



# AEI Consultants

Environmental & Engineering Services

December 5, 2011

## SOIL INVESTIGATION REPORT

Property Identification:  
Pine Meadows Golf Course  
451 Vine Hill Way  
Martinez, CA 94553

AEI Project No. 301027

Prepared for:  
Mr. Derek Pampe  
DeNova Homes  
1500 Willow Pass Court  
Concord, California 94520

Prepared by:  
AEI Consultants  
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Walnut Creek, CA 94597  
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December 5, 2011

Mr. Derek Pampe  
DeNova Homes  
1500 Willow Pass Court  
Concord, California 94520

Subject: Soil Investigation  
Pine Meadows Golf Course  
451 Vine Hill Way  
Martinez, California 94553  
AEI Project No. 301027

Dear Mr. Pampe:

### INTRODUCTION

This report describes the activities and results of the Soil Investigation performed by AEI Consultants at the above referenced property (Figure 1: Site Location Map). AEI was requested to assess whether shallow soils of the property had been impacted by onsite storage of petroleum hydrocarbons and the historical applications of pesticides associated with prior agricultural / orchard use of the land and of the golf course since the early 1970s. AEI understands that the site is being considered for residential redevelopment.

### SITE DESCRIPTION AND HISTORY

The subject property, which consists of a golf course, pro shop and restaurant, is located on the southwest corner of the intersection between Vine Hill Way and Rolling Hill Way in a residential area of Martinez, California. The property totals approximately 25.9 acres and is improved with a single-story building totaling approximately 2,634 square feet. The subject property is currently occupied by Pine Meadow's Golf Course. On-site operations include golfing, golf course maintenance, retail, and food service activities. In addition to the subject property building, the property is improved with several storage units and maintenance sheds, a pond, asphalt-paved parking areas and associated landscaping.

AEI performed a Phase I Environmental Site Assessment (ESA) for the site, detailed in a report dated October 14, 2011. The ESA identified the following Recognized Environmental Condition (REC). The site has been used as a golf course since 1970 and prior to that as agricultural land/orchard since at least 1939. The use of the properties as a golf course typically involves the application, storage, and mixing of pesticides and herbicides. A pesticide and fertilizer storage shed was observed adjacent to the maintenance building. The chemicals within the storage shed are reportedly utilized to service the golf greens/fairways located on the subject property. Based on the duration of use as a golf course and the tendency of these constituents

to remain in near surface soils, the application and storage of pesticides and herbicides at the subject property may have impacted the subject property.

In addition, a storage shed housing petroleum product (gasoline, diesel, and motor oil) associated with property use was observed approximately 45 feet southwest of the pesticide and fertilizer storage shed during the course of the Phase I ESA.

AEI was requested by the client to assess whether shallow soils of the property had been impacted by onsite storage of petroleum hydrocarbons and the historical applications of pesticides associated with prior agricultural / orchard use of the land and of the gold course since the early 1970s.

## INVESTIGATION ACTIVITIES

AEI performed the sampling activities at the site on November 14, 2011. Prior to sampling, the property was divided into a grid pattern with twenty (20) cells of approximately equal size. Twenty (20) shallow soil samples were collected throughout the property; one (1) from each grid cell (AEI-1 through AEI-20). Due to the possible difference in pesticide use within the putting green areas, four (4) additional shallow soil samples were collected from four randomly selected green areas (AEI-A through AEI-D). Two (2) shallow soil samples were collected immediately adjacent to the petroleum hydrocarbon storage shed (AEI-21 and AEI-22). Two (2) shallow soil samples were collected immediately adjacent to the pesticide and fertilizer storage shed (AEI-23 and AEI-24). In addition, one (1) sludge sample was collected from a northwestern near-shore location from the pond (SLUDGE-A). A total of twenty nine (29) discrete shallow soil samples were collected during the course of the investigation.

Refer to Figures 2 and 3 for the sampling locations.

### Shallow Soil Sample Collection

In each location, a small pit was dug to approximately 6 inches below ground surface (bgs) using a shovel. The samples were then collected into 6 inch by 2 inch brass liner driven into the soil with a wooden mallet. The soil samples were immediately sealed with Teflon tape and plastic caps, labeled, and placed in a cooler with ice to await transportation to the laboratory.

The sludge sample from the pond was collected using an AMS multi-stage sludge sampler and collected from the surface of the sludge/water interface to a depth of approximately 6-inches within the sludge.

Following sample collection, each sampling location was backfilled with soil cuttings and the sampling coordinates logged with a Garmin® Global Positioning System (GPS) device.

### Laboratory Analysis

The soil samples were transported on November 15, 2011 to McCampbell Analytical Inc. (Department of Health Services Certification #1644) of Pittsburgh, California for analysis under chain of custody.

The discrete soil samples collected from throughout the golf course and putting green areas were combined in the laboratory to form six (6) 4-point composite samples. A total of six (6) 4-point composite, two (2) discrete soil samples, and one (1) sludge sample were analyzed for organochlorine pesticides (8080 target list) low-level by EPA Method SW8081A and metals arsenic, total chromium, and lead by EPA Method SW6020. Two (2) soil samples were analyzed for Herbicides by EPA Method SW8151A. Two (2) soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPH-g), diesel (TPH-d), and motor oil (TPH-mo) by EPA Method 8015B. Silica gel cleanup was performed on all diesel and motor oil analyses.

Analytical reports and chain of custody documents are included as Appendix A.

## FINDINGS AND RESULTS

Shallow soil encountered in the sampling locations typically consisted of brown sandy/silty loam. Shallow soil in the putting green areas contained a higher percentage of medium to coarse grained sand. No apparent chemical odors or staining were observed during the collection of the shallow soil samples.

### Soil Sample Analytical Results

Aldrin was detected in one discrete sample at a concentration of 0.00015 milligrams per kilogram (mg/kg). A-chlordane and g-chlordane were detected in the sludge sample at 0.0045 and 0.0031 mg/kg, respectively. Dichlorodiphenyltrichloroethane (DDT) was detected in one composite sample at 0.0047 mg/kg. Dieldrin was detected in the same composite sample at 0.0015 mg/kg. Endosulfan II was detected in one composite sample at 0.00055 mg/kg. No other target pesticides were detected at or exceeding laboratory reporting limits in the samples analyzed. Herbicides were not detected at or exceeding laboratory reporting limits in the two samples analyzed.

TPH-g was detected in one sample at 5.4 mg/kg. TPH-d and TPH-mo were detected in two samples at maximums of 380 mg/kg and 1,100 mg/kg, respectively.

