Kissel Park

Remedial Investigation/ Feasibility Study and Cleanup Action Plan

Prepared for

The City of Yakima
Yakima, Washington

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Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

This combined Remedial Investigation/Feasibility Study (RI/FS) and Cleanup Action Plan (CAP) was prepared for the City of Yakima as a requirement of the Agreed Order (dated March 21, 2001), between the Washington State Department of Ecology (Ecology) and the City of Yakima. The Agreed Order calls for a focused RI/FS and CAP in support of the cleanup and development of Kissel Park (site). The RI/FS was termed "focused" due to the relatively simple nature of site contamination and exposure pathways. Therefore, certain elements of the complete RI/FS process, as outlined in the Model Toxics Control Act (MTCA; WAC 173-340-350), were not applicable to this site and so not performed or discussed herein.

1.1 PURPOSE OF REPORT

The purpose of a RI/FS is to collect, develop, and evaluate information regarding a site in order to select a cleanup action. Briefly, the RI describes site conditions and contaminant exposure pathways and the FS evaluates the various cleanup options. Additionally, the FS for this report incorporates data collected from a pilot study of tilling methodologies for soil remediation that was conducted in April 2001. The purpose of the CAP is to select and describe the preferred cleanup action including details of how it will be incorporated into the park development.

1.1.1 Public Participation

This is a final document that has obtained Ecology concurrence and also gone through the required public comment process on the proposed cleanup action. Public participation is an integral part of MTCA (WAC 173-340). Under MTCA, the public has the opportunity to review and comment at critical stages during the cleanup process. A 30-day public comment period for the CAP occurred during June 2001. During that period, a public meeting was held in Yakima and the public's comments accepted; however, no comment was received that resulted in changes to this document. Public comment was recorded and addressed in a Responsiveness Summary. Appendix A contains a copy of the Ecology-prepared Responsiveness Summary as well as Ecology comments on the draft RI/FS and draft CAP. The cleanup action will occur when the park construction occurs, now scheduled for Spring 2002.

1.2 SITE HISTORY AND DESCRIPTION OF KNOWN CONDITIONS

The site is composed of 17 acres of undeveloped land along the banks of Wide Hollow Creek within a residential neighborhood in the City of Yakima. Refer to Figure 1 for a site vicinity map. The site is owned by the City of Yakima. The only structure is a small building used as a pump house for a City of Yakima municipal water well, located on the northwest corner of the site. The site has a slight slope to the south except along the banks of Wide Hollow Creek where it is fairly steep. A small portion of the bank slope lies within the 100-year flood plain of the creek.

The site was originally developed as an orchard, probably during the 1930s to 1940s. A small farmhouse occupied the northeastern corner of the site based upon a 1945 aerial photograph on file with Ecology. According to a local long-term resident, by 1948 the site was used as a hay field. In 1956, private individuals sold this farmland to the Metropolitan Park District, the predecessor to the Department of Parks and Recreation. The land lay dormant until 1970, when it was leased by the Metropolitan Park District for use as a hay field. This continued until 1987 when the Eisenhower High School started to use the site as a land lab to supplement its agricultural program, primarily for growing hay. Land lab activities ceased in 2000, in anticipation of the upcoming redevelopment of the site.

The City of Yakima plans to develop the park with both active and passive elements. The active elements of the park will include nine tennis courts and three multi-purpose courts located in the southern half of the site. Active park elements will also include an 80-space parking lot, child play area, restroom, and storage building.

The northern half of the site will be developed for more passive use including landscaped open-space, picnic areas, and an 8-foot wide asphalt walking trail around the park. Figure 2 presents a conceptual site plan. No building can occur within 120 feet of the banks of Wide Hollow Creek per the City of Yakima Critical Areas Ordinance.

1.2.1 Environmental Conditions

In the first half of the 20th Century, up until 1947 when it was replaced by DDT, acid lead arsenate ($PbHAsO_4$) was commonly used as a spray-on insecticide in eastern Washington to control the codling moth in commercial apple orchards (Peryea and Creger 1994). As a consequence, many current and past orchard lands in eastern Washington contain elevated levels of lead and arsenic. Because of this concern, the City of Yakima tested soils at the site in September 2000. Results from 15 samples indicated concentrations of arsenic and lead in site soil at levels greater than their respective MTCA Method A cleanup levels of 20 mg/kg and 250 mg/kg[1]. The mean concentration in the surface soils was 34 mg/kg arsenic and 188 mg/kg lead. At a depth of one foot, the mean concentrations increased to 41 mg/kg arsenic and 249 mg/kg lead. The three-foot deep samples had lower mean concentrations of 21 mg/kg arsenic and 100 mg/kg lead. Additional testing was performed for DDT on five samples. One sample contained DDT at 1 mg/kg, which is the current MTCA Method A cleanup level. The DDT concentrations for the remaining samples were less than this level.

[1] A concentration given in milligrams per kilogram (mg/kg) is equivalent to that in parts per million (or ppm), on a weight per weight basis.

2.0 Remedial Investigation

Per the Agreed Order, a remedial investigation (RI) was performed to better understand the nature and extent of site contamination. The specific sampling objectives of the RI were detailed in an Environmental Study Plan (reproduced in Appendix B). They included:

- **Characterization of the concentrations of lead and arsenic in surface soil.** Additional sampling, based on a grid system, would establish with statistical confidence whether the initial sample results are representative, reveal the presence of "hot spots" (possibly along former tree drip lines), and identify clean areas of the site from those requiring remediation.
- **Characterization of the vertical extent (depth) of lead and arsenic.** This was necessary for determining to what depth(s) remediation of soil will be required, as well as to establish if contaminant migration has occurred to deeper soil.
- **Better definition of soil types.** Definition of the soil types at the site will allow a better understanding of the contaminant fate and transport as well as allow for better evaluation of potential site remedies (e.g., capping, treating, excavation, etc).
- **Determine the concentration of contaminants in Wide Hollow Creek.** It is necessary to determine if the sediment in Wide Hollow Creek has been impacted by lead and arsenic at the site.
- **Determine DDT concentrations and if any other organo-chlorine pesticides are present in site soils.** It is important to establish that if the preliminary test results for DDT were representative and if other commonly used chlorinated pesticides are present in site soils as well.

2.1 TEST PIT AND SAMPLE LOCATIONS

A total of 235 surface and subsurface samples were collected from 89 test pit locations across the site (a sampling density of approximately five samples per acre). The sample locations were laid out at the intersections (grid nodes) of seven north-south and 12 east-west transects set parallel to the site boundaries. Samples were collected at up to five depth intervals. At each location, a surface (0 to 0.5 foot) and shallow (0.5 to 2 feet) sample were collected with deeper samples collected at fewer locations as detailed on Table 1.

An additional nine samples were collected on a tighter grid spacing at the northeast corner of the site. This is where the 1945 aerial photograph indicates that farm buildings were once located, an area where the lead-arsenate solutions may have been mixed and spilled. Three sediment samples were also collected in Wide Hollow Creek. Figure 3 shows the sample grid, test pit, sediment locations, and the locations of the initial five soil samples collected by the City of Yakima.

2.2 SAMPLE COLLECTION AND SOIL TYPES ENCOUNTERED

Samples were collected following the procedures specified in the Environmental Study Plan using personnel from Fulcrum Environmental, a project subconsultant. Samples were collected by scraping undisturbed soil from the sidewall of a test pit dug by a backhoe. A complete description of field activities is included in Appendix B.

2.2.1 Site Geology and Groundwater

Geologically, the project site is located on an alluvial terrace consisting of a sequence of fine sands and silts intermixed with volcanic ash deposits. During the RI, homogeneous soils were encountered across the site to depths of 7 feet. The soil type was a massive, non-plastic sandy silt with no gravel. The upper several inches of soil are rich in organics from past use as a hay field. The soils became increasingly compact (cemented) with depth. Near grid node 1C, a strongly cemented silt, sand and gravel deposit prevented excavation deeper then 3 feet. In the northeastern corner of the site, very compact soils were found at ground surface and some areas of debris and gravel, most likely remnants of the former farmhouse, were noted just below the ground surface.

At three test pit locations across the site, samples were analyzed for geotechnical properties by PLSA, a local soil engineering firm. In-place field measurements of wet and dry density and percent moisture were obtained at depths of 1, 3, and 6 feet. One soil sample from each test pit was collected for laboratory grain size testing. The grain size test results classified all samples as a fine sandy silt with trace clay. Appendix B contains a copy of the PLSA report.

For deeper geologic conditions, well logs obtained from Ecology were examined. According to the driller's log of the on-site supply well, cemented gravels and clay underlie the upper sandy silt beginning at a depth of 8 feet. Below 88 feet, alternating layers of clay, sandy clay, sand and gravel occur to a depth of 1171 feet.

Groundwater conditions were not investigated during the RI due to the very low potential for the migration of lead and arsenic to site groundwater, as migration of lead arsenate is typically limited to the upper 3-4 feet of soil (Peryea and Creger 1994). Site groundwater is expected to occur no shallower then the elevation of Wide Hollow Creek, or approximately 25 feet below the level portion of the site. Well logs from the surrounding area indicate groundwater is first encountered at depths ranging from 12 to 26 feet, however different geologic materials were encountered in those wells. (Note: groundwater in the on-site supply well was measured at a depth of 18 feet below ground surface [bgs] according to the driller's log. However, this well is screened at over 400 feet bgs, and the water level likely reflects deeper artesian conditions). Regionally, groundwater is expected to flow in the direction of the topographic gradient, or to the south towards Wide Hollow Creek.

2.3 SURVEY

All exploration locations were flagged, numbered, and surveyed-in prior to sampling. The surveying was done by Huibregtse Louman and Associates, a professional surveying firm. All test pit locations were then transferred to an electronic base map in AutoCAD Format.

Appendix B contains a copy of the surveyors report with the latitude and longitude of each test pit location as well as a figure that shows the layout of the sampling grid.

2.4 ENVIRONMENTAL TESTING RESULTS

Soil samples were tested for the following parameters using standard EPA methods:

Chlorinated Pesticides	EPA Method 8081
Arsenic, Lead	EPA 6010 (ICP)

Quality control (QC) of the data was achieved by use of standard documentation forms, collection and analysis of four duplicate samples (a 5 percent frequency of collection). Due to the use of pre-cleaned sampling equipment, it was not necessary to collect an aqueous decontamination blank. For the laboratory, QC was achieved by use of standard EPA analytical methodologies, including analysis of method blanks, lab duplicates, matrix spikes and matrix spike duplicates and laboratory quality control samples.

All of the laboratory data was reviewed for quality assurance, including confirming that the holding and extraction times were met and duplicate and matrix spike analysis percent recovery and relative percent difference (RPD) were within acceptable QC limits. For the organic analysis, this also involved checking that the surrogate recoveries were within acceptable QC limits. Apart from some matrix interferences for Aldrin and Endrin in the matrix spike sample that affected the spike recoveries, there were not any QC problems with the data set. As Aldrin and Endrin were not detected in any of the field samples, this QC problem had no impact on the data usability.

The analytical results are tabulated in Tables 2 and 3. Table 2 lists all of the analytical detections, sorted by sample ID. Table 3 lists the concentrations of lead and arsenic, sorted by decreasing arsenic concentration. Appendix B contains copies of all of the original laboratory reports. The results are discussed below.

2.5 DISTRIBUTION AND CONCENTRATIONS OF LEAD AND ARSENIC IN SURFACE SOIL (0 TO 0.5 FT)

2.5.1 Arsenic

Figure 4 shows a contour map[2] of the distribution of arsenic in the surface samples (0 to 0.5 ft). The contours indicate the concentrations increase from northwest to southeast. The highest concentrations all cluster in the southeastern part of the site and the lowest concentrations are in the upper northwestern corner, with a few higher concentrations in the northeastern corner.

[2] The map was produced using Kriging, which uses moving averages and spatial trends within the data to statistically smooth out the contour lines as compared to data contoured from basic interpolation.

Summary statistics are included in Table 4. The maximum concentration of arsenic was 113 mg/kg. The mean concentration of the surface samples was 40 mg/kg. This mean is slightly higher than the five City of Yakima shallow samples, which had a mean of 34 mg/kg (due to a single very low concentration sample from the northeast corner of the site).

Overall, the arsenic concentrations were uniformly distributed in soil with little evidence of isolated areas of anomalously higher concentrations (i.e., hot spots) potentially indicative of spills or tree drip lines.

2.5.2 Lead

Figure 5 shows a contour map (produced using basic interpolation) of the distribution of lead in the surface samples. The pattern of distribution mimics that of arsenic. A review of Table 3 also reveals this correlation, in which samples with high arsenic levels also contain high lead levels and vice versa. This is expected given that the application of lead arsenate results in the simultaneous deposition of both metals in 1:1 molar ratio (i.e., there is one atom of lead for every atom of arsenic in acid lead arsenate). Since lead is about three times as heavy as arsenic, the lead concentrations in soil should therefore be around three times the arsenic concentrations. This is approximately what is observed in the surface soil data. In background soil, the concentrations of lead should be approximately equal to that of arsenic.

The maximum lead concentration in surface soil was 335 mg/kg with a mean of 108 mg/kg, as compared to a maximum of 320 mg/kg and a mean of 188 mg/kg for the City of Yakima surface samples. The significantly higher mean in the City of Yakima samples is a result of two of the five samples having lead concentrations greater than 300 mg/kg, whereas only about 5 percent of the RI samples exceeded 300 mg/kg. This difference is thought to be due to an insufficient number of samples collected by the city to determine a representative site-wide mean lead concentration.

2.6 CONTAMINANT FATE AND TRANSPORT

Both lead and arsenic from spraying of lead arsenate are known to exhibit mobility in the environment, especially in Washington State (Peryea and Creger 1994). Compared to lead, arsenic has demonstrated more downward mobility in soils, as it is found at concentrations two times greater than background levels as deep as 4 feet. While lead does not exhibit short-term mobility, downward migration can occur over a time span of decades. However, lead enrichments are generally confined to the top 30 cm (12 inches).

According to the Peryea and Creger 1994 study, the reasons for the downward transport of lead and arsenic in Washington State orchards as compared to elsewhere were attributed to three factors: (1) use of lead arsenate was much higher in Washington State, which was the dominant US market, (2) orchards were established in sandy soils lacking organic matter to bind the metals, and (3) heavy irrigation in excess of the evapotranspiration rate occurred, causing soil particles to move downward. Additionally, application of phosphate fertilizer can result in the translocation of phosphorus for arsenic, which can accelerate the downward movement of arsenic to deeper soils (Peryea and Kammereck 1997).

At Kissel Park, lead and arsenic mobility was evaluated by examining the trend of concentration with depth and comparing it with the expected behavior described above. Samples were collected at five different depth intervals with notations for each depth as follows:

Surface	0 to 0.5 ft
Shallow	0.5 to 2 ft
Intermediate	2 to 3 ft
Deep 1	3 to 5 ft
Deep 2	5 to 7 ft

Statistical summaries for the lead and arsenic data in each depth interval are in Table 4. The mean concentration for both contaminants was found to be highest in the surface samples. The mean concentrations decrease with depth, with a much greater decrease occurring for lead in the shallow samples as compared to arsenic, which decreases more gradually with depth. For both lead and arsenic, the mean concentrations of the 3 to 5 and 5 to 7 foot samples are generally similar at around 10 mg/kg each, meaning that background concentrations are likely reached by these depths.

Figures 6 and 7 show histograms of arsenic and lead concentrations in the three uppermost depth intervals. These histograms clearly show the shift towards a more narrow concentration distribution at depths of 2 to 3 feet for both metals, with this shift occurring at shallower depths for lead (0.5 to 2 feet) than for arsenic (2 to 3 feet).

Another way of presenting this depth trend is to plot the mean concentrations for each depth interval versus depth (Figure 8). Figure 8 also displays the ratio of the mean lead to arsenic concentrations. The ratio starts out slightly greater than the signature fresh acid lead arsenate concentration ratio of 3:1 in the surface soil, indicating slightly greater leaching out of arsenic over lead. The ratio steadily decreases to the background 1:1 ratio at depths of 3 to 5 feet.

The distribution of arsenic across the site by depth is represented in Figures 9 and 10, which show interpolated arsenic concentration contours at the shallow and intermediate depths.

The important point shown by the depth data is that the arsenic is found at similar concentrations to a depth of 2 feet, whereas the lead is much more highly concentrated in the upper 6 inches of soil. The lack of lead or arsenic enrichment deeper than 5 feet indicates that groundwater under the site (likely no shallower than 25 feet) is not threatened nor is likely to be in the future given that two of the three reasons for downward mobility are no longer in effect (i.e., heavy irrigation and continued application of lead arsenate). The fate and transport of lead and arsenic at this site is consistent with that shown in statewide orchard soils as discussed above.

2.6.1 Additional Sampling

In April 2001, an additional five samples were collected as part of the Cleanup Action Plan development. The samples were all collected from 1.5 to 2 feet bgs to examine more closely the arsenic concentrations within the 0.5 to 2 foot shallow interval sampled during the RI. The samples were collected from the northern half of the site along columns 2 through 4 and rows A through F. Results are included in Tables 2 and 3 and summarized below:

Sample	Arsenic Concentration (mg/kg)
4A/1.5-2.0	5.9
2B/1.5-2.0	5.7
4D/1.5-2.0	14.2
3E/1.5-2.0	29.8
4F/1.5-2.0	31.2

The results for the three samples with the highest concentrations are consistent with the RI data in that the arsenic concentrations are close to or greater than the underlying 2 to 3 foot samples, and less than the overlying surface samples. The results for the remaining two samples are anomalous as they are amongst the lowest arsenic concentrations detected during the RI and significantly less than the corresponding RI samples collected from 2 to 3 feet. This indicates a non-uniform reduction in arsenic with depth, perhaps due to a variation in soil type or migration pathways.

2.7 CONCENTRATION OF CONTAMINANTS IN WIDE HOLLOW CREEK

The three sediment samples collected from Wide Hollow Creek had concentrations of lead and arsenic that were all less than 10 mg/kg. Sample locations are shown in Figure 3 and the analytical results are included in Table 2. These concentrations are reflective of background conditions and are also less than possible future freshwater sediment quality values for Washington State, which are 40 mg/kg for arsenic and 260 mg/kg for lead (Ecology 1997).

2.8 DDT CONCENTRATIONS IN SITE SOIL

Three surface samples were analyzed for DDT and other chlorinated pesticides. Both DDT and DDE, a breakdown product of DDT, were detected in all three samples. However, the concentrations were all less than 0.1 mg/kg, which is considerably less than the current Method A cleanup standard of 3 mg/kg.

2.9 AREAS IN EXCEEDENCE OF CLEANUP LEVELS

The Method A cleanup level for arsenic in soil when land use is unrestricted (i.e., not industrial) is 20 mg/kg. This concentration reflects the high average (90th percentile) background concentration in state soil. The cleanup level based solely on protection of human health from the carcinogenic effects of ingestion of soil, as well as protection of groundwater from soil leaching, is less than 1 mg/kg, or much less than what occurs naturally. Therefore, the MTCA cleanup level has been adjusted upwards to reflect the 90th percentile concentration for naturally occurring arsenic (i.e., high background).

For lead, the Method A cleanup level for unrestricted site use is 250 mg/kg. This is based on ingestion of soil and is not adjusted for background concentrations.

The contoured areas of the site in which arsenic exceeds the 20 mg/kg cleanup level are shown in Figures 4, 9, and 10. For surface soil (Figure 4), practically the entire site exceeds this concentration.

At shallow depths (Figure 9), the samples collected along Column 1 are all less than 20 mg/kg, with the rest of the site greater than 20 mg/kg. For intermediate soils (Figure 10), only limited areas of the site, mainly in the northeast corner, exceed 20 mg/kg. All deeper soil concentrations are less than 20 mg/kg. Figures 11a through 11e show the actual sample concentrations at each of the grid locations.

For lead in surface soils, a portion of the southeastern and northeastern section of the site exceeds 250 mg/kg. This is shown as the dark areas in Figure 5. For lead in shallow soil, only four samples exceeded the cleanup level, in both the southeastern and northeastern corners of the site. No exceedance occurred in any of the deeper samples. Figures 12a through 12e display the actual sample concentrations for lead in each depth interval.

2.10 EXPOSURE PATHWAYS

According to Ecology, the exposure pathway with the greatest human health risk for arsenic in soil is by ingestion of surface soil (Ecology 2001). Exposure pathways of lesser risk are direct contact and ingestion of surface soil or inhalation of site dust. These exposure pathways exist at the site due to the high concentrations of lead and arsenic occurring in surface soil.

Exposure via ingestion of groundwater is considered to be an insignificant risk based on the demonstrated lack of contaminant migration below a depth of 5 feet. There is no reason to expect further migration, based upon the scientific literature (Peryea and Creger 1994). The on-site well is also screened at more than 400 feet bgs, which provides additional protection against exposure.

For stream sediment, the levels of both contaminants were reflective of background soil concentrations and less than potential future freshwater sediment cleanup levels. For the ecological exposure pathway, the soil cleanup level for arsenic under Table 749-1 of the to-be adopted MTCA regulation WAC 173-340-7492 (the Simplified Terrestrial Ecological Evaluation) is 20 mg/kg, which is equivalent to the Method A cleanup level.

3.0 Feasibility Study

This section of the report examines and compares various cleanup alternatives for the site. Each alternative must eliminate, reduce, or control risks posed by the following contaminants:

1. Arsenic is the primary contaminant of concern. It occurs site-wide in concentrations greater than cleanup levels in surface soil, to depths of 2 feet over a large portion of the site, and in limited areas to depths of 3 feet.
2. Lead occurs in concentrations greater than cleanup levels in limited areas of the site and mostly in surface soil. However, these areas also contain arsenic at concentrations greater than cleanup levels.

3.1 SELECTION OF REMEDY ALTERNATIVES

According to the MTCA regulation, preference is given to permanent remedies. However, if a permanent remedy is not technically possible or if the costs of a permanent remedy are clearly disproportionate to the extra degree of protection it would provide over non-permanent remedies, then the permanent remedy is considered impractical (WAC 173-340-350). One permanent remedy that is technically possible is excavation of all of the contaminated soil and disposal of that soil in a landfill. Excavation and disposal costs typically start at around $40 per ton. Given that there is approximately 70,000 tons of soil in the upper 2 feet across the site, the cost for this alternative would be, at a minimum, around $3,000,000 or $175,000 per acre. This cost is clearly disproportionate to the incremental protection provided over the other permanent and non-permanent remedies discussed below.

Another permanent alternative is soil tilling, in which the higher concentrations in the surface soil are mixed with less contaminated deeper soils to achieve an overall cleanup level in the mixing zone (NSW EPA 1995). Soil tilling relies on diluting the contaminated surface soil layer with cleaner underlying soil. Dilution is an acceptable cleanup action under the MTCA only if the incremental cost of another permanent solution, such as excavation and off-site disposal, is grossly disproportionate to the benefit, as is the case here (WAC 173-340-360). Soil tilling will be retained for more detailed analysis.

Another remedy alternative is chemical treatment. Chemical treatment technologies, such as immobilization, are technically possible. A common immobilization technology for metals-in-soil is silica micro-encapsulation, in which the soil particles are coated with a silicon dioxide coating. Upon blending of contaminated soil with the silica powder, a tight matrix is formed around each soil particle. Once encapsulated in this form, the metals are no longer soluble or bioavailable and therefore present a much reduced risk to plants, animals, or humans.

Assuming a pug mill would be available for blending, typical project costs are normally in the range of $35 to $80 per ton[3], including excavation and redeposition of soil to and from the pug mill. Again, these costs, at a minimum, would be disproportionate to the benefit, especially since the contaminants are only encapsulated (i.e., neither destroyed nor detoxified).

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[3] http://www.keeco.com

The MTCA statute (WAC 173-340-360) allows for engineering controls (i.e., capping or containment) at sites that contain large volumes of low-level hazardous substances where treatment or excavation is either impracticable or extremely costly, as is the case here. For this site, engineering controls can be accomplished by covering the contaminated surface soil with clean soil or alternatively, paving it with asphalt or concrete. These covers, if permanently maintained, prevent direct contact, ingestion and inhalation, and can be accomplished at a reasonable cost. This method will be retained for detailed analysis.

Alternatively, containment can involve a "cap", which typically refers to an engineered cover that can include multiple soil layers and/or geo-synthetic membranes to prevent or control, for example, rainwater infiltration or landfill gases. For this site, a highly engineered cap is not applicable due to the lack of significant risk to underlying groundwater, lack of subsurface gases, and the ability to manage runoff as part of park design.

3.2 DETAILED ANALYSIS

The two options being considered for detailed analysis are deep tilling and soil cover/paving of contaminated soil.

3.2.1 Deep Tilling

Deep tilling is preferred over the soil cover/paving alternative due to its permanence. However, agricultural tilling depths are typically limited to 6 to 8 inches, which is not deep enough for site conditions. Road reclaiming machines[4] can mix soil to 20 to 22 inches in depth. This limits the applicability of this option to the western most 120 feet of the site (Grid Column 1 as defined by Samples 1A through 1K). The mean concentration in the surface soil along Grid Column 1 is 24 mg/kg and between 0.5 and 2 feet is 16 mg/kg. Together, the 2-foot mean is 20 mg/kg. Theoretically, if the soil can be effectively mixed to this depth, the cleanup level should be achieved throughout the mixed soil.

3.2.2 Deep Tilling Pilot Test

A pilot test[5] was conducted at the site in April 2001 to evaluate the effectiveness of tilling soil contaminated with lead arsenate (Appendix C). Available agricultural and road construction machinery was used that supposedly had the ability to till soil deeper than 6 to 8 inches. The pilot test analyzed a switch plow, a tractor-pulled rototiller both with and without soil rippers, a motor grader, and a road reclaimer. All were evaluated on their ability to till to their claimed maximum tilling depths and how effective each was in mixing soil within the till zone.

Two areas of the site were selected for testing. The first area was located along Grid Column 1 and was selected to specifically evaluate whether deep tilling would be an effective site remedy in this area. The arsenic concentrations in this area are relatively uniform and only exceed the cleanup level in the upper 6 inches of soil. The second area was at the northeastern corner of

[4] A road reclaimer is a machine designed to rip up existing asphalt roads and mix the former pavement into the underlying soil as base coarse for a new roadway.

[5] The deep tilling pilot test was performed by the City of Yakima, but funded by Ecology, under a Memorandum of Agreement.

the site where the surface soil is more compacted, and arsenic and lead concentrations are higher and more variable. This area was selected to illustrate how effective the different tilling methodologies are in compact soil, and how efficiently they homogenize soil with greater variability in arsenic and lead concentrations.

Five test plots approximately 200 feet long by 12 feet wide were laid out parallel to each other in each of the two areas. The test plots were oriented North-South in Grid Column 1 and East-West. Figure 1 in Appendix C shows the orientation and location of the test plots. During tilling, field observations were made of:

- **Depth of Tilling.** A probe rod or shovel was inserted until it encountered firm soils and the depth of insertion measured.
- **Field Mixing Efficiency.** This was accomplished by spreading a layer of cracked corn across the length of each test plot. After each pass of the machinery, shovel holes were dug to examine the distribution of the corn in the mixed zone.
- **Dust Generation.** The amount of dust generated by each piece of equipment was noted.

Soil samples were collected for lead and arsenic prior to and after tilling from three successive 6-inch depth intervals (0 to 6 inches, 6 to 12 inches, 12 to 18 inches) at four locations along each test plot. (NOTE: If the tilling did not reach to the full 18-inch depth, post-tilling samples were not collected from the unaffected intervals and the corresponding pre-tilling samples not analyzed. If the tilling depth reached an intermediate depth, for example 10 inches, then post-tilling samples were collected from equal intervals (e.g., 0 to 5 inches and 5 to 10 inches instead of 0 to 6 inches and 6 to 10 inches).

3.2.2.1 Field Observations

The field observations concerning each methodology are summarized in the following table:

Summary of Pilot Test Field Observations

Methodology	Tilling Depth	Mixing Effectiveness	Dust Generation
Motor Grader	With time-consuming numerous passes, can scrape off soil to at least 18", and deeper if required and soil conditions permit.	Good: Soil appears to have been well mixed vertically and horizontally, however, blade pushes soil to side, then it must be pushed back for more thorough mixing. Some minor amount of small soil chunks observed.	Low
Switch Plow	Soil disturbed to maximum 8-10" after 2-3 passes, but can only affect upper 6-8" in more compact soil.	Poor: Plow generated unmixed chunks of soil and turns soil over, without complete blending.	Low to moderate.

Summary of Pilot Test Field Observations

Methodology	Tilling Depth	Mixing Effectiveness	Dust Generation
Road Reclaimer (CME 650 HP)	18-20" mixing depth was consistently observed after a single pass, including in compacted soil test plot. Efficient–can cover 65 ft/min.	Excellent: single pass leaves soil completely blended and homogenized, without chunks. Significant soil "fluffing" observed. Horizontal mixing decreases with distance, and limited to no more then 8-10 feet.	Low, most dust kept within rotor housing. Can also direct inject water inside rotor housing to control dust.
Ripper/Rototiller	Rippers with wings disturbed soil to 32". To disturb all soil within the test plot requires multiple passes with each offset a wing length from prior pass. Following ripping, maximum rototilling depth of 10" was achieved following ripping in soft soil (N-S plot), but only 5" depth in compact soil.	Poor to Excellent: Soil that was ripped but untilled had very limited mixing, whereas it was well mixed and homogenized following single pass of rototiller over ripped soil.	No dust generation during ripping, moderate-high dust generation during rototilling.
Rototiller (without ripping)	Limited to 6-8" in soft soil, to 4" in compact soil.	Excellent. Soil within rototilling interval is well mixed following single pass. Soil "fluffing" observed. Horizontal mixing decreases with distance, and limited to no more then 8-10 feet.	Moderate to high.

3.2.2.2 Analytical Results

Figure 1 of Appendix B shows the sample locations and analytical results. Also in Appendix B are tables of standard statistical parameters, such as the mean and variance, for each data set (pre- and post-tilling, depth interval, and treatment method). Appendix B also contains results of statistical analyses (analysis of variance or ANOVA) of the lead and arsenic concentrations (the dependent variables) as they varied with the depth of the sample and tilling method (the independent variables). Finally, histograms are included that show the concentration distribution of lead and arsenic by depth (both before and after tilling) and by tilling method.

Analysis of the Appendix B data collected reveals the following:

1. Prior to tilling, the arsenic concentrations in the 12– to 18–inch interval were statistically significantly lower in the N-S test plot ($p = .01$) and statistically

significantly higher in the E-W test plot (p = .07) based on one-factor ANOVA. Note that samples collected in the plow and rototiller strips were omitted from the ANOVAs to achieve a balanced design.

2. It is important to establish that a variation with depth exists in order to be able to assess whether this variation is effected by each tilling methodology.

3. Prior to tilling, the lead concentrations in the N-S test plot were statistically significantly lower in the 12– to 18–inch interval (p = .0004) whereas there was no statistically significant change in lead concentration with depth in the E-W test plot (p = .39), indicating the lead was distributed uniformly over depth. Tilling would therefore not be expected to significantly reduce average lead concentrations in the E-W plot, as there does not exist a zone of less contaminated soil available for blending to higher concentration soil.

4. Prior to tilling, the arsenic concentrations in the E-W test plot revealed a distinct non-normal distribution. This is seen in the shape of the histogram in Appendix B. Some evidence of a non-normal distribution was observed as well for lead in the N-S test plot and for lead and arsenic in the E-W test plot. Strictly speaking, ANOVA methods assume normality, although the results are generally robust to deviations in this assumption.

Following tilling, the analysis of the data reveals the following:

1. The only technique that achieved cleanup levels was the road reclaimer and only in the N-S test plot. Eleven of 12 samples collected following tilling had sample concentrations less than the 20 mg/kg cleanup level. The one sample exceeding this value had a concentration of 21 mg/kg. The mean of the samples prior to the deep tilling was 24 mg/kg and the mean of the samples following tilling was 18 mg/kg. This drop in the mean is attributed to the road reclaimer cut depth being up to 2 inches deeper then expected. As a result, uncharacterized soil from 18 to 20 inches was blended into the 0– to 18–inch interval that was well characterized prior to tilling. Apparently, the soil from 18 to 20 inches had a reduced arsenic concentration that acted to lower the overall mean in the blended soil as compared to the pre-tilling soil.

2. The variances (i.e., spread of the data around the mean) of the lead and arsenic concentrations were significantly lower following road reclaiming in both the N-S and E-W plots, indicating that homogenization occurred. This is apparent in the histograms in Appendix B that compare pre– and post–tilling concentration distributions. However, the ANOVA results indicate a slight depth effect as the 12– to 18–inch arsenic samples had a slightly higher mean concentration then the more shallow samples, indicating that the road reclaimer was unable to thoroughly homogenize the arsenic concentrations across all depths.

3. The road reclaimer significantly decreased the mean lead concentration in the N-S test plot, whereas statistically significant changes were not detected in the lead and arsenic concentrations following tilling in the E-W test plot (for lead, this was an expected result as the lead was already uniformly distributed across depths prior to tilling).

4. In all cases, the plow, road grader and ripper/rototiller were unable to significantly lower the mean lead or arsenic concentrations or tighten the variance. In fact, the

grader caused the variance for lead in the E-W plot to actually increase, as did the ripper/rototiller for arsenic in the E-W plot.

5. The rototiller was able to significantly reduce the variance for arsenic and lead in the N-S plot; but, since the tilling depth was no deeper than 8 inches, the rototiller was unable to lower the corresponding mean concentrations. In fact, the rototiller produced larger decreases in variance as compared to the road reclaimer. This is probably due to the greater number of RPMs (revolutions per minute) generated by the rototiller, hence greater homogenization. No change in variance was noted in the rototilled E-W test plots due to the very small depth (4 inches) of rototilling in the compact soils.

Appendix B contains a copy of the Ecology-approved work plan that was prepared for the pilot study as well as photographs, analytical results, statistical analyses, field observations, and other supporting documentation.

3.3 SOIL OR PAVED COVER

The second alternative is a soil or pavement cover. Approximately 25 percent of the site will be covered with paved surfaces (tennis courts, parking, trails, etc). The paved surfaces will work well to prevent an exposure pathway, as long as they are maintained.

The majority of the site will be left unpaved to serve its intended function as passive parkland. Except for Grid Column 1, the concentration and/or depth of arsenic contamination eliminates the ability to treat the soil by deep tilling. Therefore, a soil cover is the only practical alternative that balances cost vs. protectiveness. For a soil cover to be an effective barrier, it must be engineered for several purposes:

- **Prevent incidental contact with underlying soil:** A minimum thickness is necessary to satisfy this purpose. For the passive park, 6 inches of soil cover with overlying turf is considered protective against incidental contact when used in combination with all of the elements below. As this is not a residential area, it is unlikely that unintended digging would occur in the passive areas of the park, especially if covered by turf. Children's play areas are the most likely places where digging and subsequent exposure may occur. Should any play areas be constructed over contaminated soil, a permeable protective barrier such as chicken wire will be placed over contaminated soil to act as a barrier against digging. Then, a minimum of 12 inches of soil followed by a 6-inch thick layer of a fall-adsorbing material will be used as cover. This is considered protective, as the 18-inch total thickness of cover will prevent against exposure by most incidental digging in the play area. Compaction of the soil cover will also hinder deep digging.
- **Resist erosion:** Erosion can be caused by either natural forces (rainfall, wind) or by human activities, such as foot traffic. Turf is necessary to satisfy this purpose. The root system of turf will absorb rainfall and bind soil particles, thereby hindering erosion. A minimum of 3 inches of topsoil is necessary for establishment of turf, as that is a typical root depth and is also the maximum penetration depth for maintenance activities such as aeration. Finally, the area that is covered needs to be gently graded to allow for mowing. A gentle grade will also lessen the chances for soil sloughing or runoff channeling, both of which may lead to erosion of the cover.

- **Permanence:** The cover must provide permanent protection. This will occur as long as the turf is maintained. Without maintaining a healthy turf, the risk of exposure increases as the cover becomes much more susceptible to erosion, wear, digging, etc. Therefore, maintenance is the essential element that provides the long-term protectiveness of this remedy. However, since the site will be developed as a city park, turf maintenance is already a necessary activity.
- **Demarcation:** To demarcate the transition between clean cover and underlying contaminated soil, a marker material (e.g., fabric, netting, mesh) needs to be placed in between the two soil types. In addition, marker material will be placed between paved areas and underlying contaminated soil. The marker material should be tightly woven to resist penetration by incidental digging and also make breaches in the cover or paving easy to identify during routine inspection.

If contaminated soil is to be left in place at concentrations greater than the cleanup level, then institutional controls are required by the MTCA regulation (WAC 173-340-440). Institutional controls limit or prohibit activities, such as digging, that may interfere with the integrity of a cleanup action as well as ensure that the physical measures of the cleanup, such as the turf and paved areas, are maintained over time. The specific institutional controls for the soil cover/paving alternative are described in more detail in the Cleanup Action Plan (Section 4.0).

Three site-specific options were developed for the soil and paved cover alternative. They are as follows:

1. **Relocate Contaminated Soil Below Future Paved Areas.** Planned park development includes 12 tennis or multipurpose courts and an asphalt parking area. Excavating soil with arsenic concentrations exceeding 20 mg/kg (mostly found in the upper 18-24 inches) from future passive park areas and placing it below the tennis/multipurpose courts and paved parking areas. Relocation is preferable because it removes all contaminated soil from the excavated areas (thereby cleaning up these areas) and places the soil on top of areas where contaminant levels are higher and deeper and where paved areas are planned.
2. **Cover Contaminated Soil With Clean Soil Obtained On Site.** This option involves covering future unpaved park areas where surface soil arsenic concentrations exceed 20 mg/kg with 6 inches of clean soil/turf. The clean soil would be generated on site, either from over-excavation of areas cleaned up by deep tilling or relocation.
3. **Cover Contaminated Soil With Imported Soil.** This treatment option involves covering future grassed and vegetated areas where mean arsenic concentrations exceed 20 mg/kg (the upper 24 inches in most areas of the property except the westernmost 120 feet) with 6 inches of imported soil. A topsoil cover would significantly increase the viability of turf and plantings, which would add to the long-term protectiveness of the remedy.

Table 5 summarizes all the preferred remedial alternatives, including the two options above, and gives unit costs. For comparison, it also includes a no action alternative and the site-wide permanent alternative (i.e., excavation and off site disposal). Appendix D contains the engineer's calculations to arrive at the stated unit costs. These costs were verified with local contractors, suppliers, and engineers.

4.0 Cleanup Action Plan

Per the MTCA requirements for selection of cleanup actions, (WAC-173-340-360) all cleanup actions must protect human health and the environment, comply with cleanup standards and applicable state and federal laws, and provide for compliance monitoring. Cleanup actions shall also consider public concerns and provide for a reasonable restoration time frame (i.e., the public can safely use the site as soon as the park development is complete).

Two alternatives, the relocate/cover and deep tilling, satisfy all these requirements. The preferred remedy for the site is described below. It relies on a combination of these alternatives based on balancing cost, protectiveness, and impact to park design following input from the City of Yakima, Ecology, the park architects, and the public.

4.1 CLEANUP LEVELS AND POINTS OF COMPLIANCE

The selected cleanup levels for arsenic and lead in soil at this site will be the MTCA Method A values of 20 mg/kg and 250 mg/kg respectively. The points of compliance (i.e., the locations where the cleanup levels will be met) will be throughout the upper 3 feet of site soil currently in exceedance of cleanup levels.

4.2 PREFERRED REMEDY

The preferred remedy relies on tilling by road reclaimer and relocation with subsequent paving or soil covering. This combination of remedies is preferred because it achieves permanence in as much of the site as possible (via tilling or excavation) and then relies on covering or paving the remaining areas of the site. It blends well into the planned site development, as it does not cause redesign or relocation of the tennis courts or parking area. The areas of each selected alternative are shown in Figure 13 and are described as follows:

- **Area 1—Tilling.** This technique will permanently clean up Area 1 soils by mixing soil so that the mean concentration in the upper 6 inches falls to less than the cleanup level. As this mixing is permanent, it is of highest preference. However, it is expected to only be successful in Area 1 as this is the only part of the site where the mean concentration of arsenic is less than or equal to the cleanup level throughout the depth of the tilling zone. This technique was proven to be effective in the pilot test.

  Estimated volume of soil treated (to 20 inches): 8,000 cubic yards.

- **Area 3—Excavate Contaminated Soil and Relocate Elsewhere On Site.** Within Area 3, the depth of arsenic contamination is generally limited to 2 feet or less (Section 2.6.1). Accordingly, Area 3 will first be excavated (on average 18 inches) until most remaining arsenic concentrations are less than cleanup levels. Deep tilling will then be performed to treat any remaining hotspots If any soil remains with arsenic concentration greater than cleanup levels, reexcavation will occur. All excavated soil will be relocated to Areas 2 and 4 where arsenic concentrations are higher and in some locations, deeper. This is the preferred alternative because it offers a permanent remedy in this area of the site. Children's play areas should be located in this area.

Estimated volume of soil to be excavated: 15,000 cubic yards.

- **Areas 2A and 2B—Soil and Turf Cover.** Some of the contaminated soil from Area 3 will be placed atop existing contaminated soil and then regraded to the rough contours shown in Figure 14. The relocated soil will vary in thickness, depending on the grading plan. A demarcation fabric will be laid down over the contaminated soil, and then covered by 6 inches of clean soil taken from Area 1 (after it has been deep tilled), then hydroseeded. Institutional controls (discussed in Section 4.3) will be implemented to maintain the turf indefinitely.

  Estimated volume of soil to be contained under soil cover: 5,600 cubic yards.

- **Area 4—Cover Relocated Soil by either Paved Surfaces or Soil.** The rest of the soil excavated from Area 3 will be placed under the future parking lot and tennis courts (raising their elevation on average 2 feet from existing grade) and over future unpaved areas. All of Area 4 will receive marker fabric, with future unpaved areas covered with 6 inches of clean soil from Area 1, then hydroseeded. Figure 14 displays preliminary grading contours. Institutional controls will be implemented to maintain the paved and covered areas indefinitely.

  Estimated volume of soil to be contained under paved areas: 9,400 cubic yards.

4.3 DESIGN CRITERIA

The following sections present design criteria for the environmental components of the planned park development. While these criteria clarify some of the elements of the selected remedy and establish minimum requirements that must be met by the final design, construction plans and specifications will need to be prepared that detail how the remedy will be implemented. The remediation-related elements of park development will be integrated into the overall plans and specifications for Kissel Park. The plans and specifications will be prepared in conformance with accepted civil engineering practices and will include permit conditions, material specifications, and performance requirements.

4.3.1 Design Criteria for Engineered Covers

Design criteria are general, performance-based criteria for design. Specific design elements will be in the plans and specifications for the park.

Design criteria for the asphalt and concrete pavements are as follows:

- Provide sufficient load carrying capacity to meet maximum load or use conditions.
- Withstand intended use without requiring significant maintenance over the 20– to 30–year minimum life spans of these structures.
- Design pavements in accordance with site-specific geotechnical recommendations, if any.

- Provide a visual demarcation barrier such that exposure of contaminated soil caused by loss of cover thickness can be readily identified.

Design criteria for the engineered soil cover are as follows:

- Provide for a minimum cover of 6 inches of clean soil over contaminated soil. The justification for the protectiveness of the minimum 6-inch thickness cover is addressed in Section 3.3.
- Cover soil shall function as a suitable medium for growing grass or other vegetation.
- Cover soil and vegetation shall result in a durable surface that can withstand recreational traffic expected in public parks and other forces that could act to reduce cover soil thickness over time.
- Provide irrigation to optimize vitality while controlling excess irrigation to minimize ponding or other consequences that might reduce the durability of the cover soil.
- Provide a visual demarcation and penetration barrier to reduce the risk of breaching of the barrier by children via digging and allow identification of breaches in the cover during inspection.

4.3.2 Design Criteria for Stormwater Management

Design of the stormwater management system shall comply with the requirements of the City of Yakima and Ecology Stormwater Manual. Select design criteria consistent with these standards include the following:

- Stormwater shall not be allowed to leave the site other than via infiltration.
- Stormwater runoff from paved areas shall be routed to specific collection and treatment areas that will provide for infiltration through soil meeting MTCA Method A cleanup levels.
- Grassed or vegetated areas shall be sloped and contoured in a manner that does not promote ponding or erosion.

4.4 COMPLIANCE MONITORING AND INSTITUTIONAL CONTROLS

4.4.1 Health and Safety Protection Monitoring

To ensure that human health is protected during construction, site work related to grading and filling of contaminated soil will be performed under the regulations and requirements of the Occupational Safety and Health Act (OSHA) and the Washington Industrial Safety and Health Act (WISHA). This includes the development and implementation of a site-specific health and safety plan. A copy of the plan will be available on the project site at all times during earthwork activities.

4.4.2 Compliance Monitoring for Soil

Compliance monitoring is done to confirm that the cleanup action has achieved its objectives. For this project, monitoring of tilling, excavation, grading, filling, and placement of cover will occur to ensure that the cleanup was completed according to the specifications.

4.4.3 Cleanup Action Observations

For tilling, it will be necessary to ensure that entire acreage of Area 1 is effectively mixed and that the minimum tilling depth is reached.

Monitoring of the soil excavation in Area 3 will require use of grade stakes to ensure the soil is removed to the expected depth of clean soil (except along the edges, where it will be sloped to meet adjoining grade). On-site screening of soil using an XRF (x-ray fluorescence) meter will be used to make a preliminary determination of when the soil cleanup standard is achieved.

Monitoring of the soil cover placement in Areas 2A, 2B and 4 will ensure that the minimum fill depths are uniformly achieved. This will be accomplished primarily by use of grade stakes. Additionally, compaction of soil under the parking area and tennis courts will occur to minimize the potential for settlement.

4.4.4 Confirmation Soil Sampling

Confirmation soil sampling will be performed in accordance with WAC 173-340-740, Compliance Monitoring. Soil samples will be collected from the upper 6 inches of soil following tilling or final excavation to determine if the mean concentrations of lead and arsenic throughout Areas 1 and 3 are less than or equal to the cleanup levels. Per WAC 173-340-710, statistical methods to determine compliance with cleanup levels will not be used (unless there are large variations in the contaminant concentrations relative to the mean). Soil sample locations will be equally spaced and will average two samples per acre (equivalent to the sample density in the RI). Samples will be analyzed for total lead and arsenic. Additional tilling or excavation may need to occur if hot spots remain.

4.5 PROJECT SITE ENGINEERING CONTROLS

4.5.1 Erosion, Stormwater, Sedimentation, and Dust Control

Erosion and sediment control procedures, equipment, and materials will be utilized to avoid unnecessary erosion and sedimentation as a result of soil excavation and stockpiling activities. The protection and diversion of stormwater, use of erosion and sediment control Best Management Practices (BMPs), and covering of soil stockpiles will be addressed as engineering controls and practices in the plans and specifications. Permanent stormwater control will involve final site grading to minimize ponding and promote on site infiltration.

Procedures to control dust will be followed at all times during construction activities. In general, no visible dust will be allowed. Where dust generation is expected or observed, dust will be controlled by spraying water on haul roads and excavation areas and by covering stockpiled soil. The road reclaimer will use an internal water spray to suppress dust.

4.6 INSTITUTIONAL CONTROLS

Institutional controls are administrative or maintenance measures to limit or prohibit activities that may cause future exposure to hazardous substances left in place greater than cleanup levels. Institutional controls are necessary at this site for the purposes of ensuring that physical cleanup measures, such as the paved surfaces and soil covers, are regularly inspected and maintained over time. Institutional controls are also necessary to plan for and limit activities that could result in exposure to contaminated soil. Specific institutional controls will include:

- A marker material placed between the contaminated soil left in place and the import soil cover, asphalt paving, or concrete placed on top. The marker material will be a colored netting that is non-biodegradable. It will indicate when contaminated soils have been reached while intentionally digging at the site (e.g., when making repairs to the irrigation system or when digging for a new light standard) as well as provide a prominent visible indication of any unintentional breaches in the soil cover during regular inspection.
- A sign at the park informing the public of the cleanup action and prohibiting digging activities without city permission.
- An irrigation system capable of maintaining the turf in Areas 2 and 4. The irrigation system will be laid out prior to the placement of the soil cover and marker fabric. The irrigation schedule for the site will be designed to maintain turf in Areas 2 and 4, while delivering the water at a rate and schedule that minimizes ponding and does not exceed the evapotranspiration rate.
- A landscaping plan to ensure that the turf cover and plantings are constantly maintained. This will include a minimum fertilization, mowing, and weed control schedule during the growing season to keep the turf maintained.
- A plan for quarterly inspection and maintenance of paved areas and turf. The inspections will be performed by Park and Recreation personnel. They will look for cracks, potholes and other damage to the paved areas. In landscaped areas, patches of dead vegetation or sod will be noted and maintained as necessary.
- A plan for properly managing soil brought up by planned digging activities in Areas 2A, 2B and 4. These include such things as trenching for additional utilities, adding light standards, drilling, etc. To the degree possible, excavated contaminated soil will be placed back in the hole and the 6 inches of import soil cover/sod replaced. Any soil not able to be placed back in its original location will need to be disposed of at an appropriate off-site location, such as a regional landfill.

All of the plans described above will be combined into an overall Park Management Plan, prepared as part of the project plans and specifications. The plan will be tied to the existing park plans for the City of Yakima.

To ensure that the institutional controls are maintained over time, they will be described in a restrictive covenant to be placed on the property's deed following cleanup. The restrictive covenant shall include affirmative obligations for the City of Yakima to maintain the park according to the park-specific management plan. The affirmative obligations shall also allow Ecology to take administrative actions against the city should a lack of maintenance occur or, should that fail, for Ecology to take over maintenance at the city's expense. Finally, the restrictive covenant will serve to notify future owners of the site of their obligation to continue the institutional controls.

4.6.1 Long-term Cost of Institutional Controls

The long-term cost for the institutional controls in Areas 2 and 4 should be compared to the cost of a permanent remedy that would not require institutional controls (e.g., excavation and off site disposal). The cost for the institutional controls should be estimated over the reasonable expected minimum lifetime of the cleanup, in this case, 100 years. These would be:

- Cost for irrigation of turf
- Cost for maintenance of turf (i.e., mowing, fertilization, weed control, reseeding, thatching, aeration, etc.)
- Costs for regular inspections of turf, parking lot asphalt and tennis courts
- Cost for maintenance of asphalt parking lot and tennis courts
- Cost for managing contaminated soil brought up by maintenance or park improvements

Some of the items above (irrigation, turf, and paved area maintenance) are standard obligations of the City of Yakima to maintaining the park. Therefore, there is no added cost for their implementation and should not be considered in this comparison. The remaining items, regular inspections and managing contaminated soil, represent additional long-term costs above and beyond normal park maintenance.

The yearly cost for quarterly inspections is estimated to cost $240 per year, based on a one-hour inspection and write-up (hourly rate of $60). Over 100 years, and assuming a 3 percent inflation rate, this yearly cost has a present value[6] of $7,600. The cost for managing the contaminated soil on a yearly basis is assumed to be $500. This represents the cost to haul off to a landfill 80 tons of contaminated soil (at $40 per ton) plus cost for analyses and overhead. The present value of this is $15,800. The combined present value for these activities is $23,400, or a negligible amount compared to the $3,000,000 cost for excavation and off-site disposal.

4.7 SCHEDULE

The schedule for implementation of the cleanup action is not finalized at this time. Currently, the cleanup action will occur as part of site development, expected to occur in the fall of 2001 and be finished by early winter 2001. The final schedule will be determined by the City of

[6] The present value is the total amount that a series of future payments is worth now. For example, when money is borrowed, the loan amount is the present value to the lender.

Yakima, however. It is expected that the earthwork portion of the cleanup will require 2 to 3 weeks of field effort.

4.8 CONSTRUCTION DOCUMENTATION AND REPORTING

Documentation of field activities will occur during cleanup activities, up to and including placement of the 6-inch soil cover and compaction. Documentation will include a description of conditions encountered, work performed by the contractors, health and safety monitoring and sample identification and location. The field inspector will prepare a written field report summarizing the activities observed, as well as any recommendations made or sampling performed. The field reports, along with the results of all associated tests, will be transmitted weekly to Ecology.

Upon satisfactory completion of cleanup activities, a Construction Documentation Report will be prepared. This brief document will include a summary of remediation activities performed, surveyed final grades, locations of excavated, tilled, and filled areas, volumes of soil excavated and imported, analytical data for soil samples analyzed, and an evaluation of the actual site cleanup relative to that specified in the plans and specifications and cleanup levels. The Construction Documentation Report will be submitted to Ecology within 30 days following completion of cleanup actions.

5.0 References

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Kissel Park

Remedial Investigation/ Feasibility Study and Cleanup Action Plan

Tables

FINAL

Table 1
Sample Collection Schedule

Location	Analysis	Rationale	Number of Samples
Surface soil (0-0.5')	Arsenic, Lead, Pesticides	Characterize concen–trations of lead and arsenic in the soil interval that presents the greatest risk of human exposure, also determine presence and concentrations of chlorinated pesticides.	89 (Metals) 3 (Pesticides)
Shallow Soil (0.5'-2') Intermediate Soil (2-3')	Arsenic, Lead	Determine depth of contamination, use data to define deeper areas needing remediation.	89 (0.5'-2') 40 (2-3')
Deep Soil (3-5'; 5-7')	Arsenic, Lead	Determine lead and arsenic concentrations in deep soil potentially unaffected by lead arsenate.	5 (3-5') 5 (5-7')
Sediment in Wide Hollow Creek	Arsenic, Lead	Characterize lead and arsenic concentrations at up, mid and downstream locations	3
Field Quality Control Samples			
Field duplicates	Metals	Determine laboratory precision.	4 (5% frequency)

Table 2
Sample Results, All Data, Sorted By Sample ID
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	DDT / DDE (mg/kg)	Depth (ft)	Sample Date	Comments
1A/.5-2	21.5	60.1	NA	0.5-2	07-Feb-01	Soil
1A/0-6	23.9	75	NA	0-0.5	07-Feb-01	Soil
1A/2-3	21.9	52.5	NA	2-3	07-Feb-01	Soil
1B/.5-2	15.9	33.6	NA	0.5-2	07-Feb-01	Soil
1B/0-6	18.5	50.8	NA	0-0.5	07-Feb-01	Soil
1B/2-3	13.1	27.4	NA	2-3	07-Feb-01	Soil
1C/.5-2	12.6	27.3	NA	0.5-2	07-Feb-01	Soil
1C/0-6	16.6	43.4	NA	0-0.5	07-Feb-01	Soil
1D/.5-2	17.9	34.9	NA	0.5-2	07-Feb-01	Soil
1D/0-6	29.1	99.2	NA	0-0.5	07-Feb-01	Soil
1E/.5-2	17.9	46.2	NA	0.5-2	07-Feb-01	Soil
1E/0-6	22.6	69.9	NA	0-0.5	07-Feb-01	Soil
1E/2-3	17.3	48	NA	2-3	07-Feb-01	Soil
1E/7-9	23.9	73.1	NA	7-9	07-Feb-01	Duplicate of 1E/0-6
1F/.5-2	16.1	31.9	NA	0.5-2	07-Feb-01	Soil
1F/0-6	27.3	89.7	NA	0-0.5	07-Feb-01	Soil
1F/2-3	7.3	12.4	NA	2-3	07-Feb-01	Soil
1G/.5-2	9.9	15.2	NA	0.5-2	07-Feb-01	Soil
1G/0-6	23.4	88.9	NA	0-0.5	07-Feb-01	Soil
1G/2-3	7.9	13.5	NA	2-3	07-Feb-01	Soil
1H/.5-2	18.6	17.3	NA	0.5-2	07-Feb-01	Soil
1H/0-6	27.9	91.1	NA	0-0.5	07-Feb-01	Soil
1H/2-3	12.1	10.1	NA	2-3	07-Feb-01	Soil
1I/.5-2	15.4	19.9	NA	0.5-2	07-Feb-01	Soil
1I/0-6	26.1	69.1	NA	0-0.5	07-Feb-01	Soil
1J/0-6	26.1	65.2	NA	0-0.5	07-Feb-01	Soil
1J/.5-2	13.9	13.2	NA	0.5-2	07-Feb-01	Soil
1J/2-3	11.4	9.3	NA	2-3	07-Feb-01	Soil
1J/3-5	10.8	5.4	NA	3-5	07-Feb-01	Soil
1K/.5-2	15.4	17.7	NA	0.5-2	07-Feb-01	Soil
1K/0-6	28.2	75.1	NA	0-0.5	07-Feb-01	Soil
1K/2-3	11.8	8.2	NA	2-3	07-Feb-01	Soil
1K/3-5	10.4	6	NA	3-5	07-Feb-01	Soil
1S/0-6	8.1	9.5	NA	0-0.5	06-Feb-01	Sediment
2A/.5-2	23.6	52.5	NA	0.5-2	07-Feb-01	Soil
2A/0-6	32.5	96.1	NA	0-0.5	07-Feb-01	Soil
2A/2-3	14.7	22	NA	2-3	07-Feb-01	Soil

Table 2
Sample Results, All Data, Sorted By Sample ID
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	DDT / DDE (mg/kg)	Depth (ft)	Sample Date	Comments
2B/.5-2	27.1	54.5	NA	0.5-2	06-Feb-01	Soil
2B/1.5-2	5.77	NA	NA	1.5-2	18-Apr-01	Soil
2B/0-6	34.6	103	NA	0-0.5	06-Feb-01	Soil
2B/7-9	32.5	94.2	NA	7-9	06-Feb-01	Duplicate of 2B/0-6
2C/.5-2	20.9	48.1	NA	0.5-2	06-Feb-01	Soil
2C/0-6	35.4	100	NA	0-0.5	06-Feb-01	Soil
2C/3-5	12.3	9.8	NA	3-5	07-Feb-01	Soil
2D/.5-2	30.7	82.3	NA	0.5-2	06-Feb-01	Soil
2D/0-6	44.2	142	NA	0-0.5	06-Feb-01	Soil
2D/2-3	12.6	12.4	NA	2-3	06-Feb-01	Soil
2E/.5-2	27.8	35.7	NA	0.5-2	06-Feb-01	Soil
2E/0-6	35	116	NA	0-0.5	06-Feb-01	Soil
2F/.5-2	22.9	42	NA	0.5-2	06-Feb-01	Soil
2F/0-6	30.8	109	NA	0-0.5	06-Feb-01	Soil
2F/2-3	11.1	8.5	NA	2-3	06-Feb-01	Soil
2G/.5-2	30.6	86.5	NA	0.5-2	06-Feb-01	Soil
2G/0-6	31.7	108	NA	0-0.5	06-Feb-01	Soil
2G/2-3	13.1	11.5	NA	2-3	06-Feb-01	Soil
2H/.5-2	18.6	31.6	NA	0.5-2	06-Feb-01	Soil
2H/0-6	32.4	105	NA	0-0.5	06-Feb-01	Soil
2I/.5-2	32	85.6	NA	0.5-2	06-Feb-01	Soil
2I/0-6	33.6	110	NA	0-0.5	06-Feb-01	Soil
2J/.5-2	24.8	29	NA	0.5-2	06-Feb-01	Soil
2J/0-6	30.1	99.7	NA	0-0.5	06-Feb-01	Soil
2K/.5-2	13	12.1	NA	0.5-2	06-Feb-01	Soil
2K/0-6	30.7	111	NA	0-0.5	06-Feb-01	Soil
3A/.5-2	27.1	44.2	NA	0.5-2	06-Feb-01	Soil
3A/0-6	42.8	125	NA	0-0.5	06-Feb-01	Soil
3A/2-3	14.5	16.4	NA	2-3	06-Feb-01	Soil
3A/3-5	12.7	8.4	NA	3-5	06-Feb-01	Soil
3B/.5-2	17.4	29.8	NA	0.5-2	06-Feb-01	Soil
3B/0-6	43.2	143	0.033 / 0.08	0-0.5	06-Feb-01	Soil
3C/.5-2	11.9	18.4	NA	0.5-2	06-Feb-01	Soil
3C/0-6	45.5	144	NA	0-0.5	06-Feb-01	Soil
3C/5-7	12.7	10.6	NA	5-7	07-Feb-01	Soil
3D/.5-2	20.6	24.8	NA	0.5-2	06-Feb-01	Soil
3D/0-6	39.6	132	0.031 / 0.061	0-0.5	06-Feb-01	Soil

Table 2
Sample Results, All Data, Sorted By Sample ID
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	DDT / DDE (mg/kg)	Depth (ft)	Sample Date	Comments
3D/2-3	15.1	20.6	NA	2-3	06-Feb-01	Soil
3E/.5-2	65.3	187	NA	0.5-2	06-Feb-01	Soil
3E/1.5-2	29.8	NA	NA	1.5-2	18-Apr-01	Soil
3E/0-6	56.8	209	NA	0-0.5	06-Feb-01	Soil
3E/2-3	16	16.3	NA	2-3	06-Feb-01	Soil
3E/7-9	56.6	206	NA	7-9	06-Feb-01	Duplicate of 3E/0-6
3F/.5-2	19.8	22	NA	0.5-2	06-Feb-01	Soil
3F/0-6	45.1	164	NA	0-0.5	06-Feb-01	Soil
3F/2-3	13.4	9.9	NA	2-3	06-Feb-01	Soil
3G/.5-2	30.5	34.1	NA	0.5-2	06-Feb-01	Soil
3G/0-6	51	197	NA	0-0.5	06-Feb-01	Soil
3H/.5-2	34.5	104	NA	0.5-2	06-Feb-01	Soil
3H/0-6	39.6	152	NA	0-0.5	06-Feb-01	Soil
3H/2-3	21.6	51.1	NA	2-3	06-Feb-01	Soil
3I/.5-2	40.3	70.8	NA	0.5-2	06-Feb-01	Soil
3I/0-6	34.2	132	NA	0-0.5	06-Feb-01	Soil
3I/2-3	16.6	16.1	NA	2-3	06-Feb-01	Soil
3J/.5-2	44.9	125	NA	0.5-2	06-Feb-01	Soil
3J/0-6	42.4	167	NA	0-0.5	06-Feb-01	Soil
3J/7-9	42.9	161	NA	7-9	06-Feb-01	Duplicate of 4E/0-6
3K/.5-2	24.7	33.2	NA	0.5-2	07-Feb-01	Soil
3K/0-6	46.2	169	NA	0-0.5	07-Feb-01	Soil
3K/5-7	12.9	11.3	NA	5-7	07-Feb-01	Soil
4A/.5-2	32.2	53.2	NA	0.5-2	06-Feb-01	Soil
4A/1.5-2	5.9	NA	NA	1.5-2	18-Apr-01	Soil
4A/0-6	48.6	132	NA	0-0.5	06-Feb-01	Soil
4A/2-3	20.1	33.1	NA	2-3	06-Feb-01	Soil
4B/.5-2	27	50.1	NA	0.5-2	06-Feb-01	Soil
4B/0-6	41.7	106	NA	0-0.5	06-Feb-01	Soil
4C/.5-2	20.8	32.4	NA	0.5-2	06-Feb-01	Soil
4C/0-6	37.4	90.8	NA	0-0.5	06-Feb-01	Soil
4D/.5-2	40	44.9	NA	0.5-2	06-Feb-01	Soil
4D/1.5-2	14.2	NA	NA	1.5-2	18-Apr-01	Soil
4D/0-6	52.4	170	0.024 / 0.059	0-0.5	06-Feb-01	Soil
4D/2-3	18.4	22	NA	2-3	06-Feb-01	Soil
4E/.5-2	33.9	46.2	NA	0.5-2	06-Feb-01	Soil
4E/0-6	51.7	172	NA	0-0.5	06-Feb-01	Soil

Table 2
Sample Results, All Data, Sorted By Sample ID
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	DDT / DDE (mg/kg)	Depth (ft)	Sample Date	Comments
4F/.5-2	47.8	65.1	NA	0.5-2	06-Feb-01	Soil
4F/1.5-2	31.2	NA	NA	1.5-2	18-Apr-01	Soil
4F/0-6	61.6	213	NA	0-0.5	06-Feb-01	Soil
4G/.5-2	43	42.2	NA	0.5-2	06-Feb-01	Soil
4G/0-6	64.8	240	NA	0-0.5	06-Feb-01	Soil
4G/2-3	17.7	11	NA	2-3	06-Feb-01	Soil
4H/.5-2	39	59.3	NA	0.5-2	06-Feb-01	Soil
4H/0-6	52.8	196	NA	0-0.5	06-Feb-01	Soil
4I/.5-2	35.8	29.6	NA	0.5-2	06-Feb-01	Soil
4I/0-6	65.1	240	NA	0-0.5	06-Feb-01	Soil
4I/2-3	21	13	NA	2-3	06-Feb-01	Soil
4J/.5-2	33.7	82.5	NA	0.5-2	07-Feb-01	Soil
4J/0-6	52.3	190	NA	0-0.5	07-Feb-01	Soil
4K/.5-2	42.2	88.9	NA	0.5-2	07-Feb-01	Soil
4K/0-6	50.6	182	NA	0-0.5	07-Feb-01	Soil
4S/0-6	7.1	9.9	NA	0-0.5	06-Feb-01	Sediment
56AB/.5-2	26.7	43.7	NA	0.5-2	07-Feb-01	Soil
56AB/0-6	68.4	232	NA	0-0.5	07-Feb-01	Soil
56AB/2-3	20	34	NA	2-3	07-Feb-01	Soil
56BC/.5-2	31.9	53.9	NA	0.5-2	07-Feb-01	Soil
56BC/0-6	58.8	243	NA	0-0.5	07-Feb-01	Soil
56BC/5-7	18.3	15.9	NA	5-7	07-Feb-01	Soil
56CD/.5-2	41.5	20.1	NA	0.5-2	07-Feb-01	Soil
56CD/0-6	62.2	238	NA	0-0.5	07-Feb-01	Soil
5A/.5-2	59.9	178	NA	0.5-2	07-Feb-01	Soil
5A/0-6	62.7	211	NA	0-0.5	07-Feb-01	Soil
5B/.5-2	43.6	90.1	NA	0.5-2	07-Feb-01	Soil
5B/0-6	72	259	NA	0-0.5	07-Feb-01	Soil
5C/.5-2	31.4	27.1	NA	0.5-2	07-Feb-01	Soil
5C/0-6	68.7	231	NA	0-0.5	07-Feb-01	Soil
5D/.5-2	31.4	57	NA	0.5-2	07-Feb-01	Soil
5D/0-6	69.9	272	NA	0-0.5	07-Feb-01	Soil
5E/.5-2	21.5	29.8	NA	0.5-2	07-Feb-01	Soil
5E/0-6	60.7	202	NA	0-0.5	07-Feb-01	Soil
5F/.5-2	34.2	57.5	NA	0.5-2	07-Feb-01	Soil
5F/0-6	69.1	256	NA	0-0.5	07-Feb-01	Soil
5F/2-3	18.2	40.4	NA	2-3	07-Feb-01	Soil

Table 2
Sample Results, All Data, Sorted By Sample ID
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	DDT / DDE (mg/kg)	Depth (ft)	Sample Date	Comments
5G/.5-2	32.2	25.4	NA	0.5-2	07-Feb-01	Soil
5G/0-6	58.2	233	NA	0-0.5	07-Feb-01	Soil
5G/2-3	18.2	16.8	NA	2-3	07-Feb-01	Soil
5H/.5-2	56.9	135	NA	0.5-2	07-Feb-01	Soil
5H/0-6	75.3	328	NA	0-0.5	07-Feb-01	Soil
5H/2-3	16.5	17.3	NA	2-3	07-Feb-01	Soil
5I/.5-2	46.2	57.2	NA	0.5-2	07-Feb-01	Soil
5I/0-6	76.1	290	NA	0-0.5	07-Feb-01	Soil
5J/.5-2	49.4	91.8	NA	0.5-2	07-Feb-01	Soil
5J/0-6	73.9	289	NA	0-0.5	07-Feb-01	Soil
5K/.5-2	58.6	32.4	NA	0.5-2	07-Feb-01	Soil
5K/0-6	75.8	298	NA	0-0.5	07-Feb-01	Soil
5K/2-3	16.3	19.6	NA	2-3	07-Feb-01	Soil
5L/.5-2	42.2	86.6	NA	0.5-2	07-Feb-01	Soil
5L/0-6	54.5	139	NA	0-0.5	07-Feb-01	Soil
67AB/.5-2	41.6	131	NA	0.5-2	07-Feb-01	Soil
67AB/0-6	35.6	129	NA	0-0.5	07-Feb-01	Soil
67AB/2-3	16.4	16.2	NA	2-3	07-Feb-01	Soil
67BC/.5-2	61.3	131	NA	0.5-2	07-Feb-01	Soil
67BC/0-6	27	99.9	NA	0-0.5	07-Feb-01	Soil
67BC/2-3	58.9	14.4	NA	2-3	07-Feb-01	Soil
67CD/.5-2	83.6	242	NA	0.5-2	07-Feb-01	Soil
67CD/0-6	30.2	148	NA	0-0.5	07-Feb-01	Soil
6A/.5-2	11.5	16.3	NA	0.5-2	07-Feb-01	Soil
6A/0-6	53.9	161	NA	0-0.5	07-Feb-01	Soil
6A/2-3	9	9.9	NA	2-3	07-Feb-01	Soil
6B/.5-2	29.8	73.6	NA	0.5-2	07-Feb-01	Soil
6B/0-6	23.1	84.8	NA	0-0.5	07-Feb-01	Soil
6C/.5-2	42	161	NA	0.5-2	07-Feb-01	Soil
6C/0-6	34.3	155	NA	0-0.5	07-Feb-01	Soil
6C/2-3	17	19.4	NA	2-3	07-Feb-01	Soil
6D/.5-2	54.2	122	NA	0.5-2	07-Feb-01	Soil
6D/0-6	44.8	306	NA	0-0.5	07-Feb-01	Soil
6E/.5-2	50.8	123	NA	0.5-2	07-Feb-01	Soil
6E/0-6	60.6	335	NA	0-0.5	07-Feb-01	Soil
6F/.5-2	38.6	61.5	NA	0.5-2	07-Feb-01	Soil
6F/0-6	64	226	NA	0-0.5	07-Feb-01	Soil

Table 2
Sample Results, All Data, Sorted By Sample ID
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	DDT / DDE (mg/kg)	Depth (ft)	Sample Date	Comments
6F/2-3	12.7	13.4	NA	2-3	07-Feb-01	Soil
6G/.5-2	113	374	NA	0.5-2	07-Feb-01	Soil
6G/0-6	73.3	325	NA	0-0.5	07-Feb-01	Soil
6G/2-3	30.7	17.6	NA	2-3	07-Feb-01	Soil
6G/3-5	10.1	11	NA	3-5	07-Feb-01	Soil
6H/.5-2	77.2	222	NA	0.5-2	07-Feb-01	Soil
6H/0-6	76	327	NA	0-0.5	07-Feb-01	Soil
6H/5-7	3.5	3.5	NA	5-7	07-Feb-01	Soil
6I/.5-2	52.6	21.8	NA	0.5-2	07-Feb-01	Soil
6I/0-6	72.9	269	NA	0-0.5	07-Feb-01	Soil
6J/.5-2	66.2	180	NA	0.5-2	07-Feb-01	Soil
6J/0-6	82.5	320	NA	0-0.5	07-Feb-01	Soil
6K/.5-2	66.7	47.7	NA	0.5-2	07-Feb-01	Soil
6K/0-6	77.4	265	NA	0-0.5	07-Feb-01	Soil
6L/.5-2	62.5	103	NA	0.5-2	07-Feb-01	Soil
6L/0-6	72.9	235	NA	0-0.5	07-Feb-01	Soil
6L/2-3	19.6	14.6	NA	2-3	07-Feb-01	Soil
78AB/.5-2	56.3	261	NA	0.5-2	07-Feb-01	Soil
78AB/0-6	53.2	264	NA	0-0.5	07-Feb-01	Soil
78BC/.5-2	50.3	147	NA	0.5-2	07-Feb-01	Soil
78BC/0-6	28.2	140	NA	0-0.5	07-Feb-01	Soil
78BC/2-3	24	61.8	NA	2-3	07-Feb-01	Soil
78CD/.5-2	95.3	331	NA	0.5-2	07-Feb-01	Soil
78CD/0-6	34.5	120	NA	0-0.5	07-Feb-01	Soil
7A/.5-2	46.4	92.2	NA	0.5-2	07-Feb-01	Soil
7A/0-6	41.7	188	NA	0-0.5	07-Feb-01	Soil
7B/.5-2	73.7	71.1	NA	0.5-2	07-Feb-01	Soil
7B/0-6	42.4	209	NA	0-0.5	07-Feb-01	Soil
7B/2-3	44.5	16.1	NA	2-3	07-Feb-01	Soil
7C/.5-2	68.1	164	NA	0.5-2	07-Feb-01	Soil
7C/0-6	22.5	75.6	NA	0-0.5	07-Feb-01	Soil
7C/2-3	28.9	21.5	NA	2-3	07-Feb-01	Soil
7D/.5-2	29.1	129	NA	0.5-2	07-Feb-01	Soil
7D/0-6	18.7	70.7	NA	0-0.5	07-Feb-01	Soil
7D/2-3	46	101	NA	2-3	07-Feb-01	Soil
7E/.5-2	58.2	142	NA	0.5-2	07-Feb-01	Soil
7E/0-6	37.7	152	NA	0-0.5	07-Feb-01	Soil

Table 2
Sample Results, All Data, Sorted By Sample ID
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	DDT / DDE (mg/kg)	Depth (ft)	Sample Date	Comments
7E/5-7	11.2	13.4	NA	5-7	07-Feb-01	Soil
7F/.5-2	68	178	NA	0.5-2	07-Feb-01	Soil
7F/0-6	51.8	207	NA	0-0.5	07-Feb-01	Soil
7G/.5-2	56.1	103	NA	0.5-2	07-Feb-01	Soil
7G/0-6	55.1	244	NA	0-0.5	07-Feb-01	Soil
7H/.5-2	46.9	106	NA	0.5-2	07-Feb-01	Soil
7H/0-6	68.6	264	NA	0-0.5	07-Feb-01	Soil
7I/.5-2	65.6	91.2	NA	0.5-2	07-Feb-01	Soil
7I/0-6	74.6	246	NA	0-0.5	07-Feb-01	Soil
7I/2-3	13.6	16.1	NA	2-3	07-Feb-01	Soil
7J/.0-6	84.9	304	NA	0-0.5	07-Feb-01	Soil
7J/.5-2	82	316	NA	0.5-2	07-Feb-01	Soil
7J/2-3	11.3	11.9	NA	2-3	07-Feb-01	Soil
7K/.5-2	64.8	30.1	NA	0.5-2	07-Feb-01	Soil
7K/0-6	77.4	293	NA	0-0.5	07-Feb-01	Soil
7L/.5-2	20.6	16.3	NA	0.5-2	07-Feb-01	Soil
7L/0-6	69.6	249	NA	0-0.5	07-Feb-01	Soil
7S/0-6	9.1	3.7	NA	0-0.5	06-Feb-01	Sediment

Note:

NA Not analyzed

Table 3
Soil Sample Results,
Sorted By Decreasing Arsenic Concentration
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	Depth (ft)	Sample Date
6G/.5-2	113	374	0.5-2	07-Feb-01
78CD/.5-2	95.3	331	0.5-2	07-Feb-01
7J/.0-6	84.9	304	0-0.5	07-Feb-01
67CD/.5-2	83.6	242	0.5-2	07-Feb-01
6J/0-6	82.5	320	0-0.5	07-Feb-01
7J/.5-2	82	316	0.5-2	07-Feb-01
7K/0-6	77.4	293	0-0.5	07-Feb-01
6K/0-6	77.4	265	0-0.5	07-Feb-01
6H/.5-2	77.2	222	0.5-2	07-Feb-01
5I/0-6	76.1	290	0-0.5	07-Feb-01
6H/0-6	76	327	0-0.5	07-Feb-01
5K/0-6	75.8	298	0-0.5	07-Feb-01
5H/0-6	75.3	328	0-0.5	07-Feb-01
7I/0-6	74.6	246	0-0.5	07-Feb-01
5J/0-6	73.9	289	0-0.5	07-Feb-01
7B/.5-2	73.7	71.1	0.5-2	07-Feb-01
6G/0-6	73.3	325	0-0.5	07-Feb-01
6I/0-6	72.9	269	0-0.5	07-Feb-01
6L/0-6	72.9	235	0-0.5	07-Feb-01
5B/0-6	72	259	0-0.5	07-Feb-01
5D/0-6	69.9	272	0-0.5	07-Feb-01
7L/0-6	69.6	249	0-0.5	07-Feb-01
5F/0-6	69.1	256	0-0.5	07-Feb-01
5C/0-6	68.7	231	0-0.5	07-Feb-01
7H/0-6	68.6	264	0-0.5	07-Feb-01
56AB/0-6	68.4	232	0-0.5	07-Feb-01
7C/.5-2	68.1	164	0.5-2	07-Feb-01
7F/.5-2	68	178	0.5-2	07-Feb-01
6K/.5-2	66.7	47.7	0.5-2	07-Feb-01
6J/.5-2	66.2	180	0.5-2	07-Feb-01
7I/.5-2	65.6	91.2	0.5-2	07-Feb-01
3E/.5-2	65.3	187	0.5-2	06-Feb-01
4I/0-6	65.1	240	0-0.5	06-Feb-01
4G/0-6	64.8	240	0-0.5	06-Feb-01
7K/.5-2	64.8	30.1	0.5-2	07-Feb-01
6F/0-6	64	226	0-0.5	07-Feb-01

Table 3
Soil Sample Results,
Sorted By Decreasing Arsenic Concentration
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	Depth (ft)	Sample Date
5A/0-6	62.7	211	0-0.5	07-Feb-01
6L/.5-2	62.5	103	0.5-2	07-Feb-01
56CD/0-6	62.2	238	0-0.5	07-Feb-01
4F/0-6	61.6	213	0-0.5	06-Feb-01
67BC/.5-2	61.3	131	0.5-2	07-Feb-01
5E/0-6	60.7	202	0-0.5	07-Feb-01
6E/0-6	60.6	335	0-0.5	07-Feb-01
5A/.5-2	59.9	178	0.5-2	07-Feb-01
67BC/2-3	58.9	14.4	2-3	07-Feb-01
56BC/0-6	58.8	243	0-0.5	07-Feb-01
5K/.5-2	58.6	32.4	0.5-2	07-Feb-01
5G/0-6	58.2	233	0-0.5	07-Feb-01
7E/.5-2	58.2	142	0.5-2	07-Feb-01
5H/.5-2	56.9	135	0.5-2	07-Feb-01
3E/0-6	56.8	209	0-0.5	06-Feb-01
78AB/.5-2	56.3	261	0.5-2	07-Feb-01
7G/.5-2	56.1	103	0.5-2	07-Feb-01
7G/0-6	55.1	244	0-0.5	07-Feb-01
5L/0-6	54.5	139	0-0.5	07-Feb-01
6D/.5-2	54.2	122	0.5-2	07-Feb-01
6A/0-6	53.9	161	0-0.5	07-Feb-01
78AB/0-6	53.2	264	0-0.5	07-Feb-01
4H/0-6	52.8	196	0-0.5	06-Feb-01
6I/.5-2	52.6	21.8	0.5-2	07-Feb-01
4D/0-6	52.4	170	0-0.5	06-Feb-01
4J/0-6	52.3	190	0-0.5	07-Feb-01
7F/0-6	51.8	207	0-0.5	07-Feb-01
4E/0-6	51.7	172	0-0.5	06-Feb-01
3G/0-6	51	197	0-0.5	06-Feb-01
6E/.5-2	50.8	123	0.5-2	07-Feb-01
4K/0-6	50.6	182	0-0.5	07-Feb-01
78BC/.5-2	50.3	147	0.5-2	07-Feb-01
5J/.5-2	49.4	91.8	0.5-2	07-Feb-01
4A/0-6	48.6	132	0-0.5	06-Feb-01
4F/.5-2	47.8	65.1	0.5-2	06-Feb-01
7H/.5-2	46.9	106	0.5-2	07-Feb-01

