Binder	95

Note:

SAMPLE #: SP-30
LAB #: 13958.30B
SOURCE: Floor Tile Mastic
LOCATION: Maintenance area, utility room

MATERIAL DESCRIPTION:
Black asphaltic mastic

LAYER 2 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	Trac

OTHER MATERIALS	%
Asphalt Filler & Binder	100

Note:

LAYERED SAMPLE: NESHAP and AHERA regulations require layers be analyzed and reported separately.

SAMPLE #: SP-31
LAB #: 13958.31A
SOURCE: 9X9" Floor Tile
LOCATION: Maintenance office

MATERIAL DESCRIPTION:
Dark brown tile with gold streaks

LAYER 1 RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	6

OTHER FIBERS	%

OTHER MATERIALS	%
Vinyl Filler and Binder	94

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

HAZCON participates in the NIST/NVLAP Program and is accredited by NVLAP. Accreditation by NVLAP does not indicate endorsement by NVLAP or any other government agency. All bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques by trained technicians. Analyses are cross-checked by other in-house technicians and other laboratories for quality assurance and verification. The percent values reported above are based on a calibrated visual estimate by volume unless verification by Point Counting is indicated. Test results reported relate only to the samples submitted by the client to HAZCON. Trace amounts of asbestos could possibly be missed by PLM, therefore negative results cannot be guaranteed.

HEALTH HAZARD CONTROL SERVICES
HAZCON INC.
4636 E. Marginal Way So. Suite 215
Seattle, WA 98134
(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour B
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

SAMPLE #: SP-31
LAB #: 13958.31B
SOURCE: Floor Tile Mastic
LOCATION: Maintenance office

MATERIAL DESCRIPTION:
Black asphaltic mastic

LAYER 2 RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%

OTHER MATERIALS	%
Asphalt Filler & Binder	100

Note:

SAMPLE #: SP-32
LAB #: 13958.32
SOURCE: Joint Compound
LOCATION: Laundry room ceiling (by SP-1)

MATERIAL DESCRIPTION: LAYERED
Off-white paint & powdery layers

RESULTS:

Layers Homogenized for Analysis
No Regulated Asbestos

ASBESTOS TYPE	PERCENT
Chrysotile	Less than 1

OTHER FIBERS	%
Cellulose	Trac

OTHER MATERIALS	%
Paint	90
Mineral Filler & Binder	10

Note:

SAMPLE #: SP-33
LAB #: 13958.33
SOURCE: Felt
LOCATION: Horizontal exterior siding, under siding

MATERIAL DESCRIPTION: HOMOGENEOUS
White & tan paper with black asphaltic middle layer

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	70

OTHER MATERIALS	%
Asphalt Filler & Binder	30

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

HEALTH HAZARD CONTROL SERVICES
HAZCON INC.
4636 E. Marginal Way So. Suite 215
Seattle, WA 98134
(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour I
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

SAMPLE #: SP-34
LAB #: 13958.34
SOURCE: Felt
LOCATION: Vertical siding, under siding

MATERIAL DESCRIPTION: HOMOGENEOUS
Tan paper with black asphaltic middle layer

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS	%
Cellulose	70

OTHER MATERIALS	%
Asphalt Filler & Binder	30

Note:

SAMPLE #: SP-35
LAB #: 13958.35
SOURCE: Cement Board
LOCATION: Skirting, crawl space, Bldg. 9075

MATERIAL DESCRIPTION: HOMOGENEOUS
Gray hard flat fibrous cementitious material

RESULTS:

Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	8
Amosite	Less than 1
Crocidolite	Less than 1

OTHER FIBERS	%

OTHER MATERIALS	%
Cement	92

Note:

SAMPLE #: SP-36
LAB #: 13958.36
SOURCE: Sheet Vinyl
LOCATION: Model Apts., storage area

MATERIAL DESCRIPTION: LAYERED
White & rusty brown patterned vinyl with light gray fibrous backing & gold mastic (with white rubbery material on surface)

RESULTS:

Layers Homogenized for Analysis
Asbestos Containing

ASBESTOS TYPE	PERCENT
Chrysotile	30

OTHER FIBERS	%
Cellulose	2

OTHER MATERIALS	%
Vinyl Filler and Binder	63
Filler & Binder	5

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

HEALTH HAZARD CONTROL SERVICES
HAZCON INC.
4636 E. Marginal Way So. Suite 215
Seattle, WA 98134
(206) 763-7364

ASBESTOS BULK SAMPLE DATA

An AIHA #414
and
NVLAP #1106
Accredited Laboratory

Log #: 13958
Priority: 24 Hour E
Project #:
Number of Samples: 42

Client Name: GeoEngineers, Inc.
Contact: Steve Lewis
Job Location: Seward Park
Job / PO# 4152-001-R52

SAMPLE #: SP-37
LAB #: 13958.37
SOURCE: Firebrick Mortar
LOCATION: Boiler #1

MATERIAL DESCRIPTION: HOMOGENEOUS
Coarse hard sandy light grayish-brown material

RESULTS:

No Asbestos Detected

ASBESTOS TYPE	PERCENT

OTHER FIBERS %

OTHER MATERIALS %

Sand	60
Filler & Binder	40

Note:

SAMPLED BY: Client DATE: 03/14/95
COMPANY: GeoEngineers, Inc.
RECEIVED BY: Claudia McKinney DATE: 03/15/95

ANALYZED BY: Gloyd/Wright DATE: 03/16/95

Patricia Lukens
Laboratory Manager - NVLAP Approved Signatory

White granulated asphalt composition shingles

Around 1948

GEOENGINEERS, INC.
ASBESTOS CONTAINING BUILDING MATERIALS SAMPLING FORM

Project: Seward Park

Owner: –

File No: 4152-001-R52

Prepared By: WSL

Page 1 of 6

Date: 3/14/95

Report No:

ID Number	Material Description	Sampling Location: Building, Floor, Room	Homogeneous Area No.	Material Category	Friability	Hazard Ranking (1-7)	Quantity (LF,SF)	Photo Number/ Description
SP-1	Black Lower Shingles	Laundry Room Roof Bldg. 14	1	TSI Surf. (Misc.)	F (NF) X	2	18 x 21 Lower 2 layers	2
SP-2	Green Shingle - Upper	11	2	TSI Surf. (Misc)	F (NF) X	2	Upper 2 layers	2
SP-3	Lower Roofing Felt	Building 14 Roof	3	TSI Surf. (Misc)	F (NF) X	2	Lower felt layer	2
SP-4	Green Shingles	11	2?	TSI Surf. (Misc.)	F (NF) X	2	Upper layer	2
SP-5	Window Putty 1	Bldg 14	4	TSI Surf. (Misc)	F (NF) X	3	Small Windows 3' x 2½' from	3 (room Bldg 14)
SP-6	Boiler Insulation 20 15	Boiler #1	5	(TSI) Surf. Misc.	F (NF) X	7		5?

Signed: W. Stephen Tomio

Date: 3/14/95

Friability: F = friable; NF = nonfriable, X = not applicable (material is non-ACBM)

Hazard Ranking:

1 = Material is not damaged, does not have potential for damage or is non-ACBM

2 = Potential for damage

3 = Potential for significant damage

4 = Damaged

5 = Damaged and potential for further damage

6 = Damaged and potential for significant damage

7 = Significantly damaged

CHAIN OF CUSTODY RECORD

GEOENGINEERS, INC.
8410 154TH AVENUE N.E.
REDMOND, WASHINGTON 98052
(206) 861-6000

Geo Engineers

DATE 3/15/95
PAGE 1 OF 1
LAB Hazcon
LAB NO.

PROJECT NAME/LOCATION Seward Park / Seattle
PROJECT NUMBER 4152-001-R52
PROJECT MANAGER
SAMPLED BY WSC

SAMPLE IDENTIFICATION		SAMPLE COLLECTION			# OF	ANALYSIS REQUIRED	NOTES/COMMENTS
LAB	GEOENGINEERS	DATE	TIME	MATRIX	JARS	Archive for 6 mo	(Preserved, filtered, etc.)
	SP-1 through SP-37	3/14		Soil	37		

RELINQUISHED BY	FIRM	RELINQUISHED BY	FIRM	RELINQUISHED BY	FIRM
SIGNATURE	GeoEngineers	SIGNATURE		SIGNATURE	
PRINTED NAME		PRINTED NAME		PRINTED NAME	
DATE 3/15/95	TIME 9:15	DATE	TIME	DATE	TIME
RECEIVED BY	FIRM	RECEIVED BY	FIRM	RECEIVED BY	FIRM
SIGNATURE		SIGNATURE		SIGNATURE	
PRINTED NAME Claudia McKinney		PRINTED NAME		PRINTED NAME	
DATE 3/15/95	TIME 1:00	DATE	TIME	DATE	TIME

ADDITIONAL COMMENTS:

Project: Seward Park
Owner: 4152-001-R52
File No:
Prepared By: WSC

GEOENGINEERS, INC.
ASBESTOS CONTAINING BUILDING MATERIALS SAMPLING FORM

Date: 3/14/95
Report No:

ID Number	Material Description	Sampling Location: Building, Floor, Room	Homogeneous Area No.	Material Category	Friability	Hazard Ranking (1-7)	Quantity (LF,SF)	Photo Number/ Description
SP-7	Pipe Insulation 45 lower	Boiler Rm #1	6	(TSI) Surf. Misc.	(F) NF X	7	40LF BR #1	6
SP-8	Pipe insulation 10 upper	11	7	(TSI) Surf. Misc.	(F) NF X	7	50SF	
SP-9	Yel-white Sheet Vinyl + mastic	Unit 367 Kitchen 2BR Portia	8	TSI Surf. (Misc.)	F (NF) X	2	9x12	7 2 layers
SP-10	Mastic + leveling Compound	Bathroom #367 SP-9	9	TSI Surf. (Misc.)	F (NF) X	2		7
SP-11	Spackling Putty	Kitchen #367 Wall	10	TSI Surf. (Misc.)	F (NF) X	2	4 Walls exterior facing — blow in insulation	8
SP-12	Plaster/Sheetrock + Joint Compound	Kitchen Wall #367	11	TSI Surf. (Misc.)	F (NF) X	2		8

Signed: W. Stephen Terasa
Date: 3/14/95

Friability: F = friable, NF = nonfriable, X = not applicable (material is non-ACBM)
Hazard Ranking:
1 = Material is not damaged, does not have potential for damage or is non-ACBM
2 = Potential for damage
3 = Potential for significant damage
4 = Damaged
5 = Damaged and potential for further damage
6 = Damaged and potential for significant damage

Project: Seward Park

Owner:

File No: 4152-001-R57

Prepared By: WSL

GEOENGINEERS, INC.
ASBESTOS CONTAINING BUILDING MATERIALS SAMPLING FORM

Page 3 of

Date: 3/14/95

Report No:

ID Number	Material Description	Sampling Location: Building, Floor, Room	Homogeneous Area No.	Material Category	Friability	Hazard Ranking (1-7)	Quantity (LF,SF)	Photo Number/ Description
SP-13	Floor Tile + Mastic	Bathroom 2 BR - #367	12	TSI Surf. (Misc.)	F (NF) X	2	6X5	10
SP-14	Sheet Vinyl + mastic + flooring	#367 under SP-14	13	TSI Surf. (Misc.)	F (NF) X	2	11	10 — 3 loc
SP-15	Attic Insulation - gray/yellow	Above hallway #367 between 1 BR and 2 BR	14	TSI Surf. (Misc.)	F (NF) X	2	Attics	11
SP-16	Floor Tile + mastic yellow	#367 1 BR - bathroom floor	15	TSI Surf. (Misc.)	F (NF) X	2	5X6	12
SP-17	yellow sheet Vinyl and Mastic	#367 1 BR kitchen floor	16	TSI Surf. (Misc.)	F (NF) X	2	6X10	13
SP-18	Soil under 3" pipe	Crawl Space under 907S	17	(TSI) Surf. ? (Misc.)	(F) NF X	7 - pipe damage	ext. runs	

Signed: W. Stephen Lewis

Date: 3/14/95

Friability: F = friable, NF = nonfriable, X = not applicable (material is non-ACBM)

Hazard Ranking:

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2 = Potential for damage
3 = Potential for significant damage
4 = Damaged
5 = Damaged and potential for further damage
6 = Damaged and potential for significant damage
7 = Significantly damaged

Project: Seward Park

Owner:

File No: 4152-001-852

Prepared By: WSL

GEOENGINEERS, INC.
ASBESTOS CONTAINING BUILDING MATERIALS SAMPLING FORM

Page of

Date: 3/14/95

Report No:

ID Number	Material Description	Sampling Location: Building, Floor, Room	Homogeneous Area No.	Material Category	Friability	Hazard Ranking (1-7)	Quantity (LF,SF)	Photo Number/ Description
SP-19	Sheetrock/Paste + Joint Compound	#347 Ceiling - Living 1 BR Room	18	TSI Surf. (Misc.)	F (NF) X	2	all ceilings	
SP-20	Window Putty	#264 Living room window	5	TSI Surf. (Misc.)	F (NF) X	2	4x8 9 panes	
SP-21	Tan Floor Sheet Vinyl + Mastic	Kitchen #264	19	TSI Surf. (Misc.)	F (NF) X	12	9x6	
SP-22	Light Gray Floor Vinyl and Mastic	bathroom #264	20	TSI Surf. (Misc.)	F (NF) X	2	5x5	
SP-23	Sheetrock/Paste + Joint Compound	Living Room #264 by window	11	TSI Surf. (Misc.)	F (NF) X	2	walls int.	
SP-24	Sheet Vinyl and Mastic effluvia	Kitchen Unit 142	21	TSI Surf. Misc.	F NF X	2	6x10	

Signed: W. Stephen Jewis

Date: 3/14/95

Friability: F = friable, NF = nonfriable, X = not applicable (material is non-ACBM)

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6 = Damaged and potential for significant damage
7 = Significantly damaged

Project: Seward Park
Owner: 4152-001-R52
File No:
Prepared By: WSL

GEOENGINEERS, INC.
ASBESTOS CONTAINING BUILDING MATERIALS SAMPLING FORM

Page 5 of
Date: 3/14/95
Report No:

ID Number	Material Description	Sampling Location: Building, Floor, Room	Homogeneous Area No.	Material Category	Friability	Hazard Ranking (1-7)	Quantity (LF,SF)	Photo Number/ Description
SP-25	Cove Base - Mastic #142	#142 Kitchen	22	TSI Surf. (Misc.)	F (NF) X	2	8LF	
SP-26	White #142 Floor Tile + Mastic	#142 Bathroom	23	TSI Surf. (Misc.)	F (NF) X	2	5x5	
SP-27	Sheetrock/Plaster + Joint Compound	#142 Hallway	11	TSI Surf. (Misc.)	F (NF) X	2	walls	
SP-28	Tan Sheet Vinyl	Maint. Area - new vinyl	24	TSI Surf. (Misc.)	F (NF) X	2	used to upgrade units	
SP-29	Pebbled - Tan Sheet Vinyl	Rest room Maint.	25	TSI Surf. (Misc.)	F (NF) X	2	10x6 bathroom	60
SP-30	Dark Brown Floor Tile + mastic 9x9	Maint. Area - Utility Room	26	TSI Surf. Misc.	F NF X		Utility - Room 4x8	46x8 - office area

Signed: W. Stephen Lewis
Date: 3/14/95

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6 = Damaged and potential for significant damage
7 = Significantly damaged

2 laundry rooms - No PCBs

Project: Seward Park
Owner:
File No: 4152-001-B52
Prepared By: USI

GEOENGINEERS, INC.
ASBESTOS CONTAINING BUILDING MATERIALS SAMPLING FORM

Page of
Date: 3/14/95
Report No:

Entire Maint. area - remove mastic

ID Number	Material Description	Sampling Location: Building, Floor, Room	Homogeneous Area No.	Material Category	Friability	Hazard Ranking (1-7)	Quantity (LF,SF)	Photo Number/ Description
SP-31	Lt Brn 9x9 Floor Tile + Mastic	Maint. Office	27	TSI Surf. (Misc.)	F (NF) X	2	12 x 22	
SP-32	Joint Compound + Sheetrock	Ceiling Laundry Room (by SR1)	18	TSI Surf. (Misc.)	F (NF) X	2	18 x 25	
SP-33	Felt under siding	Horizontal Exterior Siding	28	TSI Surf. (Misc.)	F (NF) X	2	Building Exterior	
SP-34	Felt under siding	Vertical Siding	29	TSI Surf. (Misc.)	F (NF) X	2	11	
SP-35	CAB	Skirting Crawl Space Bldg 9075	30	TSI Surf. (Misc.)	F (NF) X	2	12 x 3	30
SP-36	Sheet Vinyl + mastic	Model Apt. Storage area	31	TSI Surf. (Misc.)	F (NF) X	2	10 x 4 2 x 3	
SP-37	Firebrick Mortar	Boiler #1	32	Misc.	NF	2	all boilers	

Signed: W. Stephen Tecca
Date: 3/14/95

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Hazard Ranking:
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7 = Significantly damaged

PACIFIC RIM ENVIRONMENTAL, INC

GeoEngineers

MAR 17 1995

Routing RGB

March 16, 1995

MR. BOB BREYNAERT, Associate
GeoEngineers, INC.
8410 154th Avenue NE
Redmond, Washington 98052

RE: **Seward Park Estates Cost Estimate for Asbestos Abatement of Crawl Spaces & Boiler Rooms**

Dear Bob:

As requested, Pacific Rim Environmental has reviewed the inherent conditions of the above referenced site with respect to asbestos containing materials (ACM's) in the housing unit crawl spaces and boiler rooms.

The following conditions were noted in the crawl spaces:

1. No access hatches in building floors or exterior access doors. Visual inspection limited to exterior vent openings and openings in concrete skirting around building perimeters. Estimate includes a cost for excavation and backfilling to access crawl spaces.

2. Crawl spaces are compartmentalized due to location of interior load bearing foundation walls. Many of the exterior concrete walls do not appear to be part of the building foundation since there are not any footings. There were a multitude of openings beneath these concrete walls into the crawl spaces. Because of the compartmentalization of the crawl spaces it will be necessary to excavate in multiple locations to access all piping.

3. Pipe insulation has been removed from pipes located directly in front of exterior vents. This was a typical condition, but it was evident that the insulation beyond the vents is still on the pipes. Remaining pipe insulation is in poor condition due to age and it is likely that the soil is contaminated. The estimate includes a cost for the removal and disposal of contaminated soil not to exceed 3" in depth.

The following conditions were noted in the boiler rooms:

1. The insulation is in very poor condition and delaminated and constitutes a health hazard. Although some of the boilers are no longer completely insulated, residual debris will have to be cleaned and the boiler surfaces are extremely corroded.

2. Piping configurations in the boiler rooms were typical even though some piping was missing or removed and set on the floor with insulation remaining.

3. The boilers, piping and asbestos containing insulation were removed from 3 of the 9 boiler rooms.

6510 Southcenter Blvd. • Tukwila, WA 98188 • Phone: (206) 244-8965 • Fax: (206) 244-9096

4. 5 of the boiler rooms contain brick that appears to have come from the boiler stacks. This should be considered contaminated and will have to removed as part of the abatement work.

5. There are gypsum wall board ceilings in the boiler rooms that are in poor condition and should be demolished as part of the boiler room abatement.

The estimate of costs is based on the following:

1. One mobilization and demobilization to perform all work in the crawl spaces and boiler rooms. Asbestos containg materials within the housing units are excluded. Subsurface piping is also excluded.

2. Estimate assumes that the soil is contaminated and will have to removed by pneumatic means.

3. Because of difficult access, piping can be either wrapped and cut or insulation may be stripped. All work will be performed within a negative pressure enclosure.

4. Accesses to crawl spaces will be mechanically excavated and backfilled upon completion.

5. All decontamination units will be exterior, thus they will require hard walls and lockable doors to prevent access to work areas.

6. An on site office with telephone and fax machine has been included in the estimate. Project duration is estimated at 4 months or 17 weeks with a crew of 16-20 men.

