Summary Report – Environmental Construction Activities

Sam's Club Store No. 4835
Renton, King County, Washington

Volume I of II

Submitted To:

Department of Ecology

21 March 2005

J-1470-10

Prepared by:

Zipper Zeman Associates, Inc.
18905 - 33rd Avenue West, Suite 117
Lynnwood, Washington 98036
(425) 771-3304
Fax (425) 771-3304

Zipper Zeman Associates, Inc.
Geotechnical and Environmental Consulting

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Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Attention: Mr. Nnamdi Madakor, P.G, P.Hg.
Headquarters VCP Policy and Technical Manager

Subject: Summary Report – Environmental Construction Activities
Sam's Club Store No. 4835
901 South Grady Way
Renton, King County, Washington

Dear Mr. Madakor:

Zipper Zeman Associates, Inc. (ZZA) presents this *Summary Report – Environmental Construction Activities* providing documentation of remediation activities performed during site development. The subject property ("Site") is situated in the City of Renton, King County, Washington (Section 20, Township 23 North, Range 5 East, W.M.).

ZZA anticipated that construction activities would encounter and generate soil and groundwater that was impacted with petroleum hydrocarbons, polychlorinated biphenyls (PCBs), carcinogenic polynuclear aromatic hydrocarbons (cPAHs), and arsenic above site-specific cleanup levels previously approved by the Department of Ecology ("Ecology"). This letter presents ZZA's findings with respect to handling and disposition of contaminated soils that were encountered during development of the Site.

Based on the results of the remediation activities described herein, ZZA believes that contaminants in soil and groundwater at the Site are currently below the site-specific cleanup levels. Accordingly, ZZA requests that Ecology reissue the No Further Action determinations for the Site previously provided to the former owner of the Site.

This report is only to be used in conjunction with the following documents prepared by ZZA, presented under separate cover:

- *Results of Slope Stability Analysis – Proposed Retail Project – State Highway 515 and Grady Way – Renton, Washington* dated 8 October 2002;

- *Phase I Environmental Site Assessment – Proposed Retail Development – South Grady Way and State Route 515 – Renton, King County, Washington* dated 4 November 2002;

- *Environmental Conditions Summary Letter – Proposed Retail Development – South Grady Way and State Route 515 – Renton, King County, Washington* dated 8 November 2002;

- *Subsurface Exploration and Geotechnical Engineering Evaluation – Proposed Retail Development – S. Grady Way and Talbot Road – Renton, Washington* dated 6 December 2002;

- *Environmental Contingency Plan –Renton Sam's Club – South Grady Way and S.R. 515 – Renton, Washington* dated 5 March 2003;

- *Summary Letter Report – Previous Environmental Characterization and Remedial Reports – Renton Sam's Club – South Grady Way and State Route 515 – Renton, Washington* dated 5 March 2003;

- *Request for Temporary Discharge Authorization – Proposed Retail Development – South Grady Way and State Route 515 (Talbot Road) – Renton, Washington 98055* dated 6 March 2003;

- *Scope of Services and Cost Estimate – Environmental Construction Monitoring Services – Renton Sam's Club – 901 South Grady Way – Renton, Washington* dated 27 March 2003;

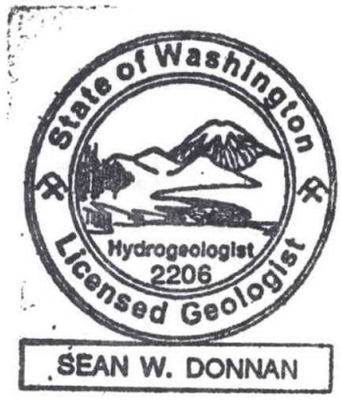
- *Subsurface Exploration and Geotechnical Engineering Evaluation – Proposed Soldier Pile Wall for Retail Project – Talbot Road and Grady Way – Renton, Washington* dated 3 April 2003;

- *Results of Soil-Cement Mix Design – Proposed Retail Development – Talbot Road and Grady Way – Renton, Washington* dated 7 April 2003;

- *Construction Dewatering Submittal – Renton Sam's Club – 915 South Grady Way – Renton, Washington* dated 2 July 2003; and

- *Construction Dewatering Self Monitoring Report – Sam's Club – 901 South Grady Way – Renton Washington 98055 (Authorization 10364-01)* dated 28 January 2004.

If you have any questions concerning the findings and conclusions contained in this report, please feel free to call us at your earliest convenience.



Respectfully submitted,
Zipper Zeman Associates, Inc.

Michael J. Bullock, P.E.
Project Engineer

Sean W. Donnan, P.G.
Associate

cc: Joe Geivett, PacLand
Bill Joyce, Salter Joyce Ziker, P.L.L.C.
Mike Alexander, Wal-Mart Stores, Inc.
Robert Boyd, Puget Western, Inc.
R. Gerard Lutz, Perkins Coie

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1.0 INTRODUCTION

Zipper Zeman Associates, Inc. (ZZA) produced this *Summary Report – Environmental Construction Activities* summarizing environmental-related construction activities performed during the development of the subject property located at 901 South Grady Way in Renton, King County, Washington (Site). See Figure 1 – *Site Location Map* for a map of the site and vicinity.

Based upon our review of previous environmental characterization activities performed by others, it was apparent that areas with contamination exceeding cleanup levels employed on this site remained even though the Washington State Department of Ecology (Ecology) had issued No Further Action (NFA) determinations for three parcels within the Site. In response, ZZA prepared the report entitled *Environmental Contingency Plan*, dated 6 March 2003, in order to comply with conditions set forth by Ecology in the NFA determinations and to address the regulatory concerns with respect to construction activities.

The purpose of this *Summary Report – Environmental Construction Activities* is to document how impacted soils, groundwater, and other materials were handled during earthwork related to site development activities. The report will also document the decommissioning of monitoring wells on the subject site and the installation and sampling of replacement groundwater monitoring wells.

Based on the remediation activities conducted at the Site, ZZA believes reissuance of an NFA determination for the Site is warranted.

2.0 PROJECT DESCRIPTION

2.1 Site Description – Pre-Construction

The Site consisted of three King County Tax Parcels and a portion of another King County Tax Parcel covering a total of 16.0 +/- acres located east of the intersection of South Grady Way and State Route 515 in Renton, King County, Washington. (See Figure 1 – *Site Location Map*).

Prior to development activities in 2003, the Site was vacant and covered with asphalt-paved parking areas, demolished buildings, and gravel parking areas. A steep slope was located on the eastern margins of the Site and was covered with blackberry bushes and trees. Hedges were planted along Grady Way and SR 515. A concrete trough carrying groundwater from the former Renton Coal Mine and surface water runoff from areas uphill of the site, ran along the east edge of the Site on the valley floor. Items such as surficial staining or spills were not observed, however, numerous monitoring well monuments were observed indicating that portions of the Site had been extensively studied.

[redacted]

A description of the previous development (prior to demolition) including building use and locations are provided in previously issued ZZA reports, including the *Phase I Environmental Site Assessment* and the *Summary Letter Report.*

2.2 Site Description – Post-Construction

Currently, the subject site is developed with an approximate 135,000 square foot retail store and associated gasoline station with parking areas, driveways, landscaping areas, and stormwater management ponds. A soldier pile retaining wall is located to the southeast of the retail structure. The concrete flume with new and modified sections is located along the eastern and southern margins of the subject site and carries groundwater from the former Renton Coal Mine and surface water from residential areas uphill of the site. Associated catchbasins, utility installations, light poles, and signage have also been installed on the subject site.

2.3 Site Geology

The geology of the Site was determined through review of reports previously prepared by others and summarized in the ZZA report entitled *Summary Letter Report*, through subsurface explorations advanced by ZZA as part of the preparation of the ZZA reports dated 8 October 2002, 6 December 2002, and 3 April 2003, through earthwork activities performed during construction, and through the installation of monitoring wells installed by ZZA as part of the current effort and described in Section 5.0 of this report.

The geology of the Site, as determined and documented in the aforementioned sources, generally consists of coal fill over native, fine-grained alluvial deposits over coarser grained deposits over sandstone bedrock. The eastern portions of the site, adjacent to Main Avenue/Benson Road South, are underlain by sandstone bedrock which dips steeply to the west. The coal fill material consists of varying sizes of coal fragments and ash as well as varying sizes of sandstone fragments and sand. Depths of fill varied across the site with the thickest fill sections present in the former lobe of coal fill located on the eastern portion of the Site

The majority of the development excavations advanced on the subject site did not extend deeper than the coal fill placed as part of previous activities or cement-treated structural fill placed during development.

2.4 Site Hydrogeology

Based upon measurements made by ZZA as part of groundwater sampling events completed during May 2004, July 2004, October 2004, and January 2005, the groundwater appears to be present at elevations ranging from 25 ½ to 30 feet above Mean Sea Level (MSL) and appears to be generally migrating in a westerly or northwesterly direction. Four groundwater contour maps are included with this report as Figures 12 through 15.

Groundwater elevations measured in the two deep groundwater monitoring wells are on the order of 6 to 10 feet lower than the elevations measured in the shallow groundwater monitoring wells. The deep monitoring wells are screened from approximately 53 to 58 feet below ground surface while the shallow monitoring wells are screened from 10 to 20 feet below ground surface. ZZA attributes these differences in measured groundwater elevations in the wells to distinct groundwater bearing zones in which the shallow and deep wells are installed.

3.0 PREVIOUS REPORTS

3.1 GeoEngineers Reports

On behalf of Puget Western, the former owner of the Site, GeoEngineers, Inc. (GeoEngineers) of Seattle, Washington conducted investigation and remediation activities on the Site and issued several reports between 1991 and 2002 regarding such activities. ZZA's report entitled *Summary Letter Report – Previous Environmental Characterization and Remedial Reports – Renton Sam's Club – South Grady Way and State Route 515 – Renton, Washington* dated 5 March 2003 provides a detailed summary of many of the GeoEngineers' reports with a brief discussion of the activities documented in said reports following herein.

Numerous characterization activities were performed on the Site by GeoEngineers including but not limited to the advancement of borings, hand-augered borings, test pits, and direct-push explorations with the collection and submission of concrete chip, soil, and groundwater samples from the Site as well as soil and sediment samples from the wetlands to the south of the Site.

These characterization activities resulted in the removal of several USTs from the subject site with associated remedial soil excavations. Several thousand tons of contaminated soils were removed from the Site. The largest soil removal activities took place in the southern portions of the Site where petroleum contamination was encountered in soils and attributed to the storm drain system. No removal of the impacted soils and sediment has been documented to have occurred in the wetland portion of the Puget Western property to the south of the Site.

The GeoEngineers reports also included the calculation of a site-specific cleanup standard for diesel range and heavy oil range petroleum hydrocarbons based upon the direct contact pathway. The lowest of these two values, 3,432 parts per million (ppm), was utilized for ZZA's cleanup standard as well. Other cleanup standards employed by GeoEngineers included constituents listed in MTCA Method A cleanup standards and CLARC II, for constituents without a MTCA Method A cleanup standard (see section 3.4 below). GeoEngineers also performed groundwater monitoring for several years but the data trends were generally inconclusive.

Based upon the results as reported by GeoEngineers for both remedial action and groundwater sampling activities, Ecology issued three NFA determinations for the three separate

"parcels" on the Site in February 2000. Continued groundwater monitoring on a semi-annual basis as well as compliance with restrictive covenants were conditions for the issuance of the NFAs for the parcels.

3.2 Phase I Environmental Site Assessment

ZZA's report entitled *Phase I Environmental Site Assessment – Proposed Retail Development – South Grady Way and State Route 515 – Renton, King County, Washington* dated 4 November 2002 identified that the Site was previously developed as a maintenance and storage facility for electrical distribution equipment including transformers, power poles, and other machinery. Prior to the construction of the Puget Power and Light Company buildings, the area was used a storage area for coal and coal cinders mined from the Renton Coal Mine. The Renton Coal Mine has had two entries including an entry constructed in 1901 purportedly located on the Site near the daylighted pipes and concrete flume and an older entry now located near the eastern edge of Interstate 405. Prior to the construction of the Renton Coal Mine in 1873, the majority of the vicinity was farmland. South Grady Way was reportedly a former rail road line. Spurs off the rail line entered or terminated near the entrance to the Renton Coal Mine to transport the coal to Seattle. In the northeast corner of the Site, Renton Glass Company had a plant producing glass bottles. After the glass company suspended operations, a concrete pipe manufacturer operated on the site.

The *Phase I Environmental Site Assessment* noted that Ecology had issued No Further Action (NFA) determinations for three parcels at the Site based on site-specific cleanup levels for contaminants of concern. Based on our review of the history of industrial operations at the Site and our opinion that data from previous remediation activities may not have been representative of Site conditions, we believed that it was probable that contamination in soil and groundwater above the site-specific cleanup levels remained at the Site.

We reached this conclusion based on the presence of PCBs, cPAH, and petroleum hydrocarbons in soil and/or groundwater exceeding MTCA Method A Cleanup Levels, as documented in the analytical data appended to GeoEngineers' reports, the lack of testing for cPAH and PCBs in many explorations and remedial excavation samples submitted, and the focus of remedial efforts on specific source areas. In light of these conditions, ZZA concluded that it was likely that soil and groundwater were present on site that exceeded the cleanup standards employed by GeoEngineers. We recommended further characterization of the Site prior to development activities. We also noted that the restrictive covenant placed on the Site as a condition for issuance of the NFA required approval by Ecology if a new exposure pathway were to be created, e.g., via construction activities.

3.3 Environmental Conditions Summary Letter

ZZA's letter entitled *Environmental Conditions Summary Letter – Proposed Retail Development – South Grady Way and State Route 515 – Renton, King County, Washington* dated

8 November 2002, stated that if excavated soils generated during development activities were impacted, those soils may need to be disposed off-site.

3.4 Environmental Contingency Plan

ZZA's report entitled *Environmental Contingency Plan –Renton Sam's Club – South Grady Way and S.R. 515 – Renton, Washington* dated 5 March 2003 provided guidance on how potentially impacted soils and groundwater were to be handled during earthwork related to site development activities.

The *Environmental Contingency Plan* applied solely to development activities performed at the Site and included specific protocols for grading, excavations, trenching, and utility installations. The *Environmental Contingency Plan* included figures showing areas of the Site where development activities, e.g., installation of new stormwater and sanitary lines and water supply lines, were proposed to occur and where impacted soil may still exist.

The *Environmental Contingency Plan* also proposed that the following site-specific cleanup levels for contaminants of concern ("COCs") be used during development activities:

Constituent	Applicable Action Level	Source
TPH-Diesel, TPH-Heavy Oil	3,432 ppm	MTCA Method B Site Specific Cleanup Level
PCBs	1.85 ppm[1]	Maximum concentration found during previous site characterization activities in the areas of proposed utility excavations[1]
cPAHs	1.7015 ppm[2]	Maximum concentration found during previous site characterization activities in the areas of proposed utility excavations[2]
Arsenic	20 ppm	MTCA Method A

1 PCB cleanup standard based on concentration in sample "TP-5-4.0" collected on 12-22-97 and reported in the 1998 Environmental Site Assessment report produced by GeoEngineers.

2 cPAH cleanup standard based upon concentration in sample "B-19-0.5" collected on 12-22-97 and reported in the 1998 Environmental Site Assessment report produced by GeoEngineers.

The site-specific cleanup levels were based on the previously calculated cleanup standard for petroleum hydrocarbons as employed by GeoEngineers, the maximum concentrations of PCBs, cPAHs confirmed by GeoEngineers to remain on site after it had performed remedial activities, and the MTCA Method A cleanup for arsenic. Ecology accepted the use of these site-specific cleanup levels when it reviewed and approved the *Environmental Contingency Plan.*

4.0 ENVIRONMENTAL ACTIVITIES DURING DEVELOPMENT OF THE SITE

4.1 Health and Safety

The Health and Safety Plan (HASP) for ZZA personnel was prepared by Larry Lee, CIH of Argus Pacific, Inc. located in Seattle, Washington and addressed major elements such as site safety personnel, work zones, emergency procedures, hazard assessment, monitoring plan, personal protection level(s), site control, site security, decontamination, training, communications, disposal procedures, and record keeping. The HASP was consistent with the requirements of 29 CFR 1910.120 and WAC 296-62 Part P (updated since then to Chapter 296-843 WAC) for excavating and handling contaminated soils and groundwater and was certified by a Certified Industrial Hygienist.

4.2 General Contractor/Subcontractor Environmental Qualifications

The general contractor selected for the project was Colorado Structures, Inc. (CSI) of Portland, Oregon and the earthwork contractor was K & B Excavating (K&B) of Woodinville, Washington. CSI completed a contractor-specific Health and Safety Plan prepared by their representatives.

4.3 Monitoring and Field Screening During Construction

All excavations performed on the Site were monitored by ZZA. While monitoring the earthwork activities, representative samples of soil were visually inspected for obvious oily sheens and/or petroleum odors and field screened for the presence of TPH compounds to facilitate appropriate soil sample selection. None of the other chemicals of concern (COCs) at the Site have properties which can be detected via field screening methods.

Due to the low volatility of the petroleum compounds present on the Site, the use of a Photoionization Detector (PID) as discussed in the *Environmental Contingency Plan* and *Health and Safety Plan* was ineffective at qualifying the soils being screened. Therefore, we relied on visual and olfactory methods to screen the soils being excavated.

4.4 Equipment Decontamination

Portions of heavy equipment coming into contact with contaminated soil and groundwater underwent a decontamination process prior to leaving the Site in order to minimize the risk of contaminated materials leaving the site. In general, contamination could leave the site via the excavating apparatus, i.e., the bucket, and the tracks or tires that come into contact with the ground surface. Therefore, decontamination of the equipment on site was performed on the bucket(s) and the tracks/tires of the excavating equipment prior to leaving the site.

4.5 Excavation and Stockpiling of On-Site Borrow Material

The "On-Site Borrow Area," was defined in the *Environmental Contingency Plan* as the stockpiled coal waste to be removed for geotechnical and development purposes located between the proposed building and Main Avenue/Benson Road South in the northeast portion of the Site. Excavated soils from the On-Site Borrow Area were field screened for the presence of petroleum hydrocarbon impact.

None of the soils excavated from the on-site borrow area had visual and/or olfactory indications of petroleum-hydrocarbon impact and therefore were not sampled. These soils were used as fill across the site and under the building pad. Prior to its use as fill, the soil was cement-treated per the recommendations of the ZZA report entitled *Results of Soil-Cement Mix Design-Proposed Retail Development – Talbot Road and Grady Way – Renton, Washington* dated 7 April 2003.

4.6 Excavation and Stockpiling of Utility Trench Excavation Spoils

Soils from excavated utility trenches were stockpiled along the side of the trench and covered with a layer of plastic sheeting of at least 6-mil thickness. The plastic sheeting was anchored as necessary around both the perimeter and atop the stockpile using appropriate measures.

ZZA collected discrete soil samples in general accordance with the sampling frequency protocol described in Section 4.8 below. The samples were submitted to a Washington-state accredited analytical laboratory for the COCs listed in Sections 3.4 and 4.9 of this report. On- or off-Site disposition of the soil was based on the sampling results and/or visual or olfactory observations of impacts.

