

4-17

134

From: "Yu Zeng" <yzeng@sotaenv.com>
To: <dcole@rb4.swrcb.ca.gov>
Date: Thu, Apr 17, 2003 3:41 PM
Subject: Ave TPH Concentration Calculations

Sample Questions Dana,

Jeff at Army Corp discussed with me about the soil sample concentration they provided for the WDR permit application. I feel that if we use the average concentration approach, it will be more accurate to represent the total TPH conc. in soil. Please review the approach below and see what you think.

Thanks, Yu

Yu Zeng (Ph.D., Project Engineer)
SOTA Environmental Technology, Inc.
16835 W Bernardo Dr., Suite 212
San Diego, CA 92127
Tel: 858-485-8100
Fax: 858-485-0812

The average concentration of total TPH is a more representative number for the soil collected at small lower lake. A more representative TPH concentration (average concentration) for the soil collected at small lower lake can be obtained through the following procedure.

First, the results of three soil samples (SS-5, SS-6, and SS-7) collected from small lower lake are used. Each soil sample was measured for TPH as gasoline, diesel, motor oil and volatile organic compounds (VOCs) and the concentrations were added up to obtain the full range total petroleum hydrocarbons.

SS-5 total (ppm) = Gasoline conc. + Diesel conc. + Motor Oil conc. + VOCs conc.

= 2170.1 ppm

SS-6 total (ppm) = 320.03 ppm

SS-7 total (ppm) = 303.07 ppm

Then, Representative TPH conc. in soil (ppm) = (SS-5 total + SS-6 total + SS-7 total) / 3

= 931 ppm

It is clear that the average concentration of 931 ppm is below the WDR landfill disposal limit of 1000 ppm for total TPH (WDR order No. 91-93 ".....An total petroleum hydrocarbons (TPH) shall not exceed an average concentration of 1000 mg/kg.....").

CC: "Armentrout, Jeffery B SPL" <Jeffery.B.Armentrout@spl01.usace.army.mil>

APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result		
				SS-5 02-06533-3	SS-6 02-06533-4	SS-7 02-06533-5
VOLATILE ORGANICS						
Dilution Factor				1.12	1.22	1.1
ACETONE	8260B	µg/kg	50	<6.1	17J	8J
BENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
BROMOBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
BROMOCHLOROMETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
BROMODICHLOROMETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
BROMOFORM	8260B	µg/kg	5	<6.1	<6.5	<5.7
BROMOMETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
METHYL ETHYL KETONE	8260B	µg/kg	100	<120	<130	<110
N-BUTYLBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
SEC-BUTYLBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
T-BUTYLBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
CARBON DISULFIDE	8260B	µg/kg	5	<6.1	<6.5	<5.7
CARBON TETRACHLORIDE	8260B	µg/kg	5	<6.1	<6.5	<5.7
CHLOROBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
DIBROMOCHLOROMETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
CHLOROETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
CHLOROFORM	8260B	µg/kg	5	<6.1	<6.5	<5.7
CHLOROMETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
2-CHLOROTOLUENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
4-CHLOROTOLUENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,2-DIBROMO-3-CHLOROPROPANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,2-DIBROMOETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
DIBROMOMETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,2-DICHLOROBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,3-DICHLOROBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,4-DICHLOROBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
DICHLORODIFLUOROMETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,1-DICHLOROETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,2-DICHLOROETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,1-DICHLOROETHENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
CIS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
TRANS-1,2-DICHLOROETHENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,2-DICHLOROPROPANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,3-DICHLOROPROPANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
2,2-DICHLOROPROPANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,1-DICHLOROPROPENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
CIS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
TRANS-1,3-DICHLOROPROPENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
ETHYLBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
HEXACHLOROBUTADIENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
ISOPROPYLBENZENE (CUMENE)	8260B	µg/kg	5	<6.1	<6.5	<5.7
P-CYMENE (P-ISOPROPYLTOLUENE)	8260B	µg/kg	5	<6.1	<6.5	<5.7

APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result		
				SS-5 02-06533-3	SS-6 02-06533-4	SS-7 02-06533-5
METHYLENE CHLORIDE	8260B	µg/kg	5	6J	6J	9
METHYL ISOBUTYL KETONE	8260B	µg/kg	50	<61	<65	<57
TERT-BUTYL METHYL ETHER	8260B	µg/kg	10	<12	<13	<11
NAPHTHALENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
N-PROPYLBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
STYRENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,1,1,2-TETRACHLOROETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,1,2,2-TETRACHLOROETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
TETRACHLOROETHENE(PCE)	8260B	µg/kg	5	<6.1	<6.5	<5.7
TOLUENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,2,3-TRICHLOROBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,2,4-TRICHLOROBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,1,1-TRICHLOROETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,1,2-TRICHLOROETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
TRICHLOROETHENE (TCE)	8260B	µg/kg	5	<6.1	<6.5	<5.7
TRICHLOROFLUOROMETHANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,2,3-TRICHLOROPROPANE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,2,4-TRIMETHYLBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
1,3,5-TRIMETHYLBENZENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
VINYL CHLORIDE	8260B	µg/kg	5	<6.1	<6.5	<5.7
O-XYLENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
M,P-XYLENE	8260B	µg/kg	5	<6.1	<6.5	<5.7
ORGANOCHLORINE PESTICIDES						
Dilution Factor				1	1	1
ALDRIN	8081A	µg/kg	1.7	<1.8	<1.8	<1.8
BETA BHC	8081A	µg/kg	1.7	<1.8	<1.8	<1.8
ALPHA BHC	8081A	µg/kg	1.7	<1.8	<1.8	<1.8
DELTA BHC	8081A	µg/kg	1.7	<1.8	<1.8	<1.8
GAMMA BHC (LINDANE)	8081A	µg/kg	1.7	<1.8	<1.8	<1.8
ALPHA-CHLORDANE	8081A	µg/kg	1	0.8J	1J	1
GAMMA-CHLORDANE	8081A	µg/kg	1	0.8J	2	1
P,P'-DDD	8081A	µg/kg	3	<3.3	<3.2	3
P,P'-DDE	8081A	µg/kg	3	<3.3	1J	2J
P,P'-DDT	8081A	µg/kg	3	<3.3	<3.2	3J
DIELDRIN	8081A	µg/kg	3	<3.3	<3.2	0.8J
ALPHA ENDOSULFAN	8081A	µg/kg	1.7	<1.8	<1.8	<1.8
BETA ENDOSULFAN	8081A	µg/kg	3	<3.3	<3.2	<3.1
ENDOSULFAN SULFATE	8081A	µg/kg	5	<5.4	<5.3	<5.2
ENDRIN	8081A	µg/kg	3	<3.3	<3.2	<3.1
ENDRIN ALDEHYDE	8081A	µg/kg	3	<3.3	<3.2	<3.1
ENDRIN KETONE	8081A	µg/kg	2	<2.2	<2.1	<2.1
HEPTACHLOR	8081A	µg/kg	1.7	<1.8	<1.8	<1.8
HEPTACHLOR EPOXIDE	8081A	µg/kg	1.7	<1.8	<1.8	<1.8
METHOXYCHLOR	8081A	µg/kg	10	<11	<11	<10
TOXAPHENE	8081A	µg/kg	100	<110	<110	<100

APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result		
				SS-5 02-06533-3	SS-6 02-06533-4	SS-7 02-06533-5
PCBS						
Dilution Factor				1	1	1
PCB-1016 (AROCLOR 1016)	8082	µg/kg	33	< 36	< 35	< 34
PCB-1221 (AROCLOR 1221)	8082	µg/kg	66	< 72	< 70	< 69
PCB-1232 (AROCLOR 1232)	8082	µg/kg	33	< 36	< 35	< 34
PCB-1242 (AROCLOR 1242)	8082	µg/kg	33	< 36	< 35	< 34
PCB-1248 (AROCLOR 1248)	8082	µg/kg	33	< 36	< 35	< 34
PCB-1254 (AROCLOR 1254)	8082	µg/kg	33	< 36	< 35	< 34
PCB-1260 (AROCLOR 1260)	8082	µg/kg	33	10J	9J	9J

Component Analyzed	Method	Unit	PQL	Analysis Result	
				SS-1 02-06533-1	SS-5 02-06533-3
TCLP METAL					
Dilution Factor				2	2
ARSENIC	6010B	µg/L	5	5.7J	9.8J
BARIUM	6010B	µg/L	10	309	678
CADMIUM	6010B	µg/L	2	1.3J	8.9
CHROMIUM	6010B	µg/L	5	3.8J	1.1J
LEAD	6010B	µg/L	5	4.4J	6.5J
Dilution Factor				1	1
MERCURY	7470A	µg/L	0.5	0.047J	0.041J
Dilution Factor				2	2
SELENIUM	6010B	µg/L	10	< 20	< 20
SILVER	6010B	µg/L	10	57.4	1.1J

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit

N.D.: Not Detected or less than the practical quantitation limit.

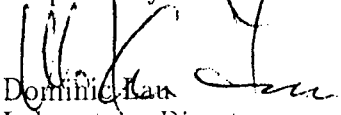
"-": Analysis is not required.

J: Reported between PQL and MDL.

