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November 29, 2001

Mr. Joe Hickey
Washington State Department of Ecology
Northwest Region
3190 160th SE
Bellevue, Washington 98008-5452

RE: Transmittal of:
Phase II Environmental Site Assessments Report – Volume I
Time Oil Co. Seattle Terminal (Property No. 01-600)
2737 W. Commodore Way; Seattle, Washington

Dear Mr. Hickey,

Please find enclosed herewith a copy of the above referenced document produced for Time Oil Co. by Foster Wheeler Environmental Corporation (FWEC). The following paragraphs present a summary of previous environmental work at the site, a summary of actions undertaken during the Phase II assessment activities, and our plans for future work. The enclosed report contains a more detailed description of the project. Please contact me should you require any additional information.

The Phase II Site Assessment also included work on contiguous Time Oil Co. properties located at 2750 West Commodore Way (George Broom's Son's and Time Oil Co. Dock) and 2805 West Commodore Way (ASKO Hydraulic). Results of the Phase II Site Assessment activities are presented in two report volumes. Volume I of the Phase II Site Assessment Report presents results of activities undertaken upon the main Time Oil Co. Seattle Terminal property located at 2737 W. Commodore Way. Volume II presents results of activities undertaken upon properties located at 2750 and 2805 West Commodore Way.

This letter and the enclosed Volume I report only present results of site assessment work conducted on the main Time Oil Co. Seattle Terminal property located at 2737 West Commodore Way. Volume II of the report, discussing work competed on properties located at 2750 and 2805 West Commodore Way, will be submitted under separate cover.

Previous Environmental Work:
Previous environmental work at the main Time Oil Co. Seattle Terminal property has consisted of a UST removal and soil excavation project completed in 1991, a temporary well assessment conducted near the UST area in 1999, and installation of five monitoring wells in the former UST area in 1999. These activities are briefly described below.

Two USTs and associated dispensers were removed from the northern area of the site adjacent to West Commodore Way in September 1991. Discolored soil and hydrocarbon odors were noted during UST removal. An attempt was made to excavate hydrocarbon affected soils; however, excavating activities were discontinued after approximately 140 cubic yards of affected soil had been removed. The resulting excavation measured approximately 25 feet by 25 feet and extended to groundwater at an approximate depth of 18 feet. Hydrocarbon impacts appeared to increase in severity near the bottom of the excavation and a hydrocarbon sheen was observed upon groundwater pooled in the excavation. Soil samples were collected

and the excavation was subsequently backfilled with clean imported fill material. A new UST system was installed in roughly the same position as the previous system. Soil samples recovered from the excavation and beneath the dispenser location indicated primarily gasoline impacts, with four of the eight samples containing hydrocarbon concentrations in excess of State of Washington Model Toxics Control Act Method A Cleanup Levels - Soil (Method A Soil Cleanup Levels). The highest hydrocarbon concentrations were detected in soil samples recovered from the dispenser location. Details of work conducted in association with the UST removal are presented in a previously submitted Time Oil Co. report dated December 20, 1991.

A temporary well investigation consisting of the installation and sampling of nine temporary wells was conducted in June 1999 to further assess soil and groundwater conditions in the UST area. Soil and grab groundwater samples were collected from the temporary wells. Analytical results from the soil samples determined that samples collected from borings near the UST location contained hydrocarbon concentrations exceeding Soil Cleanup Levels and samples collected from borings located further away from the UST location either did not contain hydrocarbons or contained hydrocarbons at concentrations below Soil Cleanup Levels. Total lead was detected at concentrations well below Soil Cleanup Levels in soil samples collected from each boring. Groundwater was encountered at depths ranging between 14 to 18 feet in the temporary well borings. Analytical results from grab groundwater samples determined that each of the samples contained hydrocarbon concentrations exceeding State of Washington Model Toxics Control Act Method A Cleanup Levels – Groundwater (Method A Groundwater Cleanup Levels).

Five 25-foot deep groundwater monitoring wells (01-MW-01 through 01-MW-05) were installed around the UST location in September 1999. Soil and groundwater analytical results from the monitoring wells essentially confirmed results of the temporary well assessment. Groundwater samples were not collected from well 01-MW-05 due to the presence of 0.78 feet of free product within the well. Hydrocarbon constituents were not detected in groundwater samples recovered from well 01-MW-01. Hydrocarbon concentrations exceeding Groundwater Cleanup Levels were detected in groundwater samples recovered from wells 01-MW-02, 01-MW-03 and 01-MW-04. A dense clay aquitard was observed at an approximate depth of 25 feet in each well boring. A sample of the dense clay collected from well boring 01-MW-05 was found to have a hydraulic conductivity of 1.7×10^{-8} centimeters per second (cm/S). Groundwater level measurements determined that the average depth to groundwater was approximately 15.9 feet below grade. The site's groundwater flow direction was determined to be to the north at an approximate gradient of 0.04 feet per foot.

Results of the temporary well assessment and monitoring well installation activities are detailed in a previously submitted IT Corporation report entitled "Site Assessment Report, Time Oil Co. Site 2737," dated March 8, 2000. For reference purposes, temporary and permanent monitoring well locations, and analytical results from the 1999 assessment activities, are respectively presented on Figure 2-2 and in Tables 2-1 and 2-2 of the enclosed report.

Comprehensive Environmental Assessment of Facility:
Assessment activities discussed in the enclosed report were initiated in late 2000 in order to more fully characterize impacts in the UST area, and assess the potential for hydrocarbon impacts to be present in several other areas of the site where hydrocarbons have historically been stored and/or handled. The areas targeted for assessment were identified during a Phase I Assessment (background research only) conducted during the Summer of 2000. The Phase I Assessment identified the following areas as potential candidates for subsurface assessment:

- Upper Rail Line Spur: Historical aerial photographs reviewed during the Phase I research showed a rail spur extending along the entire southern boundary of the site, along the southern edge of the upper tank yard. The photographs showed apparent stained soil around the spur.
- Upper Tank Yard: Interviews conducted during the Phase I study documented several small leaks and spills that had occurred throughout the years within the upper tank yard.

- Lower Tank Yard: Small leaks and spills occurring throughout time were also documented for the lower tank yard during the Phase I study. Information gathered during the Phase I study also identified a short term wood treating solution mixing project that was conducted near the southwestern corner of the lower tank yard in the late 1960's. The wood treating chemical mixing project involved mixing solid pentachlorophenol (PCP) pellets with diesel in a small above ground storage tank (AST) for a period of approximately four months. The wood treating chemical solution was then pumped through an underground pipeline to the new barrel shed area where it was dispensed into drums that were subsequently loaded onto rail cars.
- Former Rail Line Spurs: Historical aerial photographs reviewed during the Phase I research showed rail spurs extending onto the southern area of the property from the main Burlington Northern rail lines and apparent stained soil around the spurs located on Time Oil Co. property.
- Former Barrel Shed: A barrel shed was formerly located between the current office building and warehouse. The former barrel shed was used to fill drums with various fuels for loading onto liberty ships and subsequent transport overseas during World War II. The barreling of fuel products during World War II was a high volume operation and apparent soil staining was observed in this area on historical aerial photographs.
- Former AST Area: Three small ASTs were formerly located in the current employee parking area in the west central area of the property. These ASTs were reportedly used to temporarily store waste oil collected from service stations prior to bulk shipment to recycling facilities during the 1960's and 1970's.
- Former Leaking Underground Storage Tank (LUST) Area: A review of information collected during decommissioning and prior assessments of the UST area determined that additional assessment of this area was warranted to further evaluate the nature and extent of related environmental impacts.
- West Commodore Way Perimeter: The northern property boundary, adjacent to West Commodore Way was selected for subsurface assessment due to previously identified impacts in the former LUST area, the presence of bulk fuel loading truck racks, and its proximity to the northern edge of the southern tank yard.

A site map showing each of the above-listed areas is presented as Figure 1-3 of the enclosed report. Summaries of subsurface assessment activities conducted in each of the above-listed areas are presented below.

Subsurface Assessment Activities and Findings:

General:

Forty one soil borings and eight monitoring wells were drilled at the site in November and December 2000. All soil boring (SB) and monitoring well (MW) locations are respectively displayed on Figures 3-1 and 3-2 of the enclosed report. Soil samples were generally collected at 5-foot intervals in each boring, with additional samples collected at the ground surface and 2.5-feet below grade in selected borings. All soil samples were field screened for the presence of hydrocarbons and lithologically described. Most soil samples were submitted for laboratory analysis.

Generalized soil conditions encountered in the borings consisted of fine to medium grained sand with lesser amounts of silt and clay overlying more coarse-grained water bearing sediments that are underlain by a very dense dry dark gray clay aquitard. Contacts between the various soil units and depths to groundwater varied significantly between borings locations due to differing ground surface elevations and the heterogeneous nature of soils beneath the site. Detailed representations of soil types observed in the soil borings are presented as cross-sections on Figures 5-1 through 5-6 of the enclosed report.

All soil and groundwater samples submitted for laboratory analysis were analyzed for heavy oil-range petroleum hydrocarbons (ORPH), diesel-range petroleum hydrocarbons (DRPH), gasoline-range petroleum hydrocarbons (GRPH), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total lead. Soil samples collected from selected borings located near former pentachlorophenol (PCP) storage or handling facilities were also analyzed PCP. Soil samples collected from borings within the former

PCP mixing area and former barrel shed areas were analyzed for polynuclear aromatic hydrocarbons (PAHs). Soil and groundwater samples collected from borings within the former waste oil AST area were analyzed for total concentrations of selected regulated metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs).

With the exception of PCP, analytical results were compared to State of Washington Model Toxics Control Act (MTCA) Method A Cleanup Levels (Method A Cleanup Levels) to evaluate regulatory compliance. PCP soil analytical results were compared its MTCA Method B Carcinogenic Cleanup Level (Method B Cleanup Level) to evaluate regulatory compliance for soil samples containing PCP. United States Environmental Protection Agency cleanup levels (EPA Cleanup Levels) were used to evaluate regulatory compliance for constituents that do not have published MTCA Cleanup Levels.

Upper Rail Line Spur:
Soil borings SB-21 through SB-23 were drilled in the upper rail line spur area to assess the potential presence of petroleum hydrocarbon impacts in this area. No groundwater monitoring wells were installed in this area.

Soil samples collected from depths of five and ten feet below grade in SB-22 contained GRPH and/or DRPH at concentrations exceeding Method A Soil Cleanup Levels. No other petroleum hydrocarbon analytes were detected at concentrations exceeding Method A Soil Cleanup Levels in any soil sample collected from SB-22. No petroleum hydrocarbon constituents were detected in soil samples collected from SB-21 or SB-23.

Upper Tank Yard:
Soil borings SB-11 through SB-17 were drilled in the upper tank yard to assess the potential presence of petroleum hydrocarbon impacts in this area. Monitoring well 01-MW-13 was installed in SB-13 to evaluate groundwater conditions in the upper tank yard.

Soil samples collected from a depth of two feet below grade in SB-13 and SB-15 contained GRPH and DRPH at concentrations exceeding Method A Soil Cleanup Levels. Sample SB-13-2 also contained benzene and ethylbenzene at concentrations exceeding Method A Soil Cleanup Levels. No other hydrocarbon analytes were detected at concentrations exceeding Method A Soil Cleanup Levels in any other soil sample collected from borings SB-11 through SB-17.

Groundwater samples collected from well 01-MW-13 contained DRPH at a concentration exceeding its Method A Groundwater Cleanup Level. No other target analytes were detected at concentrations exceeding their respective Method A Groundwater Cleanup Levels.

Lower Tank Yard (ASTs - Petroleum Hydrocarbons):
Soil borings SB-18 through SB-20 and SB-24 were drilled in the lower tank yard to assess the potential presence of petroleum hydrocarbon impacts in this area. Monitoring well 01-MW-12 was installed in SB-24 to evaluate groundwater conditions in the lower tank yard.

Soil samples collected from depths of two and five feet below grade in SB-19 and depths of two and ten feet below grade in SB-24 contained GRPH and/or DRPH at concentrations exceeding Method A Soil Cleanup Levels. No other hydrocarbon analytes were detected at concentrations exceeding Method A Soil Cleanup Levels in any other soil sample collected from borings SB-18 through SB-20 and SB-24.

Groundwater samples collected from well 01-MW-12 contained DRPH, GRPH and benzene at concentrations slightly exceeding their respective Method A Cleanup Levels. No other target analytes were detected at concentrations exceeding their respective Method A Groundwater Cleanup Levels.

Lower Tank Yard (Former PCP Mixing Area):
Soil borings SB-01 through SB-05 were drilled, and surface samples SS-01 through SS-04 were collected, in the former PCP mixing area located near the southwest corner of the lower tank yard to assess the potential presence of petroleum hydrocarbon, PCP and PAH impacts in this area. The borings in this area were drilled with a hand auger due to limited access associated with petroleum pipelines. This method of drilling presents the potential for cross contamination of soil samples from differing depth intervals as the hand auger is repeatedly run in and out of the boring. No groundwater monitoring wells were installed in this area.

Concentrations of ORPH, DRPH and/or GRPH exceeding Method A Cleanup Levels were detected in soil samples collected from SB-02 (surface), SB-03 and SB-03A (surface and two feet bgs) and SB-04 (surface, two feet bgs and five feet bgs). Concentrations of PCP exceeding Method B Cleanup Levels were detected in soil samples collected from borings SB-03 (surface) and SB-04 (surface and five feet bgs). Concentrations of total carcinogenic PAHs exceeding Method A Cleanup Levels were detected in several soil samples collected between the ground surface and five feet bgs in borings SB-03 and SB-04 and surface samples SS-01, SS-03 and SS-04. All other soil samples collected from this area either did not contain detectable concentrations of target analytes, or contained target analytes at concentrations below their respective soil cleanup levels.

Former Rail Line Spurs (Behind Warehouse):
Soil borings SB-06 through SB-10 were drilled around the former rail line spurs behind the warehouse in the southern area of the property to assess the potential presence of petroleum hydrocarbon impacts in this area. Selected soil samples collected from borings SB-06 through SB-08 were also analyzed for PCP due to these borings' close proximity to the new barrel shed where the wood treating solution was barreled. No groundwater monitoring wells were installed in this area due to the limited nature of petroleum impacts observed.

One soil sample collected from a depth of five bgs in SB-07 contained GRPH, DRPH and BTEX concentrations exceeding Method A Soil Cleanup Levels. No other hydrocarbon analytes were detected at concentrations exceeding Method A Soil Cleanup Levels in any other soil sample collected from borings SB-06 through SB-10. PCP was not detected at concentrations exceeding its Method B Soil Cleanup level in any of the soil samples submitted for PCP analysis.

Former Barrel Shed:
Soil borings SB-26 through SB-31 were drilled in the former barrel shed area to assess the potential presence of petroleum hydrocarbon impacts in this area. Monitoring well 01-MW-06 was installed in SB-29 to evaluate groundwater conditions beneath the former barrel shed area.

Soil samples collected from depths of two and/or five feet bgs in SB-27, SB-29, SB-30 and SB-31 contained GRPH at concentrations exceeding Method A Soil Cleanup Levels. Samples collected from a depth of two feet bgs in SB-29 and SB-31 also contained DRPH and/or ORPH at concentrations exceeding Method A Soil Cleanup Levels. No other hydrocarbon analytes were detected at concentrations exceeding Method A Soil Cleanup Levels in any other soil sample collected from borings SB-26 through SB-31.

Groundwater samples collected from well 01-MW-06 did not contain petroleum hydrocarbon analytes at concentrations exceeding their respective Method A Groundwater Cleanup Levels. PCP was detected in a groundwater sample collected from well 01-MW-06 at a concentration of 1.80 µg/L. The most stringent federal maximum contaminant level (MCL) for PCP is 1.0 µg/L; however, an appropriate target groundwater cleanup level for PCP has not yet been selected for the site.

Former LUST Area:
Soil borings SB-35 and SB-36 were drilled on the western side of the former LUST area to further evaluate petroleum hydrocarbon impacts identified in this area during previous assessment work. Monitoring wells

01-MW-08 and 01-MW-09 were respectively installed in borings SB-35 and SB-36 to evaluate groundwater conditions on the western side of the former LUST area.

Soil samples collected from depths of five and/or fifteen feet bgs in SB-35 and SB-36 contained GRPH, DRPH and/or BTEX at concentrations exceeding Method A Soil Cleanup Levels. No other hydrocarbon analytes were detected at concentrations exceeding Method A Soil Cleanup Levels in any other soil sample collected from borings SB-35 and SB-36.

Groundwater samples collected from well 01-MW-09 contained GRPH, DRPH and benzene concentrations exceeding their respective Method A Groundwater Cleanup Levels. However, no petroleum hydrocarbon analytes were detected at concentrations exceeding Method A Groundwater Cleanup Levels in the groundwater samples collected from well 01-MW-08.

West Commodore Way Perimeter:
Soil borings SB-37 through SB-39 and SB-44 were drilled along the northern property boundary adjacent to West Commodore Way to further evaluate petroleum hydrocarbon impacts previously identified in the former LUST area, evaluate the potential presence of petroleum hydrocarbon impacts near the bulk loading racks, and evaluate the potential presence of petroleum hydrocarbon impacts in the area north of the lower tank yard. Monitoring wells 01-MW-10 and 01-MW-11 were respectively installed in borings SB-37 and SB-44 to evaluate groundwater conditions.

Soil samples collected from a depths of ten and fifteen feet bgs in SB-37 contained GRPH and/or DRPH at concentrations exceeding Method A Soil Cleanup Levels. Soil samples collected from a depths of two and five feet bgs in SB-39 respectively contained DRPH and GRPH at concentrations exceeding Method A Soil Cleanup Levels. No other hydrocarbon analytes were detected at concentrations exceeding Method A Soil Cleanup Levels in any other soil sample collected from borings SB-37 through SB-39 and SB-44.

Monitoring well MW-01-10 was dry and therefore could not be sampled. Groundwater samples collected from well 01-MW-11 contained DRPH at a concentration slightly exceeding its Method A Groundwater Cleanup Level.

Generalized Groundwater Conditions Throughout Property:
Monitoring well installation activities conducted during the Phase II Assessment brought the total number of monitoring wells installed at the site to thirteen (01-MW-01 through 01-MW-13). Well locations are shown on Figure 3-2 of the enclosed report.

Monitoring wells 01-MW-05 and 01-MW-10 were not sampled during the Phase II Assessment because well 01-MW-05 contained free product and well 01-MW-10 was dry. The remaining eleven wells were sampled. All recovered groundwater samples were analyzed for GRPH, DRPH, ORPH, BTEX and total lead. The groundwater sample recovered from well 01-MW-07 was also analyzed for total concentrations of selected metals, VOCs and SVOCs. The groundwater samples collected from well 01-MW-06 were also analyzed for PCP due to its proximity to an underground pipeline former used to transfer PCP.

Petroleum hydrocarbon analytes were either not detected or detected at concentrations below Method A Groundwater Cleanup levels in groundwater samples collected from wells 01-MW-06, 01-MW-07 and 01-MW-08. One or more petroleum hydrocarbon analytes were detected at concentrations exceeding Method A Cleanup Levels in the remaining monitoring wells. The most significant petroleum hydrocarbon impacts are present in the immediate vicinity of the former LUST area as evidenced by analytical/monitoring results from wells 01-MW-02 through 01-MW-05 and 01-MW-09. Lesser hydrocarbon impacts were identified along the West Commodore Way Perimeter (01-MW-11), within the Upper Tank Yard (01-MW-13) and within the Lower Tank Yard (01-MW-12). Isoconcentration maps displaying the estimated extents of DRPH, GRPH and benzene affected groundwater are respectively presented as Figures 5-7, 5-8 and 5-9 of the enclosed report.

VOCs, SVOCs and metals were not detected at concentrations exceeding Method A Groundwater Cleanup Levels in the groundwater samples collected from well 01-MW-07. PCP was detected at a concentration of 1.80 µg/L in the groundwater sample collected from well 01-MW-06. The most stringent federal maximum contaminant level (MCL) for PCP is 1.0 µg/L; however, an appropriate target groundwater cleanup level for PCP has not yet been selected for the site.

Groundwater level measurements determined that the average depth to groundwater (excluding the well with free product) was approximately 15.6 feet below grade. The site's groundwater flow direction was determined to be to the northwest at an approximate gradient of 0.04 feet per foot. Monitoring well locations, groundwater level elevations, and a groundwater elevation contour map are presented on Figure 3-3 of the enclosed report.

Conclusions:

Areas of Minimal Impact:

Soils located near the ground surface throughout much of the facility appear to be of relatively low permeability and have thus limited vertical migration of hydrocarbons released at or near the ground surface. Most of the areas investigated contain impacts to near surface soils and low-level groundwater impacts that are either below, or only slightly above, Method A Groundwater Cleanup Levels. Current site assessment information suggests that impacts present beneath such areas do not appear to present an imminent threat to human health or the environment. Active remedial efforts are not currently recommended for such areas unless land use should change. Impacts within these areas will likely be addressed through risk evaluations and natural attenuation. Areas where low level hydrocarbon impacts do not appear to require active remediation at this time, and very brief summaries of assessment findings for each such area, are listed below. Areas requiring more extensive additional site assessment work and/or remedial measures are discussed in following paragraphs.

- Upper Rail Line Spur: Hydrocarbon concentrations exceeding Method A Soil Cleanup Levels were identified in one of three borings at depths of five and ten feet bgs, well above groundwater.
- Upper Tank Yard: Soil impacts exceeding Method A Soil Cleanup Levels appear limited to the two-foot sampling interval in two of seven borings. DRPH was the only hydrocarbon constituent detected in well 01-MW-13 at a concentration above its Method A Groundwater Cleanup Level.
- Lower Tank Yard (Petroleum Hydrocarbons in AST Area): Hydrocarbon concentrations exceeding Method A Soil Cleanup Levels were identified in two of four borings at respective depths of two and five feet, and two and ten feet, bgs. GRPH, DRPH and benzene were detected in well 01-MW-12 at concentrations slightly above their Method A Groundwater Cleanup Levels.
- Former Rail Line Spurs: Hydrocarbon concentrations exceeding Method A Soil Cleanup Levels were identified in one of six borings at a depth of 5 feet bgs, well above groundwater.
- Former Barrel Shed: Soil impacts exceeding Method A Soil Cleanup Levels appear limited to the upper two to five feet in four of seven borings. No petroleum hydrocarbon analytes were detected in well 01-MW-06 at concentrations exceeding Method A Groundwater Cleanup Levels. PCP was detected in groundwater at a concentration slightly exceeding the most stringent Federal MCL.
- Former Waste Oil AST Area: Petroleum hydrocarbon concentrations exceeding Method A Soil Cleanup Levels were detected in the upper five feet in two of three borings. TCE was detected at low concentrations, only slightly exceeding its Method A Soil Cleanup Level, in several soil samples collected from each boring. No other VOCs, SVOCs, or metals were detected at concentrations exceeding Method A Soil Cleanup Levels in this area. No petroleum hydrocarbons, VOCs, or SVOCs were detected in the groundwater sample collected from well 01-MW-07. All metals concentrations detected in the groundwater samples collected from well 01-MW-07were well below applicable cleanup levels.
- West Commodore Way Perimeter: Installation of several borings and monitoring wells along West Commodore Way appears to have resulted in definition of the eastern and western extents of soil and

groundwater containing hydrocarbon concentrations exceeding Method A Cleanup Levels. Additional assessment may be necessary to provide more detailed information in the former LUST and bulk loading rack areas; however, eastern and western (cross-gradient) extents of impacts along West Commodore Way appear to have been sufficiently defined.

Lower AST Yard – Former PCP Mixing Area:
Analytical results from soil samples collected from the PCP mixing area indicate the presence of relatively high petroleum hydrocarbon concentrations, concentrations of carcinogenic PAHs that exceed Method A Soil Cleanup Levels, and PCP concentrations which exceed Method B Carcinogenic Cleanup Levels. Although these impacts appear limited to the upper five feet of soil, and within a relatively small area, the concentrations present and characteristics of the contaminants dictate that remedial actions be undertaken. Additional investigation of this area is recommended to provide a more detailed assessment of the volume of soil impacted above Method A and Method B Cleanup Levels and assess the potential for an impact to groundwater. An appropriate remedial response should be developed and implemented for this area once the area of unacceptably impacted soil has been appropriately defined.

Former LUST Area:
The presence of significant concentrations of petroleum hydrocarbons in soil, free product in one well, and significant concentrations of petroleum hydrocarbons in groundwater within four other wells, dictates that an appropriate remediation plan be developed for the former LUST area. The area of most heavily impacted groundwater has been sufficiently defined such that remedial pilot testing can commence. Although the downgradient extent of impacted groundwater is not contained within the property boundaries, the downgradient extent of affected groundwater emanating from the former LUST area was sufficiently defined by site assessment activities conducted on a contiguous Time Oil Co. property located at 2750 West Commodore Way (across West Commodore Way to the north-northwest). Results of assessment activities at 2750 West Commodore Way are detailed in Volume II of the Phase II Site Assessment Report. More detailed assessment of the lateral extent of impacted groundwater can be conducted in coordination with the installation of appropriate extraction and monitoring wells prior to the commencement of remediation pilot testing activities.

New Barrel Shed:
Phase I research identified the new barrel shed as an area to be investigated during the Phase II Assessment. This work was recommended due to the new barrel shed's former use for barreling of wood treating solution for a short time period in the late 1960's. Limited overhead clearance and the presence of a thick concrete slab beneath the new barrel shed prevented drilling within this area. The concrete slab below the shed was constructed such that fluids potentially released during barreling operations would have flowed to the north across the slab then discharged to the ground surface at the front end of the shed. Installation of a monitoring well immediately north of the new barrel shed is recommended to properly assess the potential presence of soil and groundwater impacts from former barreling operations conducted at the new barreling shed.

On-going Work:
Additional (Phase III) assessment activities to more fully characterize the former PCP mixing area, new barreling shed, and former LUST/bulk loading rack areas were completed in the Summer of 2001. The recently completed assessment activities are outlined below.

- Six soil borings were drilled and one monitoring well was installed in the former PCP mixing area to provide a more detailed estimate of the volume of unacceptably impacted soil and assess the potential presence of impacted groundwater in this area.
- One monitoring well was installed immediately north of the new barreling shed to assess the potential presence of soil and groundwater impacts in this area.
- One soil boring was drilled near existing monitoring well 01-MW-06 to assess soils in this area as a potential source of low concentration PCP groundwater impacts.

- One monitoring well was installed along the West Commodore Way Perimeter, east of the former LUST area and downgradient from the bulk truck loading rack, to more fully characterize groundwater conditions in this area.
- One monitoring well was installed in the upper rail spur area to monitor groundwater conditions in the upgradient area of the site.

A report on the findings of the Phase III assessment activities outlined above is currently being prepared and will be submitted to your attention in early 2002.

Future Work:

Operation of the Time Oil Co. Seattle Terminal as a petroleum storage and transfer facility was discontinued in October 2001. The ASTs and pipelines have been purged of petroleum products, appropriately cleaned, and are currently empty. Although the terminal improvements remain in place, there are currently no plans to use the facility for petroleum storage and/or transfer again. Thus, the potential for additional hydrocarbon releases is believed to be very low. Future environmental work at the site will be conducted in an effort to obtain regulatory case closure. Time Oil Co. is currently working with FWEC to develop appropriate site management and remedial responses to impacts identified during previous work. Brief summaries of corrective action work currently planned are presented below.

Risk Evaluations:

Risk assessment work is underway to assess potential exposure pathways and potentially exposed human and ecological receptors for the impacts identified. We expect that many of the areas of minimal impact can likely be addressed solely through risk evaluations. Risk evaluations for more heavily impacted areas of the site will be used to select target cleanup levels that will be protective of potentially exposed populations.

Limited Removal Action for Former PCP Mixing Area:

Results of previous assessment work in the former PCP mixing area will be used to develop a plan for a limited removal action to excavate soils within this area that are impacted above Method A (hydrocarbons) and Method B (PCP) Soil Cleanup Levels. Since the area of unacceptably impacted soil appears limited in lateral extent, and primarily located within the upper five feet of soil, we are not expecting an extensive removal action. Since PCP impacted soil excavated from this area will be classified as FO27 waste, a treatment and/or disposal method for the soil must be arranged for and confirmed prior to excavation. We are currently investigating potential treatment/disposal options for this soil in an effort to conduct the removal action as soon as possible. We hope to conduct the removal action in the Summer of 2002.

Remediation Pilot Testing for Former LUST Area:

FWEC has developed an informal workplan to assess the potential effectiveness of dual-phase soil vapor and groundwater extraction as a potential technology to address hydrocarbon impacts present beneath the former LUST area. We expect to install an extraction well and a small number of additional monitoring wells in early 2002 to facilitate pilot testing activities within the former LUST area. We expect that the dual phase extraction (DPE) pilot tests will be conducted in the Spring of 2002. Once the pilot tests have been completed, and assuming that the test data indicates that DPE will be an effective remedial technology, the pilot testing data will be used to design a soil and groundwater remediation system to address impacts beneath the former LUST area. A potential DPE system design may also include extraction wells within the bulk loading rack and tank farm valve pit areas adjacent to the northwest corner of the lower tank yard.

Consolidation of Environmental Work at 2737 and 2750 West Commodore Way:

Since results of Phase II assessment activities recently completed at 2750 West Commodore Way indicate that groundwater impacts at that site may be at least partially related to impacts at the 2737 West Commodore Way site, environmental assessment, monitoring, and remediation activities at both properties will be addressed as a single site during future work. The imminently forthcoming Volume II - Phase II Environmental Site Assessment Report, detailing results of site assessment activities at 2750 and 2805 West Commodore Way, will be the last separate report for Time Oil Co. West Commodore Way properties.

Quarterly Groundwater Monitoring:
A quarterly groundwater monitoring program was initiated in July 2001 following the Phase III site assessment activities. Results of groundwater monitoring activities conducted in July 2001 will be presented in the Phase III Site Assessment Report. Results of quarterly groundwater monitoring activities conducted in October 2001 will be presented in a forthcoming groundwater monitoring report. The next groundwater monitoring event is scheduled for January 2002.

BINMIC Involvement:
Time Oil Co. is working with the Ballard Interbay North-End Manufacturing and Industrial Complex (BINMIC) technical committee in an effort to assist in the development of appropriate area-wide cleanup standards and remedial approaches for the BINMIC area. Since the Time Oil Co. West Commodore Way properties are located within the BINMIC boundaries, it is possible that cleanup goals and remedial approaches for the site may be selected in accordance with future BINMIC guidelines.

Closure:
As mentioned above; Volume II of this report, presenting the findings of similar site assessment activities conducted at contiguous Time Oil Co. properties located at 2750 and 2805 West Commodore Way, will be submitted to your attention within a relatively short time frame. A final copy of this report has been received and a submittal letter is currently being prepared. We expect that Volume II will be submitted to your attention within 15 days.

Please contact me at your earliest convenience if you would like to visit the site to become more familiar with the site configuration, areas where past environmental work has been completed, and/or areas where future environmental work is planned. Please call me at (206) 286-6457 if you have any questions or comments, desire any additional information, or wish to schedule a site visit.

Sincerely,
Time Oil Co.

Scott B. Sloan, R.G.
Environmental Project Manager

Encl: "Volume I – Environmental Site Assessments...," April 2001

cc: Mr. Brian Graham – Foster Wheeler Environmental Corporation

FINAL
ENVIRONMENTAL SITE ASSESSMENT: PHASE II

at

2737 West Commodore Way
Seattle, Washington

Prepared for

Time Oil Company

RECEIVED
DEC 0 4 2001
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April 6, 2001

Prepared by

FOSTER WHEELER

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GREEN DOVE UNITED ISO 14001 SGS

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1. INTRODUCTION

In August 2000, Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) completed Phase I Environmental Site Assessments (ESAs) at seven properties owned by the Time Oil Company (TOC) located along West Commodore Way in Seattle, Washington. The results of the Phase I ESA activity were documented in Phase I ESA reports prepared for each of the seven properties (Foster Wheeler Environmental 2000). Further investigation activities were suggested for three of the seven properties.

The Phase I ESA report prepared for the property located at 2737 West Commodore Way (Property) indicated that additional investigation was required to better understand subsurface conditions. Phase II ESA activities were subsequently conducted at the Property in November and December 2000. This report presents the results of the Phase II ESA conducted at the property located at 2737 West Commodore Way, Seattle, Washington. Figure 1-1 depicts the general location of the Property and Figure 1-2 illustrates the locations of the TOC properties relative to one another (all figures and tables are placed at the end of this report).

1.1 PURPOSE AND ORGANIZAITON

The purpose of the Phase II field activities was to evaluate subsurface conditions in specific areas identified during the Phase I ESA. This report is organized into 6 sections and five appendices.

- Section 1 – Introduction
- Section 2 – Summary of Previous Investigations
- Section 3 – Field Activities
- Section 4 – Analytical Results
- Section 5 – Conclusions and Recommendations
- Section 6 – References
- Appendix A – Site Photographs
- Appendix B – Historical Photographs
- Appendix C – Soil Boring Logs
- Appendix D – Surveyor's Report
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1.2 PROJECT OBJECTIVES

The results of a Phase I ESA conducted at the Property suggested that further action be conducted at seven areas of the Property to evaluate subsurface conditions. A layout of the Property and the seven areas investigated are provided in Figure 1-3. The areas and the justification for additional investigation are as follows:

1. Upper Rail Line Spur – Historical photographs show stained soil along the former rail line spur on the south side of the Upper Tank Yard. Soil borings were planned at locations along the line to evaluate the potential for petroleum-impacted soil.
2. Upper Tank Yard – According to interviews conducted for the Phase I ESA, several of the tanks in the Upper Tank Yard have had minor leaks along their lower perimeters over the years. Soil borings and a monitoring well were planned to evaluate the potential for petroleum-impacted soil and groundwater.
3. Lower Tank Yard – According to interviews conducted for the Phase I ESA, several of the tanks in the Lower Tank Yard have had minor leaks along their lower perimeters over the years. In addition, an above ground storage tank (AST) was used in the Lower Tank Yard to mix pentachlorophenol (PCP) and diesel during a short period of time in the late 1960s. The PCP/Diesel Mixing Area is a sub-area of the Lower Tank Yard. Soil borings, hand auger screening borings, and a monitoring well were planned to evaluate the potential for petroleum-impacted and PCP-impacted soil and groundwater.
4. Former Rail Line Spurs – According to interviews conducted for the Phase I ESA and a review of historical photographs, accidental leaks and spills of petroleum from loading and unloading operations occurred frequently on the ground surface along the former rail line spurs. Soil borings were planned to evaluate the potential for petroleum-impacted soil.
5. Former Barrel Shed – The Former Barrel Shed was located between the warehouse and the office building. The pipeline from the PCP/diesel mixing tank also ran underground in this area. Soil borings and a monitoring well were planned to evaluate the potential for petroleum-impacted and PCP-impacted soil and groundwater from the former structure.

6. Former AST Area – Three ASTs were located in the parking lot and used to store waste oil. Soil borings and a monitoring well were planned to evaluate the potential for petroleum-impacted soil. Samples were also analyzed for metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs).
7. Former Leaking Underground Storage Tank (LUST) Area – Historical releases from a LUST, used to store petroleum products, have impacted the subsurface soil and groundwater in this area. Soil borings and monitoring wells were planned to evaluate the extent of petroleum-impacted soil and groundwater in the area.

1.3 LEGAL DESCRIPTION

Site Address:	Time Oil Company, Inc. 2737 West Commodore Way Seattle, Washington 98199
Property Owner:	Time Oil Company 2737 West Commodore Way Seattle, Washington 98199
Legal Description:	Section 11, township 25 north, range 3 east, Lawton Park, portions of Blocks 3, 4, and 5.

2. PROPERTY HISTORY AND PREVIOUS INVESTIGATIONS

The following sections describe the history of the Property and summarizes previously conducted investigations.

2.1 PROPERTY DESCRIPTION

The Property runs from West Commodore Way south to the Burlington Northern rail line. Most of the Property has been paved, except the area of the former rail lines behind the warehouse and the Upper and Lower Tank Yards located on the east side of the Property. A two-story office building is located in the center of the Property towards West Commodore Way. A three-section warehouse is located behind the office building, and a former boiler room is connected to the east side of the warehouse via a covered loading dock. An existing open-air barreling shed is located to the northwest of the warehouse. The tank yard is divided into two sections, the Lower Yard and the Upper Yard, each constructed at a

different time. The Lower Yard contains six ASTs, and the Upper Yard contains eight ASTs that are larger in volume than those in the Lower Yard. The south side of the Upper Yard banks steeply upward to the fence line and former rail line spur. The surface of the tank yards is unpaved gravel with patches of grass. Immediately to the west of the tank yards are a pump shed and foamite shed (used for fire suppression). Appendix A contains site photographs taken at various points on the Property during the Phase II field activities.

According to available regulatory records and interviews with TOC personnel, there are several underground storage tanks (USTs) on the Property. Two USTs are located on the north side of the office building: an unused heating oil tank is located on the east side of the office building adjacent to the former furnace room; and a gasoline vapor knock-out tank is located along the north side of the Lower Tank Yard. The knock-out tank is associated with the overhead fuel loading racks located just north of the lower yard of the tank farm. There are no known drinking water wells on the Property, but several monitoring wells from previous site investigations are installed within the shallow water-bearing zone beneath the Property.

2.2 PROPERTY OPERATION

The Property is used by TOC for a variety of purposes: it is the site for TOC administrative offices; serves as a tank farm for petroleum products; and portions are used to store equipment and supplies for service stations such as fuel dispensers, fascia, signs, and miscellaneous supplies (most of these materials are kept near the barreling shed or in part of the warehouse). The primary function of the facility is to store petroleum products in the ASTs in the tank yards. The ASTs range in size from approximately 5,225 barrels to 23,000 barrels. Fuel distribution lines connect the ASTs to an extensive manifold system that is connected to the truck loading rack and a waterfront dock located in the ship canal across West Commodore Way. Fuel is off-loaded from barges and tankers in the ship canal and transferred to the ASTs. From there the fuel is transferred to tanker trucks via the overhead loading rack outside of, and just north of, the lower tank yard.

2.3 PROPERTY HISTORY

Information about the history of the Property was derived from a review of available documents, historical photographs, and regulatory records. Former and current employees of TOC were also interviewed.

The Property was acquired by TOC around 1941. Historical photographs, presented in Appendix B, demonstrate a number of changes that have taken place at the Property since 1936. Prior to 1936, the Property appears to have been used for agricultural purposes. The photographs and fire insurance maps show the Rattan Furniture factory, a sawmill, dry kiln, and the U.S. Coast Guard facility located across West Commodore Way.

The 1946 photograph shows the original office building, the lower and upper yards of the tank farm, the pump shed and foamite building, a former barreling shed located immediately west of the office building, and overhead fuel loading racks. The unpaved surface of the lower tank yard is noticeably dark and remains unclear whether this is an artifact of the photograph or indicative of site operations. Numerous rows of empty 55-gallon drums are located to the west of the Property, which according to interviews with TOC employees, were filled with petroleum products in the former barreling shed, rolled under West Commodore Way via a barrel incline and tunnel to the TOC dock in the ship canal, and loaded onto ships. This operation was conducted primarily to support World War II efforts. Interviewees described the former barreling shed as an operation where laborers were hired to fill barrels and load them onto ships. The filling apparatus was controlled by pulling a line to dispense fuel into a drum. One pull of the line would automatically dispense 50 gallons of fuel into the 55-gallon drums via an overhead nozzle at a very high rate and if the line was pulled twice, then twice as much fuel would be dispensed (and so on). The interviewees stated they had heard of many times when drums were overfilled and fuel spilled on the ground.

In 1946, a large volume of fuel arrived at the Property via rail cars. There were four rail spurs off the main Burlington Northern line leading onto the TOC property: one spur ran behind the former barreling shed and the other lines led toward the southwest end of the tank farm's upper yard. One of these lines ran all the way behind the upper yard toward 27th Avenue West. Fuel was transferred from tanker cars via hoses to a subsurface line, from which it was pumped into the ASTs. Careful examination of the historical photograph from 1946 shows what appear to be equally-spaced dark patches of soil on the rail spur on the south side of the tank farm's upper yard. According to the interviewees, the tank cars were off-loaded with hoses; therefore, these dark patches may be related to petroleum leaks and spills that occurred during off-loading operations. After being disconnected, it was not uncommon for residual fuel to drain from the lines and onto the ground.

The historical photograph from 1960 depicts the Property largely as it is today. A warehouse building, built in the late 1940s according to the Puget Sound Regional Archives,

is located south of the office building, parallel with the rail spurs (several of the rail spurs were deactivated by the time of this photograph). A new barreling shed, built in 1952 according to the Puget Sound Regional Archive files, is located just northwest of the warehouse; the boiler house was added in 1950 (Puget Sound Regional Archive files). The barreling shed seen in the 1946 photograph is no longer on the Property in the 1960 photograph.

According to interviewees, TOC operated a fleet of a fuel delivery service trucks which were serviced across the street at the vehicle maintenance facility at 2750 West Commodore Way. The vehicles in the center of the photograph, toward the west side of the Property, may be related to this operation. Also visible in this photograph are three smaller ASTs, immediately north of the new barreling shed. According to TOC employees, these ASTs were used to store used motor oil. The immediate area surrounding the ASTs was unpaved, but an outer area was paved. The interviewees also indicated that this area had been impacted by several small spills and leaks related to used motor oil transfer and storage activities.

By 1974 a new vehicle maintenance facility was added on the adjacent property (2800 block) immediately west of the Property. After TOC terminated its fuel truck distribution service, this building was leased to Precision Engineering Specialists (a marine and engine repair facility) in 1976.

According to TOC employees, pentachlorophenol was mixed in a small AST near the west wall of the tank farm's lower yard. The pentachlorophenol was transferred via underground lines to the new barreling shed where 55-gallon drums and 5-gallon drums were filled, rolled onto a loading dock between the warehouse and the barreling shed, and loaded onto rail cars. This operation reportedly ran for 3 to 4 months during 1967 as part of a military contract. A few of the interviewees also stated that the parking lot on the Property had subsided in the vicinity where the former barrel incline ducked under West Commodore Way; the area was leveled and patched with new asphalt. The 1997 photograph shows the Property as it exists today.

Several of the interviewees mentioned that TOC had wanted to demolish the existing office building to construct a new office building. However, there was concern about excavating to the west of the existing office building because of the potential presence of petroleum-impacted soil. A couple of the interviewees also mentioned that many of the ASTs had small weeps or leaks near the bases. While there were no reports of large releases,

numerous small leaks could have had a cumulative impact. Some of the interviewees also indicated that the fuel line between the rail spurs was an area where there had been releases in the past. Other statements by the interviewees noted a release of gasoline near the northern (outer) overhead fuel loading rack. During one incident, the driver of a tanker truck is reported to have struck a portion of the loading facilities, resulting in a spill of over 1,000 gallons of gasoline; most of the fuel was reportedly recovered. The overhead loading racks initially had a center island surrounded by sand with only the driveways paved. The southern (inside) rack was replaced in the mid-1980s and the entire area surrounding both loading racks was paved. Interviewees identified the pipeline leading to the dock across the street as an area where petroleum releases may have occurred. The pipeline consists of several pipes encased in an outer conduit. The speculation was that the older 8-inch pipes had failed and newer 6-inch pipes were placed within the older pipes.

2.4 PREVIOUS INVESTIGATIONS

In September 1991 (TOC 1991), three USTs were removed from the Property, including a 4,000-gallon unleaded gasoline tank, a 2,500-gallon diesel fuel tank, and a 1,500-gallon regular leaded gasoline tank. Figure 2-1 shows the locations of the former USTs and soil sampling locations.

The diesel fuel and leaded gasoline tank were part of a baffled system (one 4,000-gallon tank) that was installed in 1980. Following removal of the USTs, a new 4,000-gallon UST was installed at the same location. This new tank is baffled to provide two compartments (one 3,000-gallon compartment and one 1,000-gallon compartment) and is therefore registered with Washington State Department of Ecology (Ecology) as two tanks. Two new fuel dispensers were also installed. The TOC report from 1991 indicated that the soil in the excavation appeared discolored and a hydrocarbon odor was evident. In addition, water with a hydrocarbon sheen was encountered at a depth of 18 feet below ground surface (bgs).

Efforts to excavate the petroleum-impacted soil were impeded by the proximity of the TOC building to the excavation and the presence of groundwater in the excavation space. Water samples were not collected, but soil samples indicated that the highest concentration (12,000 parts per million [ppm]) of hydrocarbons was present in surficial soils beneath the former fuel dispensers (east side of the building).

Additional site assessment activities were conducted in 1999, including the installation of nine soil borings and five groundwater monitoring wells (IT Corporation [IT] 2000). The

locations of the 1999 borings are shown in Figure 2-2. Soil boring logs included in the IT report indicate that soil composition beneath the Property from the surface to approximately 20 to 25 feet bgs consists of sands and silts, with varying amounts of clay and gravel. Very dense dry clay underlies this sand/silt unit and acts as an aquitard. Several soil samples contained diesel and gasoline at concentrations above the Model Toxics Control Act (MTCA) Method A cleanup level. The concentrations ranged from 381 ppm to 755,000 ppm. One soil sample (01SB-09 at 2.5 feet bgs) contained heavy oil above the MTCA Method A cleanup level and, although the analytical results for heavy oil on several other samples were below limits of detection, the detection limits exceed the MTCA cleanup level. Benzene was reported above the soil cleanup level in samples collected from borings 01SB-08, 01SB-09, and 01MW-05.

Table 2-1 presents the analytical results for soil samples with petroleum concentrations above the cleanup levels. Concentrations of benzene in soil samples ranged from 2.12 ppm to 5,590 ppm. Several soil samples also exceeded the cleanup level for toluene, ethylbenzene, and xylene.

Groundwater was encountered in eight of the nine borings and all of the monitoring wells. Depth to groundwater ranged from 14 to 17 feet bgs. The wells were sampled in September 1999. Only one well (01MW-01) did not contain detectable concentrations of hydrocarbons.

Table 2-2 lists the analytical results from the groundwater monitoring well and boring water samples collected in 1999. Well 01MW-05 contained floating product with an apparent thickness of 0.78 feet; consequently, this well was not sampled. The concentrations of gasoline in wells 01MW-01 through 01MW-04 ranged from 12.2 mg/L to 27.2 mg/L, and diesel ranged from 0.7 mg/L to 1.32 mg/L. Heavy oil was not detected in any of the wells. Benzene ranged from 3,880 mg/L to 11,300 mg/L. Wells 01MW-02 through 01MW–04 contained concentrations of toluene, ethylbenzene, and xylene above the MTCA Method A cleanup level. Total lead exceeded the cleanup level in every well except 01MW-01, with the highest concentration (130 parts per billion [ppb]) detected in 01MW-04. Most of the elevated concentrations appear to be located near the northeast corner of the office building. The IT report recommended additional site characterization.

In May 2000, TOC submitted a letter (TOC 2000) to Mr. Joe Hickey of the UST division of Ecology, summarizing previous field activities. In the letter, TOC indicated that future assessment of the extent of contamination beneath the Property would be conducted.

3. FIELD ACTIVITIES

Field activities at 2737 West Commodore Way included soil borings, hand auger screening borings, well installation, soil and groundwater sampling, and surveying. The following sections describe the methodology used to complete the field activities.

