

*Surface Soil Investigation Report*  
**MACE RANCH INNOVATION CENTER**  
Mace Boulevard & County Road 32A  
Davis, California  
WKA No. 10344.03  
December 31, 2014

*Prepared for:*  
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WKA No. 10344.03  
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Wallace-Kuhl & Associates (WKA), on behalf of the Buzz Oates Group of Companies, prepared this *Surface Soil Investigation Report* for the Mace Ranch Innovation Center project located in Davis, Yolo County, California. The report was prepared in a manner consistent with the level of care and skill ordinarily exercised by professional geologists and environmental scientists. This report was prepared under the supervision of a California Professional Geologist.

**WALLACE-KUHL & ASSOCIATES**



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## **1.0 INTRODUCTION**

This report describes information from activities conducted to characterize surface soil for the presence of organochlorine pesticides (OCPs), total arsenic, and total lead at the Mace Ranch Innovation Center project (Site). The Site is located in Davis, Yolo County, California (Figure 1) and is identified by Yolo County Assessor's Parcel Numbers (APNs): 033-630-009, 033-650-009, and 033-650-026. The Site is reported to include 212 acres of land previously used for agricultural purposes.

## **2.0 BACKGROUND**

Figure 2 illustrates the APN boundaries and the location of a detention basin and canal. The detention basin and canal are located near the center of the Site. WKA is also preparing a Phase I Environmental Site Assessment (Phase I ESA) and one of the Phase I ESA activities was a review of historical aerial photographs of the Site. The historical aerial photographs show the Site being utilized for agricultural purposes during a period when persistent pesticides were being commonly applied to agricultural land. WKA developed a sampling plan to characterize the presence of OCPs, total arsenic, and total lead in soil at the Site because of the period when the land was under agricultural use.

## **3.0 OBJECTIVE**

The purpose of this work was to evaluate surface soil within APNs 033-630-009, 033-650-009, and 033-650-026, the detention basin, and canal for concentrations of OCPs, total arsenic, and total lead that would pose a threat to human health under a commercial land use exposure scenario. WKA developed a soil sample collection plan using the Department of Toxic Substances Control Interim Guidance for Sampling Agricultural Properties (Third Revision), dated August 7, 2008 (DTSC Guidance). The DTSC guidance calls for 200 soil sample locations being distributed over a 212-acre Site.





Buzz Oates Group of Companies (Buzz Oates Group) desired that this study be preliminary to completing the full DTSC recommended sampling and laboratory analyses. The Site was initially divided into 200 approximately equally sized sections to meet the DTSC guidance. WKA responded to the Buzz Oates Group request for a reduced soil sample density by selecting approximately 10 percent of the recommended sample locations for analysis of OCPs and approximately 10 percent of the recommended sample locations for analysis of total arsenic and total lead. Thus, 34 soil sample locations were selected. Table 1 shows that OCP laboratory analyses were performed on 28 of samples that were analyzed as seven composited samples constructed using a four-to-one ratio and that the remaining six samples were analyzed as discrete samples. Tables 2 and 3 also show that 13 discrete soil samples were analyzed for total arsenic and total lead. Each sample comprising a composited sample or analyzed as a discrete soil sample was collected from locations within the agricultural use, detention basin, or canal areas of the Site.

#### 4.0 FIELD ACTIVITIES

WKA collected 34 shallow soil samples from a depth between zero and six inches below ground surface (bgs) on November 24, 2014. Soil sample locations are illustrated in Figure 3. Twenty four of the samples were collected within the agricultural use areas of the Site. Four soil samples were collected with the stormwater detention basin. WKA collected the remaining six soil samples from locations within the canal.

The agricultural use areas were gridded and six sets of four sample locations were randomly selected for sampling. The randomly selected locations were developed into sets of four adjacent grids to facilitate 4:1 composite analysis by the analytical laboratory. Samples S-1 through S-12 were collected within the agricultural use area of APN 033-630-009. Samples S-13 through S-20 were collected within the agricultural use area of APN 033-650-009. Soil collected in these areas were described as a slightly moist brown, clayey silt, containing dry vegetation. Samples S-21 through S-24 were collected within the agricultural use area of APN 033-650-026. Samples in this area were collected between rows of trimmed corn crop. Soils collected in this area were classified as a slightly moist to moist, brown, clayey silt.

WKA collected four samples within the detention basin (S-26 through S-29). Samples S-26 and S-29 represent soils at the outlet and inlet of the detention basin, respectively. Sample S-26 is located south of a concrete retention/outlet structure. Sample S-27 and S-28 were collected at the bottom of the detention basin. Sample S-29 is located at the inlet of the detention basin near a one-foot diameter pipe. Soils within the detention basin were described as a slightly moist to moist, brown, clayey silt.



WKA collected six soil samples within the canal (S-25 and S-30 through S-34). Samples S-25 and S-30 represent soils at the east and west end of the canal, respectively. Samples were collected following a period of rain and approximately two inches of standing water remained in the western portion of the canal. The canal is approximately seven feet deep and soil samples were collected along the northern side of the bottom of the canal. Soil at the west end of the canal was described as a wet, dark brown, silty clay, with an organic odor. The remaining canal soil was described as a moist, brown, silty clay.

Hand sampling methods were used to collect each soil sample. Samples were collected in eight ounce glass jars sealed with Teflon lined lids. The collected soil samples were preserved on ice and transported to a certified lab for analysis with completed chain of custody forms.

## 5.0 LABORATORY ANALYSIS

Excelchem Environmental Labs, a California State Water Resources Control Board certified laboratory, conducted the requested laboratory analyses. Soil samples collected in agricultural areas (S1 through S24) and locations within the canal (S31 through S34) were laboratory composited at a 4:1 ratio for the analysis of OCPs. One soil sample from each of the seven sets of composited samples was analyzed discretely for total arsenic and lead (seven samples). The remaining four soil samples collected from the detention basin (S-26 through S-29) and the two samples, collected at the east and west ends of the canal (S-25 and S-30), were analyzed discretely for OCPs, total arsenic, and total lead. This schedule resulted in the samples being analyzed as listed below.

- OCPs by EPA Method 8081A
  - Seven 4:1 composited samples
  - Six discrete samples
- Total Arsenic by EPA Method 6010B
  - Thirteen discrete samples
- Total Lead by EPA Method 6010
  - Thirteen discrete samples

Laboratory data sheets can be found in Appendix A.





## 6.0 FINDINGS

### 6.1 Organochlorine Pesticides

Table 1 presents laboratory results for the analyses of OCPs. Laboratory results show no detection of OCPs in samples collected from the agricultural use areas, detention basin, and canal at concentrations above their laboratory reporting limit. The laboratory reporting limit for each OCP was confirmed as falling below the constituent's California Human Health Screening Level (CHHSL) concentration.

### 6.2 Total Arsenic

Table 2 presents laboratory results for the analyses of total arsenic. Total arsenic concentrations ranged from 3.5 milligrams per kilogram (mg/kg) to 7.3 mg/kg. The detected concentrations of arsenic cannot be directly compared to its commercial CHHSL (0.24 mg/kg), as naturally occurring arsenic is often detected at concentrations exceeding this threshold. Therefore, the excess cancer risk associated with the detected concentrations at the Site was calculated and compared to the risk associated with the commercial CHHSL and DTSC's 12 mg/kg threshold for naturally occurring arsenic in soil at sensitive land use properties.

WKA uses the Environmental Protection Agency's definition of acceptable exposure level and excess cancer risk as defined in *Risk Communication Attachment 6: Useful Terms and Definitions for Explaining Risk*. Excerpts from this document containing the meaning of these terms are provided in Appendix B.