† All results are reported on dry basis for soil samples.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,


 Dominick
 Laboratory Director
 Applied P & Ch Laboratory



SOTA Environmental Technology Inc.
 16835 W. Bernardo Drive, Suite 212
 San Diego, CA 92127-1613
 Tel: (858) 485-8100 Fax: (858) 485-0812

Chain of Custody

02HW013 Page 1 of 3 Please Print in pen

Laboratory Information:				Project Information:				Analysis Items													Remarks		
Lab Name: Applied P & Ch Laboratory				Name: Lowers Lakes, HD FCB, LA, CA																			
Address: 13760 Magnolia Ave.				Proj: 02HW013																			
City: Chino State: CA Zip: 91710				PM: YU ZENG																			
Lab Phone: 1-909-590-1828 Quotation #:				Sampler: MES/DM																			
Due Date: <input checked="" type="checkbox"/> regular <input type="checkbox"/> rush _____ days _____ hours																							
Field Sample ID No.	Sample Description	Date	Time Collected	Sample Matrix	Preservative	# of Container	Type of Container	TPH-G (EPA 8015M)	VOCs, Oxygenates (EPA 8260B)	TCLP Metals (TCLP/6010)	Organo Pesticides (EPA 8081A)	PCBs (EPA 8082)	TPH-d & m (EPA 8015M)	Perchlorate (EPA 314)	13 Assorted Metals (EPA 6010)								
SS-5	Small Lower Lake Shallowest Soil Depth	11/4/02	1155	Soil	5	6	Encore-5g	x	x														
SS-5			1209	Soil	5	1	StainlessSteel Sleeve			x													
SS-5			1214	Soil	5	2	StainlessSteel Sleeve				x	x											
SS-5			1233 1158	Soil	5	2	StainlessSteel Sleeve						x	x									
SS-5			1158	Soil	5	1	StainlessSteel Sleeve									x						6533	
SS-6		11/4/02	1251	Soil	5	6	Encore-5g	x	x														
SS-6		11/4/02	1256	Soil	5	2	StainlessSteel Sleeve				x	x											
SS-6			1301	Soil	5	2	StainlessSteel Sleeve							x	x								
SS-6			1306	Soil	5	1	StainlessSteel Sleeve									x							
QC Requirement: <input type="checkbox"/> Regular <input type="checkbox"/> QA/QC Report <input type="checkbox"/> WIP <input type="checkbox"/> Raw Data <input type="checkbox"/> Extended Raw Data <input type="checkbox"/> CLP <input type="checkbox"/> ACE <input type="checkbox"/> AFCEE <input checked="" type="checkbox"/> NEESA C (E,C or D) <input type="checkbox"/> Other _____ (Please specify)				Sample Disposal: <input type="checkbox"/> Disposal by Lab <input type="checkbox"/> Hold for _____ days after receiving date.				Sample Matrix: 1 Drinking Water, 2 Waste Water, 3 Oil/Organic Liquid, 4 Solid/Soil, 5 Aqueous, 6 Air						Preservative: 1 HCl, 2 HNO3, 3 H2SO4, 4 NaOH, 5 Ice Only, 6 Other_Na2S2O8, 7 Not Preserved									
Sample Conditions: <input type="checkbox"/> Intact <input type="checkbox"/> Broken Cooler Seal: <input type="checkbox"/> Intact <input type="checkbox"/> Broken <input type="checkbox"/> None				Temperature: _____ Degrees C				Relinquished by:				Date/Time: 12/10/02 1715				Received by:				Date/Time: 12/10/02 1715			
Air Bill Number: _____																							



SOTA Environmental Technology Inc.
 16835 W. Bernardo Drive, Suite 212
 San Diego, CA 92127-1613
 Tel: (858) 485-8100 Fax: (858) 485-0812

Chain of Custody

02HW013
 Print in pen Page 2 of 3 Please

Laboratory Information:			Project Information:					Analysis Items										Remarks			
Lab Name: Applied P & Ch Laboratory			Name: Lower Lakes, HD FCB, LA, CA					TPH-G (EPA 8015M)	VOCs, Oxygenates (EPA 8260B)	Organo Pesticides (EPA 8081A)	PCBs (EPA 8082)	TPH-d & m (EPA 8015M)	Perchlorate (EPA 314)	13 Assorted Metals (EPA 6010)							
Address: 13760 Magnolia Ave.			Proj. 02HW013																		
City: Chino State: CA Zip: 91710			PM: YU ZENG																		
Lab Phone: 1-909-590-1828 Quotation #:			Sampler: MES/DM																		
Due Date: <input checked="" type="checkbox"/> regular <input type="checkbox"/> rush _____ days _____ hours			Sample Matrix	Preservative	# of Container	Type of Container															
Field Sample ID No.	Sample	Description	Date Collected	Time Collected																	
SS-7			12/10/02	1+32	Soil	5	6	Encore-5g	x	x											
SS-7			12/10/02	1434	Soil	5	2	Stainless Steel Sleeve			x	x									
SS-7				1454	Soil	5	2	Stainless Steel Sleeve				x	x								
SS-7				1503	Soil	5	1	Stainless Steel Sleeve						x							

6533

QC Requirement: Regular QA/QC Report WIP Raw Data Extended Raw Data CLP ACE AFCEE NEESA C (E, C or D) Other _____ (Please specify)

Sample Disposal: Disposal by Lab Hold for _____ days after receiving date.

