FRITO LAY
Vancouver Washington

Hydraulic Lift Area Petroleum Release

Remedial Investigation Report
Project Number 13002
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4808 NW Fruit Valley Road
Vancouver, Washington 98660

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This Report has been prepared in accordance with accepted engineering practice.

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This Report has been prepared in accordance with accepted environmental practice.

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SECTION 1. INTRODUCTION

This report describes the results of investigatory work performed to evaluate a release of petroleum hydrocarbons at the hydraulic lift area of Frito Lay's Vancouver, Washington plant site. The investigation is based on a workplan prepared by Environmental Health Management (EHM) and previously submitted to the Washington Department of Ecology (Ecology). Much of the background information applicable to this investigation is included in that plan. Most is repeated here to spare the reader the need to cross reference two documents. The work is being performed under Ecology's Voluntary Cleanup Program (Project # SW1024).

1.1 Site Description

The subject site is the hydraulic lift area of the Frito Lay facility and is described in detail in Section 2.4. The Frito Lay facility manufactures snack foods, including potato chips. It is located at 4808 NW Fruit Valley Road in Vancouver, Washington and occupies approximately 40 acres west of Fruit Valley Road near the center of Section 16, T2N R1E WM. (See **Figure 1**.)

One large processing building, including administrative offices, occupies most of the east half of the site. The remainder of the east half is paved. Most of the west half is paved truck parking and includes a few small outbuildings and a stormwater retention pond. The area surrounding the hydraulic lift is shown in **Figure 2**.

The plant site is relatively flat. There is a slight regional slope towards the NW. Ground surface elevations are approximately 40 feet above mean sea level (MSL). With the exception of the west fringe, the plant site is almost completely imperviously surfaced. The property is securely fenced and patrolled by guards and video surveillance.

1.2 Physical Setting

The site vicinity is a mix of industrial, agricultural and residential land uses. Adjacent properties include a former repair shop (Johnston property to the SE), agricultural land (City of Vancouver Property - S, W and N) and Fruit Valley Road (E). Commercial, light industrial and residential properties are located on the east side of Fruit Valley Road with the Burlington Northern/Santa Fe Railroad right of way beyond. The NuStar Terminals fuel tank farm is located approximately 400 feet north of Frito Lay. The Washington Department of Wildlife Shillapoo Wildlife Area is located adjacent to Vancouver Lake, approximately 1 mile west of the site.

Petroleum releases have been documented at the NuStar tank farm to the north. Petroleum constituents, including volatile aromatic compounds are reportedly present in soil and groundwater beneath the facility. Monitoring data suggests that groundwater flows to the south. Regular groundwater monitoring is being performed and remedial actions have been proposed.

Clark Public Utilities is currently constructing a public water supply well about 600 feet north of the NuStar site and intends to extract groundwater from the shallow Pleistocene Alluvial Aquifer within 6-10 years.

1.3 Climate

Clark County has a temperate climate (mild, wet winters and moderately warm, dry summers). Precipitation averages 39 inches annually, mostly as rain. Snowfall is usually light and transient. 75 percent of the precipitation falls between October and March. Rainfall intensity is generally light-to-moderate; however events of two to four inches in 24 hours can occur. Evapotranspiration has been estimated to range between 15 and 20 inches annually.

1.4 Hydraulic Lift Area

The hydraulic lift is used to unload truckload shipments of raw potatoes and convey them to storage. It is located adjacent to, and west of, the processing building. The location is shown in **Figure 2**.

A roughly 13-foot-wide strip provides access between the building and the lift. (see **Photos 1 - 3** in the **Appendix**). The strip is paved, as is the area beneath the lift. Access is shared with a bag house, a conveyor and the hydraulic drive for the lift. Foundations of the tilt-up concrete processing building and hydraulic lift may extend beneath the access strip.

Loaded tractor/trailers reverse onto the lift's platform from the south (See **Photo 2** in the **Appendix**). The van is staged, detached and anchored to the platform while the tractor is parked elsewhere. Two hydraulic cylinders incline the platform and van. The angle of incline is slowly increased allowing the cargo to gently fall to a hopper. From there, a conveyor system routes them to storage. The platform can be inclined up to 45^{o} from horizontal.

To support the tipping moment of the elevated trailer, the hinge end of the platform (north) and the hydraulic cylinders (south) are attached to massive concrete footings embedded in the soil beneath the platform.

Concrete pavement is continuous from the processing building to at least 40 feet west of the lift. The area west of the lift was repaved in 2005 and a bentonite barrier wall was installed along the west edge of the lift at that time. The repaving work resulted in the discovery of the hydraulic lift release and is discussed further in Section 3.3, below.

1.5 Purpose and Objectives

The purpose of this project was to further the results of previous investigations and develop an estimate of the nature and extent of petroleum contamination.

1.6 Regulations

Ecology's Model Toxic Cleanup Act (MTCA) rules govern this release. They are codified in Section 173-340 of the Washington Administrative Code.

SECTION 2. SITE HISTORY

2.1 Prior Site Use

In the late 1800s, the area was developed by orchardists, hence the name Fruit Valley. The Northern Pacific Railway (now BNSF) connected Vancouver to the Puget Sound area in 1870. Conditions remained relatively static until World War II, when industrial operations began to encroach on the area. The Frito Lay facility was constructed in the early 1970s on former agricultural land.

2.2 Previous Releases

Frito Lay records document soil cleanup during decommissioning of underground storage tanks near the southeast corner of the property and a release of Diesel oil from an oil/water separator near the south part of the property.

2.3 Hydraulic Lift Area Release

In approximately 1991, the lift collapsed during the off-loading of a shipment of potatoes. The tractor, trailer and platform fell to the west of the lift area, releasing an estimated 150 gallons of hydraulic fluid and 100 gallons of Diesel fuel from the rams and the vehicle. Contamination appeared to have been retained on pavement and was cleaned up.

On December 28, 2004, gray, discolored, silty sand was discovered by Konell Construction while removing pavement west of the lift. Thermo Fluids found Diesel- and oil-range petroleum hydrocarbons in soil samples collected from this area.

Soil analyses did not detect volatile organic compounds, PCBs, PAHs, or pesticides. Extractable barium was found below its dangerous waste threshold. Metals were not remarkable.

247.9 tons of sandy soil were excavated for off-site disposal. At 3 feet below grade, a clay layer was encountered. Contamination attenuated rapidly below this depth. Excavation to the east was restricted by the structural concrete slab and footings bearing the hydraulic lift. Residual contamination was detected beneath the slab. Gasoline was

detected beneath the NW corner of the lift. The source of the gasoline is unknown. (A possible explanation may be infiltration of fuel from vehicles or equipment through cracks or joints in the previously-replaced pavement.) Clearance samples from all other locations were below MTCA A criteria.

During repaving, Konell Construction installed a 10" wide bentonite slurry wall along the east wall of the excavation, abutting the lift slab. The wall is inset into the clay layer and extends along the length of the lift slab. The purpose of the wall was to restrict migration of hydrocarbons westward from the residual source beneath the lift slab.

A report of these activities was prepared by EHM and has been previously submitted. Thermo Fluids' sample locations can be seen in **Figures 2 and 3**. Analytical results for the residual contamination are presented in the **Appendix**.

SECTION 3. LAND USE

3.1 Current

The site is currently used for food processing. Supporting activities include vehicle and equipment maintenance, fuel and cooking oil storage, waste water treatment, vehicle and equipment parking and warehousing activities.

3.2 Future

The Frito Lay property is expected to remain in industrial use for the foreseeable future.

SECTION 4. SITE CONDITIONS

4.1 Regional Geology

The site is located in the Portland Basin which was formed by Eocene to Miocene volcanic and marine sedimentary rocks. Sediments filling the basin are generally lacustrine and fluvial. Shallow lithology consists of quarternary, mainly marine, stratified sequences. These are generally silty clays or clayey silts overlying well-graded gravels and sands. These strata extend to over 50 feet below ground surface (bgs).

Groundwater migration in the Portland Basin is generally confined to three major subsystems, or aquifers. The most widely used aquifers are the water-bearing rocks of the basin fill sediments including the Tertiary Troutdale Formation, younger Pleistocene to Holocene Alluvium, and catastrophic flood deposits of Pleistocene age.

4.2 Soils

A partial review of on-site and nearby well logs was performed. Most logs represent environmental monitoring wells or investigative borings. Previous studies at Frito Lay showed brown clay extending to 25 feet bgs, The findings from nearby sites document the uniform presence of a brown clay/silt surface layer to depths between 10 and 35 feet, consistent with that seen at Frito Lay. This interval is uniformly underlain by gray, dense, fine sand to around 50 feet. This formation comprises the Pleistocene Alluvial Aquifer (PAA).

Soils at the site are non-hydric. The National Earthquake Hazard Reduction Program (NEHRP) classifies the soil as C-D (moderate to severe risk of damage) and liquefaction potential as moderate to high.

4.3 Groundwater

Several agricultural and/or water supply wells are located within a mile of the site. Depth to groundwater varies from 11 to 32 feet bgs. The estimated elevation of the water table is around 10 feet MSL (See Washington water well report # 116511 in the **Appendix**.) Seasonal fluctuations are probable.

4.4 Chemicals of Potential Concern

Previously published reports indicate that Diesel- and oil-range petroleum products and their constituents are the principal contaminants of concern at the hydraulic lift site. Gasoline was considered a secondary contaminant of concern.

SECTION 5. CONCEPTUAL SITE MODEL

5.1 Contaminant Transport

The transport model assumes that shallow residual petroleum contamination exists beneath pavement and structures in structural sub-base and low permeability, unsaturated soils. Given the age of the release, further contaminant migration is unlikely in the absence of hydraulic head such as perched groundwater or infiltrating precipitation. Lateral transport of hydrocarbon is plausible in the more permeable structural sub-base beneath the pavement. Vertical transport through the fine grained silts will be slow, while contaminant storage capacity will be high.

Using these assumptions, perched groundwater may occur in the lift area by infiltration of surface water through pavement voids. No buried water piping was identified in the lift area. Westerly flow of perched groundwater will be impeded by the bentonite slurry wall while vertical flow will be impeded by low permeability silts and low hydraulic head. Lateral flow in other directions may be influenced by building and equipment foundations and utility corridors.

5.2 Exposure

5.2.1 Human

Human exposure to environmental contaminants occurs through inhalation, ingestion and/or skin contact. Based on the assumptions in Section 6.1, ingestion of or contact with contaminated soil is unlikely at Frito Lay except during environmental investigation or remedial work. A health and safety plan for investigatory work has been prepared.

Occupational inhalation exposure is unlikely due to the lack of volatile organic components in the petroleum mixture and the extent of pavement and the slab-on-grade building foundation.

There are no drinking water wells at Frito Lay. All water is from a municipal source.

5.2.2 Ecological Receptors

Frito Lay is a food processor and has an active vermin control program. This dissuades the presence of avian and terrestrial species. Pavement limits potential contact with contaminants to burrowing animals, while the extent of pavement reduces the likelihood of their presence in the lift area. Existing conditions are considered protective of ecological receptors.

SECTION 6. SAMPLING AND ANALYSIS

6.1 Background Data

Initial characterization samples collected by Thermo Fluids were located SW of the lift. A total of 27 soil samples were collected during the cleanup, 20 of which were located to the SW of the lift. This implies that most contamination was observed in this area. This is also consistent with the report that the failed structure fell westerly.

The lateral extent of contamination remains undefined to the north, east and south. The vertical extent of contamination was estimated at 3 feet bgs west of the lift but was not defined elsewhere. The residual hydraulic oil contamination is located in soil beneath the lift near the rams. This location is inaccessible without demolishing or jeopardizing the lift. Access for soil sampling is restricted by structures.

6.2 Sample Locations

Eight sample locations are shown in **Figure 3** (blue targets). Utility location identified underground power, preventing anticipated sample collection in the SE part of the Site. Pavement was cored prior to sampling and temporarily grouted to prevent infiltration. During sample, the Geoprobe sampler met refusal at FL-03 approximately 1 foot bgs preventing sample collection.

6.3 Soil

Soil samples were collected at 5 feet bgs at all locations. Additional samples were collected from other depths based on field observations (such as discoloration, odor, sheen or headspace volatile organic analysis).

6.3.1 Sample Collection

Samples were collected using a direct push technique. A Geoprobe 540 MTF rig was used to advance sleeved cores to depths up to 30 feet. Cores were logged using USCS terminology. Coring tools and other reused sampling equipment were decontaminated between each location using laboratory detergent solutions and distilled water rinses.

Stainless steel tubes and plungers were used to collect soil samples for NWTPH-Gx and VPH analyses. A clean tube was forced into the soil core and a sample of soil extruded directly into duplicate 40 ml VOC vials with Teflon-coated septum-lined lids.

Samples for NWTPH-Dx, EPH and/or PAH analyses were collected from the sleeves using suitable tools and transferred directly to clean, 4-ounce, clear, wide-mouth, glass jars with Teflon seals. Containers were filled to minimize head space.

Containers were uniquely labeled. ID numbers and descriptions are show in **Table 1**. Samples were preserved by cooling to 4^{o}C and transported to the analytical laboratory in refrigerated coolers under routine chain of custody documentation.

Additionally, samples from each depth and location were placed in sealable plastic bags for field screening analyses.

To help minimize cross-contamination, sampling personnel cleaned the sample processing area before sampling a new location and donned new gloves before collecting each sample.

6.3.2 Analysis

6.3.2.1 Screening Analyses

Bag samples were labeled and warmed briefly prior to screening analysis. The tip of a photoionization detector (PID) was inserted into a slit in each sample bag and the maximum reading recorded. The detector was calibrated against isobutylene and zero air on the day of use. Background readings were recorded prior to analyzing each sample and the result subtracted from the test reading.

Odor and visual appearance of the samples were recorded following PID measurements. An aliquot of soil was placed in a shallow pan, flooded with water and the surface observed for floating oil globules or sheen suggestive of petroleum contamination. Screening results are shown in **Table 2a**.

6.3.2.2 Chemical Analyses

Samples were analyzed at Specialty Analytical, Inc. in Clackamas, Oregon. Petroleum hydrocarbon fractions were quantified using Method NWTPH-Gx and NWTPH-Dx. Dx analyses were subjected to silica gel treatment due to the presence of woody debris present in near-surface soils. Percent moisture was determined using Standard Method SM 2540.

Samples at the north end of the lift (sample locations FL-01 through FL-04) were located to evaluate the gasoline and Diesel detections previously reported nearby. Analyses at these locations included NWTPH-Gx. Samples at the south end (sample locations FL-05 through FL-08) were located to evaluate previously reported Diesel and oil detections nearby. These samples were not analyzed by NWTPH-Gx.

Sample number FL-07-2 showed the highest petroleum concentration and was further analyzed using Ecology's Method for the Determination of Extractable Petroleum Hydrocarbons Fractions (EPH), Ecology's Method for the Determination of Volatile Petroleum Hydrocarbons Fractions (VPH), Risk-based Decision-making Volatile Organic Compounds (EPA Method 8260b) and Polycyclic Aromatic Hydrocarbons (PAHs) (EPA Method 8270-SIMM). These data were used for human health risk evaluations.

6.4 Groundwater

6.4.1 Sample Collection

Following soil sample collection, a hydroprobe with Teflon tubing was installed at FL-07. A peristaltic pump was used to collect a water sample. Prior to sample collection, pH, temperature (T) and specific conductance (SC) were monitored at the pump outlet. Water samples were collected after these parameters had stabilized. Stable readings were:

pH - 6.7 T - 59.0^{o}F SC - 225 µS/cm

Six HCl-preserved, 40-ml VOA vials were filled to zero headspace directly from the pump outlet. One HCl-preserved and two unpreserved, 1-liter, amber, glass bottles were similarly filled. Samples were refrigerated immediately and transported under routine chain of custody. Cross-contamination prevention was as described above.

6.4.2 Analysis

Water samples were analyzed for RBDM volatiles, PAH, EPH and VPH using the methods described, above.

6.5 Quality Assurance

No soil duplicates or blanks were collected (due to the innate heterogeneity of soil). One water trip blank, consisting of distilled, de-ionized water, was submitted for analysis. All samples were extracted and analyzed within method holding limits.

Analytical quality control was consistent with standard method requirements.

6.6 Abandonment

Bore holes were abandoned by filling them with bentonite chips to the soil surface. Concrete corings were restored to grade with quick-setting concrete. Sample locations were measured to an accuracy of +/- 0.5 feet and referenced to the SW corner of the lift.

Debris and soil cuttings were disposed of at the Hillsboro Landfill. Decontamination liquids were disposed of by the drilling contractor.

SECTION 7. RESULTS

7.1 Sample Locations

The sampling plan proposed 11 sample locations. The presence of underground utilities prevented the installation of 3 borings located adjacent to the manufacturing building. Of the 8 remaining locations, one (FL-03) was not sampled due to refusal of the sampling tool at 1 foot below grade. All soil sample locations are shown in **Figure 3**.

7.2 Stratigraphy

Boring logs are presented in the Appendix. Soil underlying the site is alluvial, grading from silty clay near the surface to sandy silt to 15 feet. Medium-to-coarse, dense, gray sand is encountered at 15 feet, extending to the limit of this investigation (32 feet).

Crushed rock sub-base underlies 4-6 inch concrete pavement at all locations. Soil immediately below this structural fill consists of silty clay with traces of woody debris. Gray discoloration appears beneath the sub-base at FL-04 through FL-07, decreasing with depth and becoming absent below 1.5 feet.

At FL-08, gray silt is present to 8 feet. FL-08 is located on the lift's entrance ramp where the ground surface is 3.0 feet higher than the remaining locations.

Groundwater was encountered at 28.6 feet bgs. A graphic showing sample locations and stratigraphic data is presented in **Figure 4**.

7.3 Field Screening

Soil screening results are shown in **Table 2a**. Field evidence of hydrocarbon contamination (hydrocarbon odor, visible sheen) was noted at sample locations FL-05-1 and FL-07-2. Gray silt observed at FL-08 did not show such evidence of contamination.

7.4 Chemical Analysis

Sample descriptions including locations, depths, soil characteristics, field observations and similar data are presented in **Table 1**.

7.4.1 Soil

Soil results are shown in **Table 2a**. Additional analytical results for soil sample FL-07-2 are presented in **Table 2b**.

Gasoline was not detected in any sample.

Diesel range organics were detected in several samples but were also detected in the laboratory method blank at 20.2 mg/kg. Diesel results are shown in **Table 2a** and have been adjusted for this background. Samples reported as non-detections were not adjusted. The raw analytical results may be found in the **Laboratory Report** (Section 14).

Adjusted Diesel concentrations ranged from 6.2 mg/kg (FL-01) to 266 mg/kg (FL-07-2).

Oil-range organics were detected in samples FL-05-1 (80.4 mg/kg) and FL-07-2 (957 mg/kg).

Sample FL-07-2, having the highest total petroleum hydrocarbon (TPH) concentration, was further analyzed for EPH, VPH, PAH and RBDM volatile organic compounds. Organics lighter than C-10 were not detected. Naphthalene (a PAH) was the only volatile organic compound detected (0.0261 mg/kg). Five other non-carcinogenic PAHs were also detected.

Data from FL-07-2 were entered into Ecology's MTCATPH11.1 Excel workbook which evaluates human health risk according to MTCA methodologies.. For chemicals or petroleum fractions that were not detected but were considered to be potentially present, 50% of the reporting limit was entered. For chemicals or petroleum fractions that were not detected and were not considered to be potentially present based on other results, a concentration of zero was used. Since gasoline and related volatile organics were not detected, seven volatile components were set to zero concentration. The raw data and results of the MTCATPH11.1 calculations are shown worksheet A2.1B, in the **Appendix**.

The TPH concentration, as determined above, is 2,188 mg/kg. The calculated TPH concentration expected to be protective to human health (MTCA Method B - unrestricted

site use) is 15,532 mg/Kg. The calculated TPH concentration expected to be protective of groundwater was also calculated and exceeds the solubility of the petroleum mixture. Data and calculations are shown in worksheet A2.2 in the **Appendix**.

7.4.2 Groundwater

Groundwater results are shown in **Table 3**.

C31-C34 aliphatic hydrocarbons were the only constituents detected in groundwater collected at FL-07 (1,400 µg/L). This fraction was also detected in the control blank prepared in the field using distilled, deionized water. The concentration in the blank was 600 µg/L. The groundwater data was not corrected for this error.

The groundwater data were also entered into MTCATPH11.1. Non-detections and unsuspected components were managed as described in Section 8.4.1, above. The data and results of the MTCATPH11.1 calculations are shown worksheet B in the **Appendix**.

The TPH concentration so measured is 1,715 µg/L. The calculated TPH concentration expected to be protective to human health (MTCA Method B) is 2,944 µg/L.

7.5 Transport Potential

Transport mechanisms were not evaluated by experiment. Vertical migration of petroleum is retarded by overlying pavement and structures, low permeability near-surface soil and low solubility of the petroleum constituents. Insufficient soil data is available to accurately model contaminant vertical migration. Vertical migration potential is roughly estimated by dilution.

Prior cleanup work by others reported residual petroleum immediately beneath the lift at TPH concentrations up to 21,000 mg/kg (combined oil and Diesel). The average TPH concentration (7 samples) was 12,816 mg/kg. From sample location data, a 10 foot diameter by 3' thick volume of uniformly contaminated soil (236 ft^3) is assumed to exist below the lift. A lateral dispersion angle of 25^o from vertical is also assumed.

Vertical migration is assumed to proceed until equilibrium is reached at 2,000 mg/Kg (Ecology's default soil saturation concentration for Diesel). A cone-shaped vertical vadose plume is formed. To dilute the contaminated soil to 2,000 mg/kg, a total soil volume of [(12,816/2,000) x 236] or 1,512 ft^3 is required.

Solving for the height of the frustum of a cone with this shape and volume, saturation is achieved at 9.2 feet below the soil surface or about 10 feet bgs.

SECTION 8. DISCUSSION

This investigation was designed to assess the nature and extent of petroleum contamination to the north, east and south of the hydraulic lift. Previous remedial work west of the lift resulted in removal of petroleum contaminated soil to MTCA Method A criteria west of the lift. The previous work identified petroleum contamination in soil beneath the lift which could not be removed without damage to, or removal of, the lift. NWTPH-Dx total concentrations ranged between 3,890 and 20,910 mg/kg. A slurry wall barrier was installed to prevent westward migration of that residual contamination.

8.1 Deviations from Plan

The workplan intended to statistically define the limits of contamination using past and current data and nearest-neighbor data analysis. The data quality for this purpose was impaired when several sample points could not be accessed due to interfering underground utilities. Preliminary plots of contaminant concentration contours were attempted but were not representative of observed conditions and were abandoned.

Inspection of soil during sampling showed the presence of woody debris in the horizons where field evidence of petroleum contamination was present. Silica gel cleanup to remove polar interferences was performed on all NWTPH-Dx analyses.

8.2 Data Quality

Quality control sample results identified impacts on analytical results.

NWTPH-Dx soil analysis showed detectable Diesel-range petroleum in laboratory blanks. The amount detected in the method blank was subtracted from the detected concentrations presented in the laboratory report. The practical quantitation limit for all samples was 18.5 mg/kg. EHM treated adjusted Diesel concentrations less than 18.5 mg/kg as non-detections.

EPH water analysis showed 600 µg/L of >nC21-nC34 aliphatic compounds in the field prepared water blank. This fraction was not detected in the method blank and the reported concentrations are not adjusted. Sample collection methods could not be identified as a potential source. Vehicles and the drilling rig were operating nearby and may represent atmospheric sources of the detected fraction.

8.3 Gasoline

The prior remedial work reported a single gasoline detection 1.5 feet beneath the NW corner of the lift. Possible sources for the gasoline were not identified. The detection was reported when this location was re-sampled for residual risk characterization

purposes. The analysis was performed using the Texas Natural Resources Conservation Commission's (TNRCC) Method 1005.

Chemical analysis in the current investigation did not detect gasoline in the north part of the hydraulic lift area and EHM concludes that the gasoline contamination reported by others is either limited in extent or anomalous.

8.4 Soil

Soil analytical results showed Diesel- and oil-range petroleum east of the hydraulic lift in the southern part of the accessible area between the lift and the plant, specifically between FL-05 and FL-07. Petroleum is further limited to near-surface soil, being most concentrated at the contact of the gravel pavement sub-base and underlying silty clay soil. No petroleum was detected at depths greater than 2 feet bgs.

Chromatographically, the petroleum is appears to be principally weathered hydraulic fluid (see chromatograms of sample FL-07-2 and a hydraulic oil standard in the **Appendix**). Elevation of the FL-02-7 curve between 6 and 8 minutes suggests that low levels of Diesel may also be present. This pattern is consistent with the reported releases from the collapse of the lift.

EPH and VPH analyses show a moderately high-boiling aliphatic petroleum mixture lacking volatile organics and carcinogenic PAHs. Such mixtures have a relatively low level of toxicity.

Ecology's MTCATPH11.1 workbook was used to estimate MTCA Method B protective concentrations based on the toxicity of the mixture. The calculated Method B soil concentration protective of human health is 7 times greater than the highest TPH concentration observed in soil in this study. The workbook-calculated soil concentration necessary to protect groundwater is greater than the solubility of the mixture in water.