Metals arsenic, total chromium, and lead were detected at concentrations representative of naturally-occurring background conditions<sup>1</sup>.

Soil sample analytical data is presented in Table 1.

## SUMMARY AND CONCLUSIONS

The investigation included the collection and analyses of shallow soil samples from twenty-nine (29) locations throughout the property. AEI was requested to assess whether shallow soils of the property had been impacted by onsite storage of petroleum hydrocarbons and the historical applications of pesticides associated with prior agricultural / orchard use of the land and of the gold course since the early 1970s.

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<sup>1</sup> Protocol for Determining Background Concentrations of Metals in Soil at Lawrence Berkeley National Laboratory (LBNL), University of California for the U.S. Department of Energy, August 1995

Relatively low, trace concentrations of the pesticides DDT, dieldrin, and endosulfan II were detected in the composite samples from the golf course and putting green areas. Aldrin was detected at a low concentration in a sampling location advanced immediately adjacent to the pesticide and fertilizer shed. Low concentrations of  $\alpha$ -chlordane and  $\gamma$ -chlordane were detected in the sludge sample collected from the pond. No other pesticides were detected exceeding laboratory reporting limits in the composite or discrete samples analyzed. Herbicides were not detected in the two sampling locations adjacent to the pesticide and fertilizer shed. Arsenic, total chromium, and lead were detected in the samples analyzed at concentrations representative of naturally-occurring background conditions<sup>1</sup>. However, significant concentrations of heavy-range petroleum hydrocarbons were detected in shallow soil adjacent to the petroleum hydrocarbon storage shed.

For comparison, sample analytical data was compared to the San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs<sup>2</sup>) and Cal-EPA Human Health Screening Levels (CHHSLs<sup>3</sup>) in Table 1. The ESLs selected for comparison were the default residential ESL and CHHSL screening values, as well as the ESL value for residential land use considering a direct exposure pathway. Residential ESLs are primarily calculated assuming 30-year residential exposure via incidental ingestion, dermal contact, and inhalation of airborne chemical constituents from affective soil media. The ESL direct exposure value presented in Table 1 considers residential and construction worker exposure scenarios and is the lowest direct exposure value (target carcinogenic risk of  $1 \times 10^{-6}$  and a hazard quotient of 0.2). None of the pesticide detections in the composite/discrete soil samples or sludge within the pond exceed applicable ESLs or the CHHSLs. Motor oil detected in the borings adjacent to the petroleum hydrocarbon storage shed exceeds both the default and direct exposure ESLs. Diesel detected in one sample adjacent to the petroleum hydrocarbon storage shed, AEI-22-0.5', exceeds both the default and direct exposure ESLs. Although arsenic exceeds the default ESLs and CHHSLs, based on AEI's experience, the observed detections are consistent with naturally-occurring background concentrations commonly observed in the Bay Area and not indicative of an anthropogenic source.

Based on the findings of the investigation, no indication of a significant release of pesticides, herbicides, or metals was identified on the property. No further investigation relating to the current or previous use or storage of pesticides and herbicides on the property is recommended at this time. However, sample analytical results indicate that a release of diesel and oil range petroleum hydrocarbons occurred in the area of the petroleum product storage shed. AEI recommends mitigation of the petroleum impacted soil prior to development. It is expected that mechanical excavation and disposal of impacted soil in the area of the storage shed following its dismantling would be a viable, cost-effective approach to mitigate the release prior to redevelopment. Based on the low mobility of oil in soil, it is expected that impact does not extend beyond a depth of 3 to 4 feet bgs in this area. Confirmation soil samples following excavation would be needed to confirm that the release has been effectively removed.

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<sup>2</sup> *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, California Regional Water Quality Control Board, San Francisco Bay Region, Interim Final, Revised May 2008

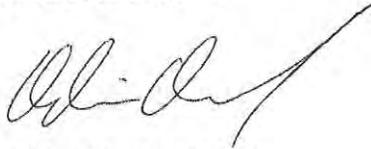
<sup>3</sup> *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*, California Environmental Protection Agency, January 2005 (including revision for Lead, September 2009)

## REPORT LIMITATIONS AND SIGNATURES

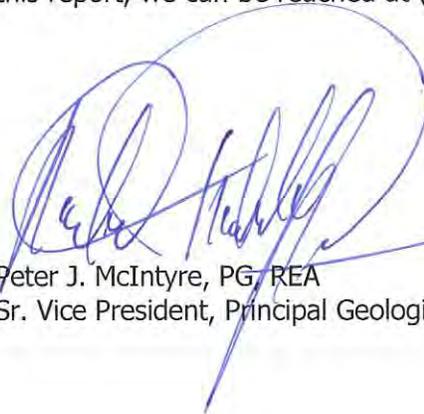
This report presents a summary of work completed by AEI, including observations and descriptions of site conditions. Where appropriate, it includes analytical results for samples taken during the course of the work. The number and location of samples are chosen to provide requested information, but it cannot be assumed that they are entirely representative of all areas not sampled. All conclusions and recommendations are based on these analyses and observations. Conclusions beyond those stated and reported herein should not be inferred from this document.

These services were performed in accordance with generally accepted practices in the environmental engineering and construction field that existed at the time and location of the work. If you have any questions regarding this report, we can be reached at (925) 746-6000.