WKA calculated the excess cancer risk associated with arsenic using the following equation:

$$Risk_{soil} = (SF_o \times C_s \times 1.57 \times 10^{-6}) + (SF_o \times C_s \times 5.1 \times 10^{-6} \times ABS) \quad \text{Eq. 1}$$

$SF_o$  = Slope Factor (mg/kg-day)<sup>-1</sup>

$C_s$  = concentration of chemical in soil (mg/kg)

ABS = fraction of chemical absorbed from soil

(Preliminary Endangerment Assessment Guidance Manual, 2013)

Equation 1 accounts for the incidental ingestion exposure and dermal exposure for a child and an adult. The equation does not include exposure from ingestion of homegrown foods grown in Site soil. A  $SF_o$  of 1.5 (mg/kg-day)<sup>-1</sup> and an ABS of 0.03 was used for arsenic risk calculation, taken from the US EPA Regional Screening Level Summary Table. A statistical analysis was conducted on the laboratory results for total arsenic (Table 2) to determine the maximum



concentration of total arsenic detected at the Site and the Site's 95% upper confidence limit (UCL) for total arsenic. These values were applied to Eq. 1 along with the commercial CHHSL for arsenic and DTSC's threshold for arsenic based on a sensitive land use to calculate the risks shown in the following table.

<b>Risk Comparison - Arsenic</b>			
Arsenic Concentration Input Basis	$C_s$ (mg/kg)	$Risk_{soil}$	Estimated Increased Cancer Occurrence (population 1,000,000)
Site Maximum	7.3	$1.89 \times 10^{-5}$	19
Site 95% UCL	6.6	$1.71 \times 10^{-5}$	17
CHHSL	0.24	$6.2 \times 10^{-7}$	<1
DTSC Sensitive Land Use	12	$3.1 \times 10^{-5}$	31

The table shows risk associated with the maximum detected concentration of total arsenic at the Site and the Site's 95% UCL for arsenic fall below the risk associated with DTSC's sensitive land use threshold.

### 6.3 Total Lead

Laboratory results for soil samples analyzed for total lead are summarized in Table 3. The laboratory results show total lead concentrations at the Site ranging from 5.4 mg/kg to 7.4 mg/kg. The detected concentration of total lead at the Site falls below the commercial CHHSL for lead (320 mg/kg).

## 7.0 CONCLUSIONS

WKA collected 34 soil samples to characterize the presence of OCPs in Site soil. WKA also collected thirteen soil samples that were analyzed as discrete samples to characterize the presence of total arsenic and lead in Site soil. No OCP was present in any soil sample at a concentration exceeding its laboratory reporting limit. WKA concluded that OCP concentrations in soil pose no risk to human health based on a commercial exposure scenario.

The maximum concentration of arsenic detected at the Site was below DTSC's threshold of 12 mg/kg for a sensitive land use. WKA calculated that the excess cancer risk associated with the maximum concentration of arsenic at the Site may cause an estimated 19 excess cases of





cancer in a population of 1,000,000. This value is approximately 60 percent of the excess cases of cancer associated with DTSC's 12 mg/kg (31 excess cases of cancer in a population of 1,000,000). The risk associated with the Site's 95% UCL was found to be 17 excess cases of cancer in a population of 1,000,000. These values fall within the range of the EPA's typical range of acceptable exposure levels (1 in 10,000 and 1 in 1,000,000) (Appendix B). Therefore, WKA has determined that an acceptable exposure level for arsenic is present at the Site and the excess cancer risk does not pose a significant risk to human health.

The laboratory analyses revealed soil samples from agricultural use areas, the detention basin, and canal contained total lead concentrations that are below the thresholds for human exposure under a commercial exposure scenario (320 mg/kg). The concentrations of total lead detected at the Site pose no risk to human health based on a commercial land use. From the information gathered during this surface soil investigation, WKA determined that the soil at the Site, overall, poses no significant risk to human health.

## 8.0 RECOMMENDATIONS

WKA performed preliminary soil sampling developed from a sample population of 28 sample locations. Results presented in this report indicate that OCPs are not present in site soil at concentrations exceeding their laboratory reporting limits. Lead was no present at concentrations exceeding 7.4 mg/kg, which is less than the 80 mg/kg threshold for residential exposure and less than the 320 mg/kg threshold for commercial exposure. Arsenic concentrations in soil did no exceed 7.3 mg/kg. WKA has shown that arsenic concentrations pose a cancer risk that falls within the range of the EPA's typical range of acceptable exposure levels (1 in 10,000 and 1 in 1,000,000). Therefore, WKA has concluded that the results support a decision for no further study of the Site. However, if the City of Davis desires additional assurances that chemical concentrations in soil are appropriate for the Site exposure scenarios, the City of Davis may seek concurrence from the appropriate regulatory agency.

## 9.0 LIMITATIONS

The statements and results presented in this report are based upon the scope of work described above and on observations made on the dates of WKA's applicable fieldwork. The summary report was prepared in a manner consistent with the level of care and skill ordinarily exercised by Professional Geologists. Work was performed using a degree of skill consistent with that of competent environmental consulting firms performing similar work in the area. No



recommendation is made as to the suitability of the property for any purpose. The result of the investigation does not preclude the possibility that materials currently, or in the future, defined as hazardous are present on the site. This report is applicable only to the investigated site and should not be used for any other site. No warranty is expressed or implied.

## 10.0 REFERENCES

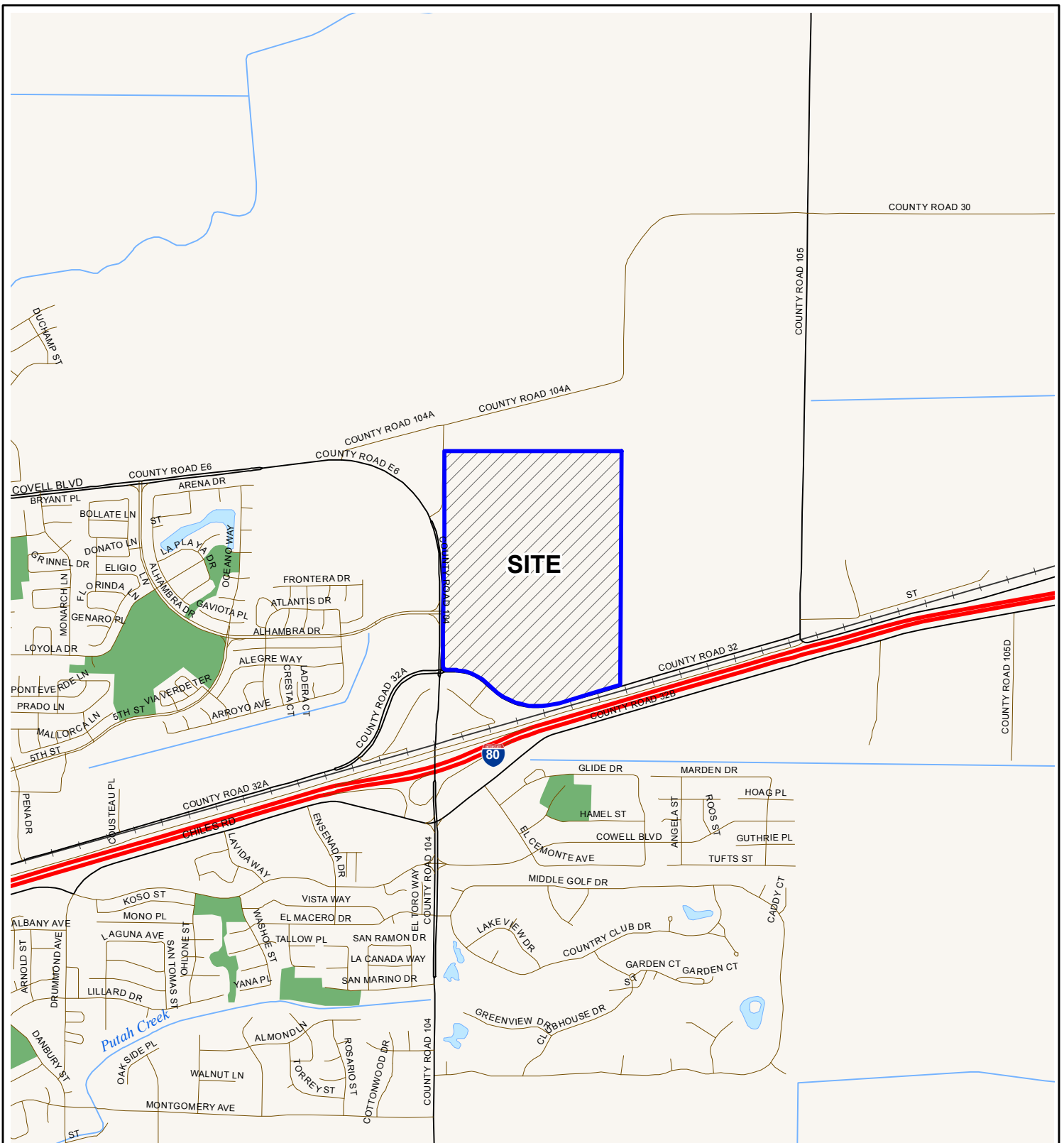
- Department of Toxic Substances Control. *Interim Guidance for Sampling Agricultural Properties – Third Revision*. N.p.: California Environmental Protection Agency. 7 Aug. 2008. Print.
- Office of Environmental Health Hazard Assessment. *Soil-Screening Numbers*. N.p.: California Environmental Protection Agency, 23 Sept. 2010. Web. 10 Dec. 2014.
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- United States Environmental Protection Agency. *Regional Screening Levels (Formerly PRGs)*. N.p.: United States Environmental Protection Agency, May 2014. Web. 10 Dec. 2014.
- United States Environmental Protection Agency. Risk Communication. N.p.: United States Environmental Protection Agency. Web. 10 Dec. 2014.



