

September 17, 2009

Michele Woods  
AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

Subject: **Calscience Work Order No.: 09-09-0198**  
Client Reference: **Sediment Sampling**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 9/2/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in black ink that reads 'Vikas Patel'.

Calscience Environmental  
Laboratories, Inc.  
Vikas Patel  
Project Manager

# Analytical Report



AECOM Environment  
 3995 Via Oro Avenue  
 Long Beach, CA 90810-1869

Date Received: 09/02/09  
 Work Order No: 09-09-0198  
 Preparation: EPA 3050B  
 Method: EPA 6010B  
 Units: mg/kg

Project: Sediment Sampling

Page 1 of 1

Client Sample Number	Lab Sample Number	Date /Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
R8-090209	09-09-0198-1-A	09/02/09 08:35	Solid	ICP 5300	09/04/09	09/08/09 19:55	090904L01

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Cadmium	0.597	0.500	1		Lead	47.8	0.500	1	
Chromium	33.2	0.250	1		Nickel	10.2	0.250	1	
Copper	43.1	0.500	1		Zinc	250	1.00	1	

R7-090109	09-09-0198-2-A	09/01/09 11:29	Solid	ICP 5300	09/04/09	09/08/09 19:56	090904L01
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Cadmium	ND	0.500	1		Lead	54.5	0.500	1	
Chromium	62.1	0.250	1		Nickel	7.78	0.250	1	
Copper	50.8	0.500	1		Zinc	191	1.00	1	

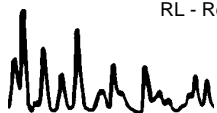
R6-090109	09-09-0198-3-A	09/01/09 14:54	Solid	ICP 5300	09/04/09	09/08/09 19:57	090904L01
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Cadmium	0.742	0.500	1		Lead	189	0.500	1	
Chromium	179	0.250	1		Nickel	27.4	0.250	1	
Copper	468	0.500	1		Zinc	317	1.00	1	

Method Blank	097-01-002-12,705	N/A	Solid	ICP 5300	09/04/09	09/04/09 11:59	090904L01
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Cadmium	ND	0.500	1		Lead	ND	0.500	1	
Chromium	ND	0.250	1		Nickel	ND	0.250	1	
Copper	ND	0.500	1		Zinc	ND	1.00	1	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



# Analytical Report



AECOM Environment  
 3995 Via Oro Avenue  
 Long Beach, CA 90810-1869

Date Received: 09/02/09  
 Work Order No: 09-09-0198  
 Preparation: EPA 3550B  
 Method: EPA 8015B (M)  
 Units: mg/kg

Project: Sediment Sampling

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
R8-090209	09-09-0198-1-A	09/02/09 08:35	Solid	GC 47	09/04/09	09/04/09 19:07	090904B04

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
C6	ND		10		C21-C22	19		10	
C7	4.9		10		C23-C24	31		10	
C8	ND		10		C25-C28	78		10	
C9-C10	2.1		10		C29-C32	120		10	
C11-C12	1.2		10		C33-C36	150		10	
C13-C14	2.7		10		C37-C40	120		10	
C15-C16	3.4		10		C41-C44	70		10	
C17-C18	15		10		C6-C44 Total	630	50	10	
C19-C20	14		10						
Surrogates:	REC (%)	Control Limits		Qual					
Decachlorobiphenyl	127	61-145							

R7-090109	09-09-0198-2-A	09/01/09 11:29	Solid	GC 47	09/04/09	09/04/09 19:23	090904B04
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
C6	ND		5		C21-C22	12		5	
C7	1.8		5		C23-C24	13		5	
C8	ND		5		C25-C28	39		5	
C9-C10	ND		5		C29-C32	56		5	
C11-C12	ND		5		C33-C36	60		5	
C13-C14	0.63		5		C37-C40	36		5	
C15-C16	2.5		5		C41-C44	16		5	
C17-C18	4.4		5		C6-C44 Total	250	25	5	
C19-C20	8.5		5						
Surrogates:	REC (%)	Control Limits		Qual					
Decachlorobiphenyl	111	61-145							

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

# Analytical Report



AECOM Environment  
 3995 Via Oro Avenue  
 Long Beach, CA 90810-1869

Date Received: 09/02/09  
 Work Order No: 09-09-0198  
 Preparation: EPA 3550B  
 Method: EPA 8015B (M)  
 Units: mg/kg

Project: Sediment Sampling

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
R6-090109	09-09-0198-3-A	09/01/09 14:54	Solid	GC 47	09/04/09	09/04/09 19:39	090904B04

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
C6	ND		5		C21-C22	190		5	
C7	5.8		5		C23-C24	160		5	
C8	10		5		C25-C28	270		5	
C9-C10	65		5		C29-C32	260		5	
C11-C12	77		5		C33-C36	200		5	
C13-C14	130		5		C37-C40	120		5	
C15-C16	160		5		C41-C44	56		5	
C17-C18	230		5		C6-C44 Total	2100	25	5	
C19-C20	210		5						
Surrogates:	REC (%)	Control Limits		Qual					
Decachlorobiphenyl	121	61-145							

Method Blank	099-12-275-2,925	N/A	Solid	GC 47	09/04/09	09/04/09 14:02	090904B04
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Parameter	Result	RL	DF	Qual
TPH as Diesel	ND	5.0	1	
Surrogates:	REC (%)	Control Limits		Qual
Decachlorobiphenyl	128	61-145		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

# Analytical Report



AECOM Environment  
 3995 Via Oro Avenue  
 Long Beach, CA 90810-1869

Date Received: 09/02/09  
 Work Order No: 09-09-0198  
 Preparation: EPA 3545  
 Method: EPA 8270C  
 Units: mg/kg

Project: Sediment Sampling

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
R8-090209	09-09-0198-1-A	09/02/09 08:35	Solid	GC/MS P	09/03/09	09/09/09 22:02	090903L09

Comment(s): -The reporting limit is elevated resulting from matrix interference.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Naphthalene	ND	5.0	10		Pyrene	ND	5.0	10	
2-Methylnaphthalene	ND	5.0	10		Benzo (a) Anthracene	ND	5.0	10	
1-Methylnaphthalene	ND	5.0	10		Chrysene	ND	5.0	10	
Acenaphthylene	ND	5.0	10		Benzo (k) Fluoranthene	ND	5.0	10	
Acenaphthene	ND	5.0	10		Benzo (b) Fluoranthene	ND	5.0	10	
Fluorene	ND	5.0	10		Benzo (a) Pyrene	ND	5.0	10	
Phenanthrene	ND	5.0	10		Indeno (1,2,3-c,d) Pyrene	ND	5.0	10	
Anthracene	ND	5.0	10		Dibenz (a,h) Anthracene	ND	5.0	10	
Fluoranthene	ND	5.0	10		Benzo (g,h,i) Perylene	ND	5.0	10	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2-Fluorophenol	72	42-120			Phenol-d6	69	46-118		
Nitrobenzene-d5	81	42-150			2-Fluorobiphenyl	71	38-134		
2,4,6-Tribromophenol	61	36-132			p-Terphenyl-d14	87	35-167		

R7-090109	09-09-0198-2-A	09/01/09 11:29	Solid	GC/MS P	09/03/09	09/09/09 01:04	090903L09
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Comment(s): -The reporting limit is elevated resulting from matrix interference.