4.7 Utility Trench Backfill

All utility excavations were backfilled with crushed recycled concrete from both on-site and off-site sources. See Section 4.14 for discussions regarding sampling of on-site concrete prior to crushing it and using it as fill as part of the development activities.

ZZA's Environmental Contingency Plan recommended construction of trench dams, although the construction methods, timeframe, and locations were modified in the field after conversations with the contractor and in response to the lack of groundwater encountered in the utility excavations.

At the locations chosen for the construction of the trench dams, concrete catchbasin or manhole structures were typically used as impermeable surfaces. Trench dams were generally constructed on the sides of said structures or around the pipe, where necessary. Following the installation of the utility, an excavation was advanced on the sides of the structure or around the pipe until native materials, or previously placed fill materials, were encountered. The trench

dam was then poured "neat" to the sidewalls of the excavation, the structure or pipe backfill, and the structure or pipe itself. The trench dams were constructed such that at least 2 feet of controlled density fill (CDF) or concrete was placed in the direction of the pipe and above the groundwater level. See Figure 15 for the locations of the trench dams installed.

4.8 Soil Sampling Methodology and Frequency of Testing

Sampling of potential impacted soil for characterization purposes was performed using, generally, a judgmental methodology per the U.S. Environmental Protection Agency (EPA), Representative Sampling Guidance document, OSWER Directive 9360.4-10. In accordance with the Ecology guidance document entitled *Guidance for Remediation of Petroleum Contaminated Soils* dated April 1994, the following frequencies were applied for samples collected from stockpiles or during the generation of stockpiles.

Cubic Yards of Soil	Minimum Number of Samples
0-100	3
101-500	5
501-1000	7
1001-2000	10
>2000	10 + 1 for each additional 500 yards

Sample identification methodology used during the course of this project generally included the use of station numbers, offset distances from site features, stockpile identifiers, foundation gridlines, and sidewall and bottom sample identifiers (remedial excavation samples) with elevations where necessary. For example, the sample identified as *60' N of CB #47 @31.5'* indicates that the sample was collected from a point in the trench 60 feet north of the catch basin identified as CB #47 at an elevation of 31.5 feet. A graphical depiction of nearly all the discrete soil samples is included with this report on the attached figures. Abbreviations used in the sample identifications are listed in Tables I through IV in this report.

4.9 Analytical Laboratory Methods

Soil and groundwater samples were submitted for analytical laboratory analysis for the following chemicals of concern (COCs). Analytical test procedures performed by a Washington State accredited laboratory included:

1. Washington State method NWTPH-Dx for diesel and heavier than-diesel range petroleum hydrocarbons. (Due to the fraction of organic matter present in the soils on site, the sample extract was passed thorough a silica gel column at the laboratory prior to analysis in order to remove the biogenic interference.);

2. EPA Method 8270 for the seven carcinogenic polynuclear aromatic hydrocarbons (cPAHs) benzo(a)anthracene, benzo(a) pyrene, benzo(b) fluoranthene, benzo(k)fluoranthene, Chrysene, dibenz(a,h)anthracene, and ideno(1,2,3-cd)pyrene.

3. EPA Method 8082 for polychlorinated biphenyls (PCBs) including, but not limited to, Aroclor 1016, Aroclor 1221, Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260, Aroclor 1262, and Aroclor 1268.

4. EPA Method 6010 for arsenic utilizing inductively coupled plasma (ICP) methods.

4.10 Remedial Excavations

Three remedial excavations were advanced on the subject site, the first for arsenic impacted soils encountered during the installation of the storm drain system, the second for petroleum-impacted soils encountered during the installation of the sanitary sewer system, and the third for cPAH-impacted soils for soils encountered during the installation of the storm drain system. Soils excavated during the advancement of these remedial excavations were disposed of off-site, except for a portion of the soils excavated during the advancement of the petroleum remedial excavation that were determined via field screening not to be impacted. (See Section 4.10.3 for more information). Other soils reported with cleanup standard were handled as described in Section 4.11.

4.10.1 General Description of Remedial Excavation Approach

During the earthwork activities, trenches were excavated to install utilities. In most cases, the trenches were backfilled soon after installation of the utilities with the understanding by the contractor that should soil samples collected from the trenches be reported with constituents exceeding the site cleanup levels, the backfill would need to be removed, and perhaps the installed utilities as well.

When soil samples were obtained that reported COCs exceeding the cleanup levels identified in Section 3.4, remedial excavations were advanced in the vicinity of the impact. The remedial excavations were extended in all directions from the location of the soil sample exceeding the cleanup standard until confirmation samples or field screening suggested that respective sidewalls and bottoms of such remedial excavations had reduced contaminant concentrations below the applicable cleanup level. Soils excavated from the remedial excavations were managed as impacted soils.

In the area of petroleum impacts, however, no indications of significant impact based upon field screening, were observed from the ground surface down to approximately 4 feet below ground surface. These upper soils, identified as "overburden," were stockpiled separately, were confirmed to contain concentrations of COCs less than the site cleanup levels, and were managed as non-impacted soils with disposition as fill on site. Further discussion is provided in Section 4.10.3.

Confirmation samples collected from the sidewalls and bottom of the remedial excavations were used to qualitatively define the limits of the remedial excavation with soils between these locations managed as impacted soils.

Soils excavated from the remedial excavations were stockpiled and covered with a layer of plastic sheeting of at least 6-mil thickness. The stockpiling occurred on a flat lying, smooth surface on a relatively impervious surface such as asphalt or concrete, or 6-mil plastic sheeting. The plastic sheeting was anchored as necessary around both the perimeter and atop the stockpile using appropriate measures.

Sections 4.10.2 through 4.10.4 highlight specific remedial excavations advanced at the Site for the purposes of removing soils with concentrations of COCs above the site cleanup levels. ZZA profiled the wastes to be exported from the Site for the Regional Disposal Company, which arranged for transportation of the materials off the Site.

4.10.2 Arsenic Remedial Excavation

During the excavation of the utility trench in order to install Pipe No. 47, located along the western property line, south of the intersection of Talbot Road and South Grady Way, arsenic was detected in a sample obtained from the sidewall of the trench (*60' N of CB #47 @ 31.5'*) at 54 ppm, which exceeded the cleanup level of 20 ppm. See Figure 4 for the location of the sample, Appendix A for laboratory documentation, and Table I for tabulated analytical data.

The material from which the sample was collected consisted of fine fragments of coal, coal cinders, ash, and occasional pockets of weathered sandstone. In response, ZZA recommended to the earthwork contractor to cover the excavation spoils from the trench between catchbasins CB #47 and CB#46 (area was still paved with asphalt) and indicated that a remedial excavation would need to be advanced.

On 14 July 2003, the remedial excavation was initiated with the removal of the pipe backfill (imported granular material), which was stockpiled separately. The excavation was advanced five feet west and east from the pipe backfill extents, five feet north and south of the 54 ppm sample location, and four feet deep. The initial remedial excavation limits were selected based upon minimizing the amount of material generated because no change in subsurface conditions was visible in the entire trench alignment that would provide a suggested limit. Samples were collected from each of the four sidewalls and one from the bottom of the excavation. The samples were identified as follows:

Pipe 47 RE - ESW @ 32.5'
Pipe 47 RE - WSW @ 31'
Pipe 47 RE - NSW @ 31.5'
Pipe 47 RE - SSW @ 31'
Pipe 47 RE - BTM @ 30.5'

The sample Pipe *47 RE - SSW @ 31'* collected from the south sidewall of the remedial excavation was reported with an arsenic concentration of 64 ppm. The material visible in the south sidewall consisted of the same type of material from which the initial sample (*60' N of CB #47 @ 31.5'*) was collected. The other samples reported non-detectable concentrations of arsenic.

In response, an additional three feet was excavated from the south sidewall, on either side of the pipe down to the elevation of the bottom sample collected, with this second sample obtained from the south sidewall identified as *Pipe 47 RE – SSW2 @ 31'* and reported with non-detectable concentrations of arsenic. Due to all confirmation samples now being reported with concentrations below the cleanup standard, the remedial excavation was determined to be complete. Additionally, based upon the limits of the impacted soils being determined, we segregated the soils removed during the excavation of the trench from this same area and managed them as impacted soils.

A graphical representation of this remedial excavation is provided with this report as Figure 10a. Soil sample results as reported by the laboratory are presented in this report on Table I with original lab documentation provided in Appendix A.

The soils excavated during the remedial activities were combined with the delineated trench spoils removed between CB#47 and CB#46 in the same area where the remedial excavation was located, as described previously. The soils were loaded onto trucks subcontracted by the Regional Disposal Company and hauled off site for disposal on 6 August 2004. According to truck tickets provided by CSI and presented in Appendix B of this report, the total amount of arsenic-impacted soils exported off-site was 64.86 tons.

4.10.3 Petroleum Remedial Excavation

During the excavation of the sanitary sewer in the southern portion of the Site, a sample obtained from the sidewall of the trench, approximately 6 feet below ground surface, (*SS STA 52+20 @ 29'*) was reported with TPH in the semi-volatile range (NWTPH-Dx) at 4,800 ppm, exceeding the site specific cleanup standard of 3,432 ppm. (See Figure 5 for a graphical representation of the sample location.) The material from which the sample was collected consisted of fine to medium sand with occasional fragments of coal. Substantial portions of the excavated soils in this area exhibited petroleum impacts through visual inspection, e.g., visual sheens, and olfactory indications.

Once the 4,800 ppm sample result was obtained, soils exhibiting strong odors, heavy sheens, or discoloration that had been excavated from the sanitary sewer trench between points located approximately 40 feet east and 50 feet west of the sample location were managed as petroleum contaminated soil (PCS) and placed in a stockpile upon plastic and covered with plastic.

On 18 July 2003, the pipe backfill (imported granular material) in this area was removed and stockpiled separately. Exploratory trenches were excavated from the location of the 4,800 ppm sample in northerly, southerly, and easterly directions until field screening methods suggested that the soils were less impacted with petroleum hydrocarbons. Additionally, a vertical excavation was advanced on the north side of the sanitary sewer pipe (left in place) until field screening suggested that the soils were less impacted with petroleum hydrocarbons. The samples collected on 18 July 2003 were identified as follows:

SSRE1 - NBTM @ 20'
SSRE1 - NSW @ 22'
SSRE1 - ESW @ 25'
SSRE1 - SSWA @ 24'

Additional excavation of the exploratory trenches was conducted to determine the westerly extent of contamination as well as the vertical extent on the south side of the sanitary sewer pipe on the following work day, 21 July 2003. The samples collected on 21 July 2003 included:

SSRE1 - SBTM @ 20'
SSRE1 - WSW @ 22'

Concentrations of 138 ppm and 390 ppm NWTPH-Dx were reported for SSRE1 - SSWA @ 24' and SSRE1 - ESW @ 25', respectively, which were well below cleanup levels. The other four samples collected from the exploratory trenches were reported with non-detectable concentrations of NWTPH-Dx. Based upon these results, it was ZZA's opinion that the horizontal and vertical limits of the impacted soil had been determined.

The excavations advanced on 18 and 21 July 2003 extended below the groundwater level (approximately 4 ½ feet below ground surface or approximately elevation 28 ½ feet) where field screening indicated significantly higher concentrations of petroleum-related hydrocarbons. Due to the apparent distinction in petroleum impacts between soils above the groundwater table and those at and below the groundwater table, ZZA determined it was appropriate to segregate this "overburden" (OB) from the apparent PCS located below the groundwater table.

These two stockpiles, "PCS" and "OB," were managed with appropriate techniques including the use of plastic covered containment berms constructed with non-impacted soils from other locations on site were sampled in accordance with the frequency described in the *Environmental Contingency Plan*. The following samples were obtained from the stockpiles per the frequency set forth in the *Environmental Contingency Plan* and listed above in Section 4.8 of this report:

SSRE1 - PCS1	*SSRE1 - OB1*
SSRE1 - PCS2	*SSRE1 - OB2*
SSRE1 - PCS3	*SSRE1 - OB3*

ZZA collected discrete soil samples from the PCS stockpile and the OB stockpile to represent the whole of each stockpile, i.e., samples were not collected directly from obvious sheens in the PCS stockpile. The samples were submitted to a Washington-state accredited analytical laboratory for NWTPH-Dx.

The samples of PCS were reported with petroleum hydrocarbons ranging from 135 ppm to 1,900 ppm and the OB samples were reported with concentrations of TPH-Dx ranging from 670 ppm to 1,440 ppm.

However, because the PCS stockpile (consisting of material excavated during the advancement of the exploratory trenches) exhibited significant visual and olfactory indications of petroleum impacts and because Ecology's policy does not allow impacted soil to be used as backfill in utility trenches, the soils were combined with the PCS excavated during the advancement of the utility trench and managed as such.

On 7 and 8 August 2003, the soil located between the confirmation samples collected from the exploratory trenches was excavated to complete the remedial excavation as depicted on Figure 10b. The excavated soils were managed as PCS and added to the stockpile of PCS excavated during the utility installation and the exploratory trenches. Tabulated data and laboratory test certificates are included in Table I and Appendix A, respectively with selected photos of the remedial excavation activities conducted on 7 and 8 August 2003 presented in Appendix E.

Backfill of the excavation was completed on 7 and 8 August 2003, by placing crushed, recycled concrete in the excavation up to the approximate invert of the installed sanitary sewer pipe. The sanitary sewer pipe was then removed within the boundaries of the remedial excavation, the new pipe sections were installed, and the backfill of the remedial excavation was completed.

The completed PCS stockpile, consisting of the delineated utility excavation spoils, the material excavated in the exploratory trenches advanced on 18 and 21 July 2003, and the remaining material removed on 7 and 8 August 2003, was loaded onto trucks subcontracted by the Regional Disposal Company, and hauled off site for disposal on 27 August 2004. According to truck tickets provided by CSI and presented in Appendix B of this report, the total amount of material exported off-site was 771.13 tons.

The OB stockpile was amended with cement utilizing the cement treated soil methods discussed previously and utilized on site as structural fill under the parking area. (Please refer to Table I of this report for tabulated data and corresponding analytical laboratory test certificates presented in Appendix A.)

4.10.4 cPAH Remedial Excavation

During the excavation of stormwater Pipe No. 49, located south of the intersection of Talbot Road and South Grady Way, a sample obtained from the sidewall of the trench (*5' N of CB #49 @ 30.5'*) was reported with 1.76 ppm cumulative cPAH, exceeding the site specific cleanup standard of 1.7015 ppm. (See Figure 4 for a graphical representation of the location of this sample, Table I for the tabulated data set, and Appendix A for the analytical laboratory test certificates). The material from which the sample was collected consisted of fine fragments of coal, coal cinders, ash, and occasional pockets of weathered sandstone.

On 5 September 2003, the remedial excavation was initiated with the removal of the backfill material, which was stockpiled separately. The excavation was advanced ten feet west and eight feet east from the pipe backfill extents, five feet north and five feet south from the sample location, and six feet deep. The initial remedial excavation limits were selected based upon minimizing the amount of material generated because no change in subsurface conditions was visible in the entire trench alignment that would provide a suggested limit. The following samples were collected from each of the four sidewalls and one from the bottom of the excavation and identified as follows:

Pipe 49 RE - ESW @ 30'
Pipe 49 RE - WSW @ 31'
Pipe 49 RE - NSW @ 31'
Pipe 49 RE - SSW @ 30'
Pipe 49 RE - Bottom @ 27'

The sample *Pipe 49 RE - Bottom @ 27'* was reported with a concentration of 1.75 ppm cumulative cPAH and consisted of the same type of material from which the initial sample was collected. The sample *Pipe 49 RE - ESW @ 30'* was reported with 0.70 ppm cumulative cPAH. The other samples reported non-detect concentrations of cumulative cPAH.

In response to the 1.75 ppm sample, an additional 1 ½ feet was excavated down from the bottom on the east side of the pipe and an additional 3 feet down on the west side of the pipe. A sample was obtained from each side of the pipe and identified as *Pipe 49 RE2 – BTME @ 25.5'* and *Pipe 49 RE2 – BTMW @ 24'*. These samples were reported with non-detectable concentrations of cumulative cPAH and the remedial excavation was thus considered completed. A graphical representation of the remedial excavation is provided with this report as Figure 10c.

The soils excavated during the remedial activities were combined with the soils excavated around the creosote-treated piles (identified as the *Pile Rind Soils Stockpile* and described in Section 4.11.1 below of this report) encountered during the utility installation, and stockpiled on, and covered with visqueen. The soils were loaded onto trucks subcontracted by the Regional Disposal Company and hauled off site for disposal on 1 October 2003. According to truck tickets provided by CSI and presented in Appendix B of this report, the total amount of material exported off-site was 300.10 tons.

[redacted]

4.11 Other Soil Sampling Activities

The following sections document soils and creosote-treated timber piling handling in other areas of the Site where a remedial excavation component was not included.

4.11.1 Creosote Treated Timber Piles

During the excavation of many of the utilities on site, creosote-treated timber piles were encountered in the trench. These piles were handled utilizing the methods described subsequently.

When creosote-treated timber piles were encountered during the excavation of utilities or stormwater ponds, the annulus of soil surrounding the creosote-treated timber pile, measuring approximately 2 feet in diameter, was removed and segregated in a separate stockpile on site identified as the *Pile Rind Soil Stockpile.* Then an additional two feet below the invert of the utility, or ground surface of the pond, was removed around the pile and added to the *Pile Rind Soil Stockpile.* The pile was then cut or broken off, removed, and stockpiled with other creosote-treated timber piles, utility poles, or creosote-treated wood debris encountered on site. Installation of the utility then continued with an appropriate amount of imported structural fill placed and compacted below the invert of the utility. Once the utility was installed, backfill with imported structural fill was completed.

Three samples of the *Pile Rind Stockpile* were collected and submitted for cPAH analyses. The sample identified as *Pile Rind Soil SP-2* was reported with a cPAH concentration of 2.25 ppm, above the 1.7015 ppm cleanup level. In addition, the stockpiled soils exhibited a strong, creosote-like odor. As discussed in Section 4.10.4 above, this stockpile was included with the material removed during the Pipe 49 Remedial Excavation and disposed off-site. Tabular data and laboratory certificates are included in Table I and Appendix A, respectively.

The stockpile of creosote-treated timber piles and various forms of apparent treated wood debris, was exported off site by the Regional Disposal Company. A total of 13.67 tons of creosote-treated wood debris (and demolished transformer vault as discussed in Section 4.14) was exported from the site as Construction, Demolition, and Landclearing (CDL) debris on 7 October 2003. Appendix B of this report contains the truck tickets documenting the disposal of the wood debris and former transformer vault.

4.11.2 Northwest Pond Stockpile Sampling

Seven samples were collected from the material excavated for the northwest pond. Concentrations of COCs in the samples were less than the site-specific cleanup levels and the excavated soils were used on site elsewhere as part of the cement-treated fill program.

