INTERIM ACTION REPORT
LEWIS AND CLARK ELEMENTARY SCHOOL
WENATCHEE, WASHINGTON

October 30, 2006

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Toxics Cleanup Program
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1.0 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

The purpose of this report is to detail cleanup activities conducted at Lewis and Clark Elementary School during the summer of 2006.

1.2 AREA WIDE INTRODUCTION

Area-wide soil contamination is defined as contamination above state cleanup levels that is dispersed over a large geographic area. The soil contamination in this case is a result of central Washington's orchard industry. Much of the region consists of current or former orchard land, where long-term pesticide application has taken its toll. Lead arsenate, a pesticide commonly used between the years of 1905 and 1947 to control the codling moth, has been identified as the primary source of increased lead and arsenic concentrations.

Due to their chemical structure, lead and arsenic tend to bond with soil particles and often remain at or near ground surface level for decades, creating an exposure pathway through inhalation and/or ingestion.

Although lead and arsenic are naturally occurring elements, elevated concentrations have been proven to have a negative impact on human health. Young children are generally more susceptible than adults, which is why Ecology has focused remediation efforts on schools.

Because of the unique nature of area-wide contamination, traditional methods of remediation are not feasible. Therefore, the Area-Wide Soil Contamination Task Force was established in 2002 to identify and pursue effective statewide strategies. Recommendations from the Task Force included soil testing, qualitative evaluations, and protective measures at child-use areas.

In the central Washington region, Okanogan, Chelan, Douglas, and Yakima counties were targeted based on the large volume of apple and pear production during the first half of the 20th century. Aerial photography from 1927 and 1947 showed a high number of school properties located on former orchard land in the Wenatchee area. Therefore, Ecology's Central Regional Office (CRO) began initial sampling and analysis during the spring of 2002.

Sampling results from the Wenatchee area showed several schools with soil contamination exceeding state cleanup standards. Based on these results, soil testing was implemented in the four priority counties. Over 100 public schools were tested for lead and arsenic during the summer of 2005. Of the schools sampled, Ecology's CRO identified 35 schools with soil contamination exceeding state cleanup standards.

The 35 schools were then prioritized for remedial activities. Remedial activities started during the summer of 2006. Four Wenatchee area schools were chosen for initial activities due to close proximity between properties and summer break schedule, including Lewis and Clark Elementary. North Omak Elementary, Brewster High School, Manson Elementary, and Naches Intermediate were chosen for remediation following cleanup activities in Wenatchee.

2.0 SITE DESCRIPTION

Lewis and Clark Elementary School is located at 1130 Princeton Street within the City of Wenatchee in Chelan County, Washington. More specifically, the site is located at 46º34'26" N and -120º31'32" (GPS Coordinates) in the NW ¼ of the NE ¼ of Section 15, Township 22 North, Range 20 East. The site is approximately ¼ mile west of the State Highway 285 as it extents north-south through downtown Wenatchee and 1 ¼ miles south of State Highway 97 (see Vicinity Map located in Appendix C).

Situated on the eastern boundary of the Wenatchee Mountains, this location is approximately 720 feet above sea level within the Wenatchee Valley. Mission Ridge is located approximately 5 miles west of the site and the Columbia River is located about ¾ mile east of the site. Relief is between 0% and 5% across the site. Ecology well log records suggest depth to groundwater is about 35 feet below ground surface. Groundwater will generally flow east toward the Columbia River.

According to the United States Department of Agriculture (USDA) Soil Survey of Chelan Area Washington, local soils are described as Burch fine sandy loam. Burch soils were generally formed in valley fill and are primarily derived from sandstone. Burch soils are generally well-drained and composed of medium-textured and moderately coarse material. Burch fine sandy loam is commonly found on flat terraces and orchard cultivation is common.

The Soil Survey describes the following soil horizons:

- At 0-8 inches below ground surface (bgs), soil consists of a dark-gray fine sandy loam. Soil is composed of a fine, weak, granular structure and is slightly hard, friable, slightly sticky and slightly plastic. Well impregnated with fine roots with few fine tubular pores. Soil has a neutral pH.
- At 8-17 inches bgs, soil is brown loam with a weak, medium, prismatic structure. Soil is slightly hard, friable, slightly sticky and slightly plastic. Well impregnated with fine roots and fine tubular pores. Neutral pH.
- Between 17 and 26 inches bgs, soil is brown loam with a weak, medium, prismatic structure. Soil is hard, friable, slightly sticky and slightly plastic. Well impregnated with fine roots and very fine tubular pores. Neutral pH.
- At 26-36 inches bgs, soil becomes yellowish-brown loam that is slightly hard and has homogeneous texture. Soil is very friable and non-sticky and non-plastic. Soil is well impregnated with fine roots and fine tubular pores. Neutral pH.
- 33-60 inches bgs, soil is yellowish-brown loam that is slightly hard and has homogeneous texture. Soil is very friable, slightly sticky and slightly plastic. Fine roots are uncommon. Many fine tubular pores. Neutral pH.

During excavation and deep mixing activities, soil appeared generally as described above.

3.0 SITE HISTORY

Lewis and Clark Elementary School was identified as a candidate for Area-Wide cleanup in 2002 as part of a pilot project conducted by Ecology's Central Regional Office (CRO). The project focused on devising appropriate sampling and analytical methods for historic orchard land currently being used as a public school or childcare facility. Lewis and Clark was selected to participate in the study based on aerial photos from 1947 indicating the school was formerly occupied by an orchard. Analytical results showed lead and arsenic contamination in excess of Model Toxics Control Act (MTCA) Method A cleanup levels.

The figure on the next page illustrates analytical results from the 2002 pilot project. Lead and arsenic concentrations across the northern area of the property were found to be in excess of Ecology MTCA Method A cleanup levels. Samples were analyzed by portable x-ray fluorescence (XRF) unit and laboratory verified by inductively coupled plasma (ICP). For an explanation of XRF technology, its impact to area-wide cleanup efforts, and comparison of XRF accuracy to the standard ICP laboratory method, see Appendix A.

Although results from pilot project sampling identified the need for soil remediation, work was delayed until area-wide cleanup efforts began in 2006.

Lewis and Clark was the second of eight schools chosen for cleanup in 2006. Experience gained at Lewis and Clark and other Wenatchee schools has been used to develop analytical and remedial strategies that have been employed by Ecology throughout central Washington.

Figure 3-1: Pilot Project Samples

4.0 SITE CONTACT INFORMATION

This project was contracted through an interagency agreement between Ecology and the Wenatchee School District (WSD). All contracts were operated by the WSD and invoices were submitted to Ecology for reimbursement. Contractual and planning phases of the project were reviewed by the WSD prior to beginning field operations. Requests in addition to the original scope of work were issued by Bryan Visscher, Director of Maintenance and Operations. Ecology maintained contact with WSD staff throughout the remedial process to maintain a positive working relationship and exchange information as needed.

CBA Environmental was contracted for deep soil mixing and acted as the general contractor for all school sites in Wenatchee School District. George Williams was the onsite representative for CBA Environmental and was responsible for managing deep mixing operations and other general contractor activities. WSD Maintenance & Operations staff were often onsite to provide information, suggestions, and requests.

The following table contains contact information for individuals responsible for various roles in the completion of remedial activities.

Table 4-1: Contacts

Name	Organization	Position	Phone Number
Les Vandervort	Wenatchee School District	Chief Financial Officer	(509) 663-8161
Bryan Visscher	Wenatchee School District	Maintenance & Operations Director	(509) 663-0555
Pam Peer	Wenatchee School District	Secretary to Maintenance & Operations	(509) 663-0555
George Williams	CBA Environmental	General Contractor/Deep Mixing	(570) 682-8742
Greg Smith	Smith Excavation	Excavation and Hauling	(509) 782-0446
Mike Stubblefield	Mountain View Landscaping	Landscaping & Irrigation	(509) 663-3168
Alfonso Lopez	Lewis & Clark Elementary School	Principal	(509) 663-5351

5.0 REMEDIAL PROCESS

5.1 RISK

The potential exposure pathways for lead and arsenic in soil are inhalation, ingestion, and dermal absorption. It is important to note that ingestion is not considered as an exposure pathway in the site hazard assessment ranking method. For the purpose of this cleanup, ingestion was considered as a significant exposure pathway. Ingestion of contaminated soil is expected to be the primary route of exposure for metals, particularly with young children. Metals in dust or soil can be ingested accidentally by hand-to-mouth activity. Pica behavior in young children, that is, eating of non-food items, will increase this exposure. Ingestion or inhalation of wind-blown soil or dust are additional pathways of exposure to lead and arsenic. Children are considered a sensitive population because they tend to ingest more soil and dust than adults and because they tend to absorb more of the lead they ingest. Metals are not readily absorbed through the skin, so dermal absorption of metals is not a significant concern at the concentrations found at schools in the area-wide cleanup program.

Evidence of groundwater contamination or the threat of groundwater contamination has not been found relative to area-wide lead and arsenic contamination. Extensive soil profile sampling in Central Washington has demonstrated that lead and arsenic contamination does not extend below 30 inches below ground surface (bgs) in undisturbed situations. Concentrations of arsenic above 50 parts per million (ppm) and concentrations of lead above 250 ppm were not found below 12 inches bgs. These results may vary in climates with more precipitation, but in this region, the findings were very consistent. Due to the depth of groundwater found in the vicinity of the school, combined with the distribution of the contamination, the risk of lead and arsenic contamination in groundwater is minimal.

5.2 REMEDIAL PROCESS

5.2.1 SAFETY AND HEALTH

The site was restricted from public access throughout the construction period by a 6-foot high chain link fence. The contractor was required to provide a specific Safety & Health Plan for the site construction activities.

5.2.2 DUST CONTROL PLAN

The contactor was required to control dust and to prepare a dust control plan. Dust control measures, at a minimum, included a water truck.

5.2.3 REMEDIAL ACTIVITIES

The initial remediation plan for Lewis and Clark was based upon sampling conducted across the site to a depth of approximately 8 inches. This data indicated that there were areas with lead and arsenic contamination high enough that some excavation would be required prior to applying deep mixing technology.

The deep mixing technology was supplied by CBA Environmental Inc. (CBA) from Hegins, Pennsylvania. The deep mixer is a piece of heavy equipment manufactured by Vermeer Manufacturing and modified by CBA for the purpose of deep soil mixing. The machine is track mounted and weighs between 50 and 120 tons depending on the model. A large rotating drum mounted on the front of the machine is lowered to a maximum depth of 4.5 feet bgs where it rotates and mixes the soil. It travels at average speeds between 4 and 8 feet per minute and typically covers between ⅓ and ½ acre per day. Studies conducted by Ecology and CBA have shown a mixing efficiency between 70% and 95% depending on soil types. After the deep mixer has made a mixing pass, a windrow of overburden is deposited next to the mixed soil. This windrow is created as a result of the decompaction caused by deep mixing.

Prior to beginning remedial excavation, additional sampling was conducted to create a more detailed delineation of the lead and arsenic concentrations. This sampling data indicated that areas of lead and arsenic requiring excavation were more extensive than previous sampling had shown. The entire west end of the site had arsenic concentrations exceeding 100 ppm between 2 inches and 12 inches bgs. The eastern end of the site had a large area with concentrations up to approximately 200 ppm at depths up to 18 inches bgs at some points. As a general rule, any contamination above 100 ppm cannot be deep mixed without some excavation to remove some of the contaminant load. Concentrations in the 60-99 ppm range may or may not need to be excavated depending on the depth of contamination and the background concentrations found in the clean soil below.

Though lead and arsenic concentrations were more extensive than expected in the top 12 inches of soil, they dropped quickly with depth. After removing 8-12 inches of soil from the west end of the site, surface arsenic concentrations rarely exceeded 50 ppm. As a result, deep mixing was very successful at the site.

A bulldozer was used for excavation prior to deep mixing. After the bulldozer had excavated an area down to a prescribed depth, the XRF was used to analyze post-excavation surface concentrations and determine whether more excavation was required. Extensive sampling demonstrated that arsenic concentrations of approximately 70 ppm were the transition point between the higher surface concentrations and the lower concentrations of the deeper clean soils at this particular site. When surface concentrations of 70 ppm were reached, excavation was considered complete for that area. A front-end loader was then used to load the stockpiles into trucks for transport to the landfill.

Approximately 6,300 cubic yards of contaminated soil were excavated from Lewis and Clark Park and disposed of at the Greater Wenatchee Landfill, operated by Waste Management, Inc. This amount was double the original estimate of 3,400 cubic yards.

Soil sampling was conducted continuously throughout the remedial process. Samples were collected directly from the deep mixing rows with a clean nitrile glove and placed in a new, clean, sealed plastic bag. Sample collection was varied between the overburden row and various

depths in the mixing row itself. As the deep mixer completed each row, that row was sampled and analyzed to ensure the mixing was successful in reducing contaminant levels below MTCA standards. In the event that lead and arsenic levels were not reduced below MTCA cleanup standards, a row could be remixed with deeper soils to reduce concentrations further. However, no re-mixing was required.

Lewis and Clark Park had more trees than was typical for school grounds found in the area. Prior to beginning remediation, a state arborist visited the site with an Ecology employee to help determine the best way to remediate soils in the vicinity of the trees. It was determined that several trees were of poor health and could be removed outright. Many of the other trees had significant trunk damage from mowing equipment, but they appeared healthy otherwise. It was recommended that the root structures not be disturbed on the trees that were to remain in place. The initial remediation plan intended to scrape down to 6 inches inside the drip line of the tree canopies. Significant root structure was found around most of the trees immediately below the sod layer. As a result, only the top 2-3 inches could be removed without inflicting serious damage. Fortunately, surface sampling indicated that lead and arsenic concentrations decrease significantly around the root system. This is likely due to disturbance of the soil by the trees root system. At the time of this report, all of the remaining trees at Lewis and Clark Park appear to be in good health.

5.3 SAMPLE RESULTS

All remedial activity at Lewis and Clark Elementary was successful in reducing the majority of lead and arsenic concentrations below MTCA cleanup levels for unrestricted land use. Of the 435 samples collected after remediation, 40 exceeded MTCA cleanup levels. Statistical analysis indicates that less than 10% of samples exceed MTCA standards. According to MTCA cleanup guidelines, a site may be considered clean if no more than 10% of samples exceed MTCA cleanup levels and no samples are greater than twice MTCA cleanup levels. Based on these guidelines, no further action is required for the site.