Cost Estimate

Corresponding estimate line items, their addresses and quantities are as follows:

- 4 Unit Apartments - 5312, 5350, 9019, 9020, 9043, 9046, 9069, 9097
  206 lf of pipe X 8 units = 1,648 lf pipe insulation
  1,906 sf each X 8 units = 15,248 sf

- 9 Unit Apartment - 5343/5349/9051
  648 lf of pipe X 1 unit = 648 lf pipe insulation
  3,752 sf each X 1 unit = 3,752 sf

- 10-12 Unit Apartments - 5307/5309, 5323/5325, 5337/5339, 9013/9017, 9014/9016, 9023/9027, 9024/9026, 9037/9039, 9040/9044, 9043/9045, 9047/9049, 9050/9052, 9051/9053, 9075/9077, 9083/9085
  898 lf of pipe X 15 units = 13,470 lf pipe insulation
  5,208 sf each X 15 units = 78,120 sf

- 12 Unit Apartment - 5311/5313/5315
  954 lf of pipe X 1 unit = 954 lf pipe insulation
  5,656 sf each X 1 unit = 5,656 sf

- 14-15 Unit Apartments - 5207/5211, 5307/5311, 9079/9081
  1,018 lf of pipe X 3 units = 3,054 lf pipe insulation
  6,664 sf each X 3 units = 19,992 sf

- 15 Unit Apartments - 9011/9015/9017, 9025/9027/9031, 9061/9065/9067
  1,248 lf of pipe X 3 units = 3,744 lf pipe insulation
  6,888 sf each X 3 units = 20,664 sf

- 15 Unit Apartment - 5301/5303/5305
  1,166 lf of pipe X 1 unit = 1,166 lf pipe insulation
  7,000 sf each X 1 unit = 7,000 sf

- 18 Unit Apartment - 5331/5333/5335
  1,394 lf of pipe X 1 unit = 1,394 lf pipe insulation
  8,624 sf each X 1 unit = 8,624 sf

- Boiler Rooms
  37 fittings each X 6 = 222 fittings insulation (separated from lf due to size)
  148 lf of pipe each X 6 = 888 lf pipe insulation
  25 sf header insulation X 6 = 150 sf header insulation
  166 sf boiler insulation X 6 = 996 sf boiler insulation
  180 sf floor area each X 6 = 1,080 sf floor area

- **Totals**
  27,188 lf pipe insulation (includes boiler rooms fittings)
  1,146 sf boiler/header or surface insulation
  160,136 sf floor area

The above quantities are approximate. All crawl space piping is 2"-3" OD.

Mobilization/Demobilization =	$ 5,189	
Supervision =	$ 24,704	
General Conditions (Office, phone, truck) =	$ 3,094	
Subtotal =		$ 32,987
4 Unit Apartments =	$ 47,769	
9 Unit Apartment =	$ 13,625	
10-12 Unit Apartments =	$280,622	
12 Unit Apartment =	$ 20,335	
14-15 Unit Apartments =	$ 68,605	
15 Unit Apartments =	$ 75,917	
15 Unit Apartment =	$ 24,814	
18 Unit Apartment =	$ 30,426	
Boiler Rooms =	$ 34,345	
Subtotal =		$596,458

Total Costs =	$629,445	
CGL Insurance =	$ 31,472	
Subtotal =	$660,917	
Washington State Sales Tax =	$ 54,195	
Subtotal =	$715,112	
Bond =	$ 14,302	
TOTAL ABATEMENT COST =		**$729,414**
TOTAL NON-PREVAILING WAGE ABATEMENT COST =		**$521,734**
BOILER ROOM ABATEMENT ONLY (w/ Tax & Bond) =		**$ 46,547**

TOTAL ABATEMENT COST assumes that project will be performed by a contractor who pays prevailing wages. Prevailing wages must be paid if the project is to have any public funding. If the project is to use HUD funding the prevailing labor rate used is unreasonably low for this locale. We have included a non-prevailing wage cost in the event project funding is to be exclusively private.

We have assumed that all or most of the piping in the crawl spaces is abandoned and there is no longer a need to access the spaces. If this is the case, it is not necessary to abate the crawl spaces, yet all accesses should be sealed and existing vent openings repaired.

Costs for on-site air monitoring have not been included. Typically, an independent third party firm is retained to performed baseline, safety and clearance monitoring. By law, the contractor is responsible for WISHA compliance monitoring. The cost for this item would be approximately $28,000 for the total project and $3,200 for boiler rooms if the contractor were to conduct his own monitoring and have the samples read by a laboratory. This amount does not reflect any consulting costs or air monitoring costs performed by PRE, but should be added to the construction cost as a minimum.

We look forward to the possibility of working with GeoEngineers on this and future projects as a subconsultant. Should you have any questions regarding the above, please contract our office at your convenience.

Sincerely,

George R. Bruce

George R. Bruce,
Construction Manager

Certificate of Training

Environmental Health Sciences, Inc.
certifies that

W. Stephen Lewis

has successfully completed the
AHERA Building Inspector
Training Refresher in accordance with
40 CFR Part 763, Subpart E, Appendix C
on this 20th day of June, 1994
in Bellevue, Washington.

Expires June 20, 1995

TRAINING DIRECTOR

940605-10
CERTIFICATION NO.

ENVIRONMENTAL HEALTH SCIENCES, INC.
Nine Lake Bellevue Building · Suite 220 · Bellevue, Washington 98005
(206) 455-2959 Phone · (206) 646-7247 Fax

APPENDIX C

Wastewater Discharge Permit

King County
Water Pollution Control Division
Industrial Waste Program
Department of Natural Resources
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658

November 5, 1996

Mr. Rob Harrison
Herrera Environmental Consultants
2200 6th Avenue North
Suite 601
Seattle, Washington 98121

Re: Authorization to Discharge Groundwater to the Sanitary Sewer from Seward Park Estates
9061 Seward Park Ave So., Seattle, WA

Dear Mr. Harrison:

The King County Department of Natural Resources' Industrial Waste Program has reviewed your November 4,1996 FAX requesting authorization to discharge groundwater pumped from the Seward Park Estates tank replacement project located at 9061 Seward Park Avenue South to the sanitary sewer. King County grants approval for the discharge of up to 75 gpm of groundwater for up to 30 days provided that: King County is notified of the date of discharge; Kami Wong (689-0833) of the City of Seattle is notified to allow for permitting of a connection to the sanitary sewer and assessment of sewer charges; no discharge occurs during a storm event; and the discharge criteria outlined in the following paragraphs are met. There is no fee for this authorization.

This authorization permits you to discharge limited amounts of groundwater into the King County sewer system in accordance with the regulations outlined in King County Code 28.84.060 and Ordinance No. 11034 (enclosed) and the following discharge criteria:

Discharge Limitations

Constituent	Maximum Concentration, ppm
Benzene	0.13
Toluene	1.5
Ethylbenzene	1.4
Nonpolar Fats, Oil & Grease	100
Settleable solids	7.0
Soluble Sulfide	0.1
Atmospheric Hydrogen Sulfide	10

In addition the following operating procedures shall apply:

Operating Procedures

a) There shall be no pronounced odor of solvent or gasoline.
b) There shall be no pronounced oil sheen or unusual color.
c) There shall be no pronounced hydrogen sulfide (rotten egg) odor.
d) There shall be no visibly pronounced turbidity; the discharge must remain translucent.

King County will expect operators on site to pay close attention to these operating procedures whenever discharge to the sanitary sewer is occurring. If any of the discharge limits or operating criteria are exceeded, you must stop discharging and notify the King County Industrial Waste Section at 689-3000.

The formal requirements and fees of a full wastewater permit will not be required as long as you maintain good compliance and do not change the nature and volume of your discharge.

Changes to, or additions at, this facility may cause us to reassess this decision and require that you obtain a full wastewater discharge permit. If you propose to substantially increase the volume of your discharge or change the type and quantities of substances discharged, you must submit a new waste discharge permit application to King County. State law requires that such application for a permit be made a minimum of sixty (60) days before starting a new discharge. Therefore, to avoid delays, please time your submittal accordingly.

King County Industrial Waste staff want to help you stay in compliance with our regulations. If at any time you have questions about this authorization, or other questions about your discharge, please do not hesitate to call me at 689-3004.

Sincerely,

Denise M Healy

Denise M. Healy
Industrial Waste Investigator
Environmental Programs

Enclosure

cc: Doug Knutson, Department of Ecology
Kami Wong, City of Seattle
Doug Hilderbrand, King County

healy\SPEDGW

APPENDIX D

Notice Placed on the Property Deed

RESTRICTIVE COVENANT

CITY OF SEATTLE, WASHINGTON

The property that is the subject of the Restrictive Covenant has been the subject of remedial action under Chapter 70.105D RCW. The work done to remediate the property is described in the Independent Cleanup Action Program (IRAP) report submitted to the State of Washington Department of Ecology. This Restrictive Covenant is required by Ecology under Ecology's rule WAC 173-340-440 (1996 ed.) because remediation on the site resulted in residual concentrations of petroleum hydrocarbons which exceed Ecology's Method A cleanup levels for soil established under WAC 173-340-700(2).

The undersigned, Lake Washington Limited Partnership, is the fee owner of real property in the County of King, State of Washington (legal description attached hereto as Exhibit A), hereafter referred to as the "Site".

The Site also refers to the subsurface areas impacted by petroleum hydrocarbons, as documented through subsurface soil sampling performed by Herrera Environmental Consultants, Inc. The Lake Washington Limited Partnership makes the following declaration as to limitations, restrictions, and uses to which the Site nay be put, and specifies that such declarations shall constitute covenants to run with the land, as provided by law, and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Site.

Section 1. No groundwater may be taken for domestic purposes from any well on the property without first conducting a groundwater investigation at the Site.

Section 2. Any activity on the Site that may result in the release of a hazardous substance currently contained within the boundaries of the Site is prohibited.

Section 3. For purposes of Sections 4, 5, and 6 of this Restrictive Covenant, the Site shall not include subsurface utilities and conveyance to and from the facility, nor shall the Site include surface and subsurface areas required for access to the facility and the subsurface conveyances and utilities (unless the Lake Washington Limited Partnership is the owner and operator) shall not be subject to or bound by the terms of this Restrictive Covenant.

Section 4. The owner of the Site must give written notice to the Department of Ecology, or to a successor agency, of the owner's intent to convey any interest in the Site. No conveyance of title, easement, lease, or other interest in the Site shall be consummated by the owner without adequate and complete provisions for the continuous operation, maintenance, and monitoring of any ongoing remedial activities.

Section 5. The owner must notify and obtain approval from the Department of Ecology, or from a successor agency, prior to any use of the Site that is inconsistent with the terms of this Restrictive Covenant. The Department of Ecology or its successor agency may approve such a use only after public notice and comment.

Section 6. The owner shall allow authorized representatives of the Department of Ecology, or as a successor agency, the right to enter the Site at reasonable times for the purpose of evaluating compliance with the IRAP, to take samples, to inspect any remedial actions conducted at the Site, and to inspect records that are related to any remedial activities.

Section 7. The owner of the Site and the owner's assigns and successors in interest reserve the right under WAC 173-340-740 and WAC 173-340-440 (1996 ed.) to record an instrument which provides that this Restrictive Covenant shall no longer limit use of the Site or be of any further force or effect. However, such an instrument may be recorded only with the consent of the Department of Ecology, or of a successor agency. The Department of Ecology or a successor agency may consent to the recording of such an instrument only after public notice and comment.

_____/_____
Name/Title
for the Lake Washington Limited Partnership

EXHIBIT A

That portion of Government Lot 3, Section 35, Township 24 North, Range 4 East, W.M, in King County, Washington, and of the shorelands of the second class in front thereof, described as follows:

Beginning at the intersection of the south line of said government lot with the east line of 52nd Avenue South as the same was condemned by the City of Seattle, in King County Superior Court Cause Number 177159 under Ordinance Number 46529 of said city;
thence north 0°09'08" east, along said east line, 968.28 feet to the south line of Henderson Street as condemned by said city in King County Superior Court Cause Number 135781 under Ordinance Number 39385 of said city;
thence south 89°50'52" east, along said south line, 624.00 feet to the west line of 54th Avenue south as the same was condemned by said City in King County Superior Court Cause Number 279198 under Ordinance Number 65076 of said city;
thence south 2°40'40" east, along said west line, 316.94 feet to a point of curve;
thence continuing along said west line on a curve to the left with a radius of 735.00 feet, an arc distance of 494.53 feet to a point of tangency;
thence continuing along said west line, south 41°13'42" east 202.296 feet to an intersection with a line in prolongation northerly of the east line of Lot 8, Block 66, Rainier Beach, according to the plat thereof recorded in Volume 8 of Plats, page 11, in King County, Washington;
thence south 0°26'50" west along said line in prolongation of the east line of said Lot 8, 51.988 feet to the said south line of Government Lot 3;
thence north 89°44'53" west along said south line 955.72 feet to the point of beginning,
EXCEPT the north 80 feet of the east 120 feet thereof.

APPENDIX E

Laboratory Sample Preparation Procedure (OnSite Environmental, Inc.)

March 7, 1997

Peter Jowise
Herrera Environmental Consultants
2200 Sixth Avenue STE 601
Seattle, WA 98121

Subject: Seward Park Estate samples

When samples are analyzed by GC-FID in accordance with method WTPH-D, a frequent problem that occurs is when interferences in the sample matrix cause false positives or elevated results. This happens when non-petroleum hydrocarbons elute off the column in the diesel and oil ranges of the chromatogram. Often this is caused by plant or other biological matter in the sample whose hydrocarbons are extracted out along with any petroleum hydrocarbons that may be in the sample. This occurred to a particularly high extreme with the Herrera Seward Park samples, which contained large amounts of peat. The laboratory must then attempt to clean the sample extracts of these interfering hydrocarbons in order to minimize the impact they have on the analytical results.

The main factor which allows us to separate petroleum hydrocarbons from biological hydrocarbons is the difference in polarity of these two groups, with petroleum hydrocarbons being less polar than the biological ones. The silica gel clean-up and acid clean-up procedures both take advantage of this difference in polarity to allow us to separate, to a large degree, the different types of compounds.

The silica gel clean-up procedure works on the premise that the greater the polarity of a compound, the higher affinity it has for silica gel. The sample extract is passed through a silica gel micro column, and the petroleum hydrocarbons (the non-polar ones) pass through while the biological hydrocarbons (the polar ones) tend to "stick" to the silica gel. In this way, the extract is "cleaned" of many of the polar hydrocarbons.

The sulfuric acid clean-up procedure takes care of many of the biological hydrocarbons which may not be as polar as the others, and therefore may pass through the silica gel column along with the petroleum hydrocarbons. It does this by reacting with these compounds in a way which makes them more polar. These reacted compounds now become more soluble in the sulfuric acid than they are in the extraction solvent, and when the solvent layer is removed from the acid, these compounds are left behind. Any reacted compounds which are still in the solvent fraction can be removed by a subsequent silica gel clean-up.

As with any clean-up procedure, there are certain limitations with the acid clean-up and silica-gel clean up procedures. Both of these procedures make use of the general differences in polarity of the two groups of compounds, but it must be remembered that polarity is not a yes/no question. A compound's polarity can exist anywhere on a scale between extremely polar and extremely non-polar. Therefore, it is not possible to achieve perfect separation between two groups of compounds, with each compound in any group exhibiting varying degrees of polarity. Another limitation is the amount of interfering compounds in the original sample. Each clean-up step can only remove a certain amount interferences, and while the clean-up steps can be repeated, this can

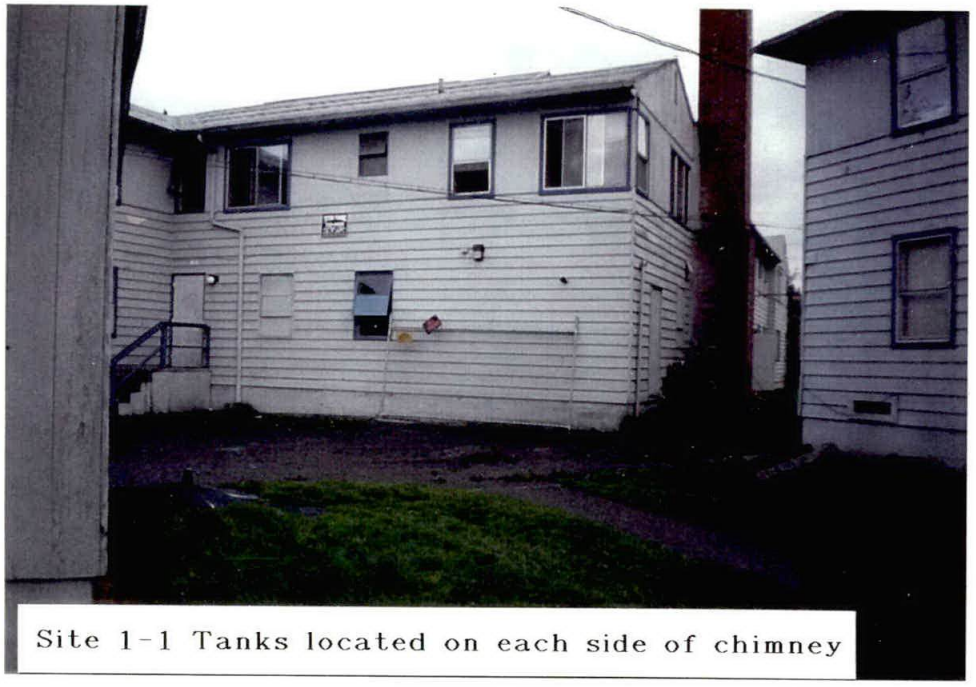
only be done a limited number of times before the cumulative negative effects that the clean-up procedures have on the extract compromise the analytical data.

The Washington analytical methods for petroleum hydrocarbon analysis require results to be on a dry weight basis, which is to compensate for wet samples which would normally bias the results low. A twenty gram sample which is 10 percent water contains only 18 grams of soil and therefore the final result needs to raised by 10 percent if we assume an initial weight of 20, not 18 grams.

Many of the samples received from Herrera contained large amounts of peat, which in turn has a high moisture content. This caused the dry weights of the samples to be very low, which raised the analytical results by as much as 1000 percent.