4.11.3 West Pond Stockpile Arsenic Sampling

Two of the six samples obtained from the stockpile of material excavated from the "West Pond" stormwater detention pond were reported with concentrations of arsenic at 21 and 26 ppm, slightly exceeding the 20 ppm arsenic cleanup standard for the Site. After discussions with two analytical laboratories called into question the reporting methodology employed by the laboratory performing the initial analysis, we elected to collect 16 more samples from this stockpile and submit them to a different laboratory. All of the subsequent samples from the stockpile were reported with arsenic concentrations below the site cleanup level. In response, the stockpiled soils were used on site as part of the cement-treated fill program.

4.11.4 Pipe Numbers 65 and 28 Stockpile Sampling

On 6 June 2003, sample *16' W of CB #28 @ 33'* was collected from the trench excavated to install Pipe No. 28 for characterization purposes. (See Figure 4 for the location of the sample). Sample *16' W of CB #28 @ 33'* was later reported with a 155 ppm concentration of TPH, well below the cleanup level. Later that day, in response to odors being detected by the earthwork contractor, ZZA collected samples of the stockpiled material excavated from the trenches in which Pipe Nos. 65 and 28 were constructed. The samples identified as *Pipe #65 & #28 SP-1*, *Pipe #65 & #28 SP-2*, and *Pipe #65 & #28 SP-3* were reported with concentrations of TPH and cPAH below the site cleanup standards. The odors were attributed to nearby creosote-treated timber piles. The soils were used on site as part of the cement-treated fill program.

4.11.5 Off-Site Soil/Sediment Sampling

ZZA was required by Ecology to perform limited soil/sediment sampling along the eastern and southern property lines in order to determine whether the wetlands to the south of the subject site were impacted by the activities historically performed on the Site.

The methodology and sample results were previously presented to Ecology in a memorandum dated 22 September 2003 entitled *Renton Sam's Club - Zipper Zeman Associates, Inc. – Near Flume Soil Sampling.*

With a single exception, all samples were reported to contain COCs (sans arsenic per Ecology) at non-detectable concentrations or well below the site cleanup level outlined in ZZA's *Environmental Contingency Plan.* The sole exception was sample *Flume S-6 @ 6"*, collected in the wetland area to the south of the Site, which was reported with cumulative cPAH at 1.73 ppm, slightly above the site cleanup standard of 1.7015 ppm. The results of the off-site flume soil sampling are presented in tabular form in Table III and graphically on Figure 8. The laboratory test certificates are included with this report in Appendix A.

As stated previously, the data does not indicate that cPAH impacts in the wetlands south of the Site originated from the Site.

4.11.6 PCB-Impacted Soil Handling

Samples were collected from the stockpile of soils excavated from the trenches advanced for the expansion of the existing concrete flume which runs along the eastern and southern portions of the Site. One of the eleven samples collected from this project area, *Flume STA 153+70 SP*, was reported by the laboratory with a concentration of total PCBs of 11.6 ppm, exceeding the site specific cleanup level for total PCBs of 1.85 ppm. The samples collected in the stockpile on either side of *Flume STA 153+70 SP*, identified as *Flume STA 153+20 SP* and *Flume STA 154+20 SP* were reported with non-detectable concentrations of PCBs. See Figure 9 for a graphical representation of the location of the samples collected.

Soil in this area of the Site consisted of very loose coal fill or sand or very soft to soft silt. ZZA recommended against removing soils below the invert of the existing concrete flume so as not to threaten the flume stability. Accordingly, no remedial excavation was advanced in this trench. Instead, soil from the stockpile on either side of *Flume STA 153+70 SP*, midway to the sample locations on either side, *Flume STA 153+20 SP* and *Flume STA 154+20 SP*, respectively, was removed and disposed off-site.

A total of 161.81 tons of PCB-impacted soils from this area was removed from the site by the Regional Disposal Company on 21 October 2003. Soil Disposal certificates are included with this report in Appendix B. Tabulated Data is presented in Table I and analytical test certificates are included in Appendix A.

4.11.7 Gasoline Station Underground Storage Tank Excavation

ZZA observed the construction of the gasoline station in the southern portion of the site. The excavation for the tanks was shored with sheet piling and the excavation for dispenser line trenches was advanced in cement-treated fill placed as part of the development. Because the shallow utilities were constructed in trenches excavated in cement-treated fill, ZZA did not collect samples from the sidewalls of the utility trenches. Additionally, because the tank excavation was shored with sheet piling, ZZA did not collect sidewall samples. However, ZZA did collect soil samples from the stockpile of excavated material and from the bottom of the excavation. The samples were collected across three days, 13 through 15 October 2003, and all were reported with concentrations of COCs below the site specific cleanup levels. The bottom samples were identified as *UST EXC 10/15/03 BS-1 @ 18.5'*, *UST EXC 10/15/03 BS-2 @ 18.5'*, and *UST EXC 10/15/03 BS-3 @ 18.5'*. The soils excavated for the USTs were used on site as part of the cement-treated fill program.

4.12 Construction Dewatering

As discussed in the *Environmental Contingency Plan*, many of the utility trench excavations were expected to encounter groundwater based upon groundwater measurements made in monitoring wells on the Site. Based upon the invert elevations of the utilities to be

installed coupled with the groundwater elevations measured in the wells, ZZA anticipated that dewatering of a majority of the excavations would be required.

ZZA obtained a Temporary Discharge Authorization permit from King County Department of Natural Resources Industrial Waste Program and the City of Renton in order to discharge construction derived dewatering fluids to the sanitary sewer system. The permit specified the parameters of the discharge including, but not limited to, limits on temperature, pH, turbidity, non-polar fats, oils, and greases (FOG), and PCBs.

A Stormwater Pollution Prevention Permit (SWPPP) was required by Ecology and was completed by CSI. The SWPPP contained provisions in order to minimize stormwater from leaving the site such as temporary stormwater earthen storage cells and contingencies for the treatment of stormwater or dewatering fluids with chitosan.

No collection or discharge of groundwater was necessary during the site development activities due to an apparent significant drop in groundwater elevations, slow recharge rates of groundwater flowing into the excavations, and the ability of the earthwork contractor to install utilities with water in the bottom of the trench.

4.13 Disposition of Excavation Spoils

Soils that were transported off-site for disposal were handled by the Regional Disposal Company. The majority of the impacted soils were transported to the LaFarge Seattle Plant in West Seattle for thermal desorption, Ecology's preferred disposal option. Soil Disposal certificates are included with this report in Appendix B.

4.14 Concrete Sampling for PCBs

Prior to the demolition and on-site use of concrete slabs and foundation elements from the former buildings present on the subject site, ZZA collected two samples of concrete from the vicinity of a concrete chip sample identified as *C-7*, collected by GeoEngineers and documented in the 1998 report entitled *Environmental Site Assessment* as containing 1.05 ppm total PCBs, the highest concentration reported in the report. In order to ensure that suspected PCB-impacted concrete was not used as fill on the site, ZZA recommended the concrete in the vicinity of the 1.05 ppm concrete sample collected by GeoEngineers be sampled prior to use on-site. On 21 May 2003, after demolition of the two slabs interpreted to be the location of the concrete chip sample collected by GeoEngineers (*C-7*), ZZA obtained two samples from each of the slab sections identified as *C-1* and *C-2* and submitted them for PCB analysis. The locations of these samples are depicted graphically on Figure 3. The samples were reported with non-detectable concentrations of PCBs. The results are reported in tabular form on Table II of this report, with laboratory test certificates presented in Appendix A.

A concrete structure covered with a grate, previously determined to be a storm drain, was discovered on 22 September 2003 to be an underground utility vault containing a transformer.

The electrical contractor on site, Potelco, was contacted and requested to coordinate removal of the transformer. On 30 September 2003, the transformer was removed by Potelco and sent to Puget Sound Energy (PSE) for testing. On 1 October 2003, ZZA was informed by PSE that initial testing revealed that the PCB content in the transformer oil exceeded 1.0 ppm. (Final laboratory results for the transformer oil as presented to ZZA indicated PCB content of less than 1.0 ppm) In response, we removed the vault, crushed it on visqueen, collected the sample *Trans. Vault Comp 1*, and covered the crushed vault with visqueen. The sample was reported with 0.9 ppm PCBs by the analytical laboratory and was removed from the site by the Regional Disposal Company as "Construction, Demolition, and Landclearing" debris (CDL) on 7 October 2003, included with the creosote-treated wood debris described in Section 4.11.1.

4.15 Agency Notification and Communication Protocols

During grading and earthwork phases of improvements, ZZA updated Ecology's Site Manager for the project, Mr. Nnamdi Madakor, as necessary.

Communication between ZZA, the contractor, the subcontractors, and the owners was facilitated through the use of daily field reports (DFRs) and transmittals of laboratory data. The information was communicated and documented via ZZA's communication protocols.

4.16 Documentation and Reporting

ZZA prepared DFRs in order to document all remedial activities associated with earthwork at the Site. DFRs were distributed to appropriate earthwork contractors and subcontractors. Where applicable, laboratory data was distributed with the DFRs.

After completion of all tasks as discussed above, ZZA prepared this final report documenting the field activities and methodologies, summarizing the analytical test results and conclusions, and documenting the excavation, stockpiling, and disposition or end use of any soil.

5.0 MONITORING WELLS

5.1 Monitoring Well Decommissioning

ZZA petitioned Ecology to terminate groundwater monitoring activities at the site and to decommission the currently-installed monitoring wells because development activities were likely to destroy the wells. A letter received from Ecology dated 3 February 2003, stated:

> *Because of the favorable groundwater quality condition at this time, it is appropriate that the existing groundwater quality monitoring wells that will impede the intended site development be properly abandoned.*

R & R Drilling, Inc., a professional well driller licensed to install and decommission resource protection wells in Washington State, completed the decommissioning of all wells on-

site that would impede site development, in accordance with WAC 173-160, *Minimum Standards for the Construction and Maintenance of Wells*. The wells decommissioned are listed below with decommissioning logs presented in Appendix C.

GMW-1	*GMW-8*	*GMW-15*	*MW-20*
GMW-2A	*GMW-9*	*GMW-16*	*ACF 223*
GMW-3A	*GMW-10*	*GMW-17*	*ACF 316*
GMW-4A	*GMW-12A*	*MW-4*	*Unknown Well 1*
GMW-5	*GMW-13*	*MW-8*	*Unknown Well 2*
GMW-6	*GMW-14*	*MW-10*	

The only well on-site that did not interfere with site development activities or whose integrity was not compromised was GMW-11, located in the extreme southwest corner of the subject site. GMW-7, located in Talbot Road (State Route 515), was also left in place. The unknown wells listed above were observed approximately halfway between the north sides of the former Service Center and Stores buildings and approximately the midpoint of the former Service Center, on the west side of the former structure.

5.2 Deep Monitoring Well Installations

On 10 May 2003, ZZA installed two deep monitoring wells to the west of the proposed building where approximately 800 driven grout piles were to be installed. These wells, identified as ZZA MW-1 and ZZA MW-2, were installed prior to driving any piles in order to establish a pre-construction groundwater quality baseline. The locations of ZZA MW-1 and ZZA MW-2 are depicted on Figure 11.

The wells were installed to a depth of approximately 58 feet below ground surface with five feet of screened casing between approximately 58 and 53 feet. Prior to sampling, the wells were subject to a limited development and purge. No soil samples were submitted from these explorations. Appendix D contains subsurface exploration logs and procedures with monitoring well construction details. Figure 11 depicts the location of the deep zone monitoring wells.

Bollards were installed around the aboveground monuments for ZZA MW-1, ZZA MW-2, as well as around GMW-11, the GeoEngineers-installed well in the southwest corner of the site. Due to the installation of these bollards, no damage was caused to any of the wells during construction activities, including the placement, mixing, and compaction of cement-treated fill materials up to several feet thick. The bollards and aboveground monuments were removed from wells ZZA MW-1 and ZZA MW-2 prior to placing subbase and subsequent asphaltic pavement. The bollards and aboveground monument with GMW-11 remain on site, however; fill material was placed around this well in a landscaping area.

At the time of the initial sampling on 15 May 2003, groundwater was reported at elevations of approximately 21 and 21 ½ feet, respectively. The two groundwater samples collected were reported with concentrations of arsenic only in ZZA MW-2 at 10 ug/L (parts per

billion – ppb) and 8 ug/L, total and dissolved, respectively. Non-detectable concentrations of the other analytes were reported in both wells during the initial sampling event. The sample results are presented on Table IV with laboratory certificates included in Appendix A.

The second sampling event took place on 3 May 2004, approximately three months (one quarter) after the completion of the construction activities. Arsenic was again reported in ZZA MW-2 at a concentration of 6 ug/L (total) with non-detectable concentrations in the dissolved fraction. Non-detectable concentrations for the other COCs were reported as well. In subsequent sampling events at ZZA MW-2, none of the COCs, including arsenic, have been detected. In addition, none of the COCs have been detected in any sampling event at ZZA MW-1. The sample results are presented on Table IV with laboratory certificates included in Appendix A. Groundwater elevations measured in ZZA MW-1 and ZZA MW-2 during sampling events completed between May 2004 and January 2005 are depicted on Figures 12 through 15.

5.3 Shallow Monitoring Well Installations

Because a relatively large portion of the Site was to be covered by new structures, fewer than 18 replacement wells were installed. Five replacement, shallow-zone groundwater monitoring wells were installed prior to the opening of the store over two days, 26 and 27 January 2004. The locations of these replacement monitoring wells were identified in a letter entitled *Proposed Monitoring Well Installations – Renton Sam's Club Project* dated 17 January 2004, which was reviewed and approved by Ecology. See Figure 11 the location of the wells installed.

The replacement wells were identified as ZZA MW-3 through ZZA MW-7 and are used in conjunction with the two remaining wells installed as part of previous site characterization activities by GeoEngineers as well as the two deep zone groundwater wells installed by ZZA and discussed above in Section 5.2 to monitor groundwater quality on the site.

The installation of the wells consisted of a hollow-stem auger-advanced boring to twenty feet with the installation of ten feet of screened casing and ten feet of blank casing and completed at the surface with a lockable expansion plug and flush-mount surface monument. See Appendix D for specific subsurface exploration procedures and the logs of the boring including monitoring well construction details.

No soil samples were submitted as part of the installation of these wells due to the extensive characterization of the site performed during site development. However, the cuttings generated during the advancement of the borings were barreled on site and characterized for disposal by a composite sample identified as *MW-3-MW-7 Comp.* The sample was reported with a single detection of 0.03 mg/kg Chrysene. The materials were removed from the site by an environmental contractor.

5.4 Groundwater Sampling

The newly installed wells were subject to a purge prior to sampling. The first sampling event took place approximately 3 months (one quarter) after the completion of construction activities on the site (May 2004) and four events have been completed to date. The sample results are presented on Table IV with laboratory certificates included in Appendix A. A graphical representation of the groundwater elevations measured in all on- and off-site wells is presented on Figures 12 through 15.

The four sampling events reported concentrations of arsenic in all monitoring wells except for ZZA MW-1, with some reporting arsenic above the cleanup level. However, these concentrations are generally consistent with background concentrations. No PCBs or cPAHs were reported in any of the wells. GMW-7 (located off-site in Talbot Road/State Route 515) was reported with concentrations of diesel-range petroleum-related hydrocarbons above the MTCA Method A Cleanup Level of 500 ug/L.

Based upon the measurement of groundwater elevations in the wells on- and off-site, it is apparent that the shallow groundwater is migrating generally to the west or northwest. Accordingly, the source of petroleum hydrocarbons in groundwater in GMW-7 does not appear to be located on the Site. Further support for this conclusion is the fact that the nearest upgradient well from GMW-7 is GMW-11 (approximately 70 feet due east) which has never reported detectable concentrations of petroleum hydrocarbons. The monitoring well locations, groundwater migration directions, and groundwater elevation measurements are presented on Figures 12 through 15.

6.0 CONCLUSION

Based on remediation activities conducted at the Site and the results of confirmation samples, ZZA believes that COCs in soil are below the site-specific cleanup levels previously approved by Ecology. Also, with the exception of arsenic concentrations that are consistent with background levels, COCs in groundwater at the Site are also below cleanup levels. Accordingly, ZZA requests that Ecology reissue an NFA for soil and groundwater at the Site.

7.0 LIMITATIONS

It should be noted that the site plans prepared as part of the scope of services for this report were based upon our review of numerous site plans prepared by GeoEngineers and others, presented in the reports reviewed. These site plans contained numerous discrepancies regarding the location of site features, borings, monitoring wells, and/or property lines. Therefore, the accuracy of the placement of the site features by ZZA should be considered approximate.