Table 3
Soil Sample Results,
Sorted By Decreasing Arsenic Concentration
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	Depth (ft)	Sample Date
7A/.5-2	46.4	92.2	0.5-2	07-Feb-01
3K/0-6	46.2	169	0-0.5	07-Feb-01
5I/.5-2	46.2	57.2	0.5-2	07-Feb-01
7D/2-3	46	101	2-3	07-Feb-01
3C/0-6	45.5	144	0-0.5	06-Feb-01
3F/0-6	45.1	164	0-0.5	06-Feb-01
3J/.5-2	44.9	125	0.5-2	06-Feb-01
6D/0-6	44.8	306	0-0.5	07-Feb-01
7B/2-3	44.5	16.1	2-3	07-Feb-01
2D/0-6	44.2	142	0-0.5	06-Feb-01
5B/.5-2	43.6	90.1	0.5-2	07-Feb-01
3B/0-6	43.2	143	0-0.5	06-Feb-01
4G/.5-2	43	42.2	0.5-2	06-Feb-01
3A/0-6	42.8	125	0-0.5	06-Feb-01
7B/0-6	42.4	209	0-0.5	07-Feb-01
3J/0-6	42.4	167	0-0.5	06-Feb-01
4K/.5-2	42.2	88.9	0.5-2	07-Feb-01
5L/.5-2	42.2	86.6	0.5-2	07-Feb-01
6C/.5-2	42	161	0.5-2	07-Feb-01
7A/0-6	41.7	188	0-0.5	07-Feb-01
4B/0-6	41.7	106	0-0.5	06-Feb-01
67AB/.5-2	41.6	131	0.5-2	07-Feb-01
56CD/.5-2	41.5	20.1	0.5-2	07-Feb-01
3I/.5-2	40.3	70.8	0.5-2	06-Feb-01
4D/.5-2	40	44.9	0.5-2	06-Feb-01
3H/0-6	39.6	152	0-0.5	06-Feb-01
3D/0-6	39.6	132	0-0.5	06-Feb-01
4H/.5-2	39	59.3	0.5-2	06-Feb-01
6F/.5-2	38.6	61.5	0.5-2	07-Feb-01
7E/0-6	37.7	152	0-0.5	07-Feb-01
4C/0-6	37.4	90.8	0-0.5	06-Feb-01
4I/.5-2	35.8	29.6	0.5-2	06-Feb-01
67AB/0-6	35.6	129	0-0.5	07-Feb-01
2C/0-6	35.4	100	0-0.5	06-Feb-01
2E/0-6	35	116	0-0.5	06-Feb-01
2B/0-6	34.6	103	0-0.5	06-Feb-01

Table 3
Soil Sample Results,
Sorted By Decreasing Arsenic Concentration
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	Depth (ft)	Sample Date
78CD/0-6	34.5	120	0-0.5	07-Feb-01
3H/.5-2	34.5	104	0.5-2	06-Feb-01
6C/0-6	34.3	155	0-0.5	07-Feb-01
3I/0-6	34.2	132	0-0.5	06-Feb-01
5F/.5-2	34.2	57.5	0.5-2	07-Feb-01
4E/.5-2	33.9	46.2	0.5-2	06-Feb-01
4J/.5-2	33.7	82.5	0.5-2	07-Feb-01
2I/0-6	33.6	110	0-0.5	06-Feb-01
2A/0-6	32.5	96.1	0-0.5	07-Feb-01
2H/0-6	32.4	105	0-0.5	06-Feb-01
4A/.5-2	32.2	53.2	0.5-2	06-Feb-01
5G/.5-2	32.2	25.4	0.5-2	07-Feb-01
2I/.5-2	32	85.6	0.5-2	06-Feb-01
56BC/.5-2	31.9	53.9	0.5-2	07-Feb-01
2G/0-6	31.7	108	0-0.5	06-Feb-01
5D/.5-2	31.4	57	0.5-2	07-Feb-01
5C/.5-2	31.4	27.1	0.5-2	07-Feb-01
4F/1.5-2	31.2	NA	1.5-2	18-Apr-01
2F/0-6	30.8	109	0-0.5	06-Feb-01
2K/0-6	30.7	111	0-0.5	06-Feb-01
2D/.5-2	30.7	82.3	0.5-2	06-Feb-01
6G/2-3	30.7	17.6	2-3	07-Feb-01
2G/.5-2	30.6	86.5	0.5-2	06-Feb-01
3G/.5-2	30.5	34.1	0.5-2	06-Feb-01
67CD/0-6	30.2	148	0-0.5	07-Feb-01
2J/0-6	30.1	99.7	0-0.5	06-Feb-01
6B/.5-2	29.8	73.6	0.5-2	07-Feb-01
3E/1.5-2	29.8	NA	1.5-2	18-Apr-01
7D/.5-2	29.1	129	0.5-2	07-Feb-01
1D/0-6	29.1	99.2	0-0.5	07-Feb-01
7C/2-3	28.9	21.5	2-3	07-Feb-01
78BC/0-6	28.2	140	0-0.5	07-Feb-01
1K/0-6	28.2	75.1	0-0.5	07-Feb-01
1H/0-6	27.9	91.1	0-0.5	07-Feb-01
2E/.5-2	27.8	35.7	0.5-2	06-Feb-01
1F/0-6	27.3	89.7	0-0.5	07-Feb-01

Table 3
Soil Sample Results,
Sorted By Decreasing Arsenic Concentration
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	Depth (ft)	Sample Date
2B/.5-2	27.1	54.5	0.5-2	06-Feb-01
3A/.5-2	27.1	44.2	0.5-2	06-Feb-01
67BC/0-6	27	99.9	0-0.5	07-Feb-01
4B/.5-2	27	50.1	0.5-2	06-Feb-01
56AB/.5-2	26.7	43.7	0.5-2	07-Feb-01
1I/0-6	26.1	69.1	0-0.5	07-Feb-01
1J/0-6	26.1	65.2	0-0.5	07-Feb-01
2J/.5-2	24.8	29	0.5-2	06-Feb-01
3K/.5-2	24.7	33.2	0.5-2	07-Feb-01
78BC/2-3	24	61.8	2-3	07-Feb-01
1A/0-6	23.9	75	0-0.5	07-Feb-01
2A/.2-5	23.6	52.5	0.2-5	07-Feb-01
1G/0-6	23.4	88.9	0-0.5	07-Feb-01
6B/0-6	23.1	84.8	0-0.5	07-Feb-01
2F/.5-2	22.9	42	0.5-2	06-Feb-01
1E/0-6	22.6	69.9	0-0.5	07-Feb-01
7C/0-6	22.5	75.6	0-0.5	07-Feb-01
1A/2-3	21.9	52.5	2-3	07-Feb-01
3H/2-3	21.6	51.1	2-3	06-Feb-01
1A/.5-2	21.5	60.1	0.5-2	07-Feb-01
5E/.5-2	21.5	29.8	0.5-2	07-Feb-01
4I/2-3	21	13	2-3	06-Feb-01
2C/.5-2	20.9	48.1	0.5-2	06-Feb-01
4C/.5-2	20.8	32.4	0.5-2	06-Feb-01
3D/.5-2	20.6	24.8	0.5-2	06-Feb-01
7L/.5-2	20.6	16.3	0.5-2	07-Feb-01
4A/2-3	20.1	33.1	2-3	06-Feb-01
56AB/2-3	20	34	2-3	07-Feb-01
3F/.5-2	19.8	22	0.5-2	06-Feb-01
6L/2-3	19.6	14.6	2-3	07-Feb-01
7D/0-6	18.7	70.7	0-0.5	07-Feb-01
2H/.5-2	18.6	31.6	0.5-2	06-Feb-01
1H/.5-2	18.6	17.3	0.5-2	07-Feb-01
1B/0-6	18.5	50.8	0-0.5	07-Feb-01
4D/2-3	18.4	22	2-3	06-Feb-01
56BC/5-7	18.3	15.9	5-7	07-Feb-01

Table 3
Soil Sample Results, Sorted By Decreasing Arsenic Concentration February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	Depth (ft)	Sample Date
5F/2-3	18.2	40.4	2-3	07-Feb-01
5G/2-3	18.2	16.8	2-3	07-Feb-01
1E/.5-2	17.9	46.2	0.5-2	07-Feb-01
1D/.5-2	17.9	34.9	0.5-2	07-Feb-01
4G/2-3	17.7	11	2-3	06-Feb-01
3B/.5-2	17.4	29.8	0.5-2	06-Feb-01
1E/2-3	17.3	48	2-3	07-Feb-01
6C/2-3	17	19.4	2-3	07-Feb-01
1C/0-6	16.6	43.4	0-0.5	07-Feb-01
3I/2-3	16.6	16.1	2-3	06-Feb-01
5H/2-3	16.5	17.3	2-3	07-Feb-01
67AB/2-3	16.4	16.2	2-3	07-Feb-01
5K/2-3	16.3	19.6	2-3	07-Feb-01
1F/.5-2	16.1	31.9	0.5-2	07-Feb-01
3E/2-3	16	16.3	2-3	06-Feb-01
1B/.5-2	15.9	33.6	0.5-2	07-Feb-01
1I/.5-2	15.4	19.9	0.5-2	07-Feb-01
1K/.2-5	15.4	17.7	0.5-2	07-Feb-01
3D/2-3	15.1	20.6	2-3	06-Feb-01
2A/2-3	14.7	22	2-3	07-Feb-01
3A/2-3	14.5	16.4	2-3	06-Feb-01
4D/1.5-2	14.2	NA	1.5-2	18-Apr-01
1J/.5-2	13.9	13.2	0.5-2	07-Feb-01
7I/2-3	13.6	16.1	2-3	07-Feb-01
3F/2-3	13.4	9.9	2-3	06-Feb-01
1B/2-3	13.1	27.4	2-3	07-Feb-01
2G/2-3	13.1	11.5	2-3	06-Feb-01
2K/.5-2	13	12.1	0.5-2	06-Feb-01
3K/5-7	12.9	11.3	5-7	07-Feb-01
6F/2-3	12.7	13.4	2-3	07-Feb-01
3C/5-7	12.7	10.6	5-7	07-Feb-01
3A/3-5	12.7	8.4	3-5	06-Feb-01
1C/.5-2	12.6	27.3	0.5-2	07-Feb-01
2D/2-3	12.6	12.4	2-3	06-Feb-01
2C/3-5	12.3	9.8	3-5	07-Feb-01
1H/2-3	12.1	10.1	2-3	07-Feb-01

Table 3
Soil Sample Results,
Sorted By Decreasing Arsenic Concentration
February 2001

Sample ID	Arsenic (mg/kg)	Lead (mg/kg)	Depth (ft)	Sample Date
3C/.5-2	11.9	18.4	0.5-2	06-Feb-01
1K/2-3	11.8	8.2	2-3	07-Feb-01
6A/.5-2	11.5	16.3	0.5-2	07-Feb-01
1J/2-3	11.4	9.3	2-3	07-Feb-01
7J/2-3	11.3	11.9	2-3	07-Feb-01
7E/5-7	11.2	13.4	5-7	07-Feb-01
2F/2-3	11.1	8.5	2-3	06-Feb-01
1J/3-5	10.8	5.4	3-5	07-Feb-01
1K/3-5	10.4	6	3-5	07-Feb-01
6G/3-5	10.1	11	3-5	07-Feb-01
1G/.5-2	9.9	15.2	0.5-2	07-Feb-01
6A/2-3	9	9.9	2-3	07-Feb-01
1G/2-3	7.9	13.5	2-3	07-Feb-01
1F/2-3	7.3	12.4	2-3	07-Feb-01
4A/1.5-2	5.9	NA	1.5-2	18-Apr-01
2B/1.5-2	5.77	NA	1.5-2	18-Apr-01
6H/5-7	3.5	3.5	5-7	07-Feb-01

Note:

NA Not analyzed

Table 4
Summary of Statistics for Arsenic and Lead

Summary Statistics for Arsenic

Dcat:	**SURFACE**
	Result
Min:	16.60000
1stQu. :	32.50000
Mean:	48.33483
Median:	45.50000
3rdQu. :	64.00000
Max:	84.90000
TotalN:	89.00000
StdDev. :	18.26674

Dcat:	**SHALLOW**
	Result
Min:	9.90000
1stQu. :	22.90000
Mean:	39.55169
Median:	34.20000
3rdQu. :	52.60000
Max:	113.00000
TotalN:	89.00000
StdDev. :	20.81320

Dcat:	**INTERMEDIATE**
	Result
Min:	7.30000
1stQu. :	13.00000
Mean:	18.76250
Median:	16.45000
3rdQu. :	20.02500
Max:	58.90000
TotalN:	40.00000
StdDev. :	10.37709

Dcat:	**DEEP1**
	Result
Min:	10.100000
1stQu. :	10.400000
Mean:	11.260000
Median:	10.800000
3rdQu. :	12.300000
Max:	12.700000
TotalN:	5.000000
StdDev. :	1.167476

Dcat:	**DEEP2**
	Result
Min:	3.500000
1stQu. :	11.200000
Mean:	11.720000
Median:	12.700000
3rdQu. :	12.900000
Max:	18.300000
TotalN:	5.000000

Summary Statistics for Lead

Dcat:	**SURFACE**
	Result
Min:	43.40000
1stQu. :	108.00000
Mean:	177.70787
Median:	167.00000
3rdQu. :	240.00000
Max:	335.00000
TotalN:	89.00000
StdDev. :	78.83257

Dcat:	**SHALLOW**
	Result
Min:	12.10000
1stQu. :	31.90000
Mean:	82.45281
Median:	57.00000
3rdQu. :	104.00000
Max:	374.00000
TotalN:	89.00000
StdDev. :	73.42485

Dcat:	**INTERMEDIATE**
	Result
Min:	8.20000
1stQu. :	12.40000
Mean:	22.68250
Median:	16.25000
3rdQu. :	22.00000
Max:	101.00000
TotalN:	40.00000
StdDev. :	18.26111

Dcat:	**DEEP1**
	Result
Min:	5.400000
1stQu. :	6.000000
Mean:	8.120000
Median:	8.400000
3rdQu. :	9.800000
Max:	11.000000
NA's:	0.000000
StdDev. :	2.402499

Dcat:	**DEEP2**
	Result
Min:	3.500000
1stQu. :	10.600000
Mean:	10.940000
Median:	11.300000
3rdQu. :	13.400000
Max:	15.900000
TotalN:	5.0000

Table 5
Summary of Remedial Alternatives

Remedial Alternatives	Pros	Cons	Estimated Unit Cost (per Acre)	Estimated Unit Cost (per sf)
No Action Alternative	♦ Lowest unit cost alternative	♦ Does not provide any additional protection to human health and the environment	$0	$0.00
Excavate Contaminated Soil and Dispose Off Site	♦ Permanent solution	♦ Cost is very high and disproportionate to benefit	$175,000	$4.00
Tilling	♦ Permanent solution ♦ Lowest unit cost alternative (except for No Action Alternative) ♦ Equipment readily available ♦ Homogenized soil useable as cover soil in other areas of the site	♦ Treatment depth limited to approximately 20-inches ♦ Effective only where average concentrations within treatment depth are at or below cleanup levels ♦ Requires additional sampling to verify effectiveness	$1,740	$0.04
Relocate Contaminated Soil Below Paved Areas	♦ Uses planned development features (tennis courts and parking areas) as cover for contaminated soil ♦ Uses on-site materials, thereby reducing the need to import soil	♦ Not a permanent solution, requires long-term institutional controls ♦ Elevates finished grade of paved areas ♦ Reduces grade in excavated areas ♦ Requires increased field oversight and surveying	$7,830	$0.18
Cover Contaminated Soil With Clean Soil Obtained On Site	♦ Does not result in significant changes in site grades ♦ Uses on-site materials, thereby reducing the need to import soil	♦ Not a permanent solution, requires long-term institutional controls ♦ May need topsoil to reestablish adequate growing conditions for turf or plantings.	$7,830	$0.18
Cover Contaminated Soil With Imported Soil	♦ Does not result in significant changes to site grades	♦ Not a permanent solution, requires long-term institutional controls ♦ May require soil amendments to establish adequate growing conditions for turf or plantings	$14,375	$0.33

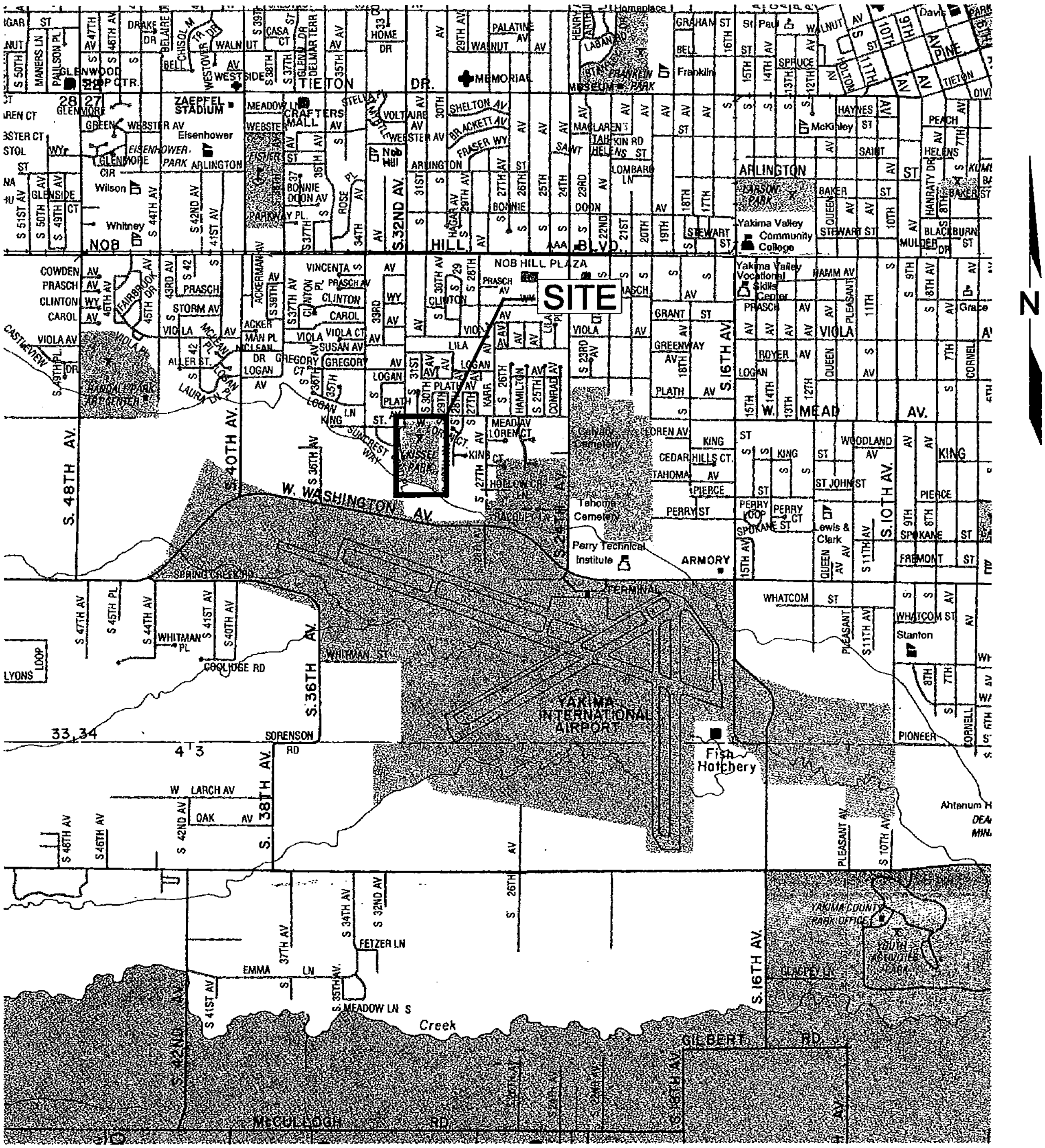
Note:
sf square foot

Kissel Park

Remedial Investigation/ Feasibility Study and Cleanup Action Plan

Figures

FINAL



Source: "Yakima: Yakima Valley Recreation" map by King of the Road Maps, Inc., dated 1991.

Not to Scale

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 1
Vicinity Map

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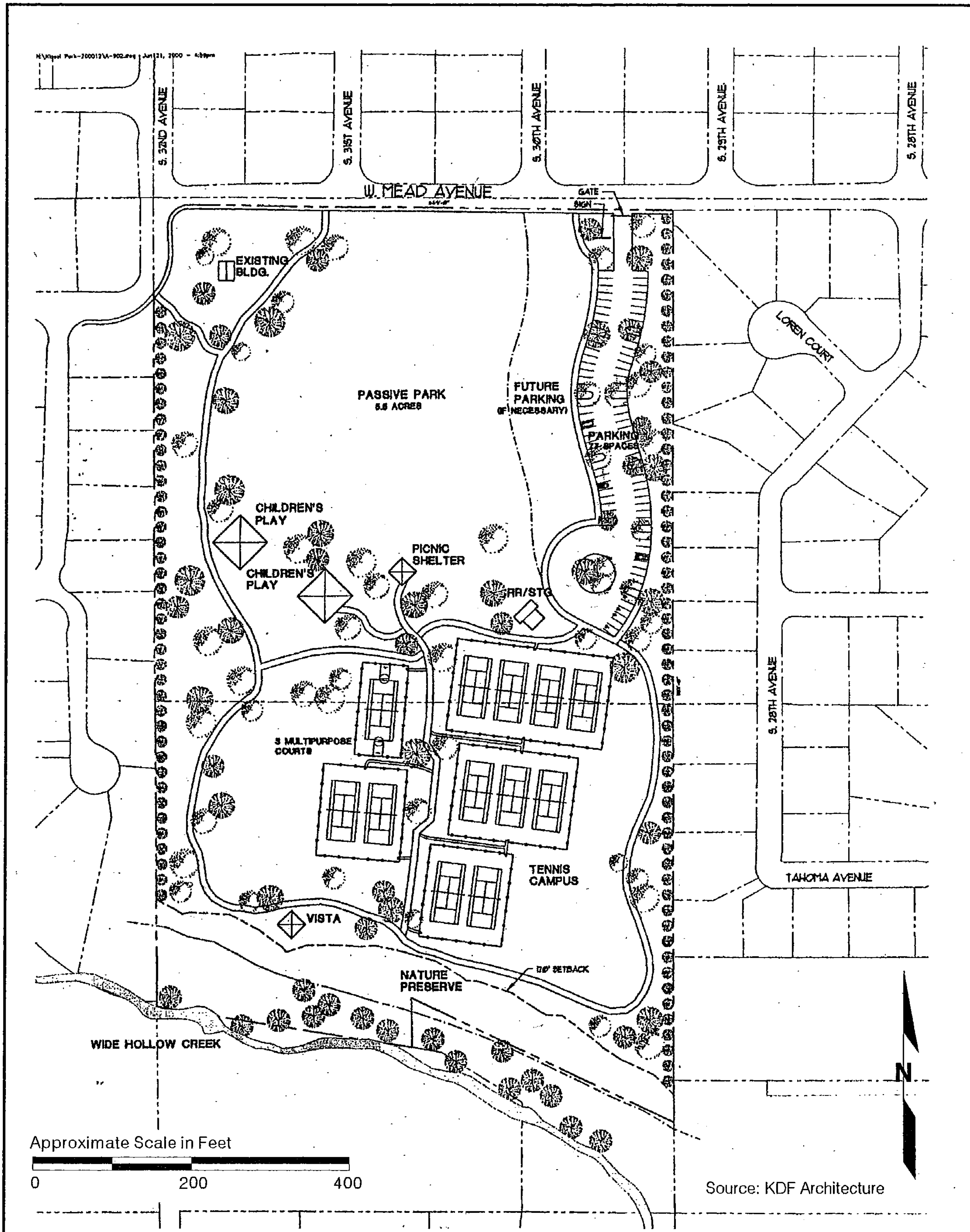


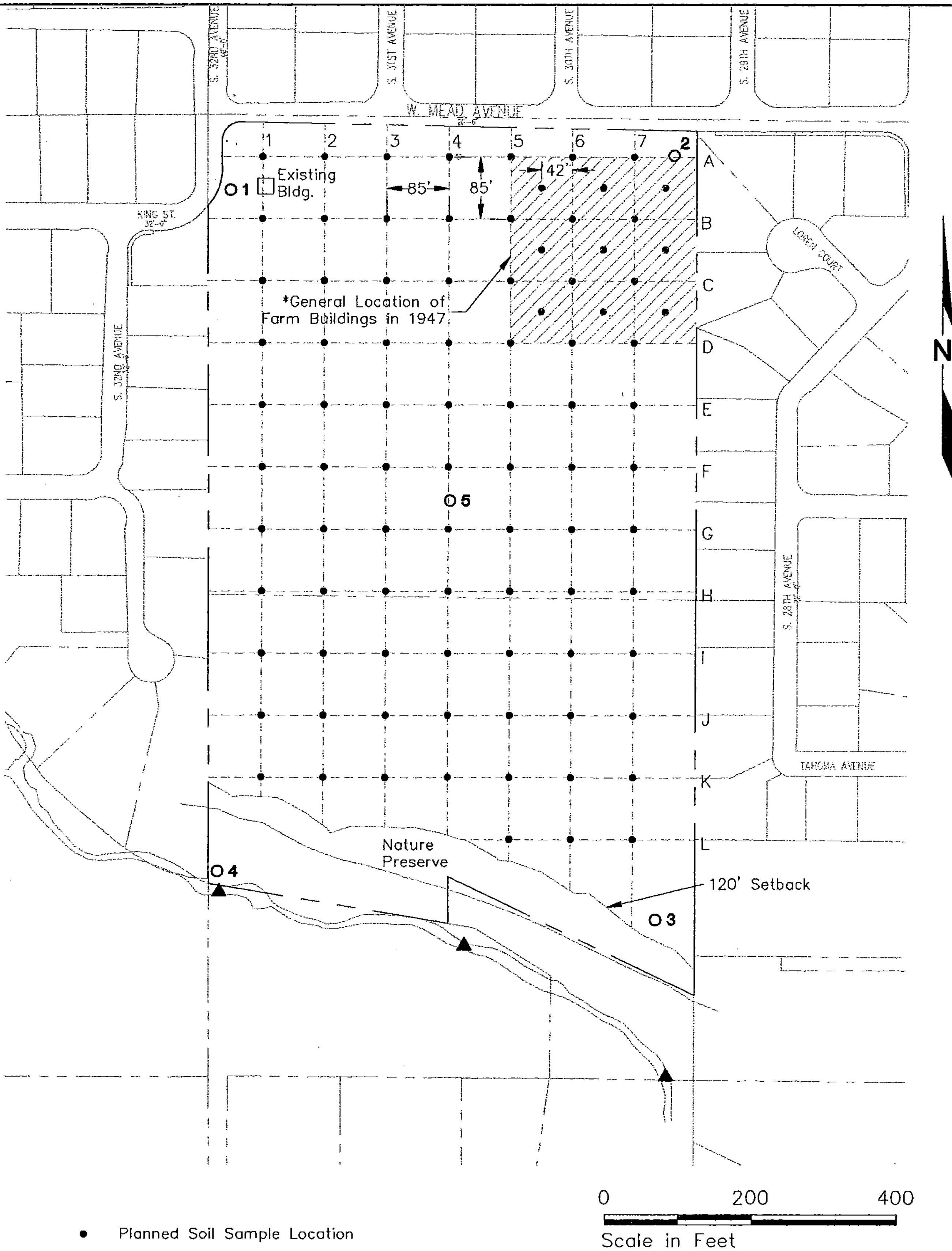
Source: KDF Architecture

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

12/14/00 Figure2.cdr

Kissel Park
Yakima, Washington

Figure 2
Conceptual Site Plan



• Planned Soil Sample Location

▲ Planned Sediment Sample Location

O Existing Sample Location

* Source: 1947 Aerial Photograph

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**Kissel Park** **Yakima, Washington**	Figure 3 Exploration Location Map

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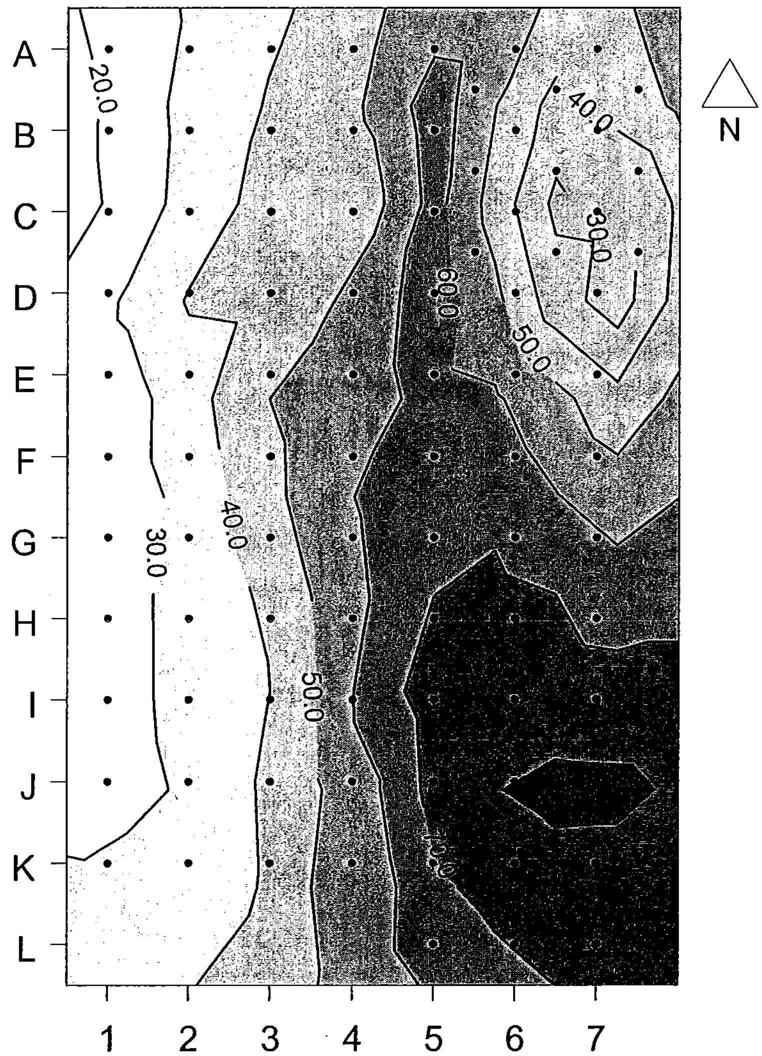
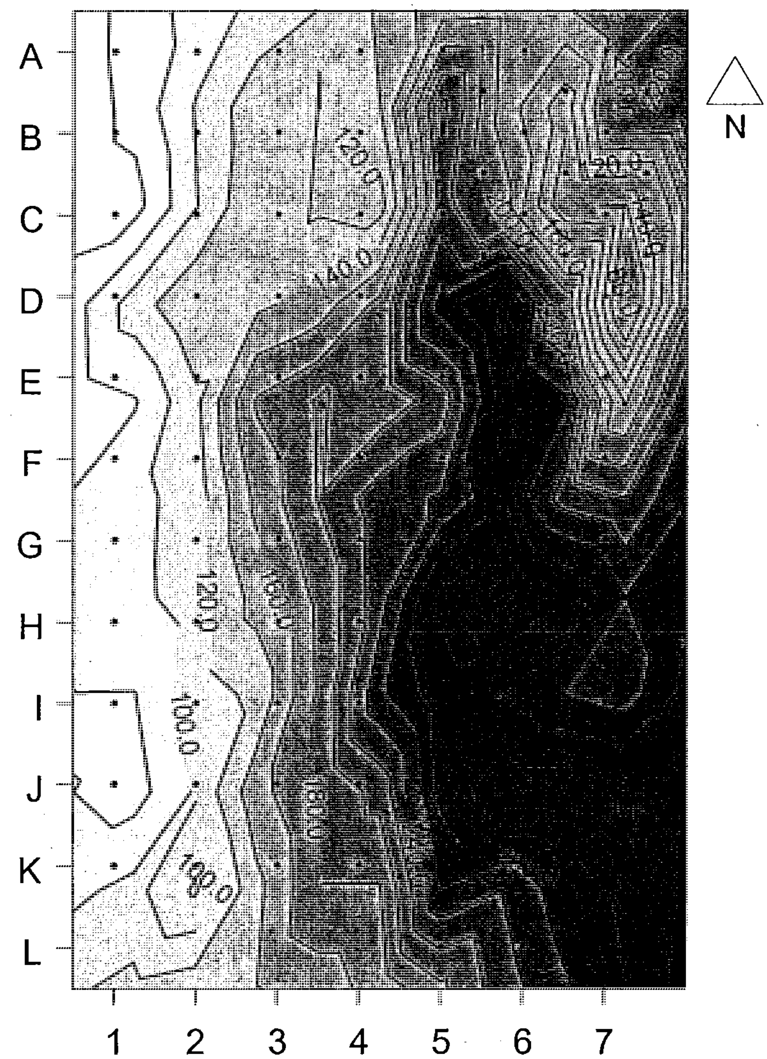


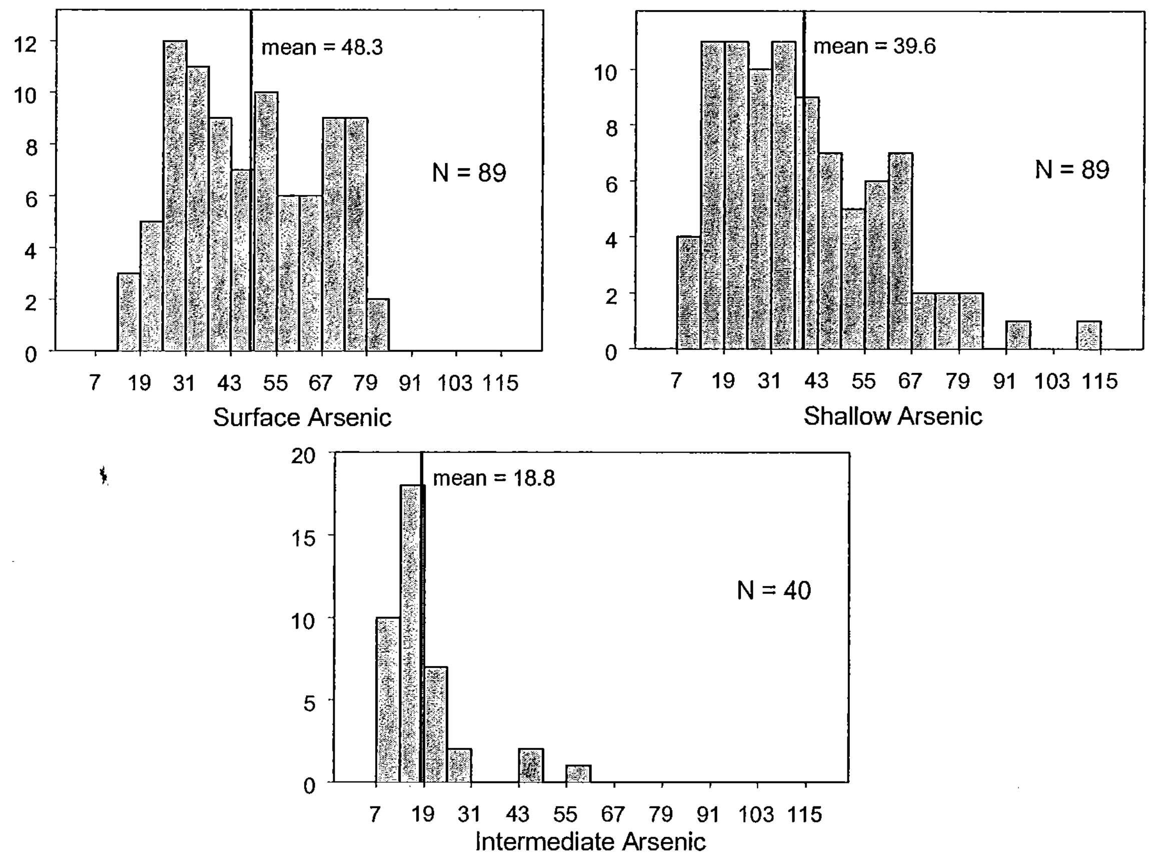
Note: 1. MTCA Method A Cleanup Level = 20 mg/kg

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**Kissel Park** **Yakima, Washington**	Figure 4 Arsenic Concentration Contours (mg/kg) Surface Soil (0-0.5')



Note: 1. MTCA Method A Cleanup Level = 250 mg/kg

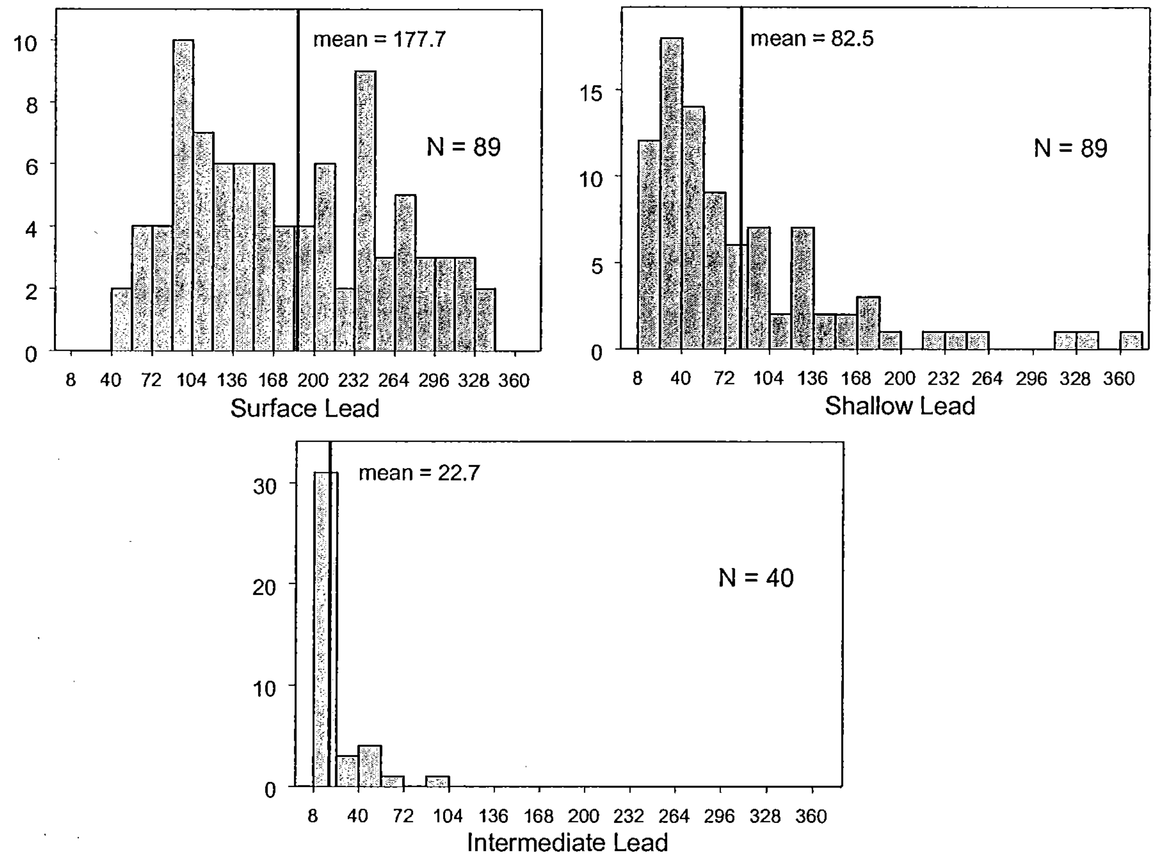
Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**Kissel Park Yakima, Washington**	Figure 5 Lead Concentration Contours (mg/kg) Surface Soil (0-0.5')



Notes: 1. X-axis units in mg/kg
2. Surface = 0-0.5'
3. Shallow = 0.5'-2'
4. Intermediate = 2'-3'

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**Kissel Park Yakima, Washington**	Figure 6 Concentration Histograms for Arsenic

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01

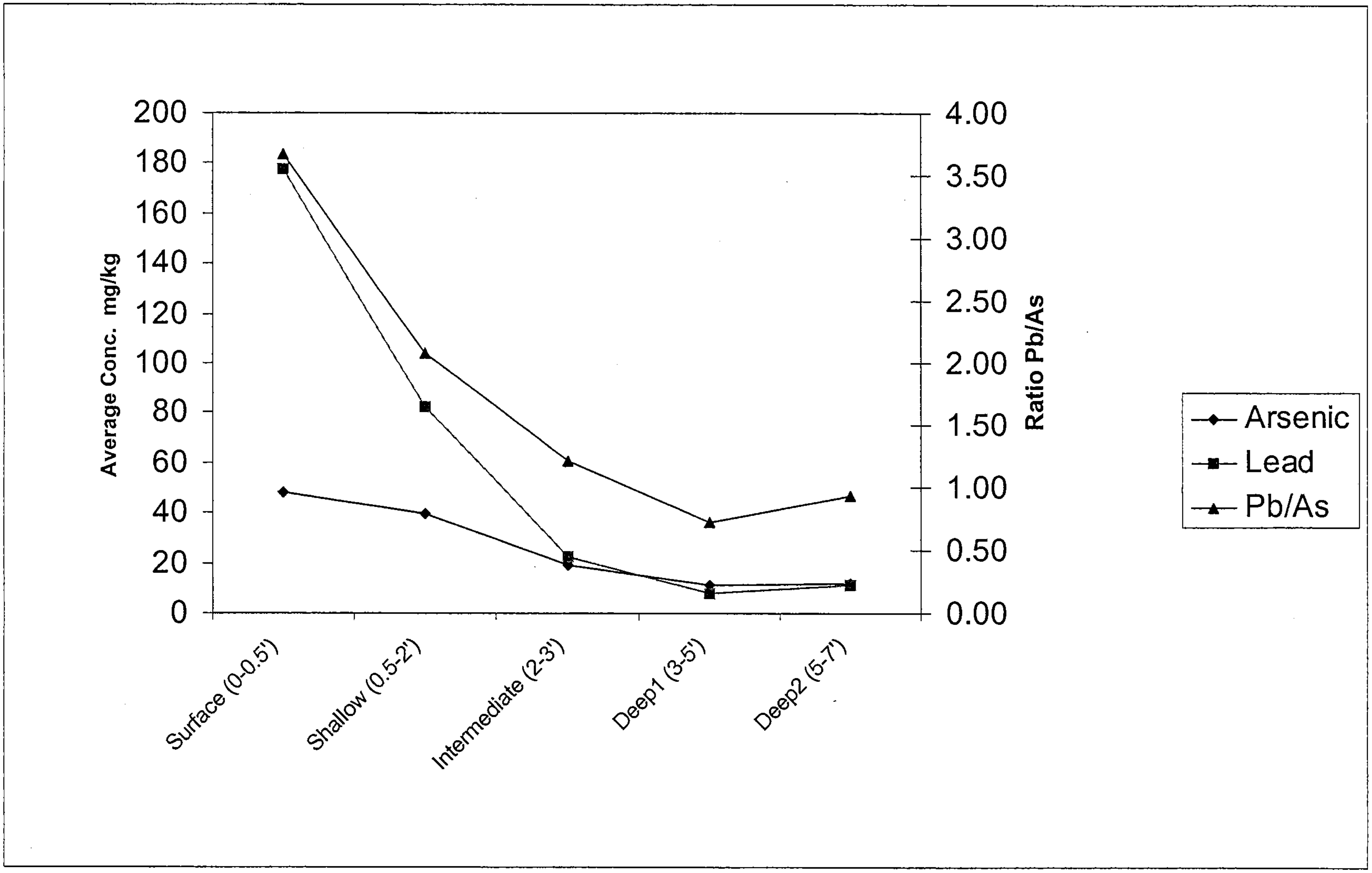


Notes: 1. X-axis units in mg/kg
2. Surface = 0-0.5'
3. Shallow = 0.5'-2'
4. Intermediate = 2'-3'

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 7
Concentration Histograms for Lead



Floyd Snider McCarthy, Inc.
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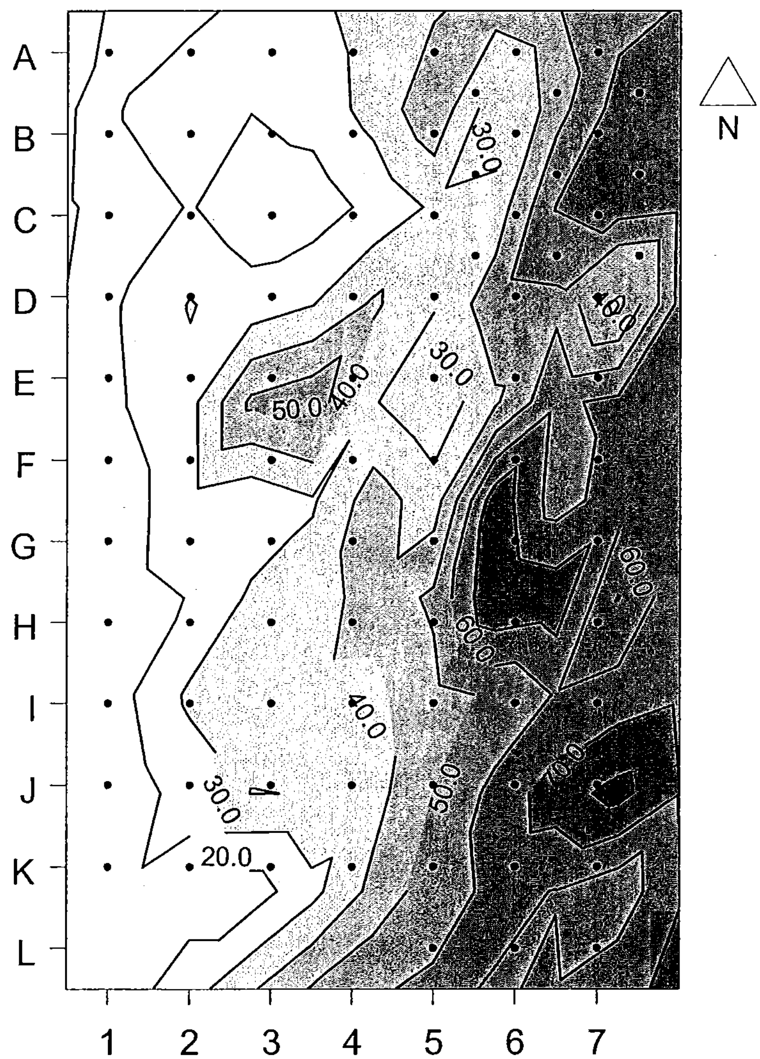
Kissel Park
Yakima, Washington

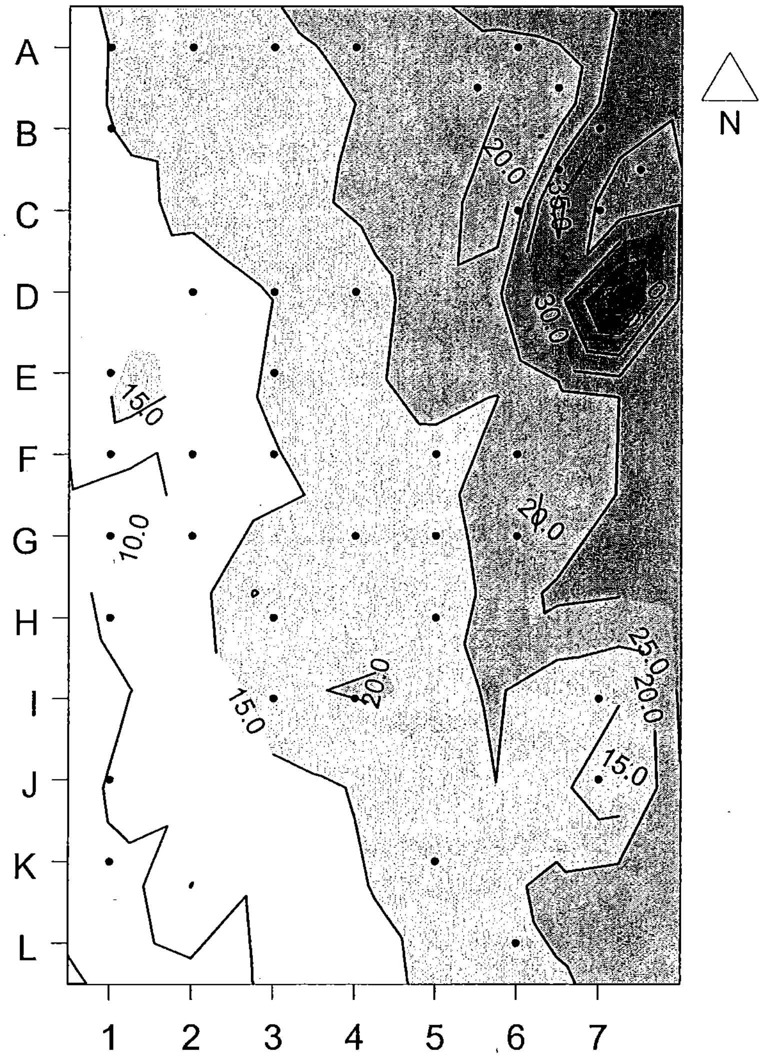
Figure 8
Average Lead and Arsenic Concentration and Ratio with Depth

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Figure 8 Kissel RevFINAL RIFSCAP.vsd



Note: 1. MTCA Method A Cleanup Level = 20 mg/kg

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**Kissel Park Yakima, Washington**	Figure 9 Arsenic Concentration Contours (mg/kg) Shallow Soil (0.5'-2')



Note: 1. MTCA Method A Cleanup Level = 20 mg/kg

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**Kissel Park Yakima, Washington**	Figure 10 Arsenic Concentration Contours (mg/kg) Intermediate Soil (2'-3')

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01

	1	2	3	4	5		6		7	
A	24	32	43	49	63		54		42	
						68		36		53
B	18	35	43	42	72		23		42	
						59		27		28
C	17	35	46	37	69		34		22	
						62		30		34
D	29	44	40	52	70		45		19	
E	23	35	57	52	61		61		38	
F	27	31	45	62	69		64		52	
G	23	32	51	65	58		73		55	
H	28	32	40	53	75		76		69	
I	26	34	34	65	76		73		75	
J	26	30	42	52	74		82		85	
K	28	31	46	51	76		77		77	
L					54		73		70	

N

Surface Arsenic

Note: 1. MTCA Method A Cleanup Level = 20 mg/kg

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 11a
Raw Data Plots
Arsenic Concentration (mg/kg)
Surface Soil (0-0.5')

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01

	1	2	3	4	5		6		7	
A	22	24	27	32	60		12		46	
						27		42		56
B	16	27	17	27	44		30		74	
						32		61		50
C	13	21	12	21	31		42		68	
						42		84		95
D	18	31	21	40	31		54		29	
E	18	28	65	34	22		51		58	
F	16	23	20	48	34		39		68	
G	10	31	30	43	32		113		56	
H	19	19	34	39	57		77		47	
I	15	32	40	36	46		53		66	
J	14	25	45	34	49		66		82	
K	15	13	25	42	59		67		65	
L					42		62		21	

N

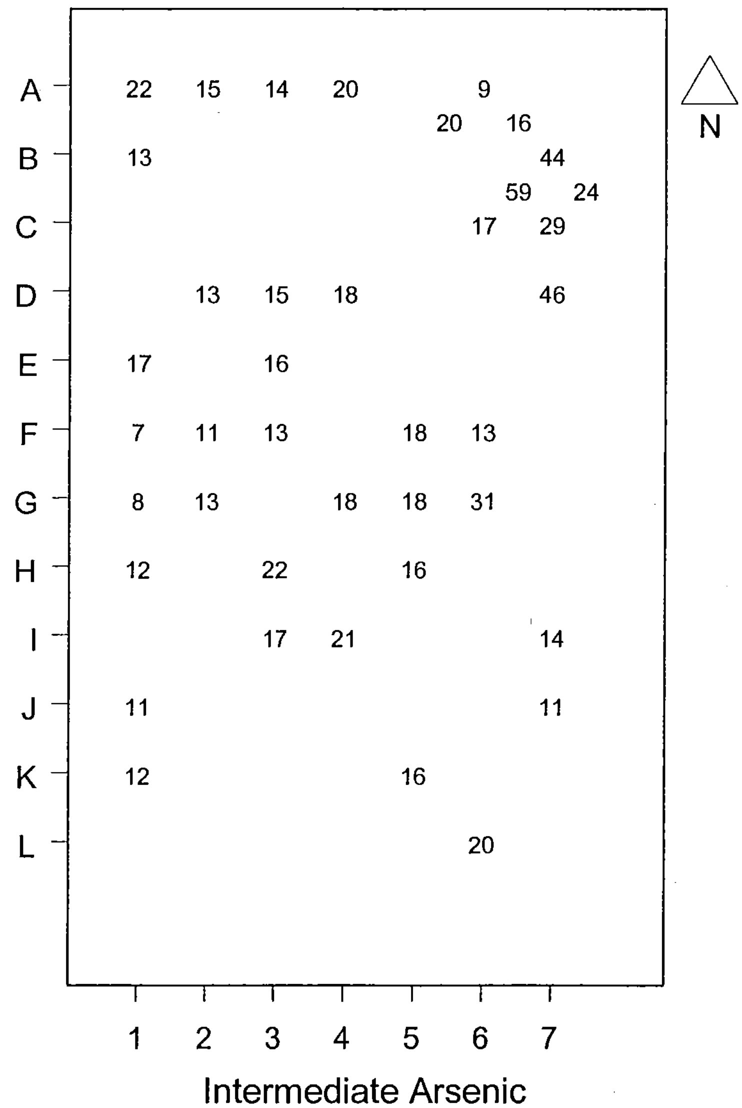
Shallow Arsenic

Note: 1. MTCA Method A Cleanup Level = 20 mg/kg

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

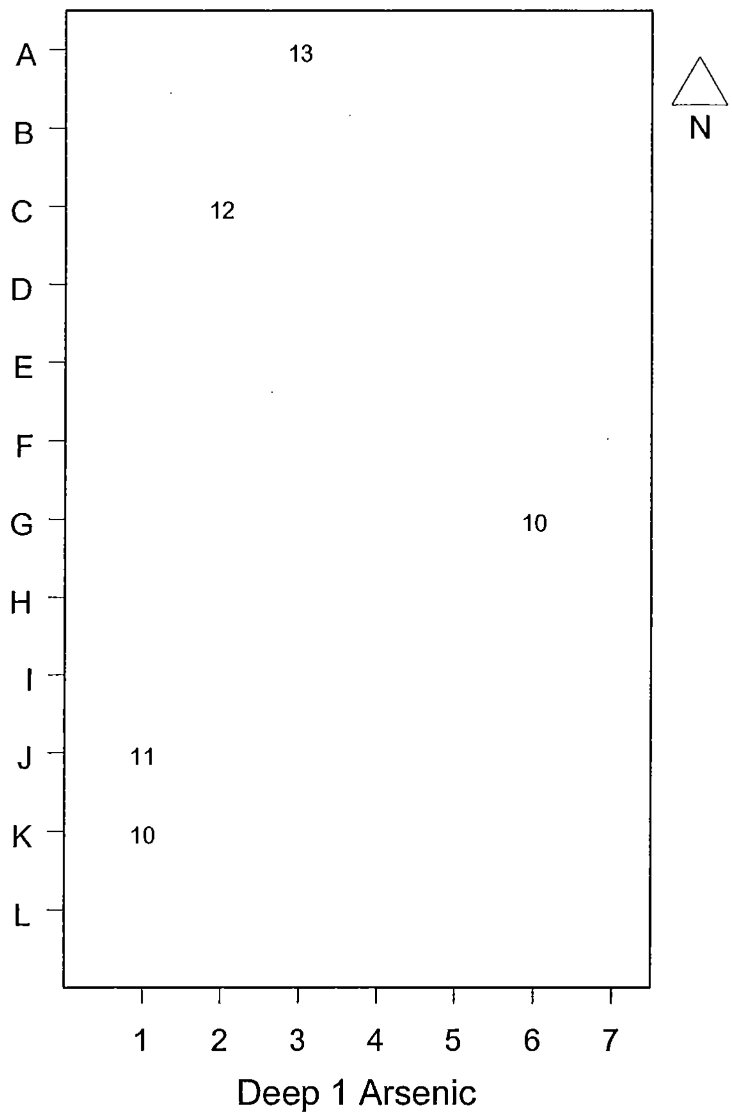
Figure 11b
Raw Data Plots
Arsenic Concentration (mg/kg)
Shallow Soil (0.5'-2')



Note: 1. MTCA Method A Cleanup Level = 20 mg/kg

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**Kissel Park Yakima, Washington**	Figure 11c Raw Data Plots Arsenic Concentration (mg/kg) Intermediate Soil (2'-3')

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01



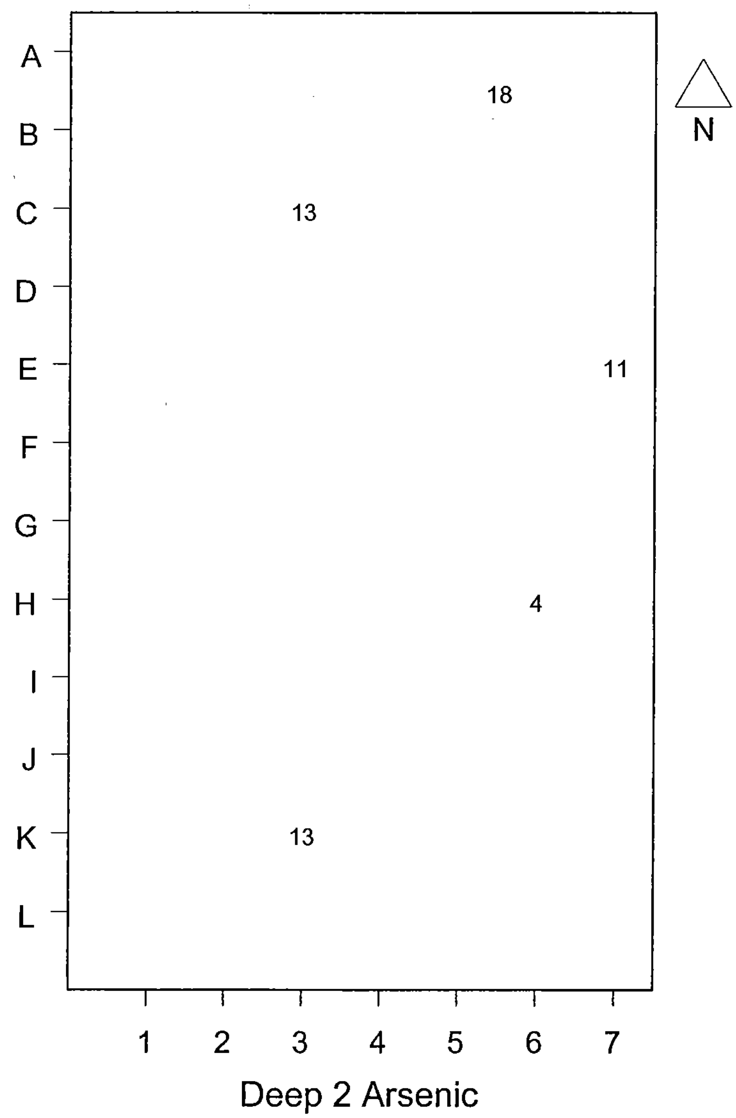
Note: 1. MTCA Method A Cleanup Level = 20 mg/kg

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 11d
Raw Data Plots
Arsenic Concentration (mg/kg)
Deep Soil 1 (3'-5')

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01



Note: 1. MTCA Method A Cleanup Level = 20 mg/kg

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**Kissel Park Yakima, Washington**	Figure 11e Raw Data Plots Arsenic Concentration (mg/kg) Deep Soil 2 (5'-7')

	1	2	3	4	5	6	7
A	75	96	125	132	211	161	188
					232	129	264
B	51	103	143	106	259	85	209
					243	100	140
C	43	100	144	91	231	155	76
					238	148	120
D	99	142	132	170	272	306	71
E	70	116	209	172	202	335	152
F	90	109	164	213	256	226	207
G	89	108	197	240	233	325	244
H	91	105	152	196	328	327	264
I	69	110	132	240	290	269	246
J	65	100	167	190	289	320	304
K	75	111	169	182	298	265	293
L					139	235	249

N

Surface Lead

Note: 1. MTCA Method A Cleanup Level = 250 mg/kg

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 12a
Raw Data Plots
Lead Concentration (mg/kg)
Surface Soil (0-0.5')

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01

	1	2	3	4	5		6		7	
A	60	52	44	53	178		16		92	
						44		131		261
B	34	54	30	50	90		74		71	
						54		131		147
C	27	48	18	32	27		161		164	
						20		242		331
D	35	82	25	45	57		122		129	
E	46	36	187	46	30		123		142	
F	32	42	22	65	58		62		178	
G	15	86	34	42	25		374		103	
H	17	32	104	59	135		222		106	
I	20	86	71	30	57		22		91	
J	13	29	125	82	92		180		316	
K	18	12	33	89	32		48		30	
L					87		103		16	

N

Shallow Lead

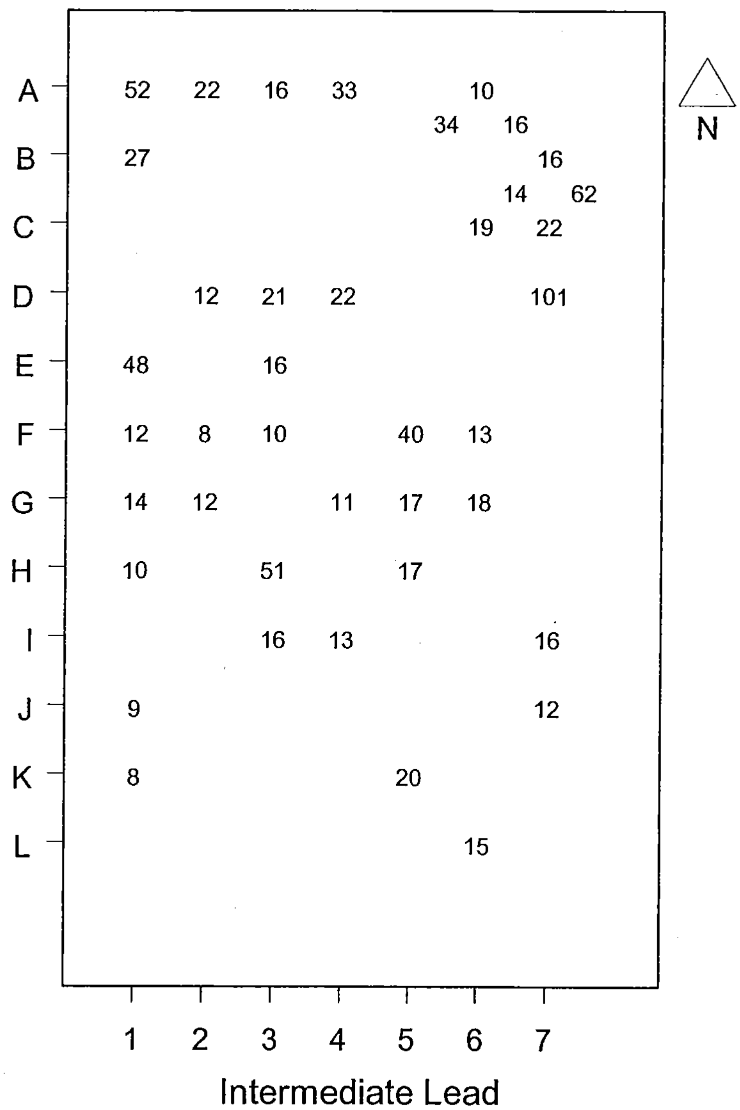
Note: 1. MTCA Method A Cleanup Level = 250 mg/kg

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 12b
Raw Data Plots
Lead Concentration (mg/kg)
Shallow Soil (0.5'-2')

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01



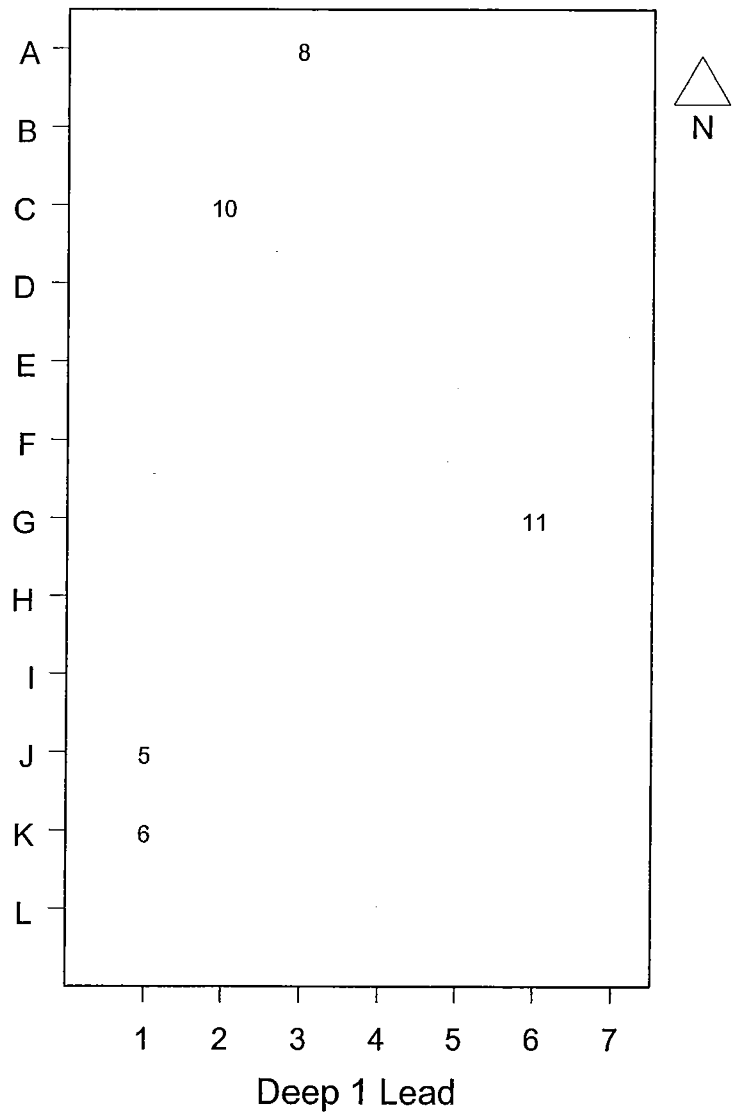
Note: 1. MTCA Method A Cleanup Level = 250 mg/kg

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 12c
Raw Data Plots
Lead Concentration (mg/kg)
Intermediate Soil (2'-3')

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01



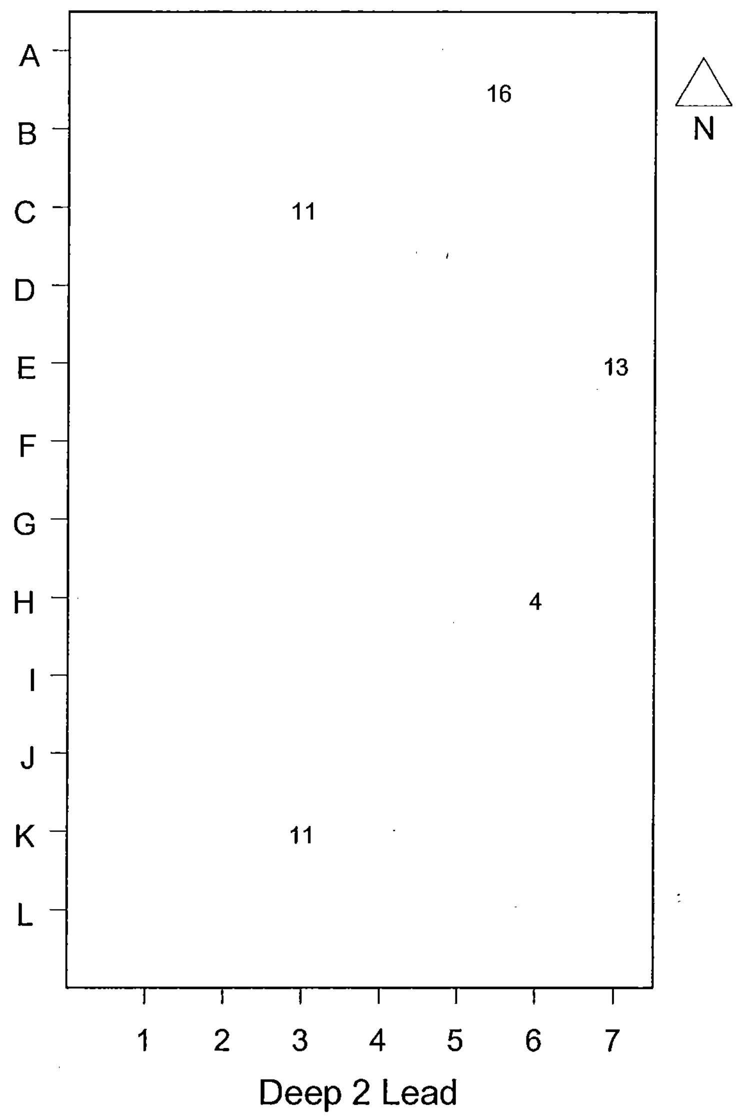
Note: 1. MTCA Method A Cleanup Level = 250 mg/kg

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 12d
Raw Data Plots
Lead Concentration (mg/kg)
Deep Soil 1 (3'-5')

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01



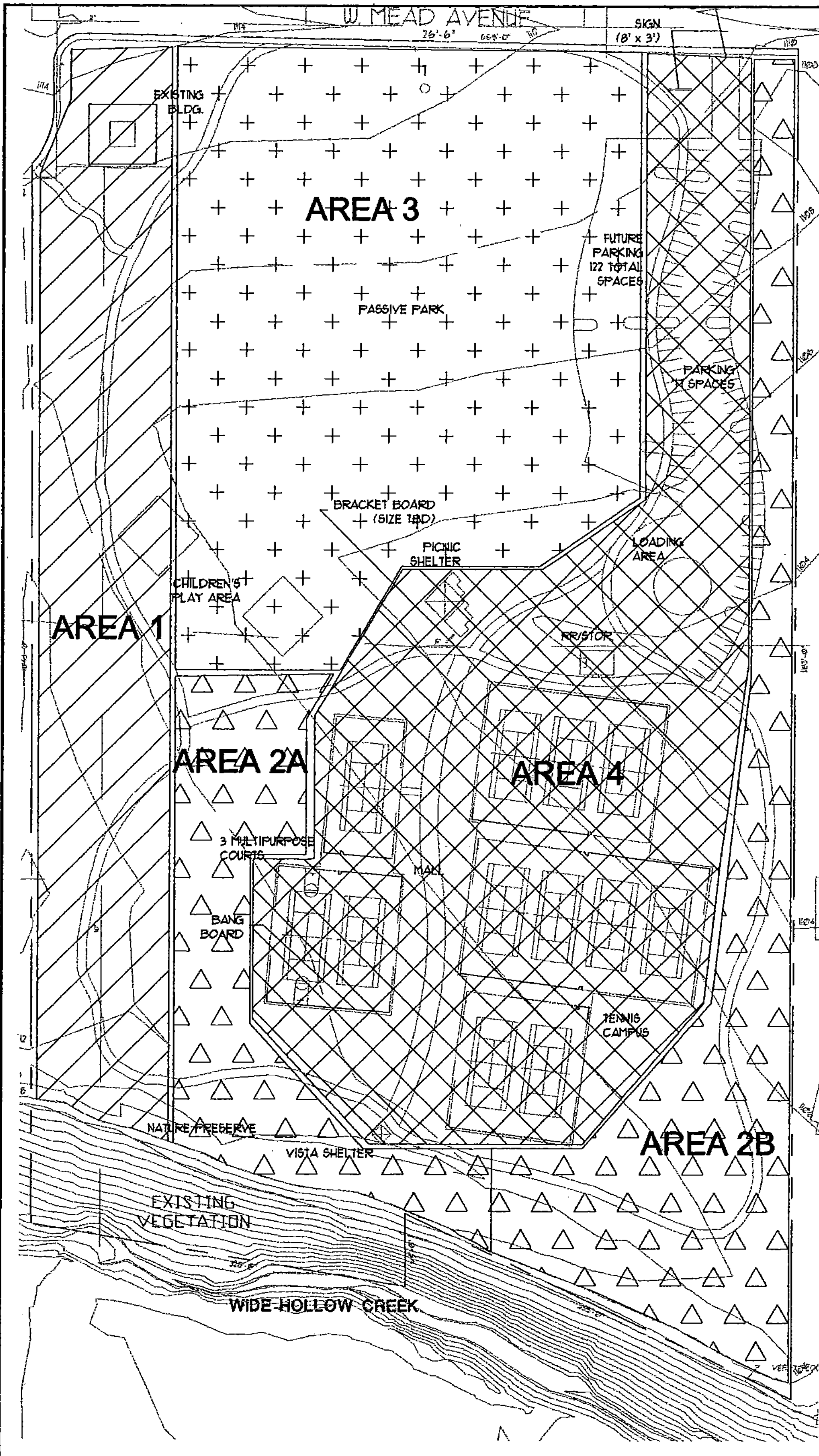
Note: 1. MTCA Method A Cleanup Level = 250 mg/kg

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 12e
Raw Data Plots
Lead Concentration (mg/kg)
Deep Soil 2 (5'-7')

F:\projects\City of Yakima-Kissel Park\CAP - RI-FS\Revised FINAL RI-FS-CAP\Figures\Kissel RevFINAL RIFSCAP Figures 4-12.vsd
08/31/01



Area 1, Deep Tilling (105,776 SF)

Area 2, 6" Soil Cover and Turf
Area 2A=51,789 SF
Area 2B=88,092 SF

Area 3, Excavate 1'–2' (196,763 SF)

Area 4, Soil Cover and Turf (96,860 SF)
Asphalt Pavement (38,860 SF)
Concrete (84,985 SF)
TOTAL: 220,705 SF

0 150 300
Scale in Feet

Note: The boundaries of each area are approximate. Final boundaries will be established during cleanup.

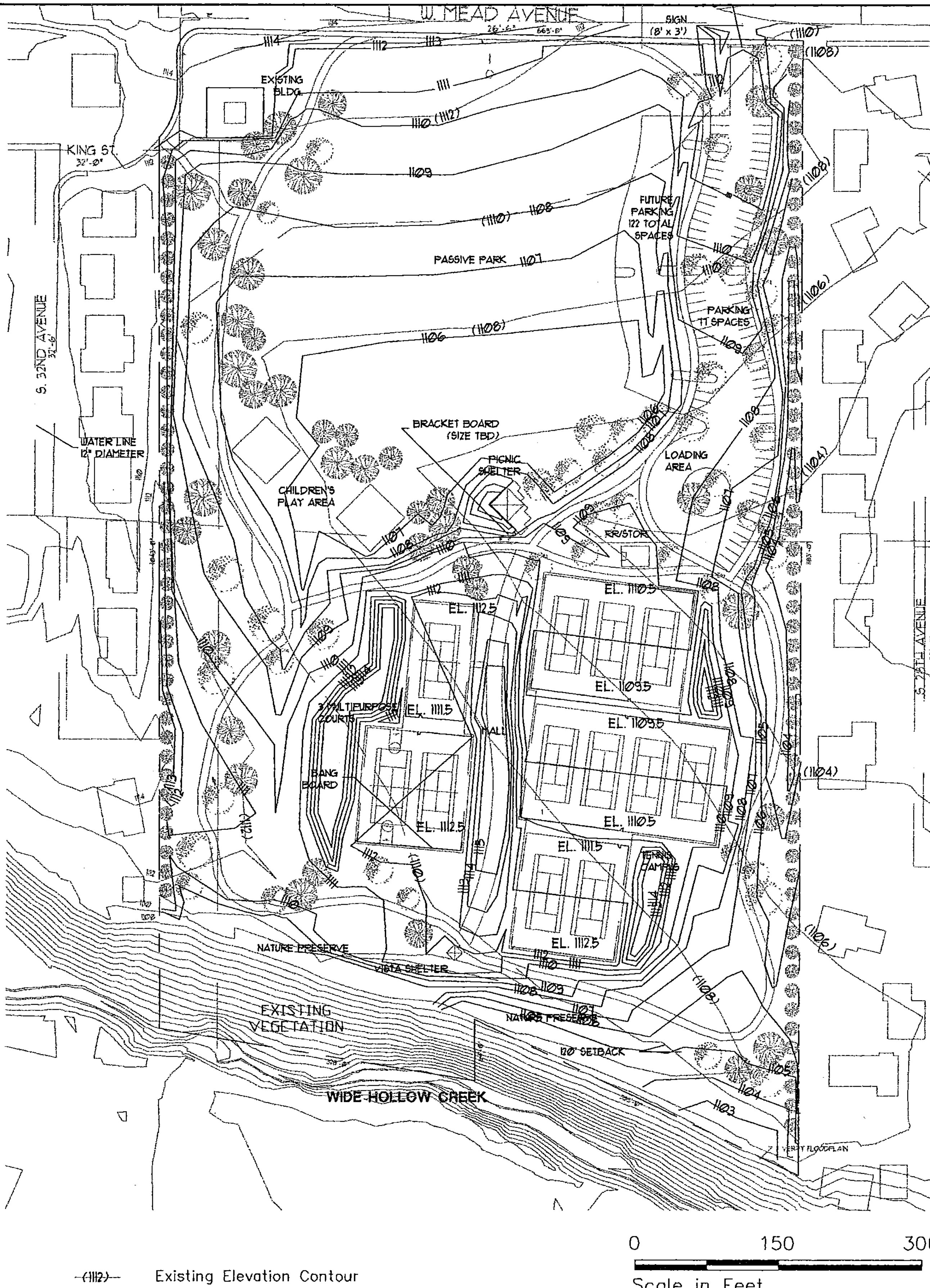
* Source: Base Map Drawing provided by KDF Architecture

DATE: 05/17/01 10:48am
DWG NAME: G:\project\Clients\Floyd and Snider\PRO_KISSEL\kissel005.dwg

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 13
Proposed Cleanup Areas



(1112) Existing Elevation Contour
1112 Proposed Elevation Contour

* Source: Drawing provided by KDF Architecture

Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

Kissel Park
Yakima, Washington

Figure 14
Preliminary Grading Plan

DATE: 05/14/01 12:05pm

Kissel Park

Remedial Investigation/ Feasibility Study and Cleanup Action Plan

Appendix A
Ecology Comments and Responsiveness Summary

FINAL

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

15 West Yakima Avenue, Suite 200 • Yakima, Washington 98902-3452 • (509) 575-2490

August 7, 2001

Tom Colligan
Floyd & Snider
83 S King Street Suite 614
Seattle WA 98104

RECEIVED
AUG 09 2001
BY:

Dear Tom:

As we have discussed, there are a few final comments that need to be incorporated into the final Kissel Park RI/FS/CAP. I apologize for taking so long in getting these comments to you. The comments are as follows:

1) Page 4-2: The discussion on areas 2a and 2b and the Design Criteria both indicate a minimum cover of 6 inches of clean soil over contaminated soil. In past discussions Ecology has indicated that a minimum of 12 inches of clean soil is necessary, especially in child play areas. Please modify the design criteria to reflect that 12 inches of clean soil or an equivalent engineered cover will be utilized.