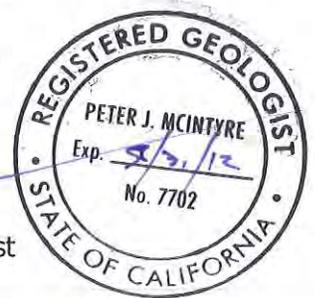
Sincerely,  
**AEI Consultants**



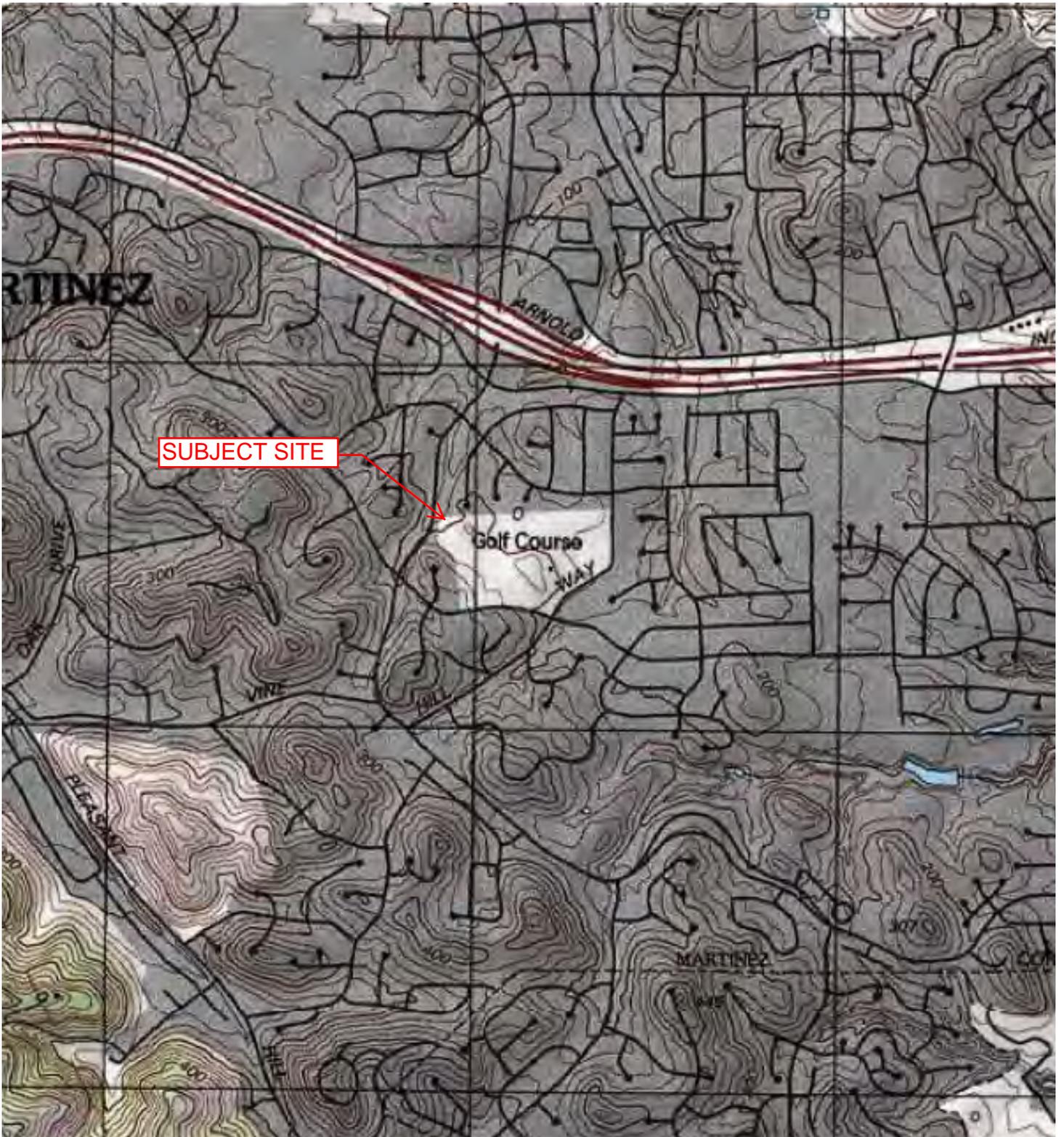
Adrian M. Angel, GIT  
Project Geologist



Peter J. McIntyre, PG, REA  
Sr. Vice President, Principal Geologist



## **FIGURES**



## SITE LOCATION MAP

451 Vine Hill Way, Martinez, California 94553





Figure 3 Inset: Sampling Locations  
AEI-21 through AEI-24

Pine Meadows  
Golf Course

SLUDGE-A

Center Avenue

Vine Hill Way

Morello Avenue

LEGEND

-  Subject Property Boundary
-  AEI Approx. Sampling Location (11/14/2011)
- Locations AEI-A through AEI-D Collected From Putting Green Areas



0' 90' 180'  
APPROX. SCALE: 1 in = ~180 ft

Site Plan

451 Vine Hill Way  
Martinez, California



FIGURE 2  
Job No: 301027



Pesticide & Fertilizer Storage Shed

Petroleum Hydrocarbon Storage Shed

AEI-24

AEI-23

AEI-22

AEI-21

LEGEND



AEI Approx. Sampling Location (11/14/2011)



0' 35'

APPROX. SCALE: 1 in = ~35 ft

Sampling Locations AEI-21 Through 24

451 Vine Hill Way  
Martinez, California

FIGURE 3  
Job No: 301027



## **TABLES**

**Table 1**  
**Soil Sample Analytical Data**  
**Petroleum Hydrocarbons, Organo-chlorine Pesticides, Herbicides, and Select Metals (As, Total Cr, Pb)**  
 AEI Project No. 301027, 451 Vine Hill Way, Martinez, CA

Sample ID	Date Collected	Approx. Depth (feet)	TPH-g mg/kg EPA Method 8015	TPH-d mg/kg EPA Method 8015	TPH-mo mg/kg	Aldrin mg/kg	a-Chlordane mg/kg	g-Chlordane mg/kg	DDT mg/kg EPA Method SW8081A LL	Dieldrin mg/kg	Endosulfan II mg/kg	All other Organo-chlorine Pesticides mg/kg	All Chlorinated Herbicides mg/kg EPA Method SW8151A	As mg/kg EPA Method SW6020	Cr** mg/kg	Pb mg/kg
*AEI-1-0.5', 2-0.5', 5-0.5', 6-0.5'	11/14/2011	0.5	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.00055	<MDL	-	5.6	22	17
*AEI-3-0.5', 4-0.5', 7-0.5', 8-0.5'	11/14/2011	0.5	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<MDL	-	5.5	20	13
*AEI-9-0.5', 10-0.5', 13-0.5', 14-0.5'	11/14/2011	0.5	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<MDL	-	5.6	33	7.5
*AEI-11-0.5', 12-0.5', 15-0.5', 16-0.5'	11/14/2011	0.5	-	-	-	<0.0010	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<MDL	-	5.4	36	9.6
*AEI-17-0.5', 18-0.5', 19-0.5', 20-0.5'	11/14/2011	0.5	-	-	-	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<MDL	-	4.8	26	12
*AEI-A-0.5', B-0.5', C-0.5', D-0.5'	11/14/2011	0.5	-	-	-	<0.0004	<0.0004	<0.0004	0.0047	0.0015	<0.0004	<MDL	-	5.0	45	21
AEI-21-0.5'	11/14/2011	0.5	5.4	67	450	-	-	-	-	-	-	-	-	-	-	-
AEI-22-0.5'	11/14/2011	0.5	<1.0	380	1,100	-	-	-	-	-	-	-	-	-	-	-
AEI-23-0.5'	11/14/2011	0.5	-	-	-	0.00015	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<MDL	<MDL	8.4	41	6.6
AEI-24-0.5'	11/14/2011	0.5	-	-	-	<0.0040	<0.004	<0.004	<0.004	<0.004	<0.004	<MDL	<MDL	6.1	37	5.0
SLUDGE-A	11/14/2011	0.5	-	-	-	<0.0001	0.0045	0.0031	<0.0004	<0.0004	<0.0004	<MDL	-	2.5	15	9.0
CHHSL - Res	-	-	-	-	-	0.033	0.43^	0.43^	1.6	0.035	-	-	-	0.07	-	80
ESL - Default Res	-	-	83	83	370	0.032	0.44^	0.44^	1.7	0.0023	-	-	-	0.39	-	200
ESL - Direct Exposure Scenario (Res)	-	-	110	110	370	0.032	0.44^	0.44^	1.7	0.034	-	-	-	0.39	-	260
RL	-	-	1.0	1.0	5.0	0.0001	0.0004	0.0004	0.0004	0.0004	0.0004	varies	varies	0.5	0.5	0.5