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Naphthalene	ND	5.0	10		Pyrene	ND	5.0	10	
2-Methylnaphthalene	ND	5.0	10		Benzo (a) Anthracene	ND	5.0	10	
1-Methylnaphthalene	ND	5.0	10		Chrysene	ND	5.0	10	
Acenaphthylene	ND	5.0	10		Benzo (k) Fluoranthene	ND	5.0	10	
Acenaphthene	ND	5.0	10		Benzo (b) Fluoranthene	ND	5.0	10	
Fluorene	ND	5.0	10		Benzo (a) Pyrene	ND	5.0	10	
Phenanthrene	ND	5.0	10		Indeno (1,2,3-c,d) Pyrene	ND	5.0	10	
Anthracene	ND	5.0	10		Dibenz (a,h) Anthracene	ND	5.0	10	
Fluoranthene	ND	5.0	10		Benzo (g,h,i) Perylene	ND	5.0	10	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2-Fluorophenol	73	42-120			Phenol-d6	64	46-118		
Nitrobenzene-d5	79	42-150			2-Fluorobiphenyl	70	38-134		
2,4,6-Tribromophenol	59	36-132			p-Terphenyl-d14	90	35-167		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

# Analytical Report



AECOM Environment  
 3995 Via Oro Avenue  
 Long Beach, CA 90810-1869

Date Received: 09/02/09  
 Work Order No: 09-09-0198  
 Preparation: EPA 3545  
 Method: EPA 8270C  
 Units: mg/kg

Project: Sediment Sampling

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
R6-090109	09-09-0198-3-A	09/01/09 14:54	Solid	GC/MS P	09/03/09	09/09/09 01:35	090903L09

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Naphthalene	ND	5.0	10		Pyrene	47	5.0	10	
2-Methylnaphthalene	5.7	5.0	10		Benzo (a) Anthracene	5.9	5.0	10	
1-Methylnaphthalene	ND	5.0	10		Chrysene	5.9	5.0	10	
Acenaphthylene	8.6	5.0	10		Benzo (k) Fluoranthene	ND	5.0	10	
Acenaphthene	ND	5.0	10		Benzo (b) Fluoranthene	ND	5.0	10	
Fluorene	ND	5.0	10		Benzo (a) Pyrene	ND	5.0	10	
Phenanthrene	ND	5.0	10		Indeno (1,2,3-c,d) Pyrene	ND	5.0	10	
Anthracene	ND	5.0	10		Dibenz (a,h) Anthracene	ND	5.0	10	
Fluoranthene	12	5.0	10		Benzo (g,h,i) Perylene	ND	5.0	10	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>
2-Fluorophenol	64	42-120			Phenol-d6	64	46-118		
Nitrobenzene-d5	81	42-150			2-Fluorobiphenyl	66	38-134		
2,4,6-Tribromophenol	59	36-132			p-Terphenyl-d14	91	35-167		

<b>Method Blank</b>	<b>099-12-549-930</b>	<b>N/A</b>	<b>Solid</b>	<b>GC/MS P</b>	<b>09/03/09</b>	<b>09/08/09 14:39</b>	<b>090903L09</b>
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Naphthalene	ND	0.50	1		Pyrene	ND	0.50	1	
2-Methylnaphthalene	ND	0.50	1		Benzo (a) Anthracene	ND	0.50	1	
1-Methylnaphthalene	ND	0.50	1		Chrysene	ND	0.50	1	
Acenaphthylene	ND	0.50	1		Benzo (k) Fluoranthene	ND	0.50	1	
Acenaphthene	ND	0.50	1		Benzo (b) Fluoranthene	ND	0.50	1	
Fluorene	ND	0.50	1		Benzo (a) Pyrene	ND	0.50	1	
Phenanthrene	ND	0.50	1		Indeno (1,2,3-c,d) Pyrene	ND	0.50	1	
Anthracene	ND	0.50	1		Dibenz (a,h) Anthracene	ND	0.50	1	
Fluoranthene	ND	0.50	1		Benzo (g,h,i) Perylene	ND	0.50	1	
<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>	<u>Surrogates:</u>	<u>REC (%)</u>	<u>Control Limits</u>		<u>Qual</u>
2-Fluorophenol	102	42-120			Phenol-d6	100	46-118		
Nitrobenzene-d5	107	42-150			2-Fluorobiphenyl	107	38-134		
2,4,6-Tribromophenol	97	36-132			p-Terphenyl-d14	123	35-167		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

# Analytical Report



AECOM Environment  
 3995 Via Oro Avenue  
 Long Beach, CA 90810-1869

Date Received: 09/02/09  
 Work Order No: 09-09-0198  
 Preparation: EPA 3545  
 Method: EPA 8082  
 Units: ug/kg

Project: Sediment Sampling

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>R8-090209</b>	<b>09-09-0198-1-A</b>	<b>09/02/09 08:35</b>	<b>Solid</b>	<b>GC 31</b>	<b>09/04/09</b>	<b>09/10/09 05:07</b>	<b>090904L08</b>

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Aroclor-1016	ND	10	1		Aroclor-1248	ND	10	1	
Aroclor-1221	ND	10	1		Aroclor-1254	ND	10	1	
Aroclor-1232	ND	10	1		Aroclor-1260	ND	10	1	
Aroclor-1242	ND	10	1		Aroclor-1262	ND	10	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2,4,5,6-Tetrachloro-m-Xylene	102	50-130			Decachlorobiphenyl	78	50-130		

<b>R7-090109</b>	<b>09-09-0198-2-A</b>	<b>09/01/09 11:29</b>	<b>Solid</b>	<b>GC 31</b>	<b>09/04/09</b>	<b>09/10/09 05:26</b>	<b>090904L08</b>
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Aroclor-1016	ND	10	1		Aroclor-1248	ND	10	1	
Aroclor-1221	ND	10	1		Aroclor-1254	ND	10	1	
Aroclor-1232	ND	10	1		Aroclor-1260	ND	10	1	
Aroclor-1242	ND	10	1		Aroclor-1262	ND	10	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2,4,5,6-Tetrachloro-m-Xylene	84	50-130			Decachlorobiphenyl	66	50-130		

<b>R6-090109</b>	<b>09-09-0198-3-A</b>	<b>09/01/09 14:54</b>	<b>Solid</b>	<b>GC 31</b>	<b>09/04/09</b>	<b>09/10/09 05:45</b>	<b>090904L08</b>
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Aroclor-1016	ND	10	1		Aroclor-1248	ND	10	1	
Aroclor-1221	ND	10	1		Aroclor-1254	ND	10	1	
Aroclor-1232	ND	10	1		Aroclor-1260	ND	10	1	
Aroclor-1242	ND	10	1		Aroclor-1262	ND	10	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2,4,5,6-Tetrachloro-m-Xylene	136	50-130		2	Decachlorobiphenyl	92	50-130		

<b>Method Blank</b>	<b>099-12-565-120</b>	<b>N/A</b>	<b>Solid</b>	<b>GC 31</b>	<b>09/04/09</b>	<b>09/08/09 17:46</b>	<b>090904L08</b>
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Aroclor-1016	ND	10	1		Aroclor-1248	ND	10	1	
Aroclor-1221	ND	10	1		Aroclor-1254	ND	10	1	
Aroclor-1232	ND	10	1		Aroclor-1260	ND	10	1	
Aroclor-1242	ND	10	1		Aroclor-1262	ND	10	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2,4,5,6-Tetrachloro-m-Xylene	119	50-130			Decachlorobiphenyl	117	50-130		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

## Analytical Report



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

Date Received: 09/02/09  
Work Order No: 09-09-0198  
Preparation: EPA 3545  
Method: EPA 8081A  
Units: ug/kg

Project: Sediment Sampling

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
R8-090209	09-09-0198-1-A	09/02/09 08:35	Solid	GC 51	09/04/09	09/09/09 22:39	090904L07

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
2,4'-DDD	11	2.0	2		4,4'-DDD	37	10	10	
2,4'-DDE	5.3	1.0	1		4,4'-DDE	40	10	10	
2,4'-DDT	ND	1.0	1		4,4'-DDT	ND	1.0	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2,4,5,6-Tetrachloro-m-Xylene	91	50-130			Decachlorobiphenyl	83	50-130		

R7-090109	09-09-0198-2-A	09/01/09 11:29	Solid	GC 51	09/04/09	09/09/09 23:06	090904L07
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
2,4'-DDD	3.6	1.0	1		4,4'-DDD	13	5.0	5	
2,4'-DDE	3.0	1.0	1		4,4'-DDE	15	5.0	5	
2,4'-DDT	ND	1.0	1		4,4'-DDT	ND	1.0	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2,4,5,6-Tetrachloro-m-Xylene	84	50-130			Decachlorobiphenyl	73	50-130		

R6-090109	09-09-0198-3-A	09/01/09 14:54	Solid	GC 51	09/04/09	09/10/09 23:47	090904L07
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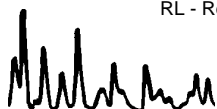
Comment(s): -The reporting limit is elevated resulting from matrix interference.