2) Table 6: Should the estimated unit cost for "Cover Contaminated Soil with Clean Soil Obtained On Site" be more than "Cover Contaminated Soil with Imported Soil"?

3) Please incorporate the responsiveness summary, a copy of which is attached, into the final document.

Thank you for the good work and cooperation on this project. I look forward to seeing the final document.

Sincerely,

Rick Roeder
Site Manager
Toxics Cleanup Program

Enclosure

Kissel Park Responsiveness Summary

Two people commented on the Proposed Kissel Park Cleanup Action. (The proposed cleanup action consists of digging a portion of the site down to clean soil and moving said contaminated soil to another part of the site for burial and capping. The other half of the site will be deep tilled to disperse the lead-arsenate to a level considered non-hazardous.) These comments have been broken down into the issues and are presented below with the response:

1) It is more beneficial and economical to move the contaminated soils to under the tennis court area. *No Response needed.*

2) Disagree with moving the soil due to disruptions to neighborhood: *All options considered for cleanup will have some disruption to the neighborhood. By managing contaminated soils onsite, additional truck traffic necessary to bring in clean fill will be avoided. Disruptions should be limited to what would occur at a clean property during construction: i.e. equipment noise, lights, dust, etc.*

3) Disagree with proposal due to dust: *The contractor will be required to control dust regardless of what cleanup action is undertaken. This will be accomplished by the contractor submitting a dust control plan that specifically addresses the contamination on site. Potential dust control methods that will be considered and used include water and /or chemical methods.*

4) Proposal as presented increases the potential to spread the contamination: *The management of contaminated soil onsite will ultimately reduce the footprint of the area of contamination. Various other alternatives involve moving the contamination to off-site disposal areas. The associated trucking and handling greatly increases the chance for spreading of the contamination (i.e. truck accidents, dust, etc) and ultimately result in only having moved the problem, not fixed the problem. The alternative of leaving the contamination lay and covering with an appropriate soil and grass cover is not an economically viable alternative with cost estimates ranging as high as $14,375 per acre for the imported soil.*

5) Don't disturb the area to the south; the proposed tennis court area. *The most cost-effective way to provide for the necessary consolidation and capping of the contaminated soils is to dig a portion of the site down to clean levels and relocate these soils. The tennis court and parking areas provide the necessary barrier between humans and the contaminated materials. From Ecology's viewpoint it is up to the City and its contractors to come to a design that is visually pleasing and acceptable to the public. Ecology's concern is that the final cap provides for a sufficient barrier (more then grass) between contaminated soils and humans.*

6) Berms around the tennis court area, as part of the remedy, will create water drainage problems. *The tennis courts will be designed to have drainage inlet structures to catch precipitation and divert the run-off to an on-site retention system. This retention system will be designed to be kept on the park site at an elevation of non-contaminated soil.*

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

15 West Yakima Avenue, Suite 200 • Yakima, Washington 98902-3452 • (509) 575-2490

July 11, 2001

RECEIVED
JUL 13 2001
BY:

Ms. Angela Kissel
1009 S 26th Avenue
Yakima WA 98902

Ms. Carol Masterson
1114 S 32nd Avenue
Yakima WA 98902

Dear Ms. Kissel and Ms. Masterson:

Enclosed you will find the Kissel Park Draft Remedial Investigation/Feasibility Study and Cleanup Action Plan Responsiveness Summary. As you will see in the enclosure, the comments made by people were broken down into topics and a response provided.

Thanks you for your comments and participation.

Sincerely,

Rick Roeder

Rick Roeder
Site Manager
Toxics Cleanup Program

cc: Denise Nichols, City of Yakima Parks Department

Kissel Park Responsiveness Summary

Two people commented on the Proposed Kissel Park Cleanup Action. (The proposed cleanup action consists of digging a portion of the site down to clean soil and moving said contaminated soil to another part of the site for burial and capping. The other half of the site will be deep tilled to disperse the lead-arsenate to a level considered non-hazardous.) These comments have been broken down into the issues and are presented below with the response:

1) It is more beneficial and economical to move the contaminated soils to under the tennis court area. *No Response needed.*

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6) Berms around the tennis court area, as part of the remedy, will create water drainage problems. *The tennis courts will be designed to have drainage inlet structures to catch precipitation and divert the run-off to an on-site retention system. This retention system will be designed to be kept on the park site at an elevation of non-contaminated soil.*

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
15 West Yakima Avenue, Suite 200 • Yakima, Washington 98902-3452 • (509) 575-2490

RECEIVED
MAY 02 2001
BY:

April 30, 2001

Ms. Denise Nichols
City of Yakima
Parks & Recreation
2301 Fruitvale Blvd
Yakima WA 98902

RE: Kissel Park Remedial Investigation/Feasibility Study Comments

Dear Ms. Nichols:

This letter is to transmit Ecology's comments on the Draft Focused Remedial Investigation and Feasibility Study (RI/FS) for Kissel Park, dated March 23, 2001. Please note that additional comments may be forthcoming from the public comment period.

Overall the study looks good and I would like to commend Floyd and Snider for the work they have done. However, after completing our review there are a few comments which will need to be addressed, either in the final or in the draft Cleanup Action Plan as appropriate.

Comments:

Remedial Investigation

General Comment: The discussion of sample averages, depths, and other statistics on pages 1-2, and 2-4 is somewhat confusing and hard to correlate. Please review and clarify as appropriate.

Section 2: Remedial Investigation: The third bullet entitled "Better Definition of Soil Types" (page 2-1) states that the "Definition of soil types at the site will allow a better understanding of the contaminant fate and transport." How and where is this incorporated into the discussion of alternatives, specifically the contaminant fate and transport? The RI presents a good understanding of the current conditions and what the fate and transport of the arsenic/lead (AS/PB) has been to date. The alternative review needs to make an attempt to predict the future fate and transport of the contaminants.

Page 2-4: Hot spots are defined as 5 times the mean. Where does this come from?

Page 2-4: In the discussion on lead the following statement is made: "This difference is thought to be due to the inadequate number of samples to adequately characterize site soil concentrations." This conclusion is confusing; is it referring to the RI data or the earlier sampling?

Page 2-5: Section 2.7: Please reference the sediment data location within the report. A simple table would be nice.

Page 2-5: Section 2.8: The current DDT standard is 1 mg/kg. The 3 mg/kg will not take effect until the new rule is implemented in August 2001.

Feasibility Study

General Comment: Any alternative that relies on institutional controls will require the implementation of these activities for perpetuity since we are dealing with metals. Because of this the FS needs to define what is actually meant when the term institutional controls is used as part of an alternative. Is it a deed restriction, an irrigation management plan, or something else? Additionally, the FS needs to provide the reader with a sense as to the long-term costs/benefits of these controls.

Page 3-2: As you noted, the pilot study results need to be inserted into this report.

Page 3-4: The term "Other factors" is used. What are these other factors?

As always, please feel free to call me at (509) 454-7837.

Sincerely,

Rick Roeder

Rick Roeder
Site Manager
Toxics Cleanup Program

cc: Tom Colligan, Floyd & Snider

Kissel Park

Remedial Investigation/ Feasibility Study and Cleanup Action Plan

Appendix B
Kissel Park Soil Investigation

FINAL

KISSEL PARK ENVIRONMENTAL STUDY PLAN
SOIL INVESTIGATION
Kissel Park
Yakima, Washington

Project Number 01-182

March 22, 2001

REGISTERED PROFESSIONAL GEOLOGIST G1727 TRAVIS LYLE TRENT OREGON

Prepared for: Floyd-Snider, Inc.
Attn: Tom Colligan
83 South King Street, Suite 614
Seattle, Washington 98104

Prepared by: Fulcrum Environmental Consulting, Inc.
122 South Third Street
Yakima, Washington 98901

Authored by: Peggy Williamson **Date:** 3/22/01

Peggy Williamson, CHMM
Fulcrum Environmental Consulting, Inc.

Reviewed by: **Date:** 3/22/01

Travis Trent, RPG
Fulcrum Environmental Consulting, Inc.

TABLE OF CONTENTS

1.0 INTRODUCTION

Fulcrum Environmental Consulting, Inc. (Fulcrum) was retained by Tom Colligan of Floyd & Snider, Inc. (FSI) to provide soil sampling, data collection, and subcontractor coordination services as part of the Kissel Park Environmental Study Plan (ESP). Appendix A contains the Kissel Park Environmental Study Plan (ESP) authored by FSI. The Kissel Park project site is located in the southwest portion of Yakima, Washington. Refer to Figure 1 Vicinity Map in the ESP for site location. Subcontractors utilized during the onsite portion of the ESP included Tri-Valley Construction, Inc. (Tri-Valley) for excavation services; Huibregtse, Louman Associates, Inc. (HLA) for survey services; and PLSA Engineering & Surveying (PLSA) for geotechnical services.

2.0 PROJECT BACKGROUND/SITE DESCRIPTION

2.1 Project Background

According to the ESP, the approximately 17 acre proposed Kissel Park site was used as an orchard from at least the 1930s to the 1950s. Historical documents reviewed during the ESP development suggested that historic farm buildings had been present in the northeastern portion of the Kissel Park site. In September of 2000, the City of Yakima conducted an initial investigation to determine the impact of historically applied pesticides to site soils. Concentrations of lead, arsenic, and dichlorodiphenyl-trichloroethane (DDT) were documented above the Washington State Department of Ecology's (Ecology) Model Toxics Control Act (MTCA) Method A cleanup levels. In response to the City of Yakima's investigation, FSI authored the Kissel Park Environmental Study Plan for the purpose of filling specific data gaps, such that a focused remedial investigation/feasibility study (RI/FS) could be completed. Of special interest to the study was the potential for a deep tilling remediation pilot study funded through a brownfield redevelopment grant.

2.2 Site Description

The Kissel Park site is located south of West Mead Avenue between 29th and 32nd Avenues, in Yakima Washington. The site is bounded on the north by West Mead Avenue and to the south by Wide Hollow Creek. The east and west boundary of the Kissel Park site is formed by residential fencing. A fenced area containing a utility substation is located in the northwest portion of the site. A City of Yakima sewer line transects the site near the east/west center of the parcel. An irrigation riser system transects the site near the north/west center of the parcel. A stormwater runoff ditch extends the width of the parcel, parallel to and approximately 30 feet south of West Mead Avenue. Several evergreen trees were present in the northeast portion of the site approximately 5 feet south of the stormwater runoff ditch. An apparently abandoned electrical riser was also present in the northeast portion of the site.

The majority of the approximate 17 acre parcel slopes slightly southward (less than 5% relief). Within approximately 50 to 100 feet of the southern boundary, the Kissel Park site drops steeply (approximately 35 feet) to the banks of Wide Hollow Creek. The site had most recently been used for agricultural crop production. Prior to the onsite investigation, the site and been mowed of crop vegetation.

3.0 SOIL SAMPLING AND ANALYSIS

3.1 Soil Sampling Rationale

The ESP called for the site to be sampled at 90 separate locations spaced at approximately equal distances from each other. In order to locate the sampling points, the ESP called for the site to be divided into 8 east-west transects, and 12 north-south transects laid out parallel to the site boundaries. Refer to Figure 3 Exploration Location Map in the ESP for the proposed site grid. The east-west transects were to be designated 1 through 8, and the north-south transects were to be designated A through L. Due to the irregular shaped southern boundary, transect L only extended across the southeast one third of the parcel. When overlain on the site, the transects created an approximate 85 square foot grid with approximately 80 intersections (grid nodes). Three additional east-west and north-south transects were laid out in the northeast portion of the site (historic location of residential buildings), creating nine additional grid nodes located in the approximate center of the nine northwest 85 square foot grids. Composite soil samples were to be collected from varying depths from each of these approximate 89 grid nodes. Three additional samples were to be collected from sediments contained within the Wide Hollow Creek bed at the east, west, and approximate center of the parcel.

The ESP design called for test pits to be excavated at each of the predetermined grid nodes. Samples were to be collected over the entire specified horizon then field composited, before being placed in the sample collection containers. All test pit locations were to be composite sampled from the 0 to 6 inch and 6 inch to 2 foot intervals. At 40 randomly selected grid nodes the test pits would have additional composite samples collected from the 2 to 3 foot interval. At 5 randomly selected grid nodes the test pits would have additional composite samples collected from the 3 to 5 foot interval. At 5 randomly selected additional grid nodes the test pits would have composite samples collected from the 5 to 7 foot interval. Blind duplicate samples were to be collected from 5 percent of the 0 to 6 inch interval sampling locations.

A random selection procedure was utilized to determine specific sampling locations for sampling horizons where less than 100 percent (assumed 90 total) of the grid nodes were to be sampled or less than 100 percent of the nodes were to be analyzed for a specified parameter. Appendix B contains the random sample location identification sheets. Following is a summary of the random selection procedure:

1. A list of all grid node locations was generated (ie, 1A, 1B, etc.).
2. A sequential number was assigned to each grid node location (1 – 90).
3. A random number was obtained from calculator with a random number function key.
4. The random number was multiplied by the total number of grid nodes (90).
5. The product was round to the nearest whole number.
6. The sample location correlating to the whole number selected was tagged for the specified sampling parameter (i.e., location for duplicate sample collection).
7. Steps 3 through 6 are repeated until the desired number of grid nodes were selected.
8. Duplicate sample locations selected for a given sampling parameter were documented then discarded.
9. Steps 1 through 8 were repeated for each sampling parameter where less than 100 percent of the locations were sampled.

3.2 Sampling Procedures

Soil samples were obtained by direct collection from excavation sidewalls down to an approximate depth of 4 feet. Due to safety concerns, samples collected from depths greater than 4 feet were collected by grab sampling from the backhoe bucket. Direct collection samples were collected by hand using new latex or vinyl gloves and disposable plastic spoons from the desired location. Grab samples were obtained from the relatively undisturbed soil at the middle of the backhoe bucket near the teeth. Samples were deposited into labeled borosilicate glass sample containers, packaged on ice, and delivered under chain-of-custody to SVL Analytical in Kellogg, Idaho.

Groundwater was not anticipated to be encountered during site sampling. A groundwater investigation was not conducted as part of this ESP. Therefore, water sampling protocol was not summarized in the ESP or in this report. Groundwater was not encountered during this soil sampling project.

3.3 Analytical Methods Selected

The agricultural chemicals of concern identified for the Kissel Park site are lead, arsenic, and DDT. The ESP identified Environmental Protection Agency (EPA) method 6010 for lead and arsenic analysis. EPA method 8081 was identified in the ESP for DDT analysis.

EPA analytical method 6010 (Inductively Coupled Plasma - ICP) was selected for lead and arsenic analysis over EPA method 7060 (Graphite Furnace Atomic Absorption - GFAA) because it results in conservative arsenic analysis and is less costly when multiple metals are analyzed. Although EPA method 6010 has a higher detection limit (1 parts per million – ppm) than method 7060 (0.1 ppm detection limit) for arsenic, the method 6010 detection limit is sufficiently low enough to reliably identify agricultural chemicals below the Model Toxics Control Act (MTCA) Method A concentrations identified in the ESP.

Analysis by method 6010 generally results in a conservative measurement of arsenic concentration. Data presented in Ecology's "Natural Background Soil Metals Concentrations in Washington State" states that at lower arsenic concentrations (less than 50 mg/kg), arsenic values produced by 6000 series analysis were significantly higher than those produced by 7000 series analysis. The skewing of analytical results is caused by iron interference and method detection limits. According to Ecology's report, where arsenic is present at concentrations of 50 ppm or less, analysis of soil samples by method 7060 resulted in significantly lower arsenic concentration than corresponding 6010 analysis.

3.4 Site Clean-up levels

Site clean-up criteria and associated clean-up actions will be consistent with the ESP and current Washington State Department of Ecology (Ecology) guidance and regulation. For screening purposes, Method A levels defined in Ecology's WAC 173-340, The Model Toxics Control Act (MTCA) Cleanup Regulation, will be used as a threshold for determining need for additional evaluation/investigation. Ecology's MTCA Method A contaminant concentrations are appropriate for unrestricted site use and are therefore appropriate for use as a screening criteria. If resultant analyses are below the levels identified in MTCA, the site will be considered clean and no additional evaluation/investigation will be required.

If resultant analyses are above the MTCA identified levels, the need for further investigation or corrective action will be evaluated against Ecology defined criteria.

3.5 Site Survey

Three representatives from HLA arrived on site the morning of February 5, 2001 and began setting up survey equipment. Fulcrum arrived on site at approximately 10:00 a.m. to review project survey objectives with the HLA survey team. The survey team was in the process of establishing a reference hub for the east-west, north-south transects. HLA's survey team was anticipating placing both a flagged stake and a flush mounted wooden pin at each of the grid nodes. Each stake would be labeled with the appropriate grid node designation as well as a numerical identifier for latitude/longitude coordination. Appendix C contains the listing of the latitude/longitude of the points identified by the survey team as well as a site map produced by HLA.

3.6 Initial Site Investigation

Fulcrum arrived onsite the morning of February 6, 2001 and met with Tri-Valley Construction, Inc. (Tri-Valley) to discuss the project schedule. Prior to mobilization, Tri-Valley requested and obtained a utility locate for the Kissel park project. Fulcrum began collecting soil samples on February 6, 2001 at approximately 11:00 a.m. along the "A" transect. Sampling continued through February 7, 2001 and was completed on February 8, 2001.

Sample collection data was recorded in field notes and on the chain of custody forms. The chain of custody forms accompanied samples from collection through analytical reporting. Samples were collected from the specified sampling horizon with a hand trowel, disposable plastic spoon, or by hand enclosed in a new latex glove. Collected soil was placed in a stainless steel bowl and thoroughly homogenized using a gloved hand. Soil samples were then placed in borosilicate sample jars, labeled and then placed immediately on ice pending shipment to the analytical laboratory. See Section 3.2 for a summary of sampling procedures. Near freezing conditions during the sampling event prohibited effective wet decontamination. As an alternate method, a combination of disposable sampling equipment and dry decontamination was utilized.

Travis Trent, a Registered Professional Geologist with Fulcrum, was onsite during the entire sampling event and observed soil characteristics during the soil investigation. Following is a summary of Mr. Trent's observations.

Soil sample were collected from the grid locations identified in the ESP with the following exceptions:

1. Grid node 1B was located within the fenced utility yard. Grid node 1B was relocated approximately 42.5 feet south (1/2 way between 1B and 1C) were site soils appeared to have been undisturbed by the utility installation.
2. Grid nodes 5A, 6A, and 7A were located within the root zone of some evergreen trees. These sampling locations were relocated approximately 15 south to avoid these trees.

See Appendix D for actual sample locations map.

In general, near surface (0 to 6 inch) site soils were loosely compacted, poorly graded medium brown silt topsoil. Some residual organic mater was remaining in near surface soils as a result of recent agricultural crop site use. Soil below 6 inches was generally moderately compact, poorly graded medium brown silt with some localized areas of cementing. Cementation of silt soils increased below 2 feet, until at approximately 4 to 5 bgs soils were firmly cemented. Backhoe refusal was not encountered in any of the test pits. In general, site soils had evident moisture to an approximate 3 foot depth in the northern portion of the site. The southern portion was damp to an approximate depth of 1 foot. During the site sampling event heavy night frost penetrated and froze soils to an approximate 6 to 10 inch depth. Following is a summary of the exceptions to the general test pit description:

1. Transite-type pipe debris was identified in grid node 1A and 2B at approximately 3 feet bgs. Transite-type piping remaining in excavation sidewalls appeared consistent with historic use as water piping.
2. Concrete and metal debris was identified in grid node 7B. Given the historic suggestion of residential buildings in this area, debris identified would have been consistent with demolition debris.
3. The northeast portion of the site (the area east of grid nodes 5A to 5D) had localized areas of gravel mixed into the upper two feet of site soils that did not appear consistent with native site material. Given the likely historic location of residential buildings, the localized area of gravel are consistent with site use at roads, walkways, building foundations, etc.
4. Grid node 1C had firmly cemented materials at 2 to 3 feet bgs.

Analytical results from the Kissel Park sampling event are included in Appendix E. The range of analytical results for each sampling depth is summarized in Table 3.5.1 and discussed in Section 4.0.

Table 3.6.1 Analytical Results Summary

Analyte	Sample Depth (all results are in ppm)						
	Method A	Near-surface (0-6")	6" -2' bgs	2'-3' bgs	3'-5' bgs	5'-7' bgs	Creek
Arsenic	20	7.1 – 84.9	9.9 – 113	7.3 – 58.9	10.4 – 12.7	3.5 – 18.3	7.1 – 9.1
Lead	250	9.5 – 335	12.1 – 374	8.2 – 101	5.4 – 11	3.5 – 15.9	3.7 – 9.9
DDT	1	0.0106 – 0.0332	NA	NA	NA	NA	NA

NA = not analyzed

3.7 Geotechnical Investigation

Fulcrum met with Brad Card of PLSA on site February 7, 2001 to discuss the scope of geotechnical services for the Kissel Park site and to examine some of the open test pits. As previously arranged, Tri-Valley provided excavation services for PLSA's investigation. On February 8, 2001, under the direction of PLSA, Tri-Valley opened 4 test pits adjacent to grid locations 1C, 5G, 2K, and 6B. Firmly cemented silt, sand, and gravel was encountered at approximately 2 feet bgs at grid lC, preventing further investigation. For each of the remaining 3 test pits PLSA logged soil lithology, conducted soil density testing at three horizons, and conducted hydrometer analysis. Appendix F contains PLSA's report summarizing the investigation findings.

4.0 CONCLUSION

As outlined in the ESP, the Kissel Park site was investigated for the potential presence of lead, arsenic and DDT. During the course of the project:

1. The site was surveyed and marked in a grid pattern as described in the ESP with variations as noted in section 3.6.
2. A utility locate was completed to identify nearby underground utilities.
3. Test pits were excavated at 89 grid or near grid locations.
4. 228 samples were collected from 5 different soil horizons within 89 grid locations.
5. 3 samples were collected from the Wide Hollow Creek bed.
6. Collected samples were submitted under chain-of-custody to SVL Analytical in Kellogg, Idaho for analysis.
7. A geotechnical investigation was conducted for three test pit locations.

Systematic sampling indicated that horizontal extent of arsenic concentrations above the MTCA Method A level was predominately pervasive across the Kissel Park site down to an approximate depth of 2 feet. The exceptions were:

1. Transect 1, where arsenic concentrations were below the Method A level at two locations at the 0 to 6 inch horizon and at all but one location at the 6 inch to 2 foot horizon,
1. Transect 2 where arsenic was below the Method A level at one southern location, and
2. Transect 3 where arsenic was below the Method A level at two northern locations.

Arsenic concentrations at the two to three foot horizon were measured at 40 gird nodes. At 11 of the 40 nodes sampled the arsenic concentration exceed the MTCA Method A level. The 11 nodes were located in the northeast portion of the site, along the A transect, and in the south central portion of the site (transect G, H, and I).

Lead concentrations above the MTCA Method A level of 250 ppm were limited to the eastern third of the site (transects 5, 6, & 7) at the 0 to 6 inch horizon. While still present at the 6 inch to 2 foot horizon, the prevalence of lead concentrations exceeding the MTCA Method A level decreased.

Results of systematic sampling indicated that at 3 feet below ground surface (bgs) arsenic concentrations were below the MTCA Method A level of 20 ppm. At 2 feet bgs, lead concentrations were below the MTCA Method A level of 250 ppm.

APPENDIX A

KISSEL PARK
ENVIRONMENTAL STUDY PLAN

Kissel Park

Environmental Study Plan

Prepared for:

The City of Yakima
Yakima, WA

Prepared by:

Floyd & Snider Inc.
83 South King Street
Suite 614
Seattle, WA 98104

January 2001

FINAL

Table of Contents

List of Tables

List of Figures

1.0 Introduction

This study plan was prepared for The City of Yakima as a requirement of the Agreed Order (in progress), between the Department of Ecology (Ecology) and the City of Yakima. The agreed order calls for an environmental investigation to collect data in support of the cleanup and development of Kissel Park (the site). Currently, surface soils at the site contain concentrations of lead and arsenic that exceed state cleanup standards. The elements of this plan include describing the rationale and location for collection of soil samples and associated sample analyses, field methodology, quality assurance, schedule, and reporting.

1.1 PURPOSE OF INVESTIGATION

The purpose of this plan is to guide an investigation to fill specific data gaps so a focused remedial investigation/feasibility study (RI/FS) can be completed. The data collected during the investigation will also help select corrective measures necessary for long-term protection of human health and the environment after the site is developed as a public park. Additionally, the data will be used to design a pilot study of deep tilling remediation methodologies. An addendum to this study plan will be prepared specifically for the pilot study. The information from this investigation and the pilot study will be used in the overall design of the park as well.

1.2 SITE HISTORY AND DESCRIPTION

The site is composed of 17 acres of undeveloped land along the banks of Wide Hollow Creek within a residential neighborhood in the City of Yakima. See Figure 1 for a site vicinity map. The site has a slight slope to the south except along the banks of Wide Hollow Creek where it is fairly steep. A small portion of the bank slope lies within the 100-year flood plain of the creek. The site is free of structures except for a small building on the northwest corner of the site used as a water supply pump station for the City of Yakima.

Between 1970 and 1986, the site was used as a hay field, and since 1987 by the Eisenhower High School as a land lab to supplement its agricultural program. Prior to that, from at least the 1930's through the 1950's, the site was used as an orchard. To control the coddling moth, lead arsenate was commonly used as a spray-on insecticide during that time. Because of this concern, the City of Yakima tested soils in September 2000 due to the possible use of site soil as fill at the planned Chesterly Park. Results of that testing are shown in Table 1. Average concentrations of arsenic were 32 mg/kg, above the 20 mg/kg Method A cleanup level. Average concentrations of lead were 179 mg/kg, less than the 250 mg/kg cleanup level. Individual samples, however, contained lead concentration up to 357 mg/kg. Additional testing was performed for DDT and one of five samples contained DDT at the 1 mg/kg cleanup level, the remaining concentrations of DDT were below this level.

The City of Yakima plans to develop the park with both active and passive elements. The active elements of the park will be centered around nine tennis courts and three multi-purpose courts located in the southern half of the site. In addition to the courts, park development will include hard-surface trails, picnic shelter, an 80-space parking lot, play area, restroom, storage building, and water and sewer lines.

The northern half of the site will be developed for passive use including landscaped open-space, picnic area, playground, and an 8-foot wide asphalt walking trail around the park. Figure 2 presents a conceptual site plan. No development will occur within 120 feet of the banks of Wide Hollow Creek per the City of Yakima Critical Areas Ordinance.

1.3 ORGANIZATION

The rest of this SAP is organized as follows:

- Section 2.0 Project Participants and Responsibilities.
- Section 3.0 Scope of Work; outlines the project data gaps and explains rationale used in selecting exploration locations and describes how samples will be collected and analyzed. Also included are the QA/QC requirements and procedures for field and laboratory work.
- Section 4.0 Schedule and Reporting; discusses the schedule of events and reporting objectives.
- Section 5.0 Health and Safety.
- Section 6.0 References.

2.0 Project Participants and Responsibilities

The City Of Yakima

The City of Yakima's responsibilities include project oversight, site access, and other miscellaneous support items associated with planning and performance of the work.

Department of Ecology

The Department of Ecology is responsible for review and approval of this plan and all future documents associated with this project (i.e. – focused RI/FS, addendum to this plan for the Pilot Study, Cleanup Action Plan). Ecology will also provide project oversight and assistance in obtaining Remedial Action grant funding.

Floyd & Snider Inc. (FSI)

FSI is the environmental consultant working under contract to the City of Yakima. FSI is responsible for development of this plan, supervising qualified contractors in implementing the scope of work, and reporting the results.

Field Subcontractors (Fulcrum Environmental, others to be selected)

FSI will be contracting out field services to qualified, locally-based firms to perform the following:

- Providing sampling equipment (backhoe, shovel, etc.) and 40-hr. trained personnel.
- Collection and logging of samples, documentation, and decontamination of sampling equipment.
- Following chain-of-custody procedures and providing transport of soil samples to laboratories.
- Surveying in of all sampling locations.

3.0 Scope of Work

A field investigation is needed to fill environmental data gaps so an adequate understanding of the nature and extent of contamination is achieved and cleanup actions selected that can be integrated into the design of the park.

3.1 ENVIRONMENTAL DATA GAPS

The existing data from the initial site sampling indicates that lead and arsenic are found at generally uniform concentrations throughout the top 3 feet of soil. This may be in part due to the many years of tilling that have occurred at the site. Data gaps necessary for a more complete understanding of the contaminants and site conditions include:

1. *Characterization of the areal distribution and concentrations of lead and arsenic.* Additional sampling, based on a grid system, will establish with statistical confidence whether the initial sample results are representative, reveal the presence of "hot spots" (along former tree drip lines), and possibly identify clean areas of the site from those requiring remediation.

2. *Characterization of the vertical extent (depth) of lead and arsenic.* This is necessary for determining to what specific depth(s) remediation of soil will be required, as well as to establish if contaminant migration has occurred to deeper unplowed soil.

3. *Better definition of soil types.* Definition of the soil types at the site will allow a better understanding of the contaminant fate and transport as well as allow for better evaluation of potential site remedies (e.g. stabilization, excavation, etc). It will also increase familiarity with the material to be excavated or capped so that a clearer construction specification can be written.

4. *Determine properties of soil that may be excavated or used as a cap.* These properties are needed to prepare design specifications for excavation, capping, temporary handling and stockpiling, dewatering (if needed) and re-use or disposal of soils. Such information will also be needed by bidders to prepare more accurate construction cost quotes.

5. *Determine the concentration of contaminants in Wide Hollow Creek.* These data are necessary to ensure that the sediments in Wide Hollow Creek have not been impacted by past usage.

6. *Determine if any other pesticides are present in site soils.* Based on other studies of orchard contaminants, chlorinated pesticides such as DDT and its breakdown products, DDD and DDE may be present. It is important to establish that the preliminary test results for DDT are representative and if other commonly used chlorinated pesticides are present as well.

The environmental and geotechnical data gaps will be addressed using the site exploration plan outlined below.

3.2 EXPLORATION LOCATIONS

To obtain the necessary data as described above, collection of over 220 surface and subsurface samples from approximately 90 locations is proposed. The sample locations within the park will be at the intersections (grid nodes) of eight east-west transects and 12 north-south transects laid out parallel to the site boundaries. Additional samples on a tighter grid spacing will be collected at the northeast corner of the site. This is where aerial photographs indicate farm buildings were once located. The lead-arsenate solutions may have been mixed (and spilled) in this general area. Samples will also be collected in Wide Hollow Creek. Figure 3 shows the proposed locations (Note: these locations are based on an approximate knowledge of site conditions. While in the field, complications may call for the relocation, elimination, or addition of certain locations). Figure 3 also identifies the location of existing soil samples.

3.3 SAMPLE COLLECTION

Samples within the park will be collected from the side walls of test pits dug by a backhoe. Eighty-five test pits will be shallow (3 feet) and five will be deep (7 feet). Samples will be collected for analytical purposes as detailed on the following table.

Sample Collection Schedule

Location	Analysis	Rationale	Expected Number of Samples
Environmental Samples			
Surface soil (0-6")	Metals[1], Pesticides[2]	Characterize areal extent of lead and arsenic in soil most likely to present risk of exposure, determine presence and concentrations of chlorinated pesticides.	90 (Metals) 5 (Pesticides)
Shallow Soil (0.5'-2') (2-3')	Metals	Determine depth of contaminants in specific areas, use data to define areas needing remediation.	90 (0.5'-2') 40 (2-3')
Deep Soil (3-5') (5-7')	Metals	Determine lead and arsenic profile with depth at five locations.	5 (3-5') 5 (5-7')
Sediment in Wide Hollow Creek	Metals	Characterize lead and arsenic concentrations at up, mid and downstream locations	3
Field Quality Control Samples			
Field duplicates	Metals	Determine laboratory precision.	4 (5% frequency)
Equipment Blank (decon water from cleaning of equipment)	Metals	Determine effectiveness of decontamination.	1

Notes:
1 Metals include arsenic and lead.
2 Pesticides include organo-chlorine compounds. See section 3.8.

3.4 FIELD LOGGING AND GEOTECHNICAL SAMPLING

Field logging of test pits will be performed by a geotechnical engineer or geologist. Field logging will involve detailed descriptions of the materials encountered including soil type, field density, color changes, debris present, etc. A soil log form will be filled out that describes the soil types encountered. Photographs will also be taken of each fill/soil type encountered.

At ten test pit locations across the site, samples will be collected for geotechnical purposes. Grab samples will be taken in each type of soil observed. This sampling routine may be modified in the field based on site conditions at the direction of the field geologist.

Soil samples will be classified and described in accordance with the Unified Soil Classification System, as defined in ASTM D-2488-93 and D-2487-93. The scope of laboratory testing and the test methods to be used are shown in the following table.

Test	Method	Sample Type & Quantity (per test)	Approximate Number
In-place bulk density	ASTM D-2937	3" dia. brass tube – 6 in.	10
Grain size	ASTM D-422	S/S –1 lb.	10
Water content	ASTM D-2216	S/S - ½ lb.	10

Notes:
1 In-place bulk density to be collected via driving of 6" tube horizontally into sidewall of test pit.

3.5 SURVEY

All exploration locations will be surveyed in for their exact latitude and longitude coordinates [i.e.- horizontal (x-y) control]. The surveying will be done by a professional surveyor and locations transferred to a electronic base map in AutoCad Format. All investigation locations will be flagged and numbered.

3.6 INVESTIGATION-DERIVED WASTE AND SITE RESTORATION

Investigation-derived waste will consist of a minimal amount of decon water and soil/debris removed during digging of the test pits. Excavated test pit soil and decon water from each test pit will be returned to the hole and then bucket compacted. Decon water will be minimized by use of dedicated sampling equipment (spoons, bowls) to the degree possible.

3.7 STANDARD FIELD PROCEDURES

Field procedures will be as described below:

Test Pits. Test pits will be accomplished using a narrow-bucket backhoe. Locations for the five deeper test pits will be distributed across the site at specific locations to be decided in the field. Spoils will be placed on adjacent soil. Soil samples to 3 feet will be collected by entering the pit and first scraping loose soil from the sides of the test pit and then scraping fresh soil from the desired interval into a stainless steel bowl using a stainless steel spoon. Deeper samples will be collected directly from the bucket. All environmental samples will then be homogenized in the bowl. Geotechnical samples do not need homogenization. Instead, they will be placed in plastic bags, or in the case of the brass tube for bulk density, capped and bagged. Immediately following the completion of sampling, the test pits will be backfilled and compacted.

Sediment Samples. Sediment samples from Wide Hollow Creek will be collected by either a small diameter piston-type core sampler or a stainless-steel spoon. These samples will be taken from the upper 6" of sediment. The sediment samples will then be homogenized in a bowl.

Sample Designation. Samples will be labeled to be in accordance with the grid transect number-letter system shown in Figure 3. Samples will be listed as number-letter/depth. For example, sample 5F/2-3' comes from the intersection of transect lines 5 and F, at a depth interval of 2-3 feet below ground surface.

Decontamination. Field sampling equipment that contacts soil samples (bowls, spoons) will be decontaminated between each sample by first brushing off any attached soils, than washing the equipment with a soapy Alconox wash and tap water rinse. One equipment blank will be collected by pouring deionized water into a 1-liter plastic bottle (inorganics) after passing over already decontaminated sampling equipment.

3.8 SOIL LABORATORY PROTOCOLS

3.8.1 Environmental Testing

Soil samples will be tested for the following parameters using standard EPA methods:

- Chlorinated Pesticides — EPA Method 608/8081
- Arsenic, Lead — EPA 6010 (ICP) or 7000 series[1]

1 Due to potential matrix interferences from iron while using the ICP to analyze for arsenic, EPA 7000 series is preferred.

3.9 QUALITY ASSURANCE

For chemical analyses, laboratory analysis quality control will be as described in the selected laboratory's Quality Assurance Project Plan (QAPP). That document details the procedures employed to ensure goals for precision, and accuracy are met. For the field, this includes use of standard field documentation forms and collection and analysis of duplicate samples (5% frequency) and decontamination blanks. For the laboratory, this includes use of standard EPA analytical methodologies, including analysis of method blanks, spikes and surrogates, and laboratory quality control samples.

Data deliverables will include a case narrative, including description of any problems and corrective actions, copy of the Chain-Of-Custodies, tabulated analytical results, data qualifiers, and blank and matrix spike results with calculated percent recoveries and differences.

100% of the data received from the laboratory will be validated at basic review including review of holding and extraction times, surrogate and spike recoveries, and matrix spike duplicates. The analytical laboratory shall participate in the Washington State Department of Ecology Environmental Laboratory Accreditation Program or the EPA Contract Laboratory Program.

4.0 Schedule and Reporting

The expected schedule is to start the field program after approval for this work plan from Ecology is obtained in late February 2001. Freezing weather may delay the expected start of sampling. All samples will be delivered to the laboratory by the end of the week. Laboratory analysis will require 3 weeks. Data evaluation and reporting will require 4 weeks after the laboratory results are received. The order and duration of each significant field activity is listed below:

Activity	Duration
Mobilization and layout of grid	1 day effort, start of Week 1
Test Pits	4-5 day effort, complete at end of Week 1
Conduct site survey of test pit locations	½ day effort, during Week 2
Receive laboratory results	3 week effort, complete at end of Week 4
Prepare Pilot Study Work Plan Addendum	2 week effort, start at Week 4, complete at end of Week 6
Prepare Focused RI Report	4 week effort, start at Week 4, complete at end of Week 8

Field and laboratory data generated as part of this investigation will be summarized in a focused Remedial Investigation/Feasibility Report. Included within the report will be copies of all field related data, including soil test pit logs, laboratory data summaries, and a survey report provided by the subcontractor. A full project schedule incorporating all of the major tasks for this project is presented in Table 2.

5.0 Health and Safety

Worker health and safety requirements will be given in a Site Specific Health and Safety Plan (HASP) to be prepared specifically for this project, in accordance with applicable state regulations for hazardous waste site workers, Chapter 296-62-300 WAC, Part P.

6.0 References

American Society of Testing and Materials. *Annual Book of ASTM Standards.* Volume 4.08.

Environmental Study Plan

Tables

Table 1

Kissel Park – City of Yakima Soil Sample Results, September 2000

Location[1]	Depth	Arsenic (As) (mg/kg)	Lead (Pb) (mg/kg)
1/Northwest Corner	Surface	24.80	108.00
	One Foot	16.80	77.50
	Three Feet	14.10	61.50
2/Northeast Corner	Surface	1.65	8.75
	One Foot	51.00	357.00
	Three Feet	30.10	140.00
3/Southeast Corner	Surface	42.9	185.00
	One Foot	47.80	317.00
	Three Feet	19.80	111.00
4/Southwest Corner	Surface	68.50	317.00
	One Foot	45.60	224.00
	Three Feet	16.10	43.10
5/Central	Surface	32.10	320.00
	One Foot	47.00	269.00
	Three Feet	23.00	144.00
Average	Surface	33.99	187.75
	One Foot	41.64	248.90
	Three Feet	20.62	99.92
	All	32.08	178.86
Median	Surface	32.10	185.00
	One Foot	47.00	269.00
	Three Feet	19.80	111.00
	All	30.10	144.00

Notes:

1 Location shown on Figure 3.

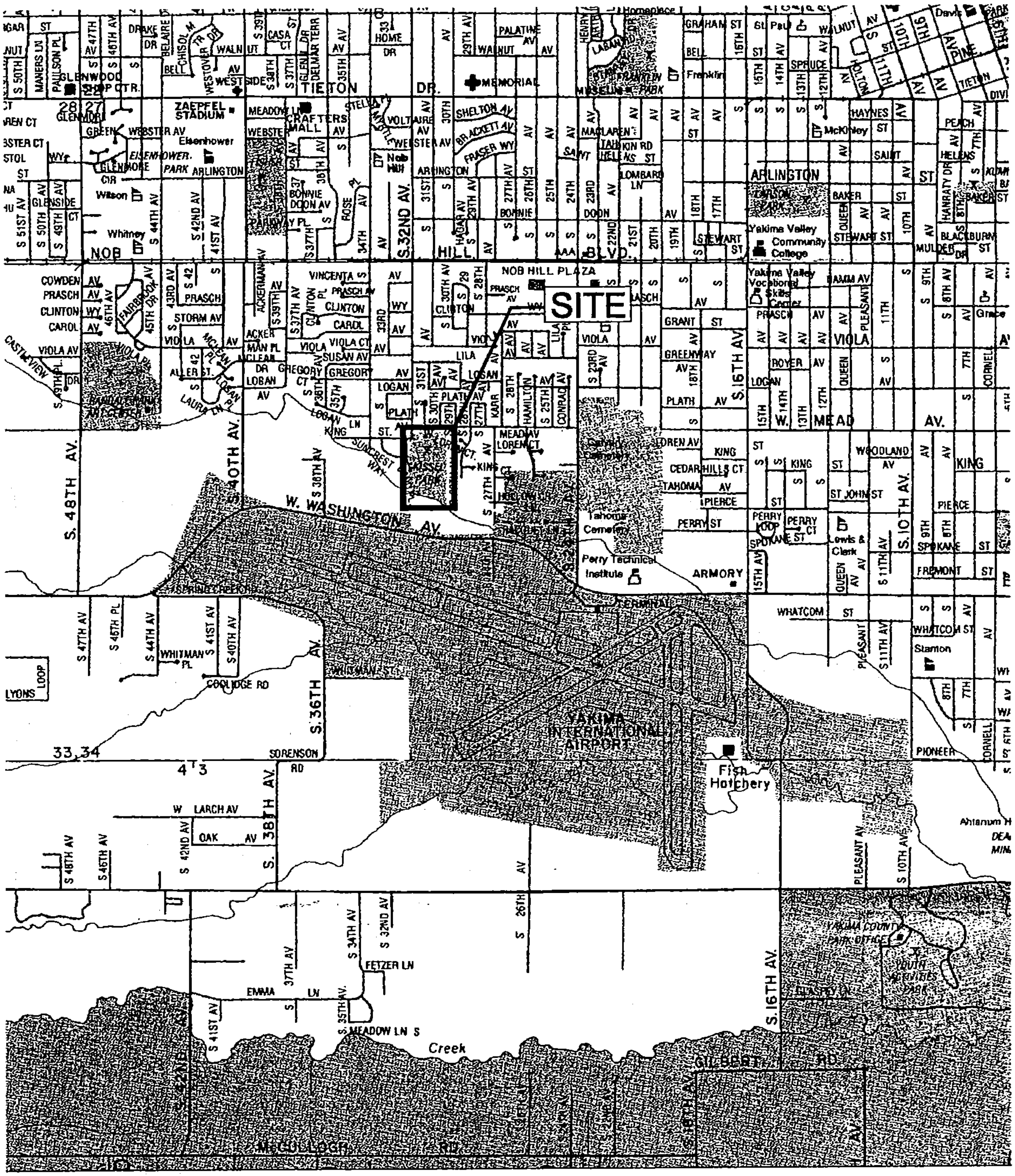
Table 2

Tasks and Schedule for Cleanup of Kissel Park

TASK	MUST START NO LATER THEN	MUST END NO LATER THEN	CRITICAL PATH?	DURATION
Draft Study Plan	11 December 2000	29 December 2000	Yes	3 weeks
Ecology Comment Period	2 January 2001	30 January 2001	Yes	30 days
Final Study Plan	1 February 2001	8 February 2001	No	1 week
Perform Field Work	19 February 2001	23 February 2001	No	1 week
Prepare Initial Remedial Action Grant Application (for study/design)	18 December 2000	22 December 2000	No	1 week
Draft of Agreed Order to Ecology	4 January 2001	19 January 2001	No	1 week
Ecology Review of Agreed Order	22 January 2001	2 February 2001	No	2 weeks
Public Comment Period- Agreed Order	12 February 2001	15 March 2001	No	30 days
Draft Focused RI/FS and Cleanup Action Plan (CAP)	12 March 2001	13 April 2001	Yes	30 days
Ecology Review of RI/FS and CAP	16 April 2001	1 May 2001	Yes	2 weeks
Final RI/FS Report and CAP	4 May 2001	18 May 2001	No	2 weeks
Public Comment Period for RI/FS Report and CAP	25 May 2001	29 June 2001	No	30 days
Perform Pilot Study Field Work	7 May 2001	25 May 2001	Yes	3 weeks
Prepare Supplemental Remedial Action Grant Application (for cleanup costs)	28 May 2001	8 June 2001	No	2 weeks
Site Design (integrated with the Cleanup elements)	2 April 2001	18 May 2001	Yes	6 weeks
Prepare Contract Documents	23 April 2001	1 June 2001	Yes	6 weeks
Receive Bids, Select Contractor, Sign Contract	1 July 2001	15 July 2001	No	2 weeks
Begin Construction	TBD			

Environmental Study Plan

Figures



Source: "Yakima: Yakima Valley Recreation" map by King of the Road Maps, Inc., dated 1991.

Not to Scale

Floyd & Snider Inc.	Yakima Kissel Park Yakima, Washington	Figure 1 Vicinity Map

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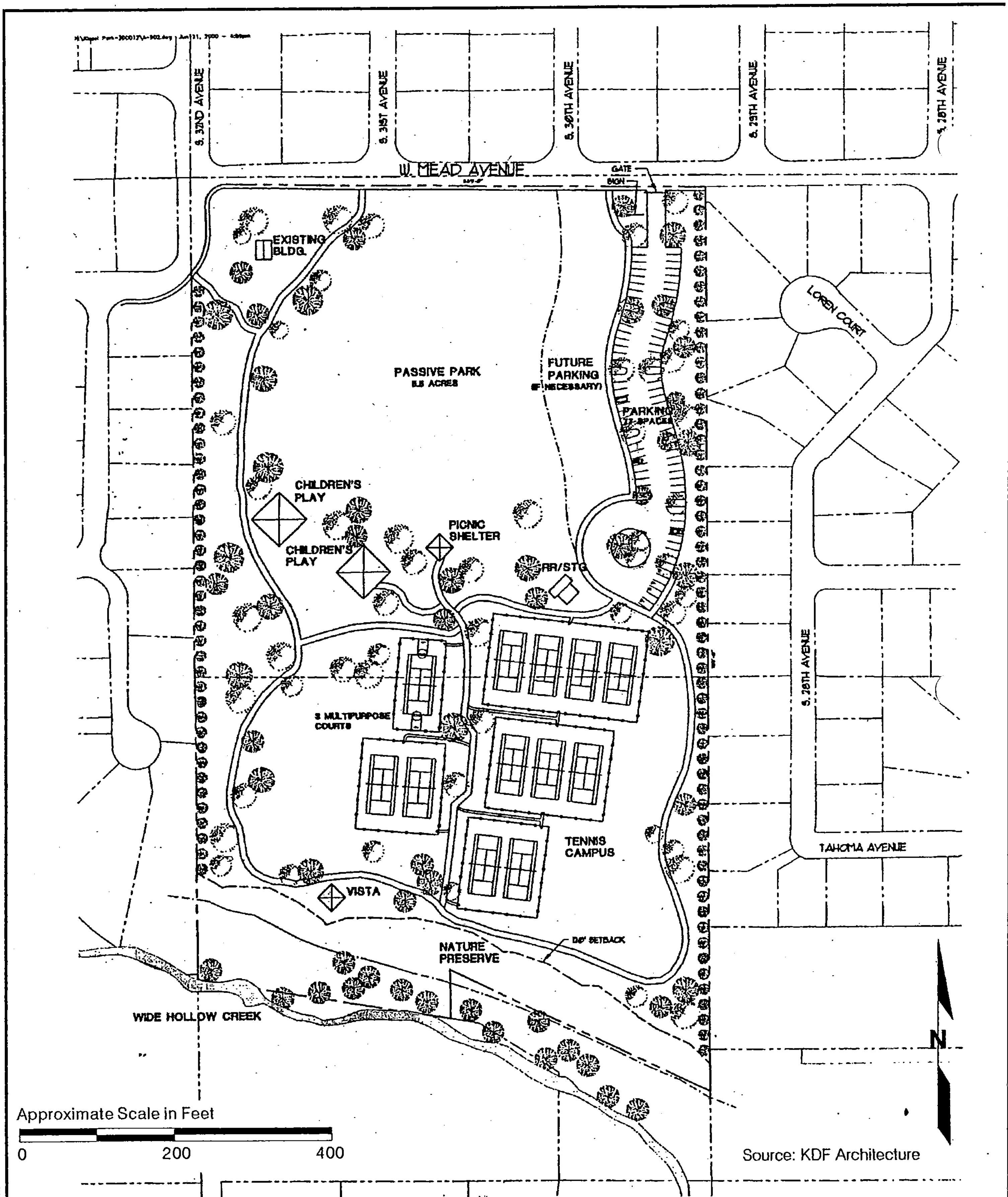

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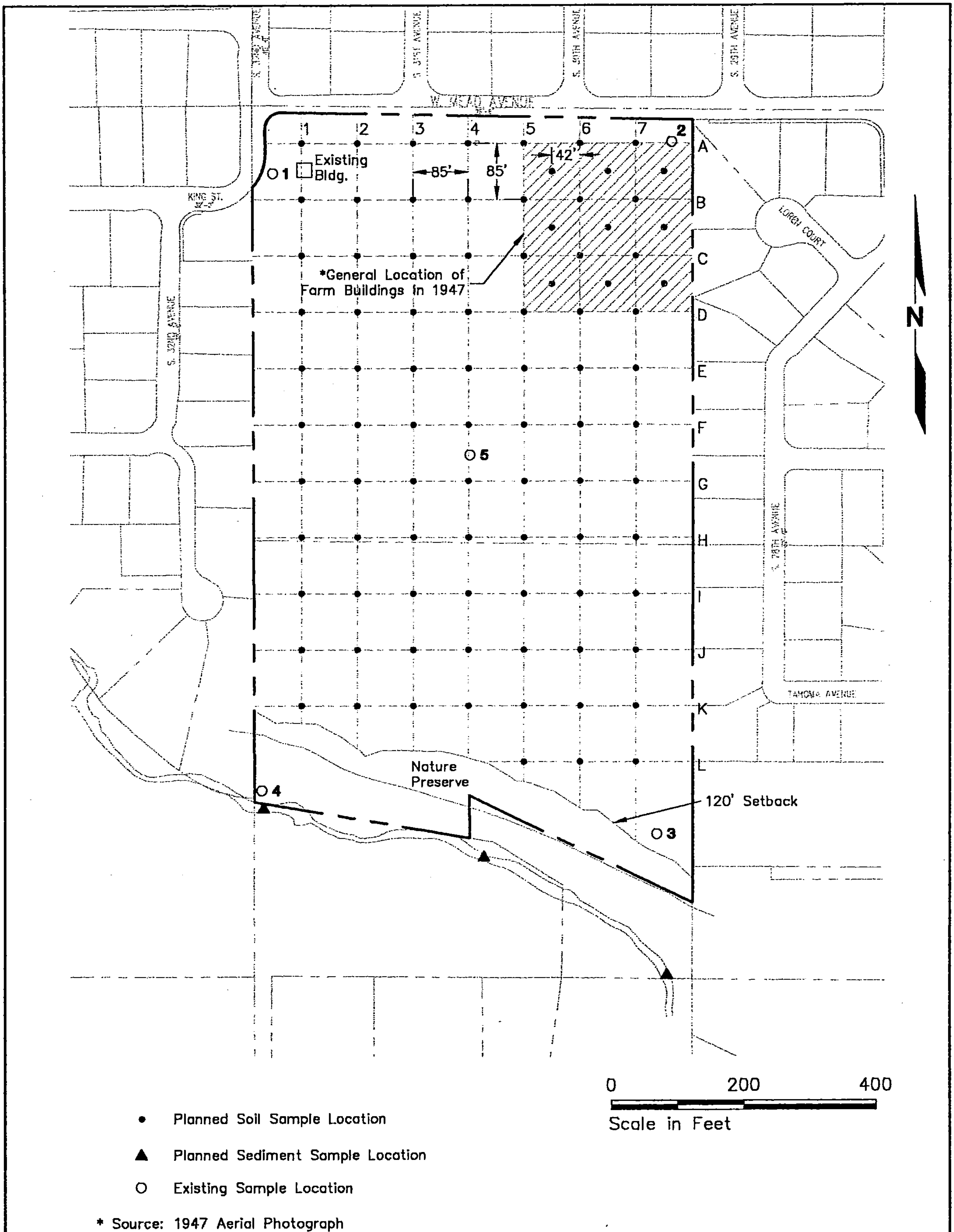
Floyd & Snider Inc.

Yakima Kissel Park
Yakima, Washington

Figure 2
Conceptual Site Plan



Floyd & Snider Inc.	Yakima Kissel Park Yakima, Washington	Figure 3 Exploration Location Map

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APPENDIX B

RANDOM SAMPLE LOCATION
IDENTIFICATION SHEET

Random Sample Location Identification Sheets

Total Number of Test Pits Proposed: 90

Random # Generated	Product of Random # times Total Test Pits	Sequence # Selected	Type of Random Sample to be Selected	Number of Location Selected	Identified Duplicates
0.1018	9.162	9	Duplicate	1	
0.7365	66.285	66	Duplicate	2	
0.3248	29.232	29	Duplicate	3	
0.3485	31.365	31	Duplicate	4	
0.8685	78.165	78	DDT	1	
0.2789	25.101	25	DDT	2	
0.3615	32.535	33	DDT	3	
0.1074	9.666	10	DDT	4	
0.2629	23.661	24	DDT	5	
0.9252	83.268	83	2'-3'	1	
0.5599	50.391	50	2'-3'	2	
0.3408	30.672	31	2'-3'	3	
0.5228	47.052	47	2'-3'	4	
0.4417	39.753	40	2'-3'	5	
0.5086	45.774	46	2'-3'	6	
0.0092	0.828	1	2'-3'	7	
0.4511	40.599	41	2'-3'	8	
0.4058	36.522	37	2'-3'	9	
0.084	7.560	8	2'-3'	10	
0.0477	4.293	4	2'-3'	11	
0.3121	28.089	28	2'-3'	12	
0.4196	37.764	38	2'-3'	13	
0.6717	60.453	60	2'-3'	14	
0.3991	35.919	36	2'-3'	15	
0.7119	64.071	64	2'-3'	16	
0.4241	38.169	38	2'-3'		duplicate
0.574	51.660	52	2'-3'	17	
0.9663	86.967	87	2'-3'	18	
0.2569	23.121	23	2'-3'	19	
0.0612	5.508	6	2'-3'	20	
0.2213	19.917	20	2'-3'	21	
0.4924	44.316	44	2'-3'	22	
0.3159	28.431	28	2'-3'		duplicate
0.8378	75.402	75	2'-3'	23	
0.6961	62.649	63	2'-3'	24	
0.1503	13.527	14	2'-3'	25	
0.6536	58.824	59	2'-3'	26	
0.7772	69.948	70	2'-3'	27	
0.2826	25.434	25	2'-3'	28	
0.9076	81.684	82	2'-3'	29	
0.8781	79.029	79	2'-3'	30	
0.0867	7.803	8	2'-3'		duplicate
0.0875	7.875	8	2'-3'		duplicate
0.3428	30.852	31	2'-3'		duplicate
0.3273	29.457	29	2'-3'	31	

Random Sample Location Identification Sheets

Total Number of Test Pits Proposed: 90

Random # Generated	Product of Random # times Total Test Pits	Sequence # Selected	Type of Random Sample to be Selected	Number of Location Selected	Identified Duplicates
0.9424	84.816	85	2'-3'	32	
0.0215	1.935	2	2'-3'	33	
0.3147	28.323	28	2'-3'		duplicate
0.0302	2.718	3	2'-3'	34	
0.5769	51.921	52	2'-3'		duplicate
0.4011	36.099	36	2'-3'		duplicate
0.538	48.420	48	2'-3'	35	
0.5069	45.621	46	2'-3'		duplicate
0.2672	24.048	24	2'-3'	36	
0.9192	82.728	83	2'-3'		duplicate
0.483	43.470	43	2'-3'	37	
0.217	19.530	20	2'-3'		duplicate
0.3431	30.879	31	2'-3'		duplicate
0.5368	48.312	48	2'-3'		duplicate
0.907	81.630	82	2'-3'		duplicate
0.2371	21.339	21	2'-3'	38	
0.7897	71.073	71	2'-3'	39	
0.7824	70.416	70	2'-3'	40	
0.5322	47.898	48	Deep 3'-5'	1	
0.0338	3.042	3	Deep 3'-5'	2	
0.183	16.470	16	Deep 3'-5'	3	
0.7878	70.902	71	Deep 3'-5'	4	
0.7146	64.314	64	Deep 3'-5'	5	
0.8074	72.666	73	Deep 5'-7'	1	
0.3836	34.524	35	Deep 5'-7'	2	
0.9607	86.463	86	Deep 5'-7'	3	
0.1934	17.406	17	Deep 5'-7'	4	
0.6101	54.909	55	Deep 5'-7'	5	

APPENDIX C

LATITUDE/LONGITUDE POINTS AND
SITE MAPS

Fixed width point lat/long/height listing
Fixed width point lat/long/height listing

Project namefulcum lat long
Coordinate UnitsUS survey feet
Distance UnitsUS survey feet
Height UnitsUS survey feet
Date printed4/13/2001 9:58:12 AM
Coordinate SystemUS State Plane 1983ZoneWashington South 460
2
DatumNAD 1983 (Conus)Geoid modelGEOID96 (Conus)