3.1 SOIL BORINGS

3.1.1 Soil Boring Locations

Fifty soil borings and hand auger screening borings were drilled at the Property as shown on Figure 3-1. The rationale for each soil boring location is listed below:

Upper Rail Line Spur:

- SB-21 was located in the center of the area and advanced to a depth of 25 feet at which groundwater was encountered.
- SB-22 was located on the east end of the area and advanced to a depth of 15 feet (groundwater was not contacted).
- SB-23 was located on the west end of the area and advanced to a depth of 15 feet (groundwater was not contacted).

Upper Tank Yard:

- SB-11 was located between ASTs 22014 and 18313. The boring was advanced to a depth of 15 feet. Groundwater was encountered at a depth of 10 feet bgs.
- SB-12 was located just south of SB-11. The boring was advanced to a depth of 15 feet at which groundwater was encountered.
- SB-13 was located between ASTs 22312 and 13910. The boring was advanced to a depth of 20 feet. Groundwater was encountered at a depth of 15 feet bgs. Monitoring well 01MW-13 was installed at this location.
- SB-14 was located just northeast of AST 18313. The boring was advanced to a depth of 15 feet. Groundwater was encountered at a depth of 5 feet bgs.
- SB-15 was located between ASTs 13910 and 13808. The boring was advanced to a depth of 20 feet. Groundwater was encountered at a depth of approximately 5 feet bgs.

- SB-16 was located just south and equidistant from ASTs 15011 and 14009. The boring was advanced to a depth of 15 feet. Groundwater was encountered at a depth of approximately 10 feet bgs.
- SB-17 was located between ASTs14009 and 18107. The boring was advanced to a depth of 20 feet. Groundwater was encountered at a depth of 10 feet bgs.

Lower Tank Yard:

- SB-01 was located southeast of the former PCP/diesel mixing area. The hand auger screening boring was advanced to a depth of 14 feet. Groundwater was encountered at a depth of approximately 4.5 feet bgs.
- SB-02 was located northeast of the former PCP/diesel mixing area. The hand auger screening boring was advanced to a depth of 14 feet. Groundwater was encountered at a depth of approximately 7.5 feet bgs.
- SB-03 was located north of the former PCP/diesel mixing area. The hand auger screening boring was advanced to a depth of 4 feet. Groundwater was encountered at a depth of approximately 3 feet bgs.
- SB-04 was located northwest of the former PCP/diesel mixing area. The hand auger screening boring was advanced to a depth of 10 feet. Groundwater was encountered at a depth of approximately 10 feet bgs.
- SB-05 was located southwest of the former PCP/diesel mixing area. The hand auger screening boring was advanced to a depth of 14 feet. Groundwater was encountered at a depth of approximately 7 feet bgs.
- SB-18 was located between ASTs 14001 and 8002. The boring was advanced to a depth of 35 feet. Groundwater was encountered at a depth of 10 feet bgs.
- SB-19 was located northeast of AST 8002. The boring was advanced to a depth of 20 feet. Groundwater was encountered at a depth of 15 feet bgs.
- SB-20 was located just south of AST 5003. The boring was advanced to a depth of 15 feet. Groundwater was encountered at a depth of 10 feet bgs.
- SB-24 was located between ASTs 14001 and 8206. The boring was advanced to a depth of 20 feet. Groundwater was encountered at a depth of 10 feet bgs. Monitoring well 01MW-12 was installed at this location.

Former Rail Line Spurs Behind Warehouse:

- SB-06 was located just south of the New Barrel Shed. The boring was advanced to a depth of 25 feet. Groundwater was not encountered.
- SB-07 was located south of the New Barrel Shed between the former main rail line and the inner spur line. The boring was advanced to a depth of 25 feet. Groundwater was not encountered.
- SB-08 was located between the rail spur lines and south of the warehouse. The boring was advanced to a depth of 25 feet. Groundwater was not encountered.
- SB-09 was located between the former main rail line and the inner spur line and behind the warehouse. The boring was advanced to a depth of 25 feet. Groundwater was not encountered.
- SB-10 was located between the rail spur lines and south of the southeast corner of the warehouse. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of 25 feet bgs.

Former Barrel Shed:

- SB-26 was located on the east end of the former barrel shed. The boring was advanced to a depth of 20 feet. Groundwater was encountered at a depth of approximately 19 feet bgs.
- SB-27 was located toward the east end of the former barrel shed and west of SB-26. The boring was advanced to a depth of 20 feet. Groundwater was encountered at a depth of approximately 16 feet bgs.
- SB-28 was located towards the middle and south side of the former barrel shed. The boring was advanced to a depth of 20 feet. Groundwater was encountered at a depth of approximately 19 feet bgs.
- SB-29 was located on the west end of the former barrel shed. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of approximately 20 feet bgs. Monitoring well 01MW-06 was installed at this location.
- SB-30 was located on the west end of the former barrel shed. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of approximately 25 feet bgs.

- SB-31 was located on the west end of the former barrel shed and north of SB-30. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of approximately 25 feet bgs.

New Barrel Shed:

- SB-51 was located near the center of the New Barrel Shed by one of the filling points. The boring was abandoned before installation because of the presence of a concrete-lined trench which was impossible to hand auger through.
- SB-25 was located on the north side of the New Barrel Shed beneath grates covering the associated piping. The boring was abandoned after 3 inches due to refusal caused by a concrete floor.

Former AST Area:

- SB-32 was located on the south side of the former AST area. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of approximately 25 feet bgs.
- SB-33 was located in the center of the former AST area. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of approximately 25 feet bgs.
- SB-34 was located on the north side of the former AST area. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of approximately 25 feet bgs.
- SB-43 was located on the north side of the former AST area and hydrologically down-gradient from the former ASTs. The boring was advanced to a depth of 30 feet. Groundwater was encountered at a depth of approximately 25 feet bgs. Monitoring well 01MW-07 was installed at this location.
- SB-45 was located on the west of SB-43. The boring was advanced to a depth of 15 feet. Groundwater was not encountered.

LUST Area:

- SB-35 was located west of the LUST area. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of approximately 20 feet bgs. Monitoring well 01MW-08 was installed at this location.

- SB-36 was located down-gradient from the LUST area. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of approximately 20 feet bgs. Monitoring well 01MW-09 was installed at this location.

West Commodore Way Perimeter:

- SB-37 was located east of the LUST area and down-gradient from the fuel dispenser rack. The boring was advanced to a depth of 25 feet. Groundwater was encountered at a depth of approximately 20 feet bgs. Monitoring well 01MW-10 was installed at this location.
- SB-38 was located outside the Lower Tank Yard containment wall and north of AST 5003. The boring was advanced to a depth of 35 feet. Groundwater was not encountered.
- SB-39 was located west of the LUST area and just north of the inner fuel dispenser rack. The boring was advanced to a depth of 21 feet. Groundwater was encountered at a depth of approximately 15 feet bgs.
- SB-44 was located outside the Lower Tank Yard containment wall and north of AST 8002. The boring was advanced to a depth of 30 feet. Groundwater was encountered at a depth of 25 feet bgs. Monitoring well 01MW-11 was installed at this location.

3.1.2 Soil Boring Methods

Most of the soil borings drilled at the Property were drilled with a CME 75 High Torque drill rig while some of the borings with restricted access were drilled using a B-59 limited access drill rig. Both of the drill rigs were operated by Cascade Drilling. The augers used on both rigs were 4.25-inch inner diameter (ID) hollow stem. Split-spoon samples were driven every 5 feet to describe lithologies and collect soil samples. In most borings, an extra split-spoon sample was driven at the 2-foot-depth interval. Split-spoon samples were 12 inches long (not including the shoe), 2-inch ID, and driven by a 300-pound down-hole jar hammer. Appendix C contains the soil boring logs for the Property.

3.1.3 Soil Sampling Methods

Soil samples were collected directly from the split-spoon and placed in the appropriate laboratory-supplied sample container. The analyses requested for each sample depended on the location. In general, the samples were analyzed for:

- Gasoline using Ecology's NWTPH-Gx Method
- Benzene, toluene, ethylbenzene, and xylene (BTEX) using U.S. Environmental Protection Agency (EPA) 8021B
- Diesel and oil using Ecology's NWTPH-Dx Method
- PCP using EPA Method 8270-sim (selected ion monitoring)
- Carcinogenic polyaromatic hydrocarbons (PAHs) using EPA Method 8270-sim
- Total metals (or only lead) using EPA 6000/7000 series
- SVOCs using EPA Method 8270C
- VOCs using EPA Method 8260B
- Volatile petroleum hydrocarbons and extractable petroleum hydrocarbons by modified Ecology interim TPH policy method

The gasoline/BTEX and VOCs samples were collected first out of each spoon. The sample containers were placed in sealed baggies and placed directly into a chilled cooler for transport to the laboratory. Soil samples were labeled according to their soil boring location and depth collected (i.e., SB-43-2 = soil boring 43, sample depth 2 feet). North Creek Analytical (Bothell, Washington) received the samples at the end of each day in the field.

The split-spoons were decontaminated by thoroughly washing them in soapy water, rinsing with water, rinsing with methanol, and finally rinsing with deionized water supplied by the analytical laboratory.

3.1.4 Field Screening Methods

Soil samples were screened in the field using a photoionization detector (PID) HNu Model P101 equipped with a 10.2 electron volt lamp. A few of the samples were screened using a Hanby Field Test Kit designed for detecting petroleum in soil. The Hanby Kit is a semi-quantitative kit where 5 grams are soil are mixed with a proprietary extract, then the extract is decanted and mixed with a catalyst and agitated for 4 minutes. The extract reacts with the catalyst. The color change in the extract indicates the type of fuel present and an approximate concentration. Samples extracted in the field were compared to photographs of standards supplied by the Hanby Kit manufacturers.

3.2 MONITORING WELL INSTALLATION

Eight new monitoring wells were installed and developed during the Phase II investigation activities. The locations for the new monitoring wells and the existing wells are shown on Figure 3-2. Table 3-1 presents the available well construction information for wells at 2737 West Commodore Way.

3.2.1 Monitoring Well Locations

Each of the wells installed was designed and located with a specific purpose in mind. The rationale behind each well location is as follows:

- 01MW-06 (SB-29) was located along the former location of the pipeline used to transfer the mixture of PCP and diesel. This location is also directly beneath the Former Barrel Shed. The well is screened within the shallow water-bearing zone.
- 01MW-07 (SB-43) was located down-gradient of the Former AST area to evaluate potential groundwater impacts. The well is screened within the shallow water-bearing zone with the bottom of the well above a dry, impermeable clay/silt layer.
- 01MW-08 (SB-35) was located just west of the LUST Area to evaluate the western extent of petroleum-impacted groundwater. The well is screened within the shallow water-bearing zone with the bottom of the well above a dry, impermeable clay/silt layer.
- 01MW-09 (SB-36) was located down-gradient of the LUST Area to evaluate the northern extent of petroleum-impacted groundwater. The well is screened within the shallow water-bearing zone with the bottom of the well above a dry, impermeable clay/silt layer.
- 01MW-10 (SB-37) was located east of the LUST Area to evaluate the eastern extent of petroleum-impacted groundwater. The well was screened within the shallow water-bearing zone. After the installation was complete, the well was found to have insufficient water (< 0.5 feet) and was not developed or used for groundwater monitoring.
- 01MW-11 (SB-44) was located north of the Lower Tank Yard and outside the containment wall. The well was located here to evaluate the eastern extent of petroleum-impacted groundwater and the potential of petroleum-impacted groundwater migrating from the Upper and Lower Tank Yards. The well is screened

within the shallow water-bearing zone with the base of the well above a dry, impermeable clay/silt layer.

- 01MW-12 (SB-24) was located in the Lower Tank Yard to evaluate the potential presence of petroleum-impacted groundwater. The well is screened within the shallow water-bearing zone with the base of the well above a dry, impermeable clay/silt layer.
- 01MW-13 (SB-13) was located in the Upper Tank Yard to evaluate the potential presence of petroleum-impacted groundwater. The well is screened within the shallow water-bearing zone with the base of the well above a dry, impermeable clay/silt layer.

3.2.2 Well Installation Methods

The monitoring wells were installed as described in Section 3.1.1.

3.2.3 Installation Materials

The wells were installed with flush-threaded, 2-inch ID polyvinyl chloride (PVC) casing with variable screen lengths of 0.010-inch slots. The sand pack consists of a 20-40 Colorado silica sand around the screen to 2 feet (typically) above the top of the screen. The sand pack is overlain by a bentonite seal of at least 1 foot (typically). Concrete and flush-mount monuments were used to complete the wells. Heavy duty well monuments were used for wells in high vehicular traffic areas.

3.2.4 Well Development

The wells were developed following the installation. For development, the wells were surged frequently with a double stage purge pump. The wells were pumped of at least three well volumes of water using the double stage purge pump. The tubing was changed on the pump between each monitoring well, and the pump was also decontaminated by washing and pumping soapy (Liquinox) water and rinsing with DI water supplied by the analytical laboratory.

Visual observations and measurement of physical parameters provided monitoring of development progress. Measurements during development and well sampling were made for pH, temperature, conductivity, and turbidity using a Horiba U-10 Water Quality Checker. The meter was calibrated before each use using standards supplied by the

instrument provider. Table 3-2 provides the final parameters measured during the sampling and development of the wells.

3.3 SURVEYING

The surveying of the soil boring locations was conducted by Inca Engineering, Inc. Horizontal control was specified to 0.1 foot, based on Washington State Plane Coordinate System, North America Datum (NAD) 83/91 City of Seattle. Vertical control was specified to 0.01 foot, based on the National America Vertical Datum (NAVD) 88 City of Seattle. A summary of the survey results are presented in Table 3-1 while the complete data is included in Appendix D.

3.4 WATER LEVEL MEASUREMENTS

Water levels measurements were made from all available wells. Depth to groundwater measurements were subtracted from surveyed measuring point elevations to produce the water level elevations (potentiometric head), as shown in Table 3-3. A potentiometric surface for the Property is shown in Figure 3-3.

3.5 GROUNDWATER SAMPLING AND ANALYSIS

Groundwater samples were collected from the previously installed wells (01MW-01 through 01MW-04) on November 16, 2000. The new wells were sampled on November 30 through December 5, 2000. Water samples were collected in laboratory supplied glassware and delivered to the laboratory each evening after sampling.

Samples were collected using a peristaltic pump, disposable high-density polyethylene (HDPE) tubing, and silicone tubing. At each well the HDPE tubing was inserted into the water, approximately the center of the well screen. A piece of disposable silicon tubing was connected to the HDPE tubing and run through the pump. Both pieces of tubing were discarded after each use and new tubing was selected for the next well.

The analyses requested for each groundwater sample depended on the location. In general, the water samples were analyzed for:

- Gasoline using Ecology's NWTPH-Gx Method
- BTEX using EPA Method 8021B
- Diesel and oil using Ecology's NWTPH-Dx Method

- PAHs using EPA Method 8270-sim
- PCP using EPA Method 8270-sim
- SVOCs using EPA Method 8270C
- VOCs using EPA Method 8260B
- Total metals (or lead only) using EPA 6000/7000 series

3.6 INVESTIGATION DERIVED WASTE

Soil cuttings from the Property were transferred to the stock piles on the Property for disposal by TOC. Decontamination water was collected by the drilling company in 55-gallon type 1A drums, transferred to TOC, and stored behind the warehouse at 2737 West Commodore Way and near a container at 2750 West Commodore Way.

4. ANALYTICAL RESULTS

Soil samples were analyzed by North Creek Analytical Labs in Bothell, Washington. Where applicable, results were compared to Ecology's proposed Method A soil cleanup levels for unrestricted land use. Ecology's proposed rule does not differentiate between industrial property and unrestricted land use, as the current regulations do, and is expected to be adopted within 6 months. The proposed soil cleanup levels for diesel and oil are higher than the current MTCA Method A cleanup levels, while the proposed soil cleanup levels for gasoline have been divided into two categories: gasoline without benzene and less than 20 percent aromatics between equivalent carbon (EC) 8 and EC16 (proposed soil cleanup level of 100 mg/kg); and all other gasoline mixtures (proposed soil cleanup level of 30 mg/kg). The proposed BTEX cleanup levels for soil have been lowered. For PCP, the soil results were compared to the MTCA Method B carcinogenic cleanup level for residential soils, and PCP concentrations in groundwater samples were compared to the federal maximum contaminant levels (MCLs). Groundwater concentrations were compared to the MTCA Method A cleanup levels for groundwater. The analytical results are presented in Tables 4-1 through 4-6.

Appendix E contains the laboratory data packages for the samples collected at the Property. In addition to the data from 2737 West Commodore Way, several of the data packages contain results for samples collected at other TOC properties (2750 and 2805 West Commodore Way). The data packages are presented in their entirety to allow the reader to

evaluate the data relative to the quality control data associated with the environmental samples from 2737 West Commodore Way.

4.1 UPPER RAIL LINE SPUR

Soil

Three soil borings (SB-21 through SB-23) were located near the Upper Rail Line Spur on the south side of the Upper Tank Yard. Fourteen soil samples were collected from three soil borings and analyzed for gasoline, diesel, and oil. Gasoline was detected above the proposed MTCA Method A cleanup level in SB-22 at depths of 5 feet (266 mg/kg) and 10 feet (293 mg/kg). Diesel was detected above the proposed MTCA Method A cleanup level in SB-22 at a depth of 10 feet (6,490 mg/kg). None of the other samples from SB-21, SB-42, or SB-23 contained concentrations of gasoline, BTEX, diesel, or oil above the cleanup levels.

Lead was not detected above the cleanup level in any of the samples.

4.2 UPPER TANK YARD

Soil

Seven soil borings (SB-11 through SB-17) were installed and 29 soil samples were collected in the Upper Tank Yard. Gasoline, benzene, ethylbenzene, and diesel were detected at concentrations above the proposed MTCA Method A cleanup levels at a depth of 2 feet in SB-13. Gasoline and diesel were detected at concentrations above the proposed MTCA Method A cleanup levels at a depth of 2 feet in SB-15.

Lead was not detected above the cleanup level in any of the samples.

Groundwater

The groundwater sample collected from 01MW-13 contained concentrations of diesel (3.94 milligrams per liter [mg/L]) above the proposed MTCA Method A cleanup level. Gasoline, toluene, and oil were also detected at concentrations below the cleanup level.

Lead was not detected above the method reporting limit.

4.3 LOWER TANK YARD

Soil

Four soil borings (SB-18 through SB-20 and SB-24) were installed in the Lower Tank Yard. Gasoline was detected at concentrations above the proposed MTCA Method A cleanup level in the top 5 feet of boring SB-19, and diesel was detected above the proposed MTCA Method A cleanup level at a depth of 2 feet. Diesel was detected at concentrations above the MTCA Method A proposed cleanup level at a depth of 2 feet in boring SB-24, and gasoline exceeded the proposed MTCA Method A cleanup level at a depth of 10 feet.

Lead was not detected above the cleanup level in any of the samples.

PCP/Diesel Mixing Area

Five hand auger screening borings were conducted near the former PCP/diesel mixing area in the southwest corner of the Lower Tank Yard. Gasoline was detected above the proposed MTCA Method A cleanup level in SB-02 at a depth of 2 feet at concentrations of 217 mg/kg. The sample collected from the bottom of SB-02 at a depth of 14 feet did not contain any concentrations of petroleum-impacted soil above the method reporting limit. Diesel and oil were detected above the proposed MTCA Method A cleanup level in SB-03 at surface at concentrations of 2,010 mg/kg and 4,780 mg/kg, respectively. Gasoline, diesel, and oil were detected above the proposed MTCA Method A cleanup level in SB-03 at a depth of 2 feet at concentrations of 1,670 mg/kg, 14,700 mg/kg, and 6,350 mg/kg, respectively. SB-03 was abandoned at a depth of 4 feet due to the presence of perched water entering the hole making it impossible to collect a discrete sample without compromising the integrity of the sample. Gasoline, diesel, and oil were detected above the proposed MTCA Method A cleanup level in SB-04 at a depth of 2 feet at concentrations of 513 mg/kg, 5,670 mg/kg, and 2,320 mg/kg, respectively.

Lead was not detected above the cleanup level.

The samples from the borings around the former PCP/diesel mixing area were analyzed for carcinogenic PAHs (cPAHs). The total concentration of cPAHs exceeded the current MTCA Method A cleanup level in SB-03 in the surface sample (SB03A) and 2 foot depth (SB03B). Concentrations were 1.08 mg/kg and 4.53 mg/kg at the surface and 2 foot sample, respectively. The original boring (SB-03) was abandoned due to the presence of perched water passing through petroleum-impacted soil, making it impossible to collect undisturbed

samples from deeper intervals. The total concentrations of cPAHS exceeded the cleanup level in SB-04 at the surface, 2 foot, and 5 foot depth. The sample collected from the bottom of SB-04 did not exceed the cleanup level for total cPAHs.

Borings SB-01 through SB-05 were analyzed for PCP. PCP was detected above the MTCA Method B residential carcinogenic cleanup level (8.33 mg/kg) in surface samples (0.6 inch) at SB-03 (202 mg/kg), SB-04 (803 mg/kg), and at a depth of 5 feet in SB-04 (20.9 mg/kg). Subsurface samples collected at SB-01, SB-02, and SB-04 contained trace levels of PCP. These concentrations are thought to be a byproduct of the hand auger screening method and may not be representative of soil conditions at depth.

Four additional surface samples (SS-01 through SS-04) were collected around the former PCP/diesel mixing area and analyzed for cPAHs and PCP. None of the additional surface samples exceeded the MTCA Method B cleanup level for PCP. According to the calculations shown on Table 4-2, the concentrations of cPAHs exceed the cleanup level in SS-01 and SS-03. However, a detailed evaluation of the data reveals that none of the individual cPAHS were detected above the method reporting limit and the total cPAHs calculation is due to the conservative data manipulation approach where half of the reporting limit is added to the total for nondetects. The total cPAHS did exceed the cleanup level at SS-04 with a calculated total concentration of 9.26 mg/kg.

Groundwater

The groundwater sample collected from 01MW-12 contained concentrations of benzene (98.4 micrograms per liter [µg/L]) above the proposed MTCA Method A cleanup levels for groundwater. Diesel and gasoline were also detected above the proposed cleanup levels at concentrations of 1.07 mg/L and 802 µg/L, respectively.

Lead was not detected above the method reporting limit.

4.4 FORMER RAIL LINE SPURS BEHIND WAREHOUSE

Soil

Five soil borings (SB-06 through SB-10) were installed near the Former Rail Line Spur behind the warehouse. At SB-07, gasoline was detected at a depth of 5 feet above the proposed MTCA Method A cleanup levels at a concentration of 1,240 mg/kg. Benzene, ethylbenzene, and xylene were detected above the proposed MTCA Method A cleanup level

at concentrations of 2.17 mg/kg, 7.6 mg/kg, and 18.2 mg/kg, respectively. The sample collected from the 10 foot depth of SB-07 did not contain concentrations of petroleum above the method reporting limit.

Lead was not detected above the current MTCA Method A cleanup levels.

4.5 FORMER BARREL SHED

Soil

Six soil borings (SB-26 through SB-31) were installed near the Former Barrel Shed. Gasoline was detected above the proposed MTCA Method A cleanup level at a depth of 5 feet in SB-27 at a concentration of 121 mg/kg. Samples from the 15-foot and 20-foot-depth interval in SB-27 did not contain concentrations of petroleum-impacted soil above the method reporting limit. Gasoline and diesel were detected above the proposed MTCA Method A cleanup level in SB-29 at a depth of 2 feet and 5 feet (gasoline only). Gasoline was detected above the proposed MTCA Method A cleanup level in SB-30 at a depth of 2 feet at a concentration of 5,120 mg/kg. Gasoline, diesel, and oil were detected above the proposed MTCA Method A cleanup level in SB-31 at a depth of 2 feet at concentrations of 577 mg/kg, 11,400 mg/kg, and 7,730 mg/kg, respectively.

Lead was not detected above the current MTCA Method A cleanup level in the borings near the Former Barrel Shed.

The concentration of cPAHs exceeded the current MTCA Method A cleanup level in SB-29 at a depth of 2 feet. The exceedance was due to the conservative approach used of summing half of the reporting limit for non-detects. It should be noted that only one cPAH (benzo[a]pyrene) was detected above the method reporting limit.

Groundwater

One groundwater sample was collected from 01MW-06 and analyzed for PCP, petroleum products, and lead. PCP was detected above the MCL at a concentration of 1.80 µg/L.

4.6 FORMER AST AREA

Soil

Five soil borings (SB-32 through SB-34, SB-43, and SB-45) were installed near the Former AST Area. Gasoline was detected above the proposed MTCA Method A cleanup level in SB-32 at a depth of 5 feet (216 mg/kg). Gasoline, diesel, and oil were detected above the MTCA Method A cleanup level in the sample from the 2-foot depth of SB-45. Gasoline and diesel exceeded the proposed cleanup level in the SB-45 at a depth of 5 feet.

Led was detected above the MTCA Method A cleanup level in SB-45 at a depth of 2 feet.

SVOCs were not detected above the MTCA Method A cleanup levels.

Trichloethene (TCE) was detected in SB-32 from a depth of 10 feet to 25 feet; in SB-33 from a depth of 10 feet to 20 feet; and in SB-34 from a depth of 10 feet to 25 feet. The concentration of TCE exceeded the proposed MTCA Method A cleanup level in each sample where detected.

Groundwater

One groundwater sample was collected from 01MW-07 and analyzed for VOCs, SVOCs, petroleum products, and total metals. None of the analytes were detected above the proposed or current MTCA Method A cleanup levels.

4.7 FORMER LUST AREA

Soil

Two soil borings (SB-35 and SB-36) were installed near the Former LUST Area. Gasoline was detected above the proposed MTCA Method A cleanup level in SB-35 at a depth of 5 feet at a concentration of 192 mg/kg. Gasoline and diesel were detected above the proposed MTCA Method A cleanup level in SB-35 at a depth of 15 feet at concentrations of 1,640 mg/kg and 9,330 mg/kg, respectively. Gasoline, ethylbenzene, xylene, and diesel were detected above the proposed MTCA Method A cleanup level in SB-36 at a depth of 15 feet.

Lead was not detected above the MTCA Method A cleanup levels.

Groundwater

The existing monitoring wells (01MW-01 through 01MW-04) were sampled on November 16, 2000, prior to the installation of the new wells. SB-35 and SB-36 were completed as monitoring wells 01MW-08 and 01MW-09, respectively. Gasoline was detected above the proposed MTCA Method A cleanup level in 01MW-02, 01MW-03, 01MW-04, and 01MW-09. Diesel concentrations exceeded the proposed MTCA Method A cleanup level in 01MW-01 through 01MW-04 and 01MW-09. BTEX exceeded the proposed MTCA Method A cleanup level in 01MW-02, 01MW-03, 01MW-04, and 01MW-09. Well 01MW-05 was not sampled due to the presence of approximately 5.28 feet of free-phase floating fuel.

Lead was not detected above the method reporting limit in either of the wells.

4.8 WEST COMMODORE WAY PERIMETER

Soil

Four borings were located along West Commodore Way and north of the Lower Tank Yard. Gasoline and diesel were detected above the MTCA Method A cleanup level in SB-37 at a depth of 10 feet at concentrations of 1,080 mg/kg and 5,770 mg/kg, respectively. The sample from the 15-foot-depth interval (9,130 mg/kg) also exceeded the proposed diesel cleanup level in SB-37. Diesel was detected above the proposed MTCA Method A cleanup level in SB-39 at a depth of 2 feet at a concentration of 2,440 mg/kg. Gasoline was detected above the proposed MTCA Method A cleanup level in SB-39 at a depth of 5 feet at a concentration of 605 mg/kg.

Lead was not detected above the MTCA Method A cleanup levels.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 SITE GEOLOGY

The Puget Sound Basin is a convex-eastward basin lying between the Cascade Range and the Olympic Mountains (coastal range). The basin is open to the north and connects to the Pacific Ocean via the Strait of Juan de Fuca. The Puget Sound Basin has been inundated with continental ice during the Pliestocene. At least five major advances and several lesser advances are recorded (Galster and Laparde 1991). The result was the deposition of several

glacial and nonglacial deposits. The most common unit, and applicable to the TOC Property, is the Vashon Drift. The Vashon Drift is divided into the Lawton Clay, Esperance Sand, Vashon Till, and Recessional deposits. The Lawton Clay, characterized by laminated dark gray clay and light gray silt, forms the basal unit and represents the deposition of sediments in a lake that formed as the Puget lobe advanced south and blocked the northern part of the Puget Sound Basin. The upper contact of the Lawton is generally transitional with the Esperance Sand which represents the advance outwash of the Vashon glacier. It is commonly a fine to medium sand, with silt beds and lenticular channel deposits of gravel (Galster and Laparde 1991). The Vashon Till is a basal lodgement till that mantles much of Seattle and generally ranges from gravely, sandy silt to silty sand with varied amounts of clay and scattered cobbles and boulders.

Soil types beneath the Property are consistent in the six soil borings installed on the east side of the ASKO Hydraulic facility and the borings installed on the Property. In general, the upper 10 feet to 15 feet of the site consists of silty fine-grained sand with occasional minor gravel (possible Vashon Till); the material is dry, dense, tan to gray, and odorless. From a depth of 15 to 25 feet, the site consists of well sorted, fine-grained sand (possible Esperance Sand); the color changes from brown to gray, with a slight increase in grain size, at the water table. In a few borings at 2737 West Commodore Way and across the street (2750), fine-grained silt/clay (possible Lawton Clay or transition zone) was encountered near sea level.

Cross sections were developed based on the boring logs from the Phase II field activities. Figure 5-1 provides a key showing the locations of the cross sections, which are presented in Figures 5-2 through 5-6.

The cross section for the Upper Tank Yard (Figure 5-2) shows a gravel surface underlain by semi-impermeable silty sand in SB-17 and impermeable silt in SB-13 and SB-15. In general, groundwater was encountered from 10 to 20 feet bgs in the well sorted sand.

The cross section for the Lower Tank Yard (Figure 5-3) shows well to poorly sorted sand in most borings. SB-24 and SB-18 had layers of silty sand over the well sorted sand that formed the aquifer unit. In three of the borings, impermeable silt and/or clay was found in the bottom at depths ranging from 17 feet (SB-24) to 30 feet (SB-18).

Figure 5-4 shows the cross section beneath the Former AST area and the Former Barrel Shed area. In general, the subsurface consists of well sorted sand with a layer of silty sand of varying thicknesses. Gravelly material is found at the surface and to a depth of 5 feet in

SB-29 and SB-33. Groundwater is found consistently in the well sorted sand at a depth of 20 feet.

Figure 5-5 shows the cross section beneath the Former AST area extending to the south by the former Rail Line Spur. In general, the area is underlain by silty, sandy gravel up to 5 feet thick in places (beneath the former ASTs). A silty sand layer is found up to 15 feet deep in SB-43 and SB-34, while only 10 feet deep in SB-33. This is underlain by well sorted sand that forms the upper aquifer.

Figure 5-6 shows the cross section beneath West Commodore Way using the perimeter wells. In general, the borings show well sorted sand to silty sand overlain by a thin layer of gravel in places. Impermeable silt was found in most deeper borings at a depth of about 25 feet. The silt layer in SB-38 was unusual in its thickness (15 feet thick from a depth of 20 to 35 feet bgs).

5.2 NATURE AND EXTENT OF CONTAMINATION

The following subsections describe the nature and extent of contamination within each area. A summary table (Table 5-1) shows all the samples exceeding the proposed MTCA Method A cleanup levels. Based on the findings of the Phase I reports and recent field activities, in general, petroleum-impacted soil at the Property appears limited to the upper 5 feet of soil in isolated areas. In some cases, petroleum-impacted soil is seen at depths of 10 to 15 feet.

5.2.1 Upper Rail Line Spur

Only two samples contained concentrations above the cleanup levels. The petroleum-impacted soil was limited to SB-22, located on the east end of the Upper Rail Line Spur, at a depth ranging from 5 to 10 feet. According to the boring log and field notes, contamination was not present above or below this interval, as confirmed by the laboratory data.

5.2.2 Upper Tank Yard

Petroleum-impacted soil appears present at a depth of 2 feet in SB-13 and SB-15, with SB-13 containing concentrations one order of magnitude higher than SB-15. In both borings, the sample was collected from a sandier portion of the split spoon. Underlying the sandier portions was a fine sand and silt layer in both borings that showed little or no

petroleum contamination. Based on the borings in this area, petroleum-impacted soils appear to be limited to SB-13 and SB-15 at a depth of 2 feet.

Groundwater in the Upper Tank Yard does contain concentrations of diesel (3.94 mg/L) and oil (0.513 mg/L) above the proposed MTCA Method A cleanup level (Table 5-2).

5.2.3 Lower Tank Yard

Diesel- and oil-impacted soil appears present near the PCP/diesel mixing area in SB-03 at depths of 0.6 feet and 2 feet, and in SB-04 at a depth of 2 feet. Gasoline was also detected above the cleanup levels in the 2 foot samples collected from SB-03 and SB-04. PCP was detected in 17 of the 24 samples analyzed at concentrations ranging from 0.0578 mg/kg (SB-01-14) to 803 mg/kg (SB-04-0.6). In most cases the PCP impacted soil was limited to the surface. The samples collected from the 2-foot-depth interval in SB-01 through SB-03 do not show concentrations of PCP above the method reporting limit; however, subsequent samples in SB-01 and SB-02 (SB-03 was terminated at a depth of 2 feet) show trace amounts of PCP in the soil. These trace amounts are believed to be a by product of the sampling method used and not representative of actual soil conditions. The highest concentration of PCP was found under the fuel lines leading to the manifold (SB-04) where PCP is visible in the surface soil; at SB-04 the concentrations continue to diminish with depth. The additional surface samples collected in the area (SS-01 through SS-04) did not show concentrations of PCP above the method reporting limit, with the exception of SS-01 (3.87 mg/kg). The PCP concentration in SS-01 was below the MTCA Method B cleanup level. The total cPAHs in SB-03 and SB-04 did exceed the MTCA cleanup level of 1 mg/kg at depths of 0 to 2 feet and 0 to 5 feet, respectively. One surface sample (SS-04) also exceeded the MTCA Method A cleanup level for cPAHs. A review of the field notes did not document the presence of material that would indicate a petroleum release.

The soil borings near the large ASTs contain petroleum-impacted soil in SB-19 at depths of 2 feet (diesel and gasoline) and 5 feet (gasoline). Diesel was detected above the proposed MTCA Method A cleanup level in SB-24 at a depth of 2 feet, and gasoline exceeded the cleanup level at a depth of 10 feet. Because groundwater is found at a depth of 6.75 feet in 01MW-12 (SB-24), the concentrations contained in sample SB-24-10 may be due to the influence of petroleum-impacted groundwater.

Groundwater in the Lower Tank Yard does contain concentrations of gasoline, diesel, and benzene above the proposed MTCA Method A cleanup levels at concentrations of 802 µg/L, 1.07 µg/L, and 98.4 µg/L, respectively.

5.2.4 Former Rail Line Spur Behind Warehouse

Soil samples collected from the borings along the Former Rail Line Spur behind the warehouse contained petroleum-impacted soil in samples collected from the 5-foot-depth interval in SB-07 (gasoline and benzene). The petroleum-impacted soil is limited in vertical and horizontal extent.

5.2.5 Former Barrel Shed

Petroleum-impacted soil was evident in SB-27 at a depth of 5 feet, in SB-29 at depths ranging from 2 to 5 feet, and in SB-30 and SB-31 at a depth of 2 feet.

SB-29 was completed as a well (01MW-06) and contained concentrations of PCP (1.80 µg/L) above the MCL. Soil samples from boring SB-29 were not analyzed for PCP, therefore, no correlation between soil concentrations and groundwater concentrations could be made.

5.2.6 Former AST Area

Petroleum-impacted soil was evident in SB-32 (gasoline) at a depth of 5 feet. TCE was detected just above the proposed MTCA Method A cleanup level (0.05 mg/kg) in many of the soil samples collected from depths of 10 to 25 feet.

Historically, TCE has not been used at the facility. It is possible that the TCE was included in the waste oil stored in the ASTs. Groundwater collected from 01MW-07 (SB-43) did not contain concentrations of VOCs above the method reporting limits; therefore, it is unlikely that the low levels of TCE detected in the borings are impacting the groundwater.

5.2.7 Former LUST Area

Petroleum-impacted soil is present in SB-35 at depths ranging from 5 to 15 feet and in SB-36 at a depth of 15 feet. It is possible petroleum-impacted soil in SB-35 is related to the historic use of the underground barrel transfer system, which transferred barrels of fuel from the Property to the dock across the street. SB-35 was located cross gradient from the well (01MW-05) which contains floating fuel, and is near the former underground barrel transfer

system. The water sample collected from 01MW-08 (SB-35) did not contain elevated levels of TPH.

Petroleum-impacted groundwater was detected beneath the Former LUST Area. Groundwater concentration contour maps (Figures 5-7 through 5-9) show the extent of diesel-, gasoline-, and benzene-impacted groundwater. A monitoring well (02MW-05) at 2750 West Commodore Way was used to establish the southern extent of the groundwater plume for gasoline and diesel. Well 02MW-05 is hydrologically up-gradient from the Former LUST Area. In general, the groundwater plume appears to originate from the Upper Tank Yard north and extend beneath the Former LUST Area and across West Commodore Way. The groundwater beneath the Former LUST Area is hydrologically connected to the Upper and Lower Tank Yards. However, the concentrations of petroleum-impacted groundwater beneath the Former Lust Area are, most likely, due to releases in the immediate area and not due to petroleum-impacted groundwater migrating from the Upper or Lower Tank Yards. The highest concentrations of petroleum-impacted groundwater beneath the Former LUST Area are found in 01MW-02. Well 01MW-02 is located near the fuel loading facility where a tanker truck accidentally released over 1,000 gallons of gasoline (see Section 2.3). This historical release, in combination with the former LUST, may represent the primary source of petroleum-impacted groundwater beneath the Former LUST Area.

5.2.8 West Commodore Way Perimeter

Petroleum-impacted soil was found in SB-39 at depths of 2 and 5 feet; samples beneath these depth intervals did not show elevated concentrations of petroleum. At SB-37, petroleum-impacted soil was detected in samples from the 10-foot and 15-foot-depth interval. A review of the boring log for SB-37 shows dry silty sand present to a depth of 10 feet and with a strong petroleum odor. A thin silt layer at 10 feet separated the silty sand from a well sorted sand. The petroleum odor continued until the 20-foot sample interval. This boring was completed as a well, however, the well did not yield sufficient water to develop or sample. It is possible that the petroleum contamination is due to influence from the nearby LUST Area or nearby overhead filling rack (SB-39). SB-44 and SB-38, located to the east of SB-37, did not show concentrations of petroleum products above the MTCA Method A cleanup levels.

5.3 RECOMMENDATIONS FOR FUTURE ACTIONS

Based on the conclusions above, Foster Wheeler Environmental recommends future actions for the Property as described in the sections below. The suggestions below include source removal, bioremediation, Risk-Based Corrective Action (RBCA) evaluations, and groundwater monitoring.

In addition to typical fuel related analytes, other parameters may be analyzed to evaluate the natural attenuation process at the site. These parameters include iron, nitrate, sulfate, and dissolved oxygen. Monitored natural attenuation (MNA) is a useful tool to demonstrate compliance regulatory cleanup levels.

According to EPA's Office of Solid Waste and Emergency Response (OSWER) directive titled Use of Monitored Natural Attenuation at Superfund RCRA Correction and UST Sites (April 1999), MNA is most appropriate when used in conjunction with other remedial actions or as a follow-up remediation measure. At this particular site, source removal activities have been conducted and additional activities are recommended depending on the area. Bioremediation and MNA, in conjunction with the quarterly monitoring of groundwater movement and petroleum and BTEX concentrations, will provide useful information to evaluate groundwater movement and monitor the effectiveness of the source removal and bioremediation activities, coupled with the natural attenuation of contaminants as they undergo degradation. RBCA evaluations should be conducted to ensure that soil and groundwater impacts proposed to be addressed by MNA do not present unacceptable threats to the environment or to the current or future inhabitants of the property.

5.3.1 Upper Rail Line Spur

Contamination is isolated to one boring at a depth of 5 to 10 feet. Further action at this area is not recommended based on the current use of the Property. Should the use of the Property change in the future or if earthwork begins in the area, petroleum-impacted soil should be handled accordingly.

5.3.2 Upper Tank Yard

Petroleum-impacted soil appears to be limited to the upper 2 to 5 feet near borings SB-13 and SB-15. Soil removal is not planned for this area due to ongoing operations and restricted access to the area, which minimize exposure potential. Continued monitoring of

the groundwater beneath the site for petroleum and natural attenuation parameters should be considered.

5.3.3 Lower Tank Yard

During the Phase II field activities, a hand auger was used to collect screening samples around the former PCP/diesel mixing area. While the hand auger screening samples did provide useful data, the integrity of the samples collected at depths greater than 2 feet may have been influenced by overlying material in the boring. Consequently, further quantitative samples are recommended for this area to further define the lateral and vertical extent of PCP-impacted soil. Foster Wheeler Environmental recommends that a portable drilling and sampling device (i.e., Minute-man) be used to collect additional samples. A down-gradient well is also recommended for the area to evaluate if groundwater has been impacted by historical operations. Based on the screening samples, it is expected that the additional sampling will confirm the premise that the PCP-impacted soil is limited to the surface soil near the fuel lines (location of SB-04) leading to the manifold system. A possible outcome is a limited removal action, whereby the top 2 feet of soil surrounding the immediate area is excavated. Continued monitoring of the groundwater beneath the site for petroleum and natural attenuation parameters should be considered. Because the area is fenced and secured, the potential for exposure to contaminant-impacted soil is minimized.

5.3.4 Former Rail Line Spurs

Petroleum-impacted soil was limited to SB-07 at depths ranging from 2 to 5 feet. One possible option for the area is the limited removal of soil exceeding cleanup levels near SB-07. This area may be addressed using the RBCA evaluations mentioned in Section 5.3.

5.3.5 Former Barrel Shed

Petroleum-impacted soil was limited to the upper 5 feet of soil in two adjacent borings (SB-27 and SB-29) and in the upper 2 feet in two other borings (SB-30 and SB-31). Because the area is paved and the soil is not accessible to the public or on-site workers, the soil does not present a direct exposure pathway. However, continued groundwater monitoring of 01MW-06 is recommended to evaluate the PCP trends present in the groundwater and ensure contaminants do not leach out of the soil into the groundwater.

5.3.6 Former AST Area

Petroleum-impacted soil was limited to the upper 5 feet in two of the three borings. Since the area is paved and the soil is not accessible to the public or on-site workers, no further action is recommended. The down-gradient well (01MW-07) should be monitored on a regular basis to ensure groundwater quality is acceptable and that TCE detected in the soil is not impacting the groundwater.

5.3.7 Former LUST Area

Petroleum-impacted soil is present in the area to the west of the LUST Area. Groundwater beneath the site contains concentrations of gasoline, diesel, and BTEX above the proposed MTCA Method A cleanup levels; in addition, free-phase product was detected in 01MW-05 at an apparent thickness of 5.28 feet. The petroleum-impacted groundwater plume appears to be bracketed to the west by 01MW-08. Well 01MW-11 did not show detections of petroleum above the method reporting units, with the exception of diesel. An additional well near 01MW-10 may be useful in understanding the eastern extent of petroleum-impacted groundwater. Drilling across the West Commodore Way from 01MW-09 and 01MW-10 are restricted due to topography and overhead power lines, but possible with the proper precautions. Foster Wheeler Environmental recommends that quarterly groundwater monitoring be conducted at the site to better understand contaminant trends beneath the site; additionally, regular bailing or fuel removal from 01MW-05 is recommended. In the event fuel cannot be removed from the well, a fuel recovery system may be necessary for the impacted well. The nature and extent of petroleum-impacted soil and groundwater in the Former LUST Area indicate that additional assessment and remedial actions are necessary to achieve compliance with MTCA cleanup levels.

5.3.8 New Barrel Shed

Borings planned at the New Barrel Shed were abandoned because of refusal at each location. Foster Wheeler Environmental recommends that one soil boring be installed in the parking area directly in front of the New Barrel Shed. The boring will be completed as a monitoring well to evaluate potential groundwater impacts.

6. REFERENCES

Foster Wheeler Environmental. 2000. Environmental Site Assessment: Phase I for Time Oil Company, 2737 West Commodore Way, Seattle, Washington. August 4, 2000.

Galster, R.W. and W.T. Laprade. 1991. Geology of Seattle, Washington, United States of America. *Bulletin of the Association of Engineering Geologists.* 28(3):235-302.

IT (IT Corporation). 2000. Site Assessment Report, Time Oil Co. Site 2737, 2750 West Commodore Way, Seattle, Washington. March 8, 2000.

TOC (Time Oil Company). 1991. Underground Storage Tank Site Check/Site Assessment at Seattle Terminal, 2737 West Commodore Way, Seattle, Washington – Property No. 01-228. December 30, 1991.

TOC. 2000. Transmittal of Site Assessment Report, Time Oil Co. Property No. 01-600; Seattle Terminal Service USTs, 2737 West Commodore Way, Seattle, Washington. May 25, 2000.