Data generated by Thermo Fluids showed two sample locations above the MTCA Method B criteria for unrestricted site use (15,532 mg/\kg). Samples 15 and 17 (17,560 and 20,910 mg/kg, respectively) are located beneath the south part of the lift near sample FL-07.

8.5 Groundwater

Groundwater analytical results showed a single petroleum fraction (>nC21-nC34 aliphatics, 1,400 µg/L) that was also present in the field blank. This error is believed to be due to atmospheric contamination from nearby exhausts. For risk calculation purposes, EHM assumed that the reported results were representative of groundwater. Ecology's MTCATPH11.1 workbook calculated the total TPH concentration at 1,715 µ/L. The calculated Method B water concentration protective of human health is 1.7 times greater than the unadjusted TPH concentration observed in the groundwater sample.

8.6 Transport

Based on the date of the release (1991) and the contaminant attenuation with depth observed in this study, vertical migration is slow. Lateral migration is most likely to occur in gravel sub-base overlying clayey silts. This is consistent with observations.

The worst-case location for vertical contaminant migration is inaccessible. Vertical migration potential was estimated and indicated equilibrium conditions near 10 feet bgs. This provides roughly 19 feet of separation between the contaminant plume and the water table observed during this investigation.

8.7 Ecological Risk

Generally, terrestrial animals are discouraged at food preparation facilities where fecal, dander and vector contamination can adulterate product. Surface paving and structures cover the project area and constitute a barrier to exposure for terrestrial plants and animals. An exclusion from performing a terrestrial ecological evaluation will be requested separately on this basis (See WAC 173-340-7491 (1)(b)).

SECTION 9. REMEDIAL ALTERNATIVES

The remedial alternatives described in this section are presented as a comparison of those considered by EHM to be effective at Frito Lay. This section is not intended to represent a formal feasibility study.

9.1 Current Condition

A residual mass of petroleum-contaminated soil with concentrations above risk-based cleanup criteria remains in place beneath the south part of the hydraulic lift. Two potential remedial alternatives have been identified to address this contamination. The first alternative, physical removal, is presented under two scenarios - delayed and immediate removal. The second alternative consists of in-situ treatment using chemical oxidation.

9.2 Physical Removal

Contaminated soil may be removed by conventional excavation following removal of the hydraulic lift and its appurtenances. Less invasive excavation techniques permitting continued operation of the lift have not been identified. If available, such methods may present geotechnical constraints necessary to ensure the stability of the lift and prevent potential catastrophic collapse. This discussion assumes removal of the lift and does not address geotechnical limitations.

9.2.1 Immediate Action

Immediate removal of the soil mass is feasible following lift removal. This alternative will affect scheduling and unloading of potato deliveries, which occur year around, and may also require temporary interruption of adjacent underground electrical services.

Prior to demolition, a temporary potato unloading system will be designed and constructed with sufficient capacity to maintain plant production. The existing lift will then be dismantled and staged on-site for later reassembly. Existing concrete pavement and ram footings will be removed and disposed of as demolition debris. Petroleum contaminated soil will be removed by conventional methods and transported for off-site landfill disposal under permit. Chemical screening and sample analysis will be performed during soil removal to monitor and document progress.

Following receipt of analytical results showing achievement of target concentrations, the excavation will be backfilled, compacted and sub-base placed for site reconstruction. The ram footings and pavement will be re-poured and allowed to cure to achieve specified 28-day strength prior to being subject to load. The lift will then be reconstructed, tested and certified. Finally, the temporary unloading system will be dismantled.

The following estimated cost for this alternative was prepared by Frito Lay based on lift design and related capital costs. Costs are expressed in 2010 dollars.

Removal of lift, concrete pavement and hydraulic ram foundations	$65,000
Soil removal, profiling, disposal and regulatory	$50,000
Sampling, analysis and reporting	$10,000
Backfill, compaction and sub-base	$40,000
Concrete surfacing and hydraulic ram foundation replacement	$60,000
Reinstallation of lift	$25,000
Temporary potato unloading (for 6 weeks)	$150,000
Subtotal	$400,000
Taxes (7.5%)	$30,000
TOTAL	**$430,000**

9.2.2 Delayed Action

This alternative assumes that soil removal will be delayed until either the plant is decommissioned or the existing lift system is relocated or reconstructed. The estimated time until removal is 25 years. Delaying soil removal requires maintenance of existing pavement which currently prevents infiltration of rainwater which could mobilize contaminants and jeopardize groundwater quality. Inspection is assumed to be performed quarterly by plant personnel. Patching and repair of damaged pavement is assumed at an average annual cost of $500. A deed restriction noting the presence of the contamination will be filed by WDOE. No cost is assumed for this requirement. Removal of the lift,

concrete removal, backfill and resurfacing are assumed to be part of the plant decommissioning process and are not included in this estimate.

Costs are expressed in 2035 dollars assuming year over year inflation at 1.5%. On-going activities (inspection, maintenance and regulatory) are inflated to the average cost over their 25 year assumed duration. Regulatory activities include estimates of on-going Ecology oversight and cost recovery. The impact of potential future events (increased regulatory requirements, fee structures, etc.) are considered unquantifiable and are not addressed here.

The following project costs (in 2035 dollars) are associated with this alternative:

Inspection and maintenance	$12,500
Soil removal, profiling, disposal	$29,000
Regulatory	$20,800
Sampling, analysis and reporting	$10,300
Subtotal	$72,600
Taxes (7.5%)	$5,400
TOTAL	**$78,000**

For direct comparison with other remedial alternative costs, the uninflated costs (2010 dollars) are shown below.

Inspection and maintenance	$12,000
Soil removal, profiling, disposal	$20,000
Regulatory	$18,000
Sampling, analysis and reporting	$7,100
Subtotal	$57,100
Taxes (7.5%)	$4,300
TOTAL	**$61,400**

9.3 In-Situ Treatment

Petroleum contaminated soil may be treated in place using either enhanced biological or chemical oxidation methods. Regenesis, a provider of materials for in situ oxidation, provided EHM with information regarding the selection and delivery of reagents.

Enhanced biological oxidation is most effective with low carbon number petroleum hydrocarbons such as fuels, which biodegrade rapidly when compared to heavier fractions. For this reason, chemical oxidation is preferred for hydraulic fluids with enhanced biological techniques used as a final treatment to provide residual degradation.

Chemical oxidation is less specific than biologic processes and can oxidize metals to higher valence cations, such as Cr^{+6}. Previous investigations at Frito Lay reported total chromium up to 20 mg/kg in soil. This is consistent with normally occurring background concentrations in Washington. Assuming all chromium was oxidized to the carcinogen

Cr^{+6}, the concentration remains below the EPA Region VI industrial and residential soil Media Specific Screening Levels of 200 and 39 mg/kg, respectively. Incidental oxidation of metals in the upper vadose zone at Frito Lay is considered insignificant.

Delivery of either biological or chemical reagents may be accomplished by direct push techniques or direct placement in excavations. The objective is to saturate the contaminated zone with a solution or suspension of reagent. Multiple injections of reagent are needed over a period of several months to address desorption and rebound. The spacing and depth of the injections are dependent largely on soil structure and the volume of the contaminated zone.

While direct push is the preferred method of delivery, the hydraulic lift and underlying concrete pavement restrict the access of conventional vertical push probe rigs to the contaminated zone at Frito Lay. This may require an alternative delivery technique such as horizontal boring. Direct push delivery is assumed.

A vertical push delivery system will be configured to inject RegenOx chemical oxidizer product into the contaminated soil area. This will require personnel and equipment access to the area immediately beneath the hydraulic lift. In addition to conventional de-energizing procedures, a positive lockout device will be designed and fabricated to safely retain the lift in an elevated position permitting safe access beneath the lift ramp
.
Buried utilities will be located and pavement will be cored, as needed, to access the contaminated soil zone. Temporary water-tight plugs will be installed between treatment events to prevent stormwater inflows. A total of approximately 2,500 lbs of RegenOx will be injected into the contaminated zone under pressure via drive rods. Soil conditions may require the use of an injection tool. Six injection events are estimated, occurring once every 2 weeks
.
Reagent dispersion will be estimated during the first round of injection and injection spacing modified as needed. Soil samples will be collected for chemical analysis prior to injection, prior to the fourth event and 2 weeks following the last event to monitor the progress of oxidation. Based on analytical results, a final (7^{th}) injection of an oxygen releasing compound (ORC) may be indicated. For planning purposes this is assumed.
The following project costs are associated with this alternative:

Design, construction of lockout system	$20,000
Installation/removal of lockout (7x)	$21,000
Concrete coring, plug fabrication, repaving	$5,000
Delivery system design, construction	$10,000
Treatment chemicals (FOB Vancouver)	$20,000
Chemical placement (7x)	$21,000
Sampling, analysis, reporting, regulatory	$20,000
Total	$117,000
Taxes (7.5%)	$8,800
TOTAL	**$125,800**

SECTION 10. CONCLUSIONS & RECOMMENDATIONS

The current study defined the horizontal and vertical limits of petroleum contamination in accessible areas and refined the nature of the hydrocarbon contamination. Previous studies identified soil contamination above MTCA Method B criteria under the south part of the hydraulic lift. Current results confirm that concentrations above MTCA Method B are limited to that area.

The maximum vertical extent of contamination could not be determined due to limited access but was estimated at 10 feet bgs.

It is unclear that groundwater is affected. The detected hydrocarbon concentration is below MTCA Method B criteria but appears to be due to sample contamination from atmospheric sources, as evidenced by similar concentrations and constituents in the field blank.

Migration potential is limited due to minimal infiltration and low permeability soil. This is consistent with observations. There remains potential for future vertical migration of contaminants in the absence of infiltration hydraulics, however dilution calculations suggest equilibrium around 10 feet below the surface, providing protection of groundwater encountered near 29 feet.

To maintain these conditions, migration of contaminants to more sensitive locations (including groundwater, surface water and surface soil) must be controlled. This may be achieved through inspection and maintenance of existing pavement and structures.

Alternatives to cap maintenance include in-situ treatment and physical excavation. Preliminary cost estimates for these alternatives are higher than cap maintenance with future contaminated soil removal.

EHM recommends that an inspection and maintenance program be developed to minimize stormwater infiltration at the hydraulic lift area. If the lift is relocated or demolished, residual contamination above MTCA Method B should be addressed at that time. Procedures to control any work which may disturb contaminated soil in the lift area or present a potential occupational exposure to workers should be developed. These procedures should include utility corridors.

SECTION 11. TABLES

TABLE 1:
Frito-Lay Vancouver
Sample Information

Sample Number	Collection Date	Sample Type	Description
FL-01	5/26/2009	Geoprobe Soil	5 feet bgs. NW of hyd lift. Dk brn fine SILT (ML). Sl plast. sl damp. No odor, no staining, no sheen. PID 0.1.
FL-02	5/26/2009	Geoprobe Soil	5 feet bgs. NE of hyd lift. Dk brn fine SILT (ML). Sl plast. sl damp. No odor, no staining, no sheen. PID 0.1.
FL-03	5/26/2009	Geoprobe Soil	Not Sampled. Refusal at 1 foot bgs. NE corner of lift near bldg.
FL-04	5/26/2009	Geoprobe Soil	2 feet bgs. E of north part of lift. Brn sandy SILT (ML) below gray sandy gravel FILL. Damp. Sl HC odor, no sheen. PID 0.1.
FL-04-5	5/26/2009	Geoprobe Soil	5 feet bgs. E of north part of lift. Brn SILT (ML) trace gray mottle. No odor, no staining, no sheen. PID 0.1.
FL-05	5/26/2009	Geoprobe Soil	5 feet bgs. E of lift N of rams. Brn sandy silt (ML). No odor, no staining, no sheen. PID 0.1.
FL-05-1	5/26/2009	Geoprobe Soil	1 foot bgs. E of lift N of rams. Blk silty gravel FILL (GM) trace wood. damp. Heavy HC odor, staining, cl globular sheen. PID 0.2.
FL-06	5/26/2009	Geoprobe Soil	5 feet bgs. E of lift adjacent to rams. Brn sandy SILT (ML). sl damp. No odor, no staining, no sheen. PID 0.4.
FL-07	5/26/2009	Geoprobe Soil	5 feet bgs. E of lift S of rams. Brn sandy SILT (ML). Sl damp. No odor, no staining, no sheen. PID 0.1.
FL-07-2	5/26/2009	Geoprobe Soil	2 feet bgs. E of lift S of rams. Blk sandy gravel FILL (GM) trace wood. damp. Heavy HC odor, staining, cl globular sheen. PID 0.7.
FL-07-12	5/26/2009	Geoprobe Soil	12 feet bgs. E of lift S of rams. Brn sandy SILT (ML). Sl damp. No odor, no staining, no sheen. PID 0.1.
FL-07-WT30	5/26/2009	Geoprobe Soil	30 feet bgs. E of lift S of rams. Gray med SAND (SW). Sat'd. No odor, no staining, no sheen. PID 0.1.
FL-07-W	5/26/2009	Water	SWL approx 28.6 ft bgs. Clear, colorless, odorless, no sheen. pH-6.7, T-59.0 F, SC-225 µS/cm - stable after 2L purge.
FL-08	5/26/2009	Geoprobe Soil	8 feet bgs (gs is 3.0 feet above gs at FL-07). W of lift on ramp. Brn sandy SILT (ML) Damp. No odor, staining or sheen. PID 0.2.
FL-08-2	5/26/2009	Geoprobe Soil	2 feet bgs (see above). W of lift on ramp. Gray silt FILL trace wood. damp. No odor, staining or sheen. PID 0.4.
FL-00-W	5/26/2009	Trip Blank (Water)	DDI water trip blank

TABLE 2a:
Frito-Lay Vancouver
Soil Analytical Results
(mg/Kg)

Sample ID:	FL-01	FL-02	FL-04	FL-04-5	FL-05-1	FL-05	FL-06	FL-07-2	FL-07	FL-08-2	FL-08
Sample Date:	5/26/2009	5/26/2009	5/26/2009	5/26/2009	5/26/2009	5/26/2009	5/26/2009	5/26/2009	5/26/2009	5/26/2009	5/26/2009
Sample Depth (Feet below ground surface):	5.0	5.0	2.0	5.0	1.0	5.0	5.0	2.0	5.0	2.0 c	8.0 c
NWTPH Petroleum Hydrocarbons (mg/Kg)											
Gasoline	3.09 U	3.10 U	3.04 U	3.03 U	-	-	-	-	-	-	-
Diesel[b]	6.1	11.7	12.0	6.6	**22.6**	9.3	11.0	**266**	10.3	18.9 U	18.8 U
Lube Oil	61.7 U	62.0 U	60.8 U	60.6 U	**80.4**	61.7 U	63.1 U	**957**	60.9 U	63.1 U	62.5 U
Extractable Petroleum Hydrocarbons (EPH)											
>nC8-nC10 Aliphatic	-	-	-	-	-	-	-	6.20 U	-	-	-
>nC10-nC12 Aliphatic	-	-	-	-	-	-	-	6.20 U	-	-	-
>nC10-nC12 Aromatic	-	-	-	-	-	-	-	6.20 U	-	-	-
>nC12-nC16 Aliphatic	-	-	-	-	-	-	-	**59.8**	-	-	-
>nC12-nC16 Aromatic	-	-	-	-	-	-	-	6.20 U	-	-	-
>nC16-nC21 Aliphatic	-	-	-	-	-	-	-	**170**	-	-	-
>nC16-nC21 Aromatic	-	-	-	-	-	-	-	**46.3**	-	-	-
>nC21-nC34 Aliphatic	-	-	-	-	-	-	-	**1,780**	-	-	-
>nC21-nC34 Aromatic	-	-	-	-	-	-	-	**120**	-	-	-
Volatile Petroleum Hydrocarbons (VPH)											
Benzene	-	-	-	-	-	-	-	0.062 U	-	-	-
Toluene	-	-	-	-	-	-	-	0.062 U	-	-	-
Ethylbenzene	-	-	-	-	-	-	-	0.062 U	-	-	-
Xylenes, Total	-	-	-	-	-	-	-	0.062 U	-	-	-
n-Hexane	-	-	-	-	-	-	-	0.31 U	-	-	-
C5-C6 Aliphatic	-	-	-	-	-	-	-	1.5 U	-	-	-
>C6-C8 Aliphatic	-	-	-	-	-	-	-	1.5 U	-	-	-
>C8-C10 Aliphatic	-	-	-	-	-	-	-	1.5 U	-	-	-
>C8-C10 Aromatic	-	-	-	-	-	-	-	1.5 U	-	-	-
>C10-C12 Aliphatic	-	-	-	-	-	-	-	1.5 U	-	-	-
>C10-C12 Aromatic	-	-	-	-	-	-	-	**5.2**	-	-	-
>C12-C13 Aromatic	-	-	-	-	-	-	-	**6.7**	-	-	-
Sheen Test	Neg	Neg	Neg	Neg	Pos	Neg	Neg	Pos	Neg	Neg	Neg
Color/Odor	None/None	None/None	None/None	None/None	Gray/HC	None/None	None/None	Gray/HC	None/None	Gray/None	None/None
Headspace by PID (ppmv)[a]	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.7	0.1	0.4	0.2

[a] Headspace vapor concentration - parts per million by volume as isobutylene

[b] Diesel concentrations are adjusted for 20.2 mg/Kg Diesel detected in the laboratory method blank

TABLE 2b:
Frito-Lay Vancouver
Soil Analytical Results
(mg/Kg)

Sample ID:	FL-07-2	
Sample Date:	5/26/2009	
Polycyclic Aromatics		
1-Methylnaphthalene	**0.0504**	
2-Methylnaphthalene	**0.0620**	
Acenaphthene	0.00827	U
Acenaphthylene	0.00827	U
Anthracene	0.00827	U
Benzo(a)anthracene	0.00827	U
Benzo(a)pyrene	0.00827	U
Benzo(b)fluoranthene	0.00827	U
Benzo(g,h,i)perylene	0.00827	U
Benzo(k)fluoranthene	0.00827	U
Chrysene	0.00827	U
Dibenzo(a,h)anthracene	0.00827	U
Fluoranthene	0.00827	U
Fluorene	**0.0107**	
Indeno(1,2,3-cd)pyrene	0.00827	U
Naphthalene	**0.0173**	
Phenanthrene	**0.0553**	
Pyrene	**0.0116**	
Volatile Organics		
1,2,4-Trimethylbenzene	0.0124	U
1,2-Dibromoethane	0.0124	U
1,2-Dichloroethane	0.0124	U
1,3,5-Trimethylbenzene	0.0124	U
Benzene	0.0124	U
Ethylebenzene	0.0124	U
Isopropylbenzene	0.0124	U
m,p-Xylenes	0.0248	U
Methyl tert-butyl ether	0.0124	U
n-Propylbenzene	0.0124	U
Naphthalene	**0.0261**	
o-Xylene	0.0124	U
Toluene	0.0124	U

U = Not found at the limit of detection shown

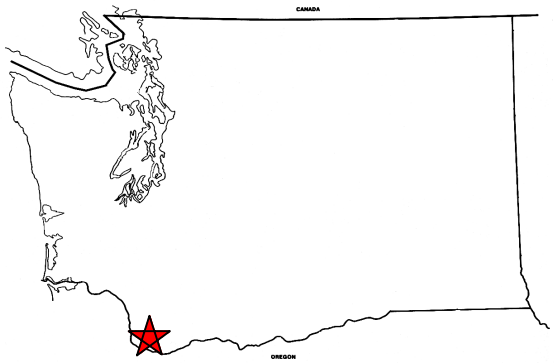
PAHs shown in RED are carcinogenic

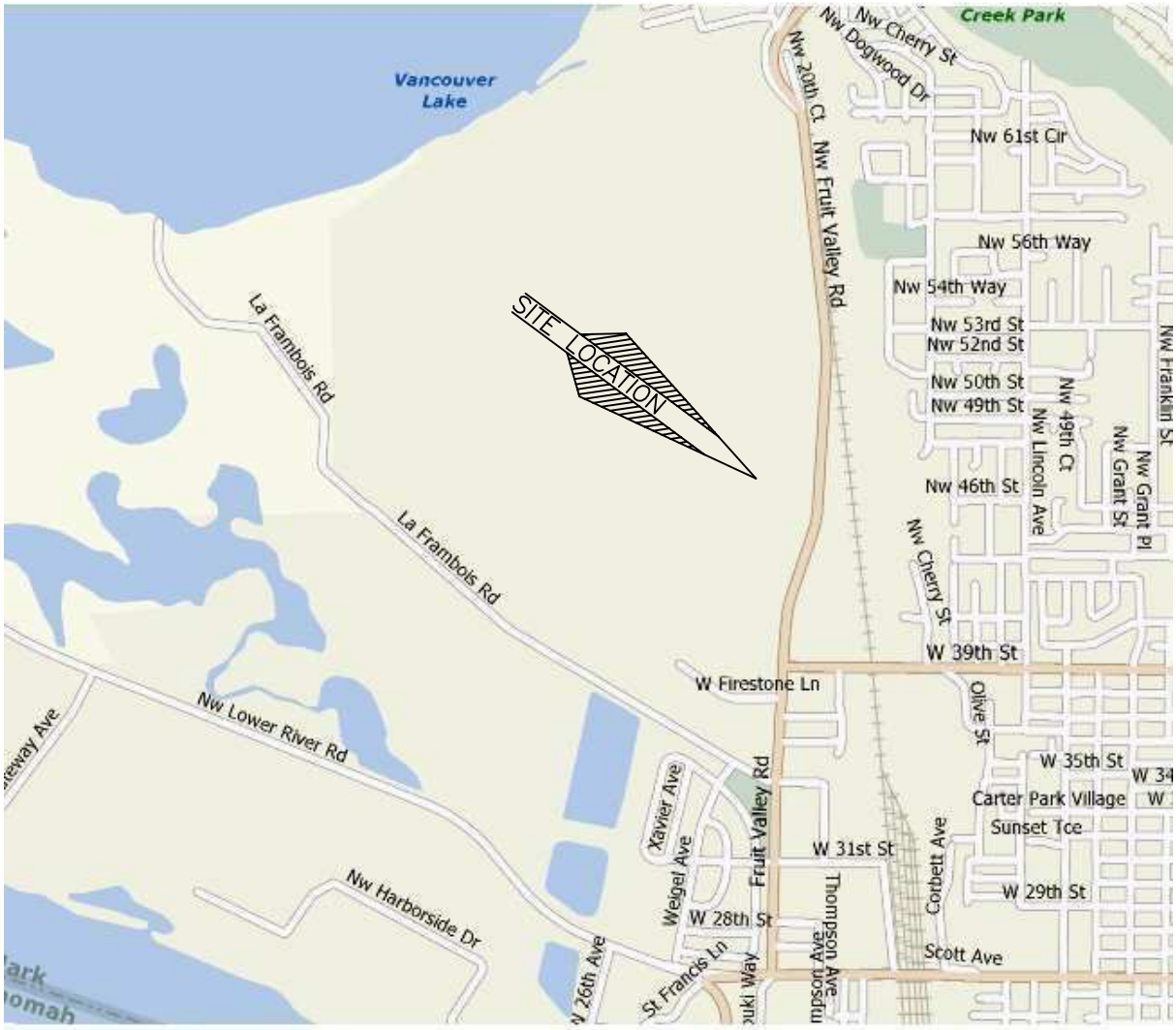
TABLE 3:
Frito-Lay Vancouver
Groundwater Analytical Results
(µg/L)

Sample ID:	FL-07-W		FL-00-W	
Sample Date:	5/26/2009		5/26/2009	
Extractable Petroleum Hydrocarbons (EPH)				
>nC8-nC10 Aliphatic	95	U	95	U
>nC10-nC12 Aliphatic	95	U	95	U
>nC10-nC12 Aromatic	95	U	95	U
>nC12-nC16 Aliphatic	95	U	95	U
>nC12-nC16 Aromatic	95	U	95	U
>nC16-nC21 Aliphatic	95	U	95	U
>nC16-nC21 Aromatic	95	U	95	U
>nC21-nC34 Aliphatic	**1,400**		**600**	
>nC21-nC34 Aromatic	95	U	95	U
Volatile Petroleum Hydrocarbons (VPH)				
Benzene	1.0	U	1.0	U
Toluene	1.0	U	1.0	U
Ethylbenzene	1.0	U	1.0	U
Xylenes, Total	1.0	U	1.0	U
n-Hexane	5.0	U	5.0	U
C5-C6 Aliphatic	25	U	25	U
>C6-C8 Aliphatic	25	U	25	U
>C8-C10 Aliphatic	25	U	25	U
>C8-C10 Aromatic	25	U	25	U
>C10-C12 Aliphatic	25	U	25	U
>C10-C12 Aromatic	25	U	25	U
>C12-C13 Aromatic	25	U	25	U
Polycyclic Aromatics (µg/Kg)				
1-Methylnaphthalene	0.0473	U	0.0473	U
2-Methylnaphthalene	0.0473	U	0.0473	U
Acenaphthene	0.0473	U	0.0473	U
Acenaphthylene	0.0473	U	0.0473	U
Anthracene	0.0473	U	0.0473	U
Benzo(a)anthracene	0.0473	U	0.0473	U
Benzo(a)pyrene	0.0473	U	0.0473	U
Benzo(b)fluoranthene	0.0473	U	0.0473	U
Benzo(g,h,i)perylene	0.0473	U	0.0473	U
Benzo(k)fluoranthene	0.0473	U	0.0473	U
Chrysene	0.0473	U	0.0473	U
Dibenzo(a,h)anthracene	0.0473	U	0.0473	U
Fluoranthene	0.0473	U	0.0473	U
Fluorene	0.0473	U	0.0473	U
Indeno(1,2,3-cd)pyrene	0.0473	U	0.0473	U
Naphthalene	0.0473	U	0.0473	U
Phenanthrene	0.0473	U	0.0473	U
Pyrene	0.0473	U	0.0473	U