APPENDIX F

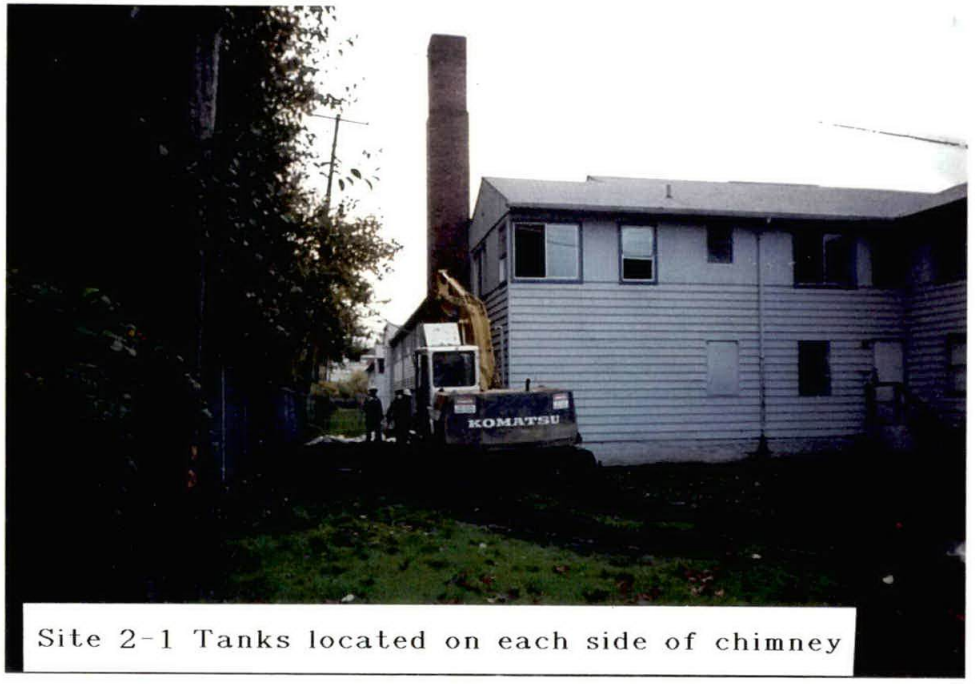
Site Photographs



Site 1-1 Tanks located on each side of chimney

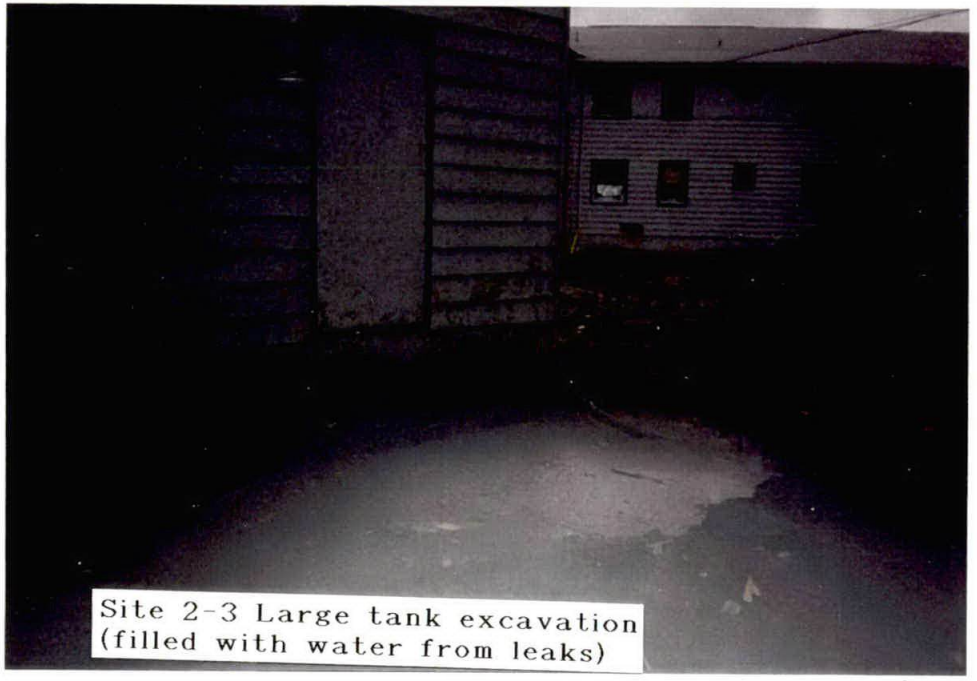
Site 1-2 Small tank location: sewer line marked

Site 1-3 Small tank excavation with stockpile

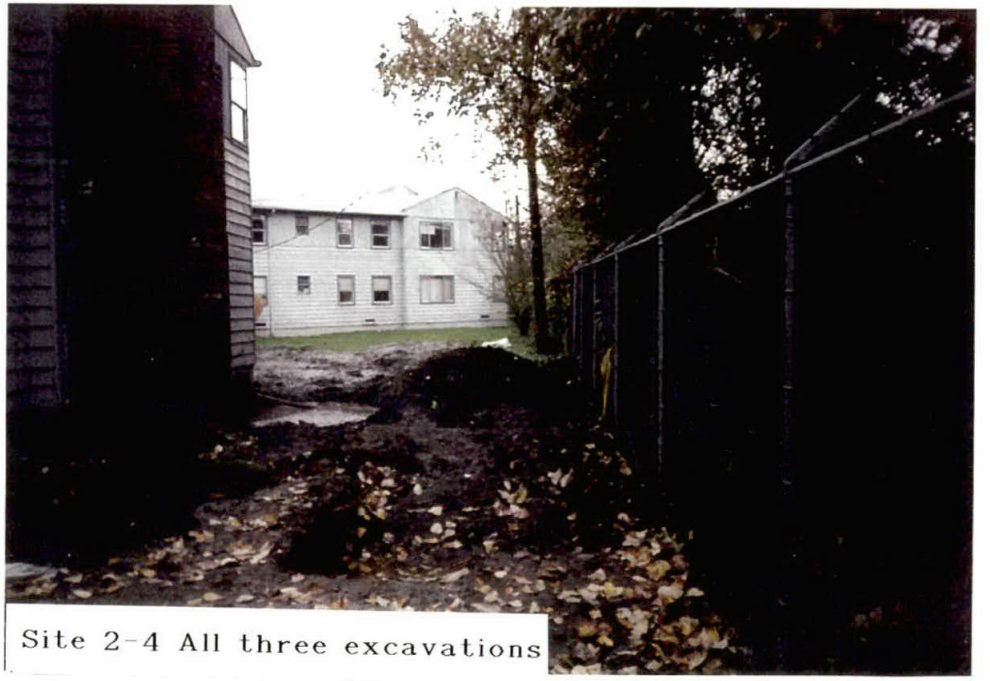


Site 2-1 Tanks located on each side of chimney

Site 2-2 Small tank and 55-gallon drum locations

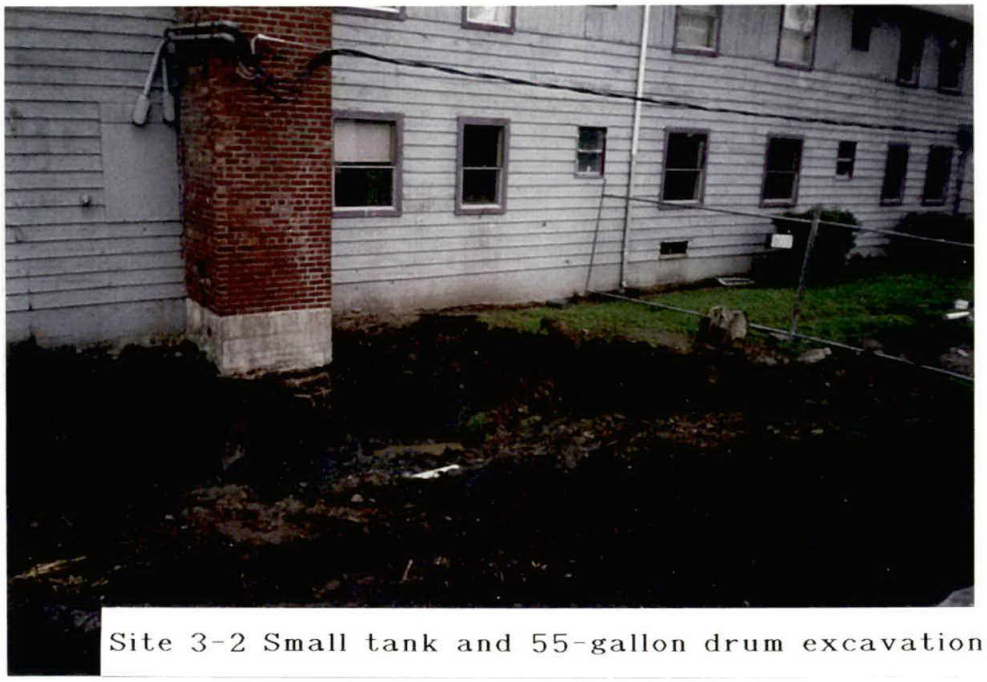


Site 2-3 Large tank excavation
(filled with water from leaks)



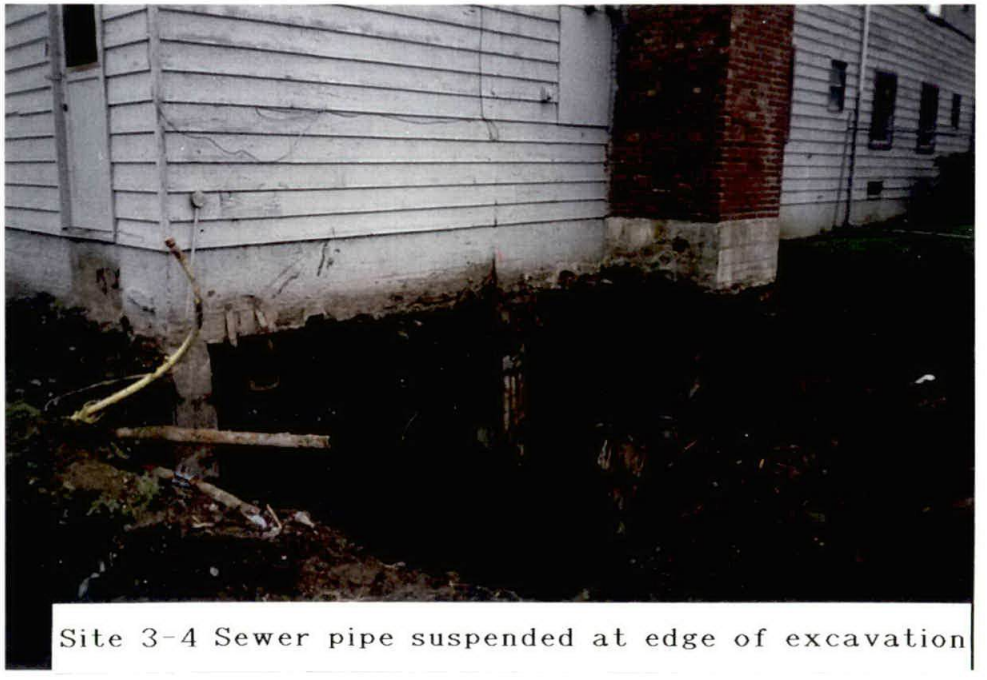
Site 2-4 All three excavations

Site 3-1 Large tank excavation



Site 3-2 Small tank and 55-gallon drum excavation

Site 3-3 Exploratory hole in foreground



Site 3-4 Sewer pipe suspended at edge of excavation

Site 4-1 Large tank and 55-gallon drum removed

Site 4-2 Large tank excavation with gas pipe valve

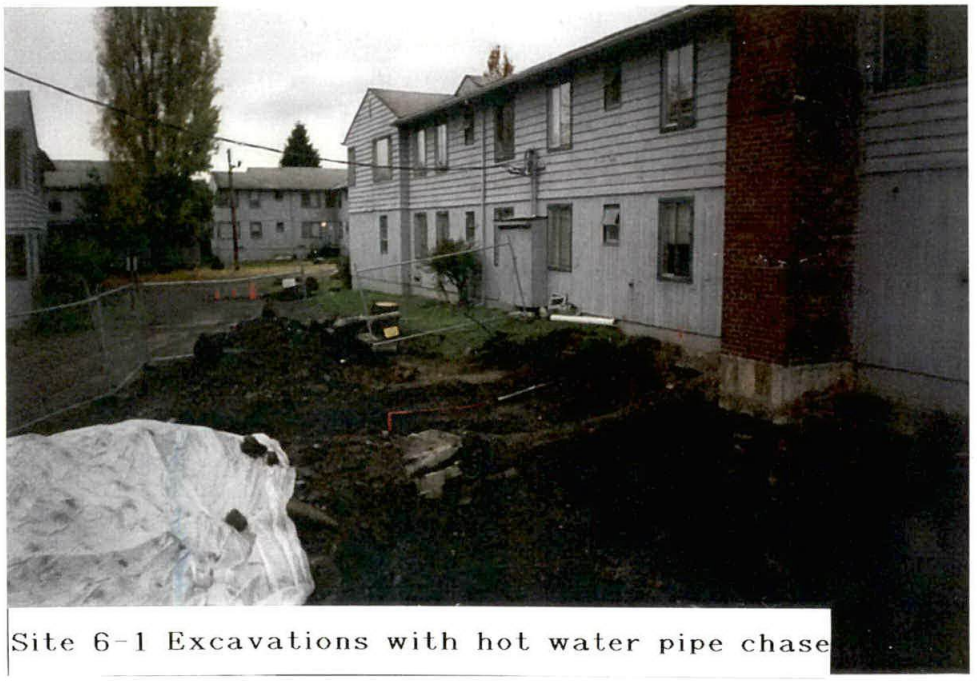
Site 4-3 Product associated with fill soil (brown peat)

Site 5-1 Large tank being removed

Site 5-2 Small tank and stockpile

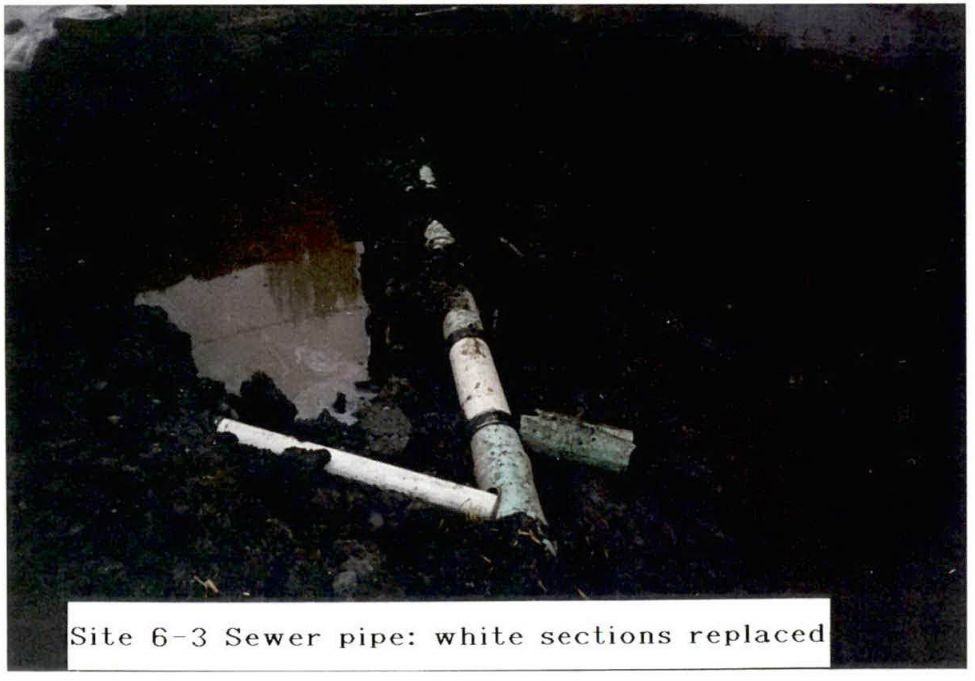
Site 5-3 Large tank excavation: water pipe on right

Site 5-4 Large tank excavation
(pilasters on top of pilings)



Site 6-1 Excavations with hot water pipe chase

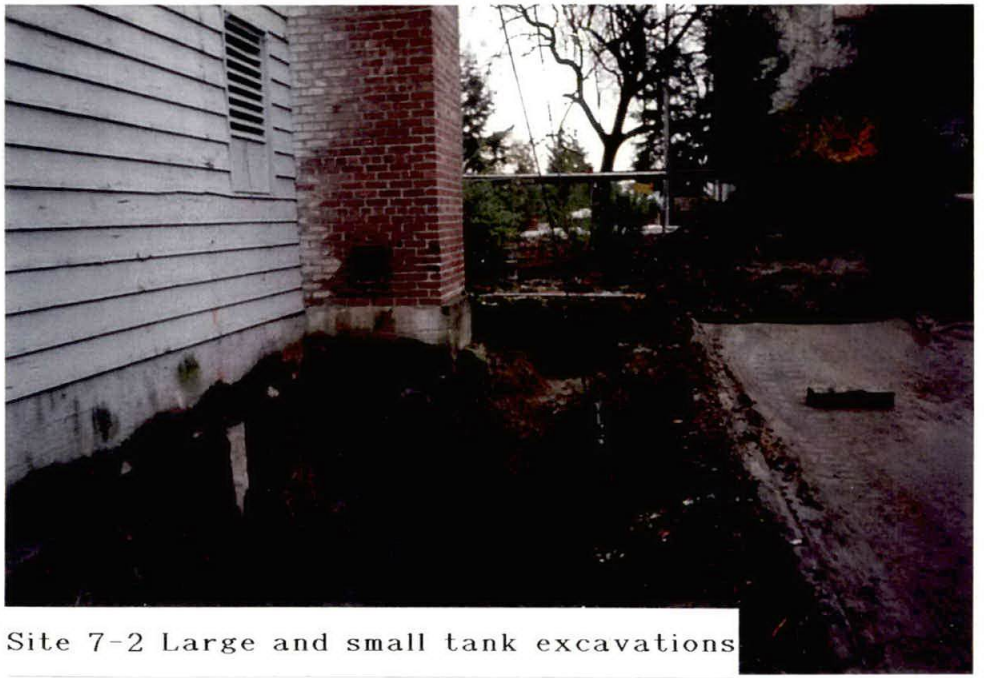
Site 6-2 Exploratory pit with brown peat & clay bottom (no visible contamination)



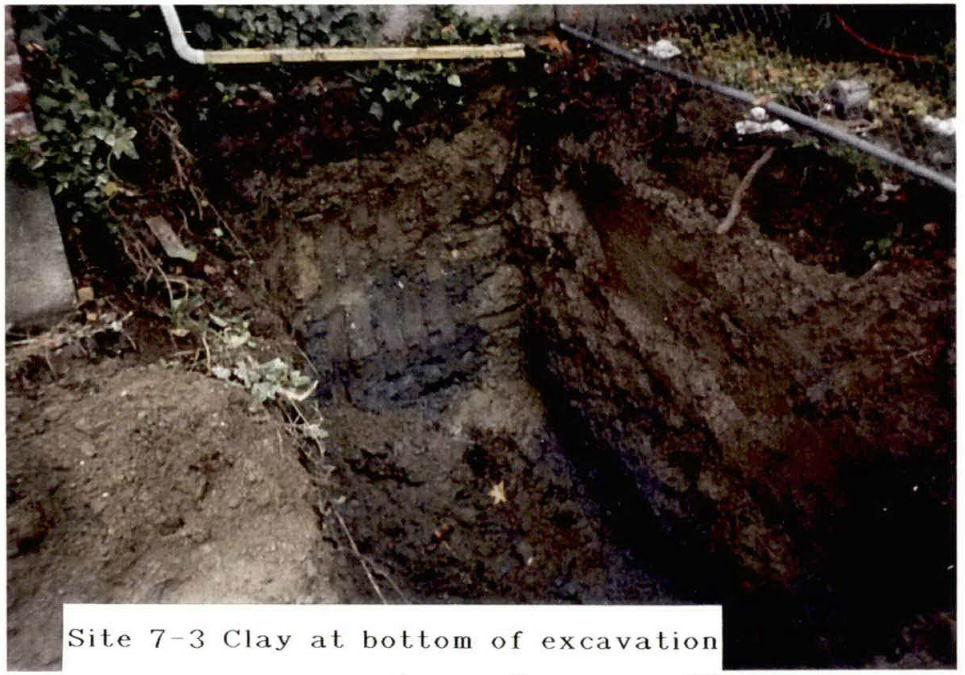
Site 6-3 Sewer pipe: white sections replaced

Site 6-4 Excavation beneath building (contaminated soil left in place beneath pipes)

Site 7-1 Large tank excavation with power pole guy wire



Site 7-2 Large and small tank excavations



Site 7-3 Clay at bottom of excavation

Site 8-1 Tanks located on either side of chimney

Site 8-2 Large tank excavation

Site 8-3 Small tank excavation

Site 8-4 Expanded excavation (tie down piling on right)

Site 9-1 Small tank excavation

Site 9-2 Large tank excavation

Site 9-3 Large tank excavation

APPENDIX G

Laboratory Data Reports

Water Sample

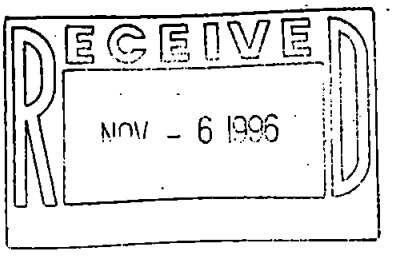
725-2167

Water

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 1, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121



Re: Analytical Data for Project 803/2
Laboratory Reference No. 9610-110

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on October 30, 1996. **Please note additional analysis will follow in a later report.**

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	ONS01-04	PAGE 1	
REPORT DATE:	11/01/96		
DATE SAMPLED:	10/30/96	DATE RECEIVED:	10/30/96

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM ONSITE ENVIRONMENTAL

CASE NARRATIVE

One water sample was received by the laboratory in good condition. The sample was analyzed according to the chain-of-custody. No difficulties were encountered in the preparation or analysis of this sample. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

SAMPLE ID	SULFIDE (mg/l)
W1030-1	0.006

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES
3927 AURORA AVENUE NORTH, SEATTLE, WA 98103
PHONE: (206) 632-2715 · FAX: (206) 632-2417

CASE FILE NUMBER:	ONS01-04	PAGE 2	
REPORT DATE:	11/01/96		
DATE SAMPLED:	10/30/96	DATE RECEIVED:	10/30/96

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM ONSITE ENVIRONMENTAL

QA/QC DATA

QC PARAMETER	SULFIDE (mg/l)
METHOD	EPA 376.2
DATE ANALYZED	10/31/96
DETECTION LIMIT	0.005
DUPLICATE	
SAMPLE ID	W1030-1
ORIGINAL	0.006
DUPLICATE	0.006
RPD	0.00%
SPIKE SAMPLE	
SAMPLE ID	
ORIGINAL	
SPIKED SAMPLE	
SPIKE ADDED	
% RECOVERY	NA
QC CHECK	
FOUND	0.028
TRUE	0.032
% RECOVERY	87.50%
BLANK	<0.005

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Steven Lazoff
Laboratory Director

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

EPA 413.1

Date Extracted: 10-31-96
Date Analyzed: 10-31-96

Matrix: Water
Units: mg/L (ppm)

Client ID	Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	Flags	PQL
W1030-1	10-110-4	0.1	**1.7**		0.50

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

EPA 602 (BTE)

Date Extracted:	10-30-96
Date Analyzed:	10-30-96
Matrix: Water	
Units: ug/L (ppb)	
Lab ID:	10-110-4
Client ID:	**W1030-1**
Dilution Factor	5

	Result	Flags	PQL
Benzene	**ND**		5.0
Toluene	**ND**		5.0
Ethyl Benzene	**ND**		5.0
4-BFB Surrogate Recovery	82%		

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

EPA 602 (BTEX)
METHOD BLANK QUALITY CONTROL

Date Extracted: 10-30-96
Date Analyzed: 10-30-96

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB1030W1

Dilution Factor 1

	Result	Flags	PQL
Benzene	ND		1.0
Toluene	ND		1.0
Ethyl Benzene	ND		1.0
m,p-Xylene	ND		1.0
o-Xylene	ND		1.0
4-BFB Surrogate Recovery	79%		

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

EPA 602 (BTEX)
DUPLICATE QUALITY CONTROL

Date Extracted: 10-16-96
Date Analyzed: 10-16-96

Matrix: Water
Units: ug/L (ppb)

Lab ID:	10-057-1	10-057-1		
	Original	**Duplicate**	**RPD**	**Flags**
Dilution Factor	1	1		
Benzene	**ND**	**ND**	NA	
Toluene	**ND**	**ND**	NA	
Ethyl Benzene	**3.62**	**4.50**	22	C
m,p-Xylene	**ND**	**ND**	NA	
o-Xylene	**ND**	**ND**	NA	
4-BFB Surrogate Recovery	84%	91%		

C - The duplicate RPD outside control limits due to analyte concentration within five times the quantitation limit.