Sample Conditions: Intact Broken Cooler Seal: Intact Broken None

Sample Matrix	1 Drinking Water	4 Solid/Soil	Preservative	1 HCl	5 Ice Only
	2 Waste Water	5 Aqueous		2 HNO3	6 Other_Na2S2O8
	3 Oil/Organic Liquid	6 Air		3 H2SO4	7 Not Preserved
				4 NaOH	

Temperature: _____ Degrees C

Relinquished by:	Date/Time 12/10/02 1715	Received by:	Date/Time 12/10/02 1715P
Relinquished by:	Date/Time	Received by:	Date/Time

Air Bill Number:

APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result	
				SS-1	SS-2
				02-06533-1	02-06533-2
PCBS					
Dilution Factor				1	1
PCB-1016 (AROCLOR 1016)	8082	µg/kg	33	<38	<36
PCB-1221 (AROCLOR 1221)	8082	µg/kg	66	<76	<73
PCB-1232 (AROCLOR 1232)	8082	µg/kg	33	<38	<36
PCB-1242 (AROCLOR 1242)	8082	µg/kg	33	<38	<36
PCB-1248 (AROCLOR 1248)	8082	µg/kg	33	<38	<36
PCB-1254 (AROCLOR 1254)	8082	µg/kg	33	<38	<36
PCB-1260 (AROCLOR 1260)	8082	µg/kg	33	<38	<36

Component Analyzed	Method	Unit	PQL	Analysis Result		
				SS-5	SS-6	SS-7
				02-06533-3	02-06533-4	02-06533-5
MOISTURE	ASTM-D2216	%Moisture	0.5	8.0	5.5	3.8
Dilution Factor				1	1	1
PERCHLORATE	314.0	µg/kg	20	<22	<21	<21
PRIORITY POLLUTANT METALS (CWA) (13)						
Dilution Factor				1	1	1
ANTIMONY	6010B	mg/kg	5	<5.4	0.11J	<5.2
ARSENIC	6010B	mg/kg	0.3	3.4	3.4	2.6
BERYLLIUM	6010B	mg/kg	0.2	<0.22	<0.21	<0.21
CADMIUM	6010B	mg/kg	0.2	0.62	0.65	0.61
CHROMIUM	6010B	mg/kg	0.5	13.8	12.0	9.5
COPPER	6010B	mg/kg	0.5	25.4	24.3	13.1
LEAD	6010B	mg/kg	0.3	21.6	29.7	13.5
MERCURY	7471A	mg/kg	0.2	0.081J	0.097J	0.094J
NICKEL	6010B	mg/kg	0.3	16.6	12.3	11.0
SELENIUM	6010B	mg/kg	0.5	<0.54	0.14J	0.16J
SILVER	6010B	mg/kg	0.5	0.15J	0.16J	<0.52
THALLIUM	6010B	mg/kg	0.5	<0.54	<0.53	<0.52
ZINC	6010B	mg/kg	0.5	92.1	86.3	53.1
Dilution Factor				1.16	1.12	1.13
PHC AS GASOLINE	M8015V	mg/kg	1	0.1J	0.03J	0.07J
Dilution Factor				5	5	5
PHC AS DIESEL FUEL	M8015E	mg/kg	10	1,970	120	53
Dilution Factor				5	5	5
MOTOR OILS	M8015E	mg/kg	10	200	200	250

Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL QA/QC Report

Component Name	Analysis Batch #	CCV (µg/l.)	CCV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	Limit %Diff
Organochlorine pesticides												
α-BHC	02G4978	50.0	98	N.D.	µg/kg	-	-	-	-	-	-	-
γ-BHC (Lindane)	02G4978	50.0	100	N.D.	µg/kg	16.7	83	80	81	1	59-111	26
β-BHC	02G4978	50.0	114	N.D.	µg/kg	-	-	-	-	-	-	-
Heptachlor	02G4978	50.0	104	N.D.	µg/kg	16.7	81	78	79	2	40-133	47
δ-BHC	02G4978	50.0	105	N.D.	µg/kg	-	-	-	-	-	-	-
Aldrin	02G4978	50.0	107	N.D.	µg/kg	16.7	86	84	85	0	58-113	28
Heptachlor epoxide	02G4978	50.0	105	N.D.	µg/kg	-	-	-	-	-	-	-
Endosulfan I	02G4978	50.0	101	N.D.	µg/kg	-	-	-	-	-	-	-
4,4'-DDE	02G4978	50.0	100	N.D.	µg/kg	-	-	-	-	-	-	-
Dieldrin	02G4978	50.0	105	N.D.	µg/kg	16.7	82	80	80	0	40-135	47
Endrin	02G4978	50.0	97	N.D.	µg/kg	16.7	81	72	74	3	40-139	50
4,4'-DDD	02G4978	50.0	102	N.D.	µg/kg	-	-	-	-	-	-	-
Endosulfan II	02G4978	50.0	106	N.D.	µg/kg	-	-	-	-	-	-	-
4,4'-DIYF	02G4978	50.0	104	N.D.	µg/kg	16.7	60	73	75	3	40-139	50
Endrin aldehyde	02G4978	50.0	113	N.D.	µg/kg	-	-	-	-	-	-	-
Endosulfan sulfate	02G4978	50.0	104	N.D.	µg/kg	-	-	-	-	-	-	-
Methoxychlor	02G4978	50.0	101	N.D.	µg/kg	-	-	-	-	-	-	-