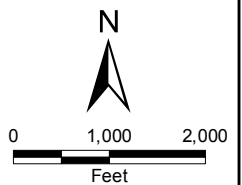
## FIGURES





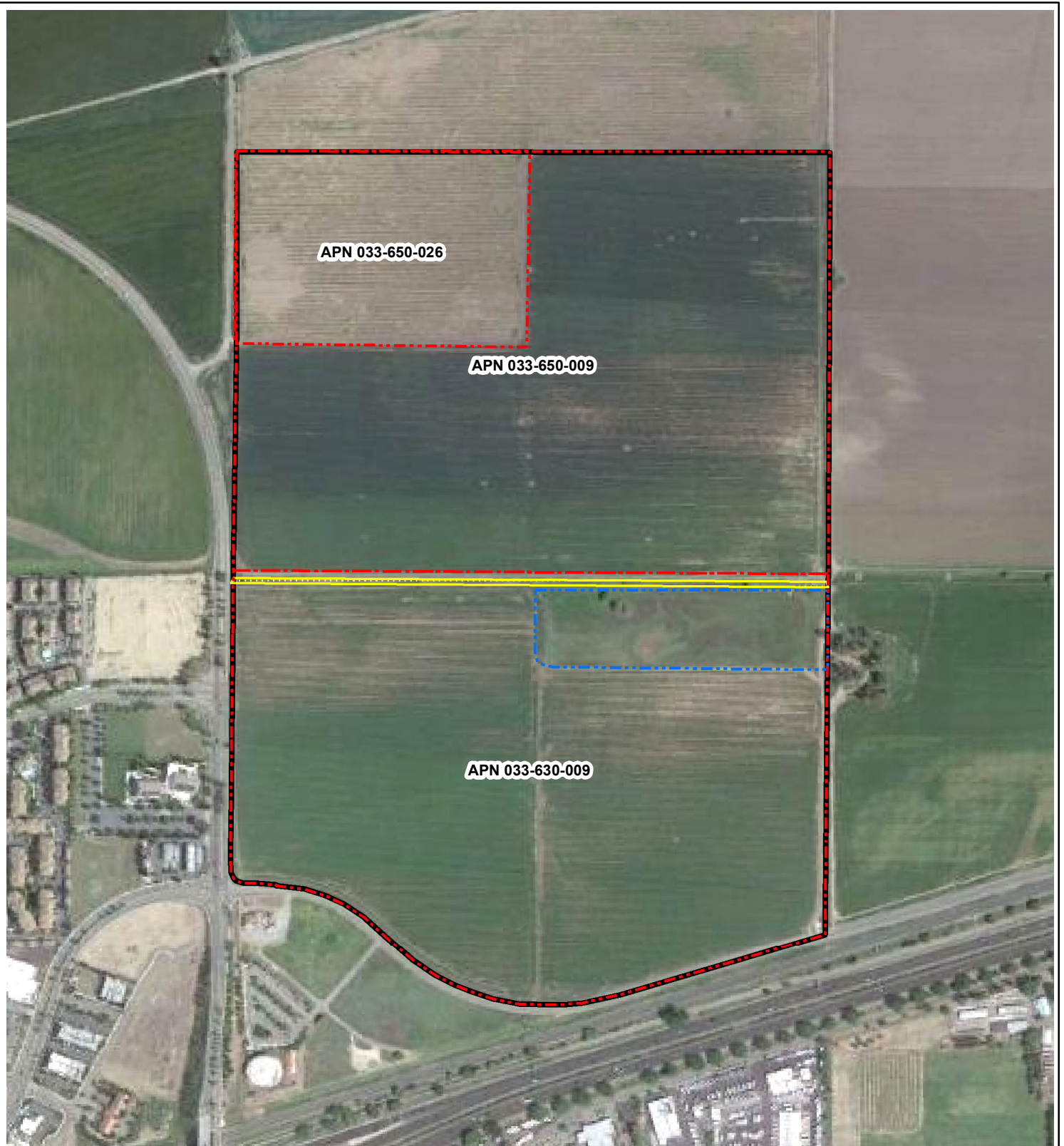


Street data courtesy of ESRI, 2010.  
 Hydrography courtesy of the U.S. Geological Survey  
 acquired from the GIS Data Depot, December, 2007.  
 Projection: NAD 83, California State Plane, Zone II







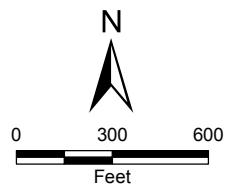
**VICINITY MAP**  
**MACE RANCH INNOVATION CENTER**  
 Davis, California

<b>FIGURE 1</b>	
DRAWN BY	TJC
CHECKED BY	NSP
PROJECT MGR	DBN
DATE	11/14
<b>WKA NO. 10344.03</b>	



Aerial from Google Imagery 4/14  
 Projection: NAD 83, California State Plane, Zone II

- Legend**
-  Parcels/Agricultural Use Area
  -  Detention Basin
  -  Canal
  -  Site boundary



**AERIAL SITE MAP**  
**MACE RANCH INNOVATION CENTER**  
 Davis, California

<b>FIGURE 2</b>	
DRAWN BY	KLP
CHECKED BY	NSP
PROJECT MGR	DBN
DATE	11/14
WKA NO. 10344.03	

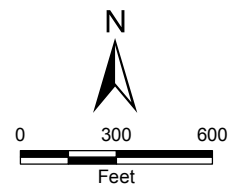




Aerial from Google Imagery 4/14  
 Projection: NAD 83, California State Plane, Zone II

**Legend**

- Sample Locations
- ▭ Parcels/Agricultural Use Area
- ▭ Detention Basin
- ▭ Canal
- ▭ Site boundary



**SAMPLE LOCATION MAP**  
 MACE RANCH INNOVATION CENTER  
 Davis, California

<b>FIGURE 3</b>	
DRAWN BY	KLP
CHECKED BY	NSP
PROJECT MGR	DBN
DATE	12/14
WKA NO. 10344.03	



## TABLES



## **APPENDIX A**

Laboratory Analytical Reports  
and  
Chain-of-Custody Documentation



**EXCELCHEM**  
**Environmental Labs**

1135 W Sunset Boulevard  
Suite A  
Rocklin, CA 95765  
Phone# 916-543-4445  
Fax# 916-543-4449



ELAP Certificate No. : 2119

04 December 2014

Greg George

Wallace Kuhl and Associates

3050 Industrial Blvd.

West Sacramento, CA 95691

RE: Davis Innovation Park

Work order number:1411156

Enclosed are the results of analyses for samples received by the laboratory on 11/24/14 15:54. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