Coordinate units: US survey feet
Elevation units: US survey feet

Point listing

Name	Latitude	Longitude	Height	Feature Code
1	46°34'41.61313"N	120°33'05.71268"W	-69.232	MON
2	46°34'40.20517"N	120°33'07.51937"W	-69.232	MON
3	46°34'40.21024"N	120°33'12.84497"W	-69.226	MON
4	46°34'36.56247"N	120°33'07.52672"W	-69.238	MOMN
100	46°34'41.21708"N	120°33'04.49660"W	-69.234	CALC-PNT
102	46°34'41.21590"N	120°33'03.27973"W	-69.235	CALC-PNT
103	46°34'41.21472"N	120°33'02.06285"W	-69.237	CALC-PNT
104	46°34'41.21354"N	120°33'00.84597"W	-69.238	CALC-PNT
105	46°34'41.21235"N	120°32'59.62909"W	-69.241	CALC-PNT
106	46°34'41.21116"N	120°32'58.41221"W	-69.242	CALC-PNT
107	46°34'41.20996"N	120°32'57.19533"W	-69.243	CALC-PNT
108	46°34'40.37086"N	120°32'57.19707"W	-69.245	CALC-PNT
109	46°34'40.37205"N	120°32'58.41394"W	-69.244	

```
CALC-PNT
   110  46°34'40.37325"N 120°32'59.63082"W      -69.242
CALC-PNT
   111  46°34'40.37443"N 120°33'00.84769"W      -69.239
CALC-PNT
   112  46°34'40.37562"N 120°33'02.06456"W      -69.238
CALC-PNT
   113  46°34'40.37680"N 120°33'03.28144"W      -69.237
CALC-PNT
   114  46°34'40.37798"N 120°33'04.49831"W      -69.235
CALC-PNT
   115  46°34'39.53887"N 120°33'04.50001"W      -69.237
CALC-PNT
   116  46°34'39.53770"N 120°33'03.28315"W      -69.238
CALC-PNT
   117  46°34'39.53652"N 120°33'02.06628"W      -69.239
CALC-PNT
   118  46°34'39.53533"N 120°33'00.84941"W      -69.241
CALC-PNT
   119  46°34'39.53414"N 120°32'59.63254"W      -69.244
CALC-PNT
   120  46°34'39.53295"N 120°32'58.41567"W      -69.245
CALC-PNT
   121  46°34'39.53176"N 120°32'57.19881"W      -69.246
CALC-PNT
   122  46°34'38.69265"N 120°32'57.20054"W      -69.248
CALC-PNT
   123  46°34'38.69385"N 120°32'58.41740"W      -69.246
CALC-PNT
   124  46°34'38.69504"N 120°32'59.63427"W      -69.245
CALC-PNT
   125  46°34'38.69623"N 120°33'00.85113"W      -69.242
CALC-PNT
   126  46°34'38.69741"N 120°33'02.06799"W      -69.241
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   127  46°34'38.69859"N 120°33'03.28486"W      -69.239
CALC-PNT
   128  46°34'38.69977"N 120°33'04.50172"W      -69.238
CALC-PNT
   129  46°34'37.86067"N 120°33'04.50342"W      -69.239
CALC-PNT
   130  46°34'37.85949"N 120°33'03.28656"W      -69.241
CALC-PNT
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131 46°34'37.85831"N 120°33'02.06971"W -69.242
CALC-PNT
132 46°34'37.85713"N 120°33'00.85285"W -69.243
CALC-PNT
133 46°34'37.85594"N 120°32'59.63599"W -69.246
CALC-PNT
134 46°34'37.85475"N 120°32'58.41914"W -69.248
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135 46°34'37.85355"N 120°32'57.20228"W -69.249
CALC-PNT
136 46°34'37.01445"N 120°32'57.20402"W -69.250
CALC-PNT
137 46°34'37.01564"N 120°32'58.42087"W -69.249
CALC-PNT
138 46°34'37.01683"N 120°32'59.63772"W -69.248
CALC-PNT
139 46°34'37.01802"N 120°33'00.85457"W -69.245
CALC-PNT
140 46°34'37.01921"N 120°33'02.07142"W -69.243
CALC-PNT
141 46°34'37.02039"N 120°33'03.28828"W -69.242
CALC-PNT
142 46°34'37.02157"N 120°33'04.50513"W -69.241
CALC-PNT
143 46°34'36.18246"N 120°33'04.50683"W -69.242
CALC-PNT
144 46°34'36.18128"N 120°33'03.28999"W -69.243
CALC-PNT
145 46°34'36.18010"N 120°33'02.07314"W -69.245
CALC-PNT
146 46°34'36.17892"N 120°33'00.85629"W -69.246
CALC-PNT
147 46°34'36.17773"N 120°32'59.63944"W -69.249
CALC-PNT
148 46°34'36.17654"N 120°32'58.42260"W -69.250
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149 46°34'36.17534"N 120°32'57.20575"W -69.252
CALC-PNT
150 46°34'35.33624"N 120°32'57.20749"W -69.253
CALC-PNT
151 46°34'35.33744"N 120°32'58.42433"W -69.252
CALC-PNT
152 46°34'35.33863"N 120°32'59.64117"W -69.250

CALC-PNT
153 46°34'35.33982"N 120°33'00.85801"W -69.247
CALC-PNT
154 46°34'35.34100"N 120°33'02.07485"W -69.246
CALC-PNT
155 46°34'35.34218"N 120°33'03.29170"W -69.245
CALC-PNT
156 46°34'35.34336"N 120°33'04.50854"W -69.243
CALC-PNT
157 46°34'34.50426"N 120°33'04.51024"W -69.245
CALC-PNT
158 46°34'34.50308"N 120°33'03.29341"W -69.246
CALC-PNT
159 46°34'34.50190"N 120°33'02.07657"W -69.247
CALC-PNT
160 46°34'34.50071"N 120°33'00.85973"W -69.249
CALC-PNT
161 46°34'34.49952"N 120°32'59.64290"W -69.252
CALC-PNT
162 46°34'34.49833"N 120°32'58.42606"W -69.253
CALC-PNT
163 46°34'34.49714"N 120°32'57.20922"W -69.254
CALC-PNT
164 46°34'33.65804"N 120°32'57.21096"W -69.256
CALC-PNT
165 46°34'33.65923"N 120°32'58.42779"W -69.254
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CALC-PNT
168 46°34'33.66279"N 120°33'02.07828"W -69.249
CALC-PNT
169 46°34'33.66398"N 120°33'03.29512"W -69.247
CALC-PNT
170 46°34'33.66515"N 120°33'04.51195"W -69.246
CALC-PNT
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CALC-PNT
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CALC-PNT
173 46°34'32.82369"N 120°33'02.08000"W -69.250
CALC-PNT

174 46°34'32.82251"N 120°33'00.86317"W -69.252
CALC-PNT
175 46°34'32.82132"N 120°32'59.64635"W -69.254
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176 46°34'32.82013"N 120°32'58.42952"W -69.256
CALC-PNT
177 46°34'32.81893"N 120°32'57.21270"W -69.257
CALC-PNT
178 46°34'31.97983"N 120°32'57.21443"W -69.258
CALC-PNT
179 46°34'31.98102"N 120°32'58.43125"W -69.257
CALC-PNT
180 46°34'31.98222"N 120°32'59.64807"W -69.256
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181 46°34'40.79101"N 120°32'57.80464"W -69.244
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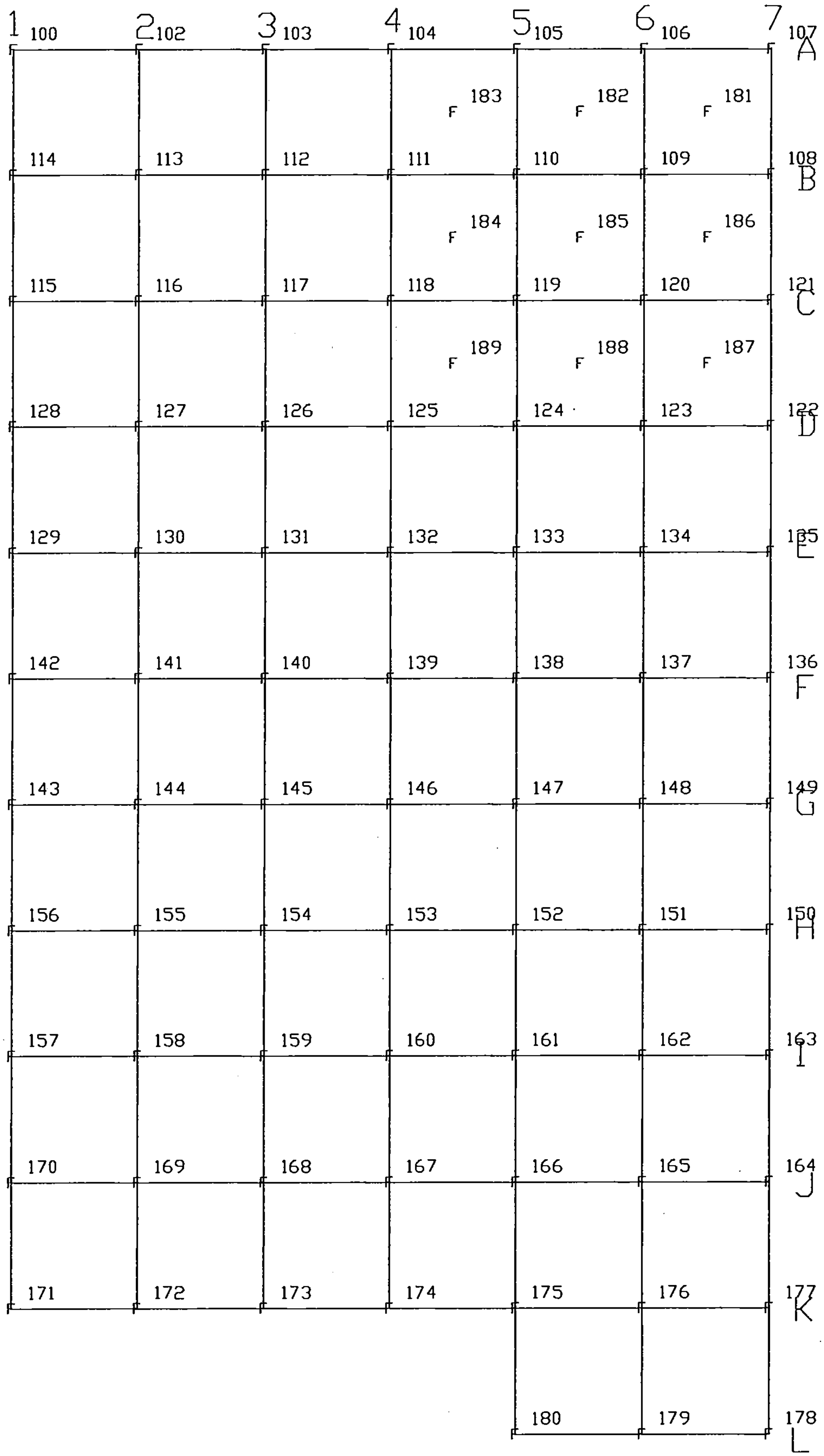
CALC-PNT
189 46°34'39.11519"N 120°33'00.24184"W -69.242
CALC-PNT
190 46°34'41.61313"N 120°33'05.71268"W -69.232
CALC-PNT
191 46°34'41.34027"N 120°33'43.31451"W -69.189
CALC-PNT

Back to top



Legend

Sampling Grid
Scale: Not to Scale
Grid Map Courtesy of
Huibregtse, Louman Assoc.

Figure C-1
Grid Location Map

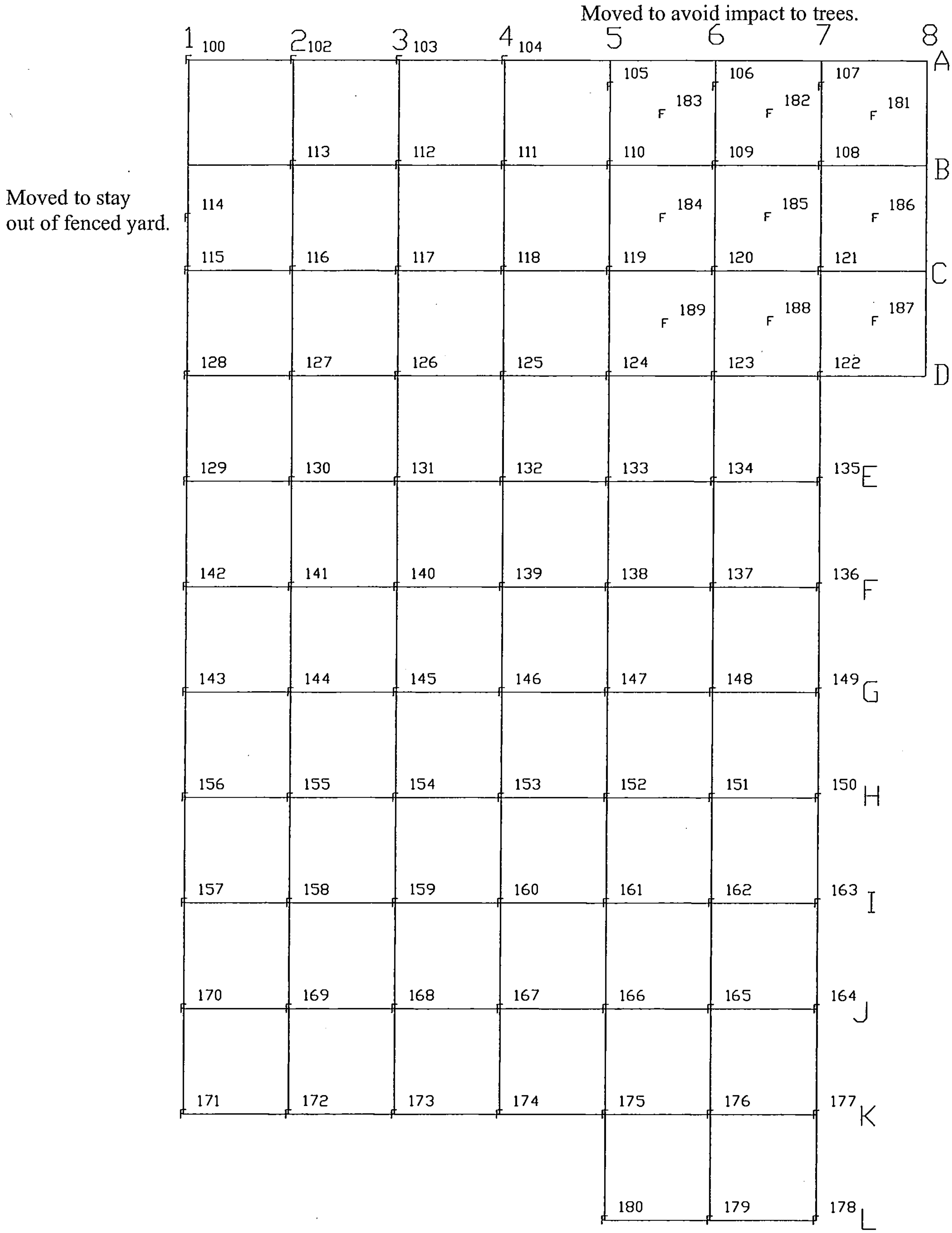
Kissel Park
Yakima, Washington

Fulcrum Environmental Consulting, Inc.
122 South Third Street
Yakima, Washington 98901
Phone (509) 574-0839 Fax (509) 575-8453

Drawn by: AMP	Project Number: 01-182
Date: 03/20/2001	File Name: Kissel Park

ATTACHMENT D

ACTUAL SAMPLE LOCATIONS MAP



Legend

Actual Sample Locations
Scale: Not to Scale
Grid Map Courtesy of
Huibregtse, Louman Assoc.

Figure D-1
Actual Sample Locations Map

Kissel Park
Yakima, Washington

Fulcrum Environmental Consulting, Inc.
122 South Third Street
Yakima, Washington 98901
Phone (509) 574-0839 Fax (509) 575-8453

Drawn by: AMP	Project Number: 01-182
Date: 03/20/2001	File Name: Kissel Park

ATTACHMENT E

ANALYTICAL RESULTS

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/09/01

SVL JOB No. : 96916
Date of Report : 2/26/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255570	5G/2-3	2/07/01	18.2mg/kg	16.8mg/kg	92.2%
S255571	5H/0-6	2/07/01	75.3mg/kg	328mg/kg	82.7%
S255572	5H/.5-2	2/07/01	56.9mg/kg	135mg/kg	96.5%
S255573	5H/2-3	2/07/01	16.5mg/kg	17.3mg/kg	86.7%
S255574	5I/0-6	2/07/01	76.1mg/kg	290mg/kg	83.8%
S255575	5I/.5-2	2/07/01	46.2mg/kg	57.2mg/kg	90.7%
S255576	5J/0-6	2/07/01	73.9mg/kg	289mg/kg	84.2%
S255577	5J/.5-2	2/07/01	49.4mg/kg	91.8mg/kg	89.1%
S255578	5K/0-6	2/07/01	75.8mg/kg	298mg/kg	84.7%
S255579	5K/.5-2	2/07/01	58.6mg/kg	32.4mg/kg	92.9%
S255580	5K/2-3	2/07/01	16.3mg/kg	19.6mg/kg	92.9%
S255581	5L/0-6	2/07/01	54.5mg/kg	139mg/kg	85.6%
S255582	5L/.5-2	2/07/01	42.2mg/kg	86.6mg/kg	93.7%
S255583	6A/0-6	2/07/01	53.9mg/kg	161mg/kg	83.8%
S255584	6A/.5-2	2/07/01	11.5mg/kg	16.3mg/kg	86.0%
S255585	6A/2-3	2/07/01	9.0mg/kg	9.9mg/kg	86.2%
S255586	6B/0-6	2/07/01	23.1mg/kg	84.8mg/kg	92.9%
S255587	6B/.5-2	2/07/01	29.8mg/kg	73.6mg/kg	93.7%
S255588	6C/0-6	2/07/01	34.3mg/kg	155mg/kg	84.8%
S255589	6C/.5-2	2/07/01	42.0mg/kg	161mg/kg	85.5%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/26/01

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

Client :Floyd & Snider, Inc.

SVL JOB No. :969[illegible]

Analyte	Method	Matrix	Units	Prep Blank	True — LCS	— Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	57.3	112.1	2/22/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	69.1	103.0	2/22/01

LEGEND:

LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

Part II Duplicate and Spike Analysis

Client :Floyd & Snider, Inc. SVL JOB No :96916

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD		%R	Test Date
As	6010B	SOIL	1	mg/kg	16.3	N/A	N/A	123	100		106.7	2/22/01
As	6010B	SOIL	2	mg/kg	54.5	59.1	8.1	178	100		123.5	2/22/01
Pb	6010B	SOIL	1	mg/kg	19.6	N/A	N/A	119	100		99.4	2/22/01
Pb	6010B	SOIL	2	mg/kg	139	183	27.3	311	100		172.0	2/22/01
Pb	6010B	SOIL	2	mg/kg	139	N/A	N/A	227	100	A	88.0	2/22/01
% Sol.	999	SOIL	2	%	85.6	85.5	0.1	N/A	N/A		N/A	2/14/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255580 Client Sample ID: 5K/2-3

QC Sample 2: SVL SAM No.: 255581 Client Sample ID: 5L/0-6

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

Client Sample ID:	5L/0-6
SVL Job #:	96916
SVL Sample ID:	S255581
Sample Matrix:	Soil
Date Sampled:	2/7/01
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	86%
Final Extraction Volume (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	56.8
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	25.4
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	71%
Decachlorobiphenyl	94%

COMMENTS: None.

Reviewed by: [signature] Date: 2/26/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

Client Sample ID:	**PREP BLANK**
SVL Job #:	96915/96916
SVL Sample ID:	S255546P
Sample Matrix:	Soil
Date Sampled:	NA
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	NA
Final Extraction Volume (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	ND
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	ND
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	44%
Decachlorobiphenyl	98%

COMMENTS:

Reviewed by: Scott C. Date: 2/26/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : LCS / LCSD *

Client Sample ID: Lab Control Samples

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

SVL Job #:	96915/96916
SVL Sample ID:	S255547C/D
Sample Matrix:	Soil
Date Sampled:	NA
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	NA
Final Ext. Vol. (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	LCS CONC.	LCSD CONC.	LCS % REC.	LCSD % REC.	RPD **	QC LIMITS RPD	QC LIMITS REC.
1	alpha-BHC	6.667	ND	2.365	2.496	35%	37%	5%	20	37-134
2	gamma-BHC	6.667	ND	2.939	2.996	44%	45%	2%	20	32-127
3	Heptachlor	6.667	ND	3.701	3.727	56%	56%	1%	20	34-111
4	Aldrin	6.667	ND	4.032	4.668	60%	70%	15%	20	42-122
5	beta-BHC	6.667	ND	5.533	5.244	83%	79%	5%	20	17-147
6	delta-BHC	6.667	ND	0.741	0.676	11%	10%	9%	20	19-140
7	Heptachlor Epoxide	6.667	ND	4.646	4.419	70%	66%	5%	20	37-142
8	Endosulfan I	6.667	ND	4.931	4.570	74%	69%	8%	20	45-153
9	4,4'-DDE	6.667	ND	6.627	6.416	99%	96%	3%	20	30-145
10	Dieldrin	6.667	ND	5.461	5.422	82%	81%	1%	20	36-146
11	Endrin	6.667	ND	8.483	7.250	127%	109%	16%	20	51-126
12	Endosulfan II	33.33	ND	27.88	28.12	84%	84%	1%	20	D-202
13	4,4'-DDD	33.33	ND	26.06	24.65	78%	74%	6%	20	30-145
14	4,4'-DDT	33.33	ND	39.84	34.67	120%	104%	14%	20	25-160
15	Endrin Aldehyde	6.667	ND	6.757	7.052	101%	106%	4%	20	NA
16	Endosulfan Sulfate	33.33	ND	30.82	28.69	92%	86%	7%	20	26-144
17	Methoxychlor	6.667	ND	17.11	9.010	257%	135%	62%	20	NA
18	Endrin Ketone	6.667	ND	7.573	7.070	114%	106%	7%	20	NA

SURROGATE RECOVERIES

COMPOUND NAME	LCS % REC.	LCSD % REC.	QC LIMITS
Tetrachloro-m-xylene	49%	54%	9 - 119
Decachlorobiphenyl	103%	107%	0 - 148

COMMENTS: The recovery for delta-BHC and Endrin fall outside the percent recovery QC limits for the LCSD, but the RPD between the LCS and LCSD is within the accepted range.

ND = Not detected
* LCS / LCSD = Laboratory Control Sample / Laboratory Control Sample Duplicate
** RPD = Relative Percent Difference

Reviewed by: Pat C Date: 2/26/2001

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : MS / MS(D) *

Client Sample ID: **Matrix Spike Samples**

Method:
Chlorinated Pesticides (8081A)

Client:
Floyd & Snider, Inc.

SVL Job #: 96915/96916
SVL Sample ID: S255342MS/MS(D)
Sample Matrix: Soil
Date Sampled: NA
Date Extracted: 02/12/01
Date Analyzed: 02/14/01
GPC Clean-up ?: NO
Analyst: TWC
Units: µg/kg (ppb)

Sample Volume (g): 30
% Dry Solids: NA
Final Ext. Vol. (mL): 10.0
Dilution Factor: 1.0

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	MS CONC.	MS(D) CONC.	MS % REC.	MS(D) % REC.	RPD **	QC LIMITS RPD	QC LIMITS REC.
1	alpha-BHC	6.667	ND	4.726	4.838	71%	73%	2%	20	37-134
2	gamma-BHC	6.667	ND	5.381	5.520	81%	83%	3%	20	32-127
3	Heptachlor	6.667	ND	6.210	6.455	93%	97%	4%	20	34-111
4	Aldrin	6.667	ND	5.829	5.919	87%	89%	2%	20	42-122
5	beta-BHC	6.667	ND	6.659	6.937	100%	104%	4%	20	17-147
6	delta-BHC	6.667	ND	1.018	1.116	15%	17%	9%	20	19-140
7	Heptachlor Epoxide	6.667	ND	5.947	6.227	89%	93%	5%	20	37-142
8	Endosulfan I	6.667	ND	5.441	5.589	82%	84%	3%	20	45-153
9	4,4'-DDE	6.667	ND	50.83	48.14	762%	722%	5%	20	30-145
10	Dieldrin	6.667	ND	6.321	6.120	95%	92%	3%	20	36-146
11	Endrin	6.667	ND	8.244	8.532	124%	128%	3%	20	51-126
12	Endosulfan II	33.33	ND	28.30	29.53	85%	89%	4%	20	D-202
13	4,4'-DDD	33.33	ND	26.48	27.43	79%	82%	4%	20	30-145
14	4,4'-DDT	33.33	ND	72.74	75.12	218%	225%	3%	20	25-160
15	Endrin Aldehyde	6.667	ND	9.708	9.663	146%	145%	0%	20	NA
16	Endosulfan Sulfate	33.33	ND	30.68	31.80	92%	95%	4%	20	26-144
17	Methoxychlor	6.667	ND	7.926	8.426	119%	126%	6%	20	NA
18	Endrin Ketone	6.667	ND	7.897	8.083	118%	121%	2%	20	NA

SURROGATE RECOVERIES

COMPOUND NAME	MS % REC.	MS(D) % REC.	QC LIMITS
Tetrachloro-m-xylene	80%	78%	9 - 119
Decachlorobiphenyl	102%	103%	0 - 148

COMMENTS: A matrix interference affected the recoveries for Aldrin and Endrin on the first analytical column. The confirmation column was used to quantitate the results for these analytes. The RPD for all analytes are in good agreement and within the limits. The recoveries for 4,4'-DDE and 4,4'-DDT are enhanced by the presence of these analytes in the sample.

ND = Not detected
* MS /MS(D) = Matrix Spike / Matrix Spike Duplicate
** RPD = Relative Percent Difference

Reviewed by: [signature] Date: 2/26/2001

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # 96916

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	arsenic 6010	lead 6010	DDT	Comments
1. 5G/2-3	02/07/01		TT	3	1	N	✓						✓	✓		
2. 5H/0-6				3	1	N	✓						✓	✓		
3. 5H/.5-2				3	1	N	✓						✓	✓		
4. 5H/2-3				3	1	N	✓						✓	✓		
5. 5I/0-6				3	1	N	✓						✓	✓		
6. 5I/.5-2				3	1	N	✓						✓	✓		
7. 5J/0-6				3	1	N	✓						✓	✓		
8. 5J/.5-2				3	1	N	✓						✓	✓		
9. 5K/0-6				3		N	✓						✓	✓		
10. 5K/.5-2				3		N	✓						✓	✓		

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
CHansen	02/08/01	3:00pm	[signature]	2/8/01	10:45

* Sample [illegible]t: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SV. [illegible]C 12/95

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kessel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # ______

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

	Sample ID	Collection: Date	Collection: Time	Misc.: Collected by: (Init.)	Misc.: Matrix Type From Table 1	Misc.: No. of Containers	Misc.: Sample Filtered ? Y/N	Pres.: Unpreserved (Ice Only)	Pres.: HNO3	Pres.: HCL	Pres.: H2SO4	Pres.: NAOH	Pres.: Other (Specify)	Analyses: Arsenic 6010	Analyses: lead 6010	Analyses: DDT							Comments
1.	5K/2-3	08/07/01		TT	3	1	N	✓						✓	✓								
2.	5L/0-6				3	2	N	✓						✓	✓	✓							
3.	5L/.5-2				3	1	N	✓						✓	✓								
4.	6A/0-6				3	1	N	✓						✓	✓								
5.	6A/.5-2				3	1	N	✓						✓	✓								
6.	6A/2-3				3	1	N	✓						✓	✓								
7.	6B/0-6				3	1	N	✓						✓	✓								
8.	6B/.5-2				3	1	N	✓						✓	✓								
9.	6C/0-6				3	1	N	✓						✓	✓								
10.	6C/.5-2				3	1	N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
C Hansen	08/08/01	3:00pm	[signature]	8/9/01	10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/09/01

SVL JOB No. : 96917
Date of Report : 2/26/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255592	6C/2-3		17.0mg/kg	19.4mg/kg	87.2%
S255593	6D/0-6		44.8mg/kg	306mg/kg	84.8%
S255594	6D/.5-2		54.2mg/kg	122mg/kg	93.4%
S255595	6E/0-6		60.6mg/kg	335mg/kg	84.6%
S255596	6E/.5-2		50.8mg/kg	123mg/kg	90.5%
S255597	6F/0-6		64.0mg/kg	226mg/kg	86.3%
S255598	6F/.5-2		38.6mg/kg	61.5mg/kg	93.3%
S255599	6F/2-3		12.7mg/kg	13.4mg/kg	94.6%
S255600	6G/0-6		73.3mg/kg	325mg/kg	81.4%
S255601	6G/.5-2		113mg/kg	374mg/kg	86.7%
S255602	6G/2-3		30.7mg/kg	17.6mg/kg	89.0%
S255603	6G/3-5		10.1mg/kg	11.0mg/kg	91.8%
S255604	6H/0-6		76.0mg/kg	327mg/kg	82.7%
S255605	6H/.5-2		77.2mg/kg	222mg/kg	89.1%
S255606	6I/0-6		72.9mg/kg	269mg/kg	84.7%
S255607	6I/.5-2		52.6mg/kg	21.8mg/kg	93.2%
S255608	6J/0-6		82.5mg/kg	320mg/kg	84.5%
S255609	6J/.5-2		66.2mg/kg	180mg/kg	89.3%
S255610	6K/0-6		77.4mg/kg	265mg/kg	85.3%
S255611	6K/.5-2		66.7mg/kg	47.7mg/kg	90.3%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/26/01

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

.ent :Floyd & Snider, Inc. SVL JOB No. :96917

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	—Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	55.7	109.0	2/23/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	69.3	103.3	2/23/01
% Solids	999	SOIL	%		N/A		N/A	2/21/01

LEGEND:

LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

Client :Floyd & Snider, Inc. SVL JOB No :9691

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD	%R	Test Date
As	6010B	SOIL	1	mg/kg	17.0	16.1	5.4	122	100	105.0	2/23/01
As	6010B	SOIL	2	mg/kg	30.7	N/A	N/A	135	100	104.3	2/23/01
Pb	6010B	SOIL	1	mg/kg	19.4	17.1	12.6	129	100	109.6	2/23/01
Pb	6010B	SOIL	2	mg/kg	17.6	N/A	N/A	113	100	95.4	2/23/01
% Sol.	999	SOIL	1	%	87.2	87.1	0.1	N/A	N/A	N/A	2/14/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255592 Client Sample ID: 6C/2-3

QC Sample 2: SVL SAM No.: 255602 Client Sample ID: 6G/2-3

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # 96917

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	lead 6010	DDT							Comments
1. 6C/2-3			TT	3	1	N	✓						✓	✓								
2. 6D/0-6				3	1	N	✓						✓	✓								
3. 6D/.5-2				3	1	N	✓						✓	✓								
4. 6E/0-6				3	1	N	✓						✓	✓								
5. 6E/.5-2				3	1	N	✓						✓	✓								
6. 6F/0-6				3		N	✓						✓	✓								
7. 6F/.5-2				3		N	✓						✓	✓								
8. 6F/2-3				3		N	✓						✓	✓								
9. 6G/0-6				3		N	✓						✓	✓								
10. 6G/.5-2				3		N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
C Hansen	02/08/01	3:00pm	Gordon Firth	02/09/01	1045
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ________

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # ________

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection: Date	Collection: Time	Miscellaneous: Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Preservative(s): Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Analyses Required: Arsenic 6010	lead 6010	DDT							Comments
1. 6G/2-3			TT	3	1	N	✓						✓	✓								
2. 6G/3-5				3	1	N	✓						✓	✓								
3. 6H/0-6				3	1	N	✓						✓	✓								
4. 6H/.5-2				3	1	N	✓						✓	✓								
5. 6I/0-6				3	1	N	✓						✓	✓								
6. 6I/.5-2				3	1	N	✓						✓	✓								
7. 6J/0-6				3	1	N	✓						✓	✓								
8. 6J/.5-2				3	1	N	✓						✓	✓								
9. 6K/0-6				3	1	N	✓						✓	✓								
10. 6K/.5-2				3	1	N	✓						✓	✓								

Relinquished by: CHansen	Date: 07/08/01	Time: 3:00pm	Received by: [illegible signature]	Date: 07/09/01	Time: 1045
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL COC 12/95

SVL ANALYTICAL, INC.

One Government Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83827-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/09/01

SVL JOB No. : 96918
Date of Report : 2/23/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255614	6L/0-6	2/07/01	72.9mg/kg	235mg/kg	85.2%
S255615	6L/.5-2	2/07/01	62.5mg/kg	103mg/kg	89.7%
S255616	7A/0-6	2/07/01	41.7mg/kg	188mg/kg	85.3%
S255617	7A/.5-2	2/07/01	46.4mg/kg	92.2mg/kg	86.8%
S255618	7B/0-6	2/07/01	42.4mg/kg	209mg/kg	86.6%
S255619	7B/.5-2	2/07/01	73.7mg/kg	71.1mg/kg	90.4%
S255620	7B/2-3	2/07/01	44.5mg/kg	16.1mg/kg	93.1%
S255621	7C/0-6	2/07/01	22.5mg/kg	75.6mg/kg	83.6%
S255622	7C/.5-2	2/07/01	68.1mg/kg	164mg/kg	86.2%
S255623	7C/2-3	2/07/01	28.9mg/kg	21.5mg/kg	88.9%
S255624	7D/0-6	2/07/01	18.7mg/kg	70.7mg/kg	85.6%
S255625	7D/.5-2	2/07/01	29.1mg/kg	129mg/kg	90.3%
S255626	7D/2-3	2/07/01	46.0mg/kg	101mg/kg	92.8%
S255627	7E/0-6	2/07/01	37.7mg/kg	152mg/kg	84.5%
S255628	7E/.5-2	2/07/01	58.2mg/kg	142mg/kg	85.6%
S255629	7F/0-6	2/07/01	51.8mg/kg	207mg/kg	86.7%
255630	7F/.5-2	2/07/01	68.0mg/kg	178mg/kg	90.9%
S255631	7G/0-6	2/07/01	55.1mg/kg	244mg/kg	89.0%
S255632	7G/.5-2	2/07/01	56.1mg/kg	103mg/kg	94.4%
S255633	7H/0-6	2/07/01	68.6mg/kg	264mg/kg	84.8%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/23/01

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

Client :Floyd & Snider, Inc. SVL JOB NO. :969[illegible]

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	—Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	61.1	119.6	2/22/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	71.6	106.7	2/22/01
% Solids	999	SOIL	%		N/A		N/A	2/21/01

LEGEND:

LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

2/23/01 8:06

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

ent :Floyd & Snider, Inc. SVL JOB No :96918

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found		RPD%	Matrix Spike Result	SPK ADD	%R	Test Date
As	6010B	SOIL	1	mg/kg	72.9	72.2		1.0	174	100	101.1	2/22/01
As	6010B	SOIL	2	mg/kg	18.7	N/A		N/A	137	100	118.3	2/22/01
Pb	6010B	SOIL	1	mg/kg	235	230	M	28.0	305	100	70.0	2/22/01
Pb	6010B	SOIL	1	mg/kg	235	N/A		N/A	319	100	84.0	2/22/01
Pb	6010B	SOIL	2	mg/kg	70.7	N/A		N/A	180	100	109.3	2/22/01
% Sol.	999	SOIL	1	%	85.2	85.5		0.4	N/A	N/A	N/A	2/15/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255614 Client Sample ID: 6L/0-6

QC Sample 2: SVL SAM No.: 255624 Client Sample ID: 7D/0-6

2/23/01 8:06

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition
PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # 76918

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	lead 6010	DDT							Comments
1. 6L/0-6	02/07/01		TT	3	1	N	✓						✓	✓								
2. 6L/.5-2	↓		↓	3	1	N	✓						✓	✓								
3. 7A/0-6				3	1	N	✓						✓	✓								
4. 7A/.5-2				3	1	N	✓						✓	✓								
5. 7B/0-6				3	1	N	✓						✓	✓								
6. 7B/.5-2				3	1	N	✓						✓	✓								
7. 7B/2-3				3	1	N	✓						✓	✓								
8. 7C/0-6				3	1	N	✓						✓	✓								
9. 7C/.5-2				3	1	N	✓						✓	✓								
10. 7C/2-3				3	1	N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
C Hansen	02/08/01	3:00pm	[signature]	2/9/01	10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL COC 12/95

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # ______

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

	Sample ID	Collection: Date	Collection: Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	lead 6010	DDT	Comments
1.	7D/0-6	02/07/01		TT	3	1	N	✓						✓	✓		
2.	7D/.5-2				3	1	N	✓						✓	✓		
3.	7D/2-3				3	1	N	✓						✓	✓		
4.	7E/0-6				3	1	N	✓						✓	✓		
5.	7E/.5-2				3	1	N	✓						✓	✓		
6.	7F/0-6				3	1	N	✓						✓	✓		
7.	7F/.5-2				3	1	N	✓						✓	✓		
8.	7G/0-6				3	1	N	✓						✓	✓		
9.	7G/.5-2				3	1	N	✓						✓	✓		
10.	7H/0-6				3	1	N	✓						✓	✓		

Relinquished by: C Hansen	Date: 02/08/01	Time: 3:00pm	Received by: [signature]	Date: 2/9	Time: 10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-COC 12/95

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/09/01

SVL JOB No. : 96919
Date of Report : 2/26/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255636	7H/.5-2	2/07/01	46.9mg/kg	106mg/kg	89.3%
S255637	7I/0-6	2/07/01	74.6mg/kg	246mg/kg	85.5%
S255638	7I/.5-2	2/07/01	65.6mg/kg	91.2mg/kg	94.3%
S255639	7I/2-3	2/07/01	13.6mg/kg	16.1mg/kg	94.1%
S255640	7J.0-6	2/07/01	84.9mg/kg	304mg/kg	84.3%
S255641	7J/.5-2	2/07/01	82.0mg/kg	316mg/kg	88.9%
S255642	7J/2-3	2/07/01	11.3mg/kg	11.9mg/kg	93.4%
S255643	6H/5-7	2/07/01	3.5mg/kg	3.5mg/kg	85.9%
S255644	7E/5-7	2/07/01	11.2mg/kg	13.4mg/kg	93.5%
S255645	7K/0-6	2/07/01	77.4mg/kg	293mg/kg	85.2%
S255646	7K/.5-2	2/07/01	64.8mg/kg	30.1mg/kg	93.0%
S255647	7L/0-6	2/07/01	69.6mg/kg	249mg/kg	86.3%
S255648	7L/.5-2	2/07/01	20.6mg/kg	16.3mg/kg	95.0%
S255649	56AB/0-6	2/07/01	68.4mg/kg	232mg/kg	87.8%
S255650	56AB/.5-2	2/07/01	26.7mg/kg	43.7mg/kg	93.1%
S255651	56AB/2-3	2/07/01	20.0mg/kg	34.0mg/kg	93.1%
S255652	56BC/0-6	2/07/01	58.8mg/kg	243mg/kg	84.9%
S255653	56BC/.5-2	2/07/01	31.9mg/kg	53.9mg/kg	92.0%
S255654	56BC/5-7	2/07/01	18.3mg/kg	15.9mg/kg	94.2%
S255655	56CD/0-6	2/07/01	62.2mg/kg	238mg/kg	83.5%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/26/01

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

Client :Floyd & Snider, Inc. SVL JOB No. :96919

Analyte	Method	Matrix	Units	Prep Blank	True — LCS	— Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	63.3	123.9	2/23/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	77.1	114.9	2/23/01
% Solids	999	SOIL	%		N/A		N/A	2/21/01

LEGEND:

LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

2/26/01 10:27

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

Client :Floyd & Snider, Inc. SVL JOB No :96919

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD	%R	Test Date
As	6010B	SOIL	1	mg/kg	46.9	49.4	5.2	153	100	106.1	2/23/01
As	6010B	SOIL	2	mg/kg	64.8	N/A	N/A	162	100	97.2	2/23/01
Pb	6010B	SOIL	1	mg/kg	106	109	2.8	202	100	96.0	2/23/01
Pb	6010B	SOIL	2	mg/kg	30.1	N/A	N/A	113	100	82.9	2/23/01
% Sol.	999	SOIL	1	%	89.3	89.0	0.3	N/A	N/A	N/A	2/15/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255636 Client Sample ID: 7H/.5-2

QC Sample 2: SVL SAM No.: 255646 Client Sample ID: 7K/.5-2

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition
PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # 96919

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	lead 6010	DDT						Comments
1. 7H/.5-2	07/07/01		TT	3	1	N	✓						✓	✓							
2. 7I/0-6				3	1	N	✓						✓	✓							
3. 7I/.5-2				3	1	N	✓						✓	✓							
4. 7I/2-3				3	1	N	✓						✓	✓							
5. 7J/0-6				3	1	N	✓						✓	✓							
6. 7J/.5-2				3	1	N	✓						✓	✓							
7. 7J/2-3				3	1	N	✓						✓	✓							
8. 6H/5-7				3	1	N	✓						✓	✓							
9. 7E/5-7				3	1	N	✓						✓	✓							
10. 7K/0-6				3	1	N	✓						✓	✓							

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
A Hansen	07/08/01	3:00pm	[illegible] Smith	07/09/01	1045
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-COC 12/95

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # ______

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection: Date	Collection: Time	Misc.: Collected by: (Init.)	Misc.: Matrix Type From Table 1	Misc.: No. of Containers	Misc.: Sample Filtered ? Y/N	Pres.: Unpreserved (Ice Only)	Pres.: HNO3	Pres.: HCL	Pres.: H2SO4	Pres.: NAOH	Pres.: Other (Specify)	Analyses Required: Arsenic 6010	Analyses Required: lead 6010	Analyses Required: DDT							Comments
1. 7K/.5-2	02/07/01		TT	3	1	N	✓						✓	✓								
2. 7L/0-6				3	1	N	✓						✓	✓								
3. 7L/.5-2				3	1	N	✓						✓	✓								
4. 56AB/0-6				3	1	N	✓						✓	✓								
5. 56AB/.5-2				3	1	N	✓						✓	✓								
6. 56AB/2-3				3	1	N	✓						✓	✓								
7. 56BC/0-6				3	1	N	✓						✓	✓								
8. 56BC/.5-2				3	1	N	✓						✓	✓								
9. 56BC/5-7				3	1	N	✓						✓	✓								
10. 56CD/0-6				3	1	N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
C Hansen	02/08/01	3:00pm	D Canton	02/09/01	1045
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days) White: LAB COPY Yellow: CUSTOMER COPY

SVL ANALYTICAL, INC. REPORT OF ANALYTICAL RESULTS

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/09/01

SVL JOB No. : 96920
Date of Report : 2/26/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255658	56CD/.5-2	2/07/01	41.5mg/kg	20.1mg/kg	87.0%
S255659	67AB/0-6	2/07/01	35.6mg/kg	129mg/kg	88.4%
S255660	67AB/.5-2	2/07/01	41.6mg/kg	131mg/kg	91.9%
S255661	67AB/2-3	2/07/01	16.4mg/kg	16.2mg/kg	87.2%
S255662	67BC/0-6	2/07/01	27.0mg/kg	99.9mg/kg	88.4%
S255663	67BC/.5-2	2/07/01	61.3mg/kg	131mg/kg	91.2%
S255664	67BC/2-3	2/07/01	58.9mg/kg	14.4mg/kg	93.0%
S255665	67CD/0-6	2/07/01	30.2mg/kg	148mg/kg	82.5%
S255666	67CD/.5-2	2/07/01	83.6mg/kg	242mg/kg	85.4%
S255667	78AB/0-6	2/07/01	53.2mg/kg	264mg/kg	86.2%
S255668	78AB/.5-2	2/07/01	56.3mg/kg	261mg/kg	91.0%
S255669	78BC/0-6	2/07/01	28.2mg/kg	140mg/kg	85.7%
S255670	78BC/.5-2	2/07/01	50.3mg/kg	147mg/kg	84.8%
S255671	78BC/2-3	2/07/01	24.0mg/kg	61.8mg/kg	85.0%
S255672	78CD/0-6	2/07/01	34.5mg/kg	120mg/kg	86.4%
55673	78CD/.5-2	2/07/01	95.3mg/kg	331mg/kg	87.9%
S255683	6L/2-3	2/07/01	19.6mg/kg	14.6mg/kg	94.3%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/26/01

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

Client :Floyd & Snider, Inc.

SVL JOB No. :969

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	—Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	57.5	112.5	2/23/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	69.0	102.8	2/23/01
% Solids	999	SOIL	%		N/A		N/A	2/21/01

LEGEND:

LCS = Laboratory Control Sample   LCS %R = LCS Percent Recovery   N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

ent :Floyd & Snider, Inc. SVL JOB No :96920

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD		%R	Test Date
As	6010B	SOIL	1	mg/kg	41.5	42.1	1.4	146	100		104.5	2/23/01
As	6010B	SOIL	2	mg/kg	56.3	N/A	N/A	173	100		116.7	2/23/01
Pb	6010B	SOIL	1	mg/kg	20.1	24.6	20.1	119	100		98.9	2/23/01
Pb	6010B	SOIL	2	mg/kg	261	N/A	N/A	408	100		147.0	2/23/01
Pb	6010B	SOIL	2	mg/kg	261	N/A	N/A	336	100	A	75.0	2/23/01
% Sol.	999	SOIL	1	%	87.0	86.8	0.2	N/A	N/A		N/A	2/15/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255658 Client Sample ID: 56CD/.5-2

QC Sample 2: SVL SAM No.: 255668 Client Sample ID: 78AB/.5-2

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St. Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # 96920

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	Lead 6010	DPT							Comments
1. 56CD/.5-2	07/07/01		T	3	1	N	✓						✓	✓								
2. 67AB/0-6	↓		↓	3	1	N	✓						✓	✓								
3. 67AB/.5-2				3	1	N	✓						✓	✓								
4. 67AB/2-3				3	1	N	✓						✓	✓								
5. 67BC/0-6				3	1	N	✓						✓	–								
6. 67BC/.5-2				3	1	N	✓						✓	✓								
7. 67BC/2-3				3	1	N	✓						✓	✓								
8. 67CD/0-6				3	1	N	✓						✓	✓								
9. 67CD/.5-2				3	1	N	✓						✓	✓								
10. 78AB/0-6	↓		↓	3	1	N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Glansen	07/08/01	3:00pm	[signature]	7/9	10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # ______

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	Lead 6010	DDT							Comments
1. 78AB/.5-2	02/07/01		TT	3	1	N	✓						✓	✓								
2. 78BC/0-6	↓		↓	3	1	N	✓						✓	✓								
3. 78BC/.5-2				3	1	N	✓						✓	✓								
4. 78BC/2-3				3	1	N	✓						✓	✓								
5. 78CD/0-6				3	1	N	✓						✓	✓								
6. 78CD/.5-2				3	1	N	✓						✓	✓								
7. 45AB/0-6				3	1	N	✓															Hold
8. 45AB/.5-2				3	1	N	✓															Hold
9. 45BC/0-6				3	1	N	✓															Hold
10. 45BC/.5-2				3	1	N	✓															Hold

Relinquished by: C Hansen	Date: 02/08/01	Time: 3:00 pm	Received by: [signature]	Date: 2/9	Time: 10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-COC 12/95

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St, Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # ______

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

	Sample ID	Collection: Date	Collection: Time	Misc: Collected by: (Init.)	Misc: Matrix Type From Table 1	Misc: No. of Containers	Misc: Sample Filtered ? Y/N	Pres: Unpreserved (Ice Only)	Pres: HNO3	Pres: HCL	Pres: H2SO4	Pres: NAOH	Pres: Other (Specify)	Analyses Required: Arsenic 6010	lead 6010	DDT							Comments
1.	45BC/2-3	02/07/01		TT	3	1	N	✓															Hold
2.	45CD/0-6	02/07/01		↓	3	1	N	✓															Hold
3.	45CD/.5-2	02/07/01		↓	3	1	N	✓															Hold
*4.	6L/2-3																						
5.																							
6.																							
7.																							
8.																							
9.																							
10.																							

* SAMPLE WAS NOT LISTED ON C.O.C. [initials] 02/09/01

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	02/08/01	3:00pm	[signature]	02/09/01	1045
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/09/01

SVL JOB No. : 96914
Date of Report : 2/22/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255526	1H/0-6	2/07/01	27.9mg/kg	91.1mg/kg	84.7%
S255527	1H/.5-2	2/07/01	18.6mg/kg	17.3mg/kg	94.2%
S255528	1H/2-3	2/07/01	12.1mg/kg	10.1mg/kg	94.9%
S255529	1I/0-6	2/07/01	26.1mg/kg	69.1mg/kg	85.2%
S255530	1I/.5-2	2/07/01	15.4mg/kg	19.9mg/kg	93.2%
S255531	1J/0-6	2/07/01	26.1mg/kg	65.2mg/kg	84.1%
S255532	IJ/.5-2	2/07/01	13.9mg/kg	13.2mg/kg	92.6%
S255533	1J/2-3	2/07/01	11.4mg/kg	9.3mg/kg	95.1%
S255534	1J/3-5	2/07/01	10.8mg/kg	5.4mg/kg	95.8%
S255535	1K/0-6	2/07/01	28.2mg/kg	75.1mg/kg	86.4%
S255536	1K/.2-5	2/07/01	15.4mg/kg	17.7mg/kg	93.0%
S255537	1K/2-3	2/07/01	11.8mg/kg	8.2mg/kg	95.3%
S255538	1K/3-5	2/07/01	10.4mg/kg	6.0mg/kg	95.3%
S255539	2A/0-6	2/07/01	32.5mg/kg	96.1mg/kg	82.9%
S255540	2A/.2-5	2/07/01	23.6mg/kg	52.5mg/kg	82.9%
?255541	2A/2-3	2/07/01	14.7mg/kg	22.0mg/kg	81.7%
.255542	2C/3-5	2/07/01	12.3mg/kg	9.8mg/kg	94.8%
S255543	3C/5-7	2/07/01	12.7mg/kg	10.6mg/kg	93.8%
S255544	4J/0-6	2/07/01	52.3mg/kg	190mg/kg	84.7%
S255545	4J/.5-2	2/07/01	33.7mg/kg	82.5mg/kg	91.6%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/22/01

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

Client :Floyd & Snider, Inc. SVL JOB No. :96

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	—Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	60.6	118.6	2/21/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	74.4	110.9	2/21/01
% Solids	999	SOIL	%		N/A		N/A	2/21/01

LEGEND:

LCS = Laboratory Control Sample

LCS %R = LCS Percent Recovery

N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

Client :Floyd & Snider, Inc. SVL JOB No :96914

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD	%R	Test Date
As	6010B	SOIL	1	mg/kg	27.9	27.3	2.2	125	100	97.1	2/21/01
As	6010B	SOIL	1	mg/kg	15.4	N/A	N/A	117	100	101.6	2/21/01
Pb	6010B	SOIL	1	mg/kg	91.1	89.1	2.2	173	100	81.9	2/21/01
Pb	6010B	SOIL	1	mg/kg	17.7	N/A	N/A	109	100	91.3	2/21/01
% Sol.	999	SOIL	1	%	84.7	84.5	0.2	N/A	N/A	N/A	2/13/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL.= Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255526 Client Sample ID: 1H/0-6

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # 96914

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	arsenic 6010	lead 6010	DDT	Comments
1. 1H/0-6	2/7/01		TT	3	1	N	✓						✓	✓		
2. 1H/.5-2				3	1	N	✓						✓	✓		
3. 1H/2-3				3	1	N	✓						✓	✓		
4. 1I/0-6				3	1	N	✓						✓	✓		
5. 1I/.5-2				3	1	N	✓						✓	✓		
6. 1J/0-6				3	1	N	✓						✓	✓		
7. 1J/.5-2				3	1	N	✓						✓	✓		
8. 1J/2-3				3	1	N	✓						✓	✓		
9. 1J/3-5				3	1	N	✓						✓	✓		
10. 1K/0-6				3	1	N	✓						✓	✓		

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
C Hansen	02/08/01	3pm	[illegible signature]	2/9/01	10:45

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)   White: LAB COPY   Yellow: CUSTOMER COPY   SVL COC 12/95

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition
PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # ______

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

	Sample ID	Collection: Date	Collection: Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	arsenic 6010	lead 6010	DDT							Comments
1.	1K/.2-5	2/7/01		TT	3	1	N	✓						✓	✓								
2.	1K/2-3				3	1	N	✓						✓	✓								
3.	1K/3-5				3	1	N	✓						✓	✓								
4.	2A/0-6				3	1	N	✓						✓	✓								
5.	2A/.2-5				3	1	N	✓						✓	✓								
6.	2A/2-3				3	1	N	✓						✓	✓								
7.	2C/3-5				3	1	N	✓						✓	✓								
8.	3C/5-7				3	1	N	✓						✓	✓								
9.	4J/0-6				3	1	N	✓						✓	✓								
10.	4J/.5-2				3	1	N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
B Hansen	02/08/01	3pm	Kyle Fuller	2/9	10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/09/01

SVL JOB No. : 96915
Date of Report : 2/23/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255548	3K/0-6	2/07/01	46.2mg/kg	169mg/kg	84.9%
S255549	3K/.5-2	2/07/01	24.7mg/kg	33.2mg/kg	94.3%
S255550	3K/5-7	2/07/01	12.9mg/kg	11.3mg/kg	95.5%
S255551	4K/0-6	2/07/01	50.6mg/kg	182mg/kg	83.8%
S255552	4K/.5-2	2/07/01	42.2mg/kg	88.9mg/kg	92.1%
S255553	5A/0-6	2/07/01	62.7mg/kg	211mg/kg	81.6%
S255554	5A/.5-2	2/07/01	59.9mg/kg	178mg/kg	85.0%
S255555	5B/0-6	2/07/01	72.0mg/kg	259mg/kg	83.2%
S255556	5B/.5-2	2/07/01	43.6mg/kg	90.1mg/kg	89.2%
S255557	5C/0-6	2/07/01	68.7mg/kg	231mg/kg	85.5%
S255558	5C/.5-2	2/07/01	31.4mg/kg	27.1mg/kg	91.7%
S255559	5D/0-6	2/07/01	69.9mg/kg	272mg/kg	88.2%
S255560	5D/.5-2	2/07/01	31.4mg/kg	57.0mg/kg	92.7%
S255561	5E/0-6	2/07/01	60.7mg/kg	202mg/kg	84.5%
S255562	5E/.5-2	2/07/01	21.5mg/kg	29.8mg/kg	86.8%
S255563	5F/0-6	2/07/01	69.1mg/kg	256mg/kg	89.4%
S255564	5F/.5-2	2/07/01	34.2mg/kg	57.5mg/kg	93.2%
S255565	5F/2-3	2/07/01	18.2mg/kg	40.4mg/kg	93.8%
S255566	5G/0-6	2/07/01	58.2mg/kg	233mg/kg	83.6%
S255567	5G/.5-2	2/07/01	32.2mg/kg	25.4mg/kg	91.3%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/23/01

SVL ANALYTICAL, INC. Quality Control Report

Part I Prep Blank and Laboratory Control Sample

.ent :Floyd & Snider, Inc. SVL JOB No. :96915

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	—Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	61.0	119.4	2/23/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	74.8	111.5	2/23/01

LEGEND:

LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

Client :Floyd & Snider, Inc. SVL JOB No :9691_

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found		RPD%	Matrix Spike Result	SPK ADD	%R	Test Date
As	6010B	SOIL	1	mg/kg	31.4	N/A		N/A	140	100	108.6	2/23/01
As	6010B	SOIL	2	mg/kg	60.7	64.5		6.1	169	100	108.3	2/23/01
Pb	6010B	SOIL	1	mg/kg	27.1	N/A		N/A	135	100	107.9	2/23/01
Pb	6010B	SOIL	2	mg/kg	202	205	M	37.9	301	100	99.0	2/23/01
% Sol.	999	SOIL	2	%	84.5	84.3		0.2	N/A	N/A	N/A	2/14/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255558 Client Sample ID: 5C/.5-2

QC Sample 2: SVL SAM No.: 255561 Client Sample ID: 5E/0-6

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:
Chlorinated Pesticides (8081A)

Client:
Floyd & Snider, Inc.

Client Sample ID:	5E/0-6
SVL Job #:	96915
SVL Sample ID:	S255561
Sample Matrix:	Soil
Date Sampled:	02/07/01
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	84%
Final Extraction Volume (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	29.8
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	10.6
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	58%
Decachlorobiphenyl	94%

COMMENTS: The recovery of tetrachloro-m-xylene was affected by the sample matrix.

Reviewed by: [signature] Date: 2/26/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:
Chlorinated Pesticides (8081A)

Client:
Floyd & Snider, Inc.

Client Sample ID:	**PREP BLANK**
SVL Job #:	96915/96916
SVL Sample ID:	S255546P
Sample Matrix:	Soil
Date Sampled:	NA
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	NA
Final Extraction Volume (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	ND
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	ND
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	44%
Decachlorobiphenyl	98%

COMMENTS:

Reviewed by: Scott C. Date: 2/26/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : LCS / LCSD *

Client Sample ID: **Lab Control Samples**

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

SVL Job #:	96915/96916
SVL Sample ID:	S255547C/D
Sample Matrix:	Soil
Date Sampled:	NA
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	NA
Final Ext. Vol. (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	LCS CONC.	LCSD CONC.	LCS % REC.	LCSD % REC.	RPD **	QC LIMITS RPD	QC LIMITS REC.
1	alpha-BHC	6.667	ND	2.365	2.496	**35%**	**37%**	5%	20	37-134
2	gamma-BHC	6.667	ND	2.939	2.996	**44%**	**45%**	2%	20	32-127
3	Heptachlor	6.667	ND	3.701	3.727	**56%**	**56%**	1%	20	34-111
4	Aldrin	6.667	ND	4.032	4.668	**60%**	**70%**	15%	20	42-122
5	beta-BHC	6.667	ND	5.533	5.244	**83%**	**79%**	5%	20	17-147
6	delta-BHC	6.667	ND	0.741	0.676	**11%**	**10%**	9%	20	19-140
7	Heptachlor Epoxide	6.667	ND	4.646	4.419	**70%**	**66%**	5%	20	37-142
8	Endosulfan I	6.667	ND	4.931	4.570	**74%**	**69%**	8%	20	45-153
9	4,4'-DDE	6.667	ND	6.627	6.416	**99%**	**96%**	3%	20	30-145
10	Dieldrin	6.667	ND	5.461	5.422	**82%**	**81%**	1%	20	36-146
11	Endrin	6.667	ND	8.483	7.250	**127%**	**109%**	16%	20	51-126
12	Endosulfan II	33.33	ND	27.88	28.12	**84%**	**84%**	1%	20	D-202
13	4,4'-DDD	33.33	ND	26.06	24.65	**78%**	**74%**	6%	20	30-145
14	4,4'-DDT	33.33	ND	39.84	34.67	**120%**	**104%**	14%	20	25-160
15	Endrin Aldehyde	6.667	ND	6.757	7.052	**101%**	**106%**	4%	20	NA
16	Endosulfan Sulfate	33.33	ND	30.82	28.69	**92%**	**86%**	7%	20	26-144
17	Methoxychlor	6.667	ND	17.11	9.010	**257%**	**135%**	62%	20	NA
18	Endrin Ketone	6.667	ND	7.573	7.070	**114%**	**106%**	7%	20	NA

SURROGATE RECOVERIES

COMPOUND NAME	LCS % REC.	LCSD % REC.	QC LIMITS
Tetrachloro-m-xylene	49%	54%	9 - 119
Decachlorobiphenyl	103%	107%	0 - 148

COMMENTS: The recovery for delta-BHC and Endrin fall outside the percent recovery QC limits for the LCSD, but the RPD between the LCS and LCSD is within the accepted range.

ND = Not detected
* LCS / LCSD = Laboratory Control Sample / Laboratory Control Sample Duplicate
** RPD = Relative Percent Difference

Reviewed by: [signature] Date: 2/26/2001

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : MS / MS(D) *

Client Sample ID: **Matrix Spike Samples**

Method:
Chlorinated Pesticides (8081A)

Client:
Floyd & Snider, Inc.

SVL Job #:	96915/96916
SVL Sample ID:	S255342MS/MS(D)
Sample Matrix:	Soil
Date Sampled:	NA
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	NA
Final Ext. Vol. (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	MS CONC.	MS(D) CONC.	MS % REC.	MS(D) % REC.	RPD **	QC LIMITS RPD	QC LIMITS REC.
1	alpha-BHC	6.667	ND	4.726	4.838	**71%**	**73%**	2%	20	37-134
2	gamma-BHC	6.667	ND	5.381	5.520	**81%**	**83%**	3%	20	32-127
3	Heptachlor	6.667	ND	6.210	6.455	**93%**	**97%**	4%	20	34-111
4	Aldrin	6.667	ND	5.829	5.919	**87%**	**89%**	2%	20	42-122
5	beta-BHC	6.667	ND	6.659	6.937	**100%**	**104%**	4%	20	17-147
6	delta-BHC	6.667	ND	1.018	1.116	**15%**	**17%**	9%	20	19-140
7	Heptachlor Epoxide	6.667	ND	5.947	6.227	**89%**	**93%**	5%	20	37-142
8	Endosulfan I	6.667	ND	5.441	5.589	**82%**	**84%**	3%	20	45-153
9	4,4'-DDE	6.667	ND	50.83	48.14	**762%**	**722%**	5%	20	30-145
10	Dieldrin	6.667	ND	6.321	6.120	**95%**	**92%**	3%	20	36-146
11	Endrin	6.667	ND	8.244	8.532	**124%**	**128%**	3%	20	51-126
12	Endosulfan II	33.33	ND	28.30	29.53	**85%**	**89%**	4%	20	D-202
13	4,4'-DDD	33.33	ND	26.48	27.43	**79%**	**82%**	4%	20	30-145
14	4,4'-DDT	33.33	ND	72.74	75.12	**218%**	**225%**	3%	20	25-160
15	Endrin Aldehyde	6.667	ND	9.708	9.663	**146%**	**145%**	0%	20	NA
16	Endosulfan Sulfate	33.33	ND	30.68	31.80	**92%**	**95%**	4%	20	26-144
17	Methoxychlor	6.667	ND	7.926	8.426	**119%**	**126%**	6%	20	NA
18	Endrin Ketone	6.667	ND	7.897	8.083	**118%**	**121%**	2%	20	NA

SURROGATE RECOVERIES

COMPOUND NAME	MS % REC.	MS(D) % REC.	QC LIMITS
Tetrachloro-m-xylene	80%	78%	9 - 119
Decachlorobiphenyl	102%	103%	0 - 148

COMMENTS: A matrix interference affected the recoveries for Aldrin and Endrin on the first analytical column. The confirmation column was used to quantitate the results for these analytes. The RPD for all analytes are in good agreement and within the limits. The recoveries for 4,4'-DDE and 4,4'-DDT are enhanced by the presence of these analytes in the sample.

ND = Not detected

* MS /MS(D) = Matrix Spike / Matrix Spike Duplicate

** RPD = Relative Percent Difference

Reviewed by: [signature] Date: 2/26/2001

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182

Project Name: Kissel Park

Table 1. -- Matrix Type

1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # 96915

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	lead 6010	DDT	Comments
1. 3K/0-6	02/07/01		TT	3	1	N	✓						✓	✓		
2. 3K/.5-2				3	1	N	✓						✓	✓		
3. 3K/5-7				3	1	N	✓						✓	✓		
4. 4K/0-6				3	1	N	✓						✓	✓		
5. 4K/.5-2				3	1	N	✓						✓	✓		
6. 5A/0-6				3	1	N	✓						✓	✓		
7. 5A/.5-2				3	1	N	✓						✓	✓		
8. 5B/0-6				3	1	N	✓						✓	✓		
9. 5B/.5-2				3	1	N	✓						✓	✓		
10. 5C/0-6				3	1	N	✓						✓	✓		

Relinquished by: C Hunsen	Date: 02/08/01	Time: 3:00pm	Received by: [illegible]	Date: 2/9/01	Time: 10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition
PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # ______

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	lead 6010	DDT							Comments
1. 5C/.5-2	07/07/01		TT	3	1	N	✓						✓	✓								
2. 5D/0-6	↓		↓	3	1	N	✓						✓	✓								
3. 5D/.5-2				3	1	N	✓						✓	✓								
4. 5E/0-6				3	2	N	✓						✓	✓	✓							
5. 5E/.5-2				3	1	N	✓						✓	✓								
6. 5F/0-6				3	1	N	✓						✓	✓								
7. 5F/.5-2				3	1	N	✓						✓	✓								
8. 5F/2-3				3	1	N	✓						✓	✓								
9. 5G/0-6				3	1	N	✓						✓	✓								
10. 5G/.5-2	↓		↓	3	1	N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
CHunsen	07/08/01	3:00pm	[signature]	7/9/01	10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-COC 12/95

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/08/01

SVL JOB No. : 96898
Date of Report : 2/23/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255363	2J/0-6	2/06/01	30.1mg/kg	99.7mg/kg	85.3%
S255364	2J/.5-2	2/06/01	24.8mg/kg	29.0mg/kg	94.0%
S255365	3I/0-6	2/06/01	34.2mg/kg	132mg/kg	85.7%
S255366	3I/.5-2	2/06/01	40.3mg/kg	70.8mg/kg	93.6%
S255367	2I/0-6	2/06/01	33.6mg/kg	110mg/kg	85.1%
S255368	2I/.5-2	2/06/01	32.0mg/kg	85.6mg/kg	89.9%
S255369	3A/0-6	2/06/01	42.8mg/kg	125mg/kg	83.4%
S255370	3A/3-5	2/06/01	12.7mg/kg	8.4mg/kg	79.7%
S255371	3A/.5-2	2/06/01	27.1mg/kg	44.2mg/kg	83.8%
S255372	3A/2-3	2/06/01	14.5mg/kg	16.4mg/kg	82.3%
S255373	3E/7-9	2/06/01	56.6mg/kg	206mg/kg	84.4%
S255374	3E/2-3	2/06/01	16.0mg/kg	16.3mg/kg	93.7%
S255375	3E/.5-2	2/06/01	65.3mg/kg	187mg/kg	93.6%
S255376	3E/0-6	2/06/01	56.8mg/kg	209mg/kg	84.1%
S255377	3B/.5-2	2/06/01	17.4mg/kg	29.8mg/kg	91.7%
S255378	3B/0-6	2/06/01	43.2mg/kg	143mg/kg	84.1%
S255379	3C/0-6	2/06/01	45.5mg/kg	144mg/kg	85.8%
S255380	3C/.5-2	2/06/01	11.9mg/kg	18.4mg/kg	93.4%
S255381	2K/.5-2	2/06/01	13.0mg/kg	12.1mg/kg	94.5%
S255382	2K/0-6	2/06/01	30.7mg/kg	111mg/kg	85.4%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson

Date: 2/23/01

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

Client :Floyd & Snider, Inc.

SVL JOB No. :968

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	—Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	57.4	112.3	2/20/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	68.3	101.8	2/20/01
% Solids	999	SOIL	%		N/A		N/A	2/19/01

LEGEND:

LCS = Laboratory Control Sample   LCS %R = LCS Percent Recovery   N/A = Not Applicable

SVL ANALYTICAL, INC. Quality Control Report

Part II Duplicate and Spike Analysis

(›nt :Floyd & Snider, Inc. SVL JOB No :96898

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD	%R	Test Date
As	6010B	SOIL	1	mg/kg	56.6	56.3	0.5	170	100	113.4	2/20/01
As	6010B	SOIL	2	mg/kg	43.2	43.5	0.7	145	100	101.8	2/20/01
Pb	6010B	SOIL	1	mg/kg	206	205	0.5	331	100	125.0	2/20/01
Pb	6010B	SOIL	2	mg/kg	143	135	5.8	230	100	87.0	2/20/01
% Sol.	999	SOIL	2	%	84.1	83.9	0.2	N/A	N/A	N/A	2/12/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255373 Client Sample ID: 3E/7-9

QC Sample 2: SVL SAM No.: 255378 Client Sample ID: 3B/0-6

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

Client Sample ID:	3B/0-6
SVL Job #:	96898
SVL Sample ID:	S255378
Sample Matrix:	Soil
Date Sampled:	2/6/01
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	85%
Final Extraction Volume (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	79.5
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	33.2
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	70%
Decachlorobiphenyl	98%

COMMENTS:

Reviewed by: *[signature]* Date: 2/26/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

Client Sample ID:	PREP BLANK
SVL Job #:	97897/96898/96899
SVL Sample ID:	S255339P
Sample Matrix:	Soil
Date Sampled:	NA
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	NA
Final Extraction Volume (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	ND
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	ND
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	44%
Decachlorobiphenyl	98%

COMMENTS: Recovery of tetrachloro-m-xylene falls outside the quality control limit.
Analytes are quantitated by external calibration.

Reviewed by: [signature] Date: 2/26/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : LCS / LCSD *

Client Sample ID: **Lab Control Samples**

Method:
Chlorinated Pesticides (8081A)

Client:
Floyd & Snider, Inc.

Sample Volume (g):	30
% Dry Solids:	NA
Final Ext. Vol. (mL):	10.0
Dilution Factor:	1.0

SVL Job #:	97897/96898/96899
SVL Sample ID:	S255340C/D
Sample Matrix:	Soil
Date Sampled:	NA
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	μg/kg (ppb)

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	LCS CONC.	LCSD CONC.	LCS % REC.	LCSD % REC.	RPD **	QC LIMITS RPD	QC LIMITS REC.
1	alpha-BHC	6.667	ND	2.365	2.496	35%	37%	5%	20	37-134
2	gamma-BHC	6.667	ND	2.939	2.996	44%	45%	2%	20	32-127
3	Heptachlor	6.667	ND	3.701	3.727	56%	56%	1%	20	34-111
4	Aldrin	6.667	ND	4.032	4.668	60%	70%	15%	20	42-122
5	beta-BHC	6.667	ND	5.533	5.244	83%	79%	5%	20	17-147
6	delta-BHC	6.667	ND	0.741	0.676	11%	10%	9%	20	19-140
7	Heptachlor Epoxide	6.667	ND	4.646	4.419	70%	66%	5%	20	37-142
8	Endosulfan I	6.667	ND	4.931	4.570	74%	69%	8%	20	45-153
9	4,4'-DDE	6.667	ND	6.627	6.416	99%	96%	3%	20	30-145
10	Dieldrin	6.667	ND	5.461	5.422	82%	81%	1%	20	36-146
11	Endrin	6.667	ND	8.483	7.250	127%	109%	16%	20	51-126
12	Endosulfan II	33.333	ND	27.884	28.121	84%	84%	1%	20	D-202
13	4,4'-DDD	33.333	ND	26.062	24.651	78%	74%	6%	20	30-145
14	4,4'-DDT	33.333	ND	39.842	34.665	120%	104%	14%	20	25-160
15	Endrin Aldehyde	6.667	ND	6.757	7.052	101%	106%	4%	20	NA
16	Endosulfan Sulfate	33.333	ND	30.823	28.694	92%	86%	7%	20	26-144
17	Methoxychlor	6.667	ND	17.113	9.010	257%	135%	62%	20	NA
18	Endrin Ketone	6.667	ND	7.573	7.070	114%	106%	7%	20	NA

SURROGATE RECOVERIES

COMPOUND NAME	LCS % REC.	LCSD % REC.	QC LIMITS
Tetrachloro-m-xylene	49%	54%	9 - 119
Decachlorobiphenyl	103%	107%	0 - 148

COMMENTS: The recovery for delta-BHC and Endrin fall outside the percent recovery QC limits for the LCSD, but the RPD between the LCS and LCSD is within the accepted range.

ND = Not detected

* LCS / LCSD = Laboratory Control Sample / Laboratory Control Sample Duplicate

** RPD = Relative Percent Difference

Reviewed by: [signature] Date: 2/26/2001

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : MS/MS(D)*

Client Sample ID: **Matrix Spike Samples**

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

SVL Job #: 97897/96898/96899
SVL Sample ID: S255342MS/MS(D)
Sample Matrix: Soil
Date Sampled: 02/06/01
Date Extracted: 02/12/01
Date Analyzed: 02/14/01
GPC Clean-up ?: NO
Analyst: TWC
Units: µg/kg (ppb)

Sample Volume (g): 30
% Dry Solids: NA
Final Ext. Vol. (mL): 10.0
Dilution Factor: 1.0

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	MS CONC.	MS(D) CONC.	MS % REC.	MS(D) % REC.	RPD **	QC LIMITS RPD	QC LIMITS REC.
1	alpha-BHC	6.667	ND	4.726	4.838	71%	73%	2%	20	37-134
2	gamma-BHC	6.667	ND	5.381	5.520	81%	83%	3%	20	32-127
3	Heptachlor	6.667	ND	6.210	6.455	93%	97%	4%	20	34-111
4	Aldrin	6.667	ND	5.829	5.919	87%	89%	2%	20	42-122
5	beta-BHC	6.667	ND	6.659	6.937	100%	104%	4%	20	17-147
6	delta-BHC	6.667	ND	1.018	1.116	15%	17%	9%	20	19-140
7	Heptachlor Epoxide	6.667	ND	5.947	6.227	89%	93%	5%	20	37-142
8	Endosulfan I	6.667	ND	5.441	5.589	82%	84%	3%	20	45-153
9	4,4'-DDE	6.667	ND	50.831	48.143	762%	722%	5%	20	30-145
10	Dieldrin	6.667	ND	6.321	6.120	95%	92%	3%	20	36-146
11	Endrin	6.667	ND	8.244	8.532	124%	128%	3%	20	51-126
12	Endosulfan II	33.333	ND	28.300	29.526	85%	89%	4%	20	D-202
13	4,4'-DDD	33.333	ND	26.484	27.435	79%	82%	4%	20	30-145
14	4,4'-DDT	33.333	ND	72.739	75.123	218%	225%	3%	20	25-160
15	Endrin Aldehyde	6.667	ND	9.708	9.663	146%	145%	0%	20	NA
16	Endosulfan Sulfate	33.333	ND	30.680	31.803	92%	95%	4%	20	26-144
17	Methoxychlor	6.667	ND	7.926	8.426	119%	126%	6%	20	NA
18	Endrin Ketone	6.667	ND	7.897	8.083	118%	121%	2%	20	NA

SURROGATE RECOVERIES

COMPOUND NAME	MS % REC.	MS(D) % REC.	QC LIMITS
Tetrachloro-m-xylene	80%	78%	9 - 119
Decachlorobiphenyl	102%	103%	0 - 148

COMMENTS: A matrix interference affected the recoveries for Aldrin and Endrin on the first analytical column. The confirmation column was used to quantitate the results for these analytes. The RPD for all analytes are in good agreement and within limits. The recoveries for 4,4'-DDE and 4,4'-DDT are enhanced by the presence of these analytes in the sample.

ND = Not detected

* MS /MS(D) = Matrix Spike / Matrix Spike Duplicate

** RPD = Relative Percent Difference

Reviewed by: [signature] Date: 2/26/2001

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St, Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
• 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kessel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # 96898

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic (6010)	Lead (6010)	DDT	Metals	Comments
1. 2J/0-6	2/06/01	400	TT	3	1	N	✓						✓	✓			
2. 2J/.5-2		400	TT	3	1	N	✓						✓	✓		✓	
3. 3I/0-6		215	TT	3	1	N	✓						✓	✓			
4. 3I/.5-2		215	TT	3	1	N	✓						✓	✓		✓	
5. 2I/0-6		355	TT	3	1	N	✓						✓	✓			
6. 2I/.5-2		356	TT	3	1	N	✓						✓	✓		✓	
7. 3A/0-6		1102A	PMW	3	1	N	✓						✓	✓			
8. 3A/3-5		1110A	PMW	3	1	N	✓						✓	✓		✓	
9. 3A/.5-2		1104A	PMW	3	1	N	✓						✓	✓		✓	
10. 3A/2-3		1108A	PMW	3	1	N	✓						✓	✓		✓	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Ann M. Palmer	2/7/01	2:25pm			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

• Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL 12/95

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kessel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # ______

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	lead 6010	DDT	~~Metals~~						Comments
1. 3E/7-9	2/6/01	240	TT	3	1	N	✓						✓	✓								
2. 3E/2-3		240	TT	3	1	N	✓						✓	✓		✓						
3. 3E/.5-2		240	TT	3	1	N	✓						✓	✓								
4. 3E/0-6		245	TT	3	1	N	✓						✓	✓								
5. 3B/.5-2		300	TT	3	1	N	✓						✓	✓								
6. 3B/0-6		300	TT	3	2	N	✓						✓	✓	✓							
7. 3C/0-6		255	TT	3	1	N	✓						✓	✓								
8. 3C/.5-2		255	TT	3	1	N	✓						✓	✓		✓						
9. 2K/.5-2		405	TT	3	1	N	✓						✓	✓		✓						
10. 2K/0-6		405	TT	3	1	N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Ann M. Palmer	2/7/01	2:25pm			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-COC 12/95

SVL ANALYTICAL, INC.

One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/08/01

SVL JOB No. : 96899
Date of Report : 2/23/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255385	3F/0-6	2/06/01	45.1mg/kg	164mg/kg	84.7%
S255386	3F/.5-2	2/06/01	19.8mg/kg	22.0mg/kg	94.2%
S255387	3F/2-3	2/06/01	13.4mg/kg	9.9mg/kg	94.5%