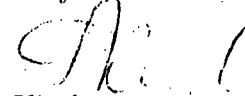
Component Name	Analysis Batch #	CCV (µg/l.)	CCV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	Limit %Diff
PCBs												
Aroclor-1016 (PCB-1016)	02G4979	1000	105	N.D.	µg/kg	167	91	103	102	1	40-139	49
Aroclor-1260 (PCB-1260)	02G4979	1000	96	N.D.	µg/kg	167	90	97	97	1	42-137	47

*: LCS/LCSD is used.

Notation: ICV - Initial Calibration Verification
 CCV - Continuation Calibration Verification
 LCS - Lab Control Spike
 MS - Matrix Spike
 MSD - Matrix Spike Duplicate
 ICS - Interference Check Standard
 MD - Matrix Duplicate
 N.D. - Not detected or less than PQL

CCB - Continuation Calibration Blank
 M-blank - Method Blank
 SP Level - Spike Level
 %Rec - Recovery Percent
 %RPD - Relative Percent Differences
 %Diff - Control Limit for %RPD
 ICP-SD - ICP Serial Dilution
 N.A. - Not Applicable

Respectfully submitted,


 Regina Kirakozova,
 Associate QA/QC Director
 Applied P & Ch Laboratory

Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL QA/QC Report

Component Name	Analysis Batch #	ICV (mg/L)	ICV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	%Diff
METAL Analysis in Soil												
Mercury	02M2462	0.0075	92	N.D.	mg/kg	0.834	110	110	108	2	75-125	20
Antimony	02M2468	4.00	100	N.D.	mg/kg	25.0	105	94	94	0	75-125	20
Arsenic	02M2468	1.00	99	N.D.	mg/kg	25.0	105	98	99	1	75-125	20
Beryllium	02M2468	1.00	101	N.D.	mg/kg	10.0	104	94	93	1	75-125	20
Cadmium	02M2468	2.00	100	N.D.	mg/kg	12.5	106	102	102	0	75-125	20
Chromium	02M2468	1.00	100	N.D.	mg/kg	50.0	107	101	100	1	75-125	20
Copper	02M2468	4.00	101	N.D.	mg/kg	50.0	102	102	101	1	75-125	20
Lead	02M2468	1.00	99	N.D.	mg/kg	150	110	103	103	0	75-125	20
Nickel	02M2468	4.00	100	N.D.	mg/kg	50.0	107	101	100	1	75-125	20
Selenium	02M2468	1.00	99	N.D.	mg/kg	25.0	105	101	100	1	75-125	20
Silver	02M2468	2.00	101	N.D.	mg/kg	50.0	105	104	103	1	75-125	20
Thallium	02M2468	1.00	99	N.D.	mg/kg	25.0	113	102	100	2	75-125	20
Zinc	02M2468	4.00	100	N.D.	mg/kg	25.0	108	102	100	1	75-125	20

Component Name	Analysis Batch #	CCV (mg/L)	CCV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	%Diff
TPH: Diesel												
Diesel	02G4977	1000	90	N.D.	mg/kg	50.0	105	68	74	9	40-138	49
Motor oil/Lubricate oil	02G4977	1000	98	N.D.	mg/kg	-	-	-	-	-	-	-

Component Name	Analysis Batch #	CCV (µg/L)	CCV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	%Diff
Volatile organics												
Vinyl chloride	02G4995	50.0	85	N.D.	µg/kg	-	-	-	-	-	-	-
1,1-Dichloroethene	02G4995	50.0	90	N.D.	µg/kg	50.0	86	87	90	4	65-134	35
Chloroform	02G4995	50.0	86	N.D.	µg/kg	-	-	-	-	-	-	-
Benzene	02G4995	50.0	91	N.D.	µg/kg	50.0	86	86	87	2	70-127	29
1,2-Dichloropropane	02G4995	50.0	91	N.D.	µg/kg	-	-	-	-	-	-	-
Trichloroethene	02G4995	50.0	93	N.D.	µg/kg	50.0	88	86	87	1	65-134	34
Toluene	02G4995	50.0	92	N.D.	µg/kg	50.0	89	88	88	1	78-119	20
Chlorobenzene	02G4995	50.0	93	N.D.	µg/kg	50.0	91	88	89	1	71-126	28
Ethylbenzene	02G4995	50.0	86	N.D.	µg/kg	-	-	-	-	-	-	-

Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL QA/QC Report

Submitted to:
 SOTA Environmental
 Attention: Yu Zeng
 16835 W. Bernardo Dr, Ste. 212
 San Diego, CA 92127
 Tel: (858)485-8100 Fax: (858)485-0812