U = Not found at the limit of detection shown

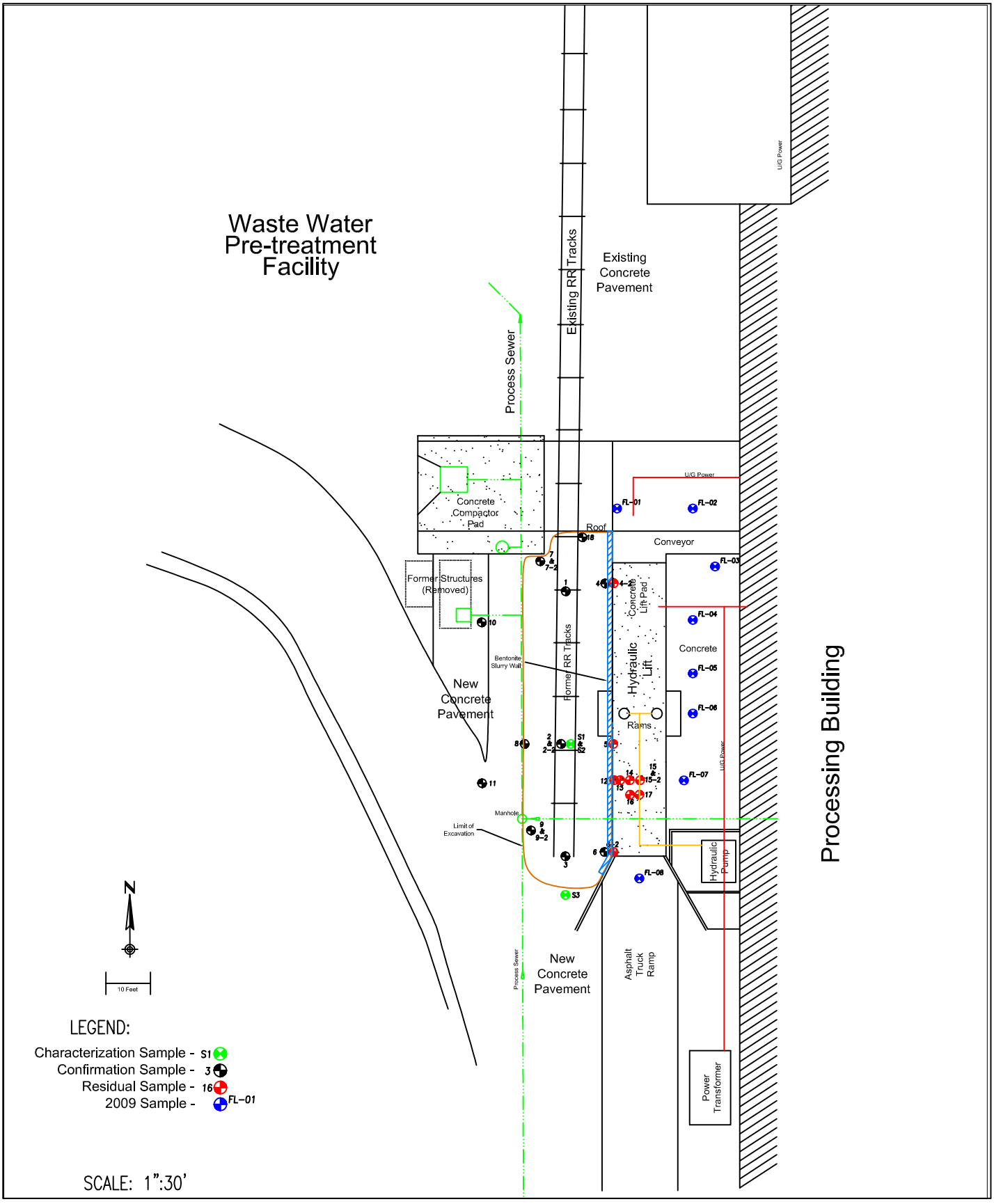
SECTION 12. FIGURES





ENVIRONMENTAL HEALTH MANAGEMENT, Inc PO BOX 1746 Lake Oswego, Oregon 97035 (503) 287-4620	DRAWN BY: KIM APPROVED BY: JHR DATE: 3/26/09 JOB NO.: 13002	FRITO LAY – Vancouver Hydraulic Lift Area Investigation Location Map

FIGURE 1



ENVIRONMENTAL
HEALTH
MANAGEMENT, INC.
PO Box 1746
Lake Oswego, Oregon 97035
(503) 287-4620

DRAWN BY:	KIM
APPROVED BY:	JHR
DATE:	7/2/09
JOB NO.:	13002

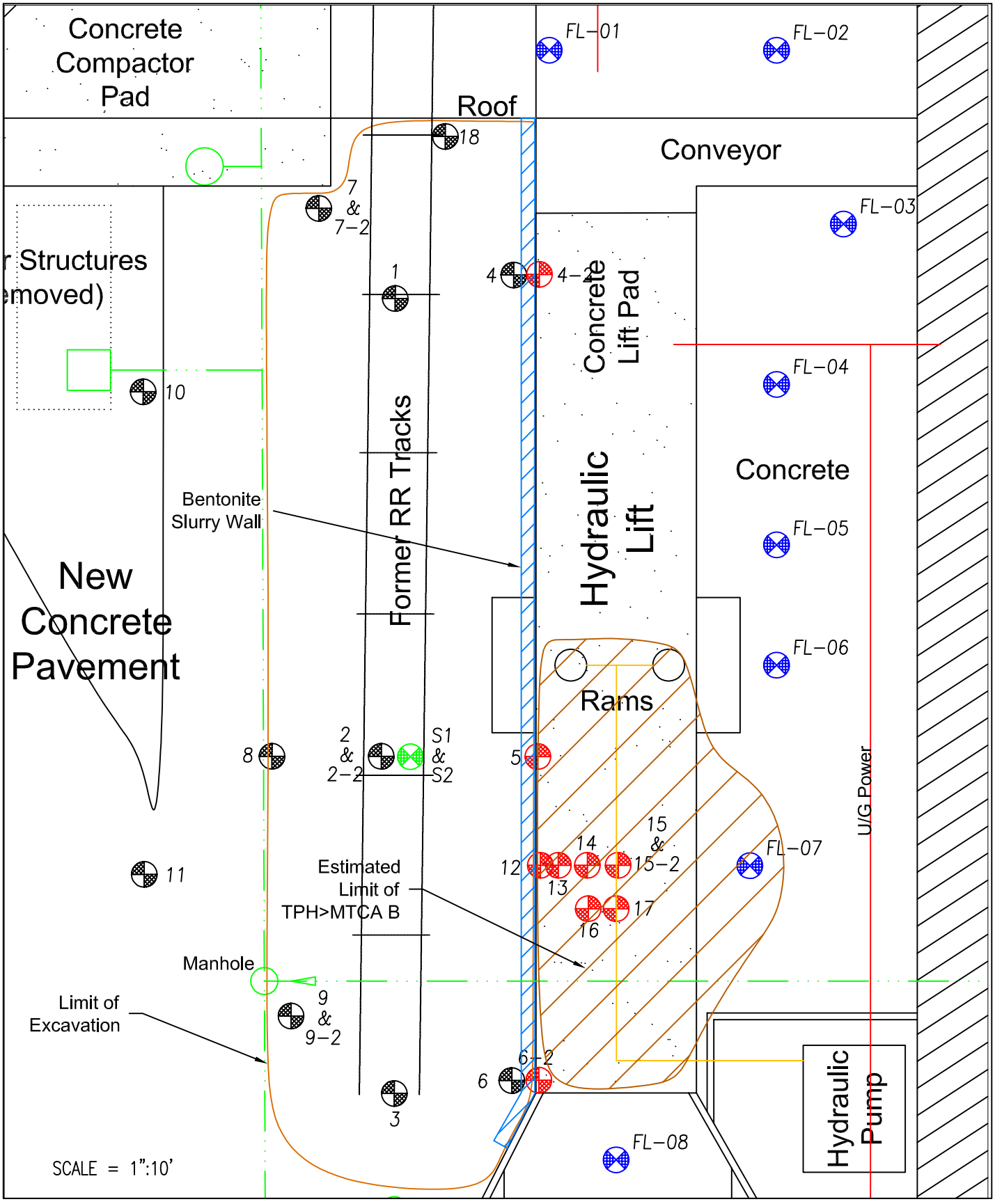
FRITO-LAY – VANCOUVER WA

Hydraulic Lift Area Investigation

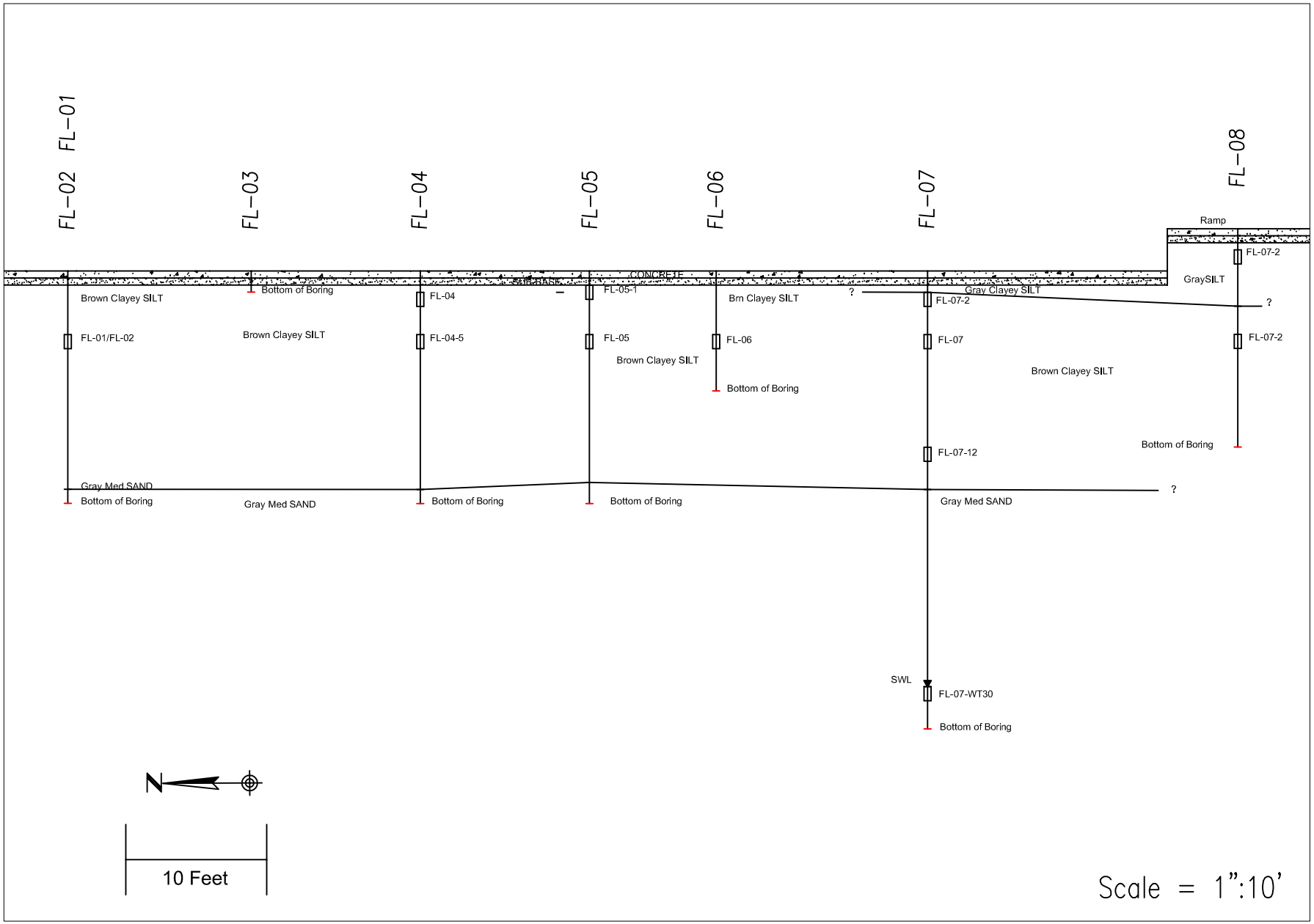
Location Details

FIGURE

2



ENVIRONMENTAL HEALTH MANAGEMENT, INC. PO Box 1746 Lake Oswego, Oregon 97035 (503) 287-4620	DRAWN BY: KIM APPROVED BY: JHR DATE: 7/2/09 JOB NO.: 13002	FRITO-LAY, VANCOUVER, WA Hydraulic Lift Area Investigation Sample Location Detail	FIGURE 3



ENVIRONMENTAL HEALTH MANAGEMENT, Inc. PO BOX 1746 Lake Oswego, Oregon 97035 (503) 287-4620	Geologic Cross—Section N/S Alignment	DRAWN BY: JHR APPROVED BY: JHR DATE: 7/19/09 PROJECT NO.: 13002	Frito Lay Vancouver, Washington Hydraulic Lift Investigation	FIGURE 4

SECTION 13. LABORATORY REPORT

Specialty Analytical

11711 SE Capps Road
Clackamas, OR 97015
(503) 607-1331
Fax (503) 607-1336

June 18, 2009

John Ruddick
Environmental Health Management
PO BOX 1746
Lake Oswego, OR 97035

TEL: (503) 287-4620
FAX (503) 287-4620

RE: Frito Lay / 13002

Order No.: 0905155

Dear John Ruddick:

Specialty Analytical received 15 samples on 5/27/2009 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Cindy Hillyard
Project Manager

Technical Review

Specialty Analytical **Date:** *18-Jun-09*

CLIENT: Environmental Health Management
Project: Frito Lay / 13002
Lab Order: 0905155

CASE NARRATIVE

The contamination found (20.2 mg/Kg) in the Method Blank (MBLK) for NWTPH-Dx with Silica Gel Cleanup is due to the cleanup process itself. Each associated sample also had a similar level of contamination in the Diesel range that matched that found in the MBLK. One sample, Specialty Analytical sample number 0905155-08 (Client ID FL-07-2), showed an elevated level of a contaminant that spread across both the Diesel and Lube Oil ranges and could not be identified as a specific petroleum product.

Specialty Analytical

Date: *18-Jun-09*

CLIENT: Environmental Health Management
Project: Frito Lay / 13002
Lab Order: 0905155

Lab ID: 0905155-01 **Collection Date:** 5/26/2009 10:15:00 AM
Client Sample ID: FL-01 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	26.3	18.5	B	mg/Kg-dry	1	5/29/2009
Lube Oil	ND	61.7		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	83.9	50-150		%REC	1	5/29/2009
NWTPH-GX		**NWTPH-GX**				Analyst: **das**
Gasoline	ND	3.09		mg/Kg-dry	1	5/30/2009
Surr: 4-Bromofluorobenzene	85.3	50-150		%REC	1	5/30/2009

Lab ID: 0905155-02 **Collection Date:** 5/26/2009 10:45:00 AM
Client Sample ID: FL-02 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	31.9	18.6	B	mg/Kg-dry	1	5/29/2009
Lube Oil	ND	62.0		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	84.8	50-150		%REC	1	5/29/2009
NWTPH-GX		**NWTPH-GX**				Analyst: **das**
Gasoline	ND	3.10		mg/Kg-dry	1	5/30/2009
Surr: 4-Bromofluorobenzene	81.5	50-150		%REC	1	5/30/2009

Lab ID: 0905155-03 **Collection Date:** 5/26/2009 11:40:00 AM
Client Sample ID: FL-04 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	32.2	18.2	B	mg/Kg-dry	1	5/29/2009
Lube Oil	ND	60.8		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	97.6	50-150		%REC	1	5/29/2009
NWTPH-GX		**NWTPH-GX**				Analyst: **das**
Gasoline	ND	3.04		mg/Kg-dry	1	5/30/2009
Surr: 4-Bromofluorobenzene	86.0	50-150		%REC	1	5/30/2009

CLIENT: Environmental Health Management **Lab Order:** 0905155
Project: Frito Lay / 13002

Lab ID: 0905155-04 **Collection Date:** 5/26/2009 11:50:00 AM
Client Sample ID: FL-04-5 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	26.8	18.2	B	mg/Kg-dry	1	5/29/2009
Lube Oil	ND	60.6		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	81.2	50-150		%REC	1	5/29/2009
NWTPH-GX		**NWTPH-GX**				Analyst: **das**
Gasoline	ND	3.03		mg/Kg-dry	1	5/30/2009
Surr: 4-Bromofluorobenzene	84.4	50-150		%REC	1	5/30/2009

Lab ID: 0905155-05 **Collection Date:** 5/26/2009 12:25:00 PM
Client Sample ID: FL-05 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	29.5	18.5	B	mg/Kg-dry	1	5/29/2009
Lube Oil	ND	61.7		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	89.7	50-150		%REC	1	5/29/2009

Lab ID: 0905155-06 **Collection Date:** 5/26/2009 12:05:00 PM
Client Sample ID: FL-05-1 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	42.8	18.0	B	mg/Kg-dry	1	5/29/2009
Lube Oil	80.4	59.9		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	87.6	50-150		%REC	1	5/29/2009

Lab ID: 0905155-07 **Collection Date:** 5/26/2009 1:05:00 PM
Client Sample ID: FL-07 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	30.5	18.3	B	mg/Kg-dry	1	5/29/2009
Lube Oil	ND	60.9		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	81.8	50-150		%REC	1	5/29/2009

Specialty Analytical

Date: *18-Jun-09*

CLIENT: Environmental Health Management
Project: Frito Lay / 13002
Lab Order: 0905155

Lab ID: 0905155-08
Collection Date: 5/26/2009 12:50:00 PM
Client Sample ID: FL-07-2
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	286	18.6	B,A1	mg/Kg-dry	1	5/29/2009
Lube Oil	957	62.0	A2	mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	93.6	50-150		%REC	1	5/29/2009
EXTRACTABLE PETROLEUM HYDROCARBONS		**EPHMOD.**				Analyst: **jrp**
>nC8-nC10 Aliphatic	ND	6.20		mg/Kg-dry	1	6/12/2009
>nC10-nC12 Aliphatic	ND	6.20		mg/Kg-dry	1	6/12/2009
>nC10-nC12 Aromatic	ND	6.20		mg/Kg-dry	1	6/15/2009
>nC12-nC16 Aliphatic	59.8	6.20		mg/Kg-dry	1	6/12/2009
>nC12-nC16 Aromatic	ND	6.20		mg/Kg-dry	1	6/15/2009
>nC16-nC21 Aliphatic	170	6.20		mg/Kg-dry	1	6/12/2009
>nC16-nC21 Aromatic	46.3	6.20		mg/Kg-dry	1	6/15/2009
>nC21-nC34 Aliphatic	1780	6.20		mg/Kg-dry	1	6/12/2009
>nC21-nC34 Aromatic	120	6.20		mg/Kg-dry	1	6/15/2009
Surr: Chlorooctadecane (Aliphatic	93.5	50-150		%REC	1	6/12/2009
Surr: o-Terphenyl (Aromatic)	59.6	50-150		%REC	1	6/15/2009
VOLATILE PETROLEUM HYDROCARBONS		**VPH**				Analyst: **jrp**
Benzene	ND	0.062		mg/Kg-dry	1	6/8/2009
Toluene	ND	0.062		mg/Kg-dry	1	6/8/2009
Ethylbenzene	ND	0.062		mg/Kg-dry	1	6/8/2009
Xylenes, Total	ND	0.062		mg/Kg-dry	1	6/8/2009
n-Hexane	ND	0.31		mg/Kg-dry	1	6/9/2009
C5-C6 Aliphatic	ND	1.5		mg/Kg-dry	1	6/8/2009
>C6-C8 Aliphatic	ND	1.5		mg/Kg-dry	1	6/8/2009
>C8-C10 Aliphatic	ND	1.5		mg/Kg-dry	1	6/8/2009
>C8-C10 Aromatic	ND	1.5		mg/Kg-dry	1	6/8/2009
>C10-C12 Aliphatic	ND	1.5		mg/Kg-dry	1	6/8/2009
>C10-C12 Aromatic	5.2	1.5		mg/Kg-dry	1	6/8/2009
>C12-C13 Aromatic	6.7	1.5		mg/Kg-dry	1	6/8/2009
Surr: aaa-Trifluorotoluene	95.3	50-150		%REC	1	6/8/2009
PAH'S BY GC/MS-OARSIM (8270C)		**8270SIM**				Analyst: **kmn**
1-Methylnaphthalene	50.4	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
2-Methylnaphthalene	62.0	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Acenaphthene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Acenaphthylene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Anthracene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Benz(a)anthracene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Benzo(a)pyrene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Benzo(b)fluoranthene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM

CLIENT: Environmental Health Management **Lab Order:** 0905155
Project: Frito Lay / 13002

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH'S BY GC/MS-OARSIM (8270C)		**8270SIM**				Analyst: **kmn**
Benzo(g,h,i)perylene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Benzo(k)fluoranthene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Chrysene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Dibenz(a,h)anthracene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Fluoranthene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Fluorene	10.7	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Indeno(1,2,3-cd)pyrene	ND	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Naphthalene	17.3	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Phenanthrene	55.3	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Pyrene	11.6	8.27		µg/Kg-dry	1	6/10/2009 8:34:00 PM
Surr: 2-Fluorobiphenyl	83.7	42.6-128		%REC	1	6/10/2009 8:34:00 PM
Surr: Nitrobenzene-d5	80.8	21.7-155		%REC	1	6/10/2009 8:34:00 PM
Surr: p-Terphenyl-d14	99.1	44.9-155		%REC	1	6/10/2009 8:34:00 PM
VOLATILES BY GC/MS		**SW8260B**				Analyst: **bda**
1,2,4-Trimethylbenzene	ND	12.4		µg/Kg-dry	1	6/4/2009 1:15:00 PM
1,2-Dibromoethane	ND	12.4		µg/Kg-dry	1	6/3/2009 11:03:00 PM
1,2-Dichloroethane	ND	12.4		µg/Kg-dry	1	6/3/2009 11:03:00 PM
1,3,5-Trimethylbenzene	ND	12.4		µg/Kg-dry	1	6/4/2009 1:15:00 PM
Benzene	ND	12.4		µg/Kg-dry	1	6/3/2009 11:03:00 PM
Ethylbenzene	ND	12.4		µg/Kg-dry	1	6/3/2009 11:03:00 PM
Isopropylbenzene	ND	12.4		µg/Kg-dry	1	6/3/2009 11:03:00 PM
m,p-Xylene	ND	24.8		µg/Kg-dry	1	6/3/2009 11:03:00 PM
Methyl tert-butyl ether	ND	12.4		µg/Kg-dry	1	6/3/2009 11:03:00 PM
n-Propylbenzene	ND	12.4		µg/Kg-dry	1	6/4/2009 1:15:00 PM
Naphthalene	26.1	12.4		µg/Kg-dry	1	6/4/2009 1:15:00 PM
o-Xylene	ND	12.4		µg/Kg-dry	1	6/3/2009 11:03:00 PM
Toluene	ND	12.4		µg/Kg-dry	1	6/3/2009 11:03:00 PM
Surr: 1,2-Dichloroethane-d4	95.8	71.5-112		%REC	1	6/3/2009 11:03:00 PM
Surr: 4-Bromofluorobenzene	119	75.7-122		%REC	1	6/3/2009 11:03:00 PM
Surr: Dibromofluoromethane	109	64.3-124		%REC	1	6/3/2009 11:03:00 PM
Surr: Toluene-d8	95.8	74.9-120		%REC	1	6/3/2009 11:03:00 PM

Lab ID: 0905155-09 **Collection Date:** 5/26/2009 1:10:00 PM
Client Sample ID: FL-07-12 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		**PER CLIENT**				Analyst: **knt**
Hold	Hold				1	6/17/2009

CLIENT: Environmental Health Management **Lab Order:** 0905155
Project: Frito Lay / 13002

Lab ID: 0905155-10 **Collection Date:** 5/26/2009 2:30:00 PM
Client Sample ID: FL-07-WT30 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		**PER CLIENT**				Analyst: **knt**
Hold	Hold				1	6/17/2009

Lab ID: 0905155-11 **Collection Date:** 5/26/2009 3:55:00 PM
Client Sample ID: FL-06 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	31.2	18.9	B	mg/Kg-dry	1	5/29/2009
Lube Oil	ND	63.1		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	86.9	50-150		%REC	1	5/29/2009