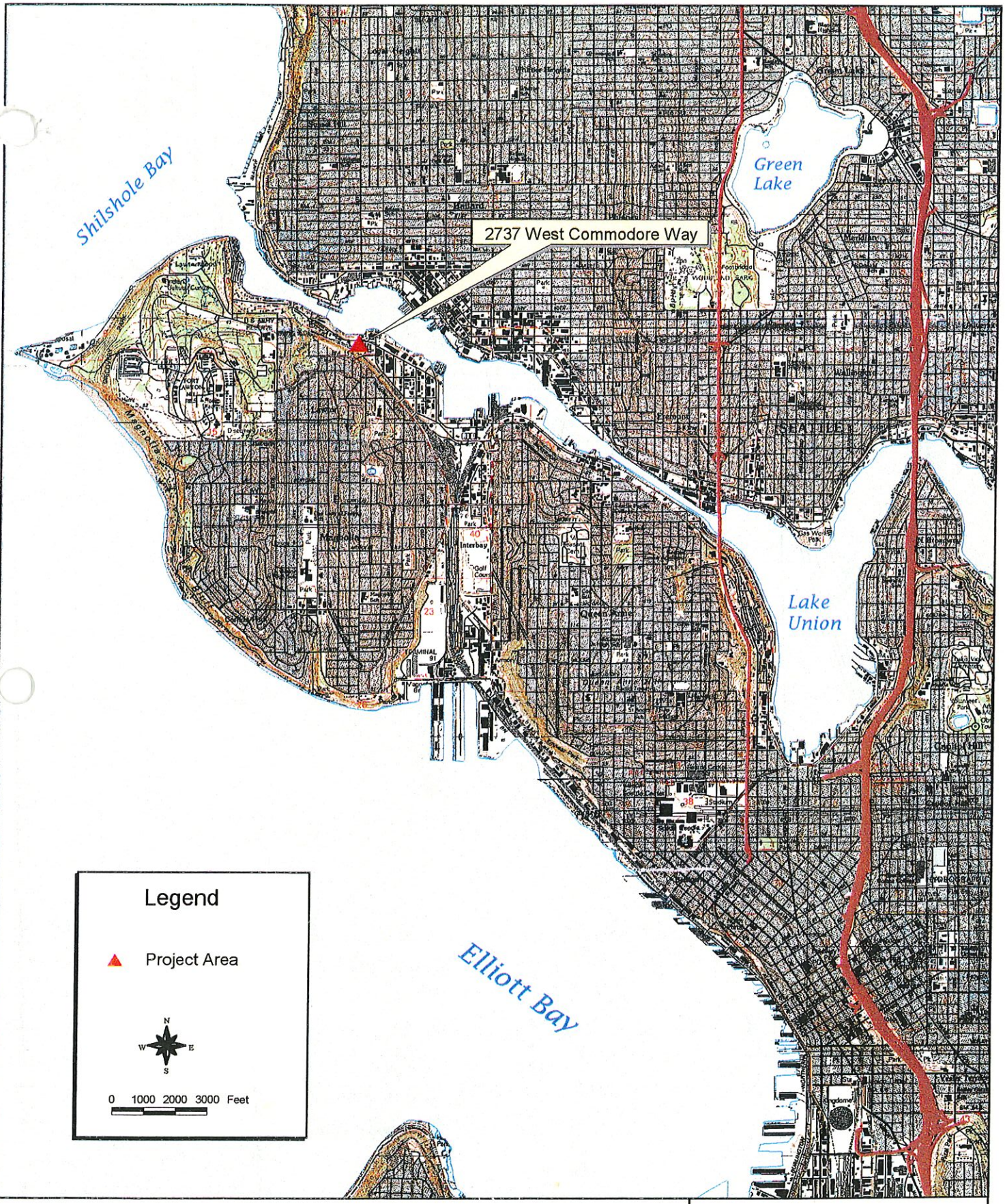
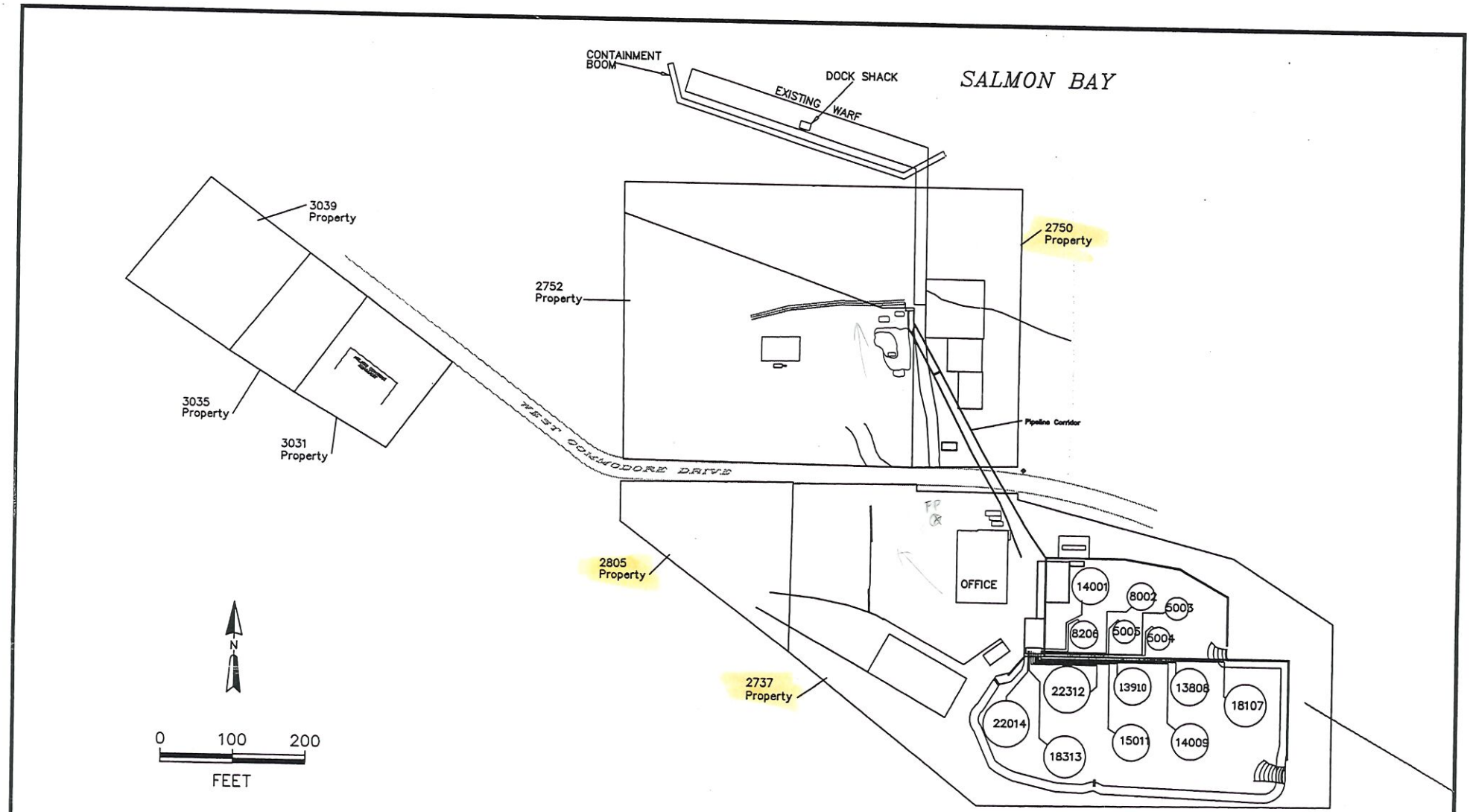


Figure 1-1

Time Oil Company Phase II
Environmental Site Assessment

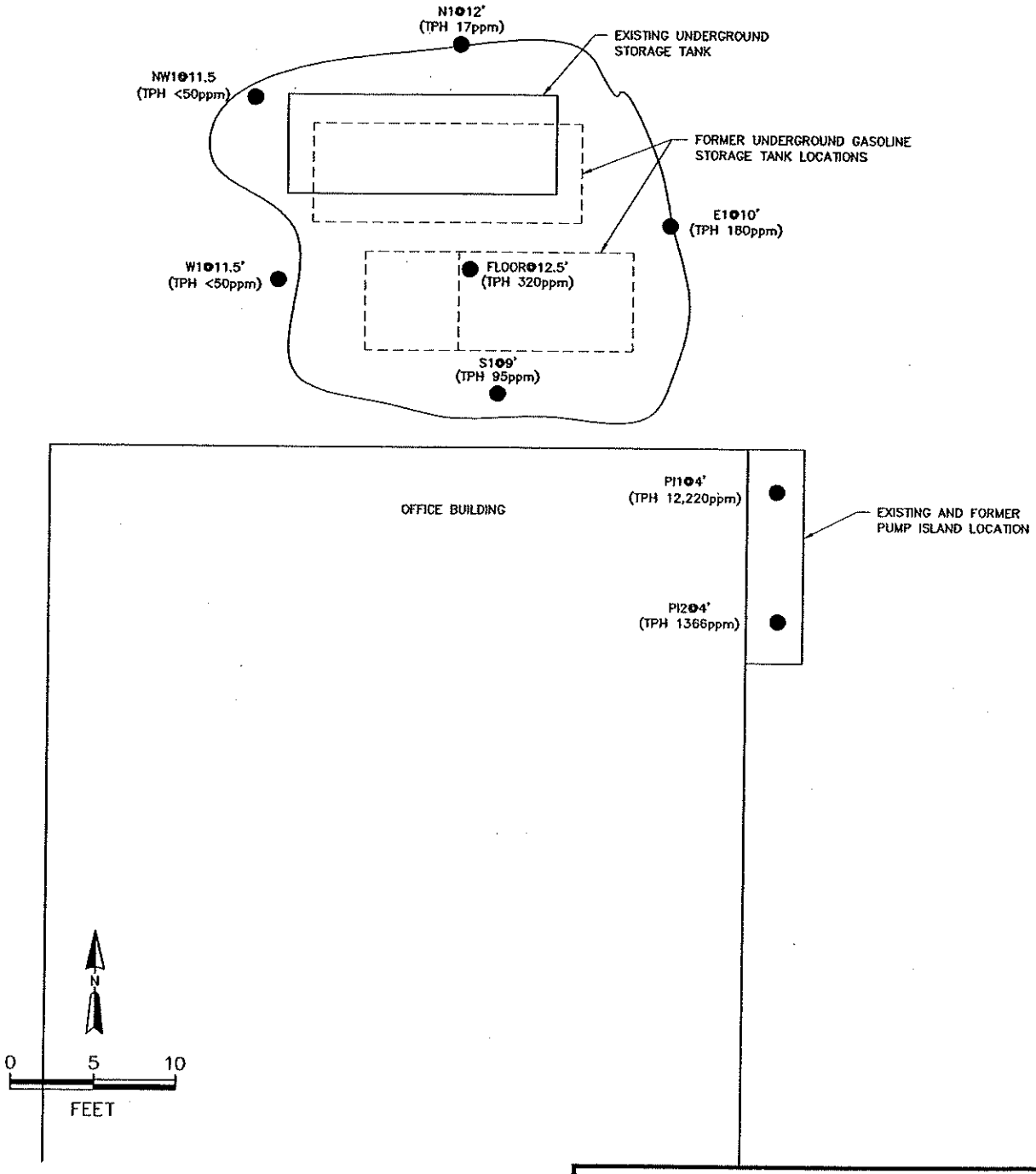
Location of Property at
2737 West Commodore Way

c:\projects\time_oil\vic_map.apr June 2000



FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 1-2
Location of TOC Properties on West Commodore Way, Seattle, Washingto



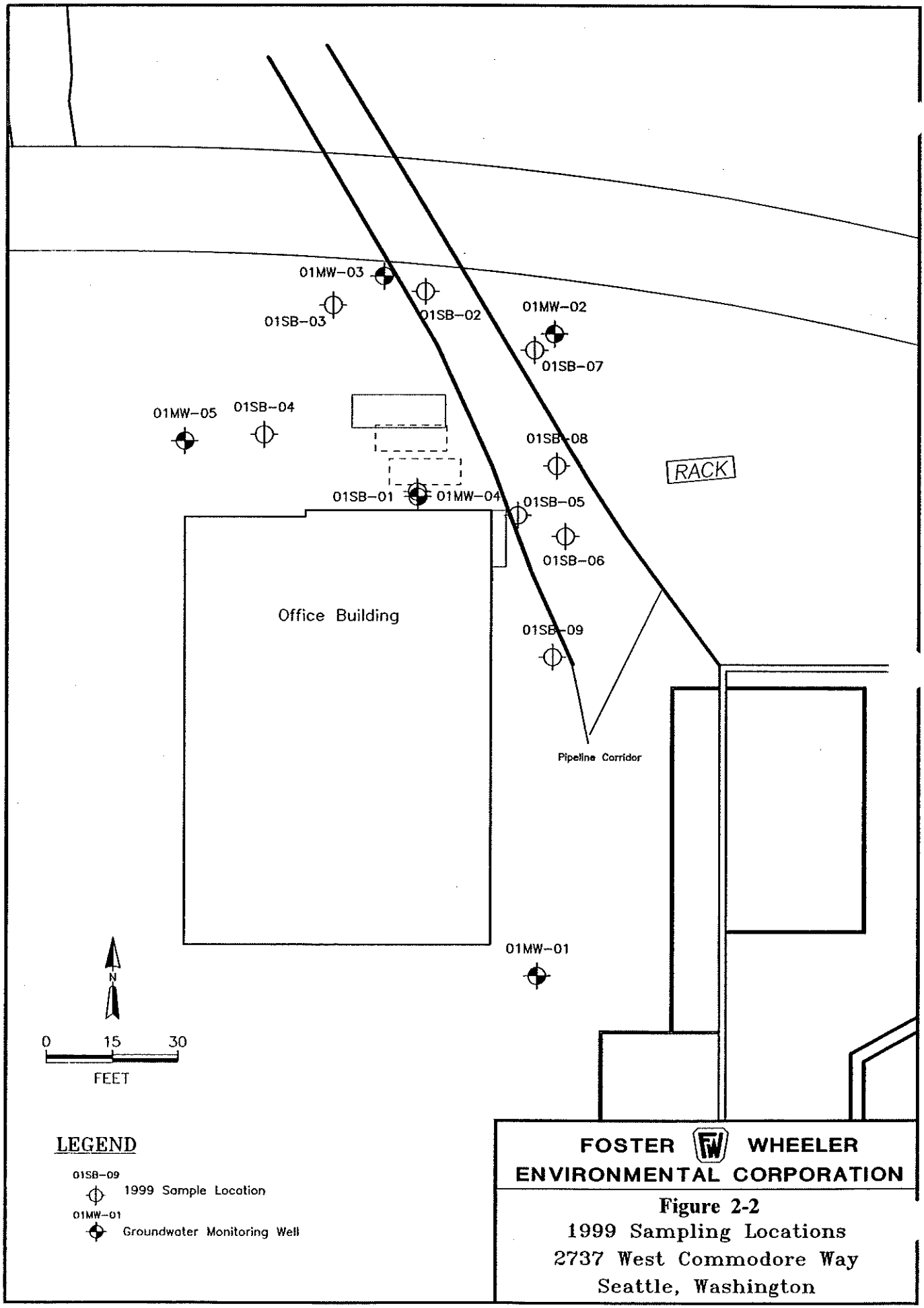
LEGEND

N1@12' (TPH 17 ppm) ● APPROXIMATE SAMPLING LOCATION WITH RESPECTIVE DEPTH AND TPH CONCENTRATION

I:\PROJECTS\23063312\DWG\ET1OFG11.DWG
PLOT/UPDATE: AUG 01 2000 13:34:04

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 2-1
1991 Sampling Locations
2737 West Commodore Way
Seattle, Washington



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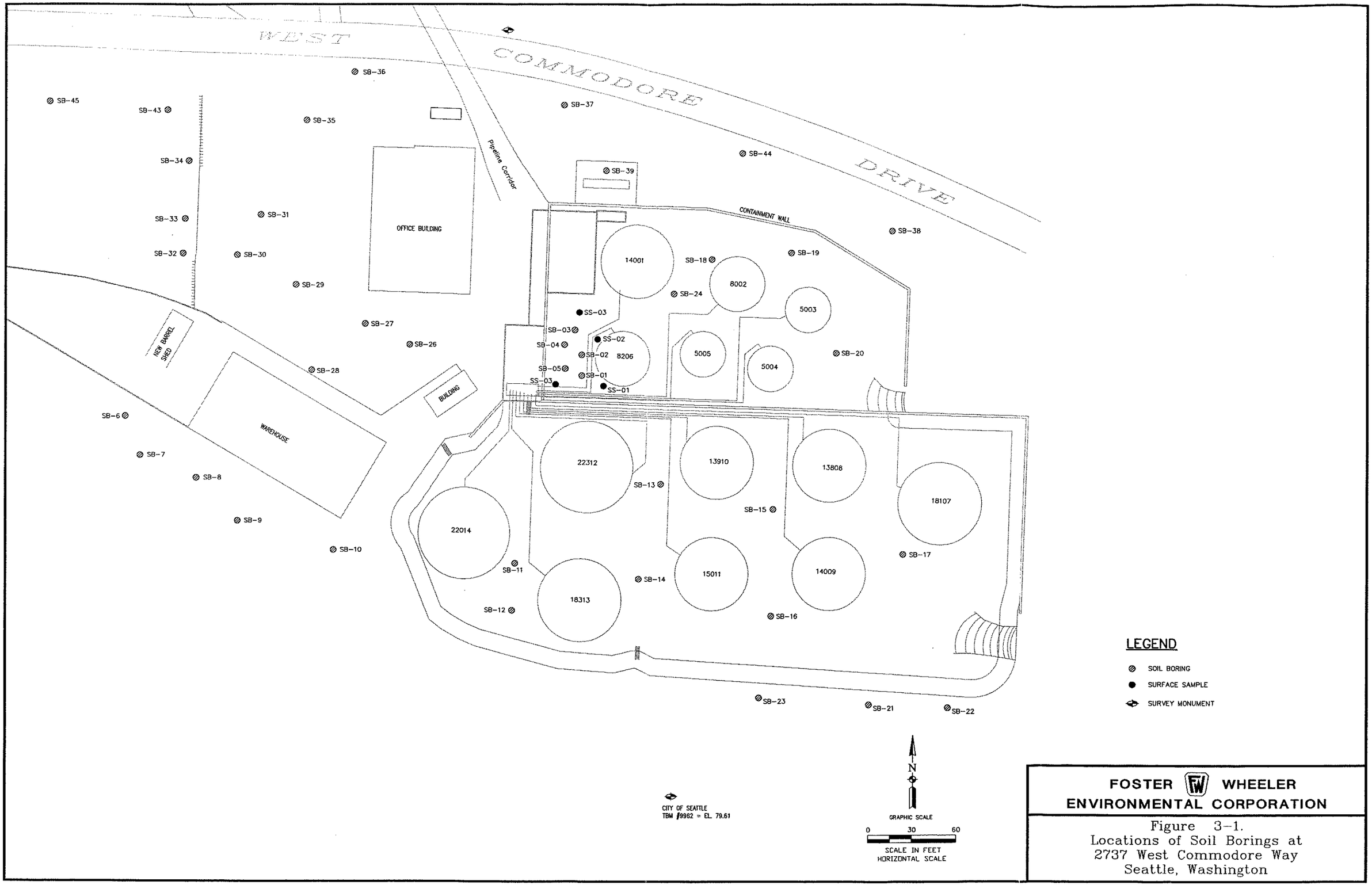
FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 2-2
1999 Sampling Locations
2737 West Commodore Way
Seattle, Washington



FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 3-1.
Locations of Soil Borings at
2737 West Commodore Way
Seattle, Washington

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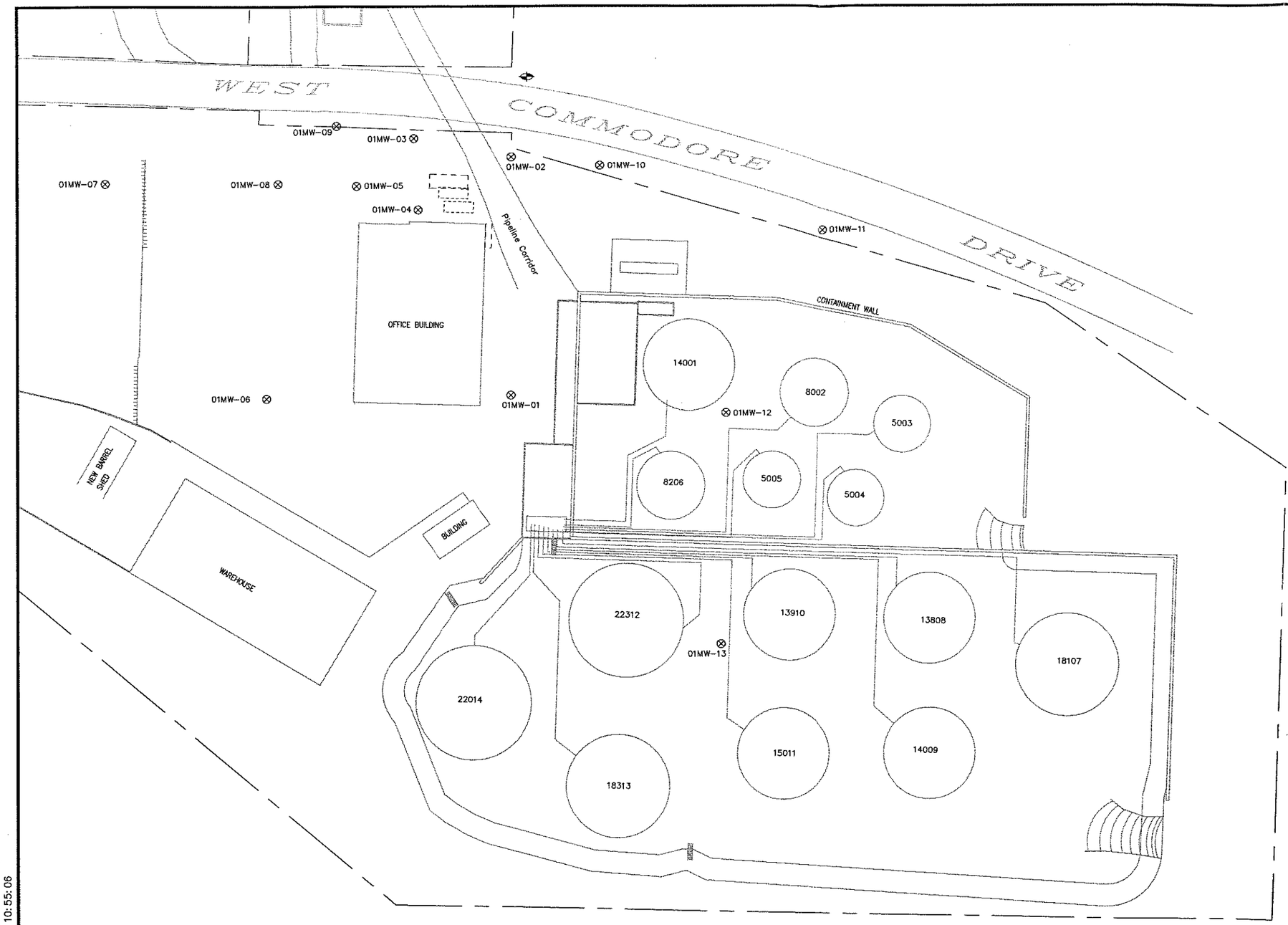
PLOT/UPDATE: MAR 29 2001 10:43:42



LEGEND

⊗ MONITORING WELL

SURVEY MONUMENT

EQUIPOTENTIAL CONTOUR

CI = EQUIPOTENTIAL CONTOUR

N

GRAPHIC SCALE

0 30 60

SCALE IN FEET

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 3-2.
Location of Wells at
2737 West Commodore Way
Seattle, Washington

I:\PROJECTS\23063312\DWG\ETOFG3-2.DWG
PLOT/UPDATE: MAR 29 2001 10:55:06

WEST COMMODORE DRIVE

01MW-09 26.90
01MW-03 29.05
01MW-02 29.08
01MW-10
01MW-07 21.66
01MW-08 28.46
01MW-05 28.87
01MW-04 30.01
01MW-11 22.98
Pipeline Corridor
CONTAINMENT WALL
OFFICE BUILDING
14001
8002
01MW-12 39.09
5003
01MW-06 31.44
01MW-01 32.01
NEW BARREL SHED
8206
5005
5004
BUILDING
WAREHOUSE
22312
13910
13808
18107
01MW-13 46.81
22014
15011
14009
18313

25 30 35 40 45

CITY OF SEATTLE
TBM #9962 = EL. 79.61

LEGEND

- ⊗ MONITORING WELL
- SURVEY MONUMENT
- 45 EQUIPOTENTIAL CONTOUR

CONTOUR INTERVAL = 5 FEET

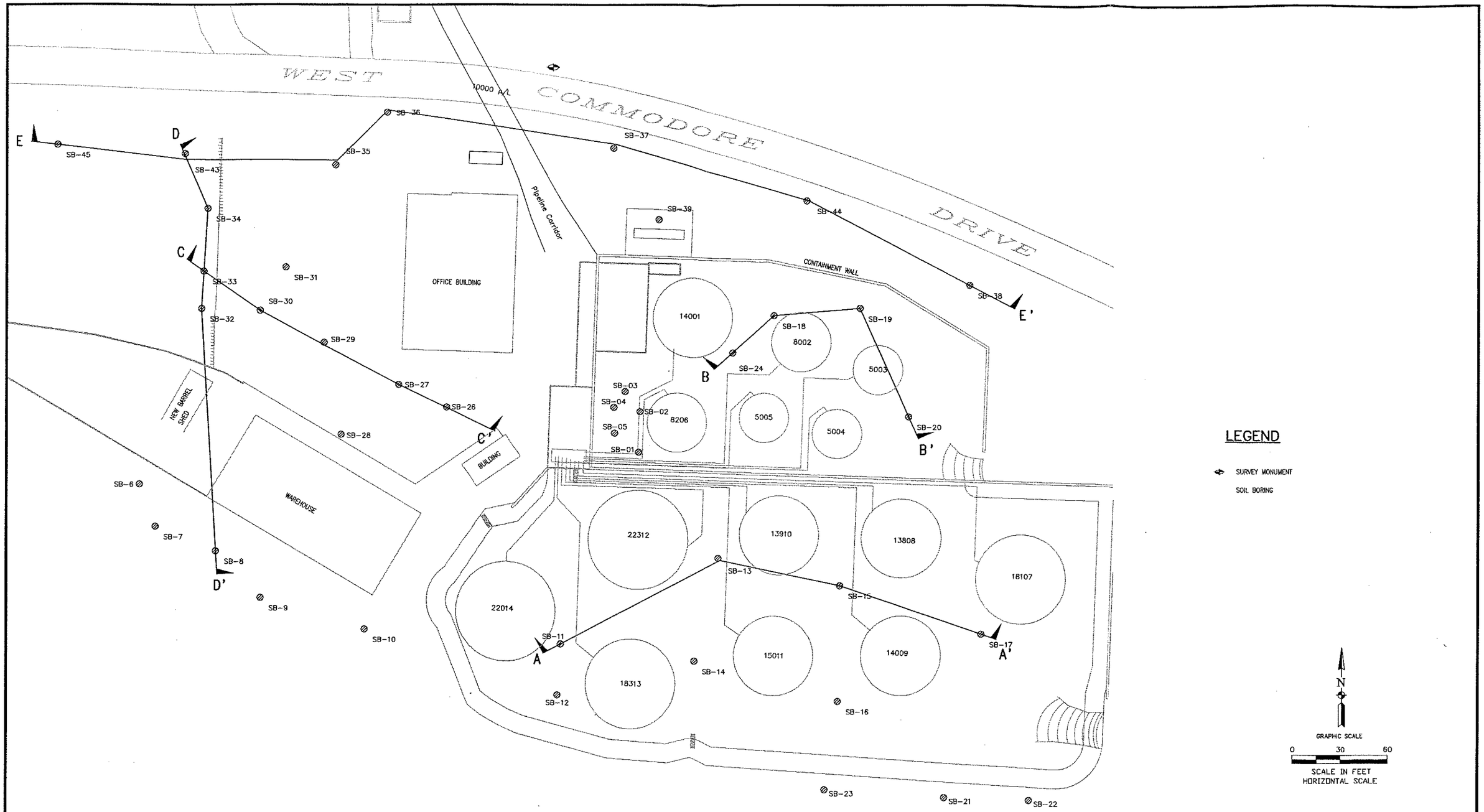
N

GRAPHIC SCALE
0 40 80
SCALE IN FEET

I:\PROJECTS\23063312\DWG\ET10FG3-3.DWG
PLOT/UPDATE: MAR 29 2001 11:05:17

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 3-3.
Potentiometric Surface (12/5/00) at
2737 West Commodore Way
Seattle, Washington



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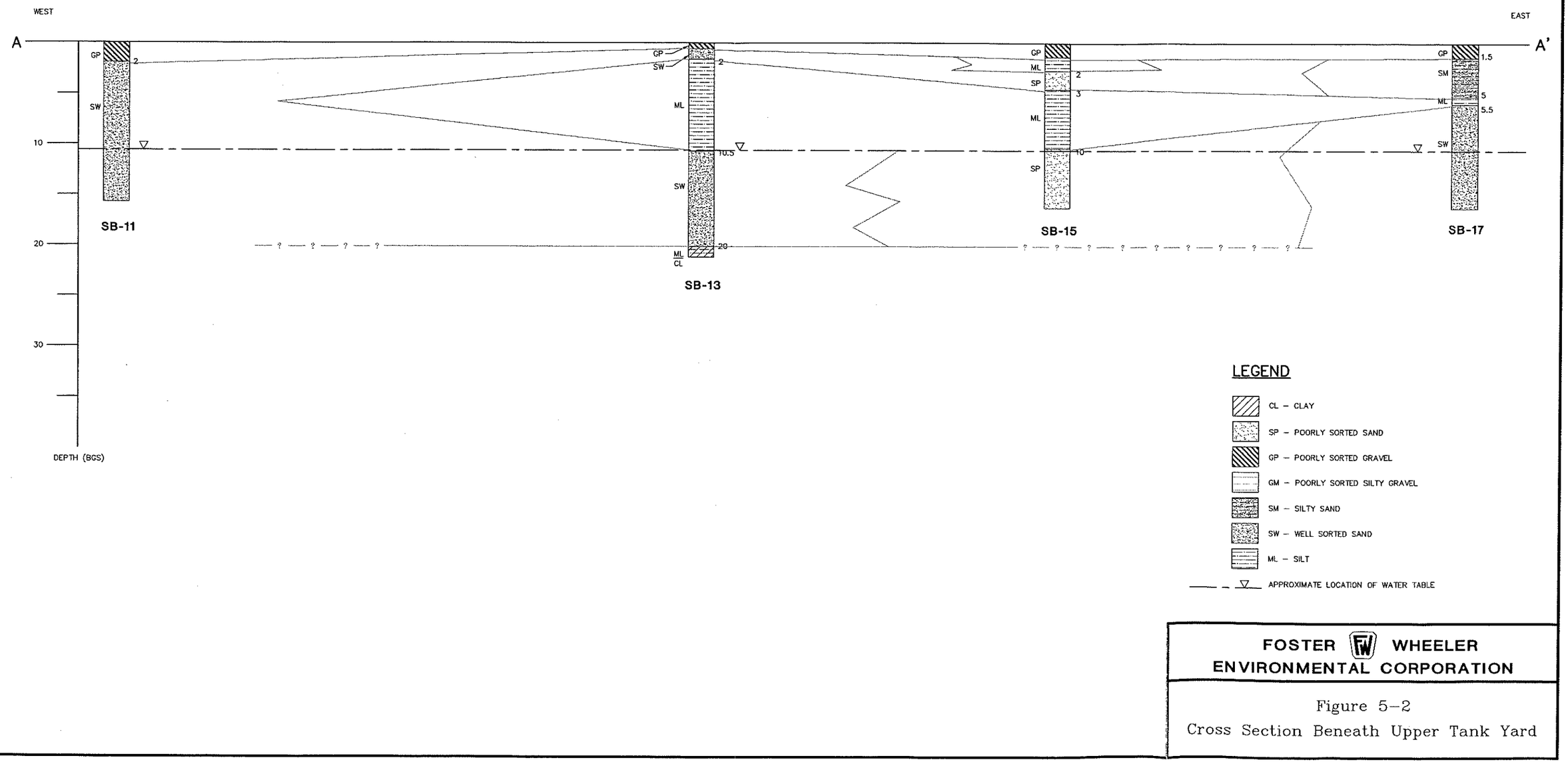
PLOT/UPDATE: MAR 19 2001 11:13:44

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 5-1
Locations of Cross Sections at
2737 West Commodore Way
Seattle, Washington



FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 5–2
Cross Section Beneath Upper Tank Yard

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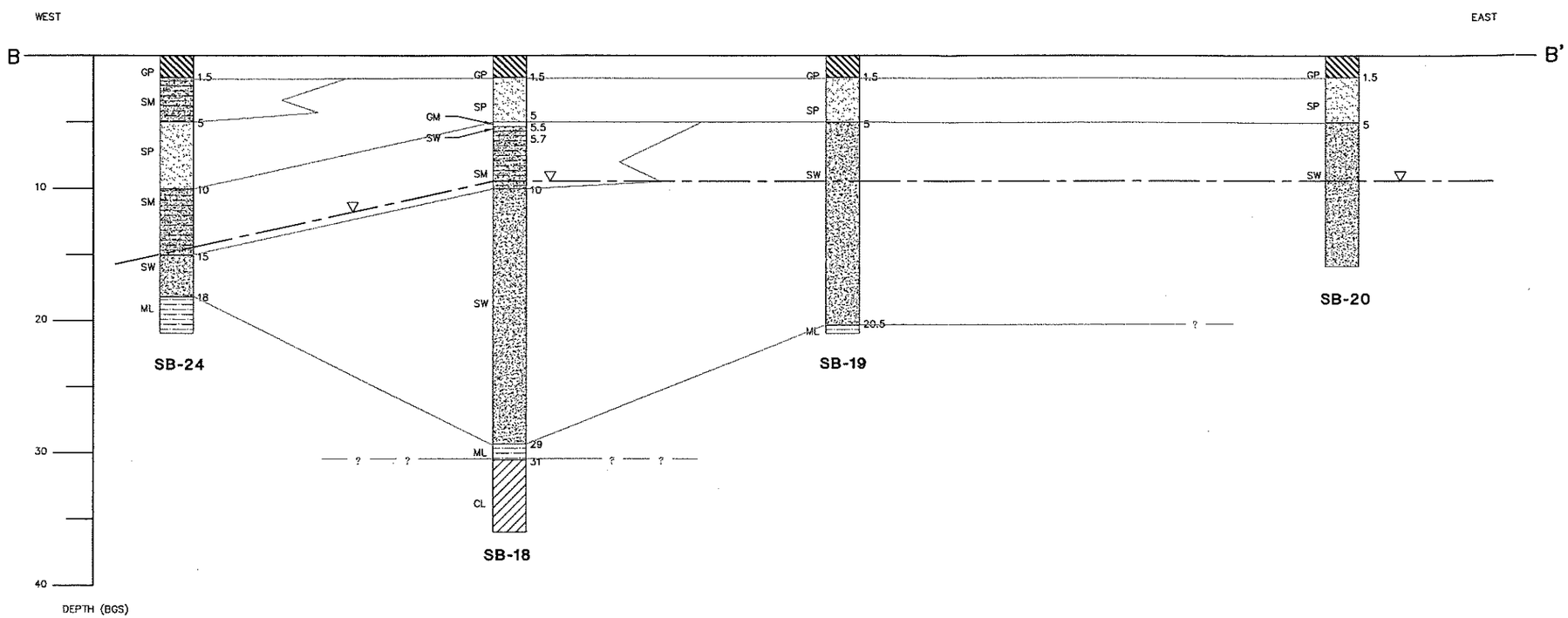

LEGEND

- CL – CLAY
- SP – POORLY SORTED SAND
- GP – POORLY SORTED GRAVEL
- GM – POORLY SORTED SILTY GRAVEL
- SM – SILTY SAND
- SW – WELL SORTED SAND
- ML – SILT
- APPROXIMATE LOCATION OF WATER TABLE

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 5–3
Cross Section Beneath
Lower Tank Yard

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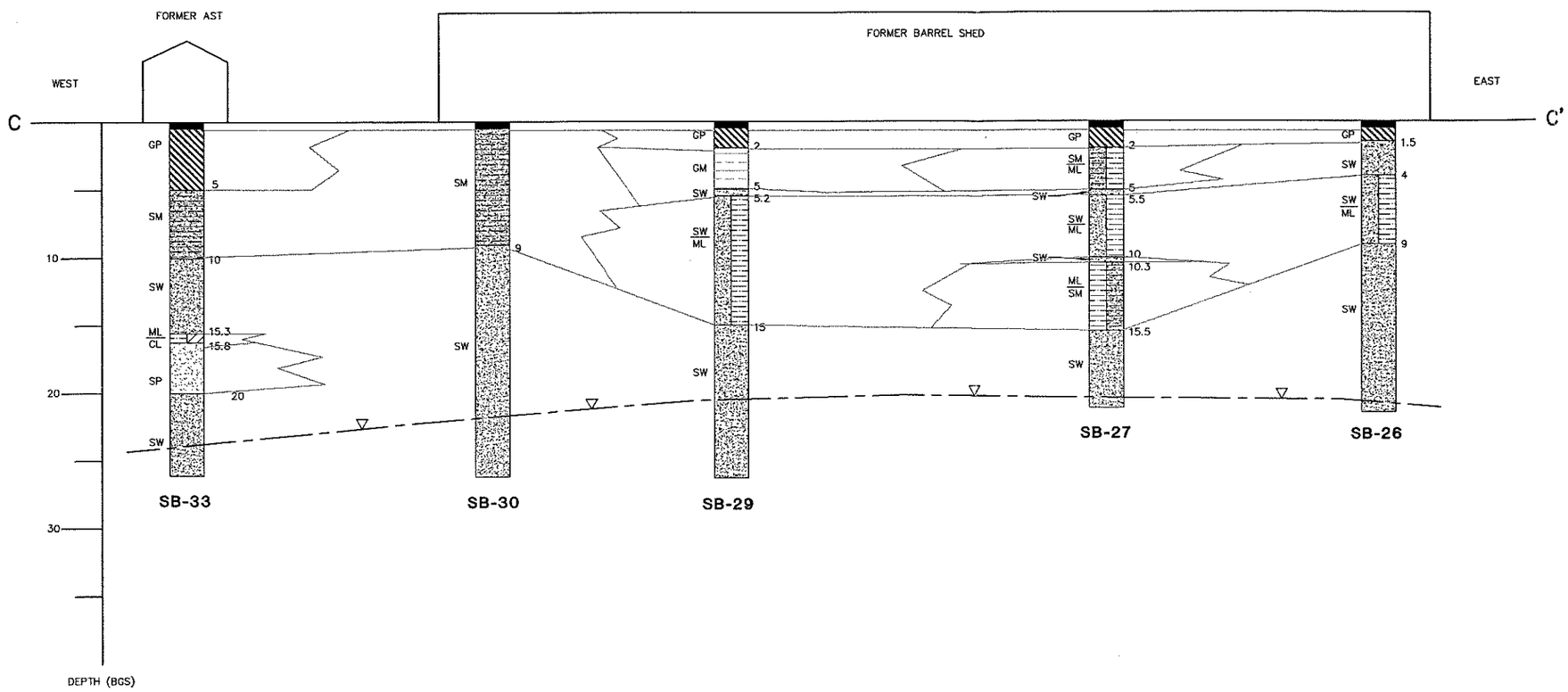
PLOT/UPDATE: FEB 05 2001 10:23:37



LEGEND

- CL – CLAY
- ML – SILT
- SP – POORLY SORTED SAND
- GP – POORLY SORTED GRAVEL
- GM – POORLY SORTED SILTY GRAVEL
- SM – SILTY SAND
- SW – WELL SORTED SAND
- APPROXIMATE LOCATION OF WATER TABLE
- ASPHALT

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 5-4

Cross Section Beneath Former Barrel Shed

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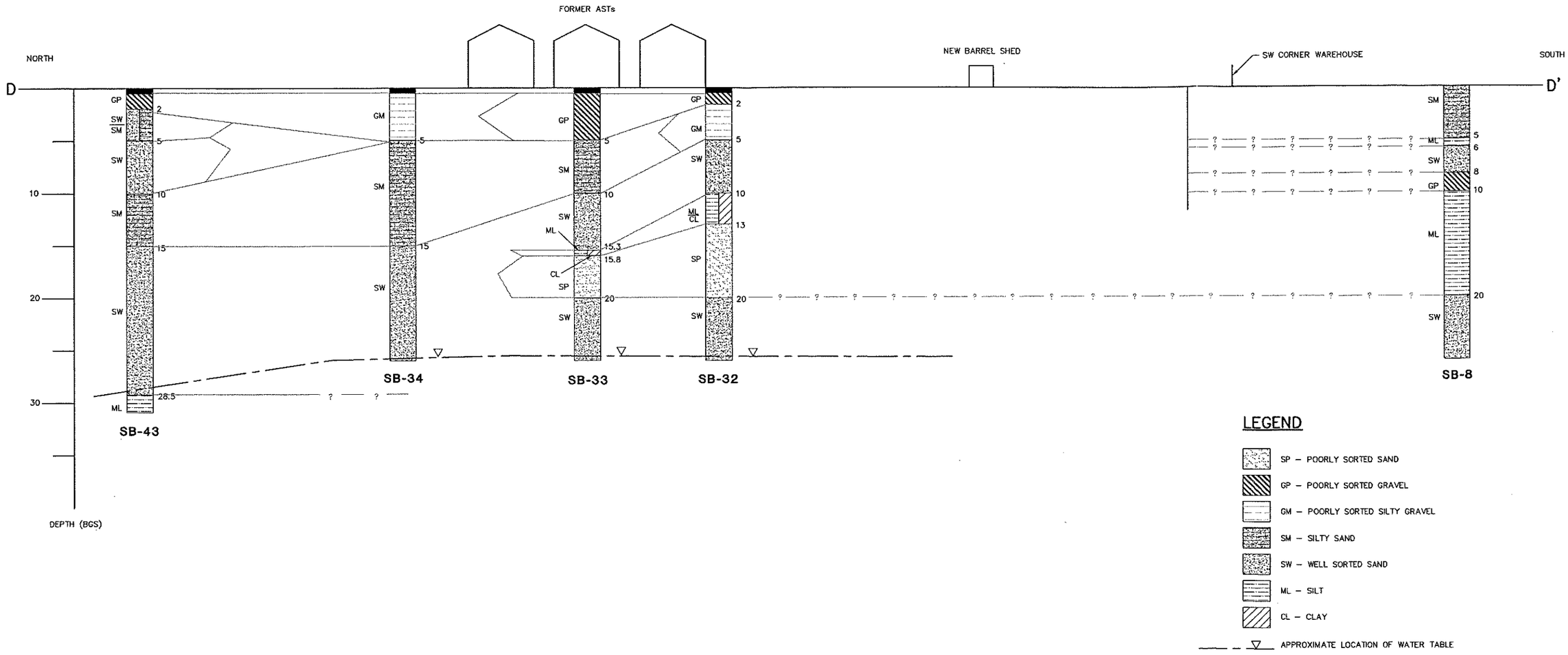
PLOT/UPDATE: FEB 05 2001 10:23:37



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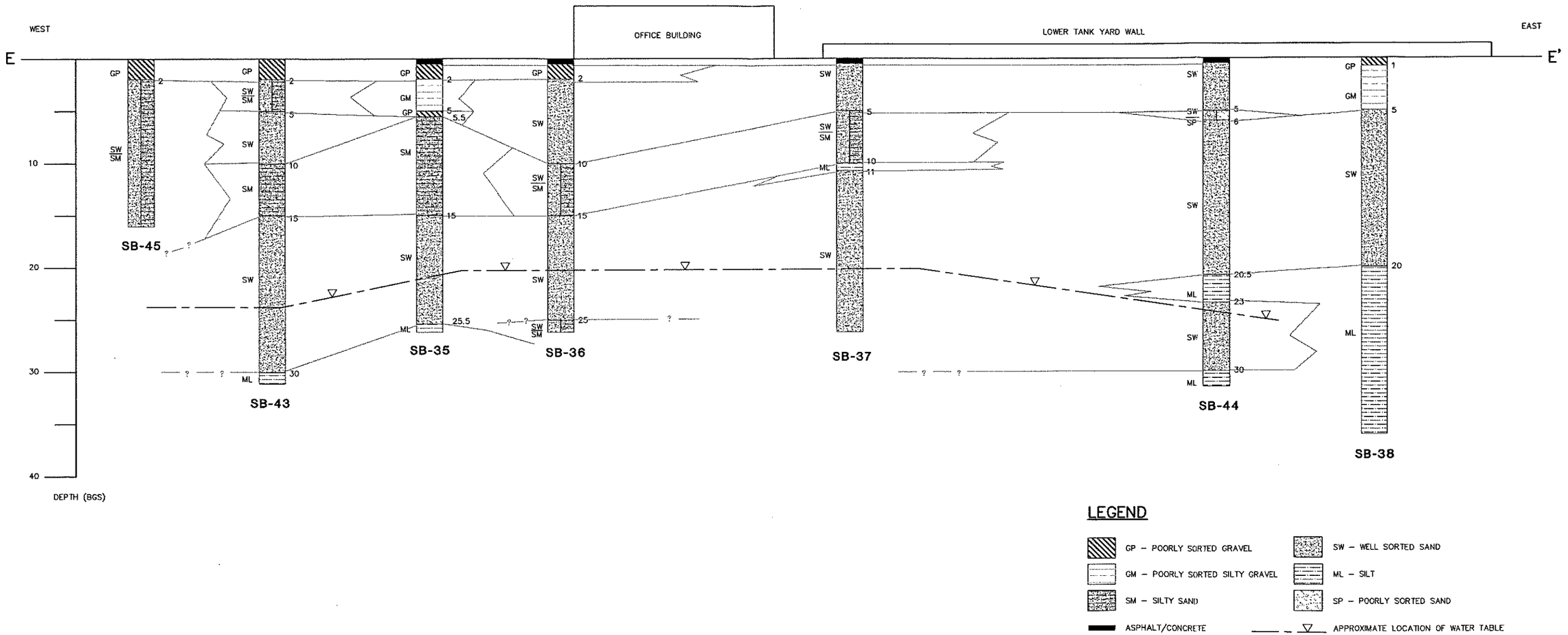
FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 5-5

Cross Section Beneath Former AST Area



LEGEND

- GP – POORLY SORTED GRAVEL
- GM – POORLY SORTED SILTY GRAVEL
- SM – SILTY SAND
- ASPHALT/CONCRETE
- SW – WELL SORTED SAND
- ML – SILT
- SP – POORLY SORTED SAND
- APPROXIMATE LOCATION OF WATER TABLE

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 5-6
Cross Section Beneath
West Commodore Way Perimeter

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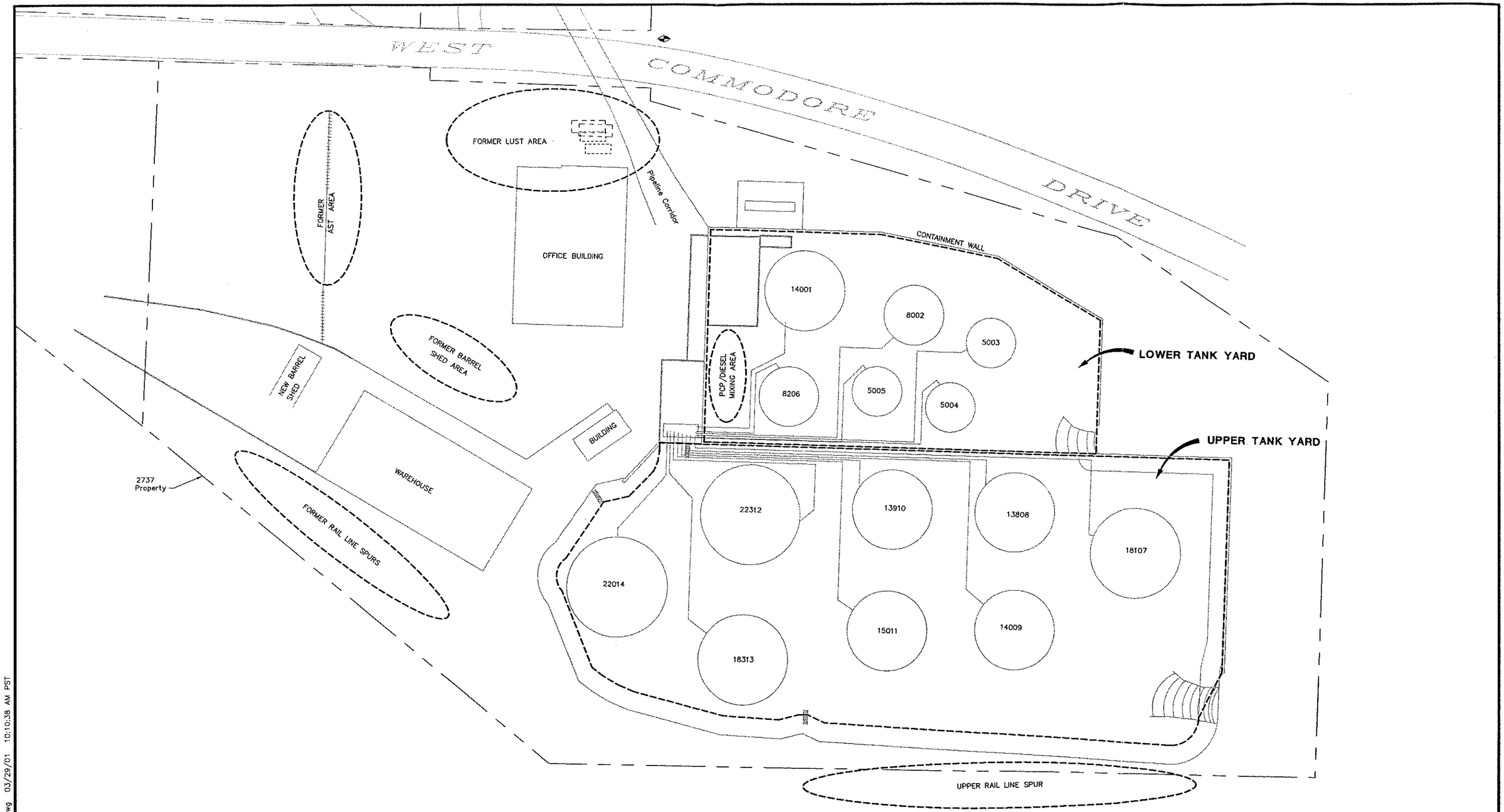

