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CH	AROUND TIME	48 hours	72 hours	96 hours	1	BILLING						SAMPLE TIME CONTAINER QTY/TYPE	0	<u>ر جو</u>		4	_			//i comme		2			
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	18501 E. Gale Ave., Suite 130 City of Industry, CA 91748	Ph: 626-964-4032	Fx: 626-964-5832					JUU		× 323-721-6700		DENTIFICATION	R. 2n		121	02				MACTUR		1 RECEVED BY	RECEIVED BY	RECEIVED BY	HEX UPS Courier ATLI C
	NOLOGY	tories. Inc.			199-10-08	TO LIGH		2 E Clous		269-53/Fa		SAMPLE ID	0110							Judo Davidan	COMPANY	Sulucion C/10/	DATE/TIME	DATE/TIME	circle one): Walk-In Fed
	NATHER		NUVUV		Project No.:			Street: 56	Citv/State/7in·	Phone& Fax: 39.3. (e-mail:	LAB USE ONLY				cn A				AUTHORIZATION TO PERFORM WORK				RELINQUISHED BY	METHOD OF TRANSPORT (

elia la

Client:MACTEC EngineeringAttn:S. V. (Jag) Jagannath

Client's Project:Metro WSE; 4953-10-1561Date Received:6/10/2011Matrix:AirUnits:% v/v

		Natur	al Gas A	nalysis l	by ASTN	A-D1945]
La	b No.:	C0610	07-01	C0610	07-02	C0610	07-03			
Client Sample I.D.: Date Sampled:		C119E	C119B - 30 6/10/2011		C119B - 55		C119B - 75			
		6/10/2			2011	6/10/2011				
Fixed Gases Date Analyzed:		6/15/2011		6/15/2011		6/15/2011				
Hydrocarbon Date Analyzed:		6/15/2011		6/15/	2011	6/15/	2011			
Analyst I	nitials:	ZK 110614GC11A2		ZI	к	ZI	K			
QC B	atch #:			110614GC11A2		110614GC11A2				
Dilution I	Factor:	1.	0	1.0		1.0				
ANALYTE	PQL	RL	Results	RL	Results	RL	Results			
Methane	0.0010	0.0010	ND	0.0010	ND	0.0010	0.012			
Ethane	0.010	0.010	ND	0.010	ND	0.010	ND			
n-Butane	0.010	0.010	ND	0.010	ND	0.010	ND			

PQL = Practical Quantitation Limit

ND = Not Detected (Below RL).

RL = PQL X Dilution Factor

dl. 1 **Reviewed/Approved By:** Mark J. Johns **Operations Manager**

Date: ______ 2/11

The cover letter is an integral part of this analytical report.



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QC for N	Natural Ga	is Analys	is by A	STM-D19	45		()		
Lab No.:	Lab No.: Blank LCS LCSD								
Fixed Gas Date Analyzed:	6/15/2	2011	6/15	5/2011	6/15	/2011			
Hydrocarbon Date Analyzed:	6/14/2	2011	6/14	/2011	6/14	/2011			
Analyst Initials:	ZK		ZK		ZK				
Dilution Factor:	1.	0	1.0		1.0				
ANALYTE	RL	Results	%R	Criteria	%R	Criteria	RPD	Criteria	
Methane	0.0010	ND	107	70-130	105	70-130	1.0	<30	
Ethane	0.010	ND	92	70-130	92	70-130	0.8	<30	
n-Butane	0.010	ND	94	70-130	93	70-130	1.2	<30	

PQL = **Practical Quantitation Limit**

ND = Not Detected (Below RL).

RL = PQL X Dilution Factor

Reviewed/Approved By: Mark Johnson

Operations Manager

The cover letter is an integral part of this analytical report

AirTECHNOLOGY Laboratories, Inc. -

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Date:



FIGURES F-11.7 THROUGH F-11.34 ANALYTICAL TESTING OF GROUNDWATER SAMPLES (PE PHASE)

WESTSIDE SUBWAY EXTENSION PROJECT



2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

Site

ANALYTICAL RESULTS

Ordered By

Attn:

MACTEC Engineering & Consulting Inc
5628 East Slauson Ave.
Los Angeles, CA 90040-
Telephone: (323)889-5300