S255388	3D/0-6	2/06/01	39.6mg/kg	132mg/kg	83.7%
S255389	3D/.5-2	2/06/01	20.6mg/kg	24.8mg/kg	92.6%
S255390	3D/2-3	2/06/01	15.1mg/kg	20.6mg/kg	93.2%
S255391	3G/0-6	2/06/01	51.0mg/kg	197mg/kg	84.3%
S255392	3G/.5-2	2/06/01	30.5mg/kg	34.1mg/kg	93.4%
S255393	3H/0-6	2/06/01	39.6mg/kg	152mg/kg	84.7%
S255394	3H/.5-2	2/06/01	34.5mg/kg	104mg/kg	91.9%
S255395	3H/2-3	2/06/01	21.6mg/kg	51.1mg/kg	92.9%
S255396	3J/7-9	2/06/01	42.9mg/kg	161mg/kg	85.6%
S255397	3J/0-6	2/06/01	42.4mg/kg	167mg/kg	85.5%
S255398	3J/.5-2	2/06/01	44.9mg/kg	125mg/kg	93.5%
S255399	3I/2-3	2/06/01	16.6mg/kg	16.1mg/kg	93.7%
S255400	1S/0-6	2/06/01	8.1mg/kg	9.5mg/kg	77.3%
S255401	4S/0-6	2/06/01	7.1mg/kg	9.9mg/kg	84.8%
S255402	7S/0-6	2/06/01	9.1mg/kg	3.7mg/kg	74.7%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson   Date: 2/23/01

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

(.ent :Floyd & Snider, Inc. SVL JOB No. :96899

Analyte	Method	Matrix	Units	Prep Blank	True——LCS——Found		LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	51.5	100.8	2/20/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	62.5	93.1	2/20/01
% Solids	999	SOIL	%		N/A		N/A	2/19/01

LEGEND:

LCS = Laboratory Control Sample

LCS %R = LCS Percent Recovery

N/A = Not Applicable

Part II Duplicate and Spike Analysis

Client :Floyd & Snider, Inc. SVL JOB No :968

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	Duplicate or MSD RPD%	Matrix Spike Result	Matrix Spike SPK ADD	Matrix Spike %R	Test Date
As	6010B	SOIL	1	mg/kg	39.6	41.3	4.2	142	100	102.4	2/20/01
As	6010B	SOIL	2	mg/kg	21.6	N/A	N/A	119	100	97.4	2/20/01
Pb	6010B	SOIL	1	mg/kg	132	135	2.2	233	100	101.0	2/20/01
Pb	6010B	SOIL	2	mg/kg	51.1	N/A	N/A	139	100	87.9	2/20/01
% Sol.	999	SOIL	1	%	83.7	83.7	0.0	N/A	N/A	N/A	2/13/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255388 Client Sample ID: 3D/0-6

QC Sample 2: SVL SAM No.: 255395 Client Sample ID: 3H/2-3

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

Client Sample ID:	3D/0-6
SVL Job #:	96899
SVL Sample ID:	S255388
Sample Matrix:	Soil
Date Sampled:	2/6/01
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	84%
Final Extraction Volume (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	61.2
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	31.0
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	69%
Decachlorobiphenyl	93%

COMMENTS: A coeluting peak enhanced the recovery of tetrachloro-m-xylene.

Reviewed by: [signature] Date: 2/26/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:
Chlorinated Pesticides (8081A)

Client:
Floyd & Snider, Inc.

Client Sample ID:	**PREP BLANK**
SVL Job #:	97897/96898/96899
SVL Sample ID:	S255339P
Sample Matrix:	Soil
Date Sampled:	NA
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	NA
Final Extraction Volume (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	ND
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	ND
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	44%
Decachlorobiphenyl	98%

COMMENTS: Recovery of tetrachloro-m-xylene falls outside the quality control limit.
Analytes are quantitated by external calibration.

Reviewed by: [signature] Date: 2/22/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : LCS / LCSD *

Client Sample ID: Lab Control Samples

Method:
Chlorinated Pesticides (8081A)

Client:
Floyd & Snider, Inc.

Sample Volume (g): 30
% Dry Solids: NA
Final Ext. Vol. (mL): 10.0
Dilution Factor: 1.0

SVL Job #: 97897/96898/96899
SVL Sample ID: S255340C/D
Sample Matrix: Soil
Date Sampled: NA
Date Extracted: 02/12/01
Date Analyzed: 02/14/01
GPC Clean-up ?: NO
Analyst: TWC
Units: µg/kg (ppb)

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	LCS CONC.	LCSD CONC.	LCS % REC.	LCSD % REC.	RPD **
1	alpha-BHC	6.667	ND	2.365	2.496	**35%**	**37%**	5%
2	gamma-BHC	6.667	ND	2.939	2.996	**44%**	**45%**	2%
3	Heptachlor	6.667	ND	3.701	3.727	**56%**	**56%**	1%
4	Aldrin	6.667	ND	4.032	4.668	**60%**	**70%**	15%
5	beta-BHC	6.667	ND	5.533	5.244	**83%**	**79%**	5%
6	delta-BHC	6.667	ND	0.741	0.676	**11%**	**10%**	9%
7	Heptachlor Epoxide	6.667	ND	4.646	4.419	**70%**	**66%**	5%
8	Endosulfan I	6.667	ND	4.931	4.570	**74%**	**69%**	8%
9	4,4'-DDE	6.667	ND	6.627	6.416	**99%**	**96%**	3%
10	Dieldrin	6.667	ND	5.461	5.422	**82%**	**81%**	1%
11	Endrin	6.667	ND	8.483	7.250	**127%**	**109%**	16%
12	Endosulfan II	33.333	ND	27.884	28.121	**84%**	**84%**	1%
13	4,4'-DDD	33.333	ND	26.062	24.651	**78%**	**74%**	6%
14	4,4'-DDT	33.333	ND	39.842	34.665	**120%**	**104%**	14%
15	Endrin Aldehyde	6.667	ND	6.757	7.052	**101%**	**106%**	4%
16	Endosulfan Sulfate	33.333	ND	30.823	28.694	**92%**	**86%**	7%
17	Methoxychlor	6.667	ND	17.113	9.010	**257%**	**135%**	62%
18	Endrin Ketone	6.667	ND	7.573	7.070	**114%**	**106%**	7%

QC LIMITS	
RPD	REC.
20	37-134
20	32-127
20	34-111
20	42-122
20	17-147
20	19-140
20	37-142
20	45-153
20	30-145
20	36-146
20	51-126
20	D-202
20	30-145
20	25-160
20	NA
20	26-144
20	NA
20	NA

SURROGATE RECOVERIES

COMPOUND NAME	LCS % REC.	LCSD % REC.
Tetrachloro-m-xylene	49%	54%
Decachlorobiphenyl	103%	107%

QC LIMITS
9 - 119
0 - 148

COMMENTS: The recovery for delta-BHC and Endrin fall outside the percent recovery QC limits for the LCSD, but the RPD between the LCS and LCSD is within the accepted range.

ND = Not detected
* LCS / LCSD = Laboratory Control Sample / Laboratory Control Sample Duplicate
** RPD = Relative Percent Difference

Reviewed by: [signature] Date: 2/26/2001

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : MS/MS(D)*

Client Sample ID: **Matrix Spike Samples**

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

Sample Volume (g): 30
% Dry Solids: NA
Final Ext. Vol. (mL): 10.0
Dilution Factor: 1.0

SVL Job #: 97897/96898/96899
SVL Sample ID: S255342MS/MS(D)
Sample Matrix: Soil
Date Sampled: 02/06/01
Date Extracted: 02/12/01
Date Analyzed: 02/14/01
GPC Clean-up ?: NO
Analyst: TWC
Units: µg/kg (ppb)

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	MS CONC.	MS(D) CONC.	MS % REC.	MS(D) % REC.	RPD **	QC LIMITS RPD	QC LIMITS REC.
1	alpha-BHC	6.667	ND	4.726	4.838	71%	73%	2%	20	37-134
2	gamma-BHC	6.667	ND	5.381	5.520	81%	83%	3%	20	32-127
3	Heptachlor	6.667	ND	6.210	6.455	93%	97%	4%	20	34-111
4	Aldrin	6.667	ND	5.829	5.919	87%	89%	2%	20	42-122
5	beta-BHC	6.667	ND	6.659	6.937	100%	104%	4%	20	17-147
6	delta-BHC	6.667	ND	1.018	1.116	15%	17%	9%	20	19-140
7	Heptachlor Epoxide	6.667	ND	5.947	6.227	89%	93%	5%	20	37-142
8	Endosulfan I	6.667	ND	5.441	5.589	82%	84%	3%	20	45-153
9	4,4'-DDE	6.667	ND	50.831	48.143	762%	722%	5%	20	30-145
10	Dieldrin	6.667	ND	6.321	6.120	95%	92%	3%	20	36-146
11	Endrin	6.667	ND	8.244	8.532	124%	128%	3%	20	51-126
12	Endosulfan II	33.333	ND	28.300	29.526	85%	89%	4%	20	D-202
13	4,4'-DDD	33.333	ND	26.484	27.435	79%	82%	4%	20	30-145
14	4,4'-DDT	33.333	ND	72.739	75.123	218%	225%	3%	20	25-160
15	Endrin Aldehyde	6.667	ND	9.708	9.663	146%	145%	0%	20	NA
16	Endosulfan Sulfate	33.333	ND	30.680	31.803	92%	95%	4%	20	26-144
17	Methoxychlor	6.667	ND	7.926	8.426	119%	126%	6%	20	NA
18	Endrin Ketone	6.667	ND	7.897	8.083	118%	121%	2%	20	NA

SURROGATE RECOVERIES

COMPOUND NAME	MS % REC.	MS(D) % REC.	QC LIMITS
Tetrachloro-m-xylene	80%	78%	9 - 119
Decachlorobiphenyl	102%	103%	0 - 148

COMMENTS: A matrix interference affected the recoveries for Aldrin and Endrin on the first analytical column. The confirmation column was used to quantitate the results for these analytes. The RPD for all analytes are in good agreement and within limits. The recoveries for 4,4'-DDE and 4,4'-DDT are enhanced by the presence of these analytes in the sample.

ND = Not detected

* MS /MS(D) = Matrix Spike / Matrix Spike Duplicate

** RPD = Relative Percent Difference

Reviewed by: [signature] Date: 2/26/2001

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St. Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kessel Park

Table I. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # 96899

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	lead 6010	DDT	Metals						Comments
1. 3F/0-6	2/6/01	136	TT	3	1	N	✓						✓	✓		X						
2. 3F/.5-2		136	TT	3	1	N	✓						✓	✓		X						
3. 3F/2-3		136	TT	3	1	N	✓						✓	✓		✓						
4. 3D/0-6		250	TT	3	2	N	✓						✓	✓	✓							
5. 3D/.5-2		250	TT	3	1	N	✓						✓	✓		✓						
6. 3D/2-3		255	TT	3	1	N	✓						✓	✓		✓						
7. 3G/0-6		231	TT	3	1	N	✓						✓	✓								
8. 3G/.5-2		231	TT	3	1	N	✓						✓	✓								
9. 3H/0-6		125	TT	3	1	N	✓						✓	✓								
10. 3H/.5-2		125	TT	3	1	N	✓						✓	✓		✓						

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Ann M. Palmer	2/7/01	2:25pm			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 12/95

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kessel Park

Table I. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # ______

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	Lead 6010	DDT	Metals						Comments
1. 3H/2-3	2/6/01	125	TT	3	1	N	✓						✓	✓								
2. 3J/7-9		201	TT	3	1	N	✓						✓	✓								
3. 3J/0-6		200	TT	3	1	N	✓						✓	✓								
4. 3J/.5-2		158	TT	3	1	N	✓						✓	✓								
5. 3J/2-3		215	TT	3	1	N	✓						✓	✓								
6. 1S/0-6		140	PMW	3	1	N	✓						✓	✓								
7. 4S/0-6		145	PMW	3	1	N	✓						✓	✓								
8. 7S/0-6		150	PMW	3	1	N	✓						✓	✓								
9.				3	1	N	✓															
10.				3	1	N	✓															

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Ann M. Palmer	2/7/01	2:25 pm			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-COC 12/95

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/09/01

SVL JOB No. : 96913
Date of Report : 2/22/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255504	1A/0-6	2/07/01	23.9mg/kg	75.0mg/kg	86.0%
S255505	1A/.5-2	2/07/01	21.5mg/kg	60.1mg/kg	89.7%
S255506	1A/2-3	2/07/01	21.9mg/kg	52.5mg/kg	89.7%
S255507	1B/0-6	2/07/01	18.5mg/kg	50.8mg/kg	85.6%
S255508	1B/.5-2	2/07/01	15.9mg/kg	33.6mg/kg	89.5%
S255509	1B/2-3	2/07/01	13.1mg/kg	27.4mg/kg	93.4%
S255510	1C/0-6	2/07/01	16.6mg/kg	43.4mg/kg	85.3%
S255511	1C/.5-2	2/07/01	12.6mg/kg	27.3mg/kg	88.7%
S255512	1D/0-6	2/07/01	29.1mg/kg	99.2mg/kg	83.5%
S255513	1D/.5-2	2/07/01	17.9mg/kg	34.9mg/kg	88.3%
S255514	1E/0-6	2/07/01	22.6mg/kg	69.9mg/kg	82.7%
S255515	1E/7-9	2/07/01	23.9mg/kg	73.1mg/kg	82.1%
S255516	1E/.5-2	2/07/01	17.9mg/kg	46.2mg/kg	90.0%
S255517	1E/2-3	2/07/01	17.3mg/kg	48.0mg/kg	88.8%
S255518	1F/0-6	2/07/01	27.3mg/kg	89.7mg/kg	83.7%
55519	1F/.5-2	2/07/01	16.1mg/kg	31.9mg/kg	92.3%
55520	1F/2-3	2/07/01	7.3mg/kg	12.4mg/kg	95.0%
S255521	1G/0-6	2/07/01	23.4mg/kg	88.9mg/kg	85.6%
S255522	1G/.5-2	2/07/01	9.9mg/kg	15.2mg/kg	93.4%
S255523	1G/2-3	2/07/01	7.9mg/kg	13.5mg/kg	93.1%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/22/01

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

Client :Floyd & Snider, Inc. SVL JOB No. :969

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	—Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	51.8	101.4	2/22/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	67.3	100.3	2/22/01
% Solids	999	SOIL	%		N/A		N/A	2/21/01

LEGEND:

LCS = Laboratory Control Sample   LCS %R = LCS Percent Recovery   N/A = Not Applicable

2/22/01 12:57

SVL ANALYTICAL, INC.

Quality Control Report

Part I Prep Blank and Laboratory Control Sample

ient :Floyd & Snider, Inc. SVL JOB No. :96913

Analyte	Method	Matrix	Units	Prep Blank	True—LCS	—Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	51.8	101.4	2/22/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	67.3	100.3	2/22/01
% Solids	999	SOIL	%		N/A		N/A	2/21/01

LEGEND:

LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

Client :Floyd & Snider, Inc. SVL JOB No :969

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD	%R	Test Date
As	6010B	SOIL	1	mg/kg	23.9	25.0	4.5	129	100	105.1	2/22/01
As	6010B	SOIL	2	mg/kg	22.6	N/A	N/A	122	100	99.4	2/22/01
Pb	6010B	SOIL	1	mg/kg	75.0	81.8	8.7	166	100	91.0	2/22/01
Pb	6010B	SOIL	2	mg/kg	69.9	N/A	N/A	166	100	96.1	2/22/01
% Sol.	999	SOIL	1	%	86.0	86.0	0.0	N/A	N/A	N/A	2/13/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255504 Client Sample ID: 1A/0-6

QC Sample 2: SVL SAM No.: 255514 Client Sample ID: 1E/0-6

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182

Project Name: Kissel Park

Table 1. -- Matrix Type

1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ________

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # 96913

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection		Miscellaneous				Preservative(s)						Analyses Required			Comments
	Date	Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	Lead 6010	DDT	
1. 1A/0-6	2/7/01		TT	3	1	N	✓						✓	✓		
2. 1A/.5-2				3	1	N	✓						✓	✓		
3. 1A/2-3				3	1	N	✓						✓	✓		
4. 1B/0-6				3	1	N	✓						✓	✓		
5. 1B/0.5-2				3	1	N	✓						✓	✓		
6. 1B/2-3				3	1	N	✓						✓	✓		
7. 1C/0-6				3	1	N	✓						✓	✓		
8. 1C/.5-2				3	1	N	✓						✓	✓		
9. 1D/0-6				3	1	N	✓						✓	✓		
10. 1D/.5-2				3	1	N	✓						✓	✓		

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Hansen	02/08/01	3:00pm	Kayla Fuller	2/9/01	10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St, Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # ______

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

	Sample ID	Collection: Date	Collection: Time	Miscellaneous: Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Preservative(s): Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Analyses Required: Arsenic 6010	Lead 6010	DDT	Comments
1.	1E/0-6	2/7/01		TT	3	1	N	✓						✓	✓		
2.	1E/7-9				3	1	N	✓						✓	✓		
3.	1E/.5-2				3	1	N	✓						✓	✓		
4.	1E/2-3				3	1	N	✓						✓	✓		
5.	1F/0-6				3	1	N	✓						✓	✓		
6.	1F/.5-2				3	1	N	✓						✓	✓		
7.	1F/2-3				3	1	N	✓						✓	✓		
8.	1G/0-6				3	1	N	✓						✓	✓		
9.	1G/.5-2				3	1	N	✓						✓	✓		
10.	1G/2-3				3	1	N	✓						✓	✓		

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
C Hansen	02/08/01	3:00pm	[illegible signature]	2/9	10:45
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample ...ct: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SV ..OC 12/95

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/08/01

SVL JOB No. : 96897
Date of Report : 2/23/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255341	4I/2-3	2/06/01	21.0mg/kg	13.0mg/kg	94.0%
S255342	4D/0-6	2/06/01	52.4mg/kg	170mg/kg	84.1%
S255343	2B/.5-2	2/06/01	27.1mg/kg	54.5mg/kg	88.7%
S255344	2B/7-9	2/06/01	32.5mg/kg	94.2mg/kg	85.1%
S255345	2B/0-6	2/06/01	34.6mg/kg	103mg/kg	84.8%
S255346	2F/2-3	2/06/01	11.1mg/kg	8.5mg/kg	94.1%
S255347	2F/.5-2	2/06/01	22.9mg/kg	42.0mg/kg	93.2%
S255348	2F/0-6	2/06/01	30.8mg/kg	109mg/kg	83.7%
S255349	2C/0-6	2/06/01	35.4mg/kg	100mg/kg	83.7%
S255350	2C/.5-2	2/06/01	20.9mg/kg	48.1mg/kg	92.8%
S255351	2E/0-6	2/06/01	35.0mg/kg	116mg/kg	83.4%
S255352	2E/.5-2	2/06/01	27.8mg/kg	35.7mg/kg	92.3%
S255353	2H/.5-2	2/06/01	18.6mg/kg	31.6mg/kg	92.8%
S255354	2H/0-6	2/06/01	32.4mg/kg	105mg/kg	85.7%
S255355	2D/.5-2	2/06/01	30.7mg/kg	82.3mg/kg	91.8%
S255356	2D/2-3	2/06/01	12.6mg/kg	12.4mg/kg	93.3%
255357	2D/0-6	2/06/01	44.2mg/kg	142mg/kg	85.4%
S255358	2G/.5-2	2/06/01	30.6mg/kg	86.5mg/kg	91.7%
S255359	2G/0-6	2/06/01	31.7mg/kg	108mg/kg	84.8%
S255360	2G/2-3	2/06/01	13.1mg/kg	11.5mg/kg	93.5%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/23/01

SVL ANALYTICAL, INC. Quality Control Report

Part I Prep Blank and Laboratory Control Sample

Client :Floyd & Snider, Inc. SVL JOB No. :96(

Analyte	Method	Matrix	Units	Prep Blank	True——LCS	——Found	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	55.1	107.8	2/21/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	64.8	96.6	2/21/01
% Solids	999	SOIL	%		N/A		N/A	2/19/01

LEGEND:

LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

C nt :Floyd & Snider, Inc.

SVL JOB No :96897

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD	%R	Test Date
As	6010B	SOIL	1	mg/kg	52.4	51.5	1.7	160	100	107.6	2/21/01
As	6010B	SOIL	2	mg/kg	35.0	N/A	N/A	148	100	113.0	2/21/01
Pb	6010B	SOIL	1	mg/kg	170	166	2.4	273	100	103.0	2/21/01
Pb	6010B	SOIL	2	mg/kg	116	N/A	N/A	224	100	108.0	2/21/01
% Sol.	999	SOIL	1	%	84.1	83.9	0.2	N/A	N/A	N/A	2/12/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255342 Client Sample ID: 4D/0-6

QC Sample 2: SVL SAM No.: 255351 Client Sample ID: 2E/0-6

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

Client Sample ID:	4D/0-6
SVL Job #:	97897
SVL Sample ID:	S255342
Sample Matrix:	Soil
Date Sampled:	02/06/01
Date Extracted:	02/12/01
Date Analyzed:	02/14/01
GPC Clean-up ?:	NO
Analyst:	TWC
Units:	µg/kg (ppb)

Sample Volume (g):	30
% Dry Solids:	84%
Final Extraction Volume (mL):	10.0
Dilution Factor:	1.0

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	58.7
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	24.2
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	70%
Decachlorobiphenyl	104%

COMMENTS: None.

Reviewed by: Scott C Date: 2/26/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

REPORT OF ANALYTICAL RESULTS

Method:		Client Sample ID:	PREP BLANK
Chlorinated Pesticides (8081A)		SVL Job #:	97897/96898/96899
Client:		SVL Sample ID:	S255339P
Floyd & Snider, Inc.		Sample Matrix:	Soil
		Date Sampled:	NA
		Date Extracted:	02/12/01
Sample Volume (g):	30	Date Analyzed:	02/14/01
% Dry Solids:	NA	GPC Clean-up ?:	NO
Final Extraction Volume (mL):	10.0	Analyst:	TWC
Dilution Factor:	1.0	Units:	µg/kg (ppb)

#	COMPOUND NAME	CAS Number	REPORTING LIMIT	SAMPLE CONCENTRATION
1	alpha-BHC	319-84-6	1.33	ND
2	gamma-BHC (Lindane)	58-89-9	1.33	ND
3	Heptachlor	76-44-8	1.33	ND
4	Aldrin	309-00-2	1.33	ND
5	beta-BHC	319-85-7	1.33	ND
6	delta-BHC	319-86-8	1.33	ND
7	Heptachlor epoxide	1024-57-3	1.33	ND
8	Endosulfan I	959-98-8	1.33	ND
9	Chlordane (technical)	12789-03-6	2.67	ND
10	4,4'-DDE	72-55-9	2.67	ND
11	Dieldrin	60-57-1	2.67	ND
12	Endrin	72-20-8	2.67	ND
13	Endosulfan II	33212-65-9	2.67	ND
14	4,4'-DDD	72-54-8	2.67	ND
15	4,4'-DDT	50-29-3	2.67	ND
16	Endrin aldehyde	7421-93-4	2.67	ND
17	Endosulfan sulfate	1031-07-8	2.67	ND
18	Endrin ketone	53494-70-5	2.67	ND
19	Methoxychlor	72-43-5	13.3	ND
20	Toxaphene	8001-35-2	167	ND

SURROGATE RECOVERIES

COMPOUND NAME	% RECOVERY
Tetrachloro-m-xylene	44%
Decachlorobiphenyl	98%

COMMENTS: Recovery of tetrachloro-m-xylene falls outside the quality control limit.
Analytes are quantitated by external calibration.

Reviewed by: *[signature]* Date: 2/26/2001

ND = Not detected at stated reporting limit.

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : LCS / LCSD *

Client Sample ID: **Lab Control Samples**

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

SVL Job #: 97897/96898/96899
SVL Sample ID: S255340C/D
Sample Matrix: Soil
Date Sampled: NA
Date Extracted: 02/12/01
Date Analyzed: 02/14/01
GPC Clean-up ?: NO
Analyst: TWC
Units: µg/kg (ppb)

Sample Volume (g): 30
% Dry Solids: NA
Final Ext. Vol. (mL): 10.0
Dilution Factor: 1.0

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	LCS CONC.	LCSD CONC.	LCS % REC.	LCSD % REC.	RPD **
1	alpha-BHC	6.667	ND	2.365	2.496	35%	37%	5%
2	gamma-BHC	6.667	ND	2.939	2.996	44%	45%	2%
3	Heptachlor	6.667	ND	3.701	3.727	56%	56%	1%
4	Aldrin	6.667	ND	4.032	4.668	60%	70%	15%
5	beta-BHC	6.667	ND	5.533	5.244	83%	79%	5%
6	delta-BHC	6.667	ND	0.741	0.676	11%	10%	9%
7	Heptachlor Epoxide	6.667	ND	4.646	4.419	70%	66%	5%
8	Endosulfan I	6.667	ND	4.931	4.570	74%	69%	8%
9	4,4'-DDE	6.667	ND	6.627	6.416	99%	96%	3%
10	Dieldrin	6.667	ND	5.461	5.422	82%	81%	1%
11	Endrin	6.667	ND	8.483	7.250	127%	109%	16%
12	Endosulfan II	33.333	ND	27.884	28.121	84%	84%	1%
13	4,4'-DDD	33.333	ND	26.062	24.651	78%	74%	6%
14	4,4'-DDT	33.333	ND	39.842	34.665	120%	104%	14%
15	Endrin Aldehyde	6.667	ND	6.757	7.052	101%	106%	4%
16	Endosulfan Sulfate	33.333	ND	30.823	28.694	92%	86%	7%
17	Methoxychlor	6.667	ND	17.113	9.010	257%	135%	62%
18	Endrin Ketone	6.667	ND	7.573	7.070	114%	106%	7%

QC LIMITS RPD	QC LIMITS REC.
20	37-134
20	32-127
20	34-111
20	42-122
20	17-147
20	19-140
20	37-142
20	45-153
20	30-145
20	36-146
20	51-126
20	D-202
20	30-145
20	25-160
20	NA
20	26-144
20	NA
20	NA

SURROGATE RECOVERIES

COMPOUND NAME	LCS % REC.	LCSD % REC.	QC LIMITS
Tetrachloro-m-xylene	49%	54%	9 - 119
Decachlorobiphenyl	103%	107%	0 - 148

COMMENTS: The recovery for delta-BHC and Endrin fall outside the percent recovery QC limits for the LCSD, but the RPD between the LCS and LCSD is within the accepted range.

ND = Not detected
* LCS / LCSD = Laboratory Control Sample / Laboratory Control Sample Duplicate
** RPD = Relative Percent Difference

Reviewed by: [signature] Date: 2/26/2001

SVL ANALYTICAL, INC.
One Government Gulch * P.O. Box 929 * Kellogg, Idaho 83837 * Phone: (208) 784-1258 * Fax: (208) 783-0891

QUALITY CONTROL REPORT : MS/MS(D)*

Client Sample ID: **Matrix Spike Samples**

Method:
Chlorinated Pesticides (8081A)
Client:
Floyd & Snider, Inc.

SVL Job #: 97897/96898/96899
SVL Sample ID: S255342MS/MS(D)
Sample Matrix: Soil
Date Sampled: 02/06/01
Date Extracted: 02/12/01
Date Analyzed: 02/14/01
GPC Clean-up ?: NO
Analyst: TWC
Units: µg/kg (ppb)

Sample Volume (g): 30
% Dry Solids: NA
Final Ext. Vol. (mL): 10.0
Dilution Factor: 1.0

#	COMPOUND NAME	SPIKE CONC.	SAMPLE CONC.	MS CONC.	MS(D) CONC.	MS % REC.	MS(D) % REC.	RPD **	QC LIMITS RPD	QC LIMITS REC.
1	alpha-BHC	6.667	ND	4.726	4.838	71%	73%	2%	20	37-134
2	gamma-BHC	6.667	ND	5.381	5.520	81%	83%	3%	20	32-127
3	Heptachlor	6.667	ND	6.210	6.455	93%	97%	4%	20	34-111
4	Aldrin	6.667	ND	5.829	5.919	87%	89%	2%	20	42-122
5	beta-BHC	6.667	ND	6.659	6.937	100%	104%	4%	20	17-147
6	delta-BHC	6.667	ND	1.018	1.116	15%	17%	9%	20	19-140
7	Heptachlor Epoxide	6.667	ND	5.947	6.227	89%	93%	5%	20	37-142
8	Endosulfan I	6.667	ND	5.441	5.589	82%	84%	3%	20	45-153
9	4,4'-DDE	6.667	ND	50.831	48.143	762%	722%	5%	20	30-145
10	Dieldrin	6.667	ND	6.321	6.120	95%	92%	3%	20	36-146
11	Endrin	6.667	ND	8.244	8.532	124%	128%	3%	20	51-126
12	Endosulfan II	33.333	ND	28.300	29.526	85%	89%	4%	20	D-202
13	4,4'-DDD	33.333	ND	26.484	27.435	79%	82%	4%	20	30-145
14	4,4'-DDT	33.333	ND	72.739	75.123	218%	225%	3%	20	25-160
15	Endrin Aldehyde	6.667	ND	9.708	9.663	146%	145%	0%	20	NA
16	Endosulfan Sulfate	33.333	ND	30.680	31.803	92%	95%	4%	20	26-144
17	Methoxychlor	6.667	ND	7.926	8.426	119%	126%	6%	20	NA
18	Endrin Ketone	6.667	ND	7.897	8.083	118%	121%	2%	20	NA

SURROGATE RECOVERIES

COMPOUND NAME	MS % REC.	MS(D) % REC.	QC LIMITS
Tetrachloro-m-xylene	80%	78%	9 - 119
Decachlorobiphenyl	102%	103%	0 - 148

COMMENTS: A matrix interference affected the recoveries for Aldrin and Endrin on the first analytical column. The confirmation column was used to quantitate the results for these analytes. The RPD for all analytes are in good agreement and within limits. The recoveries for 4,4'-DDE and 4,4'-DDT are enhanced by the presence of these analytes in the sample.

ND = Not detected

* MS /MS(D) = Matrix Spike / Matrix Spike Duplicate

** RPD = Relative Percent Difference

Reviewed by: [signature] Date: 2/26/2001

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kessel Park

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # 96897

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	Lead 6010	DDT	Metals						Comments
1. 4I/2-3	2/06/01	110	TT	3	1	N	✓						✓	✓		✓						
2. 4D/0-6		1240	TT	3	2	N	✓						✓	✓	✓	✓						
3. 2B/5-2		313	TT	3	1	N	✓						✓	✓		✓						
4. 2B/7-9		315	TT	3	1	N	✓						✓	✓		✓						
5. 2B/0-6		315	TT	3	1	N	✓						✓	✓		✓						
6. 2F/2-3		344	PMW	3	1	N	✓						✓	✓		✓						
7. 2F/1.5-2		344	PMW	3	1	N	✓						✓	✓		✓						
8. 2F/0-6		343	PMW	3	1	N	✓						✓	✓		✓						
9. 2C/0-6		320	TT	3	1	N	✓						✓	✓		✓						
10. 2C/1.5-2		320	TT	3	1	N	✓						✓	✓		✓						

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Ann M. Palmer	2/7/01	2:25pm			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-... 12/95

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St.
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition
PO#: 01-182
Project Name: Kissel Park

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # ______

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	lead 6010	DDT	~~Metals~~						Comments
1. 2E/0-6	2/06/01	335	TT	3	1	N	✓						✓	✓								
2. 2E/.5-2		335	TT	3	1	N	✓						✓	✓								
3. 2H/.5-2		351	TT	3	1	N	✓						✓	✓								
4. 2H/0-6		351	TT	3	1	N	✓						✓	✓								
5. 2D .5-2		330	TT	3	1	N	✓						✓	✓								
6. 2D 2-3		330	TT	3	1	N	✓						✓	✓								
7. 2D/0-6		330	TT	3	1	N	✓						✓	✓								
8. 2G/.5-2		345	TT	3	1	N	✓						✓	✓								
9. 2G/0-6		345	TT	3	1	N	✓						✓	✓								
10. 2G/2-3		345	TT	3	1	N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Ann M. Palmer	2/7/01	2:25pm			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY SVL-COC 12/95

SVL ANALYTICAL, INC.
One Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83827-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

REPORT OF ANALYTICAL RESULTS

CLIENT :Floyd & Snider, Inc.
Sample Receipt : 2/08/01

SVL JOB No. : 96896
Date of Report : 2/21/01

SVL ID	CLIENT SAMPLE ID	Test Method	As 6010B	Pb 6010B	% Sol. 999
S255319	4A/0-6	2/06/01	48.6mg/kg	132mg/kg	82.2%
S255320	4A/.5-2	2/06/01	32.2mg/kg	53.2mg/kg	82.7%
S255321	4A/2-3	2/06/01	20.1mg/kg	33.1mg/kg	81.5%
S255322	4B/0-6	2/06/01	41.7mg/kg	106mg/kg	84.4%
S255323	4B/.5-2	2/06/01	27.0mg/kg	50.1mg/kg	86.6%
S255324	4C/0-6	2/06/01	37.4mg/kg	90.8mg/kg	84.4%
S255325	4C/.5-2	2/06/01	20.8mg/kg	32.4mg/kg	85.4%
S255326	4D/.5-2	2/06/01	40.0mg/kg	44.9mg/kg	91.6%
S255327	4D/2-3	2/06/01	18.4mg/kg	22.0mg/kg	92.7%
S255328	4E/0-6	2/06/01	51.7mg/kg	172mg/kg	84.5%
S255329	4E/.5-2	2/06/01	33.9mg/kg	46.2mg/kg	92.9%
S255330	4F/0-6	2/06/01	61.6mg/kg	213mg/kg	83.9%
S255331	4F/.5-2	2/06/01	47.8mg/kg	65.1mg/kg	91.9%
S255332	4G/0-6	2/06/01	64.8mg/kg	240mg/kg	83.1%
S255333	4G/2-3	2/06/01	17.7mg/kg	11.0mg/kg	93.5%
S255334	4G/.5-2	2/06/01	43.0mg/kg	42.2mg/kg	85.7%
S255335	4H/0-6	2/06/01	52.8mg/kg	196mg/kg	83.7%
S255336	4H/.5-2	2/06/01	39.0mg/kg	59.3mg/kg	93.6%
S255337	4I/0-6	2/06/01	65.1mg/kg	240mg/kg	85.2%
S255338	4I/.5-2	2/06/01	35.8mg/kg	29.6mg/kg	94.1%

Soil Samples: As Received Basis

Reviewed By: Blake Johnson Date: 2/21/01

Part I Prep Blank and Laboratory Control Sample

Client :Floyd & Snider, Inc. SVL JOB No. :96896

Analyte	Method	Matrix	Units	Prep Blank	True LCS	Found LCS	LCS %R	Analysis Date
Arsenic	6010B	SOIL	mg/kg	<1.0	51.1	60.7	118.8	2/21/01
Lead	6010B	SOIL	mg/kg	<0.5	67.1	69.5	103.6	2/21/01
% Solids	999	SOIL	%		N/A		N/A	2/19/01

LEGEND:

LCS = Laboratory Control Sample LCS %R = LCS Percent Recovery N/A = Not Applicable

SVL ANALYTICAL, INC.

Quality Control Report

Part II Duplicate and Spike Analysis

Client :Floyd & Snider, Inc.

SVL JOB No :96896

Test	Method	Matrix	QC SAMPLE ID	Units	Result	Duplicate or MSD Found	RPD%	Matrix Spike Result	SPK ADD	%R	Test Date
As	6010B	SOIL	1	mg/kg	48.6	49.8	2.4	159	100	110.4	2/21/01
As	6010B	SOIL	1	mg/kg	33.9	N/A	N/A	142	100	108.1	2/21/01
Pb	6010B	SOIL	1	mg/kg	132	137	3.7	231	100	99.0	2/21/01
Pb	6010B	SOIL	1	mg/kg	46.2	N/A	N/A	146	100	99.8	2/21/01
% Sol.	999	SOIL	1	%	82.2	82.2	0.0	N/A	N/A	N/A	2/12/01

LEGEND:

RPD% = (¦SAM - DUP¦/((SAM + DUP)/2) * 100) UDL = Both SAM & DUP not detected. *Result or *Found: Interference reqired dilution.

RPD% = (¦SPK - MSD¦/((SPK + MSD)/2) * 100) M in Duplicate/MSD column indicates MSD.

SPIKE ADD column, A = Post Digest Spike; %R = Percent Recovery N/A = Not Analyzed; R > 4S = Result more than 4X the Spike Added

QC Sample 1: SVL SAM No.: 255319 Client Sample ID: 4A/0-6

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:
1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition
PO#: 01-182
Project Name: Kissel Park

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

FOR SVL USE ONLY
SVL JOB # 96896

Samplers Signature:

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection: Date	Collection: Time	Miscellaneous: Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Preservative(s): Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Analyses Required: Arsenic 6010	Lead 6010	DDT	Metals	Comments
1. 4A/0-6	2/06/01	12:20	TT	3	1	N	✓						✓	✓		✓	
2. 4A/.5-2		12 20	TT	3	1	N	✓						✓	✓		✓	
3. 4A/2-3		12 20	TT	3	1	N	✓						✓	✓		✓	
4. 4B/0-6		1230	PMW	3	1	N	✓						✓	✓		✓	
5. 4B/.5-2		1231	PMW	3	1	N	✓						✓	✓		✓	
6. 4C/0-6		1239	PMW	3	1	N	✓						✓	✓		✓	
7. 4C/.5-2		1240	PMW	3	1	N	✓						✓	✓		✓	
8. 4D/.5-2		1241	TT	3	1	N	✓						✓	✓		✓	
9. 4D/2-3		1242	TT	3	1	N	✓						✓	✓		✓	
10. 4E/0-6	↓	1250	TT	3	1	N	✓						✓	✓			

Relinquished by: Ann M. Palmer Date: 2/7/01 Time: 2:25pm Received by: Date: Time:
Relinquished by: Date: Time: Received by: Date: Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

SVL ANALYTICAL

CHAIN OF CUSTODY RECORD

Client: Fulcrum
Contact: Travis Trent
Address: 122 S Third St
Yakima, WA 98901
Phone Number: (509) 574-0839
FAX Number: (509) 575-8453

NOTES:

1) Ensure proper container packaging.
2) Ship samples promptly following collection.
* 3) Designate Sample Reject Disposition

PO#: 01-182
Project Name: Kessel Park

Table 1. – Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil/Sediment, 4 = Rinsate, 5 = Oil
6 = Waste, 7 = Other (Specify) ______

Samplers Signature:

FOR SVL USE ONLY
SVL JOB # ______

Lab Name: SVL Analytical, Inc. (208) 784-1258 FAX (208) 783-0891
Address: One Government Gulch, Kellogg, ID 83837-0929

Sample ID	Collection Date	Collection Time	Collected by: (Init.)	Matrix Type From Table 1	No. of Containers	Sample Filtered ? Y/N	Unpreserved (Ice Only)	HNO3	HCL	H2SO4	NAOH	Other (Specify)	Arsenic 6010	Lead 6010	DDT	~~Metals~~						Comments
1. 4E/.5-2	2/6/01	1251	TT	3	1	N	✓						✓	✓								
2. 4F/0-6		1254	TT	3	1	N	✓						✓	✓								
3. 4F/.5-2		1255	TT	3	1	N	✓						✓	✓								
4. 4G/0-6		100	TT	3	1	N	✓						✓	✓								
5. 4G/2-3		103	TT	3	1	N	✓						✓	✓								
6. 4G/.5-2		102	TT	3	1	N	✓						✓	✓								
7. 4H/0-6		102	TT	3	1	N	✓						✓	✓								
8. 4H/.5-2		107	TT	3	1	N	✓						✓	✓								
9. 4I/0-6		110	TT	3	1	N	✓						✓	✓								
10. 4I/.5-2		110	TT	3	1	N	✓						✓	✓								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Ann M. Palmer	2/7/01	2:25pm			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: [ ] Return [ ] Dispose [ ] Store (30 Days)

ATTACHMENT F

PLSA'S REPORT

PLSA ENGINEERING & SURVEYING

BRADLEY J. CARD, P.E.
JAMES A. PERRY, P.E.
LOUIE W. WISHERT, JR., PLS
RICHARD L. WEHR, PLS

February 12, 2001

Ms. Peggy Williamson
Fulcrum Environmental Consulting, Inc.
122 South Third Street
Yakima, WA 98901

Re: Kissel Park

Dear Peggy,

PLSA recently monitored excavation of four test pits spaced over the 17 acre Kissel Park and logged the soils encountered. During test pit excavation, in-place field density, field moisture content, and per cent air voids were measured at one foot, 3 feet, and 6 feet below ground surface. Results of these measurements and test pit logs referenced by grid location are enclosed.

Test Pit No. 1 (Grid 1C) was excavated in silt topsoil to 16 inches below the surface where an impervious stratum of strongly cemented silt, sand, and gravel was encountered. This soil is not excavatable using a tractor mounted backhoe and is typical of volcanic mudflow which is common in many parts of Central Washington. This test pit location was in the northwest corner of Kissel Park and was not typical of the other three test pits used to characterize the area.

Soils encountered in the remaining three test pits were nearly identical and contained a layer of silt topsoil followed by increasingly cemented silts down to 6 feet below the surface where excavation was terminated in each case. Cementing creates a soil structure which is usually destroyed when the soil is disturbed. Cemented silt is not uncommon in Yakima County and PLSA engineers have had vast experience with characteristics of these soils. This experience has found that a moderate degree of cementing does not necessarily affect vertical permeability. Silts in Yakima County are typically non-plastic and exhibit a high degree of capillarity and moderate water holding capacity.

1120 West Lincoln Avenue • Yakima, Washington 98902 • (509) 575-6990 • FAX (509) 575-6993

Mrs. Helen McKenzie was raised on a farm bordering the Kissel Park property on the west. She has recollection of the property being a hayfield in 1948.

Copies of the results of gradation analysis performed on samples from test pits 2, 3, and 4 in accordance with ASTM D-422 are enclosed.

Thank you for allowing us to have been of service.

Sincerely,

Brad Card

Brad Card, P.E.
Principal Engineer

BC:jc
Enclosure

PLSA ENGINEERING & SURVEYING
1120 WEST LINCOLN AVENUE
YAKIMA, WA 90902
(509) 575-6990

LOG OF TEST PIT NO.: 1

BY: BJC
JOB NO. J01036
LOCATION: KISSEL PARK GRID NO. 1C

DATE: 02/07/01
ELEVATION:

SURFACE CONDITIONS: GRASS AND WEEDS

DEPTH IN FEET	MOISTURE CONTENT %	UNIT WEIGHT	SAMPLE	SYMBOL	DESCRIPTION	REMARKS
1				ML	SILT TOPSOIL	(DRY)
2					FIRMLY CEMENTED SILT, SAND & GRAVEL	(DRY)
3					EXCAVATION TERMINATED	
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

PLSA ENGINEERING & SURVEYING
1120 WEST LINCOLN AVENUE
YAKIMA, WA 90902
(509) 575-6990

LOG OF TEST PIT NO.: 2

BY: BJC
JOB NO. J01036
LOCATION: KISSEL PARK GRID NO. 5G

DATE: 02/08/01
ELEVATION:

SURFACE CONDITIONS: GRASS AND WEEDS

DEPTH IN FEET	MOISTURE CONTENT %	UNIT WEIGHT	SAMPLE	SYMBOL	DESCRIPTION	REMARKS
1				ML	SILT TOPSOIL, BROWN	(MOIST)
2						
3						
4				ML	PARTIALLY CEMENTED SILT, TAN	(MOIST)
5						
6				ML	PARTIALLY CEMENTED SILT, GRAY	(MOIST)
7					EXCAVATION TERMINATED	
8						
9						
10						
11						
12						
13						
14						
15						

PLSA ENGINEERING & SURVEYING
1120 WEST LINCOLN AVENUE
YAKIMA, WA 90902
(509) 575-6990

LOG OF TEST PIT NO.: 3

BY: BJC
JOB NO. J01036
LOCATION: KISSEL PARK GRID NO. 2K

DATE: 02/08/01
ELEVATION:

SURFACE CONDITIONS: GRASS AND WEEDS

DEPTH IN FEET	MOISTURE CONTENT %	UNIT WEIGHT	SAMPLE	SYMBOL	DESCRIPTION	REMARKS
1				ML	SILT TOPSOIL, BROWN	(MOIST)
2						
3					PARTIALLY CEMENTED SILT TAN	(DRY)
4				ML		
5						
6				ML	FIRMLY CEMENTED SILT	(DRY)
7					EXCAVATION TERMINATED	
8						
9						
10						
11						
12						
13						
14						
15						

PLSA ENGINEERING & SURVEYING
1120 WEST LINCOLN AVENUE
YAKIMA, WA 90902
(509) 575-6990

LOG OF TEST PIT NO.: 4

BY: BJC
JOB NO. J01036
LOCATION: KISSEL PARK GRID NO. 6B

DATE: 02/08/01
ELEVATION:

SURFACE CONDITIONS: GRASS AND WEEDS

DEPTH IN FEET	MOISTURE CONTENT %	UNIT WEIGHT	SAMPLE	SYMBOL	DESCRIPTION	REMARKS
1				ML	SILT TOPSOIL	(MOIST)
2 3				ML	PARTIALLY CEMENTED SILT, LT. TAN	(MOIST)
4 5 6				ML	PARTIALLY CEMENTED SILT LT. GRAY	(DRY)
7 8 9 10 11 12 13 14 15					EXCAVATION TERMINATED	

PLSA Engineering and Surveying

1120 West Lincoln Ave.
Yakima, WA 98902
(509) 575-6990

Project:
Job #: JD10316
Date: 2.8.00
Performed By: S. ALDER

FIELD MEASURE'M'T Nuclear Relative Density Test Data
ASTM D2922

Test Number										
Location	5-G			2-K			6-B			
Elevation	-1'	-3	-6	-1	-3	-6	-1	-3	-6	
Mode / Depth										
% Oversize										
Soil Description										
Wet Density	91.5	95.8	95.1	88.6	88.3	91.7	89.7	87.3	82.2	
Air Void (%)	34.2	23.7	23.3	38.7	37.6	35.4	38.4	42.3	41.2	
Dry Density	80.1	76.5	74.9	79.9	[illegible]	79.6	81.4	81.4	81.7	
% Moisture	14.3	25.3	20.1	8.7	9.8	15.2	10.2	7.3	7.9	
Max Obj. Density										
Opt. Moisture										
% Relative Comp.										

Standard Count

Density:	
Moisture:	

Remarks:

PLSA Engineering and Surveying
1210 West Lincoln Ave.
Yakima, WA 98902
(509) 575-6990

Project: KISSEL PARK
Job #: J01037
Date: 2/10/01
Performed By: J.C.
Sampled By: S.A.

Gradation Analysis

ASTM C136

Screen Size	Wght. Retained	% Retained	% Passing	Specifications
3/8"	0	0	100	
No. 4	.8	.3	99.8	
No. 8	3.0	.6	99.2	
No. 16	6.4	1.3	97.9	
No. 30	11.9	2.3	95.6	
No. 50	22.1	4.3	91.3	
No. 100	24.2	4.7	86.6	
No. 200	44.3	8.7	77.9	
PAN	308.1	77.9		

Sample Wght: 510.8
Sample Number:
Sample Date: 2/8/01
Sample Source: ZK
Sample Description: W/ CALICHE

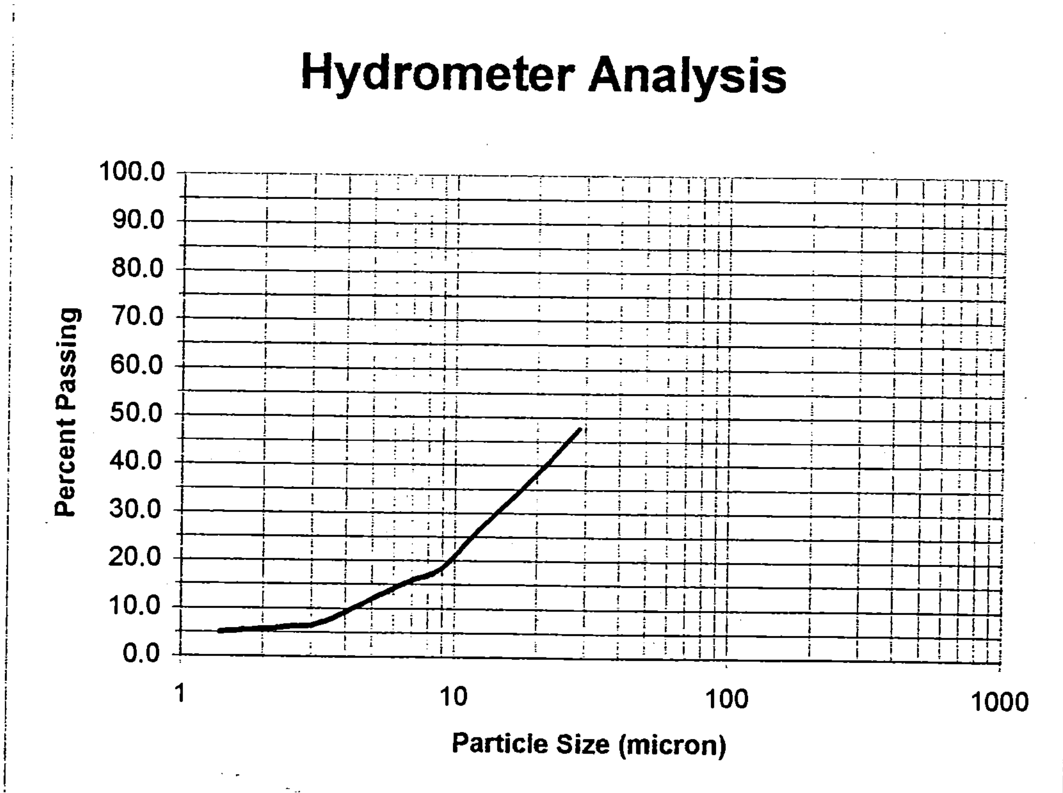
Wash	
Wght. Before Wash:	510.8
Wght. After Wash:	121.7
Wght. Washed Thru 200:	389.1

PLSA Engineering and Surveying
1120 West Lincoln Avenue
Yakima, WA 98901
Phone (509) 575-6990 Fax (509) 575-6993

HYDROMETER ANALYSIS

Job Name Kissel Park Job Num. J01037
Soil Type
Sample # 2K Spec Grav 2.63 Hydrometer Type 152H
Dry Wt (g) 89.2 Temp. (C) 21 Meniscus Correction 1
Temp. Correction 0.4 Zero Correction 3

Time	Reading	R_{cp}	% Finer	R_{cL}	L (cm)	A	D (μm)
2	45	42.4	47.8	46	8.9	0.01350	28
5	36	33.4	37.6	37	10.4	0.01350	19
15	26	23.4	26.4	27	12	0.01350	12
30	19	16.4	18.5	20	13.2	0.01350	9
60	16	13.4	15.1	17	13.7	0.01350	6
240	9	6.4	7.2	10	14.8	0.01350	3
480	8	5.4	6.1	9	15	0.01350	2
1440	7	4.4	5.0	8	15.2	0.01350	1



PLSA Engineering and Surveying
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Yakima, WA 98902
(509) 575-6990

Project: KISSEL PARK
Job #: JO1037
Date: 2/10/01
Performed By: Y.C.
Sampled By: S. A.

Gradation Analysis

ASTM C136

Screen Size	Wght. Retained	% Retained	% Passing	Specifications
3/8"	0	0	100	
No. 4	1.3	.2	99.8	
No. 8	43.0	8.2	91.6	
No. 16	16.7	3.2	88.4	
No. 30	11.2	2.1	86.3	
No. 50	17.7	3.4	82.9	
No. 100	33.4	6.4	76.5	
No 200	35.1	6.7	69.8	
PAN	365.6	69.8		

Sample Wght: 524.0
Sample Number
Sample Date: 2/8/01
Sample Source: 6B
Sample Description: W/CALICHE

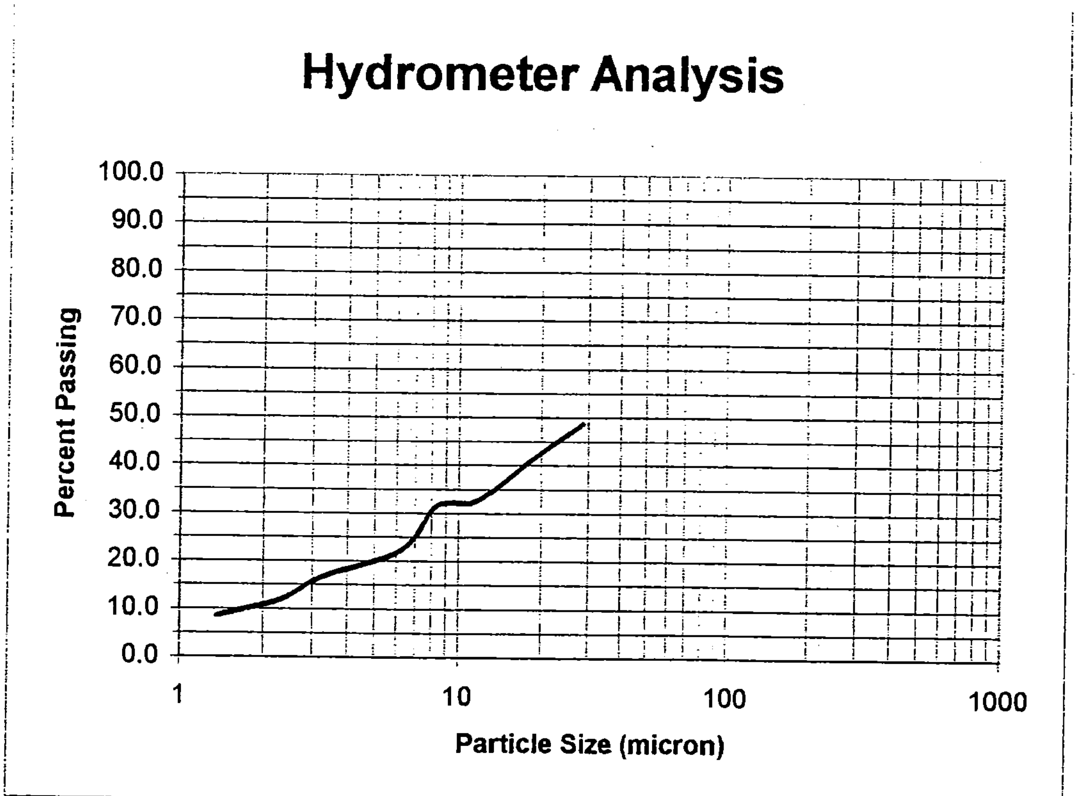
Wash	
Wght. Before Wash:	524.0
Wght. After Wash:	162.5
Wght. Washed Thru 200:	361.5

PLSA Engineering and Surveying
1120 West Lincoln Avenue
Yakima, WA 98901
Phone (509) 575-6990 Fax (509) 575-6993

HYDROMETER ANALYSIS

Job Name Kissel Park Job Num. J01037
Soil Type
Sample # 6B Spec Grav 2.63 Hydrometer Type 152H
Dry Wt (g) 87.5 Temp. (C) 21 Meniscus Correction 1
Temp. Correction 0.4 Zero Correction 3

Time	Reading	R_{cp}	% Finer	R_{cL}	L (cm)	A	D (µm)
2	45	42.4	48.7	46	8.9	0.01350	28
5	39	36.4	41.8	40	9.9	0.01350	19
15	31	28.4	32.6	32	11.2	0.01350	12
30	30	27.4	31.5	31	11.4	0.01350	8
60	22	19.4	22.3	23	12.7	0.01350	6
240	17	14.4	16.5	18	13.5	0.01350	3
480	13	10.4	11.9	14	14.2	0.01350	2
1440	10	7.4	8.5	11	14.7	0.01350	1



PLSA Engineering and Surveying
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Yakima, WA 98902
(509) 575-6990

Project: KISSEL PARK
Job #: J01037
Date: 2/10/01
Performed By: J.C.
Sampled By: S.A.

Gradation Analysis

ASTM C136

Screen Size	Wght. Retained	% Retained	% Passing	Specifications
3/8"	0	0	100	
No. 4	1.2	.2	99.8	
No. 8	.3	.1	99.7	
No. 16	2.2	.4	99.3	
No. 30	3.9	.8	98.5	
No 50	31.7	6.3	92.2	
No 100	79.8	15.6	76.6	
No. 200	18.5	3.6	73.0	
PAN	372.5	73.0		

Sample Wght: 510.2
Sample Number
Sample Date: 2/8/01
Sample Source: 5G
Sample Description: SOME GRAVEL

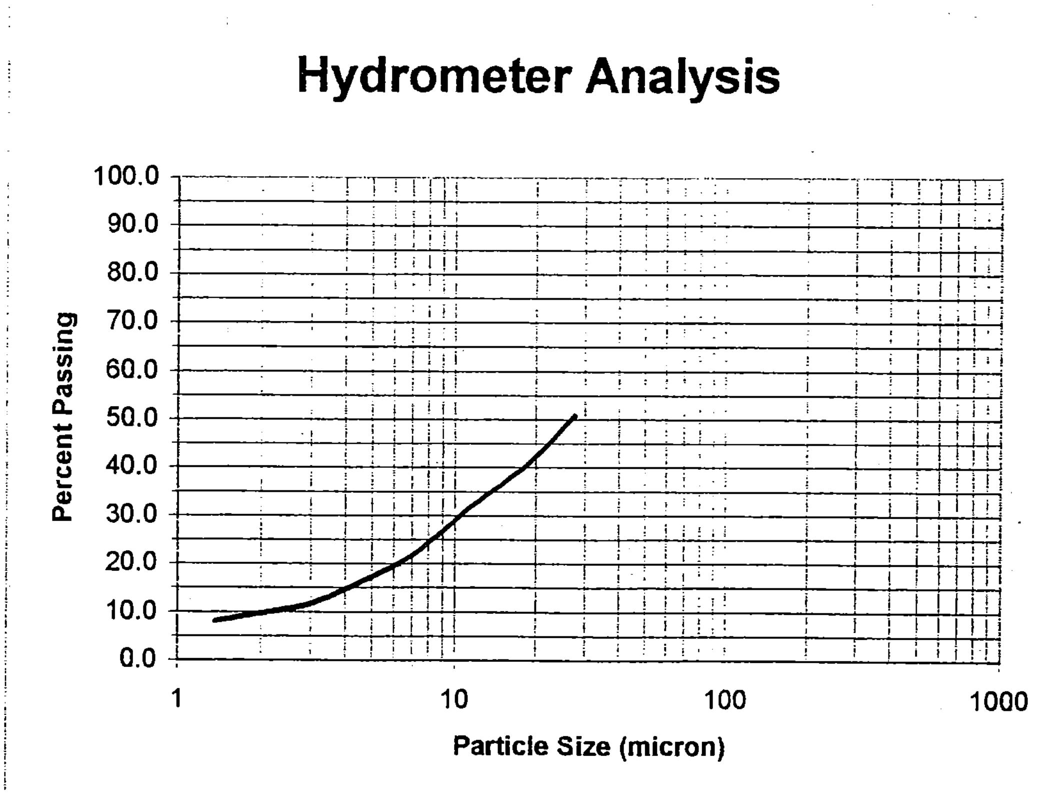
Wash	
Wght. Before Wash:	510.1
Wght. After Wash:	150.4
Wght. Washed Thru 200:	359.7

PLSA Engineering and Surveying
1120 West Lincoln Avenue
Yakima, WA 98901
Phone (509) 575-6990 Fax (509) 575-6993

HYDROMETER ANALYSIS

Job Name Kissel Park Job Num. J01037
Soil Type
Sample # 5G Spec Grav 2.63 Hydrometer Type 152H
Dry Wt (g) 91.8 Temp. (C) 21 Meniscus Correction 1
Temp. Correction 0.4 Zero Correction 3

Time	Reading	R_{cp}	% Finer	R_{cL}	L (cm)	A	D (μm)
2	49	46.4	50.8	50	8.3	0.01350	28
5	40	37.4	40.9	41	9.7	0.01350	19
15	32	29.4	32.2	33	11.1	0.01350	12
30	26	23.4	25.6	27	12	0.01350	9
60	21	18.4	20.1	22	12.9	0.01350	6
240	14	11.4	12.5	15	14	0.01350	3
480	12	9.4	10.3	13	14.3	0.01350	2
1440	10	7.4	8.1	11	14.7	0.01350	1



Kissel Park

Remedial Investigation/ Feasibility Study and Cleanup Action Plan

Appendix C
Deep Tilling Pilot Test

FINAL

Appendix C
Deep Tilling Pilot Test

Ecology Approved Work Plan

Floyd & Snider Inc. 83 South King Street Suite 614 Seattle, Washington 98104 206.292.2078 Fax 682.7867
Strategy and Technical Solutions
for Contaminated Properties

Memorandum

To: Rick Roeder, Department of Ecology, Central Office

Copies: Denise Nichols, City of Yakima Parks and Rec. ; Konrad Liegel, PrestonGates &Ellis

From: Tom Colligan

Date: 4/2/01

Re: **Pilot Test Scope of Work for Kissel Park Cleanup**

This memo outlines the objectives and details of the pilot test to evaluate soil tilling methodologies. It has been slightly modified from the draft to incorporate your comments. The pilot testing is currently scheduled to occur during the week of April 16th.

Background

In accordance with the Kissel Park Agreed Order between the Washington Department of Ecology and the City of Yakima (the City), the City will perform a pilot study of cost-effective soil treatment technologies. The purpose of the pilot study is to evaluate the effectiveness, from both a cost and technical perspective, of various technologies for remediation of site soils. Ecology hopes that the information gained will be applicable to the statewide issue of how to best treat low-level pesticide contamination in former agricultural lands now being converted for alternative uses.

Floyd & Snider Inc., as consultant for the City, will perform the pilot test activities specified below in concert with their field subcontractor, Fulcrum Environmental, and local earthwork contractors.

Nature of the Problem

Arsenic is the contaminant of concern at this site. The arsenic, being more mobile than lead, was found at concentrations above the 20 mg/kg cleanup level down to depths of 3 feet. Over most of the site, however, arsenic was found to be concentrated in the upper 2 feet of soil. Along the westernmost border of the site, arsenic concentrations above the cleanup level were only found in the upper 6" of soil. Underlying concentrations decline to background levels of approximately 10 mg/kg in soil deeper than 3 feet.

Objective

The primary objective is to field test a number of low-cost soil mixing methodologies for remediation of lead and arsenic in former agricultural lands. The idea is to completely mix the shallow more contaminated soil with deeper, lower concentration soil so the arsenic concentrations in the blended soil zone is below the cleanup level. This technique offers a permanent cleanup solution. However, its application is limited to the depth in which soil can be effectively mixed using available equipment. If the average concentration in the mixing or till zone exceeds the cleanup level, this methodology cannot be used.

Methodologies Evaluated

A variety of different methods of mixing shallow soils were examined. Sources of information were heavy equipment manufacturers and dealers, soils engineers, farmers, and road construction contractors. Four options were determined to be potentially feasible. They are:

1. Motor Grader: A road grader uses a snow-plow type blade to scrape off soil. The excess soil gets turned over during discharge from the far end of the blade. With multiple passes, each one successively deeper, a grader may be able to cost effectively blend soil to depths of 18". Motor graders are readily available in the Yakima area.

2. Road Reclaimer/Stabilizer: These machines use teeth on a rotating mandrel to crush and mix existing asphalt pavement (or a layer of chemical additive) with underlying base soil in preparation for a new pavement. Machines with cut depths of up to 20" are manufactured. These machines are not available in the Yakima area but several are located in Western Washington with cut depths to 16".

3. Roto-Tiller: A roto-tiller mounted on a tractor can effectively mix soil. However, mixing depths are limited to 14", even for the largest, heavy duty tillers manufactured locally. Roto-tillers with effective mixing depths deeper then 8" are rare in the Yakima area and in Washington State in general. One heavy duty tiller was located in the Yakima area with an effective depth greater then 8".

4. Plows: Plows have the ability to invert and mix soils. These are typically termed moldboard or switch plows. However, effective depths are typically limited to 8-12". To be able to plow to deeper depths of around 16", the soil may first need to be ripped and need successive passes. Inversion plows and soil rippers are available in the Yakima area.

Field Testing

Each of the above options will be field tested in two areas, each measuring approximately 100' x 200', at locations show on Figure 1. Within each, a series of five parallel strips will be staked out. Each strip will be separated by about 2'. The two test plot areas were selected for different reasons. The one to the west oriented N-S was selected because this area shows a large drop in concentration in arsenic between the surface (0-6") and shallow (0.5-2') soil. A large drop in concentration is desired as it makes the evaluation of data easier in samples collected before and after mixing. The second reason for selection of this area is to see if site soil can actually be remediated to below cleanup levels. This area of the site has average arsenic concentrations that are at or below the cleanup level in the upper 18" of soil. At the other site locations, the average concentrations in the upper 18" likely exceeds 20 mg/kg, so field testing in these areas could only be conducted for evaluation purposes only.

The second test plot is located in the northeastern corner of the site. This plot is oriented E-W. It was selected to evaluate horizontal mixing efficiency as this area shows either decreasing gor increasing arsenic concentrations in an E-W direction. Also, the sample density in this area is greater than the other parts of the site.

Analytical Testing

To accurately characterize lead and arsenic concentrations prior to and after field testing, samples will be collected from a minimum of four equally spaced locations within each plot. At each location in the test plot, samples will be collected at three successive 6" intervals down to 18" (i.e.- 0-6", 6-12", 12-18"). Samples will be analyzed for lead and arsenic. Following field testing, samples will be collected from the same locations at the same depth intervals within the mixed zone. Therefore, for each plot tested, a maximum of 24 samples will be collected (Note: the final number of samples analyzed may be limited by budget). Samples will be collected using a shovel to excavate a hole to 18". A spoon will be used to scrap soil from each depth interval into a stainless steel bowl for homogenization.

Evaluation Criteria

The following criteria will be evaluated. Results will be included in the Focused Feasibility Study for Kissel Park.

- Depth of Disturbance- What is the maximum depth to which soil is disturbed for each technique?

Given that the silt soils at the site are slightly cemented, this will be evaluated after each pass by simply using a shovel to dig down to harder, undisturbed soil directly below the disturbed soil zone.

- Mixing efficiency- How many passes are required for soil to be completely homogenized in the disturbed zone?

This will be accomplished by spreading a 4' wide layer of colored plastic beads or similar distinct granular material across the length of each test plots. Upon each pass with the machinery, the beads will become homogenized into the underlying soil (except with the road grader which will push the soil to the side). After each pass, a series of shovel holes will be dug to examine the relative distribution with depth of the beads into the underlying or redistributed soil. This will give a rough estimate as to the mixing efficiency of each pass.

- Final efficiency- How do the starting and final arsenic and lead concentrations compare?

This will be determined using the data from the soil samples.

- Dust Generation-

The amount of dust generated by each technique relative to each other will be noted as well as a discussion of how easy each will be to control in a full scale application.

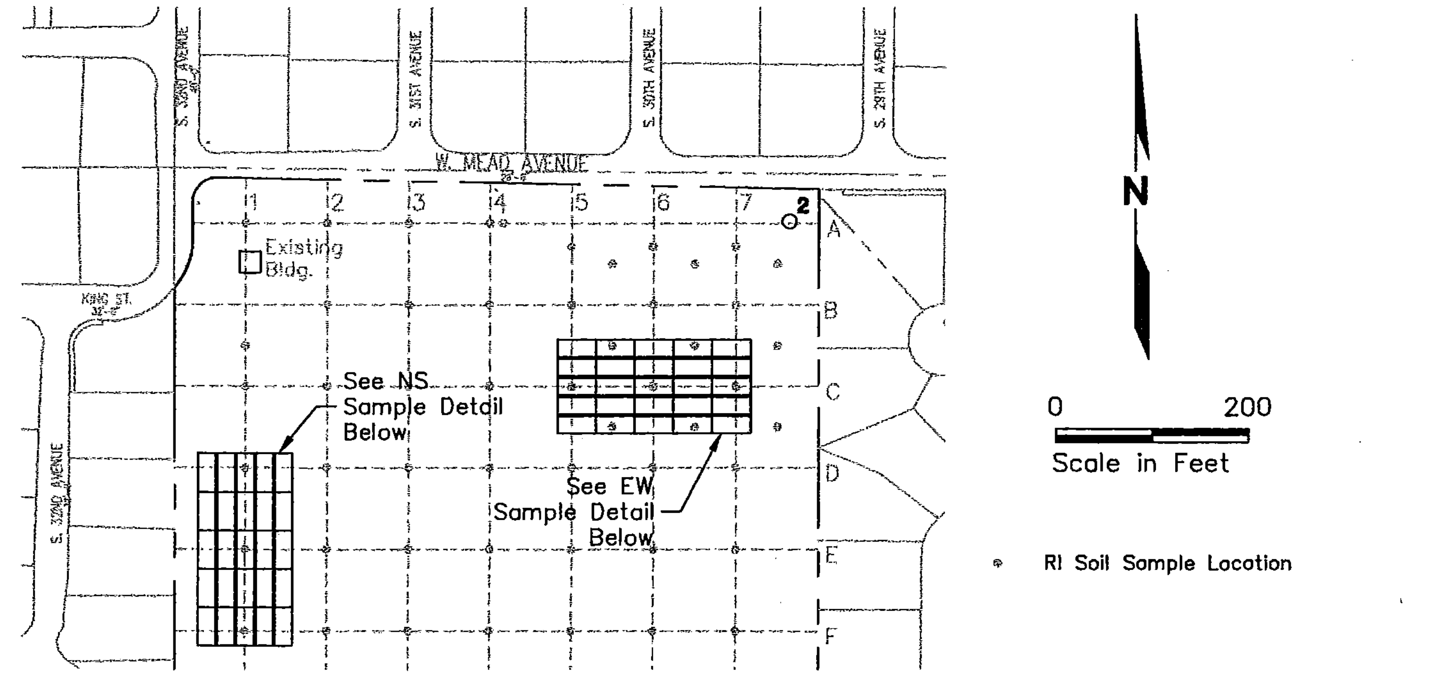
- Cost- What is the cost per acre for each?

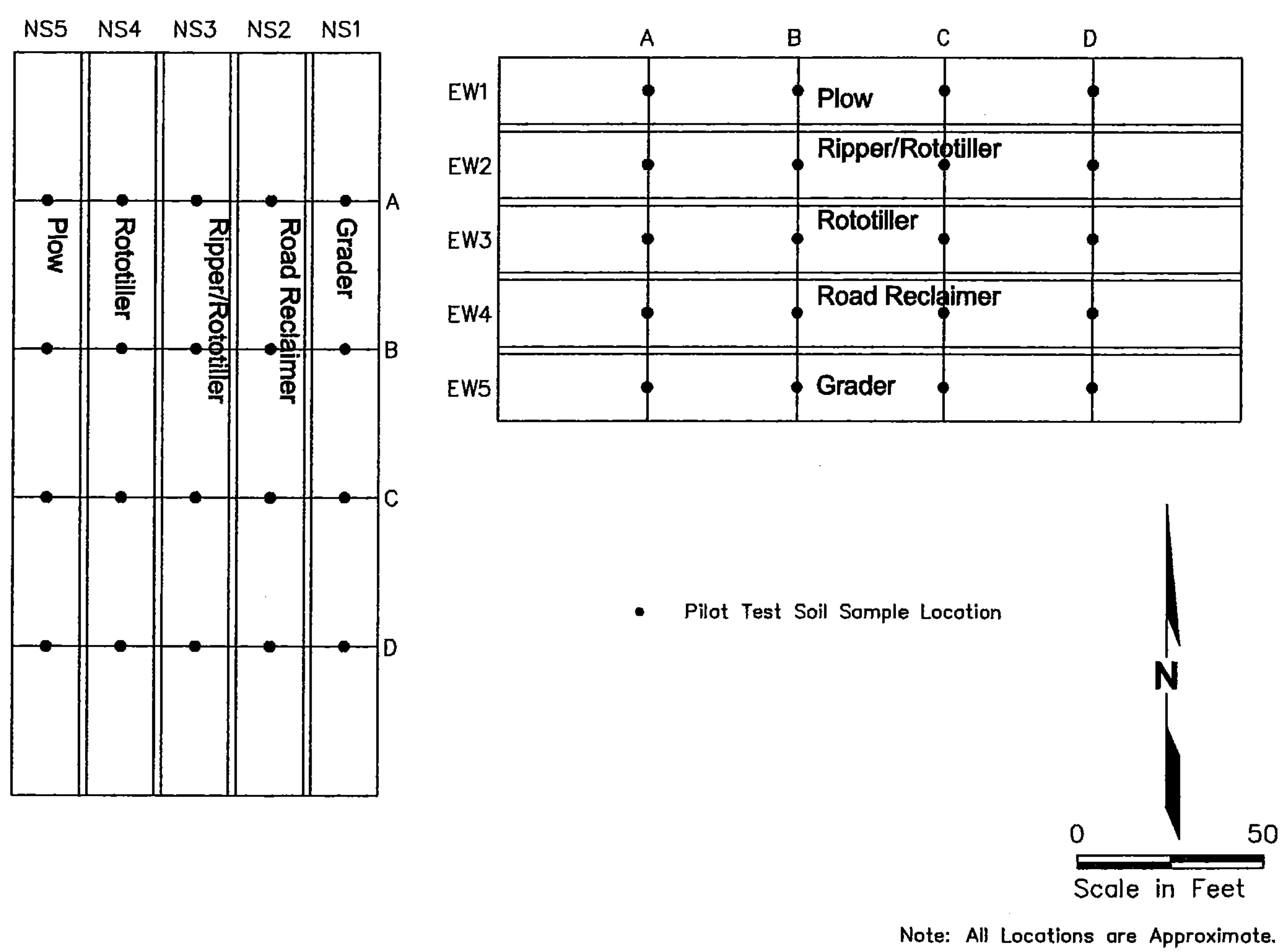
This will be evaluated based on combined standard equipment rates with the necessary number of passes to achieve effective mixing.

- Availibiltiy- The regional and seasonal availability of each piece of machinery will be determined.

Appendix C
Deep Tilling Pilot Test

Figure 1
Pilot Test Plots and Analytical Data





		NORTH-SOUTH TEST PLOT			
		ARSENIC		LEAD	
Method	Sample ID	Before	After	Before	After
Grader	NS1–A1	33.3	27.3	152	123
Grader	NS1–A2	34.0	28.4	161	134
Grader	NS1–A3	22.9	22.8	63.8	74.2
Grader	NS1–B1	27.1	26.7	121	108
Grader	NS1–B2	29.2	24.0	128	93.3
Grader	NS1–B3	21.9	23.3	51.9	46.5
Grader	NS1–C1	25.3	25.0	108	107
Grader	NS1–C2	25.5	13.6	113	40.2
Grader	NS1–C3	15.6	8.40	40.1	15.3
Grader	NS1–D1	25.2	30.2	124	128
Grader	NS1–D2	14.4	28.0	16.7	102
Grader	NS1–D3	23.5	13.6	97.7	19.3
Reclaimer	NS2–A1	30.9	17.3	129	85.8
Reclaimer	NS2–A2	29.8	19.3	115	93.3
Reclaimer	NS2–A3	19.4	15.0	74.6	69.1
Reclaimer	NS2–B1	27.9	19.0	124	83.3
Reclaimer	NS2–B2	21.7	21.0	95.3	86.7
Reclaimer	NS2–B3	20.1	18.4	69.6	69.1
Reclaimer	NS2–C1	22.8	18.3	94.7	75.9
Reclaimer	NS2–C2	22.1	18.1	94.0	71.1
Reclaimer	NS2–C3	18.1	12.3	64.9	43.5
Reclaimer	NS2–D1	26.7	19.0	121	71.6
Reclaimer	NS2–D2	26.4	19.1	122	71.7
Reclaimer	NS2–D3	21.9	14.7	58.8	45.5
Rip/Roto	NS3–A1	21.6	24.3	98.4	99.1
Rip/Roto	NS3–A2	20.7	23.2	89.8	97.9
Rip/Roto	NS3–A3	23.3	22.2	95.5	93.3
Rip/Roto	NS3–B1	19.9	20.9	81.0	80.4
Rip/Roto	NS3–B2	19.3	14.2	79.1	45.6
Rip/Roto	NS3–B3	16.3	10.8	65.2	27.0
Rip/Roto	NS3–C1	18.9	31.8	77.9	88.0
Rip/Roto	NS3–C2	19.0	21.6	79.1	85.9
Rip/Roto	NS3–C3	12.6	21.2	40.5	64.9
Rip/Roto	NS3–D1	21.1	24.2	88.8	96.1
Rip/Roto	NS3–D2	20.8	23.3	92.9	96.0
Rip/Roto	NS3–D3	13.7	23.0	35.9	83.8
Rototiller	NS4–A1	22.2	23.5	93.5	97.7
Rototiller	NS4–A2	21.0	23.3	90.7	97.0
Rototiller	NS4–B1	16.9	21.9	70.3	84.4
Rototiller	NS4–B2	20.5	22.1	81.3	84.0
Rototiller	NS4–C1	20.0	22.3	78.2	87.0
Rototiller	NS4–C2	20.5	21.9	82.3	87.5
Rototiller	NS4–D1	19.8	21.3	78.1	83.3
Rototiller	NS4–D2	18.0	21.2	70.9	82.9
Plow	NS5–A1	19.7	24.9	88.7	105
Plow	NS5–A2	20.5	24.7	94.3	102
Plow	NS5–B1	17.1	18.6	63.6	62.5
Plow	NS5–B2	16.2	17.1	56.4	51.6
Plow	NS5–C1	19.8	19.2	66.6	68.6
Plow	NS5–C2	21.8	18.8	89.0	66.0
Plow	NS5–D1	17.1	18.9	67.1	71.2
Plow	NS5–D2	16.1	18.4	52.1	67.4

		EAST-WEST TEST PLOT			
		ARSENIC		LEAD	
Method	Sample ID	Before	After	Before	After
Plow	EW1–A1	49.8	49.5	215	206
Plow	EW1–A2	57.7	56.1	252	226
Plow	EW1–B1	32.3	34.6	199	196
Plow	EW1–B2	41.1	40.1	217	240
Plow	EW1–C1	15.8	21.6	104	152
Plow	EW1–C2	28.4	19.8	147	121
Plow	EW1–D1	12.9	17.1	108	120
Plow	EW1–D2	12.6	15.1	87.2	95.1
Rip/Roto	EW2–A1	41.5	53.1	234	233
Rip/Roto	EW2–A2	38.7	54.2	238	238
Rip/Roto	EW2–A3	34.1	54.6	125	234
Rip/Roto	EW2–B1	22.8	42.1	156	177
Rip/Roto	EW2–B2	30.8	47.2	220	202
Rip/Roto	EW2–B3	35.4	51.0	169	218
Rip/Roto	EW2–C1	16.5	15.0	148	125
Rip/Roto	EW2–C2	11.8	9.55	109	66.8
Rip/Roto	EW2–C3	12.5	9.07	91.7	48.0
Rip/Roto	EW2–D1	19.9	24.6	179	204
Rip/Roto	EW2–D2	24.5	23.6	257	196
Rip/Roto	EW2–D3	24.5	41.4	191	277
Rototiller	EW3–A1	42.2	48.8	244	209
Rototiller	EW3–B1	34.2	36.4	192	234
Rototiller	EW3–C1	22.6	18.7	151	133
Rototiller	EW3–D1	15.7	16.2	106	121
Reclaimer	EW4–A1	54.1	54.0	235	222
Reclaimer	EW4–A2	57.6	46.3	255	204
Reclaimer	EW4–A3	48.5	41.9	191	156
Reclaimer	EW4–B1	33.9	45.5	217	230
Reclaimer	EW4–B2	31.2	50.3	213	243
Reclaimer	EW4–B3	48.7	41.7	239	236
Reclaimer	EW4–C1	25.4	36.3	202	229
Reclaimer	EW4–C2	19.0	38.6	151	243
Reclaimer	EW4–C3	46.2	29.1	335	167
Reclaimer	EW4–D1	9.75	18.7	82.1	151
Reclaimer	EW4–D2	12.6	20.5	98.1	163
Reclaimer	EW4–D3	39.5	21.0	370	191
Grader	EW5–A1	47.4	58.7	200	208
Grader	EW5–A2	52.8	46.6	228	160
Grader	EW5–A3	46.2	20.0	152	40.1
Grader	EW5–B1	45.2	31.8	214	164
Grader	EW5–B2	38.4	53.1	151	237
Grader	EW5–B3	37.9	52.7	135	75.8
Grader	EW5–C1	16.0	30.9	109	153
Grader	EW5–C2	19.7	39.3	143	187
Grader	EW5–C3	75.6	64.7	226	337
Grader	EW5–D1	17.3	20.8	110	135
Grader	EW5–D2	9.79	11.4	43.0	43.5
Grader	EW5–D3	56.1	9.34	286	42.4

Notes: 1. Sample IDs Ending with:
1 indicates 0"–6" Sample Depth
2 indicates 6"–12" Sample Depth
3 indicates 12"–18" Sample Depth

2. All results in mg/kg

Floyd & Snider Inc.

Kissel Park
Yakima, Washington

Appendix C, Figure 1
Pilot Test Plots and Analytical Data

DATE: G:\project\Clients\Floyd and Snider\PRO_KISSEL\kissel007.dwg
DWG NAME: 05/18/01 08:59am

Appendix C
Deep Tilling Pilot Test

Photographs

Figure 1: View of N - S test plots following soil ripping (center) and road reclaiming (far left)

Figure 2: Road grader at E - W test plot.

Figure 3: Road grader test plot after cutting to 18 inches.

Figure 4: Switch plow at N - S test plot.

Figure 5: Road reclaimer at N - S test plot.

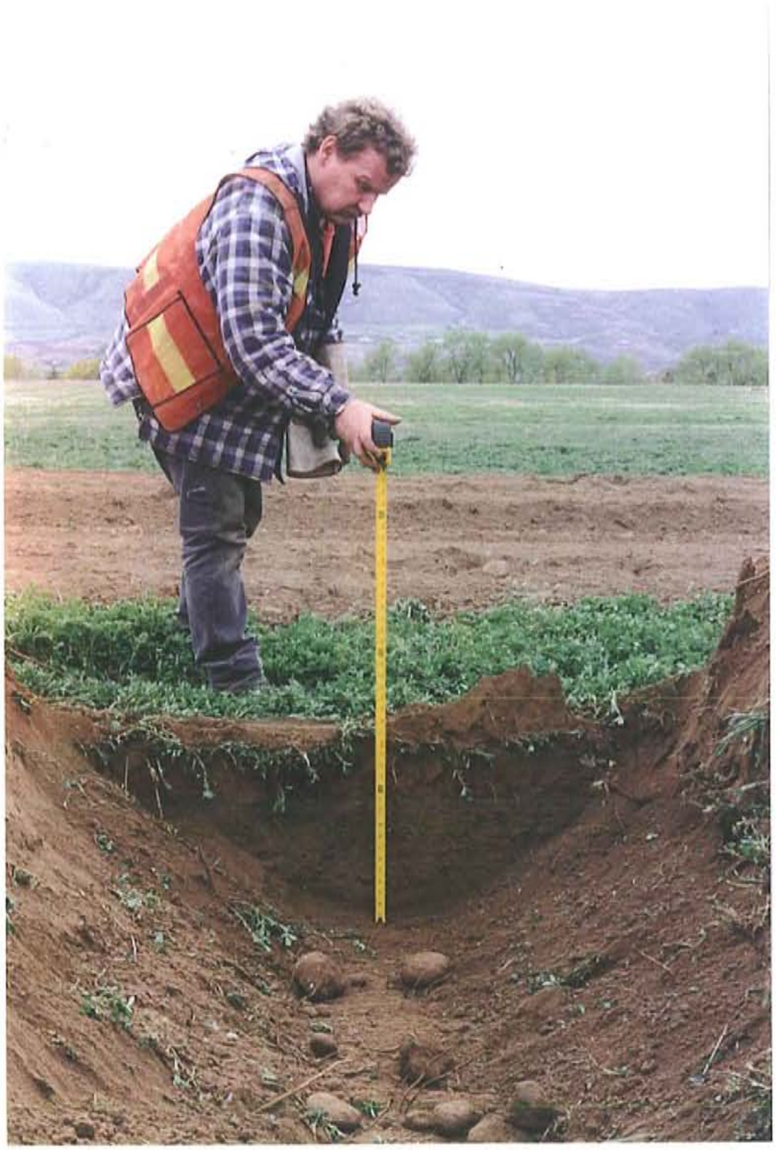


Figure 6: Measuring cut depth of road reclaimer.

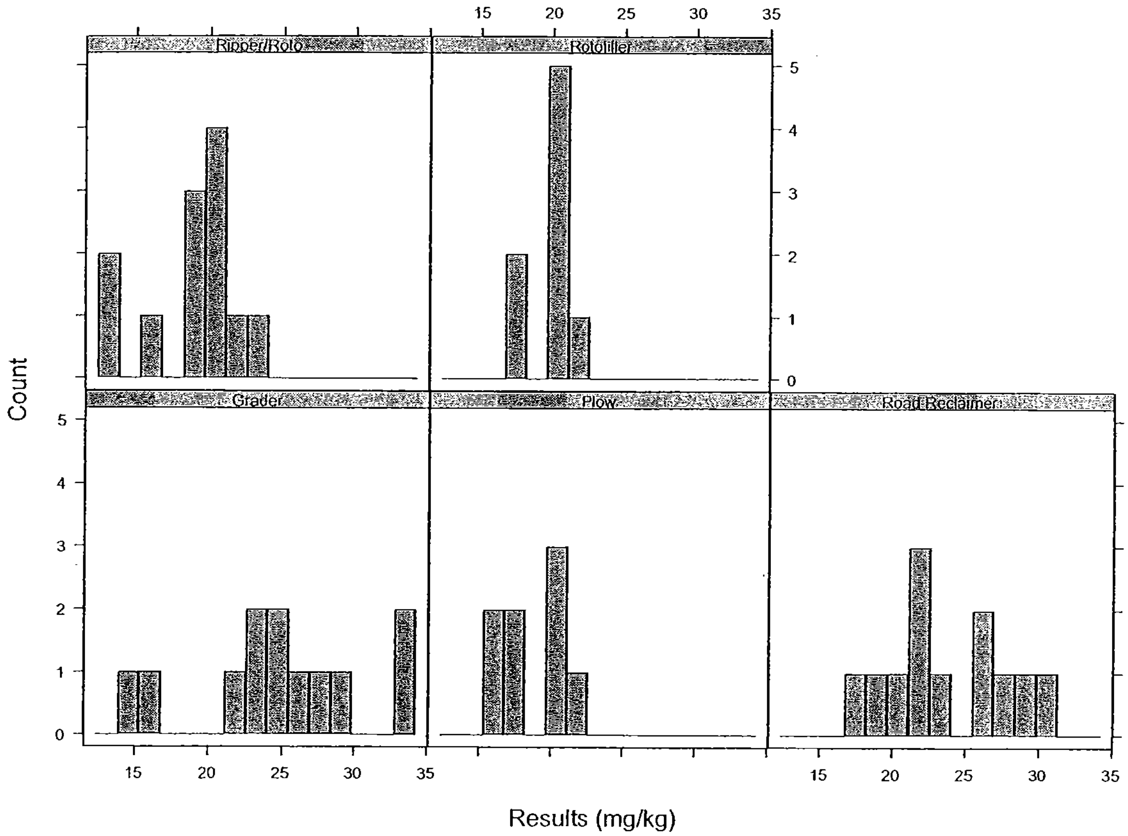
Figure 7: Soil ripping prior to roto-tilling.

Figure 8: Roto-tiller at N - S test plot: steel mesh in back of tiller acts to smooth soil.

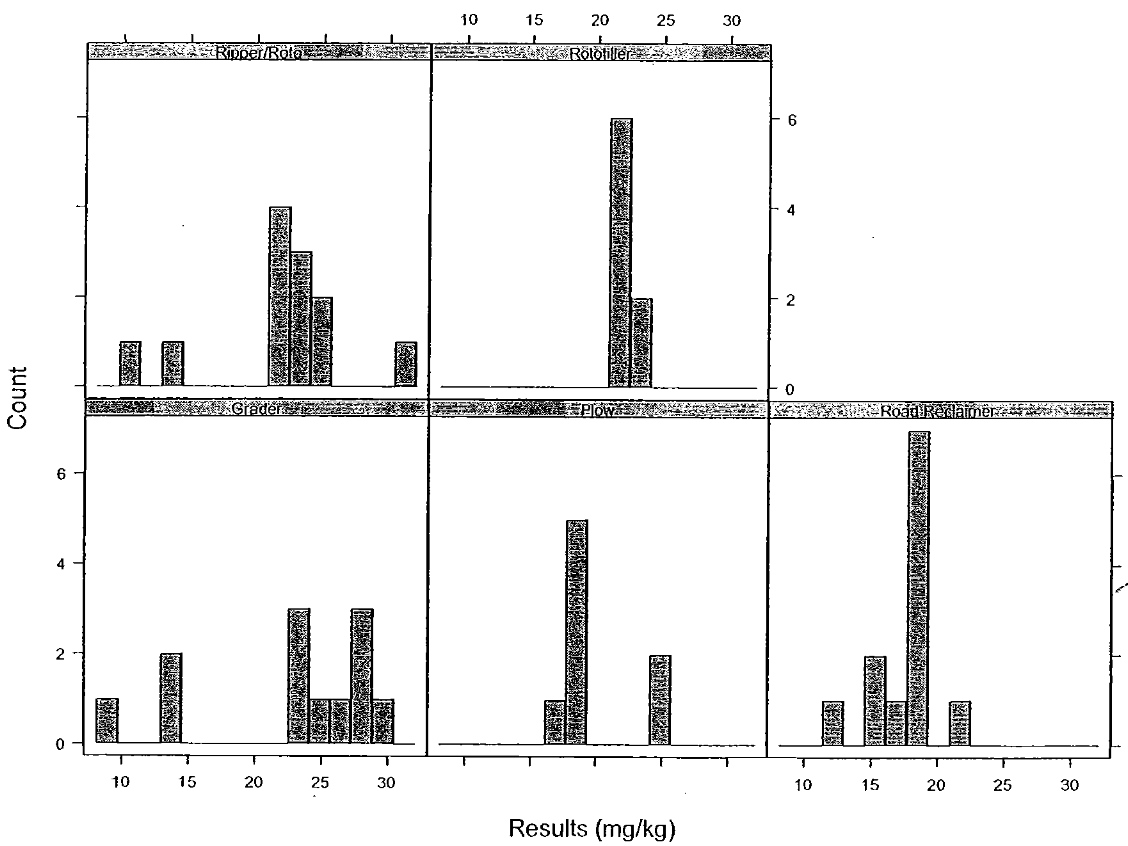
Appendix C
Deep Tilling Pilot Test

Histograms

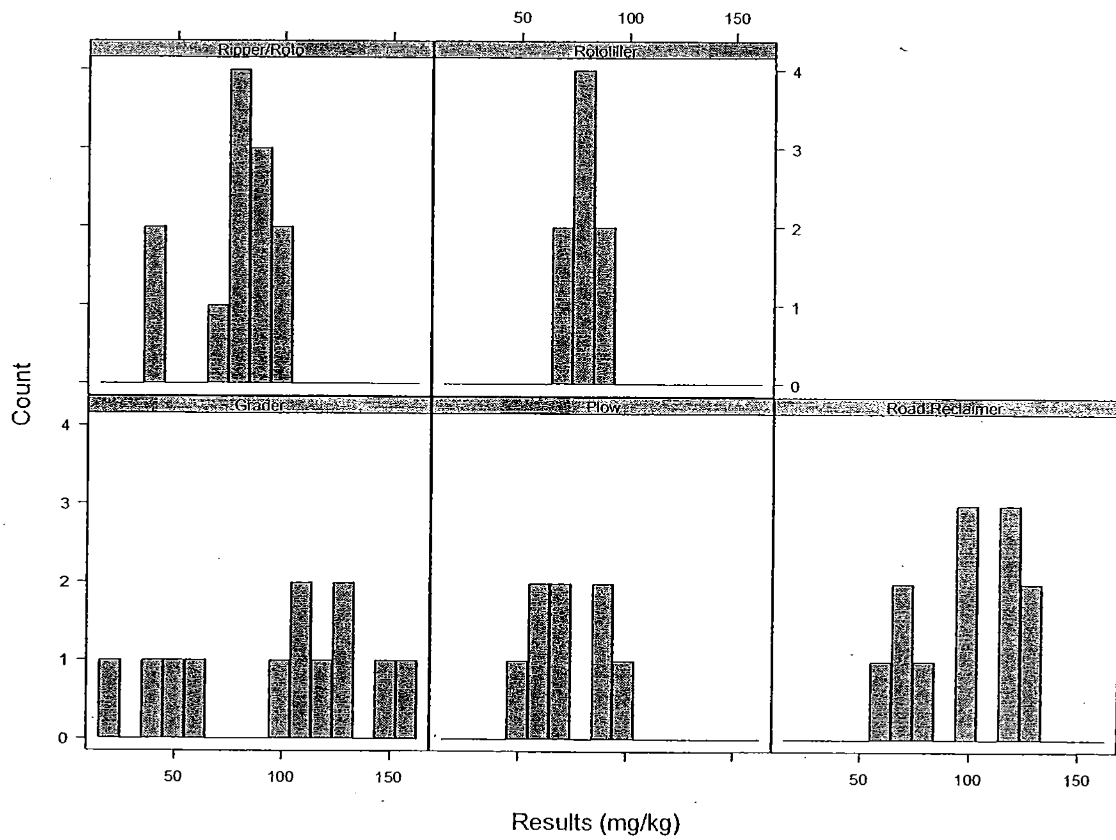
Pre-tilling Arsenic Concentration Histograms, NS Test Plot



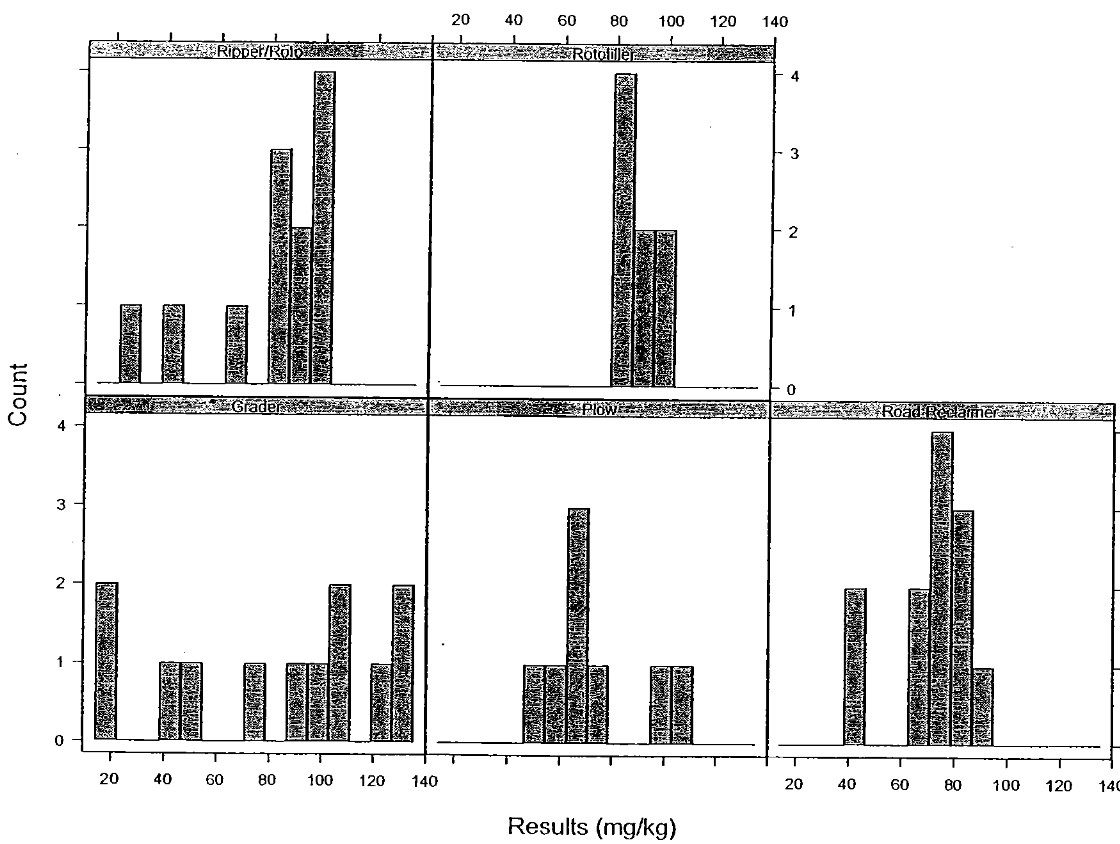
Post-tilling Arsenic Concentrations Histograms, NS Test Plot

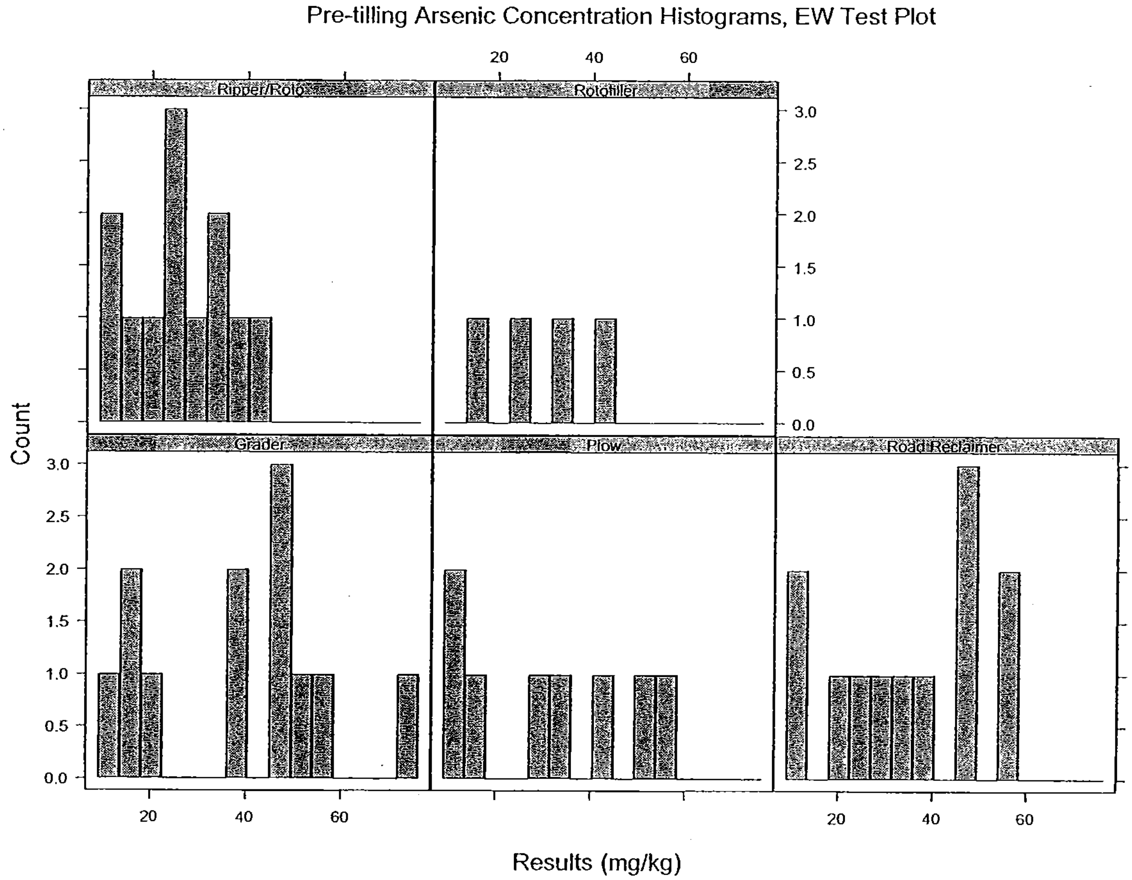


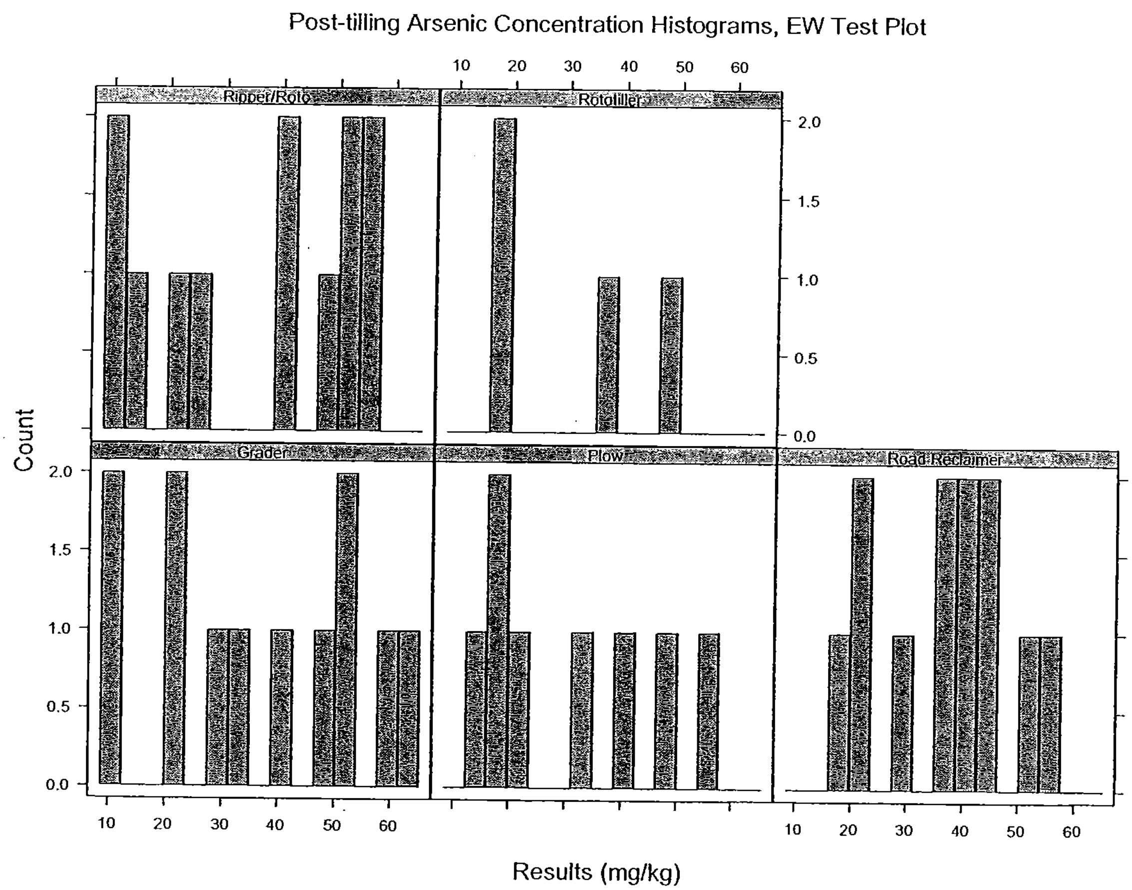
Pre-tilling Lead Concentration Histograms, NS Test Plot



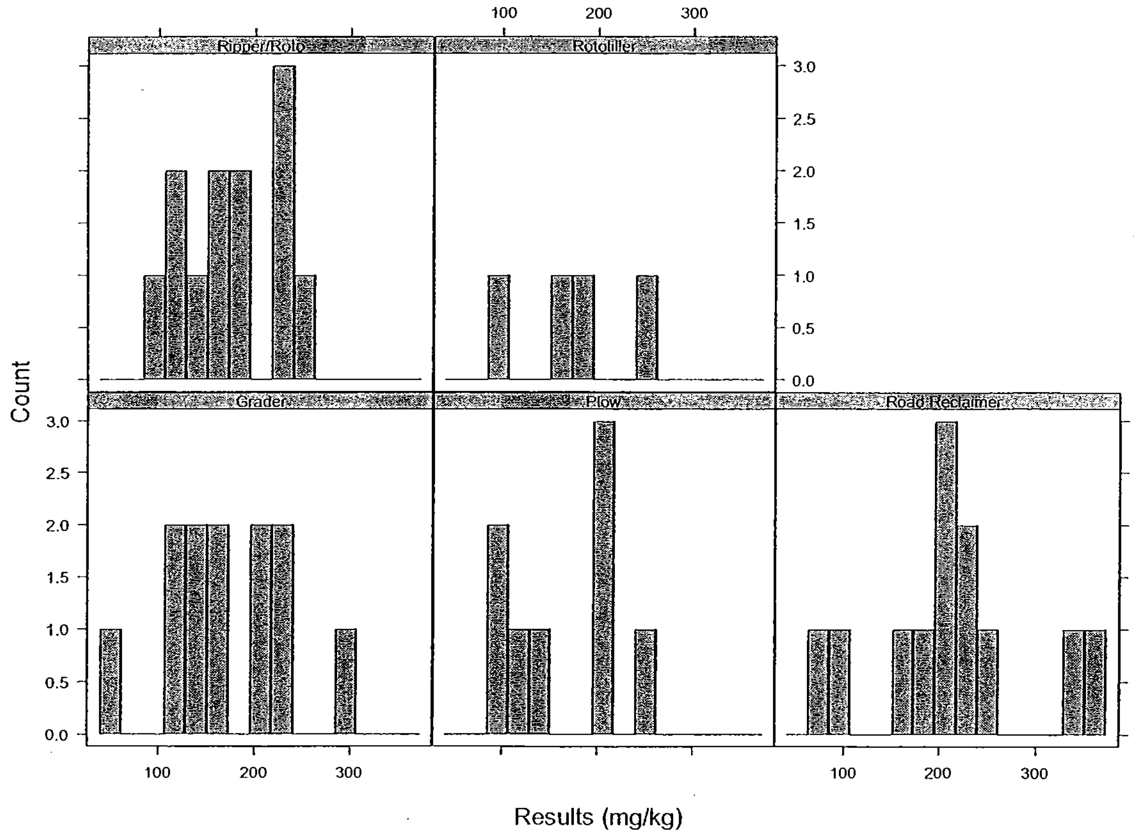
Post-tilling Lead Concentration Histograms, NS Test Plot



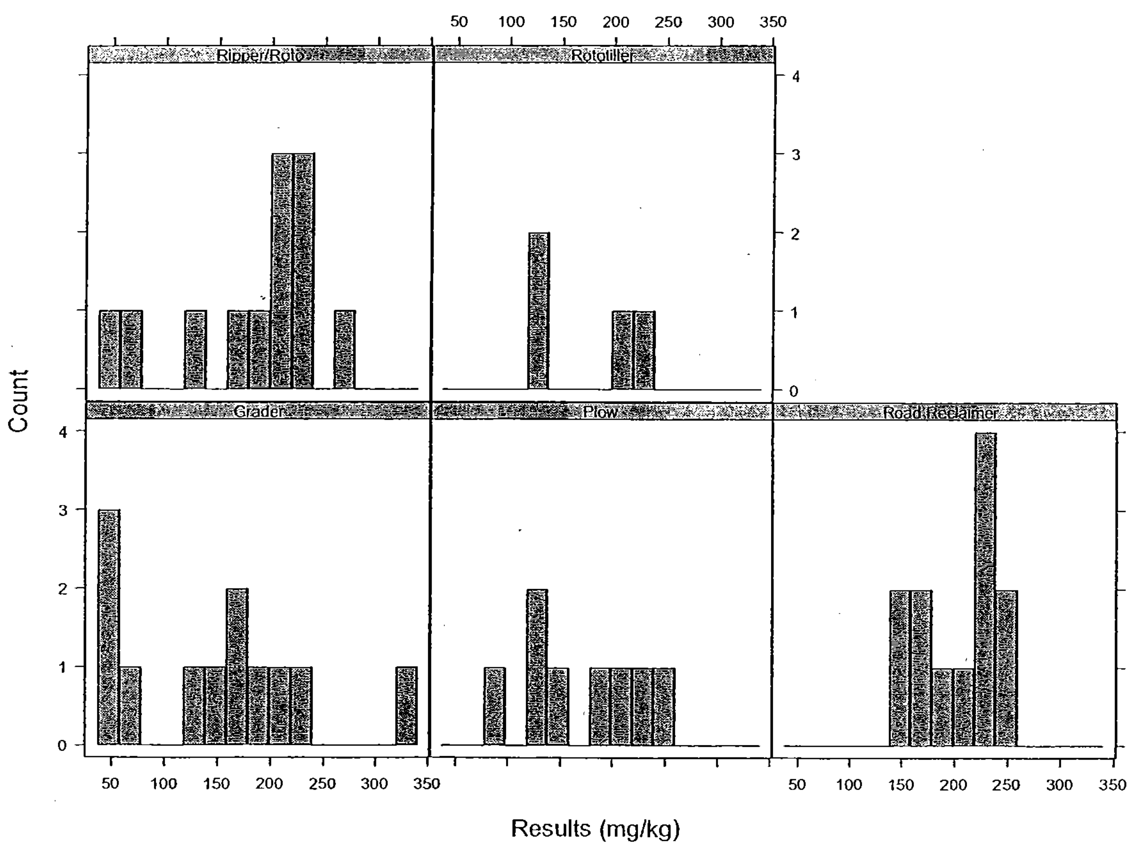

Pre-tilling Arsenic Concentration Histograms, EW Test Plot
Ripper/Roto
Rototiller
Grader
Plow
Road Reclaimer
Count
Results (mg/kg)

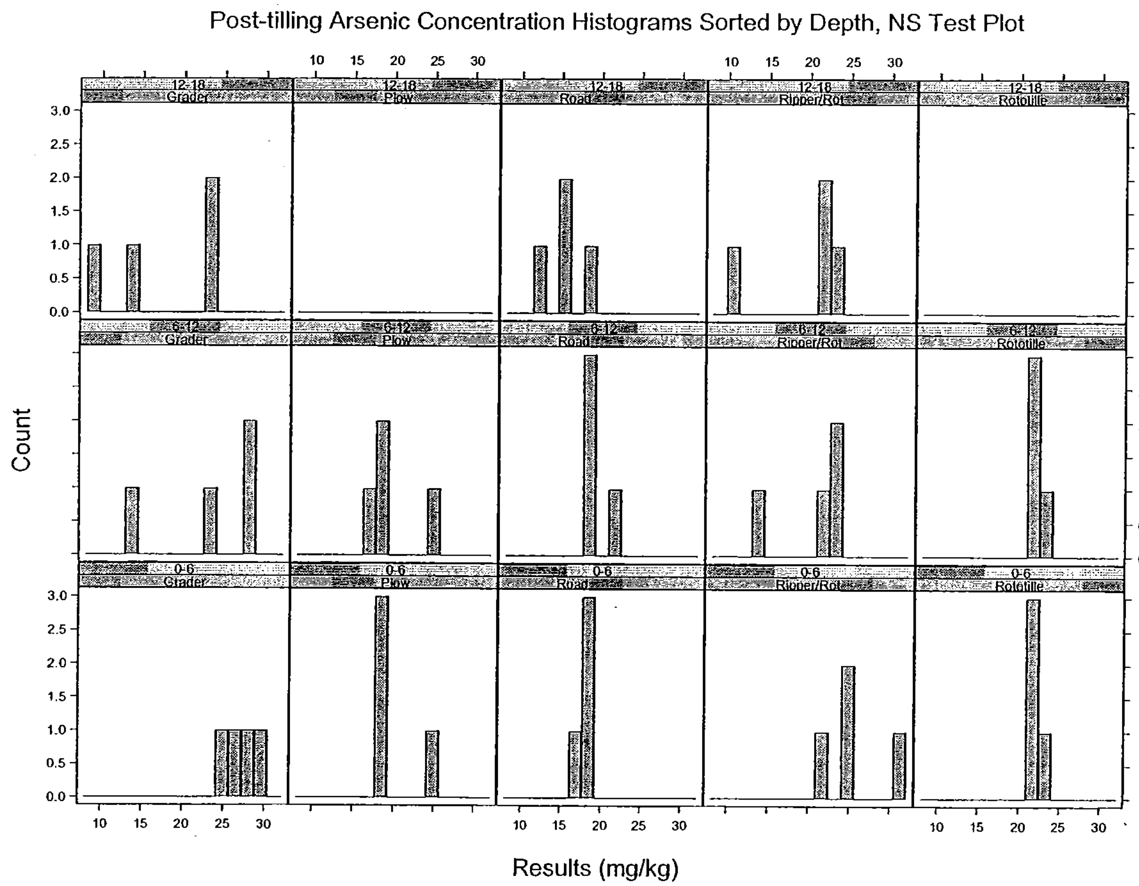

Post-tilling Arsenic Concentration Histograms, EW Test Plot
Ripper/Roto
Rototiller
Grader
Plow
Road Reclaimer
Count
Results (mg/kg)

Pre-tilling Lead Concentration Histograms, EW Test Plot

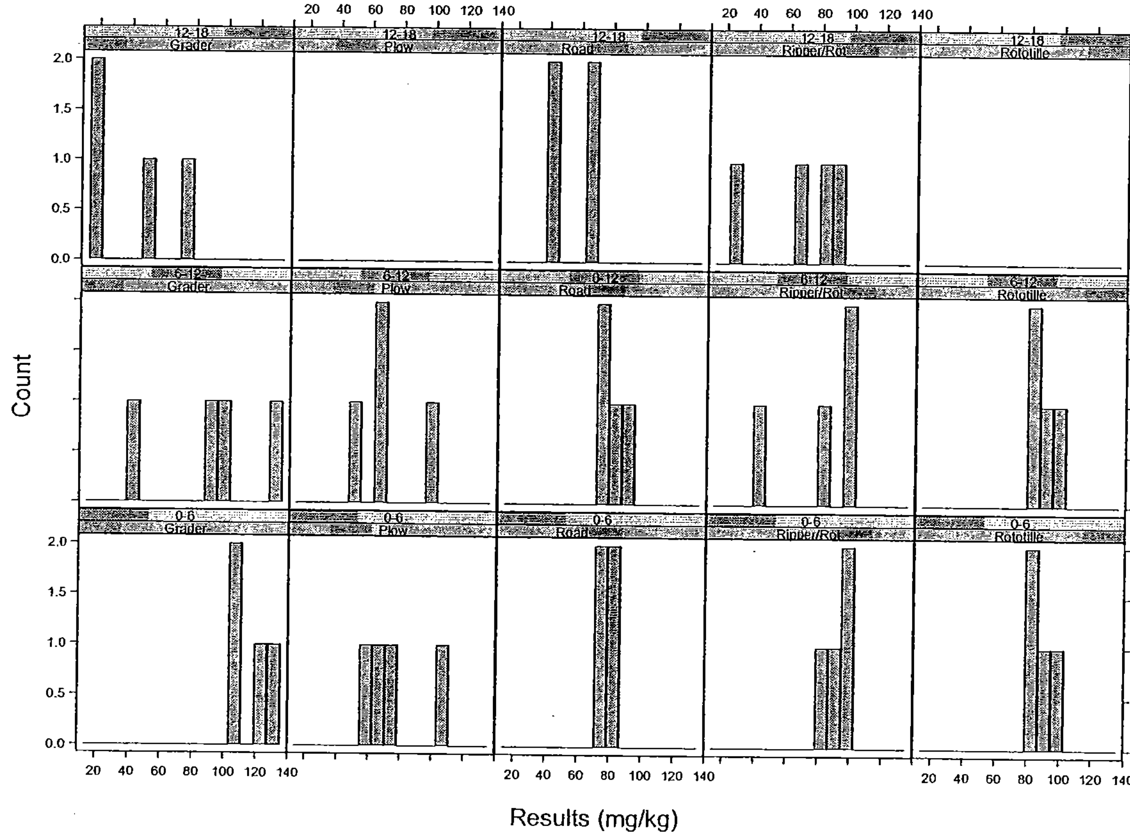


Post-tilling Lead Concentration Histograms, EW Test Plot

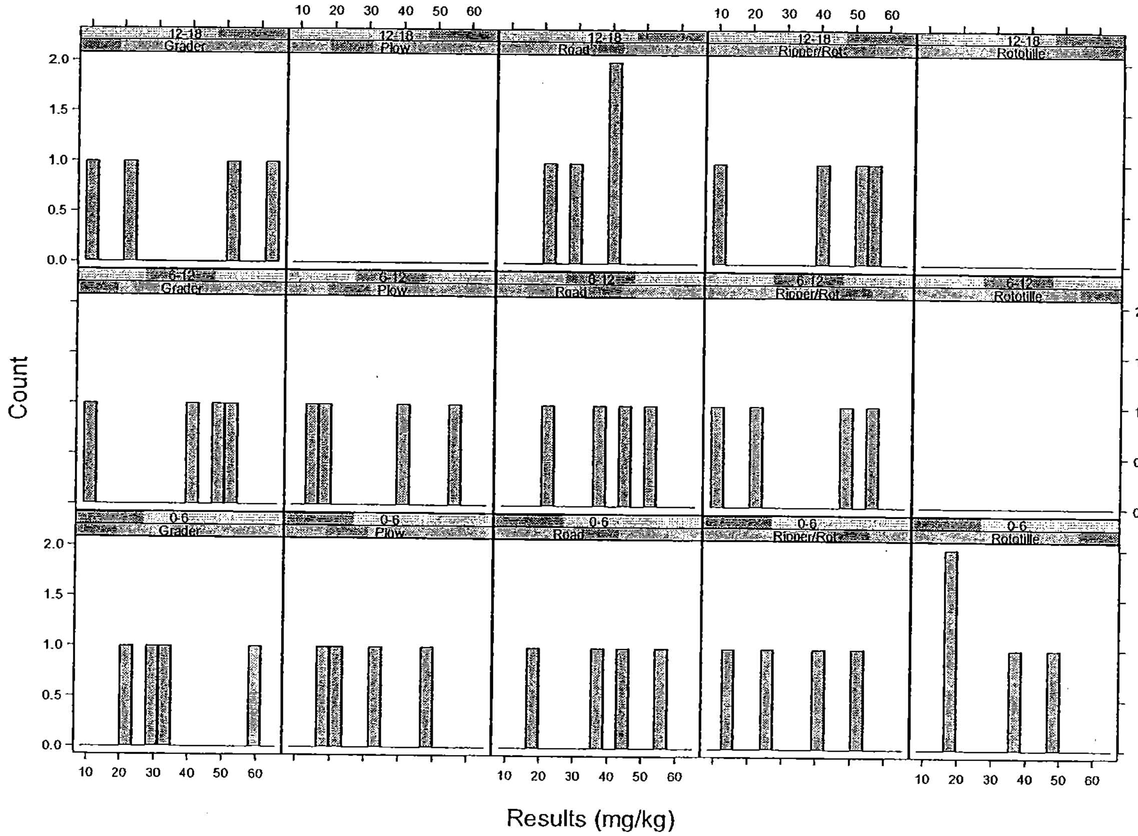



Post-tilling Arsenic Concentration Histograms Sorted by Depth, NS Test Plot
Count
Results (mg/kg)
12-18
6-12
0-6
Grader
Plow
Road
Ripper/Rot
Rototille
0.0
0.5
1.0
1.5
2.0
2.5
3.0
10
15
20
25
30

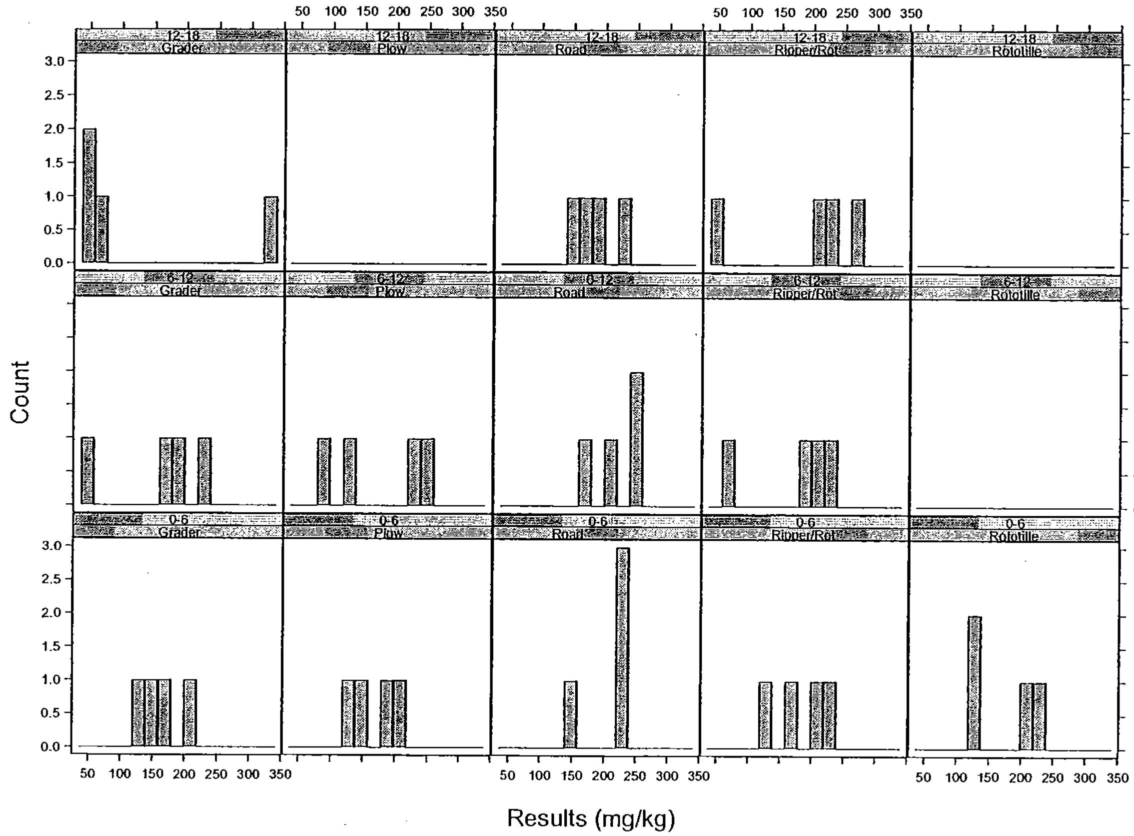
Post-tilling Lead Concentration Histograms Sorted by Depth, NS Test Plot



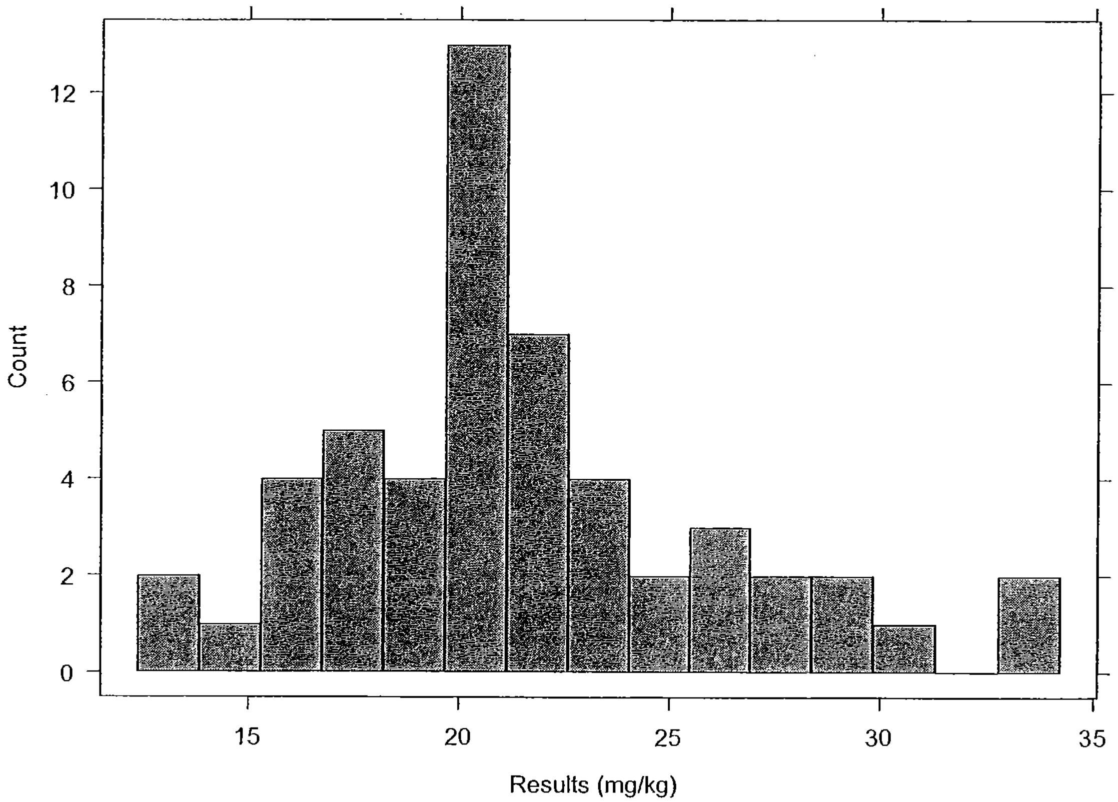
Post-tilling Arsenic Concentration Histograms Sorted by Depth, EW Test Plot



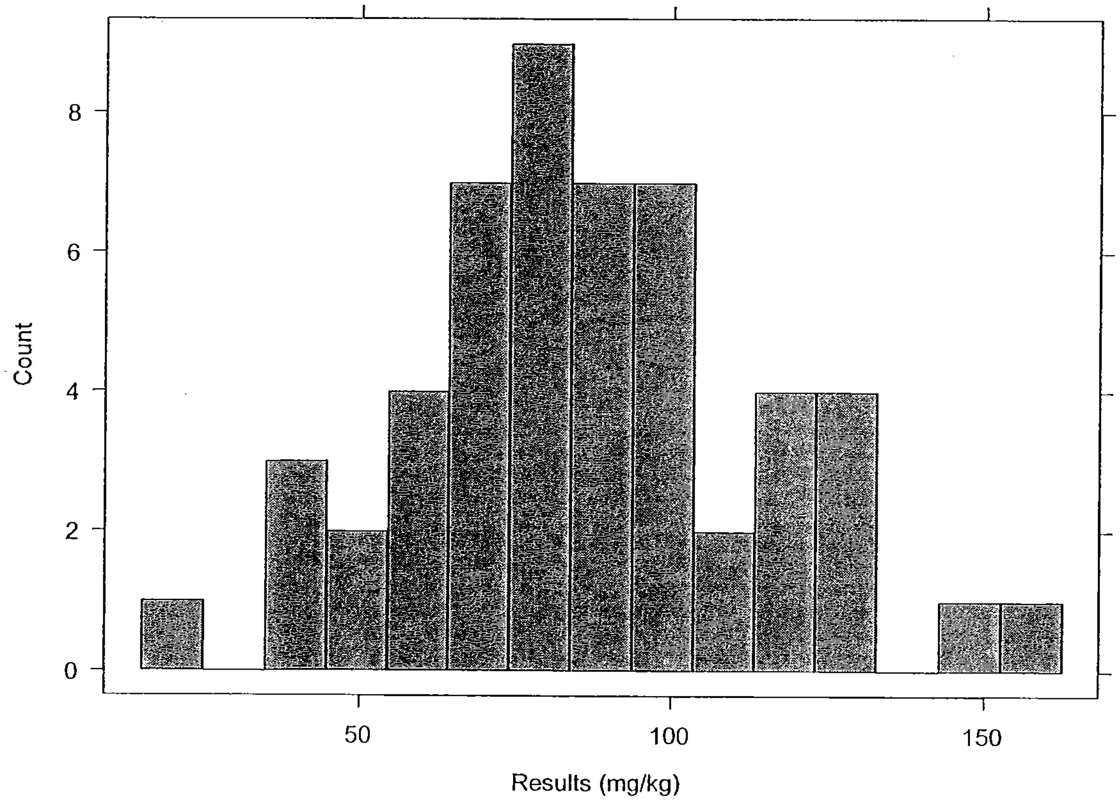
Post-tilling Lead Concentration Histograms Sorted by Depth, EW Test Plot



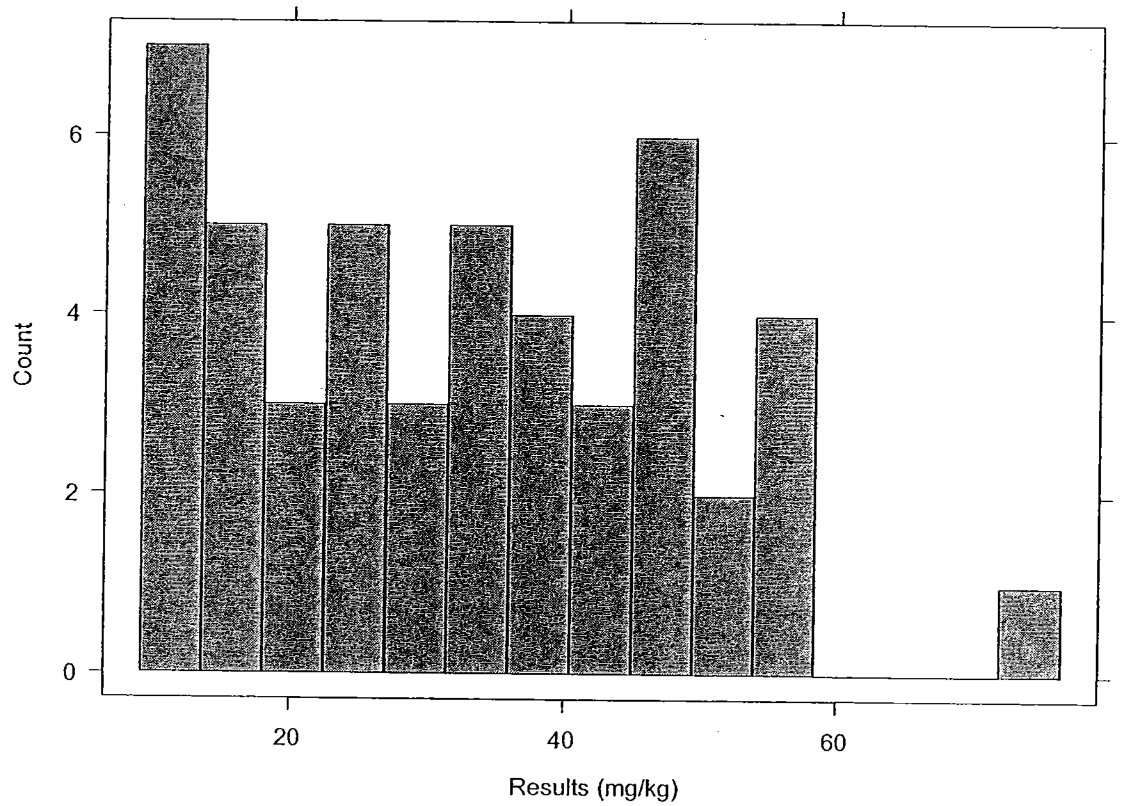
Pre-tilling Arsenic Concentration Histograms, NS Test Plot, All Data



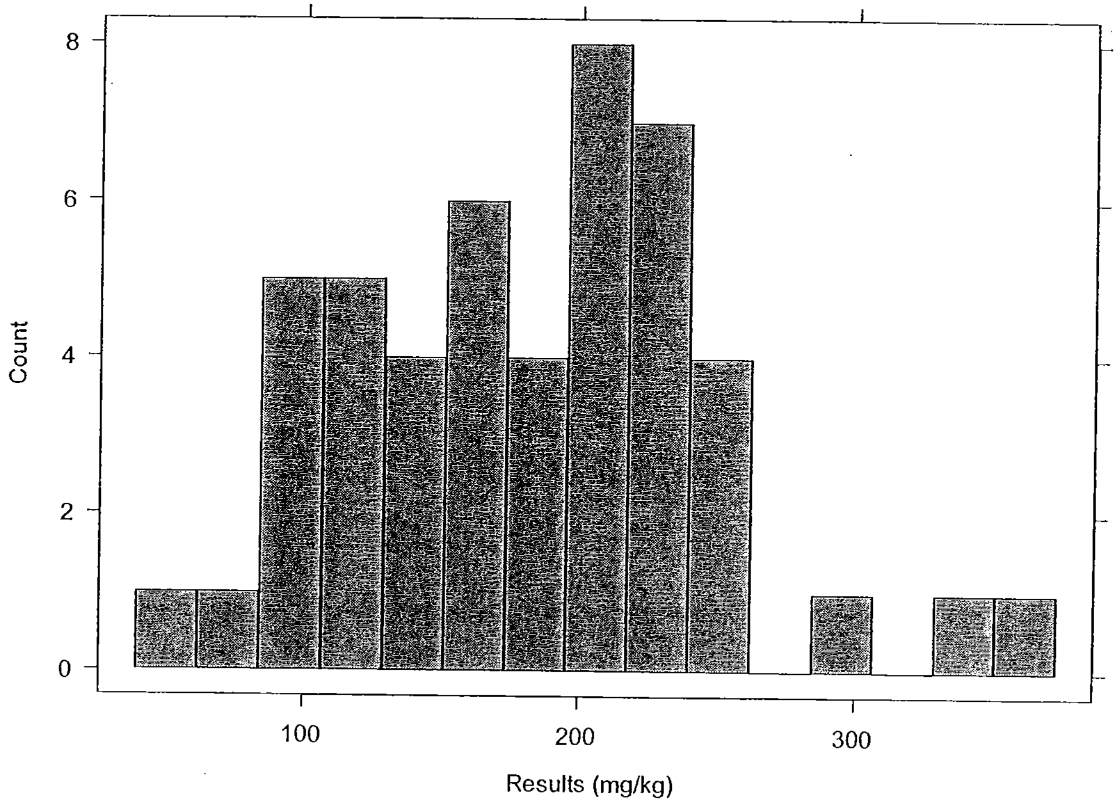
Pre-tilling Lead Concentration Histogram, NS Test Plot, All Data



Pre-tilling Arsenic Concentration Histogram, EW Test Plot, All Data



Pre-tilling Lead Concentration Histogram, EW Test Plot, All Data



Appendix C
Deep Tilling Pilot Test

Statistical Summaries and Analysis of Variance

Summary Statistics for all depths: Pre-tilling Arsenic concentrations, NS test plots