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 1–3.
Layout of Property at
2737 West Commodore Way
Seattle, Washington

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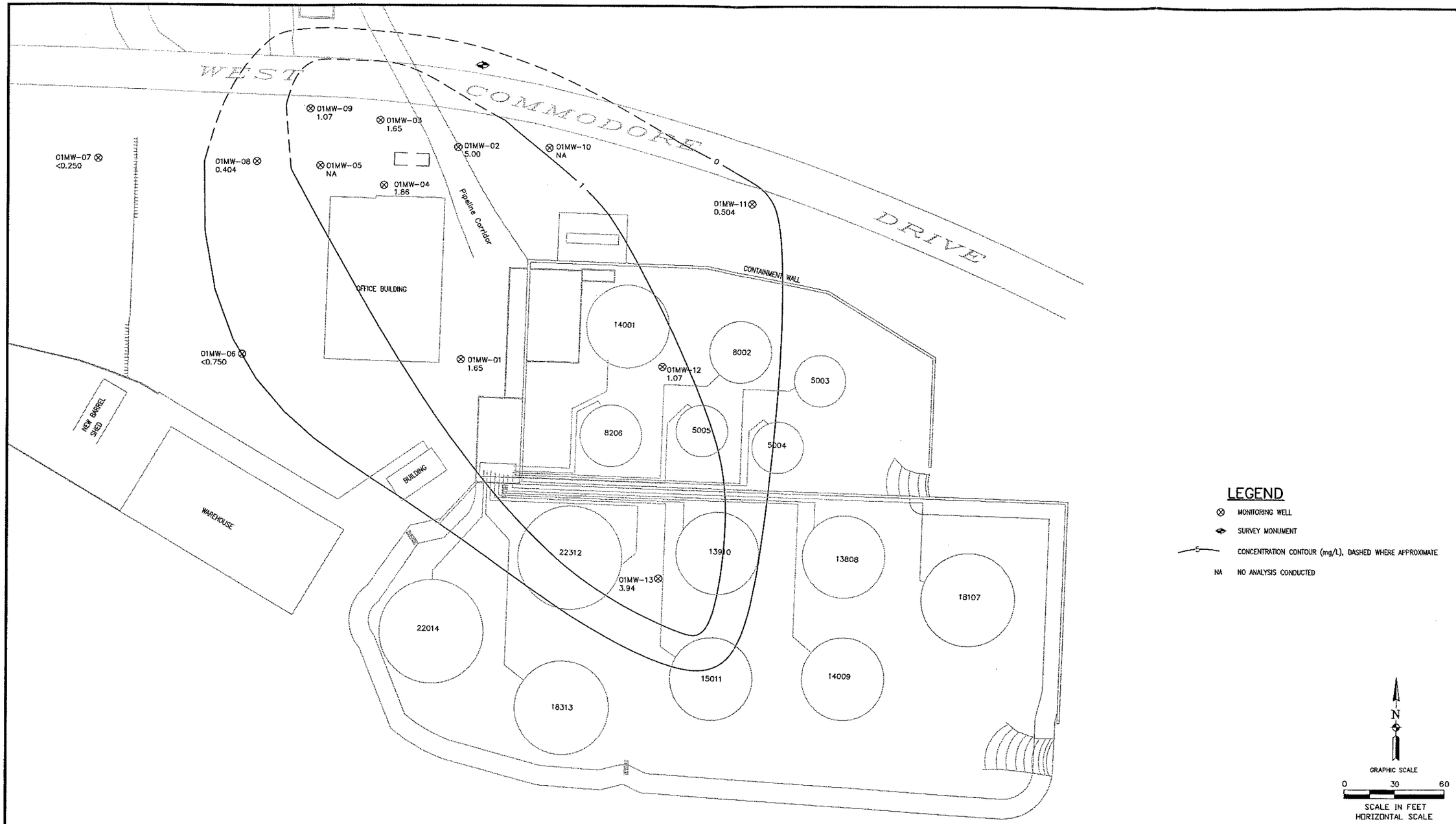

LEGEND

- ⊗ MONITORING WELL
- SURVEY MONUMENT
- 5 CONCENTRATION CONTOUR (mg/L), DASHED WHERE APPROXIMATE
- NA NO ANALYSIS CONDUCTED

N

GRAPHIC SCALE

0 30 60

SCALE IN FEET
HORIZONTAL SCALE

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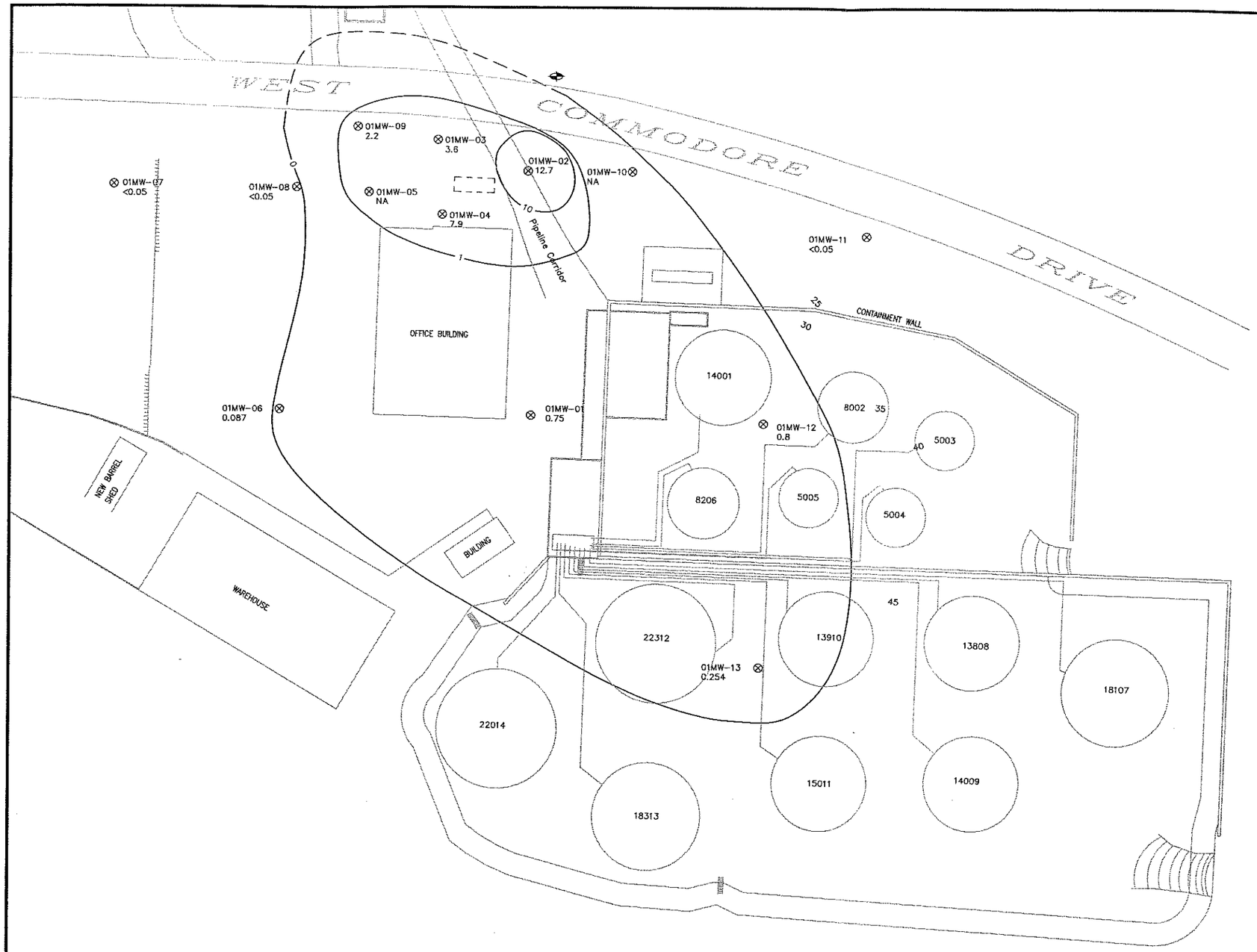
FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 5-7.
Diesel-Impacted Groundwater to
2737 West Commodore Way
Seattle, Washington



LEGEND

- ⊗ MONITORING WELL
- SURVEY MONUMENT
- CONCENTRATION CONTOUR (mg/L), DASHED WHERE APPROXIMATE
- NA NO ANALYSES CONDUCTED

N

GRAPHIC SCALE

0 30 60

SCALE IN FEET
HORIZONTAL SCALE

CITY OF SEATTLE
TBM #9962 = EL. 79.61

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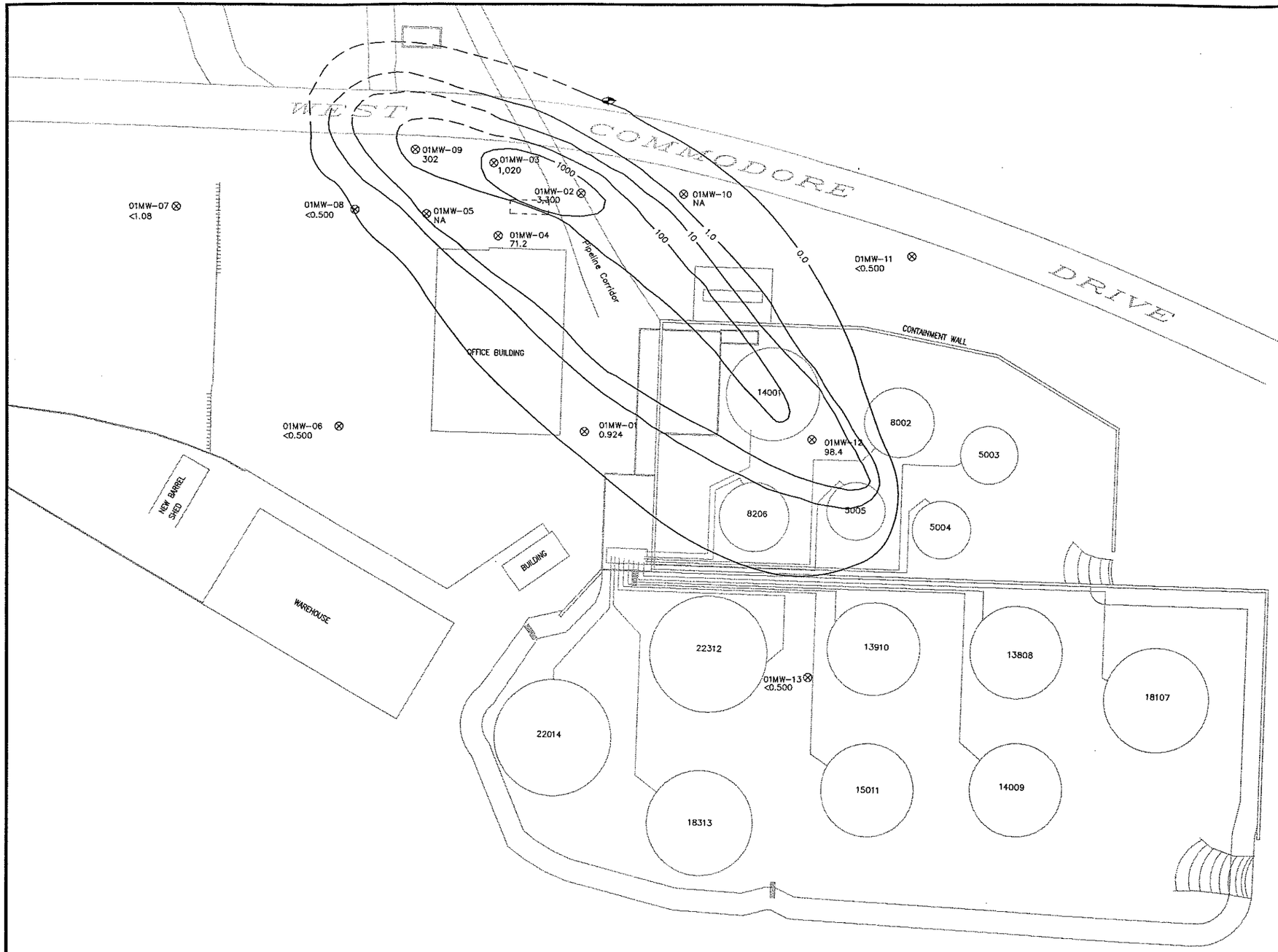
FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 5-8
Gasoline-Impacted Groundwater at
2737 West Commodore Way
Seattle, Washington



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FOSTER WHEELER ENVIRONMENTAL CORPORATION

Figure 5-9.
Benzene-Impacted Groundwater at
2737 West Commodore Way
Seattle, Washington

Table 2-1. Analytical Results from 1999 Soil Samples Above Cleanup Levels (mg/kg)

	Depth (feet)	Gasoline	Diesel	Oil	Benzene	Toluene	Ethyl benzene	Total xylene
MTCA		**100**	**200**	**200**	**0.5**	**40**	**20**	**20**
01SB-05	10	***2,360***	***2,450***	<126	<2.5	33.5	***31***	***190***
01SB-08	12.5	***3,650***	***33,900***	<1,030	***9.96***	<5.0	***20.9***	***73.4***
01SB-09	2.5	***381***	***1,780***	***514***	***2.12***	<0.2	<1.4	<1.2
01SB-09	7.0	***2,360***	***24,800***	<525	***3.45***	8.11	11.9	***32.1***
01SB-09	12.5	***755,000***	***15,000***	<525	***5,590***	***26,200***	***9,500***	***55,800***
01SB-09	18	***3,970***	***5,870***	<525	***5.26***	10.5	13.7	***61.5***

Note: Detections above current MTCA Method A cleanup levels are shown in bold and italics.

Table 2-2. Analytical Results from 1999 Groundwater and Boring Water Samples

	Date	Total lead (µg/L)	Gasoline (mg/L)	Diesel (mg/L)	Oil (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total xylene (µg/L)
MTCA		**5.0**	**1.0**	**1.0**	**1.0**	**5.0**	**40.0**	**30.0**	**20.0**
01MW-01	9/28/99	***4.15***	***<0.0500***	<0.0500	<1.0	***<0.500***	***<0.500***	***<0.500***	***<1.00***
01MW-02	9/28/99	***84.9***	***12.2***	0.714	<0.5	***3,880***	***525***	***230***	***1,100***
01MW-03	9/28/99	***87***	***27.2***	0.944	<0.5	***11,300***	***405***	***398***	***1,590***
01MW-04	9/28/99	***130***	***18.9***	***1.32***	<0.5	***4,370***	***1,150***	***606***	***2,780***
01SB-01	6/6/99	--	***9***	***7.56***	<0.5	***2,280***	***579***	***106***	***483***
01SB-02	6/6/99	--	***1.12***	***0.965***	<0.5	***25.1***	***13.5***	***19.8***	***43.6***
01SB-03	6/6/99	--	0.881	<0.25	<0.5	***147***	5.58	24.6	***68***
01SB-04	6/6/99	--	***11***	***7.12***	<0.5	***547***	***847***	***358***	***1,630***
01SB-05	6/6/99	--	***42.9***	***8.71***	***1.01***	***9,580***	***6,600***	***657***	***3,050***
01SB-07	6/6/99	--	***5.36***	***4.18***	0.577	***1,360***	***270***	***139***	***586***
01SB-08	6/6/99	--	***3.41***	***9.55***	<2.5	***1,160***	***93.3***	***60.5***	***218***
01SB-09	6/6/99	--	***54.8***	***12.8***	***1.06***	***11,000***	***7,510***	***840***	***4,570***

Note: Detections above current MTCA Method A cleanup levels are shown in bold and italics.

Table 3-1. Well Construction Details

Well	Coordinates (WA State Plane) Northing (Feet)	Easting (Feet)	Top of Casing Elevation (Feet msl)	Ground Elevation (Feet msl)	Total Depth of Boring (Feet bgs)	Total Depth of Well (Feet bgs)	Depth of Screen Interval (Feet bgs)	Elevation of Screen Interval (Feet msl)
01MW-01	245454.603	1256198.248	46.48	46.76	25.00	25.25	10 - 25	36.76 - 21.76
01MW-02	245585.027	1256198.518	44.78	45.15	25.00	24.91	10 - 25	35.15 - 20.15
01MW-03	245597.585	1256160.493	44.35	44.75	25.20	25.15	10 - 25	34.75 - 19.75
01MW-04	245563.117	1256163.148	45.08	45.56	25.00	24.90	10 - 25	35.56 - 20.56
01MW-05	245569.311	1256114.025	45.40	45.77	25.00	24.88	10 - 25	35.77 - 20.77
01MW-06	245452.677	1256064.638	47.74	48.23	25	25.10	10 - 25	38.23 -23.23
01MW-07	245570.711	1255975.885	45.17	45.53	30	28.17	15 - 30	30.53 - 15.53
01MW-08	245570.471	1256070.985	45.21	45.63	25	24.93	10 - 25	35.63 - 20.63
01MW-09	245602.062	1256103.039	43.91	44.37	25	24.70	10 - 25	34.37 - 19.37
01MW-10	245580.377	1256246.968	45.02	45.35	25	24.90	10 - 25	35.35 - 20.35
01MW-11	245545.081	1256368.92	46.10	46.45	30	29.90	15 - 30	31.45 - 16.45
01MW-12	245444.877	1256316.069	45.84	46.29	20	20.00	5 - 20	40.84 - 25.84
01MW-13	245317.347	1256313.287	46.36	46.81	20	19.88	15 - 20	31.81 - 26.81

Table 3-2. Well Development and Sampling Parameters

Well	Date	Gallons Purged	pH	Temperature (Celsius)	Conductivity (mS/cm)	Turbidity (NTU)
01MW-01	11/15/00	15	7.1	15.3	0.600	35
	11/16/00	na	6.9	14.8	0.483	3
01MW-02	11/15/00	15	6.9	15.4	0.742	54
	11/16/00	na	6.8	15.3	0.724	52
01MW-03	11/15/00	15	6.7	15.1	0.519	876
	11/16/00	na	6.8	15.0	0.291	57
01MW-04	11/13/00	45	6.7	15.2	0.294	> 1,000
	11/16/00	na	6.5	15.1	0.216	60
01MW-06	11/29/00	45	7.2	14.3	0.980	10
01MW-07	11/30/00	7	6.9	15	0.689	34
	12/1/00	na	6.9	12	0.699	3
01MW-08	11/30/00	70	7.1	15	0.684	84
	12/1/00	na	7.1	13	0.980	10
01MW-09	11/30/00	50	7.0	16	0.560	8
	12/1/00	na	6.9	14	0.554	10
01MW-11	11/30/00	21	7.1	14	0.544	110
	12/1/00	na	7.1	13	0.641	13
01MW-12	12/4/00	40	6.8	12	1.020	53
	12/5/00	na	6.7	9.6	1.00	10
01MW-13	12/4/00	54	7.1	12	0.693	245
01MW-13	12/5/00	na	6.7	10.8	0.685	10

Note: mS/cm = millisiemens per centimeter
NTU = Nephlemetric Turbid Units
na = Not applicable

Table 3-3. Water Levels Measured at 2737 West Commodore Way, December 5, 2000

Well	Date Measured	Top of Casing Elevation (Feet msl)	Ground Elevation (Feet msl)	Total Depth of Well (Feet bgs)	Depth of Fuel (Feet bgs)	Depth of Water (Feet bgs)	Fuel Thickness (Feet)	Water Elevation (Feet msl)
01MW-01	12/5/00	46.48	46.76	25.25	0.00	14.47	0.00	32.01
01MW-02	12/5/00	44.78	45.15	24.91	0.00	15.70	0.00	29.08
01MW-03	12/5/00	44.35	44.75	25.15	0.00	15.30	0.00	29.05
01MW-04	12/5/00	45.08	45.56	24.90	0.00	15.07	0.00	30.01
01MW-05	12/5/00	45.40	45.77	24.88	15.47	20.75	5.28	28.87
01MW-06	12/5/00	47.74	48.23	25.10	0.00	16.30	0.00	31.44
01MW-07	12/5/00	45.17	45.53	28.17	0.00	23.51	0.00	21.66
01MW-08	12/5/00	45.21	45.63	24.93	0.00	16.75	0.00	28.46
01MW-09	12/5/00	43.91	44.37	24.70	0.00	17.01	0.00	26.90
01MW-10	12/5/00	45.02	45.35	24.90	0.00	24.07	0.00	20.95
01MW-11	12/5/00	46.10	46.45	29.90	0.00	23.12	0.00	22.98
01MW-12	12/5/00	45.84	46.29	20.00	0.00	6.75	0.00	39.09
01MW-13	12/5/00	46.36	46.81	19.88	0.00	7.40	0.00	46.81

Table 4-1. Analytical Results for TPH, Lead, and PCP in Soil at 2737 West Commodore Way (mg/kg) (Page 1 of 8)

	Lead	Gasoline	Benzene	Toluene	Ethylbenzene	Xylene	PCP	Diesel	Oil
MTCA[1/]	**250**	**100[2/]**	**0.03**	**7**	**6**	**9**	**8.33[3/]**	**2,000**	**2,000**
Upper Rail Line Spur									
SB-21-2	8.44	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-21-5	6.19	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-21-10	5.14	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-21-15	5.56	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-21-20	2.19	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-21-25	2.18	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-22-2	5.93	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-22-5	6.61	***266***	< 0.250	< 0.250	< 0.250	< 0.500	na	19.4	< 25.0
SB-22-10	5.92	***293***	< 0.250	< 0.250	< 0.250	< 0.500	na	***6,490***	< 525
SB-22-15	23.4	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-23-2	9.10	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-23-5	10.50	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-23-10	5.62	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-23-15	5.84	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
Upper Tank Yard									
SB-11-2	4.06	81.9	< 0.100	< 0.100	0.300	0.252	na	26.5	< 25.0
SB-11-5	3.79	< 5.00	< 0.0500	< 0.0500	0.223	0.890	na	10.5	< 25.0
SB-11-10	2.46	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-11-15	2.34	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-12-2	4.23	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-12-5	3.51	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-12-10	2.34	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-12-15	2.4	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-13-2	23.1	***9,340***	***14.3***	< 13.5	***54.8***	< 75.0	na	***10,600***	1,500
SB-13-5	4.93	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	10.1	< 25.0
SB-13-10	2.50	5.57	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0

Table 4-1. Analytical Results for TPH, Lead, and PCP in Soil at 2737 West Commodore Way (mg/kg) (Page 2 of 8)

	Lead	Gasoline	Benzene	Toluene	Ethylbenzene	Xylene	PCP	Diesel	Oil
MTCA[1/]	**250**	**100[2/]**	**0.03**	**7**	**6**	**9**	**8.33[3/]**	**2,000**	**2,000**
SB-13-15	2.59	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-13-20	6.47	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-14-2	10.6	< 5.00	< 0.0500	< 0.0500	0.0587	0.102	na	< 10.0	< 25.0
SB-14-5	3.78	< 5.00	0.0983	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-14-10	2.29	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-14-15	2.21	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-15-2	28	***902***	< 0.500	< 0.500	< 3.00	< 6.00	na	***2,910***	265
SB-15-5	7.29	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	11.5	< 25.0
SB-15-10	2.35	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-15-15	2.02	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-16-2	8.01	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-16-5	2.73	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-16-10	2.37	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-16-15	2.02	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-17-2	6.88	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-17-5	2.72	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-17-10	2.15	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-17-15	1.92	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
Lower Tank Yard									
SB-18-2	3.02	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-18-5	3.48	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-18-6	26.10	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	191	369
SB-18-10	2.38	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-18-15	1.97	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-19-2	5.00	***1,500***	< 1.00	< 1.00	< 1.70	< 8.00	na	***4,070***	< 275
SB-19-5	4.60	***960***	< 0.500	< 0.500	< 0.500	< 6.00	na	1,340	< 75.0
SB-19-10	2.48	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0

Table 4-1. Analytical Results for TPH, Lead, and PCP in Soil at 2737 West Commodore Way (mg/kg) (Page 3 of 8)

	Lead	Gasoline	Benzene	Toluene	Ethylbenzene	Xylene	PCP	Diesel	Oil
MTCA[1]	**250**	**100[2]**	**0.03**	**7**	**6**	**9**	**8.33[3]**	**2,000**	**2,000**
SB-19-15	2.14	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-19-20	2.63	< 5.00	0.0593	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-20-2	6.27	25	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	190	29.4
SB-20-5	3.19	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-20-10	2.28	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-20-15	1.88	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-24-2	4.04	58.4	< 0.0500	< 0.0500	< 0.0643	< 0.164	na	***2,610***	< 1030
SB-24-5	6.37	88.9	< 0.0500	< 0.0500	< 0.235	< 0.274	na	414	54.2
SB-24-10	15.7	***252***	< 0.236	< 0.0950	< 0.910	< 1.34	na	366	60.9
SB-24-15	2.51	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-24-20	5.92	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
PCP/Diesel Mixing Area (Lower Tank Yard)									
SS-01	na	na	na	na	na	na	3.87	na	na
SS-02	na	na	na	na	na	na	< 1.25	na	na
SS-03	na	na	na	na	na	na	< 2.50	na	na
SS-04	na	na	na	na	na	na	< 0.500	na	na
SB-01-0.6	na	na	na	na	na	na	0.930	na	na
SB-01-2	9.14	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	< 0.250	114	116
SB-01-5	3.86	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0871	40.9	55.9
SB-01-10	2.62	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0812	47.2	26.2
SB-01-14	2.54	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0578	< 10.0	< 25.0
SB-02-0.6	na	na	na	na	na	na	1.15	na	na
SB-02-2	3.34	***217***	< 0.200	< 0.200	< 0.200	< 0.400	< 0.250	1,400	158
SB-02-5	6.26	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0615	15.3	< 25.0
SB-02-10	6.17	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0613	14.0	< 25.0
SB-02-14	4.60	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0585	< 10.0	< 25.0
SB-03-0.6	9.23	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	***202***	***2,010***	***4,780***
SB-03-2	3.36	***1,670***	< 1.00	< 3.20	< 7.00	< 16.2	< 0.500	***14,700***	***6,350***
SB-04-0.6	na	na	na	na	na	na	***803***	na	na

Table 4-1. Analytical Results for TPH, Lead, and PCP in Soil at 2737 West Commodore Way (mg/kg) (Page 4 of 8)

	Lead	Gasoline	Benzene	Toluene	Ethylbenzene	Xylene	PCP	Diesel	Oil
MTCA[1]	**250**	**100[2]**	**0.03**	**7**	**6**	**9**	**8.33[3]**	**2,000**	**2,000**
SB-04-2	4.55	***513***	< 0.250	< 0.250	< 0.470	< 0.875	1.26	***5,670***	***2,320***
SB-04-5	5.13	8.42	< 0.0500	< 0.0500	< 0.0500	< 0.100	***20.9***	217	260
SB-04-10	3.07	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.2330	< 25.0	< 25.0
SB-05-0.6	na	na	na	na	na	na	2.18	na	na
SB-05-2	5.87	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0761	< 10.0	< 25.0
SB-05-5	5.59	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.264	11.1	< 25.0
SB-05-10	2.66	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0981	< 10.0	< 25.0
Former Rail Line Spur Behind Warehouse									
SB-06-5	8.64	10.6	< 0.0500	< 0.0500	< 0.0500	< 0.100	< 0.250	553	369
SB-06-10	3.58	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0548	< 10.0	< 25.0
SB-06-15	9.36	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0548	< 10.0	< 25.0
SB-07-5	8.33	***1,240***	***2.17***	< 1.00	***7.6***	***18.2***	< 0.250	1,190	783
SB-07-10	9.81	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	< 0.250	< 10.0	< 25.0
SB-07-15	9.54	7.56	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0572	< 10.0	< 25.0
SB-08-5	9.52	26.2	< 0.0500	< 0.0500	< 0.0500	< 0.100	0.0560	< 10.0	< 25.0
SB-08-10	8.34	15	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	447	< 25.0
SB-08-15	9.44	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-09-5	7.88	17.1	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	30.2	< 25.0
SB-09-10	7.28	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-09-15	4.17	8.99	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-10-5	3.37	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-10-10	9.63	< 5.00	< 0.0500	< 0.0500	< 0.0500	0.119	na	< 10.0	< 25.0
SB-10-15	2.34	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
Former Barrel Shed									
SB-26-2	3.19	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	54.1	< 25.0
SB-26-4	9.18	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	10.7	< 25.0
SB-26-9	2.45	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-26-14	2.89	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0

Table 4-1. Analytical Results for TPH, Lead, and PCP in Soil at 2737 West Commodore Way (mg/kg) (Page 5 of 8)

	Lead	Gasoline	Benzene	Toluene	Ethylbenzene	Xylene	PCP	Diesel	Oil
MTCA[1]	**250**	**100[2]**	**0.03**	**7**	**6**	**9**	**8.33[3]**	**2,000**	**2,000**
SB-26-19	2.37	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-27-2	4.63	56	< 0.0500	< 0.0500	< 0.0500	< 0.150	na	562	472
SB-27-5	2.79	***121***	< 0.100	< 0.100	< 0.100	< 0.314	na	1,190	< 525
SB-27-10	7.61	71	< 0.0500	< 0.0500	< 0.0500	< 0.163	na	242	316
SB-27-15	5.56	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-27-20	2.01	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-28-2	2.41	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	12.3	< 25.0
SB-28-5	4.62	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-28-10	3.02	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-28-15	3.66	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-28-20	2.48	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-29-2	13.3	***536***	< 0.500	< 0.500	< 0.500	< 1.83	na	***3,220***	1,160
SB-29-5	4.27	***393***	< 0.200	< 0.200	< 0.560	< 1.12	na	1,930	488
SB-29-10	5.28	6.97	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-29-15	3.86	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-29-20	2.31	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-29-25	2.15	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-30-2	7.22	***5,120***	< 1.00	< 1.00	< 9.12	< 33.0	na	832	< 275
SB-30-5	3.41	19.8	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-30-10	3.82	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-30-15	3.40	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-30-20	2.50	18.7	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	16.5	< 25.0
SB-30-25	2.31	< 5.00	0.0853	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-31-2	53.9	***577***	< 0.512	< 0.248	< 0.824	< 2.52	na	***11,400***	***7,730***
SB-31-5	5.18	13.5	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-31-10	3.43	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-31-15	2.30	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-31-20	2.14	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-31-25	1.80	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0

Table 4-1. Analytical Results for TPH, Lead, and PCP in Soil at 2737 West Commodore Way (mg/kg) (Page 6 of 8)

	Lead	Gasoline	Benzene	Toluene	Ethylbenzene	Xylene	PCP	Diesel	Oil
MTCA[1/]	**250**	**100[2/]**	**0.03**	**7**	**6**	**9**	**8.33[3/]**	**2,000**	**2,000**
Former AST Area									
SB-32-2	2.91	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	11.6	< 25.0
SB-32-5	3.45	*216*	< 0.200	< 0.200	< 0.200	< 0.508	na	15.7	< 25.0
SB-32-10	5.28	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-32-15	2.89	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-32-20	2.15	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-32-25	1.77	< 5.00	0.0513	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-33-2	8.46	10.9	< 0.0500	< 0.0641	< 0.0500	< 0.100	na	60.5	123
SB-33-5	2.22	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-33-10	< 0.331	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-33-15	6.92	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-33-20	2.49	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-33-25	1.95	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-34-2	17.1	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	1,200	1,910
SB-34-5	2.26	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-34-10	3.62	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-34-15	2.82	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-34-20	2.30	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-34-25	1.95	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-43-2	12.1	93	< 0.0500	< 0.0500	< 0.0876	< 0.292	na	549	477
SB-43-5	11.8	31	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	185	124
SB-43-10	4.65	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-43-15	2.91	7.77	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-43-20	2.29	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-43-25	2.24	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-43-30	3.28	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-45-2	*226*	*3,940*	<2.50	<4.15	<25.0	<85.0	na	*2,500*	*2,800*
SB-45-5	4.86	*557*	<0.500	<0.500	<0.500	<1.30	na	*2,220*	<75.0
SB-45-10	3.50	<5.00	<0.0500	<0.0500	<0.0500	<0.100	na	<10.0	<25.0

Table 4-1. Analytical Results for TPH, Lead, and PCP in Soil at 2737 West Commodore Way (mg/kg) (Page 7 of 8)

	Lead	Gasoline	Benzene	Toluene	Ethylbenzene	Xylene	PCP	Diesel	Oil
MTCA[1/]	**250**	**100[2/]**	**0.03**	**7**	**6**	**9**	**8.33[3/]**	**2,000**	**2,000**
Former LUST Area									
SB-35-2	115	5.2	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	22.9	51.7
SB-35-5	26.6	***192***	< 0.100	< 0.100	< 0.780	< 1.72	na	1,190	631
SB-35-10	12.9	41.2	< 0.0500	< 0.0500	< 0.0500	< 0.120	na	381	58.3
SB-35-15	2.68	***1,640***	< 1.00	< 1.00	< 2.38	< 11.0	na	***9,440***	1,160
SB-35-20	2.22	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-35-25	2.07	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	46.9	< 25.0
SB-36-2	11.60	5.27	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	15.2	< 25.0
SB-36-5	4.62	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	11.2	27.3
SB-36-10	4.76	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-36-15	4.48	***4,340***	< 7.70	< 20.4	***33.8***	***171***	na	***11,300***	< 275
SB-36-20	1.99	< 5.00	0.130	< 0.0500	0.130	0.632	na	< 10.0	< 25.0
SB-36-25	5.63	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
West Commodore Way Perimeter									
SB-37-2	2.01	7.79	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	184	54.2
SB-37-5	7.57	18	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	22.6	< 25.0
SB-37-10	3.01	***1,080***	< 1.00	< 1.00	< 2.40	< 2.10	na	***5,770***	< 275
SB-37-15	2.37	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	***9,130***	< 275
SB-37-20	2.11	< 5.00	0.300	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-37-25	1.99	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-38-2	5.63	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	12.5	< 25.0
SB-38-5	3.24	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-38-10	2.75	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-38-15	2.16	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-38-20	4.58	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-38-25	na	na	na	na	na	na	na	na	na
SB-38-30	na	na	na	na	na	na	na	na	na
SB-38-35	na	8.23	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0

Table 4-1. Analytical Results for TPH, Lead, and PCP in Soil at 2737 West Commodore Way (mg/kg) (Page 8 of 8)

	Lead	Gasoline	Benzene	Toluene	Ethylbenzene	Xylene	PCP	Diesel	Oil
MTCA[1/]	**250**	**100[2/]**	**0.03**	**7**	**6**	**9**	**8.33[3/]**	**2,000**	**2,000**
SB-39-2	5.73	34.8	< 0.0500	< 0.0500	0.167	0.567	na	***2,440***	460
SB-39-5	3.68	***605***	< 0.280	< 0.200	< 1.68	< 3.24	na	1,300	157
SB-39-10	4.80	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-39-15	2.47	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-44-2	4.13	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-44-5	3.93	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	11.4	< 25.0
SB-44-10	2.83	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-44-15	2.53	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-44-20	3.73	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0
SB-44-25	3.26	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	29.9
SB-44-30	2.11	< 5.00	< 0.0500	< 0.0500	< 0.0500	< 0.100	na	< 10.0	< 25.0

Notes: [1/] Results above the proposed MTCA Method A cleanup level for unrestricted land use are shown in bold and italics.

[2/] Proposed MTCA Method A cleanup level for gasoline without benzene and < 20% aromatics between EC8 and EC16. All other gasoline mixtures are 30 mg/kg.

[3/] Results above MTCA Method B carcinogenic cleanup level are shown in bold and italics.

< symbol indicates result is less than the method reporting limit (in parenths).

na - No analysis requested.

Table 4-2. Analytical Results for PAHs in Soil at 2737 West Commodore Way (mg/kg)

Sample	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,I)perylene	Benzo(k)fluoranthene	Chrysens	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs
Former Pentachlorophenol Mixing Area																	
SS-01	na	na	na	< 0.500	< 0.500	< 0.500	na	< 0.500	< 0.500	< 0.500	na	na	< 0.500	na	na	na	***1.75***
SS-02	na	na	na	< 0.250	< 0.250	< 0.250	na	< 0.250	< 0.250	< 0.250	na	na	< 0.250	na	na	na	0.88
SS-03	na	na	na	< 0.500	< 0.500	< 0.500	na	< 0.500	< 0.500	< 0.500	na	na	< 0.500	na	na	na	***1.75***
SS-04	na	na	na	1.63	1.71	2.13	na	0.760	1.93	< 0.100	na	na	1.05	na	na	na	***9.26***
SB-01-0.6	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	0.136	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	0.35
SB-01-2	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	0.0617	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	0.18
SB-01-5	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.0118	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.0160	0.0118	0.04
SB-01-10	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.0215	0.0116	0.04
SB-01-14	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.04
SB-02-0.6	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	0.18
SB-02-2	0.343	< 0.0500	0.153	< 0.0500	< 0.0500	< 0.0500	< 0.0500	< 0.0500	0.0766	< 0.0500	0.129	0.975	< 0.0500	0.0967	1.59	0.536	0.23
SB-02-5	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.0141	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.0116	< 0.0100	< 0.0100	0.0273	0.0133	0.04
SB-02-10	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.0106	< 0.0100	< 0.0100	< 0.0100	0.0342	0.0138	0.04
SB-02-14	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.0376	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.07
SB-03-0.6	1.74	< 1.25	2.12	5.50	3.57	3.38	2.99	< 1.25	9.94	< 1.25	5.60	2.61	2.03	2.61	11.6	16.2	***25.67***
SB03A (0.6 ft)	< 0.250	< 0.250	< 0.250	< 0.250	< 0.250	< 0.250	1.72	< 0.250	< 0.250	< 0.250	< 0.250	< 0.250	0.328	< 0.250	< 0.250	< 0.250	***1.08***
SB03B (2 ft)	3.20	< 0.100	2.91	1.21	0.822	0.399	0.647	< 0.100	1.29	< 1.00	2.21	8.70	0.255	43.7	21.1	10.8	***4.53***
SB-04-0.6	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	0.505	1.05	< 0.500	0.544	< 0.500	0.700	< 0.500	0.622	< 0.500	0.583	0.894	***2.67***
SB-04-2	0.945	0.381	1.09	0.414	0.290	0.141	0.232	< 0.100	0.630	< 0.100	0.688	2.18	0.124	4.66	6.01	3.66	***1.70***
SB-04-5	0.164	< 0.100	0.287	1.32	1.46	1.78	0.934	0.704	1.59	0.246	2.60	0.106	0.991	< 0.100	1.21	2.73	***8.09***
SB-04-10	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.0151	0.0276	0.0178	0.04
SB-05-0.6	< 0.0500	< 0.0500	< 0.0500	0.0933	0.154	0.223	0.235	0.0933	0.219	< 0.0500	0.434	< 0.0500	0.154	< 0.0500	0.426	0.381	0.96
SB-05B (2 ft)	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.117	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.15
SB-05C (5 ft)	< 0.0200	< 0.0200	< 0.0200	0.0342	0.0505	0.0749	0.0456	0.0260	0.0651	< 0.0200	0.122	< 0.0200	0.0472	< 0.0200	0.0960	0.0960	0.31
SB-05D (10 ft)	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.0107	0.0152	< 0.0100	< 0.0100	0.0143	< 0.0100	0.0303	< 0.0100	0.0107	< 0.0100	0.0312	0.0232	0.07
Former Barrel Shed																	
SB-26-2	na	na	na	< 0.0200	< 0.0200	< 0.0200	na	< 0.0200	< 0.0200	< 0.0200	na	na	< 0.0200	na	na	na	0.07
SB-26-4	na	na	na	< 0.0100	< 0.0100	< 0.0100	na	< 0.0100	< 0.0100	< 0.0100	na	na	< 0.0100	na	na	na	0.04
SB-26-9	na	na	na	< 0.0100	< 0.0100	< 0.0100	na	< 0.0100	< 0.0100	< 0.0100	na	na	< 0.0100	na	na	na	0.04
SB-27-2	na	na	na	< 0.0500	< 0.0500	< 0.0500	na	< 0.0500	< 0.0500	< 0.0500	na	na	< 0.0500	na	na	na	0.18
SB-27-5	na	na	na	< 0.100	< 0.100	< 0.100	na	< 0.100	< 0.100	< 0.100	na	na	< 0.100	na	na	na	0.35
SB-27-10	na	na	na	< 0.200	< 0.200	< 0.200	na	< 0.200	< 0.200	< 0.200	na	na	< 0.200	na	na	na	0.70

Table 4-2. Analytical Results for PAHs in Soil at 2737 West Commodore Way (mg/kg)

Sample	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,I)perylene	Benzo(k)fluoranthene	Chrysens	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs
SB-29-2	na	na	na	< 0.500	< 0.500	< 0.500	na	< 0.500	< 0.500	< 0.500	na	na	< 0.500	na	na	na	***1.75***
SB-29-5	na	na	na	< 0.200	< 0.200	< 0.200	na	< 0.200	< 0.200	< 0.200	na	na	< 0.200	na	na	na	0.70
SB-29-10	na	na	na	< 0.0100	0.0430	< 0.0100	na	< 0.0100	< 0.0100	< 0.0100	na	na	< 0.0100	na	na	na	0.07
SB-30-2	na	na	na	< 0.0500	< 0.0500	< 0.0500	na	< 0.0500	< 0.0500	< 0.0500	na	na	< 0.0500	na	na	na	0.18
SB-30-5	na	na	na	< 0.0100	< 0.0100	< 0.0100	na	< 0.0100	< 0.0100	< 0.0100	na	na	< 0.0100	na	na	na	0.04
SB-30-10	na	na	na	< 0.0100	< 0.0100	< 0.0100	na	< 0.0100	< 0.0100	< 0.0100	na	na	< 0.0100	na	na	na	0.04

Notes: Total cPAHs include sum of detections. Half of reporting limit used for non-detects.
cPAHs feature a shaded header.
Total cPAHs that exceed MTCA Method A cleanup level of 1 mg/kg are shown in bold and italics.

Table 4-3. Analytical Results for Metals in Soil at 2737 West Commodore Way (mg/kg)

Sample	Silver	Arsenic	Beryllium	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Antimony	Selenium	Thallium	Zinc
MTCA[1/]	**na**	**20**	**na**	**2**	**2,000[2/]**	**na**	**2**	**na**	**250**	**na**	**na**	**na**	**na**
Former AST Area													
SB-32-2	< 0.360	3.64	< 0.360	< 0.360	37.1	9.71	< 0.100	37.4	2.91	< 0.360	< 0.360	< 0.360	36.3
SB-32-5	< 0.350	2.69	< 0.350	< 0.350	41.4	27.1	< 0.100	57.1	3.45	< 0.350	< 0.350	< 0.350	44.8
SB-32-10	< 0.340	4.07	0.392	0.467	52.3	35.0	< 0.100	81.1	5.28	< 0.340	< 0.340	< 0.340	69.9
SB-32-15	< 0.376	2.52	< 0.376	< 0.376	37.4	21.8	< 0.100	51.5	2.89	< 0.376	< 0.376	< 0.376	43.9
SB-32-20	< 0.345	2.49	< 0.345	< 0.345	30.3	15.6	< 0.100	40.8	2.15	< 0.345	0.455	< 0.345	33.3
SB-32-25	< 0.345	2.47	< 0.345	< 0.345	24.0	12.5	< 0.345	33.9	1.77	< 0.345	< 0.345	< 0.345	27.9
SB-33-2	< 0.312	4.23	0.379	0.557	46.8	19.8	< 1.00	37.3	8.46	< 0.312	< 0.312	< 0.312	78.5
SB-33-5	< 0.347	2.07	< 0.347	0.637	46.5	13.1	< 1.00	37.5	2.22	< 0.347	< 0.347	< 0.347	30.3
SB-33-10	< 0.331	3.08	< 0.331	0.728	41.3	24.1	< 1.00	2.99	< 0.331	< 0.331	< 0.331	< 0.331	44.4
SB-33-15	< 0.345	8.16	0.377	0.654	63.6	47.8	< 1.00	72.3	6.92	< 0.345	0.580	< 0.345	74.2
SB-33-20	< 0.360	2.73	< 0.360	0.493	36.6	18.7	< 1.00	50.1	2.49	< 0.360	< 0.360	< 0.360	39.0
SB-33-25	< 0.362	7.41	< 0.362	< 0.362	29.9	15.0	< 1.00	46.0	1.95	< 0.362	< 0.362	< 0.362	31.8
SB-34-2	< 0.365	7.38	0.463	0.712	54.7	21.3	< 1.00	50.8	17.1	< 0.365	< 0.365	< 0.365	105
SB-34-5	< 0.355	2.26	< 0.355	< 0.355	28.8	13.0	< 1.00	41.6	2.26	< 0.355	< 0.355	< 0.355	30.7
SB-34-10	< 0.362	3.81	< 0.362	0.488	46.5	30.3	< 1.00	68.7	3.62	< 0.362	< 0.362	< 0.362	53.2
SB-34-15	< 0.345	2.30	< 0.345	< 0.345	40.5	21.4	< 1.00	55.7	2.82	< 0.345	< 0.345	< 0.345	43.0
SB-34-20	< 0.325	1.80	< 0.325	< 0.325	34.0	16.4	< 1.00	46.8	2.30	< 0.325	< 0.325	< 0.325	34.8
SB-34-25	< 0.365	3.82	< 0.365	< 0.365	29.4	16.4	< 1.00	41.8	1.95	< 0.365	< 0.365	< 0.365	31.6

[1/] Proposed MTCA Method A cleanup levels for unrestricted land use.