Marty Hudson

241 Moreno Drive Beverly Hills, CA

Page:	2			
Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 1664, Revision A, Oil and Grease (HEM)

QC Batch No: 042611-1 Our Lab I.D. 267815 267817 Client Sample I.D. G-166-D G-165-D Date Sampled 04/22/2011 04/22/2011 Date Prepared 04/26/2011 04/26/2011 Preparation Method 04/26/2011 04/26/2011 Date Analyzed Matrix Water Water Units mg/L mg/L **Dilution Factor** 1 1 PQL Results Results Analytes Conventionals 5.00 Oil and Grease ND ND

QC Batch No: 042611-1														
	LCS	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD									
Analytes	% REC	% REC	% REC	% Limit	% Limit									
Conventionals														
Oil and Grease	92	95	3.2	80-120	<20									



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3

Marty Hudson

241 Moreno Drive Beverly Hills, CA

-				
Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 418.1, TRPH

QC Batch No: W-042811-1												
Our Lab I.D.		267815	267817									
Client Sample I.D.		G-166-D	G-165-D									
Date Sampled		04/22/2011	04/22/2011									
Date Prepared		04/27/2011	04/27/2011									
Preparation Method												
Date Analyzed		04/28/2011	04/28/2011									
Matrix		Water	Water									
Units		mg/L	mg/L									
Dilution Factor		1	1									
Analytes	PQL	Results	Results									
Total Recoverable Petroleum Hydrocarbons	0.500	ND	ND									

QUALITY CONTROL REPORT

QC Batch No: W-042811-1

	MS	MS DUP	RPD	MS/MSD	MS RPD			
Analytes	% REC	% REC	%	% Limit	% Limit			
Total Recoverable Petroleum	104	103	<1	70-130	15			
Hydrocarbons								



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Tel	ephone: (323)889-5300

Attn: Marty Hudson

Page: 4 Project Project

Site 241 Moreno Drive

Beverly Hills, CA

ID: 4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Name: MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 600, General Minerals

	QC Batch N	o: 042211-1		QC Batch No: 042211-1						
Our Lab I.D.		267815	267816	267817						
Client Sample I.D.		G-166-D	G-166-S	G-165-D						
Date Sampled		04/22/2011	04/22/2011	04/22/2011						
Date Prepared		04/22/2011	04/22/2011	04/22/2011						
Preparation Method										
Date Analyzed		04/22/2011	04/22/2011	04/22/2011						
Matrix		Water	Water	Water						
Units		mg/L	mg/L	mg/L						
Dilution Factor		1	1	1						
Analytes	PQL	Results	Results	Results						
Conventionals										
Alkalinity,Total	10.0	215	135	145						
Bicarbonate (as CaCO3)	10.0	215	135	145						
Carbonate (as CaCO3)	10.0	ND	ND	ND						
Hydroxide (as CaCO3)	10.0	ND	ND	ND						
Chloride	1.00	352	599	753						
Conductivity (umho/cm @77F)	1.00	1620	2350	2780						
Fluoride	0.100	0.500	1.15	1.25						
Hardness (Ca,Mg) as CaCO3	10.0	440	260	900						
Nitrate as N	0.100	4.17	1.18	6.95						
pH	1.00	7.53	8.01	7.10						
Sulfate	1.00	45.4	268	54.4						
Surfactants(MBAS)	0.0500	ND	ND	ND						
Total Dissolved Solids(TDS)	10.0	1070	1510	1800						
ICP Metals										
Calcium	1.00	715	644	394						
Copper	0.0100	ND	ND	0.0177						
Iron	0.0500	1.70	0.787	1.73						
Magnesium	0.250	95.2	10.6	7.70						
Manganese	0.0200	1.74	1.15	1.23						
Potassium	1.00	15.5	23.9	4.80						
Sodium	1.00	189	492	167						
Zinc	0.0100	0.0630	0.0198	0.0687						

QUALITY CONTROL REPORT

QC Batch No: 042211-1

	LCS	LCS/LCSD						
Analytes	% REC	% Limit						
Conventionals								



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ANALYTICAL RESULTS

Page:	5				
Project ID:	4953-10-1531 G165-66	ASL	Job Number	Submitted	Client
Project Name:	MTA Westside Extension		49598	04/22/2011	MACTEC