---

John Somers, Lab Director



### Excelchem Environmental Labs

Wallace Kuhl and Associates 3050 Industrial Blvd. West Sacramento, CA 95691	Project: Project Number: Project Manager:	Davis Innovation Park 10344.0-3 Greg George	Date Reported: 12/04/14 15:26
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#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S-1	1411156-01	Soil	11/24/14 07:03	11/24/14 15:54
S-1-S-4	1411156-05	Soil	11/24/14 07:14	11/24/14 15:54
S-8	1411156-09	Soil	11/24/14 07:46	11/24/14 15:54
S-5-S-8	1411156-10	Soil	11/24/14 07:46	11/24/14 15:54
S-11	1411156-13	Soil	11/24/14 08:02	11/24/14 15:54
S-9-S-12	1411156-15	Soil	11/24/14 08:07	11/24/14 15:54
S-14	1411156-17	Soil	11/24/14 08:43	11/24/14 15:54
S-13-S-16	1411156-20	Soil	11/24/14 08:49	11/24/14 15:54
S-17	1411156-21	Soil	11/24/14 09:58	11/24/14 15:54
S-17-S-20	1411156-25	Soil	11/24/14 10:07	11/24/14 15:54
S-23	1411156-28	Soil	11/24/14 09:13	11/24/14 15:54
S-21-S-24	1411156-30	Soil	11/24/14 09:17	11/24/14 15:54
S-25	1411156-31	Soil	11/24/14 10:22	11/24/14 15:54
S-26	1411156-32	Soil	11/24/14 11:59	11/24/14 15:54
S-27	1411156-33	Soil	11/24/14 11:51	11/24/14 15:54
S-28	1411156-34	Soil	11/24/14 11:31	11/24/14 15:54
S-29	1411156-35	Soil	11/24/14 11:15	11/24/14 15:54
S-30	1411156-36	Soil	11/24/14 09:39	11/24/14 15:54
S-33	1411156-39	Soil	11/24/14 11:25	11/24/14 15:54
S-31-S-34	1411156-41	Soil	11/24/14 11:43	11/24/14 15:54

Excelchem Environmental Lab.



Laboratory Representative

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

**Excelchem Environmental Labs**

Wallace Kuhl and Associates 3050 Industrial Blvd. West Sacramento, CA 95691	Project: Project Number: Project Manager:	Davis Innovation Park 10344.0-3 Greg George	Date Reported: 12/04/14 15:26
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**S-1  
1411156-01 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

**Total Recoverable Metals**

Arsenic	6.1	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	6.3	1.0	"	"	"	"	"	

Excelchem Environmental Lab.

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Laboratory Representative

**Excelchem Environmental Labs**

Wallace Kuhl and Associates  
3050 Industrial Blvd.  
West Sacramento, CA 95691

Project: Davis Innovation Park  
Project Number: 10344.0-3  
Project Manager: Greg George

Date Reported:  
12/04/14 15:26

**S-1-S-4  
1411156-05 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

**Pesticides by GC/ECD**

alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	
delta-BHC	ND	0.005	"	"	"	"	"	
Heptachlor	ND	0.005	"	"	"	"	"	
Aldrin	ND	0.005	"	"	"	"	"	
Heptachlor epoxide	ND	0.005	"	"	"	"	"	
gamma-Chlordane	ND	0.005	"	"	"	"	"	
Endosulfan I	ND	0.005	"	"	"	"	"	
alpha-Chlordane	ND	0.005	"	"	"	"	"	
4,4'-DDE	ND	0.005	"	"	"	"	"	
Dieldrin	ND	0.005	"	"	"	"	"	
Endrin	ND	0.005	"	"	"	"	"	
Endosulfan II	ND	0.005	"	"	"	"	"	
4,4'-DDD	ND	0.005	"	"	"	"	"	
Endrin aldehyde	ND	0.005	"	"	"	"	"	
Endosulfan sulfate	ND	0.005	"	"	"	"	"	
4,4'-DDT	ND	0.005	"	"	"	"	"	
Endrin Ketone	ND	0.005	"	"	"	"	"	
Methoxychlor	ND	0.005	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>	63.3 %	% Recovery Limits		50-150				"
<i>Surrogate: Tetrachloro-meta-xylene</i>	60.1 %	% Recovery Limits		50-150				"

Excelchem Environmental Lab.



Laboratory Representative

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**Excelchem Environmental Labs**

Wallace Kuhl and Associates 3050 Industrial Blvd. West Sacramento, CA 95691	Project: Davis Innovation Park Project Number: 10344.0-3 Project Manager: Greg George	Date Reported: 12/04/14 15:26
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**S-8**  
**1411156-09 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
---------	--------	-----------------	-------	-------	---------------	---------------	--------	-------

**Total Recoverable Metals**

Arsenic	6.1	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	6.3	1.0	"	"	"	"	"	

Excelchem Environmental Lab.

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Laboratory Representative

**Excelchem Environmental Labs**

Wallace Kuhl and Associates 3050 Industrial Blvd. West Sacramento, CA 95691	Project: Davis Innovation Park Project Number: 10344.0-3 Project Manager: Greg George	Date Reported: 12/04/14 15:26
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**S-5-S-8  
1411156-10 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
<b>Pesticides by GC/ECD</b>								
alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	
delta-BHC	ND	0.005	"	"	"	"	"	
Heptachlor	ND	0.005	"	"	"	"	"	
Aldrin	ND	0.005	"	"	"	"	"	
Heptachlor epoxide	ND	0.005	"	"	"	"	"	
gamma-Chlordane	ND	0.005	"	"	"	"	"	
Endosulfan I	ND	0.005	"	"	"	"	"	
alpha-Chlordane	ND	0.005	"	"	"	"	"	
4,4'-DDE	ND	0.005	"	"	"	"	"	
Dieldrin	ND	0.005	"	"	"	"	"	
Endrin	ND	0.005	"	"	"	"	"	
Endosulfan II	ND	0.005	"	"	"	"	"	
4,4'-DDD	ND	0.005	"	"	"	"	"	
Endrin aldehyde	ND	0.005	"	"	"	"	"	
Endosulfan sulfate	ND	0.005	"	"	"	"	"	
4,4'-DDT	ND	0.005	"	"	"	"	"	
Endrin Ketone	ND	0.005	"	"	"	"	"	
Methoxychlor	ND	0.005	"	"	"	"	"	
Surrogate: Decachlorobiphenyl	96.7 %	% Recovery Limits		50-150				"
Surrogate: Tetrachloro-meta-xylene	76.2 %	% Recovery Limits		50-150				"

Excelchem Environmental Lab.



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Laboratory Representative

**Excelchem Environmental Labs**

Wallace Kuhl and Associates 3050 Industrial Blvd. West Sacramento, CA 95691	Project: Project Number: Project Manager:	Davis Innovation Park 10344.0-3 Greg George	Date Reported: 12/04/14 15:26
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**S-11  
1411156-13 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Total Recoverable Metals**

Arsenic	7.3	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	7.4	1.0	"	"	"	"	"	

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**S-9-S-12**  
**1411156-15 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Pesticides by GC/ECD**

alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	
delta-BHC	ND	0.005	"	"	"	"	"	
Heptachlor	ND	0.005	"	"	"	"	"	
Aldrin	ND	0.005	"	"	"	"	"	
Heptachlor epoxide	ND	0.005	"	"	"	"	"	
gamma-Chlordane	ND	0.005	"	"	"	"	"	
Endosulfan I	ND	0.005	"	"	"	"	"	
alpha-Chlordane	ND	0.005	"	"	"	"	"	
4,4'-DDE	ND	0.005	"	"	"	"	"	
Dieldrin	ND	0.005	"	"	"	"	"	
Endrin	ND	0.005	"	"	"	"	"	
Endosulfan II	ND	0.005	"	"	"	"	"	
4,4'-DDD	ND	0.005	"	"	"	"	"	
Endrin aldehyde	ND	0.005	"	"	"	"	"	
Endosulfan sulfate	ND	0.005	"	"	"	"	"	
4,4'-DDT	ND	0.005	"	"	"	"	"	
Endrin Ketone	ND	0.005	"	"	"	"	"	
Methoxychlor	ND	0.005	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>	90.4 %	% Recovery Limits		50-150				"
<i>Surrogate: Tetrachloro-meta-xylene</i>	93.0 %	% Recovery Limits		50-150				"