Notes:  
 mg/kg = milligrams per kilogram  
 DDT = dichlorodiphenylchloroethane  
 TPH-g = total petroleum hydrocarbons as gasoline  
 TPH-d = total petroleum hydrocarbons as diesel (with silica gel cleanup)  
 TPH-mo = total petroleum hydrocarbons as motor oil (with silica gel cleanup)  
 As = arsenic, Cr = Total Chromium (unspeciated), Pb = Lead  
 ^ = ESL and CHHSL set for total Chlordane only and not speciated  
 \* = 4-point composite sample  
 \*\* = No ESL or CHHSL set for total chromium  
 RL = reporting limit (before any dilution)  
 MDL = method detection limit  
 CHHSL - Res = California Human Health Screening Levels, Residential Land Use Scenario, November 2007 (Table 1)  
 ESLs - Default Res = Environmental Screening Levels (ESLs) California Regional Water Quality Control Board, residential land use scenario  
 where groundwater is a current or potential source of drinking water (May 2008)  
 ESL - DE = ESL direct exposure scenario

**APPENDIX A**

**Laboratory Analytical Results  
And  
Chain of Custody Documentation**



## Analytical Report

AEI Consultants  2500 Camino Diablo, Ste. #200  Walnut Creek, CA 94597	Client Project ID: #301027; DeNova Homes	Date Sampled: 11/14/11
		Date Received: 11/15/11
	Client Contact: Adrian Angel	Date Reported: 11/22/11
	Client P.O.: #WC083349	Date Completed: 11/22/11

**WorkOrder: 1111521**

November 22, 2011

Dear Adrian:

Enclosed within are:

- 1) The results of the **11** analyzed samples from your project: **#301027; DeNova Homes,**
- 2) A QC report for the above samples,
- 3) A copy of the chain of custody, and
- 4) An invoice for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing McC Campbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius  
 Laboratory Manager  
 McC Campbell Analytical, Inc.

*The analytical results relate only to the items tested.*







WorkOrder: 1111521 ClientCode: AEL

WaterTrax  
  WriteOn  
  Excel  
  Fax  
  Email  
  HardCopy  
  ThirdParty  
  J-flag

**Report to:** Adrian Angel  
 AEI Consultants  
 2500 Camino Diablo, Ste. #200  
 Walnut Creek, CA 94597  
 (408) 559-7600 FAX: (408) 559-7601  
 Email: aangel@aeiconsultants.com  
 cc: #WC083349  
 ProjectNo: #301027; DeNova Homes

**Bill to:** Sara Guerin  
 AEI Consultants  
 2500 Camino Diablo, Ste. #200  
 Walnut Creek, CA 94597  
 sguerin@aeiconsultants.com

Requested TAT: 5 days

Date Received: 11/15/2011  
 Date Printed: 11/15/2011

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)																	
					1	2	3	4	5	6	7	8	9	10	11	12						
1111521-001	AEI-1,2,5,6-0.5'	Soil	11/14/2011 10:20	<input type="checkbox"/>	A																	
1111521-002	AEI-3,4,7,8-0.5'	Soil	11/14/2011 11:00	<input type="checkbox"/>	A																	
1111521-003	AEI-9,10,13,14-0.5'	Soil	11/14/2011 12:30	<input type="checkbox"/>	A																	
1111521-004	AEI-11,12,15,16-0.5'	Soil	11/14/2011 13:10	<input type="checkbox"/>	A																	
1111521-005	AEI-17-18,19,20-0.5'	Soil	11/14/2011 14:31	<input type="checkbox"/>	A																	
1111521-006	AEI-21-0.5'	Soil	11/14/2011 16:18	<input type="checkbox"/>						A												
1111521-007	AEI-22-0.5'	Soil	11/14/2011 16:20	<input type="checkbox"/>						A												
1111521-008	AEI-A,B,C,D-0.5'	Soil	11/14/2011 15:25	<input type="checkbox"/>	A																	
1111521-009	AEI-23-0.5'	Soil	11/14/2011 16:45	<input type="checkbox"/>	A					A												
1111521-010	AEI-24-0.5'	Soil	11/14/2011 16:50	<input type="checkbox"/>	A					A												
1111521-011	SLUDGE-A	Sludge	11/14/2011 17:10	<input type="checkbox"/>						A												

**Test Legend:**

1	8081_S	3	815/A_S	4	METALSMS_S	5	TPH(DMO)WSG_S
6		8		9		10	
11							

The following SampleIDs: 006A, 007A contain testgroup.

Prepared by: Ana Venegas

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days). Hazardous samples will be returned to client or disposed of at client expense.



### Sample Receipt Checklist

Client Name: **AEI Consultants** Date and Time Received: **11/15/2011 8:03:28 PM**  
 Project Name: **#301027; DeNova Homes** Checklist completed and reviewed by: **Ana Venegas**  
 WorkOrder N°: **1111521** Matrix: Sludge/Soil Carrier: Derik Cartan (MAI Courier)

**Chain of Custody (COC) Information**

Chain of custody present? Yes  No   
 Chain of custody signed when relinquished and received? Yes  No   
 Chain of custody agrees with sample labels? Yes  No   
 Sample IDs noted by Client on COC? Yes  No   
 Date and Time of collection noted by Client on COC? Yes  No   
 Sampler's name noted on COC? Yes  No

**Sample Receipt Information**

Custody seals intact on shipping container/cooler? Yes  No  NA   
 Shipping container/cooler in good condition? Yes  No   
 Samples in proper containers/bottles? Yes  No   
 Sample containers intact? Yes  No   
 Sufficient sample volume for indicated test? Yes  No

**Sample Preservation and Hold Time (HT) Information**

All samples received within holding time? Yes  No   
 Container/Temp Blank temperature Cooler Temp: 3.8°C NA   
 Water - VOA vials have zero headspace / no bubbles? Yes  No  No VOA vials submitted   
 Sample labels checked for correct preservation? Yes  No   
 Metal - pH acceptable upon receipt (pH<2)? Yes  No  NA   
 Samples Received on Ice? Yes  No

(Ice Type: WET ICE )

\* NOTE: If the "No" box is checked, see comments below.