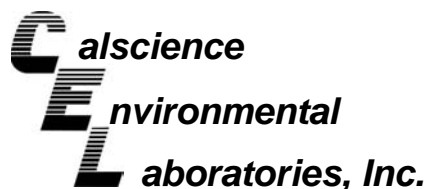
Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
2,4'-DDD	ND	2.0	2		4,4'-DDD	ND	2.0	2	
2,4'-DDE	ND	2.0	2		4,4'-DDE	ND	2.0	2	
2,4'-DDT	ND	2.0	2		4,4'-DDT	ND	2.0	2	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2,4,5,6-Tetrachloro-m-Xylene	52	50-130			Decachlorobiphenyl	54	50-130		

Method Blank	099-12-858-31	N/A	Solid	GC 51	09/04/09	09/09/09 19:28	090904L07
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Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
2,4'-DDD	ND	1.0	1		4,4'-DDD	ND	1.0	1	
2,4'-DDE	ND	1.0	1		4,4'-DDE	ND	1.0	1	
2,4'-DDT	ND	1.0	1		4,4'-DDT	ND	1.0	1	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:	REC (%)	Control Limits		Qual
2,4,5,6-Tetrachloro-m-Xylene	125	50-130			Decachlorobiphenyl	106	50-130		

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers





## Analytical Report



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

Date Received: 09/02/09  
Work Order No: 09-09-0198

Project: Sediment Sampling

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Client Sample Number	Lab Sample Number	Date Collected	Matrix
R8-090209	09-09-0198-1	09/02/09	Solid

Comment(s): (9) Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Moisture	38.6	0.100	1		%	09/03/09	09/03/09	ASTM D-2216
Carbon, Total Organic (9)	21000	810	1		mg/kg	N/A	09/09/09	EPA 9060A

R7-090109	09-09-0198-2	09/01/09	Solid
-----------	--------------	----------	-------

Comment(s): (9) Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Moisture	50.3	0.100	1		%	09/03/09	09/03/09	ASTM D-2216
Carbon, Total Organic (9)	24000	1000	1		mg/kg	N/A	09/09/09	EPA 9060A

R6-090109	09-09-0198-3	09/01/09	Solid
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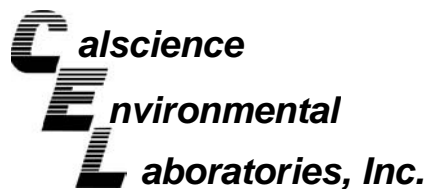
Comment(s): (9) Results are reported on a dry weight basis.

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Moisture	62.6	0.100	1		%	09/03/09	09/03/09	ASTM D-2216
Carbon, Total Organic (9)	72000	1300	1		mg/kg	N/A	09/09/09	EPA 9060A

Method Blank	N/A	Solid
--------------	-----	-------

Parameter	Result	RL	DF	Qual	Units	Date Prepared	Date Analyzed	Method
Moisture	ND	0.100	1		%	09/03/09	09/03/09	ASTM D-2216
Carbon, Total Organic	ND	500	1		mg/kg	N/A	09/09/09	EPA 9060A

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers



## Quality Control - Spike/Spike Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

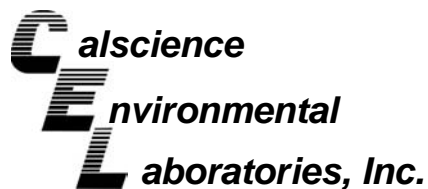
Date Received: 09/02/09  
Work Order No: 09-09-0198  
Preparation: EPA 3050B  
Method: EPA 6010B

## Project Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-09-0342-4	Solid	ICP 5300	09/04/09	09/04/09	090904S01

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Cadmium	101	99	75-125	2	0-20	
Chromium	104	101	75-125	2	0-20	
Copper	107	103	75-125	2	0-20	
Lead	99	96	75-125	2	0-20	
Nickel	101	100	75-125	1	0-20	
Zinc	38	27	75-125	3	0-20	3

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - PDS / PDSD



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

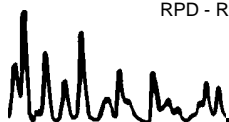
Date Received 09/02/09  
Work Order No: 09-09-0198  
Preparation: EPA 3050B  
Method: EPA 6010B

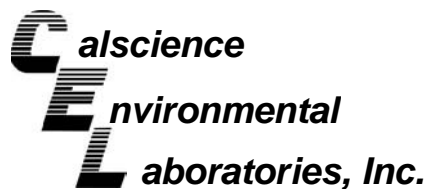
Project: Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number
09-09-0342-4	Solid	ICP 5300	09/04/09	09/04/09	090904S01

Parameter	PDS %REC	PDSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Cadmium	95	94	75-125	1	0-20	
Chromium	96	95	75-125	1	0-20	
Copper	104	103	75-125	1	0-20	
Lead	96	97	75-125	1	0-20	
Nickel	97	97	75-125	0	0-20	
Zinc	51	49	75-125	0	0-20	5

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Spike/Spike Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

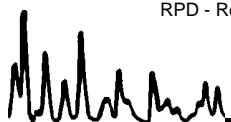
Date Received: 09/02/09  
Work Order No: 09-09-0198  
Preparation: EPA 3550B  
Method: EPA 8015B (M)

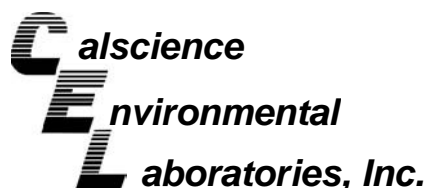
## Project Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-09-0324-10	Solid	GC 47	09/04/09	09/04/09	090904S04

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Diesel	108	109	64-130	1	0-15	

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Spike/Spike Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

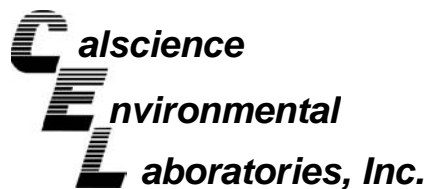
Date Received: 09/02/09  
Work Order No: 09-09-0198  
Preparation: EPA 3545  
Method: EPA 8270C

## Project Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
09-09-0221-2	Solid	GC/MS P	09/03/09	09/08/09	090903S09

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Phenol	113	108	57-123	4	0-16	
2-Chlorophenol	106	101	57-111	5	0-17	
1,4-Dichlorobenzene	85	74	49-127	15	0-20	
N-Nitroso-di-n-propylamine	109	102	54-144	7	0-17	
1,2,4-Trichlorobenzene	109	102	42-132	6	0-20	
Naphthalene	111	108	50-150	2	0-20	
4-Chloro-3-Methylphenol	115	113	50-128	2	0-17	
Dimethyl Phthalate	107	106	50-150	1	0-20	
Acenaphthylene	112	112	50-150	0	0-20	
Acenaphthene	117	117	49-133	0	0-18	
4-Nitrophenol	94	92	30-144	2	0-21	
2,4-Dinitrotoluene	95	96	50-128	1	0-18	
Fluorene	116	117	50-150	1	0-20	
Pentachlorophenol	63	63	29-113	0	0-22	
Pyrene	126	125	47-149	0	0-20	
Butyl Benzyl Phthalate	123	122	50-150	1	0-20	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

