BEE-JAY SCALES SITE
PHASE I REMEDIAL INVESTIGATION REPORT

Sunnyside, Washington
October 2003

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Bee-Jay Scales Site
Sunnyside, Washington

Prepared by:

SECOR International Incorporated
2321 Club Meridian Dr., Suite E
Okemos, MI 48864

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1.0 INTRODUCTION

This document summarizes the Phase I Remedial Investigation (RI) completed by SECOR International Incorporated (SECOR) on behalf of the Chevron Environmental Management Company (ChevronTexaco) and BP America, Incorporated (BP) at the Bee-Jay Scales Site in Sunnyside, Washington (the Site). This project is being implemented in accordance with the Washington State Department of Ecology (Ecology) Washington Model Toxics Control Act (MTCA) and Agreed Order No. DE 02TCPCR-3932.

1.1 PURPOSE

The purpose of this report is to summarize the sampling activities conducted as part of the Phase I investigation and present the data generated to focus the Phase II RI data collection and treatability study activities.

1.2 REPORT ORGANIZATION

The remaining sections of this report are organized as follows:

- The remaining portions of Section 1 include a summary of the Site description and historical operations, as well as a summary of previous investigations;
- A summary of the Phase I RI activities, including soil boring and monitoring well installation and sampling, quality control procedures, and deviations from the approved RI/FS Work Plan is presented in Section 2;
- Section 3 presents the environmental setting at and surrounding the Site, including descriptions of topography, climate, geology, and hydrogeology;
- An analytical data summary, including comparisons of analytical data to appropriate MTCA cleanup criteria, and a discussion of the soil leaching to groundwater pathway are included in Section 4;
- Section 5 includes a re-evaluation of the cleanup action alternatives, and a discussion of the proposed treatability study components;
- Summary and conclusions are presented in Section 6.

1.3 SITE BACKGROUND

Information regarding historical operations and previous investigations at the Site has been adapted from the *Remedial Investigation/Feasibility Study Work Plan, Bee-Jay Scales Site, Sunnyside, WA* (CH2M Hill, February 2003). The RI/FS Work Plan was approved by Ecology in March 2003.

1.3.1 Site Description

The Site is located in the city of Sunnyside, within Yakima County, and is composed of two property parcels: Parcel No. 22102522014 and Parcel No. 22102522015 as recorded by the Yakima County Department of Assessment. Parcel No. 22102522014 is located at 116 North 1st Street, and is owned by Bee-Jay Scales, Inc. Parcel No. 22102522015 is located at 301 Warehouse Avenue, and is owned by Hickenbottom & Sons, Inc. Hickenbottom & Sons also owns additional, contiguous property on which their business is located. The Site location is shown on Figure 1-1, and the Site layout, including building locations, is shown on Figure 1-2.

1.3.2 Site History

A summary of ownership at the Site was prepared by ChevronTexaco and is included in Appendix A. The Site and adjacent properties have been the location of agricultural warehouses, lumber yards, coal storage, and railroad transportation activities since approximately 1906.

Portions of the Site were owned by the Northern Pacific Railroad Company from 1906 until 1989 when purchased by the Glacier Park Company (GPC). An agricultural distribution facility operated at the Site from the 1960s through at least 1986. This facility consisted of buildings and above ground storage tanks (ASTs), and was operated by at least two separate companies: Laneger Agricultural Services and Valley Agricultural Inc. Documentation also indicates that during 1970s American Oil Company, now known as Amoco, leased portions of this property from Northern Pacific Railroad. The ASTs have since been removed from the Site. A lagoon was constructed by Valley Agricultural Inc. in the early 1980s to collect water from the washdown of farm chemical applicator vehicles.

The western portion of Lot 10 was purchased by the Chevron Chemical Company in 1981 and sold to Bee-Jay Scales, Inc. in 1987. Bee-Jay Scales, Inc. purchased additional portions of Lots 10 and 11 in 1995 and 1996. Hickenbottom & Sons leased a portion of the Site from the Northern Pacific Railroad Company beginning in 1961 and purchased portions of Lots 10 and 11 in 1992. The Hickenbottom property was previously used as pastureland and since 1961 has been used for food packing, storage, and a transportation business.

Three businesses currently operate at the Bee-Jay Scales portion of the property: Sandy Farms, a local trucking company; Sanleco, Inc., an interstate trucking company with an on-site tractor-trailer repair garage; and Bee-Jay Scales, a commercial scale operation.

Hickenbottom & Sons, Inc. is a food-processing and distribution company. Most of Hickenbottom & Sons' current operation consists of a refrigeration warehouse. The Hickenbottom property that makes up a portion of the Site is currently leased to the Johnson Fruit Company and is used to store produce bins, pallets, tractor-trailer rigs, and other miscellaneous equipment. The remainder of the Hickenbottom & Sons property is used for tractor-trailer and produce storage, as well as transportation.

1.3.3 Previous Investigations

The following environmental investigations have been conducted previously at the Site:

- Phase I and II environmental site assessments (ESAs) conducted by Hart Crowser;
- Phase II ESA conducted by White Shield, Inc. for Hickenbottom & Sons;
- Leaking underground storage tank (LUST) assessment and clean-up conducted by PLSA Engineering & Surveying (PLSA) for Hickenbottom & Sons; and
- Environmental media sampling conducted by Ecology in 1997.

Summaries of these previous investigations are provided below.

<u>Preliminary Environmental Site Assessment (Hart Crowser, March 1990)</u>
A limited Phase I ESA of the GPC Property Sequence No. 3833 was performed in 1990. The Phase I ESA included a site history profile, a regulatory agency list review, and a site reconnaissance. The Phase I ESA did not identify records of spills or releases. Based on visual observations and historical activities identified, the areas of potential concern include the following:

- The lagoon on the portion of the Site operated by Sandy Farms was suspected of leakage. Leakage of agricultural chemicals was suspected before lining of the lagoon and possibly through the liner at the time of the assessment.
- Soils around the washdown area north of the lagoon were suspected to be contaminated. The area was used to wash agricultural chemical applicator vehicles.
- Four ASTs located west of the lagoon that historically contained chemical fertilizers were identified.
- An underground storage tank (UST), UST-1, was identified in the Sandy Farm yard. UST-1 was formerly used to store leaded gasoline.
- Exterior drum storage areas, one of which was unpaved, were observed during the reconnaissance in or adjacent to Sandy Farms and Hickenbottom & Sons. Some of the drums were observed to be corroded. Storage of batteries in an exterior area in the northeast corner of the parcel was also observed.
- The concrete floor of Building 2 (as shown on Figure 1-2), occupied by Sandy Farms, was observed to be pitted. The report presumed that the pitting resulted from spills of agricultural chemicals previously stored in the building. A release of agricultural chemicals through the deteriorated flooring may have resulted in contamination of soil and groundwater.
- Green to yellow soil staining was observed in an area approximately 1,500 square feet in size located in the center of the Sandy Farms yard. This staining was suspected by one of the Sandy Farms representatives to be a result of "dinitro or other herbicides." It was not clear if this staining was the result of possible application of herbicides or of a possible release of herbicides.
- In addition, UST-2 and UST-3 were identified near Building 4 (as shown on Figure 1-2) on the Hickenbottom & Sons property located adjacent to the Site. UST-2 is a 12,000-gallon tank formerly used to store diesel fuel, and UST-3 is a 1,000-gallon tank formerly used to store leaded gasoline.

Subsurface Exploration and Testing GPC Property (Hart Crowser, July 1990)

A Phase II ESA was conducted by Hart Crowser for GPC to collect soil and groundwater samples from areas of potential concern identified in the Phase I report. The Phase II report, *Subsurface Exploration and Testing Glacier Park Company Property* (Hart Crowser, July 1990), summarizes the findings. The purpose of the Phase II work was to accomplish two goals: (1) assess whether the historical activities identified in the Phase I report resulted in significant subsurface contamination, and (2) estimate potential clean-up costs based on the scope of work. Areas on the Site that were addressed in this report include the following:

- Drum storage west of Building 1 (as shown on Figure 1-2);
- Agricultural chemical truck washdown area and lagoon;
- Three liquid fertilizer ASTs; and
- Areas of green and yellow soil staining.

UST-1, UST-2, and UST-3, located on the Hickenbottom & Sons property immediately adjacent to the Site, were also addressed. Exploration work included excavating test pits, performing hand-auger borings, drilling soil borings, and installing four monitoring wells. Groundwater was encountered at a depth of approximately ten feet below ground surface (bgs) with apparent flow direction toward the south. Hart Crowser reported that the groundwater was encountered within a relatively low permeability silt horizon that may be in hydraulic contact with underlying water-

producing horizons used for local domestic water supplies. The report recommended additional data collection to better define aquifer characteristics beneath the Site.

White Shield Phase II Environmental Site Assessment

A Phase II ESA of a portion of the Site was performed by White Shield (September 1991) for Hickenbottom & Sons. The investigation was initiated after the Hart Crowser (July 1990) report indicated pesticides, herbicides, and fertilizer residues existed on the Hickenbottom & Sons lease area near the washdown area and in the lagoon on the adjacent Sandy Farms lease area. The study area was limited to the lease area between the Sandy Farms lagoon and the Hickenbottom & Sons cold storage building and loading dock. Soil and groundwater samples were collected from soil borings at nine locations within the study area. Following this investigation, a portion of the property was replatted and ownership transferred to Hickenbottom & Sons.

Leaking Underground Storage Tank Environmental Site Assessment and Intermediate Clean-Up

A LUST assessment and intermediate clean-up was performed at the Hickenbottom & Sons lease site by PLSA (February 1992). A 12,000-gallon steel UST that formerly contained diesel fuel and a 1,000-gallon steel UST that formerly contained gasoline were removed from the Hickenbottom & Sons property. Both tanks were reported by PLSA to be located in a common tank basin north of the site building and truck scales. This area is adjacent to and west of the Site.

During the removal of the USTs, petroleum contamination was observed in the surrounding soils. Water was observed by PLSA to be seeping into the bottom of the excavation at an approximate depth of 13 feet bgs. PLSA stated that “free groundwater” was not encountered. PSLA staff monitored the removal of the USTs and the petroleum-contaminated soils. Approximately 2,500 cubic yards of petroleum-contaminated soils were excavated and placed on site for remediation by land farming. A letter from PLSA to Mr. Jerry Hickenbottom, dated April 16, 1992, states that samples collected from the landfarmed soils in April 1992 did not have concentrations of gasoline or diesel fuel above the method detection limits (MDLs). According to Ecology records, this Site has not received a letter of no further action (NFA) from Ecology.

Ecology Sampling

In 1997, Ecology conducted limited sampling and analysis of groundwater, soils, and lagoon sediment at the Site. Groundwater was sampled from two of the monitoring wells installed during the Hart Crowser Phase II ESA: MW-3 and MW-4 (See Figure 2-1). An additional water sample, identified as UNK, is included in the general chemistry sample results. The location of the sample and source of the water could not be determined from available records. The precise locations of the soil sample (AST 1) and the location of the lagoon sediment sample (LAG 01) are also not identified, but they are assumed to have been collected from surface soils in the vicinity of the former ASTs and within the lagoon containment.

2.0 SUMMARY OF PHASE I RI ACTIVITIES

The Phase I RI activities at the Site included a soil investigation, groundwater investigation, and a well inventory. The soil and groundwater investigation activities are described below, and the well inventory is discussed in Section 3.6. A discussion of the results of the soil and groundwater investigation is presented in Section 4.

2.1 PHASE I SOIL INVESTIGATION

SECOR completed the Phase I soil investigation in July 2003. Soil samples were collected from borings installed in each of the six identified areas at the Site. Boring locations can be found on Figure 2-1.

2.1.1 Soil Boring Installation and Sampling Procedures

Soil borings were installed by hand auger to a depth of 4.5 feet bgs, and then advanced to the water table with a truck-mounted drilling rig using a 4-inch inside diameter (ID) hollow-stem auger (HSA). All drilling and sampling equipment was decontaminated both before and after drilling. At boring completion, boreholes not converted to monitoring wells were decommissioned by sealing the borehole with hydrated bentonite chips and gravel or concrete, consistent with Washington Administrative Code (WAC) 173-160.

In five of the six identified areas, discrete soil samples were collected from the boring wall during hand clearing at the depth interval of 0.5 feet bgs to 1.5 feet bgs, and by split spoon sampler at depth intervals of 4.5 feet bgs to 6.0 feet bgs and 9.5 feet bgs to 11.0 feet bgs, and were submitted for laboratory analysis. When a shallow water table was encountered, discrete samples from the interval above groundwater were collected at a depth of 7.5 feet bgs and submitted for analysis. In Area 5, only surface soil samples were collected from the boring wall during hand clearing at depths between 0.5 feet and 1.5 feet bgs, as required by the RI/FS Work Plan, and submitted for laboratory analysis.

A portion of soil was retained from each split spoon for visual inspection, lithologic description, and field-screening for the presence of hydrocarbons. Visual inspection consisted of screening the sample for visual indications of hydrocarbons and testing for sheen by water immersion. Soil lithology was described using the United Soil Classification System (USCS). Lithologic descriptions included soil type(s), color, grain size/texture, degree of consolidation, and moisture content. Field-screening was completed by monitoring headspace vapor concentrations using a photoionization detector (PID). Observations were recorded on boring logs, which are included in Appendix B. When odor or high PID readings were observed, a discrete soil sample was collected from that interval and submitted for laboratory analysis.

2.1.2 Summary of Sampling Plan

Groups of chemical parameters for the soil sampling plan at the Site were defined by the RI/FS Work Plan as follows:

- Conventional A parameters: ammonia, nitrite, nitrate, phosphate, sulfate, chloride, pH, and moisture content;
- Conventional B parameters: total organic carbon (TOC), grain size distribution, and void ratio/porosity;
- Conventional C parameters: agronomic analyses including extractable cations; sodium bicarbonate; cation exchange capacity (CEC); diethylenetriaminepentaacetic acid (DTPA)-available iron, manganese, zinc, and copper; electrical conductivity in saturated

paste (ECe); calcium, magnesium, sodium, and chloride in saturation extract; and void ratio.

The number of borings in each area and the corresponding chemical analyses are identified below:

Area 1 - Liquid Fertilizer Plant and Truck Wash Area
Eight soil borings were installed in Area 1. Soil samples from all eight borings were analyzed for Conventional A parameters, Conventional C parameters, pesticides, herbicides, and metals. Samples from three of the borings were also analyzed for Conventional B parameters, and samples from two of the borings were analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

Area 2 - Dry Fertilizer
Seven soil borings were installed in Area 2. Soil samples from all seven borings were analyzed for Conventional A parameters, pesticides, herbicides, and metals. Samples from two of the borings were also analyzed for Conventional B parameters.

Area 3 - Drum Storage Area
Two soil borings were installed in Area 3, and samples from both borings were analyzed for Conventional A parameters, total petroleum hydrocarbon (TPH)-Gx, TPH-Dx, VOCs, SVOCs, pesticides and metals. Soil samples from one of the borings were also analyzed for Conventional B parameters.

Area 4 - Suspected Historical Washdown Area
Six soil borings were installed in Area 4, and samples from these borings were analyzed for Conventional A parameters, TPH-Gx, TPH-Dx, pesticides, herbicides, and metals. Soil samples from two of the borings were also analyzed for Conventional B parameters, VOCs, and SVOCs.

Area 5 - North Area
Five shallow soil borings were installed in Area 5. Soil samples from all five borings were analyzed for Conventional A parameters, TPH-Hydrocarbon Identification (HCID), pesticides, herbicides, and metals, and samples from two of the five borings were analyzed for Conventional B parameters.

Area 6 - Hickenbottom Area
A total of seven soil borings were installed in Area 6, two of which were shallow. Soil samples from all seven borings were analyzed for Conventional A parameters, TPH-HCID, pesticides, and herbicides. Samples from one boring were also analyzed for Conventional B parameters and VOCs, and samples from the two shallow borings were also analyzed for metals.

Soil analyses were conducted by Merit Laboratories, Inc. for all constituents except Conventional C parameters. Analysis for Conventional C parameters was provided by A&L Great Lakes Laboratories.

Chains of Custody for the Phase I RI soil samples are presented in Appendix C. Samples analyzed for conventional parameters also received geotechnical testing for moisture content, grain size distribution, and/or void ratio/porosity. Geotechnical testing results are discussed in Section 3.6 and Section 3.7. The detected soil concentrations are presented in Table 2-1, and results are discussed in Section 4.

2.2 PHASE I GROUNDWATER INVESTIGATION

SECOR completed the Phase I groundwater investigation, including the first quarter of groundwater monitoring, in July 2003.

2.2.1 Monitoring Well Installation

Three, two-inch diameter shallow wells were installed at the Site during Phase I activities. Two of the wells (MW-5 and MW-6) were installed in Area 2, and one well (MW-7) was installed in Area 5. These wells supplement existing groundwater quality information provided by three existing wells MW-1, MW-3, and MW-4. The fourth previously installed monitoring well (MW-2) could not be located during the Phase I RI (See Section 2.4). Monitoring well locations are shown on Figure 2-1.

The borings for each of the monitoring wells were advanced to approximately 30 feet bgs. During well installation, soil samples were collected from the boreholes in the same manner as described in Section 2.1. Well installations were completed with a 10-foot screen installed at a depth interval of 6 feet to 16 feet bgs. Details of well construction are provided on the boring logs included in Appendix B.

Once the wells were completed, each was developed by surging and bailing to remove fine-grained sediment from the formation and filter packs, and increase the hydraulic efficiency of the wells. The wells were surged with a surge block through the full extent of the screened interval while simultaneously being purged. Development was considered complete when each respective well produced water that was relatively free of sediment. At a minimum, three well volumes of groundwater were removed from each well during development. All development equipment was decontaminated to minimize cross-contamination between well locations. Decontamination water was contained in 55-gallon Department of Transportation (DOT)-approved drums and labeled. Seven drums of water and a soil bin containing approximately ten cubic yards of soil were generated during the Phase I investigation, and will be removed from the property by a ChevronTexaco-approved waste hauler, in accordance with state and federal regulations.

A slug test was performed at each new monitoring well to determine the horizontal hydraulic conductivity of the shallow aquifer. Slug test results are discussed in Section 3.7. In addition, each monitoring well was surveyed to establish its horizontal location and to define the top of casing elevation.

2.2.2 Groundwater Sampling Procedures

During the first quarter of groundwater sampling, samples were collected from each of the six located monitoring wells. The groundwater samples were collected using minimal drawdown procedures using a combination of dedicated and non-dedicated equipment. Relevant information was recorded on the groundwater sampling logs, which are included in Appendix D. The groundwater sampling procedures included the following five activities, and were consistent with the activities specified in the RI/FS Work Plan:

- Static water level measurement;
- Field instrument calibration;
- Calculation of the volume to be evacuated;
- Well evacuation and measurement of field water quality parameters; and
- Sample collection.

Decontamination procedures were followed to prevent cross contamination between monitoring wells during water level measurement. The well sounder was decontaminated following each measurements by spray-washing the probe and cable with Liquinox, wiping down the probe and cable, followed by a final rinse with deionized water. Dedicated tubing was used at each monitoring well to prevent cross-contamination during groundwater sampling.

Groups of chemical parameters for the groundwater sampling plan were defined by the RI/FS Work Plan as follows:

- Conventional A parameters: ammonia, nitrite, nitrate, phosphate, sulfate, chloride, and pH; and

- Conventional B parameters: TOC, total suspended solids (TSS), total dissolved solids (TDS), hardness, and alkalinity.

Groundwater samples were analyzed for Conventional A parameters, Conventional B parameters, TPH-HCID, VOCs, SVOCs, pesticides, herbicides and metals. Groundwater analysis was performed by Merit Laboratories. Chains of Custody for the first quarter groundwater samples are included in Appendix C. The detected groundwater concentrations are presented in Table 2-2, and results are discussed in Section 4.

2.3 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

To ensure accuracy in sampling results, the following quality assurance/quality control (QA/QC) samples were collected during the Phase I sampling activities: duplicates, colocates, and trip blanks. Duplicate samples were collected at a frequency of approximately ten percent to evaluate the laboratory's performance by comparing the analytical results of two samples collected at the same location. Two colocated soil borings (located in Areas 4 and 5) were designated to check variability over a short lateral distance. During the groundwater sampling, two trip blanks were submitted for VOC analysis to evaluate cross-contamination of VOCs in the samples. Equipment blanks were not collected during soil and groundwater sampling, trip blanks were not submitted during soil sampling, and duplicates were not collected during groundwater sampling. Duplicate samples will be collected during future groundwater monitoring events. A review of the analytical results shows that duplicate and colocate results were consistent, and results do not indicate that contamination from equipment or cross-contamination of VOCs was an issue.

2.4 DEVIATIONS FROM APPROVED RI/FS WORK PLAN

In general, implementation of the work plan closely followed the scope of work outlined in the RI/FS Work Plan. The following are notable deviations:

- The inspection and sampling of existing monitoring well MW-2 were not completed because this well could not be located;

- The angle-drilled boring suggested for the area north of the lagoon in Area 1 was not advanced due to concerns regarding potential impact to the lagoon liner;

- The location of A6-SB-001 was moved 20 feet to the east to avoid a hornet's nest; and

- Blow counts for soil intervals less than 4.5' in depth were not recorded, as each borehole was hand cleared to 4.5' in depth.

- Samples collected from the shallow soil interval were collected from the boring wall during hand clearing, not by split spoon sampler.

None of these deviations will have a material effect on the integrity of the RI/FS process, nor the quality of other data and results.

3.0 ENVIRONMENTAL SETTING

The Site is located within Yakima County, an important agricultural region of Washington. Major agricultural products that come from the greater Sunnyside area include wine grapes, apples, pears, asparagus, mint, hops, corn, and wheat. Cattle and dairy ranching are also represented within the region. Land use in the immediate vicinity of the Site, within the city of Sunnyside, is primarily industrial and commercial, and these activities support the region's larger agricultural interests. Typical service industries include food processing, agricultural product storage and transfer, pipe manufacturing, warehousing, tank-cleaning services, trucking, and storage. Much of the information regarding the environmental setting, presented below, is adapted from the RI/FS Work Plan.

3.1 TOPOGRAPHY

The Site is located within the Yakima River Valley, at about 750 feet elevation National Geodetic Vertical Datum (NGVD). About 1.5 miles southwest of the Site is Snipes Mountain (elevation of about 1,300 feet NGVD). Rattlesnake Ridge is located approximately 5 miles north of the Site, and the Yakima River is located approximately 4.5 miles southwest of the Site. A series of irrigation canals divert surface water from the Yakima River to serve agricultural and municipal water needs.

3.2 CLIMATE

Climate information for the Site is taken from the Western Regional Climate Center (WRCC) data for Sunnyside, Washington. Climate data have been collected at the Sunnyside station since 1948, up to the present. The annual mean temperature for the Sunnyside area is 52.4 degrees Fahrenheit. Temperatures in the area range from an average winter temperature of 34.3 degrees Fahrenheit to an average summer temperature of 70.3 degrees Fahrenheit. Annual rainfall averages 6.86 inches per year, and snowfall in Sunnyside averages approximately 10.3 inches per year.

The Site is relatively flat, with no significant topographic features that would alter air flow patterns. An air quality monitoring station, maintained by the Yakima Regional Clean Air Authority, is located approximately 0.75-miles southeast of the Site. The primary source of air pollution in Yakima County is motor vehicles. Air quality is poorest during the winter when weather patterns create an inversion layer that traps air. Wood smoke, car exhaust, road dust, and other emissions can collect in this trapped layer until weather conditions change (Yakima County, 1998).

3.3 REGIONAL GEOLOGY

The Site is located in the Columbia Basin (an intermontane basin) located between the Cascade and Rocky Mountains. The Site is within the Yakima Fold Belt, a structural subprovince characterized by dominantly east-west trending anticlinal ridges and synclinal valleys (Reidel *et al*, 1994). Harrison Hill and Snipes Mountain (located just west of Sunnyside) are anticlinal ridges with the latter measuring approximately eight miles in length and one mile in width. Cenozoic age volcanic rocks from the Columbia River Basalt Group (CRBG) and sediments fill the basin. Underlying the CRBG are Tertiary and Quaternary fluvial and glaciofluvial deposits on top of Tertiary age continental sedimentary rocks. The geological details of the region are depicted in Figures 3-1 and 3-2.

The Yakima Fold Belt is underlain by up to 7,000 feet of continental and volcaniclastic sediments, deposited in a basin separated from the adjacent crystalline basement by a suture zone. The CRBG erupted, filling the Yakima Fold Belt basin with up to 4,000 feet of tholeiitic flood basalt. The Ellensburg Formation (a series of epiclastic and volcaniclastic sedimentary rocks) is interlayered with and overlies the CRBG.

Once the CRBG eruptions ceased, folding continued in the Yakima Fold Belt and the Columbia River system controlled rock formation until the Pleistocene, resulting in deposition of the Ellensburg Formation. Sand and gravel were deposited in fluvial channels and alluvial fans. Finer-grained sediments were deposited in broad floodplain-overbank areas within the Columbia River system. The locations of Yakima Fold Belt anticlines controlled the river flow and morphology.

The advance and retreat of continental glacier systems dominated Pleistocene geology in northern North America. Glaciers affected the Columbia Basin predominantly by the damming and flooding of the Columbia River system. Fine-grained flood sediments were deposited in the valleys near Sunnyside. Depositions of loess (fine-grained flood sediments reworked and redeposited by wind) also are common on the slopes and upland areas in the Site vicinity (Busacca and McDonald, 1994; Schuster *et al*, 1997).

Surficial geology at the city of Sunnyside (including the Site) is Quaternary alluvium (Campbell, 1979). The Ellensburg Formation is exposed about 2.5 miles north of Sunnyside and extends west along the flanks of Rattlesnake Ridge (Kinnison and Sceva, 1963).

Soils in the vicinity of the Site were classified by a soil survey conducted for Yakima County as Cleman very fine sandy loam on zero to two- percent slopes (USDA, 1985, sheet 73). The 1985 survey description indicated that Cleman soils included areas of Esquatzel soils. Cleman is a well-drained soil formed in alluvium. Native vegetation on the soil is mainly grasses, forbs, and shrubs. The surface layer is brown very fine sandy loam about ten inches thick. Physical characteristics of the soil include moderate permeability, slow runoff, rare flooding, slight erosion hazard, but high soil blowing hazard. Cutbanks in the soil are not stable and are subject to caving.

3.4 REGIONAL HYDROGEOLOGY

Information in this section is summarized from Molenaar (1985) unless otherwise noted. Groundwater in the region around the Site generally occurs in each of the three major geologic units: unconsolidated Quaternary alluvium, partially consolidated Ellensburg Formation, and the CRBG. The Ellensburg Formation and the basalt aquifer are more productive than the alluvium aquifer. The regional geologic structures (anticlines, synclines, faults, and sedimentary contacts) control the direction and rate of groundwater flow. In general, groundwater flows from the margins of the valleys (structural basins) toward the center and then down the valley axis toward the Yakima River.

The Quaternary alluvium is composed of unconsolidated sand, gravel, and cobbles with minor silt and clay deposited by streams and rivers along their channels and in their flood plains. The thickness of this unit ranges from a few feet to approximately 150 feet. Groundwater occurs under unconfined conditions and generally is at or near the level of water in nearby surface water bodies.

The Ellensburg Formation is composed of partly consolidated sand and gravel, sandstone and siltstone, and minor conglomerate and claystone. The Ellensburg Formation occurs at depths of 100 feet or more in the centers of the valleys and gradually rises to the surface near the ridges. The thickness of the Ellensburg Formation is greatest in the valley middles, up to 1,000 feet. Water-bearing units in the Ellensburg Formation may be as shallow as 50 feet bgs. The shallower units generally occur on the margins of valleys and are unconfined. Deeper zones that are generally beneath the central portions of valleys may be confined.

Sedimentary Ellensburg Formation rocks interlayered with volcanic rocks of the CRBG compose the basalt aquifer, a deep, regional, and highly productive aquifer system. Groundwater occurs in fractures within the rock, rubble zones at the top and base of individual lava flows, pore spaces within the volcanic rock (vesicles and scoria), and in Ellensburg sand and gravel layers between lava flow units. Water-bearing zones may be large or small, ranging from a few feet to more than

50 feet thick with great variations in lateral continuity. Groundwater in the basalt aquifer is generally either confined or may be under artesian pressure because of the morphology of the structural basins formed in the basalts.

Sunnyside is located near the axis of the Wapato syncline, a regional structure that controls groundwater flow. Groundwater in the immediate Sunnyside area is present in the Prosser subbasin of the Lower Yakima Basin (Kennison and Sceva, 1963). Regional groundwater generally flows south-southwest off Rattlesnake Ridge toward the axis of the synclinal valley (Molenaar, 1985) and then continues to flow south-southeast toward the Yakima River (Kennison and Sceva, 1963). Water levels in local wells show seasonal fluctuations related to precipitation, with the levels highest in the late winter and spring and declining summer through fall. Water wells in the Rattlesnake Slope subarea (a groundwater basin extending from the crest of the Rattlesnake Hills to the Yakima River between Union Gap and Prosser) are used primarily for household water supply. Approximately one-third are used for irrigation.

A review of reported domestic and municipal water supply wells within a 1.0-mile radius of the Site was completed as part of the Phase I RI. The search revealed three community wells and eight domestic well sites located within a 1.0-mile radius. A physical inspection of these sites was completed to evaluate the presence and use of all of the reported wells. Figure 3-3 shows the well locations with respect to the Site, and Table 3-1 provides a summary of the well inventory.

Two wells (city of Sunnyside municipal wells #8 and #5) were reported as situated within a 0.25-mile radius of the Site. Well #8 is screened between 305 feet and 375 feet bgs. Well #5 is screened between 388 feet and 450 feet bgs. One other municipal well (well #4A) was located at a distance between 0.25-mile and 0.5-mile from the Site. This well was drilled in 1998 after two municipal wells (well #3 and well #4) were abandoned due to aquifer contamination in 1998. Well #4A is screened between 1359 feet and 1676 feet bgs.

All domestic wells reported were located at a distance greater than 0.25-mile from the Site. Only one of the well records for the domestic wells provided a screened interval: well 23J3 situated between 0.75-mile and 1.0-mile from the Site is screened between 225 and 245 feet bgs.

3.5 REGIONAL SOIL BACKGROUND CHARACTERISTICS

Information regarding background concentrations at the Site was gathered from *Natural Background Soil Metals Concentrations in Washington State* (Publication #94-115, October 1994). The purpose of this publication was to define a range of values that represent the natural concentration of metals in surficial soils throughout Washington. For the Site, the Yakima Basin background concentrations are the most representative, and both the Yakima Basin and State Wide background concentrations are summarized in the table below.

	Al	As	Be	Cd	Cr	Cu	Fe	Pb	Mn	Hg	Ni	Zn
Yakima Basin Background Concentration (mg/kg)	33,400	5	2	1	38	27	51,500	11	1,100	0.05	46	79
State Wide Background Concentration (mg/kg)	37,200	7	2	1	42	36	42,100	17	1,100	0.07	38	86

3.6 SITE GEOLOGY

Three geologic units have been identified at the Site based on subsurface information derived from well-drilling logs. They are, from youngest to oldest, Quaternary Alluvium, the Ellensberg Formation, and CRBG. The geological details of the Site are depicted in Figures 3-4 and 3-5.

The Quaternary Alluvium consists of sandy silt and extends to a depth of at least 24.5 feet below the Site (Hart Crowser, 1990). Bentley *et al* (1993) further divide the alluvium and indicate that the Site is underlain by silt, sand, and gravel deposited by tributaries of the Yakima River and that materials are dominantly of basaltic composition. The Ellensberg Formation, interbedded with silt, sand, gravel, and clay, underlies the alluvium and extends to a depth of approximately 450 feet bgs, based on logs for nearby city of Sunnyside water wells. The Ellensberg Formation is underlain by CRBG rocks to an unknown depth.

The near-surface lithology beneath the Site appears to consist of sandy silt with gravel to a depth of approximately 30 feet, followed by trace clay or clayey silt to the maximum explored depth of 31.5 feet (based on boring logs for monitoring wells and soil borings advanced at the Site during the Phase I RI).

Geotechnical analyses were required by the RI/FS Work Plan to determine soil properties that have an effect on both soil strength and groundwater behavior at the Site. Merit Laboratories provided moisture content determination. SECOR geotechnical laboratory technicians performed void ratio/porosity, grain size distribution, and permeability testing. Laboratory data sheets are provided in Appendix E, and results are summarized below. Permeability results are discussed in Section 3.7.

Moisture Content

As part of the geotechnical analyses required by the RI/FS, the analysis to estimate the moisture content was required for all samples receiving Conventional A analysis, and was performed on a total of 99 samples collected at the Site. The average moisture content of the soil at the Site was estimated as 19.2%. A summary of the moisture content data is provided in Table 3-2.

Porosity/Void Ratio

Analyses to estimate the porosity were performed on 44 samples collected at the Site. Porosity was estimated using a known volume of soil and an assumed specific gravity based on the soil description. Typical specific gravities range from 2.65 for sands to 2.70 for clays. From the porosity estimate, the void ratio was calculated using the following relation (Holtz and Kovacs, 1981):

$$e = \frac{n}{1-n}$$

Where: e = void ratio;
n = porosity.

The porosity/void ratio analysis was required for all samples that received Conventional B or Conventional C analysis. Due to sampling procedures, samples collected from the shallow interval were collected as disturbed samples (using hand auger techniques) and remolded for the porosity testing. Due to low sample recovery during field activities, samples A1-SB-006-7.5' and A3-SB-002-7.5' were also collected as disturbed samples. All other samples from the intermediate interval and the interval above groundwater were collected as undisturbed samples.

The average water content of the void ratio samples was calculated as 22.1%; the estimate for the average Site porosity is 44.4%; and the estimated void ratio for Site soils is 0.80. Typical ranges for a well-graded, clean, fine to coarse sand are 17% to 49% for porosity and 0.20 to 0.95

for void ratio (Holtz and Kovacs, 1981). The Site average falls within these ranges. The calculated water content, porosity estimate, and void ratio estimate for each sample and an average for each of the six areas are summarized in Table 3-3.

Sieve Analysis

The RI/FS also required the grain size distribution be determined for 29 samples collected at the Site. The sieve analyses were performed according to ASTM D 422, and were required for all samples that received Conventional B analysis. The following sieve sizes were used during the analysis: #4 (retains gravel), #10 (retains coarse sand), #40 (retains medium sand), #70, #100, and #200 (retains fine sand).

The average grain size distribution for soils across the Site is as follows: 0.7% gravel, 1.3% coarse sand, 4.0% medium sand, 58.2% fine sand, and 35.8% silt-clay. Most samples were categorized as well-graded, and there was a range of grain size distributions found at the Site, with a majority visually classified as sandy clay, silty clay, or sandy silt. The grain size distribution for each sample and the average for each of the six areas are summarized in Table 3-4.

3.7 SITE HYDROGEOLOGY

Site groundwater was investigated by a previous property owner, GPC, in 1990 (Hart Crowser, 1990). Four monitoring wells were installed, three on the Bee-Jay Scales portion of the Site and one on the Hickenbottom & Sons property. Well logs for the monitoring wells indicate that light-brown silt and sandy silt are present from the surface to a depth of at least 24.5 feet bgs. Groundwater was encountered in the borings at depths between 9 and 13 feet bgs. Eight test pits also were completed at the time the monitoring wells were installed. Groundwater was encountered in the base of the test pits at depths ranging from 9.5 to 11 feet bgs. Groundwater elevations ranged from 740.52 to 741.87 feet NGVD. During a previous investigation at the Site, hydraulic conductivity was estimated by conducting a bail-down test in one well. The shallowest aquifer beneath the Site was found to have relatively low permeability, approximately 10^{-4} centimeters per second (cm/s), and a flow rate of approximately 1 foot per year (ft/yr).

Groundwater at the Site was measured at depths ranging from approximately 7.4 to 11.9 feet bgs during the first quarter of groundwater monitoring. A groundwater elevation map for this event is presented in Figure 3-6. Based on this monitoring event, groundwater flow direction appears to be south-easterly. The estimated average hydraulic conductivity of the water-bearing zone based on results of slug testing on all six monitoring wells during the first quarter monitoring is 5.23E-04 feet per second (ft/s) (1.59E-02 cm/s), and the estimated hydraulic conductivity ranges from 8.44E-06 ft/s to 2.67E-03 ft/s (2.57E-04 cm/s to 8.12E-02 cm/s). The slug test results are included in Appendix F.

As part of the geotechnical analyses required by the RI/FS, the vertical permeability was calculated for one sample collected at the Site to determine the properties of the aquitard. This sample was collected from MW-7 in Area 5 at a depth of 31.5 feet, the depth at which the confining layer was encountered. The permeability was tested according to ASTM D 5084.

The estimated average permeability of the confining layer was determined by geotechnical testing to be 5.1E-06 cm/s, which is within the typical range for a mixture of silt and clay (Holtz and Kovacs, 1981). The laboratory data sheet for permeability testing is included in Appendix E.

4.0 DATA PRESENTATION AND SCREENING

Phase I RI soil and groundwater results were initially screened against Ecology's MTCA Method A Cleanup Levels (CULs) and natural background soil metals concentrations, as discussed in Section 4.1. Section 4.2 presents a comparison of indicator hazardous substances (IHSs) against MTCA Method C CULs, and Section 4.3 presents a leaching discussion. Recommendations for Phase II work are provided in Section 4.4 based on these screening results.

4.1 SCREENING AGAINST METHOD A CLEANUP LEVELS AND NATURAL BACKGROUND SOIL METALS CONCENTRATIONS

Soil analytical results were screened against MTCA Method A CULs. Constituents detected in soil were considered IHSs if the concentration exceeded Method A CULs or if no Method A CUL was available. Analytical results for metals were compared against the natural background metal concentrations for the Yakima Basin (See Section 3.5). Metals detected below natural background were eliminated as potential IHSs. Metals were further evaluated if there was not a Method A CUL available and the concentration exceeded the natural background concentrations.

Groundwater analytical results were screened against Ecology's MTCA Method A CULs documented in the Cleanup Levels and Risk Calculations (CLARC) version 3.1. Constituents detected in groundwater were considered potential IHSs if the concentration exceeded Method A CULs or if no Method A CULs were available.

4.1.1 Soil

Table 4-1 shows all detected soil analytical results screened against Method A CULs and natural background. 4,4'-DDT, arsenic, beryllium, ethylbenzene, iron, lead, manganese, mercury, naphthalene, and TPH-Dx were eliminated as potential IHSs because they did not exceed Method A CULs. All other constituents were retained as potential IHSs for one of the following reasons:

- Detected concentrations exceeded Method A CULs;
- Detected metals concentrations were above natural background; or
- Detected constituents do not have Method A CULs or natural background concentrations available.

Potential soil IHSs include: 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 2-methylnaphthalene, 4,4'-DDE, ammonia-N (as nitrogen), antimony, cadmium, chloride, chromium (total), copper, dinoseb, nickel, nitrate-N, nitrite-N, TPH-Gx, p,m-xylene, phosphate, silver, sulfate, thallium, and zinc.

4.1.2 Groundwater

Table 4-2 shows all detected groundwater analytical results screened against Method A CULs. Lead was detected in one sample, but at a concentration below the Method A CUL. Therefore, lead was eliminated as a potential IHS. All other constituents were retained as potential IHSs, since the concentration exceeded Method A CULs or no Method A CULs were available.

Groundwater IHSs include: 1,2-dichloropropane, 2,4-dichlorophenol, ammonia-N, arsenic, chloride, chlorobenzene, copper, iron, manganese, nickel, o-xylene, p,m-xylene, phosphate, sulfate, total nitrates and nitrites, and zinc.

4.2 SCREENING AGAINST METHOD C CLEANUP LEVELS

Constituents designated as IHSs based on comparison to Method A CULs and/or natural background concentrations were compared to the MTCA Method C CULs, as required by Ecology's MTCA program.

4.2.1 Soil

Table 4-3 shows the comparison of maximum concentrations of potential IHSs in soil against Method C CULs. Method C CULs for 4,4'-DDE, antimony, cadmium, copper, dinoseb, nickel, nitrate-N, nitrite-N, p,m-xylene, silver, thallium, and zinc are presented in CLARC, version 3.1. Standard Method C CULs were developed for 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, total chromium, and TPH mixtures using the "Workbook for Calculating Cleanup Levels for Individual Hazardous Substances." A summary of the input parameters and workbook calculations are found in Appendix G. The only IHS with a maximum concentration exceeding Method C CULs (from both CLARC and calculated) was TPH-Gx.

Toxicity values were not available for 2-methylnaphthalene, ammonia (as nitrogen), chloride, phosphate, and sulfate. Chloride, phosphate, and sulfate are not recognized as hazardous substances by U.S. Environmental Protection Agency (USEPA), as they are not in Table 302.4 – List of Hazardous Substances and Reportable Quantities (40 CFR, Section 302.4). These constituents were analyzed for remedial design purposes rather than for evaluation of risk to human health. Therefore Method C CULs were not developed.

Assuming nitrification converts ammonia as nitrogen into nitrate as nitrogen, the maximum concentration of ammonia-N was compared against the Method C CUL for nitrate-N. The maximum ammonia-N concentration (5,550 mg/kg) meets the nitrate-N Method C CUL of 350,000 mg/kg.

The maximum concentration of 2-methylnaphthalene was compared against the Method C CUL for naphthalene (70,000 mg/kg), and does not exceed.

4.2.2 Groundwater

Table 4-4 shows the comparison of maximum concentrations of IHSs in groundwater against Method C CULs. 1,2-Dichloropropane, arsenic, and total nitrates and nitrites exceeded Method C CULs. A review of the arsenic data shows detections in five monitoring wells (MW-1, MW-3, MW-4, MW-6, and MW-7) were at concentrations exceeding the Method C CUL of 0.000583 mg/L. Total nitrates and nitrites were detected in all six monitoring wells at concentrations exceeding the Method C CUL of 3.5 mg/L. 1,2-dichloropropane was only detected in MW-4.

Groundwater IHSs for which no toxicity values were available include chloride, iron, ammonia-N, phosphate, and sulfate. However, Washington State Board of Health Secondary Maximum Contaminant Levels (MCLs) exist for chloride, iron, and sulfate. It should be noted that secondary MCLs are based on cosmetic and aesthetic criteria for drinking water rather than on human health. The secondary MCLs are: 250 mg/L for chloride; 0.3 mg/L for iron; and 250 mg/L for sulfate. Maximum concentrations of iron from MW-5 (0.91 mg/L) and sulfate from MW-5 (624 mg/L) exceed the secondary MCLs. The maximum concentration of chloride meets the secondary MCL. These constituents were analyzed for remedial design purposes rather than for evaluation of risk to human health.

Ammonia-N detected in groundwater can be compared to the Method C CUL for nitrate-N (converted to concentration as nitrogen) since it is assumed nitrification is occurring at the Site, as further discussed in Section 4.3. Monitoring wells in which ammonia-N was detected are MW-3, MW-4, and MW-5. All concentrations of ammonia-N detected in groundwater are greater than the nitrate-N Method C CUL of 3.5 mg/L.

As stated in Section 4.2.1, phosphate is not considered a hazardous substance by USEPA and was analyzed for remedial design purposes rather than for evaluation of risk to human health. Therefore a Method C CUL was not developed.

Concentrations of select potential groundwater IHSs, including 1,2-dichloropropane, ammonia, arsenic, chloride, iron, phosphate, sulfate, and total nitrate + nitrite, are provided in Figure 4-1.

4.3 SOIL LEACHING TO GROUNDWATER

IHSs present in the soil have the potential to leach to the groundwater in excess of the applicable groundwater cleanup levels. Accordingly, this pathway must be evaluated to ensure that any remedial programs designed for soils will provide for long-term protection of the groundwater (source control). This section evaluates soil data generated during the field investigation and compares the data with the IHSs identified in the groundwater, as listed in Section 4.1.2. By completing this comparison, it is possible to identify potential soil sources that can be contributing to identified groundwater impacts.

4.3.1 Mobility of Inorganic Compounds in Fertilizer

The Site has a history of fertilizer distribution operations being conducted between 1960 and 1986. During this time period, both liquid and dry fertilizers were managed throughout the Site. As a result, there is a potential that both liquid and dry fertilizers could have been released to surface soils.

Liquid fertilizers are primarily composed of ammonium salts or liquid ammonia. Once released to the soil or groundwater, ammonia is rapidly converted to the ammonium ion by contact with water, where it may be immobilized in the soil column by cation exchange effects. Bacteria living within the root structure of surface vegetation convert the ammonium cation to nitrate through a process called nitrification. Nitrate is the form of nitrogen used by plants to produce proteins, which contribute to plant growth. Ammonium ions can be released from the soil column if the concentration of ammonium ions exceeds the cation exchange capacity of the soil. Since ammonium ions are very soluble, any ammonium ions released to the groundwater will be readily dissolved (Foth and Turk, 1972).

Ammonium ions present in the groundwater can also be converted to nitrates by nitrifying bacteria when provided with a sufficient supply of oxygen and alkalinity. Nitrates are also extremely soluble in the groundwater and have a greater human health risk when drinking water with high levels of nitrates is consumed by human receptors.

Dry fertilizers can be composed of ammonium salts or nitrate compounds. The mobility of ammonium salts once released to the environment through dry fertilizers is similar to the mobility described above for liquid fertilizers. Nitrates present in dry fertilizers do not follow the same transport mechanisms. Nitrates are extremely soluble in water and are not readily adsorbed to soils. As a result, nitrates that are applied to soils at concentrations in excess of the agronomic requirement of plants will readily leach to the groundwater. Bacteria can convert nitrates to nitrogen gas under anaerobic environmental conditions using a process known as denitrification. Denitrification is a natural process that occurs in anaerobic marsh sediments. Typically, groundwater aquifers do not provide the optimum conditions for denitrification to occur. As a result, nitrates are not readily degraded in groundwater aquifers.

4.3.2 Nitrogen in Soils

Table 4-5 sums the ammonia, nitrate, and nitrite concentrations as nitrogen at each of the soil boring locations where soil samples were collected during the Phase I investigation. Figures 4-2 through 4-10 provide summaries of these data and show concentration isopleths for total nitrogen, ammonia as nitrogen, and nitrate as nitrogen. Figures 4-2 through 4-4 provide

concentration isopleths for total nitrogen at depths of 0.5 feet bgs, 4.5 feet bgs, and 7.5 to 9.0 feet bgs. Figures 4-5 through 4-7 present concentration isopleths for ammonia as nitrogen at the same depths as described above. Finally, Figures 4-8 through 4-10 provide concentration isopleths for nitrate as nitrogen at the same depths.

A review of the data presented in these figures identifies five to seven potential shallow soil source areas where high nitrogen levels are present. For purposes of this preliminary evaluation, a source area is identified as an area where the total nitrogen concentration in soil exceeds 500 mg/kg. Based on a review of the ammonia and nitrate isopleths, the number of potential source areas decreases with depth. Accordingly, the soil data appear to depict an above ground source (fertilizer stored on the ground surface in dry or liquid form) that has leached nitrogen compounds to the soil.

The major source area appears to be directly east of the Dry Fertilizer Manufacturing Building in Area 2. In addition, two sources appear to be located adjacent to the lagoon, one to the east and one to the northwest. Ammonia and nitrate appear to contribute to the nitrogen sources in each of these areas.

Generally, the ammonia concentrations do not appear to change significantly with depth. This provides an indication of the soil's ability to retard the migration of ammonia into groundwater. Nitrate, however, decreases with depth, which provides evidence of the soil's inability to restrict the mobility of nitrates to the groundwater. As a result, soluble nitrates released from the surface soil at levels above the agronomic rates of the vegetation will leach to the groundwater.

The Phase I RI did not require the collection of subsurface soil samples in Area 5. Since the Phase I RI data identified relatively high nitrogen concentrations in surface soils, it would be appropriate to collect additional subsurface soil samples to determine the vertical extent of the nitrogen sources in this area.

In addition, the high soil nitrogen concentrations adjacent to the lagoon could indicate that this is also a potential source of nitrogen. Accordingly, samples of the lagoon contents will need to be obtained during the Phase II investigation to obtain a better understanding of the nitrogen concentrations present in this area.

4.3.3 Iron and Sulfate in Soils

Section 4.2.2 of the Phase I RI Report indicated that iron and sulfates were detected in the groundwater at MW-4 and MW-5 at concentrations in excess of the secondary MCLs. As a result, the soil data were reviewed to determine potential source areas that could result in elevated iron and sulfate concentrations in the groundwater. Table 4-6 provides a summary of the iron and sulfate data in Site soils. Figure 4-11 depicts concentration isopleths for sulfate at a depth of 0.5 feet bgs, and Figure 4-12 depicts concentration isopleths for sulfate at a depth of 4.5 feet bgs. Review of Figure 4-11 indicates that the potential source areas for sulfate are consistent with source areas identified for nitrogen compounds. This suggests that sulfate is a component of the fertilizer blends that were released at the surface. Figure 4-12 illustrates the sulfate concentrations decrease significantly with depth, which is a further indication of a surface release of fertilizer. A review of the iron data indicates a Site-wide presence of iron in the surface soil at concentrations below the natural background concentration of 51,500 mg/kg (See Section 3.5), and these concentrations in soil may be contributing to the presence of iron in groundwater.

4.3.4 Arsenic in Soils

Arsenic is naturally occurring in the environment in background soils. The natural background concentration for arsenic in soil in the Yakima Basin is 5 mg/kg. A review of the arsenic data for the Site indicates that soil arsenic concentrations are less than, or just above, the background

level, ranging from 0.65 to 5.69 mg/kg. The arsenic concentrations are below the MTCA Method A CUL, which is 20 mg/kg.

Arsenic was also detected in five monitoring wells (MW-1, MW-3, MW-4, MW-6, and MW-7) at concentrations exceeding the Method C CUL of 0.000583 mg/L. The highest arsenic concentrations in groundwater were observed at monitoring wells MW-3 (0.102 mg/l) and MW-6 (0.025 mg/l). MW-6 is located adjacent to the Burlington-Northern Railroad right-of-way. Arsenic is typically used as a wood preservative, and therefore its presence at higher levels adjacent to a railroad may be due to the presence of wooden railroad ties. A review of arsenic concentrations in soil in the area surrounding MW-3 does not indicate higher arsenic concentrations when compared to the rest of the Site. Therefore, the potential exists for arsenic to be extracted from saturated soils as a result of geo-chemical changes in the groundwater. A reducing environment in the groundwater could mobilize arsenic. Reducing conditions could exist if denitrification is occurring near MW-3. Therefore, the Phase II investigation will need to obtain data to evaluate the reducing conditions of the groundwater. Typically, this is accomplished by collecting groundwater samples and evaluating the oxidation-reduction potential (ORP) of the groundwater.

4.3.5 1,2-Dichloropropane in Soils

The organic compound 1,2-dichloropropane was detected at MW-4 at a concentration of 0.105 mg/l in the groundwater. Site soil data was reviewed and indicated that 1,2-dichloropropane was not detected in any of the soil samples. The detection limit for 1,2-dichloropropane in soils was as low as 0.001 mg/kg. Based upon this review it does not appear the Site soils are a source of the 1,2-dichloropropane detected at MW-4.

4.4 RECOMMENDATIONS FOR PHASE II

A comparison of the soil and groundwater data to MCTA C CULs as presented in Section 4.2 indicates the following:

- A TPH-Gx value exceeding Method C CULs was observed at a depth of 7.5 feet bgs at A3-SB-002;
- Nitrogen and sulfate compounds are present throughout the unsaturated zone soil samples at high concentrations in potential surface source areas;
- Potential soil source areas occur in Area 5. Only surface soils were collected in this area during the Phase I RI. Therefore, the vertical extent of the nitrogen and sulfate impacts has not been delineated;
- Nitrogen, iron, and sulfate exceeded MCTA C CULs and secondary MCLs in groundwater samples collected downgradient of potential source areas;
- Nitrogen, iron, and sulfate concentrations appear to exceed the MTCA C CULs and secondary MCLs at the southern property boundary of the Site;
- Arsenic concentrations in groundwater exceeded MTCA C CULs, although no background concentrations for arsenic are established for local groundwater; and
- The soil leaching to groundwater pathway has been evaluated using a weight of evidence approach. The first line of evidence is comparison of the groundwater data to MTCA C CULs and secondary MCLs, since the soil release occurred years ago. Any impacts from soil leaching to the groundwater should have been observed by now. Soil samples will be selected during Phase II activities for synthetic precipitate leaching procedure (SPLP) analysis to further demonstrate that the soil leaching to groundwater pathway is protective of human health.

The Phase II RI recommendation developed as a response to these findings is presented in the remaining portions of this section. During the Phase II RI, additional soil and groundwater data will be collected to fill in data gaps identified during the Phase I RI. Groundwater sampling will include vertical profile sampling and installation and sampling of new monitoring wells. Additional

soil samples will be collected to provide horizontal and vertical delineation to augment the Phase I RI data. In addition, soil samples will be collected during Phase II for SPLP analysis to more accurately evaluate the soil leaching to groundwater pathway. Water and sediment sampling will be conducted to delineate the lagoon contents. The proposed Phase II sampling activities would consist of the following elements:

Groundwater Sampling

- Installation of a permanent monitoring well 100 to 200 feet downgradient of the southern property boundary where nitrogen concentrations are highest. This well will be a shallow monitoring well constructed with a ten-foot screened interval;
- Completion of 20 vertical profile borings within the identified nitrogen plume. The vertical profile borings will extend from the water table to the aquitard located approximately 31 feet bgs. These borings will be located near the highest nitrogen concentrations identified in the Phase I soil samples. Groundwater samples will be collected at 10 feet bgs and 20 feet bgs at each boring location. Groundwater samples will be analyzed for arsenic, alkalinity, chloride, dissolved oxygen (DO), nitrogen compounds, phosphate, sulfate, iron, pH, and ORP. A Geoprobe will be used to advance the vertical profile borings;
- Arsenic concentrations identified at MW-1, MW-6, and MW-7 are believed to be representative of background conditions and background compound concentrations will be established by calculating the 95% upper confidence limit (UCL) of the data; and
- Installation of a permanent monitoring well in the middle of the nitrogen plume. This well will also be a shallow well with a ten-foot screened interval.

Soil Sampling

- Four soil borings will be advanced ten feet north, south, east, and west of Phase I boring A3-SB-002. The purpose of these borings is to delineate the TPH-Gx concentrations identified during the Phase I RI. Soil samples will be collected at 0.5 feet bgs, 4.5 feet bgs, and 7.5 feet bgs to be consistent with the Phase I RI. Samples will be analyzed for TPH-Gx;
- Ten additional soil borings will be conducted in Area 5 to define the vertical extent of nitrogen, phosphate, iron, and sulfate. Soil samples will be collected at 4.5 feet bgs and 9.0 feet bgs; and
- Ten soil samples will be selected for SPLP analysis. The soil samples will be biased towards samples with the highest nitrogen concentrations.

Sediment and Water Sampling

- One sample of the lagoon water and one sample of the lagoon sediment will be collected to obtain a better understanding of the nitrogen concentrations present in the area.

Proposed Phase II sampling locations can be found on Figure 4-13. The sampling and analytical methods described in the approved Phase I RI will be utilized for the Phase II RI.

5.0 RE-EVALUATION OF CLEANUP ALTERNATIVES AND TREATABILITY

Section 3 of the RI/FS Work Plan provided a preliminary screening of remedial alternatives based upon a review of historical data. The preliminary screening of alternatives was prepared to ensure soil and groundwater data collected as part of the RI work would support the development of remedial alternatives for evaluation during the feasibility study process.

The following sections re-evaluate the feasibility of remedial action alternatives based upon the soil and groundwater data collected during the Phase I RI. Accordingly, this review is intended to focus the Phase II RI data collection and treatability studies to ensure the necessary data is obtained to facilitate completion of the feasibility study (FS) and implementation of an approved remedy.

5.1 RE-EVALUATION OF CLEANUP ACTION ALTERNATIVES

Nutrients have been identified as the primary constituents of concern in the soil and groundwater present at the Site. Although other compounds exist in soil and groundwater at levels that may represent a risk to human health and the environment, the small size of these source areas would suggest that the areas can be eliminated based upon completion of a human health risk assessment or the areas can be addressed by limited excavation and off-site disposal. Therefore, the focus of the FS process will be to evaluate the best approach to remediate nutrients that are present in the soil and groundwater at the Site.

The RI/FS Work Plan identified the following alternatives that could be used to address impacted soil and groundwater at the Site:

Soil
- In-situ Treatment – Phytoremediation and enhanced bioremediation;
- Ex-situ Biological Treatment – Composting; and
- Ex-situ Containment – Landfill disposal.

Groundwater
- In-situ Biological Treatment – Natural Attenuation, Enhanced Biodegradation, Phytoremediation, and Agricultural Application; and
- Ex-situ Treatment – Reverse Osmosis, Ion Exchange, and Carbon Filtration.

Each of these potential remedial alternatives will be evaluated based upon the results of the Phase I RI, and may be refined based on the results of the Phase II RI.

5.1.1 Soil Treatment Alternatives

Ex-situ treatment alternatives include composting and landfill disposal. The landfill disposal option does not involve treatment prior to off-site disposal. As a result, landfill disposal transfers the nutrient containing soil to another location where the potential exists for groundwater to be impacted in the future. Since nutrients readily leach to groundwater, landfill disposal is a more viable option for a site with soils impacted by heavy metals or polynuclear aromatic hydrocarbons (PAHs) that are not readily leached to groundwater.

Ex-situ composting is a form of biological treatment. Generally, composting is used to degrade organic matter, and nutrients are added to facilitate the biological activity within the compost pile. A source of organic material such as grass clippings or leaves is not readily available at the Site. Therefore, these materials would have to be imported from an off-site location, which could potentially introduce other constituents of concern to the Site. As a result, composting does not appear to be a viable option to treat nutrient-impacted soils.

Phytoremediation is a form of in-situ biological treatment. Phytoremediation could be effective in this application during the active growing season. The downside of phytoremediation is that its effectiveness is limited by the nutrient requirements of the plants utilized. As a result, the time frame for cleanup to occur may be longer when compared with other in-situ technologies. Phytoremediation may be best used to provide hydraulic control of a nutrient plume (i.e., a barrier wall of hybrid poplar trees) and can be used in conjunction with other in-situ biological treatment programs such as enhanced bioremediation.

Enhanced bioremediation of soils is the most favorable option to remove nutrients from soils. The biological process for ammonia and nitrate treatment includes both aerobic and anaerobic treatment processes. Typically, aerobic and anaerobic treatment in soils and groundwater are limited by a sufficient carbon source. Carbon is provided in the form of alkalinity in the nitrification stage and in the form of organic carbon in the denitrification stage. Therefore, in-situ biological enhancements, which add a carbon source, can be very effective in the treatment of ammonia and nitrates.

This first step in the biological enhancement program is to convert ammonia to nitrate in an aerobic process. Microorganisms, nutrients, alkalinity, and oxygen are required to enhance the biological treatment process. The Site has sufficient nutrients to support the microorganisms. Usually soils have sufficient microorganisms and alkalinity to drive the process once the bacteria are properly acclimated. Therefore, the limiting factors for nitrification will be a sufficient supply of oxygen. Oxygen can be supplied through air injection or the addition of an oxygen-releasing compound such as calcium peroxide, which releases both oxygen and alkalinity to the subsurface. Under the optimum environmental conditions, conversion of ammonia to nitrate can be accomplished in a period of days once the microorganisms have acclimated, although contact limitations in the soil will reduce the kinetics by one to two orders of magnitude. The acclimation period may take a number of weeks.

Once all of the ammonia is converted to nitrate, the denitrification process can be initiated. Under anaerobic conditions, nitrate is converted to nitrogen gas, which volatilizes into the atmosphere. Anaerobic conditions are established by the addition of a carbon source in the form of a simple sugar (glucose or sucrose), which supports the growth of microorganisms. These microorganisms deplete the available oxygen and turn the system anaerobic. The denitrification process is also a rapid process once the system is acclimated. Denitrification should also occur in a period of days once optimum environmental conditions are achieved, but contact limitations in the soils will reduce the kinetics.

5.1.2 Groundwater Treatment Alternatives

Ex-situ treatment options consist of extracting impacted groundwater by pumping and treating in an above ground system. The technologies considered for above ground treatment systems included reverse osmosis, ion exchange, and carbon filtration. Carbon filtration cannot be used to effectively treat groundwater for removal of nitrates and ammonia. Ion exchange and reverse osmosis can be used to treat impacted groundwater, but each of these treatment processes will generate a residual material which would require disposal. As a result, ex-situ treatment systems are not the preferred alternative for removing ammonia and nitrates from the groundwater.

Ex-situ biological systems can be used effectively to treat ammonia and nitrate present in the groundwater. An ex-situ biological treatment approach is not recommended because the same technology can be used in-situ to remediate the Site in a shorter time frame. Agricultural application, although a potential beneficial reuse opportunity, could lead to the introduction of nitrates to a property where groundwater has not previously been impacted if it is not properly managed.

In-situ biological treatment systems can effectively treat ammonia and nitrate present in the groundwater in a shorter time frame when compared with other alternatives. In-situ biological

treatment will likely consist of a combination of enhanced biodegradation, phytoremediation, and natural attenuation. Enhanced biodegradation would be used to control and eliminate the source. Phytoremediation can be used to contain the plume primarily through hydraulic control. Finally, natural attenuation processes need to be considered when developing a long-term monitoring program designed to demonstrate the nutrient plume is stable and shrinking.

5.1.3 Presumptive Remedy Approach

The use of presumptive remedies can reduce the time frame for remedy development and implementation by streamlining the FS process. In-situ enhanced biological treatment of impacted soil and groundwater is the preferred approach for dealing with the nutrient impacts at the Site. This is due to the fact that the subsurface geology has sufficient porosity and permeability to facilitate injection of supplemental carbon sources and air into the subsurface. In addition, the in-situ biological treatment approaches can be implemented and completed in a shorter time frame when compared with ex-situ treatment technologies. As a result, it is recommended that the FS follow a presumptive remedy approach that focuses on developing the best methodology for in-situ enhanced biological treatment of nutrient-impacted soil and groundwater. The use of a presumptive remedy approach will allow emphasis to be placed on optimizing the biological treatment enhancements through bench-scale treatment studies and full-scale pilot studies. The remaining portions of Section 5 discuss the proposed bench-scale treatment program and full-scale pilot program that will be implemented as part of Phase II RI field work activities. In addition, a comprehensive work plan will be prepared to address the proposed bench-scale treatment study and full-scale pilot study.

5.2 BENCH-SCALE TREATMENT STUDY

The bench-scale treatment study will be designed to achieve the following data quality objectives:

- Determine if nitrifying and denitrifying bacteria can be cultured from Site soils by providing the optimum environmental conditions;
- Determine the acclimation period necessary to cultivate a population of nitrifying and denitrifying bacteria;
- Determine if the acclimation period can be shortened by the introduction of nitrifying and denitrifying bacteria purchased from microbiological supply firms;
- Determine the optimum carbon source, air requirements, and reaction kinetics for the enhanced nitrification biological treatment system;
- Determine the optimum carbon source and reaction kinetics for the denitrification process;
- Determine the acclimation period after conversion from a nitrification process to a denitrification process;
- Determine if soil washing can effectively leach nitrates from the soil to the groundwater;
- Determine process set points such as ORP and DO readings that can be utilized in the field to regulate the in-situ treatment process; and
- Determine the proper carbon dosing requirements to maximize denitrification while minimizing the potential for arsenic mobility.

The bench-scale study will be conducted using soil and groundwater samples collected from the Site. In addition, multiple carbon sources and multiple bacteria supplements will be evaluated in the bench-scale study to determine cost-effective approaches for the biological treatment enhancements.

The results of the bench-scale study will be summarized in a technical report. This report will contain recommendations for proceeding with a full-scale pilot study to demonstrate that the bench-scale technologies can be implemented in the field. The following section provides an overview of the proposed pilot study program.

5.3 FULL-SCALE PILOT STUDY

The bench-scale study will define the operating parameters for in-situ biological enhancements designed to facilitate treatment of ammonia and nitrates. Enhanced biological treatment of ammonia and nitrates requires a two-step process. The first step is the nitrification process, which converts ammonia to nitrates in an aerobic environment. The second step is the denitrification process where nitrates are converted to nitrogen gas in an anaerobic process. Data from the bench-scale studies will be utilized to define the operating parameters for both the nitrification and denitrification processes that will be employed in the full-scale pilot to ensure that optimal conditions are maintained in the subsurface environment to facilitate ammonia and nitrate removal.

The full-scale pilot will be conducted using a zone treatment approach. The treatment zone, consisting of an 80-foot by 80-foot area, will be established to the west of the lagoon in Area 1, as shown on Figure 5-1.

Initially, subsurface soils will be treated to a depth of nine feet bgs. A sodium percarbonate solution will be mixed into the soils with bacteria using excavators or a trenching device to initiate the nitrification process. Once the ammonia has been converted to nitrates, a simple sugar will be added and the soils will be remixed to create anaerobic conditions in the subsurface or nitrates will be leached to the groundwater by soil washing techniques.

The groundwater treatment activities will commence once the soil treatment has been completed. Injection points will be installed on a 20-foot grid pattern as shown on Figure 5-2. The injection points will consist of one-inch diameter stainless well points that will be installed to a depth of approximately 30 feet bgs, or just above the identified clay aquitard. A geoprobe will be used to install the injection points.

The purpose of the injection points will be to add microorganisms and alkalinity to the groundwater. Once the chemical additions have been completed, the injection points will then be used for air sparging. Air sparging will facilitate mixing the injected chemicals with the groundwater to create homogeneous environmental conditions necessary to promote nitrification.

Three piezometers will be installed in the treatment zone to monitor environmental conditions during the full-scale field pilots. The piezometers will be installed at 5-foot, 10-foot, and 15-foot distances away from the injection wells, as shown on Figure 5-2. Groundwater samples will be collected from the piezometers and analyzed in the field for qualitative parameters such as DO, ORP, alkalinity, and pH. The data from the piezometers will be used to modify injection methodologies, if necessary.

Once the nitrification process is completed, based upon a review of groundwater ammonia data, the full-scale pilot will proceed to the denitrification stage. A simple sugar and microorganisms will be added to the injection points to create an anaerobic environment in the groundwater. Air sparging will be conducted for a short period of time using nitrogen gas to mix the chemicals with the groundwater and deoxygenate the water. Once mixing has been completed, the air sparging operation will be discontinued and the groundwater will be allowed to go anaerobic. The denitrification step will be allowed to reach completion in order for the nitrates to be converted to nitrogen gas.

The results from the full-scale pilot will be used to finalize the conceptual design requirements for the in-situ biological enhancements that will be incorporated into the presumptive remedy discussion in the FS report.

6.0 SUMMARY AND CONCLUSIONS

The following findings and/or conclusions can be drawn from the Phase I RI results discussed in the preceding sections of this report:

- Potential IHSs detected in soil that exceeded Method A CULs and/or natural background concentrations, or do not have Method A CULs and/or background concentrations, include: 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 2-methylnaphthalene, 4,4'-DDE, ammonia-N (as nitrogen), antimony, cadmium, chloride, chromium (total), copper, dinoseb, nickel, nitrate-N, nitrite-N, TPH-Gx, p,m-xylene, phosphate, silver, sulfate, thallium, and zinc;
- The potential IHSs detected in groundwater above Method A CULs, or that do not have Method A CULs, include: 1,2-dichloropropane, 2,4-dichlorophenol, ammonia-N, arsenic, chloride, chlorobenzene, copper, iron, manganese, nickel, o-xylene, p,m-xylene, phosphate, sulfate, total nitrates and nitrites, and zinc;
- A TPH-Gx value exceeding Method C CULs was observed at a depth of 7.5 feet bgs at A3-SB-002;
- Nitrogen and sulfate compounds are present throughout the unsaturated zone soil samples at high concentrations in potential surface source areas;
- Potential soil source areas occur in Area 5. Only surface soils were collected in this area during the Phase I RI. Therefore, the vertical extent of the nitrogen and sulfate impacts has not been delineated;
- Nitrogen, iron, and sulfate exceeded MCTA C CULs and secondary MCLs in groundwater samples collected downgradient of potential source areas;
- Nitrogen, iron, and sulfate concentrations appear to exceed the MTCA C CULs and secondary MCLs at the southern property boundary of the Site;
- Arsenic concentrations in groundwater exceeded MTCA C CULs, although no background concentrations for arsenic have been established for local groundwater;
- The soil analytical results do not indicate a source of the 1,2-dichloropropane detected in groundwater; and
- The soil leaching to groundwater pathway has been evaluated using a weight of evidence approach. The first line of evidence is comparison of the groundwater data to MTCA C CULs and secondary MCLs, since the soil release occurred years ago. Any impacts from soil leaching to the groundwater should have been observed by now. Soil samples will be selected during Phase II activities for SPLP analysis to further demonstrate that the soil leaching to groundwater pathway is protective of human health.

Based on the findings of the Phase I RI, additional soil and groundwater data will be collected to fill in identified data gaps. Groundwater sampling will include vertical profile sampling and installation and sampling of new monitoring wells. Additional soil samples will be collected to provide horizontal and vertical delineation to augment the Phase I RI data. In addition, soil samples will be collected during Phase II for SPLP analysis to more accurately evaluate the soil leaching to groundwater pathway. Water and sediment sampling will be conducted to delineate the lagoon contents. Recommendations for the Phase II activities are as follows:

<u>Groundwater Sampling</u>

- Installation of a permanent monitoring well 100 to 200 feet downgradient of the southern property boundary where nitrogen concentrations are highest;
- Completion of 20 vertical profile borings within the identified nitrogen plume;
- Establish background concentrations of arsenic by calculating the 95% upper confidence limit (UCL) of the data from MW-1, MW-6, and MW-7; and
- Installation of a permanent monitoring well in the middle of the nitrogen plume.