[2/] Trivalent chromium

Table 4-4. Analytical Results for VOCs in Soil at 2737 West Commodore Way (mg/kg)

	MTCA[1/]	SB-32-2	SB-32-5	SB-32-10	SB-32-15	SB-32-20	SB-32-25	SB-33-2	SB-33-5	SB-33-10	SB-33-15	SB-33-20	SB-33-25	SB-34-2	SB-34-5	SB-34-10	SB-34-15	SB-34-20	SB-34-25
Acetone	na	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Benzene	0.03	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Bromobenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Bromochloromethane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Bromodichloromethane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Bromoform	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Bromomethane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
2-butanone	na	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
n-butylbenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
sec-butylbenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
tert-butylbenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Carbon disulfide	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Carbon tetrachloride	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Chlorobenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Chloroethane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Chloroform	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Chloromethane	na	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
2-chlorotoluene	100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
4-chlorotoluene	100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Dibromochloromethane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-dibromo-3-chloropropane	na	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
1,2-dibromomethane	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Dibromomethane	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-dichlorobenzene	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,3-dichlorobenzene	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,4-dichlorobenzene	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Dichlorodifluoromethane	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1-dichloroethane	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-dichloroethane	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1-dichloroethene	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
cis-1,2-dichloroethene	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	0.417	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
trans-1,2-dichloroethene	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2-dichloropropane	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,3-dichloropropane	0.001	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100

Table 4-4. Analytical Results for VOCs in Soil at 2737 West Commodore Way (mg/kg)

	MTCA[1/]	SB-32-2	SB-32-5	SB-32-10	SB-32-15	SB-32-20	SB-32-25	SB-33-2	SB-33-5	SB-33-10	SB-33-15	SB-33-20	SB-33-25	SB-34-2	SB-34-5	SB-34-10	SB-34-15	SB-34-20	SB-34-25
2,2-dichloropropane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1-dichloropropene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
cis-1,3-dichloropropene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
trans-1,3-dichloropropene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Ethylbenzene	6	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Hexachlrobutadiene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
2-Hexanone	na	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Isopropylbenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
p-isopropyltoluene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Methylene chloride	0.02	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
4-methyl-2-pentanone	na	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Naphthalene	5	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
n-propylbenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Styrene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1,1,2-tetrachloroethane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1,2,2-tetrachloroethane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Tetrachloroethene	0.05	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Toluene	7	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2,3-trichlorobenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2,4-trichlorobenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1,1-trichloroethane	2	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,1,2-trichloroethane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Trichloroethene	0.03	< 0.100	< 0.100	***0.271***	***0.381***	***0.413***	***0.545***	< 0.100	< 0.100	***0.247***	***0.360***	***0.266***	< 0.100	< 0.100	0.119	***0.213***	***0.332***	***0.422***	***0.209***
Trichlorofluoromethane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2,3-trichloropropane	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,2,4-trimethylbenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1,3,5-trimethylbenzene	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
Vinyl chloride	na	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
m,p-xylene	9	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200
o-xylene	9	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100

[1/] Proposed MTCA Method A cleanup levels for unrestricted soil.

Table 4-5. Analytical Results for SVOCs in Soil at 2737 West Commodore Way (mg/kg)

	SB-32-2	SB-32-5	SB-32-10	SB-32-15	SB-32-20	SB-32-25	SB-33-2	SB-33-5	SB-33-10	SB-33-15	SB-33-20	SB-33-25	SB-34-2	SB-34-5	SB-34-10	SB-34-15	SB-34-20	SB-34-25
Acenaphthene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Acenaphthylene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Aniline	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Anthracene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Benzoic Acid	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 5.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Benzo (a) anthracene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Benzo (b) fluoranthene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Benzo (k) fluoranthene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Benzo (g,h,I) perylene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Benzo (a) pyrene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Benzyl alcohol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
bis (2-chloroethoxy) methane	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
bis (2-chloroethyl) ether	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
bis (2-chloroisopropyl) ether	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
bis (2-ethylhexyl) phthalate	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
4-Bromophenyl phenyl ether	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Butyl benzyl phthalate	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Carbazole	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
4-chloroaniline	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
2-chloronaphthalene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
4-chloro-3-methylphenol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
2-chlorophenol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
4-chlorophenyl phenyl ether	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Chrysene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Dibenz (a,h) anthracene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Dibenzofuran	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Di-n-butyl phthalate	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
1,3-dichlorobenzene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
1,4-dichlorobenzene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
1,2-dichlorobenzene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
3,3'-dichlorobenzidine	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 25.0	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00
2,4-dichlorophenol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Diethyl phthalate	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330

Table 4-5. Analytical Results for SVOCs in Soil at 2737 West Commodore Way (mg/kg)

	SB-32-2	SB-32-5	SB-32-10	SB-32-15	SB-32-20	SB-32-25	SB-33-2	SB-33-5	SB-33-10	SB-33-15	SB-33-20	SB-33-25	SB-34-2	SB-34-5	SB-34-10	SB-34-15	SB-34-20	SB-34-25
2,4-dimethylphenol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Dimethyl phthalate	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
4,6-dinitro-2-methylphenol	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
2,4-dinitrophenol	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
2,4-dinitrotoluene	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
2,6-dinitrotoluene	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
Di-n-octyl phthalate	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Fluoranthene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Fluorene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Hexachlorobenzene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Hexachlorobutadiene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Hexachlorocyclopentadiene	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
Hexachloroethane	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Indeno (1,2,3-cd) pyrene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Isophorone	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
2-methylnaphthalene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
2-methylpheonl	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
3 & 4-methylphenol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Naphthalene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
2-nitroaniline	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
3-nitroaniline	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
4-nitroaniline	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
Nitrobenzene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
2-nitrophenol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
4-nitrophenol	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
N-nitrosodiphenylamine	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
N-nitrosodi-n-propylamine	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Pentachlorophenol	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
Phenanthrene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Phenol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
Pyrene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
1,2,4-trichlorobenzene	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
2,4,5-trichlorophenol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330
2,4,6-trichlorophenol	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.165	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330	< 0.330

Table 4-6. Analytical Results for Groundwater Samples from 2737 West Commodore Way

Sample	PCP (µg/L)	Lead (µg/L)	Gasoline (µg/L)	Diesel (mg/L)	Oil (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)
MTCA[1/]	**1.0[2/]**	**5.0**	**800**	**0.500**	**0.500**	**5.0**	**1,000**	**700**	**1,000**
Former LUST Area									
01MW-01	na	< 0.00100	75.2	***1.65***	< 0.500	0.924	1.46	< 0.500	1.93
01MW-02	na	< 0.00100	***12,700***	***5.00***	< 0.500	***3,300***	***1,010***	331	***1,510***
01MW-03	na	< 0.00100	***3,620***	***1.65***	< 0.500	***1,020***	26.9	63.6	210
01MW-04	na	< 0.00100	***7,930***	***1.86***	< 0.500	***71.2***	402	570	***2,840***
01MW-08	na	< 0.00100	< 50.0	0.404	< 0.500	< 0.500	< 0.500	< 0.500	< 1.00
01MW-09	na	< 0.00100	***2,210***	***1.07***	< 0.500	***302***	143	65.2	333
Former Barrel Shed Area									
01MW-06	***1.80***	< 0.00100	87.4	< 0.250	< 0.500	< 0.500	< 0.500	< 0.500	< 1.00
Former AST Area									
01MW-07	na	< 0.00100	< 50.0	< 0.250	< 0.500	< 1.08	< 0.500	< 0.500	< 1.00
West Commodore Way Perimeter									
01MW-11	na	< 0.00100	< 50.0	***0.504***	< 0.500	< 0.500	< 0.500	< 0.500	< 1.00
Lower Tank Yard Area									
01MW-12	na	< 0.00100	***802***	***1.07***	< 0.500	***98.4***	11.0	17.4	24.6
Upper Tank Yard Area									
01MW-13	na	< 0.00100	254	***3.94***	0.513	< 0.500	0.694	< 0.817	< 1.23

Notes: [1/]Results above the proposed MTCA Method A cleanup level are shown in bold and italics.

[2/]Results above Federal MCLs are shown in bold and italics.

[3/]Proposed MTCA cleanup level for groundwater with benzene present.

na - No analysis requested.

< symbol indicates result is less than method reporting limit.

Table 5-1. Summary of Concentrations of Petroleum-Impacted Soil above Cleanup Levels (mg/kg) (Page 1 of 2)

Sample	Gasoline	Benzene	Ethylbenzene	Xylene	PCP	Diesel	Oil	cPAHs
MTCA[1]	100	0.03	6	9	8.33[2]	2,000	2,000	1
Upper Rail Line Spur								
SB-22-5	*266*	< 0.250	< 0.250	< 0.500	na	19.4	< 25.0	na
SB-22-10	*293*	< 0.250	< 0.250	< 0.500	na	*6,490*	< 525	na
Upper Tank Yard								
SB-13-2	*9,340*	*14.3*	*54.8*	< 75.0	na	*10,600*	1,500	na
SB-15-2	*902*	< 0.500	< 3.00	< 6.00	na	*2,910*	265	na
Lower Tank Yard								
SB-19-2	*1,500*	< 1.00	< 1.70	< 8.00	na	*4,070*	< 275	na
SB-19-5	*960*	< 0.500	< 0.500	< 6.00	na	1,340	< 75.0	na
SB-24-2	58.4	< 0.0500	< 0.0643	< 0.164	na	*2,610*	< 1030	na
SB-24-10	*252*	< 0.236	< 0.910	< 1.34	na	366	60.9	na
PCP/Diesel Mixing Area (Lower Tank Yard)								
SB-02-2	*217*	< 0.200	< 0.200	< 0.400	< 0.250	1,400	158	0.23
SB-03-0.6	< 5.00	< 0.0500	< 0.0500	< 0.100	*202*	*2,010*	*4,780*	*1.08*
SB03A (2 ft)	*1,670*	< 1.00	< 7.00	< 16.2	< 0.500	*14,700*	*6,350*	*4.53*
SB-04-0.6	na	na	na	na	*803*	na	na	*2.67*
SB-04-2	*513*	< 0.250	< 0.470	< 0.875	1.26	*5,670*	*2,320*	*1.70*
SB-04-5	8.42	< 0.0500	< 0.0500	< 0.100	*20.9*	217	260	*8.09*
SS-01	na	na	na	na	3.87	na	na	*1.75*
SS-03	na	na	na	na	< 2.50	na	na	*1.75*
SS-04	na	na	na	na	< 0.500	na	na	*9.26*
Former Rail Line Spur Behind Warehouse								
SB-07-5	*1,240*	*2.17*	*7.6*	*18.2*	< 0.250	*1,190*	783	na
Former Barrel Shed								
SB-27-5	*121*	< 0.100	< 0.100	< 0.314	na	1,190	< 525	0.35
SB-29-2	*536*	< 0.500	< 0.500	< 1.83	na	*3,220*	1,160	*1.75*
SB-29-5	*393*	< 0.200	< 0.560	< 1.12	na	1,930	488	0.7
SB-30-2	*5,120*	< 1.00	< 9.12	< 33.0	na	832	< 275	0.18
SB-31-2	*577*	< 0.512	< 0.824	< 2.52	na	*11,400*	*7,730*	na
Former AST Area								
SB-32-5	*216*	< 0.200	< 0.200	< 0.508	na	15.7	< 25.0	na
SB-45-2	*3,940*	< 2.50	< 25.0	< 85.0	na	*2,500*	*2,800*	na
SB-45-5	*557*	< 0.500	< 0.500	< 1.30	na	*2,200*	< 75.0	na
Former LUST Area								
SB-35-5	*192*	< 0.100	< 0.780	< 1.72	na	1,190	631	na
SB-35-15	*1,640*	< 1.00	< 2.38	< 11.0	na	*9,440*	1,160	na
SB-36-15	*4,340*	< 7.70	*33.8*	*171*	na	*11,300*	< 275	na

Table 5-1. Summary of Concentrations of Petroleum-Impacted Soil Cleanup Levels (mg/kg) (Page 2 of 2)

Sample	Gasoline	Benzene	Ethylbenzene	Xylene	PCP	Diesel	Oil	cPAHs
MTCA[1/]	**100**	**0.03**	**6**	**9**	**8.33[2/]**	**2,000**	**2,000**	**1**
West Commodore Way Perimeter								
SB-37-10	***1,080***	< 1.00	< 2.40	< 2.10	na	***5,770***	< 275	na
SB-37-15	< 5.00	< 0.0500	< 0.0500	< 0.100	na	***9,130***	< 275	na
SB-39-2	34.8	< 0.0500	0.167	0.567	na	***2,440***	460	na
SB-39-5	***605***	< 0.280	< 1.68	< 3.24	na	1,300	157	na

Notes: [1/]Results above proposed MTCA Method A cleanup levels for unrestricted land use are shown in bold and italics.

[2/]Results above MTCA Method B carcinogenic cleanup level are shown in bold and italics.

< symbol indicates result is less than method reporting limit.

na - No analysis requested.

Table 5-2. Summary of Groundwater Concentrations above Cleanup Levels

Sample	Date	PCP (µg/L)	Lead (µg/L)	Gasoline (µg/L)	Diesel (mg/L)	Oil (mg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)
MTCA[1/]		**1.0[2/]**	**5.0**	**800[3/]**	**0.500**	**0.500**	**5.0**	**1,000**	**700**	**1,000**
Former LUST Area										
01MW-01	11/16/00	na	< 0.00100	75.2	***1.65***	< 0.500	0.924	1.46	< 0.500	193
01MW-02	9/28/99	na	***84.9***	12.2	***0.714***	< 0.500	***3,880***	525	230	***1,100***
01MW-02	11/16/00	na	< 0.00100	***12,700***	***5.00***	< 0.500	***3,300***	***1,010***	331	***1,510***
01MW-03	9/28/99	na	***87***	27.2	***0.944***	< 0.500	***11,300***	405	398	***1,590***
01MW-03	11/16/00	na	< 0.00100	***3,620***	***1.65***	< 0.500	***1,020***	26.9	63.6	***210***
01MW-04	9/28/99	na	***130***	18.9	***1.32***	< 0.500	***4,370***	***1,150***	606	***2,780***
01MW-04	11/16/00	na	< 0.00100	***7,930***	***1.86***	< 0.500	***71.2***	402	570	***2,840***
01MW-08	12/1/00	na	< 0.00100	< 50.0	0.404	< 0.500	< 5.00	< 0.500	< 0.500	< 1.00
01MW-09	12/1/00	na	< 0.00100	***2,210***	***1.07***	< 0.500	***302***	143	65.2	333
Former Barrel Shed Area										
01MW-06	11/30/00	***1.80***	< 0.00100	87.4	< 0.250	< 0.500	< 1.08	< 0.500	< 0.500	< 1.00
Former AST Area										
01MW-07	12/1/00	na	< 0.00100	< 50.0	< 0.250	< 0.500	< 5.00	< 0.500	< 0.500	< 1.00
West Commodore Way Perimeter										
01MW-11	12/1/00	na	< 0.00100	< 50.0	***0.504***	< 0.500	< 0.500	< 0.500	< 0.500	< 1.00
Lower Tank Yard Area										
01MW-12	12/5/00	na	< 0.00100	***802***	***1.07***	< 0.500	***98.4***	11.0	17.4	24.6
Upper Tank Yard Area										
01MW-13	12/5/00	na	< 0.00100	254	***3.94***	***0.513***	< 0.500	0.694	< 0.817	< 1.23

Notes: [1/] Results above MTCA Method A cleanup level in bold and italics
[2/] Results above Federal MCLs in bold and italics
[3/] Proposed MTCA Cleanup level for groundwater with benzene present
na = No analysis requested
< symbol indicates result is less than laboratory method reporting limit.

APPENDIX A

SITE PHOTOGRAPHS

Property Photographs: 2737 West Commodore Way

1. Looking southeast at tank farm and office building.
2. Looking east along axis of former barrel shed; boiler house in background.
3. Looking north towards ship canal; TOC dock on the left.
4. Looking south at TOC pipeline on 2750 West Commodore Way.
5. Looking east towards warehouse.
6. Drums stored west of new barrel shed.
7. Looking east from front of barrel shed, wood slats mark rails of former barrel operation.
8. Looking south towards warehouse.
9. Looking south, new barrel shed in center of photograph.
10. Pump shed on west side of tank farm.
11. Fuel dispensers on east side of office building.
12. Outside overhead fuel loading rack.
13. Newer inside overhead fuel loading rack.
14. Pipelines in lower yard of tank farm.
15. Base of large AST; black material is dried petroleum product.
16. Looking north into lower yard of tank farm.
17. Looking south into upper yard of tank farm.
18. West wall of upper yard of tank farm, misc. pipes from hillside.
19. Looking west along former spur of rail line.
20. Looking southeast along former spur of rail line.
21. Looking west along former spur of rail lines behind warehouse. Pipe surfacing at ground used to receive fuel from off-loading tankers.
22. Looking east along former spur of rail lines behind warehouse.



1.


2.



3.



4.


5.





7.



8.



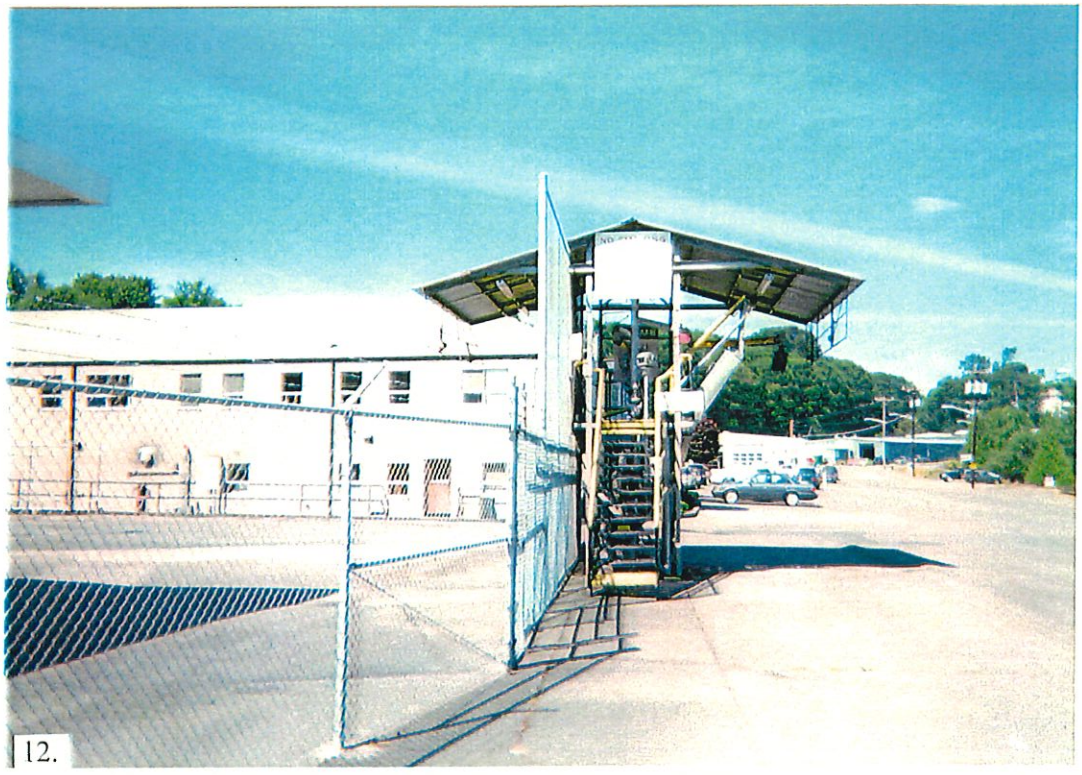
9.



10.



11.



12.



13.


14.



15.



16.



17.



18.


19.

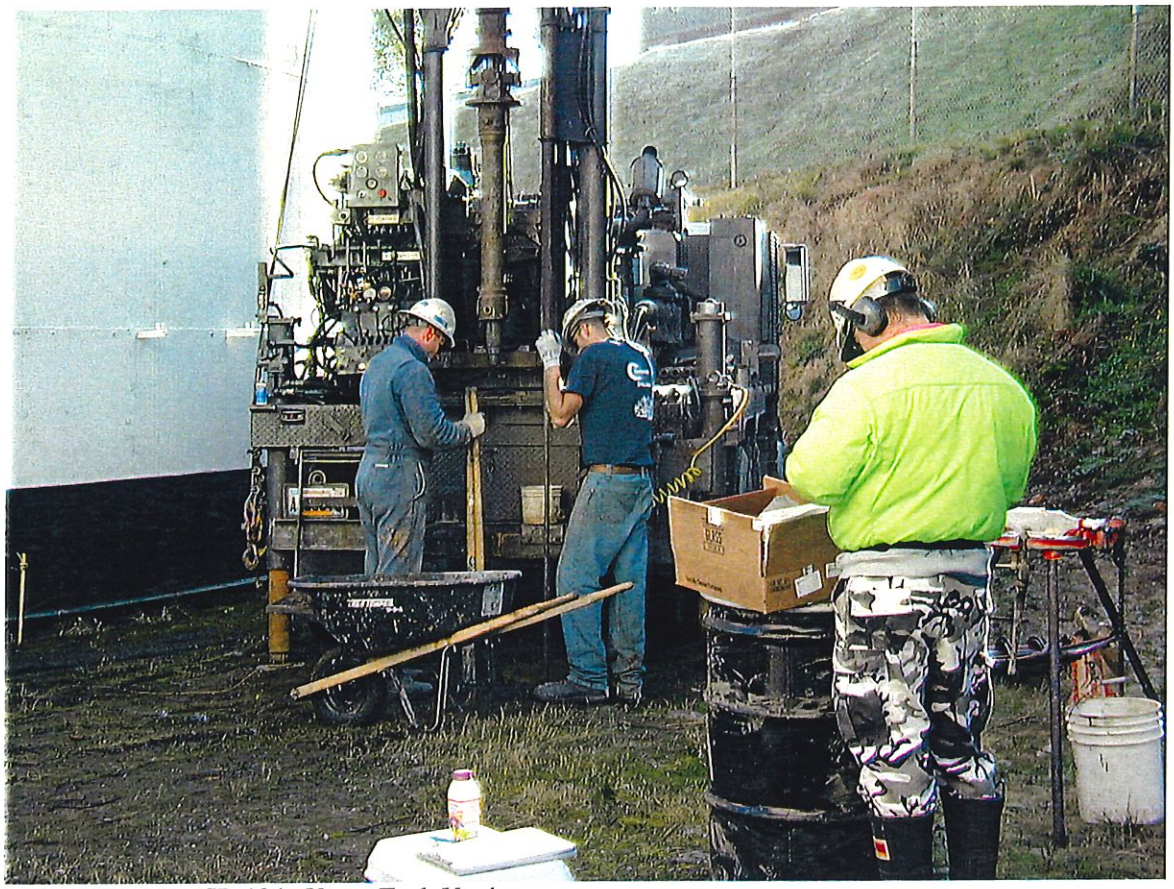

20.



21.



22.



Drill rig set up on SB-12 in Upper Tank Yard.



Horizontal oxidized layer typically found in silty sand.



Drill rig set up on SB-13; completed as monitoring well 01MW-13



Decontamination activities included washing spoons in soapy water and rinsing with methanol and water.



Typical subsurface soil. Medium-grained sand in vertical seams through fine-grained sand and silt providing migration pathway. Note discolored soil near contact.



Drilling equipment in Upper Yard.



Sample from 5-foot-depth interval in SB-18, Lower Tank Yard. Grey soil indicative of petroleum contamination.



In the tank yards, drill cuttings were shoveled into a loader bucket and transferred to a stockpile.


Looking down the boring for SB-18 in the Lower Tank Yard. Discolored soil is evident in the top 2 feet.

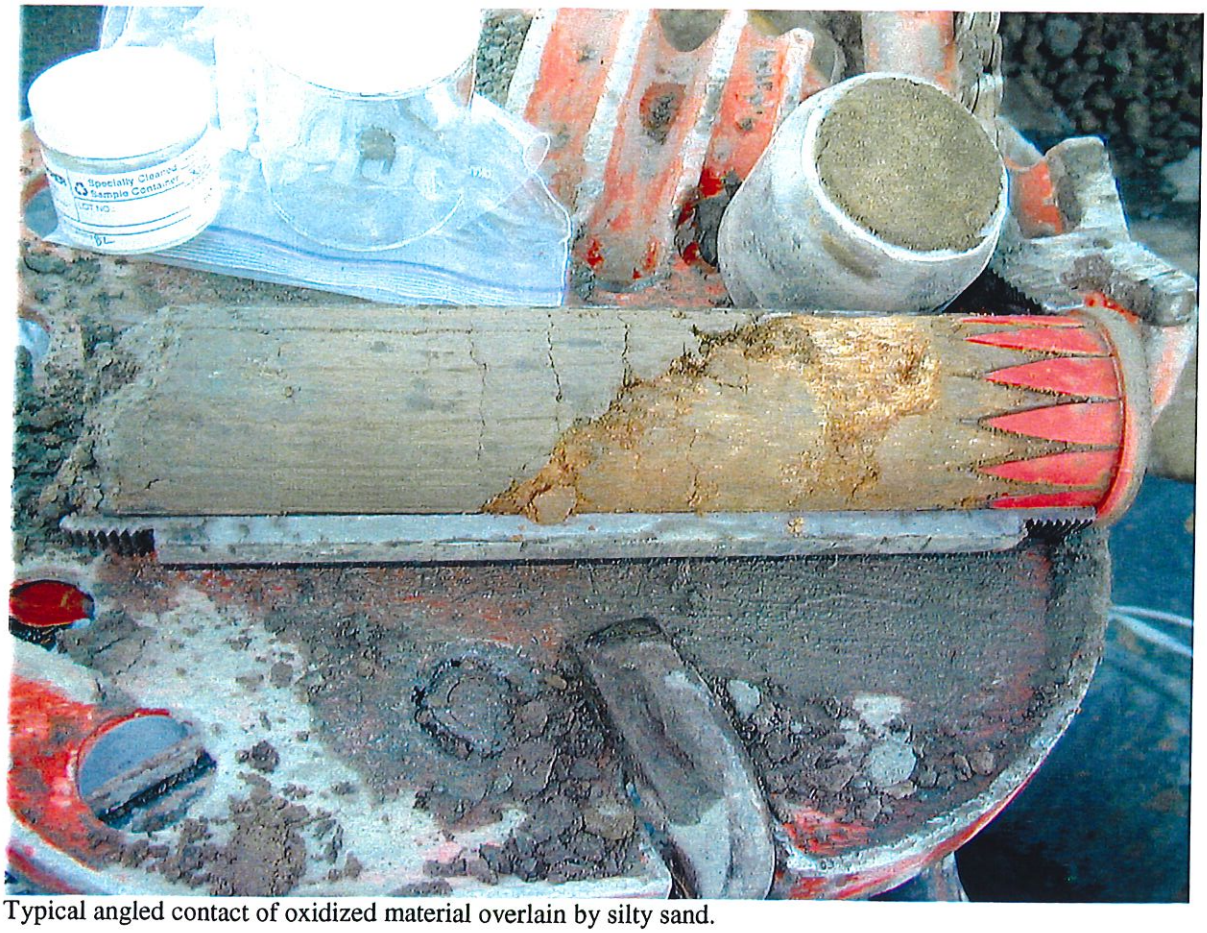


These two photographs show an oil spot in a sample collected from the 2-foot-depth interval in SB-28.





Sample collected from SB-30 showing brown silty sand in contact with medium saturated sand (left).



Typical angled contact of oxidized material overlain by silty sand.

APPENDIX B

HISTORICAL PHOTOGRAPHS

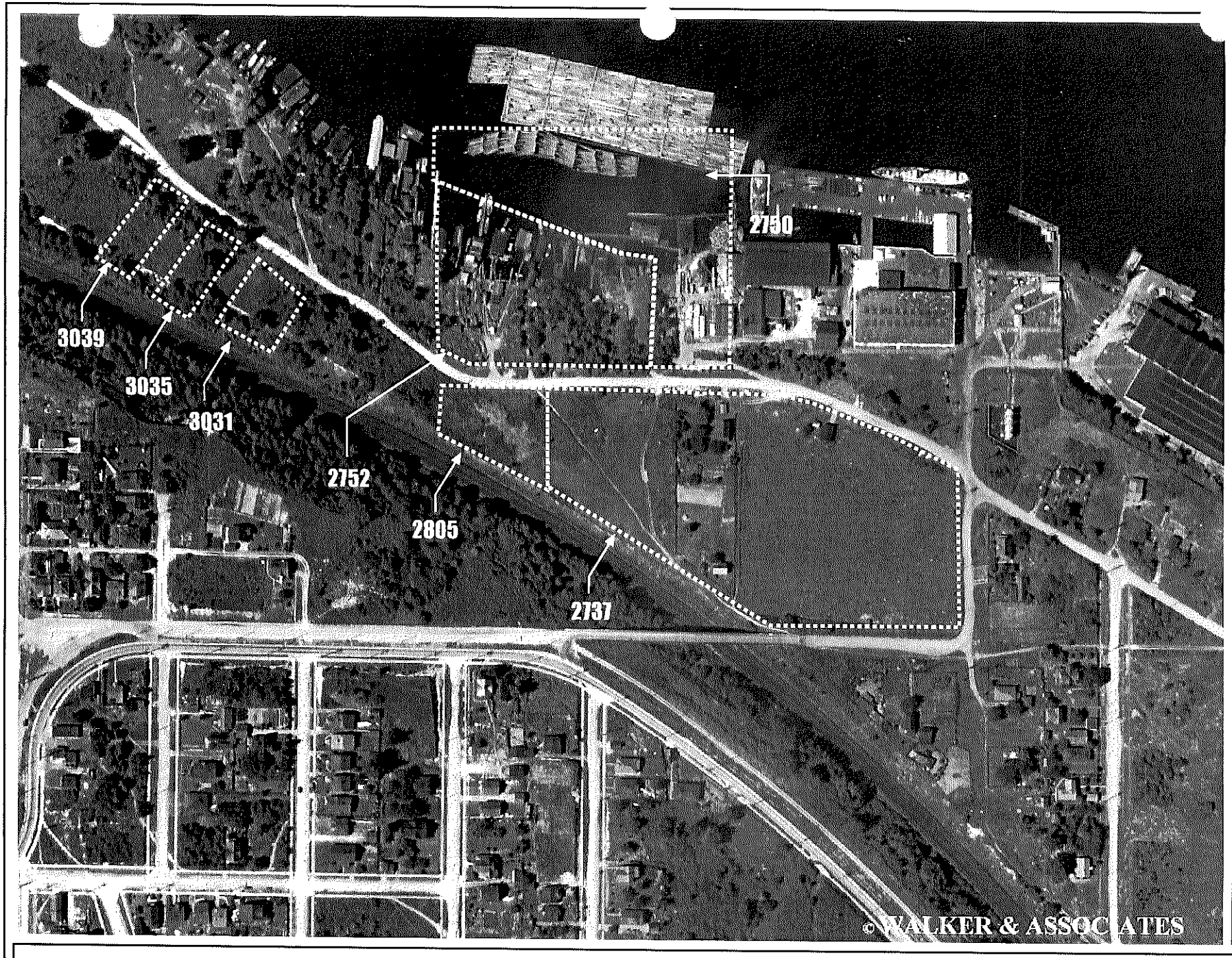


Figure B-1 Aerial Photo of West Commodore Way (1936)

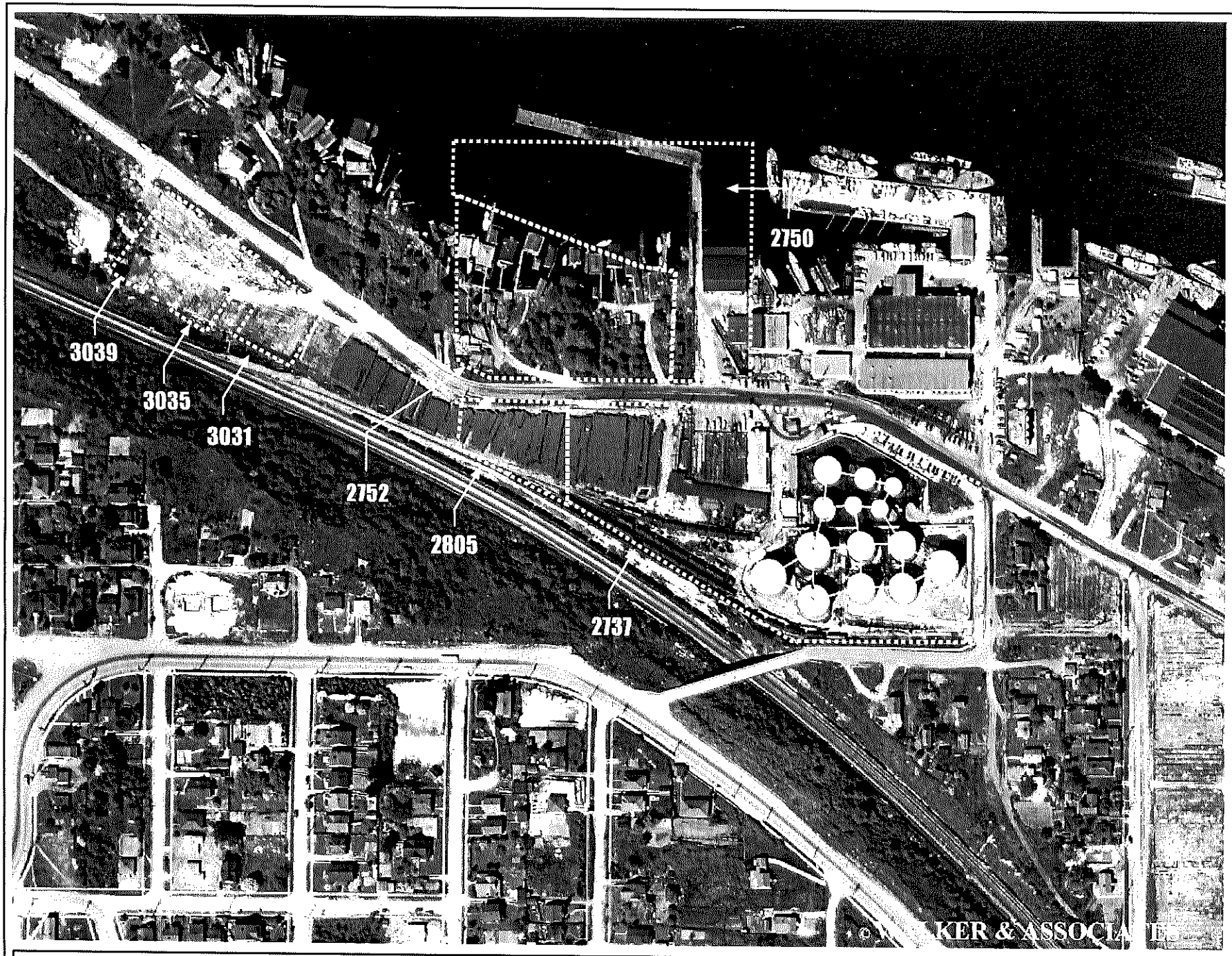


Figure B-2 Aerial Photo of West Commodore Way (1946)

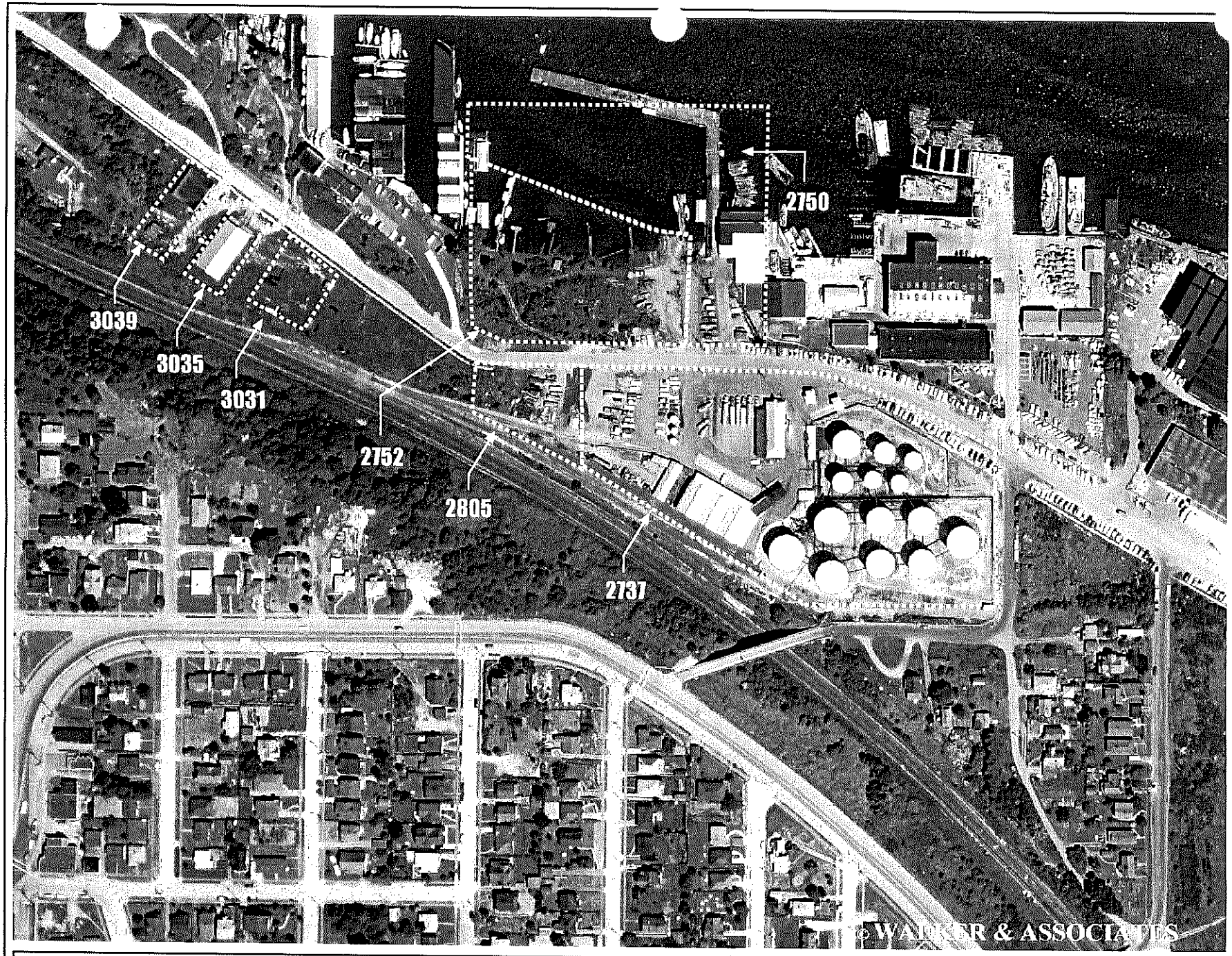


Figure B-3 Aerial Photo of West Commodore Way (1960)



Figure B-4 Aerial Photo of West Commodore Way (1974)



Figure B-5 Aerial Photo of West Commodore Way (1997)

APPENDIX C

SOIL BORING LOGS

FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-01

LOCATION: 2737 West Commodore Way

AREA: Former Penta-Diesel Mixing Area

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: Hand Auger

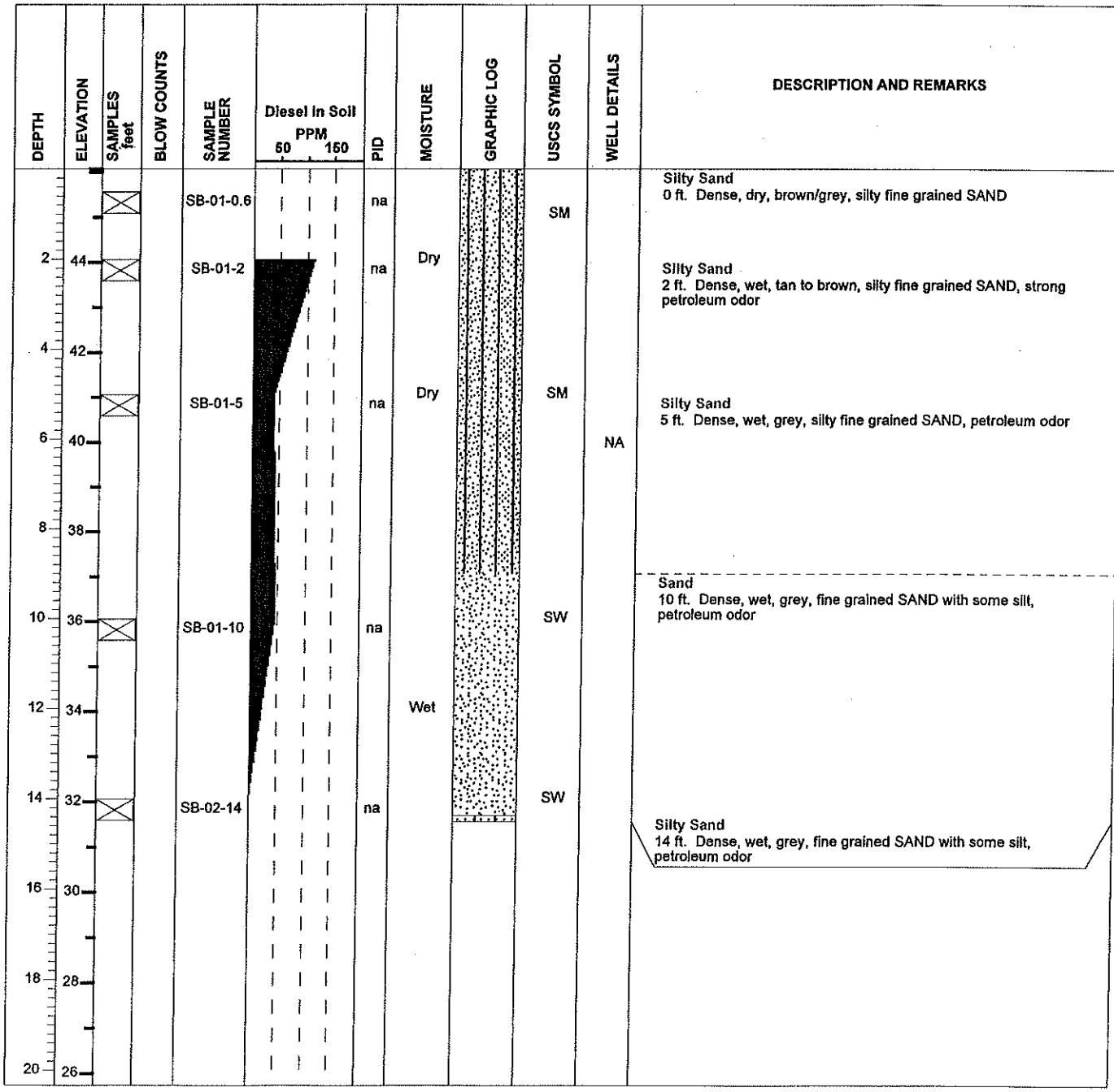
DRILLING CONTRACTOR: Foster Wheeler

DATE/TIME STARTED: 11/14/00 1030

DATE/TIME COMPLETED: 11/14/00 1215

TOTAL DEPTH: 14 feet

WATER DEPTH: ~ 10 ft



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-02

LOCATION: 2737 West Commodore Way

AREA: Former Penta-Diesel Mixing Area

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: Hand Auger

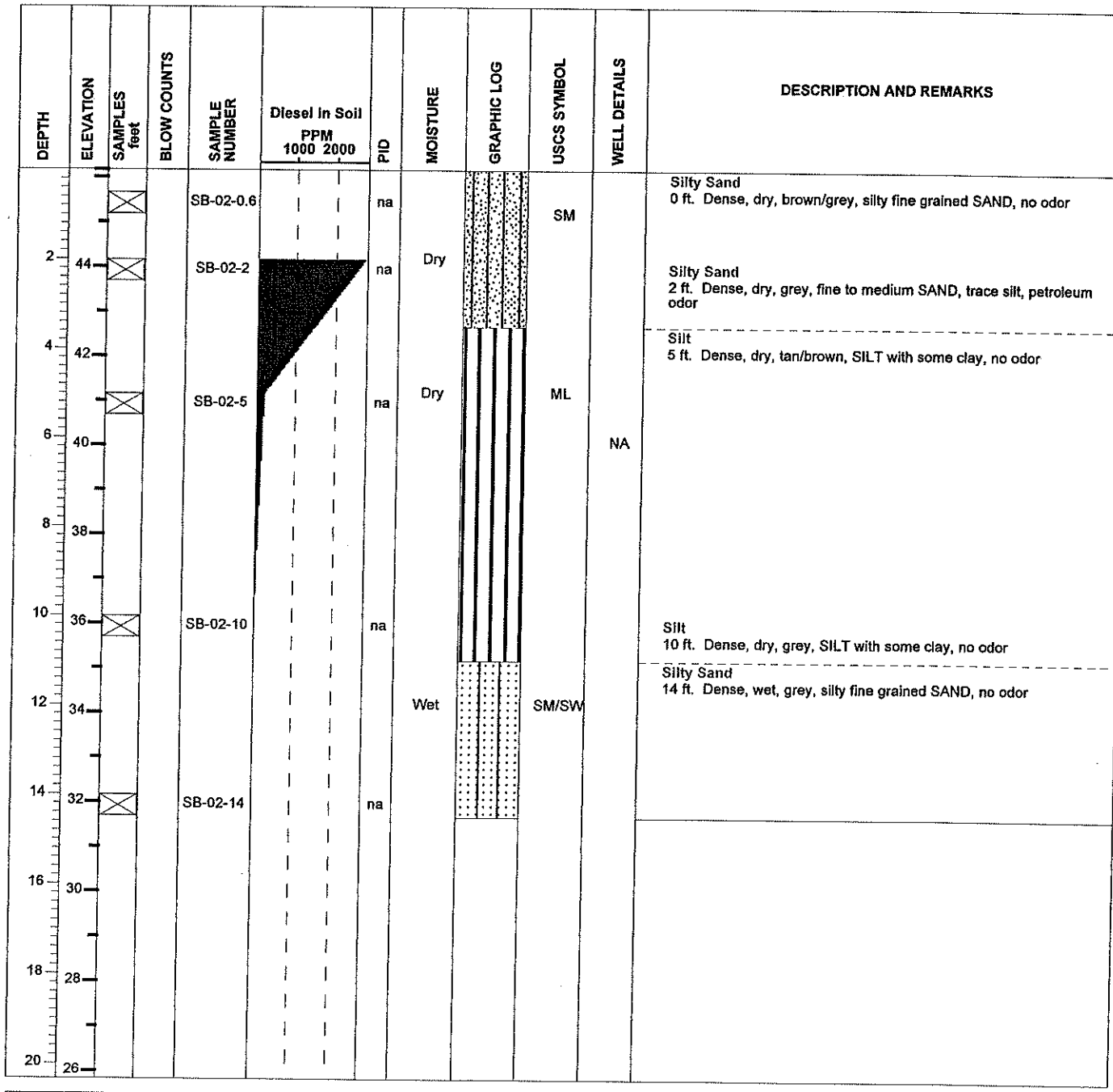
DRILLING CONTRACTOR: Foster Wheeler

DATE/TIME STARTED: 11/14/00 1310

DATE/TIME COMPLETED: 11/14/00 1500

TOTAL DEPTH: 14 feet

WATER DEPTH: ~ 7 ft



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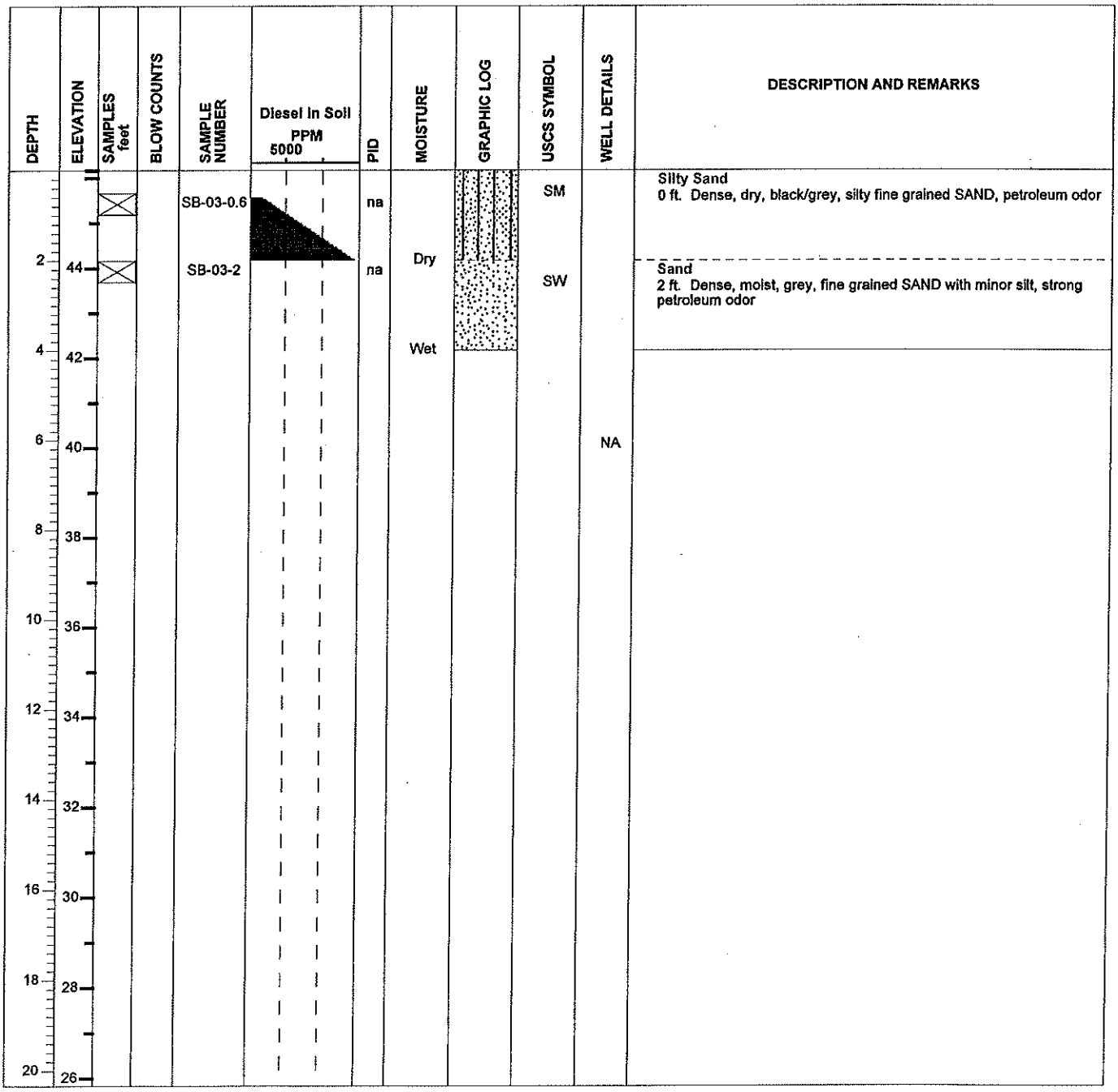
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-03
LOCATION: 2737 West Commodore Way
AREA: Former Penta-Diesel Mixing Area
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: Hand Auger
DRILLING CONTRACTOR: Foster Wheeler
DATE/TIME STARTED: 12/01/00 1315
DATE/TIME COMPLETED: 11/01/00 1400
TOTAL DEPTH: 4 feet
WATER DEPTH: ` 4 feet