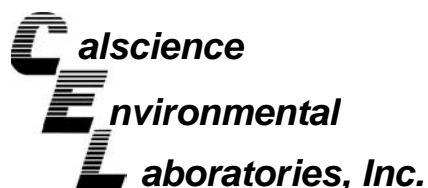
Date Received: 09/02/09  
Work Order No: 09-09-0198  
Preparation: EPA 3545  
Method: EPA 8082

## Project Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
R6-090109	Solid	GC 31	09/04/09	09/10/09	090904S08

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aroclor-1016	1038	1032	50-135	1	0-25	3
Aroclor-1260	994	967	50-135	3	0-25	3

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

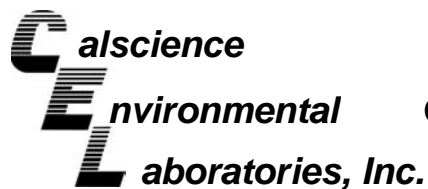
Date Received: 09/02/09  
Work Order No: 09-09-0198  
Preparation: EPA 3545  
Method: EPA 8081A

## Project Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
R6-090109	Solid	GC 51	09/04/09	09/10/09	090904S07

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aldrin	0	0	50-135	0	0-25	3
Alpha-BHC	0	0	50-135	0	0-25	3
Beta-BHC	0	129	50-135	200	0-25	3,4
Delta-BHC	0	300	50-135	200	0-25	3,4
Gamma-BHC	0	0	50-135	0	0-25	3
Dieldrin	2	0	50-135	200	0-25	3,4
4,4'-DDD	9	640	50-135	194	0-25	3,4
4,4'-DDE	6	0	50-135	200	0-25	3,4
4,4'-DDT	0	0	50-135	200	0-25	3,4
Endosulfan I	0	0	50-135	0	0-25	3
Endosulfan II	0	0	50-135	200	0-25	3,4
Endosulfan Sulfate	0	0	50-135	0	0-25	3
Endrin	56	5	50-135	168	0-25	3
Endrin Aldehyde	38	748	50-135	181	0-25	3,4
Endrin Ketone	12	0	50-135	200	0-25	3,4
Heptachlor	0	0	50-135	0	0-25	3
Heptachlor Epoxide	2	726	50-135	199	0-25	3,4
Methoxychlor	257	0	50-135	200	0-25	3,4
Alpha Chlordane	0	0	50-135	200	0-25	3,4
Gamma Chlordane	0	0	50-135	0	0-25	3

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Spike/Spike Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

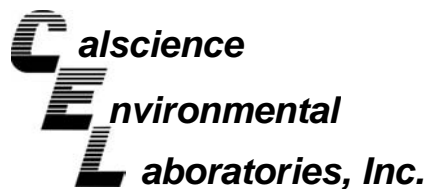
Date Received: N/A  
Work Order No: 09-09-0198

Project: Sediment Sampling

Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control Sample ID</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>MS% REC</u>	<u>MSD % REC</u>	<u>%REC CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Carbon, Total Organic	EPA 9060A	09-09-0259-1	09/09/09	N/A	91	87	75-125	4	0-25	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

Date Received: N/A  
Work Order No: 09-09-0198

Project: Sediment Sampling

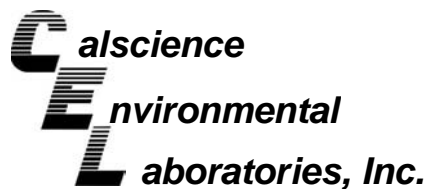
Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>QC Sample ID</u>	<u>Date Analyzed</u>	<u>Sample Conc</u>	<u>DUP Conc</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Moisture	ASTM D-2216	09-09-0107-1	09/03/09	15.6	16.2	4	0-25	

RPD - Relative Percent Difference , CL - Control Limit

A handwritten signature in black ink, appearing to be 'M. J. ...'.

7440 Lincoln Way, Garden Grove, CA 92841-1427 . TEL:(714) 895-5494 . FAX: (714) 894-7501



## Quality Control - LCS/LCS Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

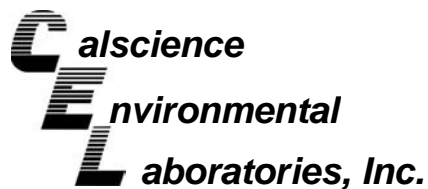
Date Received: N/A  
Work Order No: 09-09-0198  
Preparation: EPA 3050B  
Method: EPA 6010B

Project: Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
097-01-002-12,705	Solid	ICP 5300	09/04/09	09/04/09	090904L01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Cadmium	107	108	80-120	1	0-20	
Chromium	107	109	80-120	1	0-20	
Copper	109	110	80-120	1	0-20	
Lead	112	113	80-120	1	0-20	
Nickel	115	116	80-120	2	0-20	
Zinc	108	108	80-120	0	0-20	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - LCS/LCS Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

Date Received: N/A  
Work Order No: 09-09-0198  
Preparation: EPA 3550B  
Method: EPA 8015B (M)

Project: Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-275-2,925	Solid	GC 47	09/04/09	09/04/09	090904B04

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
TPH as Diesel	103	103	75-123	0	0-12	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - Laboratory Control Sample



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

Date Received: N/A  
Work Order No: 09-09-0198  
Preparation: EPA 3545  
Method: EPA 8270C

Project: Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number	
099-12-549-930	Solid	GC/MS P	09/09/09	09SEP004.rr	090903L09	
Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	ME CL	Qualifiers
Phenol	10.0	10.5	105	59-125	48-136	
2-Chlorophenol	10.0	9.79	98	60-114	51-123	
1,4-Dichlorobenzene	10.0	10.6	106	61-121	51-131	
N-Nitroso-di-n-propylamine	10.0	10.0	100	64-136	52-148	
1,2,4-Trichlorobenzene	10.0	11.2	112	58-118	48-128	
Naphthalene	10.0	11.2	112	21-133	2-152	
4-Chloro-3-Methylphenol	10.0	11.4	114	61-121	51-131	
Dimethyl Phthalate	10.0	10.8	108	0-112	0-131	
Acenaphthylene	10.0	11.1	111	33-145	14-164	
Acenaphthene	10.0	11.7	117	59-125	48-136	
4-Nitrophenol	10.0	7.40	74	38-152	19-171	
2,4-Dinitrotoluene	10.0	8.84	88	51-141	36-156	
Fluorene	10.0	11.3	113	59-121	49-131	
Pentachlorophenol	10.0	5.30	53	38-116	25-129	
Pyrene	10.0	13.2	132	51-141	36-156	
Butyl Benzyl Phthalate	10.0	12.7	127	0-152	0-177	

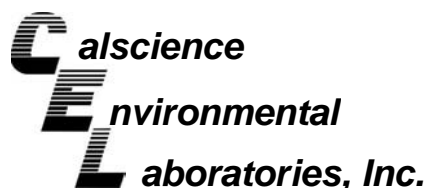
Total number of LCS compounds : 16

Total number of ME compounds: 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - LCS/LCS Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

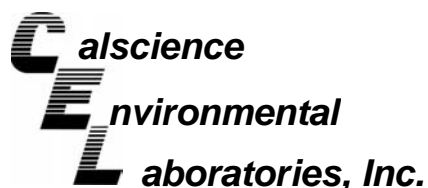
Date Received: N/A  
Work Order No: 09-09-0198  
Preparation: EPA 3545  
Method: EPA 8082

Project: Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-565-120	Solid	GC 31	09/04/09	09/08/09	090904L08

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aroclor-1016	108	109	50-135	1	0-25	
Aroclor-1260	98	100	50-135	2	0-25	

RPD - Relative Percent Difference , CL - Control Limit



## Quality Control - LCS/LCS Duplicate



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

Date Received: N/A  
Work Order No: 09-09-0198  
Preparation: EPA 3545  
Method: EPA 8081A