Soil Sampling

- Four soil borings will be advanced ten feet north, south, east and west of Phase I boring A3-SB-002;
- Ten additional soil borings will be conducted in Area 5 to define the vertical extent of nitrogen, phosphate, iron, and sulfate; and
- Ten soil samples will be selected for SPLP analysis.

Sediment and Water Sampling

- One sample of the lagoon water and one sample of the lagoon sediment will be collected to obtain a better understanding of the nitrogen concentrations present in the area.

It is recommended that the FS follow a presumptive remedy approach that focuses on developing the best methodology for in-situ enhanced biological treatment of nutrient-impacted soil and groundwater. The use of a presumptive remedy approach will allow emphasis to be placed on optimizing the biological treatment enhancements through bench-scale treatment studies and full-scale pilot studies. A comprehensive work plan will be prepared to address the proposed bench-scale treatment study and full-scale pilot study.

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TABLES

Table 2-1
Constituents Detected in Soil

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A1-SB-001-0.5'	Ammonia-N	7/7/2003	5	1
	Arsenic	7/7/2003	1.57	0.1
	Cadmium	7/7/2003	0.41	0.05
	Chromium	7/7/2003	7.91	0.5
	Copper	7/7/2003	13.2	0.5
	Iron	7/7/2003	8750	1
	Lead	7/7/2003	6.13	0.5
	Manganese	7/7/2003	392	0.5
	Nickel	7/7/2003	8.95	0.5
	Nitrate-N	7/7/2003	68	10
	Phosphate	7/7/2003	5690	10
	Zinc	7/7/2003	189	0.5
A1-SB-001-4.5'	Ammonia-N	7/7/2003	3	1
	Nitrate-N	7/7/2003	55	10
	Phosphate	7/7/2003	4630	10
A1-SB-001-9.0'	Ammonia-N	7/7/2003	683	1
	Nitrate-N	7/7/2003	29	10
	Phosphate	7/7/2003	2870	10
A1-SB-002-0.5'	Ammonia-N	7/7/2003	400	1
	Arsenic	7/7/2003	1.02	0.1
	Cadmium	7/7/2003	0.21	0.05
	Chromium	7/7/2003	10.7	0.5
	Copper	7/7/2003	32.4	0.5
	Iron	7/7/2003	6860	1
	Lead	7/7/2003	6.87	0.5
	Manganese	7/7/2003	485	0.5
	Nickel	7/7/2003	9.77	0.5
	Nitrate-N	7/7/2003	63	10
	Phosphate	7/7/2003	4620	10
	Zinc	7/7/2003	153	0.5
A1-SB-002-4.5'	Ammonia-N	7/7/2003	968	1
	Nitrate-N	7/7/2003	321	10
	Phosphate	7/7/2003	4340	10
A1-SB-002-9.0'	Ammonia-N	7/7/2003	100	1
	Nitrate-N	7/7/2003	162	10
	Phosphate	7/7/2003	3620	10
A1-SB-003-0.5'	Ammonia-N	7/7/2003	631	1
	Arsenic	7/7/2003	1.65	0.1
	Cadmium	7/7/2003	0.2	0.05

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A1-SB-003-0.5'	Chromium	7/7/2003	2.68	0.5
	Copper	7/7/2003	11.7	0.5
	Iron	7/7/2003	7170	1
	Lead	7/7/2003	7.1	0.5
	Manganese	7/7/2003	420	0.5
	Nickel	7/7/2003	7.43	0.5
	Nitrate-N	7/7/2003	80	10
	Phosphate	7/7/2003	4100	10
	Zinc	7/7/2003	17.7	0.5
A1-SB-003-4.5'	Ammonia-N	7/7/2003	583	1
	Nitrate-N	7/7/2003	87	10
	Phosphate	7/7/2003	4910	10
A1-SB-003-9.0'	Nitrate-N	7/7/2003	47	10
	Phosphate	7/7/2003	2250	10
A1-SB-004-0.5'	Ammonia-N	7/7/2003	404	1
	Arsenic	7/7/2003	2.11	0.1
	Cadmium	7/7/2003	0.06	0.05
	Chromium	7/7/2003	3.4	0.5
	Copper	7/7/2003	9.66	0.5
	Iron	7/7/2003	6330	1
	Lead	7/7/2003	4.76	0.5
	Manganese	7/7/2003	315	0.5
	Nickel	7/7/2003	8.29	0.5
	Nitrate-N	7/7/2003	310	10
	Phosphate	7/7/2003	2590	10
	Zinc	7/7/2003	14	0.5
A1-SB-004-4.5'	Ammonia-N	7/7/2003	426	1
	Nitrate-N	7/7/2003	351	10
	Phosphate	7/7/2003	5030	10
	Sulfate	7/7/2003	225	100
A1-SB-004-9.0'	Ammonia-N	7/7/2003	57	1
	Nitrate-N	7/7/2003	59	10
	Phosphate	7/7/2003	2410	10
A1-SB-005-0.5'	Arsenic	7/10/2003	2.65	0.1
	Cadmium	7/10/2003	0.24	0.05
	Chromium	7/10/2003	6.07	0.5
	Copper	7/10/2003	8.07	0.5
	Iron	7/10/2003	5580	1
	Lead	7/10/2003	11.5	0.5
	Manganese	7/10/2003	343	0.5
	Nickel	7/10/2003	6.42	0.5
	Nitrate-N	7/10/2003	161	10
	Phosphate	7/10/2003	6390	10

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A1-SB-005-0.5'	Zinc	7/10/2003	30.3	0.5
A1-SB-005-4.5'	Ammonia-N	7/10/2003	735	5
	Nitrate-N	7/10/2003	983	10
	Nitrite-N	7/10/2003	17	10
	Phosphate	7/10/2003	2670	10
	Sulfate	7/10/2003	199	100
A1-SB-005-7.5'	Ammonia-N	7/10/2003	1630	10
	Nitrate-N	7/10/2003	255	10
	Phosphate	7/10/2003	8180	10
A1-SB-006-0.5'	Ammonia-N	7/10/2003	1110	10
	Arsenic	7/10/2003	1.39	0.1
	Beryllium	7/10/2003	0.61	0.5
	Cadmium	7/10/2003	7.83	0.05
	Chromium	7/10/2003	58.3	0.5
	Copper	7/10/2003	20.5	0.5
	Iron	7/10/2003	9310	1
	Lead	7/10/2003	8.97	0.5
	Manganese	7/10/2003	343	0.5
	Nickel	7/10/2003	15.2	0.5
	Nitrate-N	7/10/2003	127	10
	Phosphate	7/10/2003	30200	100
	Zinc	7/10/2003	1030	0.5
A1-SB-006-0.5'-1	Ammonia-N	7/10/2003	1030	10
	Arsenic	7/10/2003	1.29	0.1
	Beryllium	7/10/2003	0.57	0.5
	Cadmium	7/10/2003	8.52	0.05
	Chromium	7/10/2003	48.3	0.5
	Copper	7/10/2003	19.8	0.5
	Iron	7/10/2003	8770	1
	Lead	7/10/2003	10.9	0.5
	Manganese	7/10/2003	274	0.5
	Mercury	7/10/2003	0.12	0.1
	Nickel	7/10/2003	13.7	0.5
	Nitrate-N	7/10/2003	127	10
	Phosphate	7/10/2003	29300	100
	Zinc	7/10/2003	1000	0.5
A1-SB-006-4.5'	Ammonia-N	7/10/2003	1520	10
	Nitrate-N	7/10/2003	672	10
	Phosphate	7/10/2003	6300	10
A1-SB-006-7.5'	Ammonia-N	7/10/2003	1460	10
	Nitrate-N	7/10/2003	130	10
	Phosphate	7/10/2003	5010	10
A1-SB-007-0.5'	Arsenic	7/10/2003	5.69	0.1

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A1-SB-007-0.5'	Cadmium	7/10/2003	0.12	0.05
	Chromium	7/10/2003	2.8	0.5
	Copper	7/10/2003	8.4	0.5
	Iron	7/10/2003	5630	1
	Lead	7/10/2003	11.3	0.5
	Manganese	7/10/2003	354	0.5
	Nickel	7/10/2003	6.54	0.5
	Nitrate-N	7/10/2003	172	10
	Phosphate	7/10/2003	3320	10
	Zinc	7/10/2003	30.6	0.5
A1-SB-007-4.5'	Ammonia-N	7/10/2003	281	5
	Nitrate-N	7/10/2003	405	10
	Phosphate	7/10/2003	2440	10
	Sulfate	7/10/2003	116	100
A1-SB-007-7.5'	Ammonia-N	7/10/2003	1200	10
	Nitrate-N	7/10/2003	86	10
	Phosphate	7/10/2003	3040	10
A1-SB-008-0.5'	Ammonia-N	7/10/2003	207	5
	Arsenic	7/10/2003	1.62	0.1
	Cadmium	7/10/2003	0.14	0.05
	Chromium	7/10/2003	3.28	0.5
	Copper	7/10/2003	10.1	0.5
	Iron	7/10/2003	6230	1
	Lead	7/10/2003	6.65	0.5
	Manganese	7/10/2003	567	0.5
	Nickel	7/10/2003	7.61	0.5
	Nitrate-N	7/10/2003	148	10
	Phosphate	7/10/2003	4880	10
	Zinc	7/10/2003	24.8	0.5
A1-SB-008-4.5'	Nitrate-N	7/10/2003	486	10
	Phosphate	7/10/2003	2820	10
	Sulfate	7/10/2003	114	100
A1-SB-008-7.5'	Ammonia-N	7/10/2003	337	5
	Nitrate-N	7/10/2003	318	10
	Phosphate	7/10/2003	2950	10
	Sulfate	7/10/2003	138	100
A2-SB-001-0.5'	Ammonia-N	7/8/2003	283	1
	Arsenic	7/8/2003	1.3	0.1
	Cadmium	7/8/2003	0.08	0.05
	Chromium	7/8/2003	3.37	0.5
	Copper	7/8/2003	12.7	0.5
	Iron	7/8/2003	6870	1
	Lead	7/8/2003	7.24	0.5

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A2-SB-001-0.5'	Manganese	7/8/2003	568	0.5
	Nickel	7/8/2003	9.48	0.5
	Nitrate-N	7/8/2003	294	10
	Phosphate	7/8/2003	2690	10
	Sulfate	7/8/2003	934	100
	Zinc	7/8/2003	17.8	0.5
A2-SB-001-4.5'	Nitrate-N	7/8/2003	83	10
	Phosphate	7/8/2003	2790	10
	Sulfate	7/8/2003	224	100
A2-SB-001-9.0'	Phosphate	7/8/2003	1910	10
A2-SB-002-0.5'	Ammonia-N	7/8/2003	273	1
	Arsenic	7/8/2003	1.17	0.1
	Chromium	7/8/2003	2.01	0.5
	Copper	7/8/2003	5.87	0.5
	Iron	7/8/2003	6220	1
	Lead	7/8/2003	3.82	0.5
	Manganese	7/8/2003	153	0.5
	Nickel	7/8/2003	4.93	0.5
	Nitrate-N	7/8/2003	214	10
	Phosphate	7/8/2003	2450	10
	Sulfate	7/8/2003	1640	100
	Zinc	7/8/2003	12.6	0.5
A2-SB-002-4.5'	Nitrate-N	7/8/2003	47	10
	Phosphate	7/8/2003	2470	10
	Sulfate	7/8/2003	150	100
A2-SB-002-9.0'	Nitrate-N	7/8/2003	12	10
	Phosphate	7/8/2003	2360	10
A2-SB-002-9.0'-1	Nitrate-N	7/8/2003	11	10
	Phosphate	7/8/2003	2400	10
A2-SB-003-0.5'	Ammonia-N	7/7/2003	117	1
	Arsenic	7/7/2003	1.69	0.1
	Cadmium	7/7/2003	0.06	0.05
	Chromium	7/7/2003	3.25	0.5
	Copper	7/7/2003	9	0.5
	Iron	7/7/2003	6000	1
	Lead	7/7/2003	4.26	0.5
	Manganese	7/7/2003	318	0.5
	Nickel	7/7/2003	7.66	0.5
	Nitrate-N	7/7/2003	137	10
	Phosphate	7/7/2003	2480	10
	Sulfate	7/7/2003	186	100
	Zinc	7/7/2003	12.9	0.5
A2-SB-003-4.5'	Ammonia-N	7/7/2003	7	1

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A2-SB-003-4.5'	Nitrate-N	7/7/2003	59	10
	Phosphate	7/7/2003	1810	10
A2-SB-003-9.0'	Ammonia-N	7/7/2003	31	1
	Nitrate-N	7/7/2003	13	10
	Phosphate	7/7/2003	1870	10
A2-SB-004-0.5'	Ammonia-N	7/7/2003	5550	10
	Arsenic	7/7/2003	2	0.1
	Cadmium	7/7/2003	0.92	0.05
	Chloride	7/7/2003	534	100
	Chromium	7/7/2003	3.82	0.5
	Copper	7/7/2003	17.4	0.5
	Iron	7/7/2003	7870	1
	Lead	7/7/2003	11.7	0.5
	Manganese	7/7/2003	465	0.5
	Nickel	7/7/2003	8.83	0.5
	Nitrate-N	7/7/2003	1530	10
	Nitrite-N	7/7/2003	27	10
	Phosphate	7/7/2003	5480	10
	Sulfate	7/7/2003	2900	100
	Zinc	7/7/2003	38.8	0.5
A2-SB-004-4.5'	Ammonia-N	7/7/2003	920	1
	Nitrate-N	7/7/2003	217	10
	Phosphate	7/7/2003	2480	10
	Sulfate	7/7/2003	159	100
A2-SB-004-9.0'	Ammonia-N	7/7/2003	372	1
	Nitrate-N	7/7/2003	139	10
	Phosphate	7/7/2003	2750	10
	Sulfate	7/7/2003	214	100
A2-SB-005-0.5'	Ammonia-N	7/11/2003	100	5
	Arsenic	7/11/2003	1.64	0.1
	Cadmium	7/11/2003	0.24	0.05
	Chromium	7/11/2003	3.98	0.5
	Copper	7/11/2003	7.18	0.5
	Iron	7/11/2003	6520	1
	Lead	7/11/2003	7.32	0.5
	Manganese	7/11/2003	257	0.5
	Nickel	7/11/2003	5.45	0.5
	Nitrate-N	7/11/2003	65	10
	Phosphate	7/11/2003	11200	100
	Sulfate	7/11/2003	148	100
	Zinc	7/11/2003	21.7	0.5
A2-SB-005-4.5'	Nitrate-N	7/11/2003	71	10
	Phosphate	7/11/2003	3040	10

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A2-SB-005-4.5'	Sulfate	7/11/2003	162	100
A2--SB-MW5-0.5'	Ammonia-N	7/10/2003	370	5
	Arsenic	7/10/2003	1.39	0.1
	Cadmium	7/10/2003	0.12	0.05
	Chromium	7/10/2003	1.62	0.5
	Copper	7/10/2003	6.18	0.5
	Iron	7/10/2003	4450	1
	Lead	7/10/2003	15.8	0.5
	Manganese	7/10/2003	176	0.5
	Nickel	7/10/2003	4.27	0.5
	Nitrate-N	7/10/2003	202	10
	Phosphate	7/10/2003	6420	10
	Sulfate	7/10/2003	2990	100
	Zinc	7/10/2003	25.8	0.5
A2--SB-MW5-4.5'	Ammonia-N	7/10/2003	214	5
	Nitrate-N	7/10/2003	1130	10
	Phosphate	7/10/2003	2790	10
	Sulfate	7/10/2003	442	100
A2--SB-MW5-7.5'	Ammonia-N	7/10/2003	218	5
	Nitrate-N	7/10/2003	126	10
	Phosphate	7/10/2003	2350	10
	Sulfate	7/10/2003	207	100
A2-SB-MW6-0.5'	Arsenic	7/10/2003	1.39	0.1
	Cadmium	7/10/2003	0.15	0.05
	Chromium	7/10/2003	2.7	0.5
	Copper	7/10/2003	10.9	0.5
	Iron	7/10/2003	6690	1
	Lead	7/10/2003	9.25	0.5
	Manganese	7/10/2003	520	0.5
	Nickel	7/10/2003	8.16	0.5
	Nitrate-N	7/10/2003	150	10
	Phosphate	7/10/2003	3130	10
	Sulfate	7/10/2003	2530	100
	Zinc	7/10/2003	48.8	0.5
A2-SB-MW6-0.5'-1	Ammonia-N	7/10/2003	6	5
	Arsenic	7/10/2003	1.77	0.1
	Cadmium	7/10/2003	0.09	0.05
	Chromium	7/10/2003	2.83	0.5
	Copper	7/10/2003	11.9	0.5
	Iron	7/10/2003	6550	1
	Lead	7/10/2003	12.7	0.5
	Manganese	7/10/2003	311	0.5
	Nickel	7/10/2003	6.19	0.5

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A2-SB-MW6-0.5'-1	Nitrate-N	7/10/2003	121	10
	Phosphate	7/10/2003	3440	10
	Sulfate	7/10/2003	729	100
	Zinc	7/10/2003	22.1	0.5
A2-SB-MW6-4.5'	Nitrate-N	7/10/2003	44	10
	Phosphate	7/10/2003	2750	10
	Sulfate	7/10/2003	107	100
A2-SB-MW6-7.5'	Phosphate	7/10/2003	2440	10
A3-SB-001-0.5'	Ammonia-N	7/8/2003	5	1
	Arsenic	7/8/2003	0.84	0.1
	Cadmium	7/8/2003	0.12	0.05
	Chromium	7/8/2003	2.66	0.5
	Copper	7/8/2003	11	0.5
	Iron	7/8/2003	5520	1
	Lead	7/8/2003	6.19	0.5
	Manganese	7/8/2003	489	0.5
	Nickel	7/8/2003	9.04	0.5
	Nitrate-N	7/8/2003	13	10
	Phosphate	7/8/2003	2680	10
	Zinc	7/8/2003	14.7	0.5
A3-SB-001-4.5'	Ammonia-N	7/8/2003	61	1
	Arsenic	7/8/2003	2.66	0.1
	Cadmium	7/8/2003	0.08	0.05
	Chromium	7/8/2003	2.54	0.5
	Copper	7/8/2003	11	0.5
	Iron	7/8/2003	7670	1
	Lead	7/8/2003	6.34	0.5
	Manganese	7/8/2003	447	0.5
	Nickel	7/8/2003	6.43	0.5
	Nitrate-N	7/8/2003	66	10
	Phosphate	7/8/2003	2830	10
	Sulfate	7/8/2003	165	100
	Zinc	7/8/2003	15.7	0.5
A3-SB-001-9.0'	1,2,4-Trimethylbenzene	7/8/2003	0.03	0.01
	Arsenic	7/8/2003	2.78	0.1
	Cadmium	7/8/2003	0.06	0.05
	Chromium	7/8/2003	2.87	0.5
	Copper	7/8/2003	13.1	0.5
	Ethylbenzene	7/8/2003	0.01	0.01
	Iron	7/8/2003	9140	1
	Lead	7/8/2003	4.24	0.5
	Manganese	7/8/2003	266	0.5
	Naphthalene	7/8/2003	0.03	0.01

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A3-SB-001-9.0'	Nickel	7/8/2003	11.1	0.5
	p,m-Xylene	7/8/2003	0.03	0.01
	Phosphate	7/8/2003	2930	10
	Zinc	7/8/2003	18.1	0.5
A3-SB-002-0.5'	Arsenic	7/8/2003	1.27	0.1
	Cadmium	7/8/2003	0.07	0.05
	Chromium	7/8/2003	1.89	0.5
	Copper	7/8/2003	7.12	0.5
	Iron	7/8/2003	5760	1
	Lead	7/8/2003	4.34	0.5
	Manganese	7/8/2003	426	0.5
	Nickel	7/8/2003	5.85	0.5
	Phosphate	7/8/2003	2570	10
	Zinc	7/8/2003	12.6	0.5
A3-SB-002-4.5'	Arsenic	7/8/2003	2.21	0.1
	Cadmium	7/8/2003	0.06	0.05
	Chromium	7/8/2003	3.19	0.5
	Copper	7/8/2003	10.8	0.5
	Iron	7/8/2003	8100	1
	Lead	7/8/2003	6.37	0.5
	Manganese	7/8/2003	324	0.5
	Nickel	7/8/2003	7.48	0.5
	Nitrate-N	7/8/2003	13	10
	Phosphate	7/8/2003	2580	10
	Zinc	7/8/2003	17	0.5
A3-SB-002-7.5'	1,2,4-Trimethylbenzene	7/8/2003	8	2
	1,3,5-Trimethylbenzene	7/8/2003	4	2
	2-Methylnaphthalene	7/8/2003	1.1	0.4
	Arsenic	7/8/2003	4.16	0.1
	Cadmium	7/8/2003	0.06	0.05
	Chromium	7/8/2003	2.14	0.5
	Copper	7/8/2003	10.1	0.5
	Iron	7/8/2003	8540	1
	Lead	7/8/2003	5.59	0.5
	Manganese	7/8/2003	235	0.5
	Naphthalene	7/8/2003	3	2
	Naphthalene	7/8/2003	1	0.4
	Nickel	7/8/2003	6.84	0.5
	NWTPH-Gx	7/8/2003	400	100
	p,m-Xylene	7/8/2003	6	2
	p,m-Xylene	7/8/2003	6	2
	Phosphate	7/8/2003	2830	10
	Zinc	7/8/2003	17.1	0.5

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A4-SB-001-0.5'	Arsenic	7/8/2003	0.78	0.1
	Cadmium	7/8/2003	0.05	0.05
	Chromium	7/8/2003	1.91	0.5
	Copper	7/8/2003	5.29	0.5
	Iron	7/8/2003	5570	1
	Lead	7/8/2003	3.77	0.5
	Manganese	7/8/2003	327	0.5
	Nickel	7/8/2003	6.19	0.5
	Nitrate-N	7/8/2003	43	10
	Phosphate	7/8/2003	2330	10
	Sulfate	7/8/2003	126	100
	Zinc	7/8/2003	11.4	0.5
A4-SB-001-4.5'	Ammonia-N	7/8/2003	3	1
	Nitrate-N	7/8/2003	38	10
	Phosphate	7/8/2003	2430	10
	Sulfate	7/8/2003	109	100
A4-SB-001-9.0'	Phosphate	7/8/2003	2220	10
A4-SB-002-0.5'	Ammonia-N	7/8/2003	680	1
	Arsenic	7/8/2003	0.68	0.1
	Chromium	7/8/2003	1.27	0.5
	Copper	7/8/2003	4.12	0.5
	Iron	7/8/2003	4760	1
	Lead	7/8/2003	3.28	0.5
	Manganese	7/8/2003	256	0.5
	Nickel	7/8/2003	4.17	0.5
	Nitrate-N	7/8/2003	124	10
	Phosphate	7/8/2003	2710	10
	Sulfate	7/8/2003	172	100
	Zinc	7/8/2003	9.4	0.5
A4-SB-002-0.5'-1	Ammonia-N	7/8/2003	624	1
	Arsenic	7/8/2003	0.77	0.1
	Chromium	7/8/2003	1.39	0.5
	Copper	7/8/2003	4.18	0.5
	Iron	7/8/2003	4720	1
	Lead	7/8/2003	3.3	0.5
	Manganese	7/8/2003	214	0.5
	Nickel	7/8/2003	4.11	0.5
	Nitrate-N	7/8/2003	139	10
	Phosphate	7/8/2003	2500	10
	Sulfate	7/8/2003	187	100
	Zinc	7/8/2003	9.38	0.5
A4-SB-002-4.5'	Nitrate-N	7/8/2003	28	10
	Phosphate	7/8/2003	2250	10

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A4-SB-002-4.5'	Sulfate	7/8/2003	117	100
A4-SB-002-9.0'	Phosphate	7/8/2003	2310	10
A4-SB-003-0.5'	Arsenic	7/8/2003	0.73	0.1
	Cadmium	7/8/2003	0.05	0.05
	Chromium	7/8/2003	2.2	0.5
	Copper	7/8/2003	6.32	0.5
	Iron	7/8/2003	5210	1
	Lead	7/8/2003	4.48	0.5
	Manganese	7/8/2003	366	0.5
	Nickel	7/8/2003	5.39	0.5
	Nitrate-N	7/8/2003	12	10
	Phosphate	7/8/2003	2570	10
	Zinc	7/8/2003	11.5	0.5
A4-SB-003-0.5'-1	Arsenic	7/8/2003	0.65	0.1
	Cadmium	7/8/2003	0.06	0.05
	Chromium	7/8/2003	1.85	0.5
	Copper	7/8/2003	4.88	0.5
	Iron	7/8/2003	4640	1
	Lead	7/8/2003	3.74	0.5
	Manganese	7/8/2003	366	0.5
	Nickel	7/8/2003	4.97	0.5
	Nitrate-N	7/8/2003	12	10
	Phosphate	7/8/2003	2460	10
	Zinc	7/8/2003	9.99	0.5
A4-SB-003-4.5'	Nitrate-N	7/8/2003	14	10
	Phosphate	7/8/2003	2710	10
	Sulfate	7/8/2003	128	100
A4-SB-003-6.0'	NWTPH-Dx Diesel Range	7/8/2003	70	20
A4-SB-003-9.0'	1,2,4-Trimethylbenzene	7/8/2003	0.02	0.01
	1,3,5-Trimethylbenzene	7/8/2003	0.02	0.01
	Phosphate	7/8/2003	2480	10
A4-SB-004-0.5'	Arsenic	7/9/2003	1.04	0.1
	Chromium	7/9/2003	2.04	0.5
	Copper	7/9/2003	7.95	0.5
	Iron	7/9/2003	5290	1
	Lead	7/9/2003	4.28	0.5
	Manganese	7/9/2003	229	0.5
	Nickel	7/9/2003	5.77	0.5
	Nitrate-N	7/9/2003	104	10
	Phosphate	7/9/2003	2470	10
	Sulfate	7/9/2003	153	100
	Zinc	7/9/2003	11.7	0.5
A4-SB-004-4.5'	Nitrate-N	7/9/2003	33	10

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A4-SB-004-4.5'	Phosphate	7/9/2003	2600	10
A4-SB-004-9.0'	Nitrate-N	7/9/2003	62	10
	Phosphate	7/9/2003	2070	10
	Sulfate	7/9/2003	149	100
A4-SB-005-0.5'	Ammonia-N	7/8/2003	304	1
	Arsenic	7/8/2003	0.86	0.1
	Cadmium	7/8/2003	0.06	0.05
	Chromium	7/8/2003	2.21	0.5
	Copper	7/8/2003	5.99	0.5
	Iron	7/8/2003	5000	1
	Lead	7/8/2003	4.58	0.5
	Manganese	7/8/2003	323	0.5
	Nickel	7/8/2003	5.46	0.5
	Nitrate-N	7/8/2003	104	10
	Phosphate	7/8/2003	2910	10
	Sulfate	7/8/2003	125	100
	Zinc	7/8/2003	12.4	0.5
A4-SB-005-0.5'-1	Ammonia-N	7/8/2003	328	1
	Arsenic	7/8/2003	1.27	0.1
	Cadmium	7/8/2003	0.06	0.05
	Chromium	7/8/2003	2.97	0.5
	Copper	7/8/2003	10.2	0.5
	Iron	7/8/2003	6460	1
	Lead	7/8/2003	5.55	0.5
	Manganese	7/8/2003	452	0.5
	Nickel	7/8/2003	7.77	0.5
	Nitrate-N	7/8/2003	104	10
	Phosphate	7/8/2003	2810	10
	Sulfate	7/8/2003	145	100
	Zinc	7/8/2003	14.2	0.5
A4-SB-005-4.5'	Ammonia-N	7/8/2003	4	1
	Nitrate-N	7/8/2003	188	10
	Phosphate	7/8/2003	2600	10
	Sulfate	7/8/2003	174	100
A4-SB-005-9.0'	Nitrate-N	7/8/2003	20	10
	Phosphate	7/8/2003	2070	10
A4-SB-006-0.5'	Ammonia-N	7/8/2003	326	1
	Arsenic	7/8/2003	0.72	0.1
	Chromium	7/8/2003	2.02	0.5
	Copper	7/8/2003	4.23	0.5
	Iron	7/8/2003	4230	1
	Lead	7/8/2003	5.55	0.5
	Manganese	7/8/2003	250	0.5

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A4-SB-006-0.5'	Nickel	7/8/2003	4.34	0.5
	Nitrate-N	7/8/2003	203	10
	Phosphate	7/8/2003	2430	10
	Sulfate	7/8/2003	286	100
	Zinc	7/8/2003	12.4	0.5
A5-SS-001-0.5'	Ammonia-N	7/8/2003	417	1
	Arsenic	7/8/2003	1.63	0.1
	Cadmium	7/8/2003	0.08	0.05
	Chromium	7/8/2003	2.57	0.5
	Copper	7/8/2003	8.78	0.5
	Iron	7/8/2003	6100	1
	Lead	7/8/2003	3.9	0.5
	Manganese	7/8/2003	427	0.5
	Nickel	7/8/2003	9.79	0.5
	Nitrate-N	7/8/2003	271	10
	Phosphate	7/8/2003	2250	10
	Sulfate	7/8/2003	3550	100
	Zinc	7/8/2003	12.6	0.5
A5-SS-002-0.5'	Ammonia-N	7/8/2003	4	1
	Arsenic	7/8/2003	1.49	0.1
	Cadmium	7/8/2003	0.07	0.05
	Chromium	7/8/2003	3.1	0.5
	Copper	7/8/2003	9.77	0.5
	Iron	7/8/2003	7040	1
	Lead	7/8/2003	4.42	0.5
	Manganese	7/8/2003	428	0.5
	Nickel	7/8/2003	10.6	0.5
	Nitrate-N	7/8/2003	74	10
	Phosphate	7/8/2003	2430	10
	Sulfate	7/8/2003	120	100
	Zinc	7/8/2003	14.1	0.5
A5-SS-003-0.5'	Ammonia-N	7/8/2003	4	1
	Arsenic	7/8/2003	1.93	0.1
	Chromium	7/8/2003	2.43	0.5
	Copper	7/8/2003	7.42	0.5
	Iron	7/8/2003	5130	1
	Lead	7/8/2003	4.21	0.5
	Manganese	7/8/2003	360	0.5
	Nickel	7/8/2003	7.44	0.5
	Nitrate-N	7/8/2003	566	10
	Phosphate	7/8/2003	1970	10
	Sulfate	7/8/2003	288	100
	Zinc	7/8/2003	10.9	0.5

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A5-SS-004-0.5'	Ammonia-N	7/8/2003	86	1
	Arsenic	7/8/2003	1.76	0.1
	Cadmium	7/8/2003	0.06	0.05
	Chromium	7/8/2003	2.87	0.5
	Copper	7/8/2003	10.1	0.5
	Iron	7/8/2003	7110	1
	Lead	7/8/2003	5.26	0.5
	Manganese	7/8/2003	389	0.5
	Nickel	7/8/2003	8.22	0.5
	Nitrate-N	7/8/2003	234	10
	Phosphate	7/8/2003	2710	10
	Sulfate	7/8/2003	4640	100
	Zinc	7/8/2003	14	0.5
A5-SS-005-0.5'	Arsenic	7/8/2003	2.35	0.1
	Cadmium	7/8/2003	0.06	0.05
	Chromium	7/8/2003	2.53	0.5
	Copper	7/8/2003	9.49	0.5
	Iron	7/8/2003	5200	1
	Lead	7/8/2003	4.76	0.5
	Manganese	7/8/2003	457	0.5
	Nickel	7/8/2003	9.37	0.5
	Nitrate-N	7/8/2003	561	10
	Phosphate	7/8/2003	2100	10
	Sulfate	7/8/2003	288	100
	Zinc	7/8/2003	11.6	0.5
A6-SB-001-0.5'	Nitrate-N	7/9/2003	30	10
	Phosphate	7/9/2003	2150	10
	Sulfate	7/9/2003	103	100
A6-SB-001-4.5'	Nitrate-N	7/9/2003	114	10
	Phosphate	7/9/2003	1940	10
	Sulfate	7/9/2003	314	100
A6-SB-001-7.5'	Ammonia-N	7/9/2003	15	1
	Nitrate-N	7/9/2003	54	10
	Phosphate	7/9/2003	2100	10
	Sulfate	7/9/2003	105	100
A6-SB-002-0.5'	4,4'-DDE	7/9/2003	6	0.02
	4,4'-DDT	7/9/2003	0.02	0.02
	Antimony	7/9/2003	0.53	0.5
	Arsenic	7/9/2003	3.61	0.1
	Cadmium	7/9/2003	18.4	0.05
	Chromium	7/9/2003	64.8	0.5
	Copper	7/9/2003	70.3	0.5
	Iron	7/9/2003	9040	1

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A6-SB-002-0.5'	Lead	7/9/2003	342	0.5
	Manganese	7/9/2003	586	0.5
	Mercury	7/9/2003	0.48	0.1
	Nickel	7/9/2003	88.2	0.5
	Silver	7/9/2003	0.92	0.2
	Thallium	7/9/2003	0.44	0.2
	Zinc	7/9/2003	2520	0.5
A6-SB-002b-0.5'	Ammonia-N	7/9/2003	2710	10
	Chloride	7/9/2003	733	100
	Nitrate-N	7/9/2003	591	10
	Nitrite-N	7/9/2003	16	10
	Phosphate	7/9/2003	14400	100
	Sulfate	7/9/2003	8400	100
A6-SB-002b-0.5'-1	Ammonia-N	7/9/2003	1890	10
	Chloride	7/9/2003	435	100
	Nitrate-N	7/9/2003	396	10
	Phosphate	7/9/2003	11500	100
	Sulfate	7/9/2003	3760	100
A6-SB-002b-4.5'	Ammonia-N	7/9/2003	972	1
	Chloride	7/9/2003	258	100
	Nitrate-N	7/9/2003	734	10
	Phosphate	7/9/2003	5920	10
	Sulfate	7/9/2003	2220	100
A6-SB-002b-9.0'	Ammonia-N	7/9/2003	338	5
	Nitrate-N	7/9/2003	33	10
	Phosphate	7/9/2003	3070	10
	Sulfate	7/9/2003	147	100
A6-SB-003-0.5'	Ammonia-N	7/9/2003	684	5
	Nitrate-N	7/9/2003	53	10
	Phosphate	7/9/2003	19600	100
A6-SB-003-0.5'-1	Ammonia-N	7/9/2003	162	5
	Nitrate-N	7/9/2003	43	10
	Phosphate	7/9/2003	14100	100
A6-SB-003-4.5'	Nitrate-N	7/9/2003	42	10
	Phosphate	7/9/2003	2200	10
A6-SB-003-7.5'	Ammonia-N	7/9/2003	117	5
	Nitrate-N	7/9/2003	34	10
	Phosphate	7/9/2003	2400	10
A6-SB-004-0.5'	Nitrate-N	7/9/2003	28	10
	Phosphate	7/9/2003	2370	10
	Sulfate	7/9/2003	141	100
A6-SB-004-0.5'-1	Nitrate-N	7/9/2003	23	10
	Phosphate	7/9/2003	2640	10

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)
A6-SB-004-0.5'-1	Sulfate	7/9/2003	120	100
A6-SB-004-4.5'	Ammonia-N	7/9/2003	120	5
	Dinoseb	7/9/2003	0.055	0.014
	Nitrate-N	7/9/2003	686	10
	Phosphate	7/9/2003	2060	10
	Sulfate	7/9/2003	137	100
A6-SB-004-6.0'	Ammonia-N	7/9/2003	589	5
	Nitrate-N	7/9/2003	95	10
	Phosphate	7/9/2003	1840	10
A6-SB-005-0.5'	Ammonia-N	7/9/2003	10	5
	Phosphate	7/9/2003	2940	10
	Sulfate	7/9/2003	162	100
A6-SB-005-4.5'	Ammonia-N	7/9/2003	5	5
	Dinoseb	7/9/2003	0.027	0.015
	Nitrate-N	7/9/2003	96	10
	Phosphate	7/9/2003	2160	10
	Sulfate	7/9/2003	332	100
A6-SB-005-7.5'	Phosphate	7/9/2003	1690	10
	Sulfate	7/9/2003	172	100
A6-SS-001-0.5'	Arsenic	7/9/2003	1.19	0.1
	Cadmium	7/9/2003	0.05	0.05
	Chromium	7/9/2003	2.54	0.5
	Copper	7/9/2003	8.57	0.5
	Iron	7/9/2003	6210	1
	Lead	7/9/2003	4.43	0.5
	Manganese	7/9/2003	395	0.5
	Nickel	7/9/2003	7.48	0.5
	Nitrate-N	7/9/2003	22	10
	Phosphate	7/9/2003	2340	10
	Zinc	7/9/2003	13.4	0.5
A6-SS-002-0.5'	Arsenic	7/9/2003	0.99	0.1
	Cadmium	7/9/2003	0.05	0.05
	Chromium	7/9/2003	2.66	0.5
	Copper	7/9/2003	8.97	0.5
	Iron	7/9/2003	7270	1
	Lead	7/9/2003	5.16	0.5
	Manganese	7/9/2003	414	0.5
	Nickel	7/9/2003	7.42	0.5
	Nitrate-N	7/9/2003	32	10
	Phosphate	7/9/2003	2480	10
	Sulfate	7/9/2003	171	100
	Zinc	7/9/2003	14.1	0.5

Table 2-2
Constituents Detected in Groundwater

Sample ID	Analyte	Date	Analytical Results (mg/L)	MDL (mg/L)
MW01-072903-0	Arsenic	7/29/2003	0.011	0.001
	Chloride	7/29/2003	8	1
	Iron	7/29/2003	0.05	0.02
	Manganese	7/29/2003	0.059	0.005
	Phosphate	7/29/2003	0.3	0.1
	Sulfate	7/29/2003	32	1
	Total Nitrates + Nitrites	7/29/2003	4	0.1
MW03-072903-0	Ammonia-N	7/29/2003	180	10
	Arsenic	7/29/2003	0.102	0.001
	Chloride	7/29/2003	13	1
	Chlorobenzene	7/29/2003	0.078	0.001
	Copper	7/29/2003	0.007	0.005
	Manganese	7/29/2003	0.022	0.005
	o-Xylene	7/29/2003	0.001	0.001
	p,m-Xylene	7/29/2003	0.001	0.001
	Phosphate	7/29/2003	85	1
	Sulfate	7/29/2003	38	1
	Total Nitrates + Nitrites	7/29/2003	55.1	0.1
	Zinc	7/29/2003	0.01	0.005
MW04-073003-0	1,2-Dichloropropane	7/30/2003	0.105	0.001
	2,4-Dichlorophenol	7/30/2003	0.03	0.01
	Ammonia-N	7/30/2003	850	10
	Arsenic	7/30/2003	0.007	0.001
	Chloride	7/30/2003	112	1
	Chlorobenzene	7/30/2003	0.003	0.001
	Copper	7/30/2003	0.009	0.005
	Iron	7/30/2003	0.73	0.02
	Lead	7/30/2003	0.001	0.001
	Manganese	7/30/2003	0.364	0.005
	Nickel	7/30/2003	0.021	0.005
	Phosphate	7/30/2003	0.5	0.1
	Sulfate	7/30/2003	307	1
	Total Nitrates + Nitrites	7/30/2003	986	0.1
	Zinc	7/30/2003	0.006	0.005
MW05-073003-0	Ammonia-N	7/30/2003	320	10
	Arsenic	7/30/2003	0.005	0.001
	Chloride	7/30/2003	193	1
	Copper	7/30/2003	0.005	0.005
	Iron	7/30/2003	0.91	0.02

Sample ID	Analyte	Date	Analytical Results (mg/L)	MDL (mg/L)
MW05-073003-0	Manganese	7/30/2003	1.62	0.005
	Nickel	7/30/2003	0.013	0.005
	Sulfate	7/30/2003	624	1
	Total Nitrates + Nitrites	7/30/2003	593	0.1
MW06-073003-0	Arsenic	7/30/2003	0.025	0.001
	Chloride	7/30/2003	11	1
	Iron	7/30/2003	0.11	0.02
	Manganese	7/30/2003	0.057	0.005
	Phosphate	7/30/2003	0.4	0.1
	Sulfate	7/30/2003	55	1
	Total Nitrates + Nitrites	7/30/2003	8.2	0.1
MW07-072903-0	Arsenic	7/29/2003	0.011	0.001
	Chloride	7/29/2003	10	1
	Iron	7/29/2003	0.11	0.02
	Manganese	7/29/2003	0.006	0.005
	Phosphate	7/29/2003	0.3	0.1
	Sulfate	7/29/2003	47	1
	Total Nitrates + Nitrites	7/29/2003	3.6	0.1

Table 3-1: Well Inventory - Wells Reported Within a One-Mile Radius
Bee-Jay Scales Site
Sunnyside, WA

Well Inventory Designator	Distance from Site	Sunnyside Address	Attributes	Well Use	Screened Interval
8	0 - 0.25 mi downgradient	340 Homer Street	Drilled 1994, 500 ft deep, screened	Community Water	305 '- 375'
5	0 - 0.25 mi	1st and Zillah Ave	Drilled 1953-54, 453 ft deep	Community Water	388' - 450'
4A	0.25 - 0.5 mi	7th and East Custer Ave	Drilled 1998, 1700 ft deep	Community Water	1359' - 1376'
24R2	0.25 - 0.50 mi	2930 Outlook Road	Modular home front facing road on wide strip of property	Domestic	not available
24R1	0.50 - 0.75 mi	700 West Edison Street	Home on right side end of private road	Domestic	not available
24E1	0.75 - 1.00 mi	East Woodin Rd and Scoon Rd	Hilltop Church of God - Well is visible	Domestic	not available
24K2	0.75 - 1.00 mi	900 Rouse Road	New property when drilled	Domestic	not available
24K1	0.75 - 1.00 mi	1901 Rouse Rd	Small plot, Trailer, homeowner	Domestic	not available
23H1	0.75 - 1.00 mi	806 Dayton Dr	0.5 duplex, small plot, brick unit	Domestic	not available
23J3	0.75 - 1.00 mi	350 W Wooden Rd	House on South side of Wooden	No Information	225' - 245'
23K1	0.75 - 1.00 mi	931 Woodin Rd	Small plot, Trailer, homeowner	Domestic	not available
23P1	>1.00 mi	3405 Outlook Rd- now Rougk road?	New multi site trailer homes Rougk road address Rougk original owner on well property	Unconfirmed	not available
24L1	>1.00 mi	650 Woodin Rd	Split property for family members	Domestic	not available
24Q1	----	1129 Beckner Alley	Not Found: Ray Rivas 741 Snipes Pump Rd	N/A	not available
23G1	----	Wooden Rd	Mark Drollenger- original owner	No Information	not available
23G2	----	No Information	R.H. Ray- original owner	No Information	not available
23J1	----	No Information	L.W. Healy- original owner	No Information	not available
23H2	----	No Information	Bob Stroh- original owner	No Information	not available
23J2	----	Wooden and Vel Belle	No such intersection	No Information	not available

Table 3-2: Moisture Content Summary
Bee-Jay Scales Site
Sunnyside, WA

Sample ID	Moisture Content (%)
A1-SB-001-0.5'	19.3
A1-SB-001-4.5'	24.5
A1-SB-001-9.0'	21.3
A1-SB-002-0.5'	21.8
A1-SB-002-4.5'	30.0
A1-SB-002-9.0'	29.9
A1-SB-003-0.5'	21.1
A1-SB-003-4.5'	22.9
A1-SB-003-9.0'	24.0
A1-SB-004-0.5'	19.4
A1-SB-004-4.5'	26.5
A1-SB-004-9.0'	25.7
A1-SB-005-0.5'	19.2
A1-SB-005-4.5'	21.6
A1-SB-005-7.5'	24.0
A1-SB-006-0.5'	21.1
A1-SB-006-0.5'-1	21.7
A1-SB-006-4.5'	24.0
A1-SB-006-7.5'	25.0
A1-SB-007-0.5'	19.3
A1-SB-007-4.5'	24.9
A1-SB-007-7.5'	24.1
A1-SB-008-0.5'	19.3
A1-SB-008-4.5'	26.4
A1-SB-008-7.5'	20.7
AREA 1 AVERAGE	**23.1**
A2-SB-001-0.5'	18.3
A2-SB-001-4.5'	24.4
A2-SB-001-9.0'	21.1
A2-SB-002-0.5'	10.6
A2-SB-002-4.5'	19.2
A2-SB-002-9.0'	21.6
A2-SB-002-9.0'-1	18.1
A2-SB-003-0.5'	13.5
A2-SB-003-4.5'	21.2
A2-SB-003-9.0'	23.9
A2-SB-004-0.5'	26.8
A2-SB-004-4.5'	19.1
A2-SB-004-9.0'	20.2
A2-SB-005-0.5'	11.3
A2-SB-005-4.5'	25.1
A2--SB-MW5-0.5'	17.4
A2--SB-MW5-4.5'	21.4
A2--SB-MW5-7.5'	25.2
A2-SB-MW6-0.5'	27.7
A2-SB-MW6-0.5'-1	17.8
A2-SB-MW6-4.5'	20.6
A2-SB-MW6-7.5'	22.2
AREA 2 AVERAGE	**20.3**
A3-SB-001-0.5'	17.0
A3-SB-001-4.5'	25.9
A3-SB-001-9.0'	24.5
A3-SB-002-0.5'	24.4
A3-SB-002-4.5'	20.4

Table 3-2: Moisture Content Summary
Bee-Jay Scales Site
Sunnyside, WA

Sample ID	Moisture Content (%)
A3-SB-002-7.5'	22.6
AREA 3 AVERAGE	**22.5**
A4-SB-001-0.5'	8.3
A4-SB-001-4.5'	18.9
A4-SB-001-9.0'	24.3
A4-SB-002-0.5'	6.4
A4-SB-002-0.5'-1	7.1
A4-SB-002-4.5'	23.4
A4-SB-002-9.0'	21.8
A4-SB-003-0.5'	11.7
A4-SB-003-0.5'-1	9.3
A4-SB-003-4.5'	22.0
A4-SB-003-6.0'	20.1
A4-SB-003-9.0'	19.3
A4-SB-004-0.5'	13.2
A4-SB-004-4.5'	27.2
A4-SB-004-9.0'	21.3
A4-SB-005-0.5'	10.6
A4-SB-005-0.5'-1	13.6
A4-SB-005-4.5'	24.1
A4-SB-005-9.0'	24.1
A4-SB-006-0.5'	7.5
AREA 4 AVERAGE	**16.7**
A5-SS-001-0.5'	10.5
A5-SS-002-0.5'	10.3
A5-SS-003-0.5'	12.5
A5-SS-004-0.5'	13.4
A5-SS-005-0.5'	17.1
AREA 5 AVERAGE	**12.8**
A6-SB-001-0.5'	7.5
A6-SB-001-4.5'	20.6
A6-SB-001-7.5'	23.4
A6-SB-002-0.5'	14.9
A6-SB-002b-0.5'	11.7
A6-SB-002b-0.5'-1	10.8
A6-SB-002b-4.5'	19.4
A6-SB-002b-9.0'	21.4
A6-SB-003-0.5'	15.1
A6-SB-003-0.5'-1	9.7
A6-SB-003-4.5'	22.7
A6-SB-003-7.5'	23.8
A6-SB-004-0.5'	14.3
A6-SB-004-0.5'-1	14.7
A6-SB-004-4.5'	15.3
A6-SB-004-6.0'	20.5
A6-SB-005-0.5'	9.7
A6-SB-005-4.5'	17.2
A6-SB-005-7.5'	25.4
A6-SS-001-0.5'	12.7
A6-SS-002-0.5'	10.1
AREA 6 AVERAGE	**16.2**
SITE AVERAGE	**19.2**

Table 3-3: Water Content, Porosity and Void Ratio Summary
Bee-Jay Scales Site
Sunnyside, WA

Sample ID	Condition	Water Content (%)	Porosity Estimate (%)	Void Ratio Estimate
A1-SB-001-0.5'	Disturbed	24.2	43.6	0.77
A1-SB-001-4.5'	Undisturbed	23.4	45.3	0.83
A1-SB-001-9.0'	Undisturbed	17.6	44.0	0.78
A1-SB-002-0.5'	Disturbed	28.8	46.2	0.86
A1-SB-002-4.5'	Undisturbed	22.2	43.0	0.75
A1-SB-002-9.0'	Undisturbed	27.4	47.8	0.92
A1-SB-003-0.5'	Disturbed	21.8	41.0	0.69
A1-SB-003-4.5'	Undisturbed	19.6	44.3	0.79
A1-SB-003-9.0'	Undisturbed	19.4	44.3	0.80
A1-SB-004-0.5'	Disturbed	23.0	43.1	0.76
A1-SB-004-4.5'	Undisturbed	27.0	48.7	0.95
A1-SB-004-9.0'	Undisturbed	25.3	50.6	1.03
A1-SB-005-0.5'	Disturbed	17.1	34.1	0.52
A1-SB-005-4.5'	Undisturbed	29.6	49.1	0.96
A1-SB-005-7.5'	Undisturbed	24.8	44.1	0.79
A1-SB-006-0.5'	Disturbed	26.6	43.6	0.77
A1-SB-006-0.5'-1	Disturbed	26.8	44.9	0.82
A1-SB-006-4.5'	Undisturbed	29.4	49.6	0.98
A1-SB-006-7.5'	Disturbed	23.6	39.5	0.65
A1-SB-007-0.5'	Disturbed	25.7	42.6	0.74
A1-SB-007-4.5'	Undisturbed	34.1	51.3	1.05
A1-SB-007-7.5'	Undisturbed	26.3	48.8	0.95
A1-SB-008-0.5'	Disturbed	15.5	45.5	0.83
A1-SB-008-4.5'	Undisturbed	29.2	47.2	0.89
A1-SB-008-7.5'	Undisturbed	20.8	38.6	0.63
AREA 1 AVERAGE		**24.4**	**44.8**	**0.82**
A2-SB-001-0.5'	Disturbed	19.2	38.7	0.63
A2-SB-001-4.5'	Undisturbed	18.1	43.0	0.75
A2-SB-001-9.0'	Undisturbed	23.9	46.5	0.87
A2-SB-002-0.5'	Disturbed	9.7	43.7	0.77
A2-SB-002-4.5'	Undisturbed	21.6	41.9	0.72
A2-SB-002-9.0'	Undisturbed	23.7	45.7	0.84
AREA 2 AVERAGE		**19.4**	**43.3**	**0.76**
A3-SB-002-0.5'	Disturbed	26.3	44.1	0.79
A3-SB-002-4.5'	Undisturbed	27.3	49.1	0.97
A3-SB-002-7.5'	Disturbed	25.2	44.1	0.79
AREA 3 AVERAGE		**26.3**	**45.8**	**0.85**
A4-SB-001-0.5'	Disturbed	8.8	41.8	0.72
A4-SB-001-9.0'	Undisturbed	24.2	46.3	0.86
A4-SB-003-0.5'	Disturbed	9.2	39.5	0.65
A4-SB-003-0.5'-1	Disturbed	10.7	38.3	0.62
A4-SB-003-4.5'	Undisturbed	29.6	47.1	0.89
A4-SB-003-9.0'	Undisturbed	20.7	44.9	0.81
AREA 4 AVERAGE		**17.2**	**43.0**	**0.76**
A5-SS-001-0.5'	Disturbed	10.4	43.0	0.75
A5-SS-004-0.5'	Disturbed	13.3	41.7	0.71
AREA 5 AVERAGE		**11.9**	**42.4**	**0.73**
A6-SB-001-4.5'	Undisturbed	18.3	48.5	0.94
A6-SB-001-7.5'	Undisturbed	22.2	43.3	0.77
AREA 6 AVERAGE		**20.3**	**45.9**	**0.86**
SITE AVERAGE		**22.1**	**44.4**	**0.80**

Table 3-4: Grain Size Distribution Summary
Bee-Jay Scales Site
Sunnyside, WA

Sample ID	Condition	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Silt-Clay (%)
A1-SB-003-0.5'	Disturbed	0.0	0.7	6.9	51.6	40.8
A1-SB-003-4.5'	Undisturbed	0.4	0.3	1.7	71.5	26.1
A1-SB-003-9.0'	Undisturbed	0.9	8.1	7.8	71.3	11.9
A1-SB-004-0.5'	Disturbed	0.7	0.8	3.8	85.6	9.1
A1-SB-004-4.5'	Undisturbed	0.2	1.1	6.1	45.7	46.9
A1-SB-004-9.0'	Undisturbed	0.0	0.3	1.2	70.1	28.4
A1-SB-006-0.5'	Disturbed	5.3	3.1	6.2	68.5	16.9
A1-SB-006-0.5'-1	Disturbed	2.0	2.6	8.6	68.4	18.4
A1-SB-006-4.5'	Undisturbed	0.1	2.9	8.6	62.2	26.2
A1-SB-006-7.5'	Disturbed	0.3	0.8	1.6	54.2	43.1
AREA 1 AVERAGE		**1.0**	**2.1**	**5.3**	**64.9**	**26.8**
A2-SB-001-0.5'	Disturbed	4.0	2.0	11.5	80.6	1.9
A2-SB-001-4.5'	Undisturbed	0.6	0.9	6.1	69.0	23.4
A2-SB-001-9.0'	Undisturbed	1.4	1.7	2.8	43.1	51.0
A2-SB-002-0.5'	Disturbed	0.0	0.6	0.9	48.0	50.5
A2-SB-002-4.5'	Undisturbed	0.1	1.4	6.1	52.8	39.6
A2-SB-002-9.0'	Undisturbed	0.3	1.0	1.0	17.0	80.7
AREA 2 AVERAGE		**1.1**	**1.3**	**4.7**	**51.8**	**41.2**
A3-SB-002-0.5'	Disturbed	0.0	0.1	0.6	71.8	27.5
A3-SB-002-4.5'	Undisturbed	0.0	0.2	0.7	23.8	75.3
A3-SB-002-7.5'	Disturbed	0.0	0.3	0.8	46.4	52.5
AREA 3 AVERAGE		**0.0**	**0.2**	**0.7**	**47.3**	**51.8**
A4-SB-001-0.5'	Disturbed	0.0	0.1	0.8	64.1	35.0
A4-SB-001-9.0'	Undisturbed	0.5	2.3	2.5	43.7	51.0
A4-SB-003-0.5'	Disturbed	0.0	0.3	1.7	77.6	20.4
A4-SB-003-0.5'-1	Disturbed	0.4	0.2	2.5	77.7	19.2
A4-SB-003-4.5'	Undisturbed	0.1	1.1	12.8	42.6	43.4
A4-SB-003-9.0'	Undisturbed	0.2	0.6	1.5	62.9	34.8
AREA 4 AVERAGE		**0.2**	**0.8**	**3.6**	**61.4**	**34.0**
A5-SS-001-0.5'	Disturbed	0.0	0.4	2.8	56.4	40.4
A5-SS-004-0.5'	Disturbed	0.3	0.6	2.6	72.2	24.3
AREA 5 AVERAGE		**0.2**	**0.5**	**2.7**	**64.3**	**32.4**
A6-SB-001-4.5'	Undisturbed	1.2	2.2	5.7	62.2	28.7
A6-SB-001-7.5'	Undisturbed	0.0	0.9	1.4	27.6	70.1
AREA 6 AVERAGE		**0.6**	**1.6**	**3.6**	**44.9**	**49.4**
SITE AVERAGE		**0.7**	**1.3**	**4.0**	**58.2**	**35.8**

Table 4-1
Soil Screen Against MTCA Method A Cleanup Levels* and Natural Background Concentrations**

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A1-SB-001-0.5'	Ammonia-N	7/7/2003	5	1	0		Yes
	Arsenic	7/7/2003	1.57	0.1	20	5	No
	Cadmium	7/7/2003	0.41	0.05	0	1	No
	Chromium	7/7/2003	7.91	0.5	0	38	No
	Copper	7/7/2003	13.2	0.5	0	27	No
	Iron	7/7/2003	8750	1	0	51500	No
	Lead	7/7/2003	6.13	0.5	1000	11	No
	Manganese	7/7/2003	392	0.5	0	1100	No
	Nickel	7/7/2003	8.95	0.5	0	46	No
	Nitrate-N	7/7/2003	68	10	0		Yes
	Phosphate	7/7/2003	5690	10	0		Yes
	Zinc	7/7/2003	189	0.5	0	79	Yes
A1-SB-001-4.5'	Ammonia-N	7/7/2003	3	1	0		Yes
	Nitrate-N	7/7/2003	55	10	0		Yes
	Phosphate	7/7/2003	4630	10	0		Yes
A1-SB-001-9.0'	Ammonia-N	7/7/2003	683	1	0		Yes
	Nitrate-N	7/7/2003	29	10	0		Yes
	Phosphate	7/7/2003	2870	10	0		Yes
A1-SB-002-0.5'	Ammonia-N	7/7/2003	400	1	0		Yes
	Arsenic	7/7/2003	1.02	0.1	20	5	No
	Cadmium	7/7/2003	0.21	0.05	0	1	No
	Chromium	7/7/2003	10.7	0.5	0	38	No
	Copper	7/7/2003	32.4	0.5	0	27	Yes
	Iron	7/7/2003	6860	1	0	51500	No
	Lead	7/7/2003	6.87	0.5	1000	11	No
	Manganese	7/7/2003	485	0.5	0	1100	No
	Nickel	7/7/2003	9.77	0.5	0	46	No
	Nitrate-N	7/7/2003	63	10	0		Yes
	Phosphate	7/7/2003	4620	10	0		Yes
	Zinc	7/7/2003	153	0.5	0	79	Yes
A1-SB-002-4.5'	Ammonia-N	7/7/2003	968	1	0		Yes
	Nitrate-N	7/7/2003	321	10	0		Yes
	Phosphate	7/7/2003	4340	10	0		Yes
A1-SB-002-9.0'	Ammonia-N	7/7/2003	100	1	0		Yes
	Nitrate-N	7/7/2003	162	10	0		Yes
	Phosphate	7/7/2003	3620	10	0		Yes

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A1-SB-003-0.5'	Ammonia-N	7/7/2003	631	1	0		Yes
	Arsenic	7/7/2003	1.65	0.1	20	5	No
	Cadmium	7/7/2003	0.2	0.05	0	1	No
	Chromium	7/7/2003	2.68	0.5	0	38	No
	Copper	7/7/2003	11.7	0.5	0	27	No
	Iron	7/7/2003	7170	1	0	51500	No
	Lead	7/7/2003	7.1	0.5	1000	11	No
	Manganese	7/7/2003	420	0.5	0	1100	No
	Nickel	7/7/2003	7.43	0.5	0	46	No
	Nitrate-N	7/7/2003	80	10	0		Yes
	Phosphate	7/7/2003	4100	10	0		Yes
	Zinc	7/7/2003	17.7	0.5	0	79	No
A1-SB-003-4.5'	Ammonia-N	7/7/2003	583	1	0		Yes
	Nitrate-N	7/7/2003	87	10	0		Yes
	Phosphate	7/7/2003	4910	10	0		Yes
A1-SB-003-9.0'	Nitrate-N	7/7/2003	47	10	0		Yes
	Phosphate	7/7/2003	2250	10	0		Yes
A1-SB-004-0.5'	Ammonia-N	7/7/2003	404	1	0		Yes
	Arsenic	7/7/2003	2.11	0.1	20	5	No
	Cadmium	7/7/2003	0.06	0.05	0	1	No
	Chromium	7/7/2003	3.4	0.5	0	38	No
	Copper	7/7/2003	9.66	0.5	0	27	No
	Iron	7/7/2003	6330	1	0	51500	No
	Lead	7/7/2003	4.76	0.5	1000	11	No
	Manganese	7/7/2003	315	0.5	0	1100	No
	Nickel	7/7/2003	8.29	0.5	0	46	No
	Nitrate-N	7/7/2003	310	10	0		Yes
	Phosphate	7/7/2003	2590	10	0		Yes
	Zinc	7/7/2003	14	0.5	0	79	No
A1-SB-004-4.5'	Ammonia-N	7/7/2003	426	1	0		Yes
	Nitrate-N	7/7/2003	351	10	0		Yes
	Phosphate	7/7/2003	5030	10	0		Yes
	Sulfate	7/7/2003	225	100	0		Yes
A1-SB-004-9.0'	Ammonia-N	7/7/2003	57	1	0		Yes
	Nitrate-N	7/7/2003	59	10	0		Yes
	Phosphate	7/7/2003	2410	10	0		Yes
A1-SB-005-0.5'	Arsenic	7/10/2003	2.65	0.1	20	5	No
	Cadmium	7/10/2003	0.24	0.05	0	1	No
	Chromium	7/10/2003	6.07	0.5	0	38	No
	Copper	7/10/2003	8.07	0.5	0	27	No
	Iron	7/10/2003	5580	1	0	51500	No

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A1-SB-005-0.5'	Lead	7/10/2003	11.5	0.5	1000	11	No
	Manganese	7/10/2003	343	0.5	0	1100	No
	Nickel	7/10/2003	6.42	0.5	0	46	No
	Nitrate-N	7/10/2003	161	10	0		Yes
	Phosphate	7/10/2003	6390	10	0		Yes
	Zinc	7/10/2003	30.3	0.5	0	79	No
A1-SB-005-4.5'	Ammonia-N	7/10/2003	735	5	0		Yes
	Nitrate-N	7/10/2003	983	10	0		Yes
	Nitrite-N	7/10/2003	17	10	0		Yes
	Phosphate	7/10/2003	2670	10	0		Yes
	Sulfate	7/10/2003	199	100	0		Yes
A1-SB-005-7.5'	Ammonia-N	7/10/2003	1630	10	0		Yes
	Nitrate-N	7/10/2003	255	10	0		Yes
	Phosphate	7/10/2003	8180	10	0		Yes
A1-SB-006-0.5'	Ammonia-N	7/10/2003	1110	10	0		Yes
	Arsenic	7/10/2003	1.39	0.1	20	5	No
	Beryllium	7/10/2003	0.61	0.5	0	2	No
	Cadmium	7/10/2003	7.83	0.05	0	1	Yes
	Chromium	7/10/2003	58.3	0.5	0	38	Yes
	Copper	7/10/2003	20.5	0.5	0	27	No
	Iron	7/10/2003	9310	1	0	51500	No
	Lead	7/10/2003	8.97	0.5	1000	11	No
	Manganese	7/10/2003	343	0.5	0	1100	No
	Nickel	7/10/2003	15.2	0.5	0	46	No
	Nitrate-N	7/10/2003	127	10	0		Yes
	Phosphate	7/10/2003	30200	100	0		Yes
	Zinc	7/10/2003	1030	0.5	0	79	Yes
A1-SB-006-0.5'-1	Ammonia-N	7/10/2003	1030	10	0		Yes
	Arsenic	7/10/2003	1.29	0.1	20	5	No
	Beryllium	7/10/2003	0.57	0.5	0	2	No
	Cadmium	7/10/2003	8.52	0.05	0	1	Yes
	Chromium	7/10/2003	48.3	0.5	0	38	Yes
	Copper	7/10/2003	19.8	0.5	0	27	No
	Iron	7/10/2003	8770	1	0	51500	No
	Lead	7/10/2003	10.9	0.5	1000	11	No
	Manganese	7/10/2003	274	0.5	0	1100	No
	Mercury	7/10/2003	0.12	0.1	2	0.05	No
	Nickel	7/10/2003	13.7	0.5	0	46	No
	Nitrate-N	7/10/2003	127	10	0		Yes
	Phosphate	7/10/2003	29300	100	0		Yes
	Zinc	7/10/2003	1000	0.5	0	79	Yes

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A1-SB-006-4.5'	Ammonia-N	7/10/2003	1520	10	0		Yes
	Nitrate-N	7/10/2003	672	10	0		Yes
	Phosphate	7/10/2003	6300	10	0		Yes
A1-SB-006-7.5'	Ammonia-N	7/10/2003	1460	10	0		Yes
	Nitrate-N	7/10/2003	130	10	0		Yes
	Phosphate	7/10/2003	5010	10	0		Yes
A1-SB-007-0.5'	Arsenic	7/10/2003	5.69	0.1	20	5	No
	Cadmium	7/10/2003	0.12	0.05	0	1	No
	Chromium	7/10/2003	2.8	0.5	0	38	No
	Copper	7/10/2003	8.4	0.5	0	27	No
	Iron	7/10/2003	5630	1	0	51500	No
	Lead	7/10/2003	11.3	0.5	1000	11	No
	Manganese	7/10/2003	354	0.5	0	1100	No
	Nickel	7/10/2003	6.54	0.5	0	46	No
	Nitrate-N	7/10/2003	172	10	0		Yes
	Phosphate	7/10/2003	3320	10	0		Yes
	Zinc	7/10/2003	30.6	0.5	0	79	No
A1-SB-007-4.5'	Ammonia-N	7/10/2003	281	5	0		Yes
	Nitrate-N	7/10/2003	405	10	0		Yes
	Phosphate	7/10/2003	2440	10	0		Yes
	Sulfate	7/10/2003	116	100	0		Yes
A1-SB-007-7.5'	Ammonia-N	7/10/2003	1200	10	0		Yes
	Nitrate-N	7/10/2003	86	10	0		Yes
	Phosphate	7/10/2003	3040	10	0		Yes
A1-SB-008-0.5'	Ammonia-N	7/10/2003	207	5	0		Yes
	Arsenic	7/10/2003	1.62	0.1	20	5	No
	Cadmium	7/10/2003	0.14	0.05	0	1	No
	Chromium	7/10/2003	3.28	0.5	0	38	No
	Copper	7/10/2003	10.1	0.5	0	27	No
	Iron	7/10/2003	6230	1	0	51500	No
	Lead	7/10/2003	6.65	0.5	1000	11	No
	Manganese	7/10/2003	567	0.5	0	1100	No
	Nickel	7/10/2003	7.61	0.5	0	46	No
	Nitrate-N	7/10/2003	148	10	0		Yes
	Phosphate	7/10/2003	4880	10	0		Yes
	Zinc	7/10/2003	24.8	0.5	0	79	No
A1-SB-008-4.5'	Nitrate-N	7/10/2003	486	10	0		Yes
	Phosphate	7/10/2003	2820	10	0		Yes
	Sulfate	7/10/2003	114	100	0		Yes
A1-SB-008-7.5'	Ammonia-N	7/10/2003	337	5	0		Yes
	Nitrate-N	7/10/2003	318	10	0		Yes

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A1-SB-008-7.5'	Phosphate	7/10/2003	2950	10	0		Yes
	Sulfate	7/10/2003	138	100	0		Yes
A2-SB-001-0.5'	Ammonia-N	7/8/2003	283	1	0		Yes
	Arsenic	7/8/2003	1.3	0.1	20	5	No
	Cadmium	7/8/2003	0.08	0.05	0	1	No
	Chromium	7/8/2003	3.37	0.5	0	38	No
	Copper	7/8/2003	12.7	0.5	0	27	No
	Iron	7/8/2003	6870	1	0	51500	No
	Lead	7/8/2003	7.24	0.5	1000	11	No
	Manganese	7/8/2003	568	0.5	0	1100	No
	Nickel	7/8/2003	9.48	0.5	0	46	No
	Nitrate-N	7/8/2003	294	10	0		Yes
	Phosphate	7/8/2003	2690	10	0		Yes
	Sulfate	7/8/2003	934	100	0		Yes
	Zinc	7/8/2003	17.8	0.5	0	79	No
A2-SB-001-4.5'	Nitrate-N	7/8/2003	83	10	0		Yes
	Phosphate	7/8/2003	2790	10	0		Yes
	Sulfate	7/8/2003	224	100	0		Yes
A2-SB-001-9.0'	Phosphate	7/8/2003	1910	10	0		Yes
A2-SB-002-0.5'	Ammonia-N	7/8/2003	273	1	0		Yes
	Arsenic	7/8/2003	1.17	0.1	20	5	No
	Chromium	7/8/2003	2.01	0.5	0	38	No
	Copper	7/8/2003	5.87	0.5	0	27	No
	Iron	7/8/2003	6220	1	0	51500	No
	Lead	7/8/2003	3.82	0.5	1000	11	No
	Manganese	7/8/2003	153	0.5	0	1100	No
	Nickel	7/8/2003	4.93	0.5	0	46	No
	Nitrate-N	7/8/2003	214	10	0		Yes
	Phosphate	7/8/2003	2450	10	0		Yes
	Sulfate	7/8/2003	1640	100	0		Yes
	Zinc	7/8/2003	12.6	0.5	0	79	No
A2-SB-002-4.5'	Nitrate-N	7/8/2003	47	10	0		Yes
	Phosphate	7/8/2003	2470	10	0		Yes
	Sulfate	7/8/2003	150	100	0		Yes
A2-SB-002-9.0'	Nitrate-N	7/8/2003	12	10	0		Yes
	Phosphate	7/8/2003	2360	10	0		Yes
A2-SB-002-9.0'-1	Nitrate-N	7/8/2003	11	10	0		Yes
	Phosphate	7/8/2003	2400	10	0		Yes
A2-SB-003-0.5'	Ammonia-N	7/7/2003	117	1	0		Yes
	Arsenic	7/7/2003	1.69	0.1	20	5	No
	Cadmium	7/7/2003	0.06	0.05	0	1	No