Pre-remediation arsenic samples had an average concentration of 72 ppm and a maximum concentration of 194 ppm. Pre-remediation lead samples had an average concentration of 255 ppm and a maximum concentration of 970 ppm. Post-remediation arsenic samples had an average concentration of 16 ppm and maximum concentration of 38 ppm. Post-remediation lead samples had an average concentration of 41 ppm and a maximum concentration of 185 ppm. The tables below contain pre and post remediation sample data. Maps containing a general representation of this data are available in Appendix C.

Table 5-1: Pre-Remediation Samples

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb- 250ppm

Date	As	Pb	Sample ID	Location
23-May-06	**78.71**	**444.34**	LI-1 0-3	Lewis and Clark
23-May-06	**78.07**	**511.28**	LI-1 3-6	Lewis and Clark
23-May-06	**102.37**	**281.09**	LI-1 6-9	Lewis and Clark
23-May-06	**56.66**	**273.50**	LI-2 0-3	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb- 250ppm

Date	As	Pb	Sample ID	Location
23-May-06	**75.53**	**318.30**	LI-2 3-6	Lewis and Clark
23-May-06	**89.05**	**258.17**	LI-2 6-9	Lewis and Clark
23-May-06	**108.06**	**475.32**	LI-3 0-3	Lewis and Clark
23-May-06	**125.11**	**554.13**	LI-3 3-6	Lewis and Clark
23-May-06	**147.17**	**558.05**	LI-3 6-9	Lewis and Clark
23-May-06	**43.40**	**369.14**	LI-4 0-3	Lewis and Clark
23-May-06	**60.64**	**395.66**	LI-4 3-6	Lewis and Clark
23-May-06	**123.71**	**472.95**	LI-4 6-9	Lewis and Clark
23-May-06	**95.15**	**386.02**	LI-5 0-3	Lewis and Clark
23-May-06	**140.41**	**624.26**	LI-5 3-6	Lewis and Clark
23-May-06	**132.15**	**355.51**	LI-5 6-9	Lewis and Clark
23-May-06	**55.15**	**235.95**	LI-6 0-3	Lewis and Clark
23-May-06	**61.00**	**336.11**	LI-6 3-6	Lewis and Clark
23-May-06	**75.51**	**114.06**	LI-6 6-9	Lewis and Clark
23-May-06	**79.96**	**358.66**	LI-7 0-3	Lewis and Clark
23-May-06	**115.07**	**415.89**	LI-7 3-6	Lewis and Clark
23-May-06	**103.73**	**295.36**	LI-7 6-9	Lewis and Clark
23-May-06	**91.60**	**527.52**	LI-8 0-3	Lewis and Clark
23-May-06	**118.16**	**614.59**	LI-8 3-6	Lewis and Clark
23-May-06	**109.15**	**620.75**	LI-8 6-9	Lewis and Clark
24-May-06	**77.03**	**388.02**	LI-9 0-3	Lewis and Clark
24-May-06	**110.63**	**496.16**	LI-9 3-6	Lewis and Clark
24-May-06	**129.14**	**427.33**	LI-9 6-9	Lewis and Clark
24-May-06	**75.83**	**277.33**	LI-10 0-3	Lewis and Clark
24-May-06	**90.35**	**334.30**	LI-10 3-6	Lewis and Clark
24-May-06	**137.02**	**357.94**	LI-10 6-9	Lewis and Clark
24-May-06	**104.19**	**426.90**	LI-11 0-3	Lewis and Clark
24-May-06	**121.70**	**519.44**	LI-11 3-6	Lewis and Clark
24-May-06	**127.50**	**550.72**	LI-11 6-9	Lewis and Clark
24-May-06	**86.30**	**431.65**	LI-12 0-3	Lewis and Clark
24-May-06	**129.49**	**514.27**	LI-12 3-6	Lewis and Clark
24-May-06	**160.08**	**504.12**	LI-12 6-9	Lewis and Clark
24-May-06	**56.37**	**260.62**	LI-13 0-3	Lewis and Clark
24-May-06	**75.42**	**378.04**	LI-13 3-6	Lewis and Clark
24-May-06	**109.34**	**324.41**	LI-13 6-9	Lewis and Clark
24-May-06	**44.78**	**17.77**	LI-13 12-15	Lewis and Clark
24-May-06	**54.05**	**297.14**	LI-14 0-3	Lewis and Clark
24-May-06	**67.65**	**349.10**	LI-14 3-6	Lewis and Clark
24-May-06	**94.41**	**282.67**	LI-14 6-9	Lewis and Clark
24-May-06	**74.85**	**274.03**	LI-15 0-3	Lewis and Clark
24-May-06	**99.89**	**386.04**	LI-15 3-6	Lewis and Clark
24-May-06	**90.99**	**269.04**	LI-15 6-9	Lewis and Clark
24-May-06	**77.23**	**359.90**	LI-16 0-3	Lewis and Clark
24-May-06	**97.50**	**493.12**	LI-16 3-6	Lewis and Clark
24-May-06	**111.94**	**525.10**	LI-16 6-9	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb- 250ppm

Date	As	Pb	Sample ID	Location
24-May-06	**52.94**	**529.25**	LC-17 0-3	Lewis and Clark
24-May-06	**132.16**	**789.99**	LC-17 3-6	Lewis and Clark
24-May-06	**137.37**	**617.01**	LC-17 6-9	Lewis and Clark
25-May-06	**71.92**	**349.72**	LC-18 0-3	Lewis and Clark
25-May-06	**102.64**	**426.25**	LC-18 3-6	Lewis and Clark
25-May-06	**109.09**	**203.08**	LC-18 6-9	Lewis and Clark
25-May-06	**91.17**	**495.29**	LC-19 0-3	Lewis and Clark
25-May-06	**113.75**	**692.93**	LC-19 3-6	Lewis and Clark
25-May-06	**150.44**	**718.00**	LC-19 6-9	Lewis and Clark
25-May-06	**22.72**	**69.89**	LC-20 0-3	Lewis and Clark
25-May-06	**29.27**	**112.68**	LC-20 3-6	Lewis and Clark
25-May-06	**54.09**	**147.60**	LC-20 6-9	Lewis and Clark
25-May-06	**57.92**	**381.61**	LC-21 0-3	Lewis and Clark
25-May-06	**72.26**	**443.36**	LC-21 3-6	Lewis and Clark
25-May-06	**98.68**	**333.62**	LC-21 6-9	Lewis and Clark
25-May-06	**66.47**	**111.12**	LC-21 9-12	Lewis and Clark
25-May-06	**50.79**	**242.67**	LC-22 0-3	Lewis and Clark
25-May-06	**59.20**	**245.46**	LC-21 3-6	Lewis and Clark
25-May-06	**59.50**	**258.05**	LC-22 6-9	Lewis and Clark
25-May-06	**77.35**	**245.35**	LC-22 6-9	Lewis and Clark
25-May-06	**45.73**	**448.87**	LC-23 0-3	Lewis and Clark
25-May-06	**101.03**	**508.84**	LC-23 3-6	Lewis and Clark
25-May-06	**135.34**	**369.22**	LC-23 6-9	Lewis and Clark
25-May-06	**65.59**	**289.27**	LC-24 0-3	Lewis and Clark
25-May-06	**84.25**	**392.60**	LC-24 3-6	Lewis and Clark
25-May-06	**128.87**	**412.09**	LC-24 6-9	Lewis and Clark
1-Jun-06	**44.41**	**18.71**	LC-t-1 14"	Lewis and Clark
1-Jun-06	**62.01**	**19.00**	LC-t-1 10"	Lewis and Clark
1-Jun-06	**105.57**	**321.18**	LC-t-1 6"	Lewis and Clark
1-Jun-06	**61.85**	**68.20**	LC-t-1 10"	Lewis and Clark
1-Jun-06	**36.55**	**19.18**	LC-t-1 16"	Lewis and Clark
1-Jun-06	**42.20**	**66.75**	LC-t 2 12"	Lewis and Clark
1-Jun-06	**23.08**	**27.79**	LC-t 2 20"	Lewis and Clark
1-Jun-06	**22.31**	**18.66**	LC-t 3 15"	Lewis and Clark
1-Jun-06	**112.42**	**337.88**	LC-t 3 6"	Lewis and Clark
1-Jun-06	**134.96**	**281.25**	LC-t 4 6"	Lewis and Clark
1-Jun-06	**93.07**	**57.69**	LC-t 4 8"	Lewis and Clark
1-Jun-06	**157.87**	**416.35**	LC-t 5 4"	Lewis and Clark
1-Jun-06	**93.40**	**223.90**	LC-t 6	Lewis and Clark
1-Jun-06	**106.92**	**178.70**	LC-t 7	Lewis and Clark
1-Jun-06	**137.00**	**451.56**	LC-t 8	Lewis and Clark
1-Jun-06	**132.78**	**378.70**	LC-t 9	Lewis and Clark
1-Jun-06	**13.85**	**19.04**	LC-t-10 12"	Lewis and Clark
1-Jun-06	**23.67**	**18.68**	LC-t-11 12"	Lewis and Clark
1-Jun-06	**13.52**	**17.93**	LC-t-12 12"	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb- 250ppm

Date	As	Pb	Sample ID	Location
2-Jun-06	**13.56**	**18.55**	LC-t 13 12"	Lewis and Clark
2-Jun-06	**15.76**	**19.62**	LC-t 14 10"	Lewis and Clark
5-Jun-06	**25.34**	**22.66**	LC-t 20 12"	Lewis and Clark
5-Jun-06	**71.25**	**29.35**	LC-t 21 10"	Lewis and Clark
5-Jun-06	**84.53**	**62.81**	LC-t 22 10"	Lewis and Clark
5-Jun-06	**13.38**	**18.06**	lct 23 12"	Lewis and Clark
5-Jun-06	**53.33**	**18.68**	LC-t-23	Lewis and Clark
5-Jun-06	**64.36**	**105.12**	LC-t-24 6"	Lewis and Clark
5-Jun-06	**55.67**	**18.18**	LC-t-25 8"	Lewis and Clark
2-Jun-06	**19.40**	**73.06**	LC-t-25 1	Lewis and Clark
2-Jun-06	**18.90**	**75.30**	LC-t-25 2	Lewis and Clark
2-Jun-06	**15.84**	**71.46**	LC-t-25 3	Lewis and Clark
2-Jun-06	**15.08**	**55.80**	LC-t-25 4	Lewis and Clark
2-Jun-06	**15.10**	**50.95**	LC-t-25 5	Lewis and Clark
2-Jun-06	**15.87**	**79.94**	LC-t-25 6	Lewis and Clark
2-Jun-06	**16.23**	**67.45**	LC-t-25 7	Lewis and Clark
2-Jun-06	**14.85**	**31.69**	LC-t-25 8	Lewis and Clark
5-Jun-06	**91.14**	**313.47**	LC-t-26 6"	Lewis and Clark
5-Jun-06	**96.96**	**52.86**	LC-t-27	Lewis and Clark
5-Jun-06	**14.07**	**18.23**	LC-t-28	Lewis and Clark
5-Jun-06	**46.89**	**18.66**	LC-t-29	Lewis and Clark
6-Jun-06	**79.94**	**92.14**	LC-t-30	Lewis and Clark
2-Jun-06	**55.27**	**137.28**	LC-t-30 1	Lewis and Clark
2-Jun-06	**27.72**	**101.33**	LC-t-30 2	Lewis and Clark
2-Jun-06	**30.33**	**58.56**	LC-t-30 3	Lewis and Clark
2-Jun-06	**34.84**	**58.63**	LC-t-30 4	Lewis and Clark
2-Jun-06	**16.55**	**35.32**	LC-t-30 5	Lewis and Clark
2-Jun-06	**15.08**	**42.24**	LC-t-30 6	Lewis and Clark
2-Jun-06	**38.56**	**52.19**	LC-t-30 7	Lewis and Clark
2-Jun-06	**46.76**	**95.32**	LC-t-30 8	Lewis and Clark
6-Jun-06	**94.05**	**138.96**	LC-t 31 8"	Lewis and Clark
6-Jun-06	**84.05**	**73.33**	LC-t 31 11"'	Lewis and Clark
7-Jun-06	**103.09**	**198.42**	LC-t-33 4"	Lewis and Clark
7-Jun-06	**76.74**	**288.99**	LC-T-34 4"	Lewis and Clark
7-Jun-06	**113.81**	**466.43**	LC-t-35 6"	Lewis and Clark
7-Jun-06	**97.65**	**315.91**	LC-T-36 4"	Lewis and Clark
7-Jun-06	**112.70**	**418.98**	LC-T-37 4"	Lewis and Clark
7-Jun-06	**140.20**	**675.24**	LC-T-38 4"	Lewis and Clark
7-Jun-06	**104.29**	**452.84**	LC-T-39 4"	Lewis and Clark
7-Jun-06	**35.56**	**139.32**	LC-T-40 4"	Lewis and Clark
7-Jun-06	**70.84**	**536.06**	LC-T-41 4"	Lewis and Clark
7-Jun-06	**125.01**	**689.33**	LC-T-42 4"	Lewis and Clark
7-Jun-06	**55.05**	**120.96**	LC-T-43 1-3"	Lewis and Clark
7-Jun-06	**70.34**	**164.65**	LC-T-44 1-3"	Lewis and Clark
7-Jun-06	**81.30**	**322.60**	LC-T-45 4"	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb- 250ppm