Project: Sediment Sampling

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number		
099-12-858-31	Solid	GC 51	09/04/09	09/09/09	090904L07		
Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Aldrin	123	109	50-135	36-149	12	0-25	
Alpha-BHC	126	111	50-135	36-149	13	0-25	
Beta-BHC	113	100	50-135	36-149	13	0-25	
Delta-BHC	103	88	50-135	36-149	16	0-25	
Gamma-BHC	123	108	50-135	36-149	12	0-25	
Dieldrin	120	106	50-135	36-149	12	0-25	
4,4'-DDD	114	95	50-135	36-149	17	0-25	
4,4'-DDE	115	96	50-135	36-149	18	0-25	
4,4'-DDT	122	106	50-135	36-149	14	0-25	
Endosulfan I	132	119	50-135	36-149	10	0-25	
Endosulfan II	114	102	50-135	36-149	12	0-25	
Endosulfan Sulfate	111	98	50-135	36-149	12	0-25	
Endrin	113	99	50-135	36-149	13	0-25	
Endrin Aldehyde	117	104	50-135	36-149	12	0-25	
Endrin Ketone	109	97	50-135	36-149	12	0-25	
Heptachlor	130	115	50-135	36-149	12	0-25	
Heptachlor Epoxide	119	105	50-135	36-149	12	0-25	
Methoxychlor	110	97	50-135	36-149	13	0-25	
Alpha Chlordane	123	109	50-135	36-149	12	0-25	
Gamma Chlordane	118	104	50-135	36-149	12	0-25	

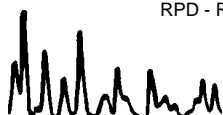
Total number of LCS compounds : 20

Total number of ME compounds : 0

Total number of ME compounds allowed : 1

LCS ME CL validation result : Pass

RPD - Relative Percent Difference , CL - Control Limit





## Quality Control - Laboratory Control Sample



AECOM Environment  
3995 Via Oro Avenue  
Long Beach, CA 90810-1869

Date Received:  
Work Order No:

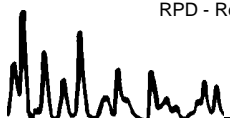
N/A  
09-09-0198

Project: Sediment Sampling

Matrix: Aqueous or Solid

<u>Parameter</u>	<u>Method</u>	<u>Quality Control Sample ID</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Conc. Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec</u>	<u>%Rec CL</u>	<u>Qualifiers</u>
Carbon, Total Organic	EPA 9060A	099-06-013-392	09/09/09	N/A	6000	5520	92	80-120	

RPD - Relative Percent Difference , CL - Control Limit

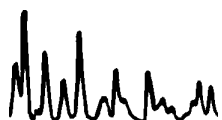


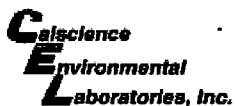
## Glossary of Terms and Qualifiers



Work Order Number: 09-09-0198

<u>Qualifier</u>	<u>Definition</u>
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS Recovery Percentage is within LCS ME Control Limit range.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture.





7440 LINCOLN WAY  
GARDEN GROVE, CA 92841-1432  
TEL: (714) 895-5494 . FAX: (714) 894-7501

# CHAIN OF CUSTODY RECORD

DATE: 9/2/2009  
PAGE: 1 OF 1

LABORATORY CLIENT: <b>AECOM Environment</b>						CLIENT PROJECT NAME / NUMBER: <b>Sediment Sampling</b>										P.O. NO.:				
ADDRESS: <b>3995 Via Oro Ave</b>						PROJECT CONTACT: <b>Michele Woods</b>										QUOTE NO.:				
CITY: <b>Long Beach, CA 90810</b>						SAMPLER(S): (SIGNATURE) 										LAB USE ONLY 09-0198				
TEL: 562/420-2933 FAX: 562/420-2915 E-MAIL:						REQUESTED ANALYSIS														
TURNAROUND TIME <input type="checkbox"/> SAME DAY <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 72 HR <input type="checkbox"/> 5 DAYS <input checked="" type="checkbox"/> 10 DAYS																				
SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY) <input type="checkbox"/> RWQCB REPORTING <input type="checkbox"/> ARCHIVE SAMPLES UNTIL ____/____/____																				
SPECIAL INSTRUCTIONS <b>Sediment Grain Size to PTS</b> <b>Chronic Bioassay to Nautilus Environmental JF 9/2/09</b> <b>DDT, DDD, and DDE Isomers (2,4' and 4,4') and PCBs to Lancaster</b> <b>Metals: 6010 (Cu,Cd,Cr,Pb,Ni,Zn)</b>																				
LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING		MAT- RIX	NO. OF CONT.	Sediment Grain Size ASTM D4464M	2,4'-DDT EPA 8081A	2,4'-DDD EPA 8081A	2,4'-DDE EPA 8081A	4,4'-DDT EPA 8081A	4,4'-DDD EPA 8081A	4,4'-DDE EPA 8081A	PCBs EPA 8082	TPH Carbon Chain (C7-C44)	Total Organic Carbon EPA 9060	Metals EPA 6010	PNAs EPA 8270		
1	R8-090209		9/2/2009	8:35	SO	6	X	X	X	X	X	X	X	X	X	X	X	X		16 oz jars
2	R7-090109		9/1/2009	11:29	SO	2	X	X	X	X	X	X	X	X	X	X	X	X		16 oz jars
3	R6-090109		9/1/2009	14:54	SO	2	X	X	X	X	X	X	X	X	X	X	X	X		16 oz jars
																				There are 4 extra R-090209 samples labeled "EXTRA"
Relinquished by: (Signature)						Received by: (Signature)										Date: 9/2/09 Time: 1250				
Relinquished by: (Signature)						Received by: (Signature)										Date: 9/2/09 Time: 1600				
Relinquished by: (Signature)						Received by: (Signature)										Date: 9/2/09 Time: 17:00				

# SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: AECOM

DATE: 9/2/09

## TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen)

Temperature 2.9 °C - 0.2°C (CF) = 2.7 °C ☒ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ Received at ambient temperature, placed on ice for transport by Courier.

Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only

Initial: WS

## CUSTODY SEALS INTACT:

☐ Cooler ☐ \_\_\_\_\_ ☐ No (Not Intact) ☒ Not Present ☐ N/A

Initial: WS

☐ Sample ☐ \_\_\_\_\_ ☐ No (Not Intact) ☒ Not Present

Initial: PS

## SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
<input type="checkbox"/> COC not relinquished. <input type="checkbox"/> No date relinquished. <input type="checkbox"/> No time relinquished.			
Sampler's name indicated on COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and good condition.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Correct containers and volume for analyses requested.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyses received within holding time.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper preservation noted on COC or sample container.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Tedlar bag(s) free of condensation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## CONTAINER TYPE:

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☒ 16ozCGJ ☐ Sleeve ☐ EnCores® ☐ TerraCores® ☐ \_\_\_\_\_

Water: ☐ VOA ☐ VOAh ☐ VOAna<sub>2</sub> ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☐ 1AGB ☐ 1AGBna<sub>2</sub> ☐ 1AGBs

☐ 500AGB ☐ 500AGJ ☐ 500AGJs ☐ 250AGB ☐ 250CGB ☐ 250CGBs ☐ 1PB ☐ 500PB ☐ 500PBna

☐ 250PB ☐ 250PBn ☐ 125PB ☐ 125PBznna ☐ 100PJ ☐ 100PJna<sub>2</sub> ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_

Air: ☐ Tedlar® ☐ Summa® ☐ \_\_\_\_\_ Other: ☐ \_\_\_\_\_ Checked/Labeled by: PS

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelop Reviewed by: WS

Preservative: h: HCL n: HNO<sub>3</sub> na<sub>2</sub>: Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> Na: NaOH p: H<sub>3</sub>PO<sub>4</sub> s: H<sub>2</sub>SO<sub>4</sub> znna: ZnAc<sub>2</sub>+NaOH f: Field-filtered Scanned by: PS



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8100 Secura Way • Santa Fe Springs, CA 90670  
Telephone (562) 347-2500 • Fax (562) 907-3610

September 16, 2009

Vik Patel  
Calscience  
7440 Lincoln Way  
Garden Grove, CA 92841-1427

Re: PTS File No: 39744  
Physical Properties Data  
09-09-0198

Dear Mr. Patel:

Please find enclosed report for Physical Properties analyses conducted upon samples received from your 09-09-0198 project. All analyses were performed by applicable ASTM, EPA, or API methodologies. An electronic version of the report has previously been sent to your attention via the internet. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal, or return of the samples.