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A2-SB-003-0.5'	Chromium	7/7/2003	3.25	0.5	0	38	No
	Copper	7/7/2003	9	0.5	0	27	No
	Iron	7/7/2003	6000	1	0	51500	No
	Lead	7/7/2003	4.26	0.5	1000	11	No
	Manganese	7/7/2003	318	0.5	0	1100	No
	Nickel	7/7/2003	7.66	0.5	0	46	No
	Nitrate-N	7/7/2003	137	10	0		Yes
	Phosphate	7/7/2003	2480	10	0		Yes
	Sulfate	7/7/2003	186	100	0		Yes
	Zinc	7/7/2003	12.9	0.5	0	79	No
A2-SB-003-4.5'	Ammonia-N	7/7/2003	7	1	0		Yes
	Nitrate-N	7/7/2003	59	10	0		Yes
	Phosphate	7/7/2003	1810	10	0		Yes
A2-SB-003-9.0'	Ammonia-N	7/7/2003	31	1	0		Yes
	Nitrate-N	7/7/2003	13	10	0		Yes
	Phosphate	7/7/2003	1870	10	0		Yes
A2-SB-004-0.5'	Ammonia-N	7/7/2003	5550	10	0		Yes
	Arsenic	7/7/2003	2	0.1	20	5	No
	Cadmium	7/7/2003	0.92	0.05	0	1	No
	Chloride	7/7/2003	534	100	0		Yes
	Chromium	7/7/2003	3.82	0.5	0	38	No
	Copper	7/7/2003	17.4	0.5	0	27	No
	Iron	7/7/2003	7870	1	0	51500	No
	Lead	7/7/2003	11.7	0.5	1000	11	No
	Manganese	7/7/2003	465	0.5	0	1100	No
	Nickel	7/7/2003	8.83	0.5	0	46	No
	Nitrate-N	7/7/2003	1530	10	0		Yes
	Nitrite-N	7/7/2003	27	10	0		Yes
	Phosphate	7/7/2003	5480	10	0		Yes
	Sulfate	7/7/2003	2900	100	0		Yes
	Zinc	7/7/2003	38.8	0.5	0	79	No
A2-SB-004-4.5'	Ammonia-N	7/7/2003	920	1	0		Yes
	Nitrate-N	7/7/2003	217	10	0		Yes
	Phosphate	7/7/2003	2480	10	0		Yes
	Sulfate	7/7/2003	159	100	0		Yes
A2-SB-004-9.0'	Ammonia-N	7/7/2003	372	1	0		Yes
	Nitrate-N	7/7/2003	139	10	0		Yes
	Phosphate	7/7/2003	2750	10	0		Yes
	Sulfate	7/7/2003	214	100	0		Yes
A2-SB-005-0.5'	Ammonia-N	7/11/2003	100	5	0		Yes
	Arsenic	7/11/2003	1.64	0.1	20	5	No

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A2-SB-005-0.5'	Cadmium	7/11/2003	0.24	0.05	0	1	No
	Chromium	7/11/2003	3.98	0.5	0	38	No
	Copper	7/11/2003	7.18	0.5	0	27	No
	Iron	7/11/2003	6520	1	0	51500	No
	Lead	7/11/2003	7.32	0.5	1000	11	No
	Manganese	7/11/2003	257	0.5	0	1100	No
	Nickel	7/11/2003	5.45	0.5	0	46	No
	Nitrate-N	7/11/2003	65	10	0		Yes
	Phosphate	7/11/2003	11200	100	0		Yes
	Sulfate	7/11/2003	148	100	0		Yes
	Zinc	7/11/2003	21.7	0.5	0	79	No
A2-SB-005-4.5'	Nitrate-N	7/11/2003	71	10	0		Yes
	Phosphate	7/11/2003	3040	10	0		Yes
	Sulfate	7/11/2003	162	100	0		Yes
A2--SB-MW5-0.5'	Ammonia-N	7/10/2003	370	5	0		Yes
	Arsenic	7/10/2003	1.39	0.1	20	5	No
	Cadmium	7/10/2003	0.12	0.05	0	1	No
	Chromium	7/10/2003	1.62	0.5	0	38	No
	Copper	7/10/2003	6.18	0.5	0	27	No
	Iron	7/10/2003	4450	1	0	51500	No
	Lead	7/10/2003	15.8	0.5	1000	11	No
	Manganese	7/10/2003	176	0.5	0	1100	No
	Nickel	7/10/2003	4.27	0.5	0	46	No
	Nitrate-N	7/10/2003	202	10	0		Yes
	Phosphate	7/10/2003	6420	10	0		Yes
	Sulfate	7/10/2003	2990	100	0		Yes
	Zinc	7/10/2003	25.8	0.5	0	79	No
A2--SB-MW5-4.5'	Ammonia-N	7/10/2003	214	5	0		Yes
	Nitrate-N	7/10/2003	1130	10	0		Yes
	Phosphate	7/10/2003	2790	10	0		Yes
	Sulfate	7/10/2003	442	100	0		Yes
A2--SB-MW5-7.5'	Ammonia-N	7/10/2003	218	5	0		Yes
	Nitrate-N	7/10/2003	126	10	0		Yes
	Phosphate	7/10/2003	2350	10	0		Yes
	Sulfate	7/10/2003	207	100	0		Yes
A2-SB-MW6-0.5'	Arsenic	7/10/2003	1.39	0.1	20	5	No
	Cadmium	7/10/2003	0.15	0.05	0	1	No
	Chromium	7/10/2003	2.7	0.5	0	38	No
	Copper	7/10/2003	10.9	0.5	0	27	No
	Iron	7/10/2003	6690	1	0	51500	No
	Lead	7/10/2003	9.25	0.5	1000	11	No

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A2-SB-MW6-0.5'	Manganese	7/10/2003	520	0.5	0	1100	No
	Nickel	7/10/2003	8.16	0.5	0	46	No
	Nitrate-N	7/10/2003	150	10	0		Yes
	Phosphate	7/10/2003	3130	10	0		Yes
	Sulfate	7/10/2003	2530	100	0		Yes
	Zinc	7/10/2003	48.8	0.5	0	79	No
A2-SB-MW6-0.5'-1	Ammonia-N	7/10/2003	6	5	0		Yes
	Arsenic	7/10/2003	1.77	0.1	20	5	No
	Cadmium	7/10/2003	0.09	0.05	0	1	No
	Chromium	7/10/2003	2.83	0.5	0	38	No
	Copper	7/10/2003	11.9	0.5	0	27	No
	Iron	7/10/2003	6550	1	0	51500	No
	Lead	7/10/2003	12.7	0.5	1000	11	No
	Manganese	7/10/2003	311	0.5	0	1100	No
	Nickel	7/10/2003	6.19	0.5	0	46	No
	Nitrate-N	7/10/2003	121	10	0		Yes
	Phosphate	7/10/2003	3440	10	0		Yes
	Sulfate	7/10/2003	729	100	0		Yes
	Zinc	7/10/2003	22.1	0.5	0	79	No
A2-SB-MW6-4.5'	Nitrate-N	7/10/2003	44	10	0		Yes
	Phosphate	7/10/2003	2750	10	0		Yes
	Sulfate	7/10/2003	107	100	0		Yes
A2-SB-MW6-7.5'	Phosphate	7/10/2003	2440	10	0		Yes
A3-SB-001-0.5'	Ammonia-N	7/8/2003	5	1	0		Yes
	Arsenic	7/8/2003	0.84	0.1	20	5	No
	Cadmium	7/8/2003	0.12	0.05	0	1	No
	Chromium	7/8/2003	2.66	0.5	0	38	No
	Copper	7/8/2003	11	0.5	0	27	No
	Iron	7/8/2003	5520	1	0	51500	No
	Lead	7/8/2003	6.19	0.5	1000	11	No
	Manganese	7/8/2003	489	0.5	0	1100	No
	Nickel	7/8/2003	9.04	0.5	0	46	No
	Nitrate-N	7/8/2003	13	10	0		Yes
	Phosphate	7/8/2003	2680	10	0		Yes
	Zinc	7/8/2003	14.7	0.5	0	79	No
A3-SB-001-4.5'	Ammonia-N	7/8/2003	61	1	0		Yes
	Arsenic	7/8/2003	2.66	0.1	20	5	No
	Cadmium	7/8/2003	0.08	0.05	0	1	No
	Chromium	7/8/2003	2.54	0.5	0	38	No
	Copper	7/8/2003	11	0.5	0	27	No
	Iron	7/8/2003	7670	1	0	51500	No

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A3-SB-001-4.5'	Lead	7/8/2003	6.34	0.5	1000	11	No
	Manganese	7/8/2003	447	0.5	0	1100	No
	Nickel	7/8/2003	6.43	0.5	0	46	No
	Nitrate-N	7/8/2003	66	10	0		Yes
	Phosphate	7/8/2003	2830	10	0		Yes
	Sulfate	7/8/2003	165	100	0		Yes
	Zinc	7/8/2003	15.7	0.5	0	79	No
A3-SB-001-9.0'	1,2,4-Trimethylbenzene	7/8/2003	0.03	0.01	0		Yes
	Arsenic	7/8/2003	2.78	0.1	20	5	No
	Cadmium	7/8/2003	0.06	0.05	0	1	No
	Chromium	7/8/2003	2.87	0.5	0	38	No
	Copper	7/8/2003	13.1	0.5	0	27	No
	Ethylbenzene	7/8/2003	0.01	0.01	6		No
	Iron	7/8/2003	9140	1	0	51500	No
	Lead	7/8/2003	4.24	0.5	1000	11	No
	Manganese	7/8/2003	266	0.5	0	1100	No
	Naphthalene	7/8/2003	0.03	0.01	5		No
	Nickel	7/8/2003	11.1	0.5	0	46	No
	p,m-Xylene	7/8/2003	0.03	0.01	0		Yes
	Phosphate	7/8/2003	2930	10	0		Yes
	Zinc	7/8/2003	18.1	0.5	0	79	No
A3-SB-002-0.5'	Arsenic	7/8/2003	1.27	0.1	20	5	No
	Cadmium	7/8/2003	0.07	0.05	0	1	No
	Chromium	7/8/2003	1.89	0.5	0	38	No
	Copper	7/8/2003	7.12	0.5	0	27	No
	Iron	7/8/2003	5760	1	0	51500	No
	Lead	7/8/2003	4.34	0.5	1000	11	No
	Manganese	7/8/2003	426	0.5	0	1100	No
	Nickel	7/8/2003	5.85	0.5	0	46	No
	Phosphate	7/8/2003	2570	10	0		Yes
	Zinc	7/8/2003	12.6	0.5	0	79	No
A3-SB-002-4.5'	Arsenic	7/8/2003	2.21	0.1	20	5	No
	Cadmium	7/8/2003	0.06	0.05	0	1	No
	Chromium	7/8/2003	3.19	0.5	0	38	No
	Copper	7/8/2003	10.8	0.5	0	27	No
	Iron	7/8/2003	8100	1	0	51500	No
	Lead	7/8/2003	6.37	0.5	1000	11	No
	Manganese	7/8/2003	324	0.5	0	1100	No
	Nickel	7/8/2003	7.48	0.5	0	46	No
	Nitrate-N	7/8/2003	13	10	0		Yes
	Phosphate	7/8/2003	2580	10	0		Yes

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A3-SB-002-4.5'	Zinc	7/8/2003	17	0.5	0	79	No
A3-SB-002-7.5'	1,2,4-Trimethylbenzene	7/8/2003	8	2	0		Yes
	1,3,5-Trimethylbenzene	7/8/2003	4	2	0		Yes
	2-Methylnaphthalene	7/8/2003	1.1	0.4	0		Yes
	Arsenic	7/8/2003	4.16	0.1	20	5	No
	Cadmium	7/8/2003	0.06	0.05	0	1	No
	Chromium	7/8/2003	2.14	0.5	0	38	No
	Copper	7/8/2003	10.1	0.5	0	27	No
	Iron	7/8/2003	8540	1	0	51500	No
	Lead	7/8/2003	5.59	0.5	1000	11	No
	Manganese	7/8/2003	235	0.5	0	1100	No
	Naphthalene	7/8/2003	3	2	5		No
	Naphthalene	7/8/2003	1	0.4	5		No
	Nickel	7/8/2003	6.84	0.5	0	46	No
	NWTPH-Gx	7/8/2003	400	100	100		Yes
	p,m-Xylene	7/8/2003	6	2	0		Yes
	p,m-Xylene	7/8/2003	6	2	0		Yes
	Phosphate	7/8/2003	2830	10	0		Yes
	Zinc	7/8/2003	17.1	0.5	0	79	No
A4-SB-001-0.5'	Arsenic	7/8/2003	0.78	0.1	20	5	No
	Cadmium	7/8/2003	0.05	0.05	0	1	No
	Chromium	7/8/2003	1.91	0.5	0	38	No
	Copper	7/8/2003	5.29	0.5	0	27	No
	Iron	7/8/2003	5570	1	0	51500	No
	Lead	7/8/2003	3.77	0.5	1000	11	No
	Manganese	7/8/2003	327	0.5	0	1100	No
	Nickel	7/8/2003	6.19	0.5	0	46	No
	Nitrate-N	7/8/2003	43	10	0		Yes
	Phosphate	7/8/2003	2330	10	0		Yes
	Sulfate	7/8/2003	126	100	0		Yes
	Zinc	7/8/2003	11.4	0.5	0	79	No
A4-SB-001-4.5'	Ammonia-N	7/8/2003	3	1	0		Yes
	Nitrate-N	7/8/2003	38	10	0		Yes
	Phosphate	7/8/2003	2430	10	0		Yes
	Sulfate	7/8/2003	109	100	0		Yes
A4-SB-001-9.0'	Phosphate	7/8/2003	2220	10	0		Yes
A4-SB-002-0.5'	Ammonia-N	7/8/2003	680	1	0		Yes
	Arsenic	7/8/2003	0.68	0.1	20	5	No
	Chromium	7/8/2003	1.27	0.5	0	38	No
	Copper	7/8/2003	4.12	0.5	0	27	No
	Iron	7/8/2003	4760	1	0	51500	No

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A4-SB-002-0.5'	Lead	7/8/2003	3.28	0.5	1000	11	No
	Manganese	7/8/2003	256	0.5	0	1100	No
	Nickel	7/8/2003	4.17	0.5	0	46	No
	Nitrate-N	7/8/2003	124	10	0		Yes
	Phosphate	7/8/2003	2710	10	0		Yes
	Sulfate	7/8/2003	172	100	0		Yes
	Zinc	7/8/2003	9.4	0.5	0	79	No
A4-SB-002-0.5'-1	Ammonia-N	7/8/2003	624	1	0		Yes
	Arsenic	7/8/2003	0.77	0.1	20	5	No
	Chromium	7/8/2003	1.39	0.5	0	38	No
	Copper	7/8/2003	4.18	0.5	0	27	No
	Iron	7/8/2003	4720	1	0	51500	No
	Lead	7/8/2003	3.3	0.5	1000	11	No
	Manganese	7/8/2003	214	0.5	0	1100	No
	Nickel	7/8/2003	4.11	0.5	0	46	No
	Nitrate-N	7/8/2003	139	10	0		Yes
	Phosphate	7/8/2003	2500	10	0		Yes
	Sulfate	7/8/2003	187	100	0		Yes
	Zinc	7/8/2003	9.38	0.5	0	79	No
A4-SB-002-4.5'	Nitrate-N	7/8/2003	28	10	0		Yes
	Phosphate	7/8/2003	2250	10	0		Yes
	Sulfate	7/8/2003	117	100	0		Yes
A4-SB-002-9.0'	Phosphate	7/8/2003	2310	10	0		Yes
A4-SB-003-0.5'	Arsenic	7/8/2003	0.73	0.1	20	5	No
	Cadmium	7/8/2003	0.05	0.05	0	1	No
	Chromium	7/8/2003	2.2	0.5	0	38	No
	Copper	7/8/2003	6.32	0.5	0	27	No
	Iron	7/8/2003	5210	1	0	51500	No
	Lead	7/8/2003	4.48	0.5	1000	11	No
	Manganese	7/8/2003	366	0.5	0	1100	No
	Nickel	7/8/2003	5.39	0.5	0	46	No
	Nitrate-N	7/8/2003	12	10	0		Yes
	Phosphate	7/8/2003	2570	10	0		Yes
	Zinc	7/8/2003	11.5	0.5	0	79	No
A4-SB-003-0.5'-1	Arsenic	7/8/2003	0.65	0.1	20	5	No
	Cadmium	7/8/2003	0.06	0.05	0	1	No
	Chromium	7/8/2003	1.85	0.5	0	38	No
	Copper	7/8/2003	4.88	0.5	0	27	No
	Iron	7/8/2003	4640	1	0	51500	No
	Lead	7/8/2003	3.74	0.5	1000	11	No
	Manganese	7/8/2003	366	0.5	0	1100	No

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A4-SB-003-0.5'-1	Nickel	7/8/2003	4.97	0.5	0	46	No
	Nitrate-N	7/8/2003	12	10	0		Yes
	Phosphate	7/8/2003	2460	10	0		Yes
	Zinc	7/8/2003	9.99	0.5	0	79	No
A4-SB-003-4.5'	Nitrate-N	7/8/2003	14	10	0		Yes
	Phosphate	7/8/2003	2710	10	0		Yes
	Sulfate	7/8/2003	128	100	0		Yes
A4-SB-003-6.0'	NWTPH-Dx Diesel Range	7/8/2003	70	20	2000		No
A4-SB-003-9.0'	1,2,4-Trimethylbenzene	7/8/2003	0.02	0.01	0		Yes
	1,3,5-Trimethylbenzene	7/8/2003	0.02	0.01	0		Yes
	Phosphate	7/8/2003	2480	10	0		Yes
A4-SB-004-0.5'	Arsenic	7/9/2003	1.04	0.1	20	5	No
	Chromium	7/9/2003	2.04	0.5	0	38	No
	Copper	7/9/2003	7.95	0.5	0	27	No
	Iron	7/9/2003	5290	1	0	51500	No
	Lead	7/9/2003	4.28	0.5	1000	11	No
	Manganese	7/9/2003	229	0.5	0	1100	No
	Nickel	7/9/2003	5.77	0.5	0	46	No
	Nitrate-N	7/9/2003	104	10	0		Yes
	Phosphate	7/9/2003	2470	10	0		Yes
	Sulfate	7/9/2003	153	100	0		Yes
	Zinc	7/9/2003	11.7	0.5	0	79	No
A4-SB-004-4.5'	Nitrate-N	7/9/2003	33	10	0		Yes
	Phosphate	7/9/2003	2600	10	0		Yes
A4-SB-004-9.0'	Nitrate-N	7/9/2003	62	10	0		Yes
	Phosphate	7/9/2003	2070	10	0		Yes
	Sulfate	7/9/2003	149	100	0		Yes
A4-SB-005-0.5'	Ammonia-N	7/8/2003	304	1	0		Yes
	Arsenic	7/8/2003	0.86	0.1	20	5	No
	Cadmium	7/8/2003	0.06	0.05	0	1	No
	Chromium	7/8/2003	2.21	0.5	0	38	No
	Copper	7/8/2003	5.99	0.5	0	27	No
	Iron	7/8/2003	5000	1	0	51500	No
	Lead	7/8/2003	4.58	0.5	1000	11	No
	Manganese	7/8/2003	323	0.5	0	1100	No
	Nickel	7/8/2003	5.46	0.5	0	46	No
	Nitrate-N	7/8/2003	104	10	0		Yes
	Phosphate	7/8/2003	2910	10	0		Yes
	Sulfate	7/8/2003	125	100	0		Yes
	Zinc	7/8/2003	12.4	0.5	0	79	No
A4-SB-005-0.5'-1	Ammonia-N	7/8/2003	328	1	0		Yes

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A4-SB-005-0.5'-1	Arsenic	7/8/2003	1.27	0.1	20	5	No
	Cadmium	7/8/2003	0.06	0.05	0	1	No
	Chromium	7/8/2003	2.97	0.5	0	38	No
	Copper	7/8/2003	10.2	0.5	0	27	No
	Iron	7/8/2003	6460	1	0	51500	No
	Lead	7/8/2003	5.55	0.5	1000	11	No
	Manganese	7/8/2003	452	0.5	0	1100	No
	Nickel	7/8/2003	7.77	0.5	0	46	No
	Nitrate-N	7/8/2003	104	10	0		Yes
	Phosphate	7/8/2003	2810	10	0		Yes
	Sulfate	7/8/2003	145	100	0		Yes
	Zinc	7/8/2003	14.2	0.5	0	79	No
A4-SB-005-4.5'	Ammonia-N	7/8/2003	4	1	0		Yes
	Nitrate-N	7/8/2003	188	10	0		Yes
	Phosphate	7/8/2003	2600	10	0		Yes
	Sulfate	7/8/2003	174	100	0		Yes
A4-SB-005-9.0'	Nitrate-N	7/8/2003	20	10	0		Yes
	Phosphate	7/8/2003	2070	10	0		Yes
A4-SB-006-0.5'	Ammonia-N	7/8/2003	326	1	0		Yes
	Arsenic	7/8/2003	0.72	0.1	20	5	No
	Chromium	7/8/2003	2.02	0.5	0	38	No
	Copper	7/8/2003	4.23	0.5	0	27	No
	Iron	7/8/2003	4230	1	0	51500	No
	Lead	7/8/2003	5.55	0.5	1000	11	No
	Manganese	7/8/2003	250	0.5	0	1100	No
	Nickel	7/8/2003	4.34	0.5	0	46	No
	Nitrate-N	7/8/2003	203	10	0		Yes
	Phosphate	7/8/2003	2430	10	0		Yes
	Sulfate	7/8/2003	286	100	0		Yes
	Zinc	7/8/2003	12.4	0.5	0	79	No
A5-SS-001-0.5'	Ammonia-N	7/8/2003	417	1	0		Yes
	Arsenic	7/8/2003	1.63	0.1	20	5	No
	Cadmium	7/8/2003	0.08	0.05	0	1	No
	Chromium	7/8/2003	2.57	0.5	0	38	No
	Copper	7/8/2003	8.78	0.5	0	27	No
	Iron	7/8/2003	6100	1	0	51500	No
	Lead	7/8/2003	3.9	0.5	1000	11	No
	Manganese	7/8/2003	427	0.5	0	1100	No
	Nickel	7/8/2003	9.79	0.5	0	46	No
	Nitrate-N	7/8/2003	271	10	0		Yes
	Phosphate	7/8/2003	2250	10	0		Yes

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A5-SS-001-0.5'	Sulfate	7/8/2003	3550	100	0		Yes
	Zinc	7/8/2003	12.6	0.5	0	79	No
A5-SS-002-0.5'	Ammonia-N	7/8/2003	4	1	0		Yes
	Arsenic	7/8/2003	1.49	0.1	20	5	No
	Cadmium	7/8/2003	0.07	0.05	0	1	No
	Chromium	7/8/2003	3.1	0.5	0	38	No
	Copper	7/8/2003	9.77	0.5	0	27	No
	Iron	7/8/2003	7040	1	0	51500	No
	Lead	7/8/2003	4.42	0.5	1000	11	No
	Manganese	7/8/2003	428	0.5	0	1100	No
	Nickel	7/8/2003	10.6	0.5	0	46	No
	Nitrate-N	7/8/2003	74	10	0		Yes
	Phosphate	7/8/2003	2430	10	0		Yes
	Sulfate	7/8/2003	120	100	0		Yes
	Zinc	7/8/2003	14.1	0.5	0	79	No
A5-SS-003-0.5'	Ammonia-N	7/8/2003	4	1	0		Yes
	Arsenic	7/8/2003	1.93	0.1	20	5	No
	Chromium	7/8/2003	2.43	0.5	0	38	No
	Copper	7/8/2003	7.42	0.5	0	27	No
	Iron	7/8/2003	5130	1	0	51500	No
	Lead	7/8/2003	4.21	0.5	1000	11	No
	Manganese	7/8/2003	360	0.5	0	1100	No
	Nickel	7/8/2003	7.44	0.5	0	46	No
	Nitrate-N	7/8/2003	566	10	0		Yes
	Phosphate	7/8/2003	1970	10	0		Yes
	Sulfate	7/8/2003	288	100	0		Yes
	Zinc	7/8/2003	10.9	0.5	0	79	No
A5-SS-004-0.5'	Ammonia-N	7/8/2003	86	1	0		Yes
	Arsenic	7/8/2003	1.76	0.1	20	5	No
	Cadmium	7/8/2003	0.06	0.05	0	1	No
	Chromium	7/8/2003	2.87	0.5	0	38	No
	Copper	7/8/2003	10.1	0.5	0	27	No
	Iron	7/8/2003	7110	1	0	51500	No
	Lead	7/8/2003	5.26	0.5	1000	11	No
	Manganese	7/8/2003	389	0.5	0	1100	No
	Nickel	7/8/2003	8.22	0.5	0	46	No
	Nitrate-N	7/8/2003	234	10	0		Yes
	Phosphate	7/8/2003	2710	10	0		Yes
	Sulfate	7/8/2003	4640	100	0		Yes
	Zinc	7/8/2003	14	0.5	0	79	No
A5-SS-005-0.5'	Arsenic	7/8/2003	2.35	0.1	20	5	No

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A5-SS-005-0.5'	Cadmium	7/8/2003	0.06	0.05	0	1	No
	Chromium	7/8/2003	2.53	0.5	0	38	No
	Copper	7/8/2003	9.49	0.5	0	27	No
	Iron	7/8/2003	5200	1	0	51500	No
	Lead	7/8/2003	4.76	0.5	1000	11	No
	Manganese	7/8/2003	457	0.5	0	1100	No
	Nickel	7/8/2003	9.37	0.5	0	46	No
	Nitrate-N	7/8/2003	561	10	0		Yes
	Phosphate	7/8/2003	2100	10	0		Yes
	Sulfate	7/8/2003	288	100	0		Yes
	Zinc	7/8/2003	11.6	0.5	0	79	No
A6-SB-001-0.5'	Nitrate-N	7/9/2003	30	10	0		Yes
	Phosphate	7/9/2003	2150	10	0		Yes
	Sulfate	7/9/2003	103	100	0		Yes
A6-SB-001-4.5'	Nitrate-N	7/9/2003	114	10	0		Yes
	Phosphate	7/9/2003	1940	10	0		Yes
	Sulfate	7/9/2003	314	100	0		Yes
A6-SB-001-7.5'	Ammonia-N	7/9/2003	15	1	0		Yes
	Nitrate-N	7/9/2003	54	10	0		Yes
	Phosphate	7/9/2003	2100	10	0		Yes
	Sulfate	7/9/2003	105	100	0		Yes
A6-SB-002-0.5'	4,4'-DDE	7/9/2003	6	0.02	0		Yes
	4,4'-DDT	7/9/2003	0.02	0.02	4		No
	Antimony	7/9/2003	0.53	0.5	0		Yes
	Arsenic	7/9/2003	3.61	0.1	20	5	No
	Cadmium	7/9/2003	18.4	0.05	0	1	Yes
	Chromium	7/9/2003	64.8	0.5	0	38	Yes
	Copper	7/9/2003	70.3	0.5	0	27	Yes
	Iron	7/9/2003	9040	1	0	51500	No
	Lead	7/9/2003	342	0.5	1000	11	No
	Manganese	7/9/2003	586	0.5	0	1100	No
	Mercury	7/9/2003	0.48	0.1	2	0.05	No
	Nickel	7/9/2003	88.2	0.5	0	46	Yes
	Silver	7/9/2003	0.92	0.2	0		Yes
	Thallium	7/9/2003	0.44	0.2	0		Yes
	Zinc	7/9/2003	2520	0.5	0	79	Yes
A6-SB-002b-0.5'	Ammonia-N	7/9/2003	2710	10	0		Yes
	Chloride	7/9/2003	733	100	0		Yes
	Nitrate-N	7/9/2003	591	10	0		Yes
	Nitrite-N	7/9/2003	16	10	0		Yes
	Phosphate	7/9/2003	14400	100	0		Yes

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A6-SB-002b-0.5'	Sulfate	7/9/2003	8400	100	0		Yes
A6-SB-002b-0.5'-1	Ammonia-N	7/9/2003	1890	10	0		Yes
	Chloride	7/9/2003	435	100	0		Yes
	Nitrate-N	7/9/2003	396	10	0		Yes
	Phosphate	7/9/2003	11500	100	0		Yes
	Sulfate	7/9/2003	3760	100	0		Yes
A6-SB-002b-4.5'	Ammonia-N	7/9/2003	972	1	0		Yes
	Chloride	7/9/2003	258	100	0		Yes
	Nitrate-N	7/9/2003	734	10	0		Yes
	Phosphate	7/9/2003	5920	10	0		Yes
	Sulfate	7/9/2003	2220	100	0		Yes
A6-SB-002b-9.0'	Ammonia-N	7/9/2003	338	5	0		Yes
	Nitrate-N	7/9/2003	33	10	0		Yes
	Phosphate	7/9/2003	3070	10	0		Yes
	Sulfate	7/9/2003	147	100	0		Yes
A6-SB-003-0.5'	Ammonia-N	7/9/2003	684	5	0		Yes
	Nitrate-N	7/9/2003	53	10	0		Yes
	Phosphate	7/9/2003	19600	100	0		Yes
A6-SB-003-0.5'-1	Ammonia-N	7/9/2003	162	5	0		Yes
	Nitrate-N	7/9/2003	43	10	0		Yes
	Phosphate	7/9/2003	14100	100	0		Yes
A6-SB-003-4.5'	Nitrate-N	7/9/2003	42	10	0		Yes
	Phosphate	7/9/2003	2200	10	0		Yes
A6-SB-003-7.5'	Ammonia-N	7/9/2003	117	5	0		Yes
	Nitrate-N	7/9/2003	34	10	0		Yes
	Phosphate	7/9/2003	2400	10	0		Yes
A6-SB-004-0.5'	Nitrate-N	7/9/2003	28	10	0		Yes
	Phosphate	7/9/2003	2370	10	0		Yes
	Sulfate	7/9/2003	141	100	0		Yes
A6-SB-004-0.5'-1	Nitrate-N	7/9/2003	23	10	0		Yes
	Phosphate	7/9/2003	2640	10	0		Yes
	Sulfate	7/9/2003	120	100	0		Yes
A6-SB-004-4.5'	Ammonia-N	7/9/2003	120	5	0		Yes
	Dinoseb	7/9/2003	0.055	0.014	0		Yes
	Nitrate-N	7/9/2003	686	10	0		Yes
	Phosphate	7/9/2003	2060	10	0		Yes
	Sulfate	7/9/2003	137	100	0		Yes
A6-SB-004-6.0'	Ammonia-N	7/9/2003	589	5	0		Yes
	Nitrate-N	7/9/2003	95	10	0		Yes
	Phosphate	7/9/2003	1840	10	0		Yes
A6-SB-005-0.5'	Ammonia-N	7/9/2003	10	5	0		Yes

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	MTCA Method A CUL (mg/kg)	Natural Background (mg/kg)	Further Evaluation Necessary?
A6-SB-005-0.5'	Phosphate	7/9/2003	2940	10	0		Yes
	Sulfate	7/9/2003	162	100	0		Yes
A6-SB-005-4.5'	Ammonia-N	7/9/2003	5	5	0		Yes
	Dinoseb	7/9/2003	0.027	0.015	0		Yes
	Nitrate-N	7/9/2003	96	10	0		Yes
	Phosphate	7/9/2003	2160	10	0		Yes
	Sulfate	7/9/2003	332	100	0		Yes
A6-SB-005-7.5'	Phosphate	7/9/2003	1690	10	0		Yes
	Sulfate	7/9/2003	172	100	0		Yes
A6-SS-001-0.5'	Arsenic	7/9/2003	1.19	0.1	20	5	No
	Cadmium	7/9/2003	0.05	0.05	0	1	No
	Chromium	7/9/2003	2.54	0.5	0	38	No
	Copper	7/9/2003	8.57	0.5	0	27	No
	Iron	7/9/2003	6210	1	0	51500	No
	Lead	7/9/2003	4.43	0.5	1000	11	No
	Manganese	7/9/2003	395	0.5	0	1100	No
	Nickel	7/9/2003	7.48	0.5	0	46	No
	Nitrate-N	7/9/2003	22	10	0		Yes
	Phosphate	7/9/2003	2340	10	0		Yes
	Zinc	7/9/2003	13.4	0.5	0	79	No
A6-SS-002-0.5'	Arsenic	7/9/2003	0.99	0.1	20	5	No
	Cadmium	7/9/2003	0.05	0.05	0	1	No
	Chromium	7/9/2003	2.66	0.5	0	38	No
	Copper	7/9/2003	8.97	0.5	0	27	No
	Iron	7/9/2003	7270	1	0	51500	No
	Lead	7/9/2003	5.16	0.5	1000	11	No
	Manganese	7/9/2003	414	0.5	0	1100	No
	Nickel	7/9/2003	7.42	0.5	0	46	No
	Nitrate-N	7/9/2003	32	10	0		Yes
	Phosphate	7/9/2003	2480	10	0		Yes
	Sulfate	7/9/2003	171	100	0		Yes
	Zinc	7/9/2003	14.1	0.5	0	79	No

Notes:

**MTCA Method A Cleanup Levels from Cleanup and Risk Calculation (CLARC) Workbook version 3.1.*

***Natural background concentrations documented in "Natural Background Soil Metals Concentrations in Washington State" (October 1994) for Yakima Basin.*

Table 4-2
Groundwater Screen Against MTCA Method A Cleanup Levels*

Sample ID	Analyte	Date	Analytical Results (mg/L)	MDL (mg/L)	MTCA Method A CUL (mg/L)	Further Evaluation Necessary?
MW01-072903-0	Arsenic	7/29/2003	0.011	0.001	0.005	Yes
	Chloride	7/29/2003	8	1	0	Yes
	Iron	7/29/2003	0.05	0.02	0	Yes
	Manganese	7/29/2003	0.059	0.005	0	Yes
	Phosphate	7/29/2003	0.3	0.1	0	Yes
	Sulfate	7/29/2003	32	1	0	Yes
	Total Nitrates + Nitrites	7/29/2003	4	0.1	0	Yes
MW03-072903-0	Ammonia-N	7/29/2003	180	10	0	Yes
	Arsenic	7/29/2003	0.102	0.001	0.005	Yes
	Chloride	7/29/2003	13	1	0	Yes
	Chlorobenzene	7/29/2003	0.078	0.001	0	Yes
	Copper	7/29/2003	0.007	0.005	0	Yes
	Manganese	7/29/2003	0.022	0.005	0	Yes
	o-Xylene	7/29/2003	0.001	0.001	0	Yes
	p,m-Xylene	7/29/2003	0.001	0.001	0	Yes
	Phosphate	7/29/2003	85	1	0	Yes
	Sulfate	7/29/2003	38	1	0	Yes
	Total Nitrates + Nitrites	7/29/2003	55.1	0.1	0	Yes
	Zinc	7/29/2003	0.01	0.005	0	Yes
MW04-073003-0	1,2-Dichloropropane	7/30/2003	0.105	0.001	0	Yes
	2,4-Dichlorophenol	7/30/2003	0.03	0.01	0	Yes
	Ammonia-N	7/30/2003	850	10	0	Yes
	Arsenic	7/30/2003	0.007	0.001	0.005	Yes
	Chloride	7/30/2003	112	1	0	Yes
	Chlorobenzene	7/30/2003	0.003	0.001	0	Yes
	Copper	7/30/2003	0.009	0.005	0	Yes
	Iron	7/30/2003	0.73	0.02	0	Yes
	Lead	7/30/2003	0.001	0.001	0.015	No
	Manganese	7/30/2003	0.364	0.005	0	Yes
	Nickel	7/30/2003	0.021	0.005	0	Yes
	Phosphate	7/30/2003	0.5	0.1	0	Yes
	Sulfate	7/30/2003	307	1	0	Yes
	Total Nitrates + Nitrites	7/30/2003	986	0.1	0	Yes
	Zinc	7/30/2003	0.006	0.005	0	Yes
MW05-073003-0	Ammonia-N	7/30/2003	320	10	0	Yes
	Arsenic	7/30/2003	0.005	0.001	0.005	No
	Chloride	7/30/2003	193	1	0	Yes

Sample ID	Analyte	Date	Analytical Results (mg/L)	MDL (mg/L)	MTCA Method A CUL (mg/L)	Further Evaluation Necessary?
MW05-073003-0	Copper	7/30/2003	0.005	0.005	0	Yes
	Iron	7/30/2003	0.91	0.02	0	Yes
	Manganese	7/30/2003	1.62	0.005	0	Yes
	Nickel	7/30/2003	0.013	0.005	0	Yes
	Sulfate	7/30/2003	624	1	0	Yes
	Total Nitrates + Nitrites	7/30/2003	593	0.1	0	Yes
MW06-073003-0	Arsenic	7/30/2003	0.025	0.001	0.005	Yes
	Chloride	7/30/2003	11	1	0	Yes
	Iron	7/30/2003	0.11	0.02	0	Yes
	Manganese	7/30/2003	0.057	0.005	0	Yes
	Phosphate	7/30/2003	0.4	0.1	0	Yes
	Sulfate	7/30/2003	55	1	0	Yes
	Total Nitrates + Nitrites	7/30/2003	8.2	0.1	0	Yes
MW07-072903-0	Arsenic	7/29/2003	0.011	0.001	0.005	Yes
	Chloride	7/29/2003	10	1	0	Yes
	Iron	7/29/2003	0.11	0.02	0	Yes
	Manganese	7/29/2003	0.006	0.005	0	Yes
	Phosphate	7/29/2003	0.3	0.1	0	Yes
	Sulfate	7/29/2003	47	1	0	Yes
	Total Nitrates + Nitrites	7/29/2003	3.6	0.1	0	Yes

Notes:
**MTCA Method A Cleanup Levels from Cleanup and Risk Calculation (CLARC) Workbook version 3.1.*

Table 4-3
Maximum Detected Soil Concentrations Against MTCA Method C Cleanup Levels*

Analyte	Analytical Result (mg/kg)	MTCA Method C CUL (mg/kg)	Exceed MTCA Method C CUL?	Comment
1,2,4-Trimethylbenzene	8	175000	No	Standard Method C CUL was calculated.
1,3,5-Trimethylbenzene	4	175000	No	Standard Method C CUL was calculated.
2-Methylnaphthalene	1.1	70000	No	Method C CUL for naphthalene is used for comparison.
4,4'-DDE	6	386	No	
Ammonia-N	5550	350000	No	Method C CUL for nitrate-N is used for comparison.
Antimony	0.53	1400	No	
Cadmium	18.4	1750	No	
Chloride	733	0	NA	
Chromium	64.8	10500	No	Standard Method C CUL was calculated using hexavalent chromium values.
Copper	70.3	130000	No	
Dinoseb	0.055	3500	No	
Nickel	88.2	70000	No	
Nitrate-N	1530	350000	No	
Nitrite-N	27	350000	No	
NWTPH-Gx	400	121	Yes	Standard Method C CUL was calculated.
p,m-Xylene	6	7000000	No	
Phosphate	30200	0	NA	
Silver	0.92	17500	No	
Sulfate	8400	0	NA	

Analyte	Analytical Result (mg/kg)	MTCA Method C CUL (mg/kg)	Exceed MTCA Method C CUL?	Comment
Thallium	0.44	245	No	
Zinc	2520	1050000	No	

Notes:

** MTCA Method C Cleanup Levels from Cleanup and Risk Calculation (CLARC) Workbook version 3.1.*

NA - MTCA Method C Cleanup Levels are not applicable.

Table 4-4
Maximum Detected Groundwater Concentrations Against MTCA Method C Cleanup Levels*

Analyte	Analytical Result (mg/L)	MTCA Method C CUL (mg/L)	Exceed MTCA Method C CUL?	Comment
1,2-Dichloropropane	0.105	0.00643	Yes	
2,4-Dichlorophenol	0.03	0.105	No	
Ammonia-N	850	3.5	Yes	Method C CUL for nitrate-N is used for comparison.
Arsenic	0.102	0.000583	Yes	
Chloride	193	250	No	Washington State Board of Health secondary MCL.
Chlorobenzene	0.078	0.35	No	
Copper	0.009	1.3	No	
Iron	0.91	0.3	Yes	Washington State Board of Health secondary MCL.
Manganese	1.62	4.9	No	
Nickel	0.021	0.7	No	
o-Xylene	0.001	35	No	
p,m-Xylene	0.001	35	No	
Phosphate	85	0	NA	
Sulfate	624	250	Yes	Washington State Board of Health secondary MCL.
Total Nitrates + Nitrites	986	3.5	Yes	
Zinc	0.01	10.5	No	

Notes:
**MTCA Method C Cleanup Levels from Cleanup and Risk Calculation (CLARC) Workbook version 3.1.*
NA - MTCA Method C Cleanup Levels are not applicable.

Table 4-5
Nitrogen Detected in Soil Boring Samples

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
A1-SB-001-0.5'	Ammonia-N	5	1	
	Nitrate-N	68	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***73***		
A1-SB-001-4.5'	Ammonia-N	3	1	
	Nitrate-N	55	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***58***		
A1-SB-001-9.0'	Ammonia-N	683	1	
	Nitrate-N	29	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***712***		
A1-SB-002-0.5'	Ammonia-N	400	1	
	Nitrate-N	63	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***463***		
A1-SB-002-4.5'	Ammonia-N	968	1	
	Nitrate-N	321	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***1289***		
A1-SB-002-9.0'	Ammonia-N	100	1	
	Nitrate-N	162	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***262***		
A1-SB-003-0.5'	Ammonia-N	631	1	
	Nitrate-N	80	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***711***		
A1-SB-003-4.5'	Ammonia-N	583	1	
	Nitrate-N	87	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***670***		
A1-SB-003-9.0'	Ammonia-N	0	6	U
	Nitrate-N	47	10	
	Nitrite-N	0	10	U

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
	Sum of Nitrogen	***47***		
A1-SB-004-0.5'	Ammonia-N	404	1	
	Nitrate-N	310	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***714***		
A1-SB-004-4.5'	Ammonia-N	426	1	
	Nitrate-N	351	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***777***		
A1-SB-004-9.0'	Ammonia-N	57	1	
	Nitrate-N	59	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***116***		
A1-SB-005-0.5'	Ammonia-N	0	5	U
	Nitrate-N	161	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***161***		
A1-SB-005-4.5'	Ammonia-N	735	5	
	Nitrate-N	983	10	
	Nitrite-N	17	10	
	Sum of Nitrogen	***1735***		
A1-SB-005-7.5'	Ammonia-N	1630	10	
	Nitrate-N	255	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***1885***		
A1-SB-006-0.5'	Ammonia-N	1110	10	
	Nitrate-N	127	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***1237***		
A1-SB-006-0.5'-1	Ammonia-N	1030	10	
	Nitrate-N	127	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***1157***		
A1-SB-006-4.5'	Ammonia-N	1520	10	
	Nitrate-N	672	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***2192***		
A1-SB-006-7.5'	Ammonia-N	1460	10	

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
A1-SB-006-7.5'	Nitrate-N	130	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***1590***		
A1-SB-007-0.5'	Ammonia-N	0	4	U
	Nitrate-N	172	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***172***		
A1-SB-007-4.5'	Ammonia-N	281	5	
	Nitrate-N	405	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***686***		
A1-SB-007-7.5'	Ammonia-N	1200	10	
	Nitrate-N	86	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***1286***		
A1-SB-008-0.5'	Ammonia-N	207	5	
	Nitrate-N	148	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***355***		
A1-SB-008-4.5'	Ammonia-N	0	4	U
	Nitrate-N	486	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***486***		
A1-SB-008-7.5'	Ammonia-N	337	5	
	Nitrate-N	318	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***655***		
A2-SB-001-0.5'	Ammonia-N	283	1	
	Nitrate-N	294	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***577***		
A2-SB-001-4.5'	Ammonia-N	0	5	U
	Nitrate-N	83	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***83***		
A2-SB-001-9.0'	Ammonia-N	0	5	U
	Nitrate-N	0	10	U
	Nitrite-N	0	10	U

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
	Sum of Nitrogen	***0***		
A2-SB-002-0.5'	Ammonia-N	273	1	
	Nitrate-N	214	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***487***		
A2-SB-002-4.5'	Ammonia-N	0	4	U
	Nitrate-N	47	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***47***		
A2-SB-002-9.0'	Ammonia-N	0	4	U
	Nitrate-N	12	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***12***		
A2-SB-002-9.0'-1	Ammonia-N	0	4	U
	Nitrate-N	11	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***11***		
A2-SB-003-0.5'	Ammonia-N	117	1	
	Nitrate-N	137	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***254***		
A2-SB-003-4.5'	Ammonia-N	7	1	
	Nitrate-N	59	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***66***		
A2-SB-003-9.0'	Ammonia-N	31	1	
	Nitrate-N	13	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***44***		
A2-SB-004-0.5'	Ammonia-N	5550	10	
	Nitrate-N	1530	10	
	Nitrite-N	27	10	
	Sum of Nitrogen	***7107***		
A2-SB-004-4.5'	Ammonia-N	920	1	
	Nitrate-N	217	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***1137***		
A2-SB-004-9.0'	Ammonia-N	372	1	

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
A2-SB-004-9.0'	Nitrate-N	139	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***511***		
A2-SB-005-0.5'	Ammonia-N	100	5	
	Nitrate-N	65	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***165***		
A2-SB-005-4.5'	Ammonia-N	0	7	U
	Nitrate-N	71	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***71***		
A2--SB-MW5-0.5'	Ammonia-N	370	5	
	Nitrate-N	202	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***572***		
A2--SB-MW5-4.5'	Ammonia-N	214	5	
	Nitrate-N	1130	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***1344***		
A2--SB-MW5-7.5'	Ammonia-N	218	5	
	Nitrate-N	126	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***344***		
A2-SB-MW6-0.5'	Ammonia-N	0	13	U
	Nitrate-N	150	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***150***		
A2-SB-MW6-0.5'-1	Ammonia-N	6	5	
	Nitrate-N	121	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***127***		
A2-SB-MW6-4.5'	Ammonia-N	0	6	U
	Nitrate-N	44	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***44***		
A2-SB-MW6-7.5'	Ammonia-N	0	6	U
	Nitrate-N	0	10	U
	Nitrite-N	0	10	U

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
	Sum of Nitrogen	***0***		
A3-SB-001-0.5'	Ammonia-N	5	1	
	Nitrate-N	13	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***18***		
A3-SB-001-4.5'	Ammonia-N	61	1	
	Nitrate-N	66	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***127***		
A3-SB-001-9.0'	Ammonia-N	0	7	U
	Nitrate-N	0	10	U
	Nitrite-N	0	10	U
	Sum of Nitrogen	***0***		
A3-SB-002-0.5'	Ammonia-N	0	5	U
	Nitrate-N	0	10	U
	Nitrite-N	0	10	U
	Sum of Nitrogen	***0***		
A3-SB-002-4.5'	Ammonia-N	0	3	U
	Nitrate-N	13	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***13***		
A3-SB-002-7.5'	Ammonia-N	0	5	U
	Nitrate-N	0	10	U
	Nitrite-N	0	10	U
	Sum of Nitrogen	***0***		
A4-SB-001-0.5'	Ammonia-N	0	4	U
	Nitrate-N	43	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***43***		
A4-SB-001-4.5'	Ammonia-N	3	1	
	Nitrate-N	38	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***41***		
A4-SB-001-9.0'	Ammonia-N	0	5	U
	Nitrate-N	0	10	U
	Nitrite-N	0	10	U
	Sum of Nitrogen	***0***		
A4-SB-002-0.5'	Ammonia-N	680	1	

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
A4-SB-002-0.5'	Nitrate-N	124	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***804***		
A4-SB-002-0.5'-1	Ammonia-N	624	1	
	Nitrate-N	139	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***763***		
A4-SB-002-4.5'	Ammonia-N	0	6	U
	Nitrate-N	28	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***28***		
A4-SB-002-9.0'	Ammonia-N	0	4	U
	Nitrate-N	0	10	U
	Nitrite-N	0	10	U
	Sum of Nitrogen	***0***		
A4-SB-003-0.5'	Ammonia-N	0	5	U
	Nitrate-N	12	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***12***		
A4-SB-003-0.5'-1	Ammonia-N	0	5	U
	Nitrate-N	12	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***12***		
A4-SB-003-4.5'	Ammonia-N	0	4	U
	Nitrate-N	14	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***14***		
A4-SB-003-9.0'	Ammonia-N	0	4	U
	Nitrate-N	0	10	U
	Nitrite-N	0	10	U
	Sum of Nitrogen	***0***		
A4-SB-004-0.5'	Ammonia-N	0	4	U
	Nitrate-N	104	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***104***		
A4-SB-004-4.5'	Ammonia-N	0	6	U
	Nitrate-N	33	10	
	Nitrite-N	0	10	U

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
	Sum of Nitrogen	***33***		
A4-SB-004-9.0'	Ammonia-N	0	5	U
	Nitrate-N	62	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***62***		
A4-SB-005-0.5'	Ammonia-N	304	1	
	Nitrate-N	104	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***408***		
A4-SB-005-0.5'-1	Ammonia-N	328	1	
	Nitrate-N	104	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***432***		
A4-SB-005-4.5'	Ammonia-N	4	1	
	Nitrate-N	188	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***192***		
A4-SB-005-9.0'	Ammonia-N	0	5	U
	Nitrate-N	20	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***20***		
A4-SB-006-0.5'	Ammonia-N	326	1	
	Nitrate-N	203	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***529***		
A5-SS-001-0.5'	Ammonia-N	417	1	
	Nitrate-N	271	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***688***		
A5-SS-002-0.5'	Ammonia-N	4	1	
	Nitrate-N	74	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***78***		
A5-SS-003-0.5'	Ammonia-N	4	1	
	Nitrate-N	566	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***570***		
A5-SS-004-0.5'	Ammonia-N	86	1	

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
A5-SS-004-0.5'	Nitrate-N	234	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***320***		
A5-SS-005-0.5'	Ammonia-N	0	4	U
	Nitrate-N	561	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***561***		
A6-SB-001-0.5'	Ammonia-N	0	4	U
	Nitrate-N	30	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***30***		
A6-SB-001-4.5'	Ammonia-N	0	5	U
	Nitrate-N	114	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***114***		
A6-SB-001-7.5'	Ammonia-N	15	1	
	Nitrate-N	54	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***69***		
A6-SB-002b-0.5'	Ammonia-N	2710	10	
	Nitrate-N	591	10	
	Nitrite-N	16	10	
	Sum of Nitrogen	***3317***		
A6-SB-002b-0.5'-1	Ammonia-N	1890	10	
	Nitrate-N	396	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***2286***		
A6-SB-002b-4.5'	Ammonia-N	972	1	
	Nitrate-N	734	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***1706***		
A6-SB-002b-9.0'	Ammonia-N	338	5	
	Nitrate-N	33	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***371***		
A6-SB-003-0.5'	Ammonia-N	684	5	
	Nitrate-N	53	10	
	Nitrite-N	0	10	U

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
	Sum of Nitrogen	***737***		
A6-SB-003-0.5'-1	Ammonia-N	162	5	
	Nitrate-N	43	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***205***		
A6-SB-003-4.5'	Ammonia-N	0	6	U
	Nitrate-N	42	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***42***		
A6-SB-003-7.5'	Ammonia-N	117	5	
	Nitrate-N	34	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***151***		
A6-SB-004-0.5'	Ammonia-N	0	5	U
	Nitrate-N	28	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***28***		
A6-SB-004-0.5'-1	Ammonia-N	0	6	U
	Nitrate-N	23	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***23***		
A6-SB-004-4.5'	Ammonia-N	120	5	
	Nitrate-N	686	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***806***		
A6-SB-004-6.0'	Ammonia-N	589	5	
	Nitrate-N	95	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***684***		
A6-SB-005-0.5'	Ammonia-N	10	5	
	Nitrate-N	0	10	U
	Nitrite-N	0	10	U
	Sum of Nitrogen	***10***		
A6-SB-005-4.5'	Ammonia-N	5	5	
	Nitrate-N	96	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***101***		
A6-SB-005-7.5'	Ammonia-N	0	5	U

Sample ID	Analyte	Results (mg/kg)	MDL	Qualifier
A6-SB-005-7.5'	Nitrate-N	0	10	U
	Nitrite-N	0	10	U
	Sum of Nitrogen	***0***		
A6-SS-001-0.5'	Ammonia-N	0	5	U
	Nitrate-N	22	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***22***		
A6-SS-002-0.5'	Ammonia-N	0	5	U
	Nitrate-N	32	10	
	Nitrite-N	0	10	U
	Sum of Nitrogen	***32***		
Grand Total		*49248*		

Table 4-6
Iron and Sulfate Concentrations in Soil

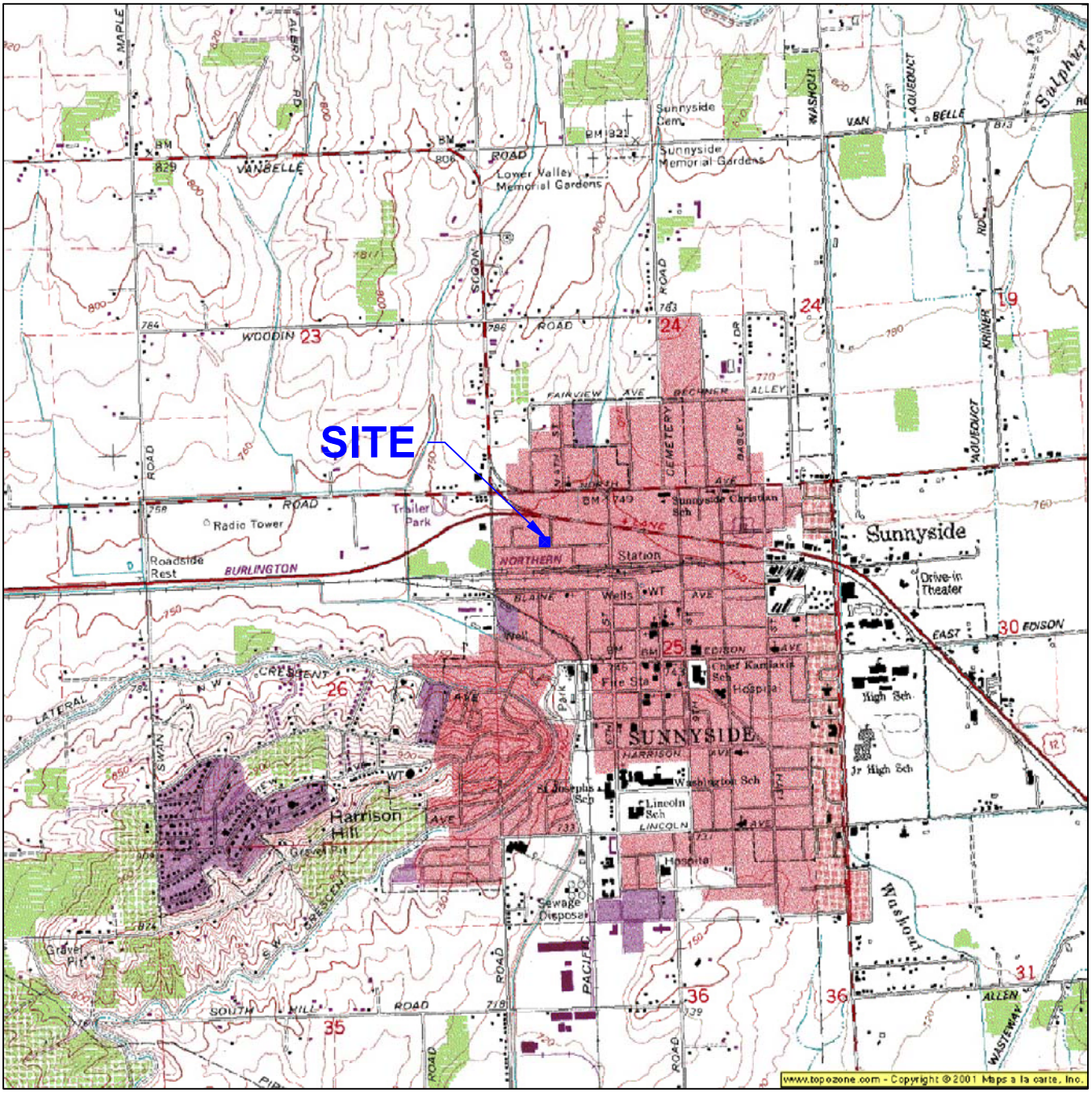
Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	Qualifier
A1-SB-001-0.5'	Iron	7/7/2003	8750	1	
	Sulfate	7/7/2003	0	100	U
A1-SB-001-4.5'	Sulfate	7/7/2003	0	100	U
A1-SB-001-9.0'	Sulfate	7/7/2003	0	100	U
A1-SB-002-0.5'	Iron	7/7/2003	6860	1	
	Sulfate	7/7/2003	0	100	U
A1-SB-002-4.5'	Sulfate	7/7/2003	0	100	U
A1-SB-002-9.0'	Sulfate	7/7/2003	0	100	U
A1-SB-003-0.5'	Iron	7/7/2003	7170	1	
	Sulfate	7/7/2003	0	100	U
A1-SB-003-4.5'	Sulfate	7/7/2003	0	100	U
A1-SB-003-9.0'	Sulfate	7/7/2003	0	100	U
A1-SB-004-0.5'	Iron	7/7/2003	6330	1	
	Sulfate	7/7/2003	0	100	U
A1-SB-004-4.5'	Sulfate	7/7/2003	225	100	
A1-SB-004-9.0'	Sulfate	7/7/2003	0	100	U
A1-SB-005-0.5'	Iron	7/10/2003	5580	1	
	Sulfate	7/10/2003	0	100	U
A1-SB-005-4.5'	Sulfate	7/10/2003	199	100	
A1-SB-005-7.5'	Sulfate	7/10/2003	0	100	U
A1-SB-006-0.5'	Iron	7/10/2003	9310	1	
	Sulfate	7/10/2003	0	100	U
A1-SB-006-0.5'-1	Iron	7/10/2003	8770	1	
	Sulfate	7/10/2003	0	100	U
A1-SB-006-4.5'	Sulfate	7/10/2003	0	100	U
A1-SB-006-7.5'	Sulfate	7/10/2003	0	100	U
A1-SB-007-0.5'	Iron	7/10/2003	5630	1	
	Sulfate	7/10/2003	0	100	U
A1-SB-007-4.5'	Sulfate	7/10/2003	116	100	
A1-SB-007-7.5'	Sulfate	7/10/2003	0	100	U
A1-SB-008-0.5'	Iron	7/10/2003	6230	1	
	Sulfate	7/10/2003	0	100	U
A1-SB-008-4.5'	Sulfate	7/10/2003	114	100	
A1-SB-008-7.5'	Sulfate	7/10/2003	138	100	
A2-SB-001-0.5'	Iron	7/8/2003	6870	1	
	Sulfate	7/8/2003	934	100	
A2-SB-001-4.5'	Sulfate	7/8/2003	224	100	
A2-SB-001-9.0'	Sulfate	7/8/2003	0	100	U
A2-SB-002-0.5'	Iron	7/8/2003	6220	1	
	Sulfate	7/8/2003	1640	100	

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	Qualifier
A2-SB-002-4.5'	Sulfate	7/8/2003	150	100	
A2-SB-002-9.0'	Sulfate	7/8/2003	0	100	U
A2-SB-002-9.0'-1	Sulfate	7/8/2003	0	100	U
A2-SB-003-0.5'	Iron	7/7/2003	6000	1	
	Sulfate	7/7/2003	186	100	
A2-SB-003-4.5'	Sulfate	7/7/2003	0	100	U
A2-SB-003-9.0'	Sulfate	7/7/2003	0	100	U
A2-SB-004-0.5'	Iron	7/7/2003	7870	1	
	Sulfate	7/7/2003	2900	100	
A2-SB-004-4.5'	Sulfate	7/7/2003	159	100	
A2-SB-004-9.0'	Sulfate	7/7/2003	214	100	
A2-SB-005-0.5'	Iron	7/11/2003	6520	1	
	Sulfate	7/11/2003	148	100	
A2-SB-005-4.5'	Sulfate	7/11/2003	162	100	
A2--SB-MW5-0.5'	Iron	7/10/2003	4450	1	
	Sulfate	7/10/2003	2990	100	
A2--SB-MW5-4.5'	Sulfate	7/10/2003	442	100	
A2--SB-MW5-7.5'	Sulfate	7/10/2003	207	100	
A2-SB-MW6-0.5'	Iron	7/10/2003	6690	1	
	Sulfate	7/10/2003	2530	100	
A2-SB-MW6-0.5'-1	Iron	7/10/2003	6550	1	
	Sulfate	7/10/2003	729	100	
A2-SB-MW6-4.5'	Sulfate	7/10/2003	107	100	
A2-SB-MW6-7.5'	Sulfate	7/10/2003	0	100	U
A3-SB-001-0.5'	Iron	7/8/2003	5520	1	
	Sulfate	7/8/2003	0	100	U
A3-SB-001-4.5'	Iron	7/8/2003	7670	1	
	Sulfate	7/8/2003	165	100	
A3-SB-001-9.0'	Iron	7/8/2003	9140	1	
	Sulfate	7/8/2003	0	100	U
A3-SB-002-0.5'	Iron	7/8/2003	5760	1	
	Sulfate	7/8/2003	0	100	U
A3-SB-002-4.5'	Iron	7/8/2003	8100	1	
	Sulfate	7/8/2003	0	100	U
A3-SB-002-7.5'	Iron	7/8/2003	8540	1	
	Sulfate	7/8/2003	0	100	U
A4-SB-001-0.5'	Iron	7/8/2003	5570	1	
	Sulfate	7/8/2003	126	100	
A4-SB-001-4.5'	Sulfate	7/8/2003	109	100	
A4-SB-001-9.0'	Sulfate	7/8/2003	0	100	U
A4-SB-002-0.5'	Iron	7/8/2003	4760	1	
	Sulfate	7/8/2003	172	100	
A4-SB-002-0.5'-1	Iron	7/8/2003	4720	1	

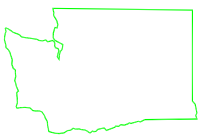
Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	Qualifier
A4-SB-002-0.5'-1	Sulfate	7/8/2003	187	100	
A4-SB-002-4.5'	Sulfate	7/8/2003	117	100	
A4-SB-002-9.0'	Sulfate	7/8/2003	0	100	U
A4-SB-003-0.5'	Iron	7/8/2003	5210	1	
	Sulfate	7/8/2003	0	100	U
A4-SB-003-0.5'-1	Iron	7/8/2003	4640	1	
	Sulfate	7/8/2003	0	100	U
A4-SB-003-4.5'	Sulfate	7/8/2003	128	100	
A4-SB-003-9.0'	Sulfate	7/8/2003	0	100	U
A4-SB-004-0.5'	Iron	7/9/2003	5290	1	
	Sulfate	7/9/2003	153	100	
A4-SB-004-4.5'	Sulfate	7/9/2003	0	100	U
A4-SB-004-9.0'	Sulfate	7/9/2003	149	100	
A4-SB-005-0.5'	Iron	7/8/2003	5000	1	
	Sulfate	7/8/2003	125	100	
A4-SB-005-0.5'-1	Iron	7/8/2003	6460	1	
	Sulfate	7/8/2003	145	100	
A4-SB-005-4.5'	Sulfate	7/8/2003	174	100	
A4-SB-005-9.0'	Sulfate	7/8/2003	0	100	U
A4-SB-006-0.5'	Iron	7/8/2003	4230	1	
	Sulfate	7/8/2003	286	100	
A5-SS-001-0.5'	Iron	7/8/2003	6100	1	
	Sulfate	7/8/2003	3550	100	
A5-SS-002-0.5'	Iron	7/8/2003	7040	1	
	Sulfate	7/8/2003	120	100	
A5-SS-003-0.5'	Iron	7/8/2003	5130	1	
	Sulfate	7/8/2003	288	100	
A5-SS-004-0.5'	Iron	7/8/2003	7110	1	
	Sulfate	7/8/2003	4640	100	
A5-SS-005-0.5'	Iron	7/8/2003	5200	1	
	Sulfate	7/8/2003	288	100	
A6-SB-001-0.5'	Sulfate	7/9/2003	103	100	
A6-SB-001-4.5'	Sulfate	7/9/2003	314	100	
A6-SB-001-7.5'	Sulfate	7/9/2003	105	100	
A6-SB-002-0.5'	Iron	7/9/2003	9040	1	
A6-SB-002b-0.5'	Sulfate	7/9/2003	8400	100	
A6-SB-002b-0.5'-1	Sulfate	7/9/2003	3760	100	
A6-SB-002b-4.5'	Sulfate	7/9/2003	2220	100	
A6-SB-002b-9.0'	Sulfate	7/9/2003	147	100	
A6-SB-003-0.5'	Sulfate	7/9/2003	0	100	U
A6-SB-003-0.5'-1	Sulfate	7/9/2003	0	100	U
A6-SB-003-4.5'	Sulfate	7/9/2003	0	100	U
A6-SB-003-7.5'	Sulfate	7/9/2003	0	100	U

Sample ID	Analyte	Date	Analytical Results (mg/kg)	MDL (mg/kg)	Qualifier
A6-SB-004-0.5'	Sulfate	7/9/2003	141	100	
A6-SB-004-0.5'-1	Sulfate	7/9/2003	120	100	
A6-SB-004-4.5'	Sulfate	7/9/2003	137	100	
A6-SB-004-6.0'	Sulfate	7/9/2003	0	100	U
A6-SB-005-0.5'	Sulfate	7/9/2003	162	100	
A6-SB-005-4.5'	Sulfate	7/9/2003	332	100	
A6-SB-005-7.5'	Sulfate	7/9/2003	172	100	
A6-SS-001-0.5'	Iron	7/9/2003	6210	1	
	Sulfate	7/9/2003	0	100	U
A6-SS-002-0.5'	Iron	7/9/2003	7270	1	
	Sulfate	7/9/2003	171	100	

FIGURES



North



WASHINGTON

1 1/2 0 1

SCALE (MILES)

1000 0 1000 2000 3000 4000 5000 6000 7000

SCALE (FEET)

REFERENCE: USGS 7.5 MINUTE QUADRANGLE; SUNNYSIDE, WASHINGTON; 1975

DRAWN BY: SES CHECKED: APPROVED: DATE: 9/19/03 JOB No.: 24CH.67201 CAD FILE: PATH ON LEFT	PREPARED BY: SECOR 12034 134th COURT NE, SUITE 102 REDMOND, WASHINGTON	PREPARED FOR: BEE-JAY SCALES 301 WAREHOUSE AVENUE SUNNYSIDE, WASHINGTON	FIGURE 1-1 SITE LOCATION MAP

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WAREHOUSE AVENUE

N. 1ST STREET

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

CARPORT

BLDG.

BLDG.

CHAINLINK FENCE

CHAINLINK FENCE

GATE

BLDG.

LAGOON

CHAINLINK FENCE

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

- RIGHT-OF-WAY LINE
- BUILDING
- BUILDING OVERHANG
- CHAINLINK FENCE

NOTE: THE LAGOON IS IN AN APPROXIMATE LOCATION.

50 0 50

SCALE: 1" = 50'

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CHECKED:	MRP
APPROVED:	JRB
DATE:	08/19/03
JOB No.:	24CH.67201.00
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Okemos, MI 48864

PREPARED FOR:

ChevronTexaco

6001 Bollinger Canyon Rd K2090
San Ramon, CA 94583

FIGURE 1-2

GENERAL SITE LAYOUT

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001

A5-SS-003

A5-SS-004

A5-SS-005

A5-SS-001

A5-SS-002

A6-SS-001

A4-SB-002

BLDG.

A4-SB-003

A4-SB-004

BLDG.

A6-SS-002

A4-SB-005

A4-SB-006

A6-SB-001

A2-SB-002

A2-SB-003

A1-SB-004

A1-SB-003

A1-SB-001

A1-SB-002

MW-3

A6-SB-002B

A6-SB-002

A2-SB-001

GATE

A2-SB-004

A1-SB-005

A1-SB-006

LAGOON

A6-SB-003

A6-SB-004

A3-SB-001

BLDG.