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-04

LOCATION: 2737 West Commodore Way

AREA: Former Penta-Diesel Mixing Area

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: Hand Auger

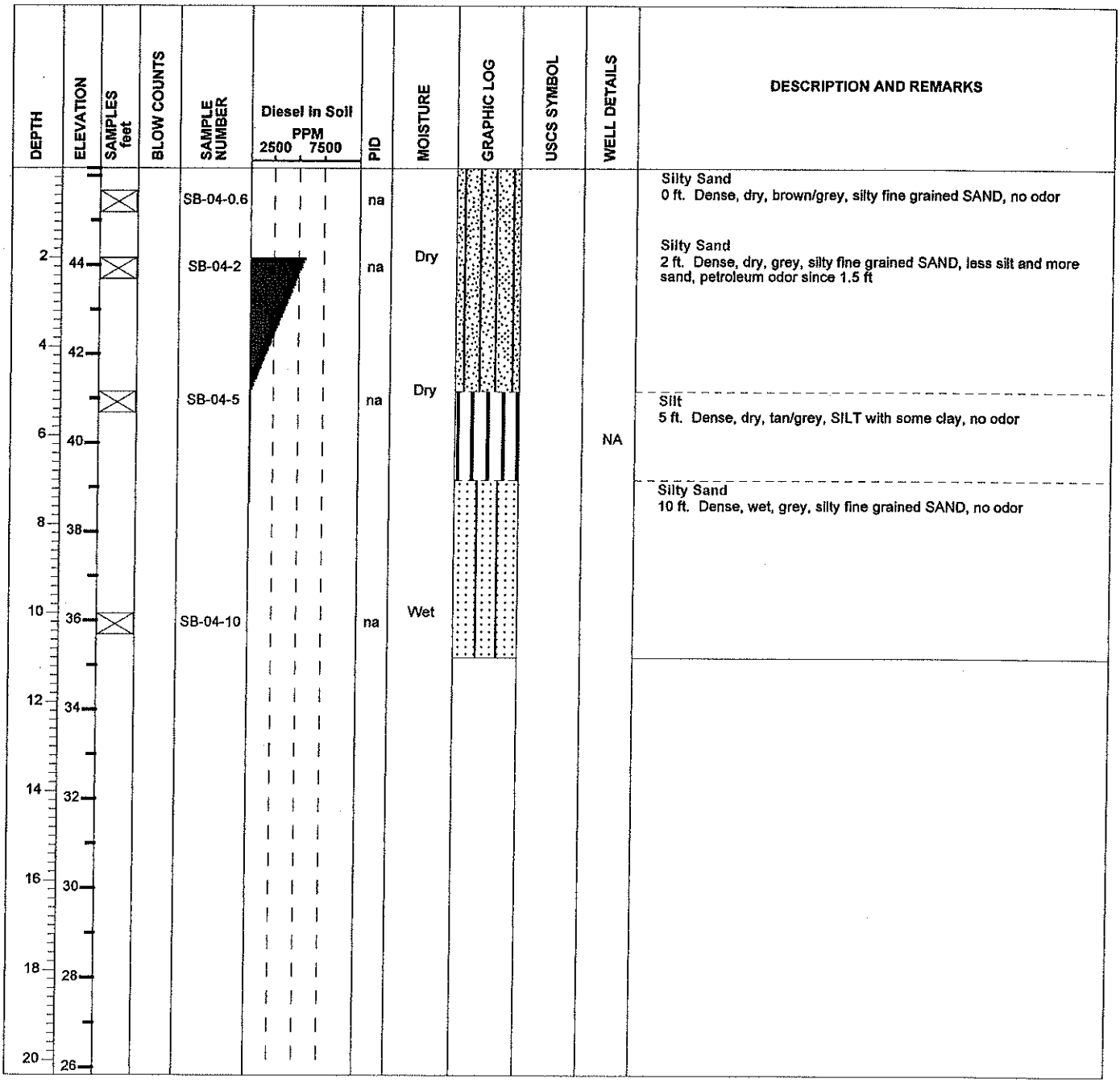
DRILLING CONTRACTOR: Foster Wheeler

DATE/TIME STARTED: 11/14/00 1500

DATE/TIME COMPLETED: 11/14/00 1600

TOTAL DEPTH: 10 feet

WATER DEPTH: ~ 7 ft



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-05
LOCATION: 2737 West Commodore Way
AREA: Former Penta-Diesel Mixing Area
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: Hand Auger
DRILLING CONTRACTOR: Foster Wheeler
DATE/TIME STARTED: 12/01/00 1115
DATE/TIME COMPLETED: 12/01/00 1300
TOTAL DEPTH: 25 feet
WATER DEPTH: ~ 7 ft

DEPTH	ELEVATION	SAMPLES feet	BLOW COUNTS	SAMPLE NUMBER	Diesel in Soil PPM 20 30 40	PID	MOISTURE	GRAPHIC LOG	USCS SYMBOL	WELL DETAILS	DESCRIPTION AND REMARKS
0				SB-05-0.6		na					Silty Sand 0 ft. Dense, dry, brown/grey, silty fine SAND, no odor
2	44			SB-05-2		na	Dry				
4	42										
5				SB-05-5		na	Dry				Silty Sand 5 ft. Same as above, dense, dry, brown/grey, silty fine grained SAND, no odor
6	40									NA	
8	38										Sand 10 ft. Dense, wet, grey, fine grained SAND with minor silt, no odor, Hanby test kit shows no detectable levels of petroleum in soil
10	36			SB-05-10		na	Wet				
12	34										
14	32										
16	30										
18	28										
20	26										

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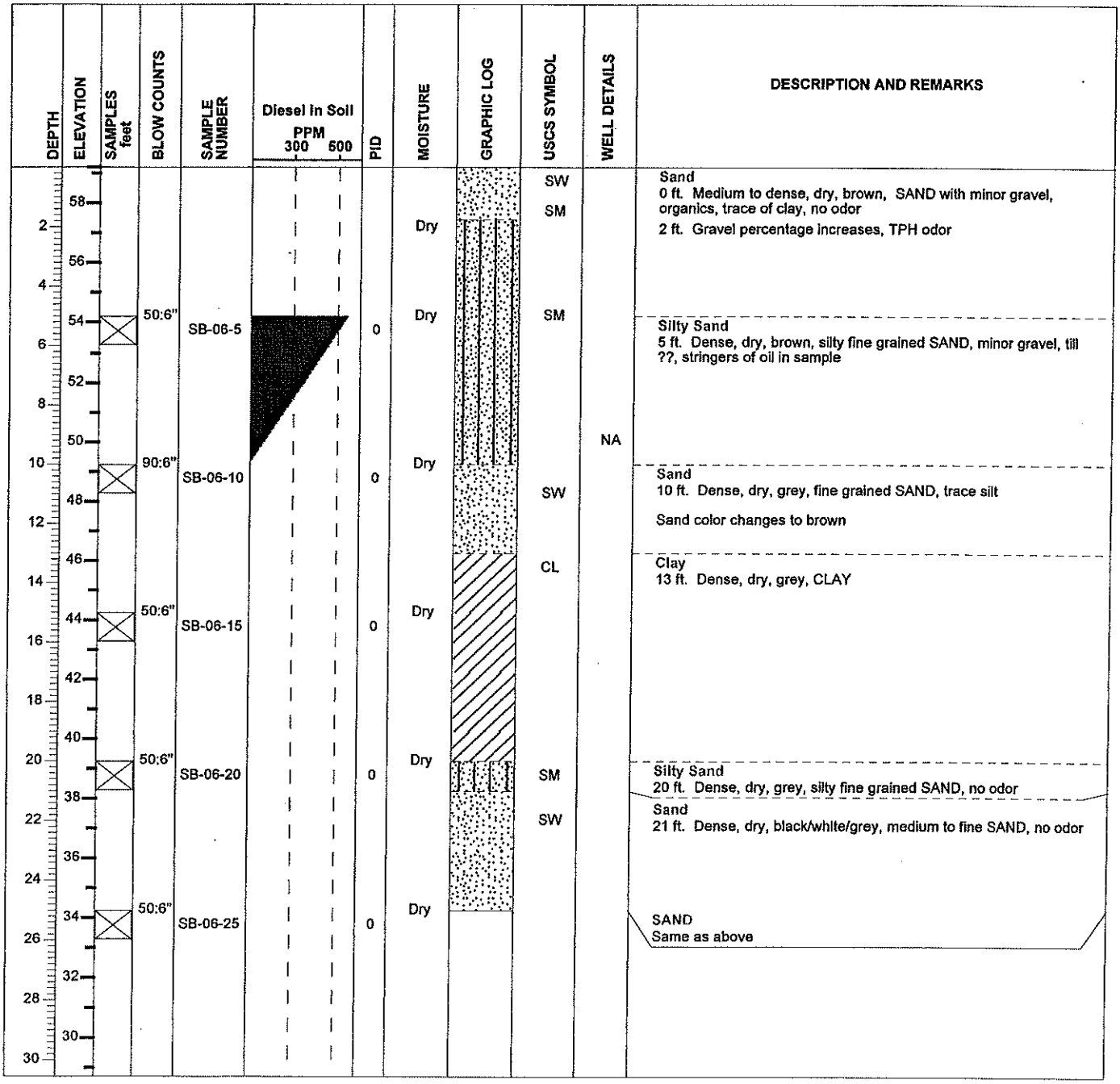
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-06
LOCATION: 2737 West Commodore Way
AREA: Former Rail Line Spurs
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/15/00 0845
DATE/TIME COMPLETED: 11/15/00 0930
TOTAL DEPTH: 25 feet
WATER DEPTH: na



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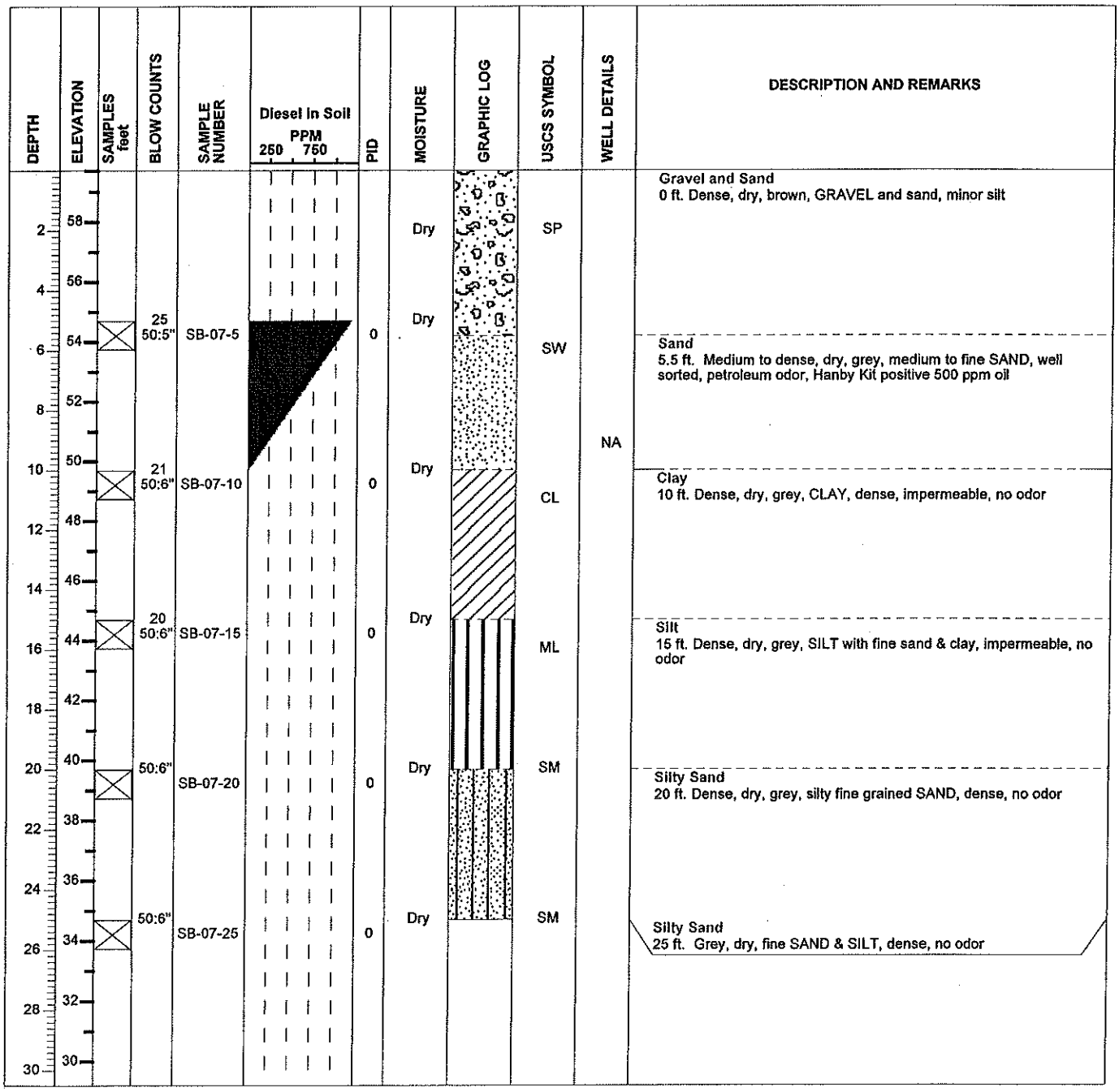
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-07
LOCATION: 2737 West Commodore Way
AREA: Former Rail Line Spurs
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/15/00 1014
DATE/TIME COMPLETED: 11/16/00 1055
TOTAL DEPTH: 25 feet
WATER DEPTH: na



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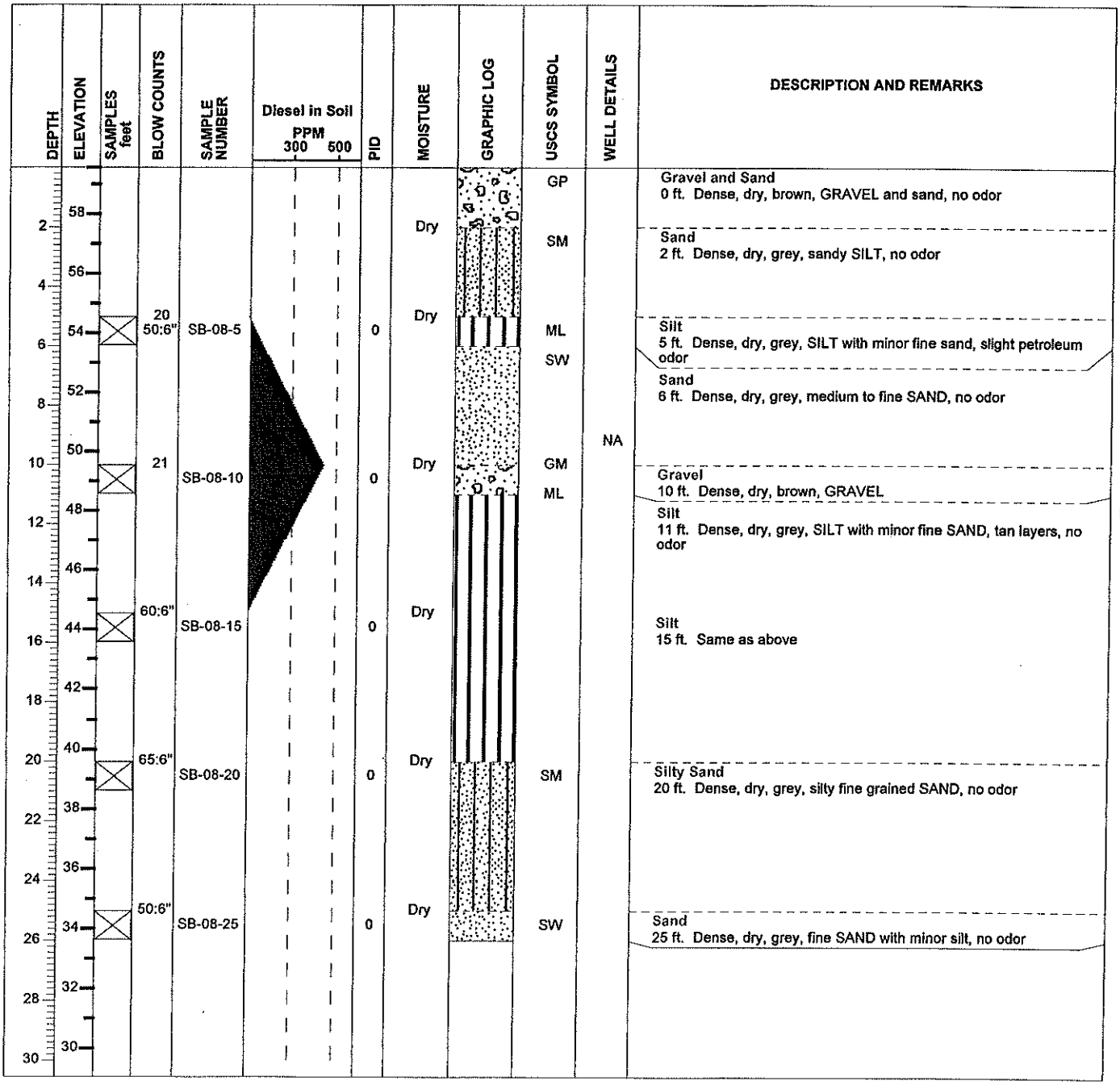
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-08
LOCATION: 2737 West Commodore Way
AREA: Former Rail Line Spurs
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/15/00 1125
DATE/TIME COMPLETED: 11/15/00 1215
TOTAL DEPTH: 25 feet
WATER DEPTH: na



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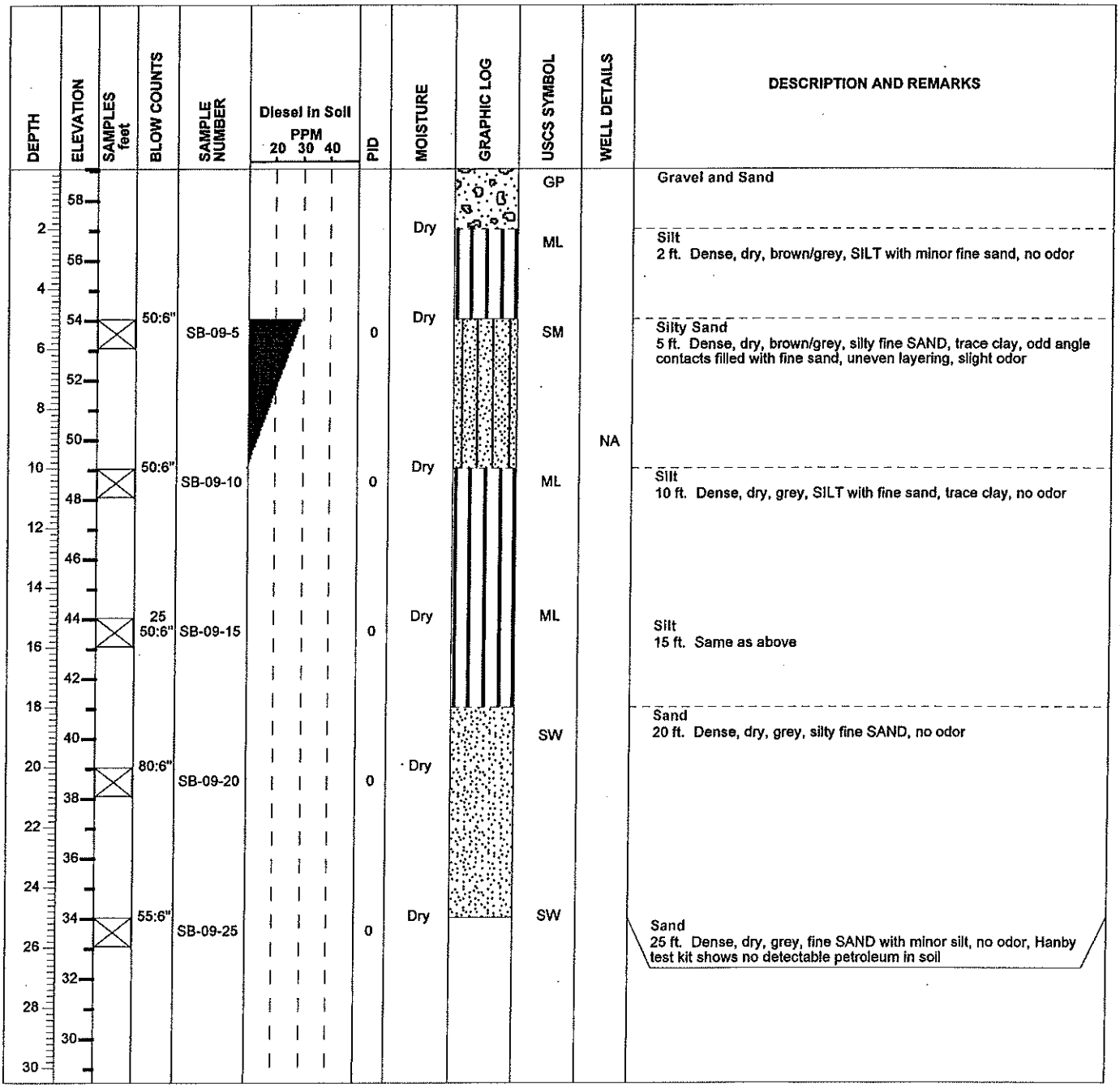
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-09
LOCATION: 2737 West Commodore Way
AREA: Former Rail Line Spurs
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/15/00 1250
DATE/TIME COMPLETED: 11/16/00 1323
TOTAL DEPTH: 25 feet
WATER DEPTH: na



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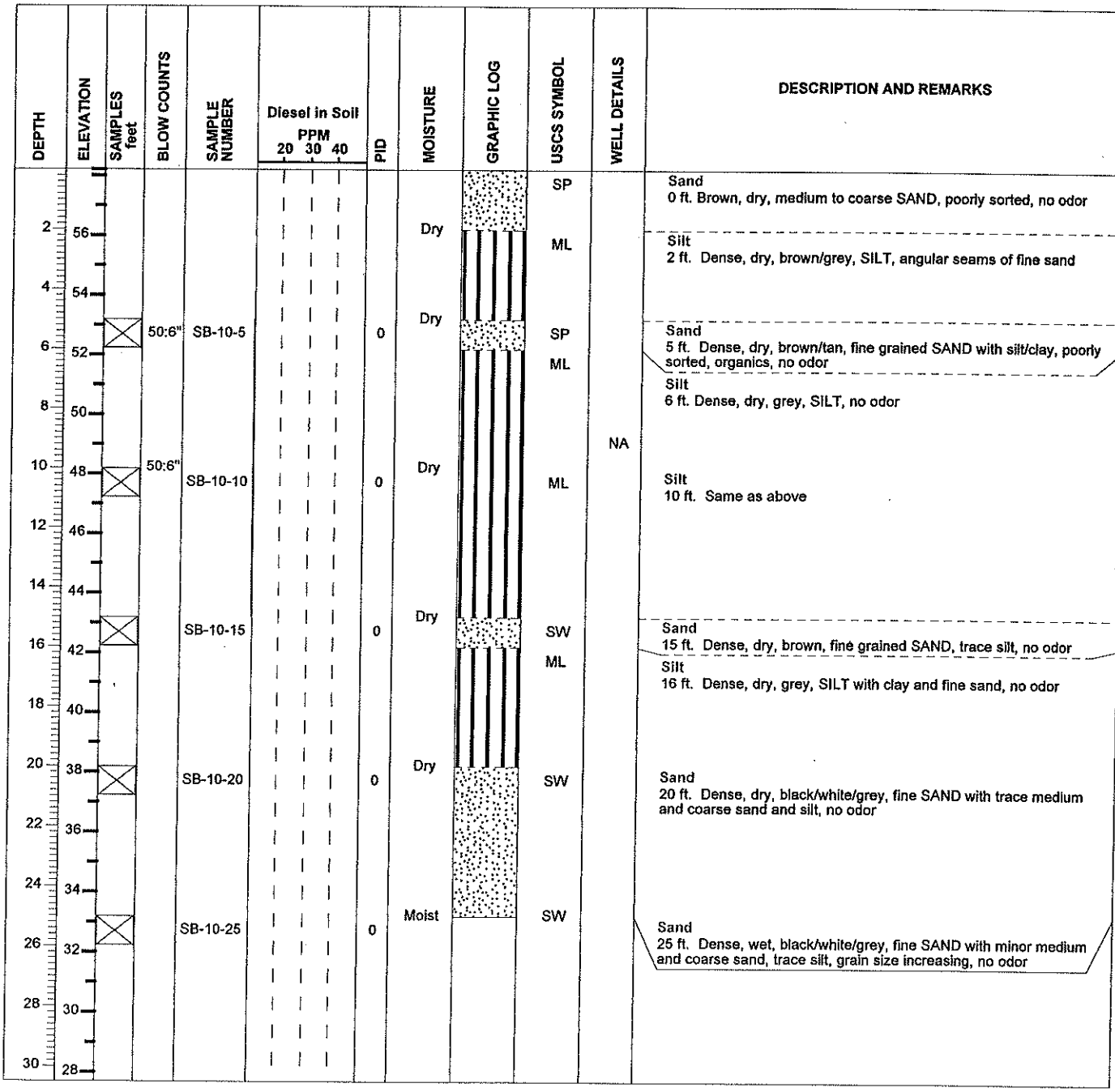
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-10
LOCATION: 2737 West Commodore Way
AREA: Former Rail Line Spurs
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/15/00 1345
DATE/TIME COMPLETED: 11/15/00 1430
TOTAL DEPTH: 25 feet
WATER DEPTH: ~ 24 feet



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-11

LOCATION: 2737 West Commodore Way

AREA: Upper Tank Yard

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA

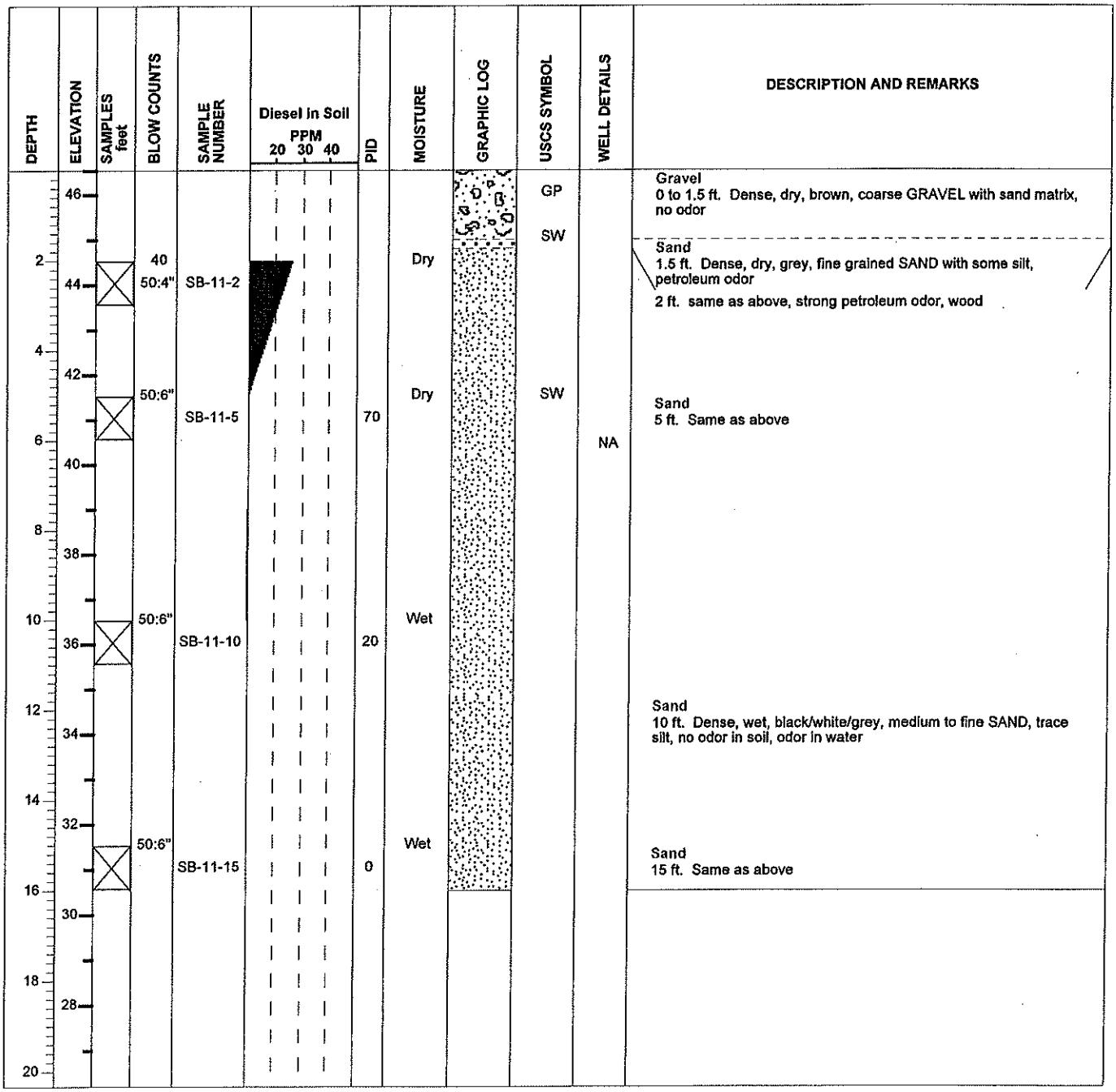
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/17/00 0820

DATE/TIME COMPLETED: 11/17/00 1855

TOTAL DEPTH: 15 feet

WATER DEPTH: ~ 11 feet



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-12
LOCATION: 2737 West Commodore Way
AREA: Upper Tank Yard
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/17/00 0915
DATE/TIME COMPLETED: 11/17/00 0945
TOTAL DEPTH: 15 feet
WATER DEPTH: ~ 11 feet

DEPTH	ELEVATION	SAMPLES feet	BLOW COUNTS	SAMPLE NUMBER	Diesel in Soil PPM 20 30 40	PID	MOISTURE	GRAPHIC LOG	USCS SYMBOL	WELL DETAILS	DESCRIPTION AND REMARKS
0	46								GP		Gravel 0 to 1.5 ft. Dense, dry, brown, coarse GRAVEL with sand matrix, no odor
2	44		50:6"	SB-12-2			Dry		SW		Sand 1.5 ft. Dense, dry, brown/tan, fine to medium grained SAND with some silt, petroleum odor
4	42		35				Dry		SW		
6	40		50:6"	SB-12-5		0				NA	Sand 5 ft. Medium to dense, dry, brown/tan, silty fine grained SAND, no odor
8	38										
10	36		60:6"	SB-12-10		0	Dry		SW		Sand 10 ft. Dense, dry, grey, fine to medium SAND, minor silt, well sorted, coarser than above, no odor
12	34										
14	32		75:6"	SB-12-15		0	Wet		SW		Sand 15 ft. Dense, wet, grey, medium grained SAND, little fines, no odor
16	30										
18	28										
20											

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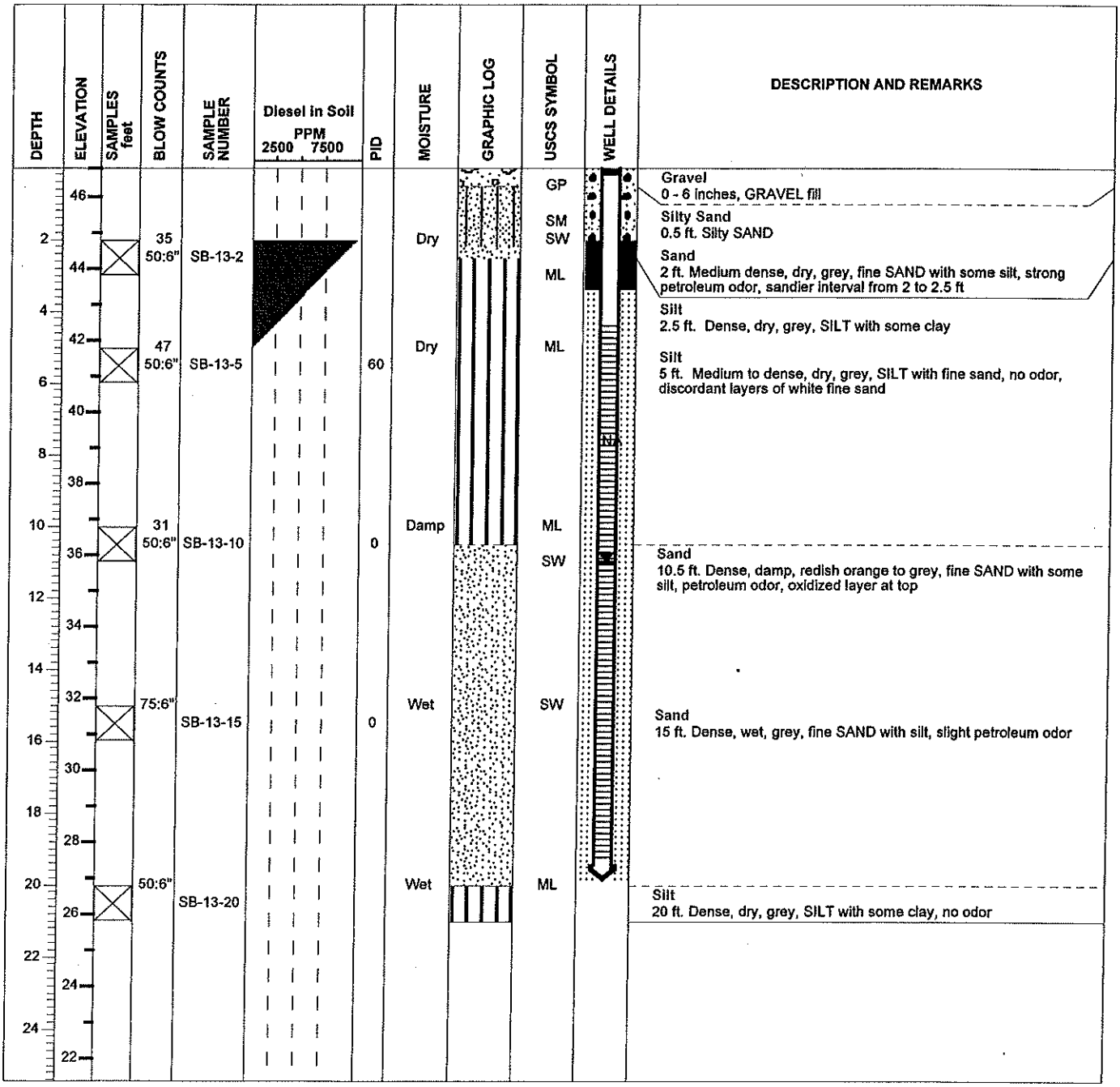
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-13
LOCATION: 2737 West Commodore Way
AREA: Upper Tank Yard
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/17/00 1015
DATE/TIME COMPLETED: 11/17/00 1200
TOTAL DEPTH: 20 feet
WATER DEPTH: ~ 11 feet



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-14

LOCATION: 2737 West Commodore Way

AREA: Upper Tank Yard

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA

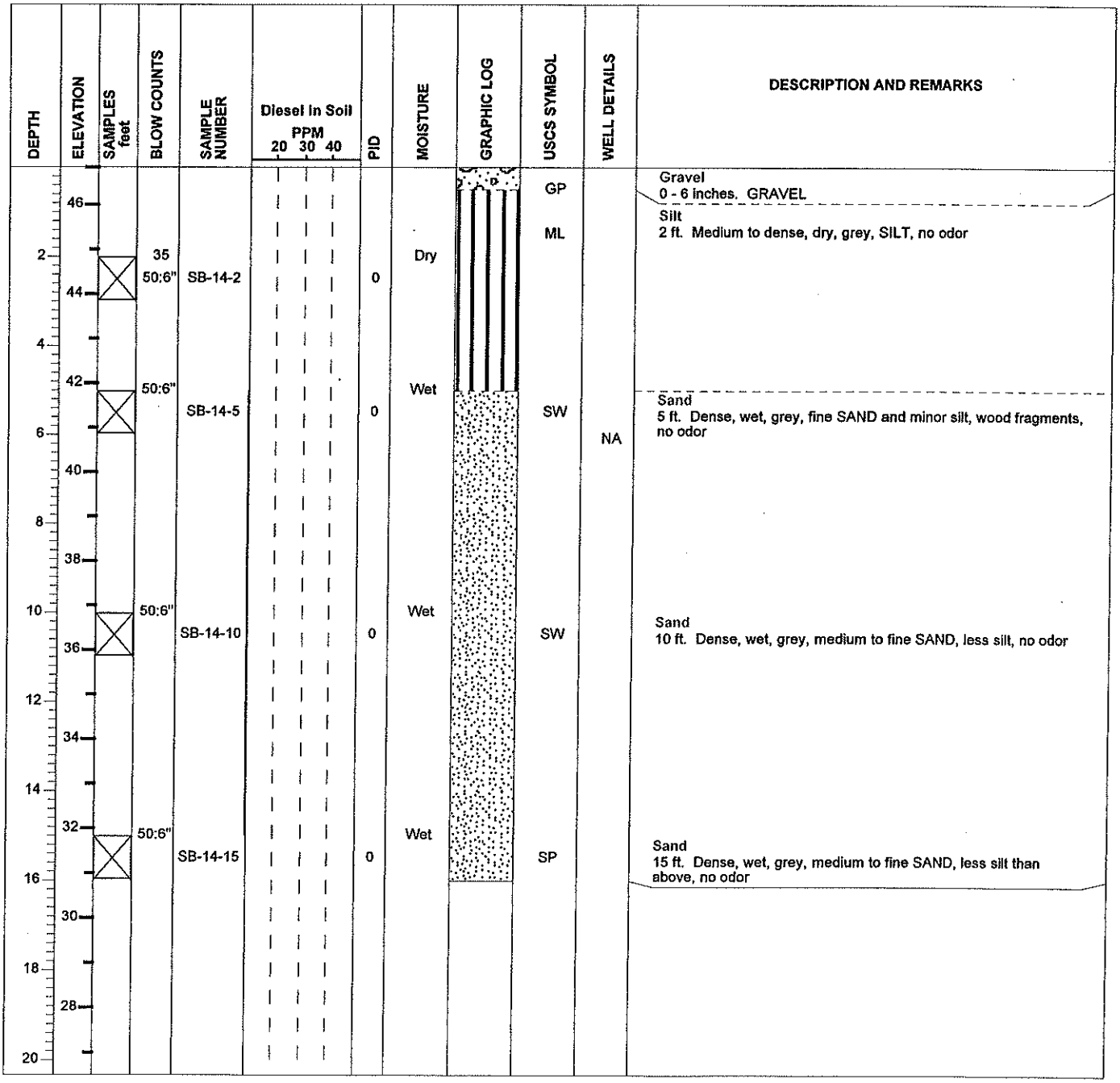
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/17/00 1350

DATE/TIME COMPLETED: 11/17/00 1420

TOTAL DEPTH: 15 feet

WATER DEPTH: ~ 10 feet



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-15

LOCATION: 2737 West Commodore Way

AREA: Upper Tank Yard

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA

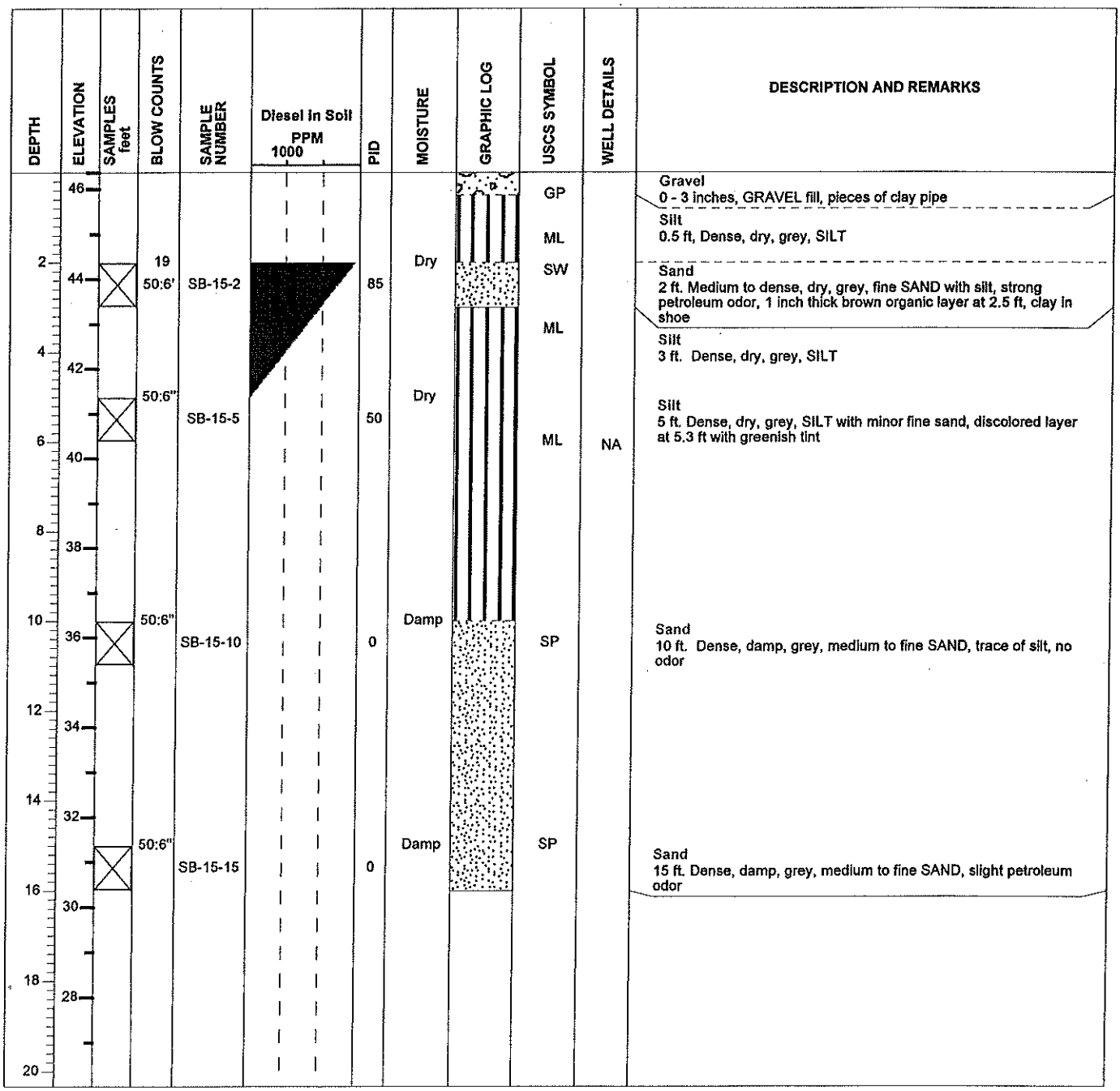
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/17/00 1430