TABLE I

ANALYTICAL LABORATORY RESULTS - SOIL

TABLE I - ANALYTICAL LABORATORY RESULTS - SOIL

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
NW Pond SP-1	05/27/03			**-**	0.26	0.33	0.30	0.15	0.19	0.08	0.05	**1.36**	-	-	-	-	-	-	-	**-**	**-**
NW Pond SP-2	05/27/03	33	82	**115**	-	0.03	0.02	0.02	-	-	-	**0.07**	-	-	-	-	-	-	-	**-**	**5.8**
NW Pond SP-3	05/27/03			**62**	-	0.03	0.03	-	-	-	-	**0.06**	-	-	-	-	-	-	-	**-**	**2.8**
NW Pond SP-4	05/27/03			**58**	0.03	0.05	0.03	-	-	-	-	**0.11**	-	-	-	-	-	-	-	**-**	**-**
NW Pond SP-5	05/28/03	38	140	**178**	0.03	0.06	0.06	-	0.04	0.03	-	**0.22**	-	-	-	-	-	-	-	**-**	**3.8**
NW Pond SP-6	05/28/03	56	150	**206**	0.24	0.26	0.17	0.05	0.15	0.06	0.03	**0.96**	-	-	-	-	-	-	-	**-**	**-**
NW Pond SP-7	05/28/03	31	110	**141**	0.08	0.11	0.09	0.04	0.07	0.04	0.02	**0.45**	-	-	-	-	-	-	-	**-**	**-**
F.8 - 12 + 8' W @ 32.3'	06/02/03	50	130	**180**	-	-	-	-	-	-	-	**-**	-	-	-	-	-	-	-	**-**	**-**
F.5 - 12 + 13' W @ 32'	06/02/03	210	430	**640**	-	0.02	-	-	-	-	-	**0.02**	-	-	-	-	-	-	-	**-**	**-**
F - 12 + 16' W @ 32.5'	06/02/03	150	350	**500**	-	0.03	0.02	-	0.02	-	-	**0.07**	-	-	-	-	-	-	-	**-**	**-**
F.8 - 14 + 28' S @ 32.5'	06/02/03			**1,100**	-	-	-	-	-	-	-	**-**	-	-	-	-	-	-	-	**-**	**-**
E-12 TO H-12 SP-1	06/03/03	200	600	**800**	-	0.04	0.03	-	-	-	-	**0.07**	-	-	-	-	-	-	-	**-**	**-**
E-12 TO H-12 SP-2	06/03/03	62	200	**262**	-	0.04	0.03	-	-	-	-	**0.07**	-	-	-	-	-	-	-	**-**	**3.6**
E-12 TO H-12 SP-3	06/03/03			**1,000**	-	0.05	0.03	-	-	-	-	**0.08**	-	-	-	-	-	-	-	**-**	**-**
E-12 TO H-12 SP-4	06/03/03			**1,400**	-	0.04	-	-	-	-	-	**0.04**	-	-	-	-	-	-	-	**-**	**-**
E-12 TO H-12 SP-5	06/03/03			**400**	-	0.03	-	-	-	-	-	**0.03**	-	-	-	-	-	-	-	**-**	**-**
West Pond SP-1	06/05/03			**-**	-	-	-	-	-	-	-	**-**	-	-	-	-	-	-	-	**-**	**-**
West Pond SP-2	06/05/03			**-**	-	-	-	-	-	-	-	**-**	-	-	-	-	-	-	-	**-**	**-**
West Pond SP-3	06/05/03			**37**	-	0.04	0.03	-	-	-	-	**0.07**	-	-	-	-	-	-	-	**-**	**-**
16' S of CB #28 @ 32.5	06/06/03	38	57	**95**	0.03	0.04	0.03	0.02	-	-	-	**0.12**	-	-	-	-	-	-	-	**-**	**-**

[redacted]

[redacted]

TABLE I - ANALYTICAL LABORATORY RESULTS - SOIL

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
16' W of CB#28 @ 33'	06/06/03	35	120	**155**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32' E of CB #29 @ 31'	06/06/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Pond SP-4	06/06/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
27' E of CB #32 @ 32'	06/06/03			**490**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**16**
Pipe #65 & #28 SP-1	06/06/03	58	86	**144**	0.03	0.04	0.05	0.04	0.04	0.03	-	**0.23**	-	-	-	-	-	-	-	-	-
Pipe #65 & #28 SP-2	06/06/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pipe #65 & #28 SP-3	06/06/03	44	83	**127**	0.05	0.07	0.07	0.06	0.04	0.03	-	**0.32**	-	-	-	-	-	-	-	-	-
25' E of CB #33 @ 33'	06/06/03	34	230	**264**	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-
West Pond SP-5	06/09/03	43	64	**107**	0.07	0.08	0.06	0.06	0.07	0.05	-	**0.39**	-	-	-	-	-	-	-	-	26
5' W of CB #10 @ 32'	06/09/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Pond SP-6	06/09/03			**53**	-	0.03	-	-	-	-	-	**0.03**	-	-	-	-	-	-	-	-	**7**
20' S of CB #24 @ 35'	06/11/03			**120**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Pond SP-7	06/17/03																				-
West Pond SP-8	06/17/03																				-
West Pond SP-9	06/17/03																				-
West Pond SP-10	06/17/03																				-
West Pond SP-11	06/17/03																				-
West Pond SP-12	06/17/03																				-
West Pond SP-13	06/17/03																				-
West Pond SP-14	06/17/03																				-

TABLE I - ANALYTICAL LABORATORY RESULTS - SOIL

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
West Pond SP-15	06/17/03																				-
West Pond SP-16	06/17/03																				-
West Pond SP-17	06/17/03																				-
West Pond SP-18	06/17/03																				**19**
West Pond SP-19	06/17/03																				-
West Pond SP-20	06/17/03																				-
West Pond SP-21	06/17/03																				-
West Pond SP-22	06/17/03																				-
WL STA 16+90 @ 34.5'	06/18/03			-	-	0.03	-	-	-	-	-	**0.03**	-	-	-	-	-	-	-	-	**10**
18' N of CB #55 @ 34'	06/18/03			**53**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL STA 16+18 @ 35.5'	06/18/03	130	370	**500**	0.03	0.18	0.04	-	-	-	-	**0.25**	-	-	-	-	-	-	-	-	-
WL STA 15+10 @ 34.5'	06/19/03			-	0.03	0.04	-	-	-	-	-	**0.07**	-	-	-	-	-	-	-	-	**13**
WL STA 14+30 @ 34'	06/19/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20' N of CB #51 @ 30'	06/23/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25' N of CB #50 @ 32'	06/23/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5' N of CB #49 @ 30.5'	06/26/03			-	0.11	0.38	0.41	0.28	0.26	0.23	0.09	1.76	-	-	-	-	-	-	-	-	-
10' N of CB #46 @ 30.5'	06/26/03			**56**	0.04	0.05	0.08	-	-	0.03	-	**0.20**									-	**13**
60' N of CB #47 @ 31.5'	06/26/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54
12' S of CB #54 @ 32'	06/27/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27' W of CB #53 33.5'	06/27/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE I - ANALYTICAL LABORATORY RESULTS - SOIL

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
SS STA 50+60 @ 28.5'	06/30/03			**170**	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	**0.1**	-
SS STA 50+90 @ 29'	06/30/03			-	0.07	0.15	0.14	0.06	0.05	0.04	-	**0.51**	-	-	-	-	-	0.2	-	**0.2**	-
SS STA 51+26 @ 29'	07/01/03			-	0.04	0.07	0.08	0.03	0.03	0.03	-	**0.28**	-	-	-	-	-	-	-	-	-
WL STA 12+82 @ 33'	07/02/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WL STA 11+99 @ 32'	07/03/03	220	140	**360**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS STA 52+20 @ 29'	07/09/03	3,900	900	**4,800**	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.1	**0.3**	-
SS STA 53+40 @ 32'	07/10/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pipe 47 RE - ESW @ 32.5'	07/14/03																				-
Pipe 47 RE - WSW @ 31'	07/14/03																				-
Pipe 47 RE - NSW @ 31.5'	07/14/03																				-
Pipe 47 RE - SSW @ 31'	07/14/03																				64
Pipe 47 RE - BTM @ 30.5'	07/14/03																				-
Pipe 47 RE - SSW2 @ 31'	07/16/03																				-
SSRE1 - NBTM @ 20'	07/18/03			-																	
SSRE1 - NSW @ 22'	07/18/03			-																	
SSRE1 - ESW @ 25'	07/18/03	130	260	**390**																	
SSRE1 - SSWA @ 24'	07/18/03	55	83	**138**																	
SSRE1 - PCS1	07/21/03	260	390	**650**																	
SSRE1 - PCS2	07/21/03	47	88	**135**																	
SSRE1 - PCS3	07/21/03	1,300	600	**1,900**																	

TABLE I - ANALYTICAL LABORATORY RESULTS - SOIL

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
SSRE1 - OB1	07/21/03	1,200	240	**1,440**																	
SSRE1 - OB2	07/21/03	670	260	**930**																	
SSRE1 - OB3	07/21/03	380	290	**670**																	
SSRE1 - SBTM @ 20'	07/21/03			-																	
SSRE1 - WSW @ 22'	07/21/03			-																	
40' W of SSMH #4 @ 30.5'	07/25/03			**91**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UT, 258' E of SR 515 @ 32'	07/28/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20' E of SSMH #7 @ 34'	07/28/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5' W of CB # 7 @ 29'	07/29/03			-	0.03	0.05	-	-	-	-	-	**0.08**	-	-	-	-	-	-	-	-	-
36' S of CB #19 @ 34'	07/29/03	41	51	**92**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30' W of CB #22 @ 28'	07/30/03			-	-	0.02	-	-	-	-	-	**0.02**	-	-	-	-	-	-	-	-	-
60' E of CB #22 @ 31.5'	08/05/03			**1,100**	0.04	0.09	-	-	-	-	-	**0.13**	-	-	-	-	-	-	-	-	-
Flume S-1 @ 6"	08/06/03			-	0.08	0.10	0.06	0.06	0.12	0.07	0.03	**0.52**	-	-	-	-	-	-	-	-	
Flume S-1 @ 3'	08/06/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Flume S-3 @ 6"	08/06/03			-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	**1.0**	
Flume S-3 @ 3'	08/06/03			**52**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Flume S-5 @ 6"	08/06/03			**59**	0.14	0.16	0.09	0.09	0.18	0.11	0.03	**0.80**	-	-	-	-	-	-	-	-	
Flume S-5 @ 3'	08/06/03			**26**	0.04	0.05	0.04	0.04	0.09	0.04	0.03	**0.33**	-	-	-	-	-	-	-	-	
UT, 75' E of SR 515 @ 33'	08/11/03			**84**	-	-	-	-	-	-	0.03	**0.03**	-	-	-	-	-	-	-	-	-
20' E of CB #61 @ 32'	08/11/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE I - ANALYTICAL LABORATORY RESULTS - SOIL

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
UT, 350' E of SR 515 @ 32'	08/11/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pile Rind Soil SP-1	09/05/03			**150**	0.17	0.19	0.06	0.07	0.12	0.06	0.06	**0.73**	-	-	-	-	-	-	-	-	**16**
Pile Rind Soil SP-2	09/05/03	98	120	**218**	0.63	0.63	0.29	0.22	0.27	0.15	0.06	**2.25**	-	-	-	-	-	-	-	-	-
Pile Rind Soil SP-3	09/05/03			**710**	0.33	0.44	0.16	0.14	0.19	0.08	0.06	**1.40**	-	-	-	-	-	-	-	-	-
Pipe 49 RE - NSW @ 31'	09/05/03				-	-	-	-	-	-	-	-									
Pipe 49 RE - SSW @ 30'	09/05/03				-	-	-	-	-	-	-	-									
Pipe 49 RE - ESW @ 30'	09/05/03				0.17	0.23	0.08	0.09	0.13	-	-	**0.70**									
Pipe 49 RE - WSW @ 31'	09/05/03				-	-	-	-	-	-	-	-									
Pipe 49 RE - Bottom @ 27'	09/05/03				0.21	0.39	0.22	0.23	0.24	0.17	0.29	**1.75**									
Pipe 49 RE2-BTME @ 25.5'	09/09/03				-	-	-	-	-	-	-	-									
Pipe 49 RE2-BTMW @ 24'	09/09/03				-	-	-	-	-	-	-	-									
UT, 60' W of SE Crn Bldg @ 33'	09/09/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ET, 36' N of Vault @ 34'	09/23/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ET, 150' N of Vault @ 29'	09/23/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SS STA 54+65 @ 31.5'	09/24/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ET, 270' N of Vault @ 29.5'	09/24/03	130	93	**223**	0.05	0.13	0.07	0.08	0.08	0.04	0.04	**0.49**	-	-	-	-	1.2	0.2	-	**1.4**	-
SS STA 56+13 @ 30'	09/25/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flume STA 154+20 SP	10/01/03			**28**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flume STA 153+70 SP	10/01/03	100	81	**181**	0.11	0.16	0.13	0.12	0.15	0.10	0.06	**0.83**	-	-	-	-	10.0	1.6	-	**11.6**	-
Flume STA 153+20 SP	10/01/03	97	130	**227**	0.02	0.03	0.02	0.02	0.07	0.03	0.03	**0.22**	-	-	-	-	-	-	-	-	-

TABLE I - ANALYTICAL LABORATORY RESULTS - SOIL

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
WL STA 28+85 @ 32'	10/02/03			**210**	-	-	-	-	-	0.03	0.03	**0.06**	-	-	-	-	-	-	-	-	-
Flume STA 155+50 SP	10/10/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**16**
Flume STA 156+00 SP	10/10/03			**29**	-	-	-	0.02	-	-	-	**0.02**	-	-	-	-	-	-	1.2	**1.2**	-
Flume STA 156+50 SP	10/10/03			-	-	0.02	-	0.03	-	-	-	**0.05**	-	-	-	-	-	-	-	-	-
UST EXC 10/13/03 SP-1	10/13/03			**79**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UST EXC 10/13/03 SP-2	10/13/03	140	54	**194**	-	0.02	-	-	-	-	-	**0.02**	-	-	-	-	-	-	-	-	-
UST EXC 10/13/03 SP-3	10/13/03			**38**	0.05	0.07	0.05	0.06	0.04	-	-	**0.27**	-	-	-	-	-	-	-	-	-
UST EXC 10/14/03 SP-4	10/14/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UST EXC 10/14/03 SP-5	10/14/03			**31**	0.08	0.10	0.04	0.06	0.04	-	-	**0.32**	-	-	-	-	-	-	-	-	-
UST EXC 10/14/03 SP-6	10/14/03			-	-	-	-	0.03	-	-	-	**0.03**	-	-	-	-	-	-	-	-	-
UST EXC 10/14/03 SP-7	10/14/03			**43**	0.04	0.08	0.04	0.05	0.03	-	-	**0.24**	-	-	-	-	0.2	-	-	**0.2**	-
UST EXC 10/14/03 SP-8	10/14/03			**88**	0.03	0.05	-	0.04	0.02	-	-	**0.14**	-	-	-	-	-	-	-	-	-
UST EXC 10/15/03 SP-9	10/15/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UST EXC 10/15/03 SP-10	10/15/03	55	69	**124**	0.05	0.07	0.03	0.05	0.04	-	-	**0.24**	-	-	-	-	-	-	-	-	-
UST EXC 10/15/03 BS-1 @ 18.5'	10/15/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UST EXC 10/15/03 BS-2 @ 18.5'	10/15/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UST EXC 10/15/03 BS-3 @ 18.5'	10/15/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flume STA 152+70 SP	11/05/03	89	280	**369**	0.08	0.13	0.09	0.11	0.08	0.06	-	**0.55**	-	-	-	-	0.9	-	-	**0.9**	-
Flume STA 152+00 SP	11/05/03	36	70	**106**	0.05	0.09	0.07	0.07	0.06	0.04	-	**0.38**	-	-	-	-	0.1			**0.1**	-
Flume Inlet SP	11/05/03			**63**	0.02	0.04	0.03	0.04	0.03	-	-	**0.16**	-	-	-	-	-	-	-	-	-

TABLE I - ANALYTICAL LABORATORY RESULTS - SOIL

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
Flume STA 150+00 SP	11/07/03	38	170	**208**	0.03	0.05	0.04	0.06	0.04	-	-	**0.22**	-	-	-	-	0.2	-	-	**0.2**	-
Flume STA 151+00 SP	11/07/03			**33**	0.02	0.04	0.03	0.04	0.03	-	-	**0.16**	-	-	-	-	-	-	-	-	-
N. Pole Soils SP	11/14/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Pole Spoils SP	11/14/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-3-MW-7 Comp.	01/27/04			-	-	0.03	-	-	-	-	-	**0.03**	-	-	-	-	-	-	-	-	
SITE SPECIFIC CLEANUP STANDARD				**3,432**								**1.7015**								**1.85**	**20**

All concentrations reported in mg/kg (parts per million). See Appendix B for the complete laboratory package including information on test procedures and methods.

- Indicates that the constituent shown was not detected above laboratory method reporting limits (MRLs). Please see Appendix B for the complete laboratory package.

A blank entry indicates that the sample was not tested for the constituent shown.

Shaded entries denote a sample had a concentration of the constituent shown above the site-specific cleanup levels as proposed in the ZZA document entitled *Environmental Contingency Plan - Renton Sam's Club - South Grady Way and S.R. 515, Renton, Washington* dated 5 March 2003.

All samples submitted for TPH analysis were subjected to a silica gel extraction process to remove any biogenic interference.

TPH results reported as distillate ranges other than diesel range or lube oil range were summed and reported in the TPH Semivolatile Range. It should be noted that many laboratory results for the petroleum hydrocarbons had laboratory notes indicating a possible high bias due to the overlap of distillate ranges.

A brief list of abbreviations shown as part of the Sample ID follows. Please see report and figures for discussion and graphical representation of sample collection locations:

BS	Bottom Sample	SR 515	**State Route 515 (Talbot Road)**
BTM	Bottom	SS	**Sanitary Sewer**
CB	Catchbasin	SSMH	**Sanitary Sewer Manhole**
ESW	East Sidewall	SSW	**South Sidewall**
ET	Eletrical Line Trench	SP	**Stockpile**
NSW	North Sidewall	UST EXC	**Underground Storage Tank Excavation**
OB	Overburden	UT	**Utility Trench**
PCS	Petroleum Contaminated Soils	WL	**Waterline**
RE	Remedial Excavation	WSW	**West Sidewall**

TABLE II

ANALYTICAL LABORATORY RESULTS – CONCRETE

TABLE II - ANALYTICAL LABORATORY RESULTS - CONCRETE

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
C-1	05/21/03												-	-	-	-	-	-	-	-	
C-2	05/21/03												-	-	-	-	-	-	-	-	
Trans. Vault Comp. 1	10/01/03												-	-	-	-	0.9	-	-	**0.9**	

All concentrations reported in mg/kg (parts per million). See Appendix B for the complete laboratory package including information on test procedures and methods.

- Indicates that the constituent shown was not detected above laboratory method reporting limits (MRLs). Please see Appendix B for the complete laboratory package.

A blank entry indicates that the sample was not tested for the constituent shown.

TABLE III

ANALYTICAL LABORATORY RESULTS – OFF-SITE SOIL/SEDIMENT

TABLE III - ANALYTICAL LABORATORY RESULTS - OFF-SITE SOIL/SEDIMENT

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	**Semivolatile Range (Total)**	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	**Total cPAHs**	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	**TOTAL PCBs**	**Arsenic**
Flume S-4 @ 6"	08/05/03	30	56	**86**	0.06	0.08	0.07	0.06	0.11	0.07	0.03	**0.48**	-	-	-	-	-	-	-	-	
Flume S-4 @ 3'	08/05/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Flume S-6 @ 6"	08/05/03			**96**	0.23	0.33	0.28	0.27	0.32	0.26	0.04	**1.73**	-	-	-	-	-	-	-	-	
Flume S-6 @ 3'	08/05/03			-	0.12	0.13	0.07	0.08	0.14	0.08	0.03	**0.65**	-	-	-	-	-	-	-	-	
Flume S-2 @ 6"	08/06/03			-	-	-	-	-	-	0.03	0.02	**0.05**	-	-	-	-	-	-	-	-	
Flume S-2 @ 3'	08/06/03			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SITE SPECIFIC CLEANUP STANDARD				**3,432**								**1.7015**								**1.85**	

All concentrations reported in mg/kg (parts per million). See Appendix B for the complete laboratory package including information on test procedures and methods.

- Indicates that the constituent shown was not detected above laboratory method reporting limits (MRLs). Please see Appendix B for the complete laboratory package.

A blank entry indicates that the sample was not tested for the constituent shown.

Shaded entries denote a sample had a concentration of the constituent shown above the site-specific cleanup levels as proposed in the ZZA document entitled *Environmental Contingency Plan - Renton Sam's Club - South Grady Way and S.R. 515, Renton, Washington* dated 5 March 2003.

All samples submitted for TPH analysis were subjected to a silica gel extraction process to remove any biogenic interference.

TPH results reported as distillate ranges other than diesel range or lube oil range were summed and reported in the TPH Semivolatile Range. It should be noted that many laboratory results for the petroleum hydrocarbons had laboratory notes indicating a possible high bias due to the overlap of distillate ranges.