Lab ID: 0905155-12 **Collection Date:** 5/26/2009 4:40:00 PM
Client Sample ID: FL-08 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	ND	18.8		mg/Kg-dry	1	5/29/2009
Lube Oil	ND	62.5		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	86.8	50-150		%REC	1	5/29/2009

Lab ID: 0905155-13 **Collection Date:** 5/26/2009 4:30:00 PM
Client Sample ID: FL-08-2 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX WITH SILICA CLEAN-UP		**NWTPH-DX/SIL**				Analyst: **das**
Diesel	ND	18.9		mg/Kg-dry	1	5/29/2009
Lube Oil	ND	63.1		mg/Kg-dry	1	5/29/2009
Surr: o-Terphenyl	70.5	50-150		%REC	1	5/29/2009

Specialty Analytical

Date: *18-Jun-09*

CLIENT: Environmental Health Management
Project: Frito Lay / 13002
Lab Order: 0905155

Lab ID: 0905155-14
Collection Date: 5/26/2009 3:15:00 PM
Client Sample ID: FL-07-W
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EXTRACTABLE PETROLEUM HYDROCARBONS		**EPHMOD.**				Analyst: **das**
>nC8-nC10 Aliphatic	ND	0.095		mg/L	1	6/3/2009
>nC10-nC12 Aliphatic	ND	0.095		mg/L	1	6/3/2009
>nC10-nC12 Aromatic	ND	0.095		mg/L	1	6/3/2009
>nC12-nC16 Aliphatic	ND	0.095		mg/L	1	6/3/2009
>nC12-nC16 Aromatic	ND	0.095		mg/L	1	6/3/2009
>nC16-nC21 Aliphatic	ND	0.095		mg/L	1	6/3/2009
>nC16-nC21 Aromatic	ND	0.095		mg/L	1	6/3/2009
>nC21-nC34 Aliphatic	1.4	0.095		mg/L	1	6/3/2009
>nC21-nC34 Aromatic	ND	0.095		mg/L	1	6/3/2009
Surr: Chlorooctadecane (Aliphatic	86.7	50-150		%REC	1	6/3/2009
Surr: o-Terphenyl (Aromatic)	74.0	50-150		%REC	1	6/3/2009
VOLATILE PETROLEUM HYDROCARBONS		**VPH**				Analyst: **jrp**
Benzene	ND	1.0		ug/L	1	6/8/2009
Toluene	ND	1.0		ug/L	1	6/8/2009
Ethylbenzene	ND	1.0		ug/L	1	6/8/2009
Xylenes, Total	ND	1.0		ug/L	1	6/8/2009
n-Hexane	ND	5.0		ug/L	1	6/9/2009
C5-C6 Aliphatic	ND	25		ug/L	1	6/8/2009
>C6-C8 Aliphatic	ND	25		ug/L	1	6/8/2009
>C8-C10 Aliphatic	ND	25		ug/L	1	6/8/2009
>C8-C10 Aromatic	ND	25		ug/L	1	6/8/2009
>C10-C12 Aliphatic	ND	25		ug/L	1	6/8/2009
>C10-C12 Aromatic	ND	25		ug/L	1	6/8/2009
>C12-C13 Aromatic	ND	25		ug/L	1	6/8/2009
Surr: aaa-Trifluorotoluene	94.2	50-150		%REC	1	6/8/2009
LOW LEVEL PAH BY GC/MS OARSIM (8270C)		**8270SIM**				Analyst: **kmn**
1-Methylnaphthalene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
2-Methylnaphthalene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Acenaphthene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Acenaphthylene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Anthracene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Benz(a)anthracene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Benzo(a)pyrene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Benzo(b)fluoranthene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Benzo(g,h,i)perylene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Benzo(k)fluoranthene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Chrysene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM
Dibenz(a,h)anthracene	ND	0.0473		µg/L	1	6/10/2009 11:00:00 PM

CLIENT: Environmental Health Management **Lab Order:** 0905155
Project: Frito Lay / 13002

LOW LEVEL PAH BY GC/MS OARSIM (8270C)		8270SIM			Analyst: **kmn**
Fluoranthene	ND	0.0473	µg/L	1	6/10/2009 11:00:00 PM
Fluorene	ND	0.0473	µg/L	1	6/10/2009 11:00:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.0473	µg/L	1	6/10/2009 11:00:00 PM
Naphthalene	ND	0.0473	µg/L	1	6/10/2009 11:00:00 PM
Phenanthrene	ND	0.0473	µg/L	1	6/10/2009 11:00:00 PM
Pyrene	ND	0.0473	µg/L	1	6/10/2009 11:00:00 PM
Surr: 2-Fluorobiphenyl	46.4	18.6-106	%REC	1	6/10/2009 11:00:00 PM
Surr: Nitrobenzene-d5	51.7	17-130	%REC	1	6/10/2009 11:00:00 PM
Surr: p-Terphenyl-d14	73.2	39.6-131	%REC	1	6/10/2009 11:00:00 PM

Specialty Analytical

Date: *18-Jun-09*

CLIENT: Environmental Health Management
Project: Frito Lay / 13002

Lab Order: 0905155

Lab ID: 0905155-15
Client Sample ID: FL-00-W

Collection Date: 5/29/2009 3:30:00 PM
Matrix: AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
EXTRACTABLE PETROLEUM HYDROCARBONS		**EPHMOD.**				Analyst: **das**
>nC8-nC10 Aliphatic	ND	0.095		mg/L	1	6/3/2009
>nC10-nC12 Aliphatic	ND	0.095		mg/L	1	6/3/2009
>nC10-nC12 Aromatic	ND	0.095		mg/L	1	6/3/2009
>nC12-nC16 Aliphatic	ND	0.095		mg/L	1	6/3/2009
>nC12-nC16 Aromatic	ND	0.095		mg/L	1	6/3/2009
>nC16-nC21 Aliphatic	ND	0.095		mg/L	1	6/3/2009
>nC16-nC21 Aromatic	ND	0.095		mg/L	1	6/3/2009
>nC21-nC34 Aliphatic	0.60	0.095		mg/L	1	6/3/2009
>nC21-nC34 Aromatic	ND	0.095		mg/L	1	6/3/2009
Surr: Chlorooctadecane (Aliphatic	79.5	50-150		%REC	1	6/3/2009
Surr: o-Terphenyl (Aromatic)	68.9	50-150		%REC	1	6/3/2009
VOLATILE PETROLEUM HYDROCARBONS		**VPH**				Analyst: **jrp**
Benzene	ND	1.0		ug/L	1	6/8/2009
Toluene	ND	1.0		ug/L	1	6/8/2009
Ethylbenzene	ND	1.0		ug/L	1	6/8/2009
Xylenes, Total	ND	1.0		ug/L	1	6/8/2009
n-Hexane	ND	5.0		ug/L	1	6/9/2009
C5-C6 Aliphatic	ND	25		ug/L	1	6/8/2009
>C6-C8 Aliphatic	ND	25		ug/L	1	6/8/2009
>C8-C10 Aliphatic	ND	25		ug/L	1	6/8/2009
>C8-C10 Aromatic	ND	25		ug/L	1	6/8/2009
>C10-C12 Aliphatic	ND	25		ug/L	1	6/8/2009
>C10-C12 Aromatic	ND	25		ug/L	1	6/8/2009
>C12-C13 Aromatic	ND	25		ug/L	1	6/8/2009
Surr: aaa-Trifluorotoluene	102	50-150		%REC	1	6/8/2009
LOW LEVEL PAH BY GC/MS OARSIM (8270C)		**8270SIM**				Analyst: **kmn**
1-Methylnaphthalene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
2-Methylnaphthalene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Acenaphthene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Acenaphthylene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Anthracene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Benz(a)anthracene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Benzo(a)pyrene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Benzo(b)fluoranthene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Benzo(g,h,i)perylene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Benzo(k)fluoranthene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Chrysene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM
Dibenz(a,h)anthracene	ND	0.0473		µg/L	1	6/10/2009 11:29:00 PM

CLIENT: Environmental Health Management **Lab Order:** 0905155
Project: Frito Lay / 13002

LOW LEVEL PAH BY GC/MS OARSIM (8270C)		8270SIM			Analyst: **kmn**
Fluoranthene	ND	0.0473	µg/L	1	6/10/2009 11:29:00 PM
Fluorene	ND	0.0473	µg/L	1	6/10/2009 11:29:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.0473	µg/L	1	6/10/2009 11:29:00 PM
Naphthalene	ND	0.0473	µg/L	1	6/10/2009 11:29:00 PM
Phenanthrene	ND	0.0473	µg/L	1	6/10/2009 11:29:00 PM
Pyrene	ND	0.0473	µg/L	1	6/10/2009 11:29:00 PM
Surr: 2-Fluorobiphenyl	63.7	18.6-106	%REC	1	6/10/2009 11:29:00 PM
Surr: Nitrobenzene-d5	73.4	17-130	%REC	1	6/10/2009 11:29:00 PM
Surr: p-Terphenyl-d14	80.5	39.6-131	%REC	1	6/10/2009 11:29:00 PM

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID **MB-23360**	SampType: **MBLK**	TestCode: **8260_S**	Units: **µg/Kg**	Prep Date: **6/3/2009**	Run ID: **5975X_090604A**
Client ID: **ZZZZZ**	Batch ID: **23360**	TestNo: **SW8260B**		Analysis Date: **6/3/2009**	SeqNo: **606811**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	10.0									
1,1,1-Trichloroethane	ND	10.0									
1,1,2,2-Tetrachloroethane	ND	10.0									
1,1,2-Trichloroethane	ND	10.0									
1,1-Dichloroethane	ND	10.0									
1,1-Dichloroethene	ND	10.0									
1,1-Dichloropropene	ND	10.0									
1,2,3-Trichlorobenzene	9.46	10.0									J
1,2,3-Trichloropropane	ND	10.0									
1,2,4-Trichlorobenzene	3.93	10.0									J
1,2,4-Trimethylbenzene	ND	10.0									
1,2-Dibromo-3-chloropropane	ND	10.0									
1,2-Dibromoethane	ND	10.0									
1,2-Dichlorobenzene	ND	10.0									
1,2-Dichloroethane	ND	10.0									
1,2-Dichloropropane	ND	10.0									
1,3,5-Trimethylbenzene	ND	10.0									
1,3-Dichlorobenzene	ND	10.0									
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	20.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	20.0									
Acetone	ND	50.0									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID	MB-23360	SampType:	MBLK	TestCode:	8260_S	Units:	µg/Kg	Prep Date:	6/3/2009	Run ID:	5975X_090604A
Client ID:	ZZZZZ	Batch ID:	23360	TestNo:	SW8260B			Analysis Date:	6/3/2009	SeqNo:	606811

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromochloromethane	ND	10.0									
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	0.73	10.0									J
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	0.75	10.0									J
Chloroform	ND	10.0									
Chloromethane	ND	10.0									
cis-1,2-Dichloroethene	1.96	10.0									J
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
Isopropylbenzene	ND	10.0									
m,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	8.02	50.0									J
n-Butylbenzene	ND	10.0									
n-Propylbenzene	ND	10.0									
Naphthalene	9.38	10.0									J
o-Xylene	ND	10.0									
sec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
tert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	ND	10.0									
trans-1,2-Dichloroethene	ND	10.0									

Qualifiers:
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B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID **MB-23360**	SampType: **MBLK**	TestCode: **8260_S**	Units: **µg/Kg**	Prep Date: **6/3/2009**	Run ID: **5975X_090604A**
Client ID: **ZZZZZ**	Batch ID: **23360**	TestNo: **SW8260B**		Analysis Date: **6/3/2009**	SeqNo: **606811**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
trans-1,3-Dichloropropene	ND	10.0									
Trichloroethene	2.76	10.0									J
Trichlorofluoromethane	ND	10.0									
Vinyl chloride	1.14	10.0									J
Surr: 1,2-Dichloroethane-d4	93.68	0	100	0	93.7	71.5	112	0	0		
Surr: 4-Bromofluorobenzene	102.6	0	100	0	103	75.7	122	0	0		
Surr: Dibromofluoromethane	103.3	0	100	0	103	64.3	124	0	0		
Surr: Toluene-d8	115.8	0	100	0	116	74.9	120	0	0		

Sample ID **LCS-23360**	SampType: **LCS**	TestCode: **8260_S**	Units: **µg/Kg**	Prep Date: **6/3/2009**	Run ID: **5975X_090604A**
Client ID: **ZZZZZ**	Batch ID: **23360**	TestNo: **SW8260B**		Analysis Date: **6/3/2009**	SeqNo: **606809**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	74.09	10.0	60	0	123	65.4	133	0	0		
Benzene	66.07	10.0	60	0	110	78	123	0	0		
Chlorobenzene	65.44	10.0	60	0	109	79.5	125	0	0		
Toluene	68.04	10.0	60	0	113	77.5	132	0	0		
Trichloroethene	63.34	10.0	60	2.76	101	72.4	124	0	0		

Sample ID **LCSD-23360**	SampType: **LCSD**	TestCode: **8260_S**	Units: **µg/Kg**	Prep Date:	Run ID: **5975X_090604A**
Client ID: **ZZZZZ**	Batch ID: **23360**	TestNo: **SW8260B**		Analysis Date: **6/3/2009**	SeqNo: **606810**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	64.92	10.0	60	0	108	65.4	133	74.09	13.2	20	
Benzene	59	10.0	60	0	98.3	78	123	66.07	11.3	20	
Chlorobenzene	56.11	10.0	60	0	93.5	79.5	125	65.44	15.4	20	
Toluene	57.75	10.0	60	0	96.2	77.5	132	68.04	16.4	20	
Trichloroethene	55.87	10.0	60	2.76	88.5	72.4	124	63.34	12.5	20	

Qualifiers:
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B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID	0906005-01BMS	SampType:	MS	TestCode:	8260_S	Units:	µg/Kg	Prep Date:		Run ID:	5975X_090604A
Client ID:	ZZZZZ	Batch ID:	23360	TestNo:	SW8260B			Analysis Date:	6/3/2009	SeqNo:	606819

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	30.73	10.0	60	0	51.2	69.2	158	0	0		S,MI
Benzene	26.38	10.0	60	0	44	71.7	147	0	0		S,MI
Chlorobenzene	17.46	10.0	60	0	29.1	75	148	0	0		S,MI
Toluene	25.78	10.0	60	0	43	75.8	153	0	0		S,MI
Trichloroethene	21.6	10.0	60	2.08	32.5	77.1	138	0	0		S,MI

Sample ID	0906005-01BMSD	SampType:	MSD	TestCode:	8260_S	Units:	µg/Kg	Prep Date:		Run ID:	5975X_090604A
Client ID:	ZZZZZ	Batch ID:	23360	TestNo:	SW8260B			Analysis Date:	6/4/2009	SeqNo:	606820

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	27.67	10.0	60	0	46.1	69.2	158	30.73	10.5	20	S,MI
Benzene	25.75	10.0	60	0	42.9	71.7	147	26.38	2.42	20	S,MI
Chlorobenzene	16.2	10.0	60	0	27	75	148	17.46	7.49	20	S,MI
Toluene	24.74	10.0	60	0	41.2	75.8	153	25.78	4.12	20	S,MI
Trichloroethene	21.38	10.0	60	2.08	32.2	77.1	138	21.6	1.02	20	S,MI

Sample ID	CCV-23360	SampType:	CCV	TestCode:	8260_S	Units:	µg/Kg	Prep Date:		Run ID:	5975X_090604A
Client ID:	ZZZZZ	Batch ID:	23360	TestNo:	SW8260B			Analysis Date:	6/3/2009	SeqNo:	606808

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	62.86	10.0	60	0	105	80	120	0	0		
1,2-Dichloropropane	66.24	10.0	60	0	110	80	120	0	0		
Chloroform	63.77	10.0	60	0	106	80	120	0	0		
Ethylbenzene	64.65	10.0	60	0	108	80	120	0	0		
Toluene	65.12	10.0	60	0	109	80	120	0	0		
Vinyl chloride	61.46	10.0	60	0	102	80	120	0	0		

Sample ID	CCV-23360	SampType:	CCV	TestCode:	8260_S	Units:	µg/Kg	Prep Date:		Run ID:	5975X_090604A
Client ID:	ZZZZZ	Batch ID:	23360	TestNo:	SW8260B			Analysis Date:	6/4/2009	SeqNo:	606973

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

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CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID	CCV-23360	SampType:	CCV	TestCode:	8260_S	Units:	µg/Kg	Prep Date:		Run ID:	5975X_090604A
Client ID:	ZZZZZ	Batch ID:	23360	TestNo:	SW8260B			Analysis Date:	6/4/2009	SeqNo:	606973

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	50.45	10.0	60	0	84.1	80	120	0	0		
1,2-Dichloropropane	67	10.0	60	0	112	80	120	0	0		
Chloroform	61.23	10.0	60	0	102	80	120	0	0		
Ethylbenzene	57.05	10.0	60	0	95.1	80	120	0	0		
Toluene	57.39	10.0	60	0	95.7	80	120	0	0		
Vinyl chloride	59.98	10.0	60	0	100	80	120	0	0		

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CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: DXSIL_S

Sample ID	MBLK-23322	SampType:	MBLK	TestCode:	DXSIL_S	Units:	mg/Kg	Prep Date:	5/28/2009	Run ID:	GC-M_090529A
Client ID:	ZZZZZ	Batch ID:	23322	TestNo:	NWTPH-Dx/S			Analysis Date:	5/29/2009	SeqNo:	606060

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	20.16	15.0									CN
Lube Oil	13.87	50.0									J
Surr: o-Terphenyl	33.9	0	33.33	0	102	50	150	0	0		

Sample ID	LCS-23322	SampType:	LCS	TestCode:	DXSIL_S	Units:	mg/Kg	Prep Date:	5/28/2009	Run ID:	GC-M_090529A
Client ID:	ZZZZZ	Batch ID:	23322	TestNo:	NWTPH-Dx/S			Analysis Date:	5/29/2009	SeqNo:	606061

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	171.2	15.0	166.7	0	103	63.1	113	0	0		B
Lube Oil	166.7	50.0	166.7	0	100	64.6	132	0	0		

Sample ID	0905155-03ADUP	SampType:	DUP	TestCode:	DXSIL_S	Units:	mg/Kg-dry	Prep Date:	5/28/2009	Run ID:	GC-M_090529A
Client ID:	FL-04	Batch ID:	23322	TestNo:	NWTPH-Dx/S			Analysis Date:	5/29/2009	SeqNo:	606065

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	27.08	18.2	0	0	0	0	0	32.18	17.2	20	B
Lube Oil	30.61	60.8	0	0	0	0	0	30.04	0	20	J

Sample ID	0905155-12ADUP	SampType:	DUP	TestCode:	DXSIL_S	Units:	mg/Kg-dry	Prep Date:	5/28/2009	Run ID:	GC-M_090529A
Client ID:	FL-08	Batch ID:	23322	TestNo:	NWTPH-Dx/S			Analysis Date:	5/29/2009	SeqNo:	606074

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	13.67	18.8	0	0	0	0	0	11.5	0	20	J
Lube Oil	22.16	62.5	0	0	0	0	0	20.2	0	20	J

Sample ID	CCV	SampType:	CCV	TestCode:	DXSIL_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-M_090529A
Client ID:	ZZZZZ	Batch ID:	23322	TestNo:	NWTPH-Dx/S			Analysis Date:	5/29/2009	SeqNo:	606059

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1110	15.0	1000	0	111	85	115	0	0		B

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ANALYTICAL QC SUMMARY REPORT

TestCode: DXSIL_S

Sample ID	CCV	SampType:	CCV	TestCode:	DXSIL_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-M_090529A
Client ID:	ZZZZZ	Batch ID:	23322	TestNo:	NWTPH-Dx/S			Analysis Date:	5/29/2009	SeqNo:	606059

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lube Oil	558.9	50.0	500	0	112	85	115	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	DXSIL_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-M_090529A
Client ID:	ZZZZZ	Batch ID:	23322	TestNo:	NWTPH-Dx/S			Analysis Date:	5/29/2009	SeqNo:	606069

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	1471	15.0	1333	0	110	85	115	0	0		B
Lube Oil	724	50.0	666.7	0	109	85	115	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	DXSIL_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-M_090529A
Client ID:	ZZZZZ	Batch ID:	23322	TestNo:	NWTPH-Dx/S			Analysis Date:	5/29/2009	SeqNo:	606076

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	999.5	15.0	1000	0	99.9	85	115	0	0		B
Lube Oil	557.2	50.0	500	0	111	85	115	0	0		

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: EPH_S

Sample ID	MB-23388	SampType:	MBLK	TestCode:	EPH_S	Units:	mg/Kg	Prep Date:	6/5/2009	Run ID:	GC-M_090612A
Client ID:	ZZZZZ	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/12/2009	SeqNo:	609597

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	ND	5.00									
>nC10-nC12 Aliphatic	ND	5.00									
>nC12-nC16 Aliphatic	ND	5.00									
>nC16-nC21 Aliphatic	ND	5.00									
>nC21-nC34 Aliphatic	ND	5.00									
Surr: Chlorooctadecane (Aliphatic)	12.31	1.00	13.33	0	92.4	50	150	0	0		

Sample ID	MB-23388	SampType:	MBLK	TestCode:	EPH_S	Units:	mg/Kg	Prep Date:	6/5/2009	Run ID:	GC-M_090612A
Client ID:	ZZZZZ	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/15/2009	SeqNo:	609605

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	ND	5.00									
>nC10-nC12 Aromatic	ND	5.00									
>nC12-nC16 Aromatic	ND	5.00									
>nC16-nC21 Aromatic	ND	5.00									
>nC21-nC34 Aromatic	ND	5.00									
Surr: o-Terphenyl (Aromatic)	8.762	1.00	13.33	0	65.7	50	150	0	0		

Sample ID	LCS-23388	SampType:	LCS	TestCode:	EPH_S	Units:	mg/Kg	Prep Date:	6/5/2009	Run ID:	GC-M_090612A
Client ID:	ZZZZZ	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/12/2009	SeqNo:	609599

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	16.32	5.00	33.33	0	49	70	130	0	0		S
>nC10-nC12 Aliphatic	21.4	5.00	33.33	0	64.2	70	130	0	0		S
>nC12-nC16 Aliphatic	24.9	5.00	33.33	0	74.7	70	130	0	0		
>nC16-nC21 Aliphatic	25.91	5.00	33.33	0	77.7	70	130	0	0		
>nC21-nC34 Aliphatic	24.16	5.00	33.33	0	72.5	70	130	0	0		

Qualifiers:
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CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: EPH_S

Sample ID	LCS-23388	SampType:	LCS	TestCode:	EPH_S	Units:	mg/Kg	Prep Date:	6/5/2009	Run ID:	GC-M_090612A
Client ID:	ZZZZZ	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/15/2009	SeqNo:	609607

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC10-nC12 Aromatic	14.07	5.00	33.33	0	42.2	70	130	0	0		S
>nC12-nC16 Aromatic	16.52	5.00	33.33	0	49.6	70	130	0	0		S
>nC16-nC21 Aromatic	24.69	5.00	33.33	0	74.1	70	130	0	0		
>nC21-nC34 Aromatic	15.89	5.00	33.33	0	47.7	70	130	0	0		S

Sample ID	0905155-08AMS	SampType:	MS	TestCode:	EPH_S	Units:	mg/Kg-dry	Prep Date:	6/5/2009	Run ID:	GC-M_090612A
Client ID:	FL-07-2	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/12/2009	SeqNo:	609600

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	21.5	6.20	41.3	0	52.1	70	130	0	0		S
>nC10-nC12 Aliphatic	25.36	6.20	41.3	5.969	46.9	70	130	0	0		S
>nC12-nC16 Aliphatic	68.84	6.20	41.3	59.8	21.9	70	130	0	0		S
>nC16-nC21 Aliphatic	176.4	6.20	41.3	169.6	16.3	70	130	0	0		S,MC
>nC21-nC34 Aliphatic	1505	6.20	41.3	1778	-662	70	130	0	0		S,MC

Sample ID	0905155-08AMS	SampType:	MS	TestCode:	EPH_S	Units:	mg/Kg-dry	Prep Date:	6/5/2009	Run ID:	GC-M_090612A
Client ID:	FL-07-2	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/15/2009	SeqNo:	609608

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC10-nC12 Aromatic	20.75	6.20	41.3	0	50.2	70	130	0	0		S
>nC12-nC16 Aromatic	24.11	6.20	41.3	0	58.4	70	130	0	0		S
>nC16-nC21 Aromatic	45.67	6.20	41.3	46.26	-1.43	70	130	0	0		S
>nC21-nC34 Aromatic	40.78	6.20	41.3	119.9	-191	70	130	0	0		S

Sample ID	0905155-08AMSD	SampType:	MSD	TestCode:	EPH_S	Units:	mg/Kg-dry	Prep Date:	6/5/2009	Run ID:	GC-M_090612A
Client ID:	FL-07-2	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/12/2009	SeqNo:	609601