DATE/TIME COMPLETED: 11/17/00 1525

TOTAL DEPTH: 15 feet

WATER DEPTH: ~ 10 feet



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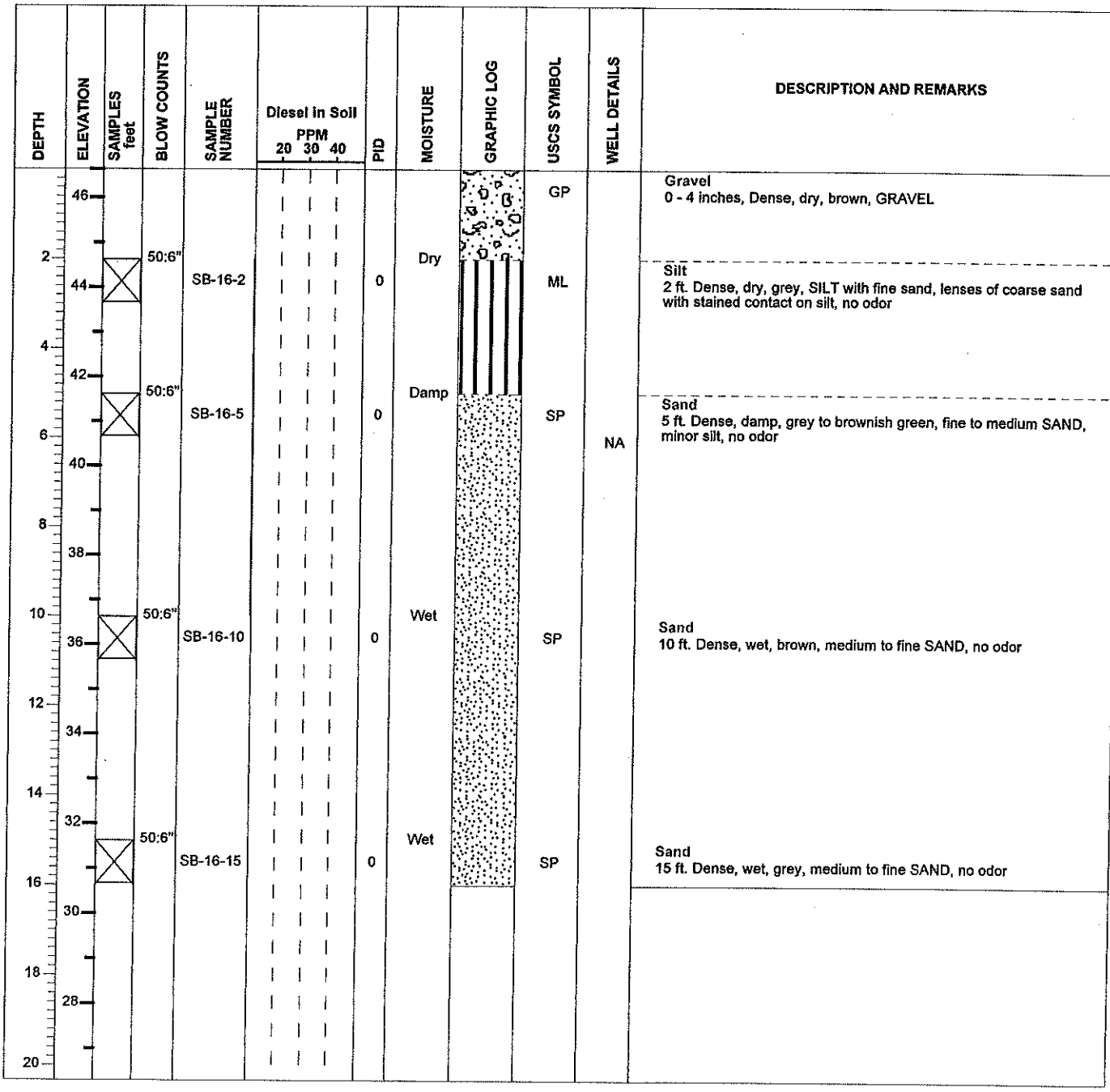
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-16
LOCATION: 2737 West Commodore Way
AREA: Upper Tank Yard
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/17/00 1540
DATE/TIME COMPLETED: 11/17/00 1605
TOTAL DEPTH: 15 feet
WATER DEPTH: ~ 10 feet



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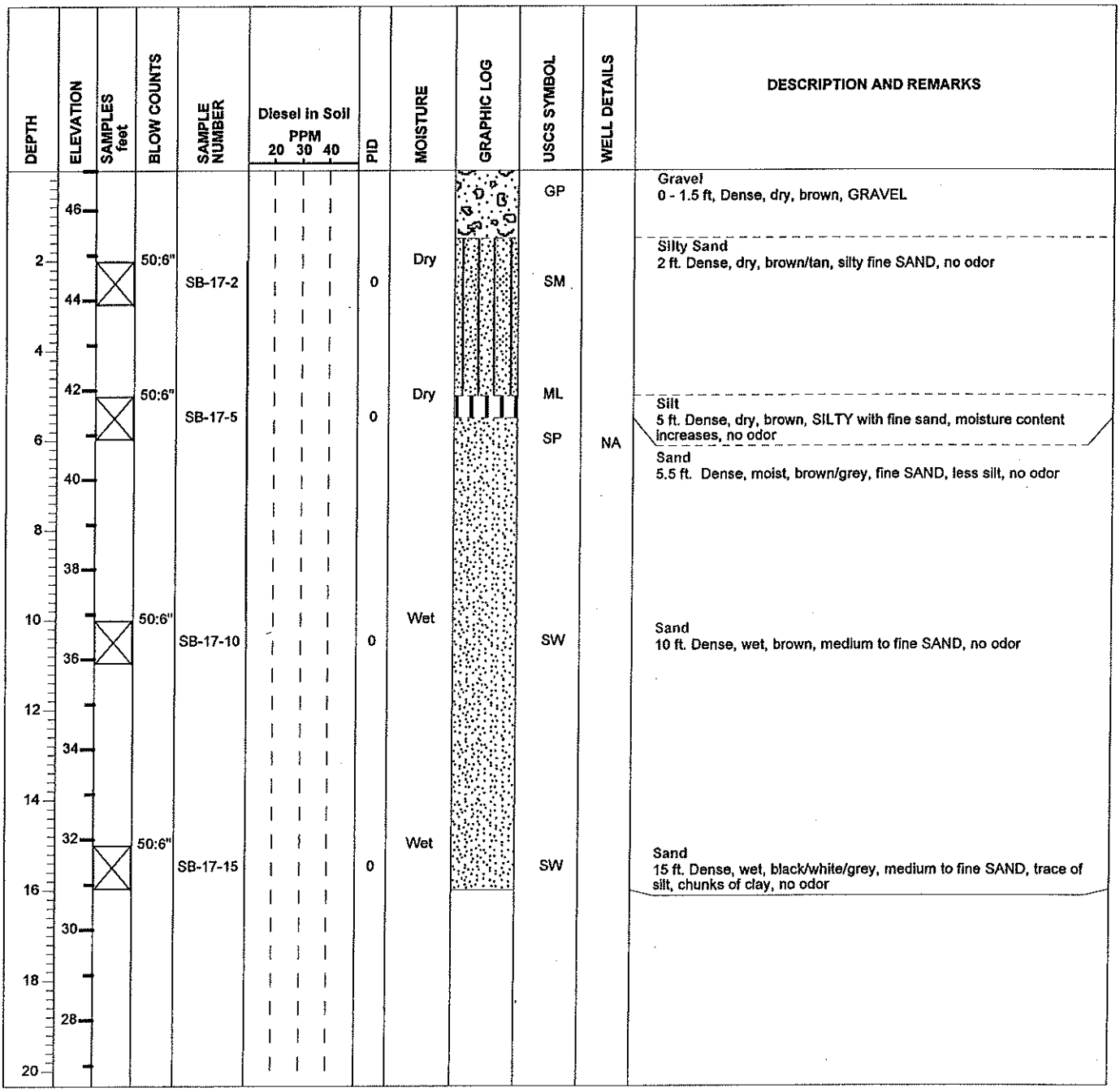
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-17
LOCATION: 2737 West Commodore Way
AREA: Upper Tank Yard
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/20/00 0818
DATE/TIME COMPLETED: 11/20/00 0840
TOTAL DEPTH: 15 feet
WATER DEPTH: ~ 10 feet



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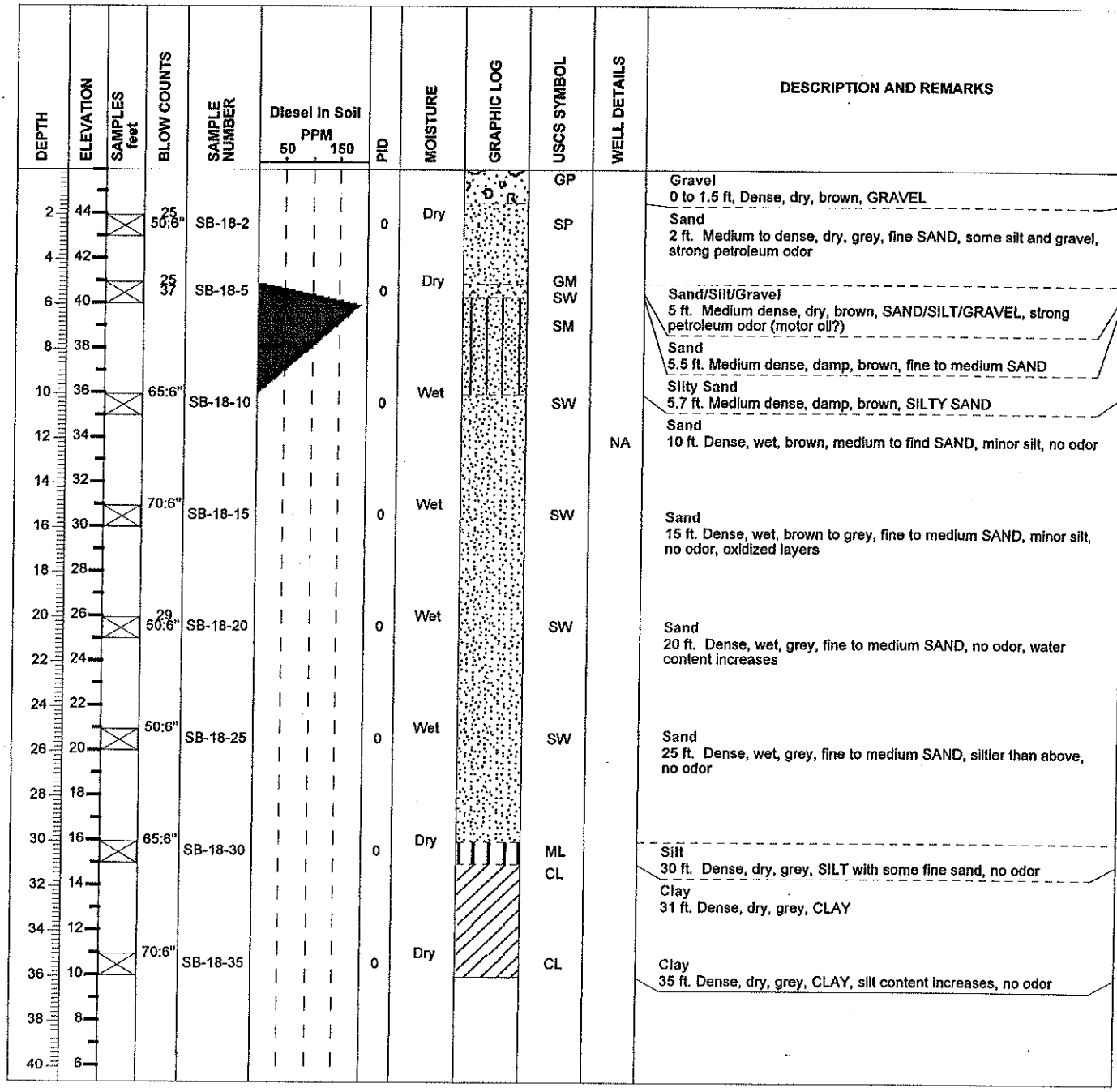
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-18
LOCATION: 2737 West Commodore Way
AREA: Lower Tank Yard
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/20/00 0930
DATE/TIME COMPLETED: 11/20/00 1100
TOTAL DEPTH: 35 feet
WATER DEPTH: ~ 10 feet



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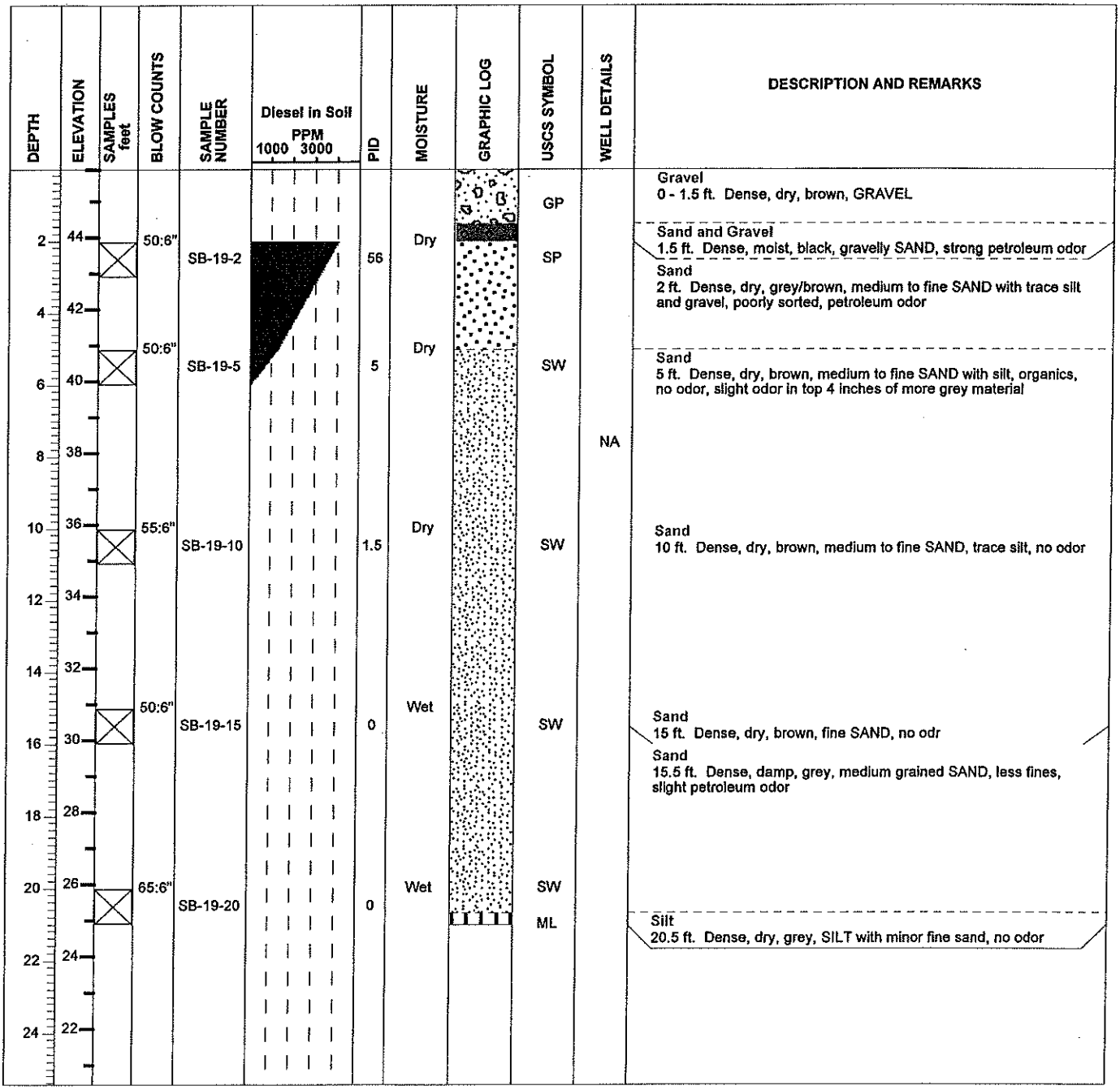
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-19
LOCATION: 2737 West Commodore Way
AREA: Lower Tank Yard
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/20/00 1108
DATE/TIME COMPLETED: 11/20/00 1209
TOTAL DEPTH: 20 feet
WATER DEPTH: ~ 15 feet



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-20

LOCATION: 2737 West Commodore Way

AREA: Lower Tank Yard

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA

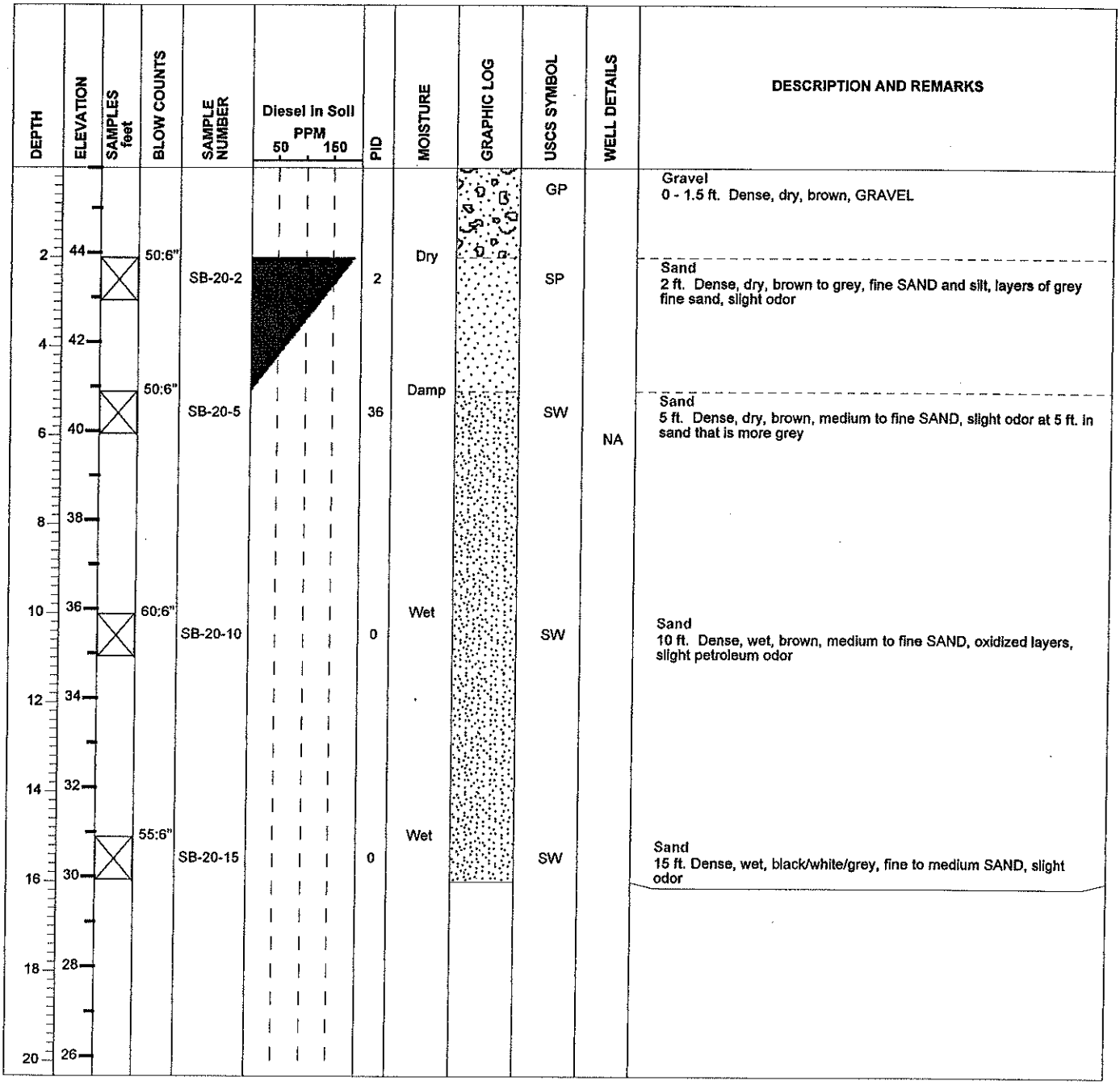
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/20/00 1300

DATE/TIME COMPLETED: 11/20/00 1345

TOTAL DEPTH: 15 feet

WATER DEPTH: ~ 10 feet



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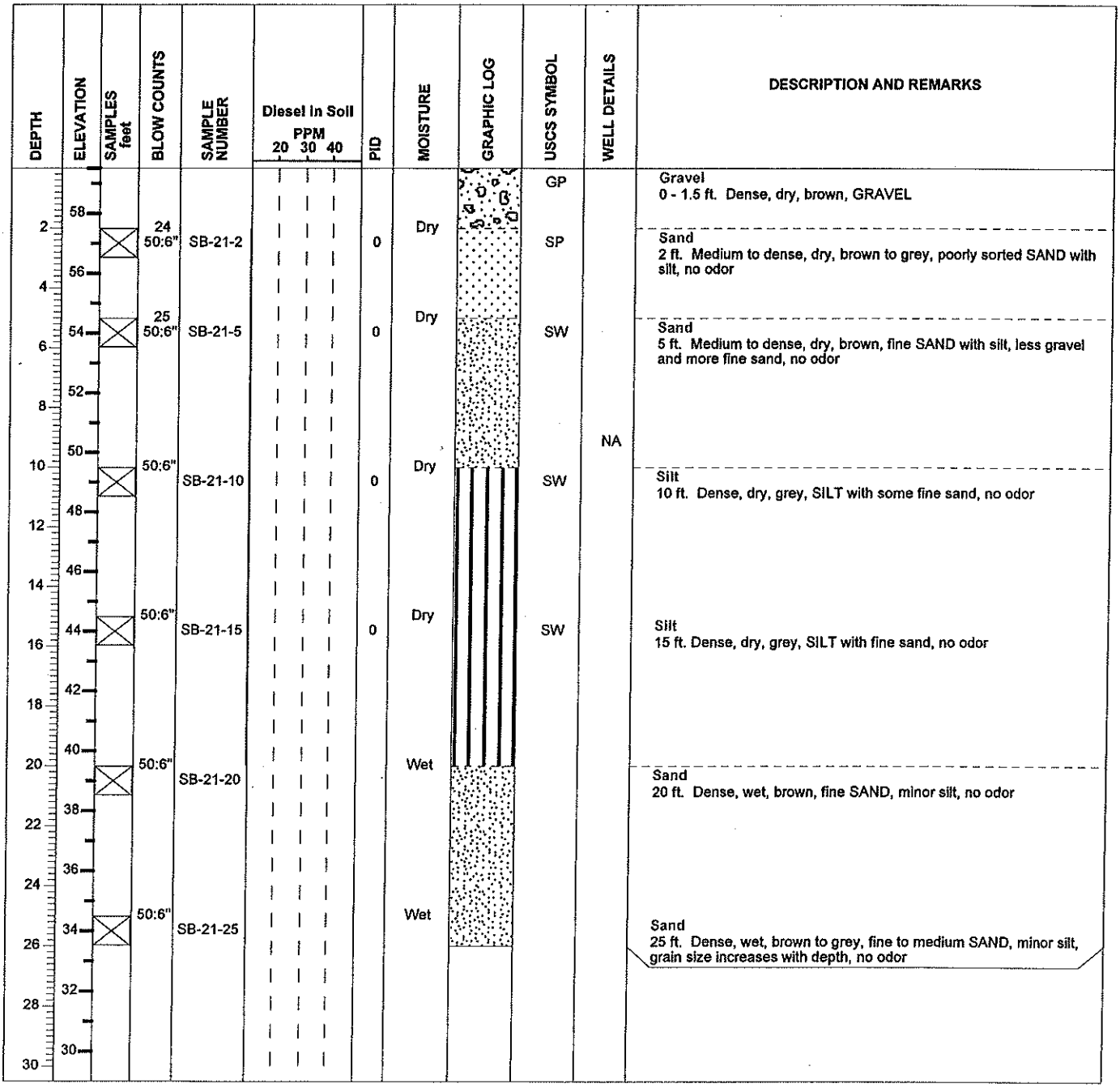
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-21
LOCATION: 2737 West Commodore Way
AREA: Upper Rail Line Spur
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/20/00 1400
DATE/TIME COMPLETED: 11/20/00 1500
TOTAL DEPTH: 25 feet
WATER DEPTH: ~ 20 feet



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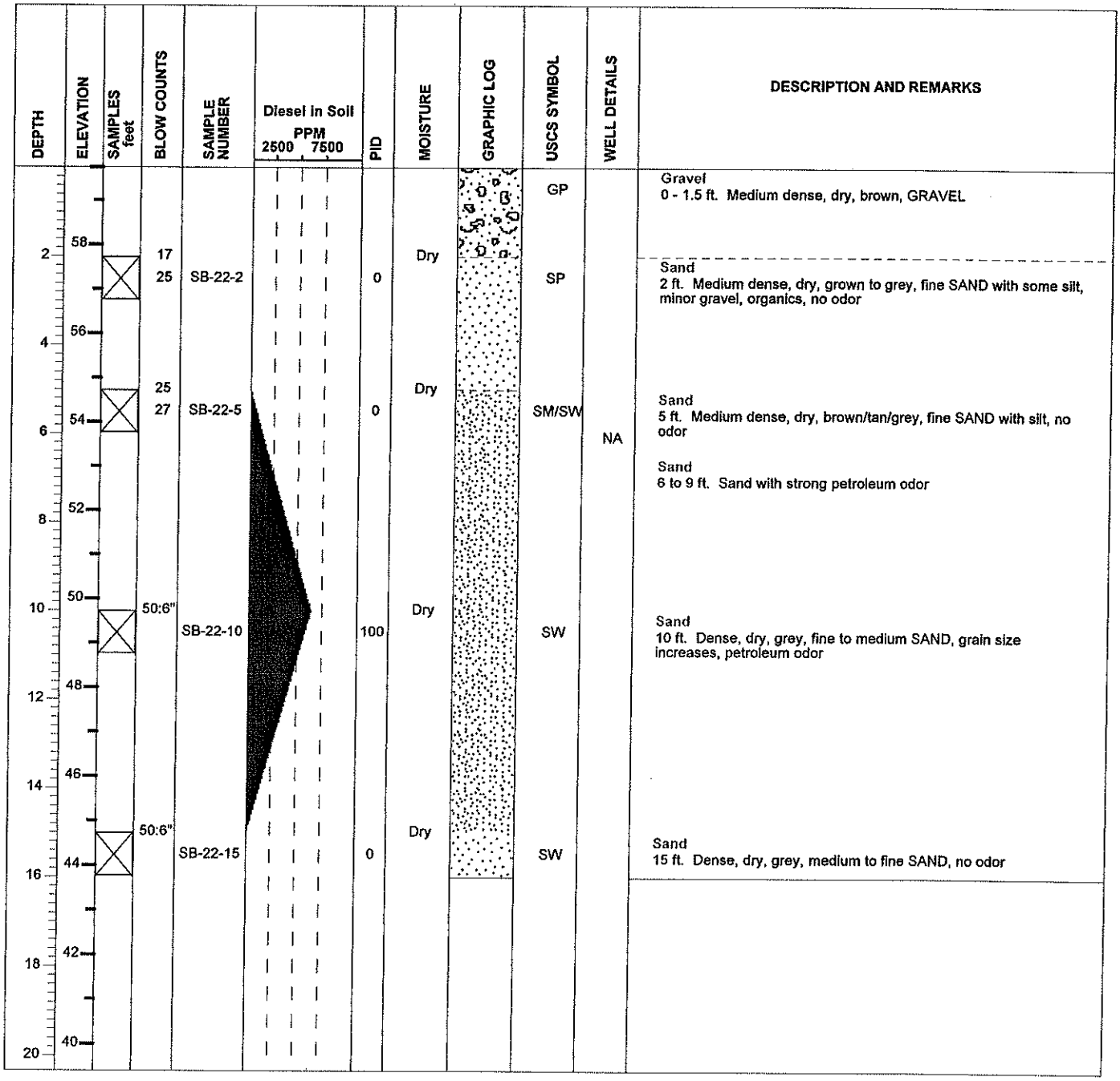
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-22
LOCATION: 2737 West Commodore Way
AREA: Upper Rail Line Spur
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/20/00 1505
DATE/TIME COMPLETED: 11/20/00 1550
TOTAL DEPTH: 15 feet
WATER DEPTH: NA



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-23
LOCATION: 2737 West Commodore Way
AREA: Upper Rail Line Spur
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/20/00 0815
DATE/TIME COMPLETED: 11/20/00 0915
TOTAL DEPTH: 15 feet
WATER DEPTH: NA

DEPTH	ELEVATION	SAMPLES feet	BLOW COUNTS	SAMPLE NUMBER	Diesel in Soil PPM 20 30 40	PID	MOISTURE	GRAPHIC LOG	USCS SYMBOL	WELL DETAILS	DESCRIPTION AND REMARKS
0									GM		Gravel 0 - 2 ft. Dense, brown, dry, GRAVEL
2	58		32				Moist				
			50:6"	SB-23-2		0			SM		Sandy Silt 2 ft. Medium to dense, moist, grey, fine grained sandy SILT with minor clay, no odor
4	56										
			29				Moist				
6	54		50:6"	SB-23-5		0			SM	NA	Sandy Silt 5 ft. Dense, moist, grey, fine grained sandy SILT, no odor
8	52										
10	50		50:6"	SB-23-10		0	Moist		SM		Sandy Silt 10 ft. Dense, moist, grey, fine grainded sandy SILT, no odor
12	48										
14	46										
	44		50:6"	SB-23-15		0	Moist		SM		Sandy Silt 15 ft. Dense, moist, grey, fine grained sandy SILT, no odor
16											
18	42										
20	40										

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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-24 (01MW-12)

LOCATION: 2737 West Commodore Way

AREA: Lower Tank Yard

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA

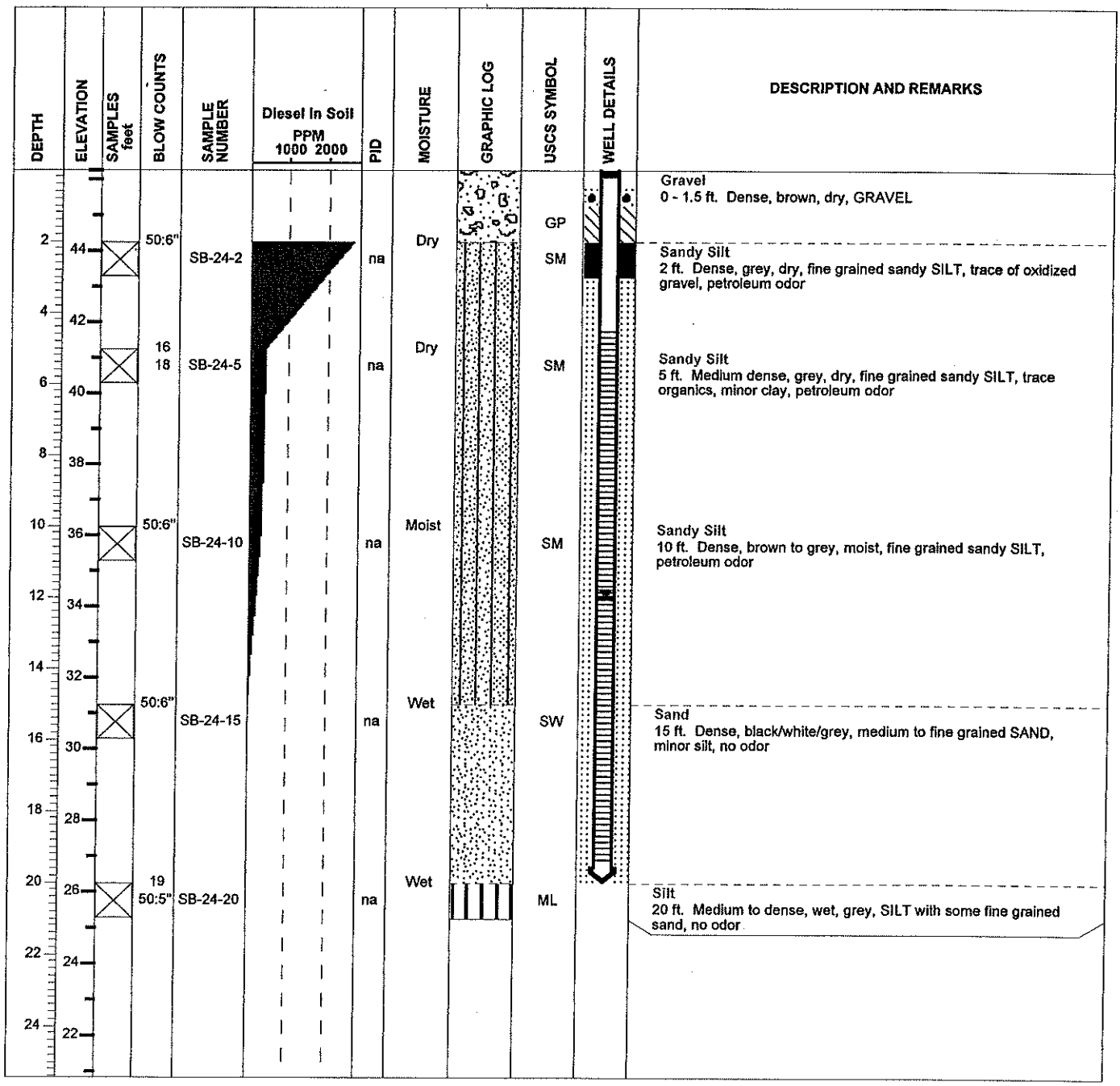
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/21/00 1000

DATE/TIME COMPLETED: 11/21/00 1045

TOTAL DEPTH: 20 ft

WATER DEPTH: 12 ft



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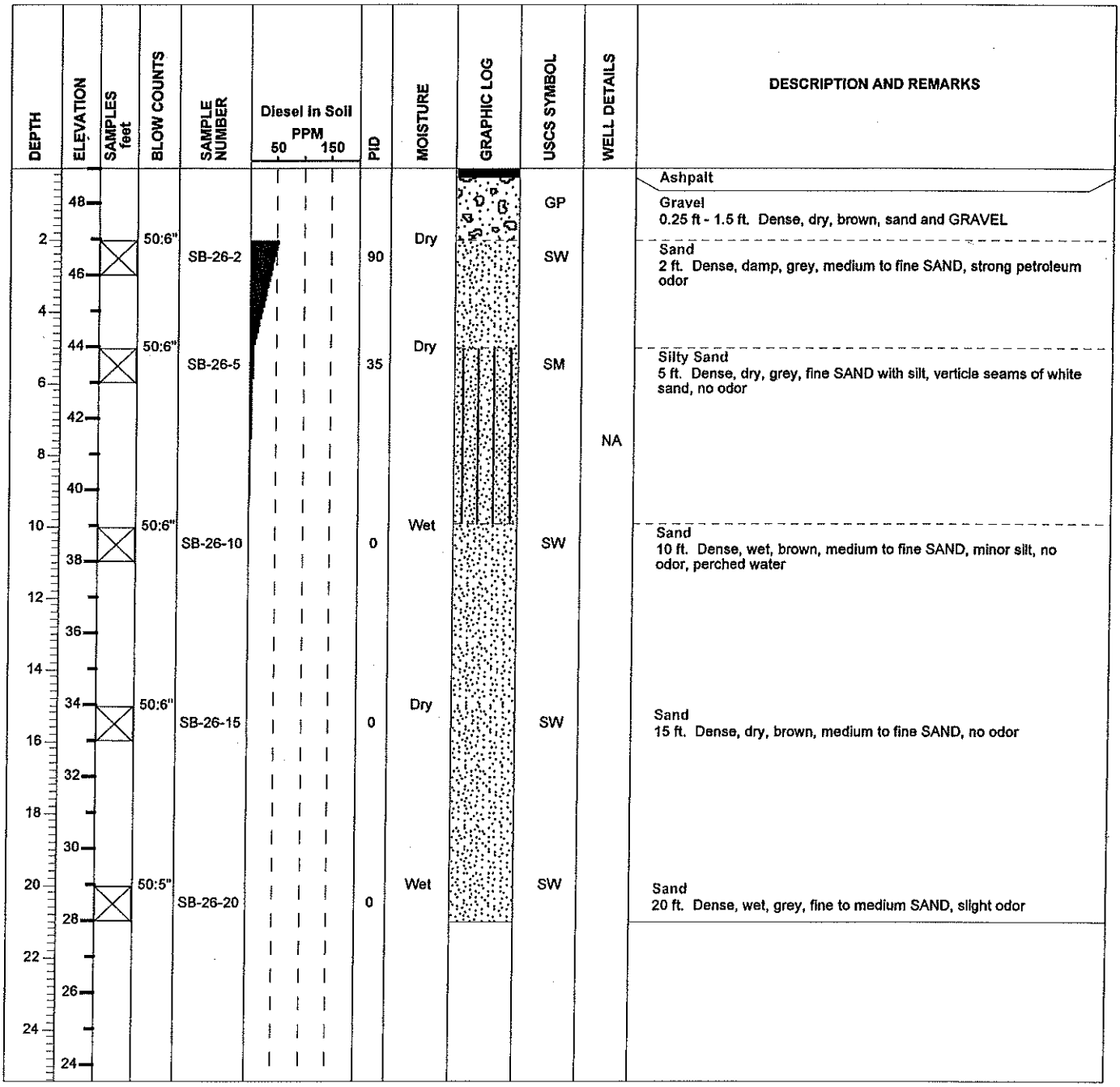
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-26
LOCATION: 2737 West Commodore Way
AREA: Former Barrel Shed
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/21/00 0815
DATE/TIME COMPLETED: 11/21/00 0902
TOTAL DEPTH: 19 feet
WATER DEPTH: Perched at 9 ft, Aquifer at 19 ft



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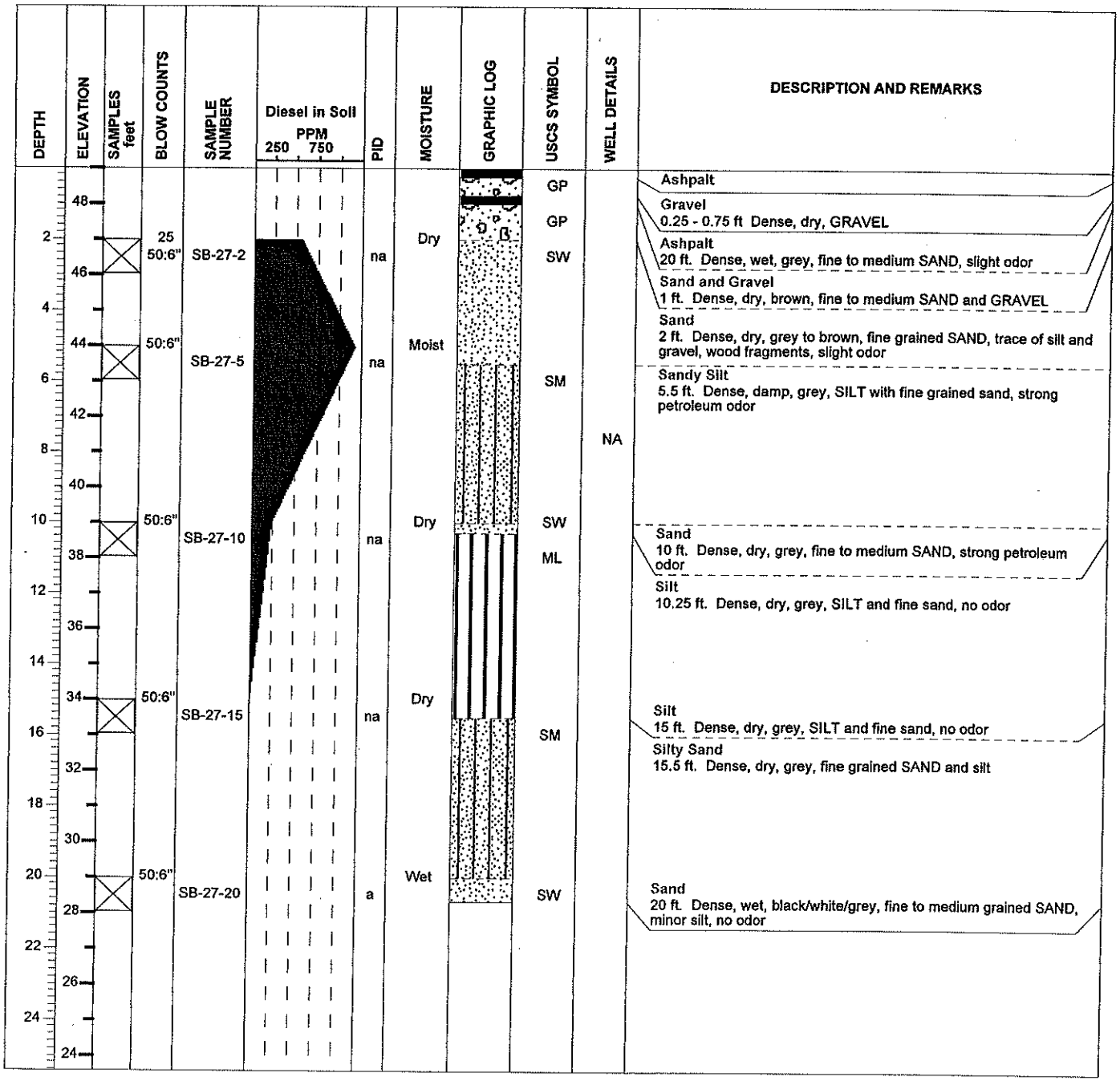
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-27
LOCATION: 2737 West Commodore Way
AREA: Former Barrel Shed
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/21/00 0945
DATE/TIME COMPLETED: 11/21/00 1035
TOTAL DEPTH: 20 feet
WATER DEPTH: ` 15 feet



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-28
LOCATION: 2737 West Commodore Way
AREA: Former Barrel Shed
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/21/00 1100
DATE/TIME COMPLETED: 11/21/00 1145
TOTAL DEPTH: 20 feet
WATER DEPTH: 19 feet

DEPTH	ELEVATION	SAMPLES feet	BLOW COUNTS	SAMPLE NUMBER	Diesel in Soil PPM 20 30 40	PID	MOISTURE	GRAPHIC LOG	USCS SYMBOL	WELL DETAILS	DESCRIPTION AND REMARKS
0	50								GP		Ashpalt Gravel 0.25 ft - 1.5 ft. Dense, dry, brown, sand and GRAVEL, resembles railroad bed, possible railroad tie on edge of boring
2	48		25 37	SB-28-2		na	Dry		SM		Silty Sand 2 ft. Dense, damp, grey, fine SAND and SILT, oil spot on recovered sample
4	46		50:6"	SB-28-5		na	Dry		SM		Silty Sand 5 ft. Dense, damp, grey, fine SAND with SILT, minor gravel, no odor
6	44									NA	
8	42										
10	40		50:6"	SB-28-10		na	Dry		SP		Sand 10 ft. Dense, damp, reddish-brown, medium to fine SAND, oxidized layers, no odor
12	38										
14	36		50:6"	SB-28-15		na	Dry		SP		Sand 15 ft. Dense, damp, brown, medium to fine SAND, no odor
16	34										
18	32										
20	30		50:6"	SB-28-20		na	Wet		SP		Sand 20 ft. Dense, wet, black/white/grey, fine to medium SAND, no odor
22	28										
24	26										

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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-29 (01MW-06)

LOCATION: 2737 West Commodore Way

AREA: Former Barrel Shed

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA

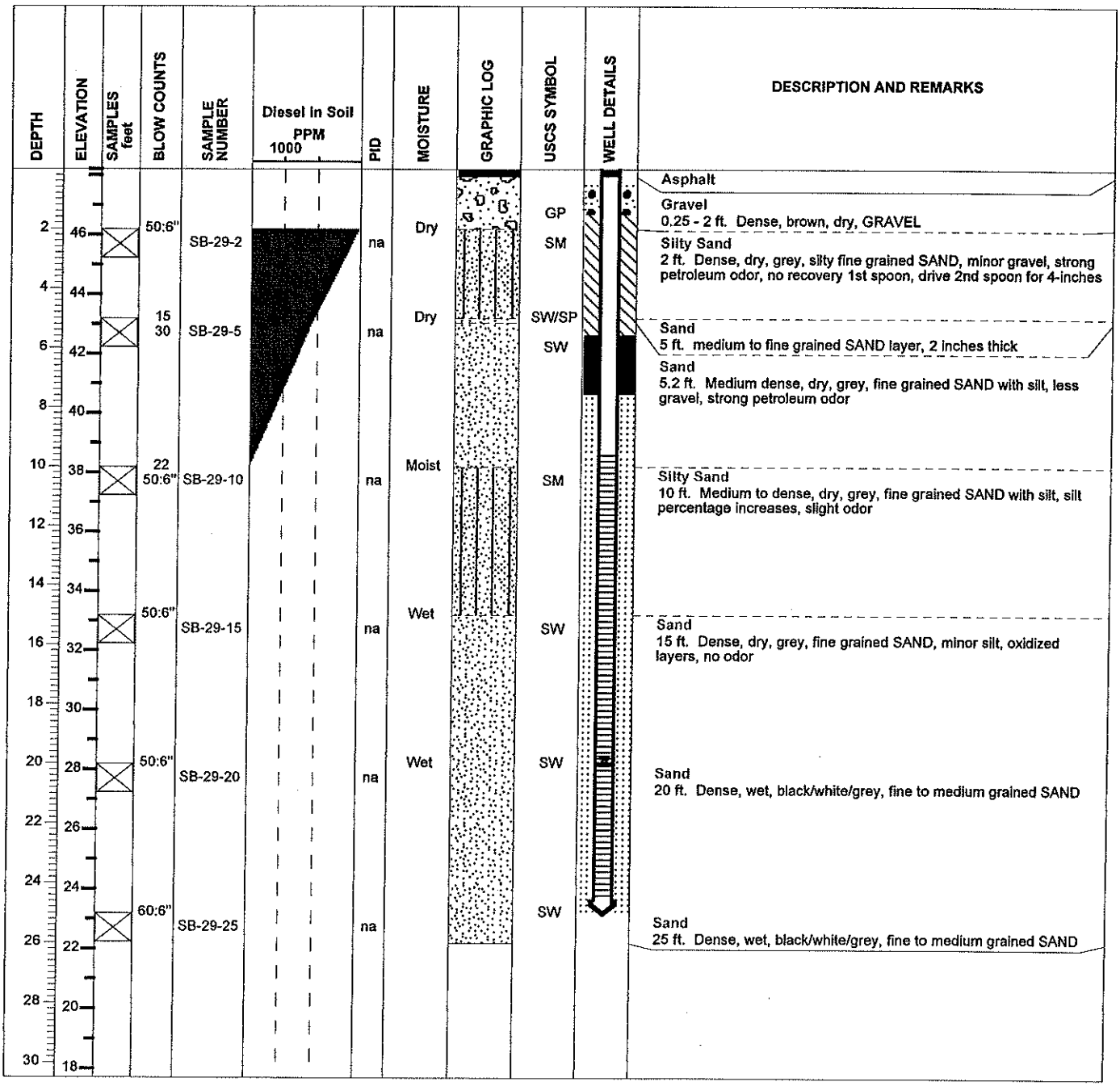
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/21/00 1315