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**S-14**  
**1411156-17 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Total Recoverable Metals**

Arsenic	6.5	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	7.3	1.0	"	"	"	"	"	

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**S-13-S-16  
1411156-20 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Pesticides by GC/ECD**

alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	
delta-BHC	ND	0.005	"	"	"	"	"	
Heptachlor	ND	0.005	"	"	"	"	"	
Aldrin	ND	0.005	"	"	"	"	"	
Heptachlor epoxide	ND	0.005	"	"	"	"	"	
gamma-Chlordane	ND	0.005	"	"	"	"	"	
Endosulfan I	ND	0.005	"	"	"	"	"	
alpha-Chlordane	ND	0.005	"	"	"	"	"	
4,4'-DDE	ND	0.005	"	"	"	"	"	
Dieldrin	ND	0.005	"	"	"	"	"	
Endrin	ND	0.005	"	"	"	"	"	
Endosulfan II	ND	0.005	"	"	"	"	"	
4,4'-DDD	ND	0.005	"	"	"	"	"	
Endrin aldehyde	ND	0.005	"	"	"	"	"	
Endosulfan sulfate	ND	0.005	"	"	"	"	"	
4,4'-DDT	ND	0.005	"	"	"	"	"	
Endrin Ketone	ND	0.005	"	"	"	"	"	
Methoxychlor	ND	0.005	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>	<i>73.1 %</i>	<i>% Recovery Limits</i>		<i>50-150</i>				<i>"</i>
<i>Surrogate: Tetrachloro-meta-xylene</i>	<i>74.6 %</i>	<i>% Recovery Limits</i>		<i>50-150</i>				<i>"</i>

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3050 Industrial Blvd.  
West Sacramento, CA 95691

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Project Number: 10344.0-3  
Project Manager: Greg George

Date Reported:  
12/04/14 15:26

**S-17**  
**1411156-21 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Total Recoverable Metals**

Arsenic	6.5	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	6.3	1.0	"	"	"	"	"	

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**S-17-S-20**  
**1411156-25 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
<b>Pesticides by GC/ECD</b>								
alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	"
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	"
delta-BHC	ND	0.005	"	"	"	"	"	"
Heptachlor	ND	0.005	"	"	"	"	"	"
Aldrin	ND	0.005	"	"	"	"	"	"
Heptachlor epoxide	ND	0.005	"	"	"	"	"	"
gamma-Chlordane	ND	0.005	"	"	"	"	"	"
Endosulfan I	ND	0.005	"	"	"	"	"	"
alpha-Chlordane	ND	0.005	"	"	"	"	"	"
4,4'-DDE	ND	0.005	"	"	"	"	"	"
Dieldrin	ND	0.005	"	"	"	"	"	"
Endrin	ND	0.005	"	"	"	"	"	"
Endosulfan II	ND	0.005	"	"	"	"	"	"
4,4'-DDD	ND	0.005	"	"	"	"	"	"
Endrin aldehyde	ND	0.005	"	"	"	"	"	"
Endosulfan sulfate	ND	0.005	"	"	"	"	"	"
4,4'-DDT	ND	0.005	"	"	"	"	"	"
Endrin Ketone	ND	0.005	"	"	"	"	"	"
Methoxychlor	ND	0.005	"	"	"	"	"	"
Surrogate: Decachlorobiphenyl	69.4 %	% Recovery Limits		50-150				"
Surrogate: Tetrachloro-meta-xylene	59.5 %	% Recovery Limits		50-150				"

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**S-23**  
**1411156-28 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Total Recoverable Metals**

Arsenic	5.8	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	6.2	1.0	"	"	"	"	"	

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**S-21-S-24  
1411156-30 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
<b>Pesticides by GC/ECD</b>								
alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	"
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	"
delta-BHC	ND	0.005	"	"	"	"	"	"
Heptachlor	ND	0.005	"	"	"	"	"	"
Aldrin	ND	0.005	"	"	"	"	"	"
Heptachlor epoxide	ND	0.005	"	"	"	"	"	"
gamma-Chlordane	ND	0.005	"	"	"	"	"	"
Endosulfan I	ND	0.005	"	"	"	"	"	"
alpha-Chlordane	ND	0.005	"	"	"	"	"	"
4,4'-DDE	ND	0.005	"	"	"	"	"	"
Dieldrin	ND	0.005	"	"	"	"	"	"
Endrin	ND	0.005	"	"	"	"	"	"
Endosulfan II	ND	0.005	"	"	"	"	"	"
4,4'-DDD	ND	0.005	"	"	"	"	"	"
Endrin aldehyde	ND	0.005	"	"	"	"	"	"
Endosulfan sulfate	ND	0.005	"	"	"	"	"	"
4,4'-DDT	ND	0.005	"	"	"	"	"	"
Endrin Ketone	ND	0.005	"	"	"	"	"	"
Methoxychlor	ND	0.005	"	"	"	"	"	"
Surrogate: Decachlorobiphenyl	65.7 %	% Recovery Limits		50-150				"
Surrogate: Tetrachloro-meta-xylene	65.2 %	% Recovery Limits		50-150				"

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**S-25  
1411156-31 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Pesticides by GC/ECD**

alpha-BHC	ND	0.050	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.050	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.050	"	"	"	"	"	
delta-BHC	ND	0.050	"	"	"	"	"	
Heptachlor	ND	0.050	"	"	"	"	"	
Aldrin	ND	0.050	"	"	"	"	"	
Heptachlor epoxide	ND	0.050	"	"	"	"	"	
gamma-Chlordane	ND	0.050	"	"	"	"	"	
Endosulfan I	ND	0.050	"	"	"	"	"	
alpha-Chlordane	ND	0.050	"	"	"	"	"	
4,4'-DDE	ND	0.050	"	"	"	"	"	
Dieldrin	ND	0.050	"	"	"	"	"	
Endrin	ND	0.050	"	"	"	"	"	
Endosulfan II	ND	0.050	"	"	"	"	"	
4,4'-DDD	ND	0.050	"	"	"	"	"	
Endrin aldehyde	ND	0.050	"	"	"	"	"	
Endosulfan sulfate	ND	0.050	"	"	"	"	"	
4,4'-DDT	ND	0.050	"	"	"	"	"	
Endrin Ketone	ND	0.050	"	"	"	"	"	
Methoxychlor	ND	0.050	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>	64.3 %	% Recovery Limits		50-150				"
<i>Surrogate: Tetrachloro-meta-xylene</i>	60.3 %	% Recovery Limits		50-150				"

**Total Recoverable Metals**

Arsenic	4.6	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	5.1	1.0	"	"	"	"	"	

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**S-26  
1411156-32 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Pesticides by GC/ECD**

alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	
delta-BHC	ND	0.005	"	"	"	"	"	
Heptachlor	ND	0.005	"	"	"	"	"	
Aldrin	ND	0.005	"	"	"	"	"	
Heptachlor epoxide	ND	0.005	"	"	"	"	"	
gamma-Chlordane	ND	0.005	"	"	"	"	"	
Endosulfan I	ND	0.005	"	"	"	"	"	
alpha-Chlordane	ND	0.005	"	"	"	"	"	
4,4'-DDE	ND	0.005	"	"	"	"	"	
Dieldrin	ND	0.005	"	"	"	"	"	
Endrin	ND	0.005	"	"	"	"	"	
Endosulfan II	ND	0.005	"	"	"	"	"	
4,4'-DDD	ND	0.005	"	"	"	"	"	
Endrin aldehyde	ND	0.005	"	"	"	"	"	
Endosulfan sulfate	ND	0.005	"	"	"	"	"	
4,4'-DDT	ND	0.005	"	"	"	"	"	
Endrin Ketone	ND	0.005	"	"	"	"	"	
Methoxychlor	ND	0.005	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>	65.9 %	% Recovery Limits		50-150				"
<i>Surrogate: Tetrachloro-meta-xylene</i>	65.7 %	% Recovery Limits		50-150				"