A1-SB-007

A1-SB-008

A6-SB-005

A3-SB-002

MW-5

MW-4

CHAINLINK FENCE

MW-6

A2-SB-005

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

A6-SS-001	SOIL BORING LOCATION
MW-7	MONITORING WELL LOCATION
	RIGHT-OF-WAY LINE
	BUILDING
	BUILDING OVERHANG
	CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NORTH

50 0 50

SCALE: 1" = 50'

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CHECKED:	MRP
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JOB No.:	24CH.67201.00
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2321 Club Meridian Dr. Suite E
Okemos, MI 48864

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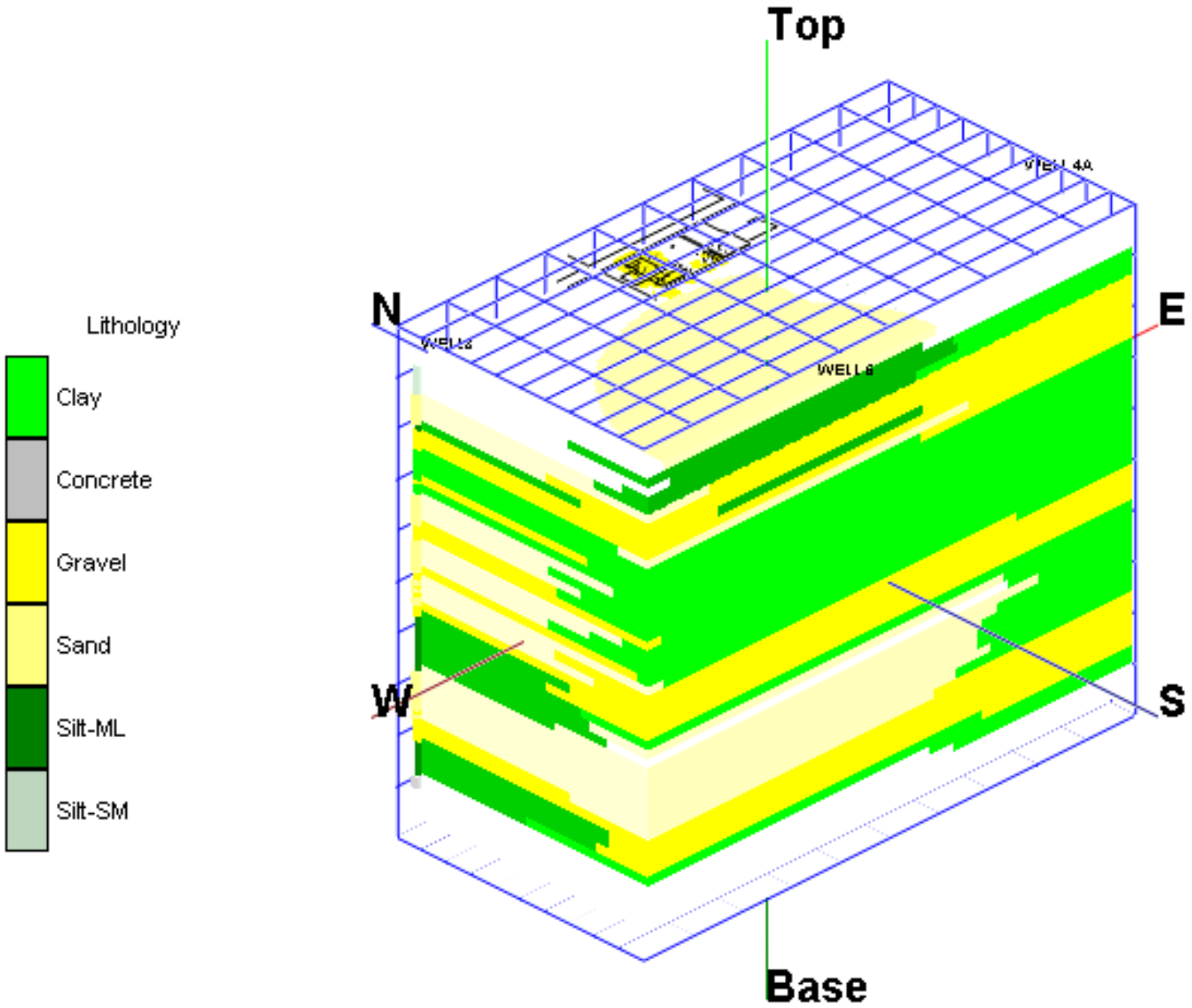
6001 Bollinger Canyon Rd K2090
San Ramon, CA 94583

FIGURE 2-1
SITE LAYOUT
SOIL BORING/MONITORING WELL LOCATIONS



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CHECKED:	MRP
APPROVED:	JRB
DATE:	09/15/03
JOB No.:	24CH.67201.00
CAD FILE:	3-d_Model.dwg

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Okemos, MI 48864

PREPARED FOR:

BEE JAY SCALES
ChevronTexaco

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FIGURE 3-1

THREE DIMENSIONAL
REGIONAL GEOLOGICAL MODEL

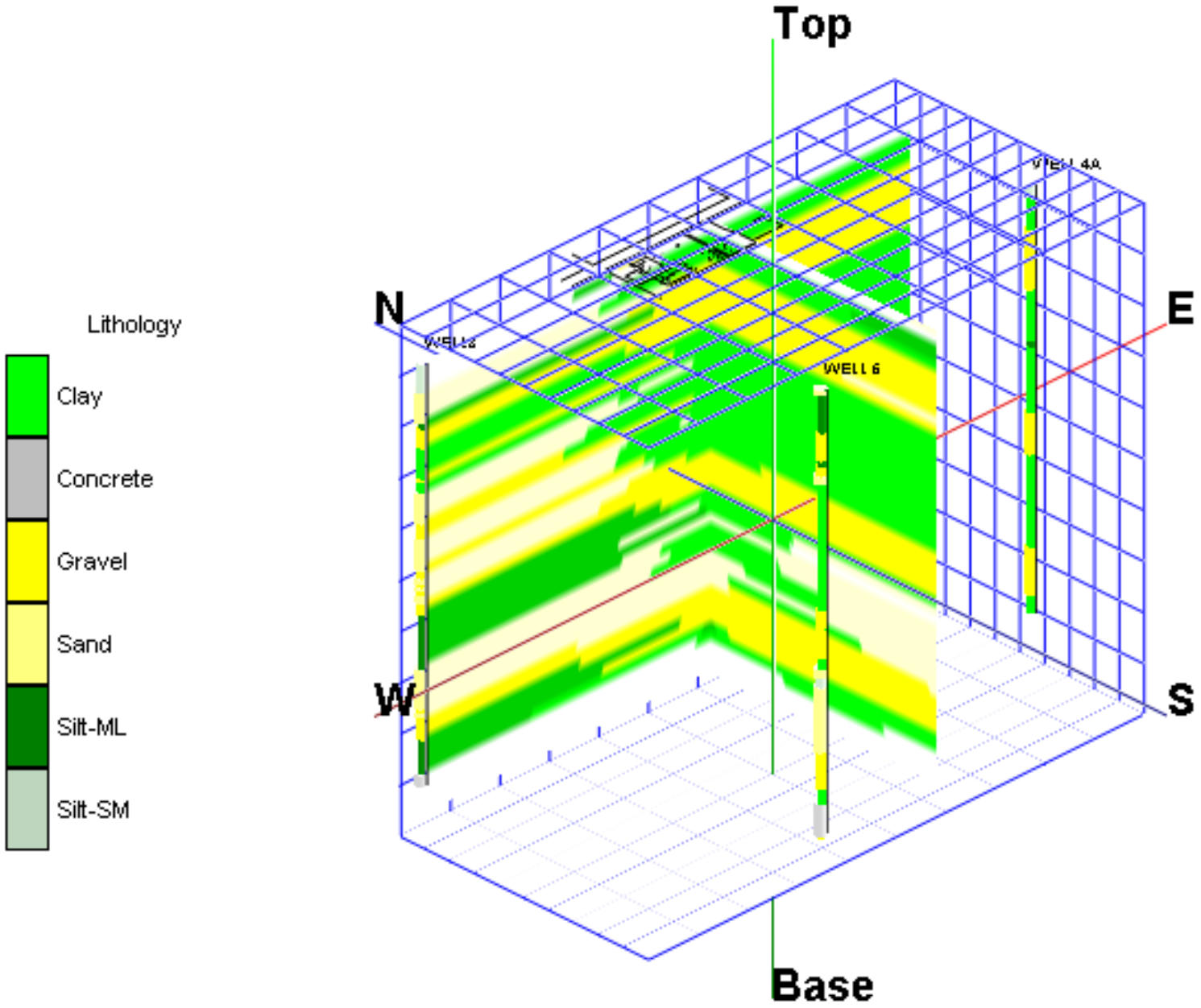

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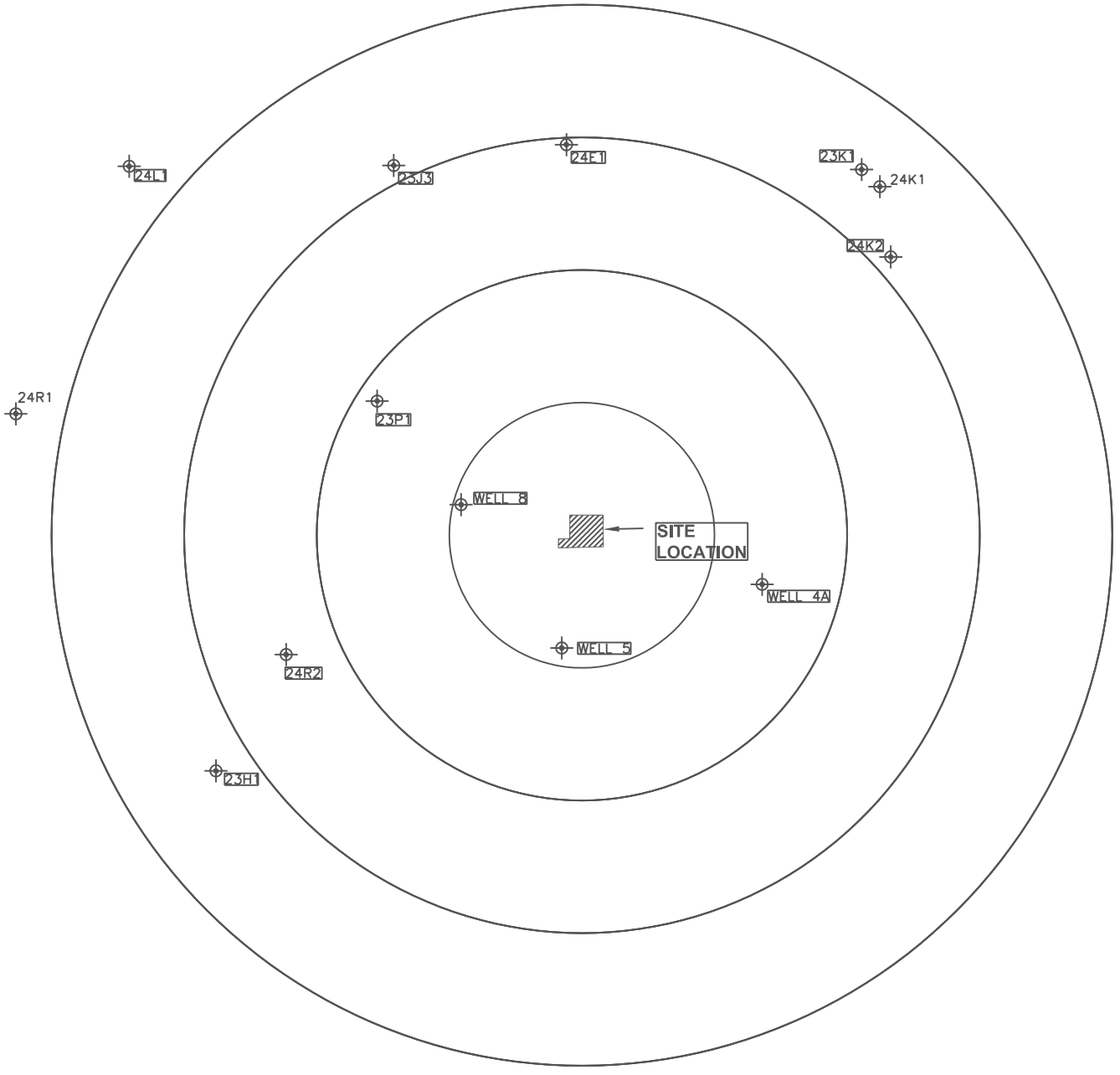
FIGURE 3-2

THREE DIMENSIONAL
REGIONAL GEOLOGICAL CROSS-SECTION



DRAWN BY: SES CHECKED: APPROVED: DATE: 8/5/03 JOB No.: 00XX.00000.00 CAD FILE: PATH ON LEFT	PREPARED BY: SECOR 12034 134th COURT NE REDMOND, WASHINGTON	PREPARED FOR: BEE-JAY SCALES 301 WAREHOUSE AVENUE SUNNYSIDE, WASHINGTON	FIGURE 3-3 WELL INVENTORY-DOMESTIC & MUNICIPAL WELL LOCATIONS WITHIN 1.0-MILE RADIUS

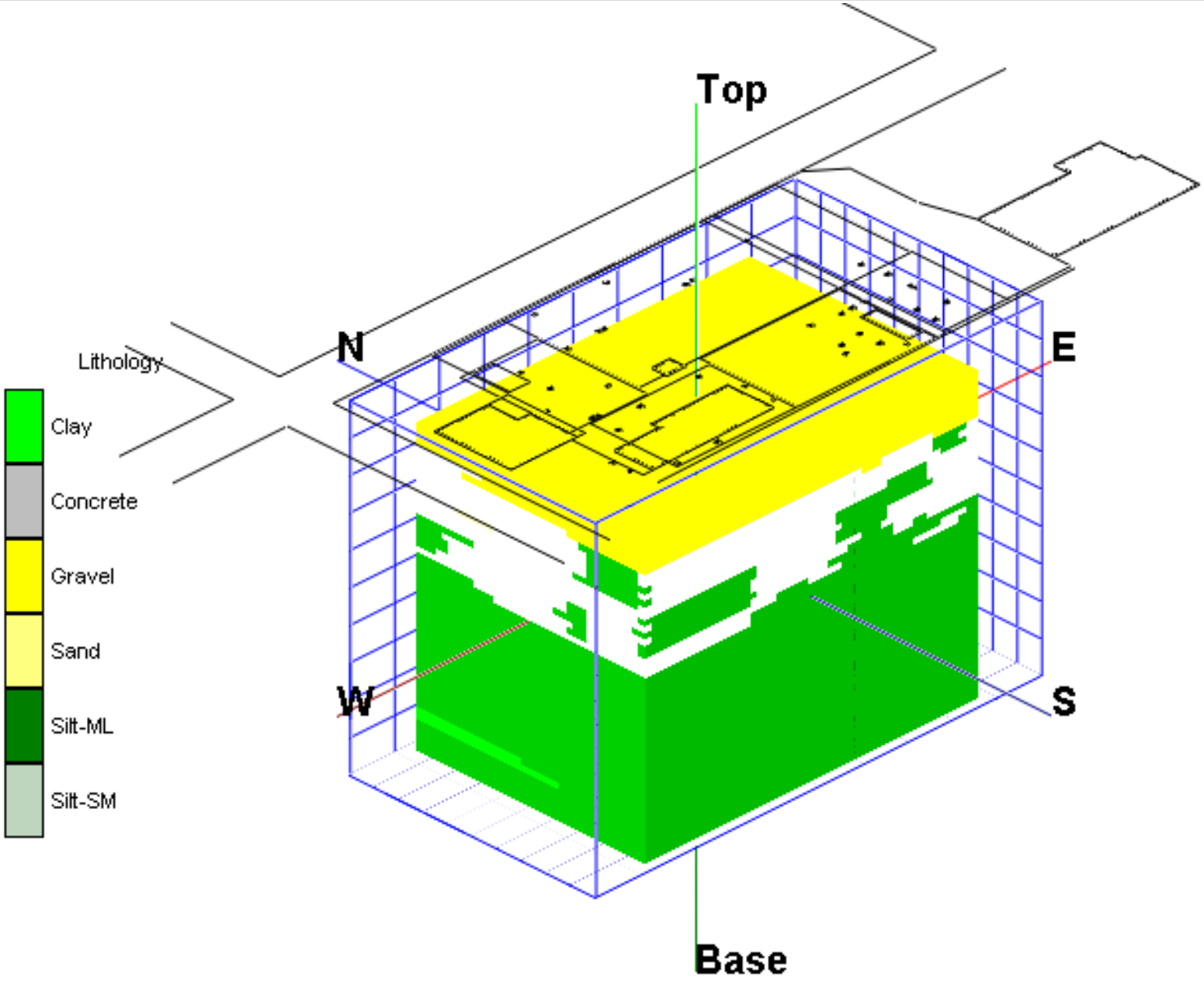


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FIGURE 3-4

THREE DIMENSIONAL
LOCAL GEOLOGICAL MODEL

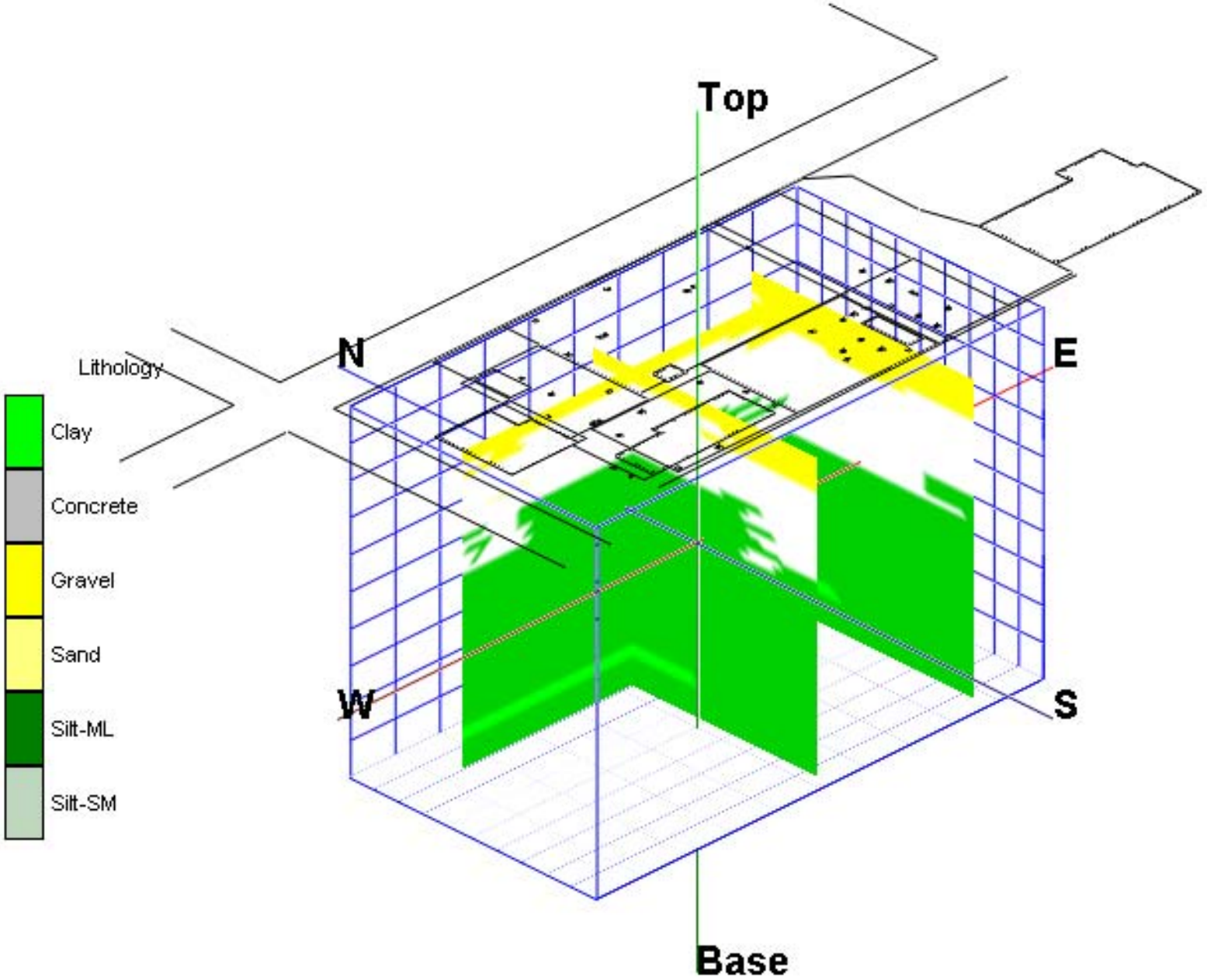

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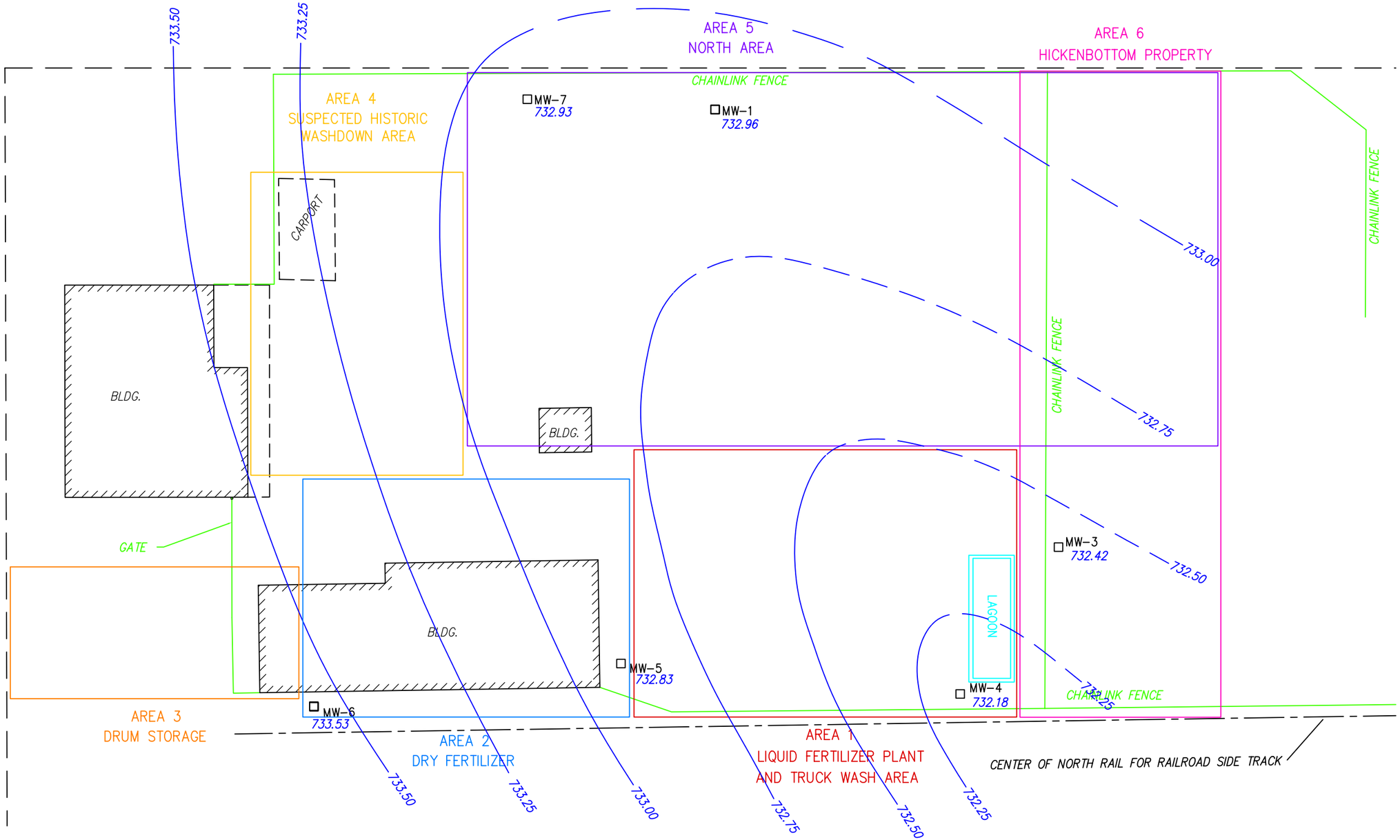
FIGURE 3-5

THREE DIMENSIONAL
LOCAL GEOLOGICAL CROSS-SECTION



LEGEND

A6-SS-001	SOIL BORING LOCATION
MW-7 732.93	MONITORING WELL LOCATION GROUNDWATER ELEVATION
732.75	GROUNDWATER CONTOUR
	RIGHT-OF-WAY LINE
	BUILDING
	BUILDING OVERHANG
	CHAINLINK FENCE

NOTE: THE LAGOON IS IN AN APPROXIMATE LOCATION.

NOTE: GROUNDWATER CONTOURS REPRESENTED BY A DASHED LINE ARE UNDEFINED.

50 0 50

SCALE: 1" = 50'

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JOB No.:	24CH.67201.00
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FIGURE 3-6

GROUNDWATER ELEVATION MAP

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7
As 0.011
Cl 10
Fe 0.11
Phosphate 0.3
Sulfate 47
Total Nitrate + Nitrite 3.6

MW-1
As 0.011
Cl 8
Fe 0.05
Phosphate 0.3
Sulfate 32
Total Nitrate + Nitrite 4

CARPORT

BLDG.

BLDG.

CHAINLINK FENCE

GATE

BLDG.

Ammonia-N 320
As 0.005
Cl 193
Fe 0.91
Sulfate 624
Total Nitrate + Nitrite 593

MW-5

1,2-Dichloropropane 0.105
Ammonia-N 850
As 0.007
Cl 112
Fe 0.73
Phosphate 0.5
Sulfate 307
Total Nitrate + Nitrite 986

LAGOON

MW-4

MW-3
Ammonia-N 180
As 0.102
Cl 13
Phosphate 85
Sulfate 38
Total Nitrate + Nitrite 55.1

CHAINLINK FENCE

AREA 3
DRUM STORAGE

MW-6
As 0.025
Cl 11
Fe 0.11
Phosphate 0.4
Sulfate 55
Total Nitrate + Nitrite 8.2

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

A6-SS-001	SOIL BORING LOCATION
MW-7	MONITORING WELL LOCATION
As 0.102	DETECTED CONCENTRATIONS IN GROUNDWATER (MG/L)
	RIGHT-OF-WAY LINE
	BUILDING
	BUILDING OVERHANG
	CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

NORTH

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
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APPROVED:	JRB
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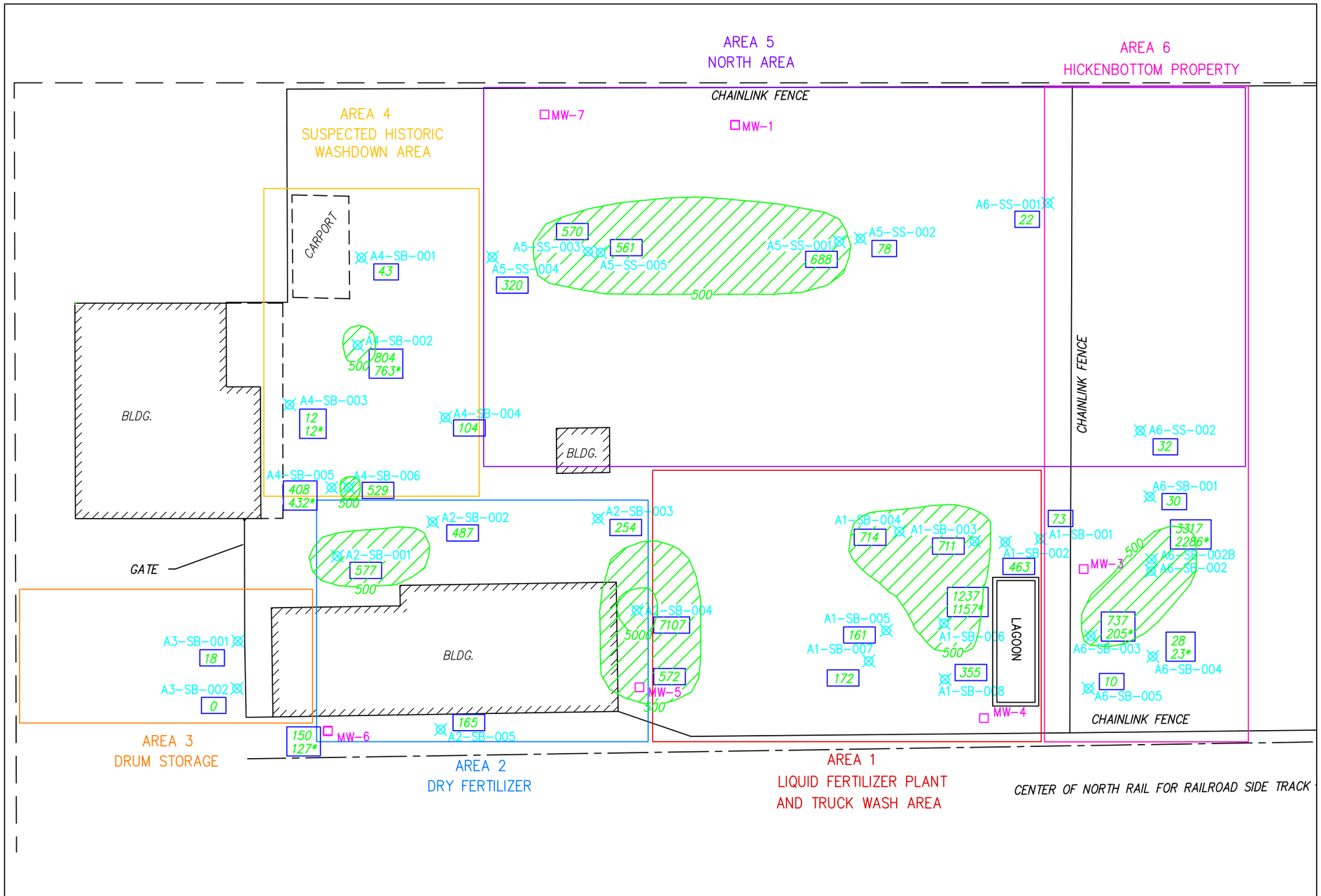
FIGURE 4-1
Concentrations of Select Potential IHSs in Groundwater



LEGEND

- A6-SS-001 — SOIL BORING LOCATION
- MW-7 — MONITORING WELL LOCATION
- 500 — NITROGEN CONCENTRATION ISOPLETH (MG/KG)
- 32 — NITROGEN CONCENTRATION (MG/KG)

NITROGEN = NITRATES + NITRITES+ AMMONIA

- RIGHT-OF-WAY LINE
- BUILDING
- BUILDING OVERHANG
- CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

NORTH

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
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DATE:	09/09/03
JOB No.:	24CH.67201.00
CAD FILE:	Nitrogen Figure.dwg

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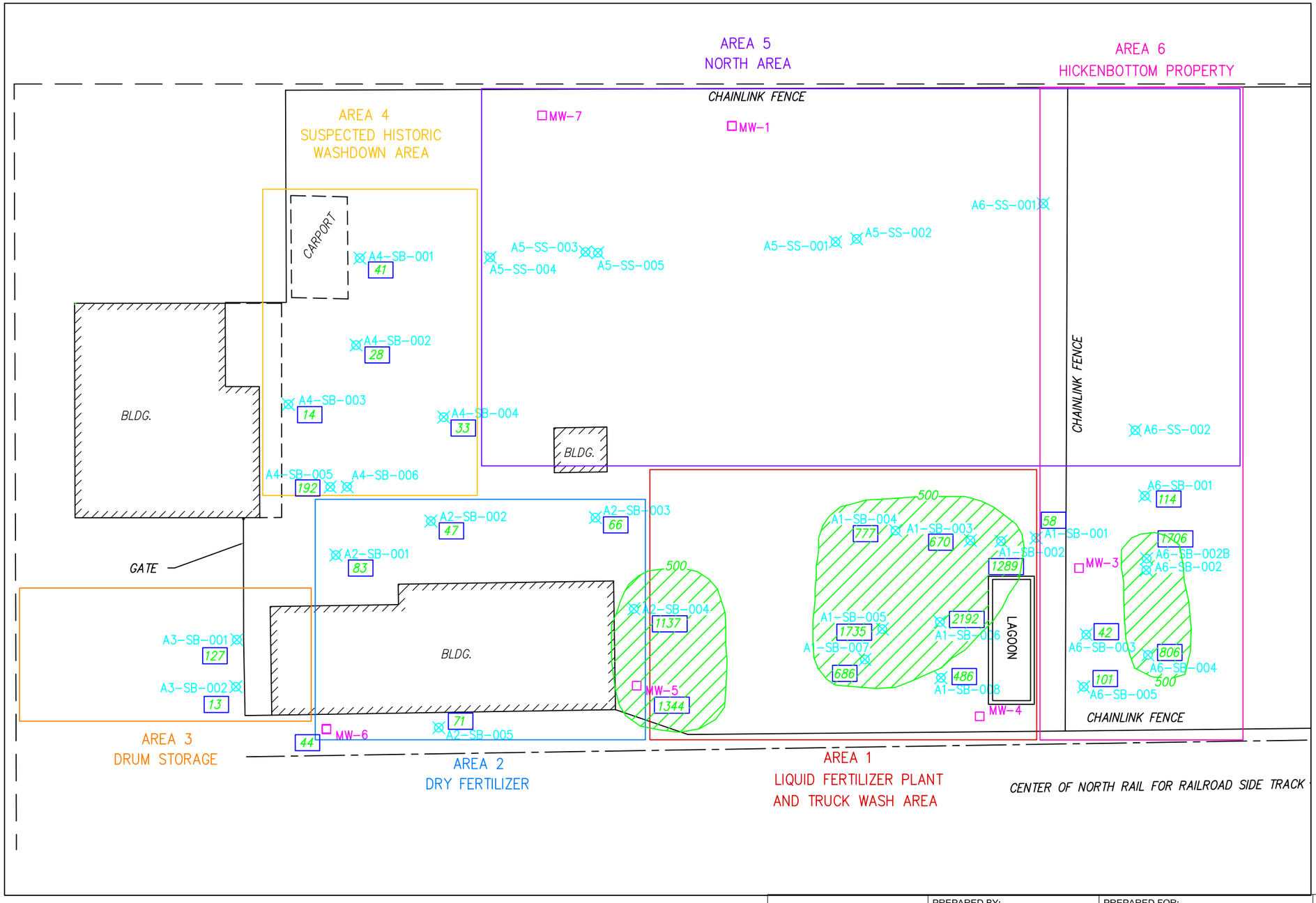
FIGURE 4-2

Nitrogen Concentration in Soil
0.5' Depth



LEGEND

- A6-SS-001 — SOIL BORING LOCATION
- MW-7 — MONITORING WELL LOCATION
- 500 — NITROGEN CONCENTRATION ISOPLETH (MG/KG)
- 32 — NITROGEN CONCENTRATION (MG/KG)

NITROGEN = NITRATES + NITRITES+ AMMONIA

- RIGHT-OF-WAY LINE
- BUILDING
- BUILDING OVERHANG
- CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
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APPROVED:	JRB
DATE:	09/09/03
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FIGURE 4-3

Nitrogen Concentration in Soil
4.5' Depth

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001 0

A5-SS-003

A5-SS-004

A5-SS-005

A5-SS-001

A5-SS-002

A6-SS-001

A4-SB-002 0

A4-SB-003 0

A4-SB-004 62

BLDG.

20

A4-SB-005

A4-SB-006

CHAINLINK FENCE

A6-SS-002

A6-SB-001 69

A2-SB-002 12 11*

A2-SB-003 44

A1-SB-004 116

A1-SB-003 47

712

A1-SB-001

371

A6-SB-002B

A6-SB-002

A1-SB-002 500 262

MW-3

GATE

A2-SB-001 0

A2-SB-004 500 511

A1-SB-005 1885

A1-SB-007 1286

1590

A1-SB-006

655

A1-SB-008

LAGOON

151

A6-SB-003

500

684-6.0'

A6-SB-004

0

A6-SB-005

A3-SB-001 0

A3-SB-002 0

BLDG.

344

MW-5

MW-4

CHAINLINK FENCE

MW-6

0

A2-SB-005

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

A6-SS-001 SOIL BORING LOCATION

MW-7 MONITORING WELL LOCATION

500 NITROGEN CONCENTRATION ISOPLETH (MG/KG)

32 NITROGEN CONCENTRATION (MG/KG)

NITROGEN = NITRATES + NITRITES+ AMMONIA

RIGHT-OF-WAY LINE

BUILDING

BUILDING OVERHANG

CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
CHECKED:	
APPROVED:	JRB
DATE:	09/09/03
JOB No.:	24CH.67201.00
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FIGURE 4-4

Nitrogen Concentration in Soil
7.5' and 9.0' Depth

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001 0

A5-SS-003 4

A5-SS-004 86

A5-SS-005 0

A5-SS-001 417

A5-SS-002 4

A6-SS-001 0

500

A4-SB-002 880 624*

A4-SB-003 0 0*

A4-SB-004 0

BLDG.

BLDG.

A6-SS-002 0

CHAINLINK FENCE

A4-SB-005 304 328*

A4-SB-006 326

A6-SB-001 0

A2-SB-002 273

A2-SB-003 117

A1-SB-004 404

A1-SB-003 631

A1-SB-001 5

A1-SB-002 400

A2-SB-001 283

GATE

MW-3

A6-SB-002B 2710 1890*

A6-SB-002

500

A2-SB-004 5550

A1-SB-005 0

A1-SB-007 0

1110 1030*

A1-SB-006

500

LAGOON

684 162*

A6-SB-003

0 0*

A6-SB-004

A3-SB-001 5

A3-SB-002 0

BLDG.

370

MW-5

207

A1-SB-008

MW-4

10

A6-SB-005

CHAINLINK FENCE

0 6*

MW-6

100

A2-SB-005

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

- A6-SS-001 — SOIL BORING LOCATION
- MW-7 — MONITORING WELL LOCATION
- 500 — AMMONIA CONCENTRATION ISOPLETH (MG/KG)
- 32 — AMMONIA CONCENTRATION (MG/KG)
- RIGHT-OF-WAY LINE
- BUILDING
- BUILDING OVERHANG
- CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
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DATE:	09/09/03
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FIGURE 4-5

Ammonia Concentration in Soil
0.5' Depth

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001
3

A5-SS-003
A5-SS-004
A5-SS-005

A5-SS-001
A5-SS-002

A6-SS-001

A4-SB-002
0

A4-SB-003
0

A4-SB-004
0

BLDG.

BLDG.

A6-SS-002

CHAINLINK FENCE

A4-SB-005
4

A4-SB-006

A2-SB-002
0

A2-SB-003
7

A2-SB-001
0

GATE

A1-SB-004
426

A1-SB-003
583

968

A1-SB-002

3

A1-SB-001

A6-SB-001
0

MW-3

972

A6-SB-002B
A6-SB-002
500

A2-SB-004
920

500

A1-SB-005
735

A1-SB-007
281

1520

A1-SB-006
500

LAGOON

0

A1-SB-008

MW-4

A6-SB-003
0

120

A6-SB-004

5

A6-SB-005

A3-SB-001
61

A3-SB-002
0

214

MW-5

BLDG.

0

MW-6

0

A2-SB-005

CHAINLINK FENCE

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

- A6-SS-001 — SOIL BORING LOCATION
- MW-7 — MONITORING WELL LOCATION
- 500 — AMMONIA CONCENTRATION ISOPLETH (MG/KG)
- 32 — AMMONIA CONCENTRATION (MG/KG)
- RIGHT-OF-WAY LINE
- BUILDING
- BUILDING OVERHANG
- CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

NORTH

50 0 50

SCALE: 1" = 50'

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JOB No.:	24CH.67201.00
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FIGURE 4-6

Ammonia Concentration in Soil
4.5' Depth

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001 0

A5-SS-003

A5-SS-004

A5-SS-005

A5-SS-001

A5-SS-002

A6-SS-001

A4-SB-002 0

A4-SB-003 0

A4-SB-004 0

BLDG.

BLDG.

A6-SS-002

CHAINLINK FENCE

A4-SB-005 0

A4-SB-006

A6-SB-001 15

A2-SB-002 0 0*

A2-SB-003 31

A2-SB-001 0

A1-SB-004 57

A1-SB-003 0

100

683

A1-SB-001

A1-SB-002 500

338

A6-SB-002B

A6-SB-002

MW-3

GATE

372

A2-SB-004

A1-SB-005 1630

A1-SB-007 1200

1460

A1-SB-006

LAGOON

117

A6-SB-007

589-6.0'

A6-SB-004 500

0

A6-SB-005

A3-SB-001 0

A3-SB-002 0

BLDG.

218

MW-5

500

337

A1-SB-008

MW-4

CHAINLINK FENCE

0

MW-6

A2-SB-005

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

A6-SS-001	SOIL BORING LOCATION
MW-7	MONITORING WELL LOCATION
500	AMMONIA CONCENTRATION ISOPLETH (MG/KG)
32	AMMONIA CONCENTRATION (MG/KG)
	RIGHT-OF-WAY LINE
	BUILDING
	BUILDING OVERHANG
	CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

NORTH

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
CHECKED:	
APPROVED:	JRB
DATE:	09/09/03
JOB No.:	24CH.67201.00
CAD FILE:	Nitrogen Figure.dwg

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FIGURE 4-7

Ammonia Concentration in Soil
7.5' and 9.0' Depth

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001
43

A5-SS-003
566

A5-SS-004
234

561

A5-SS-005
500

A5-SS-001
271

A5-SS-002
74

A6-SS-001
22

A4-SB-002
124
139*

12
12*

A4-SB-003

BLDG.

A4-SB-004
104

BLDG.

CHAINLINK FENCE

A6-SS-002
32

104
104*

203

A4-SB-005

A4-SB-006

A6-SB-001
30

A2-SB-002
214

A2-SB-003
137

A1-SB-004
310

A1-SB-003
80

63

68

A1-SB-001

A1-SB-002

500
591
396*

A6-SB-002B

A6-SB-002

MW-3

A2-SB-001
294

GATE

1530

A2-SB-004

500

A1-SB-005
161

A1-SB-007

172

127
127*

A1-SB-006

LAGOON

53
43*

A6-SB-003

28
23*

A6-SB-004

A3-SB-001
13

A3-SB-002
0

BLDG.

202

MW-5

148

A1-SB-008

0

A6-SB-005

MW-4

CHAINLINK FENCE

65

A2-SB-005

150
121*

MW-6

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

A6-SS-001	SOIL BORING LOCATION
MW-7	MONITORING WELL LOCATION
500	NITRATE CONCENTRATION ISOPLETH (MG/KG)
32	NITRATE CONCENTRATION (MG/KG)
	RIGHT-OF-WAY LINE
	BUILDING
	BUILDING OVERHANG
	CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

N

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
CHECKED:	
APPROVED:	JRB
DATE:	09/09/03
JOB No.:	24CH.67201.00
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San Ramon, CA 94583

FIGURE 4-8

Nitrate Concentration in Soil
0.5' Depth

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001
38

A5-SS-003
A5-SS-004
A5-SS-005

A5-SS-001
A5-SS-002

A6-SS-001

A4-SB-002
28

A4-SB-003
14

A4-SB-004
33

BLDG.

BLDG.

CHAINLINK FENCE

A6-SS-002

A4-SB-005
188

A4-SB-006

A6-SB-001
114

A2-SB-002
47

A2-SB-003
59

A1-SB-004
351

A1-SB-003
87

55
A1-SB-001

A1-SB-002
321

500
734
A6-SB-002B
A6-SB-002

MW-3

A2-SB-001
83

GATE

217
A2-SB-004

500

A1-SB-005
983

A1-SB-006
672

LAGOON

A1-SB-007
405

A1-SB-008
486

MW-4

42
A6-SB-003

686
A6-SB-004

96
A6-SB-005

A3-SB-001
66

A3-SB-002
13

BLDG.

1130
MW-5

71
A2-SB-005

44
MW-6

CHAINLINK FENCE

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

A6-SS-001	SOIL BORING LOCATION
MW-7	MONITORING WELL LOCATION
500	NITRATE CONCENTRATION ISOPLETH (MG/KG)
32	NITRATE CONCENTRATION (MG/KG)
	RIGHT-OF-WAY LINE
	BUILDING
	BUILDING OVERHANG
	CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
CHECKED:	
APPROVED:	JRB
DATE:	09/09/03
JOB No.:	24CH.67201.00
CAD FILE:	Nitrogen Figure.dwg

PREPARED BY:

SECOR

2321 Club Meridian Dr. Suite E
Okemos, MI 48864

PREPARED FOR:

ChevronTexaco

6001 Bollinger Canyon Rd K2090
San Ramon, CA 94583

FIGURE 4-9

Nitrate Concentration in Soil
4.5' Depth

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001 0

A5-SS-003

A5-SS-004

A5-SS-005

A5-SS-001

A5-SS-002

A6-SS-001

A4-SB-002 0

A4-SB-003 0

A4-SB-004 62

BLDG.

20

A4-SB-005

A4-SB-006

CHAINLINK FENCE

A6-SS-002

A6-SB-001 54

A2-SB-002 12 11*

A2-SB-003 13

A1-SB-004 59

A1-SB-003 47

29

A1-SB-001

A1-SB-002 162

33

A6-SB-002B

A6-SB-002

MW-3

GATE

A2-SB-001 0

139

A2-SB-004

A1-SB-005 255

A1-SB-007 86

130

A1-SB-006

LAGOON

34

A6-SB-003

95-6.0'

A6-SB-004

A3-SB-001 0

BLDG.

A3-SB-002 0

126

MW-5

318

A1-SB-008

MW-4

0

A6-SB-005

CHAINLINK FENCE

MW-6

0

A2-SB-005

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

A6-SS-001 SOIL BORING LOCATION

MW-7 MONITORING WELL LOCATION

500 NITRATE CONCENTRATION ISOPLETH (MG/KG)

32 NITRATE CONCENTRATION (MG/KG)

RIGHT-OF-WAY LINE

BUILDING

BUILDING OVERHANG

CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

N

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
CHECKED:	
APPROVED:	JRB
DATE:	09/09/03
JOB No.:	24CH.67201.00
CAD FILE:	Nitrogen Figure.dwg

PREPARED BY:

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Okemos, MI 48864

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FIGURE 4-10

Nitrate Concentration in Soil
7.5' and 9.0' Depth

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001
126

A5-SS-003
288

A5-SS-004
4640

A5-SS-005
288

500

A5-SS-001
3550

A5-SS-002
120

500

A6-SS-001
0

A4-SB-002
172
187*

0
0*

A4-SB-003

A4-SB-004
153

BLDG.

125
145*

A4-SB-005

286

A4-SB-006

500

CHAINLINK FENCE

A6-SS-002
171

A6-SB-001
103

8400
3760*

A6-SB-002B

A6-SB-002

MW-3

500

A2-SB-002
1640

A2-SB-003
186

500

A2-SB-001
934

GATE

2900

A2-SB-004

A1-SB-004
0

A1-SB-003
0

0

A1-SB-001
0

A1-SB-002

A1-SB-005
0

A1-SB-007
0

0
0*

A1-SB-006

LAGOON

0

A1-SB-008

MW-4

0
0*

A6-SB-003

141
120*

A6-SB-004

162

A6-SB-005

A3-SB-001
0

A3-SB-002
0

BLDG.

2990
MW-5

148

A2-SB-005

2535
729*

MW-6

500

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

CHAINLINK FENCE

LEGEND

A6-SS-001	SOIL BORING LOCATION
MW-7	MONITORING WELL LOCATION
500	SULFATE CONCENTRATION ISOPLETH (MG/KG)
32	SULFATE CONCENTRATION (MG/KG)
	RIGHT-OF-WAY LINE
	BUILDING
	BUILDING OVERHANG
	CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

NORTH

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
CHECKED:	
APPROVED:	JRB
DATE:	09/09/03
JOB No.:	24CH.67201.00
CAD FILE:	Nitrogen Figure.dwg

PREPARED BY:
SECOR
2321 Club Meridian Dr. Suite E
Okemos, MI 48864

PREPARED FOR:
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6001 Bollinger Canyon Rd K2090
San Ramon, CA 94583

FIGURE 4-11

Sulfate Concentration in Soil
0.5' Depth

AREA 5
NORTH AREA

AREA 6
HICKENBOTTOM PROPERTY

CHAINLINK FENCE

AREA 4
SUSPECTED HISTORIC
WASHDOWN AREA

MW-7

MW-1

CARPORT

A4-SB-001
109

A5-SS-003
A5-SS-004
A5-SS-005

A5-SS-001
A5-SS-002

A6-SS-001

A4-SB-002
117

A4-SB-003
128

0
A4-SB-004

BLDG.

A6-SS-002

CHAINLINK FENCE

174
A4-SB-005
A4-SB-006

BLDG.

A6-SB-001
314

A2-SB-002
150

A2-SB-003
0

A1-SB-004
225
A1-SB-003
0
A1-SB-001
0
A1-SB-002
0

A2-SB-001
224

GATE

MW-3

2220
A6-SB-002B
A6-SB-002

500

159
A2-SB-004

A1-SB-005
199
A1-SB-007
116

A1-SB-006
0

LAGOON

A6-SB-003
0
A6-SB-004
137

A3-SB-001
165

442
MW-5

A6-SB-005
332

A3-SB-002
0

MW-4

CHAINLINK FENCE

BLDG.

162
A2-SB-005

MW-6
107

AREA 3
DRUM STORAGE

AREA 2
DRY FERTILIZER

AREA 1
LIQUID FERTILIZER PLANT
AND TRUCK WASH AREA

CENTER OF NORTH RAIL FOR RAILROAD SIDE TRACK

LEGEND

- A6-SS-001 — SOIL BORING LOCATION
- MW-7 — MONITORING WELL LOCATION
- 500 — SULFATE CONCENTRATION ISOPLETH (MG/KG)
- 32 — SULFATE CONCENTRATION (MG/KG)
- RIGHT-OF-WAY LINE
- BUILDING
- BUILDING OVERHANG
- CHAINLINK FENCE

NOTE: SOIL BORINGS A4-SB-003, A5-SS-004, A5-SS-005, A6-SB-001, AND THE LAGOON ARE IN APPROXIMATE LOCATIONS.

NOTE: RESULTS NOTED WITH * ARE DUPLICATE SAMPLES.

50 0 50

SCALE: 1" = 50'

DRAWN BY:	PMW
CHECKED:	
APPROVED:	JRB
DATE:	09/09/03
JOB No.:	24CH.67201.00
CAD FILE:	Nitrogen Figure.dwg

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SECOR
2321 Club Meridian Dr. Suite E
Okemos, MI 48864

PREPARED FOR:
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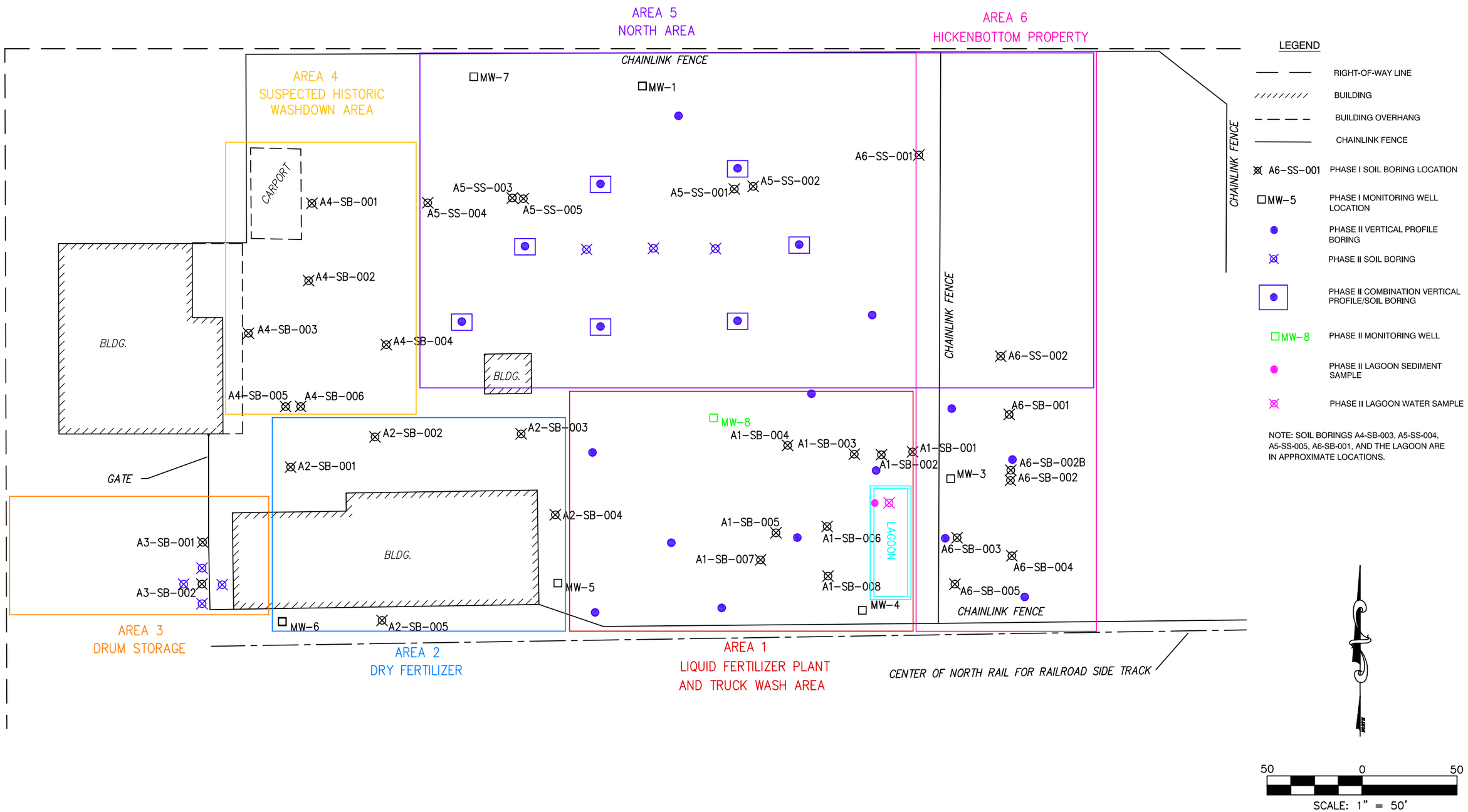
San Ramon, CA 94583

FIGURE 4-12

Sulfate Concentration in Soil
4.5' Depth



DRAWN BY:	PMW
CHECKED:	MRP
APPROVED:	JRB
DATE:	10/6/03
JOB No.:	24CH.67201.00
CAD FILE:	Figure4-13.dwg

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SECOR

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Okemos, MI 48864

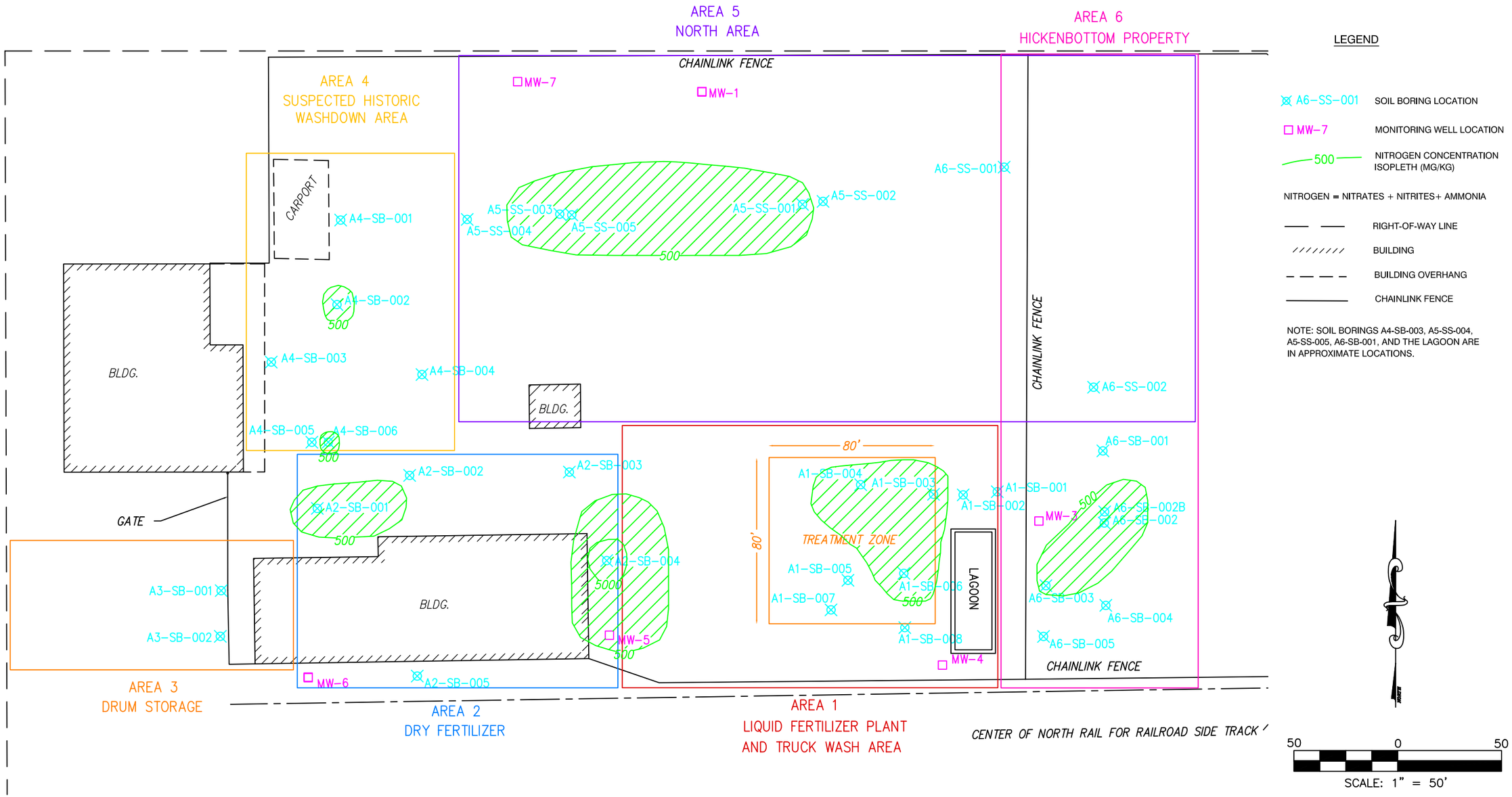
PREPARED FOR:

ChevronTexaco

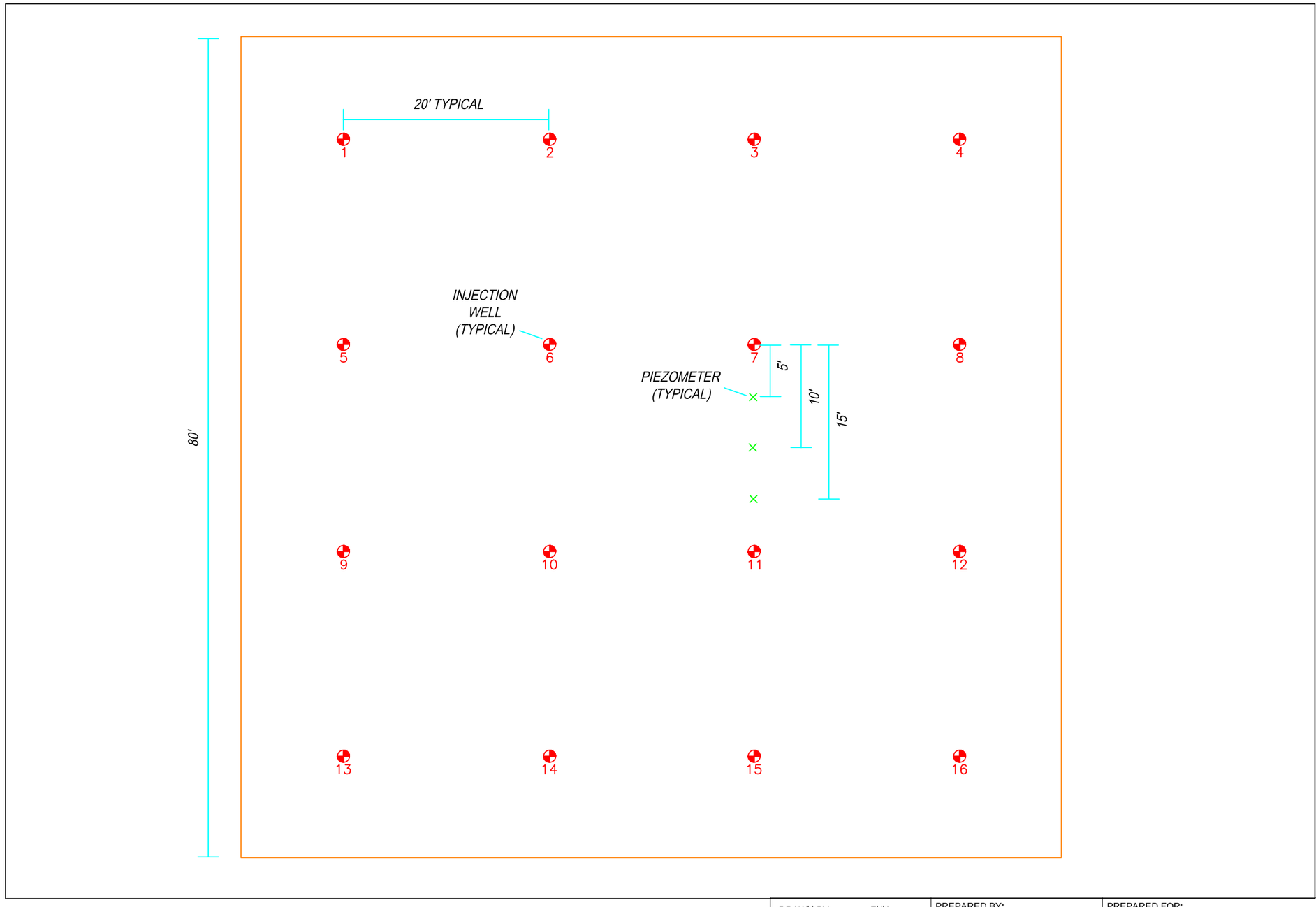
6001 Bollinger Canyon Rd K2090
San Ramon, CA 94583

FIGURE 4-13

Proposed Phase II
Sampling Locations



DRAWN BY: PMW CHECKED: ZKK APPROVED: JRB DATE: 09/17/03 JOB No.: 24CH.67201.00 CAD FILE: Nitrogen Figures_mrp.dwg	PREPARED BY: SECOR 2321 Club Meridian Dr. Suite E Okemos, MI 48864	PREPARED FOR: ChevronTexaco 6001 Bollinger Canyon Rd K2090 San Ramon, CA 94583	Figure 5-1 Full-Scale Pilot Zone Treatment Area



LEGEND

4 INJECTION WELL (TYPICAL)

PIEZOMETER (TYPICAL)

10 0 10

SCALE IN FEET

DRAWN BY:	ZKK
CHECKED:	MRP
APPROVED:	JRB
DATE:	09/17/03
JOB No.:	24CH.67201.00
CAD FILE:	Nitrogen Figures.dwg

PREPARED BY:

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PREPARED FOR:

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San Ramon, CA 94583

Figure 5-2

In-Situ Biological Treatment Enhancements
Full-Scale Pilot Layout

APPENDIX A

SUMMARY OF OWNERSHIP

Legal description of property: The western portion of Lots 10 and 11, "Block B" of GEORGE E. SHAW'S ACRE TRACTS ADDITION TO SUNNYSIDE, Washington, according to the official plat thereof recorded in Volume "A" of Plats, page 74, records of Yakima County, Washington, lying northerly of the Northern Pacific Right of Way.

Date of Recordation	Grantor	Grantee	Type of recording instrument	Notes
3/24/1902	George E. Shaw & Frances A. Shaw	S. J. Harrison	Deed	Lot 10-11 & 12 Blk "B"
8/2/1902	S. J. Harrison & Loretta R. Harrison	Naaman Woodin	Deed	Lot 10-11 & 12 Blk "B"
7/24/1903	Naaman Woodin & Lottie W. Woodin	Thomas C. Williams	Q. C. Deed	Lot 10-11 & 12 Blk "B"
5/4/1905	T. C. Williams and Margaret C. Williams	N. P. Ry Co.	Lease ???	Lot 10-11 & 12 Blk "B"
6/18/1906	Stephen J. Harrison & Loretta R. Harrison	Thomas C. Williams	Q. C. D.	Lot 10-11 & 12 Blk "B"
8/10/1906	Thomas C. Williams & Margaret C. Williams	N. P. Ry Co.	Contract for Deed for R. of W.	Lot 10 Blk "B" 250ft width being 150 on N. side & 100 ft on S. side of center line of said RR as surveyed and staked out on the ground desc as follows ...
9/7/1906	Thomas C. Williams & Margaret C. Williams	N. P. Ry Co.	Warranty Deed	Lot 10 Blk "B" 250ft width being 150 on N. side & 100 ft on S. side of center line of said RR as surveyed and staked out on the ground desc as follows ...
1/20/1925	L. C. Luce Sheriff of Yakima County Washington	The Oregon Mortgage Company Limited	Sheriff's Deed	Lots 10, 11 and 12 in Blk "B" of George E. Shaw's Acre Tracts **except right of way of the N. P. Rlway Co.**
1/31/1936	Oregon Mortgage Company	F. W. Grending & Ethel W. Grending	Deed	Lot 10 Blk "B" lying North of Northern Pacific R/W
1/31/1036	F. W. Grending & Ethel W. Grending	Home Owners' Loan Corporation	Mortgage	
	Grending	Randolph		Unrecorded lease may have been executed
6/16/1943	F. W. Grending & Ethel W. Grending	L. D. Blair	Land Contract	

Legal description of property: The western portion of Lots 10 and 11, "Block B" of GEORGE E. SHAW'S ACRE TRACTS ADDITION TO SUNNYSIDE, Washington, according to the official plat thereof recorded in Volume "A" of Plats, page 74, records of Yakima County, Washington, lying northerly of the Northern Pacific Right of Way.

Date of Recordation	Grantor	Grantee	Type of recording instrument	Notes
9/6/1944	F. W. Grending & Ethel W. Grending	L. D. Blair	Deed	Portion of Lot 10 Blk "B" ly N of the NPR Co. r/w subject to Randolph lease
9/6/1944	L. D. Blair	The Old National Bank of Spokane	Mortgage	
4/11/1946	L. D. Blair	Northern Pacific Railway Company	Deed	Portion of Lot 10 Blk "B" lying northerly of NPR Co's r/w as described by deed recorded 9/7/1906 except West 125 ft
4/11/1946	Old National Bank of Spokane	L. D. Blair	Satisfaction of Mortgage	
3/2/1949	L. D. Blair	Vernon Mitchell & Gladys P. Mitchell	Deed	West 125 Ft portion of Lot 10 Blk "B" ly Northerly of NP r/w
5/22/1961	Northern Pacific Railway Company	Elmer A. Hickenbottom and Robert R. Hickenbottom DBA as Elmer Hickenbottom and Son	Term Lease	No. 89753 Portion of Lots 10 and 11 Blk "B" lying northerly of the above described premises, easterly of a northerly production of the westerly line of Lot 13 and southerly of Warehouse Ave.
5/22/1961	Northern Pacific Railway Company	Elmer A. Hickenbottom and Robert R. Hickenbottom	Extension of Lease	No. 89753 Portion of Lots 10 and 11 Blk "B" lying northerly of the above described premises, easterly of a northerly production of the westerly line of Lot 13

gal description of property: The western portic f Lots 10 and 11, "Block B" of GEORGE E. SHAW'S ACRE TRACTS ADDITION TO SUNNYSIDE, Washington, according to the official plat thereof recorded in Volume "A" of Plats, page 74, records of Yakima County, Washington, lying northerly of the Northern Pacific Right of Way.

Date of Recordation	Grantor	Grantee	Type of recording instrument	Notes
				and southerly of Warehouse Ave.
9/28/1976	Gladys P. Mitchell	Donald W. Langenegger	Warranty Deed	West 125 ft portion of Lot 10 Blk "B" lying Northerly of NP r/w
1/25/1977	Nancy L. Langenegger	Donald W. Langenegger	Quit claim Deed	West 125 ft portion of Lot 10 Blk "B" lying Northerly of NP r/w
7/13/1981	Donald L. Langenegger	Chevron Chemical Company	Warranty Deed	West 125 ft of Lot 10 Blk "B" lying Northerly of NP r/w
9/23/1987	Chevron Chemical Company	Bee-Jay Scales, Inc.	Statutory Warranty Deed	West 125 ft of Lot 10 Blk "B" lying northerly of NP r/w except minerals, geothermal, and drilling rights below 500 ft below surface
6/15/89	Burlington Northern Railroad Company (formerly named Burlington Northern Inc.)	Glacier Park Company	Quit claim Deed	All portion Lot 10 & 11, Blk "B" except West 125 ft width of Lot 11
10/12/1989	Burlington Northern Railroad Company (formerly named Burlington Northern Inc.)	Glacier Park Company	Correction Quit claim Deed	All portion Lot 10 & 11 Blk "B" except West 125 ft width of Lots 10 & 11
4/20/90	Burlington Northern Railroad Company (formerly named Burlington Northern Inc.)	Glacier Park Company	Correction Quit Claim Deed	All portions of Lot 10 and 11 Blk "B" except West 125 ft width lying Northerly of line drawn parallel with and distant 150 ft northerly

Legal description of property: The western portion of Lots 10 and 11, "Block B" of GEORGE E. SHAW'S ACRE TRACTS ADDITION TO SUNNYSIDE, Washington, according to the official plat thereof recorded in Volume "A" of Plats, page 74, records of Yakima County, Washington, lying northerly of the Northern Pacific Right of Way.

10/4/1991	Glacier Park Company	Gordon Laird	Quit Claim Deed	All portion of Lot 10 and 11 Blk "B" lying westerly of a line drawn parallel with and distant 634 ft Easterly of West line except West 125 ft width lying Northerly of line drawn parallel with and distant 150 ft northerly
10/10/1991	Glacier Park Company	Trillium Corporation	Special Warranty Deed	All portion of Lot 10 and 11 Blk "B" except West 125 ft width lying Northerly of a line drawn parallel with and distance 150 ft northerly
1/21/1992	Trillium Corporation	Hickenbottom & Sons, Inc.	Quit Claim Deed	All portion of Lot 10 and 11 Blk "B" except all portion of Lots 10 & 11 lying Westerly of line drawn parallel with and distant 634 ft Easterly of West line
8/2/1995	Gordon Laird	Bee-Jay Scales Inc.	Real Estate Contract	All portion of Lot 10 and 11 Blk "B" except West 125 ft width lying Northerly of line drawn parallel with and distant 150 ft northerly

Legal description of property: The western portion of Lots 10 and 11, "Block B" of GEORGE E. SHAW'S ACRE TRACTS ADDITION TO SUNNYSIDE, Washington, according to the official plat thereof recorded in Volume "A" of Plats, page 74, records of Yakima County, Washington, lying northerly of the Northern Pacific Right of Way.

