Kissel Park

Cleanup Action Report

Prepared for

The City of Yakima
Yakima, Washington

Prepared by

Floyd Snider McCarthy, Inc.
83 South King Street
Suite 614
Seattle, Washington 98104

JANUARY 2003

FINAL

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1.0 Introduction

This report was prepared for the City of Yakima (City) to document the remediation of environmental contaminants from Kissel Park. The City, in order to be eligible for remedial action grant funding, entered into an Agreed Order (AO) with the Washington State Department of Ecology (Ecology). The cleanup action described in this report was a requirement of the AO (dated March 21, 2001). Per the Model Toxics Control Act (MTCA), cleanups performed under an AO shall be documented in a report submitted to Ecology for review and approval. According to the AO, once approval of this report is granted, the provisions of the AO shall be deemed satisfied upon the City's receipt of written notification from Ecology.

1.1 SITE HISTORY AND DESCRIPTION OF PRE-CLEANUP CONDITIONS

Kissel Park (the "site") is composed of 17 acres of recently developed parkland along the banks of Wide Hollow Creek in Yakima, Washington. Refer to Figure 1 for a location map. The site is owned by the City. 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 hayfield. This continued until 1987, at which time 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.

Concurrent with the cleanup action, the site was redeveloped into an active city park that now includes nine tennis courts and three multi-purpose courts, located in the southern half of the site. Other park elements include an 80-space parking lot, restroom/storage building, picnic shelter, and paved promenade. The northern third of the park is developed for more passive, open space use as is the western third. An 8-foot wide walking trail circles the park. Figure 2 presents a site plan.

1.1.1 Pre-Cleanup Environmental Conditions

In the first half of the 20th Century, 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. As a consequence, many current and past orchard lands in eastern Washington contain levels of lead and arsenic at levels greater than naturally-occurring background concentrations. Because of this concern, the City tested soils at the site in September 2000. Results from 15 samples showed 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. The City decided to cleanup the park under an AO with Ecology. The AO specified that the City perform a Remedial Investigation/Feasibility Study (RI/FS) of the site and produce a Cleanup Action Plan (CAP). The RI, performed in the spring of 2001, provided detailed data about how lead and arsenic concentrations varied across the site and at different depths. Using these data, the FS evaluated several cleanup options and selected a cleanup action for implementation that

was custom-tailored to site conditions. Also included within the FS are the results of an Ecology-funded study of four deep tilling methodologies for remediation of lead arsenate contaminated topsoil.

Following the RI/FS, a CAP was developed that detailed the cleanup action and how it was to be integrated into the overall park redevelopment. The RI/FS/CAP report was reviewed and approved by Ecology and the public was given the opportunity to review and comment on the proposed cleanup action. A public meeting was also held. Several comments were received at the public meeting and were addressed in a Responsiveness Summary prepared by Ecology. Both Ecology's comments to the draft RI/FS/CAP and a copy of their Responsiveness Summary are contained in the final RI/FS/CAP (FSM 2001).

2.0 Summary of Remedial Investigation Findings

Significant findings from the remedial investigation (RI) are discussed in the following sections.

2.1 ARSENIC CONCENTRATIONS

Prior to cleanup, arsenic was detected in surface soils site-wide at concentrations exceeding the 20 mg/kg cleanup level. Figure 3 shows a contour map of the concentration of arsenic in the surface samples (0 to 0.5 feet) across the site. The contours indicate the arsenic concentrations increase from northwest to southeast. The highest concentrations are clustered in the southeastern part of the site and the lowest concentrations were in the upper northwestern corner, with a few higher concentrations in the northeastern corner.

The maximum concentration of arsenic in surface samples was 113 mg/kg. The mean concentration of the surface samples was 40 mg/kg, or twice the state cleanup level. 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 mixing areas, spills or tree drip lines.

2.2 LEAD

Figure 4 shows a contour map of the pre-cleanup concentrations of lead in the surface samples across the site. The distribution pattern mimics that of arsenic in that samples with high arsenic levels also contain high lead levels. This is expected given that the application of lead arsenate results in the simultaneous deposition of both metals. The maximum lead concentration in surface soil was 335 mg/kg with a mean of 108 mg/kg.

2.3 VARIATION WITH DEPTH

Samples were collected at five different depth intervals with notations for each depth as follows:

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

The mean concentration for both contaminants was found to be highest in the surface samples. The mean concentrations decreased with depth, with a much greater percentage decrease occurring for lead as compared to arsenic, which decreased in concentration more gradually with depth. For both lead and arsenic, the mean concentrations of the deep samples (3 to 5 feet and 5 to 7 feet) were generally similar, at around 10 mg/kg each, meaning that background concentrations are likely reached by these depths.

The important finding provided by the depth data was that arsenic occurred at roughly equal concentrations from the surface to a depth of 2 feet, whereas the lead was much more highly

concentrated in the surface samples. The lack of lead or arsenic enrichment above background in soil deeper than 5 feet indicates that downward contaminant migration has terminated by that depth and so groundwater under the site (no shallower than 25 feet based on nearby well logs) is not threatened.

3.0 Remedial Action Description

The remedial action was a combination of deep tilling, excavation, and an engineered soil cover, each applied in a different part of the site. This combination of remedies was preferred because in addition to being cost-effective, it achieved a permanent cleanup for as much of the site as possible, thereby freeing these areas of the park from the institutional controls described below. This remedy also blended well into the park development, and did not cause redesign or relocation of the tennis courts or parking area, as originally planned. The areas of each selected remedial alternative are shown in Figure 5 and are as follows:

- **Area 1 (Passive Park) – Deep Tilling.** This technique permanently cleaned up Area 1 soils by deep tilling the upper 6 inches of contaminated soil with 18 inches of deeper, clean soils resulting in an blended arsenic concentration across the tilled zone that averaged less than the cleanup level. As this mixing is permanent, it was of the highest preference. However, deep tilling was limited to Area 1 due to the higher concentrations of arsenic in the other areas of the site that render deep tilling ineffective. Within Area 1, deep tilling was proven to be effective in the pilot test performed during the RI/FS.

  Estimated volume of soil treated (to 24 inches): 7,100 cubic yards.

- **Area 2 (Perimeter of Play Courts and Parking Lot) – Regrade and Engineered Cover.** Area 2 was extensively regraded to meet park design requirements. For example, the bioswale area (located along the eastern site boundary) was excavated to remove overlying contaminated soil so stormwater would infiltrate through clean soils. Soil from excavated areas was moved to areas that needed filling. Following this rough grading, an engineered soil cover was placed atop Area 2. The cover consists of a penetration-resistant filter fabric covered by 6 inches of clean topsoil taken from Area 1 (following deep tilling). The topsoil was then seeded and irrigated to establish a permanent turf to protect the cover soil from erosion. Institutional controls (discussed in Section 3.4) will be implemented to maintain the turf and properly handle contaminated soil exposed during any future excavation activities that breach the cover.

  Estimated acreage of engineered soil cover: 3.2 acres.

- **Area 3 (Passive Park) – Excavate Contaminated Soil and Relocate to Area 4.** Within Area 3, the depth to which arsenic concentrations exceeded the cleanup level was generally limited to the upper 1.5 feet of soil. Excavation was chosen as the preferred alternative because it permanently cleaned up Area 3 soils in the passive park area where inadvertent digging is more likely to occur. Accordingly, Area 3 was excavated until remaining arsenic concentrations were less than the cleanup levels. Excavated soils were relocated to Area 4 and placed atop existing contaminated soils.

  Estimated volume of soil excavated: 11,000 cubic yards.

- **Area 4 (Parking Lot and Play Court Area) – Regrade and Pavement or Engineered Soil Cover.** Area 4 consists mostly of paved areas. The contaminated soil in the footprint and perimeter of the parking lot area was excavated to the design

grade. This contaminated soil was placed under the play courts and picnic shelter/restroom area. The contaminated soil under the parking lot and play courts was compacted and covered by 4 to 6 inches of base course aggregate and paved with 2 inches of asphaltic concrete. The remaining unpaved areas were covered by a penetration-resistant filter fabric and 6 inches of topsoil and turf. Institutional controls (discussed in Section 3.4) will be implemented to maintain the turf and pavement.

Estimated acreage of contaminated soil under paved areas: 3.1 acres.

Estimated acreage of contaminated soil under engineered cover: 3.3 acres.

3.1 DESIGN CRITERIA

The following sections present the design criteria for the cleanup elements of the park development. These criteria clarify major elements of the selected remedy and establish minimum requirements that were met during construction. The final construction plans and specifications, including amendments, for Kissel Park contain the details of implementation (KDF Architecture 2001).

3.1.1 Design Criteria for Engineered Covers

Design criteria for the asphalt pavement covering contaminated soil 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.
- 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.
- 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 moderate recreational use expected in public parks that could act to reduce cover soil thickness over time.
- Provide irrigation to optimize healthy turf while controlling irrigation to minimize ponding/runoff 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.

3.1.2 Design Criteria for Stormwater Management

Design of the stormwater management system shall comply with the requirements of the City of Yakima and the Ecology Stormwater Manual (Ecology 1992). 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 bioswales that will provide for infiltration through soil meeting MTCA Method A cleanup levels for lead and arsenic.
- Grassed or vegetated areas shall be sloped and contoured in a manner that does not promote ponding or erosion.

3.2 CLEANUP ACTION OBSERVATIONS AND DEVIATIONS FROM THE PLANS AND SPECIFICATIONS

During the development of Kissel Park, oversight of the contractor (Jim Evans and Sons, Inc. of Yakima, Washington) was performed primarily by City personnel (Jim Maine, Steve Wingerter). Construction documentation (e.g., field notes, as-builts, elevations, grading plans, unit quantities, change orders, etc) is on file with the City. General observations relevant to the cleanup as well as deviations from the written plans and specifications are discussed below. The Ecology site manager (Norm Heppner) inspected the site several times during construction and approved of the deviations from the original plans and specifications. Photographs of the park taken during construction are included as Appendix A.

3.2.1 Area 1

The cleanup of Area 1 occurred mostly as planned. A road reclaimer (CSI Model RS-650, owned and operated by M&M Recycling of Redmond, Washington[1]) was used to deep till Area 1 in July 2002. Prior to deep tilling, soil amendments (approximately 800 cubic yards of steer manure and 1,600 cubic yards of wood chips) were delivered to the site and spread out atop Area 1 soils. The deep tilling blended these amendments into the upper 20 inches of soil to make a topsoil suitable for growing turf. In September 2002, the deep tilled topsoil was relocated to form the soil cover for Areas 2 and 4. The depth of soil excavation in Area 1 was greater than the 18 inches originally estimated. This was primarily due to the need for additional cover material for Area 4, which was expanded in size as discussed below. Following excavation, the underlying untilled soil was rototilled, fertilized, seeded and irrigated.

3.2.2 Area 2

The cleanup of Area 2 was accomplished as planned, with the following three modifications:

1. The plans and specification indicated that an engineered soil cover was unnecessary in those locations where excavation exceeded 24 inches (e.g., the bioswale area). However, it was the contractor's preference to install the engineered cover over all of

[1] M&M Recycling also performed the deep tilling for the pilot test.

Area 2, including those areas excavated to a clean soil horizon[2]. This decision was made primarily due to the difficulty of "custom fitting" the cover to match the irregular areas of clean soil and the difficulty of keeping these clean zones free from recontamination during subsequent grading activities involving contaminated soil.