**Total Recoverable Metals**

Arsenic	5.2	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	5.5	1.0	"	"	"	"	"	

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**S-27**  
**1411156-33 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
<b>Pesticides by GC/ECD</b>								
alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	
delta-BHC	ND	0.005	"	"	"	"	"	
Heptachlor	ND	0.005	"	"	"	"	"	
Aldrin	ND	0.005	"	"	"	"	"	
Heptachlor epoxide	ND	0.005	"	"	"	"	"	
gamma-Chlordane	ND	0.005	"	"	"	"	"	
Endosulfan I	ND	0.005	"	"	"	"	"	
alpha-Chlordane	ND	0.005	"	"	"	"	"	
4,4'-DDE	ND	0.005	"	"	"	"	"	
Dieldrin	ND	0.005	"	"	"	"	"	
Endrin	ND	0.005	"	"	"	"	"	
Endosulfan II	ND	0.005	"	"	"	"	"	
4,4'-DDD	ND	0.005	"	"	"	"	"	
Endrin aldehyde	ND	0.005	"	"	"	"	"	
Endosulfan sulfate	ND	0.005	"	"	"	"	"	
4,4'-DDT	ND	0.005	"	"	"	"	"	
Endrin Ketone	ND	0.005	"	"	"	"	"	
Methoxychlor	ND	0.005	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>	43.5 %	% Recovery Limits		50-150			"	Z-01
<i>Surrogate: Tetrachloro-meta-xylene</i>	43.9 %	% Recovery Limits		50-150			"	Z-01
<b>Total Recoverable Metals</b>								
Arsenic	6.6	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	4.8	1.0	"	"	"	"	"	

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**S-28  
1411156-34 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
<b>Pesticides by GC/ECD</b>								
alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	
delta-BHC	ND	0.005	"	"	"	"	"	
Heptachlor	ND	0.005	"	"	"	"	"	
Aldrin	ND	0.005	"	"	"	"	"	
Heptachlor epoxide	ND	0.005	"	"	"	"	"	
gamma-Chlordane	ND	0.005	"	"	"	"	"	
Endosulfan I	ND	0.005	"	"	"	"	"	
alpha-Chlordane	ND	0.005	"	"	"	"	"	
4,4'-DDE	ND	0.005	"	"	"	"	"	
Dieldrin	ND	0.005	"	"	"	"	"	
Endrin	ND	0.005	"	"	"	"	"	
Endosulfan II	ND	0.005	"	"	"	"	"	
4,4'-DDD	ND	0.005	"	"	"	"	"	
Endrin aldehyde	ND	0.005	"	"	"	"	"	
Endosulfan sulfate	ND	0.005	"	"	"	"	"	
4,4'-DDT	ND	0.005	"	"	"	"	"	
Endrin Ketone	ND	0.005	"	"	"	"	"	
Methoxychlor	ND	0.005	"	"	"	"	"	
Surrogate: Decachlorobiphenyl	56.4 %	% Recovery Limits		50-150			"	
Surrogate: Tetrachloro-meta-xylene	44.9 %	% Recovery Limits		50-150			"	S-GC
<b>Total Recoverable Metals</b>								
Arsenic	7.0	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	4.7	1.0	"	"	"	"	"	

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**S-29  
1411156-35 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Pesticides by GC/ECD**

alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	
delta-BHC	ND	0.005	"	"	"	"	"	
Heptachlor	ND	0.005	"	"	"	"	"	
Aldrin	ND	0.005	"	"	"	"	"	
Heptachlor epoxide	ND	0.005	"	"	"	"	"	
gamma-Chlordane	ND	0.005	"	"	"	"	"	
Endosulfan I	ND	0.005	"	"	"	"	"	
alpha-Chlordane	ND	0.005	"	"	"	"	"	
4,4'-DDE	ND	0.005	"	"	"	"	"	
Dieldrin	ND	0.005	"	"	"	"	"	
Endrin	ND	0.005	"	"	"	"	"	
Endosulfan II	ND	0.005	"	"	"	"	"	
4,4'-DDD	ND	0.005	"	"	"	"	"	
Endrin aldehyde	ND	0.005	"	"	"	"	"	
Endosulfan sulfate	ND	0.005	"	"	"	"	"	
4,4'-DDT	ND	0.005	"	"	"	"	"	
Endrin Ketone	ND	0.005	"	"	"	"	"	
Methoxychlor	ND	0.005	"	"	"	"	"	
<i>Surrogate: Decachlorobiphenyl</i>	<i>51.7 %</i>	<i>% Recovery Limits</i>		<i>50-150</i>				<i>"</i>
<i>Surrogate: Tetrachloro-meta-xylene</i>	<i>61.6 %</i>	<i>% Recovery Limits</i>		<i>50-150</i>				<i>"</i>

**Total Recoverable Metals**

Arsenic	5.9	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	6.1	1.0	"	"	"	"	"	

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**S-30  
1411156-36 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
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**Pesticides by GC/ECD**

alpha-BHC	ND	0.050	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.050	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.050	"	"	"	"	"	
delta-BHC	ND	0.050	"	"	"	"	"	
Heptachlor	ND	0.050	"	"	"	"	"	
Aldrin	ND	0.050	"	"	"	"	"	
Heptachlor epoxide	ND	0.050	"	"	"	"	"	
gamma-Chlordane	ND	0.050	"	"	"	"	"	
Endosulfan I	ND	0.050	"	"	"	"	"	
alpha-Chlordane	ND	0.050	"	"	"	"	"	
4,4'-DDE	ND	0.050	"	"	"	"	"	
Dieldrin	ND	0.050	"	"	"	"	"	
Endrin	ND	0.050	"	"	"	"	"	
Endosulfan II	ND	0.050	"	"	"	"	"	
4,4'-DDD	ND	0.050	"	"	"	"	"	
Endrin aldehyde	ND	0.050	"	"	"	"	"	
Endosulfan sulfate	ND	0.050	"	"	"	"	"	
4,4'-DDT	ND	0.050	"	"	"	"	"	
Endrin Ketone	ND	0.050	"	"	"	"	"	
Methoxychlor	ND	0.050	"	"	"	"	"	
Surrogate: Decachlorobiphenyl	77.1 %	% Recovery Limits		50-150				"
Surrogate: Tetrachloro-meta-xylene	58.4 %	% Recovery Limits		50-150				"

**Total Recoverable Metals**

Arsenic	3.5	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	4.5	1.0	"	"	"	"	"	

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Laboratory Representative

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**Excelchem Environmental Labs**

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**S-33**  
**1411156-39 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
<b>Total Recoverable Metals</b>								
Arsenic	7.1	1.0	mg/kg	AXL0042	12/01/14	12/03/14	EPA 6010B	
Lead	4.4	1.0	"	"	"	"	"	

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**S-31-S-34**  
**1411156-41 (Soil)**

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
<b>Pesticides by GC/ECD</b>								
alpha-BHC	ND	0.005	mg/kg	AXL0044	12/03/14	12/03/14	EPA 8081A	
beta-BHC	ND	0.005	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.005	"	"	"	"	"	
delta-BHC	ND	0.005	"	"	"	"	"	
Heptachlor	ND	0.005	"	"	"	"	"	
Aldrin	ND	0.005	"	"	"	"	"	
Heptachlor epoxide	ND	0.005	"	"	"	"	"	
gamma-Chlordane	ND	0.005	"	"	"	"	"	
Endosulfan I	ND	0.005	"	"	"	"	"	
alpha-Chlordane	ND	0.005	"	"	"	"	"	
4,4'-DDE	ND	0.005	"	"	"	"	"	
Dieldrin	ND	0.005	"	"	"	"	"	
Endrin	ND	0.005	"	"	"	"	"	
Endosulfan II	ND	0.005	"	"	"	"	"	
4,4'-DDD	ND	0.005	"	"	"	"	"	
Endrin aldehyde	ND	0.005	"	"	"	"	"	
Endosulfan sulfate	ND	0.005	"	"	"	"	"	
4,4'-DDT	ND	0.005	"	"	"	"	"	
Endrin Ketone	ND	0.005	"	"	"	"	"	
Methoxychlor	ND	0.005	"	"	"	"	"	
Surrogate: Decachlorobiphenyl	71.7 %	% Recovery Limits		50-150				"
Surrogate: Tetrachloro-meta-xylene	52.8 %	% Recovery Limits		50-150				"