Method: 600, General Minerals

			QC Bate	ch No: 0422	11-1			
	LCS	LCS/LCSD						
Analytes	% REC	% Limit						
Conventionals								
Alkalinity,Total	95	80-120						
Bicarbonate (as CaCO3)	95	80-120						
Carbonate (as CaCO3)	95	80-120						
Hydroxide (as CaCO3)	95	80-120						
Chloride	98	80-120						
Conductivity (umho/cm @77F)	97	80-120						
Fluoride	98	80-120						
Hardness (Ca,Mg) as CaCO3	100	80-120						
Nitrate as N	100	80-120						
pH	100	80-120						
Sulfate	95	80-120						
Surfactants(MBAS)	92	80-120						
Total Dissolved Solids(TDS)	102	80-120						
ICP Metals								
Calcium	106	80-120						
Copper	109	80-120						
Iron	105	80-120						
Magnesium	101	80-120						
Manganese	113	80-120						
Potassium	98	80-120						
Sodium	111	80-120						
Zinc	112	80-120						



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Marty Hudson

6

241 Moreno Drive Beverly Hills, CA

Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 6010B/7470A, CCR Title 22 Metals (TTLC)

QC Batch No: 042611-1								
Our Lab I.D.		267815	267816	267817				
Client Sample I.D.		G-166-D	G-166-S	G-165-D				
Date Sampled		04/22/2011	04/22/2011	04/22/2011				
Date Prepared		04/26/2011	04/26/2011	04/26/2011				
Preparation Method								
Date Analyzed		04/26/2011	04/26/2011	04/26/2011				
Matrix		Water	Water	Water				
Units		mg/L	mg/L	mg/L				
Dilution Factor		1	1	1				
Analytes	PQL	Results	Results	Results				
AA Metals								
Mercury	0.0005	ND	ND	ND				
ICP Metals								
Antimony	0.0100	ND	ND	ND				
Arsenic	0.0100	0.0258	0.0267	0.0120				
Barium	0.0100	1.21	0.921	0.840				
Beryllium	0.0050	ND	ND	ND				
Cadmium	0.0050	ND	ND	ND				
Chromium	0.0100	ND	ND	ND				
Cobalt	0.0100	ND	0.0164	0.0160				
Copper	0.0100	ND	ND	0.0177				
Lead	0.0050	ND	ND	ND				
Molybdenum	0.0100	0.0260	0.0706	ND				
Nickel	0.0100	0.0646	0.0626	0.0490				
Selenium	0.0100	0.0209	0.0192	ND				
Silver	0.0100	ND	ND	ND				
Thallium	0.0100	ND	ND	ND				
Vanadium	0.0100	ND	ND	ND				
Zinc	0.0100	0.0630	0.0198	0.0687				

QUALITY CONTROL REPORT

QC Batch No: 042611-1

	LCS	LCS/LCSD				
Analytes	% REC	% Limit				
AA Metals						
Mercury	107	80-120				
ICP Metals						
Antimony	100	80-120				
Arsenic	101	80-120				



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ANALYTICAL RESULTS

Page:	

7 Project ID: 4953-10-1531 G165-66 Project Name: MTA Westside Extension

ASL Job Number	Submitted	Client
49598	04/22/2011	MACTEC

Method: 6010B/7470A, CCR Title 22 Metals (TTLC)

	QC Batch No: 042611-1							
	LCS	LCS/LCSD						
Analytes	% REC	% Limit						
ICP Metals								
Barium	105	80-120						
Beryllium	107	80-120						
Cadmium	104	80-120						
Chromium	103	80-120						
Cobalt	102	80-120						
Copper	104	80-120						
Lead	105	80-120						
Molybdenum	100	80-120						
Nickel	106	80-120						
Selenium	100	80-120						
Silver	100	80-120						
Thallium	104	80-120						
Vanadium	100	80-120						
Zinc	106	80-120						