PTS Laboratories appreciates the opportunity to be of service. If you have any questions or require additional information, please give me a call at (562) 347-2504.

Sincerely,  
PTS Laboratories

Rachel Spitz  
Project Manager

Encl.

Project Name: N/A  
Project Number: 09-09-0198

PTS File No: 39744  
Client: Calscience

TEST PROGRAM

CORE ID	Depth ft.	Core Recovery ft.	Grain Size Analysis ASTM D4464M						Notes
		Plugs:	Grab						
Rcvd. 9/3/09									
R8-090209	N/A	N/A	X						
R7-090109	N/A	N/A	X						
R6-090109	N/A	N/A	X						
TOTALS:	3 Jars		3						

Laboratory Test Program Notes

PARTICLE SIZE SUMMARY  
(METHODOLOGY: ASTM D422/D4464M)

PROJECT NAME: N/A  
PROJECT NO: 09-09-0198

Sample ID	Depth, ft.	Mean Grain Size Description (1)	Median Grain Size mm	Particle Size Distribution, wt. percent						Silt & Clay
				Gravel	Sand Size			Silt	Clay	
					Coarse	Medium	Fine			
R8-090209	N/A	Medium sand	0.548	0.00	0.00	61.39	17.29	16.26	5.06	21.32
R7-090109	N/A	Fine sand	0.358	0.00	0.00	45.38	34.23	16.61	3.78	20.38
R6-090109	N/A	Silt	0.015	0.00	0.00	0.01	16.68	59.82	23.49	83.31

(1) Based on Mean from Trask

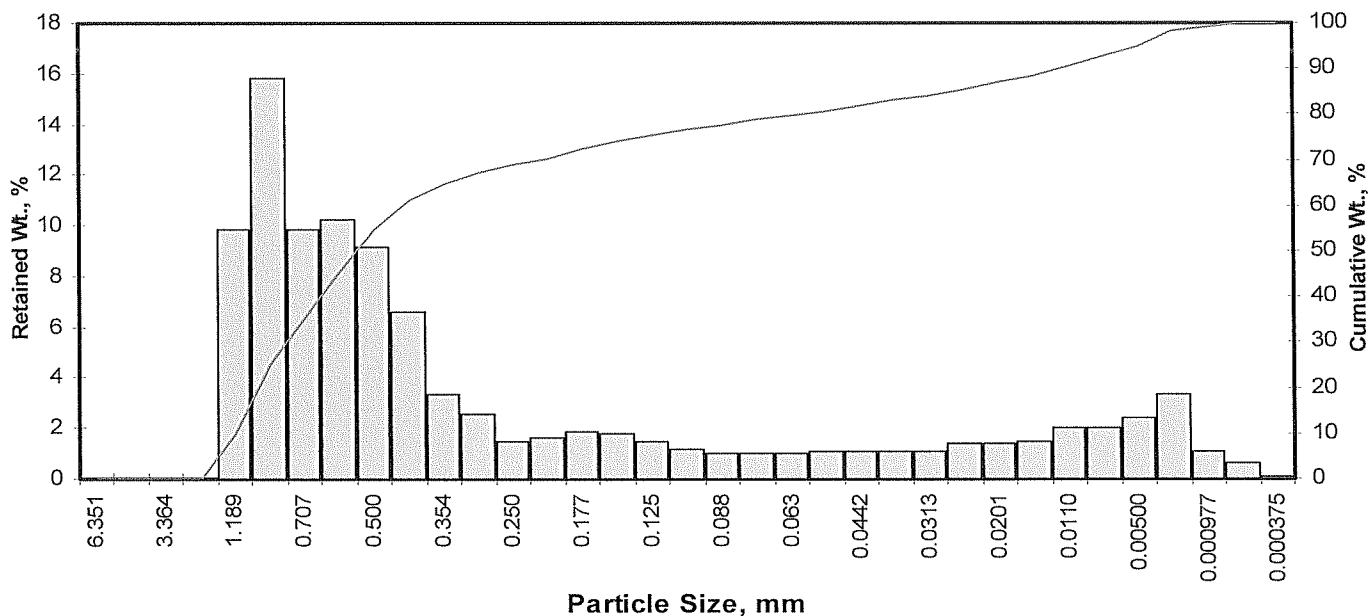
# PTS Laboratories, Inc.

## Particle Size Analysis - ASTM D4464M

Client: Calscience  
Project: N/A  
Project No: 09-09-0198

PTS File No: 39744  
Sample ID: R8-090209  
Depth, ft: N/A

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Particle Size, mm

Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent	Cumulative Weight Percent greater than			
Inches	Millimeters						Weight percent	Phi Value	Particle Size	
								Inches	Millimeters	
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00	5	-0.62	0.0604	1.535
0.1873	4.757	-2.25	4	0.00	0.00	0.00	10	-0.24	0.0466	1.184
0.1324	3.364	-1.75	6	0.00	0.00	0.00	16	-0.05	0.0409	1.038
0.0787	2.000	-1.00	10	0.00	0.00	0.00	25	0.23	0.0336	0.853
0.0468	1.189	-0.25	16	9.81	9.82	9.82	40	0.61	0.0258	0.655
0.0331	0.841	0.25	20	15.80	15.81	25.63	50	0.87	0.0216	0.548
0.0278	0.707	0.50	25	9.83	9.84	35.46	60	1.20	0.0172	0.436
0.0234	0.595	0.75	30	10.20	10.21	45.67	75	2.92	0.0052	0.132
0.0197	0.500	1.00	35	9.13	9.14	54.81	84	4.97	0.0013	0.032
0.0166	0.420	1.25	40	6.58	6.58	61.39	90	6.38	0.0005	0.012
0.0139	0.354	1.50	45	3.37	3.37	64.76	95	7.67	0.0002	0.005
0.0117	0.297	1.75	50	2.52	2.52	67.28				
0.0098	0.250	2.00	60	1.50	1.50	68.78				
0.0083	0.210	2.25	70	1.64	1.64	70.43				
0.0070	0.177	2.50	80	1.84	1.84	72.27				
0.0059	0.149	2.75	100	1.76	1.76	74.03				
0.0049	0.125	3.00	120	1.46	1.46	75.49				
0.0041	0.105	3.25	140	1.17	1.17	76.66				
0.0035	0.088	3.50	170	1.02	1.02	77.68				
0.0029	0.074	3.75	200	1.00	1.00	78.68				
0.0025	0.063	4.00	230	1.04	1.04	79.72				
0.0021	0.053	4.25	270	1.08	1.08	80.80				
0.00174	0.0442	4.50	325	1.11	1.11	81.91				
0.00146	0.0372	4.75	400	1.11	1.11	83.02				
0.00123	0.0313	5.00	450	1.10	1.10	84.12				
0.000986	0.0250	5.32	500	1.41	1.41	85.53				
0.000790	0.0201	5.64	635	1.41	1.41	86.95				
0.000615	0.0156	6.00		1.50	1.50	88.45				
0.000435	0.0110	6.50		2.04	2.04	90.49				
0.000308	0.00781	7.00		2.04	2.04	92.53				
0.000197	0.00500	7.65		2.41	2.41	94.94				
0.000077	0.00195	9.00		3.30	3.30	98.24				
0.000038	0.000977	10.00		1.10	1.10	99.34				
0.000019	0.000488	11.00		0.59	0.59	99.93				
0.000015	0.000375	11.38		0.07	0.07	100.00				
TOTALS				99.90	100.00	100.00				