2. The specified filter fabric was modified at the request of Ecology to be a heavier weight fabric. Ecology was concerned that the original fabric would not provide enough penetration resistant to children attempting to dig into the underlying contaminated soils. Appendix B contains the exact fabric specifications of the fabric used.
3. Following rough grading the City, at the request of the neighbors, fenced the entire southern boundary of the site. The fence is located approximately 4 to 5 feet from and parallel to the steep bank of Wide Hollow Creek (Figure 5). Relocated soil outside of the fence to the edge of the bank did not receive an engineered cover due to the presence of the fence. Testing of the topsoil in this strip by Ecology indicated that it contained arsenic at concentrations greater than the cleanup levels. It is the intent of the City to cover this 5-foot strip of soil outside of the fence with 12 inches of crushed rock and/or structural fill soil following the completion of the park. According the City of Yakima, the entire area along the banks of Wide Hollow Creek, including up to the fence line, will eventually be replanted with native plantings.

Field inspections by both the City and FSM personnel during the placement of the soil cover verified that its thickness (at the time of placement) met the 6-inch minimum requirement.

3.2.3 Area 3

The cleanup of Area 3 deviated from its original plan of excavating the top 18 inches of soil followed by deep tilling and if necessary, hot spot excavation. Following the initial soil excavation to 18 inches, it was apparent that additional soil needed to be excavated from Area 3 to meet the design grades in Areas 2 and 4. Between 12 to 20 inches (approx. 3,500 cubic yards) of additional soil depth was subsequently excavated. However, confirmation samples (Section 3.3) following excavation indicated hot spots of arsenic along the southern and eastern boundaries (i.e., between Areas 3 and 4). After consultation with Ecology, it was decided to extend the limits of Area 4 to cover these hot spots with an engineered cover area. This was chosen as a more cost-effective solution than excavation to deeper depths, which would have had the undesirable effect of creating low spots at the border between Areas 3 and 4.

3.2.4 Area 4

The cleanup of Area 4 was accomplished as planned, with the following three deviations:

1. The boundaries of Area 4 were expanded as discussed above. The final extent of Area 4 is shown on Figure 5.

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[2] Approximately 1,000 square feet of Area 2 did not receive a filter fabric. The filter fabric was not placed in the area shown in Figure 5, due to a slight field shortage of filter fabric needed elsewhere. Prior testing indicated that the soil under the fabric was clean.

2. Due to the over excavation of Area 3, the grade for the parking lot, which was not planned to be regraded, was excavated to meet the new, lower grade of Area 3. The contaminated soil was relocated to the play court area, which needed fill.
3. According to the original plans, filter fabric was to be placed under pavement to function as a visual indication that the pavement had worn through and needed repaving/patching. However, it was decided by Ecology that the base course aggregate under the pavement acts as an adequate visual indication of pavement failure.

3.3 CONFIRMATION SOIL SAMPLING

Confirmation soil sampling for arsenic and lead was performed in accordance with the Model Toxics Control Act (WAC 173-340-740, Compliance Monitoring). Soil samples were collected from the upper 6 inches of soil following deep tilling of Area 1, excavation of Areas 2 and 3. The sample collection density was approximately two samples per acre, equivalent to the density of samples collected for the RI. Ecology assisted with the confirmation sampling by collecting samples along the perimeter of Area 3 following excavation and also from Area 1 following deep tilling. The samples collected by Ecology were analyzed using an X-ray fluorescence meter (XRF) and an EPA-approved analytical protocol (Appendix C).

Sample results are included in Table 1 and discussed by area below. Copies of laboratory analytical reports are contained in Appendix C. Confirmation soil sample locations were collected at the locations shown on Figure 6.

3.3.1 Area 1

Following deep tilling, 14 samples were collected by Ecology from the upper 6 inches of soil. The samples were analyzed in the field for lead and arsenic using a portable X-Ray fluorescence meter (XRF). The sample results indicated that two of the 14 samples contained arsenic at concentrations slightly greater than 20 mg/kg, and an exceedance rate of 14 percent. The mean of all of the samples collected following deep tilling was 15 mg/kg. According to MTCA, no one confirmation sample may contain concentrations twice the cleanup level and the exceedance rate shall be no more than 10 percent, except when the cleanup level is based on natural background, when slightly higher rates are acceptable, as is the case here (WAC 173-340-740 7,e, i). Three field samples were submitted to an analytical laboratory to verify the XRF results. The analytical lab results confirmed the XRF results.

The 12 samples collected during the RI from the 2– to 3–foot depth interval within Area 1 were used to confirm that soils excavated to 2 to 3 feet were clean. Of these 12 samples, the mean arsenic concentration was 13 mg/kg. All samples contained arsenic at concentrations less than the cleanup level, except for one sample that contained arsenic at 22 mg/kg, which is an acceptable exceedance (refer to above paragraph).

3.3.2 Area 2

Five soil samples were collected along the southern perimeter of Area 2 in areas that had been excavated to greater than approximately 2 feet. Samples were collected to determine if an engineered cover was necessary in this area. All five samples showed arsenic and lead levels less than the cleanup levels, so the engineered soil cover was not necessary in this area. However, the contractor elected to place an engineered cover over all of Area 2 except for a small area, as described in Section 3.2.2.

3.3.3 Area 3

Eight soil samples were collected along a grid pattern in Area 3 following the final excavation of this area. Results revealed that two samples close to the boundary with Area 4 contained arsenic at concentrations considerably greater than the cleanup level. Ecology followed up by collecting an additional 19 samples along the eastern and southern perimeter to accurately define extent of the hot spot. The additional samples indicated that the hot spots were of limited extent and therefore an acceptable solution was to expand Area 4 to cover these areas rather than re-excavate to deeper depths.

3.4 INSTITUTIONAL CONTROLS

Institutional controls are administrative or maintenance measures implemented to limit or prohibit activities that may cause future exposure to hazardous substances left in place at concentrations 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 for this site include:

- The black filter fabric between the contaminated soil left in place and the clean cover soil cover. It is resistant to penetration and will prevent unintentional digging down to the contaminated soils. It will also 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 will be placed 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 was laid out prior to the placement of the filter fabric. The irrigation schedule for the site is 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 maintain the turf.

- Quarterly inspection and maintenance of paved areas and turf of Areas 2 and 4. The inspections will be performed by City personnel. They will look for cracks, potholes and other damage to the paved areas and for exposure of the filter fabric in the turf 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 2 and 4. Digging activities may include 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.

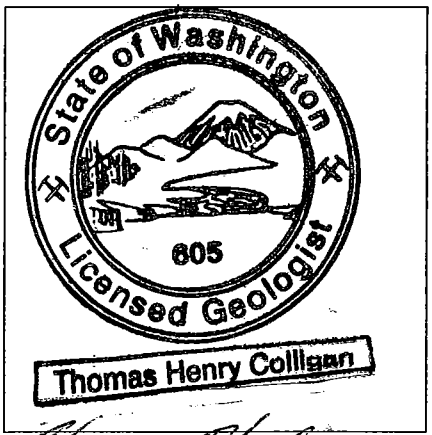
All of the institutional controls and plans described above will be combined into an overall Park Management Plan, contained in Appendix D of this document. The plan will be tied to the existing park plans for the City.

To ensure that the institutional controls are maintained over time and tied to the property, they will be described in a restrictive covenant to be placed on the property's deed following cleanup. The restrictive covenant shall obligate the City to maintain the park according to the park-specific management plan. Finally, the restrictive covenant will serve to notify future owners of the site of their obligation to continue the institutional controls. Appendix E contains a copy of the restrictive covenant.

3.5 SUMMARY OPINION

It is FSM's opinion, with the exception of the soil strip outside of the southern fence line (refer to Section 3.2.2), that the cleanup described in this report was conducted in substantial compliance with the cleanup requirements of both the MTCA and the cleanup action plan prepared specifically for this site.

Approved by:



Signature

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Date

4.0 References

Floyd Snider McCarthy (FSM) 2001. *Final Remedial Investigation/Feasibility Study and Cleanup Action Plan RI/FS/CAP.* Prepared for City of Yakima. Seattle, Washington. 31 August.

KDF Architecture 2001. *Project Manual, City of Yakima, Kissel Park Site Improvements, Yakima, Washington.* Project 200012. 9 November.

Washington State Department of Ecology (Ecology). 1992. *Stormwater Management Manual for the Puget Sound Basin.* Ecology Publication 91-75. Olympia, Washington. February.

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Tables

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Table 1
Summary of Confirmation Sampling

Sample ID	Cleanup Area	Collected By	Analytical Method	Concentration		Comments
				Arsenic (mg/kg)	Lead (mg/kg)	
CS-3B	3	FSM	Laboratory (EPA 6000/7000)	5.3	11	
CS-3D	3	FSM	Laboratory (EPA 6000/7000)	6.7	9.4	
CS-3F	3	FSM	Laboratory (EPA 6000/7000)	25.9	30.3	Covered by Expanded Area 4
CS-4A	3	FSM	Laboratory (EPA 6000/7000)	4.6	8.8	
CS-4C	3	FSM	Laboratory (EPA 6000/7000)	5.7	9.9	
CS-4E	3	FSM	Laboratory (EPA 6000/7000)	9.7	12.3	
CS-6B	3	FSM	Laboratory (EPA 6000/7000)	7.0	9.1	
CS-6D	3	FSM	Laboratory (EPA 6000/7000)	56.4	10.9	Covered by Expanded Area 4
CS-2I	2	FSM	Laboratory (EPA 6000/7000)	18.1	18.7	
CS-2J	2	FSM	Laboratory (EPA 6000/7000)	5.3	9.4	
CS-6J	2	FSM	Laboratory (EPA 6000/7000)	8.8	11.7	
CS-7J	2	FSM	Laboratory (EPA 6000/7000)	6.2	9.5	
CS-7K	2	FSM	Laboratory (EPA 6000/7000)	6.4	11.4	
84	4	Ecology	XRF	42.5	88.4	
85	4	Ecology	XRF	35.5	16.3	Duplicate of 84 – 6-inch depth at same location as Sample ID 84.
88	3	Ecology	XRF	18.1	21.2	
89	3	Ecology	XRF	9.6	17.8	
90	3	Ecology	XRF	ND	16.3	
91	3	Ecology	XRF	ND	18.6	
92	3	Ecology	XRF	ND	15.2	
93	3	Ecology	XRF	ND	21.6	

Sample ID	Cleanup Area	Collected By	Analytical Method	Concentration		Comments
				Arsenic (mg/kg)	Lead (mg/kg)	
94	3	Ecology	XRF	14.5	16.4	
95	3	Ecology	XRF	ND	ND	
96	3	Ecology	XRF	31.1	73.3	Covered by Expanded Area 4
97	3	Ecology	XRF	14.4	27.9	Covered by Expanded Area 4
98	3	Ecology	XRF	ND	24.2	
99	3	Ecology	XRF	ND	16.3	
100	3	Ecology	XRF	ND	50.4	
101	3	Ecology	XRF	ND	57.8	
102	3	Ecology	XRF	ND	14.2	Duplicate of 101
103	3	Ecology	XRF	ND	17.2	
104	3	Ecology	XRF	ND	ND	
1-K50'	1	Ecology	XRF	23.3	93.4	Lab confirmed arsenic at 26 mg/kg
2-K125'	1	Ecology	Field XRF	15.1	41.3	
3-K200'	1	Ecology	Field XRF	16.8	64	
4-K400'	1	Ecology	Field XRF	15.5	81.6	
5-K600'	1	Ecology	Field XRF	22.7	80.3	
6-KM50'	1	Ecology	Field XRF	13.4	59.6	
7-M150'	1	Ecology	Field XRF	16.8	56.6	
8-KM350'	1	Ecology	Field XRF	14.3	33.5	
9-KM450'	1	Ecology	Field XRF	12.8	44.7	
10-KM600'	1	Ecology	Field XRF	17.2	66.8	Lab confirmed arsenic at 15 g/kg
11-KO50'	1	Ecology	Field XRF	19.1	67.2	
12-KO200'	1	Ecology	Field XRF	13.5	39.9	
13-KO200'	1	Ecology	Field XRF	ND	24.5	
14-KO400'	1	Ecology	Field XRF	ND	23.5	Lab confirmed arsenic at 6 mg/kg