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Attn:	Marty Hudson				

8

241 Moreno Drive
Beverly Hills, CA

Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: W-042711-1P									
Our Lab I.D.		267815	267816	267817					
Client Sample I.D.		G-166-D	G-166-S	G-165-D					
Date Sampled		04/22/2011	04/22/2011	04/22/2011					
Date Prepared		04/27/2011	04/27/2011	04/27/2011					
Preparation Method									
Date Analyzed		04/27/2011	04/27/2011	04/27/2011					
Matrix		Water	Water	Water					
Units		mg/L	mg/L	mg/L					
Dilution Factor		1	1	1					
Analytes	PQL	Results	Results	Results					
TPH DROs (C10 to C28)	0.500	ND	ND	ND					
TPH OROs (C28+)	0.500	ND	ND	ND					

Our Lab I.D.		267815	267816	267817	
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	
Surrogate Percent Recovery					
Chlorobenzene	70-120	116	95	116	

QUALITY CONTROL REPORT

QC Batch No: W-042711-1P

	MS	MS DUP	RPD	MS/MSD	MS RPD			
Analytes	% REC	% REC	%	% Limit	% Limit			
Diesel	102	101	<1	75-120	<20			



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Marty Hudson

241 Moreno Drive Beverly Hills, CA

Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8081A, Organochlorine Pesticides

QC Batch No: 042711-1									
Our Lab I.D.		267815	267817						
Client Sample I.D.		G-166-D	G-165-D						
Date Sampled		04/22/2011	04/22/2011						
Date Prepared		04/27/2011	04/27/2011						
Preparation Method									
Date Analyzed		04/27/2011	04/27/2011						
Matrix		Water	Water						
Units		ug/L	ug/L						
Dilution Factor		1	1						
Analytes	PQL	Results	Results						
Aldrin	0.0400	ND	ND						
alpha-Hexachlorocyclohexane (Alpha-BHC)	0.120	ND	ND						
Beta-Hexachlorocyclohexane (Beta-BHC)	0.110	ND	ND						
Gamma-Chlordane	0.400	ND	ND						
alpha-Chlordane	0.400	ND	ND						
4,4'-DDD (DDD)	0.100	ND	ND						
4,4'-DDE (DDE)	0.0900	ND	ND						
4,4'-DDT (DDT)	0.0400	ND	ND						
delta-Hexachlorocyclohexane (Delta-BHC)	0.110	ND	ND						
dieldrin	0.0500	ND	ND						
Endosulfan 1	0.0600	ND	ND						
Endosulfan 11	0.0900	ND	ND						
Endosulfan sulfate	0.0700	ND	ND						
Endrin	0.0800	ND	ND						
Endrin aldehyde	0.0900	ND	ND						
Endrin ketone	0.0700	ND	ND						
gamma-Hexachlorocyclohexane (Gamma-BHC, Lindane)	0.0600	ND	ND						
Heptachlor	0.0300	ND	ND						
Heptachlor epoxide	0.0700	ND	ND						
Methoxychlor	0.100	ND	ND						
Toxaphene	10.0	ND	ND						

Our Lab I.D.		267815	267817		
Surrogates	% Rec.Limit	% Rec.	% Rec.		
Surrogate Percent Recovery					
Decachlorobiphenyl	43-169	63	60		



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ANALYTICAL RESULTS

Page:		10
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Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8081A, Organochlorine Pesticides

QC Batch No: 042711-1										
	LCS	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD					
Analytes	% REC	% REC	% REC	% Limit	% Limit					
Aldrin	116	105	10.0	42-122	<30					
4,4'-DDT (DDT)	109	107	1.9	25-160	<30					
dieldrin	119	115	3.4	36-146	<30					
Endrin	115	113	1.8	30-147	<30					
gamma-Hexachlorocyclohexane	106	113	6.4	32-127	<30					
(Gamma-BHC, Lindane)										
Heptachlor	119	108	9.7	34-111	<30					



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Page:	11			
Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8082, Polychlorinated Biphenyls(PCBs) by Gas Chromatography

QC Batch No: 042711-1							
Our Lab I.D.		267815	267817				
Client Sample I.D.		G-166-D	G-165-D				
Date Sampled		04/22/2011	04/22/2011				
Date Prepared		04/27/2011	04/27/2011				
Preparation Method							
Date Analyzed		04/27/2011	04/27/2011				
Matrix		Water	Water				
Units		ug/L	ug/L				
Dilution Factor		1	1				
Analytes	PQL	Results	Results				
Aroclor-1016 (PCB-1016)	0.650	ND	ND				
Aroclor-1221 (PCB-1221)	1.00	ND	ND				
Aroclor-1232 (PCB-1232)	0.650	ND	ND				
Aroclor-1242 (PCB-1242)	0.650	ND	ND				
Aroclor-1248 (PCB-1248)	0.650	ND	ND				
Aroclor-1254 (PCB-1254)	0.650	ND	ND				
Aroclor-1260 (PCB-1260)	0.650	ND	ND				