Measure	Trask	Inman	Folk-Ward
Median, phi	0.87	0.87	0.87
Median, in.	0.0216	0.0216	0.0216
Median, mm	0.548	0.548	0.548
Mean, phi	1.02	2.46	1.93
Mean, in.	0.0194	0.0072	0.0103
Mean, mm	0.492	0.182	0.263
Sorting	2.537	2.513	2.512
Skewness	0.614	0.633	0.637
Kurtosis	0.307	0.649	1.264

Grain Size Description		Medium sand	
(ASTM-USCS Scale)		(based on Mean from Trask)	

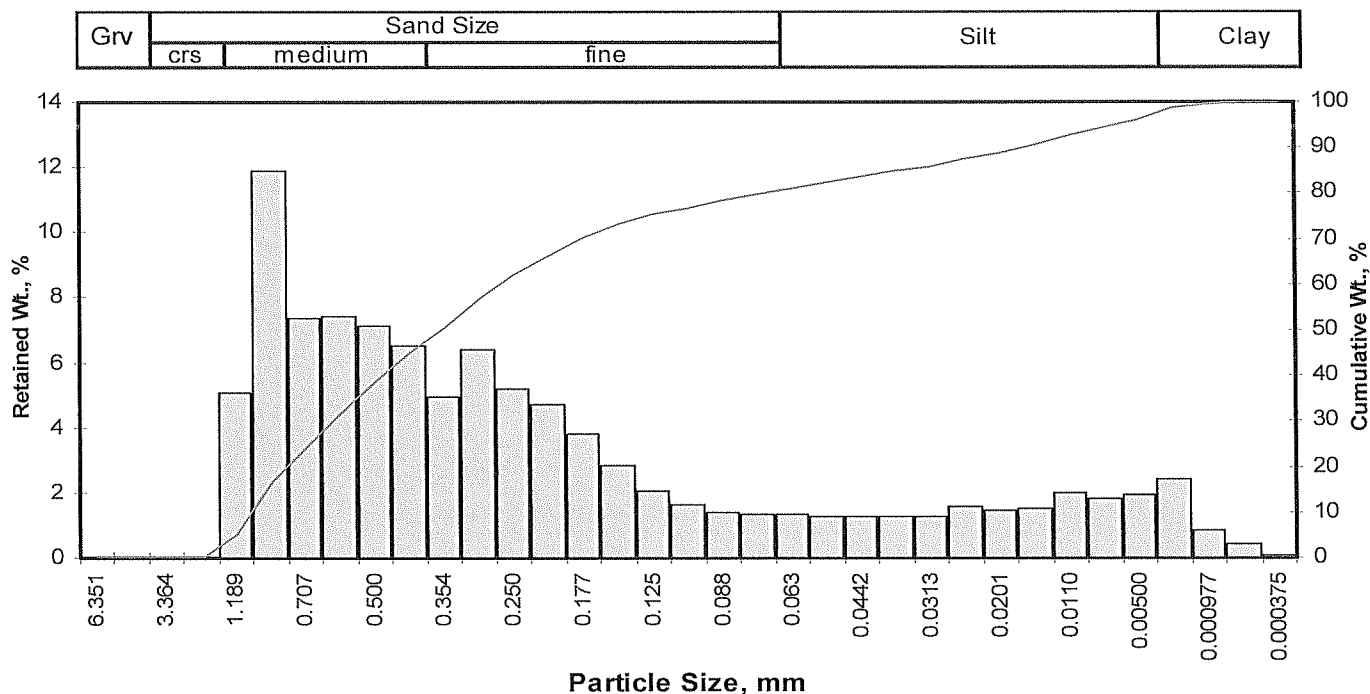
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	61.39
Fine Sand	200	17.29
Silt	>0.005 mm	16.26
Clay	<0.005 mm	5.06
Total		100

# PTS Laboratories, Inc.

## Particle Size Analysis - ASTM D4464M

Client: Calscience  
Project: N/A  
Project No: 09-09-0198

PTS File No: 39744  
Sample ID: R7-090109  
Depth, ft: N/A



Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent	Cumulative Weight Percent greater than			
Inches	Millimeters						Weight percent	Phi Value	Particle Size	
							Inches	Millimeters		
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00	5	-0.26	0.0473	1.201
0.1873	4.757	-2.25	4	0.00	0.00	0.00	10	-0.04	0.0406	1.031
0.1324	3.364	-1.75	6	0.00	0.00	0.00	16	0.21	0.0341	0.866
0.0787	2.000	-1.00	10	0.00	0.00	0.00	25	0.52	0.0274	0.696
0.0468	1.189	-0.25	16	5.10	5.10	5.10	40	1.04	0.0191	0.485
0.0331	0.841	0.25	20	11.90	11.90	17.00	50	1.48	0.0141	0.358
0.0278	0.707	0.50	25	7.35	7.35	24.35	60	1.91	0.0105	0.266
0.0234	0.595	0.75	30	7.43	7.43	31.77	75	2.97	0.0050	0.128
0.0197	0.500	1.00	35	7.12	7.12	38.89	84	4.61	0.0016	0.041
0.0166	0.420	1.25	40	6.49	6.49	45.38	90	5.88	0.0007	0.017
0.0139	0.354	1.50	45	4.94	4.94	50.32	95	7.24	0.0003	0.007
0.0117	0.297	1.75	50	6.38	6.38	56.70				
0.0098	0.250	2.00	60	5.19	5.19	61.89				
0.0083	0.210	2.25	70	4.69	4.69	66.58				
0.0070	0.177	2.50	80	3.82	3.82	70.40				
0.0059	0.149	2.75	100	2.82	2.82	73.22				
0.0049	0.125	3.00	120	2.06	2.06	75.28				
0.0041	0.105	3.25	140	1.61	1.61	76.89				
0.0035	0.088	3.50	170	1.40	1.40	78.29				
0.0029	0.074	3.75	200	1.33	1.33	79.62				
0.0025	0.063	4.00	230	1.30	1.30	80.92				
0.0021	0.053	4.25	270	1.27	1.27	82.19				
0.00174	0.0442	4.50	325	1.27	1.27	83.45				
0.00146	0.0372	4.75	400	1.26	1.26	84.71				
0.00123	0.0313	5.00	450	1.25	1.25	85.96				
0.000986	0.0250	5.32	500	1.54	1.54	87.50				
0.000790	0.0201	5.64	635	1.47	1.47	88.97				
0.000615	0.0156	6.00		1.53	1.53	90.50				
0.000435	0.0110	6.50		1.98	1.98	92.48				
0.000308	0.00781	7.00		1.80	1.80	94.28				
0.000197	0.00500	7.65		1.94	1.94	96.22				
0.000077	0.00195	9.00		2.43	2.43	98.65				
0.000038	0.000977	10.00		0.85	0.85	99.50				
0.000019	0.000488	11.00		0.45	0.45	99.95				
0.000015	0.000375	11.38		0.05	0.05	100.00				
TOTALS				100.00	100.00	100.00				

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	-0.26	0.0473	1.201
10	-0.04	0.0406	1.031
16	0.21	0.0341	0.866
25	0.52	0.0274	0.696
40	1.04	0.0191	0.485
50	1.48	0.0141	0.358
60	1.91	0.0105	0.266
75	2.97	0.0050	0.128
84	4.61	0.0016	0.041
90	5.88	0.0007	0.017
95	7.24	0.0003	0.007

Measure	Trask	Inman	Folk-Ward
Median, phi	1.48	1.48	1.48
Median, in.	0.0141	0.0141	0.0141
Median, mm	0.358	0.358	0.358
Mean, phi	1.28	2.41	2.10
Mean, in.	0.0162	0.0074	0.0092
Mean, mm	0.412	0.188	0.233
Sorting	2.333	2.200	2.237
Skewness	0.835	0.420	0.477
Kurtosis	0.280	0.705	1.258