Date	As	Pb	Sample ID	Location
7-Jun-06	**30.69**	**193.05**	LC-T-46 1-3"	Lewis and Clark
7-Jun-06	**17.50**	**37.81**	LC-T-47 mixed	Lewis and Clark
7-Jun-06	**17.09**	**39.97**	LC-T-48 mixed	Lewis and Clark
7-Jun-06	**17.25**	**58.18**	LC-T- 49 mixed 3c	Lewis and Clark
7-Jun-06	**18.55**	**42.68**	LC-T- 50 mixed 4s	Lewis and Clark
7-Jun-06	**21.64**	**59.71**	LC-T-51 mixed 5s	Lewis and Clark
7-Jun-06	**21.51**	**55.93**	LC-T-52 mixed 6c	Lewis and Clark
7-Jun-06	**20.46**	**29.65**	LC-T-53 mixed 7s	Lewis and Clark
7-Jun-06	**15.15**	**49.66**	LC-T-54 mixed 8c	Lewis and Clark
7-Jun-06	**24.80**	**76.45**	LC-T-55s	Lewis and Clark
7-Jun-06	**32.71**	**73.06**	LC-T-56c	Lewis and Clark
7-Jun-06	**23.21**	**95.34**	LC-T-58c	Lewis and Clark
7-Jun-06	**24.59**	**86.90**	LC-T-58c	Lewis and Clark
2-Jun-06	**36.69**	**85.59**	LC-b 1 0-3	Lewis and Clark
2-Jun-06	**49.02**	**83.19**	LC-b 1 3-6	Lewis and Clark
2-Jun-06	**53.79**	**60.44**	LC-b 1 6-9	Lewis and Clark
2-Jun-06	**34.41**	**19.33**	LC-b 1 9-12	Lewis and Clark
2-Jun-06	**15.56**	**18.81**	LC-b 1 12-15	Lewis and Clark
2-Jun-06	**13.16**	**17.48**	LC-b 1 15-18	Lewis and Clark
2-Jun-06	**64.32**	**161.24**	LC-b 2 1-4	Lewis and Clark
2-Jun-06	**45.60**	**131.82**	LC-b 2 6-9	Lewis and Clark
2-Jun-06	**76.99**	**73.90**	LC-b 2 9-12"	Lewis and Clark
2-Jun-06	**57.08**	**18.48**	LC-b 2 12-15"	Lewis and Clark
2-Jun-06	**24.24**	**27.05**	LC-b 2 15-18"	Lewis and Clark
2-Jun-06	**66.72**	**213.00**	LC-b 3 0-3"	Lewis and Clark
2-Jun-06	**73.45**	**201.37**	LC-b 3 3-6"	Lewis and Clark
2-Jun-06	**55.17**	**126.87**	LC-b 3 6-9"	Lewis and Clark
2-Jun-06	**24.12**	**18.87**	LC-b 3 9-12"	Lewis and Clark
2-Jun-06	**15.24**	**18.54**	LC-b 3 12-15"	Lewis and Clark
2-Jun-06	**13.95**	**19.33**	LC-b 3 15-18"	Lewis and Clark
2-Jun-06	**39.89**	**135.25**	LC-b 4 0-3"	Lewis and Clark
2-Jun-06	**40.15**	**131.86**	LC-b 4 3-6"	Lewis and Clark
2-Jun-06	**22.90**	**56.11**	LC-b 4 6-9"	Lewis and Clark
2-Jun-06	**22.09**	**33.27**	LC-b 4 9-12"	Lewis and Clark
2-Jun-06	**14.37**	**17.90**	LC-b 4 12-15	Lewis and Clark
2-Jun-06	**12.30**	**17.34**	LC-b 4 15-18"	Lewis and Clark
2-Jun-06	**35.66**	**162.79**	LC-b 5 0-3"	Lewis and Clark
2-Jun-06	**32.00**	**183.75**	LC-b 5 3-6"	Lewis and Clark
2-Jun-06	**49.20**	**113.24**	LC-b 5 6-9"	Lewis and Clark
2-Jun-06	**30.79**	**30.28**	LC-b 5 9-12"	Lewis and Clark
2-Jun-06	**17.97**	**18.62**	LC-b 5 12-15"	Lewis and Clark
2-Jun-06	**15.74**	**18.88**	LC-b 5 15-18"	Lewis and Clark
2-Jun-06	**94.41**	**387.00**	LC-b 6 0-3"	Lewis and Clark
2-Jun-06	**87.35**	**464.56**	LC-b 6 3-6"	Lewis and Clark
2-Jun-06	**89.00**	**388.82**	LC-b 6 6-9"	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb- 250ppm

Date	As	Pb	Sample ID	Location
2-Jun-06	**86.65**	**431.49**	LC-b 6 9-12"	Lewis and Clark
2-Jun-06	**104.50**	**420.16**	LC-b 6 12-15"	Lewis and Clark
2-Jun-06	**118.26**	**374.35**	LC-b 6 15-18"	Lewis and Clark
2-Jun-06	**37.38**	**279.34**	LC-b 7 0-3"	Lewis and Clark
2-Jun-06	**101.87**	**627.52**	LC-b 7 3-6"	Lewis and Clark
2-Jun-06	**157.49**	**733.60**	LC-b 7 6-9"	Lewis and Clark
2-Jun-06	**169.46**	**829.51**	LC-b 7 9-12"	Lewis and Clark
2-Jun-06	**126.68**	**396.45**	LC-b 7 12-15	Lewis and Clark
5-Jun-06	**138.90**	**368.40**	LC-B-8 0-4"	Lewis and Clark
5-Jun-06	**51.34**	**68.35**	LC-B-8 4-8"	Lewis and Clark
5-Jun-06	**71.70**	**410.24**	LC-B-9 0-4"	Lewis and Clark
5-Jun-06	**94.18**	**359.70**	LC-B-9 4-8"	Lewis and Clark
5-Jun-06	**45.64**	**188.18**	LC-b-10 0-4"	Lewis and Clark
5-Jun-06	**39.60**	**100.74**	LC-b-10 4-8"	Lewis and Clark
5-Jun-06	**121.72**	**543.87**	LC-b-11 4-8"	Lewis and Clark
5-Jun-06	**129.51**	**499.15**	LC-b-12 4-8"	Lewis and Clark
5-Jun-06	**20.65**	**35.24**	LC-b-13 3-6"	Lewis and Clark
5-Jun-06	**25.39**	**64.61**	LC-b-14 3-6"	Lewis and Clark
5-Jun-06	**14.80**	**33.12**	LC-b-15 3-6"	Lewis and Clark
5-Jun-06	**38.60**	**109.88**	LC-b-16 4-8"	Lewis and Clark
5-Jun-06	**106.01**	**198.43**	LC-b-17 4-8"'	Lewis and Clark
5-Jun-06	**133.34**	**350.12**	LC-b-18 4-8"	Lewis and Clark
5-Jun-06	**86.18**	**335.25**	LC-b-19 4-8"	Lewis and Clark
5-Jun-06	**93.61**	**381.53**	LC-b-20 4-8"	Lewis and Clark
5-Jun-06	**62.83**	**304.38**	LC-b-21 3-6"	Lewis and Clark
5-Jun-06	**78.92**	**174.89**	LC-b-21 6-9"	Lewis and Clark
5-Jun-06	**79.31**	**309.97**	LC-b-22 3-6"	Lewis and Clark
5-Jun-06	**106.18**	**327.91**	LC-b-22 6-9"	Lewis and Clark
5-Jun-06	**50.25**	**243.29**	LC-b-23 3-6"	Lewis and Clark
5-Jun-06	**60.64**	**228.58**	LC-b-23 6-9"	Lewis and Clark
5-Jun-06	**53.21**	**166.99**	LC-b-24 3--6"	Lewis and Clark
5-Jun-06	**41.91**	**90.47**	LC-b-24 6-9"	Lewis and Clark
5-Jun-06	**100.72**	**300.09**	LC-b-25 3-6"	Lewis and Clark
5-Jun-06	**69.93**	**201.53**	LC-b-25 6-9"	Lewis and Clark
6-Jun-06	**55.24**	**235.64**	LC-b-26 3-6"	Lewis and Clark
6-Jun-06	**58.25**	**311.85**	LC-b-26 6-9"	Lewis and Clark
6-Jun-06	**48.20**	**115.03**	LC-b-27 3-6"	Lewis and Clark
6-Jun-06	**25.93**	**24.87**	LC-b-27 6-9"	Lewis and Clark
6-Jun-06	**51.59**	**188.23**	LC-b-28 3-6"	Lewis and Clark
6-Jun-06	**29.12**	**96.04**	LC-b-28 6-9"	Lewis and Clark
6-Jun-06	**67.54**	**222.20**	LC-b-29 3-6"	Lewis and Clark
6-Jun-06	**57.03**	**78.06**	LC-b-29 6-9"	Lewis and Clark
6-Jun-06	**53.33**	**229.42**	LC-b-30 3-6"	Lewis and Clark
6-Jun-06	**53.23**	**118.48**	LC-b-30 6-9"	Lewis and Clark
6-Jun-06	**83.51**	**422.85**	LC-b-31 3-6"	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb- 250ppm

Date	As	Pb	Sample ID	Location
6-Jun-06	**109.20**	**505.50**	LC-b-31 6-9"	Lewis and Clark
6-Jun-06	**58.66**	**133.98**	LC-b-32 3-6"	Lewis and Clark
6-Jun-06	**48.36**	**68.11**	LC-b-32 6-9"	Lewis and Clark
6-Jun-06	**73.86**	**264.08**	LC-b-33 3-6"	Lewis and Clark
6-Jun-06	**42.93**	**71.89**	LC-b-33 6-9"	Lewis and Clark
6-Jun-06	**83.45**	**239.97**	LC-b-34 3-6"	Lewis and Clark
6-Jun-06	**46.15**	**35.54**	LC-b-34 6-9"	Lewis and Clark
12-Jun-06	**57.53**	**17.08**	LC-B 35 3-6"	Lewis and Clark
12-Jun-06	**83.78**	**371.93**	LC-B 36 6-9"	Lewis and Clark
12-Jun-06	**116.39**	**268.02**	LC-B 37 6"	Lewis and Clark
12-Jun-06	**124.69**	**464.86**	LCB-38 6"	Lewis and Clark
12-Jun-06	**149.31**	**682.95**	LCB-39 6"	Lewis and Clark
12-Jun-06	**122.90**	**509.05**	LCB-40 6"	Lewis and Clark
12-Jun-06	**177.10**	**935.76**	LCB-41	Lewis and Clark
12-Jun-06	**95.22**	**483.64**	LCB-42	Lewis and Clark
12-Jun-06	**80.49**	**324.26**	LCB-43	Lewis and Clark
12-Jun-06	**111.25**	**449.29**	LCB-44	Lewis and Clark
14-Jun-06	**53.85**	**63.42**	LCB ex 44	Lewis and Clark
14-Jun-06	**193.86**	**794.16**	LCB ex 45	Lewis and Clark
14-Jun-06	**88.20**	**273.71**	LCB ex 46	Lewis and Clark
14-Jun-06	**111.67**	**374.45**	LCB ex 47	Lewis and Clark
14-Jun-06	**85.93**	**213.96**	LCB ex 48	Lewis and Clark
14-Jun-06	**55.12**	**36.81**	LCB ex 49	Lewis and Clark
14-Jun-06	**85.78**	**219.98**	LCB ex 50	Lewis and Clark
14-Jun-06	**116.84**	**314.98**	LCB ex 51	Lewis and Clark
14-Jun-06	**182.79**	**825.75**	LCB ex 52	Lewis and Clark
14-Jun-06	**83.12**	**280.45**	LCB ex 53	Lewis and Clark
14-Jun-06	**132.31**	**706.50**	LCB ex 54	Lewis and Clark
14-Jun-06	**29.78**	**18.21**	LCB ex 55	Lewis and Clark
14-Jun-06	**56.46**	**99.09**	LCB ex 56	Lewis and Clark
14-Jun-06	**63.12**	**267.78**	LCB ex 57	Lewis and Clark
14-Jun-06	**19.90**	**164.85**	LCB ex 58	Lewis and Clark
14-Jun-06	**107.10**	**268.29**	LCB ex 59	Lewis and Clark
14-Jun-06	**16.08**	**21.04**	LCB ex 60	Lewis and Clark
14-Jun-06	**79.92**	**258.20**	LCB ex 61	Lewis and Clark
14-Jun-06	**112.55**	**410.35**	LCB ex 62	Lewis and Clark
14-Jun-06	**84.53**	**117.32**	LCB ex 63	Lewis and Clark
14-Jun-06	**129.71**	**679.52**	LCB ex 64	Lewis and Clark
14-Jun-06	**13.81**	**28.68**	LCB ex 65 1-4"	Lewis and Clark
14-Jun-06	**14.73**	**27.62**	LCB ex 65 6-9"	Lewis and Clark
14-Jun-06	**28.95**	**18.79**	LCB ex 66	Lewis and Clark
14-Jun-06	**23.21**	**42.58**	LCB ex 67	Lewis and Clark
14-Jun-06	**37.21**	**19.37**	LCB ex 68	Lewis and Clark
14-Jun-06	**103.24**	**303.97**	LCB ex 69	Lewis and Clark
14-Jun-06	**76.84**	**60.59**	LCB ex70	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb- 250ppm