Notes:

ND = not detected
XRF = x-ray fluorescence meter

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Figures

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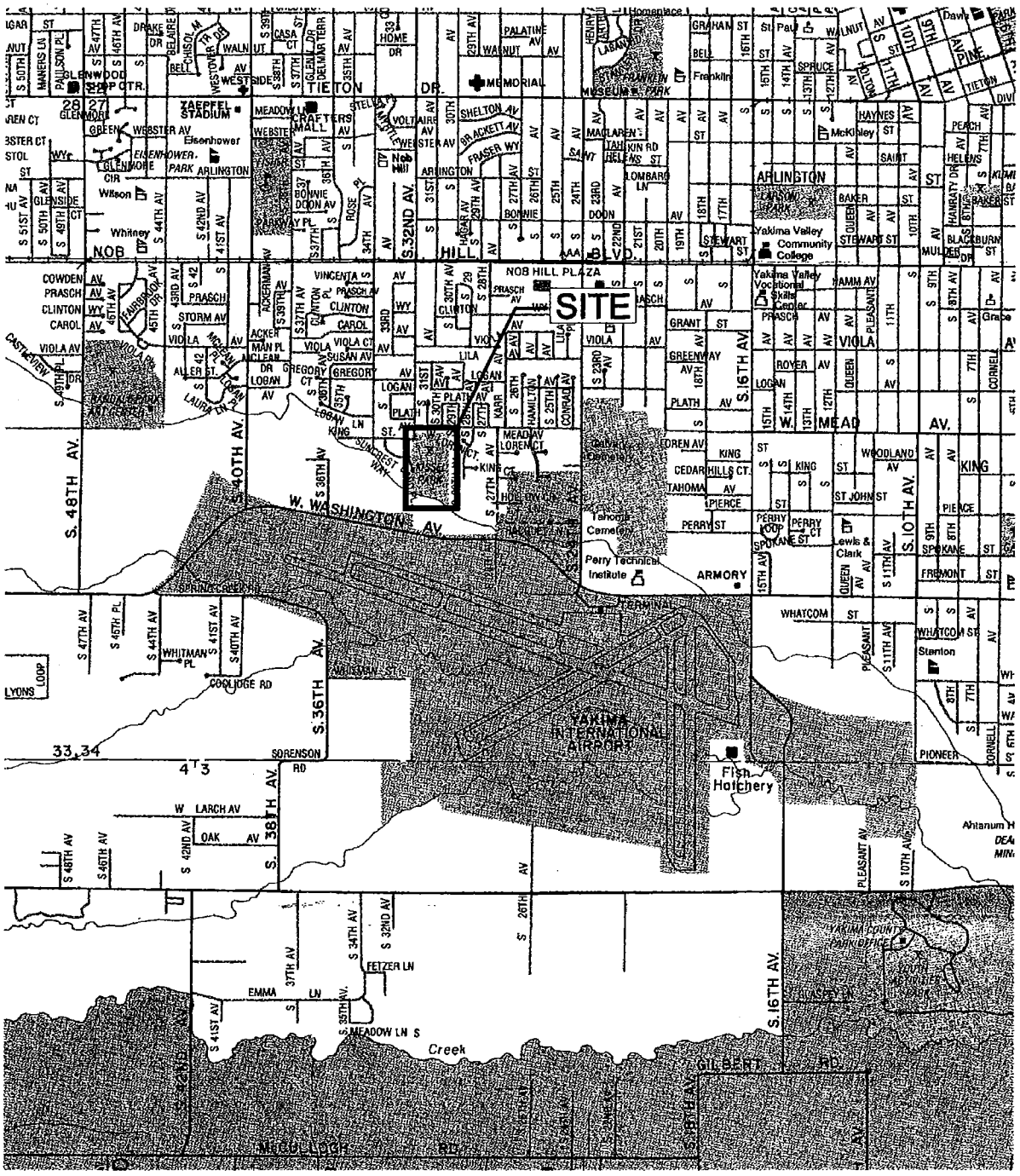

Source: "Yakima: Yakima Valley Recreation" map by King of the Road Maps, Inc., dated 1991.

Not to Scale

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**City of Yakima** **Kissel Park** **Yakima, Washington**	Figure 1 Vicinity Map

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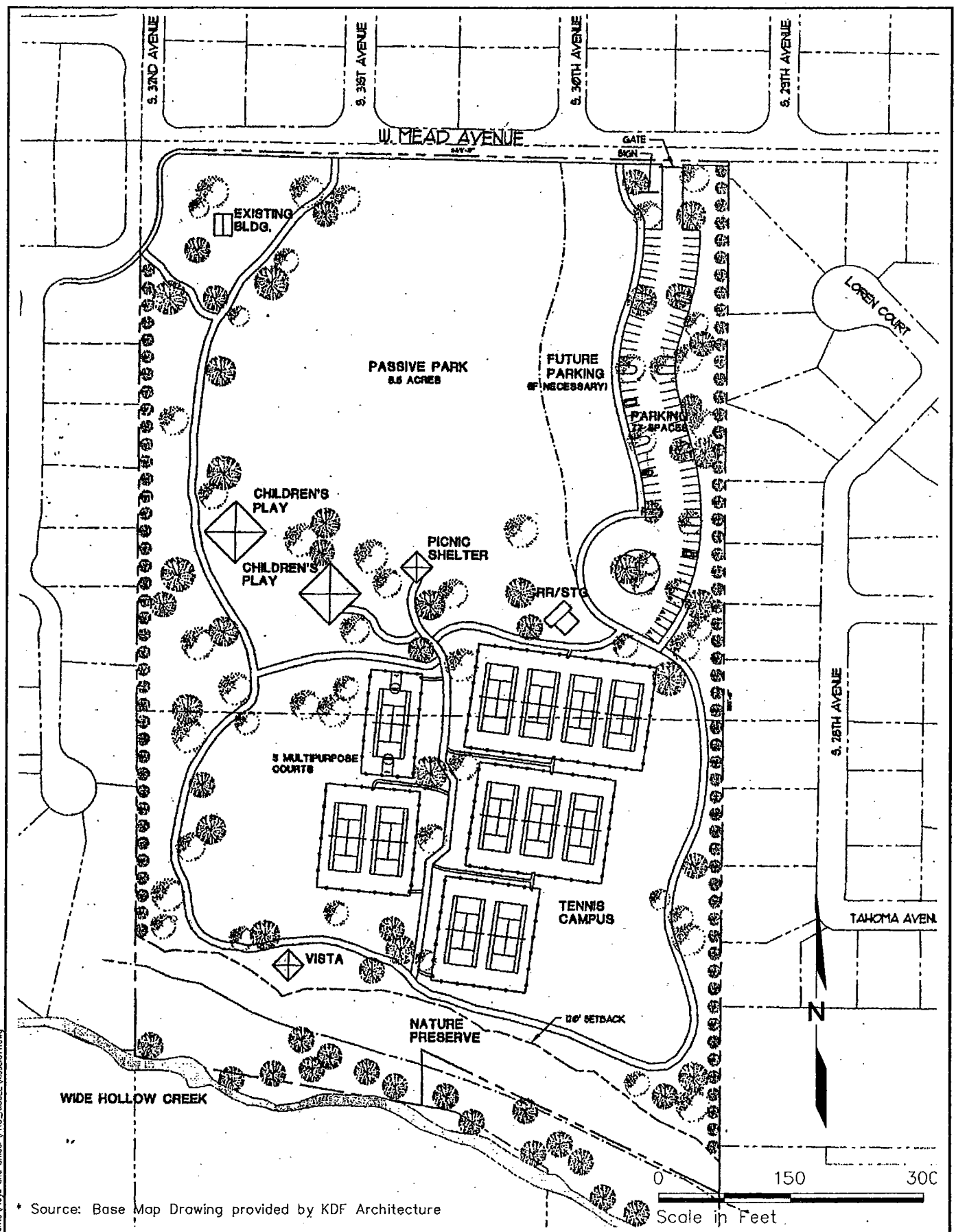

* Source: Base Map Drawing provided by KDF Architecture

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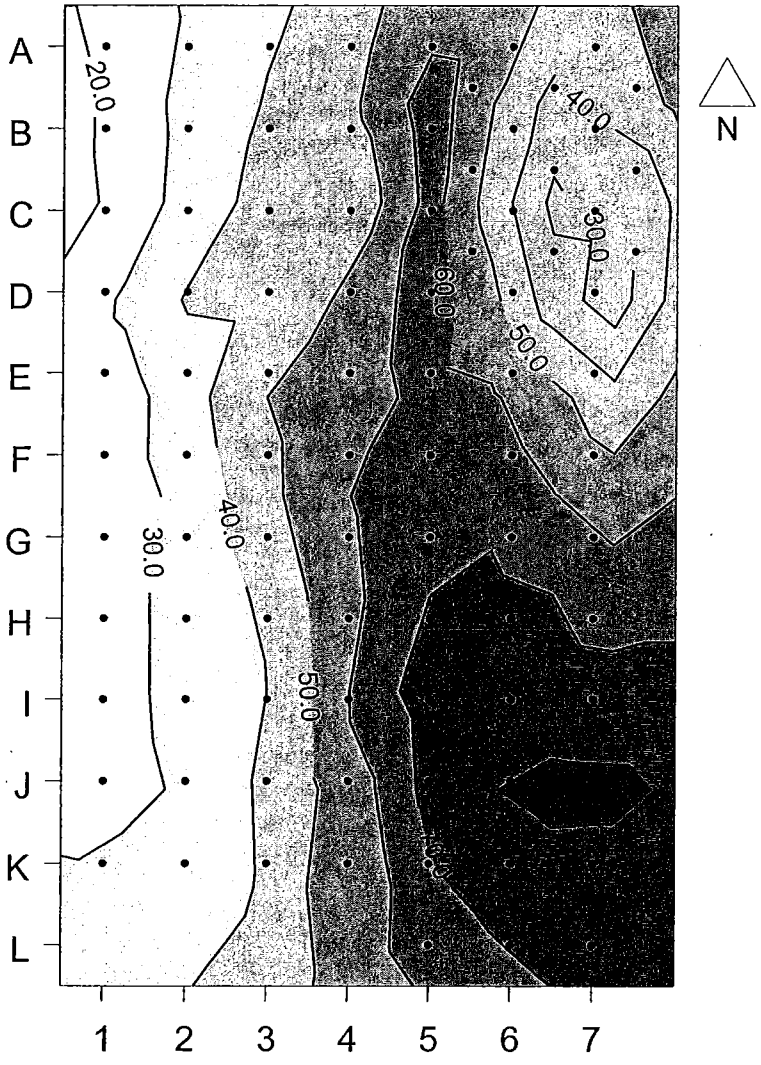
Floyd Snider McCarthy, Inc.
Strategy & Technical Solutions for Contaminated Properties

City of Yakima
Kissel Park
Yakima, Washington

Figure 2
Conceptual Site Plan



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

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**City of Yakima Kissel Park Yakima, Washington**	Figure 3 Arsenic Concentration Contours (mg/kg) Surface Soil (0-0.5')