Service ID #: 801-026533 Received: 12/10/02
 Collected by: MES/DM Tested: 12/11-17/02
 Collected on: 12/10/02 Reported: 01/09/03
 Sample description:
 Soil
 Project: Lower Lakes /02HW013

Analysis of Soil

801-026533QC

Component Name	Analysis Batch #	CCV (mg/L)	CCV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	Limit %Diff
WET Analysis in Soil												
Perchlorate	02W5654	0.05	111	N.D.	mg/kg	0.25	106	92	90	2	75-125	20

Component Name	Analysis Batch #	ICV (mg/L)	ICV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	Limit %Diff
METAL Analysis in Water												
Mercury	02M2454	0.0075	101	N.D.	mg/L	0.0050	100	98	98	0	75-125	20
Arsenic	02M2452	1.00	101	N.D.	mg/L	0.500	105	106	106	0	75-125	20
Barium	02M2452	10.0	100	N.D.	mg/L	4.00	110	107	107	0	75-125	20
Cadmium	02M2452	2.00	98	N.D.	mg/L	0.250	106	104	104	0	75-125	20
Chromium	02M2452	1.00	98	N.D.	mg/L	1.00	105	102	102	0	75-125	20
Copper	02M2452	4.00	98	N.D.	mg/L	1.00	102	95	96	0	75-125	20
Lead	02M2452	1.00	99	N.D.	mg/L	3.00	110	106	106	0	75-125	20
Nickel	02M2452	4.00	98	N.D.	mg/L	1.00	108	99	99	0	75-125	20
Selenium	02M2452	1.00	100	N.D.	mg/L	0.500	105	102	102	0	75-125	20
Silver	02M2452	2.00	98	N.D.	mg/L	1.00	101	99	99	0	75-125	20
Thallium	02M2452	1.00	98	N.D.	mg/L	0.500	110	106	106	0	75-125	20
Zinc	02M2452	4.00	98	N.D.	mg/L	0.500	105	100	100	0	75-125	20

Component Name	Analysis Batch #	CCV (µg/L)	CCV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	Limit %Diff
Gasoline												
Gasoline	02G4973	1000	101	N.D.	mg/L	0.810	106	109	114	4	65-134	35

TABLE 1
Summary of Soil Sample Analytical Results

Boring ID	PQL	SS-1	SS-2	SS-3	SS-4	QC-1	SS-5	SS-6	SS-7	BG-1
Sample Depth		3 ft bs		3 ft bs	3 ft bs					4 ft bs
Date		12/10/02	12/10/02	12/11/02	12/11/02	12/11/02	12/10/02	12/10/02	12/10/02	12/11/02
<u>Petroleum Hydrocarbon Compounds</u>										
Gasoline (8015M) mg/kg	1	<0.9J	0.02J	0.02J	0.03J	<0.95	0.1J	0.03J	0.07J	0.07J
Diesel (8015M) mg/kg	10	<0.9J	5J	11	0.9J	<11	1970	120	53	1J
Motor Oils (8015M) mg/kg	10	8J	31	9J	9J	13	200	200	250	30
<u>TTLIC 17 Metals</u>										
Antimony - mg/kg	5	<5.7	<5.5	<5.5	<5.4	<5.8	<5.4	0.11J	<5.2	<5.3
Arsenic - mg/kg	0.3	2.20	3	1.8	2	3.9	3.4	3.4	2.6	1.2
Beryllium - mg/kg	0.2	<0.23	<0.22	<0.22	<0.22	<0.21	<0.22	<0.21	<0.21	<0.21
Cadmium - mg/kg	0.2	0.048J	0.05J	0.034J	0.07J	0.034J	0.62	0.65	0.61	<0.21
Chromium - mg/kg	0.5	12.90	18.2	13.8	9.2	9.3	13.8	12	9.5	8.2
Copper - mg/kg	0.5	10.90	14.4	11	9.6	9.1	25.4	24.3	13.1	10.1
Lead - mg/kg	0.3	4.40	5.2	3.9	4.4	3.2	21.6	29.7	13.5	2.8
Mercury - mg/kg	0.2	0.089J	0.13J	0.11J	0.14J	0.12J	0.081J	0.097J	0.094J	0.058J
Nickel - mg/kg	0.3	9.20	13.2	9.2	7.2	5.8	16.6	12.3	11	5.9
Selenium - mg/kg	0.5	<0.57	<0.55	<0.55	<0.54	<0.53	<0.54	0.14J	0.16J	<0.53
Silver - mg/kg	0.5	<0.57	<0.55	<0.55	<0.54	0.19J	0.15J	0.16J	<0.52	<0.53
Thallium - mg/kg	0.5	<0.57	<0.55	<0.55	<0.54	<0.53	<0.54	<0.53	<0.52	<0.53
Zinc - mg/kg		32.00	39	32.3	27.2	26.9	92.1	86.3	53.1	28.3

Notes:

J- Reported between PQL and MDL

bs - Below Surface

PQL - Practical Quantive Limits

MDL - Method Detection Limit

TABLE 2
Groundwater Analysis Results

Sample ID	Date 2002	Depth Feet Below Surface	TPH-g (µg/L)	TPH-d (µg/L)	Motor Oil (µg/L)	Benzene 8260B (µg/L)	Toluene 8260B (µg/L)	Ethylbenzene 8260B (µg/L)	Xylenes 8260B (µg/L)	MTBE 8260B (µg/L)	Perchlorate 314 (µg/L)
SW-1-1	12/11	2.0	20J	<480	<480	<5	<5	<5	<5	<50	<4
SW-1-2	12/11	3.5	20J	<480	40J	<5	<5	<5	<5	<50	<4
QC-2	12/11		30J	<480	<480	<5	<5	<5	<5	<50	NA
SW-1-3	12/11	3"	20J	<480	30J	<5	<5	<5	<5	<50	<4
SW-2-1	12/11	3.0	30J	<480	<480	<5	<5	<5	<5	<50	<4
SW-2-2	12/11	3"	20J	<480	<480	<5	<5	<5	<5	<50	<4
SW-3-1	12/11	3.0	20J	<480	<480	<5	<5	<5	<5	<50	<4
SW-3-2	12/11	3"	20J	<480	<480	<5	<5	<5	<5	<50	<4
SW-4-1	12/12	11.5	20J	<480	20J	<5	<5	<5	<5	<50	<4
SW-4-2	12/12	6.0	20J	<480	<480	<5	<5	<5	<5	<50	<4
SW-4-3	12/12	3"	30J	<480	<480	<5	<5	<5	<5	<50	<4
SW-5-1	12/12	13.0	20J	20J	<480	<5	<5	<5	<5	<50	<4
SW-5-2	12/12	6.5	20J	20J	50J	<5	<5	<5	<5	<50	<4
SW-5-3	12/12	3"	20J	<480	<480	<5	<5	<5	<5	<50	<4
SW-6-1	12/12	10.0	20J	<480	20J	<5	<5	<5	<5	<50	<4
SW-6-2	12/12	5.5	20J	<480	<480	<5	<5	<5	<5	<50	<4
SW-6-3	12/12	3"	30J	<480	<480	<5	<5	<5	<5	<50	<4
QC-3	12/12		20J	<480	<480	<5	<5	<5	<5	<50	<4

Notes:

J - Reported between PQL and MDL

NA - Not Analyzed

PQL - Practical Quantive Limits

TABLE 3
Summary of Groundwater Analysis Results

	Method	Unit	SW-1-1	SW-1-2	QC-2	SW-1-3	SW-2-1	SW-2-2	SW-3-1	SW-3-2	SW-4-1	SW-4-2
Biological Oxygen Demand (BOD)	405.1	mg-O ₂ /L	0.84J	1.2J	NA	1.1J	1.2J	0.9J	.89J	1J	.93J	<2
Chloride	325.3	mg/L	33.5	29	NA	32	29.5	31	33	31.5	24	22
Nitrate (NO ₃) as N	353.3	mg/L	1.2	1.2	NA	1	1.1	1.1	1.1	1.1	1.1	1.2
Nitrate (NO ₂) as N	354.1	mg/L	0.017J	0.017J	NA	0.017J	0.017J	0.017J	0.017J	0.016J	0.022	0.019J
pH	9040B		7.86	7.8	NA	7.84	7.68	7.78	7.86	7.85	7.56	7.59
Solids, Settleable (SS)	160.5	mL/L-hr	<.2	<.2	NA	<.2	<.2	<.2	<.2	<.2	<.2	<.2
Solids, Total Dissolved (TDS)	160.1	mg/L	317	309	NA	311	322	323	333	312	396	365
Solids, Total Suspended (TSS)	160.2	mg/L	12	10	NA	9	10	9	11	6	4	6
Sulfate (SO ₄)	375.4	mg/L	70.5	62.2	NA	63.3	49.8	53.4	65.4	65.7	70.9	76.6
Sulfide Dissolved	376.2	mg/L	<.2	<.2	NA	<.2	<.2	<.2	<.2	<.2	<.2	<.2
Total Coliform	SM9221B	MPN/100mL	90	50	NA	140	80	300	50	50	27	130
Fecal Coliform	SM9221E	MPN/100mL	90	50	NA	140	23	50	50	30	13	23

Notes:
 J - Reported between PQL and MDL
 NA - Not Analyzed
 PQL - Practical Quantive Limits
 MDL - Method Detection Limit