```
           RESULT
     Min: 12.600000
    Mean: 21.540385
  Median: 20.750000
     Max: 34.000000
 Total N: 52.000000
Variance: 22.107553
Std Dev.:  4.701867
```

***** Summary Statistics for all depths sorted by treatment type: Pre-tilling Arsenic concentrations, NS test plot*****

```
Treatment:Grader
           RESULT
     Min: 14.400000
    Mean: 24.825000
  Median: 25.250000
     Max: 34.000000
 Total N: 12.000000
Variance: 35.358409
Std Dev.:  5.946294
-----------------------------------------------------
Treatment:Plow
           RESULT
     Min: 16.100000
    Mean: 18.537500
  Median: 18.400000
     Max: 21.800000
 Total N:  8.000000
Variance:  4.711250
Std Dev.:  2.170541
-----------------------------------------------------
Treatment:Road Reclaimer
           RESULT
     Min: 18.100000
    Mean: 23.983333
  Median: 22.450000
     Max: 30.900000
 Total N: 12.000000
Variance: 17.766970
Std Dev.:  4.215088
-----------------------------------------------------
Treatment:Ripper/Roto
          RESULT
     Min: 12.60000
    Mean: 18.93333
  Median: 19.60000
     Max: 23.30000
 Total N: 12.00000
Variance: 10.27152
Std Dev.:  3.20492
-----------------------------------------------------
Treatment:Rototiller
           RESULT
     Min: 16.900000
    Mean: 19.862500
  Median: 20.250000
     Max: 22.200000
 Total N:  8.000000
Variance:  2.834107
Std Dev.:  1.683481
```

***** Summary Statistics for all depths, sorted by treatment: Post-tilling Arsenic concentrations, NS test plot*****

```
Treatment:Grader
             RESULT
     Min:  8.400000
    Mean: 22.608333
  Median: 24.500000
     Max: 30.200000
 Total N: 12.000000
Variance: 48.304470
Std Dev.:  6.950142
-----------------------------------------------------
Treatment:Plow
             RESULT
     Min: 17.100000
    Mean: 20.075000
  Median: 18.850000
     Max: 24.900000
 Total N:  8.000000
Variance:  8.896429
Std Dev.:  2.982688
-----------------------------------------------------
Treatment:Road Reclaimer
             RESULT
     Min: 12.300000
    Mean: 17.625000
  Median: 18.350000
     Max: 21.000000
 Total N: 12.000000
Variance:  5.940227
Std Dev.:  2.437258
-----------------------------------------------------
Treatment:Ripper/Roto
             RESULT
     Min: 10.800000
    Mean: 21.725000
  Median: 22.600000
     Max: 31.800000
 Total N: 12.000000
Variance: 27.065682
Std Dev.:  5.202469
-----------------------------------------------------
Treatment:Rototiller
              RESULT
     Min: 21.2000000
    Mean: 22.1875000
  Median: 22.0000000
     Max: 23.5000000
 Total N:  8.0000000
Variance:  0.7012500
Std Dev.:  0.8374067
```

***** Summary Statistics for all depths: Pre-tilling Lead concentrations, NS test plots*****

```
            RESULT
     Min:  16.70000
    Mean:  86.29423
  Median:  85.50000
     Max: 161.00000
 Total N:  52.00000
Variance: 830.58565
Std Dev.:  28.81988
```

***** Summary Statistics for all depths sorted by treatment type: Pre-tilling Lead concentrations, NS test plot*****

```
Treatment:Grader
             RESULT
     Min:   16.70000
    Mean:   98.10000
  Median:  110.50000
     Max:  161.00000
 Total N:   12.00000
Variance: 2051.99273
Std Dev.:   45.29893
-----------------------------------------------------
Treatment:Plow
            RESULT
     Min:  52.10000
    Mean:  72.22500
  Median:  66.85000
     Max:  94.30000
 Total N:   8.00000
Variance: 261.12500
Std Dev.:  16.15936
-----------------------------------------------------
Treatment:Road Reclaimer
            RESULT
     Min:  58.80000
    Mean:  96.90833
  Median:  95.00000
     Max: 129.00000
 Total N:  12.00000
Variance: 639.74992
Std Dev.:  25.29328
-----------------------------------------------------
Treatment:Ripper/Roto
            RESULT
     Min:  35.90000
    Mean:  77.00833
  Median:  80.05000
     Max:  98.40000
 Total N:  12.00000
Variance: 412.94811
Std Dev.:  20.32112
-----------------------------------------------------
Treatment:Rototiller
            RESULT
     Min: 70.300000
    Mean: 80.662500
  Median: 79.750000
     Max: 93.500000
 Total N:  8.000000
Variance: 69.136964
Std Dev.:  8.314864
```

*** Summary Statistics for all depths sorted by treatment type: Post-tilling Lead Concentrations, NS test plot***

```
Treatment:Grader
                RESULT
     Min:    15.30000
    Mean:    82.56667
  Median:    97.65000
     Max:   134.00000
 Total N:    12.00000
Variance: 1797.66788
Std Dev.:    42.39891
------------------------------------------------------
Treatment:Plow
                RESULT
     Min:   51.60000
    Mean:   74.28750
  Median:   68.00000
     Max:  105.00000
 Total N:    8.00000
Variance:  360.41554
Std Dev.:   18.98461
------------------------------------------------------
Treatment:Road Reclaimer
                RESULT
     Min:   43.50000
    Mean:   72.21667
  Median:   71.65000
     Max:   93.30000
 Total N:   12.00000
Variance:  230.44879
Std Dev.:   15.18054
------------------------------------------------------
Treatment:Ripper/Roto
                RESULT
     Min:   27.00000
    Mean:   79.83333
  Median:   86.95000
     Max:   99.10000
 Total N:   12.00000
Variance:  519.16061
Std Dev.:   22.78510
------------------------------------------------------
Treatment:Rototiller
                RESULT
     Min: 82.900000
    Mean: 87.975000
  Median: 85.700000
     Max: 97.700000
 Total N:  8.000000
Variance: 36.199286
Std Dev.:  6.016584
```

***** Summary Statistics for all depths: Pre-tilling Arsenic concentrations, EW test plots***

	RESULT
Min:	9.75000
Mean:	32.64875
Median:	33.10000
Max:	75.60000
Total N:	48.00000
Variance:	251.17201
Std Dev.:	15.84841

***** Summary Statistics for for all depths sorted by treatment type: Pre-tilling Arsenic concentrations, EW test plot*****

Treatment:Grader

	RESULT
Min:	9.79000
Mean:	38.53250
Median:	41.80000
Max:	75.60000
Total N:	12.00000
Variance:	382.52740
Std Dev.:	19.55831

Treatment:Plow

	RESULT
Min:	12.60000
Mean:	31.32500
Median:	30.35000
Max:	57.70000
Total N:	8.00000
Variance:	296.16500
Std Dev.:	17.20945

Treatment:Road Reclaimer

	RESULT
Min:	9.75000
Mean:	35.53750
Median:	36.70000
Max:	57.60000
Total N:	12.00000
Variance:	262.80597
Std Dev.:	16.21129

Treatment:Ripper/Roto

	RESULT
Min:	11.80000
Mean:	26.08333
Median:	24.50000
Max:	41.50000
Total N:	12.00000
Variance:	100.41424
Std Dev.:	10.02069

Treatment:Rototiller

	RESULT
Min:	15.70000
Mean:	28.67500
Median:	28.40000
Max:	42.20000
Total N:	4.00000
Variance:	139.56917
Std Dev.:	11.81394

*** Summary Statistics for all depths sorted by treatment: Post-tilling Arsenic concentrations, EW test plot***

```
Treatment:Grader
            RESULT
     Min:    9.34000
    Mean:   36.61167
  Median:   35.55000
     Max:   64.70000
 Total N:   12.00000
Variance:  352.33145
Std Dev.:   18.77049
-----------------------------------------------------
Treatment:Plow
            RESULT
     Min:   15.10000
    Mean:   31.73750
  Median:   28.10000
     Max:   56.10000
 Total N:    8.00000
Variance:  246.21411
Std Dev.:   15.69121
-----------------------------------------------------
Treatment:Road Reclaimer
            RESULT
     Min:   18.70000
    Mean:   36.99167
  Median:   40.15000
     Max:   54.00000
 Total N:   12.00000
Variance:  145.39356
Std Dev.:   12.05793
-----------------------------------------------------
Treatment:Ripper/Roto
            RESULT
     Min:    9.07000
    Mean:   35.45167
  Median:   41.75000
     Max:   54.60000
 Total N:   12.00000
Variance:  321.12358
Std Dev.:   17.91992
-----------------------------------------------------
Treatment:Rototiller
            RESULT
     Min:   16.20000
    Mean:   30.02500
  Median:   27.55000
     Max:   48.80000
 Total N:    4.00000
Variance:  237.50917
Std Dev.:   15.41133
```

***** Summary Statistics for all depths: Pre-tilling Lead concentrations, EW test plots*****

	RESULT
Min:	43.00000
Mean:	181.77292
Median:	191.00000
Max:	370.00000
Total N:	48.00000
Variance:	4555.61436
Std Dev.:	67.49529

***** Summary Statistics for all depths sorted by treatment type: Pre-tilling Lead concentrations, EW test plot*****

Treatment:Grader

	RESULT
Min:	43.00000
Mean:	166.41667
Median:	151.50000
Max:	286.00000
Total N:	12.00000
Variance:	4429.71970
Std Dev.:	66.55614

Treatment:Plow

	RESULT
Min:	87.20000
Mean:	166.15000
Median:	173.00000
Max:	252.00000
Total N:	8.00000
Variance:	3895.03714
Std Dev.:	62.41023

Treatment:Road Reclaimer

	RESULT
Min:	82.10000
Mean:	215.68333
Median:	215.00000
Max:	370.00000
Total N:	12.00000
Variance:	7015.67424
Std Dev.:	83.75962

Treatment:Ripper/Roto

	RESULT
Min:	91.70000
Mean:	176.47500
Median:	174.00000
Max:	257.00000
Total N:	12.00000
Variance:	2851.43477
Std Dev.:	53.39883

Treatment:Rototiller

	RESULT
Min:	106.00000
Mean:	173.25000
Median:	171.50000
Max:	244.00000
Total N:	4.00000
Variance:	3458.25000
Std Dev.:	58.80689

*** Summary Statistics for all depths sorted by treatment: Post-tilling Lead concentrations, EW test plot***

```
Treatment:Grader
              RESULT
     Min:    40.1000
    Mean:   148.5667
  Median:   156.5000
     Max:   337.0000
 Total N:    12.0000
Variance:  8025.4552
Std Dev.:    89.5849
-----------------------------------------------------
Treatment:Plow
              RESULT
     Min:    95.10000
    Mean:   169.51250
  Median:   174.00000
     Max:   240.00000
 Total N:     8.00000
Variance:  2977.30125
Std Dev.:    54.56465
-----------------------------------------------------
Treatment:Road Reclaimer
              RESULT
     Min:   151.00000
    Mean:   202.91667
  Median:   213.00000
     Max:   243.00000
 Total N:    12.00000
Variance:  1273.53788
Std Dev.:    35.68666
-----------------------------------------------------
Treatment:Ripper/Roto
              RESULT
     Min:    48.0000
    Mean:   184.9000
  Median:   203.0000
     Max:   277.0000
 Total N:    12.0000
Variance:  4931.1018
Std Dev.:    70.2218
-----------------------------------------------------
Treatment:Rototiller
              RESULT
     Min:   121.00000
    Mean:   174.25000
  Median:   171.00000
     Max:   234.00000
 Total N:     4.00000
Variance:  3104.91667
Std Dev.:    55.72178
```

*** Summary Statistics for data sorted by treatment and depth: Pre-tilling Arsenic concentrations, EW test plot***

```
Treatment:Grader
Depth:0-6
              RESULT
     Min:   16.00000
    Mean:   31.47500
  Median:   31.25000
     Max:   47.40000
 Total N:    4.00000
Variance:  294.12917
Std Dev.:   17.15019
-----------------------------------------------------
Treatment:Plow
Depth:0-6
              RESULT
     Min:   12.90000
    Mean:   27.70000
  Median:   24.05000
     Max:   49.80000
 Total N:    4.00000
Variance:  290.07333
Std Dev.:   17.03154
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:0-6
              RESULT
     Min:    9.75000
    Mean:   30.78750
  Median:   29.65000
     Max:   54.10000
 Total N:    4.00000
Variance:  341.58729
Std Dev.:   18.48208
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:0-6
              RESULT
     Min:   16.50000
    Mean:   25.17500
  Median:   21.35000
     Max:   41.50000
 Total N:    4.00000
Variance:  125.07583
Std Dev.:   11.18373
-----------------------------------------------------
Treatment:Rototiller
Depth:0-6
              RESULT
     Min:   15.70000
    Mean:   28.67500
  Median:   28.40000
     Max:   42.20000
 Total N:    4.00000
Variance:  139.56917
Std Dev.:   11.81394
-----------------------------------------------------
```

```
Treatment:Grader
Depth:6-12
                 RESULT
     Min:     9.79000
    Mean:    30.17250
  Median:    29.05000
     Max:    52.80000
 Total N:     4.00000
Variance:   368.27169
Std Dev.:    19.19041
-----------------------------------------------------
Treatment:Plow
Depth:6-12
                 RESULT
     Min:    12.60000
    Mean:    34.95000
  Median:    34.75000
     Max:    57.70000
 Total N:     4.00000
Variance:   365.93667
Std Dev.:    19.12947
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:6-12
               RESULT
     Min:    12.6000
    Mean:    30.1000
  Median:    25.1000
     Max:    57.6000
 Total N:     4.0000
Variance:   395.6400
Std Dev.:    19.8907
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:6-12
                 RESULT
     Min:    11.80000
    Mean:    26.45000
  Median:    27.65000
     Max:    38.70000
 Total N:     4.00000
Variance:   129.13667
Std Dev.:    11.36383
-----------------------------------------------------
Treatment:Rototiller
Depth:6-12
NULL
-----------------------------------------------------
Treatment:Grader
Depth:12-18
                 RESULT
     Min:    37.90000
    Mean:    53.95000
  Median:    51.15000
     Max:    75.60000
 Total N:     4.00000
Variance:   263.67000
Std Dev.:    16.23792
-----------------------------------------------------
Treatment:Plow
Depth:12-18
NULL
-----------------------------------------------------
```

```
Treatment:Road Reclaimer
Depth:12-18
               RESULT
     Min: 39.500000
    Mean: 45.725000
  Median: 47.350000
     Max: 48.700000
 Total N:  4.000000
Variance: 18.509167
Std Dev.:  4.302228
------------------------------------------------------
Treatment:Ripper/Roto
Depth:12-18
               RESULT
     Min:  12.50000
    Mean:  26.62500
  Median:  29.30000
     Max:  35.40000
 Total N:   4.00000
Variance: 112.30250
Std Dev.:  10.59729
------------------------------------------------------
Treatment:Rototiller
Depth:12-18
NULL
```

*** Summary Statistics for data sorted by treatment and depth: Post-tilling Arsenic concentrations, EW test plot***

```
Treatment:Grader
Depth:0-6
               RESULT
     Min:   20.80000
    Mean:   35.55000
  Median:   31.35000
     Max:   58.70000
 Total N:    4.00000
Variance:  263.05667
Std Dev.:   16.21902
-----------------------------------------------------
Treatment:Plow
Depth:0-6
               RESULT
     Min:   17.10000
    Mean:   30.70000
  Median:   28.10000
     Max:   49.50000
 Total N:    4.00000
Variance:  212.14000
Std Dev.:   14.56503
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:0-6
               RESULT
     Min:   18.70000
    Mean:   38.62500
  Median:   40.90000
     Max:   54.00000
 Total N:    4.00000
Variance:  228.68917
Std Dev.:   15.12247
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:0-6
               RESULT
     Min:   15.00000
    Mean:   33.70000
  Median:   33.35000
     Max:   53.10000
 Total N:    4.00000
Variance:  293.14000
Std Dev.:   17.12133
-----------------------------------------------------
Treatment:Rototiller
Depth:0-6
               RESULT
     Min:   16.20000
    Mean:   30.02500
  Median:   27.55000
     Max:   48.80000
 Total N:    4.00000
Variance:  237.50917
Std Dev.:   15.41133
```

```
Treatment:Grader
Depth:6-12
                RESULT
      Min:   11.40000
     Mean:   37.60000
   Median:   42.95000
      Max:   53.10000
  Total N:    4.00000
Variance:  336.86000
Std Dev.:   18.35375
-----------------------------------------------------
Treatment:Plow
Depth:6-12
                RESULT
      Min:   15.1000
     Mean:   32.7750
   Median:   29.9500
      Max:   56.1000
  Total N:    4.0000
Variance:  359.4892
Std Dev.:   18.9602
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:6-12
                RESULT
      Min:   20.50000
     Mean:   38.92500
   Median:   42.45000
      Max:   50.30000
  Total N:    4.00000
Variance:  174.45583
Std Dev.:   13.20817
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:6-12
                RESULT
      Min:    9.55000
     Mean:   33.63750
   Median:   35.40000
      Max:   54.20000
  Total N:    4.00000
Variance:  429.23896
Std Dev.:   20.71808
-----------------------------------------------------
Treatment:Rototiller
Depth:6-12
NULL
-----------------------------------------------------
Treatment:Grader
Depth:12-18
                RESULT
      Min:    9.34000
     Mean:   36.68500
   Median:   36.35000
      Max:   64.70000
  Total N:    4.00000
Variance:  689.15290
Std Dev.:   26.25172
-----------------------------------------------------
Treatment:Plow
Depth:12-18
NULL
-----------------------------------------------------
```

```
Treatment:Road Reclaimer
Depth:12-18
                RESULT
     Min:  21.00000
    Mean:  33.42500
  Median:  35.40000
     Max:  41.90000
 Total N:   4.00000
Variance: 104.46250
Std Dev.:  10.22069
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:12-18
                RESULT
     Min:   9.07000
    Mean:  39.01750
 Median:  46.20000
     Max:  54.60000
 Total N:   4.00000
Variance: 429.64122
Std Dev.:  20.72779
-----------------------------------------------------
Treatment:Rototiller
Depth:12-18
NULL
```

***** Summary Statistics for data by treatment and depth: Pre-tilling Arsenic concentrations, NS test plot*****

```
Treatment:Grader
Depth:0-6
            RESULT
     Min: 25.200000
    Mean: 27.725000
  Median: 26.200000
     Max: 33.300000
 Total N:  4.000000
Variance: 14.575833
Std Dev.:  3.817831
-----------------------------------------------------
Treatment:Plow
Depth:0-6
            RESULT
     Min: 17.100000
    Mean: 18.425000
  Median: 18.400000
     Max: 19.800000
 Total N:  4.000000
Variance:  2.342500
Std Dev.:  1.530523
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:0-6
            RESULT
     Min: 22.800000
    Mean: 27.075000
  Median: 27.300000
     Max: 30.900000
 Total N:  4.000000
Variance: 11.242500
Std Dev.:  3.352984
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:0-6
            RESULT
     Min: 18.900000
    Mean: 20.375000
  Median: 20.500000
     Max: 21.600000
 Total N:  4.000000
Variance:  1.475833
Std Dev.:  1.214839
-----------------------------------------------------
Treatment:Rototiller
Depth:0-6
            RESULT
     Min: 16.900000
    Mean: 19.725000
  Median: 19.900000
     Max: 22.200000
 Total N:  4.000000
Variance:  4.729167
Std Dev.:  2.174665
-----------------------------------------------------
```

```
Treatment:Grader
Depth:6-12
                 RESULT
     Min: 14.40000
    Mean: 25.77500
  Median: 27.35000
     Max: 34.00000
 Total N:  4.00000
Variance: 69.61583
Std Dev.:  8.34361
-----------------------------------------------------
Treatment:Plow
Depth:6-12
                 RESULT
     Min: 16.100000
    Mean: 18.650000
  Median: 18.350000
     Max: 21.800000
 Total N:  4.000000
Variance:  8.616667
Std Dev.:  2.935416
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:6-12
                 RESULT
     Min: 21.700000
    Mean: 25.000000
  Median: 24.250000
     Max: 29.800000
 Total N:  4.000000
Variance: 14.766667
Std Dev.:  3.842742
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:6-12
                 RESULT
     Min: 19.0000000
    Mean: 19.9500000
  Median: 20.0000000
     Max: 20.8000000
 Total N:  4.0000000
Variance:  0.8700000
Std Dev.:  0.9327379
-----------------------------------------------------
Treatment:Rototiller
Depth:6-12
                 RESULT
     Min: 18.000000
    Mean: 20.000000
  Median: 20.500000
     Max: 21.000000
 Total N:  4.000000
Variance:  1.833333
Std Dev.:  1.354006
-----------------------------------------------------
```

```
Treatment:Grader
Depth:12-18
               RESULT
     Min: 15.600000
    Mean: 20.975000
  Median: 22.400000
     Max: 23.500000
 Total N:  4.000000
Variance: 13.275833
Std Dev.:  3.643602
-------------------------------------------------------
Treatment:Plow
Depth:12-18
NULL
-------------------------------------------------------
Treatment:Road Reclaimer
Depth:12-18
               RESULT
     Min: 18.100000
    Mean: 19.875000
  Median: 19.750000
     Max: 21.900000
 Total N:  4.000000
Variance:  2.509167
Std Dev.:  1.584035
-------------------------------------------------------
Treatment:Ripper/Roto
Depth:12-18
               RESULT
     Min: 12.600000
    Mean: 16.475000
  Median: 15.000000
     Max: 23.300000
 Total N:  4.000000
Variance: 23.109167
Std Dev.:  4.807199
-------------------------------------------------------
Treatment:Rototiller
Depth:12-18
NULL
```

***** Summary Statistics for data sorted by treatment and depth: Post-tilling Arsenic concentrations, NS test plot*****

```
Treatment:Grader
Depth:0-6
             RESULT
     Min: 25.000000
    Mean: 27.300000
  Median: 27.000000
     Max: 30.200000
 Total N:  4.000000
Variance:  4.686667
Std Dev.:  2.164871
-----------------------------------------------------
Treatment:Plow
Depth:0-6
             RESULT
     Min: 18.600000
    Mean: 20.400000
  Median: 19.050000
     Max: 24.900000
 Total N:  4.000000
Variance:  9.060000
Std Dev.:  3.009983
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:0-6
              RESULT
     Min: 17.3000000
    Mean: 18.4000000
  Median: 18.6500000
     Max: 19.0000000
 Total N:  4.0000000
Variance:  0.6466667
Std Dev.:  0.8041559
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:0-6
             RESULT
     Min: 20.900000
    Mean: 25.300000
  Median: 24.250000
     Max: 31.800000
 Total N:  4.000000
Variance: 21.273333
Std Dev.:  4.612302
-----------------------------------------------------
Treatment:Rototiller
Depth:0-6
              RESULT
     Min: 21.3000000
    Mean: 22.2500000
  Median: 22.1000000
     Max: 23.5000000
 Total N:  4.0000000
Variance:  0.8633333
Std Dev.:  0.9291573
```

```
Treatment:Grader
Depth:6-12
                RESULT
     Min: 13.600000
    Mean: 23.500000
  Median: 26.000000
     Max: 28.400000
 Total N:  4.000000
Variance: 47.506667
Std Dev.:  6.892508
-----------------------------------------------------
Treatment:Plow
Depth:6-12
                RESULT
     Min: 17.100000
    Mean: 19.750000
  Median: 18.600000
     Max: 24.700000
 Total N:  4.000000
Variance: 11.416667
Std Dev.:  3.378856
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:6-12
                RESULT
     Min: 18.100000
    Mean: 19.375000
  Median: 19.200000
     Max: 21.000000
 Total N:  4.000000
Variance:  1.449167
Std Dev.:  1.203813
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:6-12
                RESULT
     Min: 14.200000
    Mean: 20.575000
  Median: 22.400000
     Max: 23.300000
 Total N:  4.000000
Variance: 18.669167
Std Dev.:  4.320783
-----------------------------------------------------
Treatment:Rototiller
Depth:6-12
                RESULT
     Min: 21.2000000
    Mean: 22.1250000
  Median: 22.0000000
     Max: 23.3000000
 Total N:  4.0000000
Variance:  0.7625000
Std Dev.:  0.8732125
```

```
Treatment:Grader
Depth:12-18
               RESULT
     Min:  8.400000
    Mean: 17.025000
  Median: 18.200000
     Max: 23.300000
 Total N:  4.000000
Variance: 52.949167
Std Dev.:  7.276618
-----------------------------------------------------
Treatment:Plow
Depth:12-18
NULL
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:12-18
               RESULT
     Min: 12.30000
    Mean: 15.10000
  Median: 14.85000
     Max: 18.40000
 Total N:  4.00000
Variance:  6.30000
Std Dev.:  2.50998
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:12-18
               RESULT
     Min: 10.80000
    Mean: 19.30000
  Median: 21.70000
     Max: 23.00000
 Total N:  4.00000
Variance: 32.65333
Std Dev.:  5.71431
-----------------------------------------------------
Treatment:Rototiller
Depth:12-18
NULL
```

***** Summary Statistics for data sorted by treatment and depth: Pre-tilling Lead concentrations, EW test plot*****

```
Treatment:Grader
Depth:0-6
              RESULT
     Min:  109.00000
    Mean:  158.25000
  Median:  155.00000
     Max:  214.00000
 Total N:    4.00000
Variance: 3201.58333
Std Dev.:   56.58254
------------------------------------------------------
Treatment:Plow
Depth:0-6
             RESULT
     Min:  104.0000
    Mean:  156.5000
  Median:  153.5000
     Max:  215.0000
 Total N:    4.0000
Variance: 3445.6667
Std Dev.:   58.6998
------------------------------------------------------
Treatment:Road Reclaimer
Depth:0-6
              RESULT
     Min:   82.10000
    Mean:  184.02500
  Median:  209.50000
     Max:  235.00000
 Total N:    4.00000
Variance: 4799.20250
Std Dev.:   69.27628
------------------------------------------------------
Treatment:Ripper/Roto
Depth:0-6
              RESULT
     Min:  148.00000
    Mean:  179.25000
  Median:  167.50000
     Max:  234.00000
 Total N:    4.00000
Variance: 1504.91667
Std Dev.:   38.79326
------------------------------------------------------
Treatment:Rototiller
Depth:0-6
              RESULT
     Min:  106.00000
    Mean:  173.25000
  Median:  171.50000
     Max:  244.00000
 Total N:    4.00000
Variance: 3458.25000
Std Dev.:   58.80689
------------------------------------------------------
```

```
Treatment:Grader
Depth:6-12
                RESULT
     Min:    43.00000
    Mean:   141.25000
  Median:   147.00000
     Max:   228.00000
 Total N:     4.00000
Variance:  5758.91667
Std Dev.:    75.88753
------------------------------------------------------
Treatment:Plow
Depth:6-12
                RESULT
     Min:    87.20000
    Mean:   175.80000
  Median:   182.00000
     Max:   252.00000
 Total N:     4.00000
Variance:  5394.42667
Std Dev.:    73.44676
------------------------------------------------------
Treatment:Road Reclaimer
Depth:6-12
                RESULT
     Min:    98.10000
    Mean:   179.27500
  Median:   182.00000
     Max:   255.00000
 Total N:     4.00000
Variance:  4753.50250
Std Dev.:    68.94565
------------------------------------------------------
Treatment:Ripper/Roto
Depth:6-12
                RESULT
     Min:   109.00000
    Mean:   206.00000
  Median:   229.00000
     Max:   257.00000
 Total N:     4.00000
Variance:  4410.00000
Std Dev.:    66.40783
------------------------------------------------------
Treatment:Rototiller
Depth:6-12
NULL
------------------------------------------------------
Treatment:Grader
Depth:12-18
                RESULT
     Min:   135.00000
    Mean:   199.75000
  Median:   189.00000
     Max:   286.00000
 Total N:     4.00000
Variance:  4866.91667
Std Dev.:    69.76329
------------------------------------------------------
Treatment:Plow
Depth:12-18
NULL
------------------------------------------------------
```

```
Treatment:Road Reclaimer
Depth:12-18
              RESULT
     Min:  191.00000
    Mean:  283.75000
  Median:  287.00000
     Max:  370.00000
 Total N:    4.00000
Variance: 6890.25000
Std Dev.:   83.00753
------------------------------------------------------
Treatment:Ripper/Roto
Depth:12-18
              RESULT
     Min:   91.70000
    Mean:  144.17500
  Median:  147.00000
     Max:  191.00000
 Total N:    4.00000
Variance: 1976.72250
Std Dev.:   44.46035
------------------------------------------------------
Treatment:Rototiller
Depth:12-18
NULL
```

*** Summary Statistics for data sorted by treatment and depth: Post-tilling Lead concentrations, EW test plot***

```
Treatment:Grader
Depth:0-6
              RESULT
     Min: 135.00000
    Mean: 165.00000
  Median: 158.50000
     Max: 208.00000
 Total N:   4.00000
Variance: 964.66667
Std Dev.:  31.05908
-----------------------------------------------------
Treatment:Plow
Depth:0-6
              RESULT
     Min:  120.0000
    Mean:  168.5000
  Median:  174.0000
     Max:  206.0000
 Total N:    4.0000
Variance: 1595.6667
Std Dev.:   39.9458
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:0-6
              RESULT
     Min:  151.0000
    Mean:  208.0000
  Median:  225.5000
     Max:  230.0000
 Total N:    4.0000
Variance: 1456.6667
Std Dev.:   38.1663
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:0-6
              RESULT
     Min:  125.0000
    Mean:  184.7500
  Median:  190.5000
     Max:  233.0000
 Total N:    4.0000
Variance: 2109.5833
Std Dev.:   45.9302
-----------------------------------------------------
Treatment:Rototiller
Depth:0-6
              RESULT
     Min:  121.00000
    Mean:  174.25000
  Median:  171.00000
     Max:  234.00000
 Total N:    4.00000
Variance: 3104.91667
Std Dev.:   55.72178
-----------------------------------------------------
Treatment:Grader
Depth:6-12
              RESULT
     Min:   43.50000
```

```
     Mean:  156.87500
   Median:  173.50000
      Max:  237.00000
  Total N:    4.00000
 Variance: 6730.39583
 Std Dev.:   82.03899
-------------------------------------------------------
Treatment:Plow
Depth:6-12
                RESULT
      Min:   95.10000
     Mean:  170.52500
   Median:  173.50000
      Max:  240.00000
  Total N:    4.00000
 Variance: 5348.63583
 Std Dev.:   73.13437
-------------------------------------------------------
Treatment:Road Reclaimer
Depth:6-12
                RESULT
      Min:  163.00000
     Mean:  213.25000
   Median:  223.50000
      Max:  243.00000
  Total N:    4.00000
 Variance: 1460.25000
 Std Dev.:   38.21322
-------------------------------------------------------
Treatment:Ripper/Roto
Depth:6-12
               RESULT
      Min:   66.8000
     Mean:  175.7000
   Median:  199.0000
      Max:  238.0000
  Total N:    4.0000
 Variance: 5614.7600
 Std Dev.:   74.9317
-------------------------------------------------------
Treatment:Rototiller
Depth:6-12
NULL
-------------------------------------------------------
Treatment:Grader
Depth:12-18
               RESULT
      Min:    40.100
     Mean:   123.825
   Median:    59.100
      Max:   337.000
  Total N:     4.000
 Variance: 20463.296
 Std Dev.:   143.050
-------------------------------------------------------
Treatment:Plow
Depth:12-18
NULL
-------------------------------------------------------
Treatment:Road Reclaimer
Depth:12-18
                RESULT
      Min:  156.00000
```

```
    Mean:  187.50000
  Median:  179.00000
     Max:  236.00000
 Total N:    4.00000
Variance: 1259.00000
Std Dev.:   35.48239
------------------------------------------------------------
Treatment:Ripper/Roto
Depth:12-18
                RESULT
     Min:     48.0000
    Mean:    194.2500
  Median:    226.0000
     Max:    277.0000
 Total N:      4.0000
Variance:  10126.9167
Std Dev.:    100.6326
------------------------------------------------------------
Treatment:Rototiller
Depth:12-18
NULL
```

*** Summary Statistics for data sorted by treatment and depth: Pre-tilling Lead concentrations, NS test plot***

```
Treatment:Grader
Depth:0-6
              RESULT
     Min: 108.00000
    Mean: 126.25000
  Median: 122.50000
     Max: 152.00000
 Total N:   4.00000
Variance: 342.91667
Std Dev.:  18.51801
-----------------------------------------------------
Treatment:Plow
Depth:0-6
              RESULT
     Min:  63.60000
    Mean:  71.50000
  Median:  66.85000
     Max:  88.70000
 Total N:   4.00000
Variance: 133.87333
Std Dev.:  11.57036
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:0-6
             RESULT
     Min:  94.7000
    Mean: 117.1750
  Median: 122.5000
     Max: 129.0000
 Total N:   4.0000
Variance: 235.3892
Std Dev.:  15.3424
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:0-6
              RESULT
     Min: 77.900000
    Mean: 86.525000
  Median: 84.900000
     Max: 98.400000
 Total N:  4.000000
Variance: 83.702500
Std Dev.:  9.148907
-----------------------------------------------------
Treatment:Rototiller
Depth:0-6
              RESULT
     Min: 70.300000
    Mean: 80.025000
  Median: 78.150000
     Max: 93.500000
 Total N:  4.000000
Variance: 94.395833
Std Dev.:  9.715752
-----------------------------------------------------
```

```
Treatment:Grader
Depth:6-12
              RESULT
     Min:   16.70000
    Mean:  104.67500
  Median:  120.50000
     Max:  161.00000
 Total N:    4.00000
Variance: 3841.82250
Std Dev.:   61.98244
-----------------------------------------------------
Treatment:Plow
Depth:6-12
             RESULT
     Min:  52.10000
    Mean:  72.95000
  Median:  72.70000
     Max:  94.30000
 Total N:   4.00000
Variance: 474.01667
Std Dev.:  21.77192
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:6-12
             RESULT
     Min:  94.00000
    Mean: 106.57500
  Median: 105.15000
     Max: 122.00000
 Total N:   4.00000
Variance: 198.05583
Std Dev.:  14.07323
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:6-12
            RESULT
     Min: 79.10000
    Mean: 85.22500
  Median: 84.45000
     Max: 92.90000
 Total N:  4.00000
Variance: 51.62250
Std Dev.:  7.18488
-----------------------------------------------------
Treatment:Rototiller
Depth:6-12
             RESULT
     Min: 70.900000
    Mean: 81.300000
  Median: 81.800000
     Max: 90.700000
 Total N:  4.000000
Variance: 65.840000
Std Dev.:  8.114185
-----------------------------------------------------
```

```
Treatment:Grader
Depth:12-18
                RESULT
     Min:   40.10000
    Mean:   63.37500
  Median:   57.85000
     Max:   97.70000
 Total N:    4.00000
Variance:  617.26250
Std Dev.:   24.84477
-----------------------------------------------------
Treatment:Plow
Depth:12-18
NULL
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:12-18
                RESULT
     Min:  58.800000
    Mean:  66.975000
  Median:  67.250000
     Max:  74.600000
 Total N:   4.000000
Variance:  45.389167
Std Dev.:   6.737148
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:12-18
                RESULT
     Min:   35.90000
    Mean:   59.27500
  Median:   52.85000
     Max:   95.50000
 Total N:    4.00000
Variance:  748.74917
Std Dev.:   27.36328
-----------------------------------------------------
Treatment:Rototiller
Depth:12-18
NULL
```

***** Summary Statistics for data sorted by treatment and depth: Post-tilling Lead concentrations, NS test plot*****

```
Treatment:Grader
Depth:0-6
             RESULT
     Min: 107.00000
    Mean: 116.50000
  Median: 115.50000
     Max: 128.00000
 Total N:   4.00000
Variance: 112.33333
Std Dev.:  10.59874
-----------------------------------------------------
Treatment:Plow
Depth:0-6
             RESULT
     Min:  62.50000
    Mean:  76.82500
  Median:  69.90000
     Max: 105.00000
 Total N:   4.00000
Variance: 366.10917
Std Dev.:  19.13398
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:0-6
             RESULT
     Min: 71.600000
    Mean: 79.150000
  Median: 79.600000
     Max: 85.800000
 Total N:  4.000000
Variance: 43.003333
Std Dev.:  6.557693
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:0-6
             RESULT
     Min: 80.400000
    Mean: 90.900000
  Median: 92.050000
     Max: 99.100000
 Total N:  4.000000
Variance: 70.980000
Std Dev.:  8.424963
-----------------------------------------------------
Treatment:Rototiller
Depth:0-6
             RESULT
     Min: 83.300000
    Mean: 88.100000
  Median: 85.700000
     Max: 97.700000
 Total N:  4.000000
Variance: 43.366667
Std Dev.:  6.585337
-----------------------------------------------------
Treatment:Grader
Depth:6-12
             RESULT
     Min:   40.20000
```

```
      Mean:   92.37500
    Median:   97.65000
       Max:  134.00000
   Total N:    4.00000
  Variance: 1516.12250
  Std Dev.:   38.93742
------------------------------------------------------
Treatment:Plow
Depth:6-12
             RESULT
       Min:  51.60000
      Mean:  71.75000
    Median:  66.70000
       Max: 102.00000
   Total N:   4.00000
  Variance: 457.69000
  Std Dev.:  21.39369
------------------------------------------------------
Treatment:Road Reclaimer
Depth:6-12
             RESULT
       Min:  71.10000
      Mean:  80.70000
    Median:  79.20000
       Max:  93.30000
   Total N:   4.00000
  Variance: 122.64000
  Std Dev.:  11.07429
------------------------------------------------------
Treatment:Ripper/Roto
Depth:6-12
             RESULT
       Min:  45.60000
      Mean:  81.35000
    Median:  90.95000
       Max:  97.90000
   Total N:   4.00000
  Variance: 595.76333
  Std Dev.:  24.40826
------------------------------------------------------
Treatment:Rototiller
Depth:6-12
             RESULT
       Min: 82.900000
      Mean: 87.850000
    Median: 85.750000
       Max: 97.000000
   Total N:  4.000000
  Variance: 41.056667
  Std Dev.:  6.407548
```

```
Treatment:Grader
Depth:12-18
               RESULT
     Min:   15.30000
    Mean:   38.82500
  Median:   32.90000
     Max:   74.20000
 Total N:    4.00000
Variance:  748.31583
Std Dev.:   27.35536
-----------------------------------------------------
Treatment:Plow
Depth:12-18
NULL
-----------------------------------------------------
Treatment:Road Reclaimer
Depth:12-18
               RESULT
     Min:   43.50000
    Mean:   56.80000
  Median:   57.30000
     Max:   69.10000
 Total N:    4.00000
Variance:  202.38667
Std Dev.:   14.22627
-----------------------------------------------------
Treatment:Ripper/Roto
Depth:12-18
              RESULT
     Min:   27.0000
    Mean:   67.2500
  Median:   74.3500
     Max:   93.3000
 Total N:    4.0000
Variance:  859.3633
Std Dev.:   29.3149
-----------------------------------------------------
Treatment:Rototiller
Depth:12-18
NULL
```

***** Analysis of Variance Model --- Pre-tilling Arsenic, EW test plot*****

```
Short Output:
Call:
   aov(formula = RESULT ~ Depth, data = B2PreArsenic.EW.df, qr = T, contrasts =
list(Depth =
       contr.treatment), na.action = na.exclude)

Terms:
                    Depth Residuals
 Sum of Squares 1367.637  7848.919
Deg. of Freedom        2        33

Residual standard error: 15.42226
Estimated effects may be unbalanced

          Df Sum of Sq  Mean Sq  F Value      Pr(F)
    Depth  2  1367.637 683.8186 2.875047 0.07062839
Residuals 33  7848.919 237.8460

Tables of means
Grand mean

 33.384

 Depth
      1      2    3
 29.146 28.907 42.1

Standard errors for differences of means
          Depth
         6.2961
replic. 12.0000

95 % simultaneous confidence intervals for specified
linear combinations, by the Tukey method

critical point: 2.4538
response variable: RESULT

intervals excluding 0 are flagged by '****'

    Estimate Std.Error Lower Bound Upper Bound
1-2    0.238       6.3       -15.2       15.70
1-3  -13.000       6.3       -28.4        2.50
2-3  -13.200       6.3       -28.6        2.26
```

***** Analysis of Variance Model --- Pre-tilling Arsenic, NS test plot*****

```
Short Output:
Call:
   aov(formula = RESULT ~ Depth, data = B2PreArsenic.NS.df, qr = T, contrasts =
list(Depth =
       contr.treatment), na.action = na.exclude)

Terms:
                    Depth Residuals
 Sum of Squares 230.2156  710.8408
Deg. of Freedom        2        33

Residual standard error: 4.641189
Estimated effects may be unbalanced
```

```
          Df Sum of Sq  Mean Sq  F Value       Pr(F)
    Depth  2  230.2156 115.1078 5.343751 0.009763058
Residuals 33  710.8408  21.5406
```

Tables of means
Grand mean

```
 22.581

 Depth
      1      2      3
 25.058 23.575 19.108
```

Standard errors for differences of means

```
          Depth
         1.8948
replic. 12.0000
```

95 % simultaneous confidence intervals for specified
linear combinations, by the Tukey method

critical point: 2.4538
response variable: RESULT

intervals excluding 0 are flagged by '****'

```
    Estimate Std.Error Lower Bound Upper Bound
1-2     1.48      1.89      -3.170        6.13
1-3     5.95      1.89       1.300       10.60 ****
2-3     4.47      1.89      -0.183        9.12
```

***** Analysis of Variance Model --- Pre-tilling Lead, EW test plot*****

Short Output:
Call:

```
   aov(formula = RESULT ~ Depth, data = B2PreLead.EW.df, qr = T, contrasts =
list(Depth =
       contr.treatment), na.action = na.exclude)
```

Terms:

```
                   Depth Residuals
 Sum of Squares   9566.3  163961.5
Deg. of Freedom        2        33
```

Residual standard error: 70.4878
Estimated effects may be unbalanced

```
          Df Sum of Sq  Mean Sq   F Value     Pr(F)
    Depth  2    9566.3 4783.143 0.9626878 0.3923305
Residuals 33  163961.5 4968.530
```

Tables of means
Grand mean

```
 186.19

 Depth
      1      2      3
 173.84 175.51 209.22
```

```
Standard errors for differences of means
          Depth
         28.777
replic.  12.000


95 % simultaneous confidence intervals for specified
linear combinations, by the Tukey method

critical point: 2.4538
response variable: RESULT

intervals excluding 0 are flagged by '****'

    Estimate Std.Error Lower Bound Upper Bound
1-2    -1.67      28.8       -72.3        68.9
1-3   -35.40      28.8      -106.0        35.2
2-3   -33.70      28.8      -104.0        36.9
```

***** Analysis of Variance Model --- Pre-tilling Lead, NS test plot*****

```
Short Output:
Call:
   aov(formula = RESULT ~ Depth, data = B2PreLead.NS.df, qr = T, contrasts =
list(Depth =
       contr.treatment), na.action = na.exclude)

Terms:
                   Depth Residuals
 Sum of Squares 14323.82  23196.93
Deg. of Freedom        2        33

Residual standard error: 26.51296
Estimated effects may be unbalanced

          Df Sum of Sq  Mean Sq  F Value        Pr(F)
    Depth  2  14323.82 7161.912 10.18855 0.0003581975
Residuals 33  23196.93  702.937

Tables of means
Grand mean

 90.672

 Depth
      1      2      3
 109.98 98.825 63.208

Standard errors for differences of means
          Depth
         10.824
replic.  12.000
```

95 % simultaneous confidence intervals for specified linear combinations, by the Tukey method

critical point: 2.4538
response variable: RESULT

intervals excluding 0 are flagged by '****'

	Estimate	Std.Error	Lower Bound	Upper Bound	
1-2	11.2	10.8	-15.40	37.7	
1-3	46.8	10.8	20.20	73.3	****
2-3	35.6	10.8	9.06	62.2	****

Results of ANOVAs where RESULT = Pre-tilling - Post-tilling

***** Analysis of Variance Model --- Arsenic, EW test plot*****

```
Short Output:
Call:
   aov(formula = RESULT ~ Treatment * Depth, data = B2aovArsenic.EW, qr = T,
contrasts = list(Depth
        = contr.treatment, Treatment = contr.treatment), na.action = na.exclude)

Terms:
                Treatment    Depth Treatment:Depth Residuals
 Sum of Squares   805.880 1365.734        1264.869  4647.368
Deg. of Freedom         2        2               4        27

Residual standard error: 13.11963
Estimated effects may be unbalanced

                Df Sum of Sq  Mean Sq  F Value     Pr(F)
      Treatment  2   805.880 402.9399 2.340976 0.1154648
          Depth  2  1365.734 682.8672 3.967281 0.0308649
Treatment:Depth  4  1264.869 316.2173 1.837140 0.1507975
      Residuals 27  4647.368 172.1247

Tables of means
Grand mean

 -2.9672

 Treatment
 Grader      RR     Rip
 1.9208 -1.4542 -9.3683

 Depth
      1       2      3
 -6.8125 -7.8133 5.7242

 Treatment:Depth
Dim 1 : Treatment
Dim 2 : Depth
             1       2       3
Grader  -4.075  -7.428  17.265
    RR  -7.837  -8.825  12.300
   Rip  -8.525  -7.187 -12.392

Standard errors for differences of means
        Treatment   Depth Treatment:Depth
           5.3561  5.3561           9.277
replic.   12.0000 12.0000           4.000


95 % simultaneous confidence intervals for specified
linear combinations, by the Tukey method

critical point: 2.4794
response variable: RESULT

intervals excluding 0 are flagged by '****'

           Estimate Std.Error Lower Bound Upper Bound
 Grader-RR     3.37      5.36       -9.90        16.7
Grader-Rip    11.30      5.36       -1.99        24.6
    RR-Rip     7.91      5.36       -5.37        21.2
```

***** Analysis of Variance Model --- Arsenic, NS test plot*****

```
Short Output:
Call:
   aov(formula = RESULT ~ Treatment * Depth, data = B2aovArsenic.NS, qr = T,
contrasts = list(Treatment = contr.treatment, Depth = contr.treatment),
na.action = na.exclude)

Terms:
                Treatment    Depth Treatment:Depth Residuals
 Sum of Squares  503.8372   6.4339         89.0711  917.8700
Deg. of Freedom         2        2               4        27

Residual standard error: 5.830539
Estimated effects may be unbalanced

                Df Sum of Sq  Mean Sq  F Value     Pr(F)
      Treatment  2  503.8372 251.9186 7.410420 0.0027202
          Depth  2    6.4339   3.2169 0.094629 0.9100104
Treatment:Depth  4   89.0711  22.2678 0.655027 0.6284365
      Residuals 27  917.8700  33.9952