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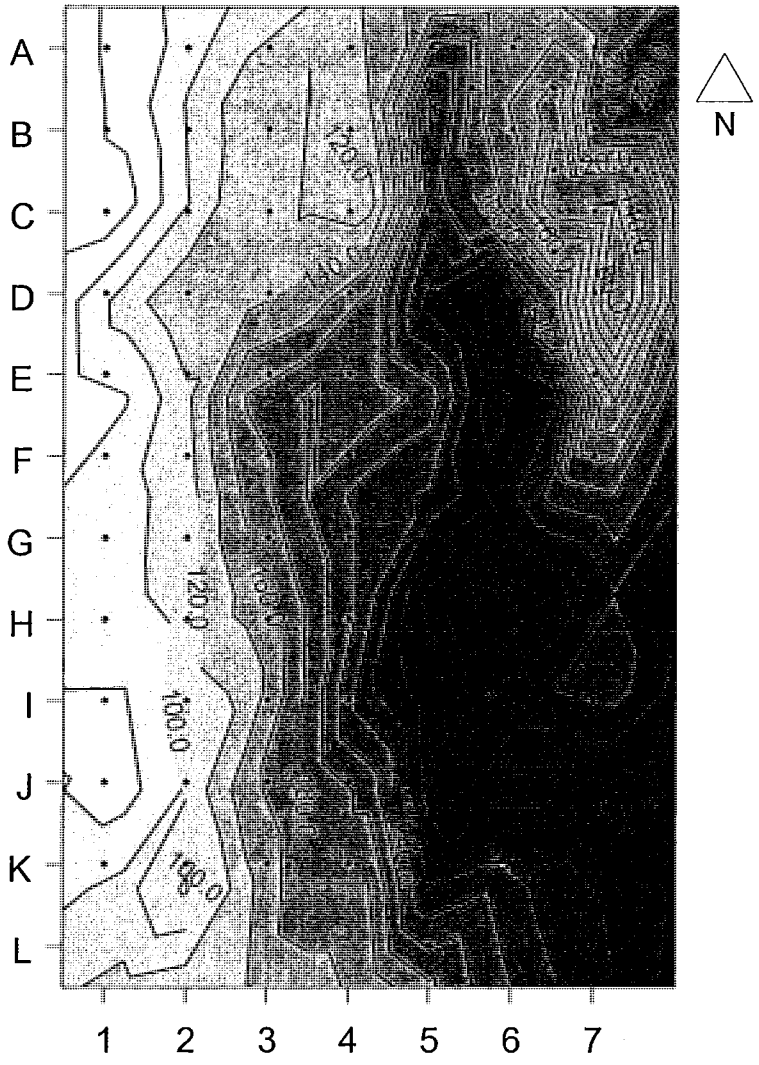
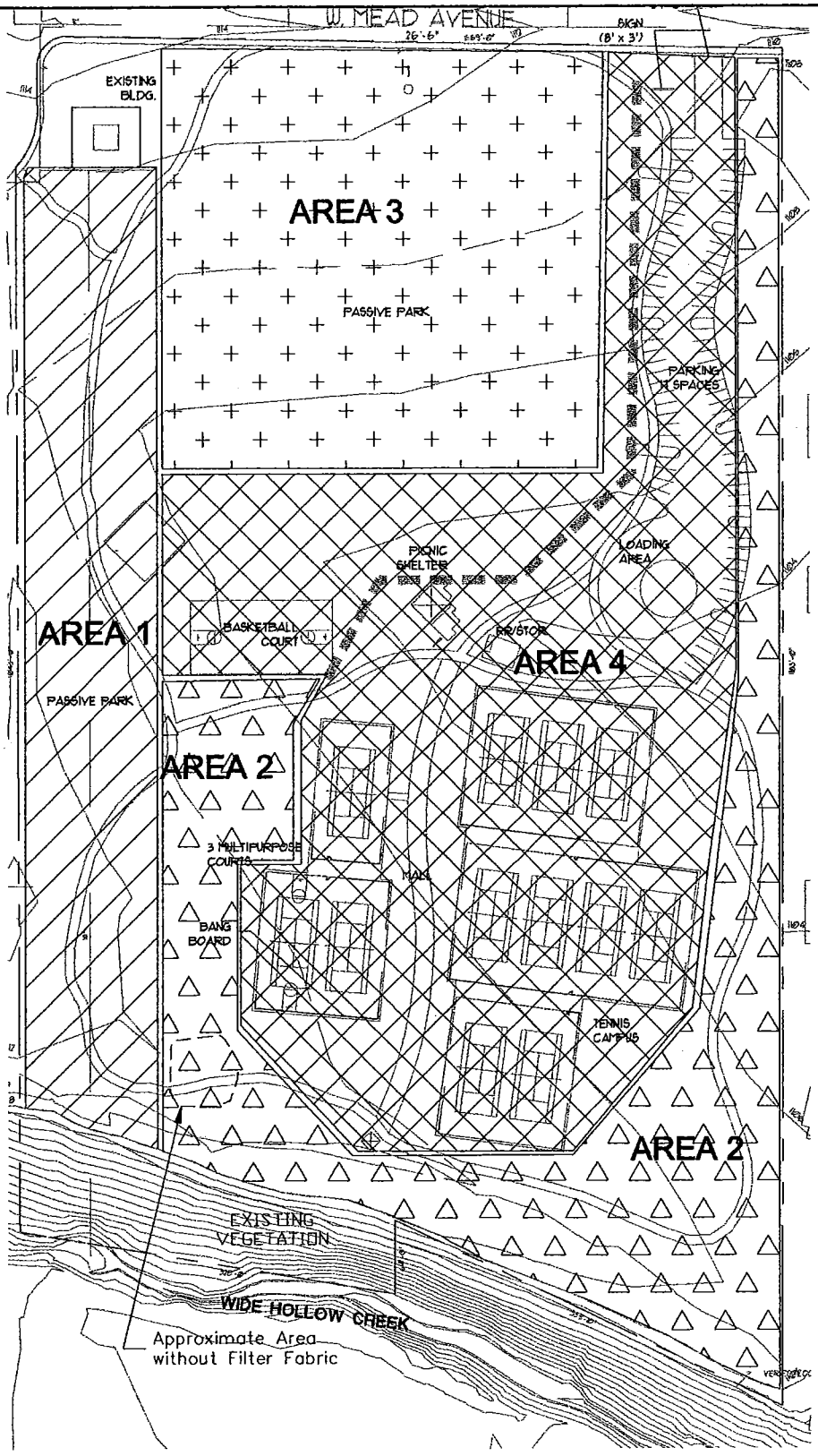


Note: 1. MTCA Method A Cleanup Level = 250 mg/kg

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

F:\projects\City of Yakima-Kissel Park\Cleanup Action Report\Draft Final\Figures\COYKisselCARFig3.vsd
12/4/02



Area 1, Deep Tilling and Soil Amendment, Excavate to 2', Relocate Soil to Areas 2 and 4. (96,166 SF)

Area 2, Regrade, Fabric, 6" Soil Cover and Turf (139,881 SF)

Area 3, Excavate to 2', Relocate Soil to Area 4 (139,580 SF)

Area 4, Fabric, 6" Soil Cover and Turf (145,136 SF)
Asphalt Pavement (131,783 SF)
TOTAL: 276,919 SF

Original Extent of Area 4

N

0 150 300

Scale in Feet

Note: The boundaries of each area are approximate. More accurate as-builts are on file with the City of Yakima.

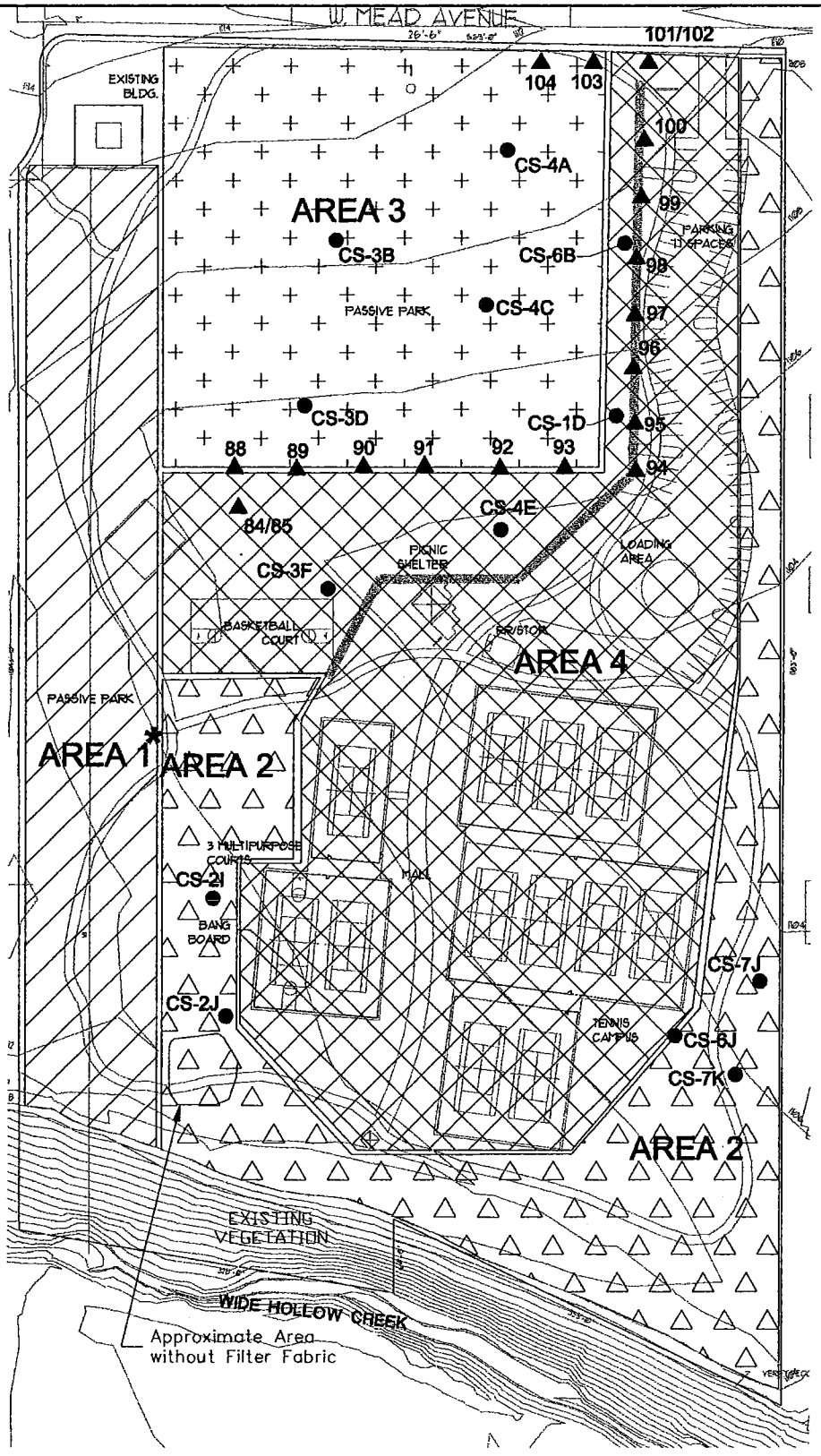
* Source: Base Map Drawing provided by KDF Architecture

DATE: 12/09/02 11:24am
DWG NAME: G:\project\Clients\Floyd and Snider\PRO_KISSEL\kissel010.dwg

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

City of Yakima
Kissel Park
Yakima, Washington

Figure 5
Extent of Cleanup Areas Following Construction



Area 1, Deep Tilling and Soil Amendment, Excavate to 2', Relocate Soil to Areas 2 and 4. (96,166 SF)

Area 2, Regrade, Fabric, 6" Soil Cover and Turf (139,881 SF)

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Area 4, Fabric, 6" Soil Cover and Turf (145,136 SF)
Asphalt Pavement (131,783 SF)
TOTAL: 276,919 SF

Original Extent of Area 4

Sample Key

▲ Collected by Ecology

● Collected by FSM

* Area 1 Confirmation Samples Collected Following Deep Tilling – Soil Relocated to Area 2/4

N

0 150 300

Scale in Feet

Note: The boundaries of each area are approximate. More accurate as-builts are on file with the City of Yakima.