-----

Client contacted: Date contacted: Contacted by:

Comments:



AEI Consultants  2500 Camino Diablo, Ste. #200  Walnut Creek, CA 94597	Client Project ID: #301027; DeNova Homes	Date Sampled: 11/14/11
	Client Contact: Adrian Angel	Date Received: 11/15/11
	Client P.O.: #WC083349	Date Extracted: 11/15/11
		Date Analyzed: 11/17/11-11/21/11

**Organochlorine Pesticides by GC-ECD (8080 Basic Target List)\***

Extraction Method: SW3550B

Analytical Method: SW8081A

Work Order: 1111521

Lab ID	1111521-001A	1111521-002A	1111521-003A	1111521-004A	Reporting Limit for DF = 1	
Client ID	AEI-1,2,5,6-0.5'	AEI-3,4,7,8-0.5'	AEI-9,10,13,14-0.5'	AEI-11,12,15,16-0.5'	MDL	RL
Matrix	S	S	S	S		
DF	1	1	1	10		
Compound	Concentration				mg/kg	mg/kg
Aldrin	ND	ND	ND	ND<0.0010	0.0001	0.001
a-BHC	ND	ND	ND	ND<0.0040	0.0004	0.001
b-BHC	ND	ND	ND	ND<0.0040	0.0004	0.001
d-BHC	ND	ND	ND	ND<0.0040	0.0004	0.001
g-BHC	ND	ND	ND	ND<0.0040	0.0004	0.001
Chlordane (Technical)	ND	ND	ND	ND<0.10	0.01	0.025
a-Chlordane	ND	ND	ND	ND<0.0040	0.0004	0.001
g-Chlordane	ND	ND	ND	ND<0.0040	0.0004	0.001
p,p-DDD	ND	ND	ND	ND<0.0040	0.0004	0.001
p,p-DDE	ND	ND	ND	ND<0.0040	0.0004	0.001
p,p-DDT	ND	ND	ND	ND<0.0040	0.0004	0.001
Dieldrin	ND	ND	ND	ND<0.0040	0.0004	0.001
Endosulfan I	ND	ND	ND	ND<0.0040	0.0004	0.001
Endosulfan II	0.00055,J	ND	ND	ND<0.0040	0.0004	0.001
Endosulfan sulfate	ND	ND	ND	ND<0.0040	0.0004	0.001
Endrin	ND	ND	ND	ND<0.0040	0.0004	0.001
Endrin aldehyde	ND	ND	ND	ND<0.0040	0.0004	0.001
Endrin ketone	ND	ND	ND	ND<0.010	0.001	0.001
Heptachlor	ND	ND	ND	ND<0.0040	0.0004	0.001
Heptachlor epoxide	ND	ND	ND	ND<0.0040	0.0004	0.001
Hexachlorobenzene	ND	ND	ND	ND<0.10	0.01	0.01
Hexachlorocyclopentadiene	ND	ND	ND	ND<0.20	0.02	0.02
Methoxychlor	ND	ND	ND	ND<0.010	0.001	0.001
Toxaphene	ND	ND	ND	ND<0.20	0.02	0.05

**Surrogate Recoveries (%)**

% SS:	101	103	112	112	
<b>Comments</b>					

\* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor.

# surrogate diluted out of range or surrogate coelutes with another peak/sample contains surrogate.

J) analyte detected below quantitation limits

a3) sample diluted due to high organic content.



AEI Consultants  2500 Camino Diablo, Ste. #200  Walnut Creek, CA 94597	Client Project ID: #301027; DeNova Homes	Date Sampled: 11/14/11
	Client Contact: Adrian Angel	Date Received: 11/15/11
	Client P.O.: #WC083349	Date Extracted: 11/15/11
		Date Analyzed: 11/17/11-11/21/11

**Organochlorine Pesticides by GC-ECD (8080 Basic Target List)\***

Extraction Method: SW3550B

Analytical Method: SW8081A

Work Order: 1111521

Lab ID	1111521-005A	1111521-008A	1111521-009A	1111521-010A	Reporting Limit for DF = 1	
Client ID	AEI-17-18,19,20-0.5'	AEI-A,B,C,D-0.5'	AEI-23-0.5'	AEI-24-0.5'	MDL	RL
Matrix	S	S	S	S		
DF	1	1	1	10		
Compound	Concentration				mg/kg	mg/kg
Aldrin	ND	ND	0.00015,J	ND<0.0040	0.0001	0.001
a-BHC	ND	ND	ND	ND<0.0040	0.0004	0.001
b-BHC	ND	ND	ND	ND<0.0040	0.0004	0.001
d-BHC	ND	ND	ND	ND<0.0040	0.0004	0.001
g-BHC	ND	ND	ND	ND<0.0040	0.0004	0.001
Chlordane (Technical)	ND	ND	ND	ND<0.10	0.01	0.025
a-Chlordane	ND	ND	ND	ND<0.0040	0.0004	0.001
g-Chlordane	ND	ND	ND	ND<0.0040	0.0004	0.001
p,p-DDD	ND	ND	ND	ND<0.0040	0.0004	0.001
p,p-DDE	ND	ND	ND	ND<0.0040	0.0004	0.001
p,p-DDT	ND	0.0047	ND	ND<0.0040	0.0004	0.001
Dieldrin	ND	0.0015	ND	ND<0.0040	0.0004	0.001
Endosulfan I	ND	ND	ND	ND<0.0040	0.0004	0.001
Endosulfan II	ND	ND	ND	ND<0.0040	0.0004	0.001
Endosulfan sulfate	ND	ND	ND	ND<0.0040	0.0004	0.001
Endrin	ND	ND	ND	ND<0.0040	0.0004	0.001
Endrin aldehyde	ND	ND	ND	ND<0.0040	0.0004	0.001
Endrin ketone	ND	ND	ND	ND<0.010	0.001	0.001
Heptachlor	ND	ND	ND	ND<0.0040	0.0004	0.001
Heptachlor epoxide	ND	ND	ND	ND<0.0040	0.0004	0.001
Hexachlorobenzene	ND	ND	ND	ND<0.10	0.01	0.01
Hexachlorocyclopentadiene	ND	ND	ND	ND<0.20	0.02	0.02
Methoxychlor	ND	ND	ND	ND<0.010	0.001	0.001
Toxaphene	ND	ND	ND	ND<0.20	0.02	0.05

**Surrogate Recoveries (%)**

% SS:	108	119	116	103	
Comments				a3	

\* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor.