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	25.15	6.20	41.3	0	60.9	70	130	21.5	15.7	25	S
>nC10-nC12 Aliphatic	23.78	6.20	41.3	5.969	43.1	70	130	25.36	6.42	25	S
>nC12-nC16 Aliphatic	45.2	6.20	41.3	59.8	-35.4	70	130	68.84	41.5	25	SR

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CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: EPH_S

Sample ID	0905155-08AMSD	SampType:	MSD	TestCode:	EPH_S	Units:	mg/Kg-dry	Prep Date:	6/5/2009	Run ID:	GC-M_090612A	
Client ID:	FL-07-2	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/12/2009	SeqNo:	609601	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC16-nC21 Aliphatic	101.7	6.20	41.3	169.6	-165	70	130	176.4	53.7	25	S,R
>nC21-nC34 Aliphatic	804.7	6.20	41.3	1778	-2360	70	130	1505	60.6	25	S,R,MC

Sample ID	0905155-08AMSD	SampType:	MSD	TestCode:	EPH_S	Units:	mg/Kg-dry	Prep Date:	6/5/2009	Run ID:	GC-M_090612A	
Client ID:	FL-07-2	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/15/2009	SeqNo:	609609	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC10-nC12 Aromatic	16.99	6.20	41.3	0	41.1	70	130	20.75	19.9	25	S
>nC12-nC16 Aromatic	17.06	6.20	41.3	0	41.3	70	130	24.11	34.2	25	SR
>nC16-nC21 Aromatic	27.51	6.20	41.3	46.26	-45.4	70	130	45.67	49.6	25	SR
>nC21-nC34 Aromatic	20.59	6.20	41.3	119.9	-240	70	130	40.78	65.8	25	SR

Sample ID	CCV	SampType:	CCV	TestCode:	EPH_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-M_090612A	
Client ID:	ZZZZZ	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/12/2009	SeqNo:	609596	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	30.59	5.00	33.33	0	91.8	80	120	0	0		
>nC10-nC12 Aliphatic	31.11	5.00	33.33	0	93.3	80	120	0	0		
>nC12-nC16 Aliphatic	31.06	5.00	33.33	0	93.2	80	120	0	0		
>nC16-nC21 Aliphatic	32.34	5.00	33.33	0	97	80	120	0	0		
>nC21-nC34 Aliphatic	29.7	5.00	33.33	0	89.1	80	120	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	EPH_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-M_090612A	
Client ID:	ZZZZZ	Batch ID:	23388	TestNo:	EPHMod.			Analysis Date:	6/12/2009	SeqNo:	609603	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	32.22	5.00	33.33	0	96.7	80	120	0	0		
>nC10-nC12 Aliphatic	32.97	5.00	33.33	0	98.9	80	120	0	0		
>nC12-nC16 Aliphatic	33.01	5.00	33.33	0	99	80	120	0	0		
>nC16-nC21 Aliphatic	34.46	5.00	33.33	0	103	80	120	0	0		
>nC21-nC34 Aliphatic	31.86	5.00	33.33	0	95.6	80	120	0	0		

Qualifiers:
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R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: EPH_S

Sample ID **CCV**	SampType: **CCV**	TestCode: **EPH_S**	Units: **mg/Kg**	Prep Date:	Run ID: **GC-M_090612A**
Client ID: **ZZZZZ**	Batch ID: **23388**	TestNo: **EPHMod.**		Analysis Date: **6/15/2009**	SeqNo: **609604**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC10-nC12 Aromatic	16.33	5.00	16.66	0	98	80	120	0	0		
>nC12-nC16 Aromatic	16.45	5.00	16.66	0	98.7	80	120	0	0		
>nC16-nC21 Aromatic	16.12	5.00	16.66	0	96.7	80	120	0	0		
>nC21-nC34 Aromatic	16.6	5.00	16.66	0	99.6	80	120	0	0		

Sample ID **CCV**	SampType: **CCV**	TestCode: **EPH_S**	Units: **mg/Kg**	Prep Date:	Run ID: **GC-M_090612A**
Client ID: **ZZZZZ**	Batch ID: **23388**	TestNo: **EPHMod.**		Analysis Date: **6/15/2009**	SeqNo: **609611**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC10-nC12 Aromatic	38.14	5.00	33.33	0	114	80	120	0	0		
>nC12-nC16 Aromatic	36.91	5.00	33.33	0	111	80	120	0	0		
>nC16-nC21 Aromatic	37.7	5.00	33.33	0	113	80	120	0	0		
>nC21-nC34 Aromatic	37.95	5.00	33.33	0	114	80	120	0	0		

Qualifiers:
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B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: EPH_W

Sample ID	MBLK-23319	SampType:	MBLK	TestCode:	EPH_W	Units:	mg/L	Prep Date:	5/28/2009	Run ID:	GC-M_090603A
Client ID:	ZZZZZ	Batch ID:	23319	TestNo:	EPHMod.			Analysis Date:	6/3/2009	SeqNo:	607921

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	ND	0.10									
>nC10-nC12 Aliphatic	ND	0.10									
>nC10-nC12 Aromatic	ND	0.10									
>nC12-nC16 Aliphatic	ND	0.10									
>nC12-nC16 Aromatic	ND	0.10									
>nC16-nC21 Aliphatic	ND	0.10									
>nC16-nC21 Aromatic	ND	0.10									
>nC21-nC34 Aliphatic	ND	0.10									
>nC21-nC34 Aromatic	ND	0.10									
Surr: Chlorooctadecane (Aliphatic)	0.1466	0	0.2	0	73.3	50	150	0	0		
Surr: o-Terphenyl (Aromatic)	0.1414	0	0.2	0	70.7	50	150	0	0		

Sample ID	LCS-23319	SampType:	LCS	TestCode:	EPH_W	Units:	mg/L	Prep Date:	5/28/2009	Run ID:	GC-M_090603A
Client ID:	ZZZZZ	Batch ID:	23319	TestNo:	EPHMod.			Analysis Date:	6/3/2009	SeqNo:	607922

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	0.01285	0.10	0.5	0	2.57	70	130	0	0		JS
>nC10-nC12 Aliphatic	0.0304	0.10	0.5	0	6.08	70	130	0	0		JS
>nC10-nC12 Aromatic	0.06424	0.10	0.5	0	12.8	70	130	0	0		JS
>nC12-nC16 Aliphatic	0.3457	0.10	0.5	0	69.1	70	130	0	0		S
>nC12-nC16 Aromatic	0.2368	0.10	0.5	0	47.4	70	130	0	0		S
>nC16-nC21 Aliphatic	0.4206	0.10	0.5	0	84.1	70	130	0	0		
>nC16-nC21 Aromatic	0.4323	0.10	0.5	0	86.5	70	130	0	0		
>nC21-nC34 Aliphatic	0.4544	0.10	0.5	0	90.9	70	130	0	0		
>nC21-nC34 Aromatic	0.433	0.10	0.5	0	86.6	70	130	0	0		

Sample ID	LCSD-23319	SampType:	LCSD	TestCode:	EPH_W	Units:	mg/L	Prep Date:	5/28/2009	Run ID:	GC-M_090603A
Client ID:	ZZZZZ	Batch ID:	23319	TestNo:	EPHMod.			Analysis Date:	6/3/2009	SeqNo:	607924

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	0.0204	0.10	0.5	0	4.08	70	130	0.01285	0	25	JS

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CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: EPH_W

Sample ID	LCSD-23319	SampType:	LCSD	TestCode:	EPH_W	Units:	mg/L	Prep Date:	5/28/2009	Run ID:	GC-M_090603A
Client ID:	ZZZZZ	Batch ID:	23319	TestNo:	EPHMod.			Analysis Date:	6/3/2009	SeqNo:	607924

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC10-nC12 Aliphatic	0.0551	0.10	0.5	0	11	70	130	0.0304	0	25	JS
>nC10-nC12 Aromatic	0.0935	0.10	0.5	0	18.7	70	130	0.06424	0	25	JS
>nC12-nC16 Aliphatic	0.3309	0.10	0.5	0	66.2	70	130	0.3457	4.37	25	S
>nC12-nC16 Aromatic	0.2354	0.10	0.5	0	47.1	70	130	0.2368	0.572	25	S
>nC16-nC21 Aliphatic	0.4356	0.10	0.5	0	87.1	70	130	0.4206	3.49	25	
>nC16-nC21 Aromatic	0.4472	0.10	0.5	0	89.4	70	130	0.4323	3.39	25	
>nC21-nC34 Aliphatic	0.4798	0.10	0.5	0	96	70	130	0.4544	5.45	25	
>nC21-nC34 Aromatic	0.4408	0.10	0.5	0	88.2	70	130	0.433	1.81	25	

Sample ID	CCV	SampType:	CCV	TestCode:	EPH_W	Units:	mg/L	Prep Date:		Run ID:	GC-M_090603A
Client ID:	ZZZZZ	Batch ID:	23319	TestNo:	EPHMod.			Analysis Date:	6/3/2009	SeqNo:	607919

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	0.537	0.10	0.5	0	107	80	120	0	0		
>nC10-nC12 Aliphatic	0.5457	0.10	0.5	0	109	80	120	0	0		
>nC10-nC12 Aromatic	0.5374	0.10	0.5	0	107	80	120	0	0		
>nC12-nC16 Aliphatic	0.554	0.10	0.5	0	111	80	120	0	0		
>nC12-nC16 Aromatic	0.5418	0.10	0.5	0	108	80	120	0	0		
>nC16-nC21 Aliphatic	0.5641	0.10	0.5	0	113	80	120	0	0		
>nC16-nC21 Aromatic	0.5337	0.10	0.5	0	107	80	120	0	0		
>nC21-nC34 Aliphatic	0.4799	0.10	0.5	0	96	80	120	0	0		
>nC21-nC34 Aromatic	0.5408	0.10	0.5	0	108	80	120	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	EPH_W	Units:	mg/L	Prep Date:		Run ID:	GC-M_090603A
Client ID:	ZZZZZ	Batch ID:	23319	TestNo:	EPHMod.			Analysis Date:	6/3/2009	SeqNo:	607928

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC8-nC10 Aliphatic	0.3908	0.10	0.4	0	97.7	80	120	0	0		
>nC10-nC12 Aliphatic	0.4009	0.10	0.4	0	100	80	120	0	0		
>nC10-nC12 Aromatic	0.5312	0.10	0.5	0	106	80	120	0	0		
>nC12-nC16 Aliphatic	0.3979	0.10	0.4	0	99.5	80	120	0	0		

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CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: EPH_W

Sample ID **CCV**	SampType: **CCV**	TestCode: **EPH_W**	Units: **mg/L**	Prep Date:	Run ID: **GC-M_090603A**
Client ID: **ZZZZZ**	Batch ID: **23319**	TestNo: **EPHMod.**		Analysis Date: **6/3/2009**	SeqNo: **607928**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>nC12-nC16 Aromatic	0.5334	0.10	0.5	0	107	80	120	0	0		
>nC16-nC21 Aliphatic	0.4025	0.10	0.4	0	101	80	120	0	0		
>nC16-nC21 Aromatic	0.5376	0.10	0.5	0	108	80	120	0	0		
>nC21-nC34 Aliphatic	0.3998	0.10	0.4	0	99.9	80	120	0	0		
>nC21-nC34 Aromatic	0.5486	0.10	0.5	0	110	80	120	0	0		

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CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHGX_S

Sample ID	MBLK-23339	SampType:	MBLK	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	5/30/2009	Run ID:	GC-I_090530A	
Client ID:	ZZZZZ	Batch ID:	23339	TestNo:	NWTPH-Gx			Analysis Date:	5/30/2009	SeqNo:	605755	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline		0.661	2.50									J
Surr: 4-Bromofluorobenzene		4.851	0	5	0	97	50	150	0	0		

Sample ID	LCS-23339	SampType:	LCS	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:	5/30/2009	Run ID:	GC-I_090530A	
Client ID:	ZZZZZ	Batch ID:	23339	TestNo:	NWTPH-Gx			Analysis Date:	5/30/2009	SeqNo:	605754	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline		46.71	2.50	50	0	93.4	53.5	121	0	0		

Sample ID	0905121-03ADUP	SampType:	DUP	TestCode:	NWTPHGX_S	Units:	mg/Kg-dry	Prep Date:	5/30/2009	Run ID:	GC-I_090530A	
Client ID:	ZZZZZ	Batch ID:	23339	TestNo:	NWTPH-Gx			Analysis Date:	5/30/2009	SeqNo:	605761	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline		171.3	3.76	0	0	0	0	0	99.29	53.2	20	R,MI

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-I_090530A	
Client ID:	ZZZZZ	Batch ID:	23339	TestNo:	NWTPH-Gx			Analysis Date:	5/30/2009	SeqNo:	605753	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline		124.3	2.50	125	0	99.4	80	120	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-I_090530A	
Client ID:	ZZZZZ	Batch ID:	23339	TestNo:	NWTPH-Gx			Analysis Date:	5/30/2009	SeqNo:	605762	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline		3024	50.0	3000	0	101	80	120	0	0		

Qualifiers:
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ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHGX_S

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-I_090530A
Client ID:	ZZZZZ	Batch ID:	23339	TestNo:	NWTPH-Gx			Analysis Date:	5/30/2009	SeqNo:	605915

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	123.8	2.50	125	0	99	80	120	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	NWTPHGX_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-I_090530A
Client ID:	ZZZZZ	Batch ID:	23339	TestNo:	NWTPH-Gx			Analysis Date:	5/30/2009	SeqNo:	605918

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	150.5	2.50	150	0	100	80	120	0	0		

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID **MB-23384**	SampType: **MBLK**	TestCode: **PAHLL_S**	Units: **µg/Kg**	Prep Date: **6/5/2009**	Run ID: **5975Q_090610A**
Client ID: **ZZZZZ**	Batch ID: **23384**	TestNo: **8270SIM**		Analysis Date: **6/10/2009**	SeqNo: **608828**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	ND	6.67									
2-Methylnaphthalene	0.6667	6.67									J
Acenaphthene	1.333	6.67									J
Acenaphthylene	ND	6.67									
Anthracene	ND	6.67									
Benz(a)anthracene	0.6667	6.67									J
Benzo(a)pyrene	0.6667	6.67									J
Benzo(b)fluoranthene	ND	6.67									
Benzo(g,h,i)perylene	ND	6.67									
Benzo(k)fluoranthene	1.333	6.67									J
Chrysene	ND	6.67									
Dibenz(a,h)anthracene	ND	6.67									
Fluoranthene	0.6667	6.67									J
Fluorene	ND	6.67									
Indeno(1,2,3-cd)pyrene	ND	6.67									
Naphthalene	ND	6.67									
Phenanthrene	ND	6.67									
Pyrene	ND	6.67									
Surr: 2-Fluorobiphenyl	4947	0	6667	0	74.2	42.6	128	0	0		
Surr: Nitrobenzene-d5	5148	0	6667	0	77.2	21.7	155	0	0		
Surr: p-Terphenyl-d14	6145	0	6667	0	92.2	44.9	155	0	0		

Sample ID **LCS-23384**	SampType: **LCS**	TestCode: **PAHLL_S**	Units: **µg/Kg**	Prep Date: **6/5/2009**	Run ID: **5975Q_090610A**
Client ID: **ZZZZZ**	Batch ID: **23384**	TestNo: **8270SIM**		Analysis Date: **6/10/2009**	SeqNo: **608829**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	198	6.67	333.3	0	59.4	29.1	109	0	0		
2-Methylnaphthalene	212.7	6.67	333.3	0.6667	63.6	29.1	109	0	0		
Acenaphthene	215.3	6.67	333.3	1.333	64.2	39.6	107	0	0		
Benzo(g,h,i)perylene	302	6.67	333.3	0	90.6	49.7	135	0	0		
Chrysene	321.3	6.67	333.3	0	96.4	57.1	130	0	0		

Qualifiers:
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CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID	LCS-23384	SampType:	LCS	TestCode:	PAHLL_S	Units:	µg/Kg	Prep Date:	6/5/2009	Run ID:	5975Q_090610A
Client ID:	ZZZZZ	Batch ID:	23384	TestNo:	8270SIM			Analysis Date:	6/10/2009	SeqNo:	608829

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	187.3	6.67	333.3	0	56.2	29.1	109	0	0		
Phenanthrene	258	6.67	333.3	0	77.4	48.4	115	0	0		
Pyrene	308.7	6.67	333.3	0	92.6	47.2	134	0	0		

Sample ID	0905155-08AMS	SampType:	MS	TestCode:	PAHLL_S	Units:	µg/Kg-dry	Prep Date:	6/5/2009	Run ID:	5975Q_090610A
Client ID:	FL-07-2	Batch ID:	23384	TestNo:	8270SIM			Analysis Date:	6/10/2009	SeqNo:	608830

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	306.5	8.27	413.1	50.39	62	27.7	108	0	0		
2-Methylnaphthalene	356.9	8.27	413.1	61.96	71.4	27.7	108	0	0		
Acenaphthene	312.3	8.27	413.1	0	75.6	33.7	111	0	0		
Benzo(g,h,i)perylene	319.7	8.27	413.1	0	77.4	15	128	0	0		
Chrysene	302.4	8.27	413.1	2.478	72.6	37.5	125	0	0		
Naphthalene	290.8	8.27	413.1	17.35	66.2	27.7	108	0	0		
Phenanthrene	346.1	8.27	413.1	55.35	70.4	20.2	139	0	0		
Pyrene	354.4	8.27	413.1	11.57	83	26.8	142	0	0		

Sample ID	0905155-08AMSD	SampType:	MSD	TestCode:	PAHLL_S	Units:	µg/Kg-dry	Prep Date:	6/5/2009	Run ID:	5975Q_090610A
Client ID:	FL-07-2	Batch ID:	23384	TestNo:	8270SIM			Analysis Date:	6/10/2009	SeqNo:	608831

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	360.2	8.27	413.1	50.39	75	27.7	108	306.5	16.1	20	
2-Methylnaphthalene	423	8.27	413.1	61.96	87.4	27.7	108	356.9	16.9	20	
Acenaphthene	364.3	8.27	413.1	0	88.2	33.7	111	312.3	15.4	20	
Benzo(g,h,i)perylene	376.7	8.27	413.1	0	91.2	15	128	319.7	16.4	20	
Chrysene	336.2	8.27	413.1	2.478	80.8	37.5	125	302.4	10.6	20	
Naphthalene	341.2	8.27	413.1	17.35	78.4	27.7	108	290.8	15.9	20	
Phenanthrene	434.5	8.27	413.1	55.35	91.8	20.2	139	346.1	22.6	20	R
Pyrene	425.4	8.27	413.1	11.57	100	26.8	142	354.4	18.2	20	

Qualifiers:
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CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID **CCV**	SampType: **CCV**	TestCode: **PAHLL_S**	Units: **µg/Kg**	Prep Date:	Run ID: **5975Q_090610A**
Client ID: **ZZZZZ**	Batch ID: **23384**	TestNo: **8270SIM**		Analysis Date: **6/10/2009**	SeqNo: **608827**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	602	6.67	666.7	0	90.3	70	130	0	0		
2-Methylnaphthalene	664	6.67	666.7	0	99.6	70	130	0	0		
Acenaphthene	637.3	6.67	666.7	0	95.6	70	130	0	0		
Acenaphthylene	661.3	6.67	666.7	0	99.2	70	130	0	0		
Anthracene	695.3	6.67	666.7	0	104	70	130	0	0		
Benz(a)anthracene	633.3	6.67	666.7	0	95	70	130	0	0		
Benzo(a)pyrene	658	6.67	666.7	0	98.7	70	130	0	0		
Benzo(b)fluoranthene	601.3	6.67	666.7	0	90.2	70	130	0	0		
Benzo(g,h,i)perylene	626	6.67	666.7	0	93.9	70	130	0	0		
Benzo(k)fluoranthene	632.7	6.67	666.7	0	94.9	70	130	0	0		
Chrysene	600.7	6.67	666.7	0	90.1	70	130	0	0		
Dibenz(a,h)anthracene	720	6.67	666.7	0	108	70	130	0	0		
Fluoranthene	626.7	6.67	666.7	0	94	70	130	0	0		
Fluorene	619.3	6.67	666.7	0	92.9	70	130	0	0		
Indeno(1,2,3-cd)pyrene	737.3	6.67	666.7	0	111	70	130	0	0		
Naphthalene	635.3	6.67	666.7	0	95.3	70	130	0	0		
Phenanthrene	570.7	6.67	666.7	0	85.6	70	130	0	0		
Pyrene	634.7	6.67	666.7	0	95.2	70	130	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_W

Sample ID **MB-23320**	SampType: **MBLK**	TestCode: **PAHLL_W**	Units: **µg/L**	Prep Date: **5/28/2009**	Run ID: **5975Q_090529A**
Client ID: **ZZZZZ**	Batch ID: **23320**	TestNo: **8270SIM**		Analysis Date: **5/29/2009**	SeqNo: **605813**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	ND	0.0500									
2-Methylnaphthalene	ND	0.0500									
Acenaphthene	0.02	0.0500									J
Acenaphthylene	ND	0.0500									
Anthracene	ND	0.0500									
Benz(a)anthracene	0.02	0.0500									J
Benzo(a)pyrene	ND	0.0500									
Benzo(b)fluoranthene	0.04	0.0500									J
Benzo(g,h,i)perylene	0.12	0.0500									
Benzo(k)fluoranthene	0.05	0.0500									
Chrysene	0.02	0.0500									J
Dibenz(a,h)anthracene	0.18	0.0500									
Fluoranthene	ND	0.0500									
Fluorene	ND	0.0500									
Indeno(1,2,3-cd)pyrene	0.2	0.0500									
Naphthalene	0.02	0.0500									J
Phenanthrene	ND	0.0500									
Pyrene	0.04	0.0500									J
Surr: 2-Fluorobiphenyl	82.34	1.00	100	0	82.3	18.6	106	0	0		
Surr: Nitrobenzene-d5	74.62	1.00	100	0	74.6	17	130	0	0		
Surr: p-Terphenyl-d14	88.71	1.00	100	0	88.7	39.6	131	0	0		

Sample ID **LCS-23320**	SampType: **LCS**	TestCode: **PAHLL_W**	Units: **µg/L**	Prep Date: **5/28/2009**	Run ID: **5975Q_090529A**
Client ID: **ZZZZZ**	Batch ID: **23320**	TestNo: **8270SIM**		Analysis Date: **5/29/2009**	SeqNo: **605814**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	3.31	0.0500	5	0.02	65.8	35.1	100	0	0		
Benzo(g,h,i)perylene	3.29	0.0500	5	0.12	63.4	20.8	120	0	0		B
Chrysene	3.57	0.0500	5	0.02	71	39.1	119	0	0		
Naphthalene	3.23	0.0500	5	0.02	64.2	25.6	106	0	0		
Phenanthrene	3.64	0.0500	5	0	72.8	38.1	106	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_W

Sample ID	LCS-23320	SampType:	LCS	TestCode:	PAHLL_W	Units:	µg/L	Prep Date:	5/28/2009	Run ID:	5975Q_090529A
Client ID:	ZZZZZ	Batch ID:	23320	TestNo:	8270SIM			Analysis Date:	5/29/2009	SeqNo:	605814

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Pyrene	3.65	0.0500	5	0.04	72.2	41.3	118	0	0		

Sample ID	LCSD-23320	SampType:	LCSD	TestCode:	PAHLL_W	Units:	µg/L	Prep Date:	5/28/2009	Run ID:	5975Q_090529A
Client ID:	ZZZZZ	Batch ID:	23320	TestNo:	8270SIM			Analysis Date:	5/29/2009	SeqNo:	605815

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	3.26	0.0500	5	0.02	64.8	35.1	100	3.31	1.52	20	
Benzo(g,h,i)perylene	3.8	0.0500	5	0.12	73.6	20.8	120	3.29	14.4	20	B
Chrysene	3.86	0.0500	5	0.02	76.8	39.1	119	3.57	7.81	20	
Naphthalene	3.29	0.0500	5	0.02	65.4	25.6	106	3.23	1.84	20	
Phenanthrene	3.86	0.0500	5	0	77.2	38.1	106	3.64	5.87	20	
Pyrene	3.9	0.0500	5	0.04	77.2	41.3	118	3.65	6.62	20	

Sample ID	CCV	SampType:	CCV	TestCode:	PAHLL_W	Units:	µg/L	Prep Date:		Run ID:	5975Q_090529A
Client ID:	ZZZZZ	Batch ID:	23320	TestNo:	8270SIM			Analysis Date:	5/29/2009	SeqNo:	605812

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	4.39	0.0500	5	0	87.8	70	130	0	0		
Acenaphthylene	3.63	0.0500	5	0	72.6	70	130	0	0		
Anthracene	4.6	0.0500	5	0	92	70	130	0	0		
Benz(a)anthracene	4.22	0.0500	5	0	84.4	70	130	0	0		
Benzo(a)pyrene	4.44	0.0500	5	0	88.8	70	130	0	0		
Benzo(b)fluoranthene	4.24	0.0500	5	0	84.8	70	130	0	0		
Benzo(g,h,i)perylene	4.23	0.0500	5	0	84.6	70	130	0	0		
Benzo(k)fluoranthene	4.83	0.0500	5	0	96.6	70	130	0	0		
Chrysene	4.37	0.0500	5	0	87.4	70	130	0	0		
Dibenz(a,h)anthracene	4.15	0.0500	5	0	83	70	130	0	0		
Fluoranthene	4.56	0.0500	5	0	91.2	70	130	0	0		
Fluorene	4.5	0.0500	5	0	90	70	130	0	0		
Indeno(1,2,3-cd)pyrene	3.94	0.0500	5	0	78.8	70	130	0	0		
Naphthalene	4.79	0.0500	5	0	95.8	70	130	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_W