Please see report and figures for discussion and graphical representation of sample collection locations:

TABLE IV

ANALYTICAL LABORATORY RESULTS - GROUNDWATER

TABLE IV - ANALYTICAL LABORATORY RESULTS - GROUNDWATER

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Total cPAHs	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Total PCBs	Arsenic (Total)	Arsenic (Dissolved)
ZZA INSTALLED WELLS																					
ZZA MW-1 (5/15/03)	05/15/03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-1	05/03/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-1	07/29/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-1	10/25/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-1	01/27/05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-2 (5/15/03)	05/15/03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	8
ZZA MW-2	05/03/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-
ZZA MW-2	07/29/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-2	10/25/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-2	01/27/05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-3	05/03/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-3	07/29/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-3	10/25/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-
ZZA MW-3	01/27/05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-4	05/03/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-4	07/29/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-4	10/25/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-4	01/27/05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	8
ZZA MW-5	05/03/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	13
ZZA MW-5	07/29/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	5
ZZA MW-5	10/26/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	10
ZZA MW-5	01/27/05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	7

TABLE IV - ANALYTICAL LABORATORY RESULTS - GROUNDWATER

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Total cPAHs	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Total PCBs	Arsenic (Total)	Arsenic (Dissolved)
ZZA MW-6	05/04/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-
ZZA MW-6	07/29/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-6	10/26/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-6	01/28/05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-7	05/03/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-7	07/29/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-7	10/26/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZA MW-7	01/28/05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-

TABLE IV - ANALYTICAL LABORATORY RESULTS - GROUNDWATER

Sample ID	Date Collected	Diesel-Range	Lube Oil Range	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Total cPAHs	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Total PCBs	Arsenic (Total)	Arsenic (Dissolved)
GEOENGINEERS INSTALLED WELLS																					
GMW-7	02/20/98											-	-	-	-	-	-	-	-		
GMW-7	08/29/98	1,250	1,960																		
GMW-7	11/03/98	9,430	15,800									-	-	-	-	-	-	-	-		
GMW-7	05/04/04	460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	10
GMW-7	07/29/04	340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-
GMW-7	10/26/04	800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	10
GMW-7	01/28/05	530	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	9
GMW-11	08/28/98	-	-	-	-	-	-	-	-	-	-										
GMW-11	11/03/98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		1.22
GMW-11	05/04/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GMW-11	07/29/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	7
GMW-11	10/26/04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	10
GMW-11	01/28/05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MTCA METHOD A CLEANUP LEVEL		500	500								0.1								0.1		5

All concentrations reported in ug/L (parts per billion). See Appendix B for the complete laboratory package including information on test procedures and methods.

- Indicates that the constituent shown was not detected above laboratory method reporting limits (MRLs). Please see Appendix B for the complete laboratory package.

A blank entry indicates that the sample was not tested for the constituent shown.

Shaded entries denote a sample had a concentration of the constituent shown above the MTCA Method A Cleanup Levels presented in Chapter 173-340 W.A.C.

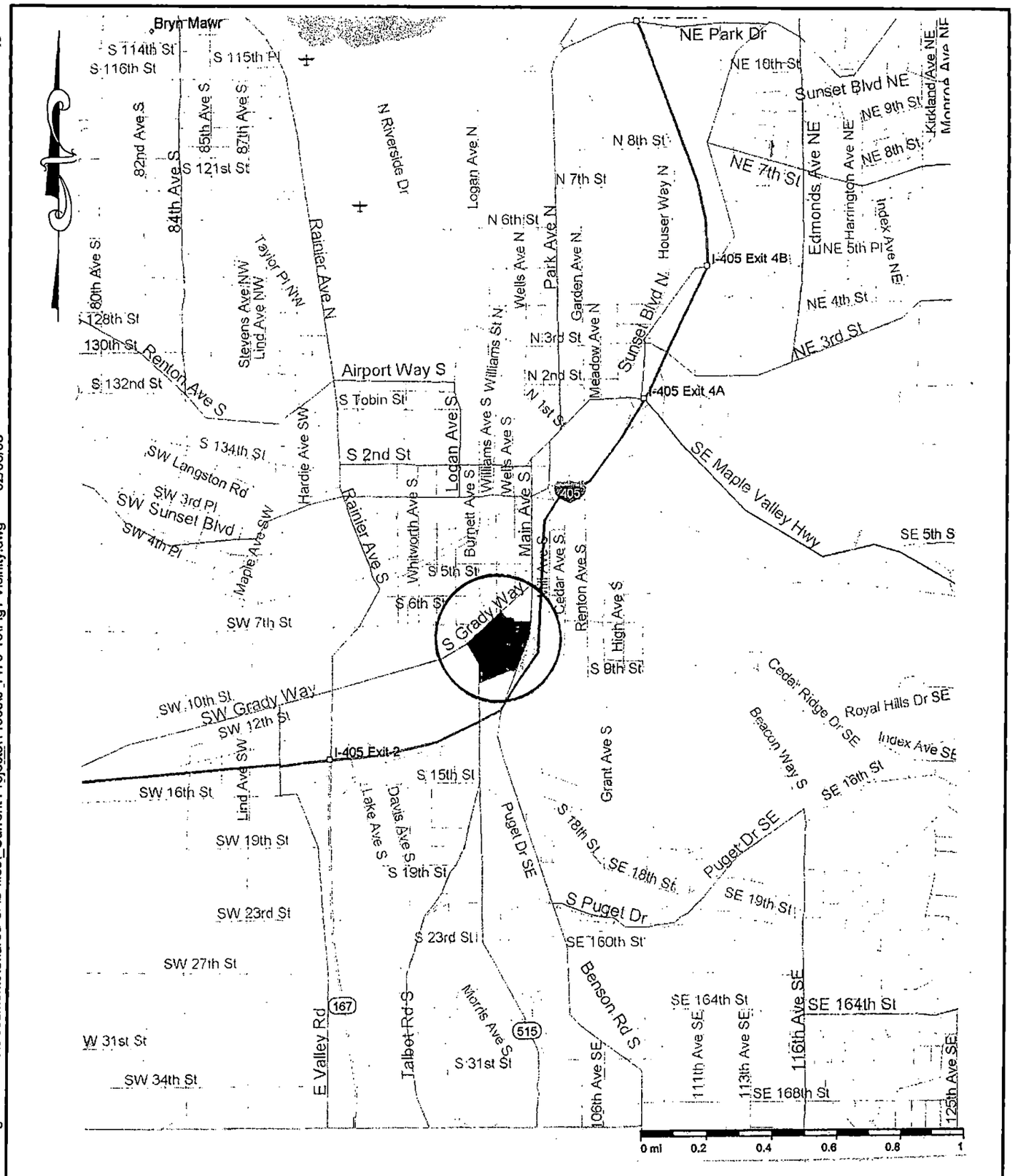
All samples submitted for TPH analysis by ZZA were subjected to a silica gel extraction process to remove any biogenic interference.

Many of the laboratory certificates contained a note indicating that the "Chromatogram indicates sample contains unidentified diesel range product."

Please see report and figures for discussion and graphical representation of sample collection locations

Samples collected from monitoring wells GMW-7 and GMW-11 by previous consultants have results listed above. It should be noted that additional constituents may have been included in previous scopes of work and are not listed above. Please refer to the ZZA document entitled *Summary Letter Report - Previous Environmental Characterization and Remedial Reports* dated 5 March 2003 for additional information.

FIGURES



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Zipper Zeman Associates, Inc.
Geotechnical and Environmental Consulting

18905 33rd Avenue West, Suite 117
Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

Project No. J-1470-10
Date: Feb., 2005
Drawn by: J. Duncan
Scale: NTS

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Sam's Club Store No. 4835
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FIGURE 1 - SITE LOCATION MAP

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LEGEND:

INCLUDES DIESEL AND LUBE OIL RANGE TOTAL PETROLEUM HYDROCARBONS ANALYZED BY THE NORTHWEST METHOD.

CARINOGENIC POLYNUCLEAR AROMATIC HYDROCARBONS (INCLUDES BENZO (a) ANTHRACENE, CHRYSENE, BENZO (b) FLUORANTHENE, BENZO (k) FLUORANTHENE, BENZO (a) PYRENE, IDENO (1,2,3-cd) PYRENE, AND DIBENZO (a,h) ANTHRACENE ANALYZED BY EPA METHOD 8270 SIM.

POLYCHLORINATED BIPHENYLS (INCLUDES AROCHLORS 1016, 1232, 1242, 1248, 1254 AND 1260) ANALYZED BY EPA METHOD 8082 MODIFIED.

ANALYZED BY EPA METHODS 6010 - INDUCTIVELY COUPLED PLASMA.

FOR INFORMATION REGARDING SAMPLE IDENTIFICATION METHODOLOGY, PLEASE REFER TO THE TEXT OF THE REPORT AS WELL AS TABULATED ANALYTICAL DATA FOOT NOTES.

FLUME STA 153 + 70 SP	
TPH SEMIVOLATILE RANGE	181 ppm
TOTAL cPAH	0.83 ppm
TOTAL PCBs	11.6
ARSENIC	-

PPM = PARTS PER MILLION

SHADED AREAS DENOTE AN EXCEEDANCE OF THE SITE SPECIFIC CLEANUP LEVELS EMPLOYED FOR THIS SITE AS DOCUMENTED IN THE ZZA REPORT ENTITLED *ENVIRONMENTAL CONTINGENCY PLAN - RENTON SAM'S CLUB - SOUTH GRADY WAY AND SR 515 - RENTON WASHINGTON* DATED 5 MARCH 2003 AND DISCUSSED HEREIN, IN SECTION 3.5.12. SPECIFICALLY THE STANDARDS EMPLOYED ARE:

CONSTIUENT	CLEAN UP LEVEL
TPH SEMIVOLATILE RANGE	3,432 ppm
TOTAL cPAH	1.7015 ppm
TOTAL PCBs	1.85 ppm
ARSENIC	20 ppm

Zipper Zeman Associates, Inc.
Geotechnical and Environmental Consulting

18905 33rd Avenue West, Suite 117
Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

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Renton, King County, Washington

FIGURE 2 - LEGEND

C-1	
TOTAL PCBs	-

C-2	
TOTAL PCBs	-

TRANS VAULT COMP. 1	
TOTAL PCBs	0.9

SR – 515 (TALBOT ROAD S.)

S. GRADY WAY

WILLIAMS AVE S.

C-7

FORMER CONCRETE BUILDING FOUNDATIONS AND SLABS

BENSON ROAD SOUTH

MAIN AVENUE

LEGEND:

- O C-7 CONCRETE SAMPLE COLLECTED BY GEOENGINEERS, 1998
- O C-1 CONCRETE SAMPLE COLLECTED BY ZZA, 2003

0 120 240

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Zipper Zeman Associates, Inc.
Geotechnical and Environmental Consulting

18905 33rd Avenue West, Suite 117
Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

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FIGURE 3 - CONCRETE SAMPLING

Basemap DWG File Provided by PacLand and modified by ZZA

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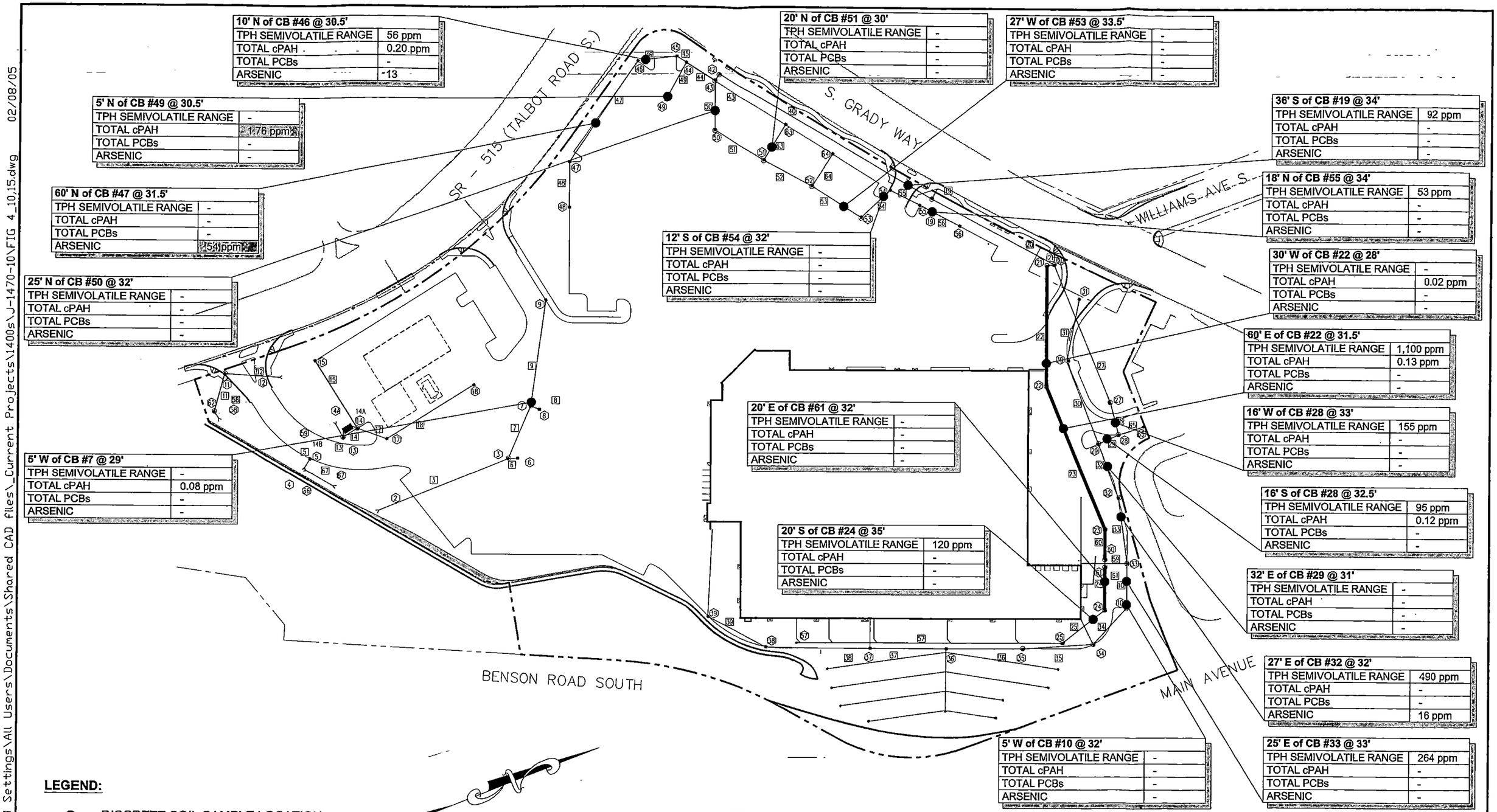

10' N of CB #46 @ 30.5'	
TPH SEMIVOLATILE RANGE	56 ppm
TOTAL cPAH	0.20 ppm
TOTAL PCBs	-
ARSENIC	13

5' N of CB #49 @ 30.5'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	1.76 ppm
TOTAL PCBs	-
ARSENIC	-

60' N of CB #47 @ 31.5'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	541ppm

25' N of CB #50 @ 32'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

5' W of CB #7 @ 29'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	0.08 ppm
TOTAL PCBs	-
ARSENIC	-

20' N of CB #51 @ 30'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

27' W of CB #53 @ 33.5'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

12' S of CB #54 @ 32'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

20' E of CB #61 @ 32'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

20' S of CB #24 @ 35'	
TPH SEMIVOLATILE RANGE	120 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

5' W of CB #10 @ 32'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

36' S of CB #19 @ 34'	
TPH SEMIVOLATILE RANGE	92 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

18' N of CB #55 @ 34'	
TPH SEMIVOLATILE RANGE	53 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

30' W of CB #22 @ 28'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	0.02 ppm
TOTAL PCBs	-
ARSENIC	-

60' E of CB #22 @ 31.5'	
TPH SEMIVOLATILE RANGE	1,100 ppm
TOTAL cPAH	0.13 ppm
TOTAL PCBs	-
ARSENIC	-

16' W of CB #28 @ 33'	
TPH SEMIVOLATILE RANGE	155 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

16' S of CB #28 @ 32.5'	
TPH SEMIVOLATILE RANGE	95 ppm
TOTAL cPAH	0.12 ppm
TOTAL PCBs	-
ARSENIC	-

32' E of CB #29 @ 31'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

27' E of CB #32 @ 32'	
TPH SEMIVOLATILE RANGE	490 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	16 ppm

25' E of CB #33 @ 33'	
TPH SEMIVOLATILE RANGE	264 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

LEGEND:

- ● DISCRETE SOIL SAMPLE LOCATION
- ⑨ CATCHBASIN
- [9] PIPE

0 120 240

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Zipper Zeman Associates, Inc.
Geotechnical and Environmental Consulting

18905 33rd Avenue West, Suite 117
Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

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FIGURE 4 - STORM DRAIN SYSTEM SOIL SAMPLING

Basemap DWG File Provided by PacLand and modified by ZZA

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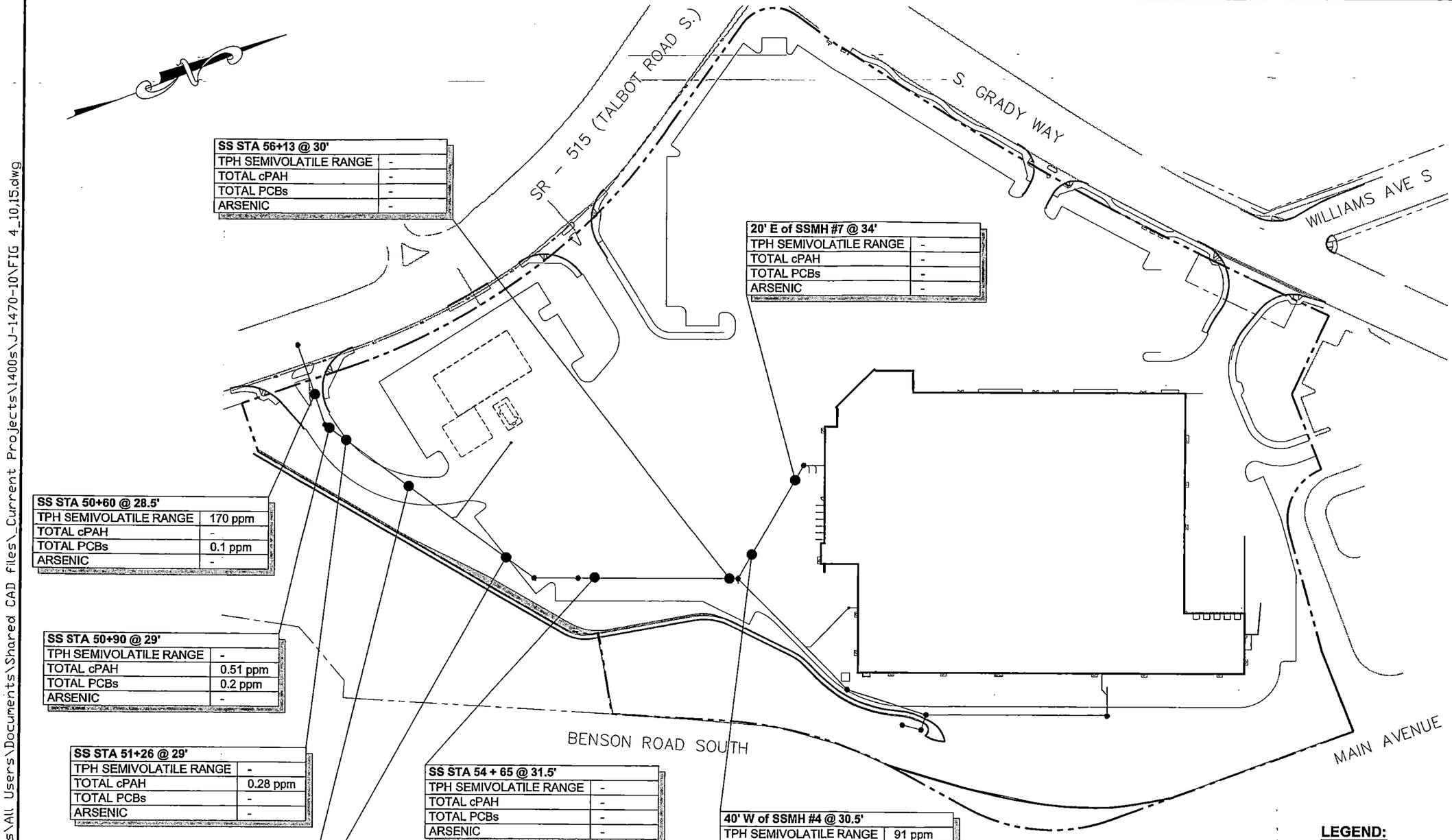