# surrogate diluted out of range or surrogate coelutes with another peak/sample contains surrogate.

J) analyte detected below quantitation limits

a3) sample diluted due to high organic content.



AEI Consultants  2500 Camino Diablo, Ste. #200  Walnut Creek, CA 94597	Client Project ID: #301027; DeNova Homes	Date Sampled: 11/14/11
	Client Contact: Adrian Angel	Date Received: 11/15/11
	Client P.O.: #WC083349	Date Extracted: 11/15/11
		Date Analyzed: 11/19/11

**Organochlorine Pesticides by GC-ECD (8080 Basic Target List)\***

Extraction Method: SW3550B

Analytical Method: SW8081A

Work Order: 1111521

Lab ID	1111521-011A				Reporting Limit for DF =1	
Client ID	SLUDGE-A					
Matrix	Sludge					
DF	1					
Compound	Concentration				mg/kg	mg/kg
Aldrin	ND				0.0001	0.001
a-BHC	ND				0.0004	0.001
b-BHC	ND				0.0004	0.001
d-BHC	ND				0.0004	0.001
g-BHC	ND				0.0004	0.001
Chlordane (Technical)	ND				0.01	0.025
a-Chlordane	0.0045				0.0004	0.001
g-Chlordane	0.0031				0.0004	0.001
p,p-DDD	ND				0.0004	0.001
p,p-DDE	ND				0.0004	0.001
p,p-DDT	ND				0.0004	0.001
Dieldrin	ND				0.0004	0.001
Endosulfan I	ND				0.0004	0.001
Endosulfan II	ND				0.0004	0.001
Endosulfan sulfate	ND				0.0004	0.001
Endrin	ND				0.0004	0.001
Endrin aldehyde	ND				0.0004	0.001
Endrin ketone	ND				0.001	0.001
Heptachlor	ND				0.0004	0.001
Heptachlor epoxide	ND				0.0004	0.001
Hexachlorobenzene	ND				0.01	0.01
Hexachlorocyclopentadiene	ND				0.02	0.02
Methoxychlor	ND				0.001	0.001
Toxaphene	ND				0.02	0.05

**Surrogate Recoveries (%)**

% SS:	94			
<b>Comments</b>				

\* water samples in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor.

# surrogate diluted out of range or surrogate coelutes with another peak.

J) analyte detected below quantitation limits



AEI Consultants  2500 Camino Diablo, Ste. #200  Walnut Creek, CA 94597	Client Project ID: #301027; DeNova Homes	Date Sampled: 11/14/11
	Client Contact: Adrian Angel	Date Received: 11/15/11
	Client P.O.: #WC083349	Date Extracted: 11/15/11
		Date Analyzed: 11/22/11

**Chlorinated Herbicides by GC-ECD (Basic Target List)\***

Extraction Method: SW8151A

Analytical Method: SW8151A

Work Order: 1111521

Lab ID	1111521-009A	1111521-010A			Reporting Limit for DF =1	
Client ID	AEI-23-0.5'	AEI-24-0.5'			MDL	RL
Matrix	S	S				
DF	20	10				

Compound	Concentration			mg/kg	mg/kg
Acifluorfen	ND<0.40	ND<0.20		0.02	0.05
Bentazon	ND<0.40	ND<0.20		0.02	0.05
Chloramben	ND<0.40	ND<0.20		0.02	0.05
2,4-D (Dichlorophenoxyacetic acid)	ND<0.40	ND<0.20		0.02	0.05
2,4-DB	ND<0.40	ND<0.20		0.02	0.05
Dalapon	ND<0.40	ND<0.20		0.02	0.05
DCPA (mono & diacid)	ND<0.40	ND<0.20		0.02	0.05
Dicamba	ND<0.40	ND<0.20		0.02	0.05
3,5-Dichlorobenzoic Acid	ND<0.40	ND<0.20		0.02	0.05
Dichloroprop	ND<0.40	ND<0.20		0.02	0.05
Dinoseb (DNBP)	ND<0.40	ND<0.20		0.02	0.05
MCPA	ND<40	ND<20		2.0	5.0
MCPP	ND<40	ND<20		2.0	5.0
4-Nitrophenol	ND<0.40	ND<0.20		0.02	0.05
Pentachlorophenol (PCP)	ND<0.40	ND<0.20		0.02	0.05
Picloram	ND<0.40	ND<0.20		0.02	0.05
2,4,5-T (Trichlorophenoxy acetic acid)	ND<0.40	ND<0.20		0.02	0.05
2,4,5-TP (Silvex)	ND<0.40	ND<0.20		0.02	0.05

**Surrogate Recoveries (%)**

%SS:	77	84		
Comments	a3	a3		

\* water samples are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

# cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

a3) sample diluted due to high organic content.





**McC Campbell Analytical, Inc.**

*"When Quality Counts"*

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AEI Consultants  2500 Camino Diablo, Ste. #200  Walnut Creek, CA 94597	Client Project ID: #301027; DeNova Homes	Date Sampled: 11/14/11
	Client Contact: Adrian Angel	Date Received: 11/15/11
	Client P.O.: #WC083349	Date Extracted: 11/15/11
		Date Analyzed: 11/17/11

**Metals\***

Extraction method: SW3050B

Analytical methods: SW6020

Work Order: 1111521

Lab ID	Client ID	Matrix	Extraction	Arsenic	Chromium	Lead	DF	% SS	Comments
001A	AEI-1,2,5,6-0.5'	S	TOTAL	5.6	22	17	1	104	
002A	AEI-3,4,7,8-0.5'	S	TOTAL	5.5	20	13	1	99	
003A	AEI-9,10,13,14-0.5'	S	TOTAL	5.6	33	7.5	1	105	
004A	AEI-11,12,15,16-0.5'	S	TOTAL	5.4	36	9.6	1	115	
005A	AEI-17-18,19,20-0.5'	S	TOTAL	4.8	26	12	1	120	
008A	AEI-A,B,C,D-0.5'	S	TOTAL	5.0	45	21	1	103	
009A	AEI-23-0.5'	S	TOTAL	8.4	41	6.6	1	124	
010A	AEI-24-0.5'	S	TOTAL	6.1	37	5.0	1	100	
011A	SLUDGE-A	Sludge	TOTAL	2.5	15	9.0	1	96	

Reporting Limit for DF=1; ND means not detected at or above the reporting limit/method detection limit	MDL	TOTAL	0.1	0.1	0.1	mg/kg
	RL	TOTAL	0.5	0.5	0.5	mg/kg

\*water samples are reported in µg/L, product/oil/non-aqueous liquid samples and all TCLP / STLC / DISTLC / SPLP extracts are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter.