Sample ID **CCV**	SampType: **CCV**	TestCode: **PAHLL_W**	Units: **µg/L**	Prep Date:	Run ID: **5975Q_090529A**
Client ID: **ZZZZZ**	Batch ID: **23320**	TestNo: **8270SIM**		Analysis Date: **5/29/2009**	SeqNo: **605812**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenanthrene	4.54	0.0500	5	0	90.8	70	130	0	0		
Pyrene	4.55	0.0500	5	0	91	70	130	0	0		

Sample ID **CCV**	SampType: **CCV**	TestCode: **PAHLL_W**	Units: **µg/L**	Prep Date:	Run ID: **5975Q_090529A**
Client ID: **ZZZZZ**	Batch ID: **23320**	TestNo: **8270SIM**		Analysis Date: **6/1/2009**	SeqNo: **605903**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	4.17	0.0500	5	0	83.4	70	130	0	0		
Acenaphthylene	3.63	0.0500	5	0	72.6	70	130	0	0		
Anthracene	4.68	0.0500	5	0	93.6	70	130	0	0		
Benz(a)anthracene	4.15	0.0500	5	0	83	70	130	0	0		
Benzo(a)pyrene	4.38	0.0500	5	0	87.6	70	130	0	0		
Benzo(b)fluoranthene	4.02	0.0500	5	0	80.4	70	130	0	0		
Benzo(g,h,i)perylene	4.06	0.0500	5	0	81.2	70	130	0	0		
Benzo(k)fluoranthene	4.82	0.0500	5	0	96.4	70	130	0	0		
Chrysene	4.29	0.0500	5	0	85.8	70	130	0	0		
Dibenz(a,h)anthracene	4.62	0.0500	5	0	92.4	70	130	0	0		
Fluoranthene	4.63	0.0500	5	0	92.6	70	130	0	0		
Fluorene	4.59	0.0500	5	0	91.8	70	130	0	0		
Indeno(1,2,3-cd)pyrene	4.36	0.0500	5	0	87.2	70	130	0	0		
Naphthalene	4.51	0.0500	5	0	90.2	70	130	0	0		
Phenanthrene	4.59	0.0500	5	0	91.8	70	130	0	0		
Pyrene	4.47	0.0500	5	0	89.4	70	130	0	0		

Sample ID **CCV**	SampType: **CCV**	TestCode: **PAHLL_W**	Units: **µg/L**	Prep Date:	Run ID: **5975Q_090529A**
Client ID: **ZZZZZ**	Batch ID: **23320**	TestNo: **8270SIM**		Analysis Date: **6/10/2009**	SeqNo: **608835**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	9.03	0.0500	10	0	90.3	70	130	0	0		
2-Methylnaphthalene	9.96	0.0500	10	0	99.6	70	130	0	0		
Acenaphthene	9.56	0.0500	10	0	95.6	70	130	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_W

Sample ID **CCV**	SampType: **CCV**	TestCode: **PAHLL_W**	Units: **µg/L**	Prep Date:	Run ID: **5975Q_090529A**
Client ID: **ZZZZZ**	Batch ID: **23320**	TestNo: **8270SIM**		Analysis Date: **6/10/2009**	SeqNo: **608835**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthylene	9.92	0.0500	10	0	99.2	70	130	0	0		
Anthracene	10.43	0.0500	10	0	104	70	130	0	0		
Benz(a)anthracene	9.5	0.0500	10	0	95	70	130	0	0		
Benzo(a)pyrene	9.87	0.0500	10	0	98.7	70	130	0	0		
Benzo(b)fluoranthene	9.02	0.0500	10	0	90.2	70	130	0	0		
Benzo(g,h,i)perylene	9.39	0.0500	10	0	93.9	70	130	0	0		
Benzo(k)fluoranthene	9.49	0.0500	10	0	94.9	70	130	0	0		
Chrysene	9.01	0.0500	10	0	90.1	70	130	0	0		
Dibenz(a,h)anthracene	10.8	0.0500	10	0	108	70	130	0	0		
Fluoranthene	9.4	0.0500	10	0	94	70	130	0	0		
Fluorene	9.29	0.0500	10	0	92.9	70	130	0	0		
Indeno(1,2,3-cd)pyrene	11.06	0.0500	10	0	111	70	130	0	0		
Naphthalene	9.53	0.0500	10	0	95.3	70	130	0	0		
Phenanthrene	8.56	0.0500	10	0	85.6	70	130	0	0		
Pyrene	9.52	0.0500	10	0	95.2	70	130	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: VPH_S

Sample ID	MB-23403	SampType:	MBLK	TestCode:	VPH_S	Units:	mg/Kg	Prep Date:	6/8/2009	Run ID:	GC-I_090608B
Client ID:	ZZZZZ	Batch ID:	23403	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608220

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	0.006	0.050									J
Toluene	ND	0.050									
Ethylbenzene	ND	0.050									
Xylenes, Total	ND	0.050									
C5-C6 Aliphatic	0.0735	1.2									J
>C6-C8 Aliphatic	ND	1.2									
>C8-C10 Aliphatic	ND	1.2									
>C8-C10 Aromatic	ND	1.2									
>C10-C12 Aliphatic	ND	1.2									
>C10-C12 Aromatic	ND	1.2									
>C12-C13 Aromatic	ND	1.2									
Surr: aaa-Trifluorotoluene	5.122	0	5	0	102	50	150	0	0		

Sample ID	MB-23403	SampType:	MBLK	TestCode:	VPH_S	Units:	mg/Kg	Prep Date:	6/8/2009	Run ID:	GC-I_090608B
Client ID:	ZZZZZ	Batch ID:	23403	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608447

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Hexane	ND	0.25									

Sample ID	LCS-23403	SampType:	LCS	TestCode:	VPH_S	Units:	mg/Kg	Prep Date:	6/8/2009	Run ID:	GC-I_090608B
Client ID:	ZZZZZ	Batch ID:	23403	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608223

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	2.344	0.050	2.5	0	93.8	70	130	0	0		
Toluene	2.345	0.050	2.5	0	93.8	70	130	0	0		
Ethylbenzene	2.38	0.050	2.5	0	95.2	70	130	0	0		
Xylenes, Total	7.162	0.050	7.5	0	95.5	70	130	0	0		
C5-C6 Aliphatic	2.874	1.2	2.5	0	115	70	130	0	0		
>C6-C8 Aliphatic	2.466	1.2	2.5	0	98.6	70	130	0	0		
>C8-C10 Aliphatic	2.376	1.2	2.5	0	95	70	130	0	0		
>C8-C10 Aromatic	12.01	1.2	12.5	0	96	70	130	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: VPH_S

Sample ID	LCS-23403	SampType:	LCS	TestCode:	VPH_S	Units:	mg/Kg	Prep Date:	6/8/2009	Run ID:	GC-I_090608B	
Client ID:	ZZZZZ	Batch ID:	23403	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608223	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
>C10-C12 Aliphatic	2.526	1.2	2.5	0	101	70	130	0	0			
>C10-C12 Aromatic	2.272	1.2	2.5	0	90.9	70	130	0	0			
>C12-C13 Aromatic	2.23	1.2	2.5	0	89.2	70	130	0	0			

Sample ID	LCS-23403	SampType:	LCS	TestCode:	VPH_S	Units:	mg/Kg	Prep Date:	6/8/2009	Run ID:	GC-I_090608B	
Client ID:	ZZZZZ	Batch ID:	23403	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608450	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
n-Hexane	2.31	0.25	2.5	0	92.4	70	130	0	0			

Sample ID	0905155-08ADUP	SampType:	DUP	TestCode:	VPH_S	Units:	mg/Kg-dry	Prep Date:	6/8/2009	Run ID:	GC-I_090608B	
Client ID:	FL-07-2	Batch ID:	23403	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608222	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Benzene	0.008055	0.062	0	0	0	0	0	0.004957	0	25	J	
Toluene	ND	0.062	0	0	0	0	0	0	0	25		
Ethylbenzene	0.009913	0.062	0	0	0	0	0	0.002478	0	25	J	
Xylenes, Total	ND	0.062	0	0	0	0	0	0	0	25		
C5-C6 Aliphatic	0.4504	1.5	0	0	0	0	0	0.4802	0	25	J	
>C6-C8 Aliphatic	0.166	1.5	0	0	0	0	0	0.06072	0	25	J	
>C8-C10 Aliphatic	ND	1.5	0	0	0	0	0	0	0	25		
>C8-C10 Aromatic	1.52	1.5	0	0	0	0	0	1.29	16.4	25		
>C10-C12 Aliphatic	ND	1.5	0	0	0	0	0	0	0	25		
>C10-C12 Aromatic	6.427	1.5	0	0	0	0	0	5.188	21.3	25		
>C12-C13 Aromatic	9.004	1.5	0	0	0	0	0	6.685	29.6	25	R,MI	

Sample ID	0905155-08ADUP	SampType:	DUP	TestCode:	VPH_S	Units:	mg/Kg-dry	Prep Date:	6/8/2009	Run ID:	GC-I_090608B	
Client ID:	FL-07-2	Batch ID:	23403	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608449	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
n-Hexane	ND	0.31	0	0	0	0	0	0	0	25		

Qualifiers:
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R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: VPH_S

Sample ID **CCV**	SampType: **CCV**	TestCode: **VPH_S**	Units: **mg/Kg**	Prep Date:	Run ID: **GC-I_090608B**
Client ID: **ZZZZZ**	Batch ID: **23403**	TestNo: **VPH**		Analysis Date: **6/8/2009**	SeqNo: **608219**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	5.233	0.050	5	0	105	85	115	0	0		
Toluene	5.284	0.050	5	0	106	85	115	0	0		
Ethylbenzene	5.292	0.050	5	0	106	85	115	0	0		
Xylenes, Total	15.69	0.050	15	0	105	85	115	0	0		
C5-C6 Aliphatic	6.108	1.2	5	0	122	80	120	0	0		SC
>C6-C8 Aliphatic	5.494	1.2	5	0	110	80	120	0	0		
>C8-C10 Aliphatic	5.28	1.2	5	0	106	80	120	0	0		
>C8-C10 Aromatic	26.25	1.2	25	0	105	80	120	0	0		
>C10-C12 Aliphatic	4.996	1.2	5	0	99.9	80	120	0	0		
>C10-C12 Aromatic	5.532	1.2	5	0	111	80	120	0	0		
>C12-C13 Aromatic	5.664	1.2	5	0	113	80	120	0	0		

Sample ID **CCV**	SampType: **CCV**	TestCode: **VPH_S**	Units: **mg/Kg**	Prep Date:	Run ID: **GC-I_090608B**
Client ID: **ZZZZZ**	Batch ID: **23403**	TestNo: **VPH**		Analysis Date: **6/8/2009**	SeqNo: **608224**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	5.014	0.050	5	0	100	85	115	0	0		
Toluene	5.072	0.050	5	0	101	85	115	0	0		
Ethylbenzene	5.036	0.050	5	0	101	85	115	0	0		
Xylenes, Total	15.14	0.050	15	0	101	85	115	0	0		
C5-C6 Aliphatic	5.488	1.2	5	0	110	80	120	0	0		
>C6-C8 Aliphatic	5.181	1.2	5	0	104	80	120	0	0		
>C8-C10 Aliphatic	4.956	1.2	5	0	99.1	80	120	0	0		
>C8-C10 Aromatic	25.22	1.2	25	0	101	80	120	0	0		
>C10-C12 Aliphatic	4.91	1.2	5	0	98.2	80	120	0	0		
>C10-C12 Aromatic	4.896	1.2	5	0	97.9	80	120	0	0		
>C12-C13 Aromatic	4.406	1.2	5	0	88.1	80	120	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: VPH_S

Sample ID	CCV	SampType:	CCV	TestCode:	VPH_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-I_090608B
Client ID:	ZZZZZ	Batch ID:	23403	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608446

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Hexane	5.149	0.25	5	0	103	85	115	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	VPH_S	Units:	mg/Kg	Prep Date:		Run ID:	GC-I_090608B
Client ID:	ZZZZZ	Batch ID:	23403	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608451

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Hexane	4.828	0.25	5	0	96.6	85	115	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: VPH_W

Sample ID	MB-23402	SampType:	MBLK	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	ZZZZZ	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608212

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	0.28	1.0									J
Toluene	0.8	1.0									J
Ethylbenzene	0.28	1.0									J
Xylenes, Total	0.65	1.0									J
C5-C6 Aliphatic	4.34	25									J
>C6-C8 Aliphatic	ND	25									
>C8-C10 Aliphatic	0.36	25									J
>C8-C10 Aromatic	3.04	25									J
>C10-C12 Aliphatic	1.31	25									J
>C10-C12 Aromatic	0.95	25									J
>C12-C13 Aromatic	5.17	25									J
Surr: aaa-Trifluorotoluene	89.09	0	100	0	89.1	50	150	0	0		

Sample ID	MB-23402	SampType:	MBLK	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	ZZZZZ	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608428

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Hexane	ND	5.0									

Sample ID	LCS-23402	SampType:	LCS	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	ZZZZZ	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608211

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	104.7	1.0	100	0	105	70	130	0	0		
Toluene	105.7	1.0	100	0	106	70	130	0	0		
Ethylbenzene	105.8	1.0	100	0	106	70	130	0	0		
Xylenes, Total	313.9	1.0	300	0	105	70	130	0	0		
C5-C6 Aliphatic	122.2	25	100	0	122	70	130	0	0		
>C6-C8 Aliphatic	109.9	25	100	0	110	70	130	0	0		
>C8-C10 Aliphatic	105.6	25	100	0	106	70	130	0	0		
>C8-C10 Aromatic	525	25	500	0	105	70	130	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: VPH_W

Sample ID	LCS-23402	SampType:	LCS	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	ZZZZZ	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608211

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>C10-C12 Aliphatic	99.92	25	100	0	99.9	70	130	0	0		
>C10-C12 Aromatic	110.6	25	100	0	111	70	130	0	0		
>C12-C13 Aromatic	113.3	25	100	0	113	70	130	0	0		

Sample ID	LCS-23402	SampType:	LCS	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	ZZZZZ	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608427

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Hexane	103	5.0	100	0	103	70	130	0	0		

Sample ID	0905155-14BMS	SampType:	MS	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	FL-07-W	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608215

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	52.5	1.0	50	0	105	60	140	0	0		
Toluene	52.93	1.0	50	0.35	105	60	140	0	0		
Ethylbenzene	52.99	1.0	50	0.06	106	60	140	0	0		
Xylenes, Total	159.9	1.0	150	0	107	60	140	0	0		
C5-C6 Aliphatic	61.9	25	50	4.03	116	60	140	0	0		
>C6-C8 Aliphatic	53.85	25	50	0	108	60	140	0	0		
>C8-C10 Aliphatic	51.84	25	50	0.27	103	60	140	0	0		
>C8-C10 Aromatic	267.4	25	250	0	107	60	140	0	0		
>C10-C12 Aliphatic	59.43	25	50	0.63	118	60	140	0	0		
>C10-C12 Aromatic	57.03	25	50	1.25	112	60	140	0	0		
>C12-C13 Aromatic	56.93	25	50	1.64	111	60	140	0	0		

Sample ID	0905155-14BMS	SampType:	MS	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	FL-07-W	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608431

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Hexane	48.61	5.0	50	0	97.2	60	140	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: VPH_W

Sample ID	0905155-14BMSD	SampType:	MSD	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	FL-07-W	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608216

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	50.26	1.0	50	0	101	60	140	52.5	4.36	20	
Toluene	50.59	1.0	50	0.35	100	60	140	52.93	4.52	20	
Ethylbenzene	50.35	1.0	50	0.06	101	60	140	52.99	5.11	20	
Xylenes, Total	151.3	1.0	150	0	101	60	140	159.9	5.50	20	
C5-C6 Aliphatic	59.19	25	50	4.03	110	60	140	61.9	4.48	20	
>C6-C8 Aliphatic	52.05	25	50	0	104	60	140	53.85	3.40	20	
>C8-C10 Aliphatic	52.16	25	50	0.27	104	60	140	51.84	0.615	20	
>C8-C10 Aromatic	251.9	25	250	0	101	60	140	267.4	5.96	20	
>C10-C12 Aliphatic	53.27	25	50	0.63	105	60	140	59.43	10.9	20	
>C10-C12 Aromatic	53.73	25	50	1.25	105	60	140	57.03	5.96	20	
>C12-C13 Aromatic	53.47	25	50	1.64	104	60	140	56.93	6.27	20	

Sample ID	0905155-14BMSD	SampType:	MSD	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	FL-07-W	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608432

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Hexane	48.01	5.0	50	0	96	60	140	48.61	1.24	20	

Sample ID	0905155-14BDUP	SampType:	DUP	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A
Client ID:	FL-07-W	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608214

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	1.0	0	0	0	0	0	0	0	20	
Toluene	0.91	1.0	0	0	0	0	0	0.35	0	20	J
Ethylbenzene	0.1	1.0	0	0	0	0	0	0.06	0	20	J
Xylenes, Total	0.43	1.0	0	0	0	0	0	0	0	20	J
C5-C6 Aliphatic	3.14	25	0	0	0	0	0	4.03	0	20	J
>C6-C8 Aliphatic	ND	25	0	0	0	0	0	0	0	20	
>C8-C10 Aliphatic	0.16	25	0	0	0	0	0	0.27	0	20	J
>C8-C10 Aromatic	1.52	25	0	0	0	0	0	0	0	20	J
>C10-C12 Aliphatic	1.3	25	0	0	0	0	0	0.63	0	20	J

Qualifiers:
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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Environmental Health Management
Work Order: 0905155
Project: Frito Lay / 13002

ANALYTICAL QC SUMMARY REPORT

TestCode: VPH_W

Sample ID	0905155-14BDUP	SampType:	DUP	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A	
Client ID:	FL-07-W	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608214	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
>C10-C12 Aromatic	ND	25	0	0	0	0	0	1.25	0	20	
>C12-C13 Aromatic	0.98	25	0	0	0	0	0	1.64	0	20	J

Sample ID	0905155-14BDUP	SampType:	DUP	TestCode:	VPH_W	Units:	ug/L	Prep Date:	6/8/2009	Run ID:	GC-I_090608A	
Client ID:	FL-07-W	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608430	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Hexane	ND	5.0	0	0	0	0	0	0	0	20	

Sample ID	CCV	SampType:	CCV	TestCode:	VPH_W	Units:	ug/L	Prep Date:		Run ID:	GC-I_090608A	
Client ID:	ZZZZZ	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/8/2009	SeqNo:	608218	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	100.3	1.0	100	0	100	85	115	0	0		
Toluene	101.5	1.0	100	0	101	85	115	0	0		
Ethylbenzene	100.7	1.0	100	0	101	85	115	0	0		
Xylenes, Total	302.8	1.0	300	0	101	85	115	0	0		
C5-C6 Aliphatic	109.8	25	100	0	110	80	120	0	0		
>C6-C8 Aliphatic	103.6	25	100	0	104	80	120	0	0		
>C8-C10 Aliphatic	99.13	25	100	0	99.1	80	120	0	0		
>C8-C10 Aromatic	504.3	25	500	0	101	80	120	0	0		
>C10-C12 Aliphatic	98.2	25	100	0	98.2	80	120	0	0		
>C10-C12 Aromatic	97.91	25	100	0	97.9	80	120	0	0		
>C12-C13 Aromatic	88.13	25	100	0	88.1	80	120	0	0		

Sample ID	CCV	SampType:	CCV	TestCode:	VPH_W	Units:	ug/L	Prep Date:		Run ID:	GC-I_090608A	
Client ID:	ZZZZZ	Batch ID:	23402	TestNo:	VPH			Analysis Date:	6/9/2009	SeqNo:	608434	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Hexane	96.56	5.0	100	0	96.6	85	115	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

KEY TO FLAGS

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
B	The blank exhibited a positive result greater than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
H	Sample was analyzed outside recommended hold time.
HT	At clients request, sample was analyzed outside recommended hold time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
N	Gasoline result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
P	Detection levels of Methylene Chloride may be laboratory contamination, due to previous analysis or background levels.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits, post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

CHAIN OF CUSTODY RECORD

Specialty Analytical
11711 SE Capps Road
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Contact Person/Project Manager: JOHN RUDDICK
Company: EHM
Address: PO BOX 1746
LK OSWEGO OR 97035
Phone: 503 287 4620 Fax: 503 287 4620
Project No.: 13002 Project Name: FRITO LAY
Project Site Location OR ___ WA X Other ___
Invoice To: EHM P.O. No. ___

Collected By:
Signature: [signature]
Printed: JOHN RUDDICK

Signature: ___
Printed: ___

Turn Around Time
☒ Normal 5-7 Business Days
☐ Rush ___
Specify

Rush Analyses Must Be Scheduled With The Lab In Advance

For Laboratory Use
Lab Job No. 0905156
Shipped Via: CLIENT
Air Bill No. —
Temperature On Receipt 5 °C
Specialty Analytical Containers? Y / N
Specialty Analytical Trip Blanks? Y / N

Date	Time	Sample I.D.	Matrix	No. of Containers	NWTPH Dx/Si.O₂	NWTPH Gx	EPH	VPH	RBDM VOLS	PAH					Comments	Lab I.D.
5/26/09	1015	FL-01	SOIL	4	X	X									Run additional tests on Highest DX	
5/26/09	1045	FL-02	↓	4	X	X										
"	1140	FL-04		4	X	X										
↓	1150	FL-04-5		1	X	X										
	1225	FL-05		4	X										Run additional tests on Highest DX	
	1205	FL-05-1		2	X											
	1305	FL-07		4	X											
	1250	FL-07-2		2	X											
	1310	FL-07-12		1											HOLD	
	1430	FL-07-WT30		1											HOLD	
	1555	FL-06		4	X											
↓	1640	FL-08	↓	4	X											

Relinquished By: [signature] Date: 5/27/09 Time: 1035
Company: EHM

Received By:
Company:

Relinquished By: Date: Time:
Company:

Received For Lab By: [signature] Date: 5/27/09 Time: 1035

Unless Reclaimed, Samples Will Be Disposed of 60 Days After Receipt.
Samples held beyond 60 days subject to storage fee(s)

Copies: White-Original Yellow-Project File Pink-Customer Copy

CHAIN OF CUSTODY RECORD

Specialty Analytical
11711 SE Capps Road
Clackamas, OR 97015
Phone: 503-607-1331
Fax: 503-607-1336

Contact Person/Project Manager: JOHN RUDDICK
Company: EHM
Address: PO Box 1746
LK OSWEGO OR 97035
Phone: 5032574620 Fax: 5032874620
Project No.: 13002 Project Name: FRITO LAY
Project Site Location OR ____ WA X Other ____
Invoice To ____ P.O. No. ____

Collected By: J. RUDDICK
Signature: J. RUDDICK
Printed: JOHN RUDDICK

Signature ____
Printed ____

Turn Around Time
☒ Normal 5-7 Business Days
☐ Rush ____
Specify
Rush Analyses Must Be Scheduled With The Lab In Advance

For Laboratory Use
Lab Job No. 0905156
Shipped Via: Client
Air Bill No. ____
Temperature On Receipt 5 °C
Specialty Analytical Containers? Y / N
Specialty Analytical Trip Blanks? Y / N

Date	Time	Sample I.D.	Matrix	No. of Containers	Analyses: NWTPH Dx/Si Gel	NWTPH Gx	EPA	VPH	RBDM VOCs	PAH	Comments	Lab I.D.
5/26/09	1630	FL-05-2	SOIL	1	X							
5/26/09	1515	FL-07-W	WATER	9			X	X	X	X	? EXT PAH + NAPH	
"	1530	FL-00-W	"	9			X	X	X	X	VOCs PENDING EPH/EPA	

Relinquished By:	Company:	Date	Time	Received By:	Company:	Relinquished By:	Company:	Date	Time
J. RUDDICK	EHM	5/27/09	1035						

Unless Reclaimed, Samples Will Be Disposed of 60 Days After Receipt.
Samples held beyond 60 days subject to storage fee(s)

Received For Lab By: ____ Date 5/27/09 Time 1035

Copies: White-Original Yellow-Project File Pink-Customer Copy

SECTION 14. APPENDIX

Photo 1: Sample locations, East side of lift, looking North. FL-07 in foreground. Rams beyond handrail to left.

Photo 2: Ramp with hydraulic lift beyond, looking North. FL-08 in foreground on concrete ramp.

Photo 3: Sample locations East side of lift, looking south. FL-04 in foreground. Note U/G power to right, crossing to lift, rams beyond stairs to right.