* Source: Base Map Drawing provided by KDF Architecture

DATE: 12/09/02 11:26am
DWG NAME: G:\project\Clients\Floyd and Snider\PRO_KISSEL\kissel012.dwg

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

City of Yakima
Kissel Park
Yakima, Washington

Figure 6
Confirmation
Sample Locations

Kissel Park

Cleanup Action Report

Appendix A
Site Photographs

FINAL

Site Photo #1: Island of unexcavated soil in Area 3.
View to the south, Area 4 in background.

Site Photo #2: Piles of compost placed in Area 1 awaiting soil amendment via deep tilling.
View to the north.

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**City of Yakima Kissel Park Yakima, Washington**	Cleanup Action Report Appendix A Site Photos #1 and #2

Site Photo #3: View from atop Area 4 following relocation of contaminated soils from Area 3. Excavated Area 2

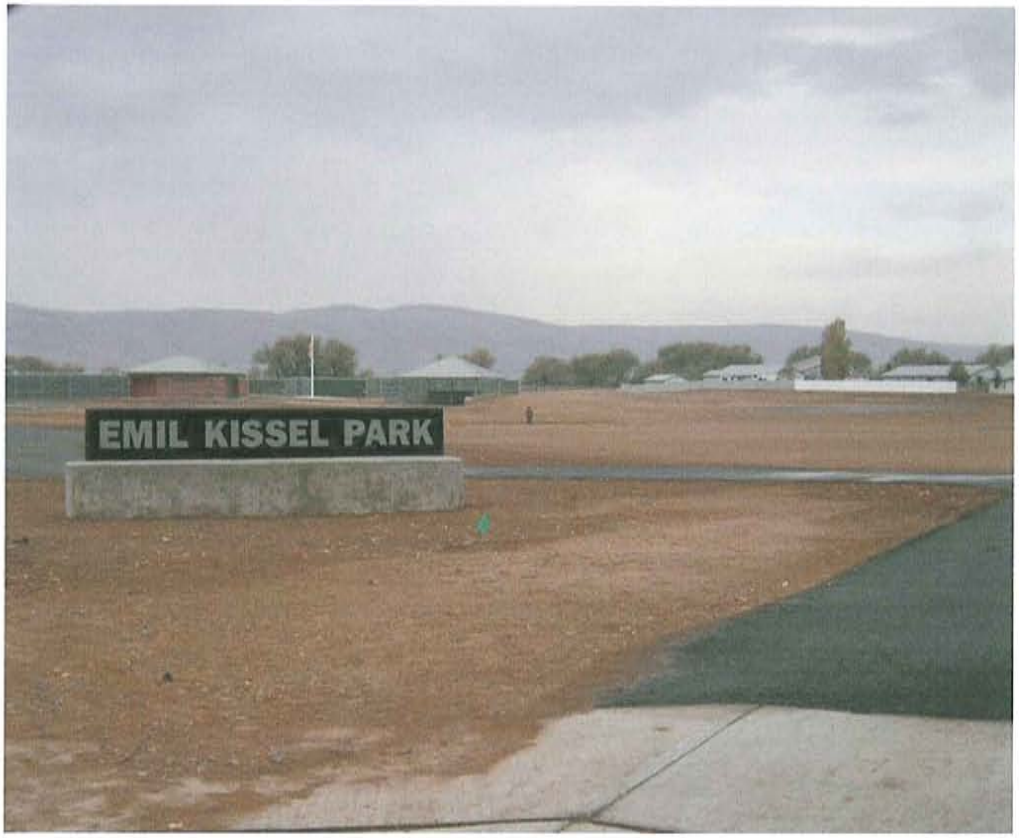
Site Photo #4: Marker fabric in Area 2 being covered with topsoil. View to the east.

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**City of Yakima Kissel Park Yakima, Washington**	Cleanup Action Report Appendix A Site Photos #3 and #4

Site Photo #5: Amended topsoil in Area 1 being relocated over marker fabric in Area 4. View to the north.

Site Photo #6: Tennis courts in center of Area 4. Note topsoil over marker fabric adjacent to walkway. View to the south.

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**City of Yakima Kissel Park Yakima, Washington**	Cleanup Action Report Appendix A Site Photos #5 and #6



Site Photo #7: Park entrance sign with Area 3 in background. View to the southwest.

Site Photo #8: Flag pole and tennis courts in Area 4 following completion of construction. View to the south.

Floyd Snider McCarthy, Inc. Strategy & Technical Solutions for Contaminated Properties	**City of Yakima Kissel Park Yakima, Washington**	Cleanup Action Report Appendix A Site Photos #7 and #8

Kissel Park

Cleanup Action Report

Appendix C
Confirmation Samples Laboratory Reports

FINAL

Tom Colligan

From: Hepner, Norm [NHEP461@ECY.WA.GOV]
Sent: Tuesday, April 23, 2002 10:19 AM
To: 'jmaine@ci.yakima.wa.us'
Cc: Tom Colligan
Subject: Request for changes to Kissel Park Project

Jim,

Based on our discussions last week, I am requesting the following:

1. The 3 ounce white geotextile be replace with a minimum 6 ounce UV stabilized, spunbound, continuous filament, needlepunched, nonwoven, polypylene black geotextile OR equivalent with the following properties:

Property (at mnfg)	Minimum Average Roll Value
Grab Strength	160 lbs
Tear Strength	65 lbs
Mullen Burst	285 psi
Puncture Resistance	80 lbs
UV Resistance (500 hrs)	70%
A.O.S.	0.212 mm
Permittivity	1.8/sec
Water Permeability	0.3 cm/sec
Water Flow Rate	135 gpm/ft2

The fabric is to be placed in all contaminated areas overlaid with 6" clean soil; areas receiving pavement shall be provided with a gravel subgrade, in lieu of fabric, which will act as the "visual demarcation barrier" as provided for in Section 4.3.1 of the CAP.

2. Area 4 shall be expanded to the North to encompass the transition area between Area 3 and Area 4 as discussed Friday. This change is necessitated because excavation of 18" did not likely occur and the soil used for the transition slopes/foundations for the structures may not be clean soil.

3. Excavation to 18" in Area 3 is required around its E, W, and N perimeters with overexcavation occurring at the Hot Spot sampling location in the SE corner of the revised Area 3.

If you have any questions, please call.

Norman T. Hepner, P.E.
Toxics Cleanup Program
15 W. Yakima Ave, Suite 200
Yakima, WA 98902
Phone: 509 457-7127
Fax: 509 575-2809

Norman T. Hepner, P.E.
Toxics Cleanup Program
15 W. Yakima Ave, Suite 200
Yakima, WA 98902
Phone: 509 457-7127
Fax: 509 575-2809

Kissel Park

Cleanup Action Report

Appendix B
Filter Fabric Specification

FINAL

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 McCarthy, Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: COY-KISSEL Project Manager: Tom Colligan	**Reported:** 04/12/02 13:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
CS-3D	B2D0153-01	Soil	04/08/02 14:25	04/09/02 11:55
CS-3F	B2D0153-02	Soil	04/08/02 14:35	04/09/02 11:55
CS-4E	B2D0153-03	Soil	04/08/02 14:45	04/09/02 11:55
CS-4C	B2D0153-04	Soil	04/08/02 14:53	04/09/02 11:55
CS-4A	B2D0153-05	Soil	04/08/02 15:10	04/09/02 11:55
CS-3B	B2D0153-06	Soil	04/08/02 15:20	04/09/02 11:55
CS-6D	B2D0153-07	Soil	04/08/02 15:35	04/09/02 11:55
CS-6B	B2D0153-08	Soil	04/08/02 15:43	04/09/02 11:55
CS-6J	B2D0153-09	Soil	04/08/02 15:56	04/09/02 11:55
CS-7K	B2D0153-10	Soil	04/08/02 16:05	04/09/02 11:55
CS-7J	B2D0153-11	Soil	04/08/02 16:10	04/09/02 11:55
CS-2I	B2D0153-12	Soil	04/08/02 16:41	04/09/02 11:55
CS-2J	B2D0153-13	Soil	04/08/02 16:52	04/09/02 11:55

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
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541.383.9310 fax 541.382.7588

Floyd Snider McCarthy, Inc. 83 South King Street, Suite 614 Seattle WA, 98104	Project: Kissel Park Project Number: COY-KISSEL Project Manager: Tom Colligan	**Reported:** 04/12/02 13:03

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	N	s
CS-3D (B2D0153-01) Soil Sampled: 04/08/02 14:25 Received: 04/09/02 11:55										
Arsenic	**6.73**	0.500	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020		
Lead	**9.42**	0.500	"	"	"	"	"	"		
CS-3F (B2D0153-02) Soil Sampled: 04/08/02 14:35 Received: 04/09/02 11:55										
Arsenic	**25.9**	0.500	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020		
Lead	**30.3**	0.500	"	"	"	"	"	"		
CS-4E (B2D0153-03) Soil Sampled: 04/08/02 14:45 Received: 04/09/02 11:55										
Arsenic	**9.69**	0.500	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020		
Lead	**12.3**	0.500	"	"	"	"	"	"		
CS-4C (B2D0153-04) Soil Sampled: 04/08/02 14:53 Received: 04/09/02 11:55										
Arsenic	**5.65**	0.450	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020		
Lead	**9.85**	0.450	"	"	"	"	"	"		
CS-4A (B2D0153-05) Soil Sampled: 04/08/02 15:10 Received: 04/09/02 11:55										
Arsenic	**4.57**	0.435	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020		
Lead	**8.77**	0.435	"	"	"	"	"	"		
CS-3B (B2D0153-06) Soil Sampled: 04/08/02 15:20 Received: 04/09/02 11:55										
Arsenic	**5.25**	0.500	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020		
Lead	**11.0**	0.500	"	"	"	"	"	"		
CS-6D (B2D0153-07) Soil Sampled: 04/08/02 15:35 Received: 04/09/02 11:55										
Arsenic	**56.4**	0.435	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020		
Lead	**10.9**	0.435	"	"	"	"	"	"		

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
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509.924.9200 fax 509.924.9290
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541.383.9310 fax 541.382.7588

Floyd Snider McCarthy, Inc.	Project: Kissel Park	
83 South King Street, Suite 614	Project Number: COY-KISSEL	**Reported:**
Seattle WA, 98104	Project Manager: Tom Colligan	04/12/02 13:03

Total Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
CS-6B (B2D0153-08) Soil Sampled: 04/08/02 15:43 Received: 04/09/02 11:55									
Arsenic	**6.96**	0.450	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020	
Lead	**9.06**	0.450	"	"	"	"	"	"	
CS-6J (B2D0153-09) Soil Sampled: 04/08/02 15:56 Received: 04/09/02 11:55									
Arsenic	**8.82**	0.450	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020	
Lead	**11.7**	0.450	"	"	"	"	"	"	
CS-7K (B2D0153-10) Soil Sampled: 04/08/02 16:05 Received: 04/09/02 11:55									
Arsenic	**6.36**	0.500	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020	
Lead	**11.4**	0.500	"	"	"	"	"	"	
CS-7J (B2D0153-11) Soil Sampled: 04/08/02 16:10 Received: 04/09/02 11:55									
Arsenic	**6.22**	0.500	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020	
Lead	**9.45**	0.500	"	"	"	"	"	"	
CS-2I (B2D0153-12) Soil Sampled: 04/08/02 16:41 Received: 04/09/02 11:55									
Arsenic	**18.1**	0.500	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020	
Lead	**18.7**	0.500	"	"	"	"	"	"	
CS-2J (B2D0153-13) Soil Sampled: 04/08/02 16:52 Received: 04/09/02 11:55									
Arsenic	**5.34**	0.500	mg/kg dry	1	2D10035	04/10/02	04/11/02	EPA 6020	
Lead	**9.42**	0.500	"	"	"	"	"	"	

Scott A. Woerman, Project Manager

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

October 24, 2002

Ms. Denise Nichols
City of Yakima
Department of Public Works
Parks & Recreation Division
2301 Fruitvale Blvd
Yakima, WA 98902

Mr. Tom Colligan
Floyd Snider McCarthy, Inc.
83 S. King Street, Suite 614
Seattle, WA 98104

Dear Ms. Nichols and Mr. Colligan:

Enclosed are the analytical results and sampling data package conducted by Ecology for the Kissel Park Project. The Kissel Park Project samples were taken to verify results obtained during the field pilot study for Area 1 deep-till remediation were consistent with those achieved during construction and to ensure area 3 excavation limits met MTCA Method A arsenic cleanup standard.