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**Pesticides by GC/ECD - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch AXL0044 - EPA 8081A**

**Blank (AXL0044-BLK1)**

Prepared & Analyzed: 12/03/14

<i>Surrogate: Decachlorobiphenyl</i>	0.0150		mg/kg	0.0200		74.8	50-150			
<i>Surrogate: Tetrachloro-meta-xylene</i>	0.0146		"	0.0200		72.8	50-150			
alpha-BHC	ND	0.005	"							
beta-BHC	ND	0.005	"							
gamma-BHC (Lindane)	ND	0.005	"							
delta-BHC	ND	0.005	"							
Heptachlor	ND	0.005	"							
Aldrin	ND	0.005	"							
Heptachlor epoxide	ND	0.005	"							
gamma-Chlordane	ND	0.005	"							
Endosulfan I	ND	0.005	"							
alpha-Chlordane	ND	0.005	"							
4,4'-DDE	ND	0.005	"							
Dieldrin	ND	0.005	"							
Endrin	ND	0.005	"							
Endosulfan II	ND	0.005	"							
4,4'-DDD	ND	0.005	"							
Endrin aldehyde	ND	0.005	"							
Endosulfan sulfate	ND	0.005	"							
4,4'-DDT	ND	0.005	"							
Endrin Ketone	ND	0.005	"							
Methoxychlor	ND	0.005	"							

**LCS (AXL0044-BS1)**

Prepared & Analyzed: 12/03/14

<i>Surrogate: Decachlorobiphenyl</i>	0.0144		mg/kg	0.0200		71.8	50-150			
<i>Surrogate: Tetrachloro-meta-xylene</i>	0.0110		"	0.0200		55.2	50-150			
gamma-BHC (Lindane)	0.010	0.005	"	0.0200		50.1	50-150			
Heptachlor	0.010	0.005	"	0.0200		50.2	50-150			
Aldrin	0.010	0.005	"	0.0200		50.7	50-150			
Dieldrin	0.025	0.005	"	0.0500		50.0	50-150			
Endrin	0.029	0.005	"	0.0500		57.5	50-150			
4,4'-DDT	0.029	0.005	"	0.0500		57.7	50-150			

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**Pesticides by GC/ECD - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch AXL0044 - EPA 8081A**

**LCS Dup (AXL0044-BSD1)**

Prepared & Analyzed: 12/03/14

<i>Surrogate: Decachlorobiphenyl</i>	0.0177		mg/kg	0.0200		88.4	50-150			
<i>Surrogate: Tetrachloro-meta-xylene</i>	0.0139		"	0.0200		69.7	50-150			
gamma-BHC (Lindane)	0.011	0.005	"	0.0200		56.2	50-150	11.5	25	
Heptachlor	0.012	0.005	"	0.0200		59.9	50-150	17.7	25	
Aldrin	0.012	0.005	"	0.0200		57.9	50-150	13.2	25	
Dieldrin	0.032	0.005	"	0.0500		64.7	50-150	25.7	25	QR-02
Endrin	0.037	0.005	"	0.0500		74.7	50-150	26.0	25	QR-02
4,4'-DDT	0.033	0.005	"	0.0500		66.3	50-150	13.8	25	

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**Total Recoverable Metals - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch AXL0042 - EPA 6010B**

**Blank (AXL0042-BLK1)** Prepared: 12/01/14 Analyzed: 12/03/14

Arsenic	ND	1.0	mg/kg							
Lead	ND	1.0	"							

**LCS (AXL0042-BS1)** Prepared: 12/01/14 Analyzed: 12/03/14

Arsenic	93.8	1.0	mg/kg	100		93.8	80-120			
Lead	94.7	1.0	"	100		94.7	80-120			

**LCS Dup (AXL0042-BSD1)** Prepared: 12/01/14 Analyzed: 12/03/14

Arsenic	94.4	1.0	mg/kg	100		94.4	80-120	0.553	25	
Lead	95.1	1.0	"	100		95.1	80-120	0.443	25	

**Matrix Spike (AXL0042-MS1)** Source: 1411156-01 Prepared: 12/01/14 Analyzed: 12/03/14

Arsenic	91.0	1.0	mg/kg	100	6.09	84.9	75-125			
Lead	84.2	1.0	"	100	6.28	77.9	75-125			

**Matrix Spike Dup (AXL0042-MSD1)** Source: 1411156-01 Prepared: 12/01/14 Analyzed: 12/03/14

Arsenic	90.7	1.0	mg/kg	100	6.09	84.6	75-125	0.330	25	
Lead	83.0	1.0	"	100	6.28	76.7	75-125	1.45	25	

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## Excelchem Environmental Labs

Wallace Kuhl and Associates  
3050 Industrial Blvd.  
West Sacramento, CA 95691

Project: Davis Innovation Park  
Project Number: 10344.0-3  
Project Manager: Greg George

Date Reported:  
12/04/14 15:26

### Notes and Definitions

- Z-01 The surrogate recovery is outside of control limits due to sample matrix interference.
- S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate(s).
- QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
- ND Analyte not detected at the reporting limit.
- NR Not reported

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**Excelchem Environmental Labs**

Wallace Kuhl and Associates  
3050 Industrial Blvd.  
West Sacramento, CA 95691

Project: Davis Innovation Park  
Project Number: 10344.0-3  
Project Manager: Greg George

Date Reported:  
12/04/14 15:26

**Sample Integrity**

**WORK ORDER 1411156**

Date Received: 11/25/14

**Section 1 - Sample Arrival Info.**

Sample Transport: ONTRAC UPS USPS Walk-In EXCELCHEM Courier Fed-Ex Other: \_\_\_\_\_

Transported In: Ice Chest Box Hand

Describe type of packing materials: Bubble Wrap Foam Packing Peanuts Paper Other: \_\_\_\_\_

Has chilling process begun?  N Samples Received: Chilled to Touch / Ambient / On Ice

Temperature of Samples (°C): 10 Ice Chest Temperature(s) (°C): 1

**Section 2 - Bottle/Analysis Info.**

	Yes	No	N/A	Comments
Did all bottles arrive unbroken and intact?	<input checked="" type="checkbox"/>			
Did all bottle labels agree with COC?	<input checked="" type="checkbox"/>			Will use earliest and latest time for composite samples.
Were correct containers used for the tests requested?	<input checked="" type="checkbox"/>			
Were correct preservations used for the tests requested?			<input checked="" type="checkbox"/>	
Was a sufficient amount of sample sent for tests indicated?	<input checked="" type="checkbox"/>			
Were bubbles present in VOA Vials?: (Volatile Methods Only)			<input checked="" type="checkbox"/>	

**Section 3 - Summa/Flow regulator Info.**

Used Summa#:	
Unused Summa#:	<b>N/A</b>
Cleaning Summa#:	
Regulator#:	
Was there any visual damage to summa canisters or flow regulators? Explain.	