Date	As	Pb	Sample ID	Location
14-Jun-06	**99.01**	**328.42**	LCB ex 71	Lewis and Clark
14-Jun-06	**132.58**	**440.46**	LCB ex 72	Lewis and Clark
14-Jun-06	**84.40**	**158.22**	LCB ex 73	Lewis and Clark
14-Jun-06	**90.19**	**303.76**	LCB ex 74 2-5"	Lewis and Clark
14-Jun-06	**127.23**	**393.61**	LCB ex 74 6-9"	Lewis and Clark
14-Jun-06	**103.45**	**363.78**	LCB ex 75	Lewis and Clark
14-Jun-06	**97.33**	**724.70**	LCB ex 76	Lewis and Clark
14-Jun-06	**76.39**	**317.04**	LCB ex 77 2-5"	Lewis and Clark
14-Jun-06	**83.38**	**369.99**	LCB ex 77 6-9"	Lewis and Clark
14-Jun-06	**13.50**	**18.45**	LCB ex 78	Lewis and Clark
14-Jun-06	**145.97**	**470.75**	LCB ex 79	Lewis and Clark
14-Jun-06	**99.13**	**494.82**	LCB ex 80	Lewis and Clark
14-Jun-06	**119.78**	**504.33**	LCB ex 81	Lewis and Clark
14-Jun-06	**178.13**	**970.28**	LCB ex 82	Lewis and Clark
15-Jun-06	**74.27**	**146.10**	LCB ex 83	Lewis and Clark
15-Jun-06	**86.80**	**232.65**	LCB ex 84	Lewis and Clark
15-Jun-06	**28.83**	**18.86**	LCB ex 85	Lewis and Clark
15-Jun-06	**43.25**	**44.58**	LCB ex 86	Lewis and Clark
15-Jun-06	**53.31**	**18.78**	LCB ex 87	Lewis and Clark
15-Jun-06	**102.00**	**407.12**	LCB ex 88	Lewis and Clark
15-Jun-06	**69.93**	**396.57**	LCB ex 89 1-4"	Lewis and Clark
15-Jun-06	**104.62**	**536.69**	LCB ex 89 6-8"	Lewis and Clark
15-Jun-06	**66.33**	**323.97**	LCB ex 90 1-4"	Lewis and Clark
15-Jun-06	**81.02**	**294.48**	LCB ex 90 6-9"	Lewis and Clark
15-Jun-06	**50.60**	**105.31**	LCB 91 1-4"	Lewis and Clark
15-Jun-06	**34.05**	**34.58**	LCB 91 6-8"	Lewis and Clark
15-Jun-06	**13.31**	**17.87**	LCB 91 10-12"	Lewis and Clark
15-Jun-06	**12.68**	**17.61**	LCB 91 16-18"	Lewis and Clark
Average	**72.16**	**254.92**		
Max	**193.86**	**970.28**		