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

EPA 602 (BTEX)
MS/MSD QUALITY CONTROL

Date Extracted: 10-16-96
Date Analyzed: 10-16-96

Matrix: Water
Units: ug/L (ppb)

Lab ID	10-057-1		10-057-1		
spiked @ 50 ppb	**MS**	Percent	**MSD**	Percent	
Dilution Factor	1	Recovery	1	Recovery	RPD
Benzene	**46.7**	**93%**	**47.2**	**94%**	1.1
Toluene	**47.8**	**96%**	**48.5**	**97%**	1.5
Ethyl Benzene	**51.9**	**97%**	**52.4**	**98%**	1.0
m,p-Xylene	**45.1**	**90%**	**45.5**	**91%**	0.88
o-Xylene	**46.7**	**93%**	**47.2**	**94%**	1.1
4-BFB					
Surrogate Recovery	92%		96%		

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

EPA 413.1
QUALITY CONTROL

Date Extracted: 10-31-96
Date Analyzed: 10-31-96

Matrix: Water
Units: mg/L (ppm)

Lab ID: MB1031W1

	Dilution Factor	Total Petroleum Hydrocarbons	Flags	PQL
Method Blank	0.1	ND	G	0.50

G - Insufficient sample quantity for duplicate analysis.

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

EPA 413.1
SB/SBD QUALITY CONTROL

Date Extracted: 10-31-96
Date Analyzed: 10-31-96

Matrix: Water
Units: mg/L (ppm)

Lab ID: SB1031W1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Flags	PQL
Spike Blank @ 20 ppm	0.1	17.2	86%		0.50
Spike Blank Duplicate	0.1	18.3	91%		0.50
RPD		5.8%			

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

Date Analyzed: 10-31-96

% MOISTURE

Client ID	Lab ID	% Moisture
STOCK-8-1	10-110-1	24
STOCK-8-2	10-110-2	30
STOCK-8-3	10-110-3	24

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turn Around Requested

(Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Company: HERRERA ENV. CONS.
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	#pl Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D w/ OIL & DIESEL RANGE QUANTS	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	FOG as TPH (418.1)	B, T, E	Total Soluble Sulfides					% Moisture
1	STOCK-8-1	10/29	9:30	SOIL	1			X																	X
2	STOCK-8-2	10/29	9:45	SOIL	1			X																	X
3	STOCK-8-3	10/29	10:00	SOIL	1			X																	X
4	W1030-1	10/30																X	X	X					

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	10/30/16	[signature]	10/30/96
FIRM: HERRERA	TIME: 1126	FIRM: ONSITE ENV.	TIME: 11:20
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

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Tank Excavation Samples

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 5, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-007

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 3, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory..

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: November 5, 1996
Samples Submitted: November 3, 1996
Lab Traveler: 11-007
Project: 803/2

WTPH-D (dual quantitation)

Date Extracted: 11-04-96
Date Analyzed: 11-04-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel MRL	Oil MRL
EXC-6-2	11-007-1	1.0	**27**	**130**	76%		25	50
EXC-6-3	11-007-2	1.0	**81**	**460**	83%		25	50

* o-Terphenyl

Date of Report: November 5, 1996
Samples Submitted: November 3, 1996
Lab Traveler: 11-007
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-04-96
Date Analyzed: 11-04-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1104S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	90%		25

* o-Terphenyl

Date of Report: November 5, 1996
Samples Submitted: November 3, 1996
Lab Traveler: 11-007
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-04-96
Date Analyzed: 11-04-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 10-114-2

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	82%		25
Duplicate	1.0	ND	80%		25
RPD		NA			

* o-Terphenyl

Date of Report: November 5, 1996
Samples Submitted: November 3, 1996
Lab Traveler: 11-007
Project: 803/2

WTPH-D
SPIKE BLANK QUALITY CONTROL

Date Extracted: 11-04-96
Date Analyzed: 11-04-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1104S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	85.5	85%	101%		25

* o-Terphenyl

Date of Report: November 5, 1996
Samples Submitted: November 3, 1996
Lab Traveler: 11-007
Project: 803/2

Date Analyzed: 11-04-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-6-2	11-007-1	58
EXC-6-3	11-007-2	74

Chain Of Custody

Page 1 of 1

OnSite Environmental Inc.

14924 NE 31st Circle • Redmond, WA 98052

Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turnaround Requested

(Check One)

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- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KW

Laboratory No. 11-007

Company: HERRERA ENV. CONS.

Project No: 803/2

Project Name: SEWARD

Project Manager: ROB HARRISON

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED w/ OIL RANGE CLEAN GUARD	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals							% Moisture
1	EXC-6-2	11/1		SOIL	1			X																X
2	EXC-6-3	11/1		SOIL	1			X																X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	11/3/96	Bob Udell Inc	11/3/96
FIRM HERRERA	TIME 1008	FIRM OSE	TIME 1008
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS: Combo Oil 1

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OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 8, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-023

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 6, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: November 8, 1996
Samples Submitted: November 6, 1996
Lab Traveler: 11-023
Project: 803/2

WTPH-D

Date Extracted: 11-07-96
Date Analyzed: 11-07-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel MRL	Oil MRL
EXC-3-1	11-023-1	1.0	**ND**	**ND**	68%		25	50
EXC-3-2	11-023-2	1.0	**ND**	**ND**	77%		25	50
EXC-3-3	11-023-3	1.0	**ND**	**ND**	74%		25	50
EXC-3-4	11-023-4	1.0	**ND**	**ND**	73%		25	50

* o-Terphenyl

Date of Report: November 8, 1996
Samples Submitted: November 6, 1996
Lab Traveler: 11-023
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-07-96
Date Analyzed: 11-07-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1107S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	88%		25

* o-Terphenyl

Date of Report: November 8, 1996
Samples Submitted: November 6, 1996
Lab Traveler: 11-023
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-05-96
Date Analyzed: 11-05-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-014-7

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	36.4	79%		25
Duplicate	1.0	33.4	82%		25
RPD		8.6%			

* o-Terphenyl

Date of Report: November 8, 1996
Samples Submitted: November 6, 1996
Lab Traveler: 11-023
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-05-96
Date Analyzed: 11-05-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1105S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	83.7	84%	98%		25
Spike Blank Duplicate	1.0	88.7	89%	105%		25
RPD		5.8%				

* o-Terphenyl

Date of Report: November 8, 1996
Samples Submitted: November 6, 1996
Lab Traveler: 11-023
Project: 803/2

Date Analyzed: 11-7-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-3-1	11-023-1	29
EXC-3-2	11-023-2	25
EXC-3-3	11-023-3	24
EXC-3-4	11-023-4	29

Chain Of Custody

Page _____ of _____

OnSite Environmental Inc.
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Turn Around Requested

(Check One)

- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Company: HERRERA

Project No: 803/2

Project Name: SEWARD

Project Manager: ROB HARRISON

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXT. W/ SILICA GEL CLEANUP	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals							% Moisture
1	EXC-3-1	11/6	11:50	SOIL				X																X
2	EXC-3-2	11/6	1:10					X																X
3	EXC-3-3	11/6	2:40					X																X
4	EXC-3-4	11/6	4:40					X																X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	11/6/96	[signature]	11/6/96
FIRM: HERRERA	TIME: 7:00	FIRM: OSE	TIME: 7:00 pm
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

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OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 12, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-039

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 9, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: November 12, 1996
Samples Submitted: November 9, 1996
Lab Traveler: 11-039
Project: 803/2

WTPH-D

Date Extracted: 11-11-96
Date Analyzed: 11-11&12-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel MRL	Oil MRL
PRODUCT	11-039-1	20.0	**32000**	**20000**	---	S	500	1000
EXC-6-4	11-039-2	20.0	**6500**	**6600**	---	S	500	1000
EXC-6-5	11-039-3	1.0	**ND**	**ND**	72%		25	50
EXC-3-5	11-039-4	1.0	**ND**	**ND**	73%		25	50
EXC-3-6	11-039-5	5.0	**740**	**840**	---	S	125	250
EXC-6-6	11-039-6	1.0	**28**	**160**	77%		25	50
EXC-6-7	11-039-7	5.0	**5300**	**2100**	---	S	125	250
EXC-6-8	11-039-8	1.0	**ND**	**ND**	65%		25	50
EXC-6-9	11-039-9	1.0	**420**	**450**	99%		25	50
EXC-8-1	11-039-10	1.0	**76**	**440**	110%		25	50
EXC-8-2	11-039-11	1.0	**ND**	**ND**	88%		25	50
EXC-8-3	11-039-12	1.0	**ND**	**ND**	77%		25	50
EXC-8-4	11-039-13	1.0	**ND**	**ND**	85%		25	50

o-Terphenyl
S - Surrogate recovery data not available due to the necessary dilution of the sample.

Date of Report: November 12, 1996
Samples Submitted: November 9, 1996
Lab Traveler: 11-039
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-11-96
Date Analyzed: 11-11&12-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1111S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	93%		25

* o-Terphenyl

Date of Report: November 12, 1996
Samples Submitted: November 9, 1996
Lab Traveler: 11-039
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-11-96
Date Analyzed: 11-11&12-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-039-8

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	65%		25
Duplicate	1.0	ND	67%		25
RPD		NA			

* o-Terphenyl

Date of Report: November 12, 1996
Samples Submitted: November 9, 1996
Lab Traveler: 11-039
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-11-96
Date Analyzed: 11-11&12-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1111S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	87.2	87%	108%		25
Spike Blank Duplicate	1.0	88.3	88%	125%		25
RPD		1.3%				

* o-Terphenyl

Date of Report: November 12, 1996
Samples Submitted: November 9, 1996
Lab Traveler: 11-039
Project: 803/2

Date Analyzed: 11-11-96

% MOISTURE

Client ID	Lab ID	% Moisture
PRODUCT	11-039-1	72
EXC-6-4	11-039-2	36
EXC-6-5	11-039-3	25
EXC-3-5	11-039-4	27
EXC-3-6	11-039-5	25
EXC-6-6	11-039-6	69
EXC-6-7	11-039-7	20
EXC-6-8	11-039-8	27
EXC-6-9	11-039-9	41
EXC-8-1	11-039-10	86
EXC-8-2	11-039-11	8.0
EXC-8-3	11-039-12	14
EXC-8-4	11-039-13	10

Chain of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA ENV. CONS.
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXT. W/D SIG QUANTS	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals							% Moisture
1	PRODUCT	11/7	4:50	SOIL	1			X																X
2	EXC-6-4		0940		1			X																X
3	EXC-6-5		4:30		1			X																X
4	EXC-3-5		3:30		1			X																X
5	EXC-3-6		3:45		1			X																X
6	EXC-6-6	11/8	2:15		1			X																X
7	EXC-6-7		2:35		1			X																X
8	EXC-6-8		3:00		1			X																X
9	EXC-6-9		4:00		1			X																X
10	EXC-8-1		4:30		1			X																X
11	EXC-8-2		4:35		1			X																X
12	EXC-8-3		4:45		1			X																X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
	11/9/96		11/9/96
FIRM HEC	TIME 2:40	FIRM On Site Environ	TIME
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:
EXC-6-9 & PRODUCT WILL BE HIGH CONC! CAN WE GET A PRODUCT I.D. ON PRODUCT?

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Chain Of Custody

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14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED W DRO	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
B	EXC-8-4	11/8	4:55	Soil	1	X		X										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	11/9/96	[signature]	11/9/96
FIRM: HEC	TIME: 2:40	FIRM: ONSITE ENVIRON.	TIME: 2:40
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

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OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 22, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-056

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 15, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

FOR

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: November 22, 1996
Samples Submitted: November 15, 1996
Lab Traveler: 11-056
Project: 803/2

WTPH-D

Date Extracted: 11-15-96
Date Analyzed: 11-19-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC-2-1	11-056-1	1.0	**40**	**150**	67%		38	190
EXC-8-5	11-056-2	0.5	**30**	**71**	79%		22	110
EXC-8-6	11-056-3	0.5	**62**	**270**	87%		36	180
EXC-8-7	11-056-4	0.5	**39**	**110**	95%		24	120

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 15, 1996
Lab Traveler: 11-056
Project: 803/2

WTPH-D
(acid cleanup)

Date Extracted: 11-15-96
Date Analyzed: 11-20-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC-8-6	11-056-3	0.5	**ND**	**190**	74%		36	180

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 15, 1996
Lab Traveler: 11-056
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-15-96
Date Analyzed: 11-18-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1115S2

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	105%		25

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 15, 1996
Lab Traveler: 11-056
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-15-96
Date Analyzed: 11-18-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-058-8

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	90%		25
Duplicate	1.0	ND	80%		25
RPD		NA			

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 15, 1996
Lab Traveler: 11-056
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-15-96
Date Analyzed: 11-18-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1115S2

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	89.5	90%	128%		25
Spike Blank Duplicate	1.0	87.1	87%	126%		25
RPD		2.8%				

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 15, 1996
Lab Traveler: 11-056
Project: 803/2

Date Analyzed: 11-15-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-2-1	11-056-1	74
EXC-8-5	11-056-2	77
EXC-8-6	11-056-3	86
EXC-8-7	11-056-4	79

Chain Of Custody

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OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turn Around Requested: (Check One)
- ☐ Same Day
- ☑ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Company: HERRERA

Project No: ~~SOT~~ 803/2

Project Name: SEWARD

Project Manager: ROB HARRISON

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D Ext. w/ DIL & HIGH QUANTITIES	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	Acid Cleanup							% Moisture
1	EXC-2-1	11/12	3:00	SOIL	1			X																	✓
2	EXC-8-5	11/14	1040	Soil	1			X																	X
3	EXC-8-6	11/14	1050	soil	1			X										(X)							✓
4	EXC-8-7	11/14	1055	soil	1			X																	X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	11/15/96	[signature]	11/15/96
FIRM: HERRERA	TIME: 7:15	FIRM: ONSITE ENVIRON.	TIME: 7:15
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:
(X) By Rob Harrison 11/20/96

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OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 22, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-069

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 17, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

FOR

Karl P. Hornyik
Project Chemist

Enclosures

14924 NE 31st Circle • Redmond, WA 98052 • (206) 883-3881 • Fax (206) 885-4603

Date of Report: November 22, 1996
Samples Submitted: November 17, 1996
Lab Traveler: 11-069
Project: 803/2

WTPH-D

Date Extracted: 11-18-96
Date Analyzed: 11-18&19-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC-5-1	11-069-1	0.5	**39**	**290**	67%		26	130
EXC-5-2	11-069-2	0.5	**55**	**290**	69%		29	150
EXC-5-3	11-069-3	0.5	**61**	**610**	72%		29	150
EXC-5-4	11-069-4	1.0	**490**	**140**	92%		13	67
EXC-5-5	11-069-5	1.0	**ND**	**ND**	80%		26	130
EXC-5-6	11-069-6	0.5	**53**	**420**	88%		31	160
EXC-5-7	11-069-7	0.5	**68**	**490**	71%		29	150
EXC-5-8	11-069-8	0.5	**49**	**470**	90%		29	150
EXC-5-9	11-069-9	0.5	**86**	**720**	86%		33	170
STOCK-5-1	11-069-10	1.0	**370**	**110**	121%		15	77
STOCK-5-2	11-069-11	1.0	**820**	**200**	177%		15	76
STOCK-5-3	11-069-12	1.0	**48**	**100**	75%		21	100

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 17, 1996
Lab Traveler: 11-069
Project: 803/2

WTPH-D
(acid cleanup)

Date Extracted: 11-18-96
Date Analyzed: 11-20-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC-5-3	11-069-3	0.5	**36**	**200**	68%		29	150

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 17, 1996
Lab Traveler: 11-069
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-18-96
Date Analyzed: 11-18-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1118S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	90%		25

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 17, 1996
Lab Traveler: 11-069
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-18-96
Date Analyzed: 11-18-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-062-2

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	93%		25
Duplicate	1.0	ND	91%		25
RPD		NA			

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 17, 1996
Lab Traveler: 11-069
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-18-96
Date Analyzed: 11-18-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1118S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	90.6	91%	107%		25
Spike Blank Duplicate	1.0	87.3	87%	104%		25
RPD		3.8%				

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 17, 1996
Lab Traveler: 11-069
Project: 803/2

Date Analyzed: 11-18-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-5-1	11-069-1	81
EXC-5-2	11-069-2	83
EXC-5-3	11-069-3	83
EXC-5-4	11-069-4	25
EXC-5-5	11-069-5	61
EXC-5-6	11-069-6	84
EXC-5-7	11-069-7	83
EXC-5-8	11-069-8	83
EXC-5-9	11-069-9	85
STOCK-5-1	11-069-10	35
STOCK-5-2	11-069-11	34
STOCK-5-3	11-069-12	52

Chain Of Custody

Page _____ of _____

OnSite Environmental Inc.