2/20/1996	Gordon Laird	Bee-Jay Scales, Inc.	Statutory Warranty Deed	All portion of Lot 10 and 11 Blk "B" except West 125 ft width lying Northerly of line drawn parallel with and distant 150 ft northerly and except West 490 ft
2/20/1996	Bee-Jay Scales, Inc.	Hickenbottom & Sons, Inc.	Statutory Warranty Deed	All portions of Lot 10 and 11 Blk "B" except West 125 ft width lying Northerly of line drawn parallel with and distant 150 ft northerly and except West 490 ft
Title currently vested as	Bee-Jay Scales, Inc. as to Parcel A and Gordon Laird on date of acquiring title as to Parcel B			Parcel A: West 125 ft of Lot 10 Blk "B" lying northerly of Northern Pacific r/w Parcel B: West 490 ft of portion of Lots 10 & 11 except west 125 ft width of Lots 10 & 11 lying northerly of a line drawn parallel with and distant 150 ft northerly

APPENDIX B

BORING LOGS

International Incorporated

A1-SB-001

PAGE 1 OF 1

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A1-SB-001
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/7/03 0840 FINISH 7/7/03 1020 CASING TOP ELEVATION
LOGGED BY D. Edward Caffrey MONITORING DEVICE OVM 580B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Concrete surface - cookie cut ≥ 4" thick			
	A1-SB-001-0.5' 0925				0-4' bgs hand cleared/excavated w/ post-hole digger, samples collected from borehole sidewall	GM		
				2	SILT and gravels			
				4				
5/5/6	A1-SB-001-4.5' 0956	NS	2.6	6	sandy SILT, olive brown (2.5Y 4/3) sand is very fine grained, soft/loose, dry, no odor present	SM		
4/5/4		NS	0.0	8	damp			
9/15/25		NS	2.6		moist			
17/20/22	A1-SB-001-9.0' 1005	NS	2.6	10	moist			
10/21/27		NS	2.6	12	wet			

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
sampler advanced to 12' bgs
GW encountered @ 11.5' bgs

International Incorporated

A1-SB-002

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A1-SB-002
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/7/03 1035 FINISH 7/7/03 1120 CASING TOP ELEVATION
LOGGED BY DEC MONITORING DEVICE OVM 580 B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	concrete surface - cookie cut ≈ 4" thick			
	A1-SB-002-0.5' 1048				0-4' bgs hand cleared/excavated with post hole digger - sample collected from borehole sidewalls, SILT and gravels	GM		
		0.0	0.0	2				
				4				
4/6/7	A1-SB-002-4.5' 1102	NS	0.0	6	sandy SILT, olive brown (2.5Y 4/3) sand is very fine grained, soft/loose, dry to damp, no odor present, trace small subangular to subrounded gravels	SM		
6/6/7		NS	1.3					
				8	same as above - no gravels			
6/5/9		NS	2.6					
9/10/16	A1-SB-002-9.0' 1110	NS	2.6	10	moist			
9/17/25		NS			wet			
			0.0	12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
GW encountered @ 12' bgs

International Incorporated

A1-SB-003

PAGE 1 OF 1

FACILITY Bee-Jay Scales JOB # 24CH. 67201.00 BORING/WELL A1-SB-003
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/7/03 1130 FINISH 7/7/03 1220 CASING TOP ELEVATION
LOGGED BY DEC MONITORING DEVICE OVM 580B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Concrete surface - coring cut ≈4" thick	GM		
					0-4' bgs hand cleared w/ post-hole digger, samples collected from borehole sidewall, SILT and gravels			
				2				
		0.0	NS	4				
		0.0	NS					
6/10/10					sandy SILT, olive brown (2.5Y 4/3), sand is very fine grained, medium stiff / loose, damp, no odor present	SM		
				6				
6/7/10		2.6	NS		@ 7' bgs ≈ 0.5" lens of silty SAND, sand is fine grained, moist			
		2.6	NS					
				8				
4/5/7					sandy SILT as above			
		2.6	NS		moist			
4/5/5				10				
		0.0	NS		wet			
7/10/15								
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

A1-SB-003-0.5' 1145
A1-SB-003-4.5' 1158
A1-SB-003-9.0' 1205

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
GW encountered @ 11.50' bgs

International Incorporated

A1-SB-004

FACILITY Bee-Jay Scales JOB # 24ctf-6720(.60) BORING/WELL A1-SB-004
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/7/03 1240 FINISH 7/7/03 1400 CASING TOP ELEVATION
LOGGED BY DSC MONITORING DEVICE OVM 580B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
	A1-SB-004-0.5' 1240			0	dirt + surface			
					0-4.5' bgs hand cleared w/ post-hole digger, sample collected from borehole sidewall	GM		
				2	SILT and gravels			
				4				
7/7/7	A1-SB-004-4.5' 1338	0.0	NS		SAND and SILT, olive brown (2.5Y 4/3) sand is very fine grained, medium stiff/ loose, damp, no odor present	SM		
7/9/5				6	SILT, olive brown, trace very fine grained sand, moist	ML		
4/4/4		2.6	SD	8				
	A1-SB-004-9.0' 1343				SAA moist			
3/4/5		0.0	NS	10				
					SAA wet			
7/14/20		0.0	NS	12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B.C 12' bgs
Sampler advanced to 12' bgs
GW encountered @ 10.5' bgs

International Incorporated

A1-SB-005

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A1-SB-005
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/10/03 FINISH 7/ /03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves ; 140 lb. hammer ; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface			
					0-4.5' bgs hand cleared			
					SILT and gravels (0-2' bgs) olive brown (2.5Y 4/3) gravels are medium to large, subrounded, dry, no odor present	GM		
				2				
					sandy SILT, olive brown, sand is very fine to fine grained, dry	SM		
				4				
2/5/10		0.0	NS					
				6				
8/9/10		0.0	NS		SILT w/ trace sand, very fine grained, damp to moist	ML		
				9	moist			
5/7/8		0.0	NS					
					sandy SILT, wet @ ≈ 9' bgs			
6/7/10		0.0	NS			SM		
				10				
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

A1-SB-005-0.5' 0728
A1-SB-005-4.5 734
A1-SB-005-7.5' 0737

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @ 10.5' bgs
Sampler advanced to 10.5' bgs
Groundwater encountered @ ≈ 9' bgs

DWG:

measured BTW @ T.D. = 9.12' bgs

International Incorporated

A1-SB-006

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A1-SB-006
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/10/03 0630 FINISH 7/10/03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves ; 140 lb. hammer ; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface			
					0-4.5' bgs hard cleared			
					SILT and gravels (0-2' bgs), olive brown (2.5 Y 4/3), gravels are medium to large, subrounded, dry, no odor present	GM		
				2				
					sandy SILT, olive brown, sand is very fine to fine grained, dry, no odor present	SM		
				4				
6/7/8		0.0	NS		becomes damp @ ≃ 5' bgs			
				6				
3/6/7		0.0	NS					
				8	becomes moist @ ≃ 8' bgs			
5/6/7		0.0	NS					
12/10/14		0.0	NS					
				10	wet			
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

A1-SB-006-0.5' 0645
A1-SB-006-4.5' S1
A1-SB-006-7.5' 0658

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @ 10.5' bgs
Sampler advanced to 10.5' bgs
Groundwater encountered @ ≃ 9' bgs

DWG:

measured DTW @ T.D. = 9.55' bgs

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A1-SB-007

PAGE 1 OF 1

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A1-SB-007
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/10/03 0841 FINISH 7/10/03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves; 140 lb. hammer; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface 0-4.5' bgs hand cleared			
					SILT and gravels (0-2' bgs), olive brown (2.5Y 4/3), gravels are med. to large, subrounded, dry, no odor present	GM		
				2	sandy SILT, olive brown sand is very fine to fine grained, dry, no odor present	SM		
				4				
3/5/7		0.0	NS		SILT, olive brown, a little very fine grained sand, damp	ML		
6/6/8		0.0	NS	6	moist,			
				8	trace clay present, moist			
5/8/8		0.0	NS					
4/9/10		0.0	NS		wet			
				10				
				12				

Boring terminated at __ feet, sampler advanced to __ feet.
Groundwater encountered at approximately __ feet during drilling.

0907 A1-SB-007-0.5'
0916 A1-SB-007-4.5'
1260 A1-SB-007-7.5'

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @ 10.5' bgs
Sampler advanced to 10.5' bgs
Groundwater encountered @ ≈ 9' bgs

DWG:

measured SWL @ T.D. = 9.40' bmp

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A1-SB-008

PAGE 1 OF

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A1-SB-008
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/10/03 0759 FINISH 7/10/03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves ; 140 lb. hammer ; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface 0-4.5' bgs hand cleared			
	A1-SB-008-0-5' 0908				SILT and gravels (0-2' bgs), olive brown (2.5Y 4/3), gravels are med. to large, subrounded, dry, no odor present	GM		
				2				
					sandy SILT olive brown, sand is very fin to fin grained, dry, no odor present	SM		
				4				
2/3/5	A1-SB-008-4.5' 0916	0.0	NS		SILT w a little very fine grained sand damp	ML		
				6				
4/4/5		0.0	NS		moist			
				8				
6/7/11	A1-SB-008-7.5' 0820	0.0	NS		sandy SILT, sand is fine grained, moist	SM		
7/9/12		0.0	NS		wet			
				10				
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @ 10.5' bgs
Sampler advanced to 10.5' bgs
Groundwater encountered @ ≈ 9' bgs

DWG:

Measured DTW @ T.D. = 8.91' bgs

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A2-SB-001

PAGE 1 OF 1

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A2-SB-001
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/8/03 0700 FINISH 7/8/03 CASING TOP ELEVATION
LOGGED BY OEE MONITORING DEVICE OVM 580B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	gravel/dirt surface			
	A2-SB-001-0.5'				0-4.5' bgs hand cleared			
					SILT and GRAVELS	GM		
				2				
						SM		
				4				
3/3/6	A2-SB-001-4.5'	0.0	NS		SAND and SILT, dark olive brown (2.5Y 3/3) sand is very fine to fine grained, soft/loose, damp			
				6	no odor present			
3/7/9		0.0	NS					
				8				
5/8/7		0.0	NS					
					SILT, dark olive brown, damp to moist	ML		
5/5/5	A2-SB-001-9.0'	0.0	NS	10				
5/4/5		0.0	NS					
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

0716
0720
0727

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
sampler advanced to 12' bgs
GW encountered @ ≃ 11' bgs

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A2-SB-002

PAGE 1 OF 1

FACILITY Bee-Jay Scales JOB # 24614.67201.00 BORING/WELL A2-SB-002
LOCATION Stanyrill, WV SURFACE ELEVATION
START 7/8/03 1025 FINISH CASING TOP ELEVATION
LOGGED BY AJG MONITORING DEVICE
SUBCONTRACTOR AND EQUIPMENT
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Dirt & gravel surface			
	A2-SB-002-4.5' 1035				0-4.5' bgs hand cleared/w posthole digger, sample collected from sidewall			
		0.0	NS	2				
				4				
5/5/5	A2-SB-002-4.5' 1044	0.0	NS		Sandy SILT, olive brown, (2.5Y 4/3), sand is fine, mod. silty/loose, damp no hydrocarbon odor			
		0.0	NS	6				
2/2/2					damp to moist	8.5		
		0.0	NS	8				
4/7/8					SAA Moist			
	A2-SB-002-9.0' 1050							
9/14/8		0.0	NS	10				
					wet			
12/15/19								
		0.0	NS	12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

International Incorporated

A2-SB-003

PAGE 1 OF 1

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A2-SB-003
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/7/03 1415 FINISH 7/7/03 1510 CASING TOP ELEVATION
LOGGED BY DEC MONITORING DEVICE OVM 580B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	concrete over lain w/ dirt and gravel			
					Concrete ≈ 4" thick			
					0-4 hand cleared	GM		
					SILT and gravels			
				2				
						SM		
				4				
6/7/8		0.0	NS		SAND and SILT, olive brown (2.5Y 4/3) sand is fine grained, medium stiff/loose, moist, no odor present			
				6				
5/5/5		0.0	NS		SILT, olive brown (2.5Y 4/3), moist trace fine grained sand	ML		
				8				
5/6/6		0.0	NS		SAA, moist (sandy SILT?)			
8/12/15		0.0	NS	10	SAA, moist (sandy SILT?)			
17/20/15		2.6	NS		SILT, almost no sand			
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

A2-SB-003-0.5' 1446
A2-SB-003-4.5' 1452
A2-SB-003-9.0' 1459

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
GW encountered @ ≈ 11' bgs

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A2-SB-004

PAGE 1 OF 1

FACILITY Bee-Jay Scales JOB # 24C4.67201-00 BORING/WELL A2-SB-004
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/7/03 1520 FINISH 7/7/03 CASING TOP ELEVATION
LOGGED BY DEL MONITORING DEVICE OVM 580 B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
	A2-SB-004-0.5' 1555			0	dirt and gravel surface			
					0-4.5' bgs hard cleared w/ post-hole digger, sample collected from borehole sidewall	GM		
		2.6	NS	2	SILT and gravels			
						SM		
		0.0	NS	4				
6/5/10	A2-SB-004-4.5' 1602				sandy SILT, olive brown (2.5Y 4/3) sand is fine grained, medium stiff/loose, ~~wet~~ damp, no odor present			
		2.6	NS	6				
9/12/15					damp to moist			
		0.0	NS	8				
4/4/4								
	A2-SB-004-9.0' 1614				SAA, moist			
5/9/12		0.0	NS	10				
5/11/12					wet			
		0.0	NS	12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
GW @ 10.5' bgs

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A2-SB-MW-5 (AREA 2)

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL MW-5
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/ /03 FINISH 7/ /03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves ; 140 lb. hammer ; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface			2" flush mount
					0-4.5' bgs hand cleared			
					SILT and gravel (0-2' bgs), olive brown (2.5Y 4/3), gravels are mod to large, subrounded, dry, no odor present	GM		
				2		SM		
					sandy SILT, olive brown, sand is very fine grained, trace clay			
				4				
5/10/10		0.0	NS		SAND and silt, olive brown (2.5Y 4/3), sand is fine grained, damp,			
		0.0	NS	6	no odor present			
5/7/4					SAA w/ sand grading finer to very fine grained, trace clay, moist			
		0.0	NS					
4/6/8				8				
		0.0	NS		becomes wet @ ≈ 8.5' bgs			
6/9/12					sandy SILT, olive brown sand is very fine to fine grained			
		0.0	NS	10				
7/7/11					SILT, trace very fine grained sand	ML		
		0.0	NS					
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 30' bgs
Sampler advanced to 31.5' bgs
Groundwater encountered @ 9.0' bgs

(see pg. 2 of 2)

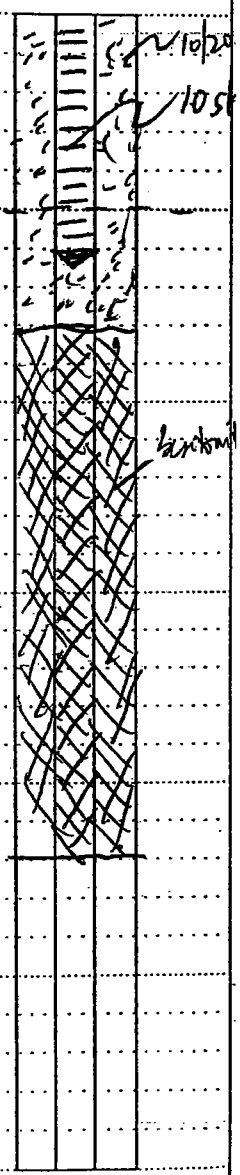
A2-SB-MW5 (AREA 2)

FACILITY Bee-Jay Scales JOB # 24CH.67201-00 BORING/WELL MW-5
LOCATION _____ SURFACE ELEVATION _____
START _____ FINISH _____ CASING TOP ELEVATION _____
LOGGED BY DEC MONITORING DEVICE _____
SUBCONTRACTOR AND EQUIPMENT _____
COMMENTS _____

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet
8/14/20				12			
		0.0	NS		SILT, olive brown, a little very fine grained Sand,	ML	
10/17/22							
		0.0	NS	15	change boring log scale to 5' intervals		
					SILT, olive brown	ML	
		0.0	NS	20			
10/14/15							
		0.0	NS	25			
14/18/18					SILT		
		0.0	NS	30			
4/4/7					clayey SILT, light brownish grey (2.5Y 6/2)		
				35			
					B.O.B. @ 30' bgs sampler advanced to 31.5' bgs GW encountered @ ≈ 9.20' bgs		
				40			

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Well Construction Schematic



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

* backfill borehole to 18' bgs w/ bentonite; 18-16' bgs w/ sand, set well screened 16-6' bgs, sand up to 3' bgs

International Incorporated

A2-SB-MW-6

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL MW-6
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/10/03 FINISH 7/ /03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM SEOB w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves ; 140 lb. hammer ; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface			2" flush mount
					0-4 Sand cleared			
					SILT and gravel (0-2) olive brown (2.5Y 4/3) gravels med, dry, no odor	GM		
				2		SM		
					Sandy SILT, olive brown, sand is very fine.			
				4				
3/4/4		0.0	NS		silty SAND, fine sand, damp, no odor			
4/6/6		0.0	NS	6	silt w/ clay, dry, moist	ML		
5/5/8		0.0	NS				6.25'	
6/8/9		0.0	NS	9				
					Silt, wet, stiff			
7/7/10		0.0	NS	10				
					Sandy SILT, olive brown, sand is very fine, wet, no odor	SM		
7/8/10		0.0	NS	12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Constructed same as MW-5

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @
Sampler advanced to
Groundwater encountered @ 9.0

DWG:

International Incorporated

Apex Well (Area) MW-6 PAGE 2 OF 2

FACILITY _____ JOB # _____ BORING/WELL _____
LOCATION _____ SURFACE ELEVATION _____
START _____ FINISH _____ CASING TOP ELEVATION _____
LOGGED BY PJG MONITORING DEVICE _____
SUBCONTRACTOR AND EQUIPMENT _____
COMMENTS _____

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				10	SILT, trace sand, sand very fine, wet, no odor	ML		
9/11/10		0 ppm						
				15	SILT, olive, brown, wet, no odor			
10/16/10				20				
7/16/10				25				
6/6/17				30	Clayey, SILT, Light brownish gray, Munsell (2.5Y 6/2)			
					Bottom of boring 31.5' bgs			
					Boring terminated at ___ feet, sampler advanced to ___ feet. Groundwater encountered at approximately ___ feet during drilling.			

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

Backfilled to 16', 16-11 sand, Bentonite
Set screen at 16'-6' bgs
Wells from 6-0 bgs

DWG:

International Incorporated

A3-SB-001

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A3-SB-001
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/ /03 FINISH 7/ /03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM SBOB w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves ; 140 lb. hammer ; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphalt/ concrete / dirt, gravel surface			
					hand cleared to 4.0' bgs			
					SILT and gravels	GM		
				2				
				4				
4/3/2		0.0	NS		SILT, olive brown (2.5Y 4/3), soft, very moist, ~~no odor present~~ no odor present	ML		
				6				
4/3/4		85.3	NS		sandy SILT, dk. olive brown (2.5Y 3/3) sand is fine to med grained. HC odor present, some mottled coloration present	SM		
3/3/3		5.5	NS	8	HC odor			
4/4/4		44.0	NS	10				
6/8/10					mottled appearance			
				12				

Boring terminated at __ feet, sampler advanced to __ feet.
Groundwater encountered at approximately __ feet during drilling.

A3-SB-001-0.5' 0922
A3-SB-001-4.5' 0932
A3-SB-001-6.0' 0935
A3-SB-001-7.5' 0937
A3-SB-001-9.0' 0950

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
Groundwater encountered @ 11' bgs

DWG:

International Incorporated

A3-SB-002

FACILITY Bee-Jay Scales JOB # 24CK.67201.00 BORING/WELL A3-SB-002
LOCATION Sunnyside WA SURFACE ELEVATION
START 7/7/03 0800 FINISH CASING TOP ELEVATION
LOGGED BY DEL MONITORING DEVICE OVM 580B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
	A3-SB-002-0-0.5' 0820			0	asphaltic surface hand cleared to 4.0' bgs SILT and gravels (0-2" bgs)	GM		
				2		ML		
3/3/2	A3-SB-002-4-4.5' 0829	NS	2.6	4	SILT, olive brown (2.5Y 4/3), soft, very moist, no odor present			
5/5/6	A3-SB-002-6.0' 0833	NS	613	6	sandy SILT dark olive brown (2.5Y 3/3) sand is fine to med. grained, HC odor present	SM		
9/8/8	A2-SB-002-7.5' 0838	SS	700	8	SAA w/ HC odor present, sand has graded finer to very fine, some root debris present			
8/9/10	A3-SB-002-9.0' 0848	NS	11.0	10				
7/8/9		NS	5.5	12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
sampler advanced to 12' bgs

International Incorporated

AY-SB-001

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL AY-SB-001
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/ /03 FINISH 7/ /03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves ; 140 lb. hammer ; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface			
					hand cleared to 4.0' bgs			
					SILT and gravels (0-2' bgs)	GM		
				2				
						SM		
				4	Sandy SILT, olive brown (2.5Y 4/3)			
					sand is vry. fri. grained, dry, no			
					odor present			
7/7/7		0.0	NS					
					@ 5 - 5.5' bgs lens of well sorted,	SW		
				6	med. grained SAND			
2/2/2		0.0	NS			SM		
					Sandy SILT as above, damp			
5/6/7		0.0	NS	9				
					moist			
5/9/11		0.0	NS					
				10				
9/12/14		0.0	NS		wet			
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

1612 AY-SB-001-0.5'
1627 AY-SB-001-4.5'
1633 AY-SB-001-9.0'

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
Groundwater encountered @ 11 C' bc

DWG:

International Incorporated

AY-SB-002

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL AY-SB-002
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/ /03 FINISH 7/ /03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves; 140 lb. hammer; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface			
					hand cleared to 4.0' bgs			
					0-2' bgs SILT and gravels	GM		
				2		SM		
				4	sandy SILT, olive brown, sand is very fine grained, dry, no odor present			
8/8/8		0.0	NS					
				6				
2/3/4		0.0	NS		moist			
2/3/7		0.0	NS	8				
4/8/10		0.0	NS					
				10				
12/12/12		0.0	NS		wet			
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

AY-SB-002-0.5' and 0.5-1' 1459
AY-SB-002-4.5' 1517
AY-SB-002-9.0' 1523

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
Groundwater encountered @ ≈ 11.0' bgs

DWG:

International Incorporated

AY-SB-003

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL AY-SB-003
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/8/03 1327 FINISH 7/8/03 1440 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves; 140 lb. hammer; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to fine sand; odor; firm and dry in place	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic concrete / dirt, gravel surface; hand cleared to 4" bgs			
					0-2' bgs SILT and gravels	GM		
				2				
						SM		
				4	sandy SILT, olive brown (2.5Y 4/3)			
2/4/5		2.6	NS		sand is very fine grained, soft/loose dry, no odor present			
				6				
5/6/7		682	SS		becomes slightly sandier 6-7.5' bgs			
					becomes slightly siltier 7.5-9.0' bgs			
8/8/8		11	NS	8				
					moist			
14/8/12		0.0	NS					
				10	moist			
2/12/10					wet			
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
Groundwater encountered @ ≃ 11' bgs

1340 AY-SB-003-0.5'
1401 AY-SB-003-4.5'
1403
1405
1408 AY-SB-003-9.0'

International Incorporated

AY-SB-004

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL AY-SB-004
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/9/03 1420 FINISH 7/9/03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves; 140 lb. hammer; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface hand cleared to 4.5 bgs			
					SILT and gravels	GM		
				2				
						SM		
				4	sandy SILT olive brown (2.5Y 4/3) sand is very fine grained, dry, no odor present			
8/8/8		0.0	NS					
				6				
5/5/5		0.0	NS		SILT olive brown, trace very fine grained sand, moist	ML		
8/4/8		0.0	NS	8				
5/7/14		0.0	NS					
				10				
10/12/15					wet			
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

AY-SB-004-0.5' 1435
AY-SB-004-4.5'
AY-SB-004-9.0' 1456

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
Groundwater encountered @ ≈ 11' bgs

DWG:

International Incorporated

AY-SB-005

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL AY-SB-005
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/ /03 FINISH 7/ /03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves; 140 lb. hammer; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface hand cleared to 4.5' bgs			
					0-2' bgs SILT and gravels	GM		
				2		SM		
				4	sandy SILT, olive brown (2.5Y 4/3) sand is very fine grained, dry, no odor present			
5/8/10	AY-SB-005-4.5'	0.0	NS					
				6	SILT, olive brown, trace very fine grained sand damp	ML		
4/5/5		0.0	NS					
				8				
4/5/6	AY-SB-005-9.0'	0.0	NS		moist, increased sand	SM		
4/5/7		0.0	NS					
				10				
7/7/7		0.0	NS		wet			
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
Groundwater encountered @ ≈ 11.5' bgs

DWG:

International Incorporated

A4-SB-006

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/ /03 FINISH 7/ /03 CASING TOP ELEVATION
LOGGED BY D. Edward Cafferty MONITORING DEVICE OVM 580B w/ 11.8 eV lamp, 100 ppm isobutylene calibrant
SUBCONTRACTOR AND EQUIPMENT Cascade HSA
COMMENTS 18" x 2.5" split spoon sampler lined w/ stainless steel sleeves ; 140 lb. hammer ; 30" drop

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic / concrete / dirt, gravel surface			
				2	colocate shallow soil sample only			
				4	see A4-SB-005 lith			
				6				
				8				
				10				
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

B.O.B. @
Sampler advanced to
Groundwater encountered @ NA

DWG:

International Incorporated A6-SB-001 PAGE 1 OF 1

FACILITY Bee Sany Scales JOB # 24CH.67201.60 BORING/WELL A6-SB-001
LOCATION SURFACE ELEVATION
START 7/9/02 FINISH CASING TOP ELEVATION
LOGGED BY PJG MONITORING DEVICE OVA SVOA Heated Lamp
SUBCONTRACTOR AND EQUIPMENT
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification		Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic surface				
					Hand cleared to 4.5' bgs SILT w/ trace small gravel to 1.5' bgs				
				2	SILT, olive brown, trace fine sand				
				4					
7/6/17		0.0	NS		Sand, SP-SM, olive brown, (2.5Y 4/3), fine grained sand, medium stiff, loose, damp, no hydrocarbon odor				
5/6/6		0.0	NS	6					
					medium stiff/dense moist				
5/7/9		0.0	NS	8					
6/10/15									
					Very moist		9.8		
		0.0	NS	10					
7/9/17					Wet				
					~~TOB~~				
		0.0	NS	12					

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

1214 A6-SB-001-4.5'
1214 A6-SB-001-4.5'
1228 A6-SB-001-2.5'

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

International Incorporated

A6-SB-0026

FACILITY Bee-Jay Scales JOB # 24CH.G7201.66 BORING/WELL A6-SB-0026
LOCATION Sunnyside WA SURFACE ELEVATION
START 7/9/03 0920 FINISH 7/9/03 CASING TOP ELEVATION
LOGGED BY DEC MONITORING DEVICE OVM 580D
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
	A6-SB-0026-0.5' 0930			0	asphaltic surface hard cleared to 4.5' bgs 0-2' bgs SILT and gravels, olive brown (2.5Y 4/3) gravels are medium to large, subrounded, dry	GM		
				2	no odor present	SM		
10/14/15	A6-SB-0026-4.5' 0941	0.0	NS	4	sandy SILT, olive brown (2.5Y 4/3) sand is very fine grained, stiff/med. dense, moist, no odor present			
6/11/11	A6-SB-0026-6.0' 0943	0.0	NS	6				
				8	SILT w/ trace very fine grained sand	ML		
5/14/14	A6-SB-0026-9.0' 0956	0.0	NS					
12/14/16		0.0	NS	10				
12/21/22		0.0	NS	12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
sampler advanced to 12' bgs
GW encountered @ ≈ 12' bgs

International Incorporated AG-SB-003 PAGE 1 OF 1

FACILITY Beer Jay Scales JOB # 24CH.6720I.00 BORING/WELL AG-SB-003
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/9/03 FINISH 7/9/03 CASING TOP ELEVATION
LOGGED BY DEL MONITORING DEVICE OVM 580B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
	AG-SB-003-0.5-1 1116			0	dirt surface			
	AG-SB-003-0-0.5				hand cleared to 4.5' bgs			
					SILT y a few small gravels	GM		
					0-2' bgs			
				2	SILT, olive brown, trace vry fine grained sand	ML		
				4				
	AG-SB-003-4.5 1127				sandy SILT	SM		
4/7/8		0.0	NS	6				
4/8/8		0.0	NS					
	AG-SB-003-7.5 1133			8	SILT, trace vry fine grained sand	ML		
8/8/8		0.0	NS					
				10				
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 9.5' bgs
Sampler advanced to 9.5' bgs
Rig refused @ 9.5' bgs

International Incorporated

A6-SB-004

PAGE 1 OF 1

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A6-SB-004
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/9/03 0700 FINISH 7/9/03 CASING TOP ELEVATION
LOGGED BY DEZ MONITORING DEVICE OVM 580B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	asphaltic surface			
					hand cleared to 4.5' bgs			
					0-2' bgs SILT and large gravels, olive brown (2.5Y 4/3), gravels are subrounded	GM		
				2		SM		
					sandy SILT, olive brown (2.5Y 4/3), sand is fine grained, damp, no odor present			
				4				
6/7/8		0.0	NS		medium stiff / loose, damp			
				6				
5/10/15		0.0	NS		stiff / medium dense, damp			
				8				
7/8/10		0.0	NS		becomes very moist			
5/7/14				10	SAA, very moist			
7/11/16					SILT olive brown (2.5Y 4/3), very moist, stiff	ML		
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

A6-SB-004-0.5' 0745
A6-SB-004-4.5' 812
A6-SB-004-6.0' 0815

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B. @ 12' bgs
Sampler advanced to 12' bgs
GW1 encountered @ ≈ 8' bgs (?)

International Incorporated

A6-SB-005

PAGE 1 OF 1

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL A6-SB-005
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/9/03 1015 FINISH 7/9/03 CASING TOP ELEVATION
LOGGED BY VEC MONITORING DEVICE OVM 580B
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
	A6-SB-005-0.5			0	dirt surface hand cleared to 4.5' bgs 0-2' bgs SILT and gravel, gravels are small	GM		
				2	SILT, olive brown (2.5Y 4/3)	ML		
				4				
5/5/5	A6-SB-005-4.5	0.0	NS		sandy SILT, olive brown (2.5Y 4/3) sand is very fine to fine grained, medium stiff / loose, damp, no	SM		
				6	odor present			
4/5/5		0.0	NS		moist			
	A6-SB-005-7.5			8				
4/5/7		0.0	NS		moist			
				10				
				12				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

1030
1040
1048

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B @ 9.0' bgs
Sampler advanced to 9.0' bgs
GW encountered @ ≈ 9.0' bgs

International Incorporated

MW-7

FACILITY Bee-Jay Scales JOB # 24CH-67206.00 BORING/WELL MW-7
LOCATION Sunnyside, WA. SURFACE ELEVATION
START 7/11/03 0630 FINISH 7/11/03 CASING TOP ELEVATION
LOGGED BY BEC MONITORING DEVICE NA
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	dirt/gravel surface			2" flush mount
					0-4.5' bgs hand cleared			
		NA			SILT and gravel (0-2' bgs) olive brown (2.5 Y 4/2), sand is very fine to fine grained, dry, no odor present	GM		
				5				
19/16/20					sandy SILT	SM		
				10				
6/8/12					SILT w/ trace sand	ML		
				15				
7/11/21					SAA			
				20				
8/15/20					SAA			
				25				
10/20/24					sloughy SILT w/ trace clay			
				30				

Boring terminated at __ feet, sampler advanced to __ feet.
Groundwater encountered at approximately __ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

B.O.B.C 31.5' bgs
sampler advanced to 31.5' bgs
GW encountered ~ 10' bgs

FACILITY Bee-Jay Scales JOB # 24CH.67201.00 BORING/WELL MW-7
LOCATION Sunnyside, WA SURFACE ELEVATION
START 7/11/03 FINISH CASING TOP ELEVATION
LOGGED BY DEC MONITORING DEVICE NA
SUBCONTRACTOR AND EQUIPMENT HSA
COMMENTS

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description (Typical name, color, description, shape, density, moisture) Example: Clayey SILT, brown; moderately plastic; coarse to to fine sand; odor; firm and dry in places	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
9/15/17				30	clayey SILT (begin @ ~ 30' bgs) moist only color changed to light brownish gray (2.5Y 6/2) @ base of interval (31.5' bgs)	ML		
DEC				35		SM		
					sandy SILT, color back to dark brown (7.5Y 4/2), sand is fine grained, a few medium grained, wet			
DEC				40				
				45	borehole not advanced past 31.5' bgs due to clayey SILT lithology - possible confining layer			
DEC				50				
				55				
				60				

Boring terminated at ___ feet, sampler advanced to ___ feet.
Groundwater encountered at approximately ___ feet during drilling.

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC
2" PVC

DWG:

APPENDIX C

CHAINS OF CUSTODY

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 1 OF 3

016187

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marisa Patterson
COMPANY: SECOR International Inc.
ADDRESS: 2321 Club Meridian Dr. Suite E
CITY: Okemos STATE: MI ZIP CODE: 48864
PHONE NO.: 517-349-9499 FAX NO.: 517-349-6863 P.O. NO.:
E-MAIL ADDRESS: mpatterson@secor.com QUOTE NO.:

PROJECT NO./NAME: Bee-Jay 24CH. 67201.00
SAMPLER(S) - PLEASE PRINT NAME: D. Edward Cafferty

INVOICE TO

CONTACT NAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. FAX NO. P.O. NO.

X SAME

815/ Per Ed Cafferty
#6 bottles

PRESERVATIVE CODE: A / Y
REFRIGERATE (Y/N)
BOTTLE TYPE
SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☒ PRODUCT ☐ SLUDGE ☐ OTHER ____
RUSH ANALYSES ☐ DUE DATE ____
RUSH PICK-UP ☐ APPROVED BY: ____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F = ____

MERIT LAB NO.	SAMPLE COLLECTION YEAR: DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	VOCs per SW846 8260B	EPA 8270D	EPA 8082	EPA 8015	NWTPH-HCID	NWTPH-Gx/BTEX	Conventional A	Conventional B	ANALYSES
13594.01	7/7/03	0925	A1-SB-001-0.5'	3, 4oz.		X	X	X			X		please hold for possible
02		0956	A1-SB-001-4.5'				X	X			X		follow-up analysis after
03		1005	A1-SB-001-9.0'				X	X			X		indicated analyses are
04		1048	A1-SB-002-0.5'			X	X	X			X		complete
05		1102	A1-SB-002-4.5'				X	X			X		
06		1110	A1-SB-002-9.0'				X	X			X		
07		1145	A1-SB-003-0.5'		X	X	X	X	X		X	X	
08		1158	A1-SB-003-4.5'				X	X			X	X	
09		1205	A1-SB-003-9.0'		X	X		X	X		X	X	
10		1248	A1-SB-004-0.5'			X	X	X			X	X	
11		1338	A1-SB-004-4.5'					X	X		X	X	
12		1343	A1-SB-004-9.0'					X	X		X	X	
13		1446	A2-SB-003-0.5'				X	X	X		X		
14		1452	A2-SB-003-4.5'	2, 4oz.							X		

RELINQUISHED BY: SIGNATURE D. Edward Cafferty ☒ SAMPLER	DATE 7/8/03	TIME	
RECEIVED BY: SIGNATURE	DATE	TIME	
RELINQUISHED BY: SIGNATURE	DATE	TIME	
RECEIVED BY: SIGNATURE	DATE	TIME	

RELINQUISHED BY: SIGNATURE	DATE	TIME	
RECEIVED AT MERIT BY: SIGNATURE	DATE 7-9-03	TIME 0930	

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL ____
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

C.O.C. PAGE # 2 OF 3

016165

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME	Marisa Patterson
COMPANY	SECOR International Inc.
ADDRESS	2321 Club Meridian Dr. Suite E
CITY	Okemos
STATE	MI
ZIP CODE	48864
PHONE NO.	517-349-9499
FAX NO.	517-349-6863
P.O. NO.	
E-MAIL ADDRESS	mpatterson@secor.com
QUOTE NO.	
PROJECT NO./NAME	Bee-Jay - 24CH. 67201.00
SAMPLER(S) - PLEASE PRINT NAME	D. Edward Cafferty

INVOICE TO

CONTACT NAME	X SAME
COMPANY	
ADDRESS	
CITY	
STATE	
ZIP CODE	
PHONE NO.	
FAX NO.	
P.O. NO.	

PRESERVATIVE CODE A
REFRIGERATE (Y/N) Y
BOTTLE TYPE

SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☒ PRODUCT ☐ SLUDGE ☐ OTHER ____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F = ____

RUSH ANALYSES ☐ DUE DATE ____
RUSH PICK-UP ☐ APPROVED BY: ____

MERIT LAB NO.	SAMPLE COLLECTION YEAR: DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	VOCs per 8260B	SVOCs per 8270	EPA Meth 7000	EPA 8081	EPA 8015 A	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Conv. A	Conv. B	ANALYSES
15	7/7/03	1459	A2-SB-003-9.0'	2, 4oz.									X		please hold for possible
16		1555	A2-SB-004-0.5'	3, 4oz.			X	X	X				X		follow-up analyses after
17		1602	A2-SB-004-4.5'	2, 4oz									X		indicated analyses are
18		1614	A2-SB-004-9.0'	2, 4oz.									X		completed
19	7/8/03	0710	A2-SB-001-0.5'	3, 4oz			X	X	X				X	X	
20		0720	A2-SB-001-4.5'	2, 4oz.									X	X	
21		0727	A2-SB-001-9.0'	2, 4oz.									X	X	
22		1035	A2-SB-002-0.5'	3, 4oz.			X	X	X				X	X	
23		1044	A2-SB-002-4.5'	2, 4oz.									X	X	
24		1050	A2-SB-002-9.0'	2, 4oz.									X	X	
25		0820	A3-SB-002-0.5'	3, 4oz.	X	X	X	X			X	X	X	X	
26		0829	A3-SB-002-4.5'	2, 4oz.			X						X	X	
27		0833	A3-SB-002-6.0'	2, 4oz.											
28		0838	A3-SB-002-7.5'	2, 4oz.	X	X	X				X	X	X	X	Don't need pesticides

RELINQUISHED BY: SIGNATURE	D. Edward Cafferty ☒ SAMPLER	DATE 7/8/03	TIME
RECEIVED BY: SIGNATURE		DATE	TIME
RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED BY: SIGNATURE		DATE	TIME

RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED AT MERIT BY: SIGNATURE	[signature]	DATE 7-8-03	TIME 0950
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL ____
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 3 OF 3

016166

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME	Marisa Patterson
COMPANY	SECOR International Inc.
ADDRESS	2321 Club Meridian Dr. Suite E
CITY	Okemos
STATE	MI
ZIP CODE	48864
PHONE NO.	517-349-9499
FAX NO.	517-349-6863
P.O. NO.	
E-MAIL ADDRESS	mpatterson@secor.com
QUOTE NO.	
PROJECT NO./NAME	Bee-Jay 24CH. 67201.00
SAMPLER(S) - PLEASE PRINT NAME	G. Edward Cafferty

INVOICE TO

☒ SAME

CONTACT NAME	
COMPANY	
ADDRESS	
CITY	
STATE	
ZIP CODE	
PHONE NO.	
FAX NO.	
P.O. NO.	

PRESERVATIVE CODE: A →
REFRIGERATE (Y/N): Y →
BOTTLE TYPE

SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☒ PRODUCT ☐ SLUDGE ☐ OTHER ____

RUSH ANALYSES ☐ DUE DATE ____
RUSH PICK-UP ☐ APPROVED BY: ____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F =

MERIT LAB NO.	DATE (SAMPLE COLLECTION YEAR:)	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	VOCs per 8260B	SVOCs per 8270	EPA Lead	EPA 8081	EPA 8082A	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Conv. A	Conv. B	ANALYSES
29	7/8/03	0848	A3-SB-002-9.0'	2, 4oz.											please hold for possible
30	↓	0922	A3-SB-001-0.5'	3, 4oz.	X	X	X	X			X	X	X		follow-up analysis once
31	↓	0932	A3-SB-001-4.5'	2, 4oz.			X						X		indicated analyses are
32	↓	0935	A3-SB-001-6.0'	2, 4oz.											Completed
33	↓	0937	A3-SB-001-7.5'	2, 4oz.											↓
34	↓	0950	A3-SB-001-9.0'	2, 4oz.	X	X	X				X	X	X		↓
35	↓	1050	A2-SB-002-9.0'-1	2, 4oz.									X	X	↓
36	↓	0840	A5-SS-001-0.5'	3 4oz.			X	X	X	X			X	X	↓
37	↓	0810	A5-SS-002-0.5'	↓			X	X	X	X			X		↓
38	↓	0920	A5-SS-003-0.5'	↓			X	X	X	X			X		↓
39	↓	1030	A5-SS-004-0.5'	↓			X	X	X	X			X	X	↓
40	↓	1120	A5-SS-005-0.5'	↓			X	X	X	X			X		↓

RELINQUISHED BY: SIGNATURE	[signature] ☒ SAMPLER	DATE 7/8/03	TIME	
RECEIVED BY: SIGNATURE		DATE	TIME	
RELINQUISHED BY: SIGNATURE		DATE	TIME	
RECEIVED BY: SIGNATURE		DATE	TIME	

RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED AT MERIT BY: SIGNATURE	[signature]	DATE 7-9-03	TIME 0930

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL ____
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 1 OF 3

016167

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marisa Patterson
COMPANY: SECOR International Inc.
ADDRESS: 2321 Club Meridian Dr. Suite E
CITY: Okemos STATE: MI ZIP CODE: 48864
PHONE NO. 517-349-9499 FAX NO. 517-349-6863 P.O. NO.
E-MAIL ADDRESS: mpatterson@secor.com QUOTE NO.
PROJECT NO./NAME: Bee-Jay 24CH.67201.00
SAMPLER(S) - PLEASE PRINT NAME: D. Edward Cafferty

INVOICE TO

☒ SAME
CONTACT NAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. FAX NO. P.O. NO.

PRESERVATIVE CODE: A →
REFRIGERATE (Y/N): Y →
BOTTLE TYPE

SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☒ PRODUCT ☐ SLUDGE ☐ OTHER ____
RUSH ANALYSES ☐ DUE DATE ____
RUSH PICK-UP ☐ APPROVED BY: ____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F = ____

ANALYSES

MERIT LAB NO.	SAMPLE COLLECTION YEAR: DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	VOCs by 8260B	SVOCs by 8270	EPA 6010/7000	EPA 8081	EPA 8151A	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Conventional A	Conventional B
136605.01	7/8/03	1612	A4-SB-001-0.5'	3, 4oz.		X	X	X	X		X	X	X	X
02	↓	1627	A4-SB-001-4.5'	↓				X	X				X	
03		1633	A4-SB-001-9.0'		X	X		X	X		X	X	X	X
04		1459	A4-SB-002-0.5'				X	X	X		X	X	X	
05		1459	A4-SB-002-0.5'-1				X	X	X		X	X	X	
06		1517	A4-SB-002-4.5'					X	X				X	
07		1523	A4-SB-002-9.0'					X	X		X	X	X	
08		1340	A4-SB-003-0.5'			X	X	X	X		X	X	X	X
09		1340	A4-SB-003-0.5'-1			X	X	X	X		X	X	X	X
10		1401	A4-SB-003-4.5'					X	X				X	X
11		1403	A4-SB-003-6.0'								X	X		
12		1405	A4-SB-003-7.5'											
13		1408	A4-SB-003-9.0'		X	X		X	X		X	X	X	X
14	↓	1245	A4-SB-005-0.5'	↓			X	X	X		X	X	X	

RELINQUISHED BY: SIGNATURE [signature] ☒ SAMPLER DATE 7/9/03 TIME
RECEIVED BY: SIGNATURE DATE TIME
RELINQUISHED BY: SIGNATURE DATE TIME
RECEIVED BY: SIGNATURE DATE TIME

RELINQUISHED BY: SIGNATURE DATE TIME
RECEIVED AT MERIT BY: SIGNATURE [signature] DATE 7-10-03 TIME 927
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
NOTES: TEMP. ON ARRIVAL ____

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 2 OF 3

016168

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marissa Patterson			
COMPANY: SECOR International Inc			
ADDRESS: 2321 Club Meridian Dr. suite E			
CITY: Okemos	STATE: MI	ZIP CODE: 48864	
PHONE NO. 517-349-9499	FAX NO. 517-349-6863	P.O. NO.	
E-MAIL ADDRESS: mpatterson@secor.com		QUOTE NO.	
PROJECT NO./NAME: Bee - Jay			
SAMPLER(S) - PLEASE PRINT NAME	D. Edward Cafferty		

INVOICE TO

☒ SAME

CONTACT NAME		
COMPANY		
ADDRESS		
CITY	STATE	ZIP CODE
PHONE NO.	FAX NO.	P.O. NO.

PRESERVATIVE CODE: A →
REFRIGERATE (Y/N): Y →
BOTTLE TYPE

SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☒ PRODUCT ☐ SLUDGE ☐ OTHER ____

RUSH ANALYSES ☐ DUE DATE ____
RUSH PICK-UP ☐ APPROVED BY: ____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F =

ANALYSES

MERIT LAB NO.	SAMPLE COLLECTION YEAR: DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	VOCs per 8260B	SVOCs per 8270	EPA 6010/7000	EPA 8081	EPA 8151A	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Conventional A	Conventional B
15	7/8/03	1245	A4-SB-005-0.5'-1	3, 4oz			X	X	X		X	X	X	
16	↓	1253	A4-SB-005-4.5'	↓				X	X				X	
17	↓	1301	A4-SB-005-9.6'	↓				X	X		X	X	X	
18	↓	1315	A4-SB-006-0.5'	↓			X	X	X		X	X	X	
19	7/9/03	1212	A6-SB-001-0.5'	↓	X			X	X	X			X	
20	↓	1218	A6-SB-001-4.5'	↓				X	X	X			X	X
21	↓	1228	A6-SB-001-7.5'	↓				X	X	X			X	X
22	↓	0910	A6-SB-002-0.5'	↓			X	X						
23	↓	0930	A6-SB-002b-0.5'	↓				X	X	X			X	
24	↓	0930	A6-SB-002b-0.5'-1	↓				X	X	X			X	
25	↓	0941	A6-SB-002b-4.5'	↓				X	X	X			X	
26	↓	0943	A6-SB-002b-6.0'	↓										
27	↓	0956	A6-SB-002b-9.0'	↓				X	X	X			X	
28	↓	1116	A6-SB-003-0.5'	↓				X	X	X			X	

RELINQUISHED BY: SIGNATURE [signature] ☒ SAMPLER	DATE 7/9/03	TIME	
RECEIVED BY: SIGNATURE	DATE	TIME	
RELINQUISHED BY: SIGNATURE	DATE	TIME	
RECEIVED BY: SIGNATURE	DATE	TIME	

RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED AT MERIT BY: SIGNATURE [signature]		DATE 7-10-03	TIME 927
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL ____
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 3 OF 3

016169

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marisa Patterson
COMPANY: SECOR International Inc.
ADDRESS: 2321 Club Meridian Dr. Suite E
CITY: Okemos STATE: MI ZIP CODE: 48864
PHONE NO.: 517-349-9499 FAX NO.: 517-349-6863 P.O. NO.:
E-MAIL ADDRESS: mpatterson@secor.com QUOTE NO.:

PROJECT NO./NAME: Bee-Jay
SAMPLER(S) - PLEASE PRINT NAME: D. Edward Cafferty

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: FAX NO.: P.O. NO.:

PRESERVATIVE CODE
REFRIGERATE (Y/N)
BOTTLE TYPE
SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☒ PRODUCT ☐ SLUDGE ☐ OTHER ____
A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F = ____
RUSH ANALYSES ☐ DUE DATE ____
RUSH PICK-UP ☐ APPROVED BY: ____

MERIT LAB NO.	SAMPLE COLLECTION YEAR: DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	ANALYSES
29	7/9/03	1116	A6-SB-003-0.5'-1	3,40z.	X X X X
30		1127	A6-SB-003-4.5'		X X X X
31		1133	A6-SB-003-7.5'		X X X X
32		0745	A6-SB-004-0.5'		X X X X
33		0745	A6-SB-004-0.5'-1		X X X X
34		0812	A6-SB-004-4.5'		X X X X
35		0815	A6-SB-004-6.0'		X X X X
36		1030	A6-SB-005-0.5'		X X X X
37		1040	A6-SB-005-4.5'		X X X X
38		1048	A6-SB-005-7.5'		X X X X
39		0830	A6-55-001-0.5'		X X X X X
40		1030	A6-55-002-0.5'		X X X X X

RELINQUISHED BY: SIGNATURE D. Edward Cafferty X SAMPLER	DATE 7/9/03	TIME	
RECEIVED BY: SIGNATURE	DATE	TIME	
RELINQUISHED BY: SIGNATURE	DATE	TIME	
RECEIVED BY: SIGNATURE	DATE	TIME	

RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED AT MERIT BY: SIGNATURE		DATE 7-10-03	TIME 927

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL ____
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

Merit Laboratories, Inc.

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Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 1 OF 2

016170

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marisa Patterson
COMPANY: SECOR International Inc.
ADDRESS: 2321 Club Meridian Dr. Suite E
CITY: Okemos STATE: MI ZIP CODE: 48864
PHONE NO.: 517-349-9499 FAX NO.: 517-349-6863 P.O. NO.:
E-MAIL ADDRESS: mpatterson@secor.com QUOTE NO.:

PROJECT NO./NAME: Bee-Jay 24CH.67201.00
SAMPLER(S) - PLEASE PRINT NAME: D. Edward Cafferty

INVOICE TO

CONTACT NAME: SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: FAX NO.: P.O. NO.:

PRESERVATIVE CODE
REFRIGERATE (Y/N)
BOTTLE TYPE

SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☒ PRODUCT ☐ SLUDGE ☐ OTHER ____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F = ____

RUSH ANALYSES ☐ DUE DATE ____
RUSH PICK-UP ☐ APPROVED BY: ____

MERIT LAB NO.	SAMPLE COLLECTION YEAR: DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	ANALYSES
13619.01	7/9/03	1435	A4-SB-004-0.5'	3, 4oz	
02	7/9/03	1451	A4-SB-004-4.5'	3, 4oz.	
03	7/9/03	1456	A4-SB-004-9.0'	3, 4oz.	
04	7/10/03	0728	A1-SB-005-0.5'		
05		0734	A1-SB-005-4.5'		
06		0737	A1-SB-005-7.5'		
07		0645	A1-SB-006-0.5'		N. JPH
08		0645	A1-SB-006-0.5'-1		
09		0651	A1-SB-006-4.5'		
10		0658	A1-SB-006-7.5'		— NoTPH
11		0907	A1-SB-007-0.5'		
12		0916	A1-SB-007-4.5'		
13		0921	A1-SB-007-7.5'		
14	↓	0808	A1-SB-008-0.5'	↓	

RELINQUISHED BY: SIGNATURE	☒ SAMPLER	DATE	TIME
RECEIVED BY: SIGNATURE		DATE	TIME
RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED BY: SIGNATURE		DATE	TIME

RELINQUISHED BY: SIGNATURE	DATE	TIME
RECEIVED AT MERIT BY: SIGNATURE	DATE 7-11-03	TIME 0915

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL ____
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 2 OF 2

016171

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marisa Patterson
COMPANY: SECOR International Inc.
ADDRESS: 2321 Club Meridian Dr. Suite E
CITY: Okemos STATE: MI ZIP CODE: 48864
PHONE NO.: 517-349-9499 FAX NO.: 517-349-6863 P.O. NO.:
E-MAIL ADDRESS: mpatterson@secor.com QUOTE NO.:
PROJECT NO./NAME: Bee-Jay 24CH.67201.00
SAMPLER(S) - PLEASE PRINT NAME: D. Edward Cafferty

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: FAX NO.: P.O. NO.:

PRESERVATIVE CODE
REFRIGERATE (Y/N)
BOTTLE TYPE

SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☒ PRODUCT ☐ SLUDGE ☐ OTHER ____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F = ____

RUSH ANALYSES ☐ DUE DATE ____
POST PICK-UP ☐ APPROVED BY: ____

MERIT LAB NO.	SAMPLE COLLECTION YEAR: DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	ANALYSES
15	7/10/03	0816	A1-SB-008-4.5'	3, 4oz.	X X X
16		0920	A1-SB-008-7.5'	3, 4oz.	X X X
17		1145	A2-SB-MW5-0.5'	3, 4oz.	X X X
18		1200	A2-SB-MW5-4.5'	2, 4oz.	X
19	↓	1206	A2-SB-MW5-7.5'	2, 4oz.	X

		DATE	TIME
RELINQUISHED BY: SIGNATURE	D. Edward Cafferty / SAMPLER		
RECEIVED BY: SIGNATURE		DATE	TIME
RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED BY: SIGNATURE		DATE	TIME

		DATE	TIME
RELINQUISHED BY: SIGNATURE			
RECEIVED AT MERIT BY: SIGNATURE	MK	7-11-03	0915

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL ____
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 1 OF 1

016172

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME	Marisa Patterson
COMPANY	SECOR International Inc.
ADDRESS	2321 Club Meridian Dr. Suite E
CITY	Okemos
STATE	MI
ZIP CODE	48864
PHONE NO.	517-349-9499
FAX NO.	517-349-6863
P.O. NO.	
E-MAIL ADDRESS	mpatterson@secor.com
QUOTE NO.	
PROJECT NO./NAME	Bee-Jay 24CH.67201.00
SAMPLER(S) - PLEASE PRINT NAME	D. Edward Cafferty

INVOICE TO

☒ SAME

CONTACT NAME	
COMPANY	
ADDRESS	
CITY	
STATE	
ZIP CODE	
PHONE NO.	
FAX NO.	
P.O. NO.	

PRESERVATIVE CODE: A →
REFRIGERATE (Y/N): Y →
BOTTLE TYPE

SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☒ PRODUCT ☐ SLUDGE ☐ OTHER ____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F =

RUSH ANALYSES ☐ DUE DATE ____
RUSH PICK-UP ☐ APPROVED BY: ____

ANALYSES

MERIT LAB NO.	SAMPLE COLLECTION DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	VOCs by 8260B	SVOCs by 8270	EPA Soils 7000	EPA 7471	EPA 6010	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Conventional	Conventional
132643 01	7/10/03	1605	A2-SB-MW6-0.5'	3, 4oz			X	X	X				X	
02	↓	1605	A2-SB-MW6-0.5'-1	3, 4oz			X	X	X				X	
03	↓	1615	A2-SB-MW6-4.5'	2, 4oz									X	
04	↓	1623	A2-SB-MW6-7.5'	2, 4oz									X	
05	7/11/03	0730	A2-SB-005-0.5'	3, 4oz			X	X	X				X	
06	7/11/03	0820	A2-SB-005-4.5'	3, 4oz									X	

RELINQUISHED BY: SIGNATURE	[signature] ☒ SAMPLER	DATE 7/11/03	TIME
RECEIVED BY: SIGNATURE		DATE	TIME
RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED BY: SIGNATURE		DATE	TIME

RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED AT MERIT BY: SIGNATURE	[signature]	DATE 7-15-03	TIME 0915
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL ____
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

8 of 8

A & L GREAT LAKES LABORATORIES, INC.
CHAIN OF CUSTODY DOCUMENTATION

Report To: attn: Marisa Patterson
SECOR International Inc.
2321 Club Meridian Dr. suite E. Okemos, MI

Project Reference: Bee-Jay
24CH. 67201.00

Shipper/Waybill Number:

F03192-0150

Sample Identification	Container Number	Container Type: Glass	Container Type: Plastic	Date Sampled	Time Sampled	Type Sample: Grab	Type Sample: Composite	Sample Preservation: Cool 4°C	Frozen	H_2SO_4 pH<2	HNO_3 pH<2	HCl pH<2	NaOH pH>12	10% $Na_2S_2O_3$	Ascorbic Acid	None	Requested Analyses	
A1-SB-001	0.5'	paper bag		7/7/03	0925	X											Conventional C	028619
	4-5'				0956	X												028620
	9.0'				1005	X												028621
A1-SB-002	0.5'				1048	X												028622
	4.5'				1102	X												028623
	9.0'				1110	X												028624
A1-SB-003	0.5'				1145	X												028625
	4.5'				1158	X												028626
	9.0'				1205	X												028627
A1-SB-004	0.5'				1248	X												028628
	4.5'				1338	X												028629
	9.0'			↓	1343	X												028630
A1-SB-005	0.5'			7/10/03	0728	X												028631
	4.5'				0734	X												028632
	7.5'				0737	X												028633
A1-SB-006	0.5'				0645	X												028634
	4.5'				0651	X												028635
	7.5'	↓		↓	0658	X										↓		028636

F03192-0151
F03192-0152
F03192-0153
F03192-0154
F03192-0155

Sampled by: [signature] (Signature)
D. Edward Cattell (Printed Name)

Relinquished by: [signature] (Signature)
DEC (Printed Name)
Date: 7/10/03
Time:

Received by: Julie Brudgner (Signature)
Julie Brudgner (Printed Name)
Date: 7-11-03
Time: 8:50 am

Special Instructions:
call M. Patterson (517-349-9499)
RE: Conventional C parameters

CM

07/25/03 FRI 12:34 FAX 260 483 5274

002

A & L GREAT LAKES LABORATORIES, INC.

CHAIN OF CUSTODY DOCUMENTATION

Report To: attn: Morris Patterson
SECOR International Inc.
2321 Club Meridian Dr. Suite E, Okemos, MI

Project Reference: Bee-Jay
24CH. 67201.00

Shipper/Waybill Number:

Sample Identification	Container Number	Container Type: Glass	Container Type: Plastic	Date Sampled	Time Sampled	Type Sample: Grab	Type Sample: Composite	Sample Preservation: Cool 4°C	Frozen	H_2SO_4 pH<2	HNO_3 pH<2	HCl pH<2	NaOH pH>12	.008% $Na_2S_2O_3$	Ascorbic Acid	ANSA	Requested Analyses
A1-SB-007	0.5'	paper	bag	7/10/03	0907	X						028637					Conventional C
	4.5'	↓		↓	0916	X						028638					F03192-0156
	7.5'				0921	X						028639					
A1-SB-008	0.5'				0808	X						028640					
	4.5'				0816	X						028641					F03192-0157
	7.5'			↓	0820	X						028642				↓	↓

Sampled by: _____ (Signature)
O. Edward Catlett (Printed Name)

Relinquished by: _____ (Signature) Date: 7/10/03
SEC (Printed Name) Time: _____

Received by: Julie Bruggner (Signature) Date: 7-11-03
Julie Bruggner (Printed Name) Time: 8:50 am

Special Instructions:
call M. Patterson (517-349-9499)
RE: Conventional C parameters

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 1 OF 1

018876

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marisa Patterson
COMPANY: Secor
ADDRESS: 2321 Clubmaridan drive Suite E
CITY: Okemos STATE: MI ZIP CODE: 48864
PHONE NO.: 5173499499 FAX NO.: 517 349 6863 P.O. NO.:
E-MAIL ADDRESS: mpatterson@secor.com QUOTE NO.:

PROJECT NO./NAME: 24CH.67201.00 Bee Jay Scales
SAMPLER(S) - PLEASE PRINT NAME: M. McMahon / T. Austin

INVOICE TO

CONTACT NAME: ☐ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: FAX NO.: P.O. NO.:

PRESERVATIVE CODE
REFRIGERATE (Y/N)
BOTTLE TYPE

SAMPLE TYPE: GW ☐ WW ☐ OIL ☐ SOIL ☐ PRODUCT ☐ SLUDGE ☐ OTHER _____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F = _____

RUSH ANALYSES ☐ DUE DATE _____
RUSH PICK-UP ☐ APPROVED BY: _____

MERIT LAB NO.	SAMPLE COLLECTION YEAR: DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	ANALYSES
13856.01	7-29-03	1430	MW07-072903-0		
02	729-03	1630	MW01-072903-0		
03	7-29-03	1750	MW03-072903-0		
04	7-30-03	1000	MW04-073003-0		

5 coolers

RELINQUISHED BY: SIGNATURE (SAMPLER)		DATE 7-30-03	TIME 2:30 pm	RELINQUISHED BY: SIGNATURE	DATE TIME
RECEIVED BY: SIGNATURE		DATE	TIME	RECEIVED AT MERIT BY: SIGNATURE	DATE 7-31-03 TIME 0900
RELINQUISHED BY: SIGNATURE		DATE	TIME	SEAL NO.	SEAL INTACT YES ☐ NO ☐ INITIALS
RECEIVED BY: SIGNATURE		DATE	TIME	SEAL NO.	SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 3/4/4/4/3 #1

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-6333

C.O.C. PAGE # 1 OF 1

018878

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Marisa Patterson
COMPANY: Secor
ADDRESS: 2321 Club Meridian Dr. Suite E
CITY: Okemos STATE: MI ZIP CODE: 48864
PHONE NO.: 517-349-9499 FAX NO.: 517 349 6863 P.O. NO.:
E-MAIL ADDRESS: MPatterson@Secor.com QUOTE NO.:

PROJECT NO./NAME: 24CH.67201.00 Bee Jay Scales
SAMPLER(S) - PLEASE PRINT NAME: Michael McMahon

INVOICE TO

CONTACT NAME ☐ SAME
COMPANY
ADDRESS
CITY STATE ZIP CODE
PHONE NO. FAX NO. P.O. NO.

PRESERVATIVE CODE
REFRIGERATE (Y/N): Y
BOTTLE TYPE: 8260B, 8270, BOD, Pesticides, Gold Book, TKN-HCL, Conventional #, Conventional #

SAMPLE TYPE: GW ☒ WW ☐ OIL ☐ SOIL ☐ PRODUCT ☐ SLUDGE ☐ OTHER _____

A = NONE
B = HNO_3
C = H_2SO_4
D = NaOH
E = HCL
F = _____

RUSH ANALYSES ☐ DUE DATE _____
RUSH PICK-UP ☐ APPROVED BY: _____

ANALYSES

MERIT LAB NO.	SAMPLE COLLECTION YEAR: DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	# OF BOTTLES	ANALYSES
138701	073003	1550	MW05-073003-0	12	X X X X X X X X
02	073003	1615	MW06-073003-0	12	X X X X X X X X

RELINQUISHED BY: SIGNATURE		DATE	TIME
Michael McMahon	☒ SAMPLER	073003	
RECEIVED BY: SIGNATURE		DATE	TIME
RELINQUISHED BY: SIGNATURE		DATE	TIME
RECEIVED BY: SIGNATURE		DATE	TIME

RELINQUISHED BY: SIGNATURE	DATE	TIME
RECEIVED AT MERIT BY: SIGNATURE	DATE 8-1-03	TIME 940

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL _____
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	4/3

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

APPENDIX D

GROUNDWATER SAMPLING LOGS

Project Name: Bee Jay Scale Project No.: 24614.67201 Well No.: MW01
Date 7-29-03
Field Personnel: MM / TA
Water Level Measurement Method: Sounder Static Water Level:
Time Start Purge: 1530 Time End Purge: 1615 Time Sampled:
Measuring Point Description: top of PVC N.
Purge Method: Peristaltic Purge Depth:

Well Volume Calculation (Fill in before purging)	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in) (Circle)			Casing Volume (gal)
	24.2	12.9 (1530)		(2)	4	6	
				0.16	0.64	1.44	

Time	1545	1555	1610	1615				
Volume Purged (gal) ~5.65								
Purge Rate (gpm) < 1 gpm								
Temperature (°C)	17.7	16.5	16.5	16.3				
pH	7.71	8.02	7.89	8.01				
Specific Conductivity (uncorrected) (µmhos)	539.8	539.1	541.7	540.3				
Turbidity/Color	mostly clear							
Odor/Sheen	None							
Depth to Water During Purge (ft)								
Number of Casing Volumes Removed ORP	120	87	107	84				
Dewatered?								

Comments:

SAMPLE DATA:
Percent Recovery: Depth to Water at Sampling (ft):
Sampling Equipment:
Comments:

Sample No.	No. of Containers	Container Type	Preservative	Field Filtration	Analysis Request (Method)	Comments

PURGE WATER DISPOSAL NOTES:
Total Discharge (gal): Disposal Method: Drum Drum Designation(s)/Volume:
Comments:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)
Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock)?: YES NO
Inside of Well Head and Outer Casing Dry?: YES NO
Well Casing?: YES NO
Comments:

Project Name: Beeday Sealas Project No.: 24C14.67201 Well No.: MW03 Date 7-29-03
Field Personnel: MM/TA
Water Level Measurement Method: Sounder Static Water Level:
Time Start Purge: 1705 Time End Purge: 1745 Time Sampled:
Measuring Point Description: top of PVC
Purge Method: peristaltic pump Purge Depth:

Well Volume Calculation (Fill in before purging)	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in) (Circle)			Casing Volume (gal)
	20.3	8.5 (1705)	11.8	(2)	4	6	
				0.16	0.64	1.44	

Time	1700	1720	1730	1739	1745			
Volume Purged (gal)	~5.9							
Purge Rate (gpm)	<1 gpm							
Temperature (°C)		21.6	19.2	19.1	18.9			
pH		8.46	8.35	8.35	8.37			
Specific Conductivity (uncorrected) (µmhos)		1368	1420	1443	1471			
Turbidity/Color			Mostly	clear				
Odor/Sheen			none					
Depth to Water During Purge (ft)								
Number of Casing Volumes Removed								
ORP		69	86	94	99			
Dewatered?								
Comments:								

SAMPLE DATA:
Percent Recovery: Depth to Water at Sampling (ft):
Sampling Equipment:
Comments:

Sample No.	No. of Containers	Container Type	Preservative	Field Filtration	Analysis Request (Method)	Comments

PURGE WATER DISPOSAL NOTES:
Total Discharge (gal): Disposal Method: Drum Designation(s)/Volume:
Comments:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)
Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock)?: YES NO
Inside of Well Head and Outer Casing Dry?: YES NO
Well Casing?: YES NO
Comments:

Project Name: Bee Jay Scales Project No.: 24CH.67201 Well No.: MW04 Date 8/3003
Field Personnel: MM
Water Level Measurement Method: Sounder Static Water Level:
Time Start Purge: 0915 Time End Purge: 1010 Time Sampled:
Measuring Point Description: top of PVC
Purge Method: Peristaltic pump Purge Depth:

Well Volume Calculation (Fill in before purging)	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in) (Circle)			Casing Volume (gal)
	18.7	9.7 0915	9	(2)	4	6	4.85
				0.16	0.64	1.44	

Time	910	940	950	1000	1005			
Volume Purged (gal)	4.85							
Purge Rate (gpm)	< 1							
Temperature (°C)		17.5	18.2	17.1	17.1			
pH		7.22	7.22	7.21	7.22			
Specific Conductivity (uncorrected) (µmhos)		9090	9221	9408	9383			
Turbidity/Color		Mellow	Yellow					
Odor/Sheen			none					
Depth to Water During Purge (ft)								
Number of Casing Volumes Removed	ORP	182	163	141	135			
Dewatered?								

Comments:

SAMPLE DATA:
Percent Recovery: Depth to Water at Sampling (ft):
Sampling Equipment:
Comments:

Sample No.	No. of Containers	Container Type	Preservative	Field Filtration	Analysis Request (Method)	Comments

PURGE WATER DISPOSAL NOTES:
Total Discharge (gal): Disposal Method: Drum Designation(s)/Volume:
Comments:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)
Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock)?: YES NO
Inside of Well Head and Outer Casing Dry?: YES NO
Well Casing?: YES NO
Comments:

Project Name: Bee Jay Scales Project No.: _____ Date 073003
Field Personnel: MM Well No.: MW05
Water Level Measurement Method: Sounder Static Water Level: _____
Time Start Purge: 1220 Time End Purge: 1255 Time Sampled: _____
Measuring Point Description: Top of PVC Norm
Purge Method: peristaltic pump Purge Depth: _____

Well Volume Calculation (Fill in before purging)	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in) (Circle)			Casing Volume (gal)
	17.4	9.1 (1220)	8.3	(2)	4	6	
				0.16	0.64	1.44	

Time	1240	1245	1250	1255				
Volume Purged (gal) 4.15								
Purge Rate (gpm) < 1								
Temperature (°C)	18.5	18.7	18.3	18.1				
pH	6.85	7.01	7.03	7.05				
Specific Conductivity (uncorrected) (µmhos)	5970	6079	6291	6355				
Turbidity/Color		mostly	clear					
Odor/Sheen		none						
Depth to Water During Purge (ft)								
Number of Casing Volumes Removed ORP	148	142	141	140				
Dewatered?								
Comments:								

SAMPLE DATA:
Percent Recovery: _____ Depth to Water at Sampling (ft): _____
Sampling Equipment: _____
Comments: _____

Sample No.	No. of Containers	Container Type	Preservative	Field Filtration	Analysis Request (Method)	Comments

PURGE WATER DISPOSAL NOTES:
Total Discharge (gal): _____ Disposal Method: _____ Drum Designation(s)/Volume: _____
Comments: _____

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)
Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock)?: YES NO
Inside of Well Head and Outer Casing Dry?: YES NO
Well Casing?: YES NO
Comments: _____

Project Name: Bee Jay Scales Project No.: _____ Date 073003

Field Personnel: mm Well No.: MW06

Water Level Measurement Method: sounder Static Water Level: _____

Time Start Purge: 1315 Time End Purge: 1348 Time Sampled: _____

Measuring Point Description: Top of PVC

Purge Method: peristaltic pump Purge Depth: _____

Well Volume Calculation (Fill in before purging)	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in) (Circle)			Casing Volume (gal)
	17.5	13.05 8.2	9.3	(2)	4	6	
				0.16	0.64	1.44	

Time	1330	1335	1340	1345				
Volume Purged (gal) 4.65								
Purge Rate (gpm) < 1								
Temperature (°C)	18.6	18.0	17.9	17.9				
pH	8.04	8.09	8.16	8.10				
Specific Conductivity (uncorrected) (µmhos)	779.3	727.1	721.5	711.9				
Turbidity/Color	mostly	clear						
Odor/Sheen	none							
Depth to Water During Purge (ft)								
Number of Casing Volumes Removed ORP	98	101	101	99				
Dewatered?								