Table 5-2: Post-Remediation Samples

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
5-Jun-06	**20.52**	**21.07**	LC-M-1 1	Lewis and Clark
5-Jun-06	**27.67**	**60.33**	LC-M-1 2	Lewis and Clark
5-Jun-06	**14.65**	**40.92**	LC-M-1 3c	Lewis and Clark
5-Jun-06	**13.40**	**18.15**	LC-M-1 4s	Lewis and Clark
5-Jun-06	**22.32**	**44.18**	LC-M-1 5c	Lewis and Clark
5-Jun-06	**13.86**	**25.67**	LC-M-1 6s	Lewis and Clark
5-Jun-06	**18.11**	**46.04**	LC-M-1 7c	Lewis and Clark
5-Jun-06	**14.70**	**27.87**	LC-M-1 8s	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
5-Jun-06	**28.48**	**42.79**	LC-M-1 9c	Lewis and Clark
5-Jun-06	**14.94**	**39.89**	LC-M-1 10s	Lewis and Clark
5-Jun-06	**16.32**	**49.39**	LC-m-1 11c	Lewis and Clark
5-Jun-06	**15.01**	**35.81**	LC-M-2 1s	Lewis and Clark
5-Jun-06	**15.37**	**46.61**	LC-M-2 2s	Lewis and Clark
5-Jun-06	**17.51**	**33.56**	LC-M-2 3s	Lewis and Clark
5-Jun-06	**15.07**	**35.06**	LC-M-2 4c	Lewis and Clark
5-Jun-06	**29.86**	**53.95**	LC-M-2 5s	Lewis and Clark
5-Jun-06	**11.12**	**18.47**	LC-M-2 6s	Lewis and Clark
5-Jun-06	**15.01**	**18.32**	LC-M-2 7c	Lewis and Clark
5-Jun-06	**13.47**	**18.27**	LC-M-2 8s	Lewis and Clark
5-Jun-06	**13.35**	**18.78**	LC-M-2 9c	Lewis and Clark
5-Jun-06	**13.83**	**18.73**	LC-M-2	Lewis and Clark
5-Jun-06	**17.43**	**18.19**	LC-M-3 1s	Lewis and Clark
5-Jun-06	**18.82**	**22.27**	LC-M-3 2c	Lewis and Clark
5-Jun-06	**17.78**	**19.65**	LC-M-3 3s	Lewis and Clark
5-Jun-06	**19.58**	**33.30**	LC-M-3 4c	Lewis and Clark
5-Jun-06	**22.17**	**56.67**	LC-M-3 5s	Lewis and Clark
5-Jun-06	**16.60**	**32.24**	LC-M-3 6c	Lewis and Clark
5-Jun-06	**17.46**	**18.18**	LC-M-3 7s	Lewis and Clark
5-Jun-06	**13.31**	**23.18**	LC-M-3 8c	Lewis and Clark
5-Jun-06	**13.68**	**18.30**	LC-M-3 9s	Lewis and Clark
5-Jun-06	**15.03**	**26.42**	LC-M4 1s	Lewis and Clark
5-Jun-06	**21.81**	**19.05**	LC-M4 2c	Lewis and Clark
5-Jun-06	**17.10**	**17.82**	LC-M4 3s	Lewis and Clark
5-Jun-06	**14.66**	**26.18**	LC-M4 4c	Lewis and Clark
5-Jun-06	**13.94**	**18.94**	LC-M4 5s	Lewis and Clark
5-Jun-06	**14.68**	**19.59**	LC-M4 6c	Lewis and Clark
5-Jun-06	**16.06**	**19.45**	LC-M4 7s	Lewis and Clark
5-Jun-06	**18.53**	**18.82**	LC-M4 8c	Lewis and Clark
5-Jun-06	**13.92**	**18.45**	LC-M4 9s	Lewis and Clark
5-Jun-06	**15.30**	**17.79**	LC-M4 10c	Lewis and Clark
5-Jun-06	**11.23**	**18.44**	LC-M4 11s	Lewis and Clark
5-Jun-06	**13.74**	**18.41**	LC-M5 1s	Lewis and Clark
5-Jun-06	**13.45**	**18.67**	LC-M5 2c	Lewis and Clark
5-Jun-06	**13.61**	**18.39**	LC-M5 3s	Lewis and Clark
5-Jun-06	**12.65**	**17.57**	LC-M5 4c	Lewis and Clark
5-Jun-06	**13.38**	**18.48**	LC-M5 5s	Lewis and Clark
5-Jun-06	**17.87**	**17.62**	LC-M5 6c	Lewis and Clark
5-Jun-06	**18.18**	**19.15**	LC-M5 7s	Lewis and Clark
5-Jun-06	**16.32**	**23.16**	LC-M5 8c	Lewis and Clark
5-Jun-06	**13.65**	**18.74**	LC-m5 2.5 mix c	Lewis and Clark
5-Jun-06	**13.58**	**18.25**	LC-m5 2..5 mix s	Lewis and Clark
5-Jun-06	**14.34**	**25.73**	LC-m5 2.5 mix s	Lewis and Clark
5-Jun-06	**13.18**	**18.42**	LC-m5 2.5 mix c	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
5-Jun-06	**14.00**	**18.69**	LC-m5 2.5 mix 1s	Lewis and Clark
5-Jun-06	**13.45**	**18.13**	LC-m5 3' mix s	Lewis and Clark
5-Jun-06	**13.43**	**18.37**	LC-m5	Lewis and Clark
5-Jun-06	**20.16**	**104.35**	LC-m6 1s	Lewis and Clark
5-Jun-06	**14.12**	**19.07**	LC-m6 2c	Lewis and Clark
5-Jun-06	**13.17**	**17.50**	LC-m6 3s	Lewis and Clark
5-Jun-06	**13.69**	**18.63**	LC-m6 4s	Lewis and Clark
5-Jun-06	**14.19**	**20.74**	LC-m6 5c	Lewis and Clark
5-Jun-06	**13.05**	**17.31**	LC-m6 6s	Lewis and Clark
5-Jun-06	**13.79**	**18.84**	LC-m6 7c	Lewis and Clark
6-Jun-06	**35.86**	**54.63**	LC-m7-1s	Lewis and Clark
6-Jun-06	**14.05**	**59.88**	LC-m7-2c	Lewis and Clark
6-Jun-06	**13.01**	**17.69**	LC-m7-3s	Lewis and Clark
6-Jun-06	**15.52**	**18.61**	LC-m7-4c	Lewis and Clark
6-Jun-06	**14.54**	**20.44**	LC-m7-5s	Lewis and Clark
6-Jun-06	**13.49**	**18.17**	LC-m8-1s	Lewis and Clark
6-Jun-06	**13.59**	**18.37**	LC-m8-2c	Lewis and Clark
6-Jun-06	**13.78**	**18.49**	LC-m8-3s	Lewis and Clark
6-Jun-06	**38.03**	**26.16**	LC-m8-4c	Lewis and Clark
6-Jun-06	**14.04**	**18.59**	LC-m9-1s	Lewis and Clark
6-Jun-06	**13.46**	**18.52**	LC-m11-1s	Lewis and Clark
6-Jun-06	**12.51**	**17.04**	LC-m11-2c	Lewis and Clark
6-Jun-06	**13.17**	**18.14**	LC-m12-1s	Lewis and Clark
6-Jun-06	**13.66**	**18.32**	LC-m12-2c	Lewis and Clark
6-Jun-06	**13.25**	**17.76**	LC-m13-1s	Lewis and Clark
6-Jun-06	**13.42**	**19.08**	LC-m13-2c	Lewis and Clark
6-Jun-06	**13.07**	**18.32**	LC-m14-1s	Lewis and Clark
6-Jun-06	**13.08**	**17.99**	LC-m14-2c	Lewis and Clark
6-Jun-06	**18.53**	**17.77**	LC-m19-1s	Lewis and Clark
6-Jun-06	**13.95**	**19.22**	LC-m18-1s	Lewis and Clark
6-Jun-06	**12.92**	**17.79**	LC-m16-1s	Lewis and Clark
6-Jun-06	**13.77**	**18.49**	LC-m16-2c	Lewis and Clark
6-Jun-06	**13.39**	**17.82**	LC-m15-1s	Lewis and Clark
6-Jun-06	**13.27**	**18.25**	LC-m15-2c	Lewis and Clark
6-Jun-06	**13.66**	**18.14**	LC-m17-1s	Lewis and Clark
6-Jun-06	**14.36**	**22.21**	LC-m17-2c	Lewis and Clark
6-Jun-06	**14.15**	**18.70**	LC-m17-2c	Lewis and Clark
6-Jun-06	**14.46**	**18.77**	LC-m19-3c	Lewis and Clark
6-Jun-06	**14.12**	**18.48**	LC-m19-4s	Lewis and Clark
6-Jun-06	**19.19**	**18.88**	LC-m18-3c	Lewis and Clark
6-Jun-06	**14.10**	**20.72**	LC-m18-4s	Lewis and Clark
6-Jun-06	**16.55**	**30.25**	LC-m21-1s	Lewis and Clark
9-Jun-06	**10.95**	**80.02**	LC-T-m15 1s	Lewis and Clark
9-Jun-06	**12.53**	**42.79**	LC-T-m15 2s	Lewis and Clark
9-Jun-06	**10.65**	**60.43**	LC-T-m15 3s	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
9-Jun-06	**17.59**	**61.91**	LC-T-m15 4s	Lewis and Clark
9-Jun-06	**23.74**	**82.04**	LC-T-m15 5s	Lewis and Clark
9-Jun-06	**14.72**	**34.59**	LC-T-m15 7s	Lewis and Clark
9-Jun-06	**17.16**	**19.26**	LC-T-m15 8c	Lewis and Clark
9-Jun-06	**14.09**	**19.60**	LC-T-m15 9s	Lewis and Clark
9-Jun-06	**14.71**	**30.97**	LC-T-m15 10s	Lewis and Clark
9-Jun-06	**14.53**	**32.60**	LC-T-m15 11c	Lewis and Clark
9-Jun-06	**11.69**	**50.39**	LC-T-m16 1s	Lewis and Clark
9-Jun-06	**31.25**	**52.79**	LC-T-m16 2c	Lewis and Clark
9-Jun-06	**14.08**	**19.08**	LC-T-m16 3s	Lewis and Clark
9-Jun-06	**14.18**	**19.07**	LC-T-m16 4c	Lewis and Clark
12-Jun-06	**13.90**	**18.65**	LC-T-m16 5s	Lewis and Clark
12-Jun-06	**14.35**	**25.04**	LC-T-m16 6c	Lewis and Clark
12-Jun-06	**18.64**	**18.72**	LC-T-m16 7s	Lewis and Clark
12-Jun-06	**17.74**	**48.32**	LC-T-m16 8c	Lewis and Clark
12-Jun-06	**16.08**	**53.82**	LC-T-m16 9s	Lewis and Clark
12-Jun-06	**19.35**	**54.59**	LC-T-m17 1s	Lewis and Clark
12-Jun-06	**26.90**	**62.76**	LC-T-m17 2c	Lewis and Clark
12-Jun-06	**13.95**	**19.55**	LC-T-m17 3s	Lewis and Clark
12-Jun-06	**14.53**	**19.43**	LC-T-m17 4c	Lewis and Clark
12-Jun-06	**19.28**	**47.50**	LC-T-m17 5s	Lewis and Clark
12-Jun-06	**21.98**	**18.84**	LC-T-m17 6c	Lewis and Clark
12-Jun-06	**14.84**	**31.61**	LC-T-m17 7s	Lewis and Clark
12-Jun-06	**16.24**	**19.05**	LC-T-m17 8s	Lewis and Clark
12-Jun-06	**14.13**	**21.42**	LC-T-m18 1s	Lewis and Clark
12-Jun-06	**14.47**	**19.72**	LC-T-m18 2c	Lewis and Clark
12-Jun-06	**13.98**	**19.81**	LC-T-m18 3s	Lewis and Clark
12-Jun-06	**14.14**	**18.63**	LC-T-m18 4c	Lewis and Clark
12-Jun-06	**14.90**	**18.18**	LC-T-m18 5c	Lewis and Clark
12-Jun-06	**13.84**	**18.67**	LC-T-m18 6s	Lewis and Clark
12-Jun-06	**10.66**	**19.23**	LC-T-m18 7c	Lewis and Clark
12-Jun-06	**14.09**	**21.19**	LC-T-m18 8c	Lewis and Clark
12-Jun-06	**19.04**	**19.16**	LC-T-m19 1s	Lewis and Clark
12-Jun-06	**14.81**	**23.94**	LC-T-m19 2c	Lewis and Clark
12-Jun-06	**28.46**	**33.83**	LC-T-m19 3s	Lewis and Clark
12-Jun-06	**15.06**	**29.51**	LC-T-m19 4c	Lewis and Clark
12-Jun-06	**13.58**	**18.33**	LC-T-m19 5s	Lewis and Clark
12-Jun-06	**16.33**	**47.00**	LC-T-m19 6c	Lewis and Clark
12-Jun-06	**14.88**	**29.06**	LC-T-m19 7s	Lewis and Clark
12-Jun-06	**13.76**	**18.53**	LC-T-m19 8c	Lewis and Clark
12-Jun-06	**15.27**	**18.97**	LC-T-m20 1s	Lewis and Clark
12-Jun-06	**14.04**	**18.90**	LC-T-m20 2c	Lewis and Clark
12-Jun-06	**14.18**	**18.83**	LC-T-m20 3s	Lewis and Clark
12-Jun-06	**14.23**	**18.93**	LC-T-m20 4c	Lewis and Clark
12-Jun-06	**13.79**	**18.28**	LC-T-m20 5s	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
12-Jun-06	**13.90**	**18.66**	LC-T-m20 6c	Lewis and Clark
12-Jun-06	**14.12**	**19.36**	LC-T-m20 7s	Lewis and Clark
12-Jun-06	**14.38**	**19.83**	LC-T-m20	Lewis and Clark
12-Jun-06	**16.37**	**39.23**	LC-T-m21 1s	Lewis and Clark
12-Jun-06	**15.96**	**42.60**	LC-T-m21 2c	Lewis and Clark
12-Jun-06	**19.25**	**37.76**	LC-T-m21 3s	Lewis and Clark
12-Jun-06	**17.71**	**45.67**	LC-T-m21 4c	Lewis and Clark
12-Jun-06	**13.19**	**17.64**	LC-T-m21 5s	Lewis and Clark
12-Jun-06	**13.55**	**18.37**	LC-T-m21 6c	Lewis and Clark
12-Jun-06	**13.35**	**18.30**	LC-T-m21 7s	Lewis and Clark
12-Jun-06	**13.46**	**18.31**	LC-T-m21 8c	Lewis and Clark
12-Jun-06	**13.71**	**18.64**	LCT-m22 1s	Lewis and Clark
12-Jun-06	**16.86**	**18.56**	LCT-m22 2c	Lewis and Clark
12-Jun-06	**13.32**	**18.32**	LCT-m22 3s	Lewis and Clark
12-Jun-06	**13.54**	**18.61**	LCT-m22 4c	Lewis and Clark
12-Jun-06	**15.56**	**29.45**	LCT-m23 1s	Lewis and Clark
12-Jun-06	**18.29**	**18.64**	LCT-m23 2c	Lewis and Clark
12-Jun-06	**13.34**	**18.31**	LCT-m23 3s	Lewis and Clark
12-Jun-06	**13.88**	**18.85**	LCT-m23 4c	Lewis and Clark
13-Jun-06	**14.89**	**33.03**	LCT M25 1s	Lewis and Clark
13-Jun-06	**19.03**	**18.64**	LCT M25 2c	Lewis and Clark
13-Jun-06	**13.75**	**18.34**	LCT M25 3s	Lewis and Clark
13-Jun-06	**15.30**	**41.92**	LCT M25 4c	Lewis and Clark
13-Jun-06	**14.03**	**21.23**	LCT M26 1s	Lewis and Clark
13-Jun-06	**10.56**	**72.82**	LCT M26 2c	Lewis and Clark
13-Jun-06	**15.43**	**49.41**	LCT M26 3s	Lewis and Clark
13-Jun-06	**15.14**	**24.09**	LCT M26 4c	Lewis and Clark
13-Jun-06	**13.75**	**18.70**	LCT M27 1s	Lewis and Clark
13-Jun-06	**13.60**	**17.95**	LCT M27 2c	Lewis and Clark
13-Jun-06	**14.35**	**19.23**	LCT M27 3s	Lewis and Clark
13-Jun-06	**13.43**	**18.26**	LCT M27 4c	Lewis and Clark
13-Jun-06	**13.80**	**18.36**	LCT M28 1s	Lewis and Clark
13-Jun-06	**23.53**	**17.74**	LCT M28 2c	Lewis and Clark
13-Jun-06	**14.60**	**19.43**	LCT M28 3s	Lewis and Clark
13-Jun-06	**13.68**	**18.85**	LCT M28 4c	Lewis and Clark
13-Jun-06	**15.27**	**40.17**	LCT M29 1s	Lewis and Clark
13-Jun-06	**14.00**	**18.67**	LCT M29 2c	Lewis and Clark
13-Jun-06	**11.02**	**18.97**	LCT M29 3s	Lewis and Clark
13-Jun-06	**13.91**	**18.73**	LCT M29 4c	Lewis and Clark
14-Jun-06	**15.66**	**56.25**	LCT M30 1s	Lewis and Clark
14-Jun-06	**18.53**	**72.92**	LCT M30 2c	Lewis and Clark
14-Jun-06	**14.47**	**18.62**	LCT M31 1s	Lewis and Clark
14-Jun-06	**23.06**	**37.13**	LCT M31 2c	Lewis and Clark
14-Jun-06	**15.88**	**18.70**	LCT M32 1s	Lewis and Clark
14-Jun-06	**13.76**	**18.66**	LCT M32 2c	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
14-Jun-06	**13.43**	**18.16**	LCT M33 1s	Lewis and Clark
14-Jun-06	**11.49**	**39.28**	LCT M33 2c	Lewis and Clark
14-Jun-06	**12.98**	**51.85**	LCT M34 1s	Lewis and Clark
14-Jun-06	**13.36**	**144.54**	LCT M34 2c	Lewis and Clark
14-Jun-06	**13.43**	**59.90**	LCT M34 3s	Lewis and Clark
14-Jun-06	**17.02**	**60.29**	LCT M34 4c	Lewis and Clark
14-Jun-06	**10.94**	**42.37**	LCT M35 1s	Lewis and Clark
14-Jun-06	**10.37**	**19.48**	LCT M35 2c	Lewis and Clark
14-Jun-06	**13.20**	**64.59**	LCT M35 4c	Lewis and Clark
14-Jun-06	**14.15**	**100.12**	LCT M36 1s	Lewis and Clark
14-Jun-06	**16.71**	**92.65**	LCT M36 2c	Lewis and Clark
14-Jun-06	**12.58**	**98.74**	LCT M37 1s	Lewis and Clark
14-Jun-06	**11.66**	**161.50**	LCT M37 2c	Lewis and Clark
14-Jun-06	**16.93**	**103.18**	LCT M37 3s	Lewis and Clark
14-Jun-06	**10.73**	**99.57**	LCT M37 4c	Lewis and Clark
14-Jun-06	**17.65**	**185.15**	LCT M38 2c	Lewis and Clark
14-Jun-06	**11.78**	**37.81**	LCT M39 1s	Lewis and Clark
14-Jun-06	**11.59**	**20.54**	LCT M39 2c	Lewis and Clark
14-Jun-06	**14.56**	**82.78**	LCT M39 3s	Lewis and Clark
14-Jun-06	**12.36**	**76.31**	LCT M39 4c	Lewis and Clark
14-Jun-06	**14.77**	**24.78**	LCT M39 5s	Lewis and Clark
14-Jun-06	**21.01**	**83.21**	LCT M39 6c	Lewis and Clark
14-Jun-06	**16.44**	**51.71**	LCT M40 1s	Lewis and Clark
14-Jun-06	**19.05**	**42.84**	LCT M40 2c	Lewis and Clark
14-Jun-06	**37.86**	**49.02**	LCT M40 3s	Lewis and Clark
14-Jun-06	**15.22**	**38.36**	LCT M40 4c	Lewis and Clark
14-Jun-06	**18.08**	**53.07**	LCT M41 1s	Lewis and Clark
14-Jun-06	**11.57**	**60.57**	LCT M41 2c	Lewis and Clark
14-Jun-06	**19.04**	**47.82**	LCT M41 3s	Lewis and Clark
14-Jun-06	**15.91**	**74.67**	LCT M41 4c	Lewis and Clark
14-Jun-06	**22.51**	**45.25**	LCT M42 1s	Lewis and Clark
14-Jun-06	**16.11**	**45.47**	LCT M42 2c	Lewis and Clark
14-Jun-06	**25.08**	**40.85**	LCT M42 3s	Lewis and Clark
14-Jun-06	**14.00**	**18.73**	LCT M42 4c	Lewis and Clark
15-Jun-06	**11.24**	**20.66**	LCT M43 1s	Lewis and Clark
15-Jun-06	**22.41**	**61.46**	LCT M43 2c	Lewis and Clark
15-Jun-06	**18.92**	**82.87**	LCT M43 3s	Lewis and Clark
15-Jun-06	**14.01**	**19.09**	LCT M43 4c	Lewis and Clark
15-Jun-06	**15.00**	**29.03**	LCT M44 1s	Lewis and Clark
15-Jun-06	**15.36**	**34.62**	LCT M44 2c	Lewis and Clark
15-Jun-06	**14.11**	**19.15**	LCT M44 3s	Lewis and Clark
15-Jun-06	**18.07**	**33.22**	LCT M44 4c	Lewis and Clark
15-Jun-06	**19.57**	**29.34**	LCT M45 1s	Lewis and Clark
15-Jun-06	**13.96**	**18.59**	LCT M45 2c	Lewis and Clark
15-Jun-06	**28.94**	**40.06**	LCT M45 3s	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
15-Jun-06	**14.57**	**23.01**	LCT M45 4c	Lewis and Clark
15-Jun-06	**15.83**	**38.54**	LCT M46 1s	Lewis and Clark
15-Jun-06	**16.11**	**52.48**	LCT M46 2c	Lewis and Clark
15-Jun-06	**13.74**	**19.28**	LCT M44 3s	Lewis and Clark
15-Jun-06	**16.01**	**19.07**	LCT M46 4c	Lewis and Clark
15-Jun-06	**15.04**	**46.70**	LCB M-1 1s	Lewis and Clark
15-Jun-06	**18.35**	**49.48**	LCB M-1 2c	Lewis and Clark
16-Jun-06	**14.44**	**50.57**	LCB M-1 3s	Lewis and Clark
16-Jun-06	**21.01**	**71.75**	LCB M-1 4c	Lewis and Clark
16-Jun-06	**18.57**	**42.90**	LCB M-1 5s	Lewis and Clark
16-Jun-06	**13.75**	**45.61**	LCB M-1 6s	Lewis and Clark
15-Jun-06	**14.00**	**18.90**	LCB M-2 1s	Lewis and Clark
15-Jun-06	**13.54**	**18.73**	LCB M-2 2c	Lewis and Clark
16-Jun-06	**14.58**	**35.01**	LCB M-2 1c	Lewis and Clark
16-Jun-06	**15.90**	**68.77**	LCB M-2 2c	Lewis and Clark
16-Jun-06	**13.15**	**40.67**	LCB M-2 3s	Lewis and Clark
16-Jun-06	**27.10**	**33.95**	LCB M-2 4c	Lewis and Clark
19-Jun-06	**18.34**	**30.79**	LCB M2 1s	Lewis and Clark
19-Jun-06	**13.17**	**39.33**	LCB M2 2c	Lewis and Clark
19-Jun-06	**24.08**	**39.51**	LCB M2 3s	Lewis and Clark
19-Jun-06	**16.18**	**47.66**	LCB M2 4c	Lewis and Clark
19-Jun-06	**11.04**	**43.66**	LCB M2 5s	Lewis and Clark
19-Jun-06	**10.47**	**53.23**	LCB M2 6c	Lewis and Clark
19-Jun-06	**16.41**	**69.38**	LCB M3 1s	Lewis and Clark
19-Jun-06	**15.05**	**63.46**	LCB M3 2c	Lewis and Clark
19-Jun-06	**16.96**	**63.12**	LCB M3 3s	Lewis and Clark
19-Jun-06	**13.60**	**58.59**	LCB M3 4c	Lewis and Clark
19-Jun-06	**12.10**	**55.82**	LCB M3 5s	Lewis and Clark
19-Jun-06	**10.91**	**41.22**	LCB M3 6c	Lewis and Clark
19-Jun-06	**21.68**	**29.68**	LCB M4 1s	Lewis and Clark
19-Jun-06	**10.87**	**46.26**	LCB M4 2c	Lewis and Clark
19-Jun-06	**19.77**	**71.86**	LCB M4 3s	Lewis and Clark
19-Jun-06	**17.90**	**84.95**	LCB M4 4c	Lewis and Clark
19-Jun-06	**11.42**	**59.96**	LCB M4 5s	Lewis and Clark
19-Jun-06	**13.92**	**73.73**	LCB M4 6s	Lewis and Clark
19-Jun-06	**14.51**	**48.95**	LCB-M5 1s	Lewis and Clark
19-Jun-06	**12.74**	**60.75**	LCB-M5 2c	Lewis and Clark
19-Jun-06	**16.47**	**70.77**	LCB-M5 3s	Lewis and Clark
19-Jun-06	**16.29**	**42.05**	LCB-M5 4c	Lewis and Clark
19-Jun-06	**16.92**	**63.37**	LCB-M5 5s	Lewis and Clark
19-Jun-06	**18.74**	**72.02**	LCB-M5 6s	Lewis and Clark
19-Jun-06	**14.48**	**56.05**	LCB-M5 7s	Lewis and Clark
19-Jun-06	**13.81**	**38.96**	LCB-M5 8c	Lewis and Clark
19-Jun-06	**15.21**	**38.51**	LCB-M6 2c	Lewis and Clark
19-Jun-06	**10.75**	**38.25**	LCB-M6 3s	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
19-Jun-06	**15.72**	**61.85**	LCB-M6 4c	Lewis and Clark
19-Jun-06	**18.31**	**42.31**	LCB-M6 5s	Lewis and Clark
19-Jun-06	**10.27**	**17.35**	LCB-M6 6c	Lewis and Clark
19-Jun-06	**19.80**	**25.06**	LCB-M6 7s	Lewis and Clark
19-Jun-06	**10.28**	**32.67**	LCB-M6 8c	Lewis and Clark
19-Jun-06	**19.49**	**64.28**	LCB M7 1s	Lewis and Clark
19-Jun-06	**16.23**	**56.52**	LCB M7 2c	Lewis and Clark
19-Jun-06	**12.73**	**64.42**	LCB M7 3s	Lewis and Clark
19-Jun-06	**21.51**	**65.26**	LCB M7 4c	Lewis and Clark
19-Jun-06	**9.52**	**22.43**	LCB M7 6c	Lewis and Clark
19-Jun-06	**11.58**	**13.24**	LCB M7 6c	Lewis and Clark
19-Jun-06	**18.35**	**41.84**	LCB M7 7s	Lewis and Clark
19-Jun-06	**13.93**	**53.99**	LCB M7 8c	Lewis and Clark
20-Jun-06	**19.40**	**70.23**	LCB-M8 1s	Lewis and Clark
20-Jun-06	**16.61**	**69.34**	LCB-M8 2c	Lewis and Clark
20-Jun-06	**14.56**	**24.34**	LCB-M8 3s	Lewis and Clark
20-Jun-06	**18.20**	**37.01**	LCB-M8 4c	Lewis and Clark
20-Jun-06	**14.58**	**21.41**	LCB-M8 5s	Lewis and Clark
20-Jun-06	**14.67**	**30.18**	LCB-M8 6c	Lewis and Clark
20-Jun-06	**17.11**	**84.91**	LCB-M8 7s	Lewis and Clark
20-Jun-06	**14.46**	**62.77**	LCB-M8 8c	Lewis and Clark
19-Jun-06	**15.50**	**70.41**	LCB M8 1s	Lewis and Clark
19-Jun-06	**14.21**	**57.76**	LCB M8 2c	Lewis and Clark
19-Jun-06	**14.39**	**60.83**	LCB M8 3s	Lewis and Clark
19-Jun-06	**13.41**	**83.08**	LCB M8 4c	Lewis and Clark
20-Jun-06	**14.99**	**35.65**	LCB-M9 1s	Lewis and Clark
20-Jun-06	**15.10**	**33.17**	LCB-M9 2c	Lewis and Clark
20-Jun-06	**15.30**	**49.45**	LCB-M10 1s	Lewis and Clark
20-Jun-06	**16.16**	**60.98**	LCB-M10 2c	Lewis and Clark
20-Jun-06	**15.36**	**41.18**	LCB-M10 3s	Lewis and Clark
20-Jun-06	**15.75**	**48.63**	LCB-M10 4c	Lewis and Clark
20-Jun-06	**17.26**	**94.88**	LCB-M11 1s	Lewis and Clark
20-Jun-06	**16.21**	**46.23**	LCB-M11 2c	Lewis and Clark
20-Jun-06	**17.39**	**44.79**	LCB-M11 3s	Lewis and Clark
20-Jun-06	**19.23**	**52.52**	LCB-M11 4c	Lewis and Clark
20-Jun-06	**13.75**	**18.50**	LCB-M11 5s	Lewis and Clark
20-Jun-06	**14.49**	**19.66**	LCB-M11 6c	Lewis and Clark
20-Jun-06	**12.88**	**17.37**	LCB-M11 7s	Lewis and Clark
20-Jun-06	**13.18**	**18.13**	LCB-M11 8c	Lewis and Clark
20-Jun-06	**16.54**	**70.24**	LCB-M12 1s	Lewis and Clark
20-Jun-06	**15.64**	**80.45**	LCB-M12 1s	Lewis and Clark
20-Jun-06	**12.15**	**88.31**	LCB-M12 2c	Lewis and Clark
20-Jun-06	**20.37**	**44.84**	LCB-M12 3s	Lewis and Clark
20-Jun-06	**10.40**	**60.77**	LCB-M12 4c	Lewis and Clark
20-Jun-06	**14.52**	**19.62**	LCB-M12 5s	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
20-Jun-06	**13.94**	**18.93**	LCB-M12 6c	Lewis and Clark
20-Jun-06	**14.35**	**18.28**	LCB-M12 7s	Lewis and Clark
20-Jun-06	**15.17**	**18.93**	LCB-M12 8c	Lewis and Clark
20-Jun-06	**14.82**	**72.00**	LCB-M13 1s	Lewis and Clark
20-Jun-06	**16.55**	**75.33**	LCB-M13 2c	Lewis and Clark
20-Jun-06	**16.32**	**55.80**	LCB-M13 3s	Lewis and Clark
20-Jun-06	**15.25**	**42.44**	LCB-M13 4c	Lewis and Clark
20-Jun-06	**13.68**	**18.14**	LCB-M13 5s	Lewis and Clark
20-Jun-06	**13.43**	**18.22**	LCB-M13 6c	Lewis and Clark
20-Jun-06	**11.06**	**55.71**	LCB-M13 7s	Lewis and Clark
20-Jun-06	**17.77**	**18.48**	LCB-M13 8c	Lewis and Clark
20-Jun-06	**17.46**	**47.77**	LCB-M13 9s	Lewis and Clark
20-Jun-06	**12.83**	**112.05**	LCB-M14 1s	Lewis and Clark
20-Jun-06	**11.97**	**107.25**	LCB-M14 2c	Lewis and Clark
20-Jun-06	**15.41**	**44.43**	LCB-M14 3s	Lewis and Clark
20-Jun-06	**18.14**	**44.59**	LCB-M14 4c	Lewis and Clark
20-Jun-06	**12.96**	**17.68**	LCB-M14 5s	Lewis and Clark
20-Jun-06	**13.23**	**47.27**	LCB-M14 6c	Lewis and Clark
20-Jun-06	**17.16**	**19.26**	LCB-M14 7s	Lewis and Clark
20-Jun-06	**15.72**	**29.89**	LCB-M14 8c	Lewis and Clark
21-Jun-06	**17.82**	**58.75**	LCB-M15 1c	Lewis and Clark
21-Jun-06	**21.19**	**78.87**	LCB-M15 2c	Lewis and Clark
21-Jun-06	**15.62**	**45.97**	LCB-M15 3c	Lewis and Clark
21-Jun-06	**21.27**	**73.11**	LCB-M15 4c	Lewis and Clark
21-Jun-06	**17.09**	**103.18**	LCB-M15 5c	Lewis and Clark
21-Jun-06	**15.15**	**31.03**	LCB-M15 6c	Lewis and Clark
21-Jun-06	**16.03**	**46.04**	LCB-M15 7c	Lewis and Clark
21-Jun-06	**15.18**	**41.59**	LCB-M15 8c	Lewis and Clark
21-Jun-06	**14.63**	**84.93**	LCB-M16 1c	Lewis and Clark
21-Jun-06	**18.09**	**42.89**	LCB-M16 2c	Lewis and Clark
21-Jun-06	**15.86**	**63.46**	LCB-M16 3c	Lewis and Clark
21-Jun-06	**14.28**	**26.31**	LCB-M16 4c	Lewis and Clark
21-Jun-06	**14.31**	**27.53**	LCB-M16 5s	Lewis and Clark
21-Jun-06	**18.43**	**108.30**	LCB-M16 6c	Lewis and Clark
21-Jun-06	**15.76**	**124.54**	LCB-M16 7c	Lewis and Clark
21-Jun-06	**13.95**	**21.98**	LCB-M16 8c	Lewis and Clark
21-Jun-06	**15.82**	**52.81**	LCB-M17 1c	Lewis and Clark
21-Jun-06	**19.31**	**44.45**	LCB-M17 2c	Lewis and Clark
21-Jun-06	**15.50**	**21.82**	LCB-M17 3c	Lewis and Clark
21-Jun-06	**13.75**	**18.40**	LCB-M17 4c	Lewis and Clark
21-Jun-06	**15.69**	**57.43**	LCB-M17 5c	Lewis and Clark
21-Jun-06	**13.36**	**158.53**	LCB-M17 6c	Lewis and Clark
21-Jun-06	**19.96**	**61.98**	LCB-M17 7c	Lewis and Clark
21-Jun-06	**13.53**	**18.62**	LCB-M17 8c	Lewis and Clark
21-Jun-06	**18.61**	**47.70**	LC-M18 1s	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
21-Jun-06	**29.65**	**97.37**	LC-M18 2s	Lewis and Clark
21-Jun-06	**9.48**	**22.43**	LC-M18 3c	Lewis and Clark
21-Jun-06	**10.79**	**31.69**	LC-M18 4s	Lewis and Clark
21-Jun-06	**12.01**	**62.83**	LC-M18 5c	Lewis and Clark
21-Jun-06	**12.37**	**93.16**	LC-M18 6s	Lewis and Clark
21-Jun-06	**11.52**	**48.72**	LC-M18 8s	Lewis and Clark
21-Jun-06	**8.82**	**17.92**	LC-M18 8c	Lewis and Clark
21-Jun-06	**15.36**	**92.28**	LC-M20 1c	Lewis and Clark
21-Jun-06	**20.57**	**65.29**	LC-M20 2s	Lewis and Clark
21-Jun-06	**17.08**	**42.86**	LC-M20 3s	Lewis and Clark
21-Jun-06	**12.40**	**17.17**	LC-M20 - FINE	Lewis and Clark
21-Jun-06	**11.63**	**38.94**	LC-M20 - CLUMPS	Lewis and Clark
22-Jun-06	**15.01**	**38.77**	LCB-M21 3c	Lewis and Clark
22-Jun-06	**17.60**	**18.95**	LCB-M21 4c	Lewis and Clark
22-Jun-06	**17.48**	**75.87**	LCB-M21 5c	Lewis and Clark
22-Jun-06	**13.54**	**18.27**	LCB-M21 6c	Lewis and Clark
22-Jun-06	**15.01**	**46.37**	LCB-M21 7c	Lewis and Clark
22-Jun-06	**13.31**	**18.49**	LCB-M21 8c	Lewis and Clark
22-Jun-06	**11.88**	**90.84**	LCB-M22 1c	Lewis and Clark
22-Jun-06	**10.75**	**81.76**	LCB-M22 2c	Lewis and Clark
22-Jun-06	**14.09**	**20.26**	LCB-M22 3c	Lewis and Clark
22-Jun-06	**20.11**	**57.10**	LCB-M22 4c	Lewis and Clark
22-Jun-06	**15.07**	**37.97**	LCB-M22 5c	Lewis and Clark
22-Jun-06	**14.30**	**33.80**	LCB-M22 6c	Lewis and Clark
22-Jun-06	**14.86**	**35.23**	LCB-M22 7c	Lewis and Clark
22-Jun-06	**14.25**	**18.47**	LCB-M22 8c	Lewis and Clark
22-Jun-06	**14.22**	**68.97**	LCB-M23 1s	Lewis and Clark
22-Jun-06	**15.85**	**108.06**	LCB-M23 2c	Lewis and Clark
22-Jun-06	**22.08**	**51.59**	LCB-M23 3s	Lewis and Clark
22-Jun-06	**14.57**	**40.42**	LCB-M23 4c	Lewis and Clark
22-Jun-06	**14.60**	**37.08**	LCB-M23 5s	Lewis and Clark
22-Jun-06	**14.95**	**35.74**	LCB-M23 6c	Lewis and Clark
22-Jun-06	**16.96**	**71.69**	LCB-M23 7s	Lewis and Clark
22-Jun-06	**14.02**	**22.07**	LCB-M23 8c	Lewis and Clark
22-Jun-06	**13.88**	**94.74**	LCB-M24 1c	Lewis and Clark
22-Jun-06	**16.96**	**93.64**	LCB-M24 2c	Lewis and Clark
22-Jun-06	**20.79**	**61.28**	LCB-M24 3s	Lewis and Clark
22-Jun-06	**13.70**	**18.74**	LCB-M24 4c	Lewis and Clark
22-Jun-06	**15.54**	**59.58**	LCB-M24 5s	Lewis and Clark
22-Jun-06	**14.54**	**33.12**	LCB-M24 6c	Lewis and Clark
22-Jun-06	**23.31**	**75.26**	LCB-M24 7s	Lewis and Clark
22-Jun-06	**14.69**	**22.62**	LCB-M24 8c	Lewis and Clark
23-Jun-06	**17.71**	**128.44**	LCB-M25 1c	Lewis and Clark
23-Jun-06	**13.78**	**85.62**	LCB-M25 2c	Lewis and Clark
23-Jun-06	**11.19**	**23.41**	LCB-M25 3c	Lewis and Clark