Tables of means
Grand mean

 1.9278

 Treatment
 Grader     RR     Rip
 2.2167 6.3583 -2.7917

 Depth
      1     2      3
 1.3917 2.425 1.9667

 Treatment:Depth
Dim 1 : Treatment
Dim 2 : Depth
            1      2      3
Grader  0.425  2.275  3.950
    RR  8.675  5.625  4.775
   Rip -4.925 -0.625 -2.825

Standard errors for differences of means
        Treatment   Depth Treatment:Depth
           2.3803  2.3803          4.1228
replic.   12.0000 12.0000          4.0000


95 % simultaneous confidence intervals for specified
linear combinations, by the Tukey method

critical point: 2.4794
response variable: RESULT

intervals excluding 0 are flagged by '****'

           Estimate Std.Error Lower Bound Upper Bound
 Grader-RR    -4.14      2.38     -10.000        1.76
Grader-Rip     5.01      2.38      -0.893       10.90
    RR-Rip     9.15      2.38       3.250       15.10 ****
```

```
*** Analysis of Variance Model --- Lead, EW test plot***

Short Output:
Call:
   aov(formula = RESULT ~ Treatment * Depth, data = B2aovLead.EW, qr = T,
contrasts = list(Treatment  = contr.treatment, Depth = contr.treatment),
na.action = na.exclude)

Terms:
                 Treatment    Depth Treatment:Depth Residuals
 Sum of Squares     4661.2  20154.3         55227.9  139255.9
Deg. of Freedom          2        2               4        27

Residual standard error: 71.81662
Estimated effects may be unbalanced

                 Df Sum of Sq  Mean Sq  F Value     Pr(F)
      Treatment  2     4661.2  2330.61 0.451875 0.6411592
          Depth  2    20154.3 10077.16 1.953836 0.1612559
Treatment:Depth  4    55227.9 13806.97 2.676999 0.0531901
      Residuals 27   139255.9  5157.63

Tables of means
Grand mean

 7.3972

 Treatment
 Grader     RR    Rip
  17.85 12.767 -8.425

 Depth
      1       2    3
 -12.075 -6.4333 40.7

 Treatment:Depth
Dim 1 : Treatment
Dim 2 : Depth
             1       2       3
Grader  -6.750 -15.625  75.925
    RR -23.975 -33.975  96.250
   Rip  -5.500  30.300 -50.075

Standard errors for differences of means
        Treatment  Depth Treatment:Depth
           29.319 29.319          50.782
replic.    12.000 12.000           4.000


95 % simultaneous confidence intervals for specified
linear combinations, by the Tukey method

critical point: 2.4794
response variable: RESULT

intervals excluding 0 are flagged by '****'

            Estimate Std.Error Lower Bound Upper Bound
 Grader-RR      5.08      29.3       -67.6        77.8
Grader-Rip     26.30      29.3       -46.4        99.0
    RR-Rip     21.20      29.3       -51.5        93.9
```

***** Analysis of Variance Model --- Lead, NS test plot*****

```
Short Output:
Call:
   aov(formula = RESULT ~ Treatment * Depth, data = B2aovLead.NS, qr = T,
contrasts = list(Treatment  = contr.treatment, Depth = contr.treatment),
na.action = na.exclude)

Terms:
                 Treatment    Depth Treatment:Depth Residuals
 Sum of Squares    4712.28   228.06         2127.65  26106.84
Deg. of Freedom          2        2               4        27

Residual standard error: 31.09534
Estimated effects may be unbalanced

                 Df Sum of Sq  Mean Sq  F Value     Pr(F)
      Treatment  2   4712.28 2356.141 2.436748 0.1064412
          Depth  2    228.06  114.030 0.117931 0.8892125
Treatment:Depth  4   2127.65  531.913 0.550111 0.7005297
      Residuals 27  26106.84  966.920

Tables of means
Grand mean

 12.467

 Treatment
 Grader     RR    Rip
 15.533 24.692 -2.825

 Depth
      1      2      3
 14.467 14.017 8.9167

 Treatment:Depth
Dim 1 : Treatment
Dim 2 : Depth
              1       2       3
Grader    9.750  12.300  24.550
    RR   38.025  25.875  10.175
   Rip   -4.375   3.875  -7.975