Comments: _____

SAMPLE DATA:

Percent Recovery: _____ Depth to Water at Sampling (ft): _____

Sampling Equipment: _____

Comments: _____

Sample No.	No. of Containers	Container Type	Preservative	Field Filtration	Analysis Request (Method)	Comments

PURGE WATER DISPOSAL NOTES:

Total Discharge (gal): _____ Disposal Method: _____ Drum Designation(s)/Volume: _____

Comments: _____

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)

Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock)?: YES NO

Inside of Well Head and Outer Casing Dry?: YES NO

Well Casing?: YES NO

Comments: _____

Project Name: Beejay Scales Project No.: 24CH.67201 Well No.: MW07 Date 7/29/03
Field Personnel: Mike M / TA
Water Level Measurement Method: sounder Static Water Level:
Time Start Purge: ~~1335~~ 1345 Time End Purge: 1425 Time Sampled:
Measuring Point Description: N top of casing
Purge Method: peristaltic pump Purge Depth:

Well Volume Calculation (Fill in before purging)	Total Depth (ft)	Depth to Water (ft)	Water Column (ft)	Multiplier for Casing Diameter (in) (Circle)			Casing Volume (gal)
	17'4.5"	~~1345~~ 11'9~~5~~"	5'~~5~~9"	(2)	4	6	2.75
				0.16	0.64	1.44	

Time	2:10pm	2:15	2:20				
Volume Purged (gal) 2.75							
Purge Rate (gpm) < 1							
Temperature (°C)	19.3	~~19.1~~ ~~7.85~~	21				
pH	7.89	7.85	7.95				
Specific Conductivity (uncorrected) (µmhos)	498.2	511.8	507.1				
Turbidity/Color	mostly clear						
Odor/Sheen	none						
Depth to Water During Purge (ft)							
~~Number of Casing Volumes Removed~~ ORP	88	98	93				
Dewatered?							
Comments:							

SAMPLE DATA:
Percent Recovery: Depth to Water at Sampling (ft):
Sampling Equipment:
Comments:

Sample No.	No. of Containers	Container Type	Preservative	Field Filtration	Analysis Request (Method)	Comments
	0					

PURGE WATER DISPOSAL NOTES:
Total Discharge (gal): Disposal Method: Drum Designation(s)/Volume:
Comments:

WELL HEAD CONDITIONS CHECKLIST (Circle YES or NO -- if NO, add comments)
Well Security Devices OK (Bollards, Christy Lid, Casing Lid and Lock)?: YES NO
Inside of Well Head and Outer Casing Dry?: YES NO
Well Casing?: YES NO
Comments:

APPENDIX E

GEOTECHNICAL LABORATORY DATA SHEETS

SECOR
International Incorporated
Geotechnical Laboratory
2321 Club Meridian Drive
Suite E
Okemos, MI 48864

Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-001-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown clayey silt

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	24.2
Porosity Estimate (%)	43.6
Void Ratio Estimate	0.77

Tare Mass (g)	8.31
Wet+Tare (g)	147.45
Dry+Tare (g)	120.38

	(g/cm^3)	(lb/ft^3)
Natural Density	1.88	117
Dry Density	1.51	94

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-001-4.5'
Tested By:	MRP/ZKK
Date:	7/29/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown sandy clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	6.16
Length (cm)	15.20

Water Content (%)	23.4
Porosity Estimate (%)	45.3
Void Ratio Estimate	0.83

Tare Mass (g)	8.13
Wet+Tare (g)	829.00
Dry+Tare (g)	673.30

	(g/cm^3)	(lb/ft^3)
Natural Density	1.81	113
Dry Density	1.47	92

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-001-9.0'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	17.6
Porosity Estimate (%)	44.0
Void Ratio Estimate	0.78

Tare Mass (g)	8.16
Wet+Tare (g)	803.80
Dry+Tare (g)	684.90

	(g/cm^3)	(lb/ft^3)
Natural Density	1.77	110
Dry Density	1.50	94

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-002-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, silty clay

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.69

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	6.87

Water Content (%)	28.8
Porosity Estimate (%)	46.2
Void Ratio Estimate	0.86

Tare Mass (g)	8.26
Wet+Tare (g)	134.39
Dry+Tare (g)	106.16

	(g/cm^3)	(lb/ft^3)
Natural Density	1.86	116
Dry Density	1.45	90

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-002-4.5'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	22.2
Porosity Estimate (%)	43.0
Void Ratio Estimate	0.75

Tare Mass (g)	8.27
Wet+Tare (g)	849.60
Dry+Tare (g)	696.50

	(g/cm^3)	(lb/ft^3)
Natural Density	1.87	117
Dry Density	1.53	95

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-002-9.0'
Tested By:	MRP/ZKK
Date:	7/29/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown clayey sand

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	6.16
Length (cm)	15.20

Water Content (%)	**27.4**
Porosity Estimate (%)	**47.8**
Void Ratio Estimate	**0.92**

Tare Mass (g)	8.11
Wet+Tare (g)	809.30
Dry+Tare (g)	637.10

	(g/cm^3)	(lb/ft^3)
Natural Density	**1.77**	**110**
Dry Density	**1.39**	**87**

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-003-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	**21.8**
Porosity Estimate (%)	**41.0**
Void Ratio Estimate	**0.69**

Tare Mass (g)	8.28
Wet+Tare (g)	151.18
Dry+Tare (g)	125.60

	(g/cm^3)	(lb/ft^3)
Natural Density	**1.93**	**120**
Dry Density	**1.58**	**99**

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-003-4.5'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, clayey silt

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	19.6
Porosity Estimate (%)	44.3
Void Ratio Estimate	0.79

Tare Mass (g)	8.12
Wet+Tare (g)	813.10
Dry+Tare (g)	681.00

	(g/cm^3)	(lb/ft^3)
Natural Density	1.79	112
Dry Density	1.49	93

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-003-9.0'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	**19.4**
Porosity Estimate (%)	**44.3**
Void Ratio Estimate	**0.80**

Tare Mass (g)	8.11
Wet+Tare (g)	811.30
Dry+Tare (g)	680.80

	(g/cm^3)	(lb/ft^3)
Natural Density	**1.78**	**111**
Dry Density	**1.49**	**93**

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-004-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown silty clay

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.69

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.09

Water Content (%)	23.0
Porosity Estimate (%)	43.1
Void Ratio Estimate	0.76

Tare Mass (g)	8.30
Wet+Tare (g)	139.72
Dry+Tare (g)	115.16

	(g/cm^3)	(lb/ft^3)
Natural Density	1.88	118
Dry Density	1.53	96

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-004-4.5'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Dark brown sandy clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	27.0
Porosity Estimate (%)	48.7
Void Ratio Estimate	0.95

Tare Mass (g)	8.08
Wet+Tare (g)	794.50
Dry+Tare (g)	627.30

	(g/cm^3)	(lb/ft^3)
Natural Density	1.75	109
Dry Density	1.37	86

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-004-9.0"
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Dark brown clayey sand

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	25.3
Porosity Estimate (%)	50.6
Void Ratio Estimate	1.03

Tare Mass (g)	8.18
Wet+Tare (g)	749.90
Dry+Tare (g)	600.00

	(g/cm^3)	(lb/ft^3)
Natural Density	1.65	103
Dry Density	1.31	82

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-005-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay with some gravel

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	17.1
Porosity Estimate (%)	34.1
Void Ratio Estimate	0.52

Tare Mass (g)	8.25
Wet+Tare (g)	161.85
Dry+Tare (g)	139.37

	(g/cm^3)	(lb/ft^3)
Natural Density	2.07	129
Dry Density	1.77	110

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-005-4.5'
Tested By:	MRP/ZKK
Date:	7/29/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	6.16
Length (cm)	15.20

Water Content (%)	**29.6**
Porosity Estimate (%)	**49.1**
Void Ratio Estimate	**0.96**

Tare Mass (g)	8.14
Wet+Tare (g)	809.80
Dry+Tare (g)	626.50

	(g/cm^3)	(lb/ft^3)
Natural Density	**1.77**	**110**
Dry Density	**1.36**	**85**

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-005-7.5'
Tested By:	MRP/ZKK
Date:	7/29/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown clayey sand

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	6.16
Length (cm)	15.20

Water Content (%)	24.8
Porosity Estimate (%)	44.1
Void Ratio Estimate	0.79

Tare Mass (g)	8.04
Wet+Tare (g)	849.60
Dry+Tare (g)	682.50

	(g/cm^3)	(lb/ft^3)
Natural Density	1.86	116
Dry Density	1.49	93

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-006-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	26.6
Porosity Estimate (%)	43.6
Void Ratio Estimate	0.77

Tare Mass (g)	8.32
Wet+Tare (g)	150.31
Dry+Tare (g)	120.49

	(g/cm^3)	(lb/ft^3)
Natural Density	1.91	119
Dry Density	1.51	94

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-006-0.5'-1
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	26.8
Porosity Estimate (%)	44.9
Void Ratio Estimate	0.82

Tare Mass (g)	8.23
Wet+Tare (g)	146.98
Dry+Tare (g)	117.69

	(g/cm^3)	(lb/ft^3)
Natural Density	1.87	117
Dry Density	1.48	92

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Sample ID:	A1-SB-006-4.5'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, silty clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.69

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	29.4
Porosity Estimate (%)	49.6
Void Ratio Estimate	0.98

Tare Mass (g)	8.09
Wet+Tare (g)	798.10
Dry+Tare (g)	618.70

	(g/cm^3)	(lb/ft^3)
Natural Density	1.75	109
Dry Density	1.36	85

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Sample ID:	A1-SB-006-7.5'
Tested By:	MRP/ZKK
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, clayey sand

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	5.68

Water Content (%)	23.6
Porosity Estimate (%)	39.5
Void Ratio Estimate	0.65

Tare Mass (g)	8.26
Wet+Tare (g)	119.50
Dry+Tare (g)	98.27

	(g/cm^3)	(lb/ft^3)
Natural Density	1.99	124
Dry Density	1.61	100

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Task:	.0003
Sample ID:	A1-SB-007-0.5'
Tested By:	MRP/ZKK
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown sandy clay with some dark staining

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.05

Water Content (%)	25.7
Porosity Estimate (%)	42.6
Void Ratio Estimate	0.74

Tare Mass (g)	8.25
Wet+Tare (g)	142.40
Dry+Tare (g)	115.01

	(g/cm^3)	(lb/ft^3)
Natural Density	1.93	121
Dry Density	1.54	96

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Sample ID:	A1-SB-007-4.5'
Tested By:	MRP/ZKK
Date:	7/29/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.70

[X] **Caliper Method:**

Diameter (cm)	6.16
Length (cm)	15.20

Water Content (%)	34.1
Porosity Estimate (%)	51.3
Void Ratio Estimate	1.05

Tare Mass (g)	8.21
Wet+Tare (g)	807.20
Dry+Tare (g)	604.00

	(g/cm^3)	(lb/ft^3)
Natural Density	1.76	110
Dry Density	1.31	82

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Task:	.0003
Sample ID:	A1-SB-007-7.5'
Tested By:	MRP/ZKK
Date:	7/29/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.70

[X] **Caliper Method:**

Diameter (cm)	6.16
Length (cm)	15.20

Water Content (%)	26.3
Porosity Estimate (%)	48.8
Void Ratio Estimate	0.95

Tare Mass (g)	8.16
Wet+Tare (g)	799.80
Dry+Tare (g)	635.00

	(g/cm^3)	(lb/ft^3)
Natural Density	1.75	109
Dry Density	1.38	86

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-008-0.5'
Tested By:	MRP/ZKK
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown sand

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.65

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	15.5
Porosity Estimate (%)	45.5
Void Ratio Estimate	0.83

Tare Mass (g)	8.25
Wet+Tare (g)	132.04
Dry+Tare (g)	115.45

	(g/cm^3)	(lb/ft^3)
Natural Density	1.67	104
Dry Density	1.44	90

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-008-4.5'
Tested By:	MRP/ZKK
Date:	7/29/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.70

[X] **Caliper Method:**

Diameter (cm)	6.16
Length (cm)	15.20

Water Content (%)	29.2
Porosity Estimate (%)	47.2
Void Ratio Estimate	0.89

Tare Mass (g)	8.02
Wet+Tare (g)	842.70
Dry+Tare (g)	654.30

	(g/cm^3)	(lb/ft^3)
Natural Density	1.84	115
Dry Density	1.43	89

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Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A1-SB-008-7.5'
Tested By:	MRP/ZKK
Date:	7/29/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown clayey sand

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	6.16
Length (cm)	15.20

Water Content (%)	**20.8**
Porosity Estimate (%)	**38.6**
Void Ratio Estimate	**0.63**

Tare Mass (g)	8.11
Wet+Tare (g)	902.20
Dry+Tare (g)	748.30

	(g/cm^3)	(lb/ft^3)
Natural Density	**1.97**	**123**
Dry Density	**1.63**	**102**

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Sample ID:	A2-SB-001-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Light brown, sandy silt

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.67

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	19.2
Porosity Estimate (%)	38.7
Void Ratio Estimate	0.63

Tare Mass (g)	8.05
Wet+Tare (g)	152.83
Dry+Tare (g)	129.49

	(g/cm^3)	(lb/ft^3)
Natural Density	1.95	122
Dry Density	1.64	102

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Client/Project:	Bee-Jay Scales Site
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Task:	.0003
Sample ID:	A2-SB-001-4.5'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Dark brown, silty clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.69

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	18.1
Porosity Estimate (%)	43.0
Void Ratio Estimate	0.75

Tare Mass (g)	8.17
Wet+Tare (g)	824.70
Dry+Tare (g)	699.60

	(g/cm^3)	(lb/ft^3)
Natural Density	1.81	113
Dry Density	1.53	96

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A2-SB-001-9.0'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, silty clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.69

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	23.9
Porosity Estimate (%)	46.5
Void Ratio Estimate	0.87

Tare Mass (g)	8.20
Wet+Tare (g)	812.30
Dry+Tare (g)	657.10

	(g/cm^3)	(lb/ft^3)
Natural Density	1.78	111
Dry Density	1.44	90

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A2-SB-002-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy silt

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.67

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	9.7
Porosity Estimate (%)	43.7
Void Ratio Estimate	0.77

Tare Mass (g)	8.21
Wet+Tare (g)	130.67
Dry+Tare (g)	119.82

	(g/cm^3)	(lb/ft^3)
Natural Density	1.65	103
Dry Density	1.50	94

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A2-SB-002-4.5'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy silt

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.67

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	11.53

Water Content (%)	21.6
Porosity Estimate (%)	41.9
Void Ratio Estimate	0.72

Tare Mass (g)	8.16
Wet+Tare (g)	654.00
Dry+Tare (g)	539.30

	(g/cm^3)	(lb/ft^3)
Natural Density	1.89	118
Dry Density	1.55	97

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Task:	.0003
Sample ID:	A2-SB-002-9.0'
Tested By:	MRP/MN
Date:	7/31/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy silt

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.67

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	**23.7**
Porosity Estimate (%)	**45.7**
Void Ratio Estimate	**0.84**

Tare Mass (g)	8.03
Wet+Tare (g)	816.60
Dry+Tare (g)	661.50

	(g/cm^3)	(lb/ft^3)
Natural Density	**1.79**	**112**
Dry Density	**1.45**	**91**

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A3-SB-002-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	26.3
Porosity Estimate (%)	44.1
Void Ratio Estimate	0.79

Tare Mass (g)	8.12
Wet+Tare (g)	148.55
Dry+Tare (g)	119.31

	(g/cm^3)	(lb/ft^3)
Natural Density	1.89	118
Dry Density	1.50	94

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A3-SB-002-4.5'
Tested By:	MRP
Date:	8/4/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	**27.3**
Porosity Estimate (%)	**49.1**
Void Ratio Estimate	**0.97**

Tare Mass (g)	8.32
Wet+Tare (g)	790.10
Dry+Tare (g)	622.40

	(g/cm^3)	(lb/ft^3)
Natural Density	**1.74**	**108**
Dry Density	**1.36**	**85**

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Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A3-SB-002-7.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy silt with metal shavings and strong odor

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.67

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.54

Water Content (%)	25.2
Porosity Estimate (%)	44.1
Void Ratio Estimate	0.79

Tare Mass (g)	8.07
Wet+Tare (g)	146.73
Dry+Tare (g)	118.79

	(g/cm^3)	(lb/ft^3)
Natural Density	1.87	117
Dry Density	1.49	93

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A4-SB-001-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, silty sand

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	6.88

Water Content (%)	8.8
Porosity Estimate (%)	41.8
Void Ratio Estimate	0.72

Tare Mass (g)	8.05
Wet+Tare (g)	122.00
Dry+Tare (g)	112.74

	(g/cm^3)	(lb/ft^3)
Natural Density	1.68	105
Dry Density	1.55	96

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A4-SB-001-9.0'
Tested By:	MRP
Date:	8/4/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, silty clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.69

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	24.2
Porosity Estimate (%)	46.3
Void Ratio Estimate	0.86

Tare Mass (g)	8.30
Wet+Tare (g)	815.90
Dry+Tare (g)	658.60

	(g/cm^3)	(lb/ft^3)
Natural Density	1.79	112
Dry Density	1.44	90

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A4-SB-003-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, silty sand

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	5.25

Water Content (%)	9.2
Porosity Estimate (%)	39.5
Void Ratio Estimate	0.65

Tare Mass (g)	8.07
Wet+Tare (g)	98.65
Dry+Tare (g)	91.04

	(g/cm^3)	(lb/ft^3)
Natural Density	1.75	109
Dry Density	1.61	100

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A4-SB-003-0.5'-1
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, silty sand

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	6.12

Water Content (%)	10.7
Porosity Estimate (%)	38.3
Void Ratio Estimate	0.62

Tare Mass (g)	8.08
Wet+Tare (g)	117.36
Dry+Tare (g)	106.77

	(g/cm^3)	(lb/ft^3)
Natural Density	1.81	113
Dry Density	1.64	102

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A4-SB-003-4.5'
Tested By:	MRP/MN
Date:	8/5/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, silty clay

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.69

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	29.6
Porosity Estimate (%)	47.1
Void Ratio Estimate	0.89

Tare Mass (g)	8.33
Wet+Tare (g)	839.10
Dry+Tare (g)	649.50

	(g/cm^3)	(lb/ft^3)
Natural Density	1.84	115
Dry Density	1.42	89

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A4-SB-003-9.0'
Tested By:	MRP/MN
Date:	8/5/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, clayey sand

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	20.7
Porosity Estimate (%)	44.9
Void Ratio Estimate	0.81

Tare Mass (g)	8.35
Wet+Tare (g)	805.20
Dry+Tare (g)	668.70

	(g/cm^3)	(lb/ft^3)
Natural Density	1.77	110
Dry Density	1.47	91

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A5-SS-001-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy silt

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.67

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	7.06

Water Content (%)	10.4
Porosity Estimate (%)	43.0
Void Ratio Estimate	0.75

Tare Mass (g)	8.07
Wet+Tare (g)	124.89
Dry+Tare (g)	113.91

	(g/cm^3)	(lb/ft^3)
Natural Density	1.68	105
Dry Density	1.52	95

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Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A5-SS-004-0.5'
Tested By:	MRP/MN
Date:	8/6/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, sandy silt with slight odor

Sample Condition: Disturbed

TRIAL 1

Specific Gravity of Solids = 2.67

[X] **Caliper Method:**

Diameter (cm)	3.54
Length (cm)	6.44

Water Content (%)	13.3
Porosity Estimate (%)	41.7
Void Ratio Estimate	0.71

Tare Mass (g)	8.08
Wet+Tare (g)	119.91
Dry+Tare (g)	106.74

	(g/cm^3)	(lb/ft^3)
Natural Density	1.76	110
Dry Density	1.56	97

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Client/Project:	**Bee-Jay Scales Site**
Job No.:	**24CH.67201.00**
Task:	**.0003**
Sample ID:	**A6-SB-001-4.5'**
Tested By:	**MRP/MN**
Date:	**8/5/2003**

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, silty sand

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.66

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	**18.3**
Porosity Estimate (%)	**48.5**
Void Ratio Estimate	**0.94**

Tare Mass (g)	8.30
Wet+Tare (g)	737.10
Dry+Tare (g)	624.40

	(g/cm^3)	(lb/ft^3)
Natural Density	**1.62**	**101**
Dry Density	**1.37**	**85**

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Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	A6-SB-001-7.5'
Tested By:	MRP/MN
Date:	8/5/2003

DENSITY AND WATER CONTENT (ASTM D 2216, EM 1110-2)
Laboratory Data and Results

Density and Water Content Analyses

Sample Description: Brown, clayey silt

Sample Condition: Undisturbed

TRIAL 1

Specific Gravity of Solids = 2.68

[X] **Caliper Method:**

Diameter (cm)	6.15
Length (cm)	15.17

Water Content (%)	22.2
Porosity Estimate (%)	43.4
Void Ratio Estimate	0.77

Tare Mass (g)	8.30
Wet+Tare (g)	843.40
Dry+Tare (g)	691.80

	(g/cm^3)	(lb/ft^3)
Natural Density	1.85	116
Dry Density	1.52	95

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Job No.:	**24CH.67201.00**
Task:	**0003**
Sample ID:	**A1-SB-003-0.5'**
Tested By:	**MRP/ZKK/MN**
Date:	**8/7/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

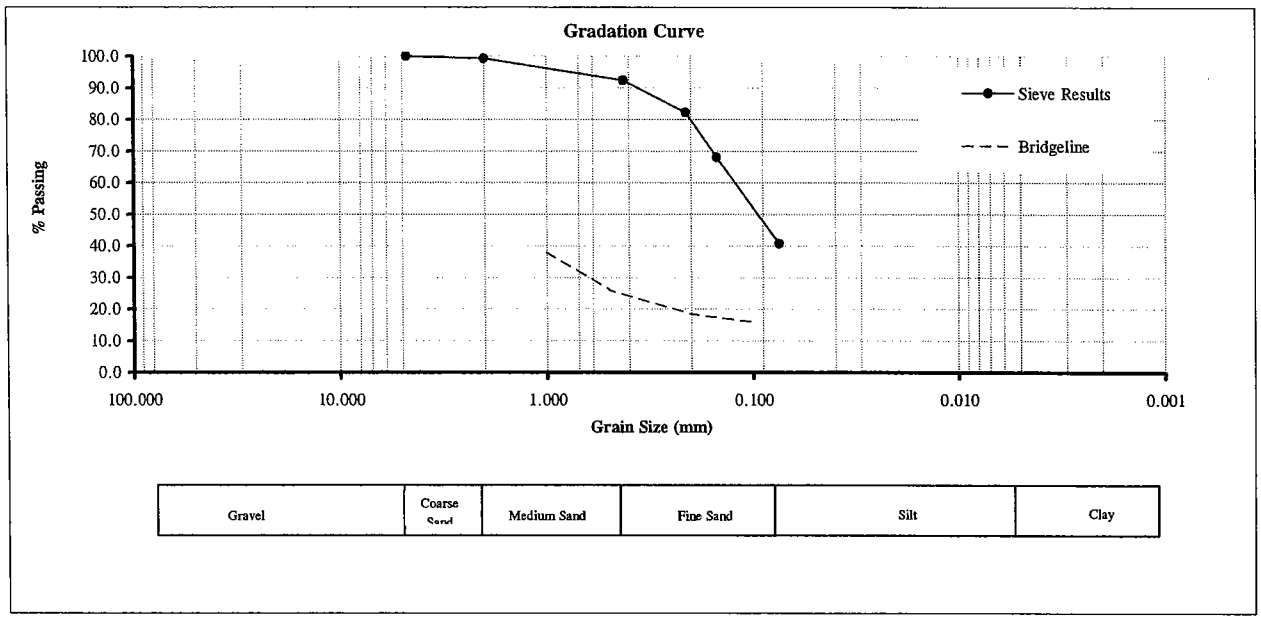
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 117.86

Error due to lost material (%) = 0.66

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.0	465.1	0.0	0.0	100.0
10	2.000	483.4	484.2	0.8	0.9	99.3
40	0.425	382.2	390.4	8.2	9.0	92.4
70	0.212	320.9	333.0	12.1	21.2	82.2
100	0.150	335.2	352.0	16.7	37.9	68.1
200	0.075	335.1	367.5	32.4	70.3	40.8
pan	--	376.3	424.7	48.4	118.6	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.7
Medium Sand	2.00mm to .425mm	6.9
Fine Sand	.425mm to .075 mm	51.6
Silt-Clay	Material smaller than .075mm	40.8

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Task:	0003
Sample ID:	A1-SB-003-4.5'
Tested By:	MRP
Date:	8/4/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

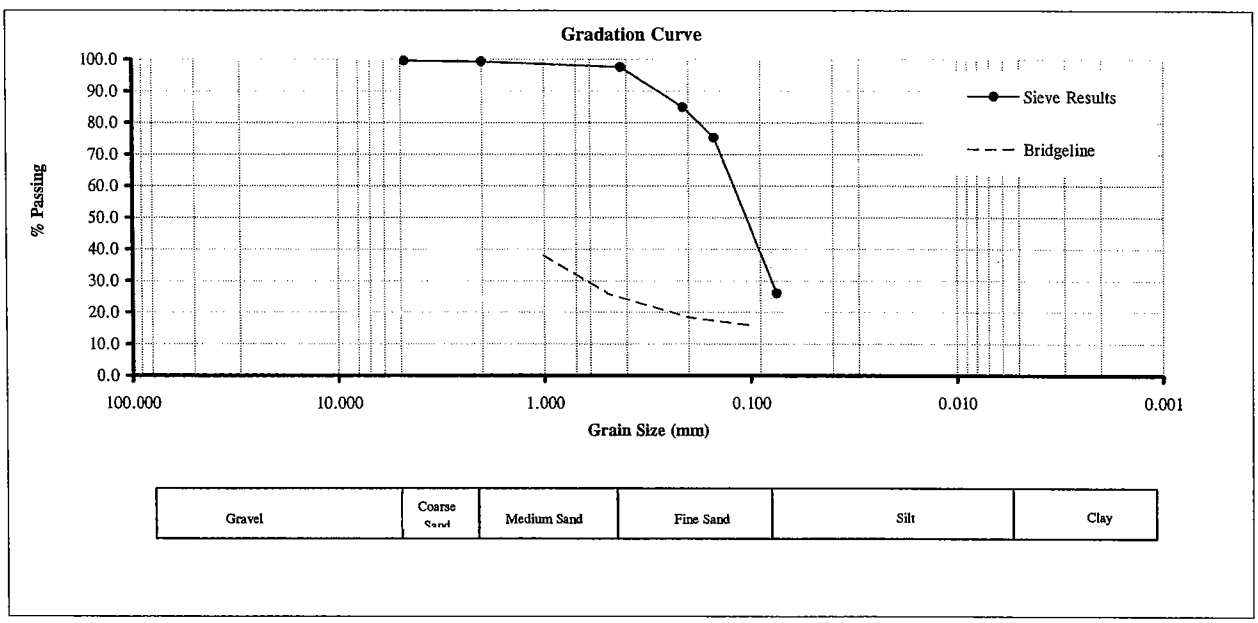
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.66

Error due to lost material (%) = 0.12

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.2	467.2	2.0	2.0	99.6
10	2.000	483.5	484.8	1.3	3.3	99.3
40	0.425	382.3	391.0	8.7	12.1	97.6
70	0.212	321.0	384.5	63.6	75.6	84.9
100	0.150	335.3	383.8	48.5	124.1	75.2
200	0.075	335.2	581.7	246.5	370.6	26.1
pan	--	376.5	507.1	130.6	501.3	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.4
Coarse Sand	4.75mm to 2.00mm	0.3
Medium Sand	2.00mm to .425mm	1.7
Fine Sand	.425mm to .075 mm	71.5
Silt-Clay	Material smaller than .075mm	26.1

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Task:	**0003**
Sample ID:	**A1-SB-003-9.0'**
Tested By:	**MRP/ZKK**
Date:	**8/1/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

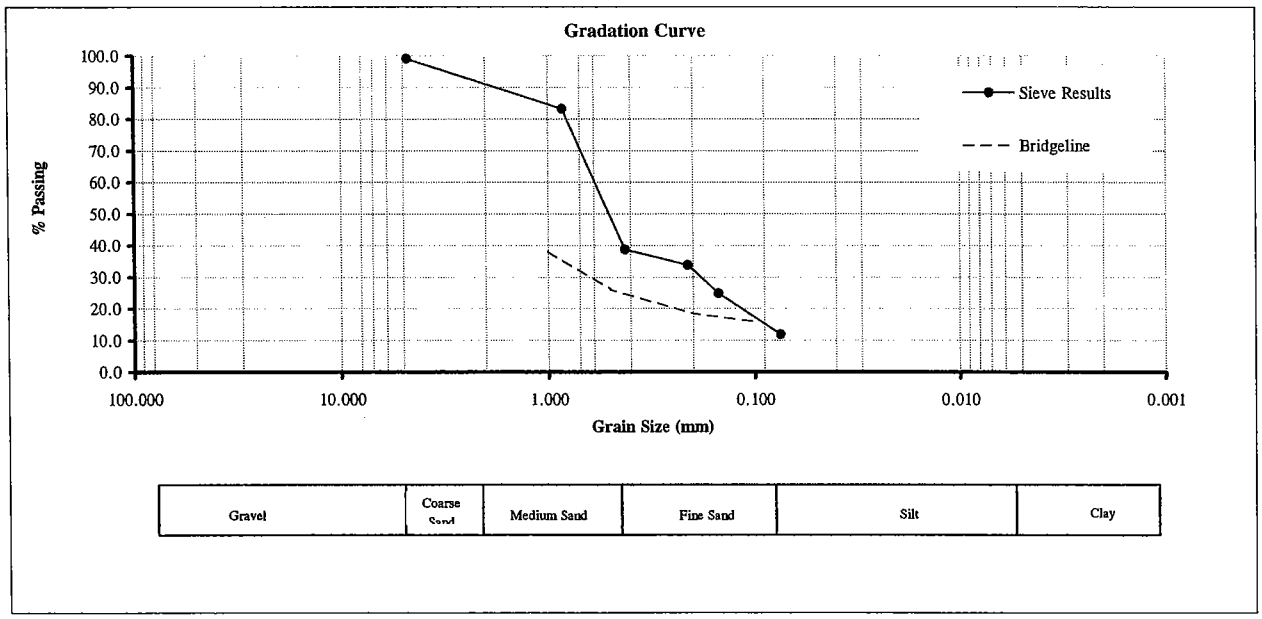
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.43

Error due to lost material (%) = 0.77

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.2	469.9	4.7	4.7	99.1
20	0.850	412.4	491.0	78.6	83.3	83.2
40	0.425	382.3	603.6	221.3	304.6	38.7
70	0.212	321.0	345.2	24.2	328.8	33.8
100	0.150	335.3	379.7	44.4	373.2	24.8
200	0.075	335.2	399.5	64.3	437.5	11.9
pan	--	376.5	435.6	59.1	496.6	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.9
Coarse Sand	4.75mm to 2.00mm	8.1
Medium Sand	2.00mm to .425mm	7.8
Fine Sand	.425mm to .075 mm	71.3
Silt-Clay	Material smaller than .075mm	11.9

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Sample ID:	A1-SB-004-0.5'
Tested By:	MRP/ZKK/MN
Date:	8/7/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

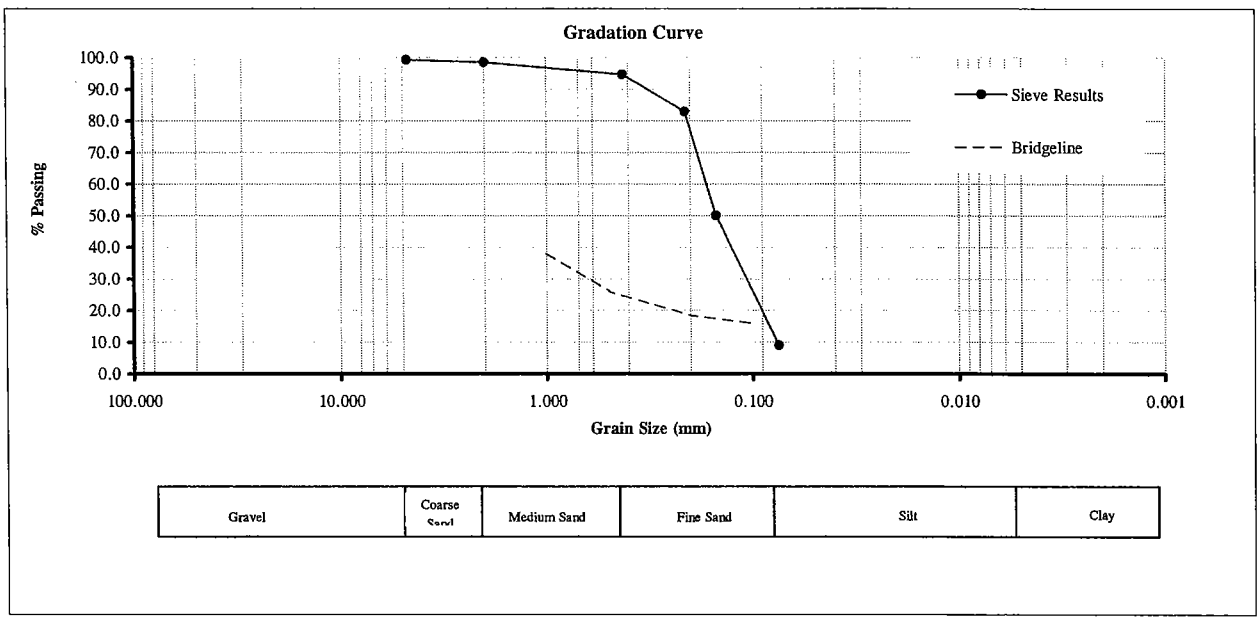
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 107.22

Error due to lost material (%) = 1.15

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	465.8	0.8	0.8	99.3
10	2.000	483.4	484.2	0.8	1.6	98.5
40	0.425	382.3	386.4	4.1	5.7	94.7
70	0.212	320.9	333.7	12.8	18.5	82.9
100	0.150	335.3	370.9	35.6	54.2	50.1
200	0.075	335.1	379.5	44.4	98.6	9.1
pan	--	376.3	386.2	9.9	108.5	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.7
Coarse Sand	4.75mm to 2.00mm	0.8
Medium Sand	2.00mm to .425mm	3.8
Fine Sand	.425mm to .075 mm	85.6
Silt-Clay	Material smaller than .075mm	9.1

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Job No.:	**24CH.67201.00**
Task:	**0003**
Sample ID:	**A1-SB-004-4.5'**
Tested By:	**MRP**
Date:	**8/4/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

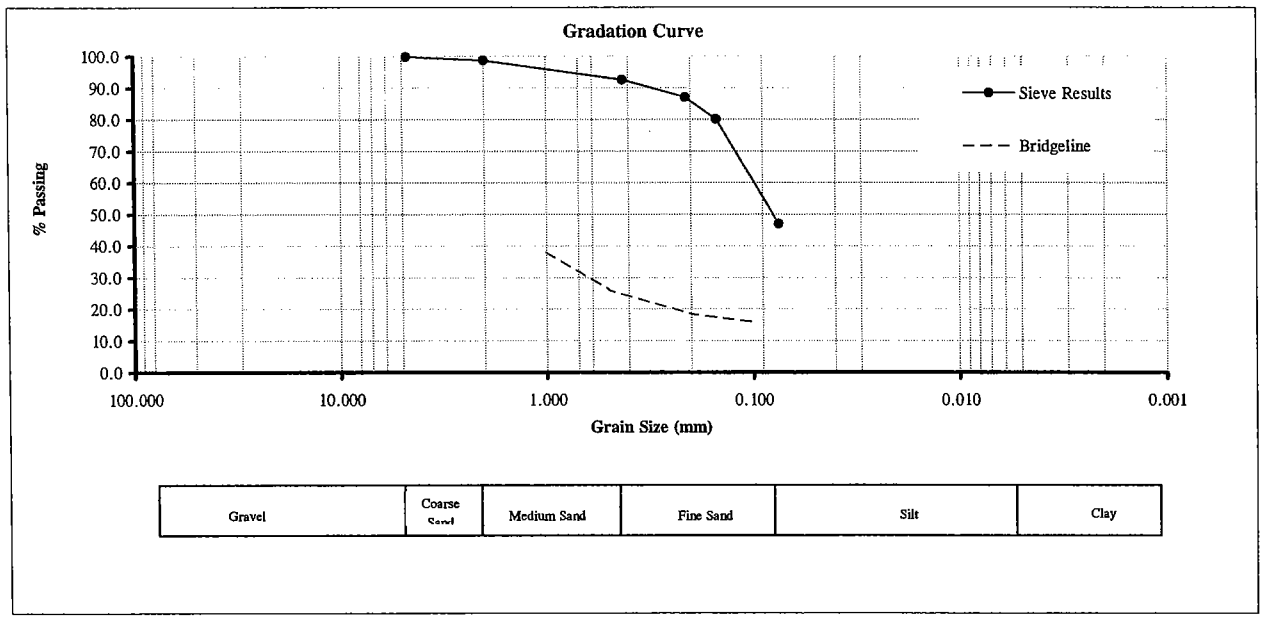
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.33

Error due to lost material (%) = 0.10

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.2	466.1	0.9	0.9	99.8
10	2.000	483.3	488.8	5.5	6.5	98.7
40	0.425	382.3	413.1	30.8	37.3	92.6
70	0.212	321.0	348.7	27.7	65.0	87.0
100	0.150	335.3	370.0	34.8	99.7	80.1
200	0.075	335.2	501.2	166.0	265.7	46.9
pan	--	376.6	611.7	235.1	500.9	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.2
Coarse Sand	4.75mm to 2.00mm	1.1
Medium Sand	2.00mm to .425mm	6.1
Fine Sand	.425mm to .075 mm	45.7
Silt-Clay	Material smaller than .075mm	46.9

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Task:	0003
Sample ID:	A1-SB-004-9.0'
Tested By:	MRP
Date:	8/4/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

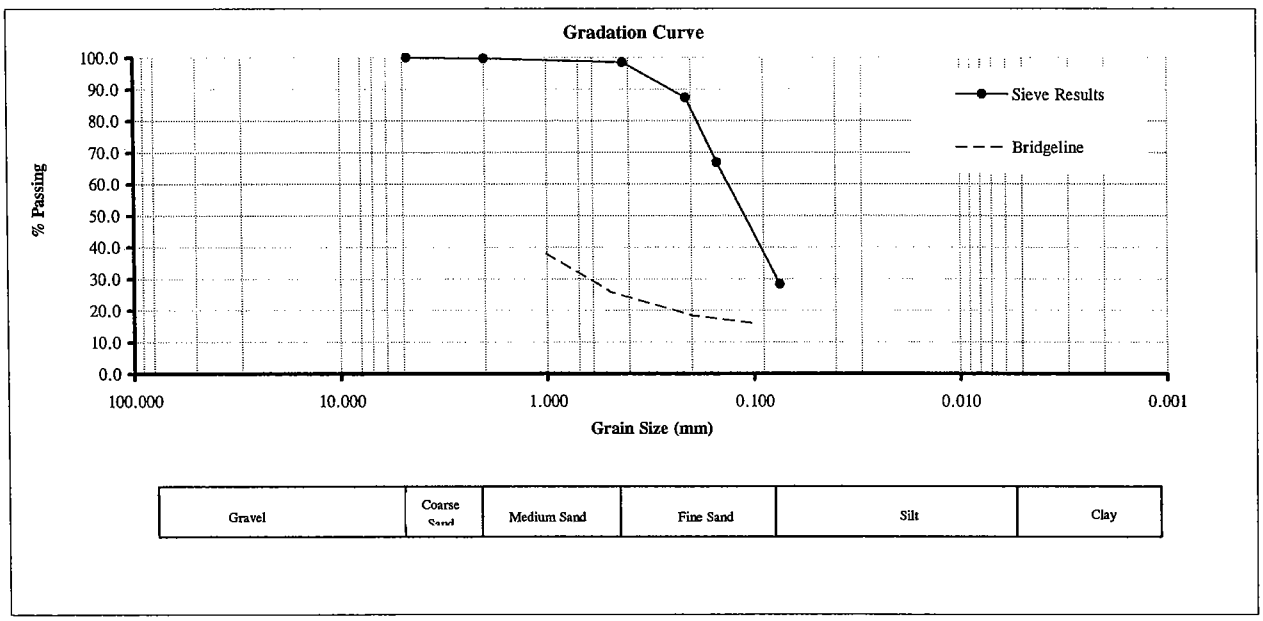
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.43

Error due to lost material (%) = 0.14

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.2	465.4	0.2	0.2	100.0
10	2.000	483.6	485.0	1.4	1.6	99.7
40	0.425	382.4	388.3	6.0	7.5	98.5
70	0.212	321.1	377.2	56.1	63.7	87.3
100	0.150	335.3	437.6	102.3	166.0	66.9
200	0.075	335.2	528.2	193.0	359.0	28.4
pan	--	376.5	518.7	142.2	501.1	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.3
Medium Sand	2.00mm to .425mm	1.2
Fine Sand	.425mm to .075 mm	70.1
Silt-Clay	Material smaller than .075mm	28.4

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Client/Project:	Bec-Jay Scales Site
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Task:	0003
Sample ID:	A1-SB-006-0.5'
Tested By:	MRP/ZKK/MN
Date:	8/7/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

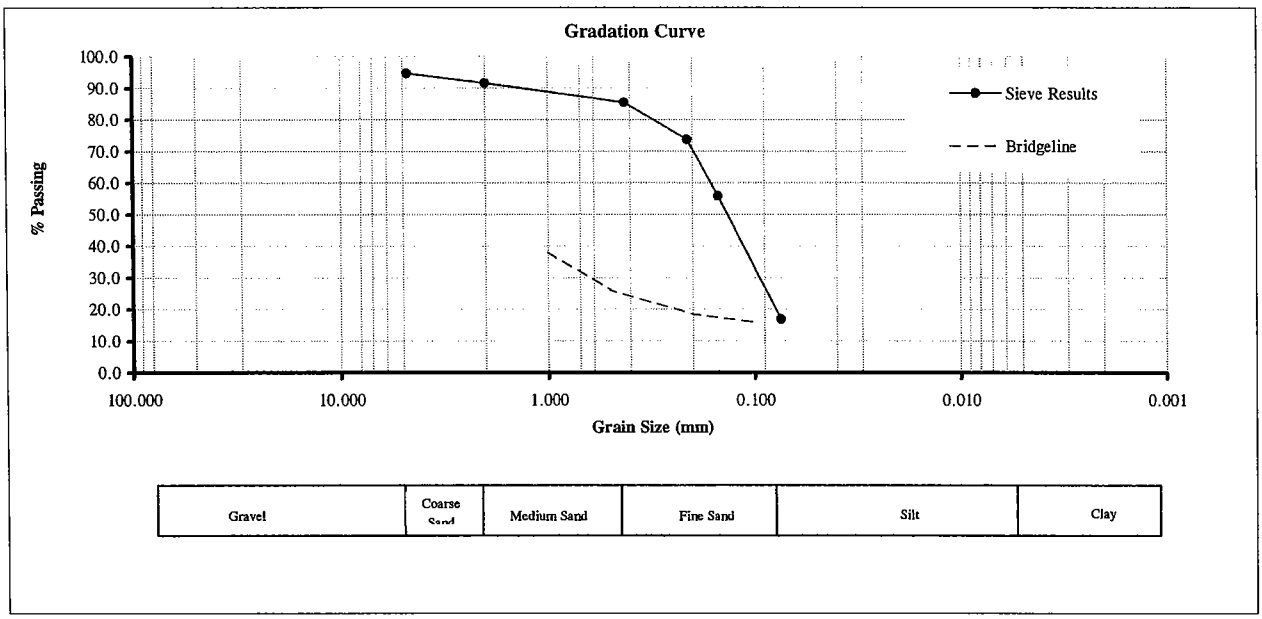
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 112.24

Error due to lost material (%) = 0.95

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.0	471.0	6.0	6.0	94.7
10	2.000	483.4	486.9	3.5	9.6	91.6
40	0.425	382.3	389.2	6.9	16.5	85.4
70	0.212	320.9	334.3	13.4	29.9	73.6
100	0.150	335.2	355.4	20.2	50.1	55.8
200	0.075	335.1	379.2	44.1	94.1	16.9
pan	--	376.3	395.5	19.2	113.3	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	5.3
Coarse Sand	4.75mm to 2.00mm	3.1
Medium Sand	2.00mm to .425mm	6.2
Fine Sand	.425mm to .075 mm	68.5
Silt-Clay	Material smaller than .075mm	16.9

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Job No.:	24CH.67201.00
Task:	0003
Sample ID:	A1-SB-006-0.5'-1
Tested By:	MRP/ZKK/MN
Date:	8/7/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

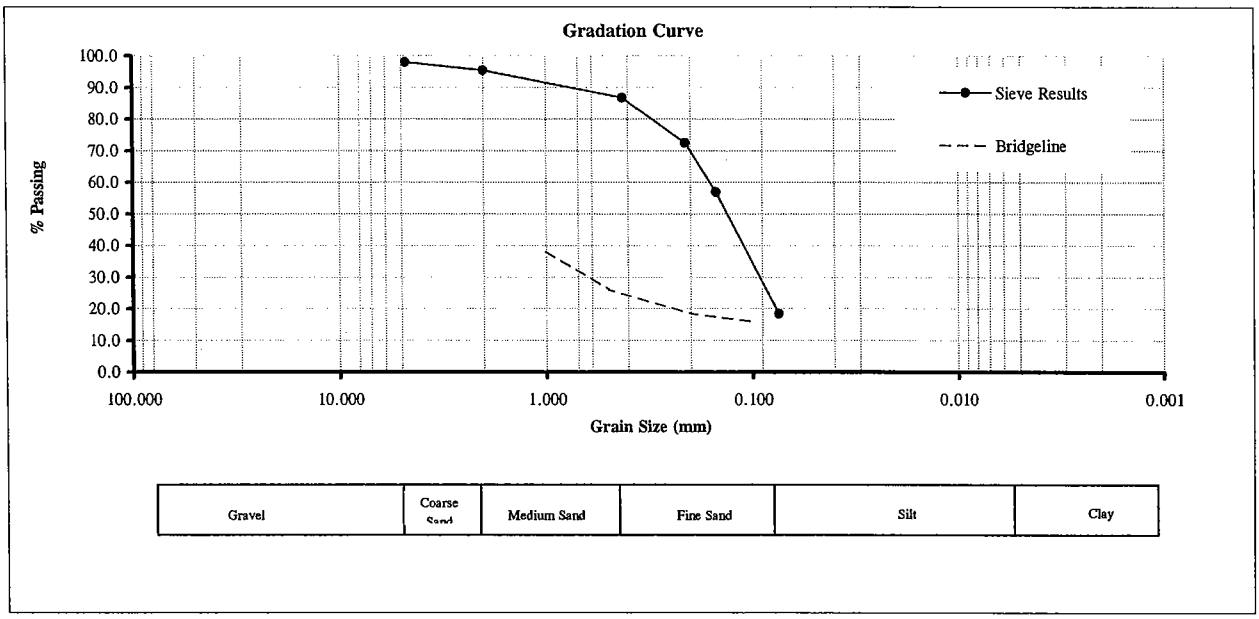
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 109.84

Error due to lost material (%) = 0.32

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	467.3	2.2	2.2	98.0
10	2.000	483.4	486.2	2.9	5.1	95.4
40	0.425	382.3	391.8	9.5	14.6	86.8
70	0.212	321.0	336.7	15.8	30.3	72.5
100	0.150	335.3	352.4	17.2	47.5	56.9
200	0.075	335.1	377.5	42.4	89.9	18.4
pan	--	376.4	396.7	20.3	110.2	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	2.0
Coarse Sand	4.75mm to 2.00mm	2.6
Medium Sand	2.00mm to .425mm	8.6
Fine Sand	.425mm to .075 mm	68.4
Silt-Clay	Material smaller than .075mm	18.4

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	0003
Sample ID:	A1-SB-006-4.5'
Tested By:	MRP/ZKK
Date:	8/1/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

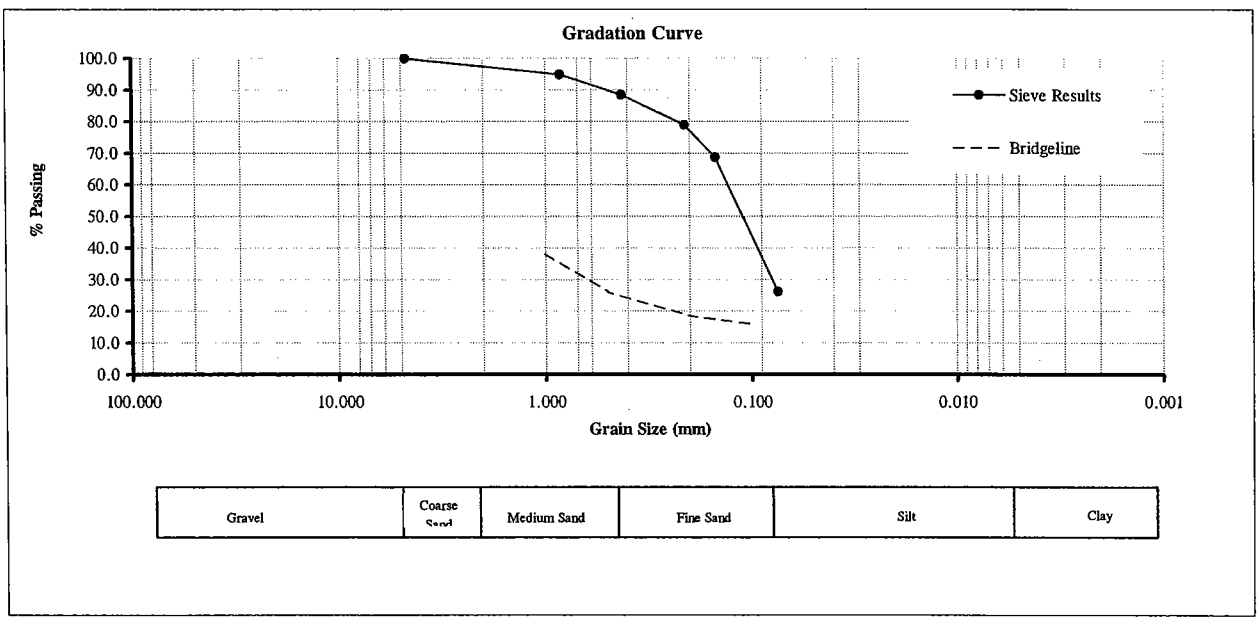
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.37

Error due to lost material (%) = 0.10

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	465.4	0.3	0.3	99.9
20	0.850	412.4	437.6	25.2	25.5	94.9
40	0.425	382.3	414.8	32.5	58.0	88.4
70	0.212	321.0	368.6	47.6	105.6	78.9
100	0.150	335.2	386.6	51.4	156.9	68.7
200	0.075	335.2	548.0	212.9	369.8	26.2
pan	--	376.6	507.6	131.1	500.9	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.1
Coarse Sand	4.75mm to 2.00mm	2.9
Medium Sand	2.00mm to .425mm	8.6
Fine Sand	.425mm to .075 mm	62.2
Silt-Clay	Material smaller than .075mm	26.2

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	0003
Sample ID:	A1-SB-006-7.5'
Tested By:	MRP/ZKK/MN
Date:	8/7/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

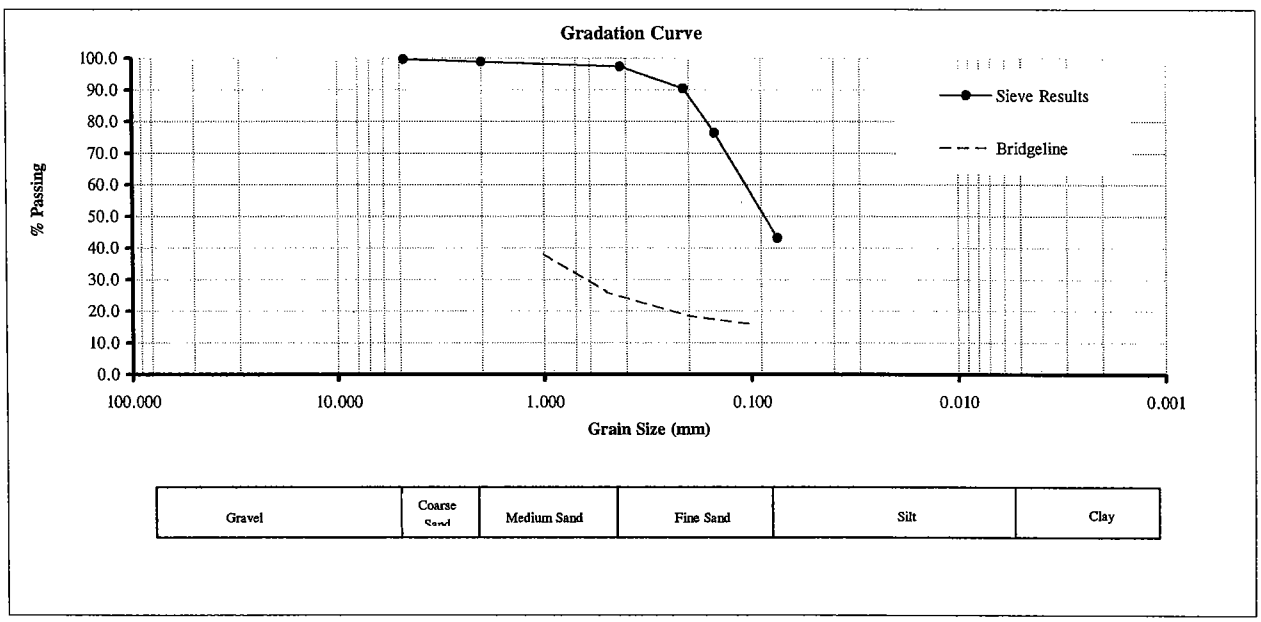
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 90.01

Error due to lost material (%) = 0.20

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	465.4	0.3	0.3	99.7
10	2.000	483.5	484.2	0.7	1.0	98.9
40	0.425	382.3	383.7	1.4	2.4	97.3
70	0.212	320.9	327.1	6.2	8.6	90.5
100	0.150	335.3	348.1	12.8	21.3	76.3
200	0.075	335.2	365.1	30.0	51.3	43.1
pan	--	376.4	415.2	38.9	90.2	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.3
Coarse Sand	4.75mm to 2.00mm	0.8
Medium Sand	2.00mm to .425mm	1.6
Fine Sand	.425mm to .075 mm	54.2
Silt-Clay	Material smaller than .075mm	43.1

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Client/Project:	**Bee-Jay Scales Site**
Job No.:	**24CH.67201.00**
Task:	**0003**
Sample ID:	**A2-SB-001-0.5'**
Tested By:	**MRP/ZKK/MN**
Date:	**8/7/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

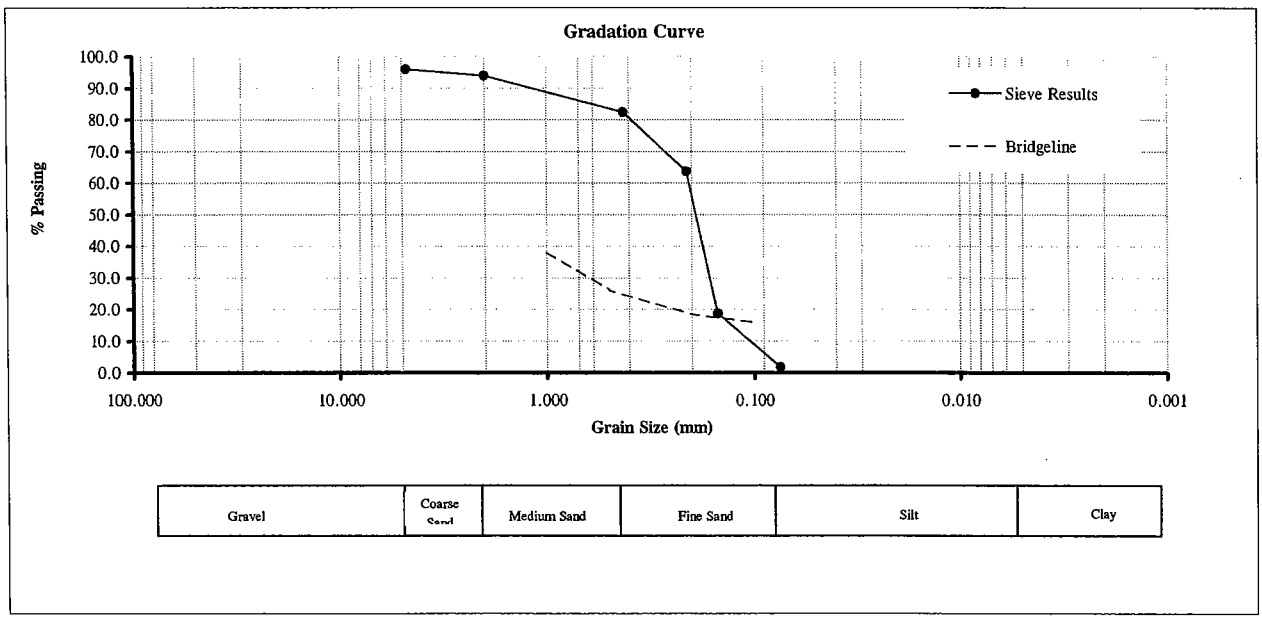
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 121.6

Error due to lost material (%) = 0.89

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.0	470.0	4.9	4.9	96.0
10	2.000	483.4	485.8	2.4	7.4	94.0
40	0.425	382.3	396.4	14.2	21.5	82.5
70	0.212	320.9	344.1	23.2	44.7	63.6
100	0.150	335.2	390.3	55.1	99.8	18.7
200	0.075	335.1	355.8	20.6	120.4	1.9
pan	--	376.3	378.6	2.3	122.7	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	4.0
Coarse Sand	4.75mm to 2.00mm	2.0
Medium Sand	2.00mm to .425mm	11.5
Fine Sand	.425mm to .075 mm	80.6
Silt-Clay	Material smaller than .075mm	1.9

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Task:	0003
Sample ID:	A2-SB-001-4.5'
Tested By:	MRP
Date:	8/4/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

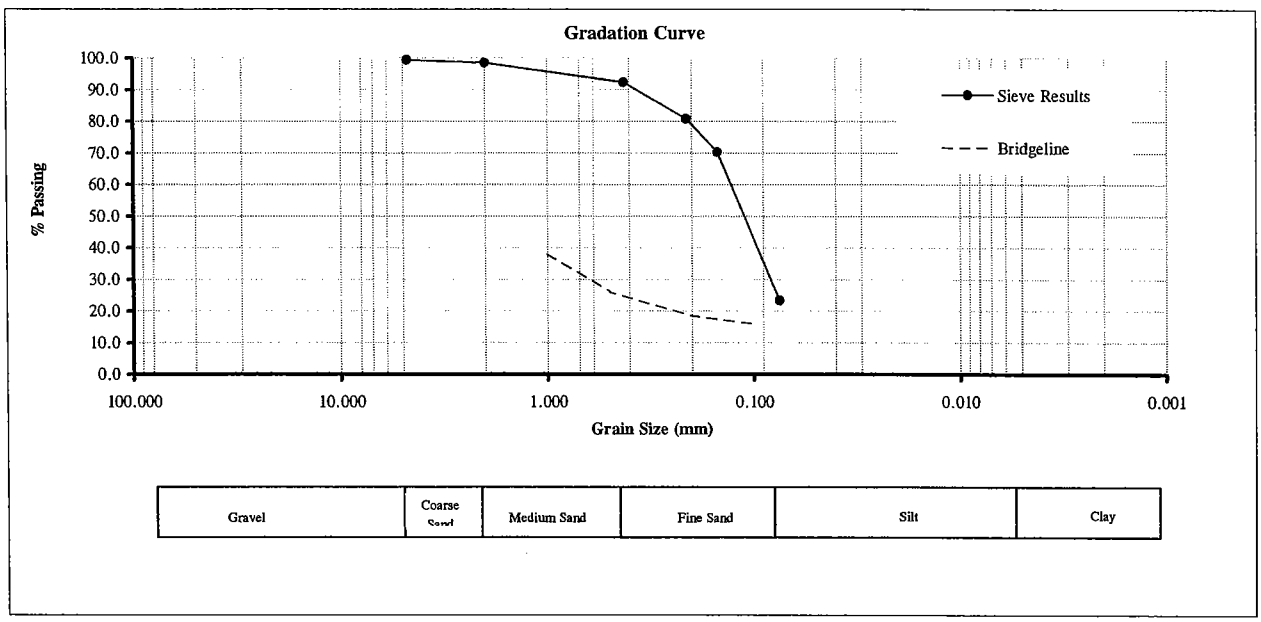
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.64

Error due to lost material (%) = 0.17

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	468.3	3.2	3.2	99.4
10	2.000	483.5	488.0	4.5	7.7	98.5
40	0.425	382.3	412.7	30.5	38.1	92.4
70	0.212	320.9	379.3	58.3	96.4	80.8
100	0.150	335.3	388.1	52.8	149.3	70.2
200	0.075	335.2	570.2	235.0	384.3	23.4
pan	--	376.5	493.7	117.2	501.5	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.6
Coarse Sand	4.75mm to 2.00mm	0.9
Medium Sand	2.00mm to .425mm	6.1
Fine Sand	.425mm to .075 mm	69.0
Silt-Clay	Material smaller than .075mm	23.4

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Sample ID:	**A2-SB-001-9.0'**
Tested By:	**MRP**
Date:	**8/4/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

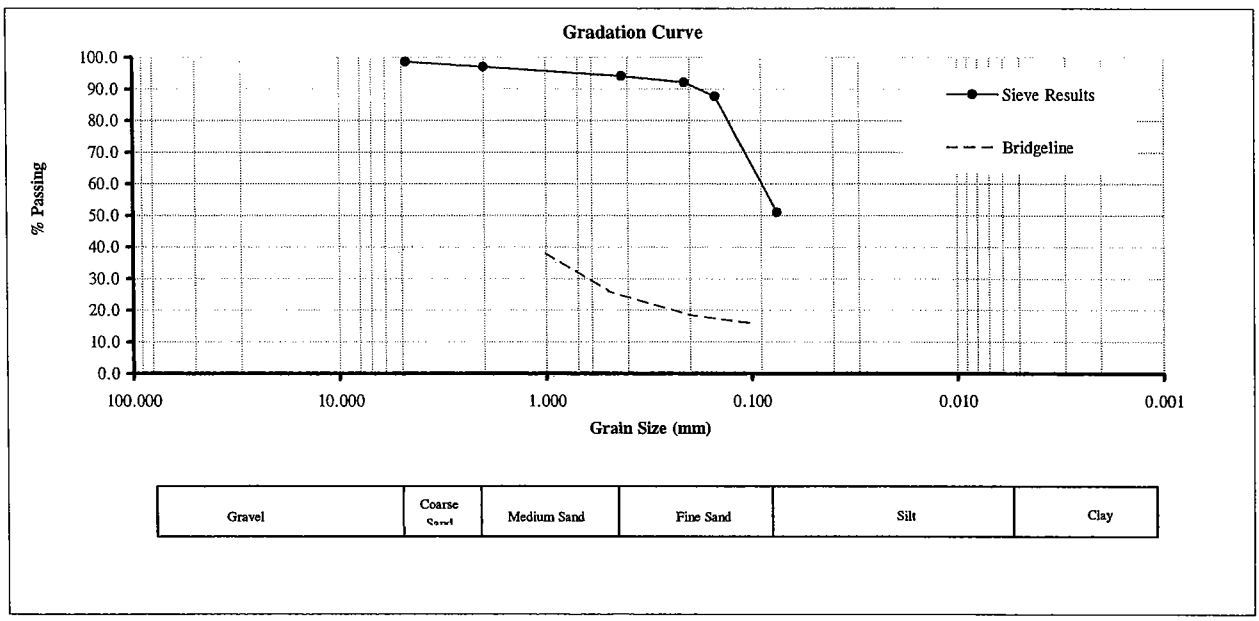
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.47

Error due to lost material (%) = 0.08

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	472.2	7.1	7.1	98.6
10	2.000	483.5	491.7	8.2	15.3	96.9
40	0.425	382.3	396.6	14.3	29.6	94.1
70	0.212	321.0	331.0	10.0	39.6	92.1
100	0.150	335.3	357.5	22.2	61.8	87.7
200	0.075	335.2	518.9	183.7	245.5	51.0
pan	--	376.5	631.9	255.4	500.9	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	1.4
Coarse Sand	4.75mm to 2.00mm	1.7
Medium Sand	2.00mm to .425mm	2.8
Fine Sand	.425mm to .075 mm	43.1
Silt-Clay	Material smaller than .075mm	51.0

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Task:	**0003**
Sample ID:	**A2-SB-002-0.5'**
Tested By:	**MRP/ZKK/MN**
Date:	**8/7/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

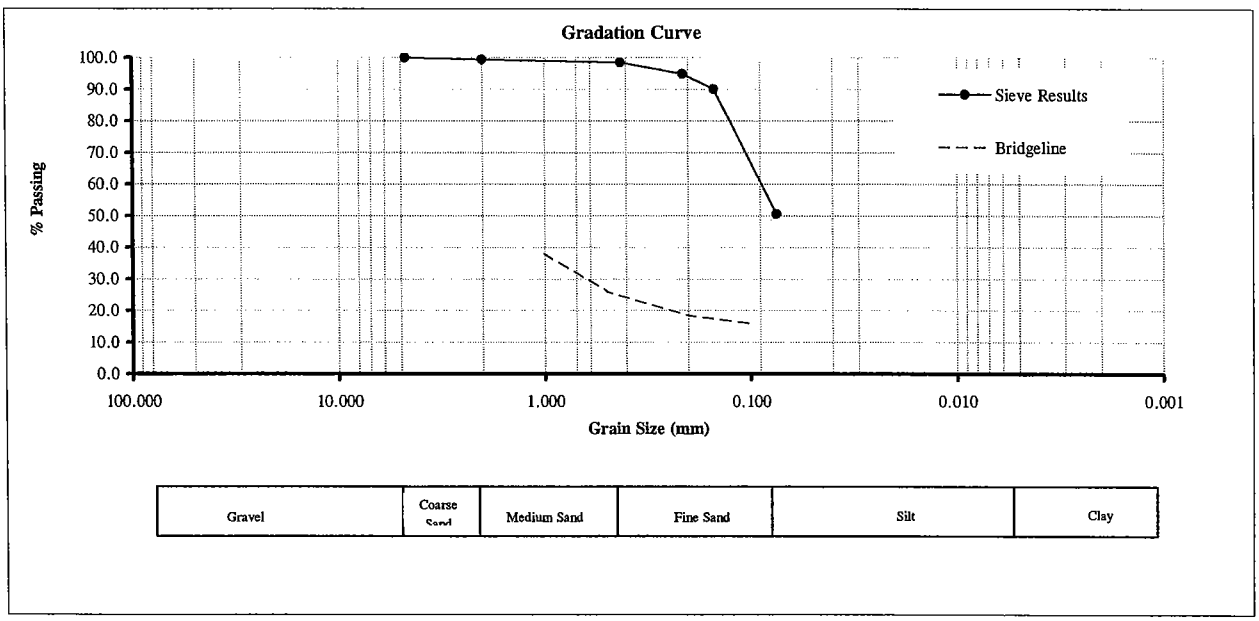
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 111.81

Error due to lost material (%) = 0.27

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.0	465.1	0.0	0.0	100.0
10	2.000	483.4	484.1	0.7	0.7	99.4
40	0.425	382.3	383.2	0.9	1.7	98.5
70	0.212	321.0	325.1	4.1	5.8	94.9
100	0.150	335.2	340.7	5.4	11.2	90.0
200	0.075	335.2	379.4	44.3	55.5	50.5
pan	--	376.4	433.1	56.7	112.1	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.6
Medium Sand	2.00mm to .425mm	0.9
Fine Sand	.425mm to .075 mm	48.0
Silt-Clay	Material smaller than .075mm	50.5

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Task:	**0003**
Sample ID:	**A2-SB-002-4.5'**
Tested By:	**MRP**
Date:	**8/4/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

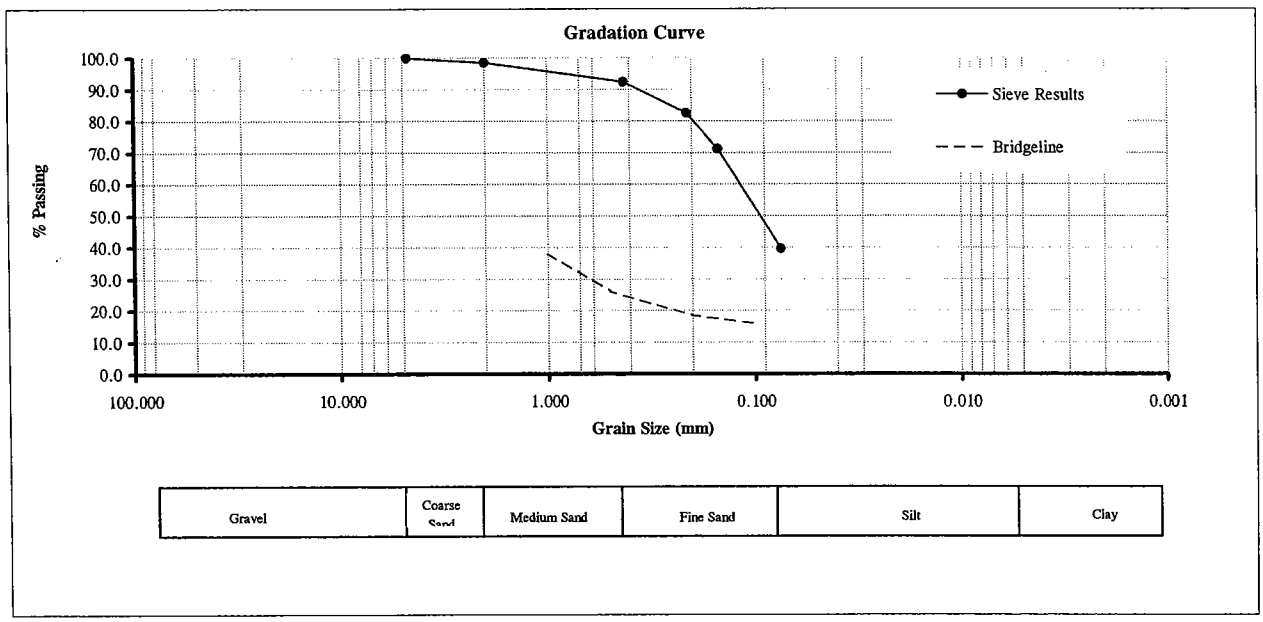
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.7