14924 NE 31st Circle • Redmond, WA 98052

Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA

Project No: 6 803/2

Project Name: SEWARD

Project Manager: ROB HARRISON

Turn Around Requested

(Check One)

- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D Ext w/ SGD	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	Acid Cleanup							% Moisture
1	EXC-5-1	11/15	1305	SOIL	1			X																	X
2	EXC-5-2		1320					X																	X
3	EXC-5-3		1330					X										(X)							X
4	EXC-5-4		1336					X																	X
5	EXC-5-5		1355					X																	X
6	EXC-5-6		1405					X																	X
7	EXC-5-7		1415					X																	X
8	EXC-5-8		1425					X																	X
9	EXC-5-9		1430					X																	X
10	STOCK-5-1		1430					X																	X
11	STOCK-5-2		1445					X																	X
12	STOCK-5-3		1440					X																	X

RELINQUISHED BY: [signature]	DATE: 11/17/96 RH	RECEIVED BY: [signature]	DATE: 11/17/96
FIRM: HERRERA	TIME: 10:15	FIRM: OSE	TIME: 10:15
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

(X) per Rod Harrison 11/20/96 EG

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OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 22, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-075

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 18, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

DSB FOR

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: November 22, 1996
Samples Submitted: November 18, 1996
Lab Traveler: 11-075
Project: 803/2

WTPH-D

Date Extracted: 11-19-96
Date Analyzed: 11-19-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC 4-1	11-075-1	0.5	**110**	**790**	103%		38	190
EXC 4-2	11-075-2	5.0	**2000**	**2600**	---	S	230	1100
EXC 4-3	11-075-3	0.5	**1100**	**1400**	---	F	26	130
EXC 4-4	11-075-4	0.5	**44**	**280**	74%		29	150
EXC 4-5	11-075-5	0.5	**190**	**890**	99%		31	160
EXC 4-6	11-075-6	0.5	**120**	**350**	116%		33	170
EXC 4-7	11-075-7	0.5	**ND**	**67**	85%		8.2	41
EXC 4-8	11-075-8	0.5	**4700**	**290**	---	F	12	60
STOCK 4-1	11-075-9	5.0	**4700**	**4600**	---	S	100	500
STOCK 4-2	11-075-10	5.0	**1100**	**770**	---	S	88	440
STOCK 4-3	11-075-11	5.0	**3700**	**4800**	---	S	130	640
STOCK 4-4	11-075-12	5.0	**2400**	**2100**	---	S	110	570
STOCK 2-1	11-075-13	1.0	**140**	**300**	104%		15	74
STOCK 2-2	11-075-14	1.0	**230**	**820**	117%		15	76
STOCK 2-3	11-075-15	0.5	**180**	**340**	78%		7.0	35

* o-Terphenyl
F - Surrogate recovery data not available due to the high concentration in the sample.
S - Surrogate recovery data not available due to the necessary dilution of the sample.

Date of Report: November 22, 1996
Samples Submitted: November 18, 1996
Lab Traveler: 11-075
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-19-96
Date Analyzed: 11-19-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1119S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	112%		25

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 18, 1996
Lab Traveler: 11-075
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-19-96
Date Analyzed: 11-19-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-070-1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	30.7	92%		25
Duplicate	1.0	27.7	94%		25
RPD		10%			

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 18, 1996
Lab Traveler: 11-075
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-19-96
Date Analyzed: 11-19-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1119S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	80.8	81%	138%		25
Spike Blank Duplicate	1.0	81.7	82%	142%		25
RPD		1.2%				

* o-Terphenyl

Date of Report: November 22, 1996
Samples Submitted: November 18, 1996
Lab Traveler: 11-075
Project: 803/2

Date Analyzed: 11-19-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC 4-1	11-075-1	87
EXC 4-2	11-075-2	78
EXC 4-3	11-075-3	81
EXC 4-4	11-075-4	83
EXC 4-5	11-075-5	84
EXC 4-6	11-075-6	85
EXC 4-7	11-075-7	39
EXC 4-8	11-075-8	58
STOCK 4-1	11-075-9	50
STOCK 4-2	11-075-10	43
STOCK 4-3	11-075-11	61
STOCK 4-4	11-075-12	56
STOCK 2-1	11-075-13	32
STOCK 2-2	11-075-14	34
STOCK 2-3	11-075-15	29

Chain Of Custody

Page _____ of _____

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: Harrera
Project No: 803/12
Project Name: Seward
Project Manager: Rob Harrison

(Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D Extended	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
1	EXC 4-1	11/18/96		Soil	2			X										X
2	EXC 4-2	↓		↓	↓			↓										X
3	EXC 4-3																	X
4	EXC 4-4																	X
5	EXC 4-5																	X
6	EXC 4-6																	X
7	EXC 4-7																	X
8	EXC 4-8																	X
9	Stock 4-1																	X
10	Stock 4-2																	X
11	Stock 4-3	↓		↓	↓			↓										X
12	Stock 4-4	↓		↓	↓			X										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Jeff McCormick	11-18-96	[signature]	11/18/96
FIRM: Harrera	TIME: 5:45	FIRM: OnSite Environ	TIME: 5:45
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

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OnSite Environmental Inc.

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Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turn Around Requested

(Check One)

- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Company: Hewlett

Project No: 803/2

Project Name: Seward

Project Manager: Rob Harrison

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D Extended	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals								% Moisture
	~~EXT~~	11/18/96		Soil	1			x																	
13	Stock 25-1	↓		↓	1			↓																	x
14	Stock 25-2				1																				x
15	Stock 25-3				1																				x

RELINQUISHED BY	DATE	RECEIVED BY	DATE	COMMENTS:
Jeff McKendrick	11-18-96		11/18/96	
FIRM Hewlett	TIME 5:45	FIRM OnSite Environ	TIME 5:45	
RELINQUISHED BY	DATE	RECEIVED BY	DATE	
FIRM	TIME	FIRM	TIME	
REVIEWED BY		DATE REVIEWED		

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OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 26, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-084

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 22, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC 7-1	11-084-1	0.5	**65**	**110**	61%		11	54
EXC 7-2	11-084-2	0.5	**29**	**89**	65%		18	89
EXC 7-3	11-084-3	0.5	**ND**	**ND**	70%		6.0	30
EXC 7-4	11-084-4	0.5	**ND**	**84**	66%		9.6	48
EXC 7-5	11-084-5	0.5	**ND**	**52**	77%		5.7	29
EXC 7-6	11-084-6	0.5	**ND**	**89**	72%		17	83
EXC 7-7	11-084-7	0.5	**95**	**ND**	68%		5.7	29
EXC 7-8	11-084-8	0.5	**ND**	**ND**	63%		6.3	31
STOCK 7-1	11-084-9	1.0	**98**	**75**	75%		14	71
STOCK 7-2	11-084-10	1.0	**55**	**ND**	69%		13	64
STOCK 7-3	11-084-11	1.0	**310**	**120**	78%		12	62
EXC 9-1	11-084-12	1.0	**41**	**280**	51%		33	170
EXC 9-2	11-084-13	1.0	**ND**	**180**	58%		24	120
EXC 9-3	11-084-14	0.5	**36**	**ND**	106%		21	100
EXC 9-4	11-084-15	1.0	**61**	**290**	52%		42	210
EXC 9-5	11-084-16	1.0	**530**	**580**	83%		22	110
EXC 9-6	11-084-17	1.0	**89**	**370**	58%		59	290
EXC 9-7	11-084-18	1.0	**85**	**260**	64%		33	170
EXC-9-8	11-084-19	0.5	**ND**	**ND**	124%		38	190
STOCK 9-1	11-084-20	1.0	**660**	**270**	72%		16	78
STOCK 9-2	11-084-21	1.0	**500**	**140**	70%		24	120
STOCK 9-3	11-084-22	1.0	**800**	**760**	61%		25	130
STOCK 9-4	11-084-23	1.0	**400**	**380**	57%		16	78
STOCK 9-5	11-084-24	1.0	**300**	**390**	51%		17	83

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1122S1
MB1122S2

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	80%		25
Method Blank	1.0	ND	91%		25

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-078-2

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	77%		25
Duplicate	1.0	ND	86%		25
RPD		NA			

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-084-15

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	52%		25
Duplicate	1.0	ND	57%		25
RPD		NA			

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1122S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	83.8	84%	99%		25
Spike Blank Duplicate	1.0	86.9	87%	105%		25
RPD		3.6%				

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1122S2

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	88.8	89%	89%		25
Spike Blank Duplicate	1.0	87.4	87%	106%		25
RPD		1.6%				

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

Date Analyzed: 11-22-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC 7-1	11-084-1	54
EXC 7-2	11-084-2	72
EXC 7-3	11-084-3	16
EXC 7-4	11-084-4	48
EXC 7-5	11-084-5	13
EXC 7-6	11-084-6	70
EXC 7-7	11-084-7	13
EXC 7-8	11-084-8	20
STOCK 7-1	11-084-9	30
STOCK 7-2	11-084-10	22
STOCK 7-3	11-084-11	19
EXC 9-1	11-084-12	70
EXC 9-2	11-084-13	59
EXC 9-3	11-084-14	76
EXC 9-4	11-084-15	76
EXC 9-5	11-084-16	54
EXC 9-6	11-084-17	83
EXC 9-7	11-084-18	70
EXC-9-8	11-084-19	87
STOCK 9-1	11-084-20	36
STOCK 9-2	11-084-21	59
STOCK 9-3	11-084-22	60
STOCK 9-4	11-084-23	36
STOCK 9-5	11-084-24	40

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: Herrera
Project No: Seward 803/12
Project Name: Seward
Project Manager: Rob Harrison

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: APH

Laboratory No. 11-084

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D Extended	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
1	Exc 7-1	11/21/96		soil	1													X
2	Exc 7-2																	
3	Exc 7-3																	
4	Exc 7-4																	
5	Exc 7-5																	
6	Exc 7-6																	
7	Exc 7-7																	
8	Exc 7-8																	
9	stock 7-1																	
10	stock 7-2																	
11	stock 7-3																	
12	Exc 9-1																	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Jeffry McLeod	11-22-96		11-22-96
FIRM Herrera	TIME 0812	FIRM OSE	TIME 0812
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turn Around Requested

(Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No. 96-004

Company: Herrera
Project No: 503/2
Project Name: Seward
Project Manager: Rob Harrison

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D Extended	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
13	EXC 9-2	11/21/96		SOIL	1													X
14	Exc 9-3																	
15	Exc 9-4																	
16	Exc 9-5																	
17	Exc 9-6																	
18	Exc 9-7																	
19	Exc 9-8																	
20	stock 9-1																	
21	stock 9-2																	
22	stock 9-3																	
23	stock 9-4																	
24	stock 9-5																	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
	11-22-96		11-22-96
FIRM: Herrera	TIME: 0812	FIRM: OSE	TIME: 0812
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy

November 26, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-090

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 22, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-090
Project: 803/2

WTPH-D

Date Extracted: 11-25-96
Date Analyzed: 11-26-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC 1-10	11-090-1	0.5	**ND**	**190**	68%		11	54
EXC 1-11	11-090-2	0.5	**170**	**280**	70%		8.6	43
EXC 1-12	11-090-3	0.5	**38**	**95**	65%		9.4	47
EXC 1-13	11-090-4	0.5	**68**	**280**	70%		15	74
EXC 1-14	11-090-5	0.5	**160**	**90**	55%		10	50

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-090
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-25-96
Date Analyzed: 11-25-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1125S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	73%		25

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-090
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-084-15

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	52%		25
Duplicate	1.0	ND	57%		25
RPD		NA			

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-090
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1122S2

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	88.8	89%	107%		25
Spike Blank Duplicate	1.0	87.4	87%	106%		25
RPD		1.6%				

* o-Terphenyl

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-090
Project: 803/2

Date Analyzed: 11-25-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC 1-10	11-090-1	54
EXC 1-11	11-090-2	42
EXC 1-12	11-090-3	47
EXC 1-13	11-090-4	66
EXC 1-14	11-090-5	50

INVOICE #: 9611-090

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

ATTENTION: ACCOUNTS PAYABLE
Terms: Net 30 days
Past Due Accounts: 1.5% interest per month

Date of Report: November 26, 1996
Samples Submitted: November 22, 1996
Project: 803/2

Quantity	Analysis	Unit Price	Amount
5	WTPH-D	$ 85.00	$ 425.00

Total Due $ 425.00

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

December 3, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-039

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 9, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: December 3, 1996
Samples Submitted: November 9, 1996
Lab Traveler: 11-039
Project: 803/2

WTPH-D (acid cleanup)

Date Extracted: 11-11-96
Date Analyzed: 11-26-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC-3-6	11-039-5	5.0	**670**	**530**	---	S	67	330
EXC-8-1	11-039-10	1.0	**ND**	**260**	107%		71	360

* o-Terphenyl
S - Surrogate recovery data not available due to the necessary dilution of the sample.

Date of Report: December 3, 1996
Samples Submitted: November 9, 1996
Lab Traveler: 11-039
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-11-96
Date Analyzed: 11-11&12-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1111S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	93%		25

* o-Terphenyl

Date of Report: December 3, 1996
Samples Submitted: November 9, 1996
Lab Traveler: 11-039
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-11-96
Date Analyzed: 11-11&12-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-039-8

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	65%		25
Duplicate	1.0	ND	67%		25
RPD		NA			

* o-Terphenyl

Date of Report: December 3, 1996
Samples Submitted: November 9, 1996
Lab Traveler: 11-039
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-11-96
Date Analyzed: 11-11&12-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1111S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	87.2	87%	108%		25
Spike Blank Duplicate	1.0	88.3	88%	125%		25
RPD		1.3%				

* o-Terphenyl

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA ENV. CONS.
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KAT

Laboratory No. 11-039

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D Ext. w/ SGC Cleanup	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
1	PRODUCT	11/7	4:50	SOIL	1			X										X
2	EXC-6-4		0940		1			X										X
3	EXC-6-5		4:30		1			X										X
4	EXC-3-5		3:30		1			X										X
5	EXC-3-6		3:45		1			X										X
6	EXC-6-6	11/8	2:15		1			X										X
7	EXC-6-7		2:35		1			X										X
8	EXC-6-8		3:00		1			X										X
9	EXC-6-9		4:00		1			X										X
10	EXC-8-1		4:30		1			X										X
11	EXC-8-2		4:35		1			X										X
12	EXC-8-3		4:45		1			X										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	11/9/96	[signature]	11/9/96
FIRM: HEC	TIME: 2:40	FIRM: OnSite Environ	TIME
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:
EXC-6-9 & PRODUCT WILL BE HIGH CONC. CAN WE GET A PRODUCT I.D. ON PRODUCT?

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No. 11-039

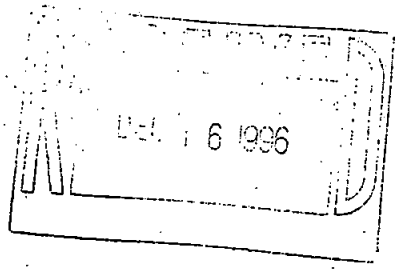
Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED W/ SGC	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
13	EXC-8--4	11/8	4:55	SOIL	1	X		X										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM HEC	TIME 2:40	FIRM OnSite Environ.	TIME 2:40
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services



December 12, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-090B

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 22, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: December 12, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-090
Project: 803/2

WTPH-D
(acid cleanup)

Date Extracted: 12-04-96
Date Analyzed: 12-04&05-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC 1-11	11-090-2	0.5	**130**	**200**	71%		8.6	43
EXC-1-13	11-090-4	0.5	**55**	**190**	65%		15	74

* o-Terphenyl

Date of Report: December 12, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-090
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-25-96
Date Analyzed: 11-25-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1125S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	73%		25

* o-Terphenyl

Date of Report: December 12, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-090
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-084-15

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	52%		25
Duplicate	1.0	ND	57%		25
RPD		NA			

* o-Terphenyl

Date of Report: December 12, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-090
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1122S2

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	88.8	89%	107%		25
Spike Blank Duplicate	1.0	87.4	87%	106%		25
RPD		1.6%				

* o-Terphenyl

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KPH

Laboratory No. 11-090

Company: Herrera
Project No: 603/2
Project Name: Seward
Project Manager: Rob Harrison

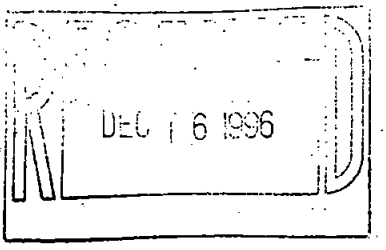
Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	#of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D Extended	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	Arc						% Moisture
1	EXC 1-10	11/20/96		Soil	1										1									X
2	EXC 1-11																	X						X
3	EXC 1-12																							X
4	EXC 1-13																	X						X
5	EXC 1-14																							X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
MG	11-22-96	DAB	11/22/96
FIRM Herrera	TIME 1726	FIRM OSE	TIME 1726
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services



December 13, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-084 B

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 22, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: December 13, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D (acid cleanup)

Date Extracted: 11-22-96
Date Analyzed: 12-03-05-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC 9-1	11-084-12	0.5	**ND**	**ND**	81%		17	83
EXC 9-4	11-084-15	0.5	**86**	**270**	61%		21	100
EXC 9-5	11-084-16	1.0	**400**	**280**	82%		22	110
EXC 9-6	11-084-17	0.5	**110**	**190**	79%		29	150
EXC 9-7	11-084-18	1.0	**84**	**ND**	59%		33	170

* o-Terphenyl

Date of Report: December 13, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1122S1
MB1122S2

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	80%		25
Method Blank	1.0	ND	91%		25

* o-Terphenyl

Date of Report: December 13, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-078-2

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	77%		25
Duplicate	1.0	ND	86%		25
RPD		NA			

* o-Terphenyl

Date of Report: December 13, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-084-15

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	52%		25
Duplicate	1.0	ND	57%		25
RPD		NA			

* o-Terphenyl

Date of Report: December 13, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1122S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	83.8	84%	99%		25
Spike Blank Duplicate	1.0	86.9	87%	105%		25
RPD		3.6%				

* o-Terphenyl

Date of Report: December 13, 1996
Samples Submitted: November 22, 1996
Lab Traveler: 11-084
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-22-96
Date Analyzed: 11-22-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1122S2

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	88.8	89%	89%		25
Spike Blank Duplicate	1.0	87.4	87%	106%		25
RPD		1.6%				

* o-Terphenyl

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KPH

Laboratory No. 11-084

Company: Herrera
Project No: Seward 803/12
Project Name: Seward
Project Manager: Rob Harrison

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	#of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D Extended	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	Acid	% Moisture
1	Exc 7-1	11/21/96		soil	1														X
2	Exc 7-2																		
3	Exc 7-3																		
4	Exc 7-4																		
5	Exc 7-5																		
6	Exc 7-6																		
7	Exc 7-7																		
8	Exc 7-8																		
9	stock 7-1																		
10	stock 7-2																		
11	stock 7-3																		
12	Exc 9-1																	X	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Jeffrey McLeod	11-22-96		11-22-96
FIRM: Herrera	TIME: 0812	FIRM: OSE	TIME: 0812
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

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Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: Herrera
Project No: 803/2
Project Name: Seward
Project Manager: Rob Harrison

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KPH

Laboratory No. 11-084

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	#of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D Extended	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	ACC	% Moisture
13	EXC 9-2	11/21/96		soil	1														X
14	Exc 9-3																	⊗	
15	Exc 9-4																	⊗	
16	Exc 9-5																	⊗	
17	Exc 9-6																	⊗	
18	Exc 9-7																	⊗	
19	Exc 9-8																		
20	stock 9-1																		
21	stock 9-2																		
22	stock 9-3																		
23	stock 9-4																	⊗ 12-24	
24	stock 9-5																	⊗	

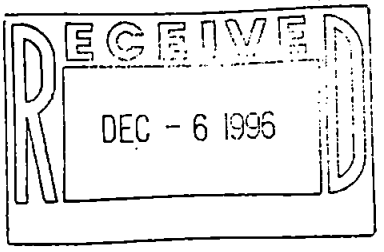
RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	11-22-96	[signature]	11-22-96
FIRM: Herrera	TIME: 0812	FIRM: OSE	TIME: 0812
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:
⊗ - Added 12-3-96 @ Rob Harrison - KPH

OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

December 4, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121



Re: Analytical Data for Project 803/2
Laboratory Reference No. 9611-111

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on November 27, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: December 4, 1996
Samples Submitted: November 27, 1996
Lab Traveler: 11-111
Project: 803/2

WTPH-D

Date Extracted: 11-27-96
Date Analyzed: 11-27-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC 5-10	11-111-1	0.5	**27**	**240**	79%		13	63
EXC 5-11	11-111-2	0.5	**2700**	**290**	---	F	8.3	42
EXC 4-10	11-111-3	0.5	**120**	**700**	110%		29	150
EXC 4-11	11-111-4	0.5	**660**	**1300**	68%		29	150
EXC 4-12	11-111-5	0.5	**54**	**700**	81%		36	180
EXC 4-13	11-111-6	0.5	**31**	**130**	81%		7.1	36
EXC 4-14	11-111-7	0.5	**110**	**1300**	69%		33	170

F - Surrogate recovery data not available due to the high concentration in the sample.
* o-Terphenyl

Date of Report: December 4, 1996
Samples Submitted: November 27, 1996
Lab Traveler: 11-111
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-27-96
Date Analyzed: 11-27-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1127S3