TABLE 3
Summary of Groundwater Analysis Results

	Method	Unit	SW-4-3	SW-5-1	SW-5-2	SW-5-3	SW-6-1	SW-6-2	SW-6-3	QC-3
Biological Oxygen Demand (BOD)	405.1	mg-O ₂ /L	<2	<2	<2	<2	.78J	<2	.68J	NA
Chloride	325.3	mg/L	24	23	22	23	25.5	23	22	NA
Nitrate (NO ₃) as N	353.3	mg/L	1.3	1.1	1.2	1.3	1.1	1.2	1.3	NA
Nitrate (NO ₂) as N	354.1	mg/L	0.021	0.021	0.024	0.024	0.02	0.018J	0.017J	NA
pH	9040B		7.55	7.58	7.6	7.61	7.62	7.62	7.63	NA
Solids, Settleable (SS)	160.5	mL/L-hr	<2	<2	<2	<2	<2	<2	<2	NA
Solids, Total Dissolved (TDS)	160.1	mg/L	372	359	369	358	389	406	396	NA
Solids, Total Suspended (TSS)	160.2	mg/L	5	5	3J	3J	4	3J	3J	NA
Sulfate (SO ₄)	375.4	mg/L	104	118	84.2	89.7	101	94.3	87.4	NA
Sulfide Dissolved	376.2	mg/L	<2	<2	<2	<2	<2	<2	<2	NA
Total Coliform	SM9221B	MPN/100mL	13	27	13	80	110	11	110	NA
Fecal Coliform	SM9221E	MPN/100mL	13	2	13	9	<2	7	<2	NA

Notes:

J - Reported between PQL and MDL

NA - Not Analyzed

PQL - Practical Quantive Limits

MDL - Method Detection Limit

TABLE 4
Summary of Groundwater Analysis Results

Boring ID	SW-1-1	SW-1-2	QC-2	SW-1-3	SW-2-1	SW-2-2	SW-3-1	DW-3-2	SW-4-1	SW-4-2	SW-4-3
TTLIC 17 Metals											
Antimony - µg/L	<10	<10	<10	<10	<10	3.5J	<10	<10	<10	3.3J	3.0J
Arsenic - µg/L	<5	<5	2.9J	2.3J	<5	2.3J	<5	3.2J	<5	<5	4J
Beryllium - µg/L	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Cadmium - µg/L	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chromium - µg/L	4.2J	2.9J	2.8J	0.68J	3.3J	<5	4.8J	1.0J	0.94J	2.1J	1.3J
Copper - µg/L	2.6J	2.1J	2.8J	1.2J	1.9J	1.0J	1.2J	1.6J	2.6J	2.8J	1.9J
Lead - µg/L	0.75J	<5	<5	<5	0.96J	<5	0.78J	<5	1.2J	23.7	1.7J
Mercury - µg/L	<.5	<.5	<.5	0.17J	0.14J	0.13J	<.5	0.19J	0.039J	0.047J	0.03J
Nickel - µg/L	8.3	18J	2.6J	0.86J	3.4J	<5	4.1J	2.2J	2J	2.7J	1.3J
Selenium - µg/L	<10	4.4J	<10	<10	<10	3.1J	<10	<10	<10	<10	<10
Silve - µg/L	<10	<10	0.53J	<10	<10	<10	0.51J	<10	.51J	<10	<10
Thallium - µg/L	3.6J	24J	3.3J	3.5J	3.1J	3.0J	2.3J	4.3J	4.1J	5.2J	2.1J
Zinc - µg/L	73.7	53.2	67.7	12.4	41.7	25.5	51.5	24.3	16.7	41.6	35.3

Notes:

J- Reported Between PQL and MDL

PQL - Practical Quantive Limits

MDL - Method Detection Limit

TABLE 4
Summary of Groundwater Analysis Results

Boring ID	SW-5-1	SW-5-2	SW-5-3	SW-6-1	SW-6-2	SW-6-3	QC-3
TTLIC 17 Metals							
Antimony - µg/L	3.9J	3.25	5.5J	4J	4.2J	3.8J	3.2J
Arsenic - µg/L	<5	2.7J	<5	1.8J	<5	<5	<5
Beryllium - µg/L	<2	<2	<2	<2	<2	<2	<2
Cadmium - µg/L	<2	<2	<2	<2	<2	<2	<2
Chromium - µg/L	.53J	.86J	<5	.77J	<5	0.49J	.83J
Copper - µg/L	3.3J	1.3J	1J	1.7J	1.3J	16J	3.7J
Lead - µg/L	2.1J	2J	1.4J	1.5J	2.2J	.86J	1.1J
Mercury - µg/L	0.034J	0.029J	.035J	0.031J	0.036J	0.072J	0.034J
Nickel - µg/L	1.4J	4.2J	6.9	3J	2.1J	3.4J	4.4J
Selenium - µg/L	<10	<10	4.4J	3.8J	<10	3.2J	<10
Silve - µg/L	<10	<10	<10	<10	<10	<10	<10
Thallium - µg/L	3.43	2J	4.3J	1.6J	2.3J	2.7J	4.6J
Zinc - µg/L	37.3	22.9	7.6J	10J	41.7	8.4J	17.6

Notes:

J- Reported Between PQL and MI

PQL - Practical Quantive Limits

MDL - Method Detection Limit