Error due to lost material (%) = 0.18

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	465.8	0.7	0.7	99.9
10	2.000	483.5	490.1	6.7	7.4	98.5
40	0.425	382.3	413.2	30.9	38.2	92.4
70	0.212	321.0	370.7	49.7	87.9	82.5
100	0.150	335.3	392.2	56.9	144.8	71.1
200	0.075	335.2	493.5	158.3	303.1	39.6
pan	--	376.5	575.0	198.5	501.6	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.1
Coarse Sand	4.75mm to 2.00mm	1.4
Medium Sand	2.00mm to .425mm	6.1
Fine Sand	.425mm to .075 mm	52.8
Silt-Clay	Material smaller than .075mm	39.6

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Task:	**0003**
Sample ID:	**A2-SB-002-9.0'**
Tested By:	**MRP**
Date:	**8/4/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

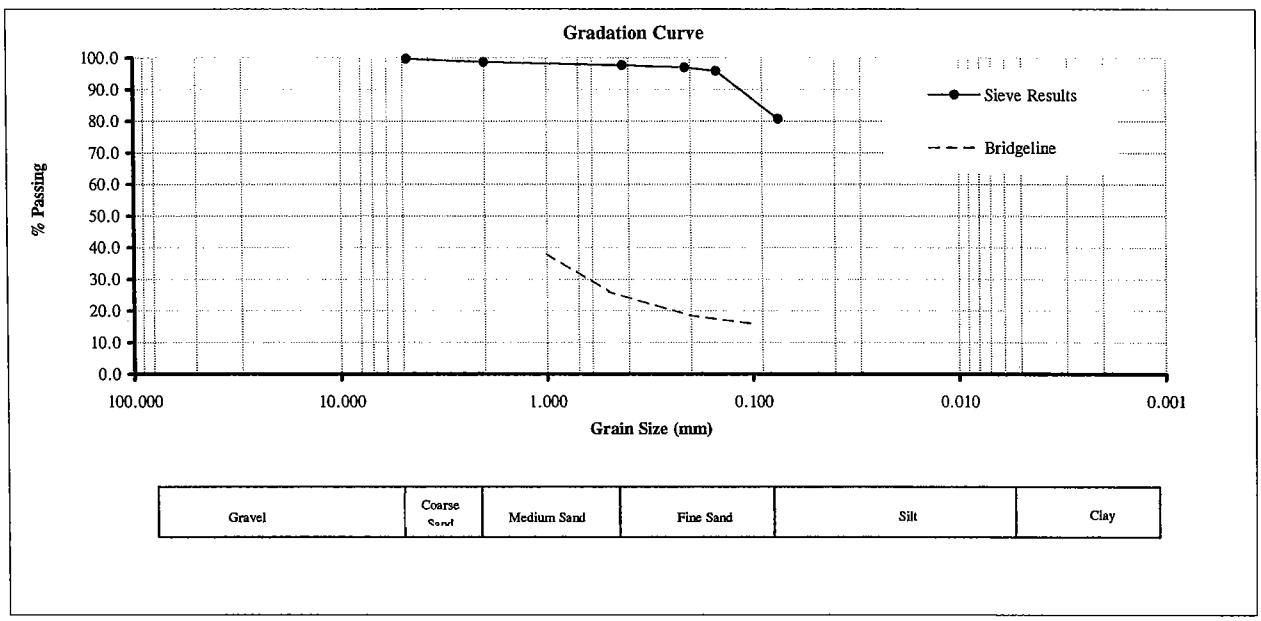
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.46

Error due to lost material (%) = 0.05

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.2	466.6	1.4	1.4	99.7
10	2.000	483.5	488.5	5.0	6.5	98.7
40	0.425	382.4	387.4	5.1	11.6	97.7
70	0.212	321.0	324.5	3.4	15.0	97.0
100	0.150	335.4	340.8	5.4	20.5	95.9
200	0.075	335.2	411.4	76.1	96.6	80.7
pan	--	376.5	780.1	403.6	500.2	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.3
Coarse Sand	4.75mm to 2.00mm	1.0
Medium Sand	2.00mm to .425mm	1.0
Fine Sand	.425mm to .075 mm	17.0
Silt-Clay	Material smaller than .075mm	80.7

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Tested By:	MRP/ZKK/MN
Date:	8/7/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

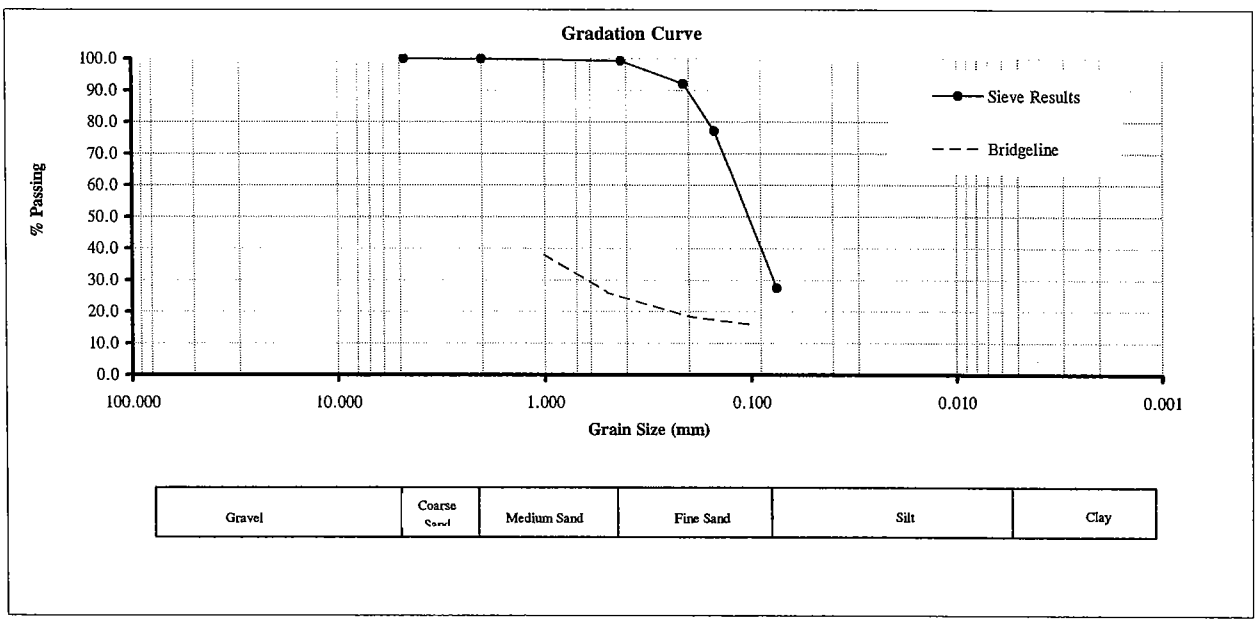
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 111.16

Error due to lost material (%) = 0.22

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	465.1	0.0	0.0	100.0
10	2.000	483.4	483.5	0.1	0.1	99.9
40	0.425	382.3	382.9	0.6	0.7	99.3
70	0.212	320.9	329.1	8.1	8.9	92.0
100	0.150	335.2	351.9	16.6	25.5	77.1
200	0.075	335.2	390.5	55.3	80.8	27.5
pan	--	376.4	407.0	30.6	111.4	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.1
Medium Sand	2.00mm to .425mm	0.6
Fine Sand	.425mm to .075 mm	71.8
Silt-Clay	Material smaller than .075mm	27.5

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Tested By:	MRP/MN
Date:	8/5/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

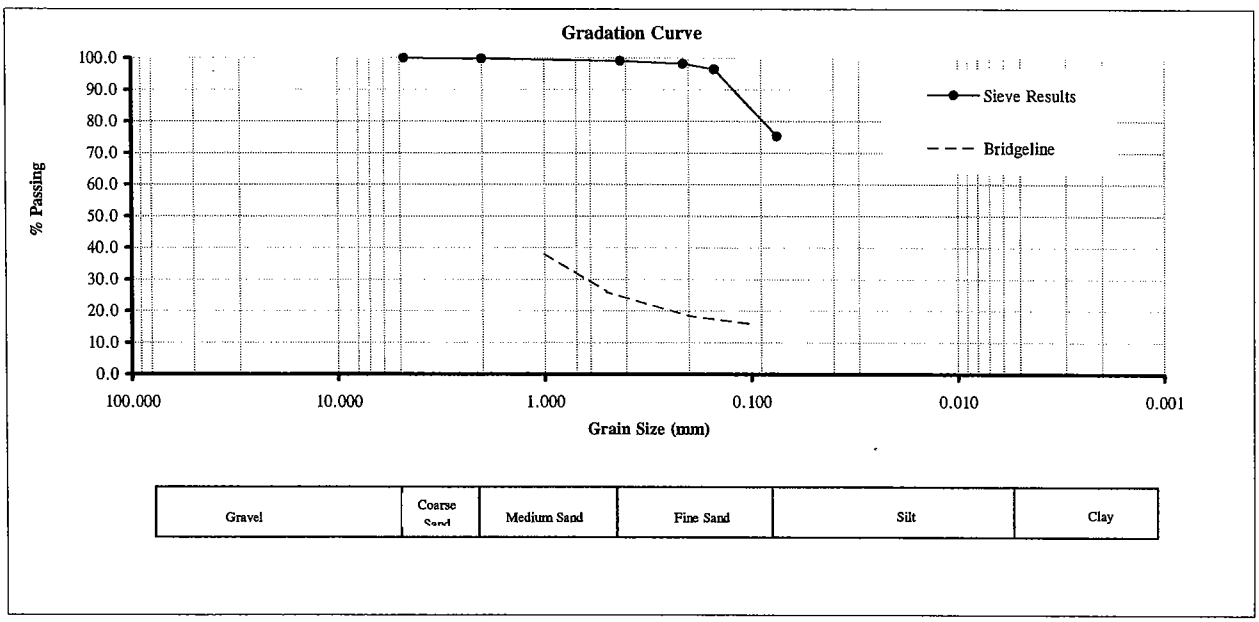
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.89

Error due to lost material (%) = 0.14

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	465.3	0.2	0.2	100.0
10	2.000	483.3	484.2	0.9	1.0	99.8
40	0.425	382.3	385.5	3.3	4.3	99.1
70	0.212	320.9	325.7	4.8	9.1	98.2
100	0.150	335.2	343.7	8.4	17.5	96.5
200	0.075	335.2	441.8	106.6	124.1	75.3
pan	--	376.4	753.9	377.5	501.6	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.2
Medium Sand	2.00mm to .425mm	0.7
Fine Sand	.425mm to .075 mm	23.8
Silt-Clay	Material smaller than .075mm	75.3

Sieve_A3SB00245.xls

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Task:	**0003**
Sample ID:	**A3-SB-002-7.5'**
Tested By:	**MRP/ZKK/MN**
Date:	**8/7/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

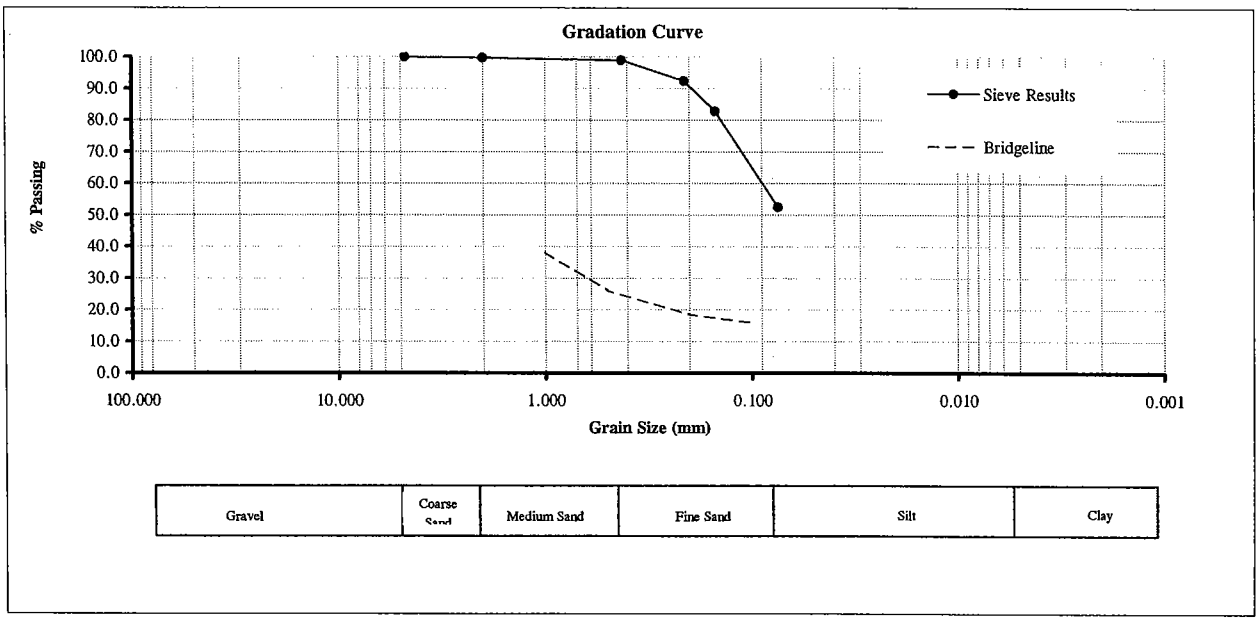
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 110.63

Error due to lost material (%) = 0.59

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.0	465.0	0.0	0.0	100.0
10	2.000	483.4	483.7	0.3	0.3	99.7
40	0.425	382.3	383.2	0.9	1.2	98.9
70	0.212	320.9	328.2	7.3	8.5	92.3
100	0.150	335.2	345.8	10.6	19.1	82.8
200	0.075	335.1	368.8	33.7	52.9	52.5
pan	--	376.3	434.7	58.4	111.3	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.3
Medium Sand	2.00mm to .425mm	0.8
Fine Sand	.425mm to .075 mm	46.4
Silt-Clay	Material smaller than .075mm	52.5

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Tested By:	MRP/ZKK/MN
Date:	8/7/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

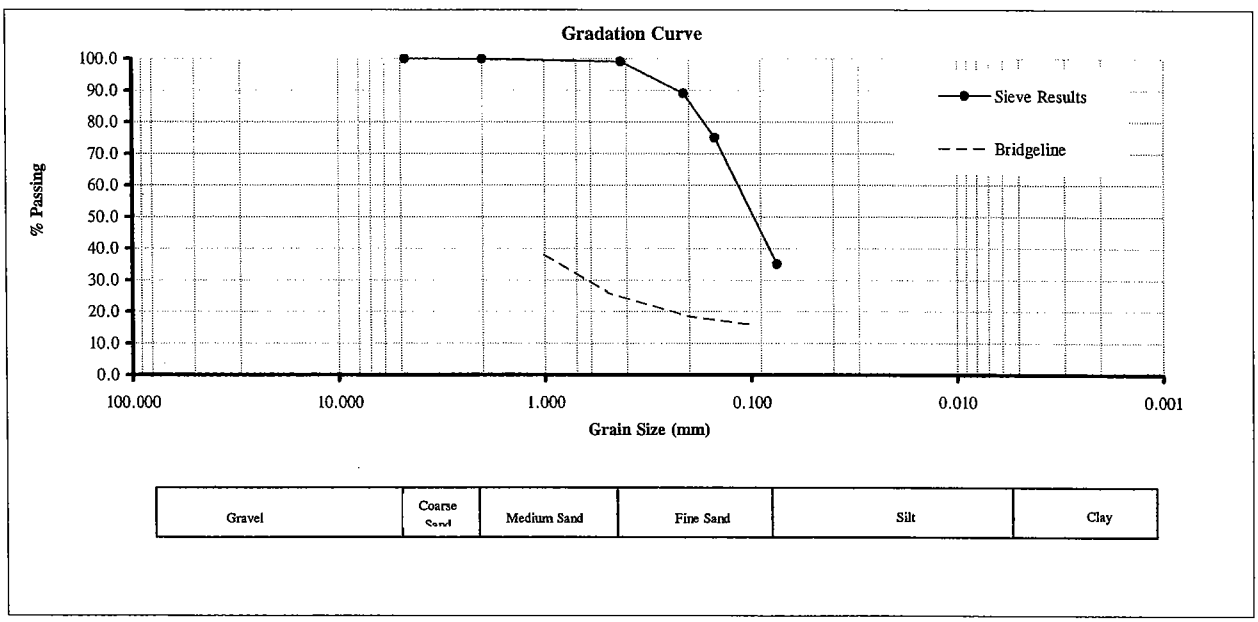
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 104.75

Error due to lost material (%) = 0.14

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.0	465.0	0.0	0.0	100.0
10	2.000	483.4	483.4	0.0	0.1	99.9
40	0.425	382.3	383.2	0.9	1.0	99.1
70	0.212	321.0	331.4	10.5	11.4	89.1
100	0.150	335.2	349.9	14.6	26.1	75.1
200	0.075	335.2	377.0	41.9	67.9	35.0
pan	--	376.4	413.0	36.7	104.6	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.1
Medium Sand	2.00mm to .425mm	0.8
Fine Sand	.425mm to .075 mm	64.1
Silt-Clay	Material smaller than .075mm	35.0

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Tested By:	MRP/MN
Date:	8/5/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

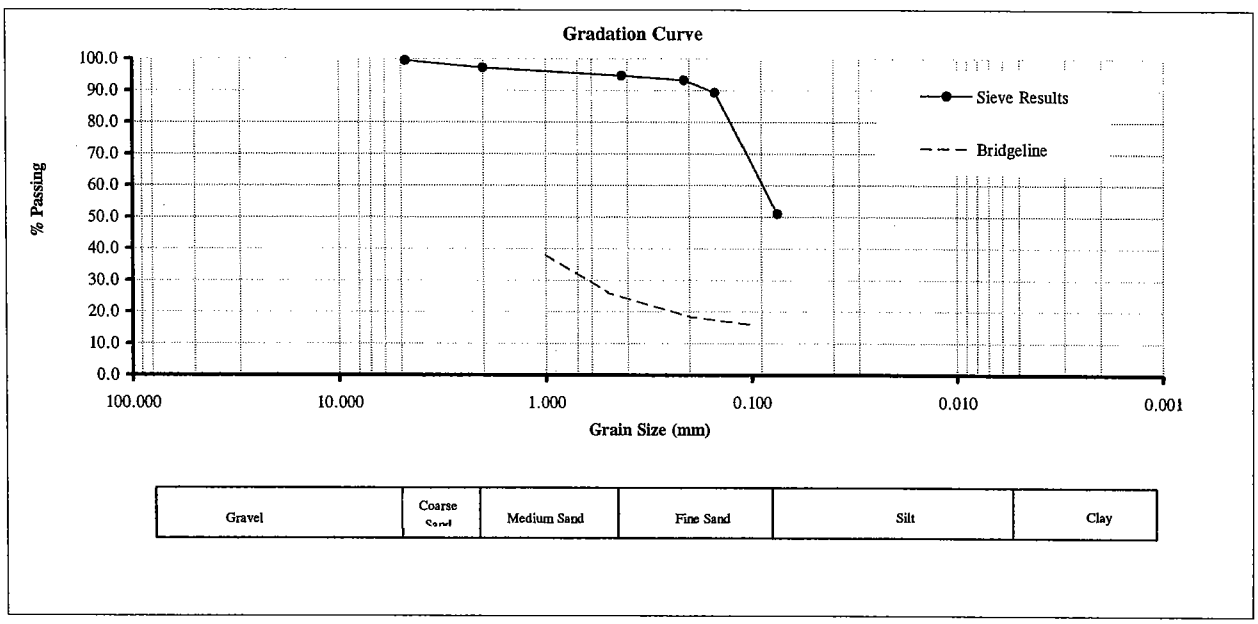
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.82

Error due to lost material (%) = 0.10

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.2	467.8	2.6	2.6	99.5
10	2.000	483.5	494.9	11.5	14.0	97.2
40	0.425	382.3	395.1	12.8	26.8	94.7
70	0.212	321.0	328.1	7.1	33.9	93.2
100	0.150	335.2	354.8	19.6	53.4	89.3
200	0.075	335.2	527.4	192.3	245.7	51.0
pan	--	376.5	632.2	255.7	501.3	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.5
Coarse Sand	4.75mm to 2.00mm	2.3
Medium Sand	2.00mm to .425mm	2.5
Fine Sand	.425mm to .075 mm	43.7
Silt-Clay	Material smaller than .075mm	51.0

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Sample ID:	A4-SB-003-0.5'
Tested By:	MRP/ZKK/MN
Date:	8/7/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

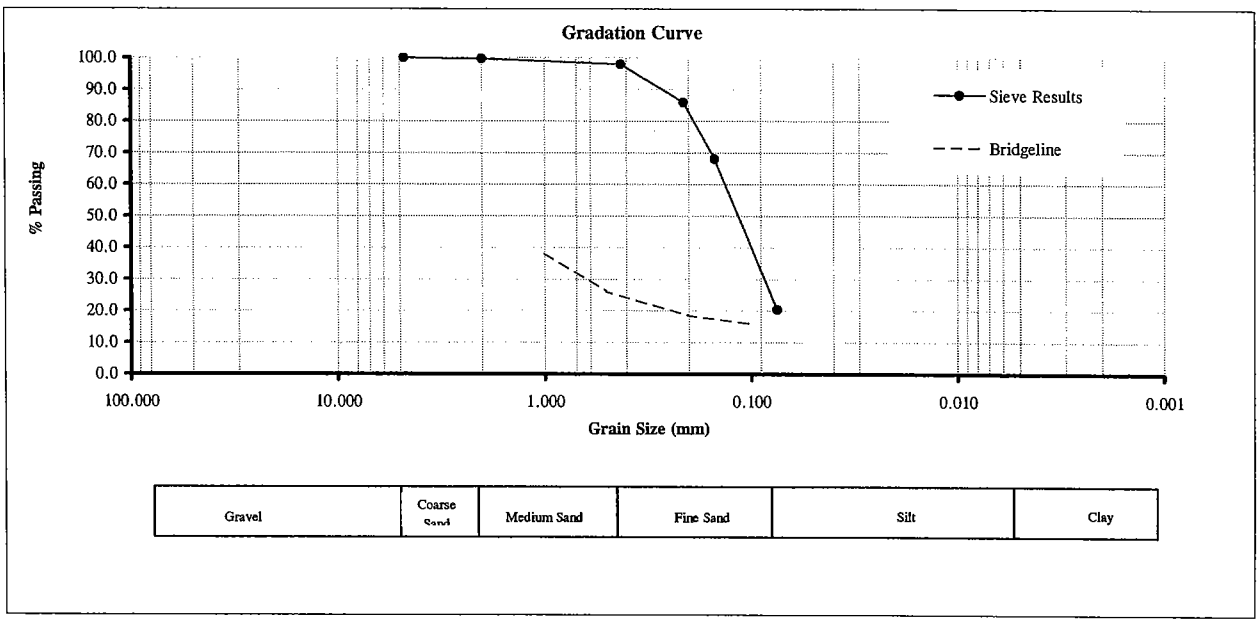
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 83.19

Error due to lost material (%) = 0.52

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.0	465.1	0.0	0.0	100.0
10	2.000	483.4	483.6	0.3	0.3	99.7
40	0.425	382.3	383.7	1.4	1.7	98.0
70	0.212	320.9	331.1	10.1	11.8	85.9
100	0.150	335.3	350.2	14.9	26.7	68.1
200	0.075	335.1	375.0	39.9	66.6	20.4
pan	--	376.4	393.4	17.1	83.6	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.3
Medium Sand	2.00mm to .425mm	1.7
Fine Sand	.425mm to .075 mm	77.6
Silt-Clay	Material smaller than .075mm	20.4

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Sample ID:	A4-SB-003-0.5'-1
Tested By:	MRP/ZKK/MN
Date:	8/7/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

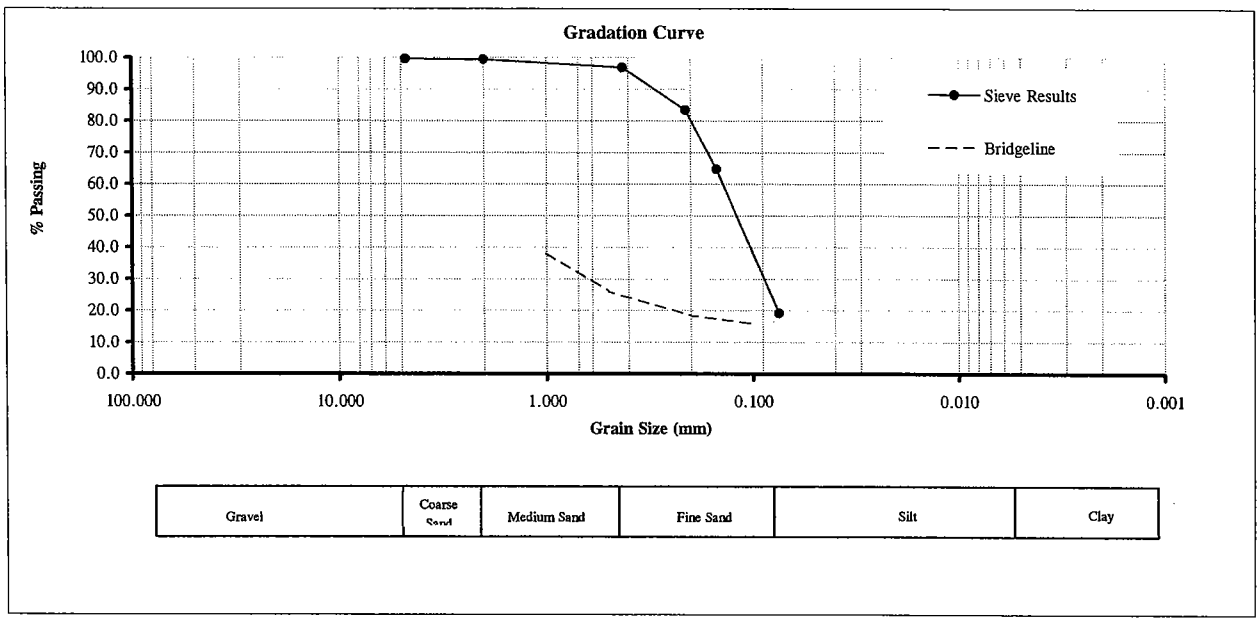
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 99.02

Error due to lost material (%) = 0.41

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.0	465.4	0.4	0.4	99.6
10	2.000	483.4	483.6	0.2	0.6	99.4
40	0.425	382.3	384.8	2.5	3.1	96.9
70	0.212	320.9	334.3	13.4	16.5	83.4
100	0.150	335.2	353.8	18.6	35.1	64.7
200	0.075	335.2	380.4	45.2	80.3	19.2
pan	--	376.4	395.5	19.1	99.4	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.4
Coarse Sand	4.75mm to 2.00mm	0.2
Medium Sand	2.00mm to .425mm	2.5
Fine Sand	.425mm to .075 mm	77.7
Silt-Clay	Material smaller than .075mm	19.2

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Sample ID:	A4-SB-003-4.5'
Tested By:	MRP
Date:	8/6/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

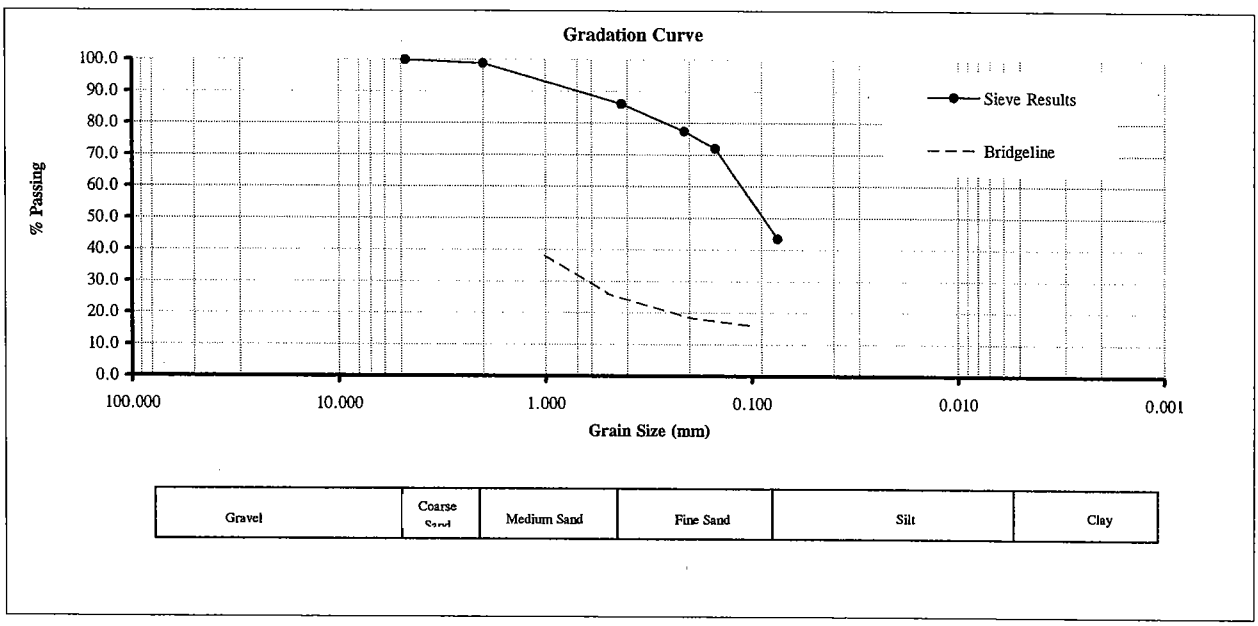
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.53

Error due to lost material (%) = 0.04

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.2	465.4	0.3	0.3	99.9
10	2.000	483.6	489.5	5.9	6.2	98.8
40	0.425	382.3	446.2	63.8	70.0	86.0
70	0.212	321.0	364.0	43.0	113.0	77.4
100	0.150	335.3	362.8	27.5	140.5	71.9
200	0.075	335.2	478.0	142.8	283.3	43.4
pan	--	376.5	593.5	217.0	500.3	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.1
Coarse Sand	4.75mm to 2.00mm	1.1
Medium Sand	2.00mm to .425mm	12.8
Fine Sand	.425mm to .075 mm	42.6
Silt-Clay	Material smaller than .075mm	43.4

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Geotechnical Laboratory
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Suite E
Okemos, MI 48864

Client/Project:	Bec-Jay Scales Site
Job No.:	24CH.67201.00
Task:	0003
Sample ID:	A4-SB-003-9.0'
Tested By:	MRP/MN
Date:	8/6/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

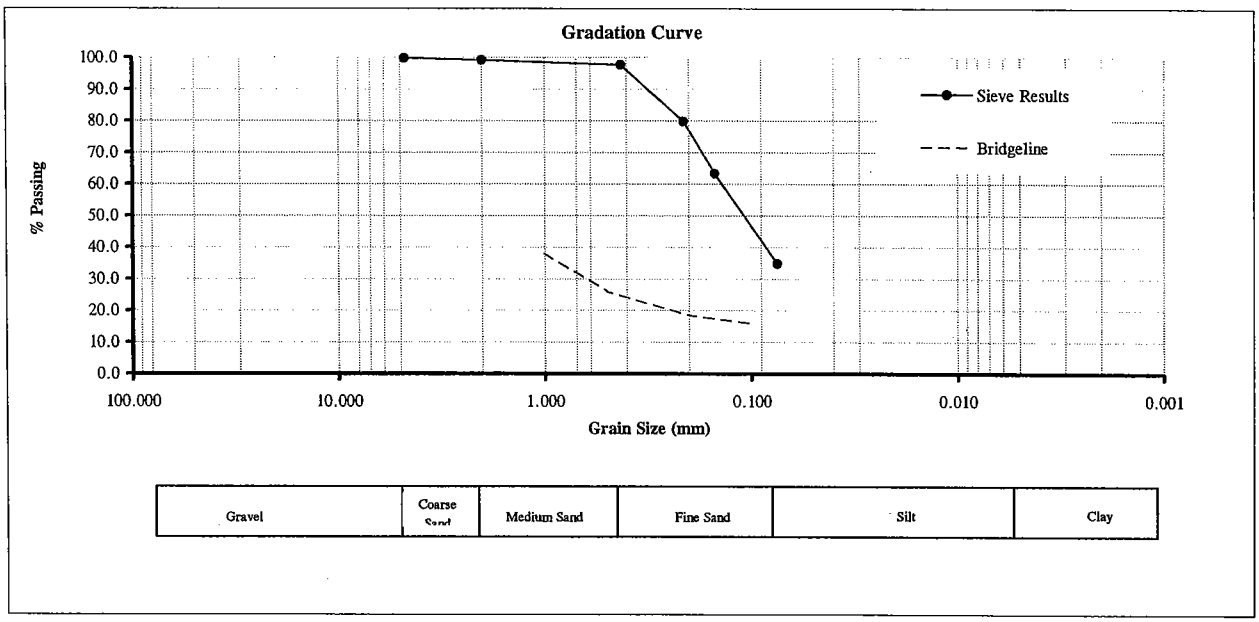
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.49

Error due to lost material (%) = 0.09

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	466.2	1.0	1.0	99.8
10	2.000	483.5	486.3	2.9	3.9	99.2
40	0.425	382.3	389.7	7.4	11.3	97.7
70	0.212	320.9	410.8	89.8	101.2	79.8
100	0.150	335.3	418.0	82.7	183.8	63.3
200	0.075	335.2	478.1	143.0	326.8	34.8
pan	--	376.5	550.6	174.2	500.9	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.2
Coarse Sand	4.75mm to 2.00mm	0.6
Medium Sand	2.00mm to .425mm	1.5
Fine Sand	.425mm to .075 mm	62.9
Silt-Clay	Material smaller than .075mm	34.8

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Client/Project:	**Bee-Jay Scales Site**
Job No.:	**24CH.67201.00**
Task:	**0003**
Sample ID:	**A5-SS-001-0.5'**
Tested By:	**MRP/ZKK/MN**
Date:	**8/7/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

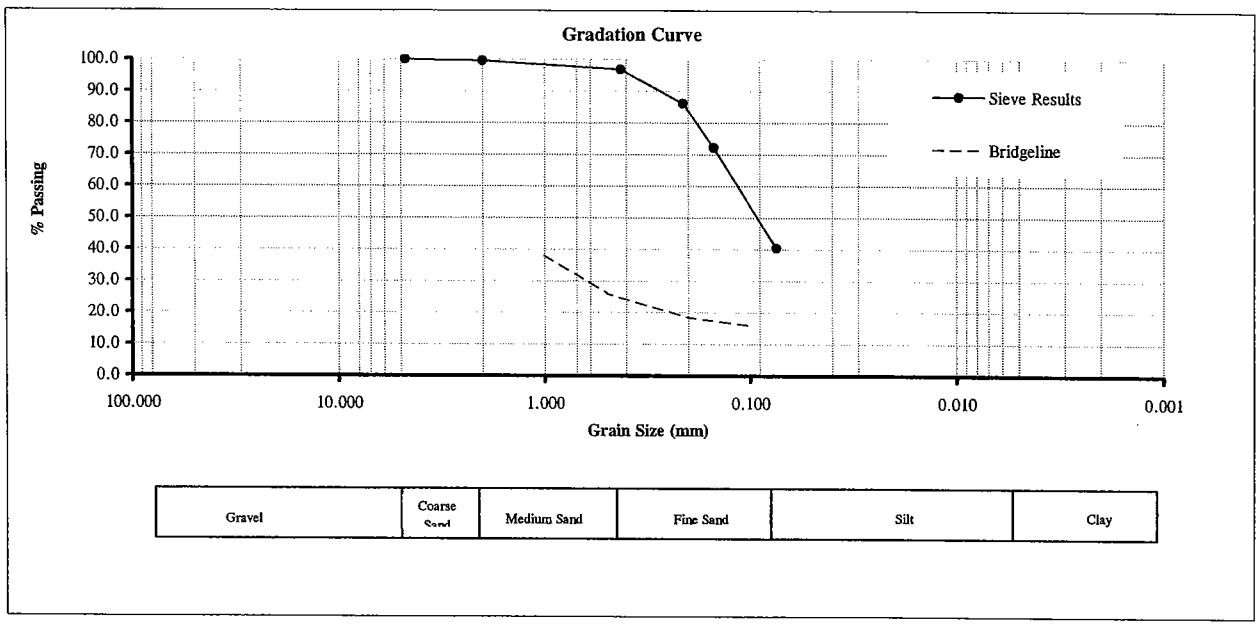
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 105.85

Error due to lost material (%) = 0.65

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.0	465.0	0.0	0.0	100.0
10	2.000	483.4	483.8	0.4	0.4	99.6
40	0.425	382.3	385.2	2.9	3.4	96.8
70	0.212	320.9	332.4	11.4	14.8	86.1
100	0.150	335.2	350.1	14.9	29.7	72.1
200	0.075	335.1	368.9	33.8	63.5	40.4
pan	--	376.3	419.4	43.0	106.5	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.4
Medium Sand	2.00mm to .425mm	2.8
Fine Sand	.425mm to .075 mm	56.4
Silt-Clay	Material smaller than .075mm	40.4

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Client/Project:	**Bee-Jay Scales Site**
Job No.:	**24CH.67201.00**
Task:	**0003**
Sample ID:	**A5-SS-004-0.5'**
Tested By:	**MRP/ZKK/MN**
Date:	**8/7/2003**

GRAIN SIZE ANALYSIS (ASTM D 422)

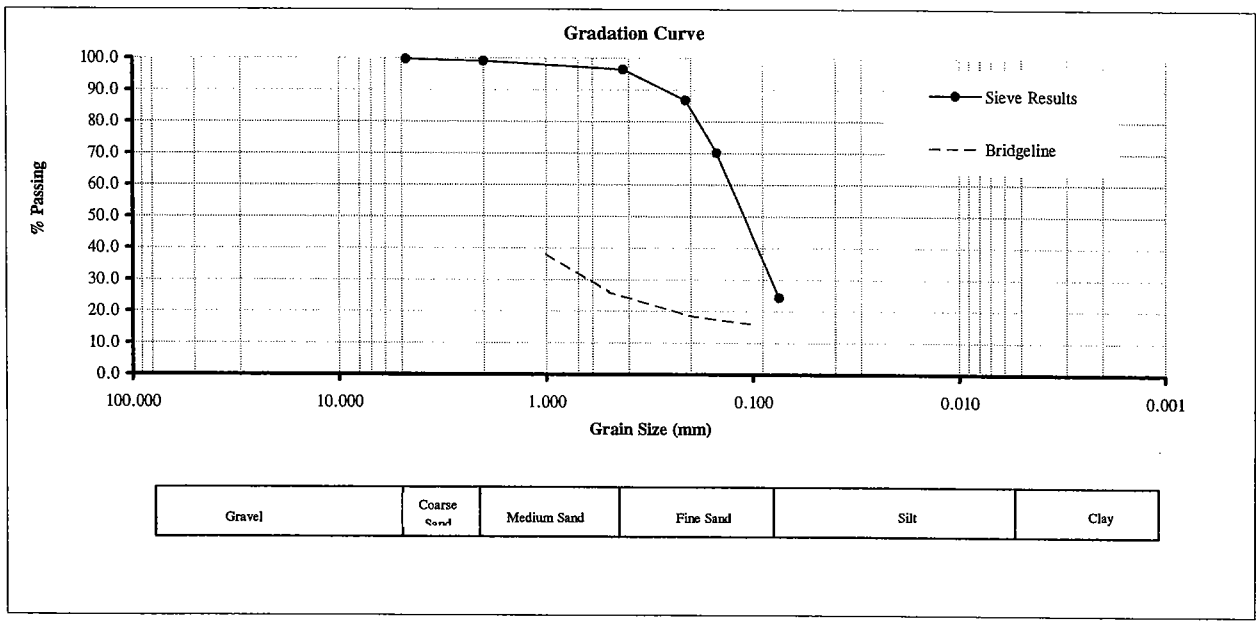
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 98.89

Error due to lost material (%) = 0.35

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	465.3	0.3	0.3	99.7
10	2.000	483.4	484.0	0.6	0.9	99.1
40	0.425	382.3	384.9	2.6	3.5	96.5
70	0.212	321.0	330.6	9.6	13.1	86.8
100	0.150	335.3	351.8	16.4	29.6	70.2
200	0.075	335.1	380.7	45.6	75.1	24.3
pan	--	376.4	400.5	24.1	99.2	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.3
Coarse Sand	4.75mm to 2.00mm	0.6
Medium Sand	2.00mm to .425mm	2.6
Fine Sand	.425mm to .075 mm	72.2
Silt-Clay	Material smaller than .075mm	24.3

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	0003
Sample ID:	A6-SB-001-4.5'
Tested By:	MRP/MN
Date:	8/6/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

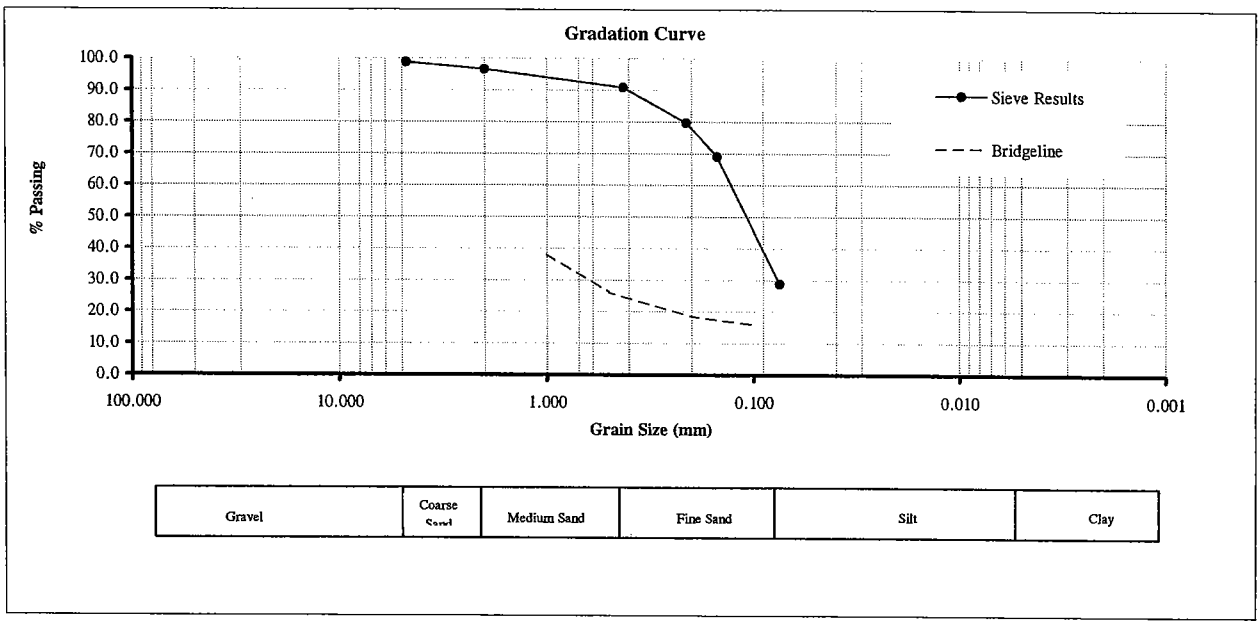
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.05

Error due to lost material (%) = 0.13

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.2	471.0	5.8	5.8	98.8
10	2.000	483.5	494.8	11.3	17.1	96.6
40	0.425	382.3	410.9	28.6	45.8	90.9
70	0.212	321.0	376.7	55.8	101.5	79.7
100	0.150	335.3	388.5	53.2	154.8	69.1
200	0.075	335.2	537.3	202.1	356.9	28.7
pan	--	376.5	520.3	143.8	500.7	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	1.2
Coarse Sand	4.75mm to 2.00mm	2.2
Medium Sand	2.00mm to .425mm	5.7
Fine Sand	.425mm to .075 mm	62.2
Silt-Clay	Material smaller than .075mm	28.7

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Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	0003
Sample ID:	A6-SB-001-7.5'
Tested By:	MRP/MN
Date:	8/6/2003

GRAIN SIZE ANALYSIS (ASTM D 422)

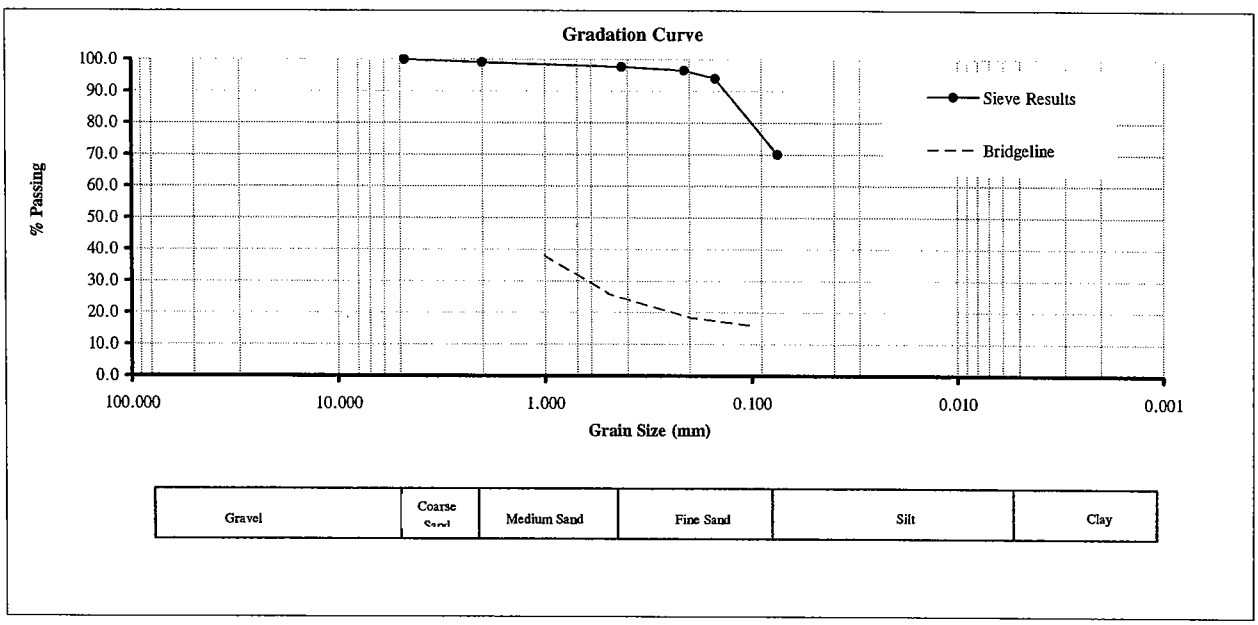
LABORATORY DATA

Sieve Analysis

Mass of soil used (g) = 500.34

Error due to lost material (%) = 0.10

Sieve Number	Opening Size (mm)	Sieve Mass (grams)	Total Mass (grams)	Soil Mass (grams)	Cum. Mass (grams)	Percent Passing
4	4.750	465.1	465.2	0.1	0.1	100.0
10	2.000	483.6	487.8	4.3	4.3	99.1
40	0.425	382.3	389.6	7.3	11.6	97.7
70	0.212	321.1	326.5	5.4	17.0	96.6
100	0.150	335.3	348.5	13.2	30.2	94.0
200	0.075	335.2	454.6	119.4	149.6	70.1
pan	--	376.4	726.7	350.3	499.9	0.0



Soil Grain Size Distribution By Sieve Analysis

Soil Fraction	Size Range	% of Total
Gravel	75mm to 4.75mm	0.0
Coarse Sand	4.75mm to 2.00mm	0.9
Medium Sand	2.00mm to .425mm	1.4
Fine Sand	.425mm to .075 mm	27.6
Silt-Clay	Material smaller than .075mm	70.1

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HYDRAULIC CONDUCTIVITY ANALYSIS

ASTM D 5084 (Method C)

Client/Project:	Bee-Jay Scales Site
Job No.:	24CH.67201.00
Task:	.0003
Sample ID:	MW-7-31.5'
Tested By:	ZKK
Date:	8/6/2003
Sample Condition: (Undisturbed or Remolded)	Undisturbed

Sample Description:

Brown clayey sand.

Initial Sample Data:

Sample Length (cm)	7.26
Diameter (cm)	3.47
Mass of Sample (cm)	119.80
$Area_{sample}$ (cm^2)	9.48

Final Sample Data:

Sample Length (cm)	7.19
Diameter (cm)	3.48
Mass of Sample (g)	125.31
$Area_{sample}$ (cm^2)	9.50

Initial Water Content:

Tare (g)	8.34
Tare + $Sample_{wet}$ (g)	48.07
Tare + $Sample_{dry}$ (g)	44.1
ω%	11.1

Final Water Content Data:

Tare (g)	8.04
Tare + $Sample_{wet}$ (g)	133.35
Tare + $Sample_{dry}$ (g)	102.32
ω%	32.9

Initial Sample Density:

	g/cm^3	lb/ft^3
Wet Density	1.72	107.6
Dry Density	1.55	96.9

Final Sample Density:

	g/cm^3	lb/ft^3
Wet Density	1.84	114.5
Dry Density	1.38	86.2

Testing Conditions:

Cell Pressure (psi)	26.3
Total Backpressure (psi)	0.0
Max. Effective Stress (psi)	26.3
Min. Effective Stress (psi)	26.3
Applied Gradient	0.0
Permeant Liquid	H_2O

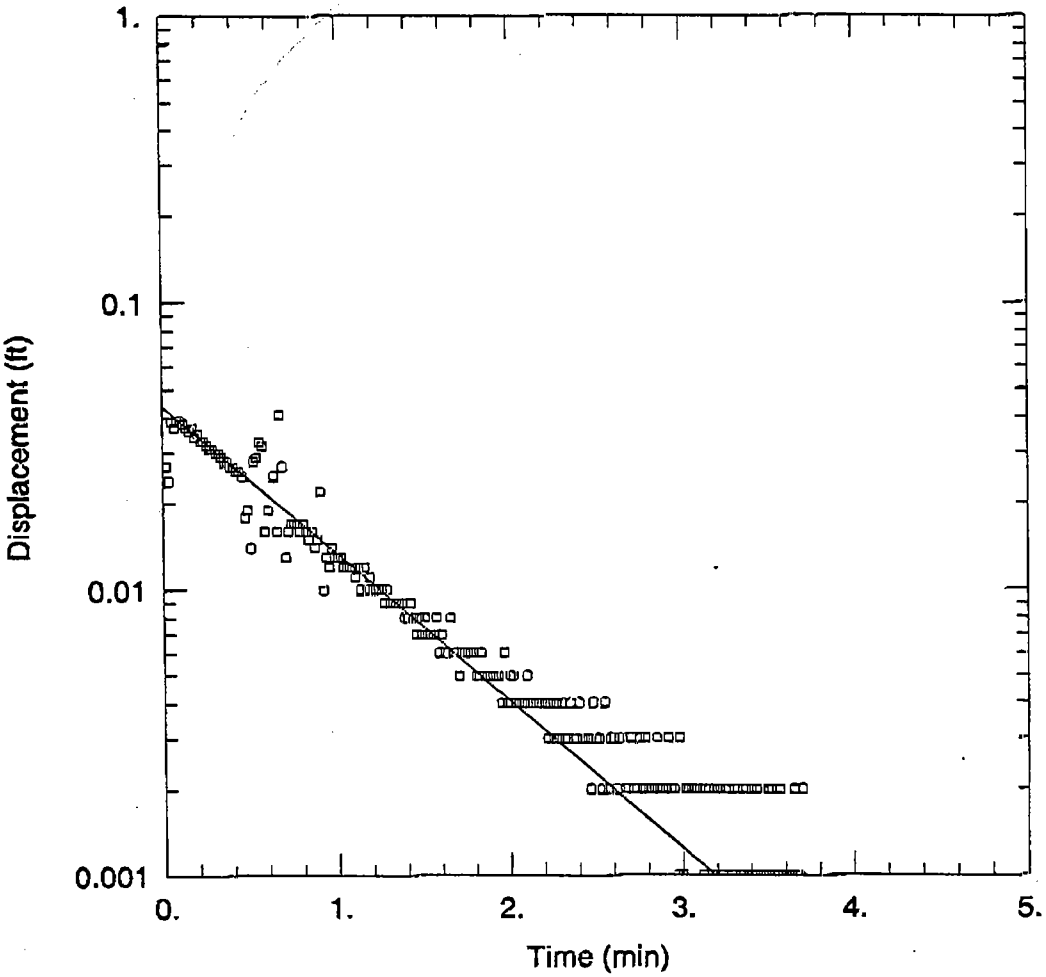
Results:

Hydraulic Conductivity (cm/sec)	**5.1E-06**

Comments

APPENDIX F

SLUG TEST RESULTS



MW-1 SLUG TEST #1

Data Set: P:\Doane Cafferty\MW1#1 Bouwer Rice.aqt
Date: 09/19/03 Time: 14:08:06

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Test Location: Bee-Jay Scales Site
Test Well: MW-1
Test Date: 07/30/03

AQUIFER DATA

Saturated Thickness: 11.07 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-1)

Initial Displacement: 2.317 ft
Wellbore Radius: 0.25 ft
Screen Length: 9.45 ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.083 ft
Well Skin Radius: 0.25 ft
Total Well Penetration Depth: 11.07 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

Data Set: P:\Doane Cafferty\MW1#1 Bouwer Rice.aqt
Title: MW-1 slug test #1
Date: 09/19/03
Time: 14:13:42

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Location: Bee-Jay Scales Site
Test Date: 07/30/03
Test Well: MW-1

AQUIFER DATA

Saturated Thickness: 11.07 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Initial Displacement: 2.317 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.25 ft
Well Skin Radius: 0.25 ft
Screen Length: 9.45 ft
Total Well Penetration Depth: 11.07 ft
Gravel Pack Porosity: 0.3

No. of observations: 221

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.0167	0.027	1.883	0.005
0.0333	0.024	1.9	0.005
0.05	0.039	1.917	0.005
0.0667	0.037	1.933	0.005
0.0833	0.039	1.95	0.004
0.1	0.039	1.967	0.006
0.1167	0.038	1.983	0.004
0.1333	0.037	2.	0.005
0.15	0.036	2.017	0.005
0.1667	0.037	2.033	0.004
0.1833	0.034	2.05	0.004
0.2	0.035	2.067	0.004
0.2167	0.033	2.083	0.004
0.2333	0.033	2.1	0.005
0.25	0.032	2.117	0.004
0.2667	0.031	2.133	0.004
0.2833	0.031	2.15	0.004
0.3	0.03	2.167	0.004
0.3167	0.03	2.183	0.004
0.3333	0.029	2.2	0.004
0.35	0.028	2.217	0.003
0.3667	0.028	2.233	0.004
0.3833	0.027	2.25	0.003

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.4	0.027	2.267	0.004
0.4167	0.026	2.283	0.003
0.4333	0.026	2.3	0.004
0.45	0.025	2.317	0.003
0.4667	0.018	2.333	0.003
0.4833	0.019	2.35	0.004
0.5	0.014	2.367	0.003
0.5167	0.028	2.383	0.003
0.5333	0.029	2.4	0.004
0.55	0.033	2.417	0.003
0.5667	0.032	2.433	0.003
0.5833	0.016	2.45	0.003
0.6	0.019	2.467	0.002
0.6333	0.025	2.483	0.004
0.65	0.016	2.5	0.003
0.6667	0.041	2.517	0.003
0.6833	0.027	2.533	0.002
0.7	0.013	2.55	0.004
0.7167	0.016	2.567	0.002
0.7333	0.017	2.583	0.003
0.75	0.017	2.6	0.003
0.7667	0.017	2.617	0.002
0.7833	0.016	2.633	0.003
0.8	0.017	2.65	0.003
0.8167	0.016	2.667	0.002
0.8333	0.015	2.683	0.002
0.85	0.016	2.7	0.003
0.8667	0.014	2.717	0.002
0.8833	0.015	2.733	0.002
0.9	0.022	2.75	0.003
0.9167	0.01	2.767	0.002
0.9333	0.013	2.783	0.003
0.95	0.012	2.8	0.002
0.9667	0.014	2.817	0.002
0.9833	0.013	2.833	0.002
1.	0.013	2.85	0.003
1.017	0.013	2.867	0.002
1.033	0.012	2.883	0.002
1.05	0.012	2.9	0.002
1.067	0.012	2.917	0.003
1.083	0.012	2.933	0.002
1.1	0.011	2.95	0.002
1.117	0.012	2.967	0.001
1.133	0.01	2.983	0.003
1.15	0.012	3.	0.001
1.167	0.01	3.017	0.002
1.183	0.011	3.033	0.002
1.2	0.01	3.05	0.002
1.217	0.01	3.067	0.002
1.233	0.01	3.083	0.002
1.25	0.01	3.1	0.002
1.267	0.009	3.117	0.001
1.283	0.01	3.133	0.002
1.3	0.009	3.15	0.002
1.317	0.009	3.167	0.001

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
1.333	0.009	3.183	0.002
1.35	0.009	3.2	0.002
1.367	0.009	3.217	0.002
1.383	0.008	3.233	0.001
1.4	0.008	3.25	0.002
1.417	0.009	3.267	0.002
1.433	0.008	3.283	0.001
1.45	0.007	3.3	0.002
1.467	0.008	3.317	0.002
1.483	0.007	3.333	0.001
1.5	0.008	3.35	0.001
1.517	0.007	3.367	0.002
1.533	0.007	3.383	0.001
1.55	0.007	3.4	0.002
1.567	0.008	3.417	0.001
1.583	0.006	3.433	0.002
1.6	0.007	3.45	0.001
1.617	0.006	3.467	0.001
1.633	0.006	3.483	0.001
1.65	0.008	3.5	0.002
1.667	0.006	3.517	0.002
1.683	0.006	3.533	0.001
1.7	0.005	3.55	0.001
1.717	0.006	3.567	0.002
1.733	0.006	3.583	0.001
1.75	0.006	3.6	0.001
1.767	0.006	3.617	0.001
1.783	0.006	3.633	0.001
1.8	0.005	3.65	0.002
1.817	0.005	3.667	0.001
1.833	0.006	3.683	0.001
1.85	0.005	3.7	0.002
1.867	0.005		

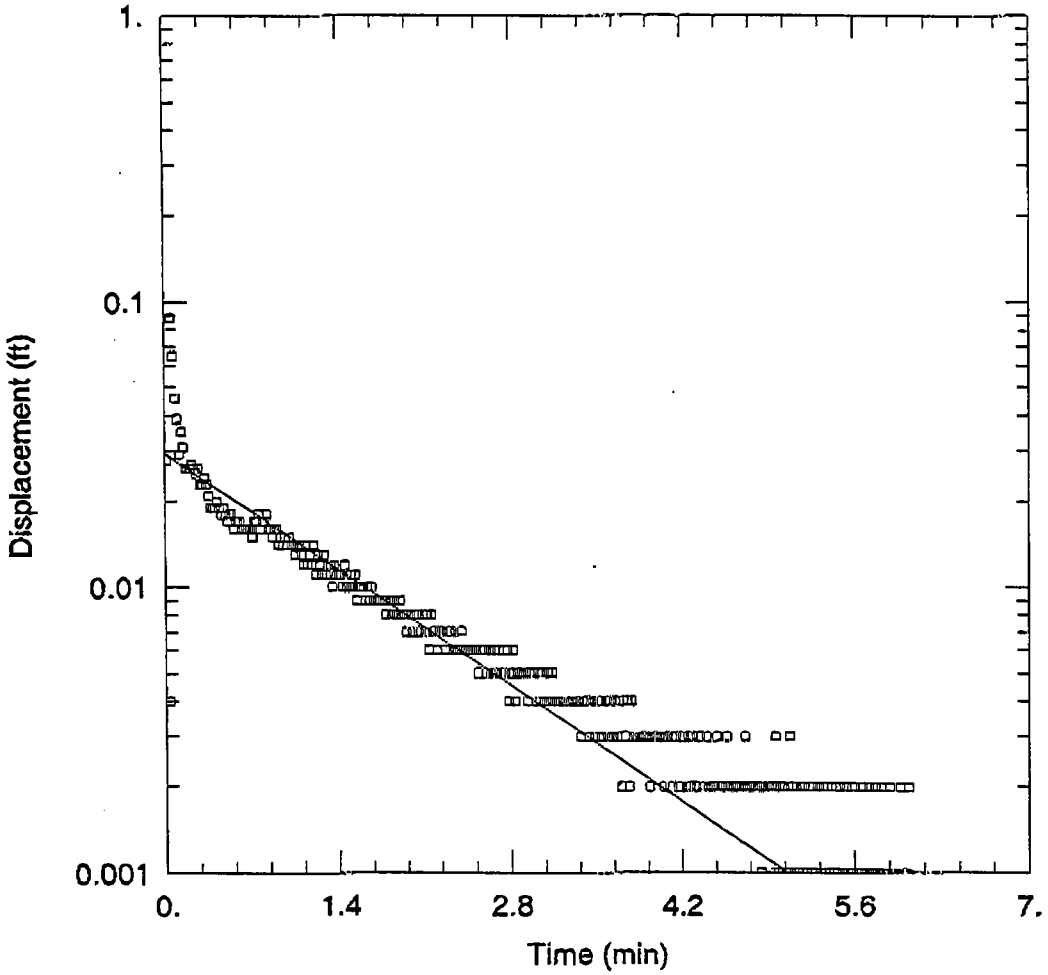
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.001638	ft/min
y0	0.04358	ft



MW-1 SLUG TEST #2

Data Set: P:\Doane Cafferty\MW1#2 Bouwer Rice.aqt
Date: 09/19/03 Time: 14:08:17

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Test Location: Bee-Jay Scales Site
Test Well: MW-1
Test Date: 07/30/03

AQUIFER DATA

Saturated Thickness: 11.06 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-1)

Initial Displacement: 2.95 ft
Wellbore Radius: 0.25 ft
Screen Length: 9.45 ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.083 ft
Well Skin Radius: 0.25 ft
Total Well Penetration Depth: 11.06 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

Data Set: P:\Doane Cafferty\MW1#2 Bouwer Rice.aqt
Title: MW-1 slug test #2
Date: 09/19/03
Time: 14:14:00

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Location: Bee-Jay Scales Site
Test Date: 07/30/03
Test Well: MW-1

AQUIFER DATA

Saturated Thickness: 11.06 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Initial Displacement: 2.95 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.25 ft
Well Skin Radius: 0.25 ft
Screen Length: 9.45 ft
Total Well Penetration Depth: 11.06 ft
Gravel Pack Porosity: 0.3

No. of observations: 362

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.0167	0.028	3.033	0.004
0.0333	0.004	3.05	0.005
0.05	0.088	3.067	0.004
0.0667	0.065	3.083	0.004
0.0833	0.046	3.1	0.005
0.1	0.039	3.117	0.004
0.1167	0.029	3.133	0.005
0.1333	0.035	3.15	0.004
0.15	0.031	3.167	0.004
0.1667	0.026	3.183	0.004
0.1833	0.026	3.2	0.004
0.2	0.026	3.217	0.004
0.2167	0.027	3.233	0.004
0.2333	0.026	3.25	0.004
0.25	0.025	3.267	0.004
0.2667	0.026	3.283	0.004
0.2833	0.023	3.3	0.004
0.3	0.023	3.317	0.004
0.3167	0.024	3.333	0.004
0.3333	0.023	3.35	0.004
0.35	0.021	3.367	0.003
0.3667	0.019	3.383	0.004
0.3833	0.019	3.4	0.004

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.4	0.019	3.417	0.004
0.4167	0.02	3.433	0.003
0.4333	0.019	3.45	0.004
0.45	0.018	3.467	0.004
0.4667	0.019	3.483	0.003
0.4833	0.018	3.5	0.004
0.5	0.017	3.517	0.004
0.5167	0.018	3.533	0.003
0.5333	0.018	3.55	0.003
0.55	0.016	3.567	0.004
0.5667	0.017	3.583	0.003
0.5833	0.017	3.6	0.004
0.6	0.017	3.617	0.003
0.6167	0.016	3.633	0.003
0.6333	0.016	3.65	0.004
0.65	0.016	3.667	0.003
0.6667	0.016	3.683	0.004
0.6833	0.016	3.7	0.002
0.7	0.015	3.717	0.004
0.7167	0.017	3.733	0.003
0.7333	0.017	3.75	0.004
0.75	0.018	3.767	0.002
0.7667	0.016	3.783	0.004
0.7833	0.017	3.8	0.003
0.8	0.017	3.817	0.003
0.8167	0.018	3.833	0.003
0.8333	0.016	3.85	0.003
0.85	0.016	3.867	0.003
0.8667	0.015	3.883	0.003
0.8833	0.016	3.9	0.003
0.9	0.016	3.917	0.003
0.9167	0.014	3.933	0.002
0.9333	0.015	3.95	0.003
0.95	0.014	3.967	0.003
0.9667	0.015	3.983	0.003
0.9833	0.014	4.	0.003
1.	0.015	4.017	0.003
1.017	0.014	4.033	0.003
1.033	0.014	4.05	0.002
1.05	0.013	4.067	0.003
1.067	0.014	4.083	0.003
1.083	0.014	4.1	0.002
1.1	0.013	4.117	0.003
1.117	0.012	4.133	0.003
1.133	0.014	4.15	0.003
1.15	0.012	4.167	0.002
1.167	0.013	4.183	0.002
1.183	0.012	4.2	0.003
1.2	0.014	4.217	0.003
1.217	0.011	4.233	0.002
1.233	0.013	4.25	0.003
1.25	0.012	4.267	0.002
1.267	0.011	4.283	0.003
1.283	0.013	4.3	0.002
1.3	0.011	4.317	0.002

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
1.317	0.012	4.333	0.003
1.333	0.012	4.35	0.003
1.35	0.01	4.367	0.002
1.367	0.012	4.383	0.002
1.383	0.011	4.4	0.003
1.4	0.011	4.417	0.002
1.417	0.011	4.433	0.002
1.433	0.01	4.45	0.002
1.45	0.012	4.467	0.002
1.467	0.01	4.483	0.003
1.483	0.01	4.5	0.002
1.5	0.011	4.517	0.002
1.517	0.01	4.533	0.002
1.533	0.011	4.55	0.002
1.55	0.009	4.567	0.003
1.567	0.01	4.583	0.002
1.583	0.01	4.6	0.002
1.6	0.01	4.617	0.002
1.617	0.009	4.633	0.002
1.633	0.01	4.65	0.002
1.65	0.009	4.667	0.002
1.667	0.01	4.683	0.002
1.683	0.009	4.7	0.002
1.7	0.009	4.717	0.003
1.717	0.009	4.733	0.002
1.733	0.009	4.75	0.002
1.75	0.009	4.767	0.002
1.767	0.009	4.783	0.002
1.783	0.008	4.8	0.002
1.8	0.009	4.817	0.002
1.817	0.009	4.833	0.002
1.833	0.008	4.85	0.001
1.85	0.009	4.867	0.002
1.867	0.008	4.883	0.002
1.883	0.008	4.9	0.002
1.9	0.009	4.917	0.002
1.917	0.008	4.933	0.002
1.933	0.008	4.95	0.001
1.95	0.007	4.967	0.003
1.967	0.008	4.983	0.001
1.983	0.008	5.	0.002
2.	0.007	5.017	0.002
2.017	0.008	5.033	0.002
2.033	0.008	5.05	0.001
2.05	0.007	5.067	0.001
2.067	0.007	5.083	0.003
2.083	0.008	5.1	0.002
2.1	0.007	5.117	0.001
2.117	0.008	5.133	0.002
2.133	0.006	5.15	0.001
2.15	0.008	5.167	0.002
2.167	0.007	5.183	0.002
2.183	0.007	5.2	0.002
2.2	0.006	5.217	0.001
2.217	0.007	5.233	0.002

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
2.233	0.007	5.25	0.001
2.25	0.007	5.267	0.002
2.267	0.006	5.283	0.001
2.283	0.007	5.3	0.002
2.3	0.007	5.317	0.002
2.317	0.007	5.333	0.001
2.333	0.006	5.35	0.002
2.35	0.006	5.367	0.001
2.367	0.006	5.383	0.002
2.383	0.006	5.4	0.001
2.4	0.007	5.417	0.002
2.417	0.006	5.433	0.001
2.433	0.006	5.45	0.002
2.45	0.006	5.467	0.001
2.467	0.006	5.483	0.002
2.483	0.006	5.5	0.001
2.5	0.006	5.517	0.001
2.517	0.006	5.533	0.002
2.533	0.005	5.55	0.001
2.55	0.006	5.567	0.001
2.567	0.006	5.583	0.002
2.583	0.006	5.6	0.002
2.6	0.005	5.617	0.001
2.617	0.006	5.633	0.001
2.633	0.005	5.65	0.001
2.65	0.005	5.667	0.002
2.667	0.006	5.683	0.001
2.683	0.005	5.7	0.001
2.7	0.006	5.717	0.002
2.717	0.005	5.733	0.001
2.733	0.005	5.75	0.001
2.75	0.005	5.767	0.002
2.767	0.006	5.783	0.001
2.783	0.004	5.8	0.001
2.8	0.005	5.817	0.002
2.817	0.006	5.833	0.001
2.833	0.004	5.85	0.001
2.85	0.005	5.867	0.001
2.867	0.005	5.883	0.002
2.883	0.005	5.9	0.001
2.9	0.005	5.917	0.001
2.917	0.005	5.933	0.001
2.933	0.004	5.95	0.001
2.95	0.005	5.967	0.002
2.967	0.005	5.983	0.001
2.983	0.005	6.	0.001
3.	0.004	6.017	0.001
3.017	0.005	6.033	0.002