MTCA Method A Soil Cleanup Levels

As- 20 ppm

Pb-250 ppm

Date	As	Pb	Sample ID	Location
23-Jun-06	**14.03**	**31.40**	LCB-M25 4c	Lewis and Clark
23-Jun-06	**14.80**	**40.90**	LCB-M25 5c	Lewis and Clark
23-Jun-06	**21.09**	**53.85**	LCB-M25 6c	Lewis and Clark
23-Jun-06	**18.85**	**54.94**	LCB-M25 7c	Lewis and Clark
23-Jun-06	**12.08**	**18.23**	LCB-M25 8c	Lewis and Clark
23-Jun-06	**10.25**	**49.69**	LCB-M26 1c	Lewis and Clark
23-Jun-06	**17.45**	**88.52**	LCB-M26 2c	Lewis and Clark
23-Jun-06	**21.09**	**83.92**	LCB-M26 3c	Lewis and Clark
23-Jun-06	**10.43**	**42.52**	LCB-M26 4c	Lewis and Clark
23-Jun-06	**10.06**	**19.42**	LCB-M26 5c	Lewis and Clark
23-Jun-06	**12.63**	**10.39**	LCB-M26 6c	Lewis and Clark
23-Jun-06	**11.42**	**56.69**	LCB-M27 1c	Lewis and Clark
23-Jun-06	**13.96**	**83.53**	LCB-M27 2c	Lewis and Clark
23-Jun-06	**19.58**	**85.82**	LCB-M27 3c	Lewis and Clark
23-Jun-06	**9.31**	**18.58**	LCB-M27 4c	Lewis and Clark
23-Jun-06	**11.48**	**11.32**	LCB-M27 5c	Lewis and Clark
23-Jun-06	**11.05**	**11.27**	LCB-M27 6c	Lewis and Clark
23-Jun-06	**17.65**	**82.79**	LCB-M28 1c	Lewis and Clark
23-Jun-06	**18.76**	**58.24**	LCB-M28 2c	Lewis and Clark
23-Jun-06	**9.59**	**29.09**	LCB-M28 3c	Lewis and Clark
23-Jun-06	**9.35**	**24.97**	LCB-M28 4c	Lewis and Clark
23-Jun-06	**11.72**	**19.74**	LCB-M28 5c	Lewis and Clark
23-Jun-06	**13.26**	**68.11**	LCB-M28 6c	Lewis and Clark
Average	**15.54**	**40.85**		
Max	**38.03**	**185.15**		

5.4 CONFIRMATIONAL SAMPLING

Though samples were analyzed by XRF continuously during the remedial process, it was decided that a significant number of samples should also be collected for certified lab analysis. Certified lab analysis serves two purposes: it provides additional third party data to validate remedial activities, and it provides additional data to correlate the relationship between XRF and wet chemistry.