# means surrogate diluted out of range; ND means not detected above the reporting limit/method detection limit; N/A means not applicable to this sample or instrument.

TOTAL = Hot acid digestion of a representative sample aliquot.  
 TRM = Total recoverable metals is the "direct analysis" of a sample aliquot taken from its acid-preserved container.  
 DISS = Dissolved metals by direct analysis of 0.45 µm filtered and acidified sample.

%SS = Percent Recovery of Surrogate Standard  
 DF = Dilution Factor



AEI Consultants  2500 Camino Diablo, Ste. #200  Walnut Creek, CA 94597	Client Project ID: #301027; DeNova Homes	Date Sampled: 11/14/11
	Client Contact: Adrian Angel	Date Received: 11/15/11
	Client P.O.: #WC083349	Date Extracted: 11/15/11
		Date Analyzed: 11/21/11

**Total Extractable Petroleum Hydrocarbons with Silica Gel Clean-Up\***

Extraction method: SW3550B/3630C

Analytical methods: SW8015B

Work Order: 1111521

Lab ID	Client ID	Matrix	TPH-Diesel (C10-C23)	TPH-Motor Oil (C18-C36)	DF	% SS	Comments
1111521-006A	AEI-21-0.5'	S	67	450	20	99	e7,e2
1111521-007A	AEI-22-0.5'	S	380	1100	50	107	e7,e2

Reporting Limit for DF =1; ND means not detected at or above the RL/MDL	MDL	1.0	5.0	mg/Kg
	RL	1.0	5.0	mg/Kg

\* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

# cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

%SS = Percent Recovery of Surrogate Standard. DF = Dilution Factor

The following descriptions of the TPH chromatogram are cursory in nature and McC Campbell Analytical is not responsible for their interpretation:  
 e2) diesel range compounds are significant; no recognizable pattern  
 e7) oil range compounds are significant



**QC SUMMARY REPORT FOR SW8081A**

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 62750

WorkOrder: 1111521

EPA Method: SW8081A		Extraction: SW3550B							Spiked Sample ID: 1111515-055A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Aldrin	ND<0.0020	0.020	72.7	73.1	0.575	103	106	2.98	70 - 130	30	70 - 130	30
g-BHC	ND<0.0020	0.020	74.3	71.1	4.44	86.6	88.8	2.41	70 - 130	30	70 - 130	30
p,p-DDT	ND<0.0020	0.050	70.3	70.3	0	78.7	81.7	3.79	70 - 130	30	70 - 130	30
Dieldrin	ND<0.0020	0.050	78.6	78.4	0.290	94.3	97.1	2.95	70 - 130	30	70 - 130	30
Endrin	ND<0.0020	0.050	78.3	77	1.70	96.4	99.1	2.78	70 - 130	30	70 - 130	30
Heptachlor	ND<0.0020	0.020	78.3	79.2	1.13	98	100	2.35	70 - 130	30	70 - 130	30
%SS:	110	0.050	107	107	0	96	100	4.43	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

BATCH 62750 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1111521-001A	11/14/11 10:20 AM	11/15/11	11/17/11 11:41 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% Recovery = 100 * (MS - Sample) / (Amount Spiked)$ ;  $RPD = 100 * (MS - MSD) / ((MS + MSD) / 2)$ .  
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 # surrogate diluted out of range or surrogate coelutes with another peak  
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



**QC SUMMARY REPORT FOR SW8081A**

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 62796

WorkOrder: 1111521

EPA Method: SW8081A		Extraction: SW3550B							Spiked Sample ID: 1111521-010A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Aldrin	ND<0.010	0.020	NR	NR	NR	104	104	0	70 - 130	30	70 - 130	30
g-BHC	ND<0.010	0.020	NR	NR	NR	86.8	87.2	0.527	70 - 130	30	70 - 130	30
p,p-DDT	ND<0.010	0.050	NR	NR	NR	80.2	80.3	0.138	70 - 130	30	70 - 130	30
Dieldrin	ND<0.010	0.050	NR	NR	NR	93.5	94.6	1.13	70 - 130	30	70 - 130	30
Endrin	ND<0.010	0.050	NR	NR	NR	95.8	96.4	0.581	70 - 130	30	70 - 130	30
Heptachlor	ND<0.010	0.020	NR	NR	NR	100	100	0	70 - 130	30	70 - 130	30
%SS:	103	0.050	101	100	1.16	101	101	0	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

BATCH 62796 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1111521-002A	11/14/11 11:00 AM	11/15/11	11/17/11 12:37 PM	1111521-003A	11/14/11 12:30 PM	11/15/11	11/17/11 1:34 PM
1111521-004A	11/14/11 1:10 PM	11/15/11	11/17/11 2:30 PM	1111521-005A	11/14/11 2:31 PM	11/15/11	11/19/11 11:44 AM
1111521-008A	11/14/11 3:25 PM	11/15/11	11/21/11 12:14 PM	1111521-009A	11/14/11 4:45 PM	11/15/11	11/21/11 1:10 PM
1111521-010A	11/14/11 4:50 PM	11/15/11	11/17/11 8:54 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% \text{ Recovery} = 100 * (\text{MS-Sample}) / (\text{Amount Spiked}); \text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2).$   
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 # surrogate diluted out of range or surrogate coelutes with another peak  
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



**QC SUMMARY REPORT FOR SW8081A**

W.O. Sample Matrix: Sludge

QC Matrix: Soil

BatchID: 62796

WorkOrder: 111521

EPA Method: SW8081A		Extraction: SW3550B							Spiked Sample ID: 111521-010A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Aldrin	ND<0.010	0.020	NR	NR	NR	104	104	0	70 - 130	30	70 - 130	30
g-BHC	ND<0.010	0.020	NR	NR	NR	86.8	87.2	0.527	70 - 130	30	70 - 130	30
p,p-DDT	ND<0.010	0.050	NR	NR	NR	80.2	80.3	0.138	70 - 130	30	70 - 130	30
Dieldrin	ND<0.010	0.050	NR	NR	NR	93.5	94.6	1.13	70 - 130	30	70 - 130	30
Endrin	ND<0.010	0.050	NR	NR	NR	95.8	96.4	0.581	70 - 130	30	70 - 130	30
Heptachlor	ND<0.010	0.020	NR	NR	NR	100	100	0	70 - 130	30	70 - 130	30
%SS:	103	0.050	101	100	1.16	101	101	0	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