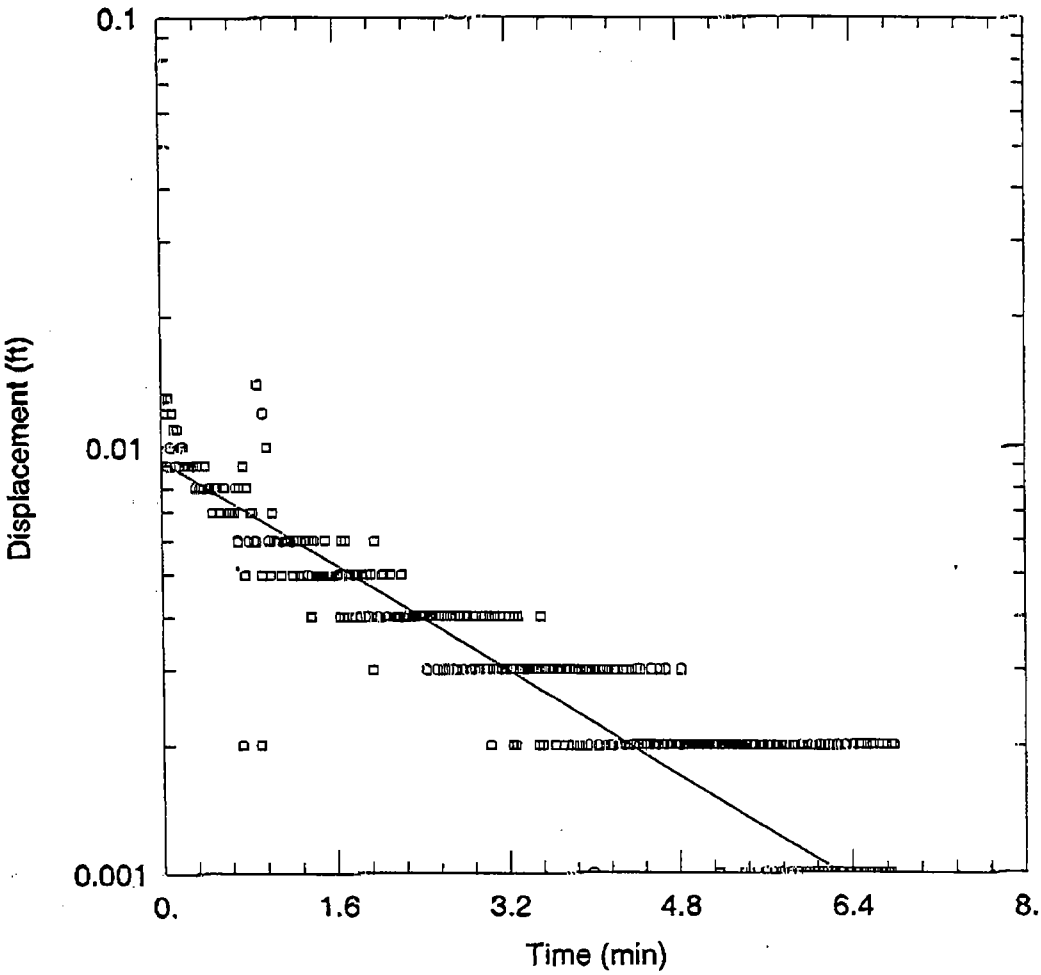
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0009215	ft/min
y0	0.02929	ft



MW-3 SLUG TEST #1

Data Set: P:\Doane Cafferty\MW3 #1 Bouwer Rice.aqt
Date: 09/19/03 Time: 14:08:25

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Test Location: Bee-Jay Scales Site
Test Well: MW-3
Test Date: 07/30/03

AQUIFER DATA

Saturated Thickness: 11.73 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-3)

Initial Displacement: 1.935 ft
Wellbore Radius: 0.25 ft
Screen Length: 9.2 ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.083 ft
Well Skin Radius: 0.25 ft
Total Well Penetration Depth: 11.73 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

Data Set: P:\Doane Cafferty\MW3 #1 Bouwer Rice.aqt
Title: MW-3 slug test #1
Date: 09/19/03
Time: 14:14:12

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Location: Bee-Jay Scales Site
Test Date: 07/30/03
Test Well: MW-3

AQUIFER DATA

Saturated Thickness: 11.73 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Initial Displacement: 1.935 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.25 ft
Well Skin Radius: 0.25 ft
Screen Length: 9.2 ft
Total Well Penetration Depth: 11.73 ft
Gravel Pack Porosity: 0.3

No. of observations: 406

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.0167	0.013	3.417	0.003
0.0333	0.012	3.433	0.003
0.05	0.009	3.45	0.003
0.0667	0.013	3.467	0.003
0.0833	0.01	3.483	0.002
0.1	0.012	3.5	0.004
0.1167	0.011	3.517	0.002
0.1333	0.009	3.533	0.003
0.15	0.011	3.55	0.003
0.1667	0.009	3.567	0.003
0.1833	0.01	3.583	0.003
0.2	0.01	3.6	0.003
0.2167	0.009	3.617	0.003
0.2333	0.009	3.633	0.002
0.25	0.009	3.65	0.003
0.2667	0.009	3.667	0.003
0.2833	0.009	3.683	0.003
0.3	0.009	3.7	0.003
0.3167	0.008	3.717	0.002
0.3333	0.009	3.733	0.003
0.35	0.008	3.75	0.003
0.3667	0.008	3.767	0.003
0.3833	0.008	3.783	0.002

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.4	0.009	3.8	0.003
0.4167	0.008	3.817	0.003
0.4333	0.008	3.833	0.002
0.45	0.008	3.85	0.003
0.4667	0.007	3.867	0.003
0.4833	0.008	3.883	0.002
0.5	0.008	3.9	0.003
0.5167	0.008	3.917	0.003
0.5333	0.007	3.933	0.002
0.55	0.007	3.95	0.003
0.5667	0.008	3.967	0.003
0.5833	0.008	3.983	0.001
0.6	0.007	4.	0.003
0.6167	0.007	4.017	0.003
0.6333	0.007	4.033	0.002
0.65	0.007	4.05	0.002
0.6667	0.007	4.067	0.003
0.6833	0.008	4.083	0.003
0.7	0.006	4.1	0.002
0.7167	0.008	4.117	0.003
0.7333	0.002	4.133	0.003
0.75	0.009	4.15	0.002
0.7667	0.005	4.167	0.002
0.7833	0.008	4.183	0.003
0.8	0.006	4.2	0.003
0.8167	0.007	4.217	0.002
0.8333	0.007	4.233	0.002
0.85	0.006	4.25	0.002
0.8667	0.006	4.267	0.003
0.8833	0.014	4.283	0.002
0.9	0.002	4.3	0.003
0.9167	0.005	4.317	0.002
0.9333	0.012	4.333	0.002
0.9667	0.01	4.35	0.003
0.9833	0.006	4.367	0.002
1.	0.005	4.383	0.002
1.017	0.007	4.4	0.003
1.033	0.006	4.417	0.002
1.05	0.006	4.433	0.003
1.067	0.006	4.45	0.002
1.083	0.006	4.467	0.002
1.1	0.005	4.483	0.002
1.117	0.006	4.5	0.002
1.133	0.006	4.517	0.002
1.15	0.006	4.533	0.003
1.167	0.006	4.55	0.002
1.183	0.006	4.567	0.002
1.2	0.005	4.583	0.002
1.217	0.006	4.6	0.002
1.233	0.006	4.617	0.003
1.25	0.006	4.633	0.002
1.267	0.005	4.65	0.002
1.283	0.006	4.667	0.003
1.3	0.005	4.683	0.002
1.317	0.006	4.7	0.002

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
1.333	0.005	4.717	0.002
1.35	0.006	4.733	0.002
1.367	0.004	4.75	0.002
1.383	0.006	4.767	0.002
1.4	0.006	4.783	0.002
1.417	0.005	4.8	0.002
1.433	0.005	4.817	0.003
1.45	0.005	4.833	0.002
1.467	0.005	4.85	0.002
1.483	0.005	4.867	0.002
1.5	0.006	4.883	0.002
1.517	0.005	4.9	0.002
1.533	0.005	4.917	0.002
1.55	0.005	4.933	0.002
1.567	0.005	4.95	0.002
1.583	0.005	4.967	0.002
1.6	0.005	4.983	0.002
1.617	0.005	5.	0.002
1.633	0.004	5.017	0.002
1.65	0.006	5.033	0.002
1.667	0.004	5.05	0.002
1.683	0.006	5.067	0.002
1.7	0.004	5.083	0.002
1.717	0.005	5.1	0.002
1.733	0.005	5.117	0.002
1.75	0.004	5.133	0.002
1.767	0.005	5.15	0.002
1.783	0.005	5.167	0.001
1.8	0.005	5.183	0.002
1.817	0.004	5.2	0.002
1.833	0.005	5.217	0.002
1.85	0.005	5.233	0.002
1.867	0.004	5.25	0.002
1.883	0.005	5.267	0.002
1.9	0.004	5.283	0.002
1.917	0.005	5.3	0.002
1.933	0.003	5.317	0.002
1.95	0.006	5.333	0.002
1.967	0.004	5.35	0.002
1.983	0.004	5.367	0.002
2.	0.004	5.383	0.002
2.017	0.005	5.4	0.001
2.033	0.005	5.417	0.002
2.05	0.004	5.433	0.002
2.067	0.004	5.45	0.001
2.083	0.004	5.467	0.002
2.1	0.005	5.483	0.002
2.117	0.004	5.5	0.002
2.133	0.004	5.517	0.001
2.15	0.004	5.533	0.002
2.167	0.004	5.55	0.002
2.183	0.004	5.567	0.002
2.2	0.005	5.583	0.002
2.217	0.004	5.6	0.001
2.233	0.004	5.617	0.002

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
2.25	0.004	5.633	0.002
2.267	0.004	5.65	0.002
2.283	0.004	5.667	0.001
2.3	0.004	5.683	0.002
2.317	0.004	5.7	0.002
2.333	0.004	5.717	0.002
2.35	0.004	5.733	0.001
2.367	0.004	5.75	0.002
2.383	0.004	5.767	0.001
2.4	0.004	5.783	0.002
2.417	0.004	5.8	0.002
2.433	0.003	5.817	0.002
2.45	0.004	5.833	0.001
2.467	0.004	5.85	0.002
2.483	0.004	5.867	0.002
2.5	0.004	5.883	0.001
2.517	0.004	5.9	0.001
2.533	0.003	5.917	0.002
2.55	0.004	5.933	0.002
2.567	0.004	5.95	0.002
2.583	0.003	5.967	0.001
2.6	0.004	5.983	0.002
2.617	0.004	6.	0.001
2.633	0.003	6.017	0.002
2.65	0.004	6.033	0.002
2.667	0.004	6.05	0.001
2.683	0.003	6.067	0.002
2.7	0.004	6.083	0.001
2.717	0.003	6.1	0.002
2.733	0.004	6.117	0.002
2.75	0.004	6.133	0.001
2.767	0.003	6.15	0.002
2.783	0.003	6.167	0.001
2.8	0.004	6.183	0.002
2.817	0.004	6.2	0.001
2.833	0.003	6.217	0.002
2.85	0.003	6.233	0.001
2.867	0.004	6.25	0.002
2.883	0.003	6.267	0.002
2.9	0.004	6.283	0.001
2.917	0.003	6.3	0.001
2.933	0.003	6.317	0.001
2.95	0.004	6.333	0.002
2.967	0.004	6.35	0.002
2.983	0.003	6.367	0.001
3.	0.003	6.383	0.001
3.017	0.004	6.4	0.002
3.033	0.002	6.417	0.002
3.05	0.003	6.433	0.001
3.067	0.004	6.45	0.001
3.083	0.003	6.467	0.002
3.1	0.003	6.483	0.002
3.117	0.004	6.5	0.001
3.133	0.003	6.517	0.001
3.15	0.003	6.533	0.002

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
3.167	0.003	6.55	0.001
3.183	0.003	6.567	0.001
3.2	0.004	6.583	0.002
3.217	0.003	6.6	0.002
3.233	0.002	6.617	0.001
3.25	0.004	6.633	0.001
3.267	0.002	6.65	0.002
3.283	0.004	6.667	0.001
3.3	0.003	6.683	0.001
3.317	0.003	6.7	0.001
3.333	0.003	6.717	0.002
3.35	0.003	6.733	0.001
3.367	0.003	6.75	0.001
3.383	0.003	6.767	0.002
3.4	0.003	6.783	0.002

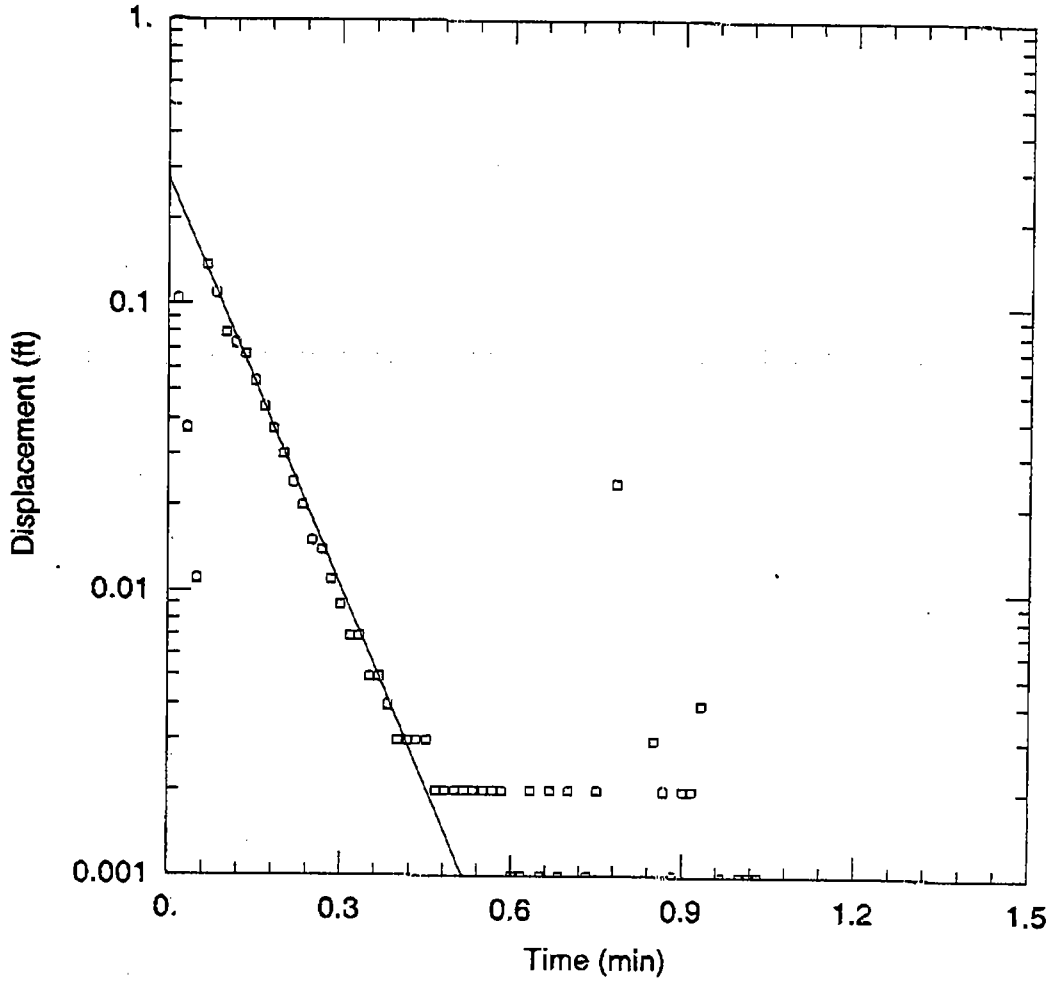
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.0005064	ft/min
y0	0.009261	ft



MW-4 SLUG TEST

Data Set: P:\Doane Cafferty\MW4 Bouwer Rice.aqt
Date: 09/19/03 Time: 14:08:34

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Test Location: Bee-Jay Scales Site
Test Well: MW-4
Test Date: 07/30/03

AQUIFER DATA

Saturated Thickness: 8.77 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-4)

Initial Displacement: 1.322 ft
Wellbore Radius: 0.25 ft
Screen Length: 9.49 ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.083 ft
Well Skin Radius: 0.25 ft
Total Well Penetration Depth: 8.77 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

Data Set: P:\Doane Cafferty\MW4 Bouwer Rice.aqt
Title: MW-4 slug test
Date: 09/19/03
Time: 14:14:27

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Location: Bee-Jay Scales Site
Test Date: 07/30/03
Test Well: MW-4

AQUIFER DATA

Saturated Thickness: 8.77 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Initial Displacement: 1.322 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.25 ft
Well Skin Radius: 0.25 ft
Screen Length: 9.49 ft
Total Well Penetration Depth: 8.77 ft
Gravel Pack Porosity: 0.3

No. of observations: 55

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.0167	0.104	0.4833	0.002
0.0333	0.037	0.5	0.002
0.05	0.011	0.5167	0.002
0.0667	0.137	0.5333	0.002
0.0833	0.109	0.55	0.002
0.1	0.079	0.5667	0.002
0.1167	0.073	0.5833	0.002
0.1333	0.067	0.6	0.001
0.15	0.054	0.6167	0.001
0.1667	0.044	0.6333	0.002
0.1833	0.037	0.65	0.001
0.2	0.03	0.6667	0.002
0.2167	0.024	0.6833	0.001
0.2333	0.02	0.7	0.002
0.25	0.015	0.7333	0.001
0.2667	0.014	0.75	0.002
0.2833	0.011	0.7833	0.024
0.3	0.009	0.85	0.003
0.3167	0.007	0.8667	0.002
0.3333	0.007	0.8833	0.001
0.35	0.005	0.9	0.002
0.3667	0.005	0.9167	0.002
0.3833	0.004	0.9333	0.004

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.4	0.003	0.9667	0.001
0.4167	0.003	1.	0.001
0.4333	0.003	1.017	0.001
0.45	0.003	1.033	0.001
0.4667	0.002		

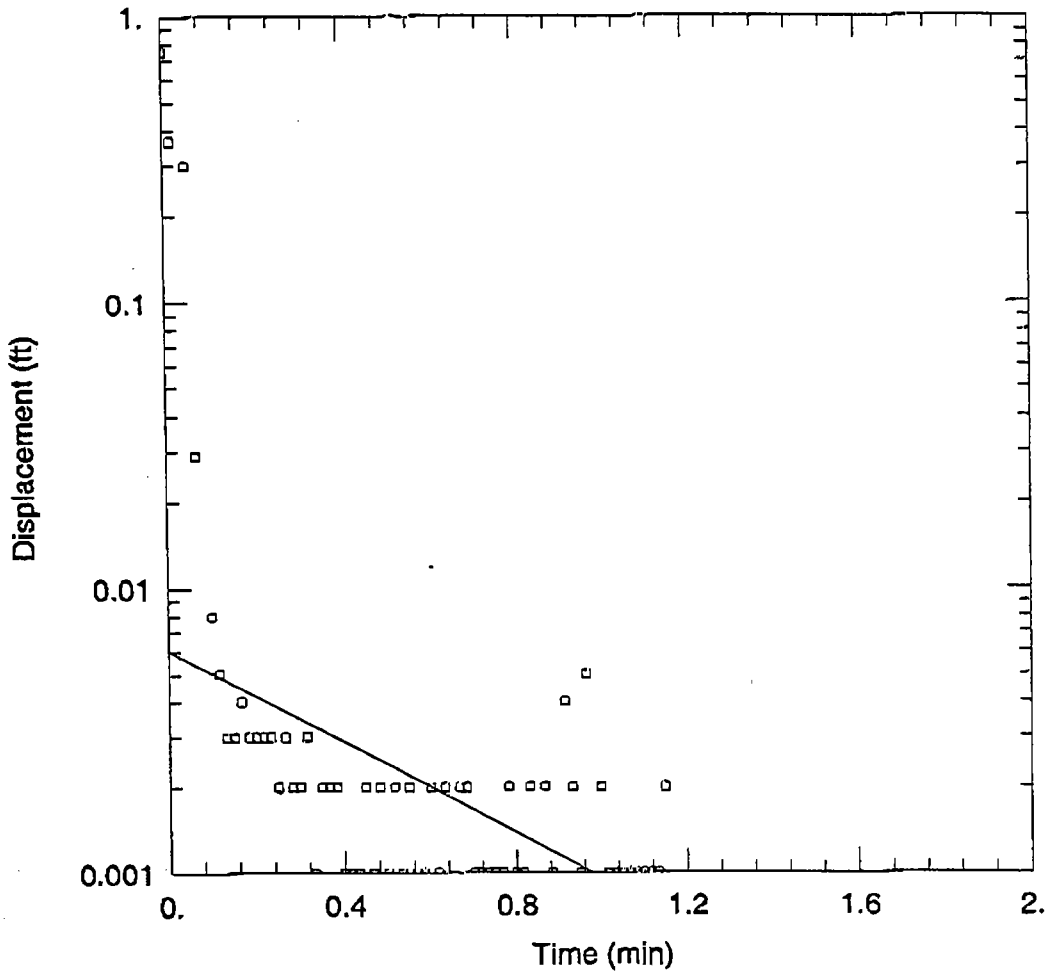
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.03693	ft/min
y0	0.2771	ft



MW-5 SLUG TEST

Data Set: P:\Doane Cafferty\MW5 Bouwer Rice.aqt
Date: 09/19/03 Time: 14:08:42

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Test Location: Bee-Jay Scales Site
Test Well: MW-5
Test Date: 07/30/03

AQUIFER DATA

Saturated Thickness: 8.05 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-5)

Initial Displacement: 0.754 ft
Wellbore Radius: 0.25 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.083 ft
Well Skin Radius: 0.25 ft
Total Well Penetration Depth: 8.05 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

Data Set: P:\Doane Cafferty\MW5 Bouwer Rice.aqt
Title: MW-5 slug test
Date: 09/19/03
Time: 14:14:39

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Location: Bee-Jay Scales Site
Test Date: 07/30/03
Test Well: MW-5

AQUIFER DATA

Saturated Thickness: 8.05 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Initial Displacement: 0.754 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.25 ft
Well Skin Radius: 0.25 ft
Screen Length: 10. ft
Total Well Penetration Depth: 8.05 ft
Gravel Pack Porosity: 0.3

No. of observations: 63

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.0167	0.367	0.5833	0.001
0.05	0.301	0.6	0.002
0.0667	0.029	0.6167	0.001
0.1	0.008	0.6333	0.002
0.1167	0.005	0.6667	0.002
0.1333	0.003	0.6833	0.002
0.15	0.003	0.7	0.001
0.1667	0.004	0.7167	0.001
0.1833	0.003	0.7333	0.001
0.2	0.003	0.75	0.001
0.2167	0.003	0.7667	0.001
0.2333	0.003	0.7833	0.002
0.25	0.002	0.8	0.001
0.2667	0.003	0.8167	0.001
0.2833	0.002	0.8333	0.002
0.3	0.002	0.8667	0.002
0.3167	0.003	0.8833	0.001
0.3333	0.001	0.9167	0.004
0.35	0.002	0.9333	0.002
0.3667	0.002	0.95	0.001
0.3833	0.002	0.9667	0.005
0.4	0.001	1.	0.002
0.4167	0.001	1.017	0.001

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.4333	0.001	1.033	0.001
0.45	0.002	1.05	0.001
0.4667	0.001	1.067	0.001
0.4833	0.002	1.083	0.001
0.5	0.001	1.1	0.001
0.5167	0.002	1.117	0.001
0.5333	0.001	1.133	0.001
0.55	0.002	1.15	0.002
0.5667	0.001		

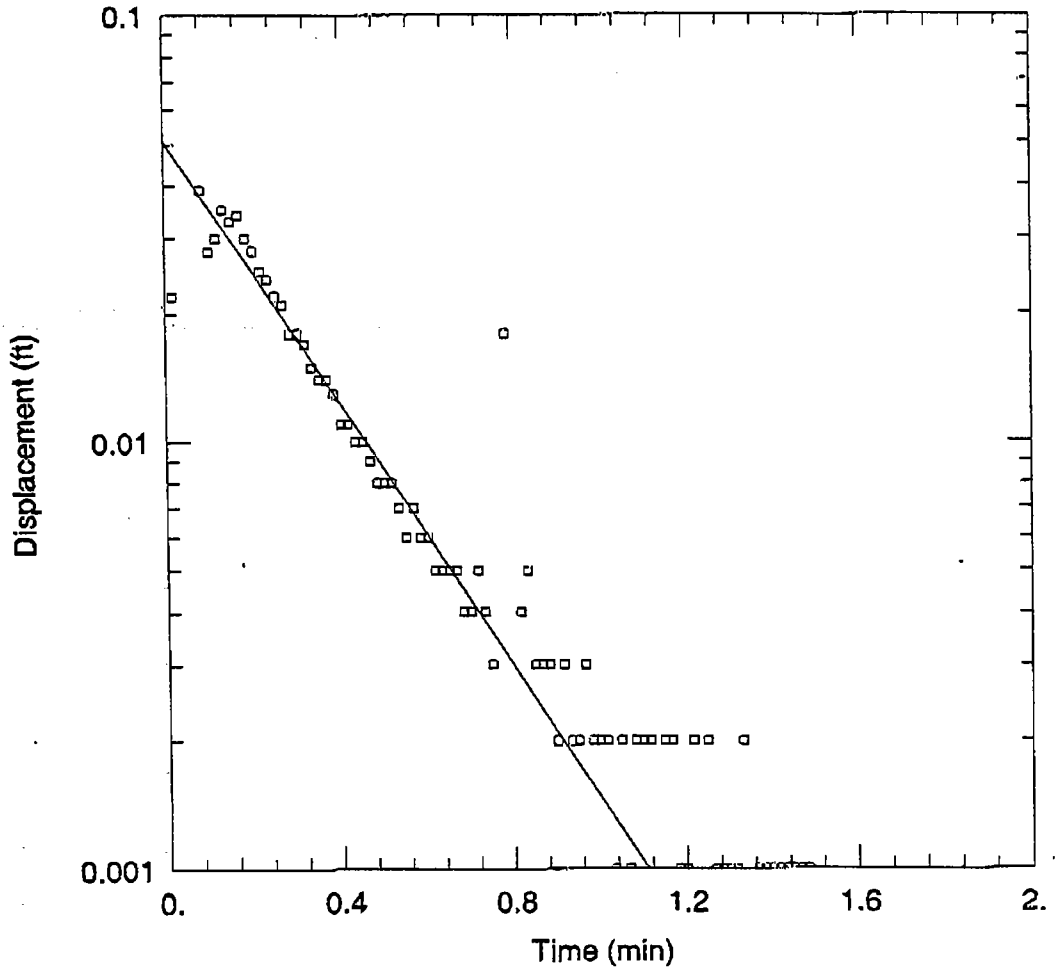
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.005795	ft/min
y0	0.006042	ft



MW-6 SLUG TEST

Data Set: P:\Doane Cafferty\MW6 Bouwer Rice.aqt
Date: 09/19/03 Time: 14:08:52

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Test Location: Bee-Jay Scales Site
Test Well: MW-6
Test Date: 07/30/03

AQUIFER DATA

Saturated Thickness: 9.07 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-6)

Initial Displacement: 0.919 ft
Wellbore Radius: 0.25 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.083 ft
Well Skin Radius: 0.25 ft
Total Well Penetration Depth: 9.07 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

Data Set: P:\Doane Cafferty\MW6 Bouwer Rice.aqt
Title: MW-6 slug test
Date: 09/19/03
Time: 14:14:51

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Location: Bee-Jay Scales Site
Test Date: 07/30/03
Test Well: MW-6

AQUIFER DATA

Saturated Thickness: 9.07 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Initial Displacement: 0.919 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.25 ft
Well Skin Radius: 0.25 ft
Screen Length: 10. ft
Total Well Penetration Depth: 9.07 ft
Gravel Pack Porosity: 0.3

No. of observations: 81

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.0167	0.022	0.75	0.003
0.0833	0.039	0.7833	0.018
0.1	0.028	0.8167	0.004
0.1167	0.03	0.8333	0.005
0.1333	0.035	0.85	0.003
0.15	0.033	0.8667	0.003
0.1667	0.034	0.8833	0.003
0.1833	0.03	0.9	0.002
0.2	0.028	0.9167	0.003
0.2167	0.025	0.9333	0.002
0.2333	0.024	0.95	0.002
0.25	0.022	0.9667	0.003
0.2667	0.021	0.9833	0.002
0.2833	0.018	1.	0.002
0.3	0.018	1.017	0.002
0.3167	0.017	1.033	0.001
0.3333	0.015	1.05	0.002
0.35	0.014	1.067	0.001
0.3667	0.014	1.083	0.002
0.3833	0.013	1.1	0.002
0.4	0.011	1.117	0.002
0.4167	0.011	1.15	0.002
0.4333	0.01	1.167	0.002

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.45	0.01	1.183	0.001
0.4667	0.009	1.2	0.001
0.4833	0.008	1.217	0.002
0.5	0.008	1.25	0.002
0.5167	0.008	1.267	0.001
0.5333	0.007	1.283	0.001
0.55	0.006	1.3	0.001
0.5667	0.007	1.317	0.001
0.5833	0.006	1.333	0.002
0.6	0.006	1.367	0.001
0.6167	0.005	1.383	0.001
0.6333	0.005	1.4	0.001
0.65	0.005	1.417	0.001
0.6667	0.005	1.433	0.001
0.6833	0.004	1.45	0.001
0.7	0.004	1.467	0.001
0.7167	0.005	1.483	0.001
0.7333	0.004		

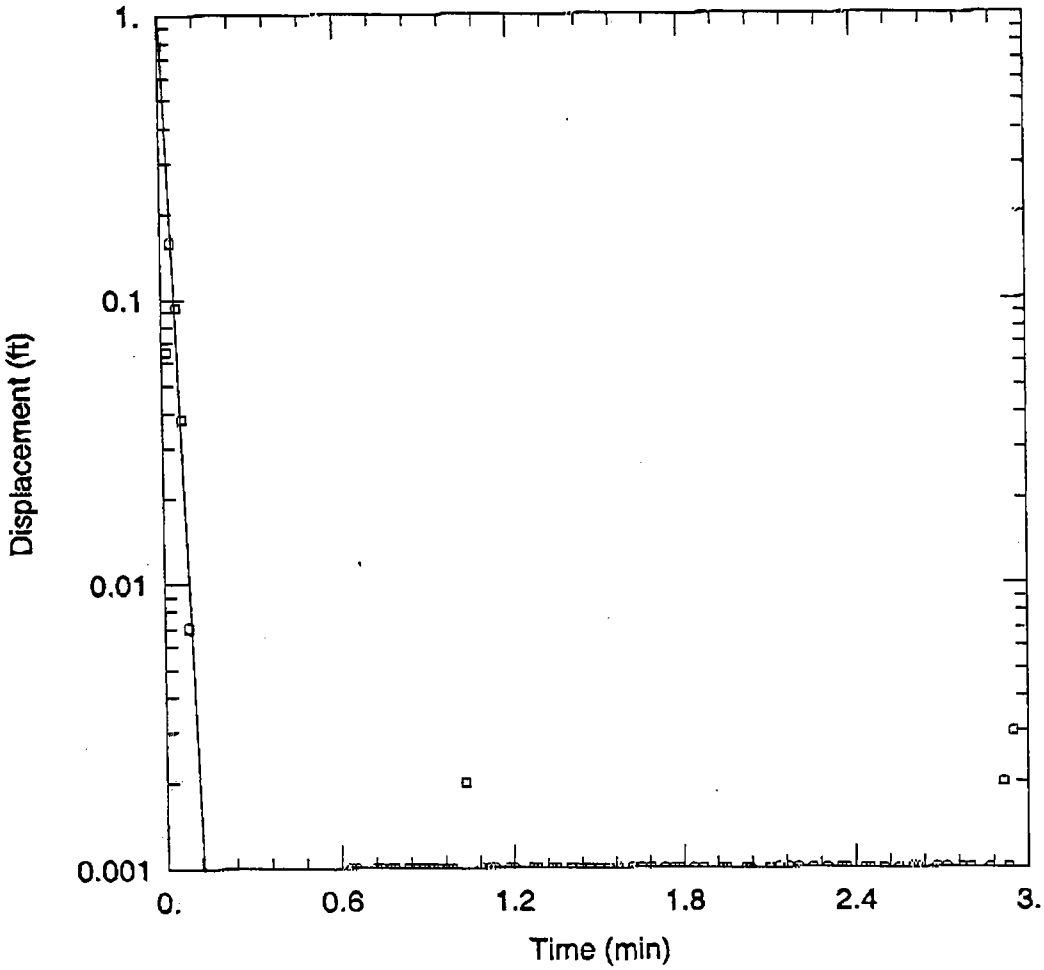
SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.01148	ft/min
y0	0.05076	ft



MW-7 SLUG TEST #1

Data Set: P:\Doane Cafferty\MW7 Bouwer Rice.aqt
Date: 09/19/03 Time: 14:08:59

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Test Location: Bee-Jay Scales Site
Test Well: MW-7
Test Date: 07/30/03

AQUIFER DATA

Saturated Thickness: 5.22 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-7)

Initial Displacement: 0.792 ft
Wellbore Radius: 0.25 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.083 ft
Well Skin Radius: 0.25 ft
Total Well Penetration Depth: 5.22 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

Data Set: P:\Doane Cafferty\MW7 Bouwer Rice.aqt
Title: MW-7 slug test #1
Date: 09/19/03
Time: 14:15:02

PROJECT INFORMATION

Company: SECOR International Inc.
Client: ChevronTexaco
Project: 24CH.67201.00
Location: Bee-Jay Scales Site
Test Date: 07/30/03
Test Well: MW-7

AQUIFER DATA

Saturated Thickness: 5.22 ft
Anisotropy Ratio (Kz/Kr): 0.1

SLUG TEST WELL DATA

Initial Displacement: 0.792 ft
Casing Radius: 0.083 ft
Wellbore Radius: 0.25 ft
Well Skin Radius: 0.25 ft
Screen Length: 10. ft
Total Well Penetration Depth: 5.22 ft
Gravel Pack Porosity: 0.3

No. of observations: 69

Observation Data

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.0167	0.065	1.617	0.001
0.0333	0.158	1.65	0.001
0.05	0.093	1.683	0.001
0.0667	0.038	1.733	0.001
0.0833	0.007	1.767	0.001
0.6333	0.001	1.783	0.001
0.65	0.001	1.833	0.001
0.7167	0.001	1.867	0.001
0.7333	0.001	1.933	0.001
0.7667	0.001	1.95	0.001
0.7833	0.001	2.017	0.001
0.8333	0.001	2.033	0.001
0.85	0.001	2.1	0.001
0.8833	0.001	2.133	0.001
0.9	0.001	2.167	0.001
0.9167	0.001	2.2	0.001
0.9333	0.001	2.25	0.001
0.9667	0.001	2.3	0.001
0.9833	0.001	2.35	0.001
1.033	0.002	2.367	0.001
1.083	0.001	2.433	0.001
1.117	0.001	2.45	0.001
1.133	0.001	2.5	0.001

Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
1.183	0.001	2.55	0.001
1.2	0.001	2.6	0.001
1.267	0.001	2.617	0.001
1.283	0.001	2.683	0.001
1.333	0.001	2.717	0.001
1.35	0.001	2.767	0.001
1.4	0.001	2.8	0.001
1.433	0.001	2.867	0.001
1.467	0.001	2.917	0.002
1.5	0.001	2.933	0.001
1.533	0.001	2.95	0.003
1.567	0.001		

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.1599	ft/min
y0	1.276	ft

APPENDIX G

SUMMARY OF INPUT PARAMETERS AND WORKBOOK CALCULATIONS OF METHOD C CULs

Worksheet for Calculating Soil Cleanup Levels for Unrestricted & Industrial Land Use

Date: 9/9/2003
Site Name: Bee-Jay Scales Site
Evaluator: Brian Deeken

Refer to WAC 173-340-720, 740, 745, 747 and 750 for details.

A. INPUT PARAMETERS FOR SOIL CLEANUP LEVEL CALCULATIONS

Note: If no data is available for any of the following inputs, then leave the input box blank

Item	Symbol	Value	Units
1. General information			
Name of Chemical:		1,2,4-Trimethylbenzene	
Measured Soil Concentration, if any:	C_s	8	mg/kg
Natural Background Concentration for Soil:	NB_s		mg/kg
Practical Quantitation Limit for Soil:	PQL_s	0.01	mg/kg
To evaluate the ingestion and dermal pathways concurrently, check here and input values for AF, ABS_d, GI:	☐		
2. Toxicological Properties of the Chemical: Chemical-Specific			
Oral Reference Dose:	RfD_o	0.05	mg/kg-day
Oral Carcinogenic Potency Factor:	CPF_o		kg-day/mg
Inhalation Reference Dose:	RfD_i		mg/kg-day
Inhalation Carcinogenic Potency Factor:	CPF_i		kg-day/mg
3. Exposure Parameters			
Inhalation Correction Factor (default = "2" for volatiles; "1" for all others): for target ground water cleanup level	INH	2	unitless
Inhalation Absorption Fraction (default = "1"): for target air cleanup level	ABS_i	1	unitless
Gastrointestinal Absorption Fraction (default = "1"): for ingestion & dermal exposure pathways	$AB1$	1	unitless
Adherence Factor (default = "0.2"): for dermal exposure pathway	AF		mg/cm^2-day
Dermal Absorption Fraction (chemical-specific or defaults): for dermal exposure pathway	ABS_d		unitless
Gastrointestinal Absorption Conversion Factor (chemical-specific or defaults): for dermal exposure pathway	GI		unitless
4. Physical and Chemical Properties of the Chemical: Chemical-Specific			
Soil Organic Carbon-Water Partitioning Coefficient: for metals, enter K_d value here and enter "1" for f_{oc} value	K_{oc}	3.720E+03	l/kg
Henry's Law Constant: for the evaluation of ground water and vapor exposure pathway	H_{cc}	2.337E-01	unitless
**If the value for Henry's Law Constant is given in the unit of "atm.m^3/mol", enter value here:*	H		atm.m^3/mol
**Converted unitless form of H_{cc} @13 °C: (Enter this converted value into "H_{cc} input Box" above for a calculation)*	H_{cc}	*0.000E+00*	unitless
Solubility of the Chemical in Water: for the calculation of soil saturation limit	S	5.700E+01	mg/l
5. Target Ground Water Cleanup Level			

Target Ground Water Cleanup Level applicable for a soil cleanup level calculation: **Results from the Ground Water Cleanup Level Worksheet are not automatically transferred into this worksheet.*	C_w	8.750E+02	ug/l
6. Site-Specific Hydrogeological Characteristics			
Total Soil Porosity (default = "0.43"):	n	0.43	unitless
Volumetric Water Content (default = "0.30"):	Θ_w	0.3	unitless
Volumetric Air Content (default = "0.13"):	Θ_α	0.13	unitless
Dry Soil Bulk Density (default = "1.50"):	ρ_b	1.5	kg/l
Fraction Soil Organic Carbon (default = "0.001"): for metals, enter "1" for f_{oc} value here	f_{oc}	0.001	unitless
Dilution Factor (default = "20" for unsaturated zone soil; "1" for saturated zone soil; or site-specific)	DF	20	unitless
7. Vapor Attenuation Factor due to Advection (building structure) & Diffusion (soil layer) Mechanisms			
** Vapor Attenuation Factor is the ratio of vapor-phase contaminant concentration within the soil at the source to the air concentration at the exposure point (e.g., within the building)*			
Enter Vapor Attenuation Factor: for the evaluation of vapor exposure pathway	VAF		unitless

B. SUMMARY OF SOIL CLEANUP LEVEL CALCULATIONS

Chemical of Concern: 1,2,4-Trimethylbenzene

1. Summary of Results

To calculate a soil cleanup level based on Industrial Land Use (Method C) for Direct Soil Contact, check here: ☑

To calculate a soil concentration based on Method C vapor pathway, check here: ☑

Basis for Soil Concentration	Conc	Units
Most stringent soil concentration based on Soil Direct Contact & Ground Water Protection:	6.895E+01	mg/kg
Natural Background concentration for Soil:	N/A	mg/kg
Practical Quantitation Limit for Soil:	0.01	mg/kg
Soil Cleanup Level (not considering vapor pathway):	6.895E+01	mg/kg
Warning! Soil Cleanup Level above may not be protective of vapor exposure pathway - evaluate vapor pathway further.		
Soil concentration based on Vapor Pathway (informational purposes only):	0.000E+00	mg/kg
Soil Saturation Limit, C_{sat}:	2.246E+02	mg/kg
Retardation Factor, R:	14.0	unitless

C_{sat} corresponds to the total soil chemical concentration saturated in soil.

R is the ratio of the ground water flow velocity to the contaminant migration velocity in saturated zone.

2. Summary of Calculation for each Exposure Pathway

Summary by Exposure Pathway						
Soil Direct Contact			*Method B* *Unrestricted Land Use* @ HQ=1.0; RISK =1.0E-6		*Method C* *Industrial Land Use* @ HQ=1.0; RISK =1.0E-5	
			Ingestion only	Ingestion & Dermal	Ingestion only	Ingestion & Dermal
	Under the Current Condition	HQ? @ Exposure Point	2.000E-03	N/A	4.571E-05	N/A
		RISK? @ Exposure Point	N/A	N/A	N/A	N/A
	Target Soil CUL? mg/kg	@HQ=1.0	4.000E+03	N/A	1.750E+05	N/A
		@RISK =1.0E-6 or 1.0E-5	N/A	N/A	N/A	N/A
Protection of Potable Ground Water			*Method B* @ HQ=1.0; RISK =1.0E-6		*Method C* @ HQ=1.0; RISK =1.0E-5	
	Under the Current Condition	Predicted Ground Water Conc? ug/l	1.015E+02			
		HQ? @ Exposure Point	2.538E-01		1.160E-01	
		RISK? @ Exposure Point	N/A		N/A	
	Target Ground Water CUL? ug/l		8.750E+02			
	Target Soil CUL? mg/kg		6.895E+01			
Protection of Air Quality ***(for informational purpose only)***			*Method B* @ HQ=1.0; RISK =1.0E-6		*Method C* @ HQ=1.0; RISK =1.0E-5	
	Under the Current Condition	Predicted Air Conc? ug/m^3 @Exposure Point	#DIV/0!			
		HQ? @ Exposure Point	N/A		N/A	
		RISK? @ Exposure Point	N/A		N/A	
	Target Air CUL? ug/m^3	@ HQ=1.0	N/A		N/A	
		@ RISK=1.0E-6 or 1.0E-5	N/A		N/A	
	Target Soil CUL? mg/kg	@ HQ=1.0	N/A		N/A	
		@ RISK=1.0E-6 or 1.0E-5	N/A		N/A	

NOTES: "CUL" = Cleanup Level; "Conc" = concentration; "HQ" = hazard quotient; "RISK" = carcinogenic risk.

CAUTION: The requirements and procedures for establishing soil cleanup levels that are protective of human health and the environment are specified in the MTCA Cleanup Regulation (see WAC 173-340-740, 173-340-745, 173-340-747 and 173-340-7490

environment are specified in the MTCA Cleanup Regulation (see WAC 173-340-740, 173-340-745, 173-340-747 and 173-340-7490 through 173-340-7494). The use of this Workbook is not sufficient to establish soil cleanup levels under the regulation. Specifically, the soil cleanup levels derived using this Workbook do not account for the following:

- Concentrations based on applicable state and federal laws (see WAC 173-340-740(3)(b)(i) and 173-340-745(5)(b)(i));
- Soil residual saturation (see WAC 173-340-747(10));
- Ecological impacts (see WAC 173-340-7490 through 7494); and
- Total site risk (see WAC 173-340-740(5)(a) and 173-340-745(6)(a)).

Other exposure pathways may also need to be evaluated on a site-specific basis to establish soil cleanup levels.

CAUTION: The requirements and procedures for establishing air cleanup levels that are protective of human health and the environment are specified in the MTCA Cleanup Regulation (see WAC 173-340-750). The use of this Workbook may not be sufficient to establish air cleanup levels under the regulation. Specifically, the air cleanup levels derived using this Workbook do not account for the following:

- Concentrations based on applicable state and federal laws (see WAC 173-340-750(3)(b)(i) and (4)(b)(i));
- Concentrations based on natural background and the practical quantitation limit (see WAC 173-340-750(5)(c));
- Total site risk (see WAC 173-340-750(5)(a)).

Worksheet for Calculating Soil Cleanup Levels for Unrestricted & Industrial Land Use

Date: 9/9/2003

Site Name: Bee-Jay Scales Site

Evaluator:

Refer to WAC 173-340-720, 740, 745, 747 and 750 for details.

A. INPUT PARAMETERS FOR SOIL CLEANUP LEVEL CALCULATIONS

Note: If no data is available for any of the following inputs, then leave the input box blank

Item	Symbol	Value	Units
1. General information			
Name of Chemical:		1,3,5-Trimethylbenzene	
Measured Soil Concentration, if any:	C_s		mg/kg
Natural Background Concentration for Soil:	NB_s		mg/kg
Practical Quantitation Limit for Soil:	PQL_s		mg/kg
To evaluate the ingestion and dermal pathways concurrently, check here and input values for AF, ABS_d, GI:		☐	
2. Toxicological Properties of the Chemical: Chemical-Specific			
Oral Reference Dose:	RfD_o	0.05	mg/kg-day
Oral Carcinogenic Potency Factor:	CPF_o		kg-day/mg
Inhalation Reference Dose:	RfD_i		mg/kg-day
Inhalation Carcinogenic Potency Factor:	CPF_i		kg-day/mg
3. Exposure Parameters			
Inhalation Correction Factor (default = "2" for volatiles; "1" for all others): for target ground water cleanup level	INH	2	unitless
Inhalation Absorption Fraction (default = "1"): for target air cleanup level	ABS_i	1	unitless
Gastrointestinal Absorption Fraction (default = "1"): for ingestion & dermal exposure pathways	$AB1$	1	unitless
Adherence Factor (default = "0.2"): for dermal exposure pathway	AF		mg/cm^2-day
Dermal Absorption Fraction (chemical-specific or defaults): for dermal exposure pathway	ABS_d		unitless
Gastrointestinal Absorption Conversion Factor (chemical-specific or defaults): for dermal exposure pathway	GI		unitless
4. Physical and Chemical Properties of the Chemical: Chemical-Specific			
Soil Organic Carbon-Water Partitioning Coefficient: for metals, enter K_d value here and enter "1" for f_{oc} value	K_{oc}	8.190E+02	l/kg
Henry's Law Constant: for the evaluation of ground water and vapor exposure pathway	H_{cc}	3.161E-01	unitless
**If the value for Henry's Law Constant is given in the unit of "atm.m^3/mol", enter value here:*	H		atm.m^3/mol
**Converted unitless form of H_{cc} @13° C: (Enter this converted value into "H_{cc} input Box" above for a calculation)*	H_{cc}	*0.000E+00*	unitless

Solubility of the Chemical in Water: for the calculation of soil saturation limit	S	4.820E+01	mg/l
5. Target Ground Water Cleanup Level			
Target Ground Water Cleanup Level applicable for a soil cleanup level calculation: **Results from the Ground Water Cleanup Level Worksheet are not automatically transferred into this worksheet.*	C_w	8.750E+02	ug/l
6. Site-Specific Hydrogeological Characteristics			
Total Soil Porosity (default = "0.43"):	n	0.43	unitless
Volumetric Water Content (default = "0.30"):	Θ_w	0.3	unitless
Volumetric Air Content (default = "0.13"):	Θ_a	0.13	unitless
Dry Soil Bulk Density (default = "1.50"):	ρ_b	1.5	kg/l
Fraction Soil Organic Carbon (default = "0.001"): for metals, enter "1" for f_{oc} value here	f_{oc}	0.001	unitless
Dilution Factor (default = "20" for unsaturated zone soil; "1" for saturated zone soil; or site-specific)	DF	20	unitless
7. Vapor Attenuation Factor due to Advection (building structure) & Diffusion (soil layer) Mechanisms			
** Vapor Attenuation Factor is the ratio of vapor-phase contaminant concentration within the soil at the source to the air concentration at the exposure point (e.g., within the building)*			
Enter Vapor Attenuation Factor: for the evaluation of vapor exposure pathway	VAF		unitless

B. SUMMARY OF SOIL CLEANUP LEVEL CALCULATIONS

Chemical of Concern: 1,3,5-Trimethylbenzene

1. Summary of Results

To calculate a soil cleanup level based on Industrial Land Use (Method C) for Direct Soil Contact, check here: ☑

To calculate a soil concentration based on Method C vapor pathway, check here: ☑

Basis for Soil Concentration	Conc	Units
Most stringent soil concentration based on Soil Direct Contact & Ground Water Protection:	1.831E+01	mg/kg
Natural Background concentration for Soil:	N/A	mg/kg
Practical Quantitation Limit for Soil:	N/A	mg/kg
Soil Cleanup Level (not considering vapor pathway):	1.831E+01	mg/kg
Warning! Soil Cleanup Level above may not be protective of vapor exposure pathway - evaluate vapor pathway further.		
Soil concentration based on Vapor Pathway (informational purposes only):	0.000E+00	mg/kg

C_{sat} corresponds to the total soil chemical concentration saturated in soil.

R is the ratio of the ground water flow velocity to the

Soil Saturation Limit, C_{sat}:	5.044E+01	mg/kg
Retardation Factor, ***R***:	3.9	unitless

R is the ratio of the ground water flow velocity to the contaminant migration velocity in saturated zone.

2. Summary of Calculation for each Exposure Pathway

Summary by Exposure Pathway

			Method B Unrestricted Land Use @ HQ=1.0; RISK =1.0E-6		*Method C* Industrial Land Use @ HQ=1.0; RISK =1.0E-5	
			Ingestion only	Ingestion & Dermal	Ingestion only	Ingestion & Dermal
Soil Direct Contact	Under the Current Condition	HQ? @ Exposure Point	N/A	N/A	N/A	N/A
		RISK? @ Exposure Point	N/A	N/A	N/A	N/A
	Target Soil CUL? mg/kg	@HQ=1.0	4.000E+03	N/A	1.750E+05	N/A
		@RISK =1.0E-6 or 1.0E-5	N/A	N/A	N/A	N/A

			Method B @ HQ=1.0; RISK =1.0E-6	*Method C* @ HQ=1.0; RISK =1.0E-5
Protection of Potable Ground Water	Under the Current Condition	Predicted Ground Water Conc? ug/l	N/A	
		HQ? @ Exposure Point	N/A	N/A
		RISK? @ Exposure Point	N/A	N/A
	Target Ground Water CUL? ug/l		8.750E+02	
	Target Soil CUL? mg/kg		1.831E+01	

			Method B @ HQ=1.0; RISK =1.0E-6	*Method C* @ HQ=1.0; RISK =1.0E-5
Protection of Air Quality ***(for informational purpose only)***	Under the Current Condition	Predicted Air Conc? ug/m^3 @Exposure Point	N/A	
		HQ? @ Exposure Point	N/A	N/A
		RISK? @ Exposure Point	N/A	N/A
	Target Air CUL? ug/m^3	@ HQ=1.0	N/A	N/A
		@ RISK=1.0E-6 or 1.0E-5	N/A	N/A
	Target Soil CUL? mg/kg	@ HQ=1.0	N/A	N/A
		@ RISK=1.0E-6 or 1.0E-5	N/A	N/A

NOTES: "CUL" = Cleanup Level; "Conc" = concentration; "HQ" = hazard quotient; "RISK" = carcinogenic risk.

CAUTION: The requirements and procedures for establishing soil cleanup levels that are protective of human health and the environment are specified in the MTCA Cleanup Regulation (see WAC 173-340-740, 173-340-745, 173-340-747 and 173-340-7490 through 173-340-7494). The use of this Workbook is not sufficient to establish soil cleanup levels under the regulation. Specifically, the soil cleanup levels derived using this Workbook do not account for the following:

- Concentrations based on applicable state and federal laws (see WAC 173-340-740(3)(b)(i) and 173-340-745(5)(b)(i));
- Soil residual saturation (see WAC 173-340-747(10));
- Ecological impacts (see WAC 173-340-7490 through 7494); and
- Total site risk (see WAC 173-340-740(5)(a) and 173-340-745(6)(a)).

Other exposure pathways may also need to be evaluated on a site-specific basis to establish soil cleanup levels.

CAUTION: The requirements and procedures for establishing air cleanup levels that are protective of human health and the environment are specified in the MTCA Cleanup Regulation (see WAC 173-340-750). The use of this Workbook may not be sufficient to establish air cleanup levels under the regulation. Specifically, the air cleanup levels derived using this Workbook do not account for the following:

- Concentrations based on applicable state and federal laws (see WAC 173-340-750(3)(b)(i) and (4)(b)(i));
- Concentrations based on natural background and the practical quantitation limit (see WAC 173-340-750(5)(c));
- Total site risk (see WAC 173-340-750(5)(a)).

Worksheet for Calculating Soil Cleanup Levels for Unrestricted & Industrial Land Use

Date: 9/9/2003

Site Name: Bee-Jay Scales Site

Evaluator:

Refer to WAC 173-340-720, 740, 745, 747 and 750 for details.

A. INPUT PARAMETERS FOR SOIL CLEANUP LEVEL CALCULATIONS

Note: If no data is available for any of the following inputs, then leave the input box blank

Item	Symbol	Value	Units
1. General information			
Name of Chemical:		Chromium	
Measured Soil Concentration, if any:	C_s	64.8	mg/kg
Natural Background Concentration for Soil:	NB_s		mg/kg
Practical Quantitation Limit for Soil:	PQL_s	0.5	mg/kg
To evaluate the ingestion and dermal pathways concurrently, check here and input values for *AF, ABS_d, GI*:	☐		
2. Toxicological Properties of the Chemical: Chemical-Specific			
Oral Reference Dose:	RfD_o	0.003	mg/kg-day
Oral Carcinogenic Potency Factor:	CPF_o		kg-day/mg
Inhalation Reference Dose:	RfD_i		mg/kg-day
Inhalation Carcinogenic Potency Factor:	CPF_i		kg-day/mg
3. Exposure Parameters			
Inhalation Correction Factor (default = "2" for volatiles; "1" for all others): for target ground water cleanup level	*INH*	1	unitless
Inhalation Absorption Fraction (default = "1"): for target air cleanup level	ABS_i	1	unitless
Gastrointestinal Absorption Fraction (default = "1"): for ingestion & dermal exposure pathways	*AB1*	1	unitless
Adherence Factor (default = "0.2"): for dermal exposure pathway	*AF*		mg/cm^2-day
Dermal Absorption Fraction (chemical-specific or defaults): for dermal exposure pathway	ABS_d		unitless
Gastrointestinal Absorption Conversion Factor (chemical-specific or defaults): for dermal exposure pathway	*GI*		unitless
4. Physical and Chemical Properties of the Chemical: Chemical-Specific			
Soil Organic Carbon-Water Partitioning Coefficient: for metals, enter K_d value here and enter "1" for f_{oc} value	K_{oc}	1.900E+01	l/kg
Henry's Law Constant: for the evaluation of ground water and vapor exposure pathway	H_{cc}	0.000E+00	unitless
**If the value for Henry's Law Constant is given in the unit of "atm.m^3/mol", enter value here:*	*H*		atm.m^3/mol
**Converted unitless form of H_{cc} @13° C: (Enter this converted value into "H_{cc} input Box" above for a calculation)*	H_{cc}	*0.000E+00*	unitless

Solubility of the Chemical in Water: for the calculation of soil saturation limit	S	0.000E+00	mg/l
5. Target Ground Water Cleanup Level			
Target Ground Water Cleanup Level applicable for a soil cleanup level calculation: **Results from the Ground Water Cleanup Level Worksheet are not automatically transferred into this worksheet.*	C_w	1.050E+02	ug/l
6. Site-Specific Hydrogeological Characteristics			
Total Soil Porosity (default = "0.43"):	n	0.43	unitless
Volumetric Water Content (default = "0.30"):	Θ_w	0.3	unitless
Volumetric Air Content (default = "0.13"):	Θ_a	0.13	unitless
Dry Soil Bulk Density (default = "1.50"):	ρ_b	1.5	kg/l
Fraction Soil Organic Carbon (default = "0.001"): for metals, enter "1" for f_{oc} value here	f_{oc}	0.001	unitless
Dilution Factor (default = "20" for unsaturated zone soil; "1" for saturated zone soil; or site-specific)	DF	20	unitless
7. Vapor Attenuation Factor due to Advection (building structure) & Diffusion (soil layer) Mechanisms			
** Vapor Attenuation Factor is the ratio of vapor-phase contaminant concentration within the soil at the source to the air concentration at the exposure point (e.g., within the building)*			
Enter Vapor Attenuation Factor: for the evaluation of vapor exposure pathway	VAF		unitless

B. SUMMARY OF SOIL CLEANUP LEVEL CALCULATIONS

Chemical of Concern: Chromium

1. Summary of Results

To calculate a soil cleanup level based on Industrial Land Use (Method C) for Direct Soil Contact, check here: ☑

To calculate a soil concentration based on Method C vapor pathway, check here: ☑

Basis for Soil Concentration	Conc	Units
Most stringent soil concentration based on Soil Direct Contact & Ground Water Protection:	4.599E-01	mg/kg
Natural Background concentration for Soil:	N/A	mg/kg
Practical Quantitation Limit for Soil:	0.5	mg/kg
Soil Cleanup Level (not considering vapor pathway):	5.000E-01	mg/kg
Warning! Soil Cleanup Level above may not be protective of vapor exposure pathway - evaluate vapor pathway further.		
Soil concentration based on Vapor Pathway (informational purposes only):	0.000E+00	mg/kg

Warning: Soil Cleanup Level is higher than Soil Saturation Limit!

C_{sat} corresponds to the total soil chemical concentration saturated in soil.

R is the ratio of the ground water flow velocity to the

Soil Saturation Limit, C_{sat}:	0.000E+00	mg/kg
Retardation Factor, R:	1.1	unitless

R is the ratio of the ground water flow velocity to the contaminant migration velocity in saturated zone.

2. Summary of Calculation for each Exposure Pathway

Summary by Exposure Pathway

			Method B Unrestricted Land Use @ HQ=1.0; RISK =1.0E-6		*Method C* Industrial Land Use @ HQ=1.0; RISK =1.0E-5	
			Ingestion only	Ingestion & Dermal	Ingestion only	Ingestion & Dermal
Soil Direct Contact	Under the Current Condition	HQ? @ Exposure Point	2.700E-01	N/A	6.171E-03	N/A
		RISK? @ Exposure Point	N/A	N/A	N/A	N/A
	Target Soil CUL? mg/kg	@HQ=1.0	2.400E+02	N/A	1.050E+04	N/A
		@RISK =1.0E-6 or 1.0E-5	N/A	N/A	N/A	N/A

			Method B @ HQ=1.0; RISK =1.0E-6	*Method C* @ HQ=1.0; RISK =1.0E-5
Protection of Potable Ground Water	Under the Current Condition	Predicted Ground Water Conc? ug/l	1.479E+04	
		HQ? @ Exposure Point	3.082E+02	1.409E+02
		RISK? @ Exposure Point	N/A	N/A
	Target Ground Water CUL? ug/l		1.050E+02	
	Target Soil CUL? mg/kg		4.599E-01	

			Method B @ HQ=1.0; RISK =1.0E-6	*Method C* @ HQ=1.0; RISK =1.0E-5
Protection of Air Quality ***(for informational purpose only)***	Under the Current Condition	Predicted Air Conc? ug/m^3 @Exposure Point	#DIV/0!	
		HQ? @ Exposure Point	N/A	N/A
		RISK? @ Exposure Point	N/A	N/A
	Target Air CUL? ug/m^3	@ HQ=1.0	N/A	N/A
		@ RISK=1.0E-6 or 1.0E-5	N/A	N/A
	Target Soil CUL? mg/kg	@ HQ=1.0	N/A	N/A
		@ RISK=1.0E-6 or 1.0E-5	N/A	N/A

NOTES: "CUL" = Cleanup Level; "Conc" = concentration; "HQ" = hazard quotient; "RISK" = carcinogenic risk.

CAUTION: The requirements and procedures for establishing soil cleanup levels that are protective of human health and the environment are specified in the MTCA Cleanup Regulation (see WAC 173-340-740, 173-340-745, 173-340-747 and 173-340-7490 through 173-340-7494). The use of this Workbook is not sufficient to establish soil cleanup levels under the regulation. Specifically, the soil cleanup levels derived using this Workbook do not account for the following:

- Concentrations based on applicable state and federal laws (see WAC 173-340-740(3)(b)(i) and 173-340-745(5)(b)(i));
- Soil residual saturation (see WAC 173-340-747(10));
- Ecological impacts (see WAC 173-340-7490 through 7494); and
- Total site risk (see WAC 173-340-740(5)(a) and 173-340-745(6)(a)).

Other exposure pathways may also need to be evaluated on a site-specific basis to establish soil cleanup levels.

CAUTION: The requirements and procedures for establishing air cleanup levels that are protective of human health and the environment are specified in the MTCA Cleanup Regulation (see WAC 173-340-750). The use of this Workbook may not be sufficient to establish air cleanup levels under the regulation. Specifically, the air cleanup levels derived using this Workbook do not account for the following:

- Concentrations based on applicable state and federal laws (see WAC 173-340-750(3)(b)(i) and (4)(b)(i));
- Concentrations based on natural background and the practical quantitation limit (see WAC 173-340-750(5)(c));
- Total site risk (see WAC 173-340-750(5)(a)).

Soil Cleanup Levels: Worksheet for Data Entry

Refer to WAC 173-340-720, 740,745, 747, 750

Date: 09/17/03
Site Name: Bee-Jay Scales Site
Sample Name:

1. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10		0.00%
AL_EC >10-12		0.00%
AL_EC >12-16		0.00%
AL_EC >16-21		0.00%
AL_EC >21-34		0.00%
AR_EC >8-10		0.00%
AR_EC >10-12		0.00%
AR_EC >12-16		0.00%
AR_EC >16-21		0.00%
AR_EC >21-34		0.00%
Benzene	0.005	0.05%
Toluene	0.005	0.05%
Ethylbenzene	0.01	0.10%
Total Xylenes	6.03	57.65%
Total Naphthalenes	3	28.68%
n-Hexane	0	0.00%
MTBE	0.005	0.05%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0.005	0.05%
Benzo(a)anthracene	0.2	1.91%
Benzo(b)fluoranthene	0.2	1.91%
Benzo(k)fluoranthene	0.2	1.91%
Benzo(a)pyrene	0.2	1.91%
Chrysene	0.2	1.91%
Dibenzo(a,h)anthracene	0.2	1.91%
Indeno(1,2,3-cd)pyrene	0.2	1.91%
Sum	10.46	100.00%

2. Enter Site-Specific Hydrogeological Data

Total soil porosity: default is 0.43	0.45	Unitless
Volumetric water content: default is 0.3	0.3	Unitless
Volumetric air content: default is 0.13	0.15	Unitless
Soil bulk density measured: default is 1.5	1.5	kg/l
Fraction Organic Carbon: default is 0.001	0.001	Unitless
Dilution Factor: default is 20	20	Unitless

Exposure Pathway		Pass or Fail?	HI	RISK
Soil Direct Contact	Unrestricted Land use			
	Industrial Land use			
Method B Potable Ground Water Protection				

Note:

1. All data must be numeric values. Use of alphabetical characters (i.e., "ND", "NA", "<", ">", or "=") will cause an error.
2. Try to avoid double counting: The Petroleum Equivalent Carbon (EC) fractions include many individual substances that must be analyzed separately. When entering the concentration of petroleum EC fraction into the data entry cell, make sure you subtract the concentration of individual substances from the appropriate EC fraction. (See User's Guide)
3. For the values of soil measurement below the method detection limit, substitute one-half the method detection limit as required by WAC173-340 740-(7). For the values for soil measurement above the method detection limit but below the practical quantitation limit, substitute the method detection limit. However, for a hazardous substance or petroleum fraction which has never been detected in any sample at a site and these substances are not suspected of being present at the site based on site history and other knowledge, enter "0" for that hazardous substances or petroleum fraction for further calculation. Refer to WAC173-340-740(7) for detail.
4. For detail analytical testing requirements for petroleum contaminated sites, refer to WAC 173-340-820, 830 and 840, and Table 830-1.
5. For detail information on site-specific hydrogeological conditions, refer to WAC 173-340-747.

REMARK:
Enter site-specific information here.....

Worksheet for Calculating Soil Cleanup Level for Soil Direct Contact Pathway: Method C-Industrial Land Use (Refer to MTCA WAC 173-340-745)

Date: 17-Sep-03
Site Name: Bee-Jay Scales Site
Sample Name: 00-Jan-00

a. "TPH Test" button below is for testing adjusted condition at a specified TPH concentration.
b. Check columns at left for Pass/Fail detail.

Chemical of Concern or EC Group	Measured Soil Conc dry basis	Exposure Parameters				Toxicity Parameters		Current Condition			Adjusted Condition			
		AB1	AF	ABS_d	GI	RfD_o	CPF_o	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	mg/cm^2-day	unitless	unitless	mg/kg-day	kg-day/mg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction														
AL_EC >5-6	0	1	0.2	0.03	0.8	5.7					0.00E+00			
AL_EC >6-8	0	1	0.2	0.03	0.8	5.7					0.00E+00			
AL_EC >8-10	0	1	0.2	0.03	0.8	0.03					0.00E+00			
AL_EC >10-12	0	1	0.2	0.03	0.8	0.03					0.00E+00			
AL_EC >12-16	0	1	0.2	0.1	0.5	0.03					0.00E+00			
AL_EC >16-21	0	1	0.2	0.1	0.5	2					0.00E+00			
AL_EC >21-34	0	1	0.2	0.1	0.5	2					0.00E+00			
AR_EC >8-10	0	1	0.2	0.03	0.8	0.05					0.00E+00			
AR_EC >10-12	0	1	0.2	0.03	0.8	0.05					0.00E+00			
AR_EC >12-16	0	1	0.2	0.1	0.5	0.05					0.00E+00			
AR_EC >16-21	0	1	0.2	0.1	0.5	0.03					0.00E+00			
AR_EC >21-34	0	1	0.2	0.1	0.5	0.03					0.00E+00			
Benzene	0.005	1	0.2	0.0005	0.95	0.003	0.055	8.38E-07	3.69E-11		5.77E-02	9.66E-06	4.25E-10	
Toluene	0.005	1	0.2	0.03	1	0.2		1.63E-08			5.77E-02	1.87E-07		
Ethylbenzene	0.01	1	0.2	0.03	0.92	0.1		6.63E-08			1.15E-01	7.65E-07		
Total Xylenes	6.03	1	0.2	0.03	0.9	2		2.01E-06			6.95E+01	2.32E-05		
Total Naphthalenes	3	1	0.2	0.13	0.89	0.02		1.85E-04			3.46E+01	2.13E-03		
n-Hexane	0	1	0.2	0.03	0.8	0.06					0.00E+00	0.00E+00		
MTBE	0.005										5.77E-02			
Ethylene Dibromide (EDB)	0	1	0.2	0.03	0.8	0.000057	85		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0.005	1	0.2	0.03	0.8	0.03	0.091	1.15E-07	8.34E-11		5.77E-02	1.32E-06	9.62E-10	
Benzo(a)anthracene	0.2	1	0.2	0.13	0.89		0.73		4.79E-08		2.31E+00		5.52E-07	
Benzo(b)fluoranthene	0.2	1	0.2	0.13	0.89		0.73		4.79E-08		2.31E+00		5.52E-07	
Benzo(k)fluoranthene	0.2	1	0.2	0.13	0.89		0.73		4.79E-08		2.31E+00		5.52E-07	
Benzo(a)pyrene	0.2	1	0.2	0.13	0.89		7.3		4.79E-07		2.31E+00		5.52E-06	
Chrysene	0.2	1	0.2	0.13	0.89		0.073		4.79E-09		2.31E+00		5.52E-08	
Dibenzo(a,h)anthracene	0.2	1	0.2	0.13	0.89		2.92		1.92E-07		2.31E+00		2.21E-06	
Indeno(1,2,3-cd)pyrene	0.2	1	0.2	0.13	0.89		0.73		4.79E-08		2.31E+00		5.52E-07	
Sum	**10.46**							1.88E-04	8.67E-07		1.21E+02	2.16E-03	1.00E-05	

Current Condition

TPH, mg/kg= 10.460
HI= 1.876E-04
Cancer RISK= 8.671E-07
Pass or Fail? Pass

Adjusted Condition

TPH, mg/kg= 120.628
HI= 2.163E-03
Cancer RISK= 1.000E-05
Pass or Fail? Pass

Exposure Parameters		
for Non-carcinogens		Units
Average Body Weight, ABW	70	kg
Averaging Time, AT	20	yr
Exposure Frequency, EF	0.7	unitless
Exposure Duration, ED	20	year
Soil Ingestion Rate, SIR	50	mg/day
Dermal Surface Area, SA	2500	cm^2
for Carcinogens		
Parameters for Carcinogens		unit
Averaging time, AT_C	75	yr