Samples collected for laboratory analysis were collected after all remediation was complete in 2006. A clean soil probe was used to collect a sample from 1-8 inches bgs. This sample was thoroughly mixed in a clean stainless steel bowl to homogenize the sample. The sample was then split into two portions. One portion was placed in a new, clean, sealed plastic bag and analyzed with the XRF. The other portion was placed in a clean, laboratory supplied, glass jar for laboratory analysis. The samples collected for laboratory analysis were then sent under sealed chain-of-custody to CCI Analytical Laboratory in Everett, Washington for lead and arsenic analysis.

The analysis found that the Innov-X XRF had a correlation coefficient (r2 value) between field and Inductively-Coupled Plasma (ICP) laboratory analyses of 0.779 for arsenic and 0.893 for lead. It should be noted that many of the data points were actually method detection limits for samples in which lead or arsenic was not detected. When those non-detect data points are removed, the analysis found that the Innov-X XRF had a correlation coefficient (r2 value) between field and Inductively-Coupled Plasma (ICP) laboratory analyses of 0.838 for arsenic and 0.879 for lead. The samples specific to Westside Alternative School are available in the table below.

Table 5-3: XRF-ICP Split Samples

Date	As Lab	As XRF	Pb Lab	Pb XRF	Sample ID	School
12-Sep-06	2.00	7.51	2.00	11.58	LC-lab-1	Lewis and Clark
12-Sep-06	2.00	7.80	2.00	10.53	LC-lab-2	Lewis and Clark
12-Sep-06	2.10	7.81	2.10	10.44	LC-lab-3	Lewis and Clark
12-Sep-06	2.10	7.81	2.10	10.34	LC-lab-4	Lewis and Clark
12-Sep-06	38.00	26.36	74.00	97.94	LC-lab-5	Lewis and Clark
12-Sep-06	23.00	21.50	36.00	45.42	LC-lab-6	Lewis and Clark
12-Sep-06	12.00	9.66	16.00	25.75	LC-lab-7	Lewis and Clark
12-Sep-06	13.00	11.16	22.00	44.68	LC-lab-8	Lewis and Clark
12-Sep-06	7.00	8.79	2.10	13.33	LC-lab-9	Lewis and Clark
12-Sep-06	22.00	25.97	26.00	33.72	LC-lab-10	Lewis and Clark
12-Sep-06	26.00	10.07	41.00	26.53	LC-lab-11	Lewis and Clark
12-Sep-06	15.00	8.99	21.00	15.34	LC-lab-12	Lewis and Clark
12-Sep-06	9.90	9.05	8.20	20.00	LC-lab-13	Lewis and Clark
12-Sep-06	16.00	13.97	20.00	16.35	LC-lab-14	Lewis and Clark
12-Sep-06	19.00	10.13	21.00	31.08	LC-lab-15	Lewis and Clark
12-Sep-06	18.00	16.77	19.00	21.63	LC-lab-16	Lewis and Clark
12-Sep-06	13.00	9.88	12.00	25.88	LC-lab-17	Lewis and Clark
12-Sep-06	19.00	11.51	25.00	18.61	LC-lab-18	Lewis and Clark
12-Sep-06	18.00	9.81	15.00	17.87	LC-lab-19	Lewis and Clark
12-Sep-06	22.00	11.42	32.00	48.00	LC-lab-20	Lewis and Clark

* These values represent the detection limit of non-detect samples. They are not actual values.

6.0 PROJECT SUMMARY

Soil samples collected at Lewis and Clark Elementary School during sampling events in 2002 and 2006 indicated lead and arsenic contamination existed in surface soils at concentrations above MTCA cleanup levels. Deep mixing technology was used to blend the contaminated surface soil with deeper clean soils. As a result, lead and arsenic concentrations at the site were spread throughout a four foot soil profile and the majority of soil on site no longer contains concentrations above MTCA cleanup levels. Though some samples still slightly exceed MTCA cleanup levels, statistical analysis was used to show that fewer than 10% of samples exceeded MTCA cleanup levels and none were twice the MTCA cleanup level. MTCA cleanup guidelines require no further action at a site when these conditions are met. Following remediation, the site was restored to its original condition.

7.0 APPENDICES

Appendix A: XRF USE

The summer 2006 area-wide contamination clean-up projects involved the collection and analysis of a vast number of soil samples. Concentrations of lead and arsenic in these soil samples provided information as to whether or not an area was contaminated, and this information was used to determine how the remedial activities would proceed. Therefore project staff needed a way to quickly and reliably evaluate soil arsenic and lead concentrations. This was achieved through the use of two portable X-Ray Fluorescence (XRF) Analyzers manufactured by Innov-x Systems.

The instruments use x-ray technology to excite elemental electrons in a soil sample and cause these elements to emit characteristic x-rays. The intensity of these elemental x-rays is then measured to determine the amount of a particular element present in the sample. The entire analysis is performed in approximately one minute and the data is stored in a removable Hewlett-Packard (HP) iPAQ personal data assistant which can transmit the information to a laptop.

The use of portable XRF units for the determination of soil elemental concentrations has been described by EPA Method 6200 and has been found to provide, “a rapid field screening procedure” for site characterization [US EPA]. Results from the study conducted by Ecology in 2002 (as shown in the graphs below) found that a portable Niton XRF had a correlation coefficient (r2 value) between field and Inductively-Coupled Plasma (ICP) laboratory analyses of 0.8057 for lead and 0.933 for arsenic. In addition, a verification study conducted by the EPA Superfund Innovative Technology Evaluation (SITE) Monitoring and Measurement Technology (MMT) Program provides additional support for the use of this technology. The investigation compared an Innov-x XRF model, similar to the one used by Ecology, with reference laboratory data and showed a correlation coefficient of 0.8762 for arsenic and 0.91 for lead [US EPA]. All of this data shows that an XRF can be an effective tool for characterizing large contamination sites.

Figure A-1: 2002 Arsenic Comparison

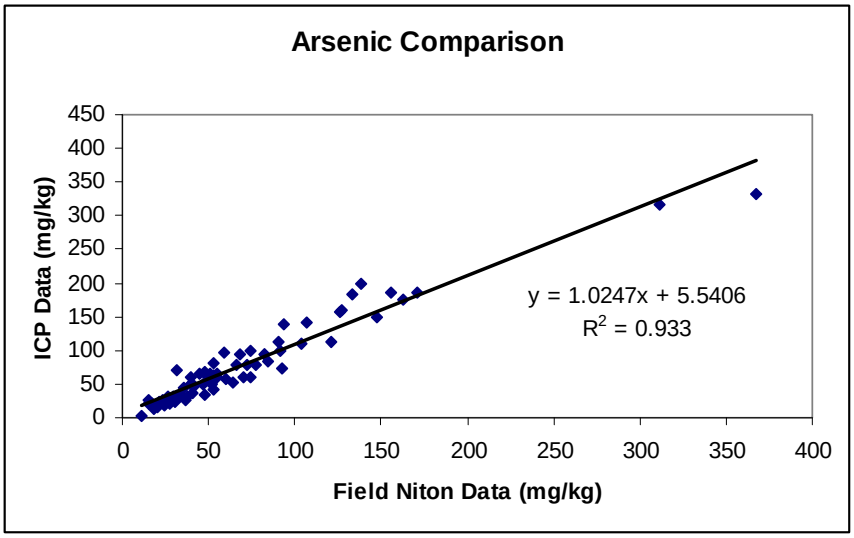
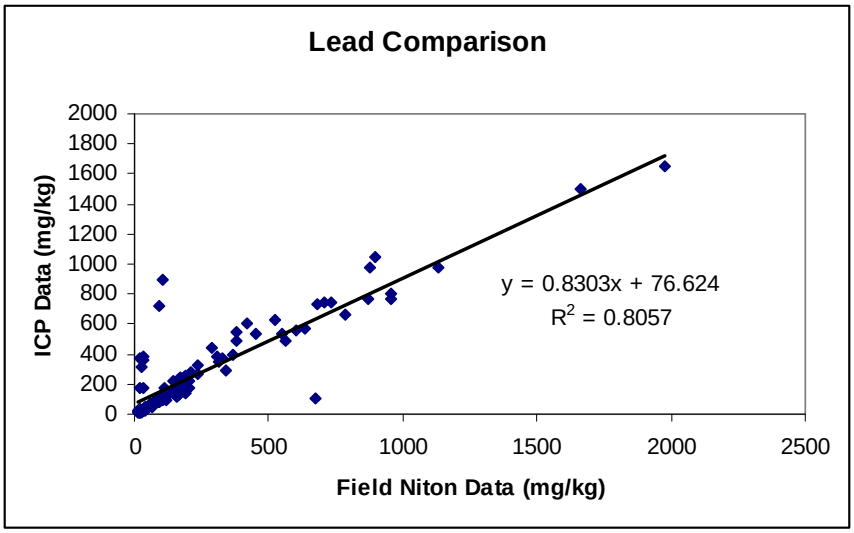


Figure A-2: 2002 Lead Comparison



During the summer 2006 projects, soil samples were collected and analyzed with the XRF instruments from a variety of locations. These locations included: undisturbed portions of the school playfields, sections of the playfields where initial soil excavations had occurred, and areas that had been processed by the deep mixer. As timely decision making was often required to keep the projects on schedule, the ability to assess the effectiveness of remediation activities with on-site soil analysis was invaluable to the overall success of the project. The XRF could determine concentrations of lead and arsenic in minutes. Sending samples for laboratory analysis at standard rates takes 2-3 weeks and would have drastically reduced the efficiency of remedial activities. Real-time results from these field analyses enabled project staff to make decisions such as whether the removal of additional soil was necessary or whether the barrel of the deep mixer should be raised to mix less soil or lowered to mix more.

Following the completion of the remediation projects conducted in 2006, additional samples were collected for comparison between XRF and laboratory ICP methods. A total of 95 additional samples were collected and analyzed by both methods. These samples were analyzed by XRF prior to packaging in clean sealed jar. The analysis (as shown in the graphs below) found that the Innov-X XRF had a correlation coefficient (r2 value) between field and Inductively-Coupled Plasma (ICP) laboratory analyses of 0.779 for arsenic and 0.893 for lead. It should be noted that many of the data points were actually detection limits of both analysis methods for samples where lead or arsenic was not detected. When those non-detect data points are removed, the analysis found that the Innov-X XRF had a correlation coefficient (r2 value) between field and Inductively-Coupled Plasma (ICP) laboratory analyses of 0.838 for arsenic and 0.879 for lead.

Figure A-3: 2006 Arsenic Comparison

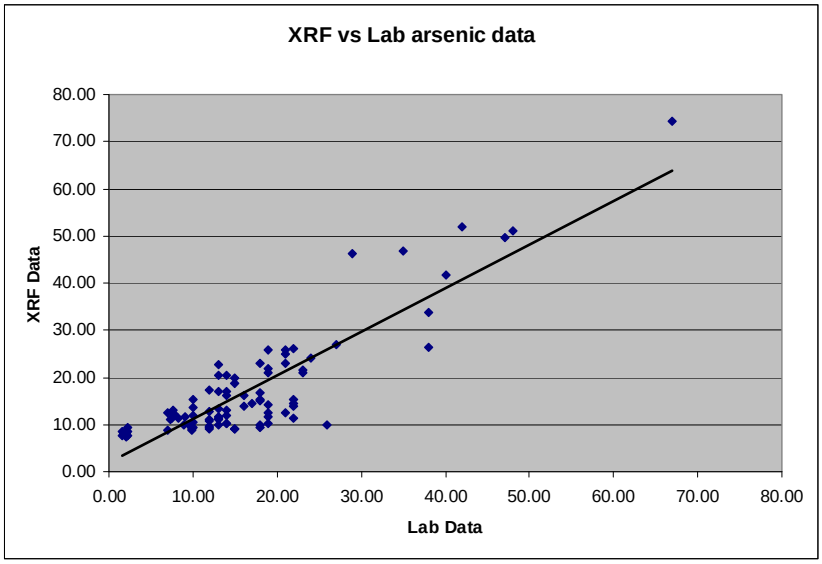
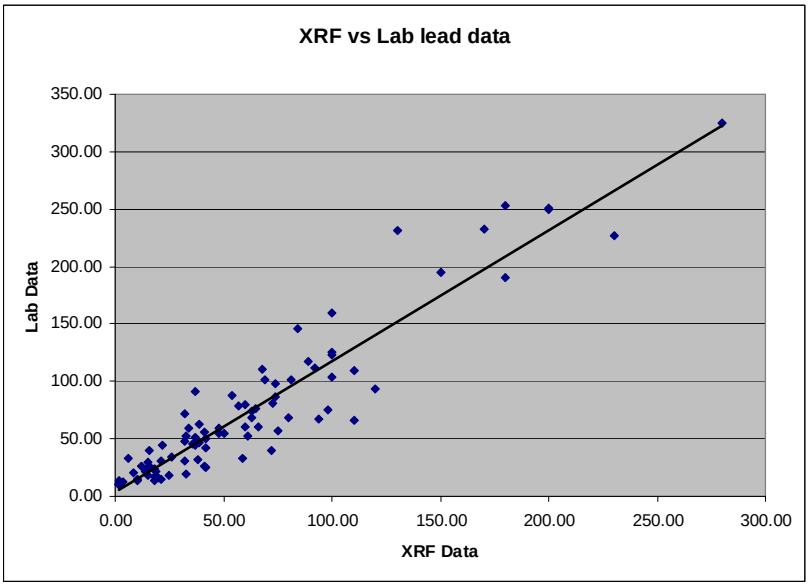


Figure A-4: 2006 Lead Comparison



Project staff followed all safety protocols for use of the XRF instruments including completion of mandatory information and safety trainings before sampling analysis began. In order to reduce health risks associated with radiation exposure, the instruments were operated while in a docking station and careful attention was paid to eliminate direct x-ray exposure. Actual amounts of radiation exposure as regulated by OSHA were monitored with the use of dosimeters which were carried by all sampling personnel.