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	96%		25

* o-Terphenyl

Date of Report: December 4, 1996
Samples Submitted: November 27, 1996
Lab Traveler: 11-111
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 11-27-96
Date Analyzed: 11-27-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 11-104-7

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	ND	80%		25
Duplicate	1.0	ND	81%		25
RPD		NA			

* o-Terphenyl

Date of Report: December 4, 1996
Samples Submitted: November 27, 1996
Lab Traveler: 11-111
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 11-27-96
Date Analyzed: 11-27-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1127S2

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	96.6	97%	115%		25
Spike Blank Duplicate	1.0	97.4	97%	118%		25
RPD		0.85%				

* o-Terphenyl

Date of Report: December 4, 1996
Samples Submitted: November 27, 1996
Lab Traveler: 11-111
Project: 803/2

Date Analyzed: 11-27-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC 5-10	11-111-1	60
EXC 5-11	11-111-2	40
EXC 4-10	11-111-3	83
EXC 4-11	11-111-4	83
EXC 4-12	11-111-5	86
EXC 4-13	11-111-6	30
EXC 4-14	11-111-7	85

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: Herrera
Project No: 803/2
Project Name: Seward
Project Manager: Rob Harrison

Turn Around Requested (Check One)
- ☐ Same Day
- ☐ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☑ 12/2 Monday Seward
- ☐ (other)

Project Chemist: KPH
Laboratory No. 11-111

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D Extended	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
1	Exc 5-10	11/26/96		soil	2			X										X
2	Exc 5-11	↓		↓	↓			↓										X
3	Exc 4-10																	X
4	Exc 4-11																	X
5	Exc 4-12																	X
6	Exc 4-13																	X
7	Exc 4-14	↓		↓	↓			↓										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	11-27-96	[signature] Jessica Johnson	11-27-96
FIRM Herrera	TIME 1100	FIRM OSE.	TIME 1100
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

December 10, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9612-026

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on December 7, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: December 10, 1996
Samples Submitted: December 7, 1996
Lab Traveler: 12-026
Project: 803/2

WTPH-D (dual quantitation)

Date Extracted: 12-09-96
Date Analyzed: 12-09-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC-1-1	12-026-1	0.5	**36**	**100**	82%	Y	15	74
EXC-1-2	12-026-2	0.5	**ND**	**ND**	79%		6.0	30
EXC-1-3	12-026-3	0.5	**ND**	**ND**	80%		6.0	30
EXC-2-2	12-026-4	0.5	**ND**	**ND**	72%		6.0	30
EXC-2-3	12-026-5	0.5	**ND**	**ND**	75%		5.7	29
EXC-2-4	12-026-6	0.5	**41**	**180**	82%	Y	31	160
EXC-8-8	12-026-7	0.5	**46**	**190**	86%	Y	29	150

* o-Terphenyl
Y- acid cleanup

Date of Report: December 10, 1996
Samples Submitted: December 7, 1996
Lab Traveler: 12-026
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 12-09-96
Date Analyzed: 12-09-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1209S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	89%		25

* o-Terphenyl

Date of Report: December 10, 1996
Samples Submitted: December 7, 1996
Lab Traveler: 12-026
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 12-09-96
Date Analyzed: 12-09-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 12-026-1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	0.5	ND	82%		13
Duplicate	0.5	ND	83%		13
RPD		NA			

* o-Terphenyl

Date of Report: December 10, 1996
Samples Submitted: December 7, 1996
Lab Traveler: 12-026
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 12-09-96
Date Analyzed: 12-09-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1209S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	81.6	82%	102%		25
Spike Blank Duplicate	1.0	87.7	88%	111%		25
RPD		7.1%				

* o-Terphenyl

Date of Report: December 10, 1996
Samples Submitted: December 7, 1996
Lab Traveler: 12-026
Project: 803/2

Date Analyzed: 12-9-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-1-1	12-026-1	66
EXC-1-2	12-026-2	16
EXC-1-3	12-026-3	17
EXC-2-2	12-026-4	16
EXC-2-3	12-026-5	13
EXC-2-4	12-026-6	84
EXC-8-8	12-026-7	83

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

TURN AROUND TIME

(Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☒ Turn 9pm (other)

Project Chemist: KH

Laboratory No. 12-026

Company: HERRERA
Project No: 803/2
Project Name: SEWARD
Project Manager: BOB HARRISON

REQUESTED ANALYSIS

ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Containers	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED WITH OIL & DIESEL QUALITY	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
1	EXC-1-1	12/5/96	1500	SOIL	1			X										X
2	EXC-1-2	12/5/96	1505		1			X										X
3	EXC-1-3	12/5/96	1507		1			X										X
4	EXC-2-2	12/5/96	1530		1			X										X
5	EXC-2-3	12/5/96	1540		1			X										X
6	EXC-2-4	12/5/96	1600		1			X										X
7	EXC-8-8	12/6/96	1040	V	1			X										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	12/7/96	[signature]	12/7/96
FIRM: HERRERA	TIME: 12:10	FIRM: On Site Environ.	TIME: 12:10
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:
. PLEASE RUN THE FOLLOWING WITH ACID CLEAN-UP:
EXC-1-1
EXC-2-4
EXC-8-8

OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

January 15, 1997

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9701-012

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on January 9, 1997.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: January 15, 1997
Samples Submitted: January 9, 1997
Lab Traveler: 01-012
Project: 803/2

WTPH-D

Date Extracted: 1-09-97
Date Analyzed: 1-09&10-97

Matrix Soil
Units mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC-2-4	01-012-1	0.50	**170**	**590**	74	Y	45	227
EXC-2-5	01-012-2	0.50	**97**	**ND**	70	Y	33	167
EXC-2-6	01-012-3	0.25	**36**	**ND**	92	Y	21	104
EXC-2-7	01-012-4	0.50	**120**	**270**	82	Y	42	208
EXC-2-8	01-012-5	1.0	**3100**	**170**	---	F	13	63
EXC-2-9	01-012-6	0.50	**86**	**91**	79	Y	18	89
EXC-2-10	01-012-7	1.0	**910**	**ND**	117		13	63

F - Surrogate recovery data not available due to the high concentration in the sample.
Y - Acid cleanup.
* o-Terphenyl

Date of Report: January 15, 1997
Samples Submitted: January 9, 1997
Lab Traveler: 01-012
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-09-97
Date Analyzed: 1-09-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	Diesel MRL
MB0109S1	1.0	ND	77%		25

* o-Terphenyl

Date of Report: January 15, 1997
Samples Submitted: January 9, 1997
Lab Traveler: 01-012
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 1-09-97
Date Analyzed: 1-09-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	Diesel MRL
01-012-7	1.0	910	117%		25
01-012-7 DUP	1.0	1100	---	F	25
RPD		19%			

F - Surrogate recovery data not available due to the high concentration in the sample.
* o-Terphenyl

Date of Report: January 15, 1997
Samples Submitted: January 9, 1997
Lab Traveler: 01-012
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 1-09-97
Date Analyzed: 1-09-97
Spiked @ 100 ppm

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags
SB0109S1	1.0	80.0	80%	109%	
SB0109S1 DUP	1.0	87.0	87%	122%	
RPD		8.0%			

* o-Terphenyl

Date of Report: January 15, 1997
Samples Submitted: January 9, 1997
Lab Traveler: 01-012
Project: 803/2

Date Analyzed: 1-9-97

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-2-4	01-012-1	89
EXC-2-5	01-012-2	85
EXC-2-6	01-012-3	88
EXC-2-7	01-012-4	88
EXC-2-8	01-012-5	20
EXC-2-9	01-012-6	72
EXC-2-10	01-012-7	21

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turnaround Requested (Check One): ☐ Same Day ☒ 24 Hours ☐ 48 Hours ☐ Standard ☐ ______ (other)

Project Chemist: CR

Laboratory No.

Company: HERRERA ENV. CONSULTANTS

Project No: 803/2

Project Name: SEWARD

Project Manager: ROB HARRISON

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D W/O & D QUANTS EXT.	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	ACID CLEANUP							% Moisture
1	EXC-2-4	1-8-97	1045	SOIL	1			X										X							X
2	EXC-2-5	↓	1115	↓	↓			X										X							X
3	EXC-2-6	↓	1125	↓	↓			X										X							X
4	EXC-2-7	↓	1430	↓	↓			X										X							X
5	EXC-2-8	↓	1445	↓	↓			X																	X
6	EXC-2-9	↓	1520	↓	↓			X										X							X
7	EXC-2-10	↓	1630	↓	↓			X																	X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	1/9/97	Bob Walls	1-9-97
FIRM: HERRERA	TIME: 0735	FIRM: OSE	TIME: 0735
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS: EXC-2-8 MAY HAVE A MODERATELY HIGH TPH CONCENTRATION. (~1000ppm?)

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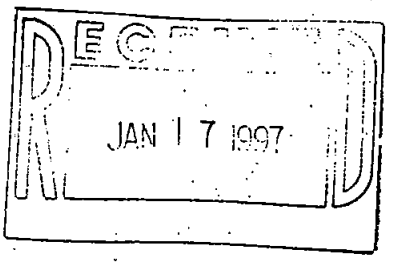
OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services



January 16, 1997

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9701-014

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on January 10, 1997.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

for

Christine Ransom
Project Chemist

Enclosures

Date of Report: January 16, 1997
Samples Submitted: January 10, 1997
Lab Traveler: 01-014
Project: 803/2

WTPH-D

Date Extracted: 1-10-97
Date Analyzed: 1-10-97

Matrix Soil
Units mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel PQL	Oil PQL
EXC-4-15	01-014-01	1.0	**ND**	**ND**	88%		25	50
EXC-4-16	01-014-02	0.50	**ND**	**ND**	82%	Y	36	180
EXC-4-17	01-014-03	1.0	**ND**	**ND**	87%		25	50
EXC-4-18	01-014-04	0.50	**ND**	**ND**	79%	Y	29	150
EXC-4-19	01-014-05	1.0	**ND**	**ND**	83%		25	50
EXC-4-20	01-014-06	0.50	**ND**	**ND**	81%	Y	38	190
EXC-6-10	01-014-07	1.0	**ND**	**ND**	91%		25	50
EXC-6-11	01-014-08	0.50	**17**	**ND**	76%	Y	12	61
EXC-6-12	01-014-09	0.50	**18**	**ND**	79%	Y	13	63
EXC-6-13	01-014-10	1.0	**ND**	**ND**	92%		25	50
EXC-6-14	01-014-11	0.50	**ND**	**ND**	76%	Y	15	74
EXC-6-15	01-014-12	1.0	**ND**	**ND**	85%		25	50

Y - Acid Cleanup.
* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 10, 1997
Lab Traveler: 01-014
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-10-97
Date Analyzed: 1-10-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	Diesel PQL
MB0110S1	1.0	ND	97%		25

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 10, 1997
Lab Traveler: 01-014
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 1-09-97
Date Analyzed: 1-09-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	Diesel MRL
01-012-7	1.0	910	117%		25
01-012-7 DUP	1.0	1100	---	F	25
RPD		19%			

* o-Terphenyl
F - Surrogate recovery data not available due to the high concentration in the sample.

Date of Report: January 16, 1997
Samples Submitted: January 10, 1997
Lab Traveler: 01-014
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 1-09-97
Date Analyzed: 1-09-97
Spiked @ 100 ppm

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags
SB0109S1	1.0	80.0	80%	109%	
SB0109S1 DUP	1.0	87.0	87%	122%	
RPD		8.0%			

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 10, 1997
Lab Traveler: 01-014
Project: 803/2

Date Analyzed: 1-10-97

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-4-15	01-014-01	25
EXC-4-16	01-014-02	86
EXC-4-17	01-014-03	13
EXC-4-18	01-014-04	83
EXC-4-19	01-014-05	19
EXC-4-20	01-014-06	87
EXC-6-10	01-014-07	17
EXC-6-11	01-014-08	59
EXC-6-12	01-014-09	60
EXC-6-13	01-014-10	20
EXC-6-14	01-014-11	66
EXC-6-15	01-014-12	24

Chain Of Custody

Page 1 of 2

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA ENV. CONS.
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Turnaround Requested (Check One)
- [x] Same Day
- [x] 24 Hours
- [ ] 48 Hours
- [ ] Standard
- [ ] _____ (other)

Project Chemist: CR

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Vol/ Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED C10, C40 QUANTS	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	ACID CLEAN-UP							% Moisture
1	EXC-4-15	1-9-97	1148	SOIL	1			X																	X
2	EXC-4-16		1210		1			X										X							X
3	EXC-4-17		1315		1			X																	X
4	EXC-4-18		1345		1			X										X							X
5	EXC-4-19		1425		1			X																	X
6	EXC-4-20		1440		1			X										X							X
7	EXC-6-10		0850		1			X																	X
8	EXC-6-11		0903		1			X										X							X
9	EXC-6-12		0910		1			X										X							X
10	EXC-6-13		0930		1			X																	X
11	EXC-6-14		0935		1			X										X							X
12	EXC-6-15		1110		1			X																	X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	1-10-97	[signature]	1-10-97
FIRM: HERRERA	TIME: 0735	FIRM: OSE	TIME: 0735
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

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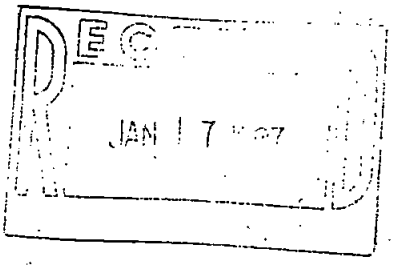
Analytical Testing and Mobile Laboratory Services



January 16, 1997

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9701-020

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on January 11, 1997.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

FOR

Christine Ransom
Project Chemist

Enclosures

14924 NE 31st Circle • Redmond, WA 98052 • (206) 883-3881 • Fax (206) 885-4603

Date of Report: January 16, 1997
Samples Submitted: January 11, 1997
Lab Traveler: 01-020
Project: 803/2

WTPH-D (extended)

Date Extracted: 1-13-97
Date Analyzed: 1-13-97

Matrix Soil
Units mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel MRL	Oil MRL
EXC-9-9	01-020-1	1.0	**ND**	**ND**	76%		25	50
EXC-9-10	01-020-2	1.0	**ND**	**ND**	79%		25	50
EXC-9-11	01-020-3	1.0	**ND**	**ND**	76%		25	50

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 11, 1997
Lab Traveler: 01-020
Project: 803/2

WTPH-D (extended)
METHOD BLANK QUALITY CONTROL

Date Extracted: 01-13-97
Date Analyzed: 01-13-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel MRL	Oil MRL
MB0113S1	1.0	**ND**	**ND**	91%		25	50

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 11, 1997
Lab Traveler: 01-020
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 1-10-97
Date Analyzed: 1-10-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	Diesel MRL
01-015-4	1.0	ND	101%		25
01-015-4 DUP	1.0	ND	97%		25
RPD		NA			

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 11, 1997
Lab Traveler: 01-020
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 1-10-97
Date Analyzed: 1-10-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Spike Level	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	Diesl MRL
SB0110S1	1.0	100	105	105%	141%		25
SB0110S1 DUP	1.0	100	101	101%	135%		25
RPD			4.0%				

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 11, 1997
Lab Traveler: 01-020
Project: 803/2

Date Analyzed: 1-13-97

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-9-9	01-020-1	19
EXC-9-10	01-020-2	14
EXC-9-11	01-020-3	13

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB. HARRISON

Turn Around Time
(Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: CR

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
1	EXC-9-9	1-10-97	1015	SOIL	1			X										X
2	EXC-9-10	↓	1045	↓	1			X										X
3	EXC-9-11	↓	1107	↓	1			X										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	1-11-97	[signature]	1/11/97
FIRM: HERRERA	TIME: 1206	FIRM: OnSite Environ	TIME: 12:06
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

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OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

January 16, 1997

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9701-022

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on January 14, 1997.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Christine Ransom
Project Chemist

Enclosures

Date of Report: January 16, 1997
Samples Submitted: January 14, 1997
Lab Traveler: 01-022
Project: 803/2

WTPH-D

Date Extracted: 1-14-97
Date Analyzed: 1-14-97

Matrix Soil
Units mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Diesel MRL	Oil MRL	Flags
EXC-2-11	01-022-1	1.0	**ND**	**ND**	94%	25	50	
EXC-2-12	01-022-2	1.0	**ND**	**ND**	90%	25	50	

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 14, 1997
Lab Traveler: 01-022
Project: 803/2

WTPH-D (acid cleanup)

Date Extracted: 1-14-97
Date Analyzed: 1-14-97

Matrix Soil
Units mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Diesel MRL	Oil MRL	Flags
EXC-2-13	01-022-3	0.50	**63**	**ND**	77%	29	150	

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 14, 1997
Lab Traveler: 01-022
Project: 803/2

WTPH-D (acid cleanup)
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-14-97
Date Analyzed: 1-14-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Diesel MRL	Oil MRL
MB0114S1	1.0	ND	ND	95%	25	50

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 14, 1997
Lab Traveler: 01-022
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 1-14-97
Date Analyzed: 1-14-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	RPD	Surrogate Recovery*	Diesel MRL
01-023-4	1.0	ND		89%	25
01-023-4 DUP	1.0	ND	NA	91%	25

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 14, 1997
Lab Traveler: 01-022
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 1-14-97
Date Analyzed: 1-14-97

Matrix Soil
Units mg/Kg (ppm)

Lab ID	Dilution Factor	Spike Level	Total Petroleum Hydrocarbons	RPD	Percent Recovery	Surrogate Recovery*	Diesel MRL
SB0114S1	1.0	100	103		103%	126%	25
SB0114S1 DUP	1.0	100	111	7.0%	111%	125%	25

* o-Terphenyl

Date of Report: January 16, 1997
Samples Submitted: January 14, 1997
Lab Traveler: 01-022
Project: 803/2

Date Analyzed: 1-14-97

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-2-11	01-022-1	18
EXC-2-12	01-022-2	18
EXC-2-13	01-022-3	83

Chain Of Custody

Page _____ of _____

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA ENV. CONS.
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Turnaround Requested
(Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: CR

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED w/ SILICA GEL CLEANUP	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals							ACID CLEANUP	% Moisture
1	EXC-2-11	1-13-97	1600	SOIL	1			X																	X
2	EXC-2-12	↓	1640	↓	1			X																	X
3	EXC-2-13	↓	1650	↓	1			X																X	X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	1-14-97	[signature]	1-14-97
FIRM HERRERA	TIME 0740	FIRM GSI	TIME 0740
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

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OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

January 21, 1997

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9701-029

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on January 15, 1997.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

14924 NE 31st Circle • Redmond, WA 98052 • (206) 883-3881 • Fax (206) 885-4603

Date of Report: January 21, 1997
Samples Submitted: January 15, 1997
Lab Traveler: 01-029
Project: 803/2

WTPH-D

Date Extracted: 1-15-97
Date Analyzed: 1-15-97

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Diesel PQL	Oil PQL	Flags
EXC-5-14	01-029-3	1.0	**ND**	**ND**	79%	12	60	
EXC-5-16	01-029-5	1.0	**29**	**ND**	90%	12	62	

* o-Terphenyl

Date of Report: January 21, 1997
Samples Submitted: January 15, 1997
Lab Traveler: 01-029
Project: 803/2

WTPH-D (acid cleanup)

Date Extracted: 1-15-97
Date Analyzed: 1-15-97

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Diesel PQL	Oil PQL	Flags
EXC-5-12	01-029-1	0.5	**37**	**180**	140%	28	140	
EXC-5-13	01-029-2	0.5	**57**	**290**	190%	36	180	
EXC-5-15	01-029-4	0.5	**31**	**130**	170%	20	104	
EXC-5-17	01-029-6	0.5	**16**	**110**	180%	14	68	
EXC-5-18	01-029-7	0.5	**39**	**190**	170%	28	140	

* o-Terphenyl

Date of Report: January 21, 1997
Samples Submitted: January 15, 1997
Lab Traveler: 01-029
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 01-15-97
Date Analyzed: 01-16-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Diesel MRL	Oil MRL
MB0115S1	1.0	**ND**	**ND**	116%	25	50

* o-Terphenyl

Date of Report: January 21, 1997
Samples Submitted: January 15, 1997
Lab Traveler: 01-029
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 1-15-97
Date Analyzed: 1-15&16-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Diesel MRL
01-029-3	1.0	ND	79%	25
01-029-3 DUP	1.0	ND	83%	25
RPD		NA		

* o-Terphenyl

Date of Report: January 21, 1997
Samples Submitted: January 15, 1997
Lab Traveler: 01-029
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 1-15-97
Date Analyzed: 1-17-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	Spike Level	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Diesel MRL
SB0115S1	1.0	100	82.5	83%	108%	25
SB0115S1 DUP	1.0	100	85.4	85%	111%	25
RPD			3.0%			

* o-Terphenyl

Date of Report: January 21, 1997
Samples Submitted: January 15, 1997
Lab Traveler: 01-029
Project: 803/2

Date Analyzed: 1-15-97

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-5-12	01-029-1	82
EXC-5-13	01-029-2	86
EXC-5-14	01-029-3	16
EXC-5-15	01-029-4	76
EXC-5-16	01-029-5	18
EXC-5-17	01-029-6	63
EXC-5-18	01-029-7	82

Chain Of Custody

Page _____ of _____

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Company: HERRERA
Project No: 803/2
Project Name: SEWATED
Project Manager: ROB HARRISON

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED W/ SILICA GEL CLEAN UP	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	ACID-CLEANUP						% Moisture
1	EXC-5-12	1-14-97		SOIL	1			X										X						X
2	EXC-5-13	↓		↓	↓			X										X						X
3	EXC-5-14							X																X
4	EXC-5-15							X										X						X
5	EXC-5-16							X																X
6	EXC-5-17							X										X						X
7	EXC-5-18							X										X						X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
	1-15-97		1-15-97
FIRM HEC	TIME 736	FIRM OSE	TIME 7:36
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

DISTRIBUTION LEGEND: White - OnSite Copy; Yellow - ...; Pink - Client C...