Area 1 Deep-Till Sampling

All Area 1 samples were taken at the surface following deep-tilling (see attachment 1 for stockpile sample locations). A stainless steel trowel was used to place the sample into a whirl-pak bag and visible contamination removed from the trowel between sample locations using a clean towel. The sample was then analyzed using a NITON XRF and immediately following analysis placed into a cooler for transport to Ecology. The sample was stored at 4 degree centigrade awaiting Laboratory XRF and three of the samples were shipped to AMTEST laboratories for analysis on July 11, 2002. A complete data package is enclosed for your records (attachment 2).

Field sampling with the NITON XRF verified an average arsenic concentration of approximately 15 mg/kg in the Area 1 stockpile with 2 of the 15 discrete locations in the stockpile exceeding the MTCA Method A cleanup level of 20 mg/kg. Additionally, 20% Laboratory ICP data was used to adjust Laboratory XRF data for arsenic. Laboratory XRF data over-reported arsenic concentrations by an estimated 33% because of:

1. Limited NITON analysis time
2. Low arsenic concentrations
3. Lead contaminant interference

The adjusted Laboratory XRF data showed an average arsenic concentration of 14 mg/kg in the stockpile with 3 of the 15 discrete locations in the stockpile exceeding the MTCA Method A

cleanup level of 20 mg/kg.

Area 3 Excavation Limit Sampling

During Kissel Park construction it was determined that excavation of soil in Area 3 exceeded planned estimates and that arsenic contaminated soil was removed to Area 2 and 4 for use in achieving park planned elevations; these soils have been subsequently capped. The City requested that deep-tilling Area 3 not be required to meet MTCA Method A cleanup levels. Ecology approved the City's request after reviewing pre and post surveyed contours of Area 3, reviewing previous depth sample results from the RI/FS, and conducting NITON XRF sampling of perimeter Area 3 along the boundary with Areas 2 and 4. The perimeter boundary between Areas 2 and 4 offered the greatest likelihood of exceeding MTCA limits based on historical contaminant concentrations present and minimum depth of excavation at these locations.

Perimeter Area 3 Field NITON XRF analysis was conducted on June 12, 2002 (see attachment 3 for results). A 6" depth sample using a 1/2" diameter conduit was taken at each location along the Area 2 and 4 border (see attachment 4 for locations) and mixed with mortar and pestle prior to placing in whirl-pak bag. Following initial results of XRF sampling and the understanding that additional fill was required in the transition from Area 3 to 4, Ecology moved the Area 3 perimeter boundary approximately 12' with the City's approval. Based on the new perimeter, the average field arsenic concentration was approximately 14 mg/kg for the 18 sample locations analyzed with only 1 measurement exceeding the MTCA Method A cleanup level.

Field and Laboratory XRF Analysis Procedure

Field NITON XRF analysis was performed using procedures outlined in the NITON User's Guide, Version 5.2, Chapter 3, Analysis of Bagged Bulk Samples.

Laboratory NITON XRF analysis was performed using procedures described in EPA Method 6200, Field Portable X-Ray Fluorescence Spectrorometry for the Determination of Elemental Concentrations in Soil and Sediment.

Conclusion

This sample data package should be included in the post construction report for the Site. The NITON XRF field sampling and analysis with laboratory confirmation data, construction field inspection reports, pre and post contour surveys, previous RI/FS sampling data, etc., should be used to conclude whether the cleanup action was constructed in substantial compliance with the plans and specifications. Ecology looks forward to reviewing the final construction report, deed restriction, and operations and maintenance plan for this Site.

Ecology enjoyed the opportunity to support the City of Yakima in completing this remediation project. Based on the experiences gained, we look forward to supporting the City with field sampling needs for the Gailleon Park remediation project in the near future. If you have any questions or need additional clarification, please contact me at (509) 457-7127.

Sincerely,

Norman T. Hepner, P.E.
Site Manager
Toxics Cleanup Program

Enclosure

ATTH 2: Field NITON XRF printout AREA 1 Stockpile.

Serial #XL700-U35737059LY
BULK
Header: Field Analysis.
Site: <none> Kissel, Area 1

No	XLNo	Source	Ssec	Date/Time	Pb	Pb Error	As	As Error
1	437	BLANK	124.5	7/12/2002 9:09	<LOD	9.9	<LOD	10.2
2	438	LOW	123.6	7/12/2002 9:13	26	10.3	<LOD	15.75
3	439	LOW	122.2	7/12/2002 9:16	26	10.4	<LOD	16.35
4	440	LOW	122.3	7/12/2002 9:19	17.9	10.1	<LOD	15.9
5	441	1-K50'	439.1	7/12/2002 9:23	93.4	7.4	23.3	7.4
6	442	2-K125'	468.1	7/12/2002 9:35	41.3	5.6	15.1	5.8
7	443	3-K200'	392.4	7/12/2002 9:49	64	6.7	16.8	6.8
8	444	4-K400'	390.6	7/12/2002 10:00	81.6	7.1	15.5	7
9	445	5-K600'	384.7	7/12/2002 10:10	80.3	7.4	22.7	7.5
10	446	6-KM50'	499.5	7/12/2002 10:21	59.6	5.7	13.4	5.7
11	447	7-M150'	575.5	7/12/2002 10:34	56.6	5.2	16.8	5.2
12	448	8-KM350'	390.4	7/12/2002 10:50	33.5	5.2	14.3	5.4
13	449	9-KM450'	467.6	7/12/2002 11:01	44.7	5	12.8	5.1
14	450	10-KM600'	958	7/12/2002 11:15	66.8	4.4	17.2	4.4
15	451	11-KO50'	528.8	7/12/2002 11:40	67.2	5.9	19.1	6
16	452	12-KO200'	411	7/12/2002 11:55	39.9	5.6	13.5	5.7
17	453	13-KO200'	415.5	7/12/2002 12:07	24.5	5	<LOD	7.5
18	454	14-KO400'	452.3	7/12/2002 13:42	23.5	4.5	<LOD	6.75
19	455	15-KO600'	487.2	7/12/2002 13:55	31.4	5.2	12.4	5.4
23	459	BLANK	256.5	7/12/2002 14:09	<LOD	6.75	<LOD	7.05
24	460	LOW	125.1	7/12/2002 14:16	27.2	10.4	21.6	11.2
25	461	LOW	124.9	7/12/2002 14:20	24.7	10.3	<LOD	15.75
26	462	LOW	133.5	7/12/2002 14:23	16.6	9.5	21.4	10.4

ATCH 2
LAB NITON XRF
AREA 1 Stockpile

Serial #XL700-U35737059LY
BULK
Header: LAB Analysis.
Site: <none> Kissel, Area 1

No	XLNo	Source	Ssec	Date/Time	Pb	Pb Err	As	As Error
1	602	BLANK	130.7	7/22/2002 11:31	<LOD	10.05	<LOD	10.35
2	603	LOW	122.5	7/22/2002 11:35	27.1	10.5	<LOD	16.35
3	604	LOW	122.5	7/22/2002 11:39	27.6	10.5	<LOD	16.5
4	605	LOW	124	7/22/2002 11:46	<LOD	14.55	20.9	10.6
5	606	1	401.9	7/22/2002 11:59	109.3	8.3	32.2	8.4
6	607	2	457.7	7/22/2002 13:21	45.7	6.3	11.5	6.3
7	608	3	447	7/22/2002 13:49	86.9	7.4	22.4	7.4
8	609	4	479	7/22/2002 14:50	107.1	7.5	31.5	7.6
9	610	5	486.8	7/22/2002 15:28	111.4	7.7	34.6	7.8
10	611	6	450.1	7/22/2002 16:13	84.3	7.3	23.2	7.3
11	612	BLANK	129.1	7/22/2002 16:25	<LOD	10.35	<LOD	10.05
12	613	LOW	123.4	7/22/2002 16:29	23.6	10.3	<LOD	16.2
13	614	LOW	132.3	7/22/2002 16:32	21.5	9.8	15.5	10.3
14	615	LOW	124.2	7/22/2002 16:36	21.9	10.2	21	11
16	617	BLANK	124.1	7/23/2002 8:55	<LOD	10.05	<LOD	10.35
17	618	LOW	341.6	7/23/2002 10:51	26.5	6.2	15.2	6.5
18	619	LOW	258.4	7/23/2002 11:00	28.2	7.2	12.1	7.4
19	620	LOW	124.6	7/23/2002 11:07	20.6	10.2	20.3	11
20	621	7	423.5	7/23/2002 11:27	86.4	7.4	18.6	7.4
21	622	8	423.9	7/23/2002 11:58	59.6	6.4	17.6	6.5
22	623	9	428.4	7/23/2002 13:25	81.2	7.1	21.8	7.1
23	624	10	409.2	7/23/2002 13:57	92.7	7.9	21.7	7.9
24	625	11	435.6	7/23/2002 14:26	92.7	7.6	22	7.6
25	626	12	466.3	7/23/2002 14:54	56.8	6.4	20.6	6.5
26	627	13	405.9	7/23/2002 16:06	39.3	6.3	12.4	6.5
27	628	14	415.7	7/23/2002 16:35	30.5	5.7	<LOD	8.7
28	629	15	406	7/23/2002 16:55	50.9	6.8	14.1	6.9
29	630	BLANK	124.7	7/23/2002 17:06	<LOD	10.65	<LOD	10.65
30	631	LOW	134.7	7/23/2002 17:10	19.8	9.6	18.6	10.3
31	632	LOW	151.8	7/23/2002 17:14	22.4	9.2	16.8	9.7
32	633	LOW	122.5	7/23/2002 17:18	18	10.1	20.4	11

ATCH 2

ATCH 2

AMTEST LABORATORIES

Am Test Inc.
14603 N.E. 87th St.
Redmond, WA
98052

Tel: 425.885.1664
Fax: 425.883.3495
www.amtestlab.com

Professional Analytical Services

Aug 19 2002
Department of Ecology
C/O Bay Zinc
15 W Yakima Ave, Suite 200
Yakima, WA 98902
Attention: Norman Hepner

Dear Norman Hepner:

Enclosed please find the analytical data for your Bay Zinc project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AM TEST ID	TEST
DR-1	Water	02-A009033	MET,
K-1	Soil	02-A009034	CONV, MET,
K-10	Soil	02-A009035	CONV, MET,
K-14	Soil	02-A009036	CONV, MET,
D-1A	Soil	02-A009037	CONV, MET,
D-2A	Soil	02-A009038	CONV, MET,
D-3B	Soil	02-A009039	CONV, MET,
D-4A	Soil	02-A009040	CONV, MET,
D-5A	Soil	02-A009041	CONV, MET,
D-6A	Soil	02-A009042	CONV, MET,
D-7A	Soil	02-A009043	CONV, MET,
D-8A	Soil	02-A009044	CONV, MET,
D-9A	Soil	02-A009045	CONV, MET,
D-10B	Soil	02-A009046	CONV, MET,
D-11A	Soil	02-A009047	CONV, MET,
D-12A	Soil	02-A009048	CONV, MET,
D-13A	Soil	02-A009049	CONV, MET,
D-14A	Soil	02-A009050	CONV, MET,
D-15Bs	Soil	02-A009051	CONV, MET,
D-16A	Soil	02-A009052	CONV, MET,
D-17B	Soil	02-A009053	CONV, MET,
D-18B	Soil	02-A009054	CONV, MET,
D-19B	Soil	02-A009055	CONV, MET,
D-20A	Soil	02-A009056	CONV, MET,
D-22C	Soil	02-A009057	CONV, MET,
D-23A	Soil	02-A009058	CONV, MET,
D-24A	Soil	02-A009059	CONV, MET,
D-25A	Soil	02-A009060	CONV, MET,
D-26A	Soil	02-A009061	CONV, MET,
D-20D	Soil	02-A009062	CONV, MET,
D-1B	Soil	02-A009063	CONV, MET,

At the time of receipt, the samples were logged in and properly maintained prior to their subsequent analyses.

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Professio
Analytic
Services

Department of Ecology
Norm Hepner

The analytical procedures used at Am Test are well documented, and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the QC results and "Methodology Report". This table includes information relative to the detection limits, analyses dates and method references.

Please note that the detection limits that are listed in the body of the report refer to the Method Detection Limits (MDL's), as opposed to Practical Quantitation Limits (PQL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Kathy Fugiel
Director of Inorganic Laboratory

Project #: Bay Zinc

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics

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AMTEST LABORATORIES

Professional Analytical Services

ANALYSIS REPORT

Department of Ecology
C/O Bay Zinc
15 W Yakima Ave, Suite 200
Yakima, WA 98902
Attention: Norm Hepner

Date Received: 7/12/02
Date Reported: 8/19/02

Project Name: Bay Zinc
Project #: Bay Zinc

SOIL SAMPLES

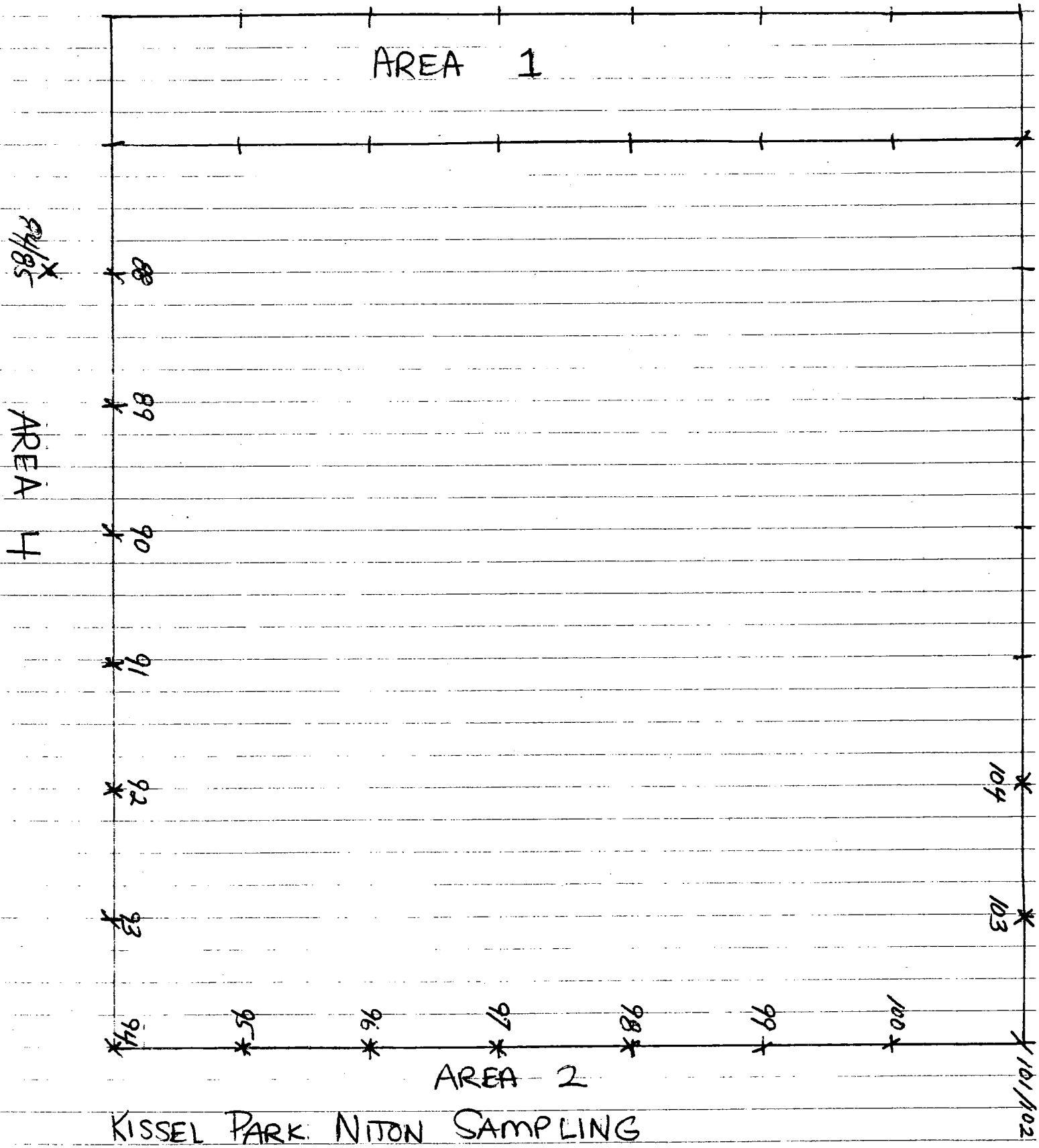
PARAMETER	Units	Result
02-A009034		
Client ID: K-1		
Date Sampled: ,		
Total Solids	%	91.
METALS		
Arsenic	ug/g	26.
Lead	ug/g	110
Metals reported on a "dry weight basis".		
02-A009035		
Client ID: K-10		
Date Sampled: ,		
Total Solids	%	87.
METALS		
Arsenic	ug/g	15.
Lead	ug/g	64.
Metals reported on a "dry weight basis".		
02-A009036		
Client ID: K-14		
Date Sampled: ,		
Total Solids	%	82.
METALS		
Arsenic	ug/g	6.0
Lead	ug/g	23.
Metals reported on a "dry weight basis".		

ATCH 3. Field NITON XRF printout. AREA 3

Serial #XL700-U35737059LY
BULK
Header: Field Analysis
Kissel Park June 12 Perimeter Sampling of Area 3 between Area 2 and 4
Site: <NONE>

No	XLNo	Site	Ssec	Date/Time	Pb	Pb Er	As	Level of As Detect	As Error
1	83	LOW NIST SAMPLE	500.7	6/12/2002 7:22	24.8	5.1	15		5.4
2	84	Original permiter; previous high scr	271.8	6/12/2002 7:48	88.4	9.7	42.5		10.3
3	85	Original permiter; previous high scr	761.2	6/12/2002 9:26	16.3	5.1	35.5		6
6	88	new permiter 50' in from corner of 1	502.5	6/12/2002 10:05	21.2	5	18.1	18.1	5.4
7	89	between 3 & 4: 50' from 88	497.8	6/12/2002 10:19	17.8	5	9.6	9.6	5.2
8	90	between 3 & 4: 50' from 89	537.6	6/12/2002 10:32	16.3	5	<LOD	7.95	7.95
9	91	between 3 & 4: 50' from 90	251.9	6/12/2002 10:46	18.6	7.6	<LOD	12	12
10	92	between 3 & 4: 50' from 91	501.8	6/12/2002 10:53	15.2	6.1	<LOD	10.2	10.2
11	93	between 3 & 4: 50' from 92	500.2	6/12/2002 11:06	21.6	5.4	<LOD	8.4	8.4
12	94	corner of 3,4, & 2	672.5	6/12/2002 11:19	16.4	4.8	14.5	14.5	5.3
13	95	between 2 & 3: 50' from 94	185.9	6/12/2002 11:36	<LOD	13.35	<LOD	14.55	14.55
14	96	between 2 & 3: 50' from 95	670.8	6/12/2002 11:42	73.3	6.8	31.1	31.1	7.6
15	97	between 2 & 3: 50' from 96	792.9	6/12/2002 11:59	27.9	4.9	14.4	14.4	5.3
16	98	between 2 & 3: 50' from 97	532.4	6/12/2002 12:19	24.2	5	<LOD	7.65	7.65
17	99	between 2 & 3: 50' from 98	242.5	6/12/2002 12:33	16.3	8.1	<LOD	13.5	13.5
18	100	between 2 & 3: 50' from 99	286.2	6/12/2002 12:39	50.4	9.9	<LOD	16.5	16.5
19	101	coner of Area 2 & 3, and Mead Ave	382.3	6/12/2002 12:47	57.8	7.4	<LOD	11.1	11.1
20	102	101 rerun	278.8	6/12/2002 12:57	14.2	7.2	<LOD	11.7	11.7
21	103	between area 3 and Mead Ave: 50'	162.5	6/12/2002 13:04	17.2	9	<LOD	13.8	13.8
22	104	between area 3 and Mead Ave: 100	109.5	6/12/2002 13:08	<LOD	16.8	<LOD	18.75	18.75
23	105	LOW NIST SAMPLE	2000.8	6/12/2002 13:13	22.3	2.5	16.3	16.3	2.7

ATCH 4
AREA 3 Perimeter Sampling Locations.



KISSEL PARK NITON SAMPLING
JUNE 12, 2002
N.T. HEPNER

Kissel Park

Cleanup Action Report

Appendix D
Park Management Plan

FINAL

Appendix D
Park Management Plan – Contaminated Soils

Kissel Park was developed on former orchard land. As a result, arsenic and lead occurred in the surface soils. This caused the city to undertake a cleanup of the park during its construction in 2002. As part of the cleanup, soil with arsenic and lead concentrations greater than the state's cleanup level was concentrated in a specific portion of the park (Areas 2 and 4) and covered by either pavement (parking lot, tennis courts) or 6" of clean topsoil. Under the clean topsoil is a black marker fabric that delineates the boundary between the contaminated and clean soils. Under the pavement is a base course that lies atop contaminated soils. Consult the Cleanup Action Report for the Park to obtain details on the cleanup action.

The rest of the park (Areas 1 and 3) was completely cleaned up and therefore exempt from the requirements of this plan.

Refer to Figure D-1 for the boundaries of Areas 2 and 4. The contaminated soils in these areas are now covered by either pavement or turf. Under the turf is 6 inches of clean cover soils. Over time, however, both pavement and turf can wear and lose their ability to adequately protect park visitors for exposure to contaminated soils. For example, in heavily trafficked areas of the park, turf may die, causing erosion of underlying soils to the point where the underlying contaminated soils may be exposed. As a result, "institution controls" which maintain and inspect the pavement and turf must be implemented indefinitely. The following sections describe the specific institutional controls that must be followed within Areas 2 and 4.