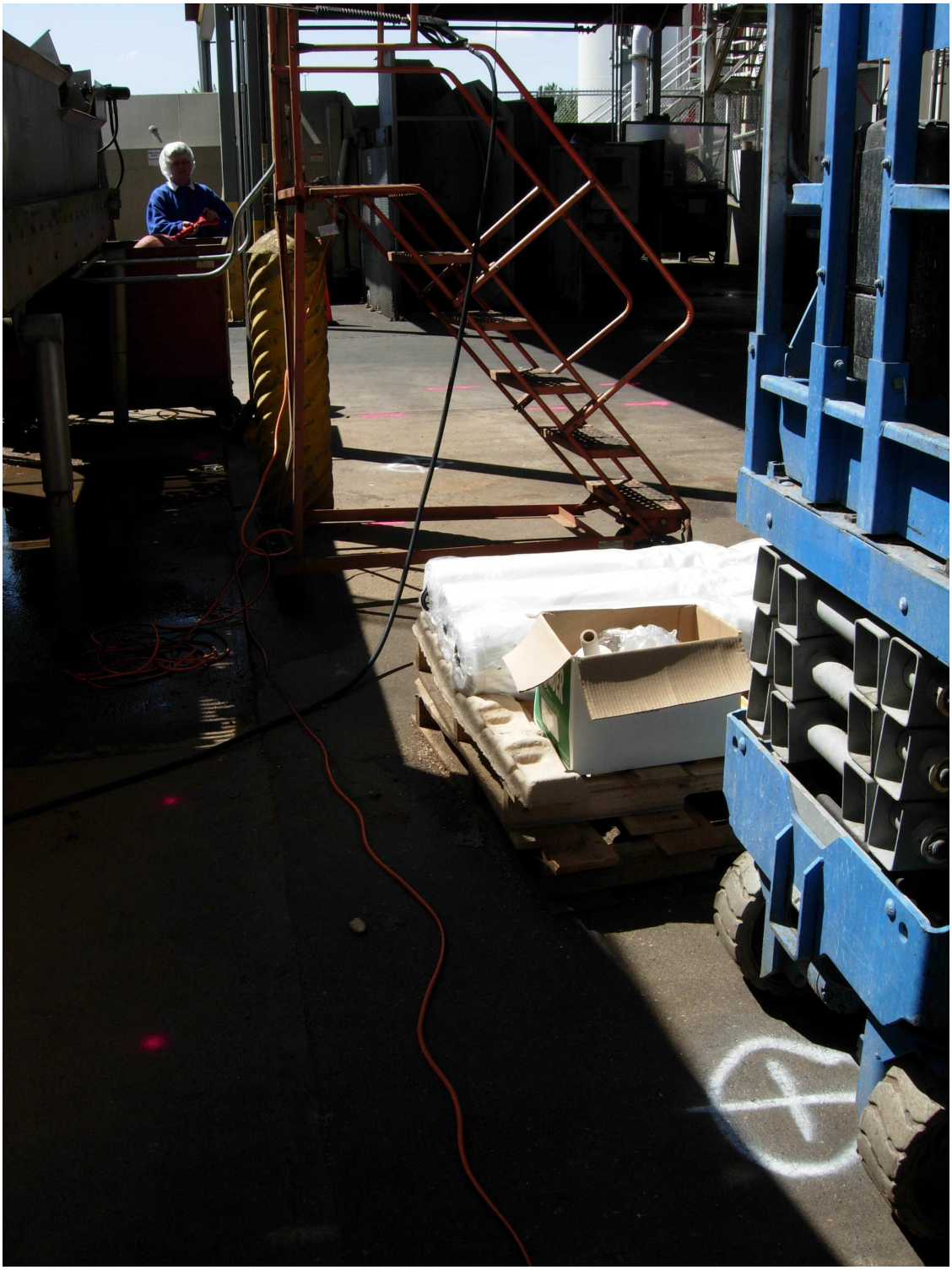


Photo 4: Sample locations at North end of lift, looking West. FL-02 in foreground with FL-01 distant near yellow post.

Photo 5: Sample locations at North end of lift, looking South. FL-01 to right. Cleanup sample 4-2 located to right of red drop box

FRITO-LAY

Hydraulic Lift Area Soil Cleanup Project

Confirmation Samples

PAH, Solids and Other Organic Results

Sample ID:		1	2	2-2	3	4	6	7	7-2	8	9	9-2	18
Sample Date:		12/30/2004	12/30/2004	1/7/2005	12/30/2004	12/30/2004	12/30/2004	1/3/2005	1/7/2005	1/3/2005	1/3/2005	1/7/2005	1/12/2005
PAHs	**Units**												
Acenaphthene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Acenaphthylene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Anthracene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Benzo(a)anthracene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Benzo(a)pyrene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Benzo(b)fluoranthene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Benzo(j)fluoranthene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Benzo(k)fluoranthene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Benzo(g,h,i)perylene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Chrysene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Dibenz(a,h)acridine	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Dibenz(a,j)acridine	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Dibenzo(a,h)anthracene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
7H-Dibenzo(c,g)carbazole	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Dibenzo(a,e)pyrene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Dibenzo(a,h)pyrene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Dibenzo(a,i)pyrene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Fluoranthene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Fluorene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Indeno(1,2,3-c,d)pyrene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
3-methylcholanthrene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Naphthalene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Phenanthrene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Pyrene	mg/Kg	N/A	N/A	0.50 U	N/A	N/A	N/A	N/A	0.50 U	N/A	N/A	0.50 U	0.50 U
Volatile Organics	**Units**												
EDB	mg/Kg	N/A	N/A	0.001 U	N/A	N/A	N/A	N/A	0.001 U	N/A	N/A	0.001 U	0.001 U
Other	mg/Kg	N/A	N/A	0.100 U	N/A	N/A	N/A	N/A	0.100 U	N/A	N/A	0.100 U	0.100 U
Pesticides	**Units**												
Lindane	mg/Kg	N/A	N/A	0.010 U	N/A	N/A	N/A	N/A	0.010 U	N/A	N/A	0.010 U	0.010 U
DDT	mg/Kg	N/A	N/A	0.010 U	N/A	N/A	N/A	N/A	0.010 U	N/A	N/A	0.010 U	0.010 U
PCBs	**Units**												
Total PCBs	mg/Kg	N/A	N/A	0.05 U	N/A	N/A	N/A	N/A	0.05 U	N/A	N/A	0.05 U	0.05 U
Solids	**Units**												
Total Solids	% (w/w)	80.3	77.1	N/A	81.5	90.9	92.0	93.0	N/A	88.8	92.9	N/A	81.4

Notes:

[a] EPA Region IX 2004 Preliminary Remedial Goals (PRGs)

[b] CLARC Version 3.1 Spreadsheet Soil Values

U = not detected at the limit of detection shown

N/E = Criterion not established for this analyte

N/A = Not analyzed for this analyte

Analytes exceeding one or more MTCA criterion are highlighted in RED.

FRITO-LAY
Hydraulic Lift Area Soil Cleanup Project
Confirmation Samples
Metals and Petroleum Hydrocarbon Results

Sample ID:		EPA PRG[a]		Ecology Human Health[b]			1	2	2-2	3	4	6	7	7-2	8	9	9-2	18
Sample Date:	**Units**	Residential	Industrial	Method A	Method B	B Industrial	12/30/2004	12/30/2004	1/7/2005	12/30/2004	12/30/2004	12/30/2004	1/3/2005	1/7/2005	1/3/2005	1/3/2005	1/7/2005	1/12/2005
Metals, TCLP																		
Arsenic	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	0.500 U	N/A	N/A	N/A	N/A	0.500 U	N/A	N/A	0.500 U	0.500 U
Barium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	2.106	N/A	N/A	N/A	N/A	1.442	N/A	N/A	0.300	0.100 U
Cadmium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	0.100 U	N/A	N/A	N/A	N/A	0.100 U	N/A	N/A	0.100 U	0.100 U
Chromium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	0.300	N/A	N/A	N/A	N/A	0.216	N/A	N/A	0.180	0.150 U
Lead	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	0.390 U	N/A	N/A	N/A	N/A	0.390 U	N/A	N/A	0.390 U	0.390 U
Mercury	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	0.170 U	N/A	N/A	N/A	N/A	0.170 U	N/A	N/A	0.170 U	0.170 U
Selenium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	0.630 U	N/A	N/A	N/A	N/A	0.630 U	N/A	N/A	0.630 U	0.630 U
Silver	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	0.130 U	N/A	N/A	N/A	N/A	0.130 U	N/A	N/A	0.130 U	0.130 U
Metals, Total																		
Arsenic [c]	mg/Kg	0.39	1.6	20	20	0.67	N/A	N/A	6.786	N/A	N/A	N/A	N/A	0.500 U	N/A	N/A	3.080	0.50 U
Barium	mg/Kg	5,400	67,000	N/E	N/E	5,600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	151.51
Cadmium	mg/Kg	37	450	2	2	80	N/A	N/A	1.501	N/A	N/A	N/A	N/A	1.396	N/A	N/A	1.112	1.065
Chromium [d]	mg/Kg	100,000	10,000	2,000	2,000	120,000	N/A	N/A	20.084	N/A	N/A	N/A	N/A	7.968	N/A	N/A	14.007	14.401
Lead	mg/Kg	400	800	250	1,000	N/E	N/A	N/A	10.548	N/A	N/A	N/A	N/A	3.554	N/A	N/A	5.872	12.548
Mercury	mg/Kg	23	310	2.0	2.0	24	N/A	N/A	0.170 U	N/A	N/A	N/A	N/A	0.170 U	N/A	N/A	0.170 U	0.17 U
Selenium	mg/Kg	390	5,100	N/E	N/E	400	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.63 U
Silver	mg/Kg	390	5,100	N/E	N/E	400	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.346
Chromium (VI)	mg/Kg	30	64	19	19	240	N/A	N/A	0.20 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Petroleum																		
NWTPH-Gx	mg/Kg	N/E	N/E	30/100	30/100	N/E	N/A	N/A	N/A	N/A	N/A	N/A	4.00 U	N/A	N/A	4.00 U	N/A	4.0 U
NWTPH-Dx Diesel	mg/Kg	N/E	N/E	2,000	2,000	N/E	25.0 U	25.0 U	N/A	25.0 U	158	56.9	55.1	N/A	25.0 U	54.5	N/A	41.4 U
NWTPH-Dx Oil	mg/Kg	N/E	N/E	2,000	2,000	N/E	50.0 U	72.4	N/A	50.0 U	565	245	124.0	N/A	83.2	257.0	N/A	82.9 U
NC6-12 Gas	mg/Kg	N/E	N/E	30/100	30/100	N/E	N/A	N/A	50 U	N/A	N/A	N/A	N/A	50 U	N/A	N/A	50 U	50 U
NC>12-22 Diesel	mg/Kg	N/E	N/E	2,000	2,000	N/E	N/A	N/A	50 U	N/A	N/A	N/A	N/A	50 U	N/A	N/A	50 U	50 U
NC>22-35 Lube Oil	mg/Kg	N/E	N/E	2,000	2,000	N/E	N/A	N/A	50 U	N/A	N/A	N/A	N/A	50 U	N/A	N/A	1,360	50 U
NC>35-40 Heavy Oil	mg/Kg	N/E	N/E	2,000	2,000	N/E	N/A	N/A	50 U	N/A	N/A	N/A	N/A	50 U	N/A	N/A	110	50 U
NC6-40 Total HC	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	50 U	N/A	N/A	N/A	N/A	50 U	N/A	N/A	1,470	50 U

Notes:

[a] EPA Region IX 2004 Preliminary Remedial Goals (PRGs)

[b] CLARC Version 3.1 Spreadsheet Soil Values

[c] Arsenic background concentrations in Vancouver are typically > Human health risk-based criteria but generally less than 8.0 mg/Kg.

[d] Total chromium oxidation states not determined. PRGs and MTCA values are for Cr (III)

U = not detected at the limit of detection shown

N/E = Criterion not established for this analyte

N/A = Not analyzed for this analyte

Analytes exceeding one or more MTCA criterion are highlighted in RED.

FRITO-LAY

Hydraulic Lift Area Soil Cleanup Project

Sample Location Data

Sample Number	Sample Type	Map Location	Depth (Ft bgs)	Comments
S1	Characterization	W of rams	0-0.5	Surface soil
S2	Characterization	W of rams	3.0	At clay layer
S3	Characterization	S near ramp	0-0.5	Surface soil
Rainwater	Characterization	W Runoff	N/A	Stormwater from surface
1	Confirmation	N center of exc.	3.0	Base of excavation
2	Confirmation	Center of exc.	3.0	Base of excavation
2-2	Confirmation	Center of exc.	3.0	Resample of 2 for MTCA analyses
3	Confirmation	S center of exc.	3.0	Base of excavation
4	Confirmation	NE Sidewall	3.0	Sidewall sample
4-2	Residual	NE Sidewall	1.5	Resample of 4 for MTCA analyses
5	Confirmation	Center Sidewall	1.5	Sidewall sample
6	Confirmation	SE Sidewall	1.5	Sidewall sample
6-2	Residual	SE Sidewall	1.5	Resample of 6 for MTCA analyses
7	Confirmation	NW corner exc.	1.5	Base of excavation
7-2	Confirmation	NW corner exc.	1.5	Resample of 7 for MTCA analyses
8	Confirmation	W center exc.	1.5	Base of excavation
9	Confirmation	SW corner exc.	5.0	Base of excavation
9-2	Confirmation	SW corner exc.	5.0	Resample of 9 for MTCA analyses
10	Confirmation	NW of exc.	1.5	Not analyzed per 7, 8 and 9 results
11	Confirmation	SW of exc.	1.5	Not analyzed per 7, 8 and 9 results
12	Residual	below ram foundn	1.0	6" east of E sidewall
13	Residual	below ram foundn	1.0	12" east of E sidewall
14	Residual	below ram foundn	1.0	24" east of E sidewall
15	Residual	below ram foundn	1.0	36" east of E sidewall
15-2	Residual	below ram foundn	1.5	Resample of 15 for MTCA analyses
16	Residual	5' S of 12	1.0	24" east of E sidewall
17	Residual	5' S of 12	1.0	36" east of E sidewall
18	Confirmation	N edge of exc.	2.0	Base of excavation

FRITO-LAY
Hydraulic Lift Area Soil Cleanup Project
Site Characterization Results

Sample ID:		S-1	S-2	S-3	Rainwater	
Sample Date:	**Units**	12/28/2004	12/28/2004	12/28/2004	**Units**	12/28/2004
Metals, TCLP						
Arsenic	mg/L	0.500 U	N/A	N/A		N/A
Barium	mg/L	0.504	N/A	N/A		N/A
Cadmium	mg/L	0.100 U	N/A	N/A		N/A
Chromium	mg/L	0.150 U	N/A	N/A		N/A
Lead	mg/L	0.390 U	N/A	N/A		N/A
Mercury	mg/L	0.170 U	N/A	N/A		N/A
Selenium	mg/L	0.630 U	N/A	N/A		N/A
Silver	mg/L	0.130 U	N/A	N/A		N/A
Metals, Total						
Arsenic	mg/Kg	N/A	N/A	N/A		N/A
Cadmium	mg/Kg	N/A	N/A	N/A		N/A
Chromium	mg/Kg	N/A	N/A	N/A		N/A
Lead	mg/Kg	N/A	N/A	N/A		N/A
Mercury	mg/Kg	N/A	N/A	N/A		N/A
Chromium VI	mg/Kg	N/A	N/A	N/A		N/A
Petroleum						
NWTPH-Gx	mg/Kg	N/A	N/A	N/A		N/A
NWTPH-Dx Diesel	mg/Kg	N/A	N/A	N/A		N/A
NWTPH-Dx Oil	mg/Kg	N/A	N/A	N/A		N/A
NC6-12 Gas	mg/Kg	N/A	N/A	N/A		N/A
NC>12-22 Diesel	mg/Kg	N/A	N/A	N/A		N/A
NC>22-35 Lube Oil	mg/Kg	N/A	N/A	N/A		N/A
NC>35-40 Heavy Oil	mg/Kg	N/A	N/A	N/A		N/A
Total HC (418.1)	mg/Kg	4,700	235.1	265.4		N/A
PAHs						
Acenaphthene	mg/Kg	50 U	N/A	N/A		N/A
Acenaphthylene	mg/Kg	50 U	N/A	N/A		N/A
Anthracene	mg/Kg	50 U	N/A	N/A		N/A
Benzo(a)anthracene	mg/Kg	50 U	N/A	N/A		N/A
Benzo(a)pyrene	mg/Kg	50 U	N/A	N/A		N/A
Benzo(b)fluoranthene	mg/Kg	50 U	N/A	N/A		N/A
Benzo(g,h,i)perylene	mg/Kg	50 U	N/A	N/A		N/A
Benzo(k)fluoranthene	mg/Kg	50 U	N/A	N/A		N/A
Chrysene	mg/Kg	50 U	N/A	N/A		N/A
Dibenzo(a,h)anthracene	mg/Kg	50 U	N/A	N/A		N/A
Fluoranthene	mg/Kg	50 U	N/A	N/A		N/A
Fluorene	mg/Kg	50 U	N/A	N/A		N/A
Indeno(1,2,3-c,d)pyrene	mg/Kg	50 U	N/A	N/A		N/A
Naphthalene	mg/Kg	50 U	N/A	N/A		N/A
Phenanthrene	mg/Kg	50 U	N/A	N/A		N/A
Pyrene	mg/Kg	50 U	N/A	N/A		N/A
Volatile Organics						
EDB	mg/Kg (1)	0.003 U	N/A	N/A		N/A
Other	mg/Kg (1)	0.01 U	N/A	N/A	mg/L	0.100 U
Pesticides						
Lindane	mg/Kg	0.01 U	N/A	N/A		N/A
DDT	mg/Kg	0.01 U	N/A	N/A		N/A
PCBs						
Total PCBs	mg/Kg	0.05 U	N/A	N/A		N/A
Solids						
Total Solids	% (w/w)	N/A	N/A	N/A		N/A

Notes: 1) EDB and Volatile Organics incorrectly reported in mg/L by laboratory for sample S-1.

U = not detected at the limit of detection shown

N/A = Not analyzed for this analyte

FRITO-LAY

Hydraulic Lift Area Soil Cleanup Project

Residual Contamination Samples

Analytical Results

Sample ID:		EPA PRG[a]		Ecology Human Health[b]			12@6	13@12	14@24	15@36	15-2	16@24	17@36	5	4-2	6-2
Sample Date:	**Units**	Residential	Industrial	A Unrestricted	A Industrial	B Unrestricted	1/6/2005	1/6/2005	1/6/2005	1/6/2005	1/7/2005	1/6/2005	1/6/2005	12/30/2004	1/7/2005	1/7/2005
Metals, TCLP																
Arsenic	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.500 U	N/A	N/A	N/A	0.500 U	0.500 U
Barium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	1.442	N/A	N/A	N/A	1.442	1.442
Cadmium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.100 U	N/A	N/A	N/A	0.100 U	0.100 U
Chromium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.216	N/A	N/A	N/A	0.216	0.216
Lead	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.390 U	N/A	N/A	N/A	0.390 U	0.390 U
Mercury	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.170 U	N/A	N/A	N/A	0.170 U	0.170 U
Selenium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.630 U	N/A	N/A	N/A	0.630 U	0.630 U
Silver	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.130 U	N/A	N/A	N/A	0.130 U	0.130 U
Metals, Total																
Arsenic	mg/Kg	0.39	1.6	20	20	0.67	N/A	N/A	N/A	N/A	0.520	N/A	N/A	N/A	0.500 U	2.851
Cadmium	mg/Kg	37	450	2	2	80	N/A	N/A	N/A	N/A	1.984	N/A	N/A	N/A	2.317	2.532
Chromium	mg/Kg	100,000	100,000	2,000	2,000	120,000	N/A	N/A	N/A	N/A	30.016	N/A	N/A	N/A	9.846	20.965
Lead	mg/Kg	400	800	250	1,000	N/E	N/A	N/A	N/A	N/A	10.555	N/A	N/A	N/A	3.118	10.225
Mercury	mg/Kg	23	310	2.0	2.0	24	N/A	N/A	N/A	N/A	0.170 U	N/A	N/A	N/A	0.170 U	0.170 U
Chromium VI	mg/Kg	30	64	19	19	240	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Petroleum																
NWTPH-Gx	mg/Kg	N/E	N/E	30/100	30/100	N/E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NWTPH-Dx Diesel	mg/Kg	N/E	N/E	2,000	2,000	N/E	1,150	4,790	3,380	4,860	N/A	2,740	4,010	2,910	N/A	N/A
NWTPH-Dx Oil	mg/Kg	N/E	N/E	2,000	2,000	N/E	2,740	8,650	7,910	12,700	N/A	10,800	16,900	6,750	N/A	N/A
NC6-12 Gas	mg/Kg	N/E	N/E	30/100	30/100	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	455	50 U
NC>12-22 Diesel	mg/Kg	N/E	N/E	2,000	2,000	N/E	N/A	N/A	N/A	N/A	135	N/A	N/A	N/A	3,980	86
NC>22-35 Lube Oil	mg/Kg	N/E	N/E	2,000	2,000	N/E	N/A	N/A	N/A	N/A	8,485	N/A	N/A	N/A	125	1,979
NC>35-40 Heavy Oil	mg/Kg	N/E	N/E	2,000	2,000	N/E	N/A	N/A	N/A	N/A	460	N/A	N/A	N/A	50 U	205
NC6-40 Total HC	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	9,080	N/A	N/A	N/A	4,560	2,270
PAHs																
Acenaphthene	mg/Kg	3,700	29,000	N/E	N/E	4,800	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Acenaphthylene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Anthracene	mg/Kg	22,000	100,000	N/E	N/E	24,000	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(a)anthracene	mg/Kg	0.62	2.10	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(a)pyrene	mg/Kg	0.062	0.210	0.1	2.0	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(b)fluoranthene	mg/Kg	0.62	2.10	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(j)fluoranthene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(k)fluoranthene	mg/Kg	6.2	21	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(g,h,i)perylene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Chrysene	mg/Kg	0.062	0.210	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenz(a,h)acridine	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenz(a,j)acridine	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenzo(a,h)anthracene	mg/Kg	0	0	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
7H-Dibenzo(c,g)carbazole	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenzo(a,e)pyrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenzo(a,h)pyrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenzo(a,i)pyrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Fluoranthene	mg/Kg	2,300	22,000	N/E	N/E	3,200	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Fluorene	mg/Kg	2,700	26,000	N/E	N/E	3,200	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Indeno(1,2,3-c,d)pyrene	mg/Kg	0.62	2.10	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
3-methylcholanthrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Naphthalene	mg/Kg	56	190	5	5	1,600	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Phenanthrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Pyrene	mg/Kg	2,300	29,000	N/E	N/E	2,400	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Volatile Organics																
EDB	mg/Kg	0.032	0.073	0.005	0.005	0.0118	N/A	N/A	0.001 U	N/A	0.001 U	N/A	N/A	N/A	0.001 U	0.001 U
Other	mg/Kg	Varies	Varies	Varies	Varies	Varies	N/A	N/A	0.10 U	N/A	0.100 U	N/A	N/A	N/A	3.128 [a,c]	0.100 U
Pesticides																
Lindane	mg/Kg	0.44	1.70	0.01	0.01	0.769	N/A	N/A	0.010 U	N/A	0.010 U	N/A	N/A	N/A	0.010 U	0.010 U
DDT	mg/Kg	1.7	7.0	3	4	2.94	N/A	N/A	0.010 U	N/A	0.010 U	N/A	N/A	N/A	0.010 U	0.010 U
PCBs																
Total PCBs	mg/Kg	3.9/0.22	21/0.74	1	10	N/E	N/A	N/A	0.05 U	N/A	0.05 U	N/A	N/A	N/A	0.05 U	0.05 U
Solids																
Total Solids	% (w/w)	N/E	N/E	N/E	N/E	N/E	81.1	86.5	86.6	89.5	N/A	90.3	81.6	84.7	N/A	N/A

NOTES: a: Total 8260 volatiles. Detected analytes are: benzene - 0.726 mg/Kg, ethylbenzene - 0.180 mg/Kg, toluene - 1.604 mg/Kg, xylenes - 0.618 mg/Kg.

U = not detected at the limit of detection shown

N/A = Not analyzed for this analyte

N/E = Criterion not established for this analyte

Analytes exceeding one or more MTCA criterion are highlighted in RED.