Zipper Zeman Associates, Inc.
Geotechnical and Environmental Consulting
18905 33rd Avenue West, Suite 117
Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

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FIGURE 5 - SANITARY SEWER SYSTEM SOILS SAMPLING

Basemap DWG File Provided by PacLand and modified by ZZA

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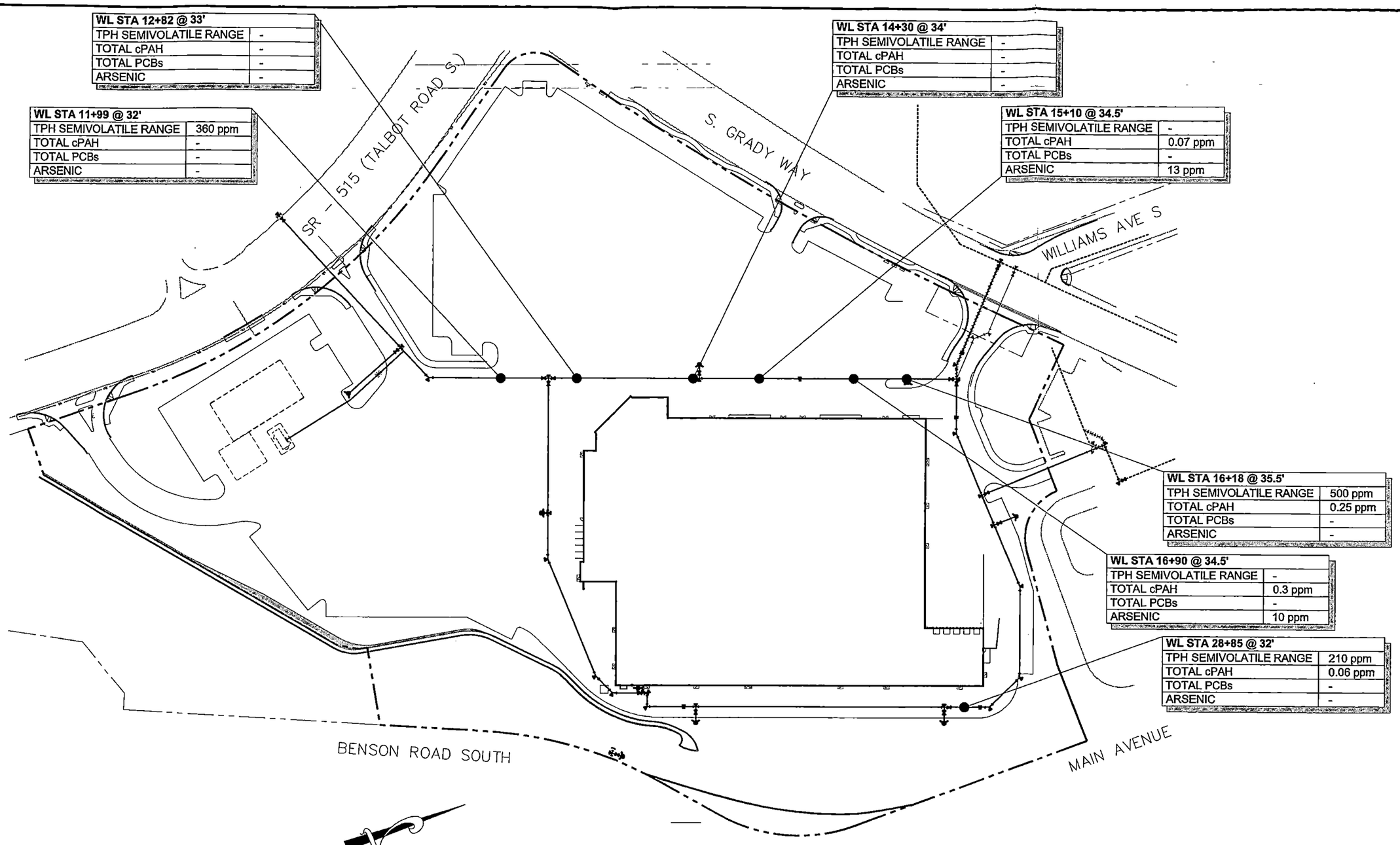

WL STA 12+82 @ 33'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

WL STA 11+99 @ 32'	
TPH SEMIVOLATILE RANGE	360 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

WL STA 14+30 @ 34'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

WL STA 15+10 @ 34.5'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	0.07 ppm
TOTAL PCBs	-
ARSENIC	13 ppm

WL STA 16+18 @ 35.5'	
TPH SEMIVOLATILE RANGE	500 ppm
TOTAL cPAH	0.25 ppm
TOTAL PCBs	-
ARSENIC	-

WL STA 16+90 @ 34.5'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	0.3 ppm
TOTAL PCBs	-
ARSENIC	10 ppm

WL STA 28+85 @ 32'	
TPH SEMIVOLATILE RANGE	210 ppm
TOTAL cPAH	0.06 ppm
TOTAL PCBs	-
ARSENIC	-

LEGEND:

● DISCRETE SOIL SAMPLE LOCATION

0 120 240

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Zipper Zeman Associates, Inc.
Geotechnical and Environmental Consulting

18905 33rd Avenue West, Suite 117
Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

Project No: J-1470-10

Drawn by:J. Duncan

Date:Feb., 2005

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FIGURE 6 - WATER LINE SYSTEM SOIL SAMPLING

Basemap DWG File Provided by PacLand and modified by ZZA

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ET, 270' N of Vault @ 30'	
TPH SEMIVOLATILE RANGE	223 ppm
TOTAL cPAH	0.49 ppm
TOTAL PCBs	1.4 ppm
ARSENIC	-

ET, 150' N of Vault @ 29'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

ET, 36' N of Vault @ 34'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

UT, 75' E of SR 515 @ 33'	
TPH SEMIVOLATILE RANGE	84 ppm
TOTAL cPAH	0.03 ppm
TOTAL PCBs	-
ARSENIC	-

UT, 258' E of SR 515 @ 32'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

UT, 350' E of SR 515 @ 32'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

UT, 60' W of SE Crn Bldg @ 33'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

F - 12 + 16' W @ 32.5'	
TPH SEMIVOLATILE RANGE	500 ppm
TOTAL cPAH	0.07 ppm
TOTAL PCBs	-
ARSENIC	-

F.5 - 12 + 13' W @ 32'	
TPH SEMIVOLATILE RANGE	640 ppm
TOTAL cPAH	0.02 ppm
TOTAL PCBs	-
ARSENIC	-

F.8 - 12 + 8' W @ 32.3'	
TPH SEMIVOLATILE RANGE	180 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

F.8 - 14 + 28' S @ 32.5'	
TPH SEMIVOLATILE RANGE	1,100 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

LEGEND:

● DISCRETE SOIL SAMPLE LOCATION

SR – 515 (TALBOT ROAD S.)

S. GRADY WAY

WILLIAMS AVE S

BENSON ROAD SOUTH

MAIN AVENUE

0 120 240

APPROXIMATE SCALE IN FEET

Zipper Zeman Associates, Inc.
Geotechnical and Environmental Consulting

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Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

Project No: J-1470-10

Drawn by:J. Duncan

Date: Feb., 2005

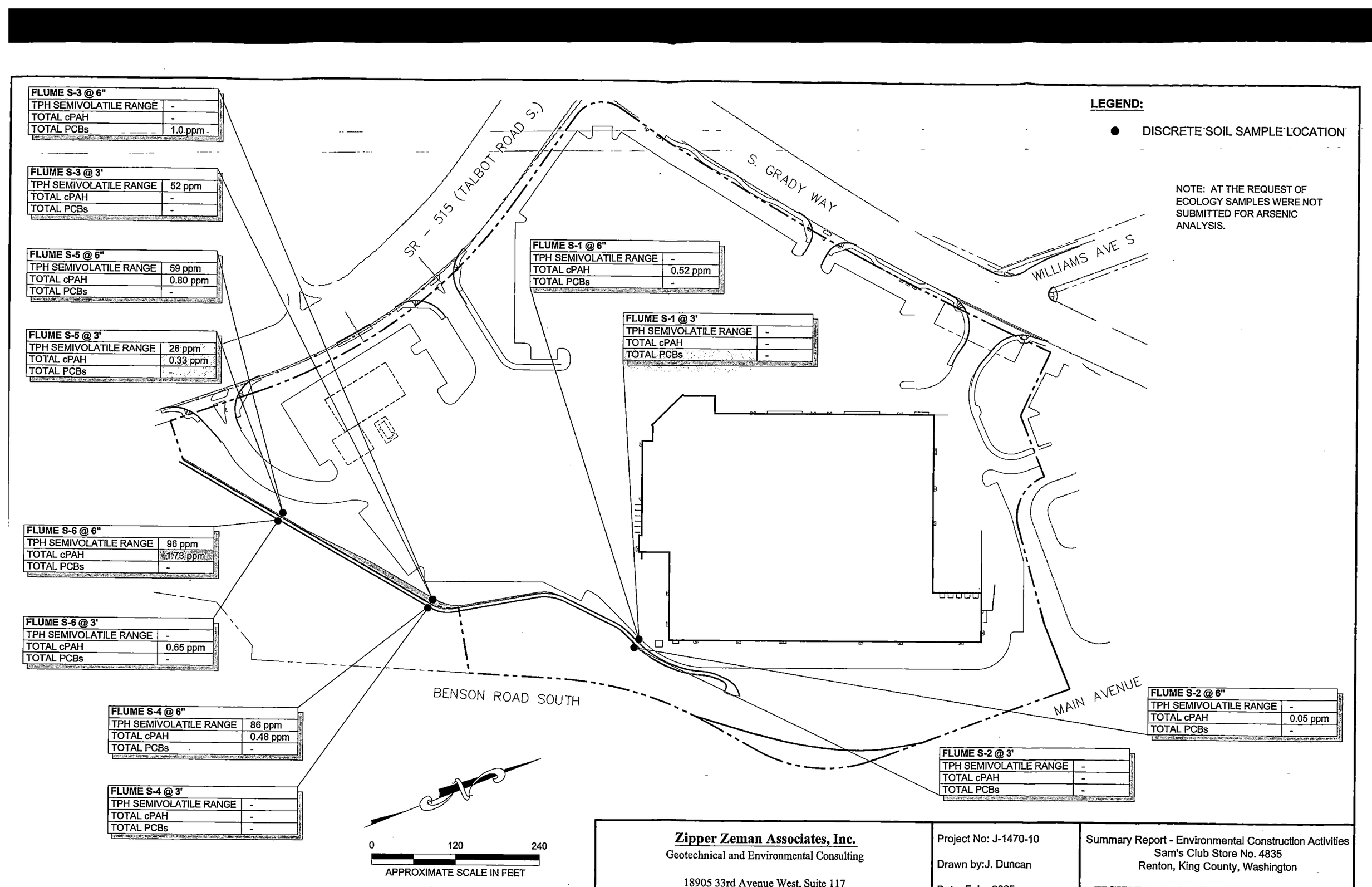
Scale: As Noted

Summary Report - Environmental Construction Activities
Sam's Club Store No. 4835
Renton, King County, Washington

FIGURE 7 - OTHER UTILITY SYSTEMS SOIL SAMPLING

Basemap DWG File Provided by PacLand and modified by ZZA

C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 4_10_15.dwg



FLUME S-3 @ 6"	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	1.0 ppm

FLUME S-3 @ 3'	
TPH SEMIVOLATILE RANGE	52 ppm
TOTAL cPAH	-
TOTAL PCBs	-

FLUME S-5 @ 6"	
TPH SEMIVOLATILE RANGE	59 ppm
TOTAL cPAH	0.80 ppm
TOTAL PCBs	-

FLUME S-5 @ 3'	
TPH SEMIVOLATILE RANGE	26 ppm
TOTAL cPAH	0.33 ppm
TOTAL PCBs	-

FLUME S-6 @ 6"	
TPH SEMIVOLATILE RANGE	96 ppm
TOTAL cPAH	1.73 ppm
TOTAL PCBs	-

FLUME S-6 @ 3'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	0.65 ppm
TOTAL PCBs	-

FLUME S-4 @ 6"	
TPH SEMIVOLATILE RANGE	86 ppm
TOTAL cPAH	0.48 ppm
TOTAL PCBs	-

FLUME S-4 @ 3'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-

FLUME S-1 @ 6"	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	0.52 ppm
TOTAL PCBs	-

FLUME S-1 @ 3'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-

FLUME S-2 @ 6"	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	0.05 ppm
TOTAL PCBs	-

FLUME S-2 @ 3'	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-

LEGEND:

● DISCRETE SOIL SAMPLE LOCATION

NOTE: AT THE REQUEST OF ECOLOGY SAMPLES WERE NOT SUBMITTED FOR ARSENIC ANALYSIS.

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Geotechnical and Environmental Consulting

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Lynnwood, Washington 98036
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Project No: J-1470-10

Drawn by:J. Duncan

Date: Feb., 2005

Scale: As Noted

Summary Report - Environmental Construction Activities
Sam's Club Store No. 4835
Renton, King County, Washington

FIGURE 8 - ON & OFF SITE FLUME SOILS SAMPLING

[redacted]

FLUME STA 153 + 20 SP	
TPH SEMIVOLATILE RANGE	227 ppm
TOTAL cPAH	0.22 ppm
TOTAL PCBs	-
ARSENIC	-

FLUME STA 153 + 70 SP	
TPH SEMIVOLATILE RANGE	181 ppm
TOTAL cPAH	0.83 ppm
TOTAL PCBs	1.16
ARSENIC	-

FLUME STA 154 + 20 SP	
TPH SEMIVOLATILE RANGE	28 ppm
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	-

FLUME STA 152 + 70 SP	
TPH SEMIVOLATILE RANGE	369 ppm
TOTAL cPAH	0.55 ppm
TOTAL PCBs	0.9 ppm
ARSENIC	-

FLUME STA 150 + 00 SP	
TPH SEMIVOLATILE RANGE	208 ppm
TOTAL cPAH	0.22 ppm
TOTAL PCBs	0.2 ppm
ARSENIC	-

FLUME STA 151 + 00 SP	
TPH SEMIVOLATILE RANGE	33 ppm
TOTAL cPAH	0.16 ppm
TOTAL PCBs	-
ARSENIC	-

FLUME STA 152 + 00 SP	
TPH SEMIVOLATILE RANGE	106 ppm
TOTAL cPAH	0.38 ppm
TOTAL PCBs	0.1 ppm
ARSENIC	-

FLUME STA 155 + 50 SP	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	-
TOTAL PCBs	-
ARSENIC	16 ppm

FLUME STA 156 + 00 SP	
TPH SEMIVOLATILE RANGE	29 ppm
TOTAL cPAH	0.02 ppm
TOTAL PCBs	1.2 ppm
ARSENIC	-

FLUME STA 156 + 50 SP	
TPH SEMIVOLATILE RANGE	-
TOTAL cPAH	0.05 ppm
TOTAL PCBs	-
ARSENIC	-

SR – 515 (TALBOT ROAD S.)