Fill Pipe Samples

OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

February 12, 1997

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9702-025

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on February 10, 1997.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this Project 803/2. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

14924 NE 31st Circle • Redmond, WA 98052 • (206) 883-3881 • Fax (206) 885-4603

Date of Report: February 12, 1997
Samples Submitted: February 10, 1997
Lab Traveler: 02-025
Project: 803/2

WTPH-D

Date Extracted: 2-10-97
Date Analyzed: 2-10-97

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	o-Terphenyl Surrogate Recovery	Diesel PQL	Oil PQL	Flags
RFP-1-1	02-025-1	1.0	ND	ND	78%	28	56	
RFP-1-2	02-025-2	1.0	50	160	87%	30	61	
RFP-1-3	02-025-3	1.0	ND	ND	80%	28	56	
RFP-1-5	02-025-4	1.0	51	140	94%	30	60	
RFP-3-1	02-025-5	1.0	ND	ND	84%	29	59	
RFP-3-2	02-025-6	1.0	ND	ND	81%	27	55	
RFP-5-1	02-025-7	1.0	ND	ND	87%	28	57	
RFP-5-2	02-025-8	1.0	ND	ND	64%	36	72	

Date of Report: February 12, 1997
Samples Submitted: February 10, 1997
Lab Traveler: 02-025
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 2-10-97
Date Analyzed: 2-10-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	o-Terphenyl Surrogate Recovery	Diesel PQL	Oil PQL
MB0210S1	1.0	ND	ND	87%	25	50

Date of Report: February 12, 1997
Samples Submitted: February 10, 1997
Lab Traveler: 02-025
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 2-05-97
Date Analyzed: 2-05-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	o-Terphenyl Surrogate Recovery	Diesel PQL	Flags
02-004-3	1.0	ND	72%	31	
02-004-3 DUP	1.0	ND	74%	31	
RPD		NA			

Date of Report: February 12, 1997
Samples Submitted: February 10, 1997
Lab Traveler: 02-025
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 2-05-97
Date Analyzed: 2-05-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	Spike Level	Total Petroleum Hydrocarbons	Percent Recovery	o-Terphenyl Surrogate Recovery	Diesel PQL
SB0205S1	1.0	100	80.6	81%	111%	25
SB0205S1 DUP	1.0	100	76.3	76%	111%	25
RPD			5.5%			

Date of Report: February 12, 1997
Samples Submitted: February 10, 1997
Lab Traveler: 02-025
Project: 803/2

Date Analyzed: 2-10-97

% MOISTURE

Client ID	Lab ID	% Moisture
RFP-1-1	02-025-1	11
RFP-1-2	02-025-2	18
RFP-1-3	02-025-3	11
RFP-1-5	02-025-4	17
RFP-3-1	02-025-5	15
RFP-3-2	02-025-6	9.0
RFP-5-1	02-025-7	12
RFP-5-2	02-025-8	31

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

A - Due to high sample concentration, amount spiked insufficient for meaningful MS/MSD data recovery.

B - The analyte indicated was also found in the blank sample.

D - Data from 1:____ dilution.

E - Value reported exceeds the quantitation range. Value is an estimate.

F - Surrogate recovery data not available due to the high concentration in the sample.

G - Insufficient sample quantity for duplicate analysis.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD outside control limited due to sample inhomogeniety. Sample re-extracted and re-analyzed with similar results.

L - Quantitated from C7-C34 as diesel fuel #2.

M - Predominantly _____ range hydrocarbons present in the sample.

N - Hydrocarbons in the gasoline range (C7-toluene) present in the sample.
N1 - Hydrocarbons in the gasoline range (C7-toluene) present in the sample which are elevating the diesel result.

O - Hydrocarbons in the heavy oil range (>C24) present in the sample.
O1 - Hydrocarbons in the heavy oil range (>C24) present in the sample which are elevating the diesel result.

R - Hydrocarbons outside defined gasoline range present in the sample.

S - Surrogate recovery data not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - Matrix Spike/Matrix Spike Duplicate RPD outside control limits due to matrix effects.

V - Matrix Spike/Matrix Spike Duplicate recoveries outside control limits due to matrix effects.

Z - Interferences were present which prevented the quantitation of the analyte below the detection limit reported.

ND - Not Detected

MRL - Method Reporting Limit

PQL - Practical Quantitation Limit

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA ENVIRONMENTAL CONSULTANTS
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Turn Around Requested
(Check One)
- ☐ Same Day
- ☐ 24 Hours
- ☐ 48 Hours
- ☒ Standard
- ☐ _____ (other)

Project Chemist:

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED w/SIL & DIESEL QUANT. S	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
	RFP-1-1	2/6/97		SOIL	1			X										
	RFP-1-2	↓		↓	↓			X										
	RFP-1-3							X										
	RFP-1-5							X										
	RFP-3-1							X										
	RFP-3-2							X										
	RFP-5-2							X										
	RFP-5-1							X										

RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM HERRERA	TIME 7:30	FIRM	TIME
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS: NO ACID CLEANUP!

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OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: HERRERA ENVIRONMENTAL CONSULTANTS

Project No: 803/2

Project Name: SEWARD

Project Manager: ROB HARRISON

Turn Around Requested (Check One)
- [ ] Same Day
- [ ] 24 Hours
- [ ] 48 Hours
- [x] Standard
- [ ] ______ (other)

Project Chemist:

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED w/ OIL & DIESEL QUANT. S	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
	RFP-1-1	2/6/97		SOIL	1			X										
	RFP-1-2	↓		↓	↓			X										
	RFP-1-3	↓		↓	↓			X										
	RFP-1-5	↓		↓	↓			X										
	RFP-3-1	↓		↓	↓			X										
	RFP-3-2	↓		↓	↓			X										
	RFP-5-2	↓		↓	↓			X										
	RFP-5-1	↓		↓	↓			X										

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	2/10/97		
FIRM: HERRERA	TIME: 7:30	FIRM	TIME
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS: NO ACID CLEANUP!

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Page _____ of _____

OnSite Environmental Inc.

14924 NE 31st Circle • Redmond, WA 98052

Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: Hart A.

Project No:

Project Name:

Project Manager:

Turn Around Requested

(Check One)

- ☐ Same Day
- ☐ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KPH

Laboratory No. 02-025-3

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D w/ silica gel	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals							% Moisture
-1	RTP-1-1							X																X
-2	-1-2							X																X
-3	-1-3							X																X
-4	-1-5							X																X
5	-3-1							X																X
6	-3-2							X																X
7	-5-1							X																X
8	-5-2			S				X																X

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FIRM	TIME	FIRM	TIME
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

Temp
COC
Rin

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OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

March 11, 1997

Peter Jowise
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project Seward Park
Laboratory Reference No. 9703-025

Dear Peter:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on March 7, 1997.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

14924 NE 31st Circle • Redmond, WA 98052 • (206) 883-3881 • Fax (206) 885-4603

Date of Report: March 11, 1997
Samples Submitted: March 7, 1997
Lab Traveler: 03-025
Project: Seward Park

WTPH-D

Date Extracted: 3-07-97
Date Analyzed: 3-10-97

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	o-Terphenyl Surrogate Recovery	Diesel PQL	Oil PQL	Flags
FP-1	03-025-1	1.0	120	300	78%	30	60	

RFP 5-3

Date of Report: March 11, 1997
Samples Submitted: March 7, 1997
Lab Traveler: 03-025
Project: Seward Park

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 3-7-97
Date Analyzed: 3-8-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	o-Terphenyl Surrogate Recovery	Diesel PQL	Oil PQL
MB0307S1	1.0	ND	ND	88%	25	50

Date of Report: March 11, 1997
Samples Submitted: March 7, 1997
Lab Traveler: 03-025
Project: Seward Park

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 3-07-97
Date Analyzed: 3-08-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	o-Terphenyl Surrogate Recovery	Diesel PQL	Flags
03-024-1	1.0	ND	64%	32	
03-024-1 DUP	1.0	ND	57%	32	
RPD		NA			

Date of Report: March 11, 1997
Samples Submitted: March 7, 1997
Lab Traveler: 03-025
Project: Seward Park

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 3-07-97
Date Analyzed: 3-10-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	Spike Level	Total Petroleum Hydrocarbons	Percent Recovery	o-Terphenyl Surrogate Recovery	Diesel PQL
SB0307S1	1.0	100	95.9	96%	110%	25
SB0307S1 DUP	1.0	100	93.3	93%	114%	25
RPD			2.7%			

Date of Report: March 11, 1997
Samples Submitted: March 7, 1997
Lab Traveler: 03-025
Project: Seward Park

Date Analyzed: 3-7-97

% MOISTURE

Client ID	Lab ID	% Moisture
FP-1	03-025-1	17

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

A - Due to high sample concentration, amount spiked insufficient for meaningful MS/MSD data recovery.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD outside control limits due to analyte concentration within five times the quantitation limit.

D - Data from 1:____ dilution.

E - Value reported exceeds the quantitation range. Value is an estimate.

F - Surrogate recovery data not available due to the high concentration in the sample.

G - Insufficient sample quantity for duplicate analysis.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD outside control limited due to sample inhomogeniety. Sample re-extracted and re-analyzed with similar results.

L - Quantitated from C7-C34 as diesel fuel #2.

M - Predominantly _____ range hydrocarbons present in the sample.

N - Hydrocarbons in the gasoline range (C7-toluene) present in the sample.
N1 - Hydrocarbons in the gasoline range (C7-toluene) present in the sample which are elevating the diesel result.

O - Hydrocarbons in the heavy oil range (>C24) present in the sample.
O1 - Hydrocarbons in the heavy oil range (>C24) present in the sample which are elevating the diesel result.

R - Hydrocarbons outside defined gasoline range present in the sample.

S - Surrogate recovery data not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - Matrix Spike/Matrix Spike Duplicate RPD outside control limits due to matrix effects.

V - Matrix Spike/Matrix Spike Duplicate recoveries outside control limits due to matrix effects.

Z - Interferences were present which prevented the quantitation of the analyte below the detection limit reported.

ND - Not Detected

MRL - Method Reporting Limit

PQL - Practical Quantitation Limit

Chain Of Custody

Page 1 of 1

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Company: Herrera Environmental
Project No: [redacted] Seward Park
Project Name: [redacted] Seward Park
Project Manager: Peter J.

Turn Around Requested (Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: VH

Laboratory No.

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D extended	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
1	FP-1	3/7/97	1130	S				X										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	3/7/97	[signature]	3/7/97
FIRM	TIME	FIRM	TIME
		OnSite Environ.	12:30
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

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OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

February 26, 1997

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9702-045

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on February 19, 1997.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

14924 NE 31st Circle • Redmond, WA 98052 • (206) 883-3881 • Fax (206) 885-4603

Date of Report: February 26, 1997
Samples Submitted: February 19, 1997
Lab Traveler: 02-045
Project: 803/2

WTPH-D

Date Extracted: 2-20-97
Date Analyzed: 2-20-97

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	o-Terphenyl Surrogate Recovery	Diesel PQL	Oil PQL	Flags
RFP-3-3	02-045-1	1.0	ND	ND	83%	27	55	
RFP-3-4	02-045-2	1.0	ND	ND	81%	27	53	
RFP-3-5	02-045-3	1.0	160	99	92%	29	58	
RFP-3-6	02-045-4	1.0	100	110	73%	53	106	

Date of Report: February 26, 1997
Samples Submitted: February 19, 1997
Lab Traveler: 02-045
Project: 803/2

WTPH-D
(Acid Cleanup)

Date Extracted: 2-20-97
Date Analyzed: 2-20-97

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	o-Terphenyl Surrogate Recovery	Diesel PQL	Oil PQL	Flags
RFP-3-6	02-045-4	1.0	64	ND	74%	53	106	

Date of Report: February 26, 1997
Samples Submitted: February 19, 1997
Lab Traveler: 02-045
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 2-20-97
Date Analyzed: 2-20-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	o-Terphenyl Surrogate Recovery	Diesel PQL	Oil PQL
MB0220S1	1.0	ND	ND	73%	25	50

Date of Report: February 26, 1997
Samples Submitted: February 19, 1997
Lab Traveler: 02-045
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 2-20-97
Date Analyzed: 2-20-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	Total Petroleum Hydrocarbons	o-Terphenyl Surrogate Recovery	Diesel PQL	Flags
02-045-2	1.0	ND	81%	27	
02-045-2 DUP	1.0	ND	79%	27	
RPD		NA			

Date of Report: February 26, 1997
Samples Submitted: February 19, 1997
Lab Traveler: 02-045
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 2-20-97
Date Analyzed: 2-20-97

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID	Dilution Factor	Spike Level	Total Petroleum Hydrocarbons	Percent Recovery	o-Terphenyl Surrogate Recovery	Diesel PQL
SB0220S1	1.0	100	83.3	83%	104%	25
SB0220S1 DUP	1.0	100	80.7	81%	98%	25
RPD			3.2%			

Date of Report: February 26, 1997
Samples Submitted: February 19, 1997
Lab Traveler: 02-045
Project: 803/2

Date Analyzed: 2-20-97

% MOISTURE

Client ID	Lab ID	% Moisture
RFP-3-3	02-045-1	9.0
RFP-3-4	02-045-2	6.0
RFP-3-5	02-045-3	14
RFP-3-6	02-045-4	53

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

A - Due to high sample concentration, amount spiked insufficient for meaningful MS/MSD data recovery.

B - The analyte indicated was also found in the blank sample.

D - Data from 1:____ dilution.

E - Value reported exceeds the quantitation range. Value is an estimate.

F - Surrogate recovery data not available due to the high concentration in the sample.

G - Insufficient sample quantity for duplicate analysis.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD outside control limited due to sample inhomogeniety. Sample re-extracted and re-analyzed with similar results.

L - Quantitated from C7-C34 as diesel fuel #2.

M - Predominantly _____ range hydrocarbons present in the sample.

N - Hydrocarbons in the gasoline range (C7-toluene) present in the sample.
N1 - Hydrocarbons in the gasoline range (C7-toluene) present in the sample which are elevating the diesel result.

O - Hydrocarbons in the heavy oil range (>C24) present in the sample.
O1 - Hydrocarbons in the heavy oil range (>C24) present in the sample which are elevating the diesel result.

R - Hydrocarbons outside defined gasoline range present in the sample.

S - Surrogate recovery data not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - Matrix Spike/Matrix Spike Duplicate RPD outside control limits due to matrix effects.

V - Matrix Spike/Matrix Spike Duplicate recoveries outside control limits due to matrix effects.

Z - Interferences were present which prevented the quantitation of the analyte below the detection limit reported.

ND - Not Detected

MRL - Method Reporting Limit

PQL - Practical Quantitation Limit

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turn Around Requested
(Check One)
- ☐ Same Day
- ☐ 24 Hours
- ☐ 48 Hours
- ☒ Standard
- ☐ _____ (other)

Project Chemist: CR

Laboratory No. 02-045

Company: HERRERA
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED W/ SILICA GEL OIL & DIESEL QUANT.'S	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	ACID CLEAN-UP						% Moisture
1	RFP-3-3	2/17	1130	SOIL	1			X																X
2	RFP-3-4	↓	1250	↓	↓			X																X
3	RFP-3-5		1505					X																X
4	RFP-3-6	↓	1540	↓	↓			X										X						X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM: HERRERA	TIME: 0730	FIRM: OSE	TIME: 09:00
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

Stockpile Samples

OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

October 24, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project Seward 803
Laboratory Reference No. 9610-081

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on October 22, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: October 24, 1996
Samples Submitted: October 22, 1996
Lab Traveler: 10-081
Project: Seward 803

WTPH-D

Date Extracted: 10-23-96
Date Analyzed: 10-23-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel MRL	Oil MRL
STOCK-1-1	10-081-1	1.0	**290**	**59**	88%		25	50
STOCK-2-1	10-081-2	1.0	**620**	**110**	145%		25	50
STOCK-3-1	10-081-3	1.0	**220**	**130**	82%		25	50
STOCK-3-2	10-081-4	1.0	**350**	**260**	94%		25	50
STOCK-3-3	10-081-5	1.0	**170**	**85**	73%		25	50

* o-Terphenyl

Date of Report: October 24, 1996
Samples Submitted: October 22, 1996
Lab Traveler: 10-081
Project: Seward 803

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 10-23-96
Date Analyzed: 10-23-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1023S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	87%		25

* o-Terphenyl

Date of Report: October 24, 1996
Samples Submitted: October 22, 1996
Lab Traveler: 10-081
Project: Seward 803

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 10-23-96
Date Analyzed: 10-23-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 10-081-1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	262	88%		25
Duplicate	1.0	278	90%		25
RPD		5.9%			

* o-Terphenyl

Date of Report: October 24, 1996
Samples Submitted: October 22, 1996
Lab Traveler: 10-081
Project: Seward 803

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 10-23-96
Date Analyzed: 10-24-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1023S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	86.1	86%	106%		25
Spike Blank Duplicate	1.0	89.9	90%	106%		25
RPD		4.3%				

* o-Terphenyl

Date of Report: October 24, 1996
Samples Submitted: October 22, 1996
Lab Traveler: 10-081
Project: Seward 803

Date Analyzed: 10-23-96

% MOISTURE

Client ID	Lab ID	% Moisture
STOCK-1-1	10-081-1	17
STOCK-2-1	10-081-2	25
STOCK-3-1	10-081-3	31
STOCK-3-2	10-081-4	39
STOCK-3-3	10-081-5	20

Chain Of Custody

Page _____ of _____

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turnaround Requested

(Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Company: HERRERA

Project No: SEWARD 803

Project Name:

Project Manager: ROB HARRISON

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
1	STOCK-1-1							X										X
	~~STOCK-1-2~~ TPH							X										
2	STOCK-2-1							X										X
3	STOCK-3-1							X										X
4	STOCK-3-2							X										X
5	STOCK-3-3							X										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	10/22/96	[signature]	10/22/96
FIRM HEC	TIME 4:35	FIRM OnSite Environ.	TIME 4:35
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

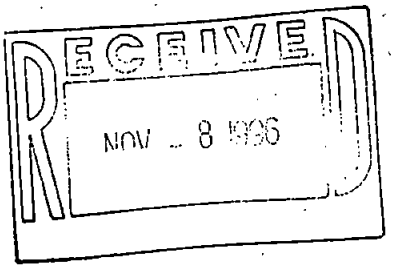
COMMENTS:

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy

OnSite
Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 7, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121



Re: Analytical Data for Project 803/2
Laboratory Reference No. 9610-110

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on October 30, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

WTPH-D

Date Extracted: 10-31-96
Date Analyzed: 10-31-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel MRL	Oil MRL
STOCK-8-1	10-110-1	1.0	**2600**	**150**	---	F	25	50
STOCK-8-2	10-110-2	1.0	**1100**	**290**	---	F	25	50
STOCK-8-3	10-110-3	5.0	**880**	**720**	---	S	125	250

* o-Terphenyl
F - Surrogate recovery data not available due to the high concentration in the sample.
S - Surrogate recovery data not available due to the necessary dilution of the sample.