Standard errors for differences of means
        Treatment  Depth Treatment:Depth
           12.695 12.695          21.988
replic.    12.000 12.000           4.000
```

Appendix C
Deep Tilling Pilot Test

Field Notes

MEMO FROM FULCRUM ENVIRONMENTAL CONSULTING, INC.

YAKIMA, WA 98901 (509) 574-0839

To: Tom Colligan May 16, 2001

From: Peggy Williamson
Fulcrum Environmental Consulting, Inc.

Re: Transmittal of Phase II Field Notes and Phase I Final Report

Enclosed are copies of the field notes and pictures collected during Pilot Test conducted at the Kissel Park site April 16 through April 19, 2001. Also enclosed is an unbound copy of the final report produced for the Focused Remedial Investigation and Feasibility Study conducted at the Kissel Park site earlier this year. The edits you suggested on the draft report have been incorporated.

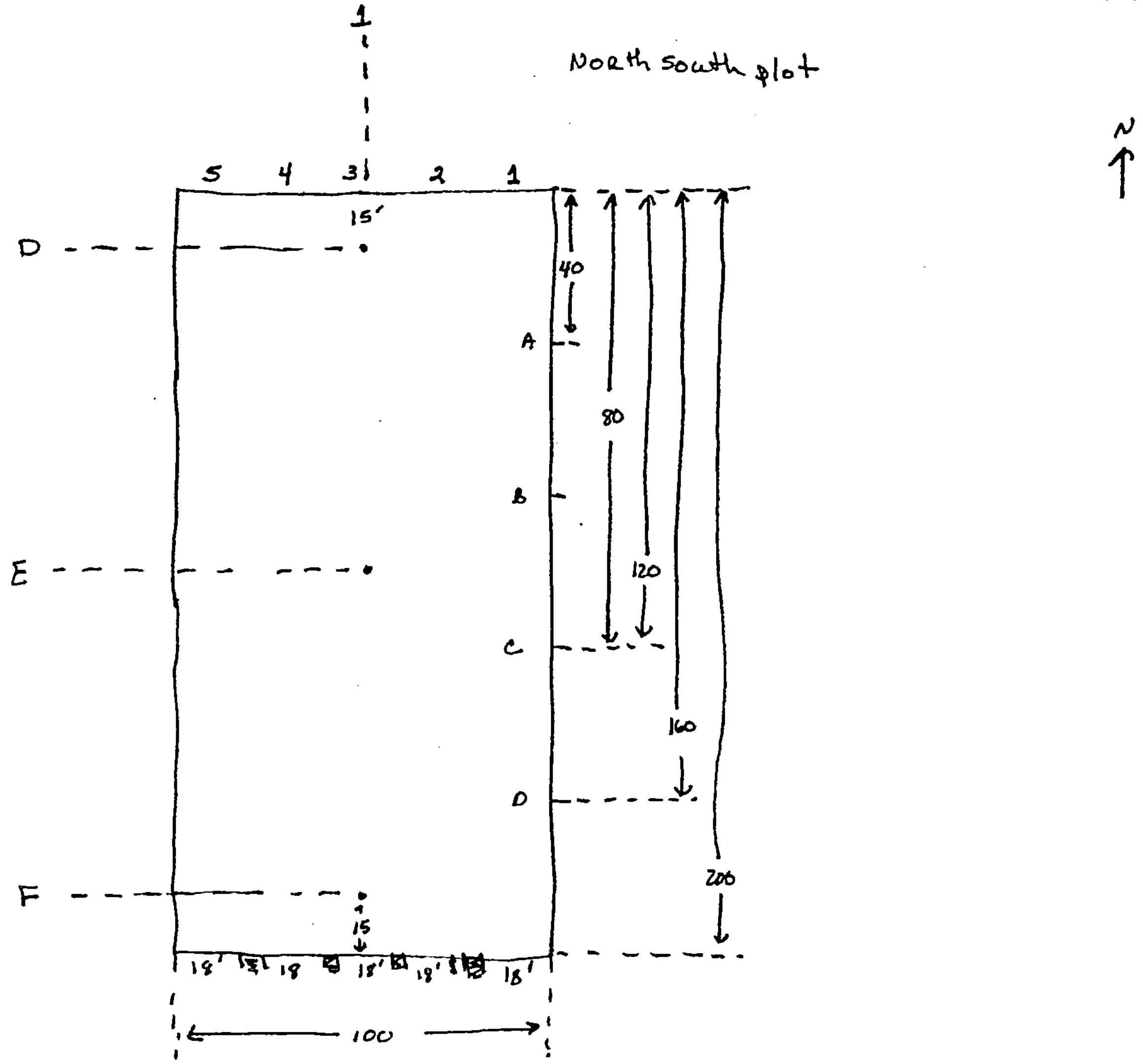
If you have any questions or I can be of further assistance please call me.

4/16/01

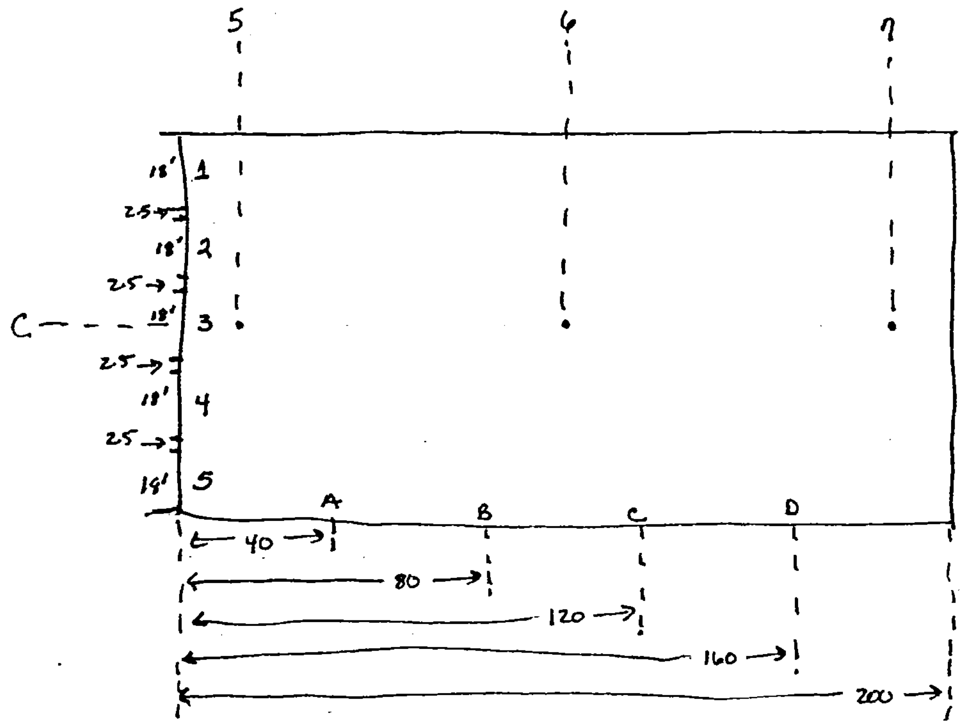
Chad T & Peggy W arrived on site at ≅ 2:00 pm and began laying out the 2 test plots. We began w/ the North South (NS) plot. The plot was centered over transect 1, beginning ≅ 15' North of transect D, and Extending ≅ 50' East & west of transect 1. The plot was 100' (E/W) by 200' N/S. The plot Extended southward to ≅ 15' South of transect F. See attached field map. Each test strip was 18' wide by 200' long. There was ≅ 25' seperating each test strip. Next the pre & Post sampling transects were placed. Beginning at the NE corner a marker was placed at 40', 80', 120' & 160' along the border (East & West side). We then moved to the East West (E/W) test plot and began the same process. The E/W plot began ≅ 15' west of transect 5 and Extended ≅ 15 East of transect 7. The E/W plot Extended 50' North of transect C, & 50' South. We tentatively Numbered the test plot strips 1-5 and the sampling transects A, B, C, D. We departed from the site ≅ 4:30. At the office we gathered sampling supplies for next day.

4/16/01

North south plot



East west plot



TOPS 35500

Chad T + Peggy W arrived on site ≅ 8:00 - Road grader operator already on site & waiting. Chad T began collecting pre samples from grid locations of NS 1. Discussions w/ grader operator suggested ~~that~~ that an outside lane would allow more room for the grader operator to work. The switch plow operator and Rick Roeden from Ecology arrived on site at ≅ 8:30. A short health and safety mtg (HSP) was conducted. During the HSP mtg the project description and objectives were summarized in addition to the general safety + health concerns. Excessively packed dirt made pre sample collection difficult (extremely). Soil was somewhat cemented and slightly damp. One of the operators talked w/ one of the city works on a nearby site & had them mob their backhoe over to the test plots (≅ ½ block away) to assist w/ test pit excavation. Backhoe began opening shallow (18") pits ≅ 10:15. The Road grader began on the NS 1 plot at ≅ 10:30. The grader operator suggested that he begins w/ using the ripper teeth, he thought grading would go faster. See pg 1 of assessment sheets. Ripping took appx 15 minutes (2 passes), grading took ≅ 45 minutes. Grader had difficulty working the soil as he had started blading along the inside, as a result he had to continually fight the rolled soil. Tom Mackie w/ Ecology was on site for portions of the project.

The switch plow began on NS 5 at ≅ 10:45. Completed 2 passes (2 lengths/pass) completed by 10:55. Very quiet compared to grader. See page 2 Field sheets for summary. Still collecting pre samples from E/W plot - so operators demobed for lunch - Returned shortly before noon. Discussed w/ the grader operator about beginning on outside of tract and moving towards the inside to allow more room for soil moving. Operator suggested cutting veg first so dont have so much difficulty when trying to roll soil back.

Began E/W 5 w/ grader concurrent w/ E/W 1 w/ plow. Grader 3 lengths (1 pass) to cut veg. 4 lengths (2 passes) Ripping. Grading avg ≅ 5 minutes a pass - E/W soil much harder than NS plot. 3 passes (6 lengths) to cut to 18", 1 pass (2 lengths) to move soil back. Much more efficient this time. See Pg 3 Field form. Switch plow operating concurrent. East end of EW 1 was Extremely cemented/hard. The plow skipped up out of soil on first pass. Took multiple passes to get any depth on that side. Kept going over to get depth on east end - West side not much more after first 2 passes (2 lengths). Mixing not great - Big clump of sod/vegitation scratch not mixed well. Corn is definately a better marker that oats or wheat - Very visible - takes a lot to have enough to assess mixing.

Over all better mix w/ grader than plow. Plow much faster than grader. Grader dustier than plow. Plow gets ≅ 80% of depth w/ first pass - grader ≅ 30% first pass.

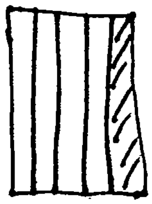
TOPS 3550C

Date: 4/17/01 Project #: 01 182.1 Project Name: Kissel Park II

Soil Mixing Method: Road Grader

Test Plot Location: NS 1 ~~EW 5~~ (PM)

Soil Marking Matrix: Oats



Location ID	BEFORE 0-6"	6-12'	12-18'	AFTER 0-6"	6-12'	12-18'
NS1 - A	1	2	3	1	2	3
NS1 - B	1	2	3	1	2	3
NS1 - C	1	2	3	1	2	3
NS1 - D	1	2	3	1	2	3

Evaluation Criteria

Depth of Disturbance/Pass: after initial kp ≅ 6" first cut, just moved dirt second blade pass, ≅ 2↓ ~~pa~~ 3 B as 4th pass move dirt, talked w/ operator, OK to move outside stakes 18' Kendra ... 5th pass ≅ 12↓ on inside, 6th pass clear E side, surface vegetation visible 7th pass ↓ 4-6" on East, 8 → ≅ 18↓ at N end - not south. 9th pass Rip west side Kelly indicated S. side very hard (cemented), 10th pass Rip East side, 11th Blade West, 12th Blade Grade OK Chris to roll soil back for to excavation finished ≅ 10:30

Mixing Efficiency (# passes required for complete homogenization) 2 lengths to Rip site initially (1 pass) ≅ 3 lengths per pass - 3 passes total to get to 18"↓, 2 more (multiple length) passes to move soil back. Oats are ~~spread~~ horizontially ≅ 3-4', vertical not very consistent (clumpy)

Dust Generation (How much? How easy to control?) Damp soil at < 3" bgs. none to low dust. Surface dust - (driving around site) greater dust generation - windy day - dust spread 30-40' (light particulate) NO drift off site.

Time to Complete Ripping 10:35 - 10:45 same direction (slowed efficiency) Started grading ≅ 10:45 - complete: 11:30 ≅ 45 min

R ||
B ||||
||||

Comments: Kelly (operator suggested starting w/ ripper to tear sod then use blade) Started ripping ≅ 10:35 - talked Rick R. OK alternate plan. Rick Tom and I discussed other ways

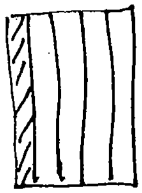
Tom Macking onsite as well

Date: 4-17-01 Project #: 01182.1 Project Name: Kissel Park IF

Soil Mixing Method: 4 Bottom Plow (Switch Plow)

Test Plot Location: NS 5

Soil Marking Matrix: Oats



Location ID	BEFORE 0-6"	BEFORE 6-12'	BEFORE 12-18'	AFTER 0-6"	AFTER 6-12'	AFTER 12-18'
NS5 1	1	2	3	1	2	NC
NS5 2	1	2	3	1	2	NC
NS5 3	1	2	3	1	2	NC
NS5 4	1	2	3	1	2	NC

NC = Not collected

Evaluation Criteria

Depth of Disturbance/Pass: 10:45 first pass ≅ 8" bgs East oats, Rolled, Second pass on West | Second pass 3rd West side ≅ 10" bgs - oats some mixing - still some clumpy - 4th pass East side ≅ 9-10" bgs finished ≅ 10:55

Mixing Efficiency (# passes required for complete homogenization) Oats are clumpy (not mixed well). mostly the switch plow rolls dirt over portions of oats or moves them forward ≅ 2'

Dust Generation (How much? How easy to control?) some dust w/ plow - still windy not much more than length of vehicle. Dust w/ 3' of plow.

Time to Complete Began 10:45 - Finish 10:55 = 10 min

Comments: Backhoe from city dug test pits, used the grader to knock the stockpile back into the hole

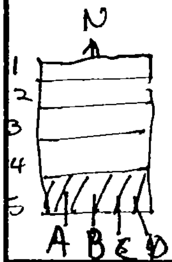
Post samples only collected to 12" as that was extent of plow effectiveness

Date: 4/1/0[illegible] Project #: 01182.1 Project Name: Kissel park II

Soil Mixing Method: grader (Motor Grader)

Test Plot Location: South track of E/W plot E/W S

Soil Marking Matrix: scratch (cracked corn + wheat)



Location ID	BEFORE			AFTER		
	0-6"	6-12'	12-18'	0-6"	6-12'	12-18'
EWS-A	1	2	3	1	2	3
B	gravel 1	some gravel 2	silts 3 [illegible]	1	2	3
C	some gravel →	2	silt 3	1	2	3
D	1	layer of organics 2 ≅ 12"		1	2	3

Evaluation Criteria

Depth of Disturbance/Pass: 3 South get rid of Vegitation - give room for roll back. 4th 5 Pass ripping on North/South - prep for grading, Second rip pass (2), Began grading 12:30, ≅ 6" first cut very hard soil (2), Next grader cut ≅ 234 - Start N push out ≅ 12" ↓, Next 2 cuts ≅ 12:40 ≅ 12-18" ↓, next (2) pass to get close 18 across area. Finished ≅ 12:55, Began pushing soil back to North - IIII

2 passes to cover test area.

Mixing Efficiency (# passes required for complete homogenization) Marker gets shoved to the side at the first pass difficult to assess mixing. However by completion corn is moved 5/6' East and west of original location. Vertical mixing difficult to assess.

Dust Generation (How much? How easy to control?) Working slow because of the hardness, as a result not much dust ≅ 5' from Blade usually less.

Time to Complete Began Vegitation removal ≅ 12:05 finished = 12:15, Began rip about 12:20 finish ≅ 12:30, began grade ≅ 12:30 finished 12:55

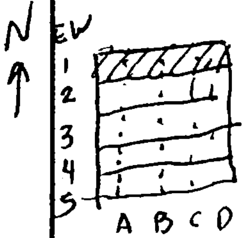
Comments: Start ≅ 12:05 grade South side to get some Roll room.

Date: 4-17-01 Project #: 01182.1 Project Name: Kiesel Phase II

Soil Mixing Method: Plowing (switch plow)

Test Plot Location: E/West plot - North track EW1

Soil Marking Matrix: chicken scratch - (cracked corn + wheat)



Location ID	BEFORE 0-6"	BEFORE 6-12'	BEFORE 12-18'	AFTER 0-6"	AFTER 6-12'	AFTER 12-18'
EW1-A	12-18"	Bread	wrapper 3	1	2	NC
EW1-B	pebbles	2 0-6"	3	1	2	NC
EW1-C	pebble	0-8 1/2	3	1	2	NC
EW1-D	gravel-hq	2 0-8"	3	1	2	NC

NC = not collected

Evaluation Criteria

Depth of Disturbance/Pass: 1 + 2 initial pass first S then N. ≅ 6" bgs lot of skipping on return pass - very hard soil. ~~4th pass~~ NORTH + East Second Run (2 passes) to get deeper. ≅ 8" ↓ most 6-8" still some skipping - extremely hard soil - try 3rd pass. Start N/S corn - easier to see - depth more consistent ≅ 8-10" ↓ - still problem w/ NE end will attempt 4th pass (?) 12:34, start 5th pass 12:40 - NE (by D) still not great.

Mixing Efficiency (# passes required for complete homogenization) Moderate mixing ≅ 3 passes, relatively even distribution some areas of small clumps not much vertical mix except in localized areas.

Dust Generation (How much? How easy to control?) No real dust - moving slow cause of hard soil conditions. dust ≅ 3' from plow.

Time to Complete Began 12:15 finished ≅ 12:45, 5 passes because of cementing - couple of stops to discuss ≅ average 6 min / pass (2 lengths)

Comments: Start ≅ 12:15 grader pushed dust back in to excavation. Some debris (cable in area) can little bolts mix identifier.

Post work samples only collected to 12" depth as that was extent of mixing.

4/18/01

Arrived on Site ≅ 8:00 AM (Chad T + Peggy W). Met w/ M+M's crew & Rich Roaden ≅ 8:15. M+M went back to highway to P.U. Equipment - Conducted HSP meeting before they left. Summarized the scope & objectives of project in addition to health concerns. M+M identified unsafe areas around the stabilizer ie behind when they are dropping the rotar in. Soil Stabilizer was quick, not much dust, and good mixing w/ single pass, see pg 5 of field notes.

Began 6/10 Pass ≅ 10:30 - stopped several times to Examine depth - moved to area N of EW1 to Evaluate really compacted soil - no appreciable difference in depth. No decrease in speed See pg 6 of field form for more detail.

Newspaper and other media on site during portions of project.

Contractor de-mobed from site ≅ 11:15. Chad T continued Post sampling to get caught up. post sampling in Soil Stabilizer areas not bad, - post sampling in other very difficult. Tom oked us not to collect at depth samples from areas where not disturbed (like switch plow)

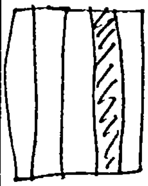
TOPS 5500

Date: 4/18/01 Project #: 01182.1 Project Name: Kiesel II

Soil Mixing Method: Soil Stabilizer

Test Plot Location: NS 2

Soil Marking Matrix: (cracked corn)



Location ID	BEFORE 0-6"	BEFORE 6-12'	BEFORE 12-18'	AFTER 0-6"	AFTER 6-12'	AFTER 12-18'
NS2 A	1	2	3	1	2	3
NS2 B	1	2	3	1	2	3
NS 2 C	1	2	3	1	2	3
NS2 D	1	2	3	1	2	3

Evaluation Criteria

Depth of Disturbance/Pass: 20-24" ↓ w/ first pass (however ↑ to 6" fluff of soil above grade). actual depth ≈ 17"-18"

Mixing Efficiency (# passes required for complete homogenization) after first pass inspected area ≈ 5' South of transect A (cream corn) dug down ≈ 24" (inclusive of fluff) bits of green fluff to bottom - pretty even distribution of corn ≈ 6-8' horizontal moving, some kernals as far as 20'

Dust Generation (How much? How easy to control?) When rotor dropped in ≈ 2' dust Either side. Return pass ≈ 2-4' vertical spread of dust when rotor in, not much during travel ≈ 1-2' out side - back of rotor intermittent dust

Time to Complete Began ≈ 10:00 am ≈ 10:03 S End, Return began 10:15 finish 10:18 ≈ 2 min per length

Running ≈ 65' minute

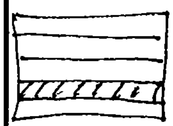
Comments: Met w/ M+M's crew ≈ 8:15 Review HSP, Roeder on site. Contractor back to Highway to pu equipment. Returned ≈ 9:25 began unloading Ready by 10:00 Am.

Date: 4/18 Project #: 01182.1 Project Name: Kissel H

Soil Mixing Method: Soil Stabilizer

Test Plot Location: EW4

Soil Marking Matrix: Cracked corn.



Location ID	BEFORE			AFTER		
	0-6"	6-12'	12-18'	0-6"	6-12'	12-18'
EW4 A	1	2	3	1	2	3
EW4 B	1 angular gravels 0-12"	2	3	1	2	3
EW4 C	1 scattered gravel 0-8"	2	3	1	2	3
EW4 D	1	2	3	1	2	3

Evaluation Criteria

Depth of Disturbance/Pass: About 20-24" inclusive of up to 6" fluff w/ first pass – maybe another couple of inches w/ second pass. ≅ 16-17" first pass actual – dryer harder soil.

Mixing Efficiency (# passes required for complete homogenization) first pass ≅ 80% of mixing efficiency of 2 passes. Corn visible to 18-20" below new surface (some fluff). Very even distribution – large vertical + horizontal spread.

Dust Generation (How much? How easy to control?) ≅ same as N/W pass 2-4' when rotor goes in – 1-2 during movement – harder soils didn't have much effect. Equipment can input water if necessary.

Time to Complete ≅ 2-3 min a ~~pass~~ length 2 lengths to a pass

Running 65'/minute even in hardest soil

Comments: Cool Equipment. Newspaper Pictures.

4/19/01

Met onsite ≈ 8:15 assisted Chad T w/ sample collection. Contractor arrived w/ Ripper, and Tom arrived. Rich onsite as well. Conducted a HSP after the operator of the Rotovator arrived. Discussed the scope + objectives of the project. Began Ripping N/S 3 prior to Running Rotovator over site. Rotovator very dusty. Broke a shear bolt on Ripper near end of last pass. see pg 7 of Field form

Rotovator very dusty! most so far see page 8 of field forms.

Moved to G/W plot ≈ 10:10 – some down time with broken shear bolts – due to harder packed soil – have to move slower

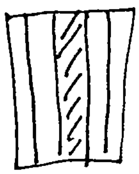
See attached Post sampling notes for further discussion of ~~[illegible]~~ depth of disturbance.

Date: 4/19/01 Project #: 01182.1 Project Name: Kissel II

Soil Mixing Method: Ripper w/ Rotovator over top

Test Plot Location: NS 3

Soil Marking Matrix: Corn



Location ID	BEFORE 0-6"	BEFORE 6-12'	BEFORE 12-18'	AFTER 0-6"	AFTER 6-12'	AFTER 12-18'
NS3 A	1	2	3	1	2	3
NS3 B	1	2	3	1	2	3
NS3 C	1	2	3	1	2	3
NS3 D	1	2	3	1	2	3

Evaluation Criteria

Depth of Disturbance/Pass: ≅ 2 minutes per length, takes several lengths to complete pass due to distance between Rippers. Some loss of tractor traction during return pass ≅ 22-26" ↓ to 20" between Ripp's ie 95 ← disturban

Mixing Efficiency (# passes required for complete homogenization) not much mixing - slight in area of Ripper mostly to aerate soil.

Dust Generation (How much? How easy to control?) low dust (moist soil) ≅ 5' behind Equip. mostly light dust + Exhaust.
Rotovater more dust ≅ 10-20' outside - small dust greater distance.

Time to Complete ≅ 2-3 minutes per length. 2 lengths to complete a pass.
Start 9:15 - 9:36 to complete 3 passes.
Rotovater ≅ 4 minutes per 2 length pass.

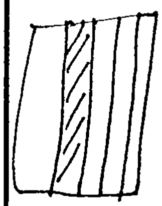
Comments: 160 Horsepower tractor. Rippers ≅ 5' apart ≅ 2' in length.
Can put Extra tires on front to increase traction. would need bigger tractor to narrow Rippers or ↑ # of Rippers. Rock + gravel slow Equipment - Causes more breakage.

Date: 4/19/01 Project #: 01 182.1 Project Name: Kesael II

Soil Mixing Method: Rotovata only

Test Plot Location: NS 4

Soil Marking Matrix:



Location ID	BEFORE 0-6"	BEFORE 6-12'	BEFORE 12-18'	AFTER 0-6"	AFTER 6-12'	AFTER 12-18'
NS4 A	1	2	3	1	2	NC
NS4 B	1	2	3	1	2	NC
NS4 C	1	2	3	1	2	NC
NS4 D	7	2	3	1	2	NC

NC = not collected.

Evaluation Criteria

Depth of Disturbance/Pass: ≅ 6-8" ↓ first pass - Second pass more uniform 8" depth. appears as 10" due to fluff ~~[illegible]~~ but only 8-9 ↓ original grade.

Mixing Efficiency (# passes required for complete homogenization) Some surface grouping ≅ 3-4' lateral spread. 2nd pass 4' lateral drag to 10', vertical mixing ~~[illegible]~~ pretty good - still some clumping.

Dust Generation (How much? How easy to control?) The most dust so far. ≅ 10-20' outside. Smell dust from an extended distance.

Time to Complete ≅ 3-4 minutes per ~~pass~~ length ≅ 7 minutes a pass.

Comments: due to width of Rotovata ≅ 80% over lap on Return pass. Hydraulics seem to limit ability to push Rotovator any deeper.

Date: 4/19/07 Project #: 01182 Project Name: Kissel II

Soil Mixing Method: Ripper w/ Rotovator over

Test Plot Location: EW 2

Soil Marking Matrix: Crackedcorn

Location ID	BEFORE 0-6"	BEFORE 6-12'	BEFORE 12-18'	AFTER 0-6"	AFTER 6-12'	AFTER 12-18'
EW2-A	Hard Packed	Soil		1	2	3
EW2-B	Gravel	0-6"		1	2	3
EW2-C	Gravel	0-6",	Cobbles 6-12"	1	2	3
EW2-D	Cobbles	& Glass	Debris	1	2	3

1st

2nd pass

Evaluation Criteria

Depth of Disturbance/Pass: ≃18" on first Pass - down + Back, 2nd pass = 18-19" Off to s. de off fines

1 X Rip ≃19" bgs → depth of disturbance like N/S Pass ~~[illegible]~~ depending upon ~~the~~ number of passes.

- One area near West End was cross (X) ripped to look at effect

Mixing Efficiency (# passes required for complete homogenization) about same as N/S Pass.

≃1' bgs at X rip width - still high concentration in surface. - not much at depth.

Dust Generation (How much? How easy to control?)

Same as N/S - for Ripper

heavy dust ≃ 5' to 30' light dust w/ Rotovator. dryer harder soil

Time to Complete much slower due to tightly compacted material. 10:22 return pass. 1st moved time

2nd lane 10:34 - 10:40 -

Rotovator ≃ 3-4 min/pass.

Comments: Broke Shear Bolt at begging at West, ripped ≃70% of length Broke second Shear

Ripper 28½" ⟷ ↓ 28-38 from Bolt Lower 38 28 28½' width.

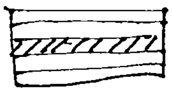
≃1100 Rotovator onsite -

Date: 4/19/01 Project #: 01182.1 Project Name: Kissel II

Soil Mixing Method: Rotovator - No ripper

Test Plot Location: EW3

Soil Marking Matrix: Cracked corn



Location ID	BEFORE 0-6"	6-12'	12-18'	AFTER 0-6"	6-12'	12-18'
EW3 A	1	2	3	1	NC	NC
EW3 B	1 gravel 0-6	2	3	1	NC	NC
EW3 C	1 gravel 0-6	2 cobbles 6-12	3	1	NC	NC
EW3 D	cobbles 1 0-12	2	3	1	NC	NC

NC = not collected

Evaluation Criteria

Depth of Disturbance/Pass: ≅ 6-8 first ✓, ≅ 4-6 second. lots of skipping due to very hard packed soil + some gravel

Mixing Efficiency (# passes required for complete homogenization)

≅ 1-5' lateral dispersion of corn. Verticle mix OK not ~~much~~ much depth so not much

Dust Generation (How much? How easy to control?)

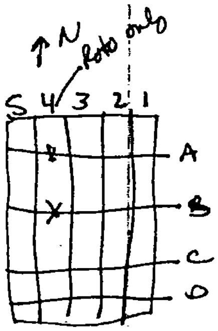
greater dust = 20'-30' fine 5-10 denser. (≅15-20%) some dust due to more Rotovator bounce because of hard soil + presence of rock

Time to Complete ≅ 34 minutes / pass

Comments: PTO angle causing some limiting on ability to push Rotovator into soil

4/19 Post mixing sampling

NS 4 Rototill only - only 6-8 ↓ bgz only 2 elevations



A transect	PNS4-A1	silt	2:20	≅ 6" vertical mix
	A2	silt	2:20 pm	
B transect	PNS4-~~B~~1	Silt	2:30 pm	≅ 8" vertical mix
	~~B~~2	silt		
C transect	PNS4-C1	silt	2:38 pm	≅ 8" ↓ mix
	C2	silt	2:38	
D transect	PSN4 ~~D~~ D1			
	PSN4- D2	silt	2:48 pm	8 ≅ ↓ mix
		silt		

NS 3 - Roto over Ripper

A transect PNS3	A1	silt	3:20	
clumpy - mixed vegetation	A2	silt		depth of disturbance > 18"
	A3	silt		
	~~A4~~			
B transect	B1	silt	3:36	
	B2			Not as much veg as
	B3			~~Silt~~ Extent ≅ 18"
C transect	C1	silt	344	↓ 16-17" uneven
	C2			mix
	C3			Some lower
D transect	D1	silt	352	Easy dig to 16"
	D2			17-18 harder
	D3			Packed @ 18

4/19 East/west transect

↑N

A B C D

Plow	1
Rip/Roto	2
Roto	3
Soil Stabily	4
Scraper	5

PEW 2 A1 A2 A3 — 405 — Silt — depth of mix variable 12-18"

PEW 2 B1 B2 B3 — 4:23 — Silt some crushed gravel / " " " " / Silt — depth to bottom varied 12-18"

PEW 2 C1 C2 C3 — 427 — Silt w/ crushed rock + surface larger Rock — hard at 15" ↓ lots of fist sized Rock

PEW 2 D1 D2 D3 — 4:54 — Silt w/ some crushed rock / " " some larger rock / some broken caliche — Variable bottom 12-18↓

Some white salts at all level

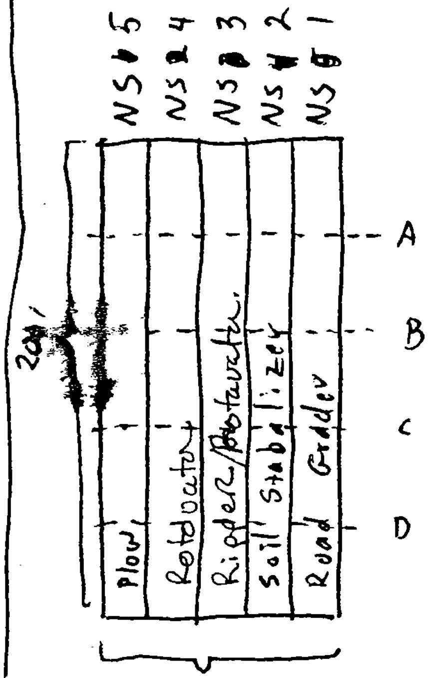
PEW 3 A1 Silt 4:10 — 4-6" ↓ of Roto at strip, Packed hard below

PEW 3 B1 Silt w/ crushed Rock 4:24 — ≈ 4" ↓ hard after, lots of gravel + Veg.

PEW 3 C1 Silt w/ crushed Rock 4:45 — hard ↓ 6" lots of veg

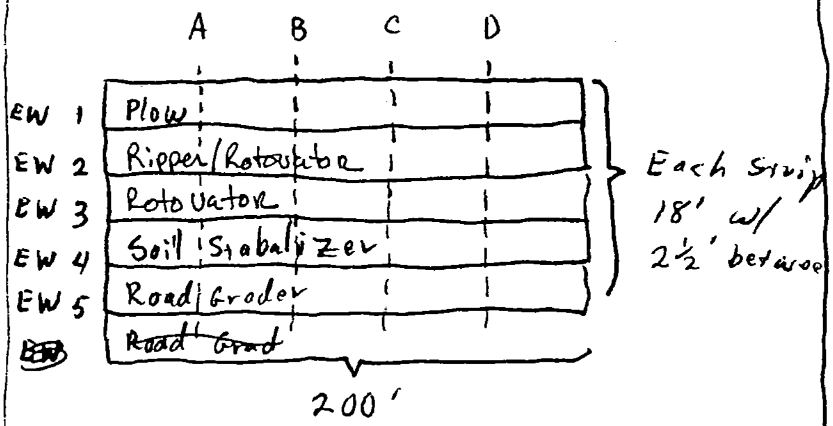
PEW 3 D1 5:05 Silt w/ crushed rock — hard ↓ 6-7" ↓ Lots of Veg

N



Each strip is 18' wide w/ 2½' between

Irrigation Main



Sample Id: (NS, EW)(1-5) – (A-D)(1-3)

NS, EW : 2 Plots – Direction of Rows
1-5 : Row #; EW → NS
NS → E→W
A-D : Row divided 40' intervals
1-3 : 1: 1"-6"
2: 6"-12"
3: 12"-18"

* A P before the (NS, EW) indicates post samples

NS 1 Road Grader
NS 2 Soil Stabilizer
NS 3 Ripper/Rotovator
NS 4 ~~Soil~~ ~~Conditioner~~ ~~Stabalizer~~ Rotovator
NS 5 Plow (On Post only 1-6 & 6-12

EW 1 Plow
EW 2 Ripper/Rotovator
EW 3 Rotovator
EW 4 Soil ~~Conditioner~~ Stabalizer
EW 5 Road Grader

Kissel Park Phase II
Samples Collected

Pre-Samples	Post-Samples	Pre-Samples	Post-Samples	Pre-Samples	Post-Samples
NS1-A1	PNS1-A1	NS3-A1	PNS3-A1	NS5-A1	PNS5-A1
NS1-A2	PNS1-A2	NS3-A2	PNS3-A2	NS5-A2	PNS5-A2
NS1-A3	PNS1-A3	NS3-A3	PNS3-A3	NS5-A3	
NS1-B1	PNS1-B1	NS3-B1	PNS3-B1	NS5-B1	PNS5-B1
NS1-B2	PNS1-B2	NS3-B2	PNS3-B2	NS5-B2	PNS5-B2
NS1-B3	PNS1-B3	NS3-B3	PNS3-B3	NS5-B3	
NS1-C1	PNS1-C1	NS3-C1	PNS3-C1	NS5-C1	PNS5-C1
NS1-C2	PNS1-C2	NS3-C2	PNS3-C2	NS5-C2	PNS5-C2
NS1-C3	PNS1-C3	NS3-C3	PNS3-C3	NS5-C3	
NS1-D1	PNS1-D1	NS3-D1	PNS3-D1	NS5-D1	PNS5-D1
NS1-D2	PNS1-D2	NS3-D2	PNS3-D2	NS5-D2	PNS5-D2
NS1-D3	PNS1-D3	NS3-D3	PNS3-D3	NS5-D3	
NS2-A1	PNS2-A1	NS4-A1	PNS4-A1		
NS2-A2	PNS2-A2	NS4-A2	PNS4-A2		
NS2-A3	PNS2-A3	NS4-A3			
NS2-B1	PNS2-B1	NS4-B1	PNS4-B1		
NS2-B2	PNS2-B2	NS4-B2	PNS4-B2		
NS2-B3	PNS2-B3	NS4-B3			
NS2-C1	PNS2-C1	NS4-C1	PNS4-C1		
NS2-C2	PNS2-C2	NS4-C2	PNS4-C2		
NS2-C3	PNS2-C3	NS4-C3			
NS2-D1	PNS2-D1	NS4-D1	PNS4-D1		
NS2-D2	PNS2-D2	NS4-D2	PNS4-D2		
NS2-D3	PNS2-D3	NS4-D3			

NS=North/South

Sample numbers designated as 1 were collected from 1"-6"
Sample numbers designated as 2 were collected from 6"-12"
Sample numbers designated as 3 were collected from 12"-18"

Kissel Park Phase II

Samples Collected

Pre-Samples	Post-Samples	Pre-Samples	Post-Samples	Pre-Samples	Post-Samples
EW1-A1	PEW1-A1	EW3-A1	PEW3-A1	EW5-A1	PEW5-A1
EW1-A2	PEW1-A2	EW3-A2		EW5-A2	PEW5-A2
EW1-A3		EW3-A3		EW5-A3	PEW5-A3
EW1-B1	PEW1-B1	EW3-B1	PEW3-B1	EW5-B1	PEW5-B1
EW1-B2	PEW1-B2	EW3-B2		EW5-B2	PEW5-B2
EW1-B3		EW3-B3		EW5-B3	PEW5-B3
EW1-C1	PEW1-C1	EW3-C1	PEW3-C1	EW5-C1	PEW5-C1
EW1-C2	PEW1-C2	EW3-C2		EW5-C2	PEW5-C2
EW1-C3		EW3-C3		EW5-C3	PEW5-C3
EW1-D1	PEW1-D1	EW3-D1	PEW3-D1	EW5-D1	PEW5-D1
EW1-D2	PEW1-D2	EW3-D2		EW5-D2	PEW5-D2
EW1-D3		EW3-D3		EW5-D3	PEW5-D3
EW2-A1	PEW2-A1	EW4-A1	PEW4-A1		
EW2-A2	PEW2-A2	EW4-A2	PEW4-A2		
EW2-A3	PEW2-A3	EW4-A3	PEW4-A3		
EW2-B1	PEW2-B1	EW4-B1	PEW4-B1		
EW2-B2	PEW2-B2	EW4-B2	PEW4-B2		
EW2-B3	PEW2-B3	EW4-B3	PEW4-B3		
EW2-C1	PEW2-C1	EW4-C1	PEW4-C1		
EW2-C2	PEW2-C2	EW4-C2	PEW4-C2		
EW2-C3	PEW2-C3	EW4-C3	PEW4-C3		
EW2-D1	PEW2-D1	EW4-D1	PEW4-D1		
EW2-D2	PEW2-D2	EW4-D2	PEW4-D2		
EW2-D3	PEW2-D3	EW4-D3	PEW4-D3		

EW=East/West

Sample numbers designated as 1 were collected from 1"-6"
Sample numbers designated as 2 were collected from 6"-12"
Sample numbers designated as 3 were collected from 12"-18"

Kissel Park Phase II

Samples Collected

Pre-Samples	Post-Samples	Pre-Samples	Post-Samples	Pre-Samples	Post-Samples
NS1-A1	PNS1-A1	NS3-A1	PNS3-A1	NS5-A1	PNS5-A1
NS1-A2	PNS1-A2	NS3-A2	PNS3-A2	NS5-A2	PNS5-A2
NS1-A3	PNS1-A3	NS3-A3	PNS3-A3	NS5-A3	
NS1-B1	PNS1-B1	NS3-B1	PNS3-B1	NS5-B1	PNS5-B1
NS1-B2	PNS1-B2	NS3-B2	PNS3-B2	NS5-B2	PNS5-B2
NS1-B3	PNS1-B3	NS3-B3	PNS3-B3	NS5-B3	
NS1-C1	PNS1-C1	NS3-C1	PNS3-C1	NS5-C1	PNS5-C1
NS1-C2	PNS1-C2	NS3-C2	PNS3-C2	NS5-C2	PNS5-C2
NS1-C3	PNS1-C3	NS3-C3	PNS3-C3	NS5-C3	
NS1-D1	PNS1-D1	NS3-D1	PNS3-D1	NS5-D1	PNS5-D1
NS1-D2	PNS1-D2	NS3-D2	PNS3-D2	NS5-D2	PNS5-D2
NS1-D3	PNS1-D3	NS3-D3	PNS3-D3	NS5-D3	
NS2-A1	PNS2-A1	NS4-A1	PNS4-A1		
NS2-A2	PNS2-A2	NS4-A2	PNS4-A2		
NS2-A3	PNS2-A3	NS4-A3			
NS2-B1	PNS2-B1	NS4-B1	PNS4-B1		
NS2-B2	PNS2-B2	NS4-B2	PNS4-B2		
NS2-B3	PNS2-B3	NS4-B3			
NS2-C1	PNS2-C1	NS4-C1	PNS4-C1		
NS2-C2	PNS2-C2	NS4-C2	PNS4-C2		
NS2-C3	PNS2-C3	NS4-C3			
NS2-D1	PNS2-D1	NS4-D1	PNS4-D1		
NS2-D2	PNS2-D2	NS4-D2	PNS4-D2		
NS2-D3	PNS2-D3	NS4-D3			

NS=North/South

Sample numbers designated as 1 were collected from 1"-6"
Sample numbers designated as 2 were collected from 6"-12"
Sample numbers designated as 3 were collected from 12"-18"

Kissel Park Phase II

Samples Collected

Pre-Samples	Post-Samples	Pre-Samples	Post-Samples	Pre-Samples	Post-Samples
EW1-A1	PEW1-A1	EW3-A1	PEW3-A1	EW5-A1	PEW5-A1
EW1-A2	PEW1-A2	EW3-A2		EW5-A2	PEW5-A2
EW1-A3		EW3-A3		EW5-A3	PEW5-A3
EW1-B1	PEW1-B1	EW3-B1	PEW3-B1	EW5-B1	PEW5-B1
EW1-B2	PEW1-B2	EW3-B2		EW5-B2	PEW5-B2
EW1-B3		EW3-B3		EW5-B3	PEW5-B3
EW1-C1	PEW1-C1	EW3-C1	PEW3-C1	EW5-C1	PEW5-C1
EW1-C2	PEW1-C2	EW3-C2		EW5-C2	PEW5-C2
EW1-C3		EW3-C3		EW5-C3	PEW5-C3
EW1-D1	PEW1-D1	EW3-D1	PEW3-D1	EW5-D1	PEW5-D1
EW1-D2	PEW1-D2	EW3-D2		EW5-D2	PEW5-D2
EW1-D3		EW3-D3		EW5-D3	PEW5-D3
EW2-A1	PEW2-A1	EW4-A1	PEW4-A1		
EW2-A2	PEW2-A2	EW4-A2	PEW4-A2		
EW2-A3	PEW2-A3	EW4-A3	PEW4-A3		
EW2-B1	PEW2-B1	EW4-B1	PEW4-B1		
EW2-B2	PEW2-B2	EW4-B2	PEW4-B2		
EW2-B3	PEW2-B3	EW4-B3	PEW4-B3		
EW2-C1	PEW2-C1	EW4-C1	PEW4-C1		
EW2-C2	PEW2-C2	EW4-C2	PEW4-C2		
EW2-C3	PEW2-C3	EW4-C3	PEW4-C3		
EW2-D1	PEW2-D1	EW4-D1	PEW4-D1		
EW2-D2	PEW2-D2	EW4-D2	PEW4-D2		
EW2-D3	PEW2-D3	EW4-D3	PEW4-D3		

EW=East/West

Sample numbers designated as 1 were collected from 1"-6"
Sample numbers designated as 2 were collected from 6"-12"
Sample numbers designated as 3 were collected from 12"-18"

Appendix C
Deep Tilling Pilot Test

North Creek Analytical, Inc.
Analytical Reports

www.ncalabs.com

Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

RECEIVED
MAY 15 2001
BY:

10 May, 2001

Tom Colligan
Floyd & Snider Inc.
83 South King Street, Suite 614
Seattle, WA 98104

RE: Kissel Park

Enclosed are the results of analyses for samples received by the laboratory on 04/26/01 09:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Scott A. Woerman
Project Manager

www.ncalabs.com

Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:57

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW3-B1	B1D0723-01	Soil	04/17/01 12:00	04/26/01 09:30
EW3-C1	B1D0723-04	Soil	04/17/01 12:00	04/26/01 09:30
EW3-D1	B1D0723-07	Soil	04/17/01 12:00	04/26/01 09:30
NS3-A1	B1D0723-10	Soil	04/17/01 12:00	04/26/01 09:30
NS3-A2	B1D0723-11	Soil	04/17/01 12:00	04/26/01 09:30
NS3-A3	B1D0723-12	Soil	04/17/01 12:00	04/26/01 09:30
NS4-A1	B1D0723-13	Soil	04/17/01 12:00	04/26/01 09:30
NS4-A2	B1D0723-14	Soil	04/17/01 12:00	04/26/01 09:30
NS4-B1	B1D0723-16	Soil	04/18/01 12:00	04/26/01 09:30
NS4-B2	B1D0723-17	Soil	04/18/01 12:00	04/26/01 09:30
NS4-C1	B1D0723-19	Soil	04/18/01 12:00	04/26/01 09:30
NS4-C2	B1D0723-20	Soil	04/18/01 12:00	04/26/01 09:30
NS4-D1	B1D0723-22	Soil	04/18/01 12:00	04/26/01 09:30
NS4-D2	B1D0723-23	Soil	04/18/01 12:00	04/26/01 09:30
PNS1-A1	B1D0723-25	Soil	04/18/01 12:00	04/26/01 09:30
PNS1-A2	B1D0723-26	Soil	04/18/01 12:00	04/26/01 09:30
PNS1-A3	B1D0723-27	Soil	04/18/01 12:00	04/26/01 09:30
PNS1-B1	B1D0723-28	Soil	04/18/01 12:00	04/26/01 09:30
PNS1-B2	B1D0723-29	Soil	04/18/01 12:00	04/26/01 09:30
PNS1-B3	B1D0723-30	Soil	04/18/01 12:00	04/26/01 09:30
PNS1-C3	B1D0723-31	Soil	04/18/01 12:00	04/26/01 09:30
NS3-B3	B1D0723-32	Soil	04/18/01 12:00	04/26/01 09:30
NS3-C2	B1D0723-33	Soil	04/18/01 12:00	04/26/01 09:30
NS3-C3	B1D0723-34	Soil	04/18/01 12:00	04/26/01 09:30
NS3-D1	B1D0723-35	Soil	04/18/01 12:00	04/26/01 09:30
NS3-D2	B1D0723-36	Soil	04/18/01 12:00	04/26/01 09:30
NS3-D3	B1D0723-37	Soil	04/18/01 12:00	04/26/01 09:30
PEW2-A1	B1D0723-38	Soil	04/18/01 12:00	04/26/01 09:30
PEW2-A2	B1D0723-39	Soil	04/18/01 12:00	04/26/01 09:30

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PEW2-A3	B1D0723-40	Soil	04/18/01 12:00	04/26/01 09:30
PEW2-B1	B1D0723-41	Soil	04/18/01 12:00	04/26/01 09:30
PEW2-B2	B1D0723-42	Soil	04/18/01 12:00	04/26/01 09:30
PEW2-B3	B1D0723-43	Soil	04/18/01 12:00	04/26/01 09:30
PEW2-C1	B1D0723-44	Soil	04/18/01 12:00	04/26/01 09:30
PEW2-C2	B1D0723-45	Soil	04/18/01 12:00	04/26/01 09:30
PEW2-C3	B1D0723-46	Soil	04/17/01 12:00	04/26/01 09:30
PEW3-A1	B1D0723-47	Soil	04/17/01 12:00	04/26/01 09:30
PEW3-B1	B1D0723-48	Soil	04/17/01 12:00	04/26/01 09:30
NS2-B2	B1D0723-49	Soil	04/17/01 12:00	04/26/01 09:30
NS2-B3	B1D0723-50	Soil	04/17/01 12:00	04/26/01 09:30
NS2-C1	B1D0723-51	Soil	04/17/01 12:00	04/26/01 09:30
NS2-C2	B1D0723-52	Soil	04/17/01 12:00	04/26/01 09:30
NS2-C3	B1D0723-53	Soil	04/17/01 12:00	04/26/01 09:30
NS2-D1	B1D0723-54	Soil	04/17/01 12:00	04/26/01 09:30
NS2-D2	B1D0723-55	Soil	04/17/01 12:00	04/26/01 09:30
NS2-D3	B1D0723-56	Soil	04/17/01 12:00	04/26/01 09:30
EW4-A1	B1D0723-57	Soil	04/17/01 12:00	04/26/01 09:30
EW4-A2	B1D0723-58	Soil	04/17/01 12:00	04/26/01 09:30
EW4-A3	B1D0723-59	Soil	04/17/01 12:00	04/26/01 09:30

Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW3-B1 (B1D0723-01) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	34.2	0.680	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	192	0.680	"	"	"	"	"	"	
EW3-C1 (B1D0723-04) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	22.6	0.671	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	151	0.671	"	"	"	"	"	"	
EW3-D1 (B1D0723-07) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	15.7	0.637	mg/kg dry	2	1E05006	05/05/01	05/08/01	EPA 6020	
Lead	106	0.637	"	"	"	"	"	"	
NS3-A1 (B1D0723-10) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	21.6	0.595	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	98.4	0.595	"	"	"	"	"	"	
NS3-A2 (B1D0723-11) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	20.7	0.588	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	89.8	0.588	"	"	"	"	"	"	
NS3-A3 (B1D0723-12) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	23.3	0.637	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	95.5	0.637	"	"	"	"	"	"	
NS4-A1 (B1D0723-13) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	22.2	0.610	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	93.5	0.610	"	"	"	"	"	"	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS4-A2 (B1D0723-14) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.0**	0.649	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**90.7**	0.649	"	"	"	"	"	"	
NS4-B1 (B1D0723-16) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**16.9**	0.562	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**70.3**	0.562	"	"	"	"	"	"	
NS4-B2 (B1D0723-17) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**20.5**	0.613	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**81.3**	0.613	"	"	"	"	"	"	
NS4-C1 (B1D0723-19) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**20.0**	0.709	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**78.2**	0.709	"	"	"	"	"	"	
NS4-C2 (B1D0723-20) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**20.5**	0.694	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**82.3**	0.694	"	"	"	"	"	"	
NS4-D1 (B1D0723-22) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**19.8**	0.621	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**78.1**	0.621	"	"	"	"	"	"	
NS4-D2 (B1D0723-23) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**18.0**	0.578	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**70.9**	0.578	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:57

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS1-A1 (B1D0723-25) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**27.3**	0.610	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**123**	0.610	"	"	"	"	"	"	
PNS1-A2 (B1D0723-26) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**28.4**	0.575	mg/kg dry	2	1E05007	05/05/01	05/07/01	EPA 6020	
Lead	**134**	0.575	"	"	"	"	"	"	
PNS1-A3 (B1D0723-27) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**22.8**	0.725	mg/kg dry	2	1E05007	05/05/01	05/07/01	EPA 6020	
Lead	**74.2**	0.725	"	"	"	"	"	"	
PNS1-B1 (B1D0723-28) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**26.7**	0.637	mg/kg dry	2	1E05007	05/05/01	05/08/01	EPA 6020	
Lead	**108**	0.637	"	"	"	"	"	"	
PNS1-B2 (B1D0723-29) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**24.0**	0.667	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	**93.3**	0.667	"	"	"	"	"	"	
PNS1-B3 (B1D0723-30) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**23.3**	0.606	mg/kg dry	2	1E05007	05/05/01	05/08/01	EPA 6020	
Lead	**46.5**	0.606	"	"	"	"	"	"	
PNS1-C3 (B1D0723-31) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**8.40**	0.649	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	**15.3**	0.649	"	"	"	"	"	"	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS3-B3 (B1D0723-32) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**16.3**	0.602	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	**65.2**	0.602	"	"	"	"	"	"	
NS3-C2 (B1D0723-33) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**19.0**	0.595	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	**79.1**	0.595	"	"	"	"	"	"	
NS3-C3 (B1D0723-34) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**12.6**	0.658	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	**40.5**	0.658	"	"	"	"	"	"	
NS3-D1 (B1D0723-35) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.1**	0.704	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	**88.8**	0.704	"	"	"	"	"	"	
NS3-D2 (B1D0723-36) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**20.8**	0.556	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	**92.9**	0.556	"	"	"	"	"	"	
NS3-D3 (B1D0723-37) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**13.7**	0.617	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	**35.9**	0.617	"	"	"	"	"	"	
PEW2-A1 (B1D0723-38) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**53.1**	0.599	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	**233**	0.599	"	"	"	"	"	"	

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83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW2-A2 (B1D0723-39) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	54.2	0.676	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	238	0.676	"	"	"	"	"	"	
PEW2-A3 (B1D0723-40) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	54.6	0.714	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	234	0.714	"	"	"	"	"	"	
PEW2-B1 (B1D0723-41) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	42.1	0.610	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	177	0.610	"	"	"	"	"	"	
PEW2-B2 (B1D0723-42) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	47.2	0.613	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	202	0.613	"	"	"	"	"	"	
PEW2-B3 (B1D0723-43) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	51.0	0.568	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	218	0.568	"	"	"	"	"	"	
PEW2-C1 (B1D0723-44) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	15.0	0.571	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	125	0.571	"	"	"	"	"	"	
PEW2-C2 (B1D0723-45) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	9.55	0.610	mg/kg dry	2	1E05007	05/05/01	05/09/01	EPA 6020	
Lead	66.8	0.610	"	"	"	"	"	"	

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83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW2-C3 (B1D0723-46) Soil Sampled: 04/17/01 12:00 Received: 04/26/01 09:30									
Arsenic	**9.07**	0.676	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	**48.0**	0.676	"	"	"	"	"	"	
PEW3-A1 (B1D0723-47) Soil Sampled: 04/17/01 12:00 Received: 04/26/01 09:30									
Arsenic	**48.8**	0.592	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	**209**	0.592	"	"	"	"	"	"	
PEW3-B1 (B1D0723-48) Soil Sampled: 04/17/01 12:00 Received: 04/26/01 09:30									
Arsenic	**36.4**	0.625	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	**234**	0.625	"	"	"	"	"	"	
NS2-B2 (B1D0723-49) Soil Sampled: 04/17/01 12:00 Received: 04/26/01 09:30									
Arsenic	**21.7**	0.575	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	**95.3**	0.575	"	"	"	"	"	"	
NS2-B3 (B1D0723-50) Soil Sampled: 04/17/01 12:00 Received: 04/26/01 09:30									
Arsenic	**20.1**	0.633	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	**69.6**	0.633	"	"	"	"	"	"	
NS2-C1 (B1D0723-51) Soil Sampled: 04/17/01 12:00 Received: 04/26/01 09:30									
Arsenic	**22.8**	0.649	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	**94.7**	0.649	"	"	"	"	"	"	
NS2-C2 (B1D0723-52) Soil Sampled: 04/17/01 12:00 Received: 04/26/01 09:30									
Arsenic	**22.1**	0.556	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	**94.0**	0.556	"	"	"	"	"	"	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS2-C3 (B1D0723-53) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	18.1	0.568	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	64.9	0.568	"	"	"	"	"	"	
NS2-D1 (B1D0723-54) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	26.7	0.588	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	121	0.588	"	"	"	"	"	"	
NS2-D2 (B1D0723-55) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	26.4	0.585	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	122	0.585	"	"	"	"	"	"	
NS2-D3 (B1D0723-56) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	21.9	0.704	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	58.8	0.704	"	"	"	"	"	"	
EW4-A1 (B1D0723-57) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	54.1	0.568	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	235	0.568	"	"	"	"	"	"	
EW4-A2 (B1D0723-58) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	57.6	0.621	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	255	0.621	"	"	"	"	"	"	
EW4-A3 (B1D0723-59) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	48.5	0.568	mg/kg dry	2	1E05008	05/05/01	05/09/01	EPA 6020	
Lead	191	0.568	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:57

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW3-B1 (B1D0723-01) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**93.3**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
EW3-C1 (B1D0723-04) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**93.4**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
EW3-D1 (B1D0723-07) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**89.8**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
NS3-A1 (B1D0723-10) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**87.0**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
NS3-A2 (B1D0723-11) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**86.2**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
NS3-A3 (B1D0723-12) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**87.2**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
-A1 (B1D0723-13) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.4**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
NS4-A2 (B1D0723-14) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**86.7**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
NS4-B1 (B1D0723-16) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**90.5**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS4-B2 (B1D0723-17) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.5	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
NS4-C1 (B1D0723-19) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.6	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
NS4-C2 (B1D0723-20) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.9	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
NS4-D1 (B1D0723-22) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.1	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
NS4-D2 (B1D0723-23) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.8	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
PNS1-A1 (B1D0723-25) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.5	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
PNS1-A2 (B1D0723-26) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.4	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
PNS1-A3 (B1D0723-27) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.9	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
PNS1-B1 (B1D0723-28) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.3	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:57

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS1-B2 (B1D0723-29) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.0**	1.00	%	1	1E04002	05/04/01	05/07/01	BSOPSPL003R07	
PNS1-B3 (B1D0723-30) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.4**	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PNS1-C3 (B1D0723-31) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**92.2**	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
NS3-B3 (B1D0723-32) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**89.0**	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
NS3-C2 (B1D0723-33) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**87.7**	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
NS3-C3 (B1D0723-34) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**89.2**	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
-D1 (B1D0723-35) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.8**	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
NS3-D2 (B1D0723-36) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.8**	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
NS3-D3 (B1D0723-37) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**90.6**	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:57

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW2-A1 (B1D0723-38) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.6	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PEW2-A2 (B1D0723-39) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	94.1	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PEW2-A3 (B1D0723-40) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.6	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PEW2-B1 (B1D0723-41) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.3	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PEW2-B2 (B1D0723-42) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.0	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PEW2-B3 (B1D0723-43) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	91.7	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PEW2-C1 (B1D0723-44) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	94.8	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PEW2-C2 (B1D0723-45) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	94.6	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PEW2-C3 (B1D0723-46) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.7	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW3-A1 (B1D0723-47) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	94.8	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
PEW3-B1 (B1D0723-48) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	94.2	1.00	%	1	1E04004	05/04/01	05/07/01	BSOPSPL003R07	
NS2-B2 (B1D0723-49) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	84.3	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	
NS2-B3 (B1D0723-50) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.6	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	
NS2-C1 (B1D0723-51) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.4	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	
NS2-C2 (B1D0723-52) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.3	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	
-C3 (B1D0723-53) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.5	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	
NS2-D1 (B1D0723-54) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.8	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	
NS2-D2 (B1D0723-55) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.2	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	

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83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS2-D3 (B1D0723-56) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**90.2**	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	
EW4-A1 (B1D0723-57) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**89.0**	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	
EW4-A2 (B1D0723-58) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.1**	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	
EW4-A3 (B1D0723-59) Soil	**Sampled: 04/17/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.3**	1.00	%	1	1E04005	05/04/01	05/07/01	BSOPSPL003R07	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Total Metals by EPA 6000/7000 Series Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E05006: Prepared 05/05/01 Using EPA 3050B										
Blank (1E05006-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1E05006-BS1)										
Arsenic	22.1	0.500	mg/kg wet	25.0		88.4	70-130			
Lead	22.5	0.500	"	25.0		90.0	80-120			
Matrix Spike (1E05006-MS1)					**Source: B1D0722-49**					
Arsenic	81.6	0.709	mg/kg dry	19.8	25.0	286	70-130			Q-15
Lead	268	0.709	"	19.8	107	813	70-130			Q-15
Matrix Spike Dup (1E05006-MSD1)					**Source: B1D0722-49**					
Arsenic	50.6	0.709	mg/kg dry	19.8	25.0	129	70-130	46.9	20	Q-15
[illegible]	158	0.709	"	19.8	107	258	70-130	51.6	20	Q-15
Batch 1E05007: Prepared 05/05/01 Using EPA 3050B										
Blank (1E05007-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1E05007-BS1)										
Arsenic	21.6	0.500	mg/kg wet	25.0		86.4	70-130			
Lead	22.6	0.500	"	25.0		90.4	80-120			
Matrix Spike (1E05007-MS1)					**Source: B1D0723-26**					
Arsenic	44.1	0.575	mg/kg dry	16.6	28.4	94.6	70-130			
Lead	162	0.575	"	16.6	134	169	70-130			Q-15

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:57

Total Metals by EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E05007: Prepared 05/05/01 Using EPA 3050B										
Matrix Spike Dup (1E05007-MSD1)					**Source: B1D0723-26**					
Arsenic	38.7	0.575	mg/kg dry	16.6	28.4	62.0	70-130	13.0	20	Q-01
Lead	136	0.575	"	16.6	134	12.0	70-130	17.4	20	Q-15
Batch 1E05008: Prepared 05/05/01 Using EPA 3050B										
Blank (1E05008-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1E05008-BS1)										
Arsenic	22.8	0.500	mg/kg wet	25.0		91.2	70-130			
Lead	24.5	0.500	"	25.0		98.0	80-120			
Matrix Spike (1E05008-MS1)					**Source: B1D0723-46**					
Arsenic	24.9	0.676	mg/kg dry	18.0	9.07	87.9	70-130			
Lead	72.0	0.676	"	18.0	48.0	133	70-130			Q-01
Matrix Spike Dup (1E05008-MSD1)					**Source: B1D0723-46**					
Arsenic	24.2	0.676	mg/kg dry	18.0	9.07	84.1	70-130	2.85	20	
Lead	68.5	0.676	"	18.0	48.0	114	70-130	4.98	20	

The results in this report apply to the samples analyzed in accordance with the c[illegible] of custody document. This analytical report must be reproduced in its [illegible]y.

S. Woerman

Scott A. Woerman, Project Manager

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:57

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E04002: Prepared 05/04/01 Using Dry Weight										
Blank (1E04002-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E04004: Prepared 05/04/01 Using Dry Weight										
Blank (1E04004-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E04005: Prepared 05/04/01 Using Dry Weight										
Blank (1E04005-BLK1)										
Dry Weight	100	1.00	%							

Notes and Definitions

Q-01	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
Q-15	Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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#3

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20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: Floyd & Snider / Fulcrum Environmental
REPORT TO: Peggy Williamson
ADDRESS: 122 S. 3rd St, Yakima, WA 98901
PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 (STD.) 7 5 4 3 2 1 <1
Petroleum Hydrocarbon Analyses: 5 (STD.) 4 3 2 1 <1
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME													MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. EW3-B1	4/17/01													S	1	Hold all	
2. EW3-B2	↓													↓	↓	samples - an	
3. EW3-B3																updated coc	
4. EW3-C1																with those	
5. EW3-C2																samples that	
6. EW3-C3																need to be	
7. EW3-D1																run will	
8. EW3-D2																follow shortly.	
9. EW3-D3																	
10. NS3-A1																Per Tom	
11. NS3-A2																Colligan at	
12. NS3-A3																Floyd & Snider	
13. NS4-A1																	
14. NS4-A2																	
15. NS4-A3																	

RELINQUISHED BY: Ann M. Palmer DATE: 4/25/01 RECEIVED BY: DATE: 4/26/01
PRINT NAME: Ann M. Palmer FIRM: Fulcrum TIME: 11:25am PRINT NAME: FIRM: NCA TIME: 0930
RELINQUISHED BY: DATE: RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME: PRINT NAME: FIRM: TIME:
ADDITIONAL REMARKS: w/o
TEMP: 21.2
COC REV 3/99
PAGE 1 OF 4

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CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: Floyd & Snider / Fulcrum Environmental
REPORT TO: Peggy Williamson
ADDRESS: 122 S. 3rd st, Yakima, WA 98901
PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 7 5 4 3 2 1 <1 (STD.)
Petroleum Hydrocarbon Analyses: 5 4 3 2 1 <1 (STD.)
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. NS4-B1	4/18/01	S	1	Hold all	
2. NS4-B2				samples- an	
3. NS4-B3				updated COC	
4. NS4-C1				with those	
5. NS4-C2				samples that	
6. NS4-C3				need to be	
7. NS4-D1				run will	
8. NS4-D2				follow shortly.	
9. NS4-D3					
10. PNS1-A1				Pee Tom	
11. PNS1-A2				Culligan at	
12. PNS1-A3				Floyd & Snider	
13. PNS1-B1					
14. PNS1-B2					
15. PNS1-B3					

RELINQUISHED BY: Ann M. Palmer DATE: 4/25/01 RECEIVED BY: DATE:
PRINT NAME: Ann M. Palmer FIRM: Fulcrum TIME: 11:25 am PRINT NAME: FIRM: TIME:
RELINQUISHED BY: DATE: RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME: PRINT NAME: FIRM: TIME:
ADDITIONAL REMARKS: TI

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CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: Floyd & Snider/Fulcrum Environmental
REPORT TO: Peggy Williamson
ADDRESS: 1225. 3rd st, Yakima, WA 98901
PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: 10 (STD.) | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 (STD.) | 4 | 3 | 2 | 1 | <1

OTHER Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME													MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. PNS1-C3	4/10/01													S	1	Hold all	
2. NS3-B3																samples - an	
3. NS3-C2																updated coc	
4. NS3-C3																with those	
5. NS3-D1																samples that	
6. NS3-D2																need to be	
7. NS3-B3																ran will	
8. PEW2-A1																follow shortly.	
9. PEW2-A2																	
10. PEW2-A3																Per Tom	
11. PEW2-B1																Colligan at	
12. PEW2-B2																Floyd & Snider	
13. PEW2-B3																	
14. PEW2-C1																	
15. PEW2-C2																	

RELINQUISHED BY: Ann M. Palmer DATE: 4/25/01 RECEIVED BY: DATE:
PRINT NAME: Ann M. Palmer FIRM: Fulcrum TIME: 11:25am PRINT NAME: FIRM: TIME:

RELINQUISHED BY: DATE: RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME: PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS: TEMP:

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CHAIN OF CUSTODY REPORT

Work Order #:

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PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 (STD.) 7 5 4 3 2 1 <1
Petroleum Hydrocarbon Analyses: 5 (STD.) 4 3 2 1 <1
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	REQUESTED ANALYSES													MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. PEW2-C3	4/17/01														S	1	Hold all	
2. PEW3-A1																	samples-an	
3. PEW3-B1																	updated coc	
4. NS2-B2																	with those	
5. NS2-B3																	samples that	
6. NS2-C1																	need to be	
7. NS2-C2																	ran will	
8. NS2-C3																	follow shortly.	
9. NS2-D1																		
10. NS2-D2																	Per Tom	
11. NS2-B3																	colligan at	
12. EW4-A1																	Floyd&Snider	
13. EW4-A2																		
14. EW4-A3																		
15.																		

RELINQUISHED BY: Ann M. Palmer DATE: 4/25/01 RECEIVED BY: DATE:
PRINT NAME: Ann M. Palmer FIRM: Fulcrum TIME: 11:25am PRINT NAME: FIRM: TIME:
RELINQUISHED BY: DATE: RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME: PRINT NAME: FIRM: TIME:
ADDITIONAL REMARKS: TE

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RECEIVED
MAY 15 2001
BY:

10 May, 2001

Tom Colligan
Floyd & Snider Inc.
83 South King Street, Suite 614
Seattle, WA 98104

RE: Kissel Park

Enclosed are the results of analyses for samples received by the laboratory on 04/26/01 09:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

S. Wo

Scott A. Woerman
Project Manager

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 14:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PNS3-A1	B1D0713-01	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-A2	B1D0713-02	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-A3	B1D0713-03	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-B1	B1D0713-04	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-B2	B1D0713-05	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-B3	B1D0713-06	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-C1	B1D0713-07	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-C2	B1D0713-08	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-C3	B1D0713-09	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-D1	B1D0713-10	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-D2	B1D0713-11	Soil	04/19/01 12:00	04/26/01 09:30
PNS3-D3	B1D0713-12	Soil	04/19/01 12:00	04/26/01 09:30
PNS4-A1	B1D0713-13	Soil	04/19/01 12:00	04/26/01 09:30
PNS4-A2	B1D0713-14	Soil	04/19/01 12:00	04/26/01 09:30
PNS4-B1	B1D0713-15	Soil	04/19/01 12:00	04/26/01 09:30
PNS4-B2	B1D0713-16	Soil	04/19/01 12:00	04/26/01 09:30
PNS4-C1	B1D0713-17	Soil	04/19/01 12:00	04/26/01 09:30
PNS4-C2	B1D0713-18	Soil	04/19/01 12:00	04/26/01 09:30
PNS4-D1	B1D0713-19	Soil	04/19/01 12:00	04/26/01 09:30
PNS4-D2	B1D0713-20	Soil	04/19/01 12:00	04/26/01 09:30
PEW2-D1	B1D0713-21	Soil	04/19/01 12:00	04/26/01 09:30
PEW2-D2	B1D0713-22	Soil	04/19/01 12:00	04/26/01 09:30
PEW2-D3	B1D0713-23	Soil	04/19/01 12:00	04/26/01 09:30
PEW3-D1	B1D0713-24	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-A1	B1D0713-25	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-A2	B1D0713-26	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-A3	B1D0713-27	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-B1	B1D0713-28	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-B2	B1D0713-29	Soil	04/19/01 12:00	04/26/01 09:30

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 14:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PEW5-B3	B1D0713-30	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-C1	B1D0713-31	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-C2	B1D0713-32	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-C3	B1D0713-33	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-D1	B1D0713-34	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-D2	B1D0713-35	Soil	04/19/01 12:00	04/26/01 09:30
PEW5-D3	B1D0713-36	Soil	04/19/01 12:00	04/26/01 09:30
PEW1-A1	B1D0713-37	Soil	04/19/01 12:00	04/26/01 09:30
PEW1-A2	B1D0713-38	Soil	04/19/01 12:00	04/26/01 09:30
PEW1-B1	B1D0713-39	Soil	04/19/01 12:00	04/26/01 09:30
PEW1-B2	B1D0713-40	Soil	04/19/01 12:00	04/26/01 09:30
PEW1-C1	B1D0713-41	Soil	04/19/01 12:00	04/26/01 09:30
ᵕW1-C2	B1D0713-42	Soil	04/19/01 12:00	04/26/01 09:30
PEW1-D1	B1D0713-43	Soil	04/19/01 12:00	04/26/01 09:30
PEW1-D2	B1D0713-44	Soil	04/19/01 12:00	04/26/01 09:30
PEW3-C1	B1D0713-45	Soil	04/19/01 12:00	04/26/01 09:30
PNS1-D1	B1D0713-46	Soil	04/19/01 12:00	04/26/01 09:30
PNS1-D2	B1D0713-47	Soil	04/19/01 12:00	04/26/01 09:30
PNS1-D3	B1D0713-48	Soil	04/19/01 12:00	04/26/01 09:30
PNS5-A1	B1D0713-49	Soil	04/19/01 12:00	04/26/01 09:30
PNS5-A2	B1D0713-50	Soil	04/19/01 12:00	04/26/01 09:30
PNS5-B1	B1D0713-51	Soil	04/19/01 12:00	04/26/01 09:30
PNS5-B2	B1D0713-52	Soil	04/19/01 12:00	04/26/01 09:30
PNS5-C1	B1D0713-53	Soil	04/19/01 12:00	04/26/01 09:30
PNS5-C2	B1D0713-54	Soil	04/19/01 12:00	04/26/01 09:30
PNS5-D1	B1D0713-55	Soil	04/19/01 12:00	04/26/01 09:30
PNS5-D2	B1D0713-56	Soil	04/19/01 12:00	04/26/01 09:30
NS2-A1	B1D0713-57	Soil	04/19/01 12:00	04/26/01 09:30
NS2-A2	B1D0713-58	Soil	04/19/01 12:00	04/26/01 09:30

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541.383.9310 fax 541.382.7588

Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
NS2-A3	B1D0713-59	Soil	04/19/01 12:00	04/26/01 09:30
NS2-B1	B1D0713-60	Soil	04/19/01 12:00	04/26/01 09:30

Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS3-A1 (B1D0713-01) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**24.3**	0.806	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**99.1**	0.806	"	"	"	"	"	"	
PNS3-A2 (B1D0713-02) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**23.2**	0.794	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**97.9**	0.794	"	"	"	"	"	"	
PNS3-A3 (B1D0713-03) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**22.2**	0.662	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**93.3**	0.662	"	"	"	"	"	"	
PNS3-B1 (B1D0713-04) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**20.9**	0.794	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**80.4**	0.794	"	"	"	"	"	"	
PNS3-B2 (B1D0713-05) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**14.2**	0.699	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**45.6**	0.699	"	"	"	"	"	"	
PNS3-B3 (B1D0713-06) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**10.8**	0.746	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**27.0**	0.746	"	"	"	"	"	"	
PNS3-C1 (B1D0713-07) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**31.8**	0.676	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**88.0**	0.676	"	"	"	"	"	"	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS3-C2 (B1D0713-08) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.6**	0.719	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**85.9**	0.719	"	"	"	"	"	"	
PNS3-C3 (B1D0713-09) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.2**	0.800	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**64.9**	0.800	"	"	"	"	"	"	
PNS3-D1 (B1D0713-10) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**24.2**	0.826	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**96.1**	0.826	"	"	"	"	"	"	
PNS3-D2 (B1D0713-11) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**23.3**	0.654	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**96.0**	0.654	"	"	"	"	"	"	
PNS3-D3 (B1D0713-12) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**23.0**	0.769	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**83.8**	0.769	"	"	"	"	"	"	
PNS4-A1 (B1D0713-13) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**23.5**	0.800	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**97.7**	0.800	"	"	"	"	"	"	
PNS4-A2 (B1D0713-14) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**23.3**	0.730	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**97.0**	0.730	"	"	"	"	"	"	

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Scott A. Woerman, Project Manager

Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS4-B1 (B1D0713-15) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.9**	0.826	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**84.4**	0.826	"	"	"	"	"	"	
PNS4-B2 (B1D0713-16) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**22.1**	0.787	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**84.0**	0.787	"	"	"	"	"	"	
PNS4-C1 (B1D0713-17) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**22.3**	0.800	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**87.0**	0.800	"	"	"	"	"	"	
PNS4-C2 (B1D0713-18) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.9**	0.719	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**87.5**	0.719	"	"	"	"	"	"	
[illegible]S4-D1 (B1D0713-19) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
[illegible]enic	**21.3**	0.758	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**83.3**	0.758	"	"	"	"	"	"	
PNS4-D2 (B1D0713-20) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.2**	0.704	mg/kg dry	2	1E04010	05/04/01	05/06/01	EPA 6020	
Lead	**82.9**	0.704	"	"	"	"	"	"	
PEW2-D1 (B1D0713-21) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**24.6**	0.775	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	**204**	0.775	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW2-D2 (B1D0713-22) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**23.6**	0.741	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	**196**	0.741	"	"	"	"	"	"	
PEW2-D3 (B1D0713-23) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**41.4**	0.758	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	**277**	0.758	"	"	"	"	"	"	
PEW3-D1 (B1D0713-24) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**16.2**	0.685	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	**121**	0.685	"	"	"	"	"	"	
PEW5-A1 (B1D0713-25) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**58.7**	0.870	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	**208**	0.870	"	"	"	"	"	"	
PEW5-A2 (B1D0713-26) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**46.6**	0.680	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	**160**	0.680	"	"	"	"	"	"	
PEW5-A3 (B1D0713-27) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**20.0**	0.787	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	**40.1**	0.787	"	"	"	"	"	"	
PEW5-B1 (B1D0713-28) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**31.8**	0.680	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	**164**	0.680	"	"	"	"	"	"	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW5-B2 (B1D0713-29) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	53.1	0.694	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	237	0.694	"	"	"	"	"	"	
PEW5-B3 (B1D0713-30) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	52.7	0.775	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	75.8	0.775	"	"	"	"	"	"	
PEW5-C1 (B1D0713-31) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	30.9	0.769	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	153	0.769	"	"	"	"	"	"	
PEW5-C2 (B1D0713-32) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	39.3	0.820	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	187	0.820	"	"	"	"	"	"	
PEW5-C3 (B1D0713-33) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	64.7	0.699	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	337	1.75	"	5	"	"	05/06/01	"	
PEW5-D1 (B1D0713-34) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	20.8	0.719	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	135	0.719	"	"	"	"	"	"	
PEW5-D2 (B1D0713-35) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	11.4	0.680	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	43.5	0.680	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW5-D3 (B1D0713-36) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	9.34	0.794	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	42.4	0.794	"	"	"	"	"	"	
PEW1-A1 (B1D0713-37) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	49.5	0.758	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	206	0.758	"	"	"	"	"	"	
PEW1-A2 (B1D0713-38) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	56.1	0.769	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	226	0.769	"	"	"	"	"	"	
PEW1-B1 (B1D0713-39) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	34.6	0.833	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	196	0.833	"	"	"	"	"	"	
PEW1-B2 (B1D0713-40) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	40.1	0.794	mg/kg dry	2	1E04011	05/04/01	05/06/01	EPA 6020	
Lead	240	0.794	"	"	"	"	"	"	
PEW1-C1 (B1D0713-41) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	21.6	0.763	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	152	0.763	"	"	"	"	"	"	
PEW1-C2 (B1D0713-42) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	19.8	0.735	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	121	0.735	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW1-D1 (B1D0713-43) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**17.1**	0.719	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**120**	0.719	"	"	"	"	"	"	
PEW1-D2 (B1D0713-44) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**15.1**	0.763	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**95.1**	0.763	"	"	"	"	"	"	
PEW3-C1 (B1D0713-45) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**18.7**	0.685	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**133**	0.685	"	"	"	"	"	"	
PNS1-D1 (B1D0713-46) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**30.2**	0.763	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**128**	0.763	"	"	"	"	"	"	
PNS1-D2 (B1D0713-47) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**28.0**	0.709	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**102**	0.709	"	"	"	"	"	"	
PNS1-D3 (B1D0713-48) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**13.6**	0.730	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**19.3**	0.730	"	"	"	"	"	"	
PNS5-A1 (B1D0713-49) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**24.9**	0.752	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**105**	0.752	"	"	"	"	"	"	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	Reported:
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS5-A2 (B1D0713-50) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	24.7	0.704	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	102	0.704	"	"	"	"	"	"	
PNS5-B1 (B1D0713-51) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	18.6	0.719	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	62.5	0.719	"	"	"	"	"	"	
PNS5-B2 (B1D0713-52) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	17.1	0.775	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	51.6	0.775	"	"	"	"	"	"	
PNS5-C1 (B1D0713-53) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	19.2	0.781	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	68.6	0.781	"	"	"	"	"	"	
PNS5-C2 (B1D0713-54) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	18.8	0.794	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	66.0	0.794	"	"	"	"	"	"	
PNS5-D1 (B1D0713-55) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	18.9	0.800	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	71.2	0.800	"	"	"	"	"	"	
PNS5-D2 (B1D0713-56) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	18.4	0.820	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	67.4	0.820	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS2-A1 (B1D0713-57) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**30.9**	0.806	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**129**	0.806	"	"	"	"	"	"	
NS2-A2 (B1D0713-58) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**29.8**	0.781	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**115**	0.781	"	"	"	"	"	"	
NS2-A3 (B1D0713-59) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**19.4**	0.781	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**74.6**	0.781	"	"	"	"	"	"	
NS2-B1 (B1D0713-60) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**27.9**	0.763	mg/kg dry	2	1E04013	05/04/01	05/06/01	EPA 6020	
Lead	**124**	0.763	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	Reported: 05/10/01 14:16

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS3-A1 (B1D0713-01) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.1	1.00	%	1	1E02013	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-A2 (B1D0713-02) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.0	1.00	%	1	1E02013	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-A3 (B1D0713-03) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.1	1.00	%	1	1E02013	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-B1 (B1D0713-04) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.3	1.00	%	1	1E02013	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-B2 (B1D0713-05) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.3	1.00	%	1	1E02013	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-B3 (B1D0713-06) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.4	1.00	%	1	1E02013	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-C1 (B1D0713-07) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.6	1.00	%	1	1E02013	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-C2 (B1D0713-08) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.9	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-C3 (B1D0713-09) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.6	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	

Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS3-D1 (B1D0713-10) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.5	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-D2 (B1D0713-11) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.8	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PNS3-D3 (B1D0713-12) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	90.2	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PNS4-A1 (B1D0713-13) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.8	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PNS4-A2 (B1D0713-14) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.3	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PNS4-B1 (B1D0713-15) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.0	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
54-B2 (B1D0713-16) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.3	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PNS4-C1 (B1D0713-17) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.6	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PNS4-C2 (B1D0713-18) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.3	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 14:16

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS4-D1 (B1D0713-19) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.8	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PNS4-D2 (B1D0713-20) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.9	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PEW2-D1 (B1D0713-21) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	95.1	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PEW2-D2 (B1D0713-22) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	94.7	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PEW2-D3 (B1D0713-23) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.8	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PEW3-D1 (B1D0713-24) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.1	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-A1 (B1D0713-25) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.3	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-A2 (B1D0713-26) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.7	1.00	%	1	1E02014	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-A3 (B1D0713-27) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.7	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	

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83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
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Physical Parameters by APHA/ASTM/EPA Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW5-B1 (B1D0713-28) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	91.4	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-B2 (B1D0713-29) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	91.0	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-B3 (B1D0713-30) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.4	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-C1 (B1D0713-31) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.2	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-C2 (B1D0713-32) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	90.2	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-C3 (B1D0713-33) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	90.4	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
W5-D1 (B1D0713-34) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	91.8	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-D2 (B1D0713-35) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.7	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW5-D3 (B1D0713-36) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.2	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW1-A1 (B1D0713-37) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**90.2**	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW1-A2 (B1D0713-38) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**90.2**	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW1-B1 (B1D0713-39) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**93.6**	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW1-B2 (B1D0713-40) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**93.3**	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW1-C1 (B1D0713-41) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**93.6**	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW1-C2 (B1D0713-42) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**94.3**	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW1-D1 (B1D0713-43) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**94.1**	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW1-D2 (B1D0713-44) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**94.1**	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	
PEW3-C1 (B1D0713-45) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**95.3**	1.00	%	1	1E02016	05/02/01	05/03/01	BSOPSPL003R07	

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Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS1-D1 (B1D0713-46) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.8	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
PNS1-D2 (B1D0713-47) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.8	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
PNS1-D3 (B1D0713-48) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.5	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
PNS5-A1 (B1D0713-49) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.1	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
PNS5-A2 (B1D0713-50) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.5	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
PNS5-B1 (B1D0713-51) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.2	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
5-B2 (B1D0713-52) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.2	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
PNS5-C1 (B1D0713-53) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.9	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
PNS5-C2 (B1D0713-54) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.1	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	

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Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS5-D1 (B1D0713-55) Soil Sampled: 04/19/01 12:00 Received: 04/26/01 09:30									
Dry Weight	88.8	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
PNS5-D2 (B1D0713-56) Soil Sampled: 04/19/01 12:00 Received: 04/26/01 09:30									
Dry Weight	88.1	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
NS2-A1 (B1D0713-57) Soil Sampled: 04/19/01 12:00 Received: 04/26/01 09:30									
Dry Weight	86.3	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
NS2-A2 (B1D0713-58) Soil Sampled: 04/19/01 12:00 Received: 04/26/01 09:30									
Dry Weight	85.6	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
NS2-A3 (B1D0713-59) Soil Sampled: 04/19/01 12:00 Received: 04/26/01 09:30									
Dry Weight	85.9	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
NS2-B1 (B1D0713-60) Soil Sampled: 04/19/01 12:00 Received: 04/26/01 09:30									
Dry Weight	85.7	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	Reported:
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E04010: Prepared 05/04/01 Using EPA 3050B										
Blank (1E04010-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1E04010-BS1)										
Arsenic	25.9	0.500	mg/kg wet	25.0		104	70-130			
Lead	25.5	0.500	"	25.0		102	80-120			
Matrix Spike (1E04010-MS1)				**Source: B1D0713-01**						
Arsenic	43.1	0.769	mg/kg dry	22.3	24.3	84.3	70-130			
Lead	114	0.769	"	22.3	99.1	66.8	70-130			Q-01
Matrix Spike Dup (1E04010-MSD1)				**Source: B1D0713-01**						
Arsenic	42.5	0.769	mg/kg dry	22.3	24.3	81.6	70-130	1.40	20	
[illegible]	116	0.769	"	22.3	99.1	75.8	70-130	1.74	20	
Batch 1E04011: Prepared 05/04/01 Using EPA 3050B										
Blank (1E04011-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1E04011-BS1)										
Arsenic	24.7	0.500	mg/kg wet	25.0		98.8	70-130			
Lead	24.0	0.500	"	25.0		96.0	80-120			
Matrix Spike (1E04011-MS1)				**Source: B1D0713-21**						
Arsenic	38.5	0.735	mg/kg dry	19.3	24.6	72.0	70-130			
Lead	195	0.735	"	19.3	204	-46.6	70-130			Q-01

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 14:16

Total Metals by EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E04011: Prepared 05/04/01 Using EPA 3050B										
Matrix Spike Dup (1E04011-MSD1)					**Source: B1D0713-21**					
Arsenic	42.5	0.741	mg/kg dry	19.5	24.6	91.8	70-130	9.88	20	
Lead	227	0.741	"	19.5	204	118	70-130	15.2	20	
Batch 1E04013: Prepared 05/04/01 Using EPA 3050B										
Blank (1E04013-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1E04013-BS1)										
Arsenic	25.1	0.500	mg/kg wet	25.0		100	70-130			
Lead	25.2	0.500	"	25.0		101	80-120			
Matrix Spike (1E04013-MS1)					**Source: B1D0713-41**					
Arsenic	40.4	0.763	mg/kg dry	20.4	21.6	92.2	70-130			
Lead	157	0.763	"	20.4	152	24.5	70-130			Q-15
Matrix Spike Dup (1E04013-MSD1)					**Source: B1D0713-41**					
Arsenic	39.8	0.752	mg/kg dry	20.1	21.6	90.5	70-130	1.50	20	
Lead	153	0.752	"	20.1	152	4.98	70-130	2.58	20	Q-15

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E02013: Prepared 05/02/01 Using Dry Weight										
Blank (1E02013-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E02014: Prepared 05/02/01 Using Dry Weight										
Blank (1E02014-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E02016: Prepared 05/02/01 Using Dry Weight										
Blank (1E02016-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E02017: Prepared 05/02/01 Using Dry Weight										
Blank (1E02017-BLK1)										
Weight	100	1.00	%							

Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 14:16

Notes and Definitions

Q-01	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
Q-15	Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

#2

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Environmental Laboratory Network
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CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: Floyd & Snider/Fulcrum Environmental
REPORT TO: Peggy Williamson
ADDRESS: 1225. 3rd st, Yakima, WA 98901
PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 (STD.) | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: 5 (STD.) | 4 | 3 | 2 | 1 | <1
OTHER — Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	REQUESTED ANALYSES	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. PSN3-A1	4/19/01		S	1	Hold all	
2. PSN3-A2					samples - an	
3. PSN3-A3					updated COC	
4. PSN3-B1					with those	
5. PSN3-B2					samples that	
6. PSN3-B3					need to be	
7. PSN3-C1					run will	
8. PSN3-C2					follow shortly.	
9. PSN3-C3						
10. PSN3-D1					Per Tom	
11. PSN3-D2					Colligan at	
12. PSN3-D3					Floyd & Snider	
13. PSN4-A1						
14. PSN4-A2						
15. PSN4-B1						

RELINQUISHED BY: Ann M. Palmer
PRINT NAME: Ann M. Palmer FIRM: Fulcrum DATE: 4/25/01 TIME: 11:20am
RECEIVED BY:
PRINT NAME: FIRM: NCA DATE: 4/26/01 TIME: 0930

RELINQUISHED BY:
PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:
SAMPLES WERE NOT @ 2-6C UPON RECEIPT

ADDITIONAL REMARKS:
W/O
TEMP: 22.6

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CHAIN OF CUSTODY REPORT

Work Order #:

CLIENT: Floyd & Snider/Fulcrum Environmental
REPORT TO: Peggy Williamson
ADDRESS: 1223 3rd st, Yakima, WA 98901
PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 (STD.) 7 5 4 3 2 1 <1
Petroleum Hydrocarbon Analyses: 5 (STD.) 4 3 2 1 <1
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME														MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. PSN4-B2	4/19/01														S	1	Hold all	
2. PSN4-C1																	samples - an	
3. PSN4-C2																	updated coc	
4. PSN4-D1																	with those	
5. PSN4-D2																	samples that	
6. PEW2-D1																	need to be	
7. PEW2-D2																	ran will	
8. PEW2-D3																	follow shortly.	
9. PEW3-D1																		
10. PEW5-A1																	Pee Tom	
11. PEW5-A2																	Colligan at	
12. PEW5-A3																	Floyd & Snider	
13. PEW5-B1																		
14. PEW5-B2																		
15. PEW5-B3																		

RELINQUISHED BY: Ann M. Palmer DATE: 4/25/01 RECEIVED BY: DATE:
PRINT NAME: Ann M. Palmer FIRM: Fulcrum TIME: 11:20am PRINT NAME: FIRM: TIME:
RELINQUISHED BY: DATE: RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME: PRINT NAME: FIRM: TIME:

SAMPLES WERE NOT @ 2-6C UPON RECEI...

ADDITIONAL REMARKS:

TEM

COC REV 3/99

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MAY 15 2001
BY:

10 May, 2001

Tom Colligan
Floyd & Snider Inc.
83 South King Street, Suite 614
Seattle, WA 98104

RE: Kissel Park

Enclosed are the results of analyses for samples received by the laboratory on 04/26/01 09:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

S. Wo

Scott A. Woerman
Project Manager

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	Reported:
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW5-A1	B1D0722-01	Soil	04/19/01 12:00	04/26/01 09:30
EW5-A2	B1D0722-02	Soil	04/19/01 12:00	04/26/01 09:30
EW5-A3	B1D0722-03	Soil	04/19/01 12:00	04/26/01 09:30
EW5-B1	B1D0722-04	Soil	04/19/01 12:00	04/26/01 09:30
EW5-B2	B1D0722-05	Soil	04/19/01 12:00	04/26/01 09:30
EW5-B3	B1D0722-06	Soil	04/19/01 12:00	04/26/01 09:30
EW5-C1	B1D0722-07	Soil	04/19/01 12:00	04/26/01 09:30
EW5-C2	B1D0722-08	Soil	04/19/01 12:00	04/26/01 09:30
EW5-C3	B1D0722-09	Soil	04/19/01 12:00	04/26/01 09:30
EW5-D1	B1D0722-10	Soil	04/19/01 12:00	04/26/01 09:30
EW5-D2	B1D0722-11	Soil	04/19/01 12:00	04/26/01 09:30
EW5-D3	B1D0722-12	Soil	04/19/01 12:00	04/26/01 09:30
EW1-A1	B1D0722-13	Soil	04/19/01 12:00	04/26/01 09:30
EW1-A2	B1D0722-14	Soil	04/19/01 12:00	04/26/01 09:30
EW1-B1	B1D0722-16	Soil	04/18/01 12:00	04/26/01 09:30
EW1-B2	B1D0722-17	Soil	04/18/01 12:00	04/26/01 09:30
EW1-C1	B1D0722-19	Soil	04/18/01 12:00	04/26/01 09:30
EW1-C2	B1D0722-20	Soil	04/18/01 12:00	04/26/01 09:30
EW1-D1	B1D0722-22	Soil	04/18/01 12:00	04/26/01 09:30
EW1-D2	B1D0722-23	Soil	04/18/01 12:00	04/26/01 09:30
NS1-A1	B1D0722-25	Soil	04/18/01 12:00	04/26/01 09:30
NS1-A2	B1D0722-26	Soil	04/18/01 12:00	04/26/01 09:30
NS1-A3	B1D0722-27	Soil	04/18/01 12:00	04/26/01 09:30
NS1-B1	B1D0722-28	Soil	04/18/01 12:00	04/26/01 09:30
NS1-B2	B1D0722-29	Soil	04/18/01 12:00	04/26/01 09:30
NS1-B3	B1D0722-30	Soil	04/18/01 12:00	04/26/01 09:30
NS1-C1	B1D0722-31	Soil	04/18/01 12:00	04/26/01 09:30
NS1-C2	B1D0722-32	Soil	04/18/01 12:00	04/26/01 09:30
NS1-C3	B1D0722-33	Soil	04/18/01 12:00	04/26/01 09:30

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
NS1-D1	B1D0722-34	Soil	04/18/01 12:00	04/26/01 09:30
NS1-D2	B1D0722-35	Soil	04/18/01 12:00	04/26/01 09:30
NS1-D3	B1D0722-36	Soil	04/18/01 12:00	04/26/01 09:30
NS5-A1	B1D0722-37	Soil	04/18/01 12:00	04/26/01 09:30
NS5-A2	B1D0722-38	Soil	04/18/01 12:00	04/26/01 09:30
NS5-B1	B1D0722-40	Soil	04/18/01 12:00	04/26/01 09:30
NS5-B2	B1D0722-41	Soil	04/18/01 12:00	04/26/01 09:30
NS5-C1	B1D0722-43	Soil	04/18/01 12:00	04/26/01 09:30
NS5-C2	B1D0722-44	Soil	04/18/01 12:00	04/26/01 09:30
NS5-D1	B1D0722-46	Soil	04/19/01 12:00	04/26/01 09:30
NS5-D2	B1D0722-47	Soil	04/19/01 12:00	04/26/01 09:30
PNS1-C1	B1D0722-49	Soil	04/19/01 12:00	04/26/01 09:30
'S1-C2	B1D0722-50	Soil	04/19/01 12:00	04/26/01 09:30
NS3-B1	B1D0722-51	Soil	04/19/01 12:00	04/26/01 09:30
NS3-B2	B1D0722-52	Soil	04/19/01 12:00	04/26/01 09:30
NS3-C1	B1D0722-53	Soil	04/19/01 12:00	04/26/01 09:30

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:45

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW5-A1 (B1D0722-01) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	47.4	0.658	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	200	0.658	"	"	"	"	"	"	
EW5-A2 (B1D0722-02) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	52.8	0.694	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	228	0.694	"	"	"	"	"	"	
EW5-A3 (B1D0722-03) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	46.2	0.625	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	152	0.625	"	"	"	"	"	"	
EW5-B1 (B1D0722-04) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	45.2	0.667	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	214	0.667	"	"	"	"	"	"	
EW5-B2 (B1D0722-05) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	38.4	0.592	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	151	0.592	"	"	"	"	"	"	
EW5-B3 (B1D0722-06) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	37.9	0.704	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	135	0.704	"	"	"	"	"	"	
EW5-C1 (B1D0722-07) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	16.0	0.606	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	109	0.606	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:45

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW5-C2 (B1D0722-08) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	19.7	0.699	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	143	0.699	"	"	"	"	"	"	
EW5-C3 (B1D0722-09) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	75.6	0.602	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	226	1.51	"	5	"	"	05/09/01	"	
EW5-D1 (B1D0722-10) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	17.3	0.654	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	110	0.654	"	"	"	"	"	"	
EW5-D2 (B1D0722-11) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	9.79	0.658	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	43.0	0.658	"	"	"	"	"	"	
EW5-D3 (B1D0722-12) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	56.1	0.676	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	286	0.676	"	"	"	"	"	"	
EW1-A1 (B1D0722-13) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	49.8	0.649	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	215	0.649	"	"	"	"	"	"	
EW1-A2 (B1D0722-14) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	57.7	0.658	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	252	0.658	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:45

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW1-B1 (B1D0722-16) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	32.3	0.578	mg/kg dry	2	1E05004	05/05/01	05/07/01	EPA 6020	
Lead	199	0.578	"	"	"	"	"	"	
EW1-B2 (B1D0722-17) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	41.1	0.602	mg/kg dry	2	1E05004	05/05/01	05/07/01	EPA 6020	
Lead	217	0.602	"	"	"	"	"	"	
EW1-C1 (B1D0722-19) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	15.8	0.575	mg/kg dry	2	1E05004	05/05/01	05/07/01	EPA 6020	
Lead	104	0.575	"	"	"	"	"	"	
EW1-C2 (B1D0722-20) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	28.4	0.694	mg/kg dry	2	1E05004	05/05/01	05/08/01	EPA 6020	
Lead	147	0.694	"	"	"	"	"	"	
EW1-D1 (B1D0722-22) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	12.9	0.714	mg/kg dry	2	1E05004	05/05/01	05/07/01	EPA 6020	
Lead	108	0.714	"	"	"	"	"	"	
EW1-D2 (B1D0722-23) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	12.6	0.676	mg/kg dry	2	1E05004	05/05/01	05/07/01	EPA 6020	
Lead	87.2	0.676	"	"	"	"	"	"	
NS1-A1 (B1D0722-25) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	33.3	0.671	mg/kg dry	2	1E05005	05/05/01	05/08/01	EPA 6020	
Lead	152	0.671	"	"	"	"	"	"	

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Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS1-A2 (B1D0722-26) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**34.0**	0.680	mg/kg dry	2	1E05005	05/05/01	05/08/01	EPA 6020	
Lead	**161**	0.680	"	"	"	"	"	"	
NS1-A3 (B1D0722-27) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**22.9**	0.595	mg/kg dry	2	1E05005	05/05/01	05/08/01	EPA 6020	
Lead	**63.8**	0.595	"	"	"	"	"	"	
NS1-B1 (B1D0722-28) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**27.1**	0.658	mg/kg dry	2	1E05005	05/05/01	05/08/01	EPA 6020	
Lead	**121**	0.658	"	"	"	"	"	"	
NS1-B2 (B1D0722-29) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**29.2**	0.641	mg/kg dry	2	1E05005	05/05/01	05/08/01	EPA 6020	
Lead	**128**	0.641	"	"	"	"	"	"	
NS1-B3 (B1D0722-30) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.9**	0.676	mg/kg dry	2	1E05005	05/05/01	05/08/01	EPA 6020	
Lead	**51.9**	0.676	"	"	"	"	"	"	
NS1-C1 (B1D0722-31) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**25.3**	0.714	mg/kg dry	2	1E05005	05/05/01	05/09/01	EPA 6020	
Lead	**108**	0.714	"	"	"	"	"	"	
NS1-C2 (B1D0722-32) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**25.5**	0.565	mg/kg dry	2	1E05005	05/05/01	05/09/01	EPA 6020	
Lead	**113**	0.565	"	"	"	"	"	"	

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Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS1-C3 (B1D0722-33) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**15.6**	0.709	mg/kg dry	2	1E05005	05/05/01	05/07/01	EPA 6020	
Lead	**40.1**	0.709	"	"	"	"	"	"	
NS1-D1 (B1D0722-34) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**25.2**	0.719	mg/kg dry	2	1E05005	05/05/01	05/07/01	EPA 6020	
Lead	**124**	0.719	"	"	"	"	"	"	
NS1-D2 (B1D0722-35) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**14.4**	0.613	mg/kg dry	2	1E05005	05/05/01	05/07/01	EPA 6020	
Lead	**16.7**	0.613	"	"	"	"	"	"	
NS1-D3 (B1D0722-36) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**23.5**	0.719	mg/kg dry	2	1E05005	05/05/01	05/07/01	EPA 6020	
Lead	**97.7**	0.719	"	"	"	"	"	"	
NS5-A1 (B1D0722-37) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**19.7**	0.595	mg/kg dry	2	1E05005	05/05/01	05/07/01	EPA 6020	
Lead	**88.7**	0.595	"	"	"	"	"	"	
NS5-A2 (B1D0722-38) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**20.5**	0.641	mg/kg dry	2	1E05005	05/05/01	05/07/01	EPA 6020	
Lead	**94.3**	0.641	"	"	"	"	"	"	
NS5-B1 (B1D0722-40) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**17.1**	0.641	mg/kg dry	2	1E05005	05/05/01	05/07/01	EPA 6020	
Lead	**63.6**	0.641	"	"	"	"	"	"	

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Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS5-B2 (B1D0722-41) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**16.2**	0.571	mg/kg dry	2	1E05005	05/05/01	05/07/01	EPA 6020	
Lead	**56.4**	0.571	"	"	"	"	"	"	
NS5-C1 (B1D0722-43) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**19.8**	0.610	mg/kg dry	2	1E05005	05/05/01	05/08/01	EPA 6020	
Lead	**66.6**	0.610	"	"	"	"	"	"	
NS5-C2 (B1D0722-44) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.8**	0.654	mg/kg dry	2	1E05005	05/05/01	05/08/01	EPA 6020	
Lead	**89.0**	0.654	"	"	"	"	"	"	
NS5-D1 (B1D0722-46) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**17.1**	0.617	mg/kg dry	2	1E05005	05/05/01	05/07/01	EPA 6020	
Lead	**67.1**	0.617	"	"	"	"	"	"	
NS5-D2 (B1D0722-47) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**16.1**	0.704	mg/kg dry	2	1E05005	05/05/01	05/09/01	EPA 6020	
Lead	**52.1**	0.704	"	"	"	"	"	"	
PNS1-C1 (B1D0722-49) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**25.0**	0.709	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**107**	0.709	"	"	"	"	"	"	
PNS1-C2 (B1D0722-50) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**13.6**	0.709	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	**40.2**	0.709	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:45

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS3-B1 (B1D0722-51) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	19.9	0.654	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	81.0	0.654	"	"	"	"	"	"	
NS3-B2 (B1D0722-52) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	19.3	0.690	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	79.1	0.690	"	"	"	"	"	"	
NS3-C1 (B1D0722-53) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	18.9	0.581	mg/kg dry	2	1E05006	05/05/01	05/09/01	EPA 6020	
Lead	77.9	0.581	"	"	"	"	"	"	

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83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:45

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW5-A1 (B1D0722-01) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.5	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
EW5-A2 (B1D0722-02) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.7	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
EW5-A3 (B1D0722-03) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.5	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
EW5-B1 (B1D0722-04) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	94.2	1.00	%	1	1E02017	05/02/01	05/03/01	BSOPSPL003R07	
EW5-B2 (B1D0722-05) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.2	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW5-B3 (B1D0722-06) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.2	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
5-C1 (B1D0722-07) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	91.7	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW5-C2 (B1D0722-08) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	91.3	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW5-C3 (B1D0722-09) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	90.7	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	

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Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW5-D1 (B1D0722-10) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	91.5	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW5-D2 (B1D0722-11) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.0	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW5-D3 (B1D0722-12) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.6	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW1-A1 (B1D0722-13) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	90.4	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW1-A2 (B1D0722-14) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.5	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW1-B1 (B1D0722-16) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	95.0	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW1-B2 (B1D0722-17) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.1	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW1-C1 (B1D0722-19) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	95.7	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW1-C2 (B1D0722-20) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.8	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	

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Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW1-D1 (B1D0722-22) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	**94.3**	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
EW1-D2 (B1D0722-23) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	**94.3**	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
NS1-A1 (B1D0722-25) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	**85.9**	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
NS1-A2 (B1D0722-26) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	**86.4**	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
NS1-A3 (B1D0722-27) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	**89.0**	1.00	%	1	1E02018	05/02/01	05/03/01	BSOPSPL003R07	
NS1-B1 (B1D0722-28) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	**86.1**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
-B2 (B1D0722-29) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	**85.6**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS1-B3 (B1D0722-30) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	**88.0**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS1-C1 (B1D0722-31) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	**87.1**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	

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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:45

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS1-C2 (B1D0722-32) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.1**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS1-C3 (B1D0722-33) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**89.0**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS1-D1 (B1D0722-34) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**89.0**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS1-D2 (B1D0722-35) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**91.9**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS1-D3 (B1D0722-36) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**90.7**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS5-A1 (B1D0722-37) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**85.5**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS5-A2 (B1D0722-38) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**86.9**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS5-B1 (B1D0722-40) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**89.2**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS5-B2 (B1D0722-41) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**90.4**	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	

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Scott A. Woerman, Project Manager

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:45

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
NS5-C1 (B1D0722-43) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.3	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS5-C2 (B1D0722-44) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.1	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS5-D1 (B1D0722-46) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.7	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
NS5-D2 (B1D0722-47) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.8	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
PNS1-C1 (B1D0722-49) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.4	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
PNS1-C2 (B1D0722-50) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	90.8	1.00	%	1	1E02019	05/02/01	05/03/01	BSOPSPL003R07	
J-B1 (B1D0722-51) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.5	1.00	%	1	1E02020	05/02/01	05/03/01	BSOPSPL003R07	
NS3-B2 (B1D0722-52) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.6	1.00	%	1	1E02020	05/02/01	05/03/01	BSOPSPL003R07	
NS3-C1 (B1D0722-53) Soil	**Sampled: 04/19/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.9	1.00	%	1	1E02020	05/02/01	05/03/01	BSOPSPL003R07	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	Reported:
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:45

Total Metals by EPA 6000/7000 Series Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E05004: Prepared 05/05/01 Using EPA 3050B										
Blank (1E05004-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1E05004-BS1)										
Arsenic	21.7	1.00	mg/kg wet	25.0		86.8	70-130			
Lead	21.9	1.00	"	25.0		87.6	80-120			
Matrix Spike (1E05004-MS1)					**Source: B1D0722-01**					
Arsenic	71.5	0.658	mg/kg dry	18.4	47.4	131	70-130			Q-15
Lead	250	0.658	"	18.4	200	272	70-130			Q-15
Matrix Spike Dup (1E05004-MSD1)					**Source: B1D0722-01**					
Arsenic	44.2	0.658	mg/kg dry	18.4	47.4	-17.4	70-130	47.2	20	Q-15
Lead	136	0.658	"	18.4	200	-348	70-130	59.1	20	
Batch 1E05005: Prepared 05/05/01 Using EPA 3050B										
Blank (1E05005-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1E05005-BS1)										
Arsenic	23.4	0.500	mg/kg wet	25.0		93.6	70-130			
Lead	24.1	0.500	"	25.0		96.4	80-120			
Matrix Spike (1E05005-MS1)					**Source: B1D0722-25**					
Arsenic	49.1	0.671	mg/kg dry	19.5	33.3	81.0	70-130			
Lead	169	0.671	"	19.5	152	87.2	70-130			

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:45

Total Metals by EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E05005: Prepared 05/05/01 Using EPA 3050B										
Matrix Spike Dup (1E05005-MSD1)					**Source: B1D0722-25**					
Arsenic	50.8	0.671	mg/kg dry	19.5	33.3	89.7	70-130	3.40	20	
Lead	178	0.671	"	19.5	152	133	70-130	5.19	20	Q-01
Batch 1E05006: Prepared 05/05/01 Using EPA 3050B										
Blank (1E05006-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1E05006-BS1)										
Arsenic	22.1	0.500	mg/kg wet	25.0		88.4	70-130			
Lead	22.5	0.500	"	25.0		90.0	80-120			
Matrix Spike (1E05006-MS1)					**Source: B1D0722-49**					
nic	81.6	0.709	mg/kg dry	19.8	25.0	286	70-130			Q-15
Lead	268	0.709	"	19.8	107	813	70-130			Q-15
Matrix Spike Dup (1E05006-MSD1)					**Source: B1D0722-49**					
Arsenic	50.6	0.709	mg/kg dry	19.8	25.0	129	70-130	46.9	20	Q-15
Lead	158	0.709	"	19.8	107	258	70-130	51.6	20	Q-15

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:45

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E02017: Prepared 05/02/01 Using Dry Weight										
Blank (1E02017-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E02018: Prepared 05/02/01 Using Dry Weight										
Blank (1E02018-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E02019: Prepared 05/02/01 Using Dry Weight										
Blank (1E02019-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E02020: Prepared 05/02/01 Using Dry Weight										
Blank (1E02020-BLK1)										
Dry Weight	100	1.00	%							

Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:45

Notes and Definitions

Q-01	The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch.
Q-15	Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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#4

CHAIN OF CUSTODY REPORT

Work Order #: B1D0722

CLIENT: Floyd & Snider/Fulcrum Environmental
REPORT TO: Peggy Williamson
ADDRESS: 1225 Jeckst, Yakima, WA 98901
PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Tissue Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 (STD.) 7 5 4 3 2 1 <1
Petroleum Hydrocarbon Analyses: 5 (STD.) 4 3 2 1 <1
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Pb	As	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1.	EWS-A1	4/19/01	✓	✓	S	1	Hold all	01
2.	EWS-A2		✓	✓			samples - an	02
3.	EWS-A3		✓	✓			updated coc	03
4.	EWS-B1		✓	✓			with those	04
5.	EWS-B2		✓	✓			samples that	05
6.	EWS-B3		✓	✓			need to be	06
7.	EWS-C1		✓	✓			ran will	07
8.	EWS-C2		✓	✓			follow shortly.	08
9.	EWS-C3		✓	✓				09
10.	EWS-D1		✓	✓			Per Tom	10
11.	EWS-D2		✓	✓			Colligan at	11
12.	EWS-D3		✓	✓			Floyd & Snider	12
13.	EW1-A1		✓	✓				13
14.	EW1-A2		✓	✓				14
15.	EW1-A3	—	HOLD					15

RELINQUISHED BY: Ann M. Palmer
PRINT NAME: Ann M. Palmer FIRM: Fulcrum
DATE: 4/25/01 TIME: 11:30 am
RECEIVED BY: [signature]
PRINT NAME:
FIRM: NCA
DATE: 4/26/01 TIME: 0930

RELINQUISHED BY:
PRINT NAME: FIRM:
DATE: TIME:
RECEIVED BY:
PRINT NAME: FIRM:
DATE: TIME:

ADDITIONAL REMARKS:

TEMP: 22.3

SAMPLES WERE NOT @ 2-6C UPON RECEIPT

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CHAIN OF CUSTODY REPORT

Work Order #: B1D0722

CLIENT: Floyd & Snider/Fulcrum Environmental
REPORT TO: Peggy Williamson
ADDRESS: 1223 3rd St, Yakima, WA 98901
PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 (STD.) 7 5 4 3 2 1 <1
Petroleum Hydrocarbon Analyses: 5 (STD.) 4 3 2 1 <1
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Pb	As	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1.	EWI-B1	4/18/01	✓	✓	S	1	Hold all	16
2.	EWI-B2		✓	✓			samples - an	17
3.	EWI-B3		— HOLD —				updated coc.	18
4.	EWI-C1		✓	✓			with those	19
5.	EWI-C2		✓	✓			samples that	20
6.	EWI-C3		— HOLD —				need to be	21
7.	EWI-D1		✓	✓			run will	22
8.	EWI-D2		✓	✓			follow shortly.	23
9.	EWI-D3		— HOLD —					24
10.	NSI-A1		✓	✓			Per Tom	25
11.	NSI-A2		✓	✓			Calligan at	26
12.	NSI-A3		✓	✓			Floyd & Snider.	27
13.	NSI-B1		✓	✓				28
14.	NSI-B2		✓	✓				29
15.	NSI-B3		✓	✓				30

RELINQUISHED BY: Ann M. Palmer
PRINT NAME: Ann M. Palmer FIRM: Fulcrum DATE: 4/25/01 TIME: 11:30am
RECEIVED BY: [signature]
PRINT NAME: FIRM: NCA DATE: 4/26/01 TIME: 0930
RELINQUISHED BY:
PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:
ADDITIONAL REMARKS:

SAMPLES WERE NOT @ 2-6C UPON RECEI[illegible] TEMP: 22.3

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CHAIN OF CUSTODY REPORT

Work Order #: B1D0122

CLIENT: Floyd & Snider/Fulcrum Environmental
REPORT TO: Peggy Williamson
ADDRESS: 1225 3rd st, Yakima, WA 98901
PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider

P.O. NUMBER:

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Pb	As	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. NS1-C1	4/18/01	✓	✓	S	1	Hold all	31
2. NS1-C2		✓	✓			samples - an	32
3. NS1-C3		✓	✓			updated coc	33
4. NS1-D1		✓	✓			with those	34
5. NS1-D2		✓	✓			samples that	35
6. NS1-D3		✓	✓			need to be	36
7. NS5-A1		✓	✓			ran will	37
8. NS5-A2		✓	✓			follow shortly.	38
9. NS5-A3		HOLD					39
10. NS5-B1		✓	✓				40
11. NS5-B2		✓	✓			Ask Tom	41
12. NS5-B3		HOLD				Colligan at	42
13. NS5-C1		✓	✓			Floyd & Snider.	43
14. NS5-C2		✓	✓				44
15. NS5-C3		HOLD					45

RELINQUISHED BY: Ann M. Palmer
PRINT NAME: Ann M. Palmer FIRM: Fulcrum DATE: 4/25/01 TIME: 11:30am
RECEIVED BY: [signature]
PRINT NAME: FIRM: NCA DATE: 4/26/01 TIME: 0930
RELINQUISHED BY:
PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:
ADDITIONAL REMARKS:

SAMPLES WERE NOT @ 2-6C UPON RECEIPT

TEMP:

W/O 22.3

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CHAIN OF CUSTODY REPORT

Work Order #: B1D0722

CLIENT: Floyd & Snider/Fulcrum Environmental
REPORT TO: Peggy Williamson
ADDRESS: 1225 3rd St, Yakima, WA 98901
PHONE: (509) 574-0839 FAX: (509) 575-8453
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-182.1
SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
P.O. NUMBER:

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 (STD.) 7 5 4 3 2 1 <1
Petroleum Hydrocarbon Analyses: 5 (STD.) 4 3 2 1 <1
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PB	AS	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1.	N66-01	4/19/01	✓	✓	S	1	Hold all	46
2.	N65-02		✓	✓			samples - an	47
3.	N65-03		HOLD				updated coc.	48
4.	PN51-C1		✓	✓			with those	49
5.	PN51-C2		✓	✓			samples that	50
6.	N53-B1		✓	✓			need to be	51
7.	N53-B2		✓	✓			run will	52
8.	N53-C1		✓	✓			follow shortly.	53
9.								~~54~~ SG 4-27-01
10.							Per Tom	
11.							Colligan at	
12.							Floyd & Snider	
13.								
14.								
15.								

RELINQUISHED BY: Ann M. Palmer
PRINT NAME: Ann M. Palmer FIRM: Fulcrum DATE: 4/25/01 TIME: 11:30am
RECEIVED BY: [signature]
PRINT NAME: FIRM: NCA DATE: 4/26/01 TIME: 0930
RELINQUISHED BY:
PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:
ADDITIONAL REMARKS:

SAMPLES WERE NOT @ ... UPON RECEIPT
TEMP: W/D 22.3

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10 May, 2001

Tom Colligan
Floyd & Snider Inc.
83 South King Street, Suite 614
Seattle, WA 98104

RE: Kissel Park

Enclosed are the results of analyses for samples received by the laboratory on 04/26/01 09:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Scott A. Woerman
Project Manager

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Floyd & Snider Inc.
83 South King Street, Suite 614
Seattle WA, 98104

Project: Kissel Park
Project Number: 01-182.1
Project Manager: Tom Colligan

Reported:
05/10/01 13:24

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PNS2-C1	B1D0712-01	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-D2	B1D0712-02	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-D3	B1D0712-03	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-B3	B1D0712-04	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-B2	B1D0712-05	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-B1	B1D0712-06	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-D1	B1D0712-07	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-C3	B1D0712-08	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-C2	B1D0712-09	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-A3	B1D0712-10	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-A2	B1D0712-11	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-A1	B1D0712-12	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-C1	B1D0712-13	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-C2	B1D0712-14	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-C3	B1D0712-15	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-B1	B1D0712-16	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-B2	B1D0712-17	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-B3	B1D0712-18	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-D1	B1D0712-19	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-D2	B1D0712-20	Soil	04/18/01 12:00	04/26/01 09:30
PEW4-D3	B1D0712-21	Soil	04/18/01 12:00	04/26/01 09:30
EW3-A1	B1D0712-22	Soil	04/18/01 12:00	04/26/01 09:30
EW4-C1	B1D0712-25	Soil	04/18/01 12:00	04/26/01 09:30
EW4-C2	B1D0712-26	Soil	04/18/01 12:00	04/26/01 09:30
EW4-C3	B1D0712-27	Soil	04/18/01 12:00	04/26/01 09:30
EW4-B1	B1D0712-28	Soil	04/18/01 12:00	04/26/01 09:30
EW4-B2	B1D0712-29	Soil	04/18/01 12:00	04/26/01 09:30
EW4-B3	B1D0712-30	Soil	04/18/01 12:00	04/26/01 09:30
EW4-D1	B1D0712-31	Soil	04/18/01 12:00	04/26/01 09:30

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Scott A. Woerman, Project Manager

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	Reported: 05/10/01 13:24

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EW4-D2	B1D0712-32	Soil	04/18/01 12:00	04/26/01 09:30
EW4-D3	B1D0712-33	Soil	04/18/01 12:00	04/26/01 09:30
EW2-A1	B1D0712-34	Soil	04/18/01 12:00	04/26/01 09:30
EW2-A2	B1D0712-35	Soil	04/18/01 12:00	04/26/01 09:30
EW2-A3	B1D0712-36	Soil	04/18/01 12:00	04/26/01 09:30
EW2-B1	B1D0712-37	Soil	04/18/01 12:00	04/26/01 09:30
EW2-B2	B1D0712-38	Soil	04/18/01 12:00	04/26/01 09:30
EW2-B3	B1D0712-39	Soil	04/18/01 12:00	04/26/01 09:30
EW2-C1	B1D0712-40	Soil	04/18/01 12:00	04/26/01 09:30
EW2-C2	B1D0712-41	Soil	04/18/01 12:00	04/26/01 09:30
EW2-C3	B1D0712-42	Soil	04/18/01 12:00	04/26/01 09:30
EW2-D1	B1D0712-43	Soil	04/18/01 12:00	04/26/01 09:30
EW2-D2	B1D0712-44	Soil	04/18/01 12:00	04/26/01 09:30
EW2-D3	B1D0712-45	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-A1	B1D0712-46	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-A2	B1D0712-47	Soil	04/18/01 12:00	04/26/01 09:30
PNS2-A3	B1D0712-48	Soil	04/18/01 12:00	04/26/01 09:30

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS2-C1 (B1D0712-01) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**18.3**	0.333	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	**75.9**	0.333	"	"	"	"	"	"	
PNS2-D2 (B1D0712-02) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**19.1**	0.382	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	**71.7**	0.382	"	"	"	"	"	"	
PNS2-D3 (B1D0712-03) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**14.7**	0.394	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	**45.5**	0.394	"	"	"	"	"	"	
PNS2-B3 (B1D0712-04) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**18.4**	0.394	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	**69.1**	0.394	"	"	"	"	"	"	
PNS2-B2 (B1D0712-05) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**21.0**	0.340	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	**86.7**	0.340	"	"	"	"	"	"	
PNS2-B1 (B1D0712-06) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**19.0**	0.355	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	**83.3**	0.355	"	"	"	"	"	"	
PNS2-D1 (B1D0712-07) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**19.0**	0.365	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	**71.6**	0.365	"	"	"	"	"	"	

POST

PRE

B1 21.9 D1 [illegible]
B2 21.7 D2 26.4
B3 20.1 D3 21.9
C1 22.8 A1 34.9
C2 22.1 A2 29.2
C3 18.1 A3 14.4

C3 18.3
C2 18.1
C1 18.3
D2 19.1
D3 [illegible]
B3 18.4
B2 21
B1 19

D1 19
A1 17.3
A2 19.3
A3 15.0

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	Reported: 05/10/01 13:24

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS2-C3 (B1D0712-08) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	12.3	0.379	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	43.5	0.379	"	"	"	"	"	"	
PNS2-C2 (B1D0712-09) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	18.1	0.355	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	71.1	0.355	"	"	"	"	"	"	
PEW4-A3 (B1D0712-10) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	41.9	0.382	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	156	0.382	"	"	"	"	"	"	
PEW4-A2 (B1D0712-11) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	46.3	0.340	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	204	0.680	"	2	"	"	05/04/01	"	
PEW4-A1 (B1D0712-12) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	54.0	0.385	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	222	0.769	"	2	"	"	05/04/01	"	
PEW4-C1 (B1D0712-13) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	36.3	0.352	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	229	0.704	"	2	"	"	05/04/01	"	
PEW4-C2 (B1D0712-14) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	38.6	0.373	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	243	0.746	"	2	"	"	05/04/01	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW4-C3 (B1D0712-15) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	29.1	0.331	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	167	0.662	"	2	"	"	05/04/01	"	
PEW4-B1 (B1D0712-16) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	45.5	0.345	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	230	0.690	"	2	"	"	05/04/01	"	
PEW4-B2 (B1D0712-17) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	50.3	0.394	mg/kg dry	1	1D30038	04/30/01	05/03/01	EPA 6020	
Lead	243	0.787	"	2	"	"	05/04/01	"	
PEW4-B3 (B1D0712-18) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	41.7	0.394	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	236	0.787	"	2	"	"	05/04/01	"	
PEW4-D1 (B1D0712-19) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	18.7	0.352	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	151	0.352	"	"	"	"	"	"	
PEW4-D2 (B1D0712-20) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	20.5	0.407	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	163	0.407	"	"	"	"	"	"	
PEW4-D3 (B1D0712-21) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	21.0	0.407	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	191	0.813	"	2	"	"	05/04/01	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW3-A1 (B1D0712-22) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	42.2	0.407	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	244	0.813	"	2	"	"	05/04/01	"	
EW4-C1 (B1D0712-25) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	25.4	0.410	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	202	0.820	"	2	"	"	05/04/01	"	
EW4-C2 (B1D0712-26) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	19.0	0.357	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	151	0.357	"	"	"	"	"	"	
EW4-C3 (B1D0712-27) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	46.2	0.368	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	335	1.84	"	5	"	"	05/04/01	"	
EW4-B1 (B1D0712-28) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	33.9	0.394	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	217	0.787	"	2	"	"	05/04/01	"	
EW4-B2 (B1D0712-29) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	31.2	0.373	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	213	0.746	"	2	"	"	05/04/01	"	
EW4-B3 (B1D0712-30) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	48.7	0.391	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	239	0.781	"	2	"	"	05/04/01	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW4-D1 (B1D0712-31) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	9.75	0.362	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	82.1	0.362	"	"	"	"	"	"	
EW4-D2 (B1D0712-32) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	12.6	0.394	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	98.1	0.394	"	"	"	"	"	"	
EW4-D3 (B1D0712-33) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	39.5	0.413	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	370	2.07	"	5	"	"	05/04/01	"	
EW2-A1 (B1D0712-34) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	41.5	0.407	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	234	0.813	"	2	"	"	05/04/01	"	
EW2-A2 (B1D0712-35) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	38.7	0.385	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	238	0.769	"	2	"	"	05/04/01	"	
EW2-A3 (B1D0712-36) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	34.1	0.318	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	125	0.318	"	"	"	"	"	"	
EW2-B1 (B1D0712-37) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	22.8	0.373	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	156	0.373	"	"	"	"	"	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW2-B2 (B1D0712-38) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**30.8**	0.376	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	**220**	0.752	"	2	"	"	05/04/01	"	
EW2-B3 (B1D0712-39) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**35.4**	0.403	mg/kg dry	1	1D30039	04/30/01	05/03/01	EPA 6020	
Lead	**169**	0.403	"	"	"	"	"	"	
EW2-C1 (B1D0712-40) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**16.5**	0.321	mg/kg dry	1	1D30040	04/30/01	05/02/01	EPA 6020	
Lead	**148**	0.641	"	2	"	"	05/02/01	"	
EW2-C2 (B1D0712-41) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**11.8**	0.370	mg/kg dry	1	1D30040	04/30/01	05/02/01	EPA 6020	
Lead	**109**	0.370	"	"	"	"	"	"	
EW2-C3 (B1D0712-42) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**12.5**	0.388	mg/kg dry	1	1D30040	04/30/01	05/02/01	EPA 6020	
Lead	**91.7**	0.388	"	"	"	"	"	"	
EW2-D1 (B1D0712-43) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**19.9**	0.350	mg/kg dry	1	1D30040	04/30/01	05/02/01	EPA 6020	
Lead	**179**	0.699	"	2	"	"	05/04/01	"	
EW2-D2 (B1D0712-44) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Arsenic	**24.5**	0.400	mg/kg dry	1	1D30040	04/30/01	05/02/01	EPA 6020	
Lead	**257**	0.800	"	2	"	"	05/04/01	"	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW2-D3 (B1D0712-45) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	24.5	0.373	mg/kg dry	1	1D30040	04/30/01	05/02/01	EPA 6020	
Lead	191	0.746	"	2	"	"	05/04/01	"	
PNS2-A1 (B1D0712-46) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	17.3	0.388	mg/kg dry	1	1D30040	04/30/01	05/02/01	EPA 6020	
Lead	85.8	0.388	"	"	"	"	"	"	
PNS2-A2 (B1D0712-47) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	19.3	0.360	mg/kg dry	1	1D30040	04/30/01	05/02/01	EPA 6020	
Lead	93.3	0.360	"	"	"	"	"	"	
PNS2-A3 (B1D0712-48) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Arsenic	15.0	0.379	mg/kg dry	1	1D30040	04/30/01	05/02/01	EPA 6020	
Lead	69.1	0.379	"	"	"	"	"	"	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	Reported:
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:24

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS2-C1 (B1D0712-01) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.1	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-D2 (B1D0712-02) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.2	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-D3 (B1D0712-03) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	91.8	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-B3 (B1D0712-04) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.5	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-B2 (B1D0712-05) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	86.9	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-B1 (B1D0712-06) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.0	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-D1 (B1D0712-07) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.5	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-C3 (B1D0712-08) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	91.2	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-C2 (B1D0712-09) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.7	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW4-A3 (B1D0712-10) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.3**	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-A2 (B1D0712-11) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**88.8**	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-A1 (B1D0712-12) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**89.3**	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-C1 (B1D0712-13) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**91.8**	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-C2 (B1D0712-14) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**90.8**	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-C3 (B1D0712-15) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**89.7**	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-B1 (B1D0712-16) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**91.2**	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-B2 (B1D0712-17) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**90.8**	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-B3 (B1D0712-18) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	**92.9**	1.00	%	1	1E01002	05/01/01	05/02/01	BSOPSPL003R07	

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Floyd & Snider Inc.
83 South King Street, Suite 614
Seattle WA, 98104

Project: Kissel Park
Project Number: 01-182.1
Project Manager: Tom Colligan

Reported:
05/10/01 13:24

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PEW4-D1 (B1D0712-19) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	91.5	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-D2 (B1D0712-20) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	90.3	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
PEW4-D3 (B1D0712-21) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	90.3	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW3-A1 (B1D0712-22) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	93.0	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW4-C1 (B1D0712-25) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	92.8	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW4-C2 (B1D0712-26) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	92.5	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW4-C3 (B1D0712-27) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	90.5	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW4-B1 (B1D0712-28) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	91.2	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW4-B2 (B1D0712-29) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	93.9	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW4-B3 (B1D0712-30) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	88.9	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW4-D1 (B1D0712-31) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	90.4	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW4-D2 (B1D0712-32) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.7	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW4-D3 (B1D0712-33) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	89.7	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW2-A1 (B1D0712-34) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.6	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW2-A2 (B1D0712-35) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.3	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW2-A3 (B1D0712-36) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.4	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW2-B1 (B1D0712-37) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.2	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW2-B2 (B1D0712-38) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.2	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
EW2-B3 (B1D0712-39) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.3	1.00	%	1	1E01003	05/01/01	05/02/01	BSOPSPL003R07	
EW2-C1 (B1D0712-40) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	95.3	1.00	%	1	1E01004	05/01/01	05/02/01	BSOPSPL003R07	
EW2-C2 (B1D0712-41) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	94.7	1.00	%	1	1E01004	05/01/01	05/02/01	BSOPSPL003R07	
EW2-C3 (B1D0712-42) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.8	1.00	%	1	1E01004	05/01/01	05/02/01	BSOPSPL003R07	
EW2-D1 (B1D0712-43) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	94.3	1.00	%	1	1E01004	05/01/01	05/02/01	BSOPSPL003R07	
EW2-D2 (B1D0712-44) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	93.2	1.00	%	1	1E01004	05/01/01	05/02/01	BSOPSPL003R07	
EW2-D3 (B1D0712-45) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	92.4	1.00	%	1	1E01004	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-A1 (B1D0712-46) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.3	1.00	%	1	1E01004	05/01/01	05/02/01	BSOPSPL003R07	
PNS2-A2 (B1D0712-47) Soil	**Sampled: 04/18/01 12:00**	**Received: 04/26/01 09:30**							
Dry Weight	87.3	1.00	%	1	1E01004	05/01/01	05/02/01	BSOPSPL003R07	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: 01-182.1	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/10/01 13:24

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
PNS2-A3 (B1D0712-48) Soil Sampled: 04/18/01 12:00 Received: 04/26/01 09:30									
Dry Weight	88.0	1.00	%	1	1E01004	05/01/01	05/02/01	BSOPSPL003R07	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	Reported: 05/10/01 13:24

Total Metals by EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D30038: Prepared 04/30/01 Using EPA 3050B										
Blank (1D30038-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1D30038-BS1)										
Arsenic	21.2	0.500	mg/kg wet	25.0		84.8	70-130			
Lead	23.0	0.500	"	25.0		92.0	80-120			
Matrix Spike (1D30038-MS1)					**Source: B1D0679-01**					
Arsenic	24.2	0.355	mg/kg dry	23.7	5.52	78.8	70-130			
Lead	55.3	0.355	"	23.7	30.4	105	70-130			
Matrix Spike Dup (1D30038-MSD1)					**Source: B1D0679-01**					
Arsenic	23.1	0.355	mg/kg dry	23.7	5.52	74.2	70-130	4.65	20	
Lead	52.7	0.355	"	23.7	30.4	94.1	70-130	4.81	20	
Batch 1D30039: Prepared 04/30/01 Using EPA 3050B										
Blank (1D30039-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1D30039-BS1)										
Arsenic	21.4	0.500	mg/kg wet	25.0		85.6	70-130			
Lead	24.9	0.500	"	25.0		99.6	80-120			
Matrix Spike (1D30039-MS1)					**Source: B1D0712-18**					
Arsenic	55.7	0.388	mg/kg dry	20.9	41.7	67.0	70-130			Q-13
Lead	234	0.775	"	20.9	236	-9.57	70-130			Q-15

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	Reported: 05/10/01 13:24

Total Metals by EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D30039: Prepared 04/30/01 Using EPA 3050B										
Matrix Spike Dup (1D30039-MSD1)					**Source: B1D0712-18**					
Arsenic	51.5	0.388	mg/kg dry	20.9	41.7	46.9	70-130	7.84	20	Q-13
Lead	236	0.775	"	20.9	236	0.00	70-130	0.851	20	Q-15
Post Spike (1D30039-PS1)					**Source: B1D0712-18**					
Arsenic	490	1.97	mg/kg dry	424	41.7	106	80-120			
Batch 1D30040: Prepared 04/30/01 Using EPA 3050B										
Blank (1D30040-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
Lead	ND	0.500	"							
LCS (1D30040-BS1)										
Arsenic	25.4	0.500	mg/kg wet	25.0		102	70-130			
Lead	25.2	0.500	"	25.0		101	80-120			
Matrix Spike (1D30040-MS1)					**Source: B1D0712-40**					
Arsenic	33.8	0.350	mg/kg dry	18.3	16.5	94.5	70-130			
Lead	194	0.699	"	18.3	148	251	70-130			Q-15
Matrix Spike Dup (1D30040-MSD1)					**Source: B1D0712-40**					
Arsenic	34.1	0.350	mg/kg dry	18.3	16.5	96.2	70-130	0.884	20	
Lead	194	0.699	"	18.3	148	251	70-130	0.00	20	Q-15

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	Reported: 05/10/01 13:24

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1E01002: Prepared 05/01/01 Using Dry Weight										
Blank (1E01002-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E01003: Prepared 05/01/01 Using Dry Weight										
Blank (1E01003-BLK1)										
Dry Weight	100	1.00	%							
Batch 1E01004: Prepared 05/01/01 Using Dry Weight										
Blank (1E01004-BLK1)										
Dry Weight	100	1.00	%							

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: 01-182.1 Project Manager: Tom Colligan	**Reported:** 05/10/01 13:24

Notes and Definitions

Q-13	Multiple analyses indicate the percent recovery is outside the control limits due to a matrix effect.
Q-15	Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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#1

CHAIN OF CUSTODY REPORT

Work Order #: B1D0712

CLIENT: Floyd & Snider/Fulcrum Environmental

REPORT TO: ~~Peggy Williamson~~

ADDRESS: ~~... St.~~ ~~Yakima, WA 98901~~

PHONE: (...) ...-0839 FAX: (...)

PROJECT NAME: Kissel Park

PROJECT NUMBER: ~~...~~

SAMPLED BY: Peggy Williamson

INVOICE TO: Floyd & Snider
Tom Colligan
83 S. King St. Suite 614
Seattle WA 98104

P.O. NUMBER: ~~...~~ COY-KISSEL

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: [X] 10 STD. [ ] 7 [ ] 5 [ ] 4 [ ] 3 [ ] 2 [ ] 1 [ ] <1
Petroleum Hydrocarbon Analyses: [ ] 5 STD. [ ] 4 [ ] 3 [ ] 2 [ ] 1 [ ] <1
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges

REQUESTED ANALYSES: lead, arsenic — 6010 ICP/MS

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PB	AS	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. PNS2-C1	4/25/01	✓	✓	S	1	~~Hold all~~	-01
2. PNS2-D2		✓	✓			~~Samples on~~	-02
3. PNS2-D3		✓	✓			~~updated coc~~	-03
4. PNS2-B3		✓	✓			~~with these~~	-04
5. PNS2-B2		✓	✓			~~samples that~~	-05
6. PNS2-B1		✓	✓			~~need to be~~	-06
7. PNS2-D1		✓	✓			~~run will~~	-07
8. PNS2-C3		✓	✓			~~follow shortly~~	-08
9. PNS2-C2		✓	✓				-09
10. PEW4-A3		✓	✓			Per Tom Colligan	-10
11. PEW4-A2		✓	✓			at Floyd +	-11
12. PEW4-A1		✓	✓			Snider	-12
13. PEW4-C1		✓	✓				-13
14. PEW4-C2		✓	✓			SAMPLES WERE NOT @	-14
15. PEW4-C3		✓	✓			2-6C UPON RECEIPT	-15

RELINQUISHED BY: Ann M. Palmer
PRINT NAME: Ann M. Palmer FIRM: Fulcrum DATE: 4/25/01 TIME: 11:45 a.m.
RECEIVED BY: [signature]
PRINT NAME: FIRM: NCA DATE: 4/26/01 TIME: 0935
RELINQUISHED BY:
PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:
ADDITIONAL REMARKS: Tom Colligan 4/26/01
TEMP: ... 3.4
WO 24

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CHAIN OF CUSTODY REPORT

Work Order #: B1D0712

CLIENT: Floyd & Snider / Fulcrum Environmental
REPORT TO:
ADDRESS: See Page 1
PHONE: FAX:
INVOICE TO: Floyd & Snider
P.O. NUMBER:
PROJECT NAME: Kissel Park
PROJECT NUMBER: 01-1821
SAMPLED BY: Peggy Williamson

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: ~~10~~ 7 5 4 3 2 1 <1
Petroleum Hydrocarbon Analyses: 5 4 3 2 1 <1
STD. OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Pb	As	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1. PEW4-B1	4/18/01	✓	✓	S	1	See comments	-16
2. PEW4-B2	↓	✓	✓	↓	↓	on Page 1	-17
3. PEW4-B3		✓	✓				-18
4. PEW4-D1		✓	✓				-19
5. PEW4-D2		✓	✓				-20
6. PEW4-D3		✓	✓				-21
7. EW3-A1		✓	✓				-22
8. EW3-A2		HOLD	HOLD				-23
9. EW3-A3		HOLD	HOLD				-24
10. EW4-C1		✓	✓				-25
11. EW4-C2		✓	✓				-26
12. EW4-C3		✓	✓				-27
13. EW4-B1		✓	✓				-28
14. EW4-B2		✓	✓				-29
15. EW4-B3	↓	✓	✓	↓	↓		-30

SAMPLES WERE NOT @ 2-6C UPON RECEIPT

RELINQUISHED BY: Ann M. Palmer
PRINT NAME: Ann M. Palmer FIRM: Fulcrum
DATE: 4/25/01 TIME: 11:20am
RECEIVED BY: [signature]
PRINT NAME: FIRM: NCA
DATE: 4/26/01 TIME: 0930
RELINQUISHED BY:
PRINT NAME: FIRM:
DATE: TIME:
RECEIVED BY:
PRINT NAME: FIRM:
DATE: TIME:
ADDITIONAL REMARKS:
TEMP

w/o 24.0

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CHAIN OF CUSTODY REPORT

Work Order #: B1D0712

CLIENT: Floyd & Snider / Fulcrum Environmental

INVOICE TO: Floyd & Snider

REPORT TO:

ADDRESS: See Page

PHONE: FAX:

P.O. NUMBER:

PROJECT NAME: Kissel Park

PROJECT NUMBER: 01-182.1

SAMPLED BY: Peggy Williamson

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: ~~10~~ 7 5 4 3 2 1 <1 STD.

Petroleum Hydrocarbon Analyses: 5 4 3 2 1 <1 STD.

OTHER Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Pb	[illegible]	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1.	EW4-01	4/17/01	✓	✓	S	1	See Comments	-31
2.	EW4-02		✓	✓			On Page 1	-32
3.	EW4-03		✓	✓				-33
4.	EW2-A1		✓	✓				-34
5.	EW2-A2		✓	✓				-35
6.	EW2-A3		✓	✓				-36
7.	EW2-B1		✓	✓				-37
8.	EW2-B2		✓	✓				-38
9.	EW2-~~B2~~ B3		✓	✓				-39
10.	EW2-C1		✓	✓				-40
11.	EW2-C2		✓	✓				-41
12.	EW2-C3		✓	✓				-42
13.	EW2-D1		✓	✓				-43
14.	EW2-D2		✓	✓				-44
15.	EW2-D3		✓	✓				-45

SAMPLES WERE NOT @ 2-6C UPON RECEIPT

RELINQUISHED BY: Ann M. Palmer
PRINT NAME: Ann M. Palmer FIRM: Fulcrum
DATE: 4/25/01 TIME: 11:20am
RECEIVED BY: [signature]
PRINT NAME: FIRM: DATE: TIME:

RELINQUISHED BY:
PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY:
PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS:

TEMP:

Page 2 of 4

24.0

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CHAIN OF CUSTODY REPORT

Work Order #: B1D0712

CLIENT: Floyd + Snider/Fulcrum Environmental
INVOICE TO: Floyd + Snider
REPORT TO:
ADDRESS: See Page 1
PHONE: FAX:
P.O. NUMBER:
PROJECT NAME: Vissel Park
PROJECT NUMBER: 01-152.1
SAMPLED BY: Peggy Williamson

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: ~~10~~ 7 5 4 3 2 1 <1 STD.
Petroleum Hydrocarbon Analyses: 5 4 3 2 1 <1 STD.
OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

REQUESTED ANALYSES

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Pb	As	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA WO ID
1.	PNS2-A1	4/18/01	✓	✓	S	1	See Comment	-46
2.	PNS2-A2	↓	✓	✓	↓	↓	on Page 1	-47
3.	PNS2-A3	↓	✓	✓	↓	↓		-48
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								

SAMPLES WERE NOT @ 2-6C UPON RECEIPT

RELINQUISHED BY: Ann M. Palmer DATE: 4/25/01 RECEIVED BY: [signature] DATE:
PRINT NAME: Ann M. Palmer FIRM: Fulcrum TIME: 11:20am PRINT NAME: FIRM: TIME:
RELINQUISHED BY: DATE: RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME: PRINT NAME: FIRM: TIME:
ADDITIONAL REMARKS:
TEMP:
10 24.0

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: COY-KISSEL Project Manager: Tom Colligan	**Reported:** 05/04/01 10:33

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
2B/1.5-2.0	B1D0613-01	Soil	04/18/01 17:29	04/20/01 14:10
4A/1.5-2.0	B1D0613-02	Soil	04/18/01 17:30	04/20/01 14:10
4D/1.5-2.0	B1D0613-03	Soil	04/18/01 17:25	04/20/01 14:10
3E/1.5-2.0	B1D0613-04	Soil	04/18/01 17:35	04/20/01 14:10
4F/1.5-2.0	B1D0613-05	Soil	04/18/01 17:22	04/20/01 14:10

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Floyd & Snider Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: COY-KISSEL Project Manager: Tom Colligan	**Reported:** 05/04/01 10:33

Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2B/1.5-2.0 (B1D0613-01) Soil	**Sampled: 04/18/01 17:29**	**Received: 04/20/01 14:10**							
Arsenic	5.77	0.365	mg/kg dry	1	1D26026	04/26/01	04/30/01	EPA 6020	
4A/1.5-2.0 (B1D0613-02) Soil	**Sampled: 04/18/01 17:30**	**Received: 04/20/01 14:10**							
Arsenic	5.90	0.347	mg/kg dry	1	1D26026	04/26/01	04/30/01	EPA 6020	
4D/1.5-2.0 (B1D0613-03) Soil	**Sampled: 04/18/01 17:25**	**Received: 04/20/01 14:10**							
Arsenic	14.2	0.362	mg/kg dry	1	1D26026	04/26/01	04/30/01	EPA 6020	
3E/1.5-2.0 (B1D0613-04) Soil	**Sampled: 04/18/01 17:35**	**Received: 04/20/01 14:10**							
Arsenic	29.8	0.338	mg/kg dry	1	1D26026	04/26/01	04/30/01	EPA 6020	
4F/1.5-2.0 (B1D0613-05) Soil	**Sampled: 04/18/01 17:22**	**Received: 04/20/01 14:10**							
Arsenic	31.2	0.357	mg/kg dry	1	1D26026	04/26/01	04/30/01	EPA 6020	

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Scott A. Woerman, Project Manager

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: COY-KISSEL	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/04/01 10:33

Physical Parameters by APHA/ASTM/EPA Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
2B/1.5-2.0 (B1D0613-01) Soil	**Sampled: 04/18/01 17:29**	**Received: 04/20/01 14:10**							
Dry Weight	89.4	1.00	%	1	1D25023	04/25/01	04/26/01	BSOPSPL003R07	
4A/1.5-2.0 (B1D0613-02) Soil	**Sampled: 04/18/01 17:30**	**Received: 04/20/01 14:10**							
Dry Weight	83.5	1.00	%	1	1D25023	04/25/01	04/26/01	BSOPSPL003R07	
4D/1.5-2.0 (B1D0613-03) Soil	**Sampled: 04/18/01 17:25**	**Received: 04/20/01 14:10**							
Dry Weight	91.2	1.00	%	1	1D25023	04/25/01	04/26/01	BSOPSPL003R07	
3E/1.5-2.0 (B1D0613-04) Soil	**Sampled: 04/18/01 17:35**	**Received: 04/20/01 14:10**							
Dry Weight	94.2	1.00	%	1	1D25023	04/25/01	04/26/01	BSOPSPL003R07	
4F/1.5-2.0 (B1D0613-05) Soil	**Sampled: 04/18/01 17:22**	**Received: 04/20/01 14:10**							
Dry Weight	92.1	1.00	%	1	1D25023	04/25/01	04/26/01	BSOPSPL003R07	

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: COY-KISSEL	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/04/01 10:33

Total Metals by EPA 6000/7000 Series Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D26026: Prepared 04/26/01 Using EPA 3050B										
Blank (1D26026-BLK1)										
Arsenic	ND	0.500	mg/kg wet							
LCS (1D26026-BS1)										
Arsenic	25.0	0.500	mg/kg wet	25.0		100	70-130			
Matrix Spike (1D26026-MS1)					**Source: B1D0613-01**					
Arsenic	22.2	0.365	mg/kg dry	20.4	5.77	80.5	70-130			
Matrix Spike Dup (1D26026-MSD1)					**Source: B1D0613-01**					
Arsenic	23.1	0.365	mg/kg dry	20.4	5.77	85.0	70-130	3.97	20	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

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Floyd & Snider Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: COY-KISSEL	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	05/04/01 10:33

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1D25023: Prepared 04/25/01 Using Dry Weight										
Blank (1D25023-BLK1)										
Dry Weight	100	1.00	%							

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Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 420-9200 FAX 420-9210
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9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-9210

CHAIN OF CUSTODY REPORT

Work Order # BID0613

REPORT TO: TOM COLLIGAN FLOYD & SNIDER
ATTENTION:
ADDRESS: 83 S. KING ST. SUITE 614 Seattle WA 98104
PHONE: 206-292-2078 FAX: 206-682-7867
PROJECT NAME: KISSEL PARK
PROJECT NUMBER: COY-KISSEL
SAMPLED BY: TOM COLLIGAN

INVOICE TO: SAME
ATTENTION:
ADDRESS: "
P.O. NUMBER: COY-KISSEL NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

Analysis Request: 6020 LEAD ICP-MS; Arsenic ICP-MS

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	6020 LEAD ICP-MS	Arsenic ICP-MS	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	2B/1.5-2.0	4/18 17:29				S	1	BID0613-01
2.	4A/1.5-2.0	" 17:30				"	1	02
3.	4D/1.5-2.0	" 17:25				"	1	03
4.	3E/1.5-2.0'	" 17:35				"	1	04
5.	4F-1.5-2.0	" 17:22				"	1	05
6.								
7.								
8.								
9.								
10.								

SAMPLES WERE NOT @ 2-6C UPON RECEIPT

RELINQUISHED BY (Signature): Thomas Colligan DATE: 4/20/01
PRINT NAME: Thomas Colligan FIRM: FSI TIME: 12:31
RECEIVED BY (Signature): Bill K DATE: 4/20/01
PRINT NAME: BILL KUNIHOLM FIRM: NCA TIME: 12:31

RELINQUISHED BY (Signature): Bill K DATE: 4-20-01
PRINT NAME: FIRM: NCA TIME: 14:10
RECEIVED BY (Signature): Br. Tonty NCA DATE: 4-20-01
PRINT NAME: BRANY TONTZ FIRM: NCA TIME: 14:10

ADDITIONAL REMARKS: 1st samples as part of large set being delivered next week

W/O 9.2
PAGE OF

COC Rev 8, 1/96

Kissel Park

Remedial Investigation/ Feasibility Study and Cleanup Action Plan

Appendix D Engineer's Calculations

FINAL

Qty Takeoffs

Option #1: Deep Tilling

Deep tilling (to 12"-18") along western 120' of property.

Area = (120)(900) = 108,000 sf

= 2.5 acre

Vol (12" deep) = 4,000 CY

Option #2: Relocate soil from future grassed areas (except deep tilling area) to tennis campus & parking are

Areas -

Tennis Campus = 122,500 sf (= 2.8 acre)
Parking Area = 46,750 sf (= 1.1 acre) } 3

Area A = 37,200 sf (= 0.8 acre)
Area B = 82,175 sf (= 1.9 acre)
Area C = 240,800 (= 5.5 acre)
Area D = 22,000 (= 0.5 acre) } 8

Volumes (Assume 2'-0" cut)

Area A = 2,750 CY
B = 6,100 CY
C = 17,850 CY
D = 1,625 CY

28,325 CY

Ave Haul Distance ≈ 300'

Option # 3: Flip-Flop - Bury surficial soil (0-2') @ depth (2'-3') & place deep soil at surface.

Areas

All Future Grassed areas (A, B, C, & D) except western most 120'. = 382,175 sf (= 8.8 ac)

Volumes

Entire Park (3' deep cut) = 42,500 cy

Average Haul Dist. ≈ 200'

Option #4: Cap existing soil. Use imported topsoil for future grassed areas & import base course for future paved areas.

Areas

Future grassed areas

Area A	= 37,200 sf
Area B	= 82,175 sf
Area C	= 240,800 sf
Area D	= 22,000 sf
	382,175 sf

Future Paved Area

Parking	= 46,750 sf
Tennis Campus	= 122,500 sf
	169,250 sf

Volumes

Topsoil (@ 6" deep on all areas A, B, C & D) = 7,100 cy

Base Course (@ 6" deep on all future paved areas) = 3,100 cy

Option #1 - Deep tilling (to 12-inches) of future grassed areas along the western portion of the property.

Quantities

Area - Assume area is approximately 120' wide by 900' long ⇒ 108,000 s.f. (2.5 acre)

Volume - Assume tilling can effectively homogenize soil to a depth of 12-inches.
= (108,000 sf)(1' deep) ÷ 27 = 4,000 cy

Equipment

1 -	Foreman w/ p/u truck	- $60/hr
1 -	Large row crop type tractor	- 85/hr
1 -	P.T.O tiller attachment (10' wide)	- 65/hr
1 -	Compactor	- 75/hr
1 -	Water Truck	- 95/hr
		$380/hr

Production

Assume large tractor / tiller combination can till 10 acre/day (single pass). Therefore assume 2.5 acre/day if four passes are made to ensure complete homogenization (to be verified via pilot scale study).

Unit Cost

($380/hr)(8 hr) ÷ 2.5 acre ⇒ $1216/acre
($0.03/s.f.

Mob/Demob Costs

Tractor & tiller	- say $300	= 300
Compactor	say 150	= 150
Water Truck	say 75	= 75
		$525 each

Option #1

Estimated Cost

1. Mob/Demob $525 × 2 = $1,050
2. Till Soil $1216/acre × 2.5 acre = 3040
3. Survey Layout, say $500 = 500

$4,590

Unit Cost (per cy) ⇒ $1.15/cy

Unit Cost (per s.f.) ⇒ $0.04/s.f.

Option #2 - Relocate soil from future grassed area to tennis campus & parking area.

Volumes - Assume an average cut of 2'-0"
- 28,325 cy

Ave Haul Distance - 300'

Equip Spread (operated rate, including labor, OH & P)

1 - Foreman w/ p/u truck	= 60^{00}/hr
2 Grade checker (@ 35/hr)	- 70^{00}/hr
2 - 615 Scrapers (@ 180/hr)	- 360^{00}/hr
1 - 14G Motor Grader	- 125^{00}/hr
1 Compactor (@ 95/hr)	- 95^{00}/hr
2 Water Truck (@ 95/hr)	- 190/hr
1 D8 Dozer (@ 180/hr)	- 180^{00}/hr
	\$1080/hr

Cycle Time (623 Scraper), 23 cy capacity

Load	1.0 min
Travel	1.0 min
Unload	1.0 min
Travel	1.0 min
	(4.0 min)

Production (per scraper

$$\frac{19\ bcy}{23\ lcy}\left(\frac{23\ lcy}{cycle}\right)\left(\frac{cycle}{4.0\ min}\right)\left(\frac{60\ min}{hr}\right)\left(\frac{50^{m}}{60^{m}}\right) = 235\ bcy/hr$$

Efficiency

⇒ 470 cy/hr (2 scrapers)

Unit Cost - \$1080/470 = \$2.20/cy

Mob/DeMob Costs

623 Scraper	-	say \$300/ea × 2	= 600
14G Blade	-	say 250/ea	= 250
Compactor	-	say 150/ea × 1	= 150
Water Truck	-	say 75/ea × 2	150
Dozer	-	say 300/ea	300
			\$1450/ea

Option # 2

Est. Cost

1. Mob / Demob $1450 × 2 = 2900
2. Relocate Soil $2.20/cy × 28,325 cy = 62,315
3. Survey Layout = 1500

$ 66,715

Unit Cost (per cy) ⇒ $ 2.35 / cy

Unit Cost (per sf of future grassed area) ⇒ $0.18 / sf

$ 66,715 / 382,175 sf

Option # 3 - Flip - Flop. Bury surficial soil (0'-2') at depth (2'-3') and place soil from 2' to 3' at surface. Perform over all future grassed areas except western most 120' (to be filled).

Volumes - Assume average cut of 3'-0" over 8.8 a
= 42,500 cy (to be handled twice!)

Ave Haul Distance ≈ 200'

Equipment Spread - Same as Option # 2 (Scraper base

$$\frac{\$1080/hr}{470\ cy/hr} = \$2.20/cy$$

Estimated Cost

1. Mob/Demob (See Option #2) - $ 2,900
2. Flip Flop Soil: $2.20/cy × 42,500cy × 2 - $187,000
3. Survey Layout - $ 1,500

$ 191,400

Unit Cost per s.f. of future grassed area: ⇒ $0.50/sf
$ 191,400/382,175 sf

Option #4 - Cover existing soil using general fill & topsoil for ~~future~~ future grassed area (& base course & concrete or asphalt for future paved area - not costed here)

4a - Assume 6" layer of imported topsoil placed over all future grassed areas except westernmost 120' (deep tilling area).

Volume - (382,175 sf)(0.5 ft)/27 = 7,100 cy

Equip Spread

1 - Foreman w/ p/u truck	- 60.00/hr
1 - Grade checkers	- 35.00/hr
1 - Dozers (D8)	- 180.00/hr
1 - Compactor	- 95/hr
1 - Water Truck	- 95/hr
	$465/hr

Production Rate - Say 7,000 cy of soil brought in over 4 day period. (7,100)/4 day (day/8 hr) ⇒ 220 cy/hr

Unit Cost for Placement
Placement price $\frac{\$465/hr}{220\ cy/hr}$ = 2.11/cy

Mob Costs

Dozer - say	$300/ea	- 300
Compactor -	150/ea	- 150
Water Truck	75/ea	75
		$525/ea mob

Option # 4a

Estimated Cost

1. Mob/Demob $ 525 × 2 = 1050
2. Import Topsoil 7,100 cy × $15/cy = 106,500
3. Place Topsoil 7,100 cy × 2$/cy = 15,000
4. Survey Layout = 1,500

$124,050

Unit Cost (per cy) ⇒ $17.47/
$124,050/7,100 cy

Unit Cost (per s.f. of area covered) ⇒ $0.33/s
$124,050/382,175 sf

4b - Assume 6" layer of topsoil and 6" layer of general fill placed over all future grassed areas except westernmost 120' (deep filling area).

Volume - 2 × 7,100 cy = 14,200 cy (total)

Assume same equipment & unit costs as in Option 4a

Estimated Cost

1. Mob/Demob (same as Option 4a) - $1,050
2. Import Topsoil 7,100 cy @ 15^{00}/cy - 106,500
3. Place Topsoil 7,100 cy × 2^{11}/cy - 15,000
4. Import General Fill 7,100 @ 10^{00}/cy - 71,000
5. Place General Fill 7,100 @ 2^{11}/cy 15,000
6 Survey Layout 1,500

$210,050

Unit Cost (per cy) ⇒ 14^{79}/
210,050/14,200 cy

Unit Cost (per s.f.) ⇒ $0.55/
210,050/382,175