**Section 4 - COC Info.**

	Completed		Info From Container		Completed		Comments
	Yes	No			Yes	No	
Was COC Received	<input checked="" type="checkbox"/>			Analysis Requested	<input checked="" type="checkbox"/>		
Date Sampled	<input checked="" type="checkbox"/>			Samples arrived within holding time	<input checked="" type="checkbox"/>		
Time Sampled	<input checked="" type="checkbox"/>			Any hold times less than 72 hrs		<input checked="" type="checkbox"/>	
Sample ID	<input checked="" type="checkbox"/>			Client Name	<input checked="" type="checkbox"/>		
Rush TAT	<input checked="" type="checkbox"/>			Address/Telephone #	<input checked="" type="checkbox"/>		

**Section 5 - Comments / Discrepancies**

Was Client notified of discrepancies: Yes No  Notified by: \_\_\_\_\_

Explanations / Comments:  
\_\_\_\_\_  
\_\_\_\_\_

Samples Labeled by: BV  
Bin #: S3  
COC Scanned/Attached by: BV  
Sample labels reviewed by: \_\_\_\_\_

Filled Barrett Via Date: 11/25/14  
Out by: \_\_\_\_\_ Time: 12:00



**Excelchem Environmental Labs**

Wallace Kuhl and Associates  
3050 Industrial Blvd.  
West Sacramento, CA 95691

Project: Davis Innovation Park  
Project Number: 10344.0-3  
Project Manager: Greg George

Date Reported:  
12/04/14 15:26

Page 1 of 1

**Front Desk**

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**From:** Greg George [ggeorge@wallace-kuhl.com]  
**Sent:** Tuesday, November 25, 2014 10:45 AM  
**To:** Front Desk  
**Cc:** 'Nelson Pi'  
**Subject:** Davis Innovation Park  
**Attachments:** Color\_0064\_0001.pdf

As per the attached COCs, please proceed in analyzing the soil samples from Davis Innovation Park.

Regards,

**Gregory George, PG, CEG**  
*Senior Engineering Geologist*  
**Wallace-Kuhl & Associates**  
916/372-1434 x3458 office  
916/997-5280 mobile

11/25/2014

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**Excelchem Environmental Labs**

Wallace Kuhl and Associates  
3050 Industrial Blvd.  
West Sacramento, CA 95691

Project: Davis Innovation Park  
Project Number: 10344.0-3  
Project Manager: Greg George

Date Reported:  
12/04/14 15:26

Lab No. \_\_\_\_\_ Page 1 of 3

**Chain-of-Custody Record and Analysis Request**

**Project Contact (Handcopy or PDF Tol):**  
Greg George  
Company / Address:  
see above  
Phone No.: see above  
Fax No.: see above  
P.O. No.: 10344.0V-3

**Project Name:**  
Davis Innovation Park  
**Project Address:**  
see above

**Global ID:**  
see above

**EDF Deliverable To (Email Address):**  
see above

**Sampler Signature:**  
*Greg George*

**California EDF Report?**  Yes  No

Recommended but not mandatory to complete this section:  
Sampling Company Log Code:

**Container / Preservative Matrix**

Sample Designation	Date	Time	6-oz Glass Jar	250-ml Poly	500ml Poly	AMBER	NONE	H2SO4	ICE	WATER	SOIL
S1	11-24-14	7:03							X	X	X
S2		7:09							X	X	X
S3		7:20							X	X	X
S4		7:49							X	X	X
S5		7:53							X	X	X
S6		7:57							X	X	X
S7		7:42							X	X	X
S8		7:46							X	X	X
S9		8:07							X	X	X
S10		7:51							X	X	X
S11		8:02							X	X	X
S12		7:56							X	X	X

**Remarks:**  
Total Lead (EPA 8010) C D D  
Total Arsenic (EPA 8010) C D D  
OCs (EPA 8010) C D D  
C - Composite Analysis D - Discrete Analysis

**Relinquished by:** *Greg George* Date: 11/24/14 Time: 7:56  
**Relinquished by:** *Greg George* Date: 11/24/14 Time: 7:56  
**Relinquished by:** *Greg George* Date: 11/25/14 Time: 10:30

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*Greg George*

Laboratory Representative

## **APPENDIX B**

Definitions for Explaining Risk





## Attachment 6: Useful Terms and Definitions for Explaining Risk

*This document was developed for OSWER staff who interface with communities. The definitions included here are not official Agency definitions and this information is not intended to be a standalone document. Instead, we envision staff would adopt definitions in this document to meet their communication needs (e.g., on fact sheets, in risk communication conversations, and other communication methods). The goal of creating this document is to aid field staff in their risk communication efforts and continually build community capacity to engage with EPA.*

\*The term “contaminant” is consistently used throughout the document to mean hazardous substances, pollutants, pollution, and chemicals, unless a legal definition uses another term.

**Acute:** Occurring over a short period of time.

**Acute Exposure:** Exposure to a contaminant within a short time period (24 hours to a few days). During acute exposures, which may occur as a result of an accident or emergency, contaminant concentrations are typically higher than during regular or continuous exposures.

**Acute Risk:** Health risks associated with exposure to a contaminant within a short time period (acute exposure). Acute risk typically occurs in occupational settings where workers are using chemicals as part of their job. Health effects are often reversible. However, exposure may also result in harmful effects to major organs, depending upon the contaminant and its concentration.

**Acute Toxicity:** The ability of a contaminant to cause harmful health effects (sometimes death) soon after exposure within a short time period.

**Acceptable Exposure Level:** This is a legal term defined in the National Contingency Plan (NCP), which is the regulation that promulgates CERCLA (see below for definition). An acceptable exposure level is the “concentration level of a contaminant to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime...” For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent lifetime cancer risk to an individual of between  $10^{-4}$  (1 in 10,000) and  $10^{-6}$  (1 in 1,000,000) using information on the relationship between the dose and response. The  $10^{-6}$  risk level shall be used as the point of departure for determining remediation goals for alternatives when Applicable or Relevant and Appropriate Requirements (ARARs) are not available or are not sufficiently protective because of the presence of multiple contaminants at a site or multiple pathways of exposure.” Sometimes this is referred to as the acceptable risk range (Source: National Oil and Hazardous Substances Pollution Contingency Plan).

Sometimes “acceptable exposure level” is referred to as “acceptable risk.”

*Alternative definition: An “acceptable” risk level (or range) of a contaminant, defined by law, that EPA uses to make cleanup decisions at Superfund sites. This is a risk level (or range) that people can be exposed to, including sensitive populations, without health problems. For carcinogens, the acceptable risk range is between  $10^{-4}$  (1 in 10,000) and  $10^{-6}$  (1 in 1,000,000).*

**Additive Risk Assessment:** A process that considers the aggregate (i.e., additive) ecologic or health risk to a target organ caused by the accumulation of risk from multiple stressors (any physical, chemical, or biological entity that can induce a harmful response) and multiple pathways of exposure.

**Adverse/Harmful Health Effect:** A change in body function (e.g., organ function or cell structure) that might lead to disease or health problems.



**Endpoint:** An observable health effect (e.g., a certain concentration of a contaminant causing liver damage).

**Epidemiology:** Study of the distribution of disease, or other health-related events in human populations.

**Excess Cancer Risk:** The additional risk of cancer from exposure to a contaminant beyond an individual's risk of cancer from everyday life. Excess cancer risk is described in terms of the probability that an exposed individual will develop cancer because of that exposure by age 70. At a Superfund site, excess cancer risks are summed across all contaminants of concern, or COCs, and exposure pathways that contribute to exposure. In general, EPA considers excess cancer risks that are below about 1 chance in 1,000,000 ( $1 \times 10^{-6}$  or  $1E-06$ ) to be so small as to be negligible, and risks above 1 in 1,000 ( $1 \times 10^{-4}$  or  $1E-04$ ) to be sufficiently large that some sort of remediation is desirable. Excess cancer risks that range between  $1E-06$  and  $1E-04$  are generally considered to be "acceptable".

*Alternative definition:* The probability that an individual will contract cancer over a lifetime above and beyond the probability of the general population.

**Exposure:** According to EPA guidance, "contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut) and available for absorption" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition:* Contact with a contaminant by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term (acute) or long-term (chronic).

**Exposure Assessment:** According to EPA guidance, "the determination or estimation (qualitative or quantitative) of the magnitude, frequency, duration, and route of exposure" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition:* The process of finding out how people come into contact with contaminants; how often and for how long; and how much they are in contact with.