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 10-31-96
Date Analyzed: 10-31-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1031S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	87%		25

* o-Terphenyl

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 10-30-96
Date Analyzed: 10-30-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 10-088-13

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	116	101%		25
Duplicate	1.0	124	96%		25
RPD		6.7%			

* o-Terphenyl

Date of Report: November 1, 1996
Samples Submitted: October 30, 1996
Lab Traveler: 10-110
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 10-30-96
Date Analyzed: 10-30-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1030S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	84.3	84%	117%		25
Spike Blank Duplicate	1.0	84.9	85%	120%		25
RPD		0.69%				

* o-Terphenyl

Chain Of Custody

OnSite Environmental Inc.
14924 NE 31st Circle • Redmond, WA 98052
Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turn Around Required

(Check One)
- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No. 10-110

Company: HERRERA ENV. CONS.
Project No: 803/2
Project Name: SEWARD
Project Manager: ROB HARRISON

Analyses Required

Sample ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. Containers	WTPH-HCID	WTPH-G/BTEX	WTPH-D w/ Oil & Diesel Extended Range	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240.8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	FCG as TPH (418.1)	BTE	Total Soluble Sulfides				% Moisture
1	STOCK-8-1	10/29	9:30	soil	1			X																X
2	STOCK-8-2	10/29	9:45	soil	1			X																X
3	STOCK-8-3	10/29	10:00	soil	1			X																X
4	W1030-1	10/30		W	4													X	X	X				

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	10/30/96	[signature]	10/30/96
FIRM: HERRERA	TIME: 1126	FIRM: ONSITE ENVIRON.	TIME: 1130
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

November 1, 1996

Rob Harrison
Herrera & Associates
2200 6th Avenue, Suite 601
Seattle, WA 98121

Re: Analytical Data for Project 803/2
Laboratory Reference No. 9610-101

Dear Rob:

Enclosed are the results of the analyses, and associated quality control data, of samples submitted on October 26, 1996.

The standard policy of OnSite Environmental Inc., is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

Karl P. Hornyik
Project Chemist

Enclosures

Date of Report: November 1, 1996
Samples Submitted: October 26, 1996
Lab Traveler: 10-101
Project: 803/2

WTPH-D

Date Extracted: 10-28-96
Date Analyzed: 10-28-96

Matrix: Soil
Units: mg/Kg (ppm)

Client ID	Lab ID	Dilution Factor	TPH-Diesel C12-C24	TPH-Oil C24-C34	Surrogate Recovery*	Flags	Diesel MRL	Oil MRL
EXC-6-1	10-101-1	1.0	**170**	**150**	84%		25	50
STOCK-6-1	10-101-2	10.0	**4500**	**4300**	---	S	250	500
STOCK-6-2	10-101-3	10.0	**2100**	**2400**	---	S	250	500
STOCK-6-3	10-101-4	10.0	**6800**	**4300**	---	S	250	500

* o-Terphenyl
S - Surrogate recovery data not available due to the necessary dilution of the sample.

Date of Report: November 1, 1996
Samples Submitted: October 26, 1996
Lab Traveler: 10-101
Project: 803/2

WTPH-D
METHOD BLANK QUALITY CONTROL

Date Extracted: 10-28-96
Date Analyzed: 10-28-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1028S1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Method Blank	1.0	ND	81%		25

* o-Terphenyl

Date of Report: November 1, 1996
Samples Submitted: October 26, 1996
Lab Traveler: 10-101
Project: 803/2

WTPH-D
DUPLICATE QUALITY CONTROL

Date Extracted: 10-25-96
Date Analyzed: 10-28-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: 10-073-1

	Dilution Factor	Total Petroleum Hydrocarbons	Surrogate Recovery*	Flags	MRL
Sample	1.0	1830	---	F	25
Duplicate	1.0	2060	---	F	25
RPD		12%			

* o-Terphenyl
F - Surrogate recovery data not available due to the high concentration in the sample.

Date of Report: November 1, 1996
Samples Submitted: October 26, 1996
Lab Traveler: 10-101
Project: 803/2

WTPH-D
SB/SBD QUALITY CONTROL

Date Extracted: 10-25-96
Date Analyzed: 10-28-96

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: SB1025S1

	Dilution Factor	Total Petroleum Hydrocarbons	Percent Recovery	Surrogate Recovery*	Flags	MRL
Spike Blank @ 100 ppm	1.0	89.9	90%	122%		25
Spike Blank Duplicate	1.0	82.4	82%	114%		25
RPD		8.8%				

* o-Terphenyl

Date of Report: November 1, 1996
Samples Submitted: October 26, 1996
Lab Traveler: 10-101
Project: 803/2

Date Analyzed: 10-28-96

% MOISTURE

Client ID	Lab ID	% Moisture
EXC-6-1	10-101-1	28
STOCK-6-1	10-101-2	22
STOCK-6-2	10-101-3	24
STOCK-6-3	10-101-4	26

Chain Of Custody

Page _____ of _____

OnSite Environmental Inc.

14924 NE 31st Circle • Redmond, WA 98052

Fax: (206) 885-4603 • **Phone: (206) 883-3881**

Turnaround Required

(Check One)

- ☐ Same Day
- ☒ 24 Hours
- ☐ 48 Hours
- ☐ Standard
- ☐ _____ (other)

Project Chemist: KH

Laboratory No.

Company: HERRERA

Project No: 803/2

Project Name: SEWARD

Project Manager: ROB HARRISON

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	WTPH-HCID	WTPH-G/BTEX	WTPH-D EXTENDED W/ DRO SEPARATE QUANTIT	WTPH-418.1	Volatiles by 8240/624	Volatiles by 8260	Chlorinated Volatiles by 8240/8260/624	Semivolatiles by 8270/625	PAHs by 8270/625	PCB's by 8080/608	Total RCRA Metals (8)	TCLP Metals	% Moisture
1	EXC-6-1	10/25	9:00	SOIL	1			X										X
2	STOCK-6-1	10/25	10:00	"	1			X										X
3	STOCK-6-2	10/25	10:15	"	1			X										X
4	STOCK-6-3	10/25	10:30	"	1			X										X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
[signature]	10-26-96	[signature]	10/26/96
FIRM: HERRERA	TIME: 1220	FIRM: ONSITE ENVIRONMENTAL	TIME: 12:20
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

DISTRIBUTION LEGEND - White - Cust. Copy - Yellow - Report Copy - Pink - Client Copy

APPENDIX H

Tank Strip and Rinse Records

Seward Park Project

Tank Strip & Rinse Amounts

Date	From Where	Amount	Unit	Product
15-Oct	tank 1	200	gal	oil & water
15-Oct	tank 2	500	gal	oil & water
15-Oct	tank 3	1200	gal	oil & water
16-Oct	1a	450	gal	oil & water
16-Oct	1b	400	gal	oil & water
16-Oct	3a	300	gal	oil & water
16-Oct	5a	500	gal	diesel & water
16-Oct	6a	400	gal	diesel
16-Oct	8a	1600	gal	diesel
16-Oct	8b	250	gal	oil
21-Oct	tank 2b	1000	gal	water & diesel
21-Oct	tank 3b	1000	gal	water & diesel
21-Oct	tank 7b	50	gal	diesel
21-Oct	9b	50	gal	diesel
21-Oct	9c	400	gal	diesel
21-Oct	2c	25	gal	diesel
21-Oct	1c	25	gal	diesel
20-Nov	500 g tank	100	gal	diesel

Total Tank Gallonage: 8450 gal

DISPOSAL CERTIFICATION

Omega Services
3214 16th Ave. SW
Seattle, WA 98134

Job Site: SEWARD PARK ESTATES

Omega's Job #

CTC's Job # 3319

Dear Sirs,

This letter is to certify that Coastal Tank Cleaning, Inc. (CTC) has received the following tank(s) for cleaning and disposal in accordance with all Federal, State and Local rules and regulations.

1 each 3-55 GALLON DRUMS
75 FEET OF PIPE

DATE RECEIVED: 12/6/96

DATE CLEANED: 12/6/96

MARINE CHEMIST CERT. # N/A

DATE DIPSOSED: 12/6/96

BILL OF LADING:

METHOD OF DISPOSAL: SCRAP METAL

If you have any questions regarding this matter please feel free to call at (206) 624-9843.

Sincerely, James Reynolds

DISPOSAL CERTIFICATION

Omega Services
3214 16th Ave. SW
Seattle, WA 98134

Job Site: SEWARD PARK ESTATES

Omega's Job # [redacted]

CTC's Job # 3319

Dear Sirs,

This letter is to certify that Coastal Tank Cleaning, Inc. (CTC) has received the following tank(s) for cleaning and disposal in accordance with all Federal, State and Local rules and regulations.

1 each 7-55 GAL DRUMS

DATE RECEIVED: 12/2/96

DATE CLEANED: 12/2/96

MARINE CHEMIST CERT. # N/A

DATE DIPSOSED: 12/2/96

BILL OF LADING: 7849

METHOD OF DISPOSAL: SCRAP METAL

If you have any questions regarding this matter please feel free to call at (206) 624-9845.

Sincerely, James Raymond

DISPOSAL CERTIFICATION

Omega Services
3214 16th Ave. SW
Seattle, WA 98134

Job Site: SEWARD PARK ESTATES

Omega's Job #

CTC's Job # 3319

Dear Sirs,

This letter is to certify that Coastal Tank Cleaning, Inc. (CTC) has received the following tank(s) for cleaning and disposal in accordance with all Federal, State and Local rules and regulations.

1 each 1-1200 GALLON UST DIESEL

DATE RECEIVED: 11/25/96

DATE CLEANED: 11/25/96

MARINE CHEMIST CERT. # 4329

DATE DISPOSED: 11/25/96

BILL OF LADING: 8227

METHOD OF DISPOSAL: SCRAP METAL

If you have any questions regarding this matter please feel free to call at (206) 624-9843.

Sincerely, James Raymond

DISPOSAL CERTIFICATION

Omega Services
3214 16th Ave SW
Seattle, WA 98134

Job Site: SEWARD PARK ESTATES

Omega's Job #

CTC's Job # 3819

Dear Sirs,

This letter is to certify that Coastal Tank Cleaning, Inc. (CTC) has received the following tank(s) for cleaning and disposal in accordance with all Federal, State and Local rules and regulations.

1 each 1-1200 GALLON UST DIESEL
1-300 GALLON UST DIESEL

DATE RECEIVED: 11/21/96

DATE CLEANED: 11/25/96

MARINE CHEMIST CERT. # 43219

DATE DIPSOSED: 11/25/96

BILL OF LADING: 9847

METHOD OF DISPOSAL: SCRAP METAL

If you have any questions regarding this matter please feel free to call at (206) 624-9843.

Sincerely, James Raymond

DISPOSAL CERTIFICATION

Omega Services
3214 16th Ave. SW
Seattle, WA 98134

Job Site: SEWARD PARK ESTATES

Omega's Job #

CTC's Job # 3319

Dear Sirs,

This letter is to certify that Coastal Tank Cleaning, Inc. (CTC) has received the following tank(s) for cleaning and disposal in accordance with all Federal, State and Local rules and regulations.

1 each 1-1200 GALLON UST DIESEL
1-300 GALLON UST DIESEL

DATE RECEIVED: 11/20/96

DATE CLEANED: 11/25/96

MARINE CHEMIST CERT. # 4322

DATE DIPSOSED: 11/25/96

BILL OF LADING: 7846

METHOD OF DISPOSAL: SCRAP METAL

If you have any questions regarding this matter please feel free to call at (206) 624-9843.

Sincerely, James Raymond

DISPOSAL CERTIFICATION

Omega Services
3214 16th Ave. SW
Seattle, WA 98134

Job Site: STEWARD PARK ESTATES

Omega's Job # ~

CTC's Job # 3319

Dear Sirs,

This letter is to certify that Coastal Tank Cleaning, Inc. (CTC) has received the following tank(s) for cleaning and disposal in accordance with all Federal, State and Local rules and regulations.

1 each 1-1200 GALLON UST DIESEL

DATE RECEIVED: 11/15/96

DATE CLEANED: 11/22/96

MARINE CHEMIST CERT. # 4322

DATE DISPOSED: 11/25/96

BILL OF LADING: 7845

METHOD OF DISPOSAL: SCRAP METAL

If you have any questions regarding this matter please feel free to call at (206) 624-9843.

Sincerely, James Raymond

DISPOSAL CERTIFICATION

Omega Services
3214 16th Ave. SW
Seattle, WA 98134

Job Site: SEWARD PARK ESTATES

Omega's Job #

CTC's Job # 3319

Dear Sirs,

This letter is to certify that Coastal Tank Cleaning, Inc. (CTC) has received the following tank(s) for cleaning and disposal in accordance with all Federal, State and Local rules and regulations.

1 each 2-1200 GALLON UST DIESEL
2-300 GALLON UST DIESEL

DATE RECEIVED: 11/14/96

DATE CLEANED: 11/22/96

MARINE CHEMIST CERT. # 4322

DATE DIPSOSED: 11/25/96

BILL OF LADING: 7845

METHOD OF DISPOSAL: SCRAP METAL

If you have any questions regarding this matter please feel free to call at (206) 624-9843.

Sincerely, James Raymond

DISPOSAL CERTIFICATION

Omega Services
3214 16th Ave. SW
Seattle, WA 98134

Job Site: SEWARD PARK ESTATES

Omega's Job #

CTC's Job # 3319

Dear Sirs,

This letter is to certify that Coastal Tank Cleaning, Inc. (CTC) has received the following tank(s) for cleaning and disposal in accordance with all Federal, State and Local rules and regulations.

1 each 2-2000 GALLON UST DIESEL
2-300 GALLON UST DIESEL

DATE RECEIVED: 10/24/96

DATE CLEANED: 10/23/96

MARINE CHEMIST CERT. # 43217

DATE DIPSOSED: 10/27/96

BILL OF LADING: 7838

METHOD OF DISPOSAL: SCRAP METAL

If you have any questions regarding this matter please feel free to call at (206) 624-9843.

Sincerely, James Raymond

DISPOSAL CERTIFICATION

Omega Services
3214 16th Ave. SW
Seattle, WA 98134

Job Site: SEWARD PARK ESTATES

Omega's Job #

CTC's Job # 3319

Dear Sirs,

This letter is to certify that Coastal Tank Cleaning, Inc. (CTC) has received the following tank(s) for cleaning and disposal in accordance with all Federal, State and Local rules and regulations.

1 each 1-1000 GALLON UST DIESEL
3-500 GALLON UST DIESEL

DATE RECEIVED: 10/17/96

DATE CLEANED: 10/23/96

MARINE CHEMIST CERT. # 43217

DATE DIPSOSED: 10/27/96

BILL OF LADING: 8226

METHOD OF DISPOSAL: SCRAP METAL

If you have any questions regarding this matter please feel free to call at (206) 624-9843.

Sincerely, James Reynard

APPENDIX I

Contaminated Soil Load Ticket Record

Taneum Recovery Corp.
P.C.S. Remediation & Recycling
TANEURCO55DC

BILL OF LADING

BILL OF LADING #: 96-56-1 DATE: 12/7/96

GENERATOR NAME/ADDRESS:	SITE OF GENERATION:
Lk. Washington Limited Partnership	STREET 9061 Seward Park Estates So.
C/O S.E. Effective Dev. Company	TOWN Seattle
(510) 837-6756	STATE Washington
Omega Services, Inc. CONTACT/TEL #: (206) 682-2440	TRANSPORT ACCIDENT ☐ Y ☒ N

PCS (TOTAL PROJECTED QUANTITY): WT (tons) ______ VOL (cu yds) ______

TYPE OF CONTAMINATION: ☐ GASOLINE ☒ DIESEL ☐ WASTE OIL ☐ KEROSENE ☐ OTHER (specify) ______

ANALYSIS ATTACHED: ☐ YES ☒ NO

LAB NAME: ONSITE Enviro.

TRANSPORTER NAME/ADDRESS:

Taneum Recovery Corp.
P.O. Box 1419
Ellensburg, Wa. 98926
CONTACT/TEL #: (206) 392-5815

RECEIVED
Oct. 29, 1996 Thru
DEC. 7, 1996
DATE
TANEUM RECOVERY CORP.

GENERATOR'S SIGNATURE: ______ DATE: ______

TRANSPORTER'S SIGNATURE: Taneum Recovery Corp. by [signature] Sec. DATE: 12/7/96

MATERIALS RECEIVED AT PIT: DATE: 10/29/96 thru 12/7/96

QUANTITY RECEIVED: 1,308.37 TONS ✓ PB 3-21-97

NUMBER OF TRUCKS DELIVERING: 38 T&T

SCALEHOUSE SIGNATURE: ______

COMMENTS: ______

Taneum Recovery Corp.

P.C.S. Remediation & Recycling
TANEURCO55DC

BILL OF LADING

BILL OF LADING #: 97-4 DATE: 2/24/97

GENERATOR NAME/ADDRESS:
Lk. Washington Limited Partnership
C/O S.E. Effective Dev. Company
(510) 837-6756
Omega Services, Inc.
CONTACT/TEL #: (206) 682-2440

SITE OF GENERATION:
BLDG 9061 Seward Park Estates No.
TOWN Seattle
STATE Washington
TRANSPORT ACCIDENT ☐ Y XXN

PCS (TOTAL PROJECTED QUANTITY): WT (tons) VOL (cu yds)

TYPE OF CONTAMINATION:
☐ GASOLINE XX DIESEL ☐ WASTE OIL
☐ KEROSENE ☐ OTHER (specify) Heating oil

ANALYSIS ATTACHED:
☐ YES ☐ NO
LAB NAME: Onsite Enviro.

TRANSPORTER NAME/ADDRESS:
Taneum Recovery Corp.
P.O. Box 1419
Ellensburg, Wa. 98926
CONTACT/TEL #: (206) 392-5815

RECEIVED
2/19,24/97
DATE
TANEUM RECOVERY CORP.

GENERATOR'S SIGNATURE: Taneum Recovery Corp. by DATE:
TRANSPORTER'S SIGNATURE: DATE: 2/24/97

MATERIALS RECEIVED AT PIT: DATE: 2/19,24/97
QUANTITY RECEIVED: 47.35 TONS
NUMBER OF TRUCKS DELIVERING: 2
one TRT , one Solo
SCALEHOUSE SIGNATURE:
COMMENTS:

Taneum Recovery Corp.

P.C.S. Remediation & Recycling
TANEURCO55DC

OMEGA SERVICES
JAN 31 1997

BILL OF LADING

BILL OF LADING #: 97-3

DATE: 1/17/97

GENERATOR NAME/ADDRESS:	SITE OF GENERATION:
Lk. Washington Limited Partnership C/O S.E. Effective Dev. Company (510) 837-6756 Omega Services, Inc. CONTACT/TEL #: (206) 682-2440	STREET 9061 Seward Park Estates So. TOWN Seattle STATE Washington TRANSPORT ACCIDENT ☐ Y ☒ N

PCS (TOTAL PROJECTED QUANTITY): WT (tons) ______ VOL (cu yds) ______

TYPE OF CONTAMINATION:

☐ GASOLINE ☒ DIESEL ☐ WASTE OIL

☐ KEROSENE ☐ OTHER (specify) Heating oil

ANALYSIS ATTACHED: ☐ YES ☒ NO

LAB NAME: Onsite Enviro.

TRANSPORTER NAME/ADDRESS:

Taneum Recovery Corp.
P.O. Box 1419
Ellensburg, Wa. 98926

CONTACT/TEL #: (206) 392-5815

RECEIVED
1-14,15,17-97
DATE
TANEUM RECOVERY CORP.

GENERATOR'S SIGNATURE: ______ DATE: ______

TRANSPORTER'S SIGNATURE: Taneum Recovery Corp. by [signature] Sec. DATE: 1/17/97

MATERIALS RECEIVED AT PIT: DATE: 1/14,15,17/97

QUANTITY RECEIVED: 245.14 TONS

NUMBER OF TRUCKS DELIVERING: 7 T&T

SCALEHOUSE SIGNATURE: [signature]

COMMENTS: ______