S. GRADY WAY

WILLIAMS AVE S

BENSON ROAD SOUTH

MAIN AVENUE

LEGEND:

● DISCRETE SOIL SAMPLE LOCATION

0 120 240

APPROXIMATE SCALE IN FEET

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Geotechnical and Environmental Consulting

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Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

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Summary Report - Environmental Construction Activities
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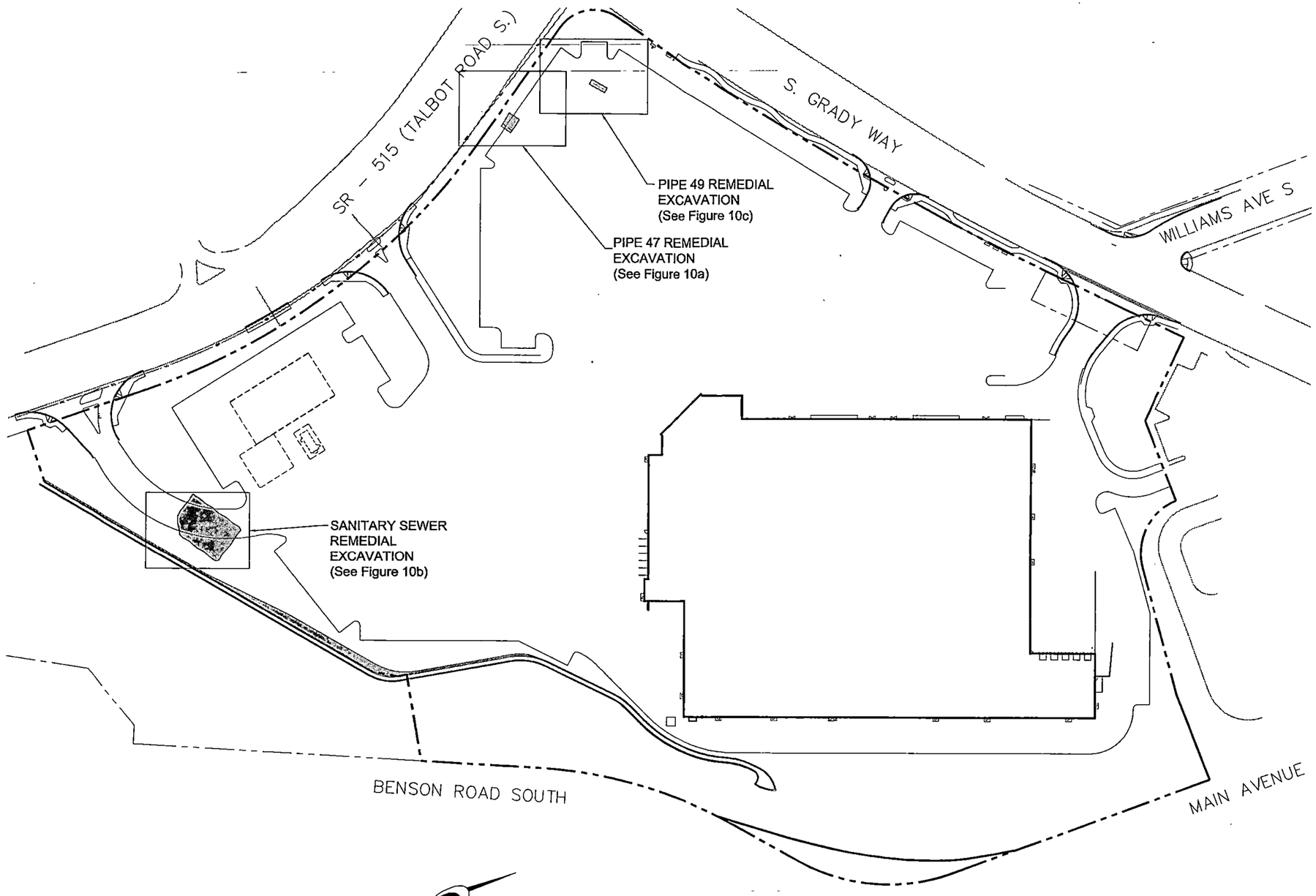
FIGURE 9 - FLUME STOCKPILE SOIL SAMPLING

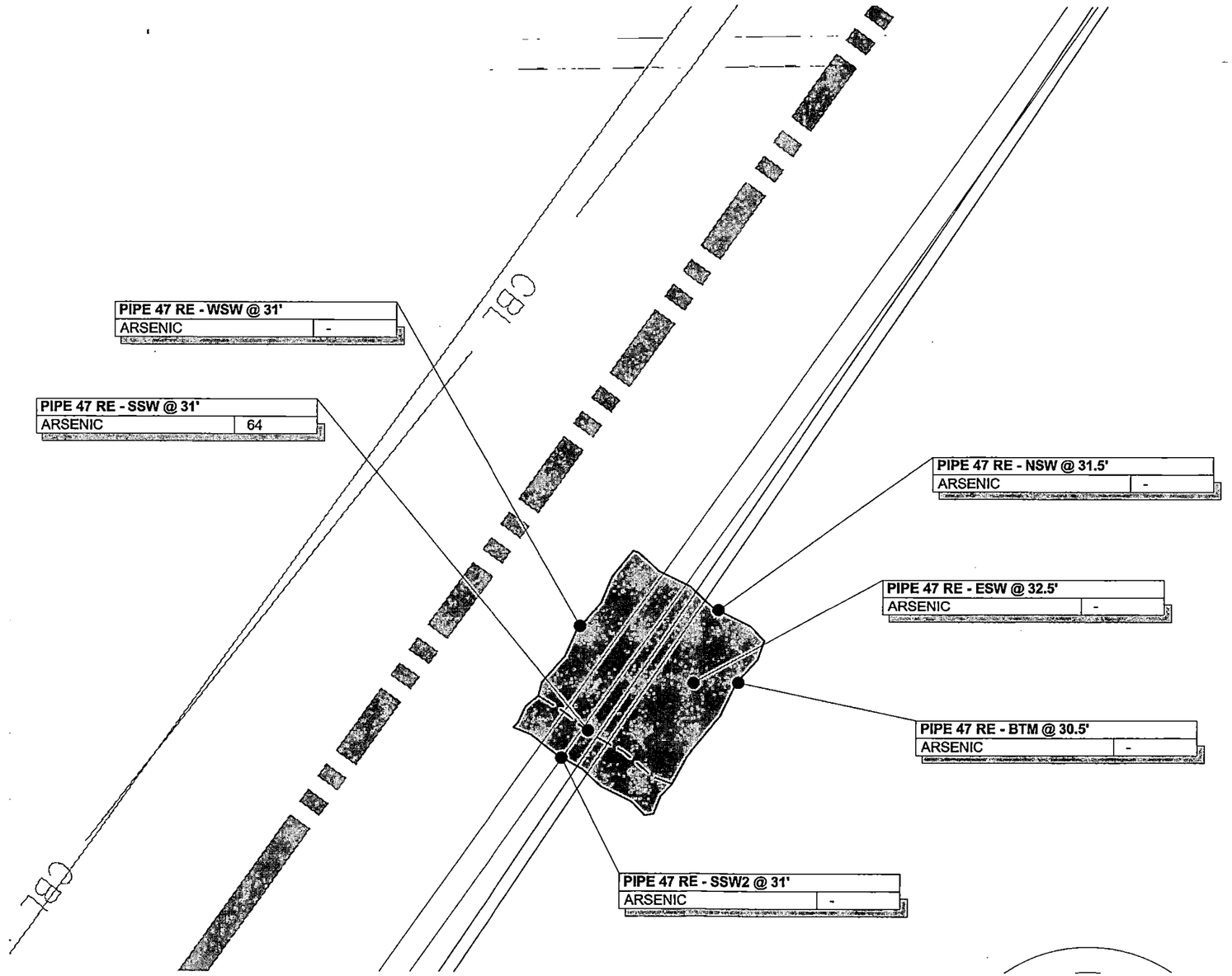
Basemap DWG File Provided by PacLand and modified by ZZA

C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 4_10,15.dwg



C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 4_10,15.dwg

Zipper Zeman Associates, Inc. Geotechnical and Environmental Consulting 18905 33rd Avenue West, Suite 117 Lynnwood, Washington 98036 Tele: (425) 771-3304 Fax: (425) 771-3549	Project No: J-1470-10 Drawn by:J. Duncan Date: Feb., 2005 Scale: As Noted	Summary Report - Environmental Construction Activities Sam's Club Store No. 4835 Renton, King County, Washington **FIGURE 10 - REMEDIAL EXCAVATIONS** Basemap DWG File Provided by PacLand and modified by ZZA



LEGEND:

● DISCRETE SOIL SAMPLE LOCATION

0 10 20

APPROXIMATE SCALE IN FEET

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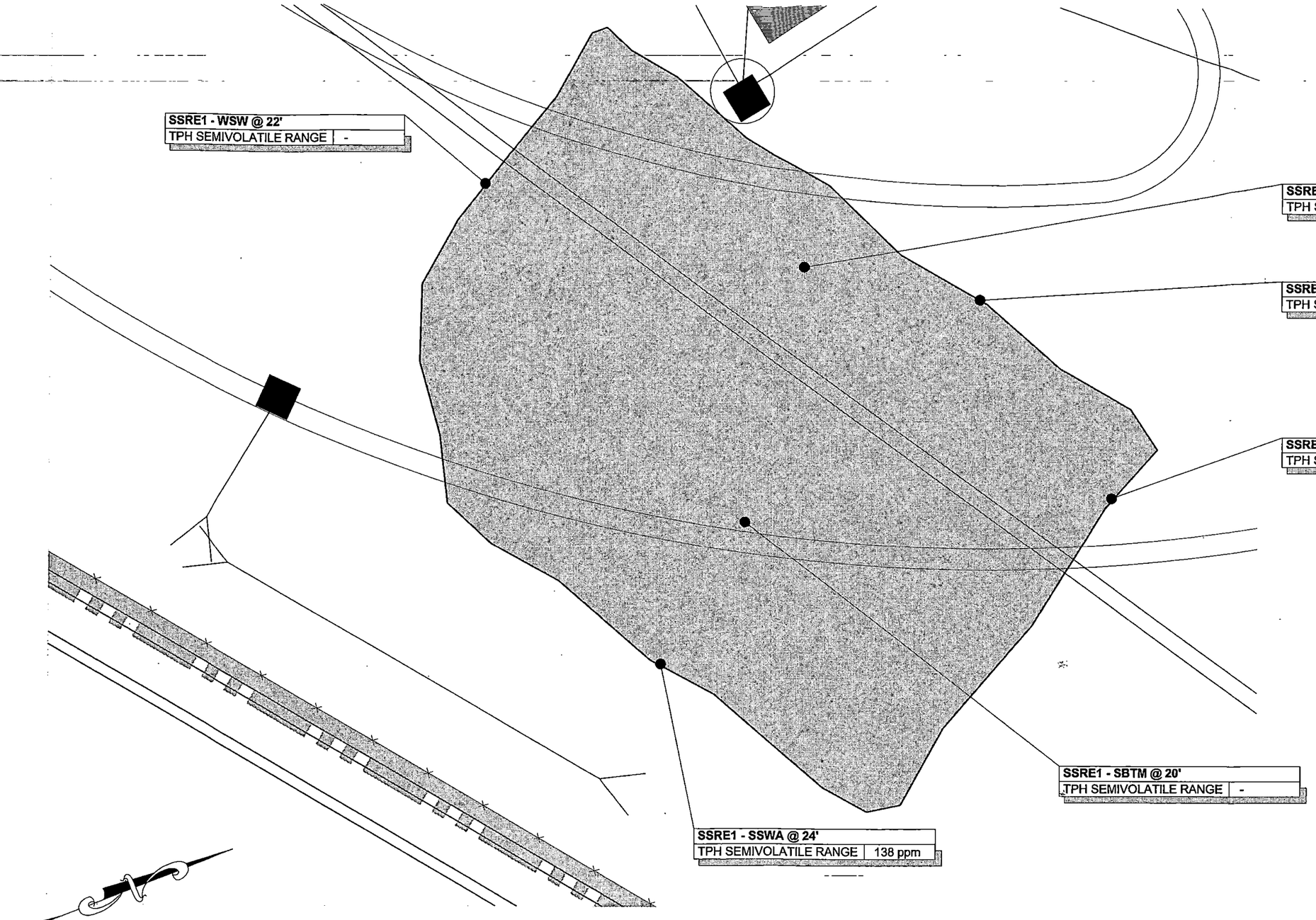
Sam's Club Store No. 4835
Renton, King County, Washington

FIGURE 10a - PIPE 47 REMEDIAL EXCAVATION

Basemap DWG File Provided by PacLand and modified by ZZA

C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 10a-10c.dwg



0 10 20

APPROXIMATE SCALE IN FEET

LEGEND:

● DISCRETE SOIL SAMPLE LOCATION

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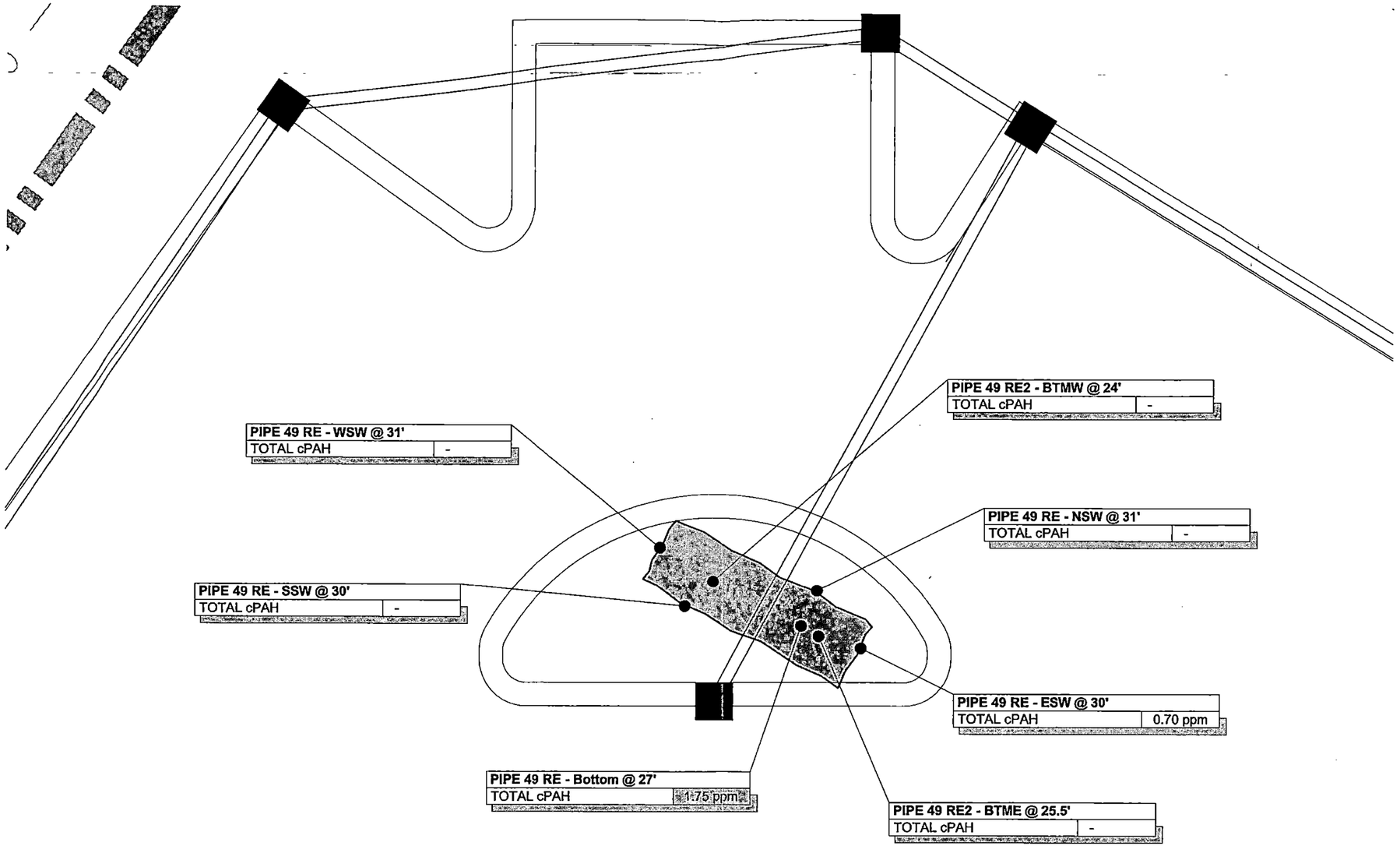
Renton, King County, Washington

FIGURE 10b - SANITARY SEWER REMEDIAL EXCAVATION

Basemap DWG File Provided by PacLand and modified by ZZA

C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 10a-10c.dwg



LEGEND:

● DISCRETE SOIL SAMPLE LOCATION

0 10 20

APPROXIMATE SCALE IN FEET

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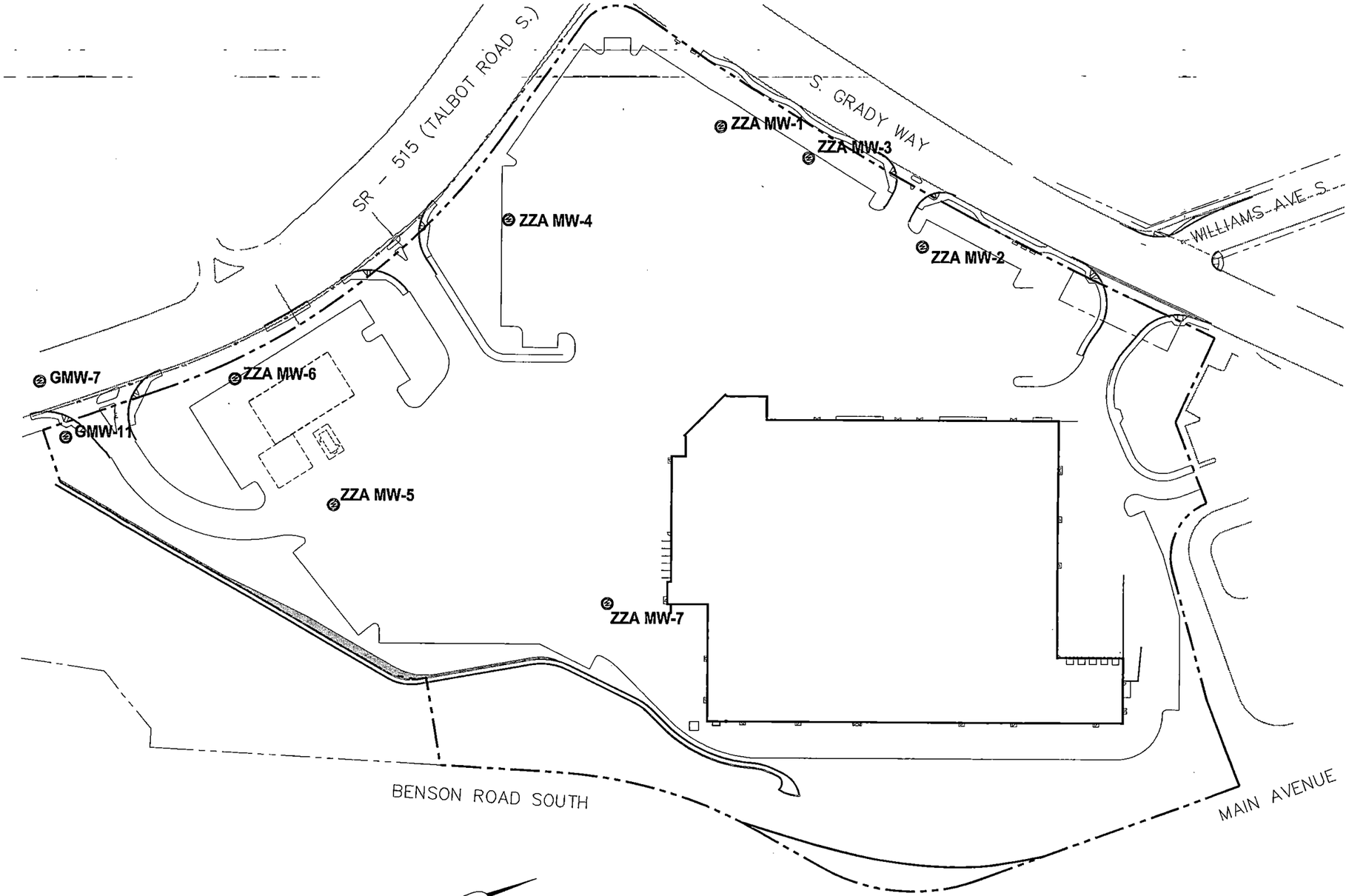
Summary Report - Environmental Construction Activities
Sam's Club Store No. 4835
Renton, King County, Washington

FIGURE 10c - PIPE 49 REMEDIAL EXCAVATION

Basemap DWG File Provided by PacLand and modified by ZZA

C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 10a-10c.dwg



LEGEND:

Ⓦ **ZZA MW-1** MONITORING WELL NUMBER AND APPROXIMATE LOCATION

0 120 240

APPROXIMATE SCALE IN FEET

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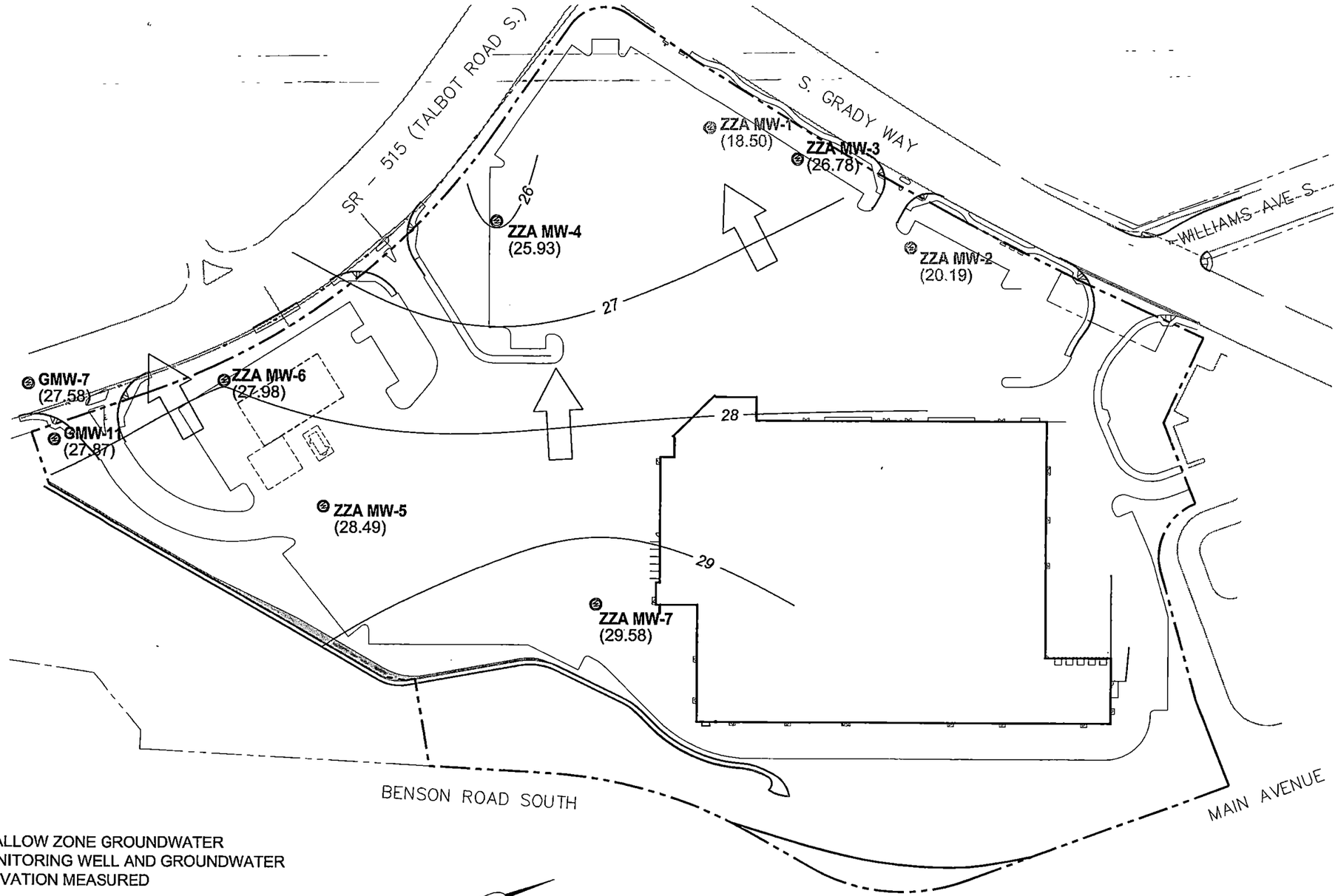
FIGURE 11 - GROUNDWATER MONITORING WELL INSTALLATIONS

Basemap DWG File Provided by PacLand and modified by ZZA

C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 4_10,15.dwg 02/08/05



LEGEND:

ⓦ **ZZA MW-3** (26.78)	SHALLOW ZONE GROUNDWATER MONITORING WELL AND GROUNDWATER ELEVATION MEASURED
ⓦ ZZA MW-1 (18.50)	DEEP ZONE GROUNDWATER MONITORING WELL AND GROUNDWATER ELEVATION MEASURED
27	GROUNDWATER ELEVATION CONTOUR
	GROUNDWATER FLOW DIRECTION

0 120 240

APPROXIMATE SCALE IN FEET

NOTE: DEEP ZONE WELLS NOT USED TO CALCULATE GROUNDWATER ELEVATION CONTOURS.

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Geotechnical and Environmental Consulting

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Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

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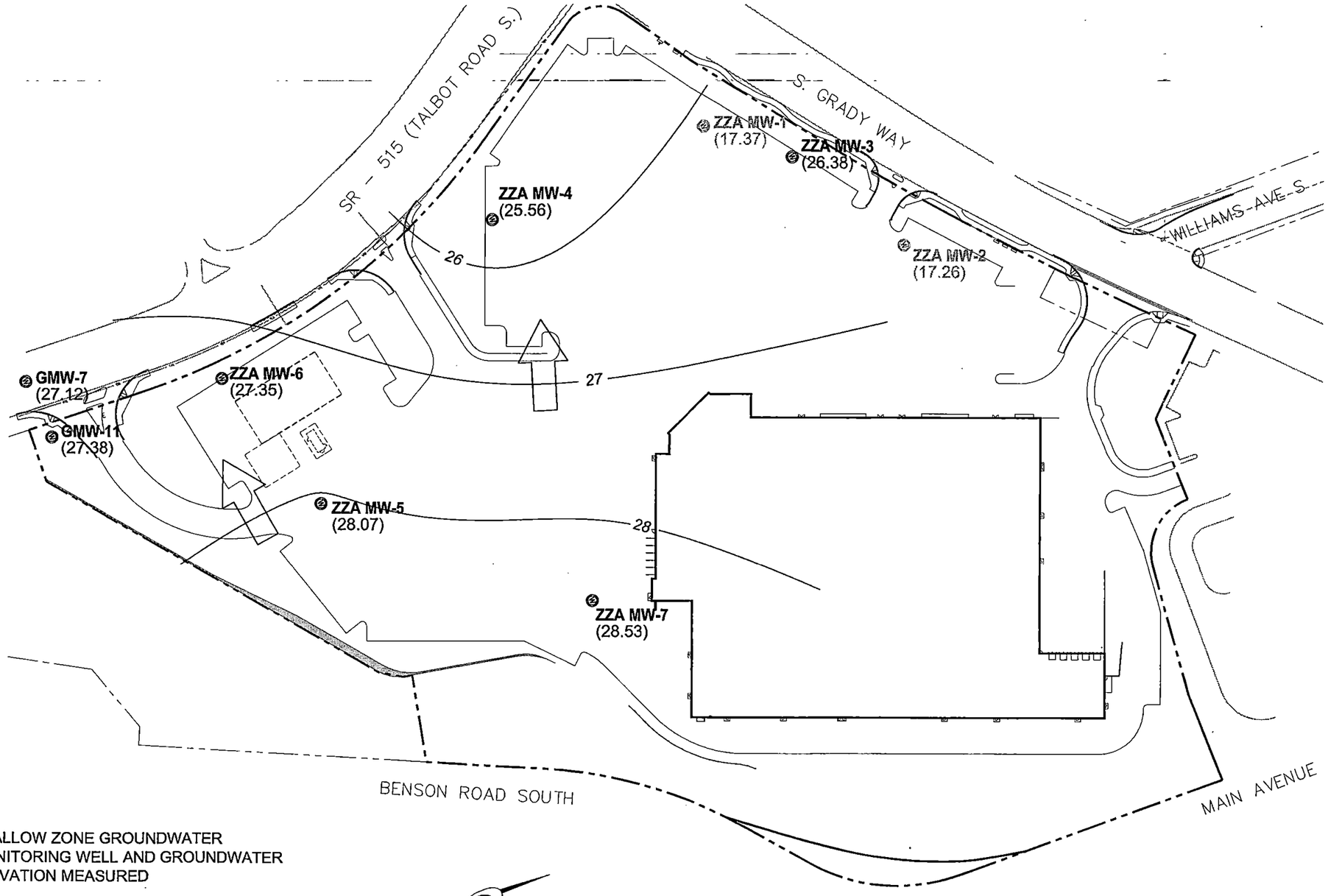
Sam's Club Store No. 4835
Renton, King County, Washington

FIGURE 12 - GROUNDWATER CONTOUR MAP (May 2004)

Basemap DWG File Provided by PacLand and modified by ZZA



LEGEND:

ⓦ ZZA MW-3 (26.38)	SHALLOW ZONE GROUNDWATER MONITORING WELL AND GROUNDWATER ELEVATION MEASURED
ⓦ ZZA MW-1 (17.37)	DEEP ZONE GROUNDWATER MONITORING WELL AND GROUNDWATER ELEVATION MEASURED
27	GROUNDWATER ELEVATION CONTOUR
	GROUNDWATER FLOW DIRECTION

0 120 240

APPROXIMATE SCALE IN FEET

NOTE: DEEP ZONE WELLS NOT USED TO CALCULATE GROUNDWATER ELEVATION CONTOURS.

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Geotechnical and Environmental Consulting

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Lynnwood, Washington 98036
Tele: (425) 771-3304 Fax: (425) 771-3549

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Date: Feb., 2005

Scale: As Noted

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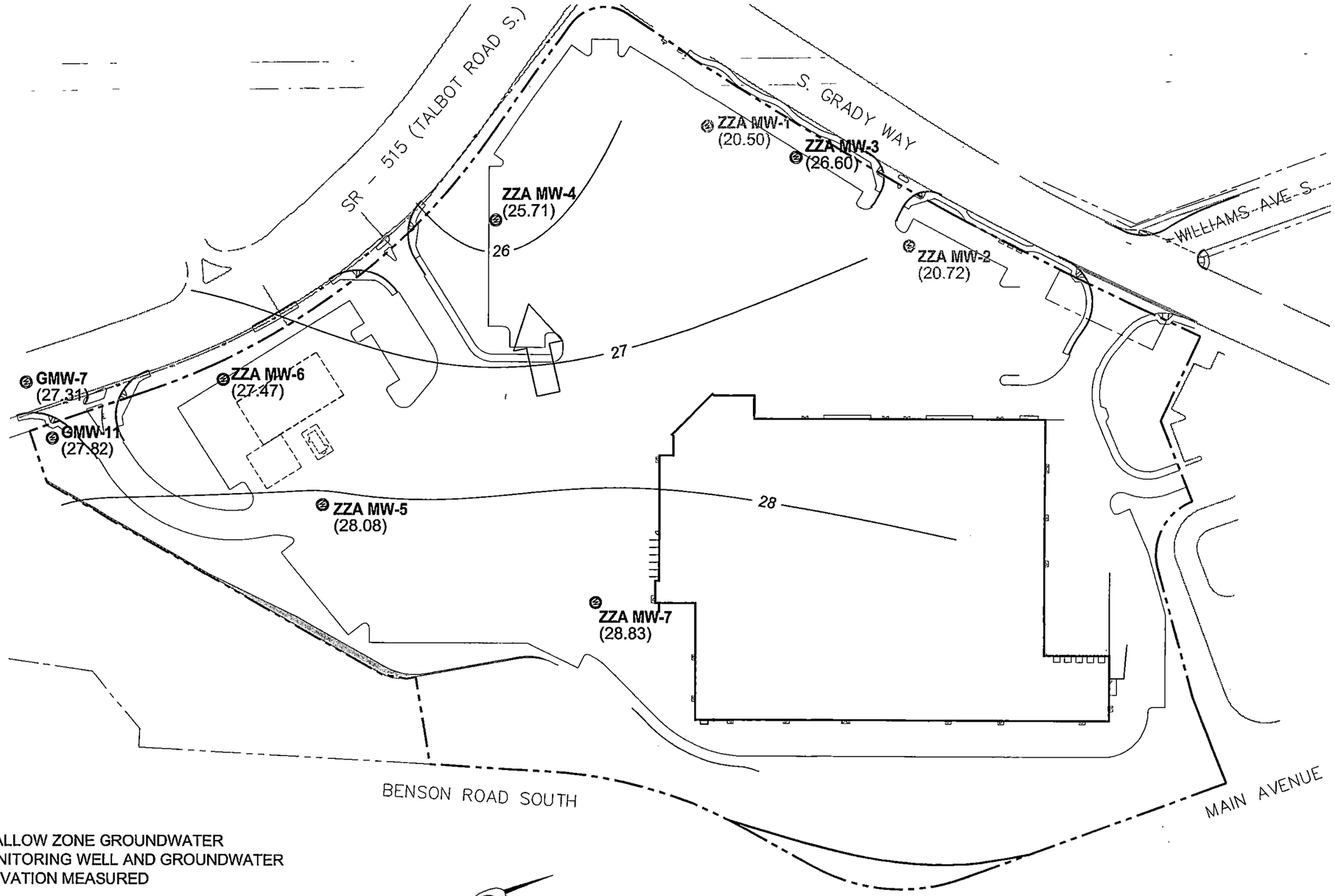
FIGURE 13 - GROUNDWATER CONTOUR MAP (July 2004)

Basemap DWG File Provided by PacLand and modified by ZZA

C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 12_14.dwg 02/08/05



LEGEND:

ⓦ **ZZA MW-3** (26.60)	SHALLOW ZONE GROUNDWATER MONITORING WELL AND GROUNDWATER ELEVATION MEASURED
ⓦ **ZZA MW-1** (20.50)	DEEP ZONE GROUNDWATER MONITORING WELL AND GROUNDWATER ELEVATION MEASURED
—— 27 ——	GROUNDWATER ELEVATION CONTOUR
	GROUNDWATER FLOW DIRECTION

0 120 240

APPROXIMATE SCALE IN FEET

NOTE: DEEP ZONE WELLS NOT USED TO CALCULATE GROUNDWATER ELEVATION CONTOURS.

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Drawn by:J. Duncan

Date: Feb., 2005

Scale: As Noted

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Renton, King County, Washington

FIGURE 14 - GROUNDWATER CONTOUR MAP (October 2004)

Basemap DWG File Provided by PacLand and modified by ZZA

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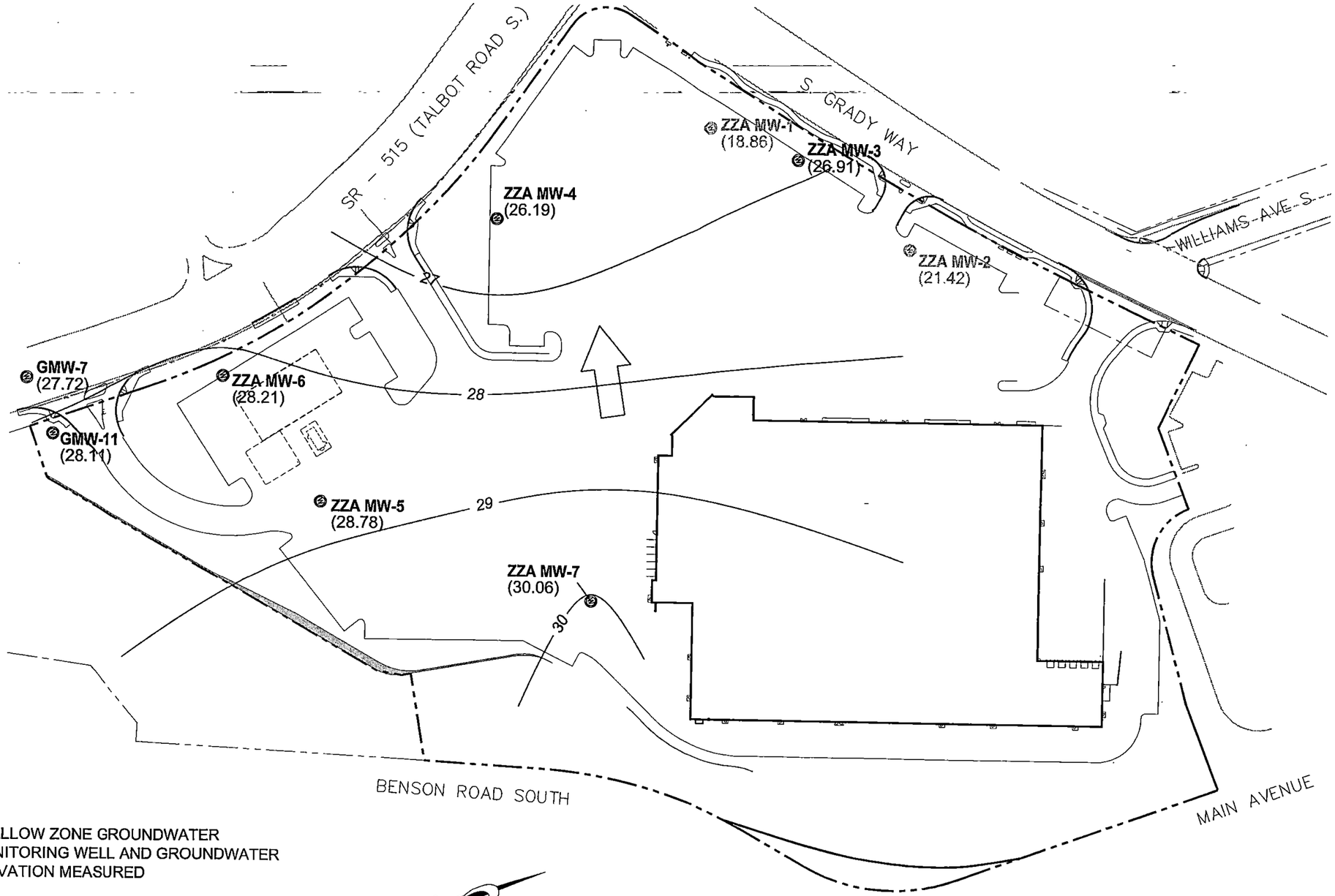

LEGEND:

ⓦ **ZZA MW-3** (26.91)	SHALLOW ZONE GROUNDWATER MONITORING WELL AND GROUNDWATER ELEVATION MEASURED
ⓦ ZZA MW-1 (18.86)	DEEP ZONE GROUNDWATER MONITORING WELL AND GROUNDWATER ELEVATION MEASURED
— 27 —	GROUNDWATER ELEVATION CONTOUR
	GROUNDWATER FLOW DIRECTION

0 120 240

APPROXIMATE SCALE IN FEET

NOTE: DEEP ZONE WELLS NOT USED TO CALCULATE GROUNDWATER ELEVATION CONTOURS.

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Scale: As Noted

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Sam's Club Store No. 4835
Renton, King County, Washington

FIGURE 15 - GROUNDWATER CONTOUR MAP (January 2005)

Basemap DWG File Provided by PacLand and modified by ZZA

C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 12_15.dwg 02/23/05

C:\Documents and Settings\All Users\Documents\Shared CAD files_Current Projects\1400s\J-1470-10\FIG 4_10,16.dwg 02/22/05

SR - 515 (TALBOT ROAD S.)

S. GRADY WAY

WILLIAMS AVE S.

BENSON ROAD SOUTH

MAIN AVENUE

LEGEND:

- TRENCH DAM (Not To Scale)
- CATCHBASIN
- PIPE

0 120 240

APPROXIMATE SCALE IN FEET

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Geotechnical and Environmental Consulting

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Project No: J-1470-10

Drawn by:J. Duncan

Date: Feb., 2005

Scale: As Noted

Summary Report - Environmental Construction Activities
Sam's Club Store No. 4835
Renton, King County, Washington

FIGURE 16 - TRENCH DAM LOCATIONS

Basemap DWG File Provided by PacLand and modified by ZZA