Finally, in addition to the time saving benefits of the XRF instruments, their use proved to be a cost effective option for sample analysis. Due to the area (total acreage) covered during the school remediation projects, a large number of samples were required to characterize site progress. Use of the instruments resulted in a significant reduction in the number of soil samples sent off for laboratory analysis at a cost of $62-$66 per sample. Therefore, instead of project money being spent on one time analyses, it was invested in a second XRF instrument which enabled remediation work to occur simultaneously in several locations. Not only has the instrument paid for itself over the course of a single summer, but it will now be available for use in many future projects.

Appendix B: COSTS

Remediation costs for Lewis and Clark Elementary were higher than anticipated for the following reasons:

- An above average number of trees were encountered. Therefore, they were either removed or shallow excavation had to be done around the root structures to preserve the trees.
- Several structures that were located on the property had to be taken down prior to remediation.

Lewis & Clark Park Remediation Costs

Mobilization	
Soil Transport and Disposal	$302,461
Final Grading	$14,407
Import Top Soil	$871
¼ Demobilization	$6,625
Deep Mixing Costs	
Vertical Blending	$116,145
Excavation Costs	
Shallow Excavation	$69,300
Landscaping	
Soil Amendment	$31,338
Tree Removal	$3,342
Rototilling	$2,200
Additional Landscaping	$7,222
Fencing	$4954
Hydroseeding	$33,000
Irrigation	
Install Irrigation	$67,568
Install meter Irrigation Controls	$2,293
Miscellaneous	
Building and Pool Demo	$8,800
Total	$670,526
Acres remediated	7.95
Cost per acre	$84,343
Square feet remediated	346,302
Cost per square foot	$2

Appendix C: FIGURES

Figure C-1: Vicinity Map

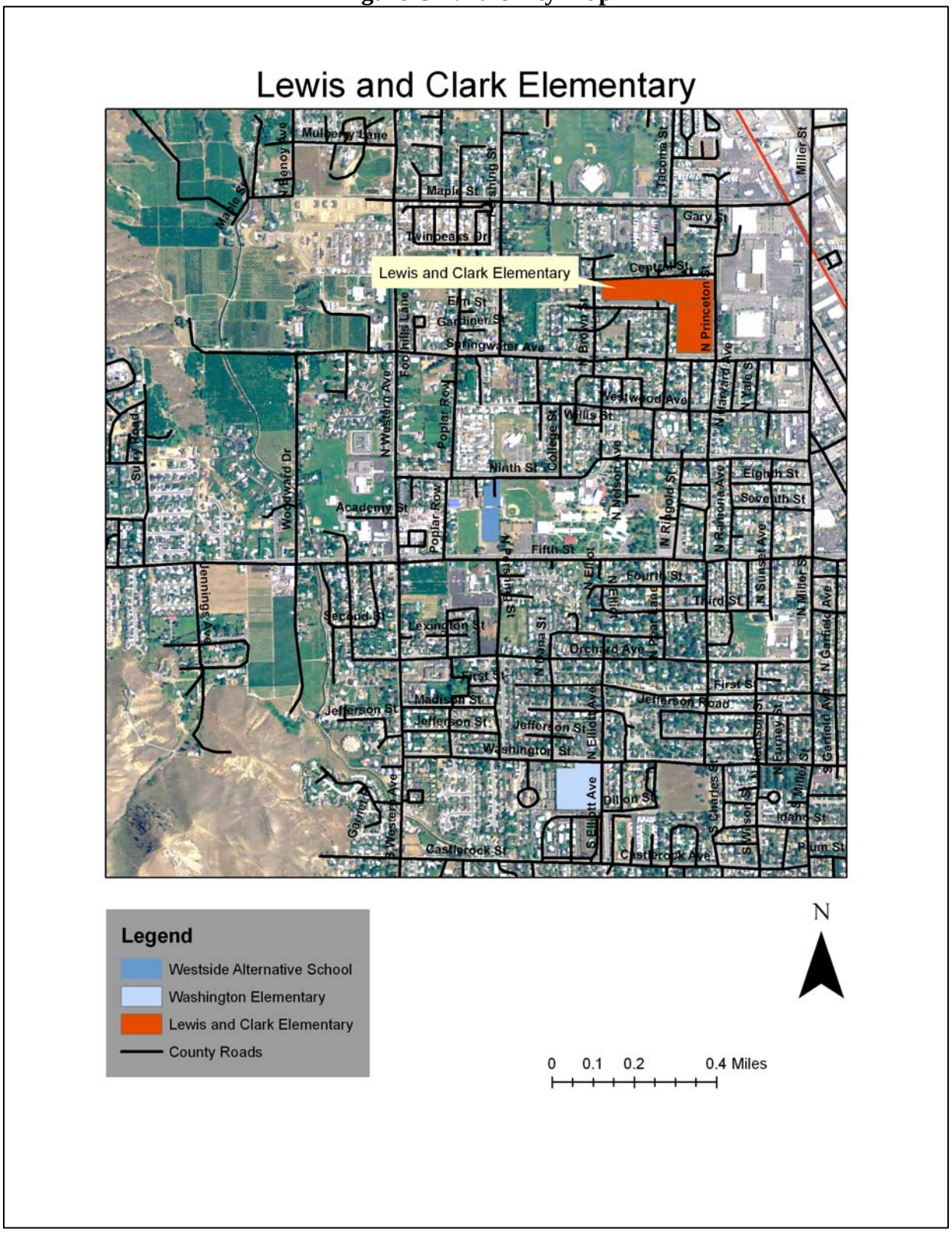


Figure C-2: Pre-Remediation Samples

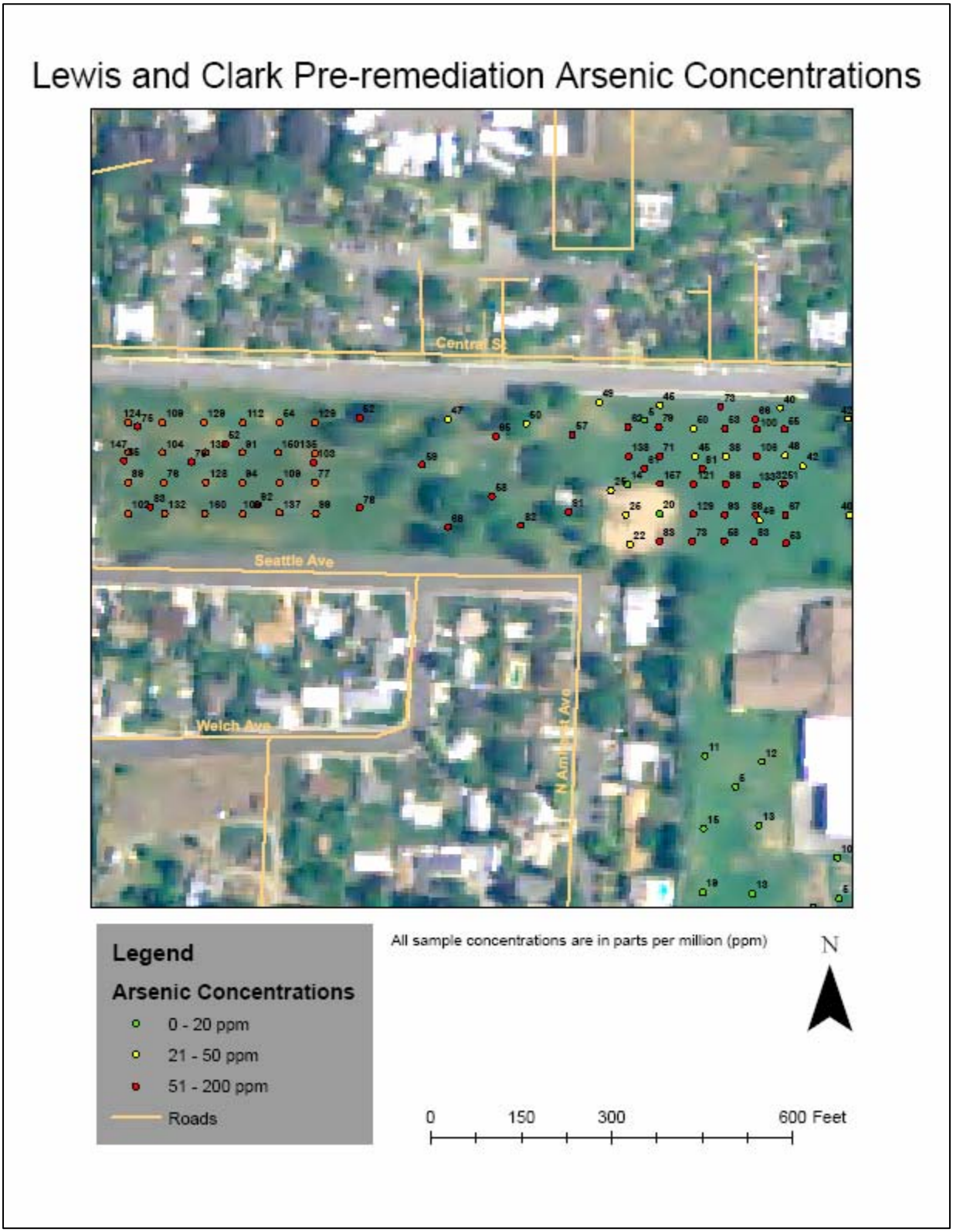
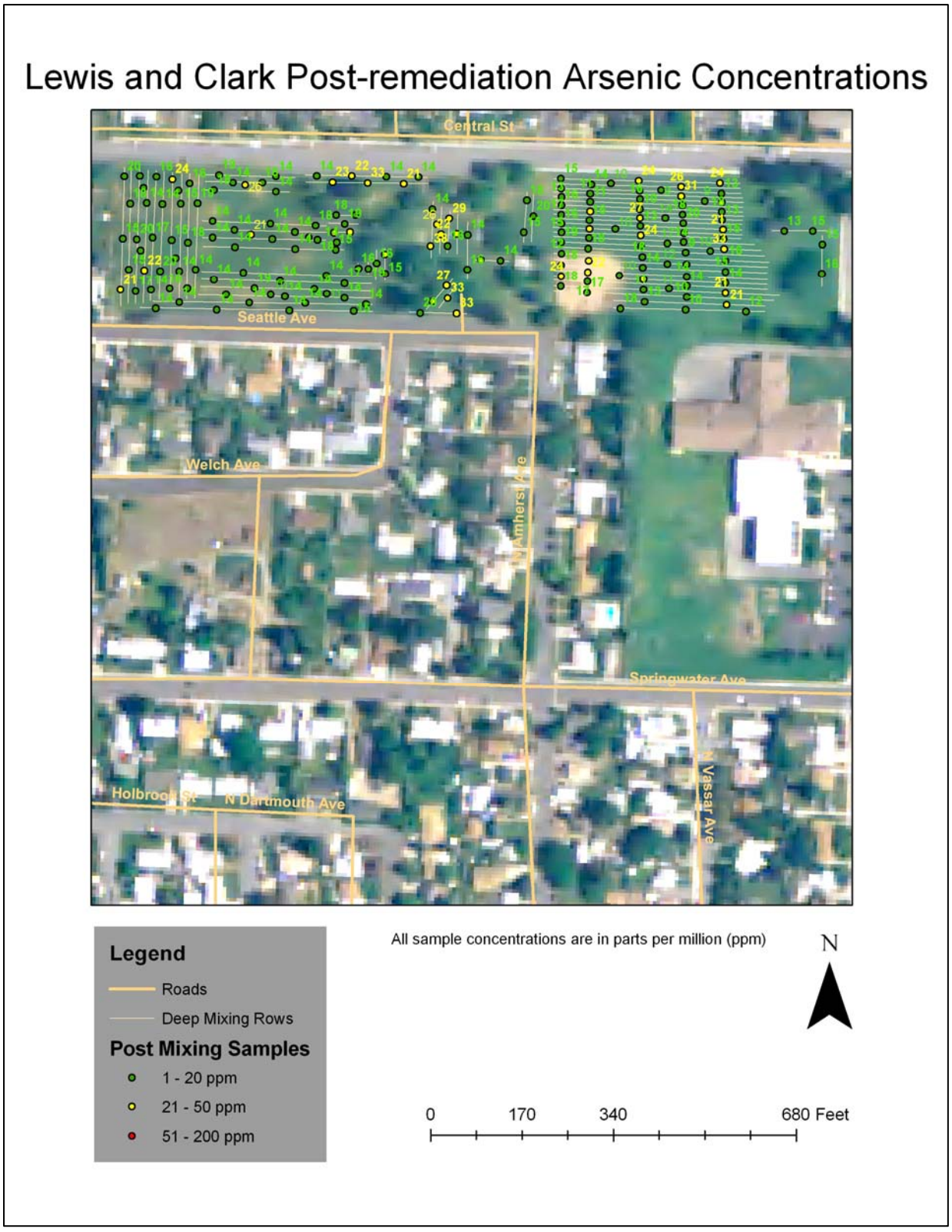


Figure C-3: Post-Remediation Samples



Appendix D: PHOTO LOG

Figure D-1: Deep mixer in action at Lewis & Clark

Figure D-2: Dozer excavating at Lewis & Clark

Figure D-3: Collecting deep soil profile samples at Lewis & Clark

Figure D-4: Lewis & Clark after completion

Appendix E: BIBLIOGRAPHY

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US EPA. "Innovative Technology Verification Report: XRF Technologies for Measuring Trace Elements in Soil and Sediment: Innov-X XT400 Series XRF Analyzer". EPA/540/R-06/002. February 2006.

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