DATE/TIME COMPLETED: 11/21/00 1430

TOTAL DEPTH: 25 ft

WATER DEPTH: 20 ft



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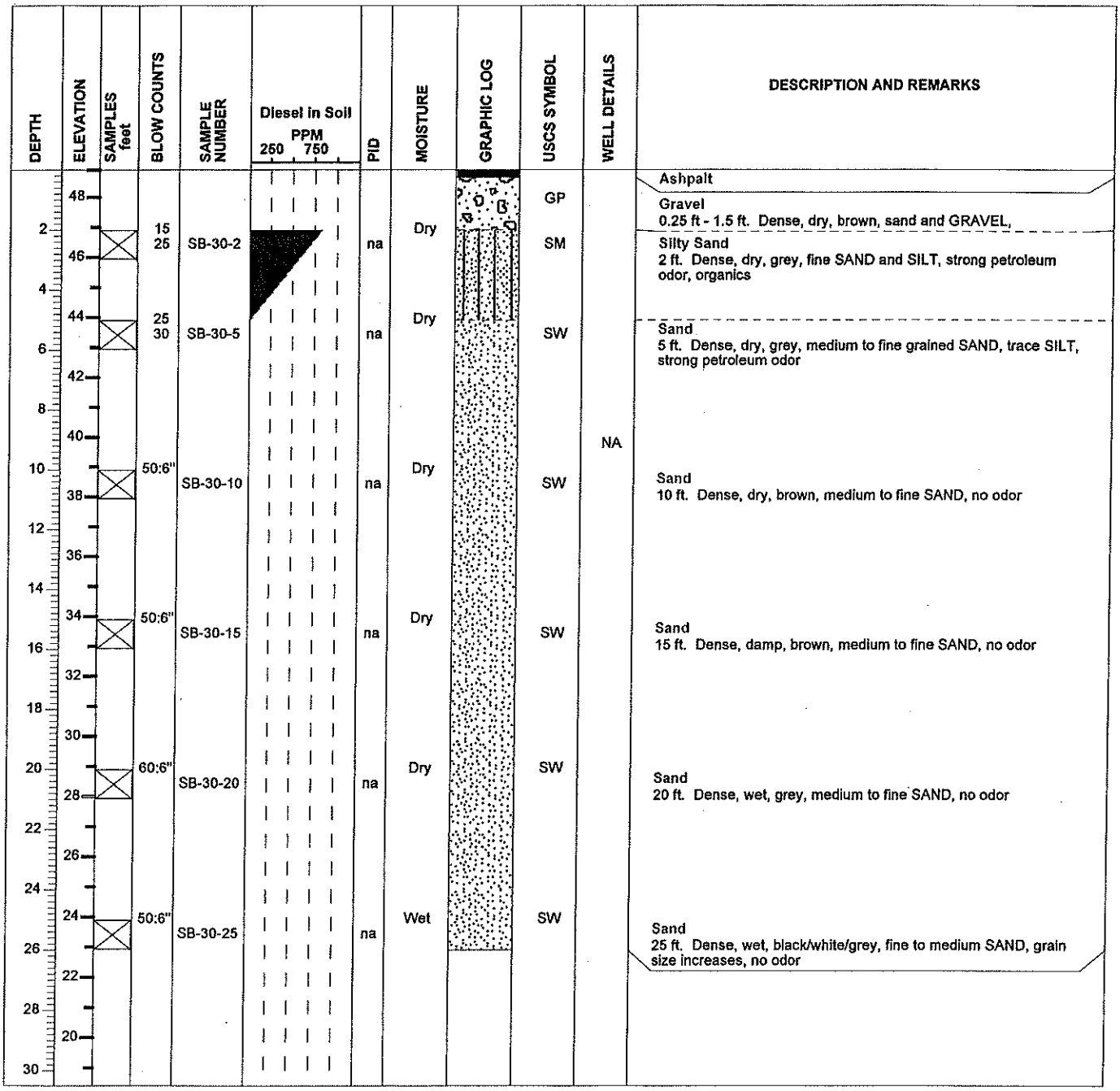
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-30
LOCATION: 2737 West Commodore Way
AREA: Former Barrel Shed
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/21/00 1450
DATE/TIME COMPLETED: 11/21/00 1525
TOTAL DEPTH: 25 feet
WATER DEPTH: ~25 feet



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-31
LOCATION: 2737 West Commodore Way
AREA: Former Barrel Shed
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/22/00 0800
DATE/TIME COMPLETED: 11/22/00 0850
TOTAL DEPTH: 25 feet
WATER DEPTH: ~25 feet

DEPTH	ELEVATION	SAMPLES feet	BLOW COUNTS	SAMPLE NUMBER	Diesel in Soil PPM 2500 7500	PID	MOISTURE	GRAPHIC LOG	USCS SYMBOL	WELL DETAILS	DESCRIPTION AND REMARKS
0	46								GP		Concrete
2			14								Gravel 0.5 ft - 2 ft. Medium dense, dry, grey, pea-sized GRAVEL
	44		12	SB-31-2		na	Dry		GM		Sand with Gravel and Silt 2 ft. Medium dense, dry, black/brown, SAND with some silt and gravel, strong petroleum odor, organics
4											
	42		26				Dry				
6			50:6"	SB-31-5		na			SW		Sand 5 ft. Dense, dry, grey, medium to fine grained SAND, trace SILT, strong petroleum odor
	40										
8									ML		Silt 7 ft. Dense, dry, grey, SILT with some fine sand, no odor
	38									NA	
10			19				Dry				
	36		50:6"	SB-31-10		na			SP		Sand 10 ft. Dense, dry, brown, medium to fine SAND, poorly sorted, no odor
12											
	34										
14											
	32		50:6"				Dry				
16				SB-31-15		na			SW		Sand 15 ft. Dense, damp, brown, medium to fine SAND, no odor
	30										
18											
	28										
20			50:6"				Dry				
	26			SB-31-20		na			SW		Sand 20 ft. Dense, wet, grey, medium to fine SAND, no odor
22											
	24										
24											
	22		50:6"				Wet				
26				SB-31-25		na			SW		Sand 25 ft. Dense, wet, black/white/grey, fine to medium SAND, grain size increases, no odor
	20										
28											
	18										
30											

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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-32

LOCATION: 2737 West Commodore Way

AREA: Former AST Area

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA

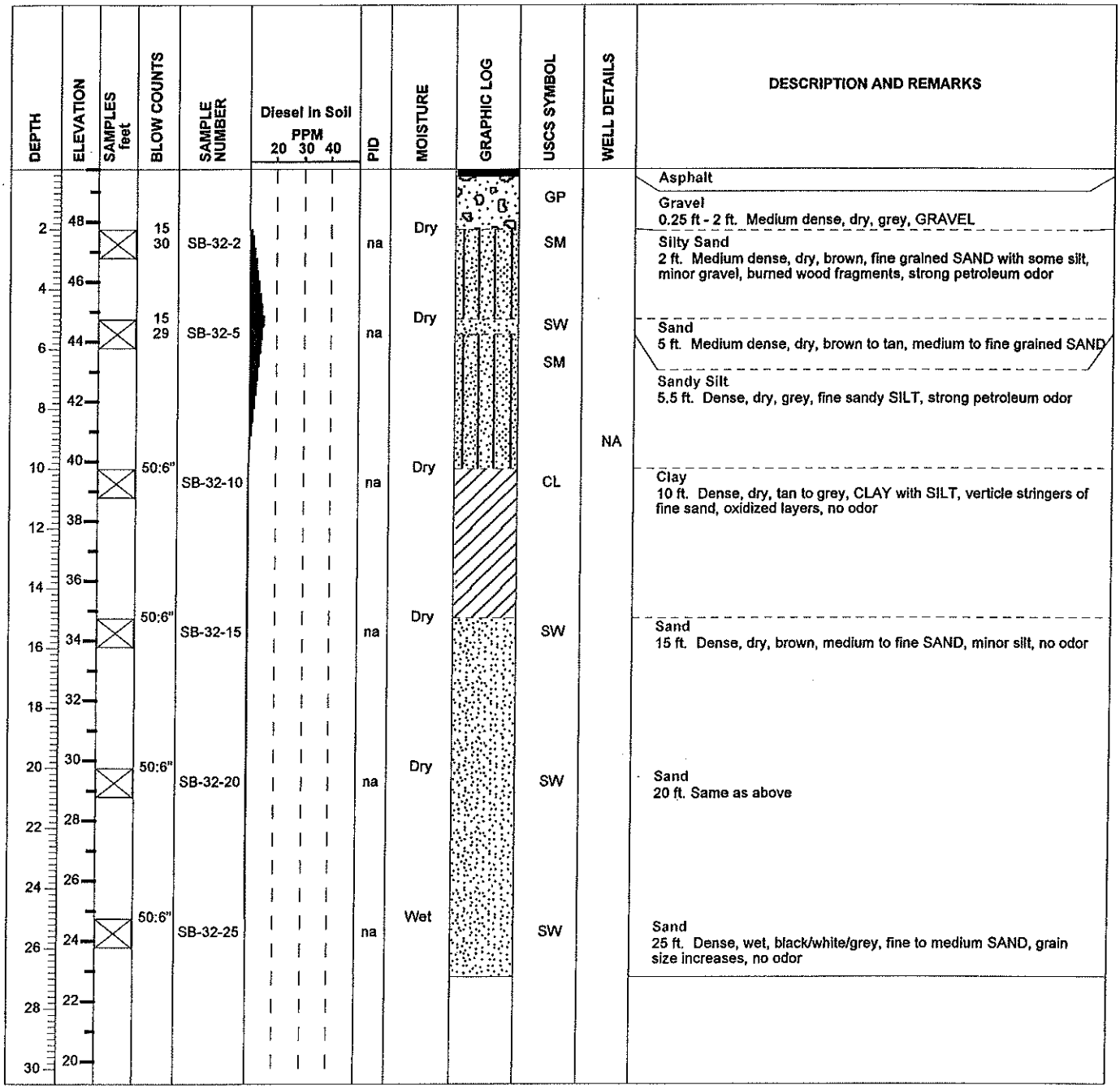
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/22/00 0940

DATE/TIME COMPLETED: 11/22/00 1030

TOTAL DEPTH: 25 feet

WATER DEPTH: ~25 feet



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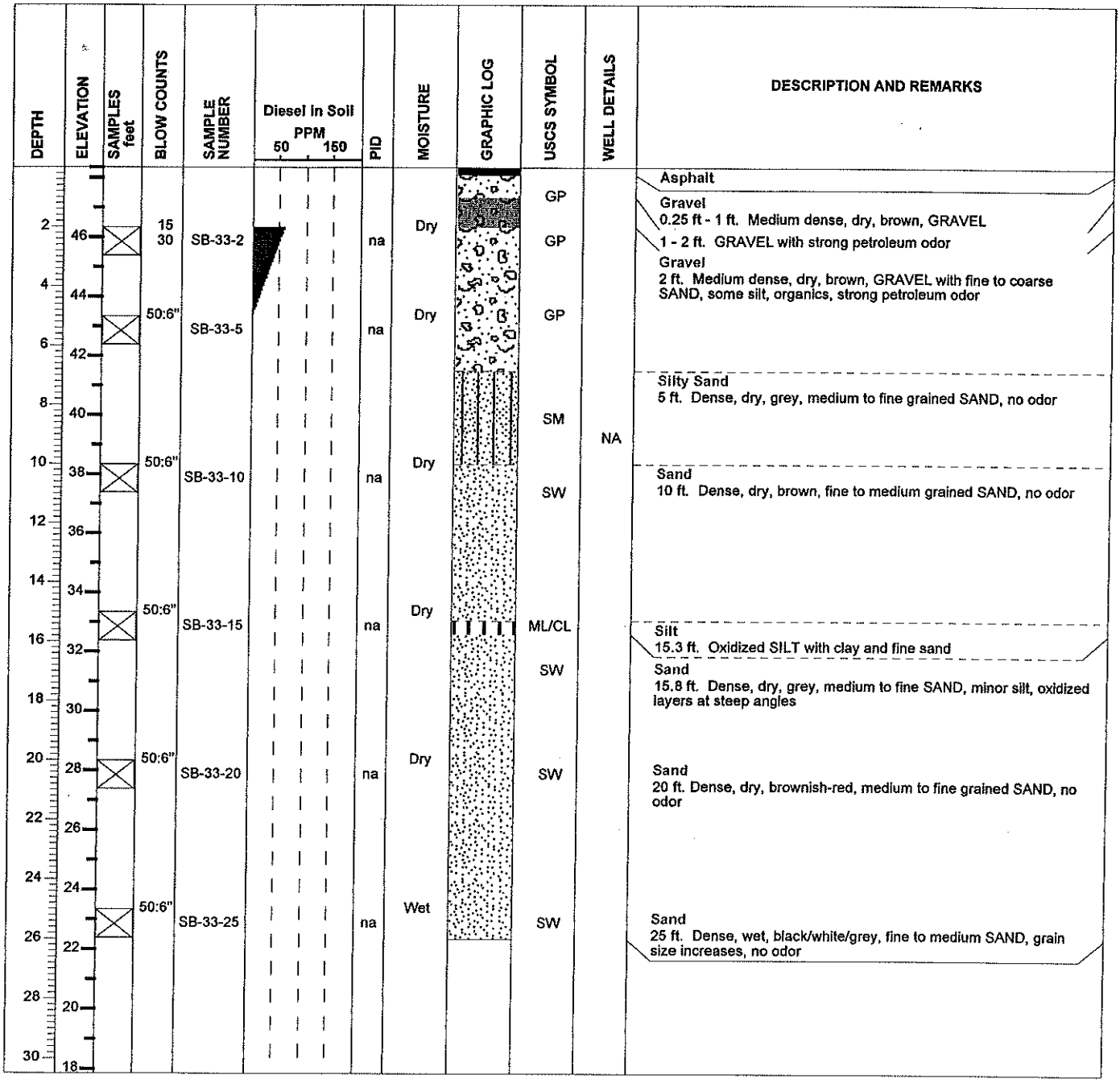
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-33
LOCATION: 2737 West Commodore Way
AREA: Former AST Area
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/22/00 1130
DATE/TIME COMPLETED: 11/22/00 1230
TOTAL DEPTH: 25 feet
WATER DEPTH: ~25 feet



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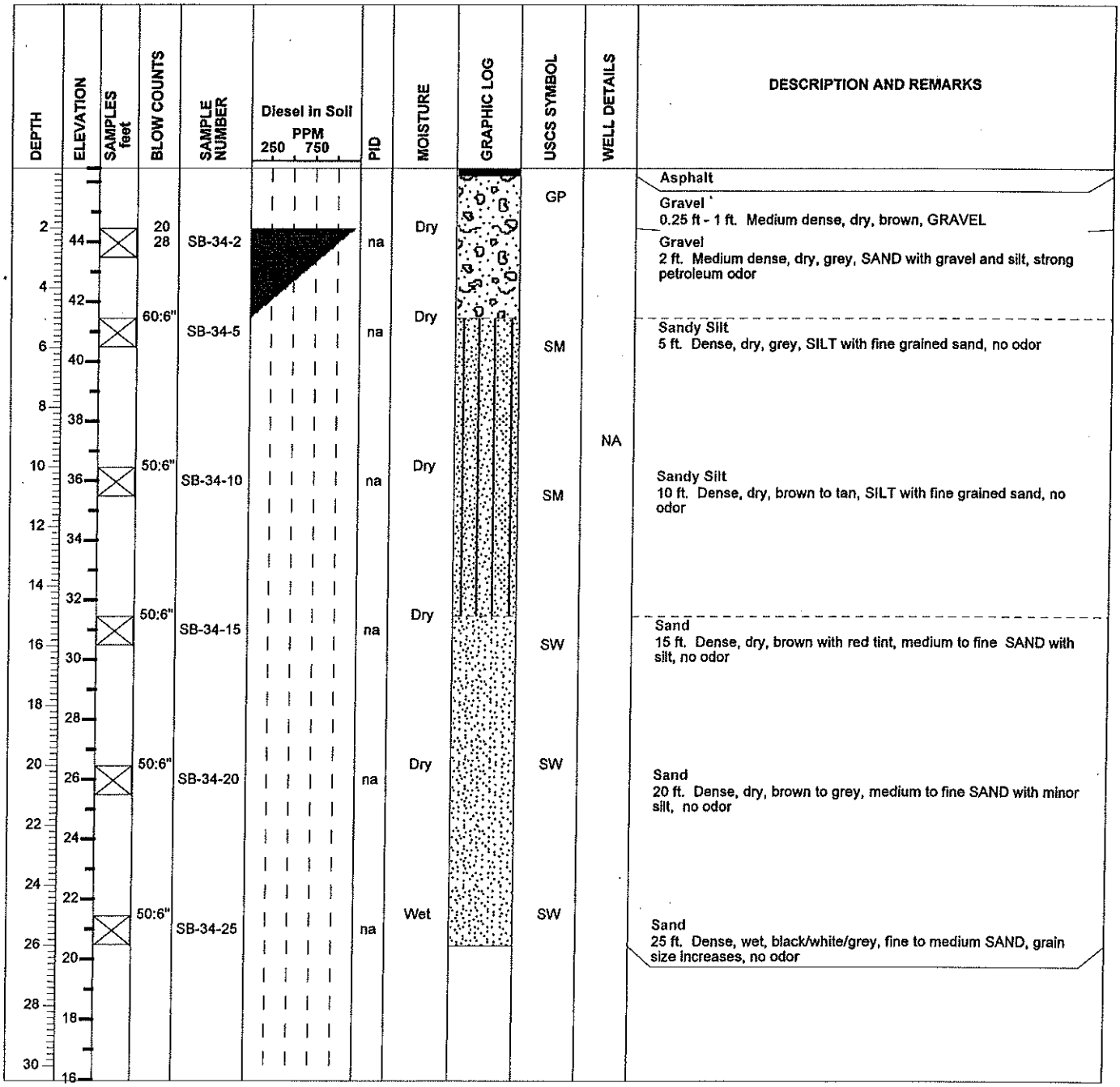
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-34
LOCATION: 2737 West Commodore Way
AREA: Former AST Area
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/22/00 1300
DATE/TIME COMPLETED: 11/22/00 1400
TOTAL DEPTH: 25 feet
WATER DEPTH: ~25 feet



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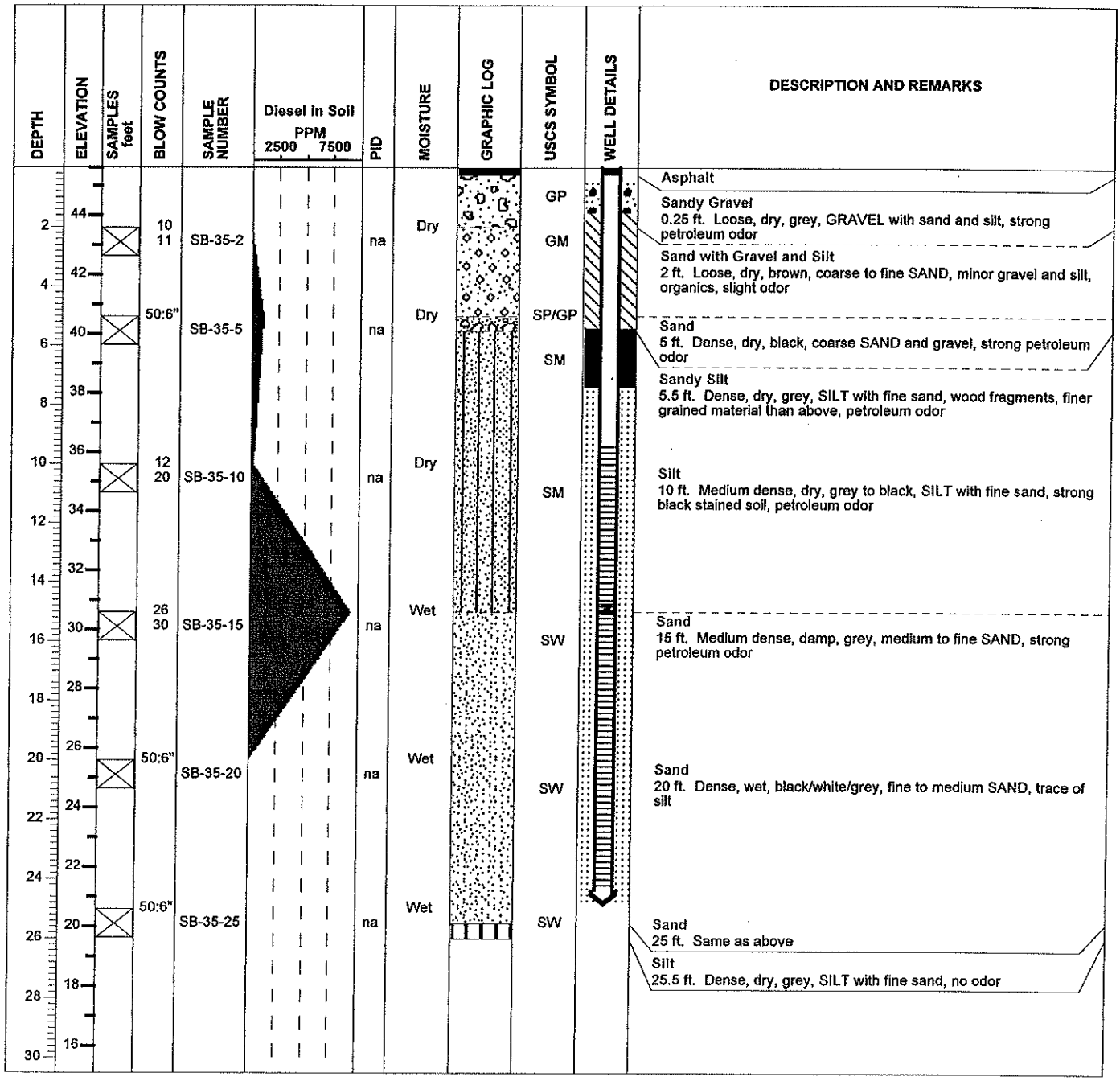
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-35 (01MW-08)
LOCATION: 2737 West Commodore Way
AREA: Former LUST Area
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/22/00 1415
DATE/TIME COMPLETED: 11/22/00 1530
TOTAL DEPTH: 25 ft
WATER DEPTH: 15 ft



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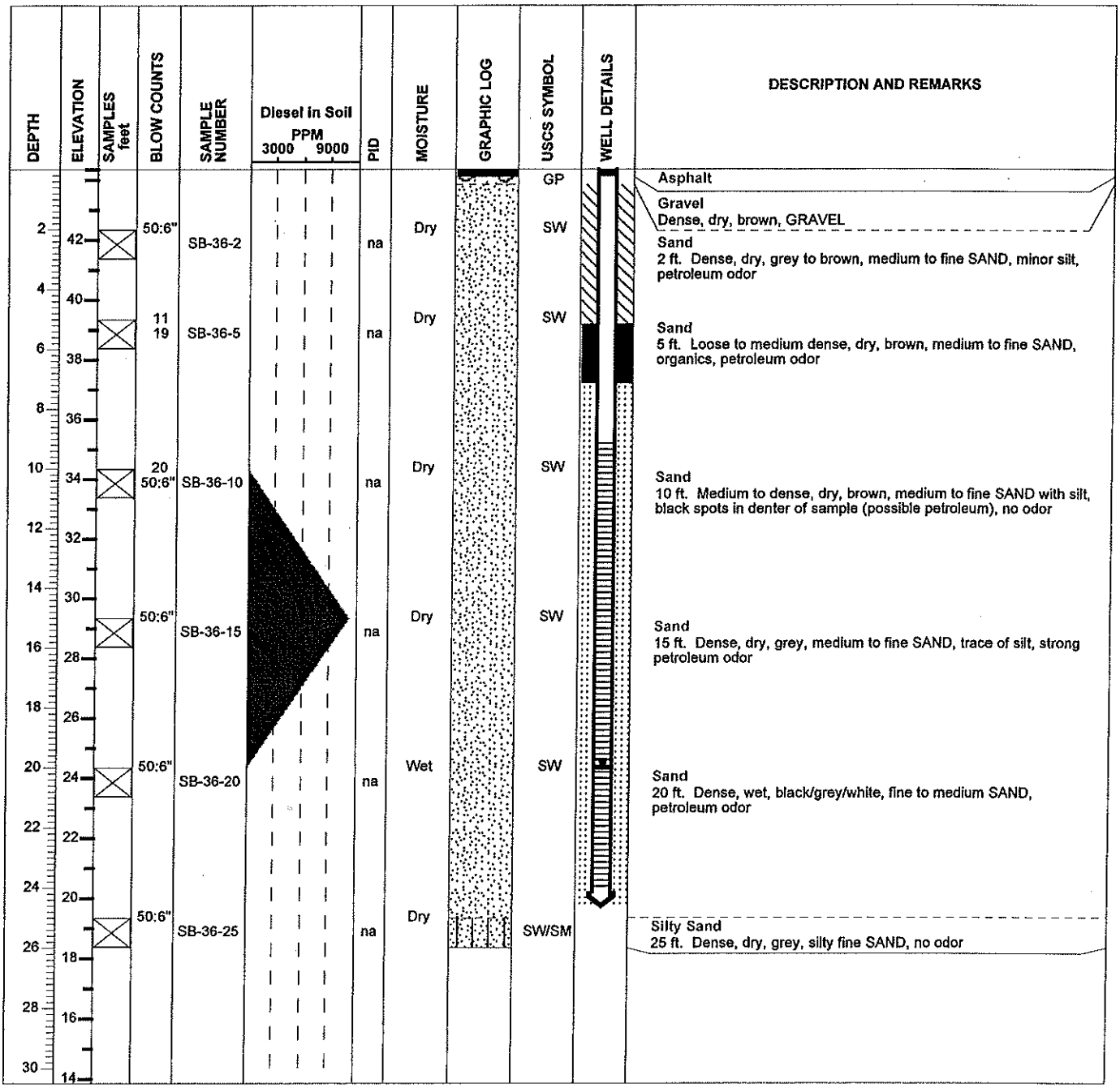
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-36 (01MW-09)
LOCATION: 2737 West Commodore Way
AREA: Former LUST Area
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/27/00 1300
DATE/TIME COMPLETED: 11/27/00 1345
TOTAL DEPTH: 25 ft
WATER DEPTH: 20 ft



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-37 (01MW-10)

LOCATION: 2737 West Commodore Way

AREA: West Commodore Way Perimeter

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA

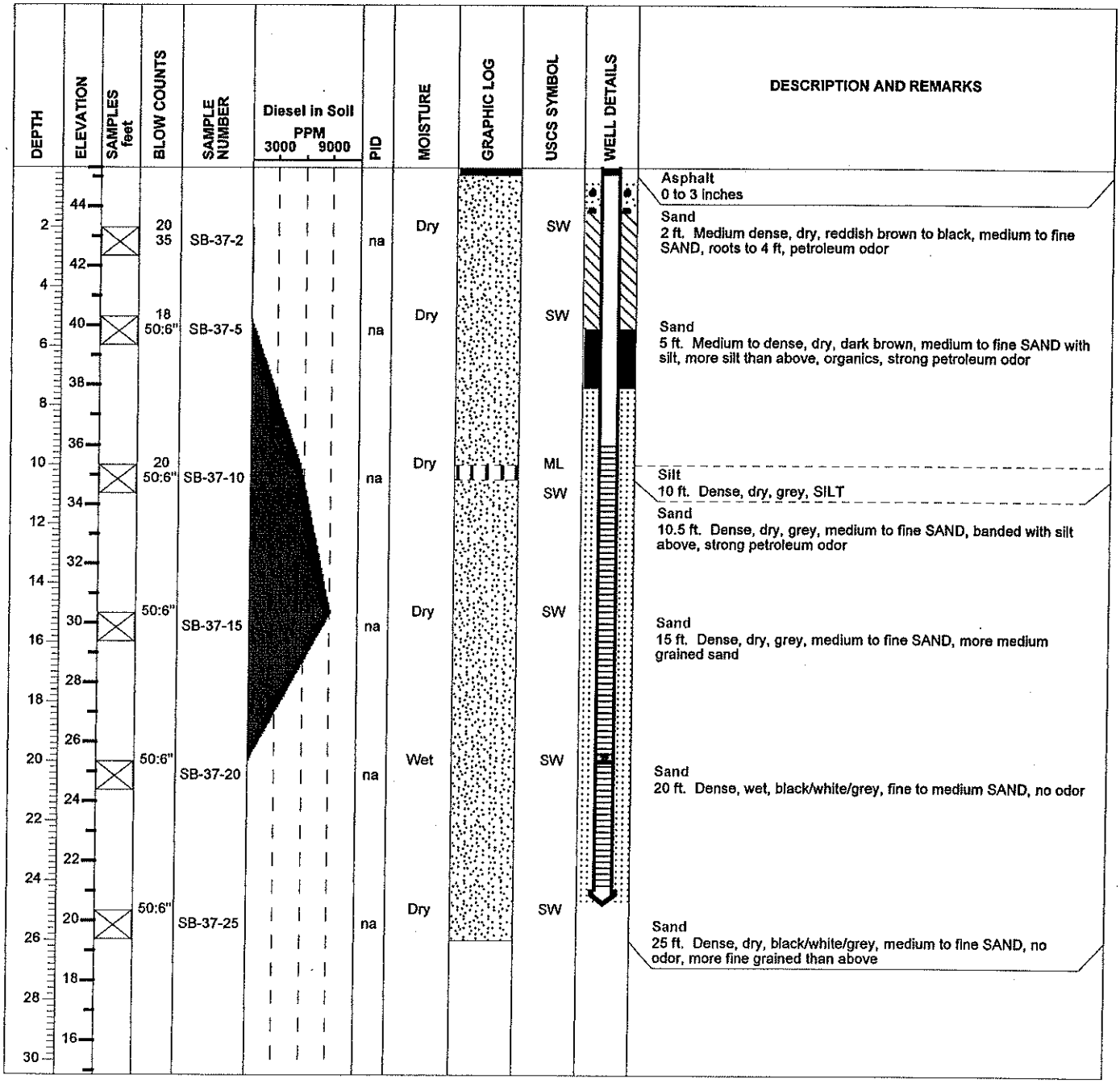
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/27/00 1030

DATE/TIME COMPLETED: 11/27/00 1115

TOTAL DEPTH: 25 ft

WATER DEPTH: 20 ft



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-38
LOCATION: 2737 West Commodore Way
AREA: West Commodore Way Perimeter
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/27/00 0845
DATE/TIME COMPLETED: 11/27/00 0945
TOTAL DEPTH: 35 feet
WATER DEPTH: na

DEPTH	ELEVATION	SAMPLES feet	BLOW COUNTS	SAMPLE NUMBER	Diesel In Soil PPM 20 30 40	PID	MOISTURE	GRAPHIC LOG	USCS SYMBOL	WELL DETAILS	DESCRIPTION AND REMARKS
0	46								GP		Asphalt 0 to 3 inches
2			12 14	SB-38-2		na	Dry		GM		Gravel 0.25 ft to 1 ft. Dense, dry, brown, GRAVEL
4	44										Gravel, Sand, and Silt 2 ft. Loose, dry, brownish/orange, GRAVEL/SAND/SILT, no odor
6	42		50:6"	SB-38-5		na	Dry		SW		Sand 5 ft. Dense, dry, brown, medium to fine SAND, minor silt, oxidized layers, no odor
8	40										
10	38		65:6"	SB-38-10		na	Dry		SW		Sand 10 ft. Same as above
12	36									NA	
14	34										
16	32		55:6"	SB-38-15		na	Dry		SW		Sand 15 ft. Same as above
18	30										
20	28		50:6"	SB-38-20		na	Dry		ML		Silt 20 ft. Dense, dry, grey, SILT with fine sand
22	26										
24	24										
26	22		50:4"	SB-34-25		na	Dry		ML		Silt 25 ft. Same as above
28	20										
30	18		50:6"	SB-38-30		na	Dry		ML		Silt 30 ft. Same as above
32	16										
34	14										
36	12		60:6"	SB-38-35		na	Wet Dry		ML		Silt 35 ft. Same as above, 3 inch saturated layer of fine sand and silt, dry clay below interval
38	10										
40	8										

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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-39

LOCATION: 2737 West Commodore Way

AREA: North side of fuel loading rack

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA

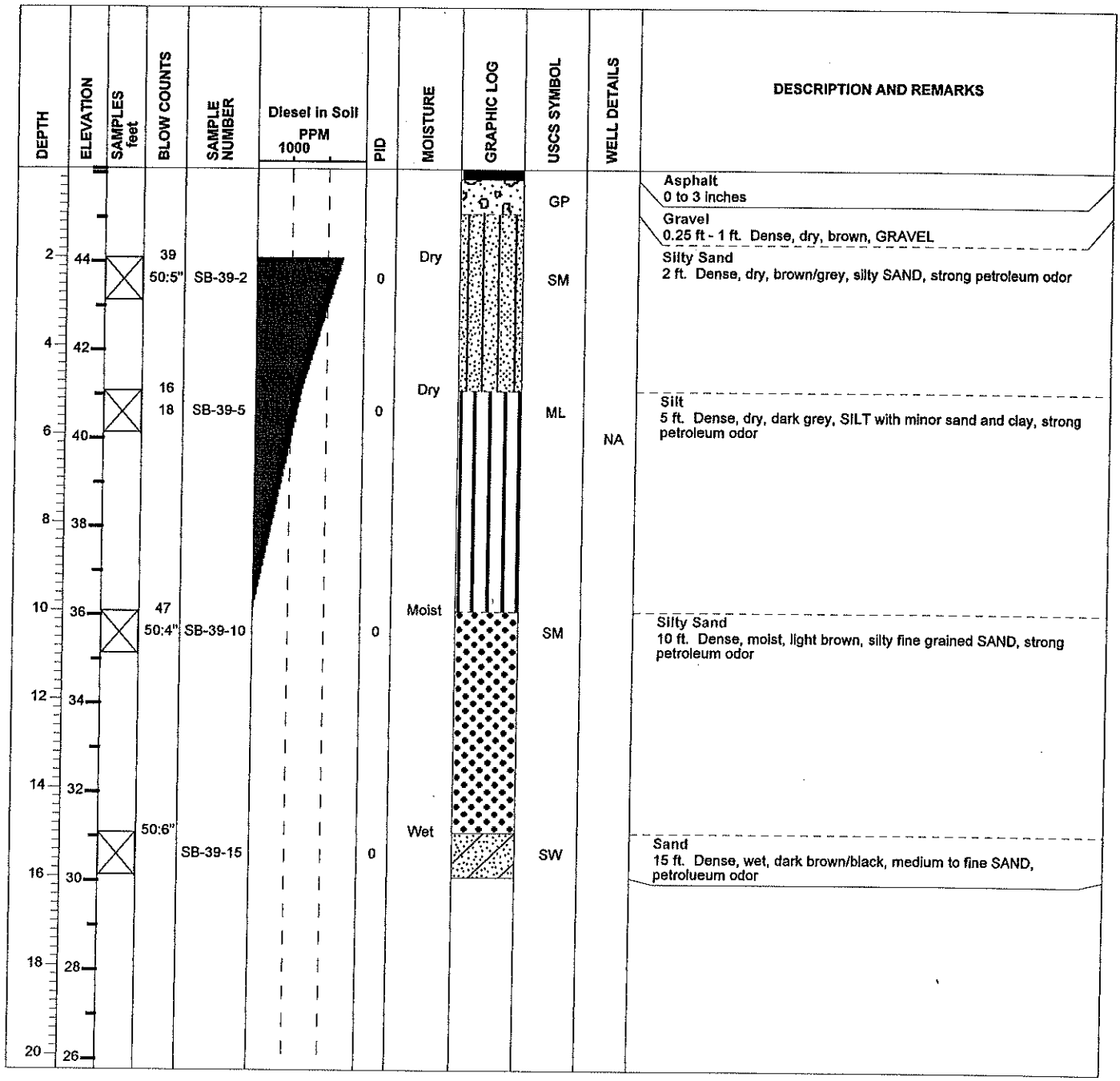
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/22/00 1000

DATE/TIME COMPLETED: 11/22/00 1045

TOTAL DEPTH: 15 feet

WATER DEPTH: 15 feet



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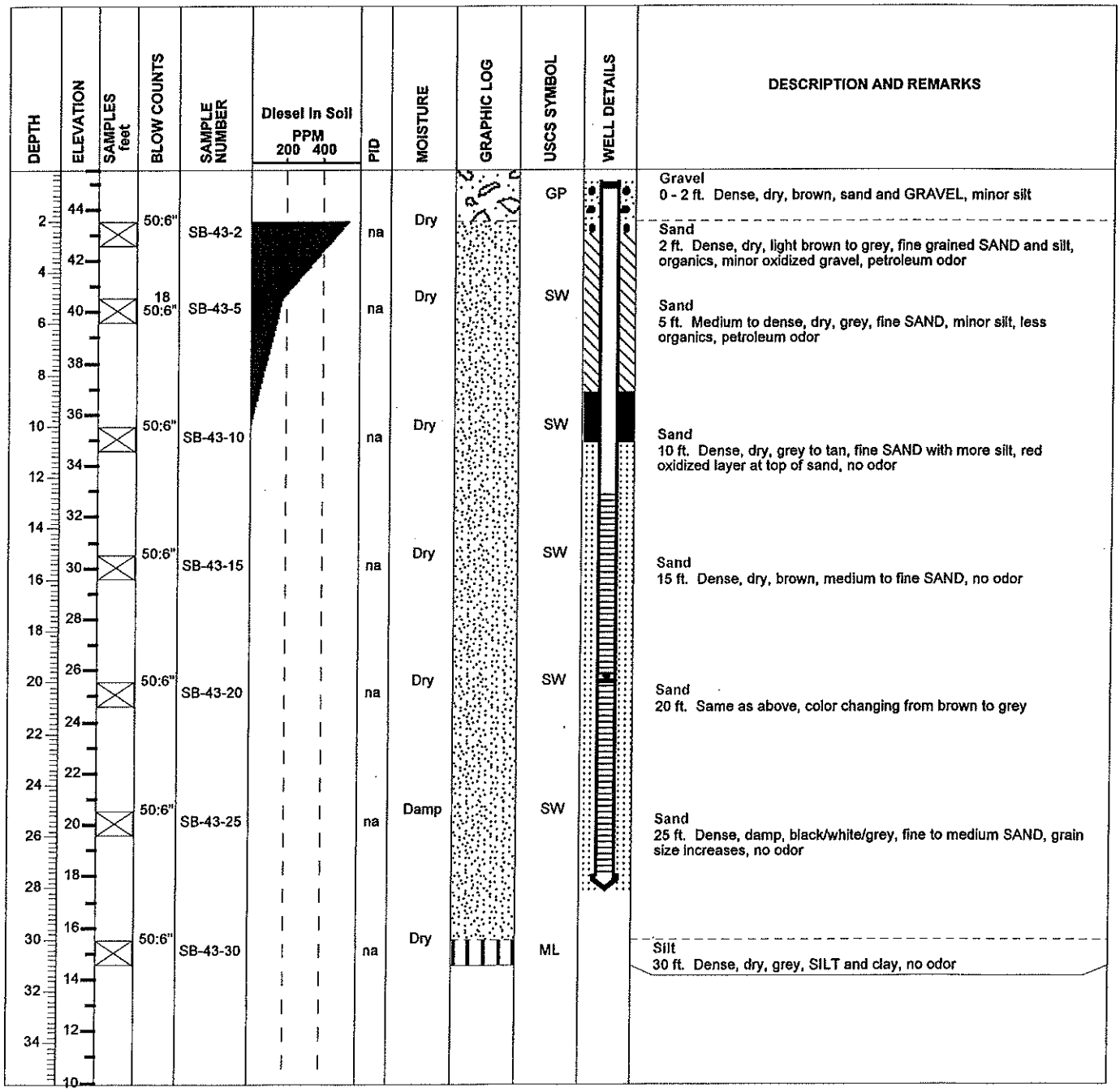
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-43 (01MW-07)
LOCATION: 2737 West Commodore Way
AREA: Former AST Area
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-Inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/27/00 1430
DATE/TIME COMPLETED: 11/27/00 1540
TOTAL DEPTH: 30 ft
WATER DEPTH: 20 ft



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FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment

BORING NUMBER: SB-44 (01MW-11)

LOCATION: 2737 West Commodore Way

AREA: West Commodore Way Perimeter

CLIENT: Time Oil Company

SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA

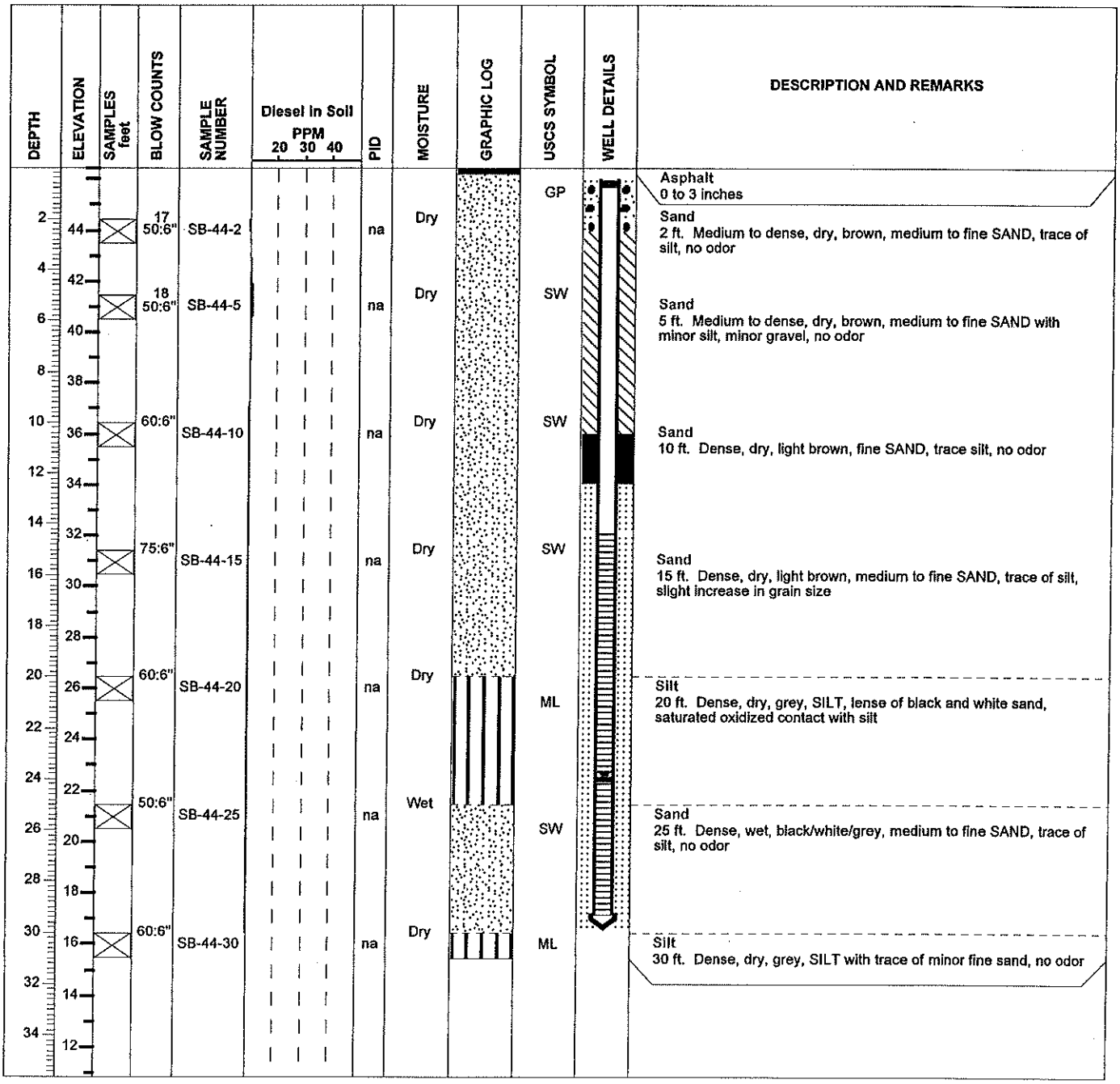
DRILLING CONTRACTOR: Cascade

DATE/TIME STARTED: 11/28/00 0810

DATE/TIME COMPLETED: 11/28/00 0900

TOTAL DEPTH: 30 ft

WATER DEPTH: 24 ft



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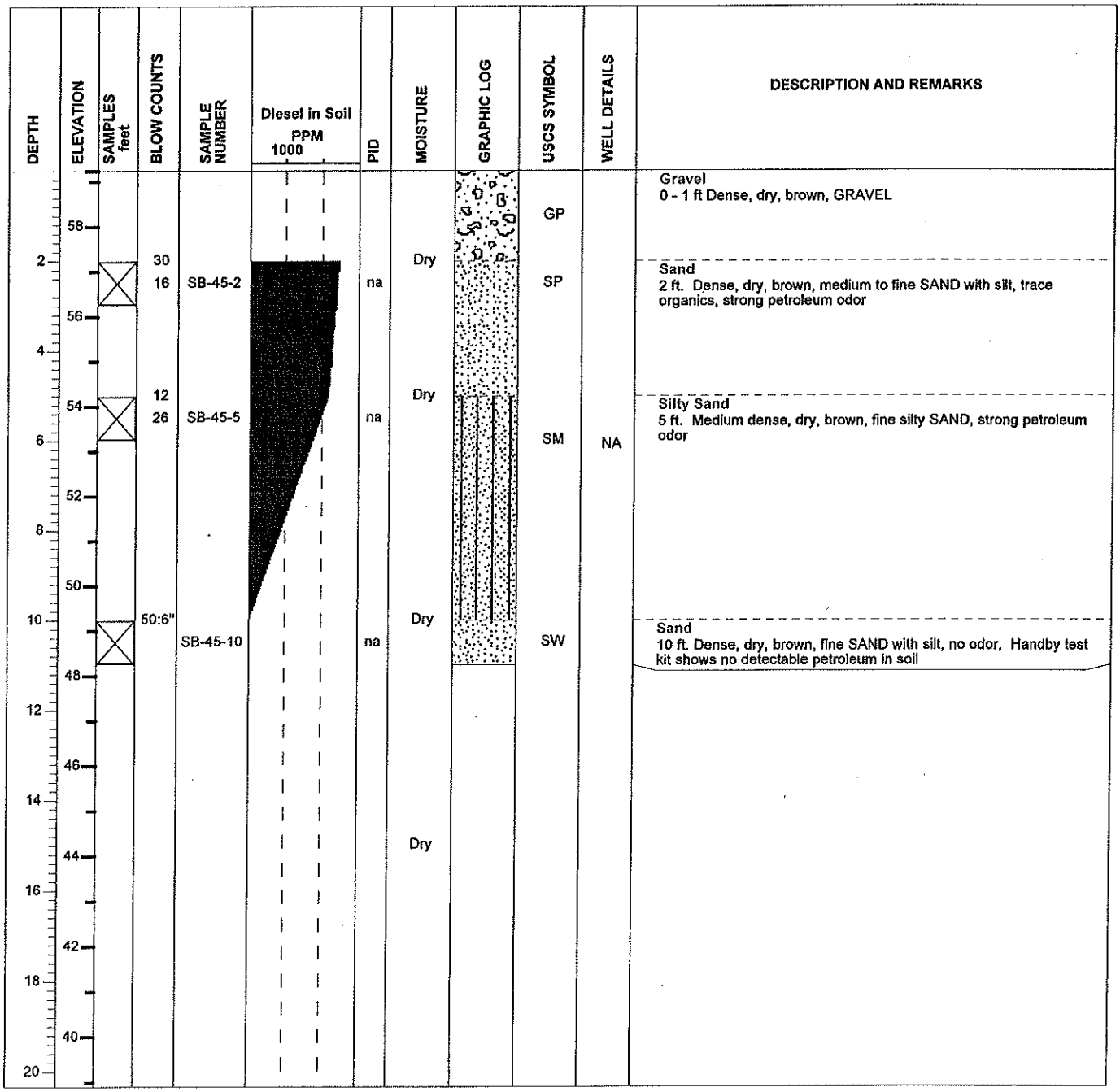
FOSTER WHEELER ENVIRONMENTAL CORP.

PROJECT NAME: Phase II Site Assessment
BORING NUMBER: SB-45
LOCATION: 2737 West Commodore Way
AREA: Edge of concrete east of ASKO
CLIENT: Time Oil Company
SITE MANAGER: Scott Sloan

DRILLING METHOD: 4-inch HSA
DRILLING CONTRACTOR: Cascade
DATE/TIME STARTED: 11/28/00 1050
DATE/TIME COMPLETED: 11/28/00 1120
TOTAL DEPTH: 10 feet
WATER DEPTH: na



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