BATCH 62796 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
111521-011A	11/14/11 5:10 PM	11/15/11	11/19/11 12:40 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% \text{ Recovery} = 100 * (\text{MS-Sample}) / (\text{Amount Spiked}); \text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2).$   
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



**QC SUMMARY REPORT FOR SW8151A**

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 62797

WorkOrder: 1111521

EPA Method: SW8151A		Extraction: SW8151A							Spiked Sample ID: 1111521-009A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
2,4-D (Dichlorophenoxyacetic acid)	ND<1.0	0.10	NR	NR	NR	86	88.7	3.13	60 - 140	30	60 - 140	30
2,4-DB	ND<1.0	0.10	NR	NR	NR	90.2	92.7	2.73	60 - 140	30	60 - 140	30
Dalapon	ND<1.0	0.10	NR	NR	NR	69.2	71.4	3.11	60 - 140	30	60 - 140	30
Dicamba	ND<1.0	0.10	NR	NR	NR	91.6	94.7	3.29	60 - 140	30	60 - 140	30
2,4,5-TP (Silvex)	ND<1.0	0.10	NR	NR	NR	98.3	101	2.61	60 - 140	30	60 - 140	30
%SS:	77	0.10	---#	---#	---#	83	86	3.76	60 - 140	30	60 - 140	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

BATCH 62797 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1111521-009A	11/14/11 4:45 PM	11/15/11	11/22/11 3:01 AM	1111521-010A	11/14/11 4:50 PM	11/15/11	11/22/11 3:58 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% \text{ Recovery} = 100 * (\text{MS-Sample}) / (\text{Amount Spiked}); \text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2).$   
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not applicable or not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.  
 # cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.



**QC SUMMARY REPORT FOR SW8021B/8015Bm**

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 62742

WorkOrder: 1111521

EPA Method: SW8021B/8015Bm		Extraction: SW5030B							Spiked Sample ID: 1111449-002A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH(btex) <sup>£</sup>	ND	0.60	108	114	5.87	120	114	5.16	70 - 130	20	70 - 130	20
MTBE	ND	0.10	86.1	84.1	2.41	91.6	86.1	6.17	70 - 130	20	70 - 130	20
Benzene	ND	0.10	107	108	0.472	113	106	6.42	70 - 130	20	70 - 130	20
Toluene	ND	0.10	107	108	0.667	113	107	6.05	70 - 130	20	70 - 130	20
Ethylbenzene	ND	0.10	107	108	0.609	112	104	8.15	70 - 130	20	70 - 130	20
Xylenes	ND	0.30	109	110	0.884	116	107	8.73	70 - 130	20	70 - 130	20
%SS:	112	0.10	97	91	6.18	93	86	7.89	70 - 130	20	70 - 130	20

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

BATCH 62742 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1111521-006A	11/14/11 4:18 PM	11/15/11	11/21/11 12:27 PM	1111521-007A	11/14/11 4:20 PM	11/15/11	11/19/11 4:50 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% \text{ Recovery} = 100 * (\text{MS-Sample}) / (\text{Amount Spiked}); \text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2).$   
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 £ TPH(btex) = sum of BTEX areas from the FID.  
 # cluttered chromatogram; sample peak coelutes with surrogate peak.  
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



### QC SUMMARY REPORT FOR SW6020

W.O. Sample Matrix: Soil

QC Matrix: Soil

WorkOrder: 1111521

EPA Method: SW6020		Extraction: SW3050B				BatchID: 62773			Spiked Sample ID: 1111521-001A				
Analyte	Sample	Spiked	MS	MSD	MS-MSD	Spiked	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	mg/Kg	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Arsenic	5.6	50	97.3	96	1.19	10	109	107	1.30	75 - 125	20	75 - 125	20
Chromium	22	50	90.1	88.4	1.25	10	104	104	0	75 - 125	20	75 - 125	20
Lead	17	50	93.2	92.2	0.762	10	99.2	98.9	0.273	75 - 125	20	75 - 125	20
%SS:	104	500	103	103	0	500	91	91	0	70 - 130	20	70 - 130	20

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

#### BATCH 62773 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1111521-001A	11/14/11 10:20 AM	11/15/11	11/17/11 7:09 PM	1111521-002A	11/14/11 11:00 AM	11/15/11	11/17/11 3:44 AM
1111521-003A	11/14/11 12:30 PM	11/15/11	11/17/11 3:51 AM	1111521-004A	11/14/11 1:10 PM	11/15/11	11/17/11 3:59 AM
1111521-005A	11/14/11 2:31 PM	11/15/11	11/17/11 4:06 AM	1111521-008A	11/14/11 3:25 PM	11/15/11	11/17/11 4:14 AM
1111521-009A	11/14/11 4:45 PM	11/15/11	11/17/11 4:21 AM	1111521-010A	11/14/11 4:50 PM	11/15/11	11/17/11 4:28 AM
1111521-011A	11/14/11 5:10 PM	11/15/11	11/17/11 4:36 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% \text{ Recovery} = 100 * (\text{MS} - \text{Sample}) / (\text{Amount Spiked})$ ;  $\text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2)$ .  
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not applicable to this method.  
 NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



**QC SUMMARY REPORT FOR SW8015B**

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 62693

WorkOrder: 1111521

EPA Method: SW8015B		Extraction: SW3550B/3630C							Spiked Sample ID: 1111389-097A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH-Diesel (C10-C23)	10	40	94.2	106	8.99	108	109	1.63	70 - 130	30	70 - 130	30
%SS:	98	25	94	108	13.5	97	99	1.89	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

BATCH 62693 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1111521-006A	11/14/11 4:18 PM	11/15/11	11/21/11 1:47 PM	1111521-007A	11/14/11 4:20 PM	11/15/11	11/21/11 12:47 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.  
 $\% \text{ Recovery} = 100 * (\text{MS-Sample}) / (\text{Amount Spiked}); \text{RPD} = 100 * (\text{MS} - \text{MSD}) / ((\text{MS} + \text{MSD}) / 2).$   
 MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.  
 N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
 NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.