File Original with Department of Ecology
Second Copy Owner's Copy
Third Copy Driller's Copy 116511

WATER WELL REPORT
STATE OF WASHINGTON

Notice of Intent R0522 54
UNIQUE WELL I D # AGP-461
Water Right Permit No

(1) **OWNER** Name Clark Public Utilities Address PO Box 8900, Vancouver, WA 98668

(2) **LOCATION OF WELL** County Clark NE 1/4 NW 1/4 Sec 16 T 2 N R 1E WM

(2a) **STREET ADDRESS OF WELL** (or nearest address)

TAX PARCEL NO 147361000

(3) **PROPOSED USE** ☐ Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☒ Test Well ☐ Other ☐ DeWater

(4) **TYPE OF WORK** Owner's number of well (if more than one) TW-4
☒ New Well Method ☐ Dug ☐ Bored ☐ Deepened ☐ Cable ☐ Driven ☐ Reconditioned ☒ Rotary ☐ Jetted ☐ Decommission

(5) **DIMENSIONS** Diameter of well 8 inches
Drilled 178 feet Depth of completed well 155 ft

(6) **CONSTRUCTION DETAILS**
Casing Installed
☒ Welded 8 Diam from +2 ft to 70 ft
☐ Liner installed Diam from ft to ft
☐ Threaded Diam from ft to ft

Perforations ☐ Yes ☒ No
Type of perforator used
SIZE of perforations in by in
perforations from ft to ft

Screens ☒ Yes ☐ No ☐ K Pac Location 66 Ct
Manufacturer's Name Johnson stainless steel
Type ~~See screen description~~ Model No
Diam Slot Size from ft to ft
Diam Slot Size from ft to ft

Gravel/Filter packed ☐ Yes ☒ No ☐ Size of gravel/sand
Material placed from ft to ft

Surface seal ☒ Yes ☐ No To what depth? 18 ft
Material used in seal Bentonite Chips
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

(7) **PUMP** Manufacturer's Name
Type H P

(8) **WATER LEVELS** Land surface elevation above mean sea level 20 ft
Static level 11.1 ft below top of well Date 6/18/02
Artesian pressure lbs per square inch Date
Artesian water is controlled by (Cap valve etc)

(9) **WELL TESTS** Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes by whom? P&G / Holt
Yield 703 gal /min with 465 ft drawdown after 9 hrs
Yield gal /min with ft drawdown after hrs
Yield gal /min with ft drawdown after hrs
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
1	11.4	5	11.25	30	11.19
2	11.32	10	11.23	60	11.19
3	11.3	20	11.20		

Date of test
Bailer test gal /min with ft drawdown after hrs
Airtest gal /min with ft drawdown after hrs
Artesian flow g p m Date
Temperature of water 53°F Was a chemical analysis made? ☒ Yes ☐ No

RECEIVED
JUN 28 2002
Washington State Department of Ecology

(10) **WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION**
Formation Describe by color character size of material and structure and the kind and nature of the material in each stratum penetrated with at least one entry for each change of information Indicate all water encountered

MATERIAL	FROM	TO
Brown SILT	0	33
Gray-black fine SAND	33	53
Gray-black silty SAND & GRAVEL	53	70
Gray-black, med-coarse SAND & GRAVEL	70	77
Gray-black, medium-coarse SAND	77	93
Brown-black, medium-coarse SAND	93	117
Brown-black silty fine-coarse SAND	117	120
Brown-black SAND & GRAVEL	120	163
Brown-black slightly silty to silty SAND & GRAVEL	163	178
Screens:		
66-70 - blank pipe w/k-packer		
70-90 - 8" telescopic screen-60 slot		
90-96 - blank pipe		
96-110 - 8" telescopic screen-60 slot		
110-116 - blank pipe		
116-152 - 8" telescopic screen-80 slot		

Work Started 5/28 2002 Completed 6/19 2002

WELL CONSTRUCTION CERTIFICATION

I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Type or Print Name Randy Holt License No 1099
(Licensed Driller/Engineer)

Trainee Name License No
Drilling Company Holt Drilling Inc
(Signed) Randy Holt License No 1099
(Licensed Driller/Engineer)
Address PO Box 1890 Milton WA 98354
Contractors Registration No HOLTDI360CG Date 6/24/02

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer For special accommodation needs contact the Water Resources Program at (360) 407 6600 The TDD number is (360) 407 6006

ECY 050 1 20 (11/98)

A2. 1B Worksheet for Calculating Soil Cleanup Levels for Protection of Human Health: (Soil Direct Contact Pathway)
Method B: Unrestricted Land Use (WAC 173-340-740)

Date: 5/26/2009
Site Name: Frito Lay Vancouver
Sample Name: FL-07-2

Chemical of Concern or EC group	Current Condition				Adjusted Condition			
	Measured Soil Conc @dry basis	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction								
AL_EC >5-6	0.75	5.97E-06			5.32E+00	4.24E-05		
AL_EC >6-8	0.75	5.97E-06			5.32E+00	4.24E-05		
AL_EC >8-10	0.75	3.38E-04			5.32E+00	2.40E-03		
AL_EC >10-12	0.75	3.38E-04			5.32E+00	2.40E-03		
AL_EC >12-16	59.8	3.59E-02			4.24E+02	2.55E-01		
AL_EC >16-21	170	1.53E-03			1.21E+03	1.09E-02		
AL_EC >21-34	1780	1.60E-02			1.26E+04	1.14E-01		
AR_EC >8-10	0.75	1.01E-04			5.32E+00	7.20E-04		
AR_EC >10-12	5.2	3.52E-03			3.69E+01	2.50E-02		
AR_EC >12-16	3.1	1.12E-03			2.20E+01	7.92E-03		
AR_EC >16-21	46.3	2.78E-02			3.29E+02	1.97E-01		
AR_EC >21-34	120	5.40E-02			8.52E+02	3.83E-01		
Benzene	0		0.00E+00		0.00E+00		0.00E+00	
Toluene	0				0.00E+00			
Ethylbenzene	0				0.00E+00			
Total Xylenes	0				0.00E+00			
Naphthalene	0.0261	2.16E-05			1.85E-01	1.53E-04		
1-Methyl Naphthalene	0.0504	1.29E-05			3.58E-01	9.19E-05		
2-Methyl Naphthalene	0.062	1.99E-04			4.40E-01	1.41E-03		
n-Hexane	0.16	3.61E-05			1.14E+00	2.56E-04		
MTBE	0				0.00E+00			
Ethylene Dibromide (EDB)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0.00414		3.99E-09	*For*	2.94E-02		2.83E-08	*For*
Benzo(b)fluoranthene	0.00414		3.99E-09	*all*	2.94E-02		2.83E-08	*all*
Benzo(k)fluoranthene	0.00414		3.99E-09	*cPAHs*	2.94E-02		2.83E-08	*cPAHs*
Benzo(a)pyrene	0.00414		3.99E-08		2.94E-02		2.83E-07	
Chrysene	0.00414		3.99E-10		2.94E-02		2.83E-09	
Dibenz(a,h)anthracene	0.00414		3.99E-09	Σ Risk=	2.94E-02		2.83E-08	Σ Risk=
Indeno(1,2,3-cd)pyrene	0.00414		3.99E-09	6.03E-08	2.94E-02		2.83E-08	4.28E-07
Sum	**2188.47748**	1.41E-01	6.03E-08		1.55E+04	1.00E+00	4.28E-07	

TEST CURRENT CONDITION

Measured TPH Soil Conc, mg/kg= 2188.477
HI= 1.409E-01
RISK= 6.030E-08
Pass or Fail? Pass
Check Residual Saturation (WAC340-747(10))

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate protective TPH soil concentration based on various soil quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH Soil Conc

Selected Criterion: @HI=1
Most Stringent? YES
Protctive TPH Soil Conc, mg/kg = 15531.72
HI = 1.00E+00
RISK = 4.28E-07

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

Test Adjusted TPH Soil Conc

Tested TPH Soil Conc, mg/kg =
HI =
RISK =
Pass or Fail?

A2. 2 Worksheet for Calculating Soil Cleanup Level for the Protection of Ground Water Quality: (Leaching Pathway)
WAC 173-340-740 and 747

Washington State Department of Ecology, Toxics Cleanup Program: Soil Cleanup Level for TPH Sites - Protection of Potable Ground Water

Date: 5/26/2009
Site Name: Frito Lay Vancouver
Sample Name: FL-07-2

Chemical of Concern or EC Group	Measured Soil Conc @dry basis	GW Cleanup Level	Adjusted Condition: Soil Conc being tested	Predicted Conc @Well	HQ @ Well	RISK @ Well	Pass or Fail?
	mg/kg	ug/L	mg/kg	ug/L	unitless	unitless	
Petroleum EC Fraction							
AL_EC >5-6	0.75		2.41E+01	2.66E+00	1.95E-04		
AL_EC >6-8	0.75		2.41E+01	3.25E-01	2.39E-05		
AL_EC >8-10	0.75		2.41E+01	1.99E-02	8.31E-05		
AL_EC >10-12	0.75		2.41E+01	1.28E-03	5.34E-06		
AL_EC >12-16	59.8		1.92E+03	1.83E-03	3.81E-06		
AL_EC >16-21	170		5.47E+03	6.58E-06	2.06E-10		
AL_EC >21-34	1780		5.72E+04	5.37E-10	1.68E-14		
AR_EC >8-10	0.75		2.41E+01	3.25E+00	4.06E-03		
AR_EC >10-12	5.2		1.67E+02	8.02E+00	5.01E-02		
AR_EC >12-16	3.1		9.97E+01	9.63E-01	1.20E-03		
AR_EC >16-21	46.3		1.49E+03	9.99E-01	2.08E-03		
AR_EC >21-34	120		3.86E+03	2.65E-02	4.15E-05		
Benzene	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Toluene	0	1000	0.00E+00	0.00E+00	0.00E+00		
Ethylbenzene	0	700	0.00E+00	0.00E+00	0.00E+00		
Total Xylenes	0	1000	0.00E+00	0.00E+00	0.00E+00		
Naphthalene	0.0261	160	8.39E-01	5.08E-02	3.17E-04		
1-Methyl Naphthalene	0.0504		1.62E+00	7.11E-02	1.78E-04		
2-Methyl Naphthalene	0.062		1.99E+00	8.60E-02	2.69E-03		
n-Hexane	0.16		5.14E+00	1.41E-01	2.94E-04		
MTBE	0	20	0.00E+00	0.00E+00	0.00E+00		
Ethylene Dibromide (EDB)	0	0.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0	5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0.00414	for	1.33E-01	1.37E-06		1.14E-11	for
Benzo(b)fluoranthene	0.00414	all	1.33E-01	1.98E-07		1.65E-12	all
Benzo(k)fluoranthene	0.00414	cPAHs	1.33E-01	1.06E-07		8.81E-13	cPAHs
Benzo(a)pyrene	0.00414	Risk=	1.33E-01	2.14E-07		1.78E-11	
Chrysene	0.00414	1E-05	1.33E-01	2.33E-07		1.95E-13	
Dibenz(a,h)anthracene	0.00414		1.33E-01	2.98E-07		2.49E-12	Σ Risk=
Indeno(1,2,3-cd)pyrene	0.00414		1.33E-01	2.65E-09		2.21E-14	3.45E-11
Sum	2188.47748		7.04E+04	1.66E+01	6.13E-02	3.45E-11	Pass

Site-Specific Hydrogeological Properties previously entered:

Item	Symbol	Value	Units
Total soil porosity:	n	0.43	unitless
Volumetric water content:	Θ_w	0.3	unitless
Volumetric air content:	Θ_a	0.13	unitless
Soil bulk density measured:	ρ_b	1.5	kg/L
Fraction Organic Carbon:	f_{oc}	0.001	unitless
Dilution Factor:	DF	20	unitless

Target Ground Water TPH conc adjusted previously if any:

Target Ground Water TPH Conc, ug/L ⇒ 0

CALCULATE PROTECTIVE CONDITION OR TEST ADJUSTED CONDITION

Calculate or Test

@ HI=1

Pass or Fail? YES

Tested TPH Soil Conc, mg/kg = **100% NAPL**

Predicted TPH GW Conc, ug/L = 1.66E+01

RISK @ Well = 3.45E-11

HI @Well = 6.13E-02

DEDAILED MODEL RESULTS TPH Range Test

Type of model used for computation:	4-Phase Model
Computation completed?	Yes!
Initial Weighted Average MW of NAPL, g/mol:	351.9
Equilibrated Weighted Average MW of NAPL, g/mol:	352.0
Initial Weighted Average Density of NAPL, kg/L:	0.812
Volumetric NAPL Content, Θ_{NAPL} :	1.3E-01
NAPL Saturation (%), Θ_{NAPL}/n :	30.23%
100% NAPL, mg/kg	70368.5
Mass Distribution Pattern @ 4-phase in soil pore system:	Mass Balance Pattern
Total Mass distributed in Water Phase: 0.00%	in Solid: 0.00%
Total Mass distributed in Air Phase: 0.00%	in NAPL: 100.00%

Please Check Soil Residual Saturation TPH Levels: Refer to Table 747-5!

B. Worksheet for Calculating Potable Ground Water Cleanup Levels (Method B only) WAC 173-340-720

1. Enter Site Information

Date: 5/26/2009
Site Name: Frito Lay Vancouver
Sample info: FL-07-W

2. Enter Ground Water Concentration Measured

Notes for Data Entry

Chemical of Concern or EC Group	Measured GW Conc	GW Cleanup Level	Current Condition HQ	Current Condition RISK	Current Condition Pass or Fail?	Adjusted Condition GW Conc being tested	Adjusted Condition HQ	Adjusted Condition RISK	Adjusted Condition Pass or Fail?
	ug/L	ug/L	unitless	unitless		ug/L	unitless	unitless	
Petroleum EC Fraction									
AL_EC >5-6	12.5		9.19E-04			2.15E+01	1.58E-03		
AL_EC >6-8	12.5		9.19E-04			2.15E+01	1.58E-03		
AL_EC >8-10	12.5		5.21E-02			2.15E+01	8.94E-02		
AL_EC >10-12	12.5		5.21E-02			2.15E+01	8.94E-02		
AL_EC >12-16	47.5		9.90E-02			8.15E+01	1.70E-01		
AL_EC >16-21	47.5		1.48E-03			8.15E+01	2.55E-03		
AL_EC >21-34	1400		4.38E-02			2.40E+03	7.51E-02		
AR_EC >8-10	12.5		1.56E-02			2.15E+01	2.68E-02		
AR_EC >10-12	12.5		7.81E-02			2.15E+01	1.34E-01		
AR_EC >12-16	47.5		5.94E-02			8.15E+01	1.02E-01		
AR_EC >16-21	47.5		9.90E-02			8.15E+01	1.70E-01		
AR_EC >21-34	47.5		7.42E-02			8.15E+01	1.27E-01		
Benzene	0	5							
Toluene	0	1000							
Ethylbenzene	0	700							
Total Xylenes	0	1000							
Naphthalene	0.0237	160	1.48E-04			4.07E-02	2.54E-04		
1-Methyl Naphthalene	0.0237		5.93E-05			4.07E-02	1.02E-04		
2-Methyl Naphthalene	0.0237		7.41E-04			4.07E-02	1.27E-03		
n-Hexane	2.5		5.21E-03			4.29E+00	8.94E-03		
MTBE	0	20							
Ethylene Dibromide (EDB)	0	0.01							
1,2 Dichloroethane (EDC)	0	5							
Benzo(a)anthracene	0.0237	for		1.98E-07	*for*	4.07E-02		3.39E-07	*for*
Benzo(b)fluoranthene	0.0237	all		1.98E-07	*all*	4.07E-02		3.39E-07	*all*
Benzo(k)fluoranthene	0.0237	cPAHs		1.98E-07	*cPAHs*	4.07E-02		3.39E-07	*cPAHs*
Benzo(a)pyrene	0.0237	Risk =		1.98E-06		4.07E-02		3.39E-06	
Chrysene	0.0237	1E-05		1.98E-08		4.07E-02		3.39E-08	
Dibenz(a,h)anthracene	0.0237			1.98E-07	Σ Risk=	4.07E-02		3.39E-07	Σ Risk=
Indeno(1,2,3-cd)pyrene	0.0237			1.98E-07	2.99E-06	4.07E-02		3.39E-07	5.12E-06
Sum	**1715.237**		5.83E-01	2.99E-06		2.94E+03	1.00E+00	5.12E-06	

TEST CURRENT CONDITION

Measured TPH GW Conc, ug/L = 1715.237
HI = 5.827E-01
RISK = 2.986E-06
Pass or Fail? Pass

Please check WAC 246-290-310!

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate a protective TPH ground water concentration based on various ground water quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH GW Conc

Selected Criterion: @ HI=1
Most Stringent? YES
Protective TPH GW Conc, ug/L = 2943.82
HI = 1.00E+00
RISK = 5.12E-06

SUMMARY OF PROTECTIVE GW CONCENTRATIONS

Protective GW TPH Conc, ug/L				
Most Stringent Criterion				
Ground Water Criteria	Most Stringent?	GW TPH, ug/L	RISK @	HI @
HI = 1				
Total Risk = 1E-5				
Total Risk = 1E-6				
Benzene MCL = 5 ug/L				
MTBE = 20 ug/L				
Risk of cPAHs = 1E-5				
Toluene =1000 ug/L				
Ethylbenzene = 700 ug/L				
Total Xylenes = 1000 ug/L				

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

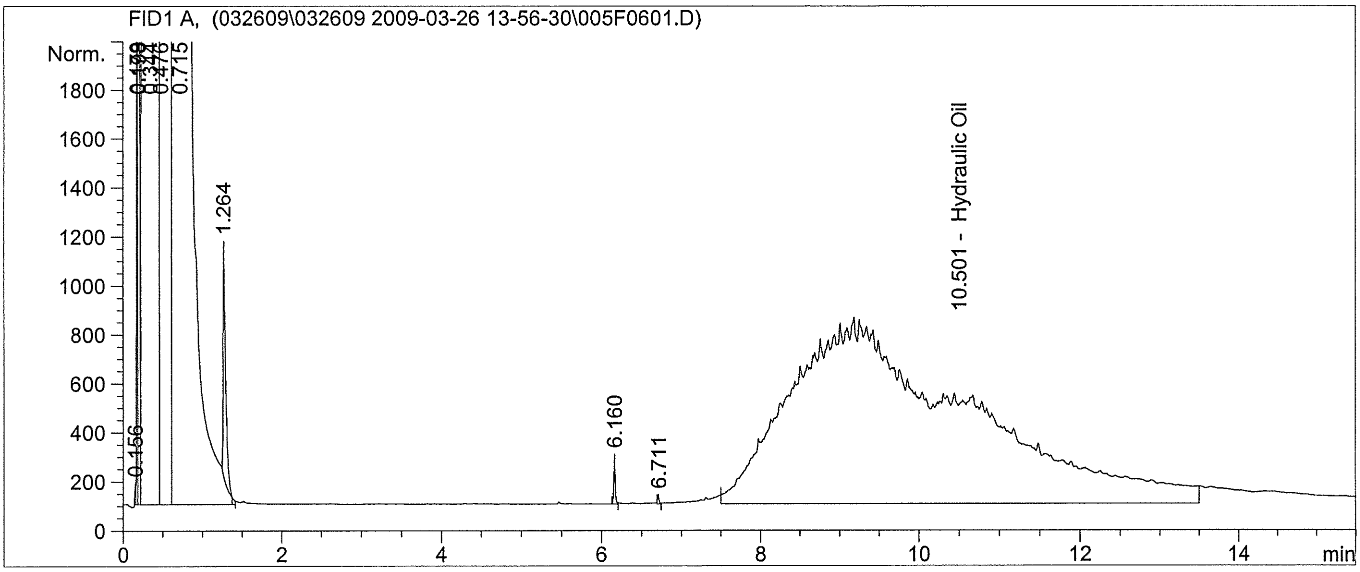
Test Adjusted TPH GW Conc

Tested TPH GW Conc, ug/L=
HI=
RISK=
Pass or Fail?

Data File C:\CHEM32\1\DATA\032609\032609 2009-03-26 13-56-30\005F0601.D
Sample Name: 2K HO CAL SVWS-2434

===

Acq. Operator : JRP   Seq. Line : 6
Acq. Instrument : GC-M   Location : Vial 5
Injection Date : 3/26/2009 3:57:16 PM   Inj : 1
Inj Volume : 5 µl
Acq. Method : C:\Chem32\1\DATA\032609\032609 2009-03-26 13-56-30\DUAL_ACQ.M
Last changed : 3/18/2009 11:17:10 AM by JRP
Analysis Method : C:\CHEM32\1\METHODS\HYF032609.M
Last changed : 3/27/2009 8:04:17 AM by JRP
Method Info : Dx Aquisition Method 1/10/2007



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External Standard Report

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Sorted By : Signal
Calib. Data Modified : Friday, March 27, 2009 8:03:52 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ng/ul]	Grp	Name
10.501	HHA+	1.15938e5	1.81476e-2	2103.99002		Hydraulic Oil

Totals : 2103.99002

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*** End of Report ***

Data File C:\CHEM32\1\DATA\052909\052909 2009-05-29 17-46-38\019F2401.D
Sample Name: 0905155-08A

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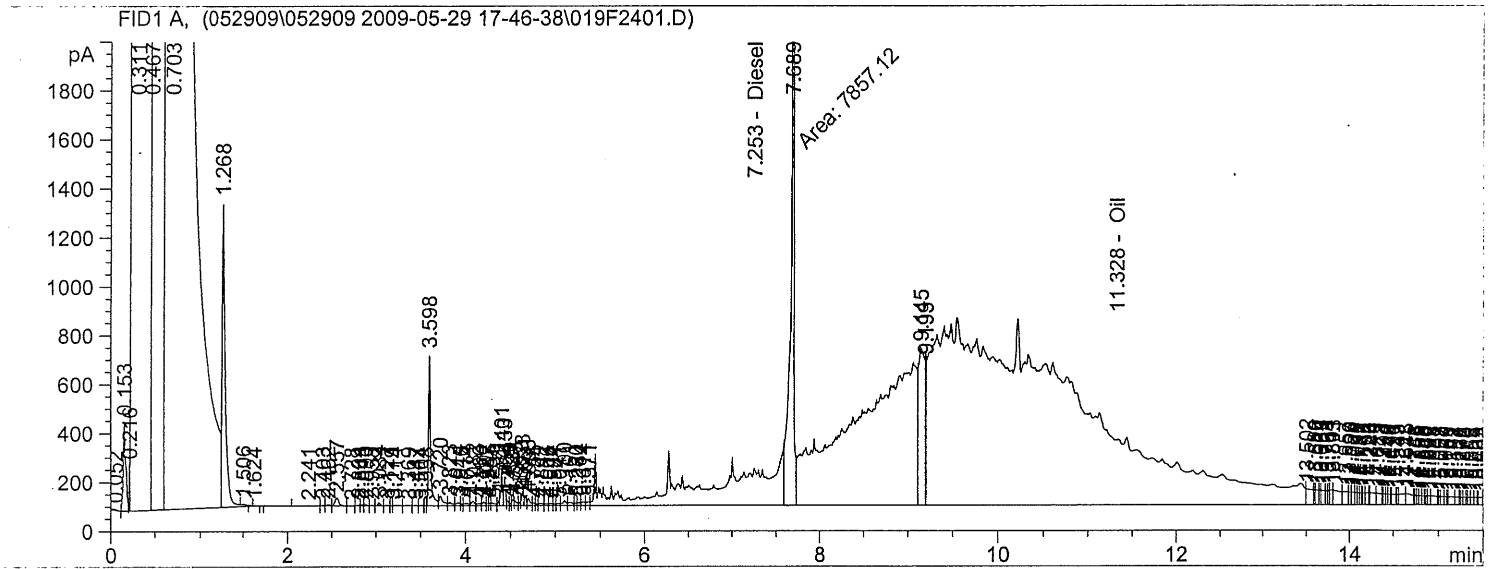
Acq. Operator	: das	Seq. Line :	24
Acq. Instrument	: GC-M	Location :	Vial 19
Injection Date	: 5/30/2009 12:25:54 AM	Inj :	1
		Inj Volume :	5 µl

Acq. Method : C:\Chem32\1\DATA\052909\052909 2009-05-29 17-46-38\DUAL_ACQ.M
Last changed : 4/29/2009 9:03:40 AM by JRP
Analysis Method : C:\CHEM32\1\METHODS\NF031809.M
Last changed : 5/5/2009 8:38:24 AM by JRP
Method Info : Dx Aquisition Method 1/10/2007



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External Standard Report

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Sorted By	:	Signal
Calib. Data Modified	:	Thursday, March 19, 2009 9:41:59 AM
Multiplier	:	1.0000
Dilution	:	1.0000

Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount	Grp	Name
7.253	HHAR	3.97530e4	1.73942e-2	691.47282		Diesel A1
11.328	HHA+	8.70031e4	2.66200e-2	2316.01883		Oil A2 6/2/09

Totals : 3007.49165

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*** End of Report ***

Vertical Attenuation Estimate

Cleanup samples below ram area

Location	TPH mg/kg
12-6	3,890
13-12	13,440
14-24	11,290
15-36	17,560
15-2	9,080
16-24	13,540
17-36	20,910
Average	**12,816** mg/kg

Diameter	10	ft	Width of lift
Area	79	ft^2	Calculated
Depth	3	ft	Assumed from adjacent data
Volume	236	ft^3	Volume of soil at average concentration
Assumed [HC] @ saturation	2,000	mg.kg	
Total volume of soil needed	1509.82	ft^3	

Assume a frustrum of a cone with top surface 10' diameter and slope angle of 25°

Diameter of base at h feet:	18.52615	feet	D
tan 25° =	0.466308	feet	
Length a =	4.663077	feet	
Diameter at top of frustrum:	10	feet	d
Volume of frustrum:	1513.728	ft^3	

pi/12 h (D^2+Dd+d^2)

angle =	25	
h=	**9.2**	**Depth to equilibrium at saturation**
D=	18.52615	
d=	10	