1.0 LANDSCAPING

The following procedures must be performed to keep the turf healthy in landscaped areas:

- Turf must be seasonally fertilized and irrigated.
- The irrigation system must be maintained in accordance the City's Parks Department policies (winterization, testing, repainting, updating, use of rainfall sensors).
- Dead turf areas must be resodded or reseeded.
- Turf must be mowed in accordance with the general requirements of Parks and Recreation.
- Over-irrigation leading to ponding must not be allowed to occur. A rain sensor will allow for shutdown of the irrigation system during time of rainfall.

In addition, fertilization and weed control shall be performed at the discretion of the Parks Department with the objective to maintain healthy and weed-free turf.

2.0 HANDLING OF CONTAMINATED SOILS

Within Areas 2 and 4, future improvements or repairs may result in breaching of the filter fabric or base course overlying contaminated soils. Should this occur, and contaminated soils brought to the surface, the City of Yakima shall take the following actions:

- Plastic sheeting shall be used to contain the soil brought up below the filter fabric or base course.
- Following completion of the digging activities, to the extent possible, the contaminated soil contained upon the plastic sheeting shall be returned to the hole, compacted, and the filter fabric/topsoil or base course replaced, and resodded or patched.
- Should any contaminated soil not be able to be returned to the hole, then it shall be transported off site to a regional landfill (e.g., the Regional Disposal Company landfill near Goldendale, Washington) permitted to accept such soils.

3.0 QUARTERLY INSPECTION OF AREAS 2 AND 4

Four times a year, an inspection of Areas 2 and 4 must occur. Any City employee can carry out the inspection. The inspection shall walk over Areas 2 and 4 and note the presence of all of the following:

- Overall condition of the pavement (i.e.- excellent, good, fair, poor) at both the parking lot and play courts
- Presence of any potholes or large cracks or other signs of pavement deterioration
- Cracking or spalling of the asphalt along the edges of the parking lot or play courts
- Overall condition of the turf (excellent, fair, poor)
- Areas of dead or dying sod
- Exposure of black marker fabric
- Areas where inadvertent digging has occurred

Should the presence of base course underlying any area of asphalt be noted, then immediate repairs shall be implemented. It is expected when the asphalt degrades to an overall poor condition, that repaving of the parking lot will occur. Should dead areas of turf be noted, they shall be reseeded or resodded. Any areas where the black marker fabric is exposed are to be flagged off and filled with 6" of import topsoil and reseeded or resodded.

Recommendations for any follow up work noted as a result of the inspection should be made on the form itself.

A copy of the inspection report shall be forwarded to the Washington State Department of Ecology at the address below.

Norman T. Hepner, P.E.
Toxics Cleanup Program
15 W. Yakima Ave, Suite 200
Yakima, WA 98902
Phone: 509 457-7127
Fax: 509 575-2809

Kissel Park

Cleanup Action Report

Appendix E
Restrictive Covenant

FINAL

ORDINANCE NO. 2003-_____

AN ORDINANCE concerning land use and environmental regulation and imposing a restrictive covenant on real property owned by the City of Yakima commonly known as Kissel Park and Gailleon Park (the "Parks") as a part of the City's environmental remediation of arsenic- and lead-contaminated soils located at the Parks, undertaken in conjunction with the Washington State Department of Ecology's Toxics Cleanup Program.

WHEREAS, both Kissel Park and Gailleon Park have been identified as being the sites of soils contaminated with arsenic and lead at levels in excess of those permitted by the Model Toxics Control Act due to agricultural activities predating the use of the Parks for recreational purposes; and

WHEREAS, the City has worked cooperatively with the Washington State Department of Ecology to reach an agreed plan for remediating the soil contamination at the Parks, which plan calls for a variety of controls and safeguards to reduce the effect of the soil contamination on the environment and on public health; and

WHEREAS, an integral component of the plan for remediating the soil contamination at the Parks is the recording of restrictive covenants in the forms attached hereto as Exhibits "A" and "B" to serve as institutional controls on the future use of the Parks and to avoid uses of the Parks which otherwise might inadvertently result in the exposure of underlying contaminated soil; and

WHEREAS, the City Council finds that it is in the best interest of the City to enact the following; **now therefore:**

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF YAKIMA, WASHINGTON:

Section 1. The City Manager of the City of Yakima is hereby instructed and directed to execute the restrictive covenants attached hereto as Exhibits "A" and "B" and incorporated herein by this reference and further to record the same with the

Yakima County Auditor against the City's real property title for Kissel Park and Gailleon Park.

Section 2. Severability: If any section, subsection, paragraph, sentence, clause or phrase of this ordinance is declared invalid or unconstitutional for any reason, such decision shall not affect the validity of the remaining portions of this ordinance.

Section 3. This ordinance shall be in full force and effect 30 days after its passage, approval, and publication as provided by law and by the City Charter.

PASSED BY THE CITY COUNCIL at a regular meeting and signed and approved this _____ day of January, 2003.

_____
Mary Place, Mayor

ATTEST:

_____
City Clerk

Publication Date: _____ Effective Date: _____

WHEN RECORDED RETURN TO:

City of Yakima Clerks Office
129 North Second Street
Yakima, WA 98901

RESTRICTIVE COVENANT

Grantor: CITY OF YAKIMA

Grantee: WASHINGTON DEPARTMENT OF ECOLOGY

Legal Description: Parcel A: NW ¼, NW ¼, NW ¼, Sec 35, Twp 13N, R 18, E.W.M.
Parcel B: Portion of SW ¼, NW ¼, NW ¼, Sec 35, Twp 13N, R 18, E.W.M.

Full legal shown in Exhibit A.

Assessor's Property Tax Parcel Account Number(s):
Parcel A: 18-13-35-22014
Parcel B: 18-13-35-22007

7311044
Page: 1 of 7
01/08/2003 03:18P
LYNN QUESENBURY COV $25.00
Yakima Co, WA

a) A marker fabric placed between the contaminated soil left in place within Areas 2 and 4 as shown on Exhibit B, and the overlying non-contaminated soil cover or asphalt paving. The marker material is a black-colored netting that is non-biodegradable. It indicates when contaminated soils have been reached while intentionally digging at the Property (e.g., when making repairs to the irrigation system or when digging for a new light standard) as well as provides a barrier to penetration by inadvertent digging, and provides a prominent visible indication of any unintentional breaches in the soil or asphalt cover during regular inspection.

b) A sign at the Property informing the public of the Remedial Action and prohibiting digging activities without City permission.

c) An irrigation system capable of maintaining the turf in Areas 2 and 4, the location of which is shown on Exhibit B and described in more detail in the Remedial Action Documents. The irrigation system was installed prior to the placement of the soil cover and marker fabric. The irrigation schedule for the site must 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.

d) A Landscaping Plan implemented by the Owner to ensure the turf cover and plantings are constantly maintained. This plan must include a minimum fertilization, mowing, and weed control schedule during the growing season to keep the turf maintained.

e) An Inspection Plan for inspection and maintenance of paved areas and turf. The inspection must look for cracks, potholes and other damage to the paved areas. In landscaped areas, patches of dead vegetation or sod must be noted and maintained as necessary. The Owner must implement and follow this plan which must include quarterly inspections by Park and Recreation Personnel. Should the Property be conveyed to a third party, Ecology may designate another party to make quarterly inspections.

f) A Soil Management Plan implemented by the Owner for properly managing soil brought up by digging activities in Areas 2 and 4, the locations of which are shown on Exhibit B and described in more detail in the Remedial Action Documents. Such planned digging activities may include trenching for additional utilities, adding light standards, drilling and other activities. To the degree possible, excavated contaminated soil from below the marker fabric must be placed back in the hole and the six inches of import soil cover/sod replaced. Any soil not able to be placed back in its original location must be disposed of at an appropriate off-site location, such as the Yakima County municipal solid waste landfill.

Section 2. Any activity on the Property that may interfere with the integrity of the Remedial Action and continued protection of human health and the environment is prohibited.

Section 3. Any activity on the Property that may result in the release or exposure to the environment of a hazardous substance that remains on the Property as part of the Remedial Action, or create a new exposure pathway, is prohibited without prior written approval from Ecology.

Section 4. The Owner of the Property must give thirty (30) days advance written notice to Ecology of the Owner's intent to convey any interest in the Property. No conveyance of title, easement, lease or other interest in the Property shall be consummated by the Owner without adequate and complete provision for the continued operation, maintenance and monitoring of the Remedial Action.

Section 5. The Owner must restrict leases to uses and activities consistent with the Restrictive Covenant and notify all lessees of the restrictions on the use of the Property.

Section 6. The Owner must notify and obtain approval from Ecology prior to any use of the Property that is inconsistent with the terms of this Restrictive Covenant. Ecology may approve any inconsistent use only after public notice and comment.

Section 7. The Owner shall allow authorized representatives of Ecology the right to enter the Property at reasonable times for the purpose of evaluating the Remedial Action; to take samples, to inspect remedial actions conducted at the Property, and to inspect records that are related to the Remedial Action.

Section 8. The Owner of the Property reserves the right under WAC 173-340-440 to record an instrument that provides that this Restrictive Covenant shall no longer limit use of the Property or be of any further force or effect. However, such an instrument may be recorded only if Ecology, after public notice and opportunity for comment, concurs.

CITY OF YAKIMA

By: _____

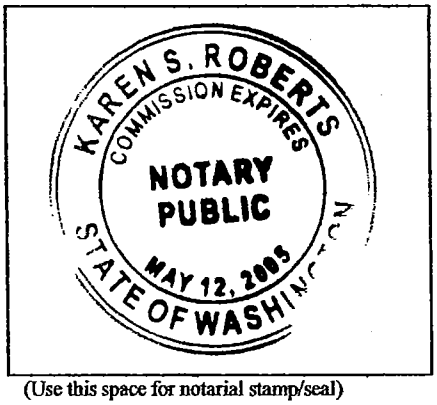
Its City Manager, R.A. Zais, Jr.

Dated: January 8, 2003

STATE OF WASHINGTON)
) ss.
COUNTY OF YAKIMA)

I certify that I know or have satisfactory evidence that R.A. Zais, Jr. is the person who appeared before me, and said person acknowledged that s/he signed this instrument, on oath stated that s/he was authorized to execute the instrument and acknowledged it to as the City Manager of the CITY OF YAKIMA to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

Dated: January 8, 2003



(Use this space for notarial stamp/seal)

Karen S Roberts
Notary Public
Print Name Karen S. Roberts
My commission expires 5-12-2005

K:\25722\00006\KJL\KJL_A216E

EXHIBIT A
LEGAL DESCRIPTION

The following premises situated in the City of Yakima, County of Yakima, State of Washington, described as follows:

PARCEL A: The Northwest Quarter of the Northwest quarter of the Northwest quarter of Section 35, Township 13 North, Range 18, E.W.M.

PARCEL B: That part of the Southwest quarter of the Northwest quarter of the northwest quarter of Section 35, Township 13 North, Range 18 E.W.M., lying North of a line beginning at the intersection of Wide Hollow Creek with the West line of said subdivision; thence Southeasterly along said creek 330 feet, more or less, to a point 20 rods from the west line of subdivision; thence North 66 feet; thence Southeasterly to a point on the East line of said subdivision 115.5 feet North of the Southeast corner of said subdivision.

Except one-half interest in the West 1 rod of said Parcels A and B, said West one (1) rod to be used for irrigation purposes.