Grain Size Description		Fine sand	
(ASTM-USCS Scale)		(based on Mean from Trask)	

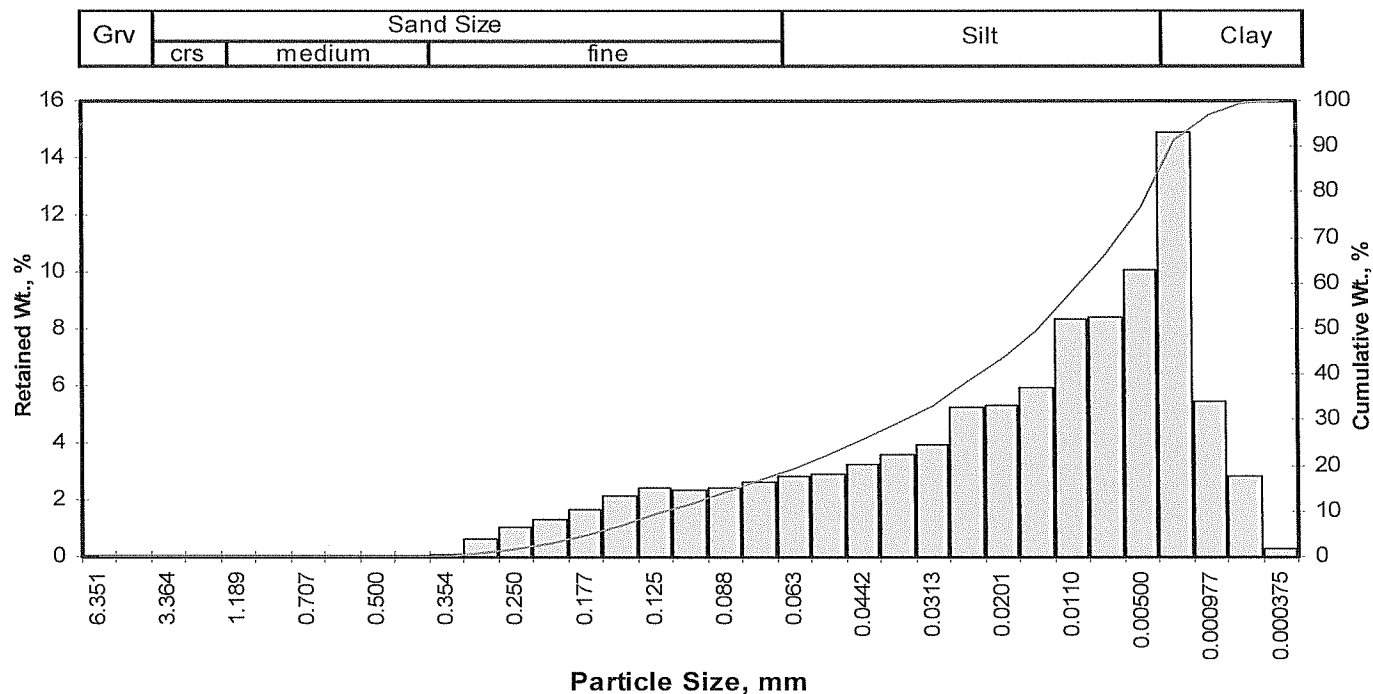
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	45.38
Fine Sand	200	34.23
Silt	>0.005 mm	16.61
Clay	<0.005 mm	3.78
Total		100

# PTS Laboratories, Inc.

## Particle Size Analysis - ASTM D4464M

Client: Calscience  
Project: N/A  
Project No: 09-09-0198

PTS File No: 39744  
Sample ID: R6-090109  
Depth, ft: N/A



Opening		Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent	Cumulative Weight Percent greater than			
Inches	Millimeters						Weight percent	Phi Value	Particle Size	
									Inches	Millimeters
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00	5	2.53	0.0068	0.173
0.1873	4.757	-2.25	4	0.00	0.00	0.00	10	3.08	0.0047	0.118
0.1324	3.364	-1.75	6	0.00	0.00	0.00	16	3.68	0.0031	0.078
0.0787	2.000	-1.00	10	0.00	0.00	0.00	25	4.45	0.0018	0.046
0.0468	1.189	-0.25	16	0.00	0.00	0.00	40	5.41	0.0009	0.023
0.0331	0.841	0.25	20	0.00	0.00	0.00	50	6.02	0.0006	0.015
0.0278	0.707	0.50	25	0.00	0.00	0.00	60	6.62	0.0004	0.010
0.0234	0.595	0.75	30	0.00	0.00	0.00	75	7.55	0.0002	0.005
0.0197	0.500	1.00	35	0.00	0.00	0.00	84	8.33	0.0001	0.003
0.0166	0.420	1.25	40	0.01	0.01	0.01	90	8.87	0.0001	0.002
0.0139	0.354	1.50	45	0.10	0.09	0.10	95	9.66	0.0000	0.001
0.0117	0.297	1.75	50	0.60	0.60	0.70				
0.0098	0.250	2.00	60	1.01	1.01	1.71				
0.0083	0.210	2.25	70	1.32	1.32	3.03				
0.0070	0.177	2.50	80	1.68	1.68	4.71				
0.0059	0.149	2.75	100	2.17	2.17	6.88				
0.0049	0.125	3.00	120	2.39	2.39	9.27				
0.0041	0.105	3.25	140	2.36	2.36	11.63				
0.0035	0.088	3.50	170	2.42	2.42	14.05				
0.0029	0.074	3.75	200	2.64	2.64	16.69				
0.0025	0.063	4.00	230	2.82	2.82	19.51				
0.0021	0.053	4.25	270	2.93	2.93	22.44				
0.00174	0.0442	4.50	325	3.21	3.21	25.65				
0.00146	0.0372	4.75	400	3.62	3.62	29.27				
0.00123	0.0313	5.00	450	3.95	3.95	33.22				
0.000986	0.0250	5.32	500	5.22	5.22	38.44				
0.000790	0.0201	5.64	635	5.30	5.30	43.74				
0.000615	0.0156	6.00		5.93	5.93	49.67				
0.000435	0.0110	6.50		8.32	8.32	57.98				
0.000308	0.00781	7.00		8.43	8.43	66.41				
0.000197	0.00500	7.65		10.10	10.10	76.51				
0.000077	0.00195	9.00		14.90	14.90	91.41				
0.000038	0.000977	10.00		5.47	5.47	96.88				
0.000019	0.000488	11.00		2.82	2.82	99.70				
0.000015	0.000375	11.38		0.30	0.30	100.00				
TOTALS				100.00	100.00	100.00				

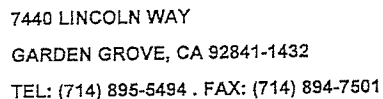
Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size	
		Inches	Millimeters
5	2.53	0.0068	0.173
10	3.08	0.0047	0.118
16	3.68	0.0031	0.078
25	4.45	0.0018	0.046
40	5.41	0.0009	0.023
50	6.02	0.0006	0.015
60	6.62	0.0004	0.010
75	7.55	0.0002	0.005
84	8.33	0.0001	0.003
90	8.87	0.0001	0.002
95	9.66	0.0000	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	6.02	6.02	6.02
Median, in.	0.0006	0.0006	0.0006
Median, mm	0.015	0.015	0.015
Mean, phi	5.29	6.01	6.01
Mean, in.	0.0010	0.0006	0.0006
Mean, mm	0.026	0.016	0.016
Sorting	2.927	2.321	2.240
Skewness	1.015	-0.006	0.007
Kurtosis	0.174	0.535	0.942

Grain Size Description		Silt	
(ASTM-USCS Scale)		(based on Mean from Trask)	
Description		Retained on Sieve #	Weight Percent
Gravel		4	0.00
Coarse Sand		10	0.00
Medium Sand		40	0.01
Fine Sand		200	16.68
Silt		>0.005 mm	59.82
Clay		<0.005 mm	23.49
Total			100



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