Our Lab I.D.		267815	267817		
Surrogates	% Rec.Limit	% Rec.	% Rec.		
Surrogate Percent Recovery					
Decachlorobiphenyl	43-169	63	60		

QC Batch No: 042711-1										
	LCS	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD					
Analytes	% REC	% REC	% REC	% Limit	% Limit					
Aroclor-1260 (PCB-1260)	106	100	5.8	39-150	<30					



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Page:	12			
Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8260B, Volatile Organic Compounds

Our Lab LD.267814267815267816267817Client Sample I.D.G-165-SG-166-DG-165-DG-165-DDate Sampled04/22/201104/22/201104/22/201104/22/2011Date Sampled04/22/201104/22/201104/22/201104/22/2011Date Analyzed04/27/201104/27/201104/27/201104/27/2011MatrixWaterWaterWaterWaterUnitsug/Lug/Lug/Lug/Lug/LDilution Factor1111AnalytesPQLResultsResultsResultsAccione1.00NDNDNDNDBroncohloromethane()1.00NDNDNDBroncohloromethane()1.00NDNDNDBroncohloromethane(Chichorboromethane)5.00NDNDNDBroncohloromethane(Chichorboromethane)1.00NDNDNDBroncohloromethane(Chichorboromethane)1.00NDNDNDParametane (Achichorboromethane)1.00NDNDNDBroncohloromethane(Chichorboromethane)1.00NDNDNDPatanore (MEK, Methyl ethyl kotone)5.00NDNDNDPatanore (MEK, Methyl ethyl kotone)1.00NDNDNDPatanore (MEK, Methyl ethyl kotone)1.00NDNDNDCarbon disulfide1.00NDNDNDNDCarbon disulfide1.00NDND </th <th colspan="8">QC Batch No: W-042611-2B</th>	QC Batch No: W-042611-2B							
Chent Sample LD.GradesampledGradesampl	Our Lab I.D.		267814	267815	267816	267817		
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Chlorobenzene1.00NDNDNDNDChloroethane3.00NDNDNDND2-Chloroethyl vinyl ether5.00NDNDNDNDChloroform (Trichloromethane)1.002.871.141.47NDChloroform (Trichloromethane)1.00NDNDNDNDChlorotoluene (p-Chlorotoluene)3.00NDNDNDND2-Chlorotoluene (p-Chlorotoluene)1.00NDNDNDND2-Chlorotoluene (o-Chlorotoluene)1.00NDNDNDND1,2-Dibromo-3-chloropropane (DBCP)5.00NDNDNDNDDibromochloromethane1.004.32ND2.43ND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDND1,3-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDNDND1,3-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (hance3.00NDNDNDND1,4-Dichlorobenzene (hance3.00NDNDNDND1,4-Dichlorobenzene (hance3.00NDNDNDND1,4-Dichlorobenzene (hance1.00NDNDNDND1,4-Dichlorobenzene (hance <t< td=""><td>Carbon tetrachloride (Tetrachloromethane)</td><td>1.00</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td></td></t<>	Carbon tetrachloride (Tetrachloromethane)	1.00	ND	ND	ND	ND		
Chloroethane3.00NDNDNDND2-Chloroethyl vinyl ether5.00NDNDNDNDChloroform (Trichloromethane)1.002.871.141.47NDChloromethane (Methyl chloride)3.00NDNDNDND4-Chlorotoluene (p-Chlorotoluene)1.00NDNDNDND2-Chlorotoluene (o-Chlorotoluene)1.00NDNDNDND2-Chlorotoluene (o-Chlorotoluene)1.00NDNDNDND1,2-Dibromo-3-chloropropane (DBCP)5.00NDNDNDNDDibromoethane1.00NDNDNDND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDND1,2-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDND1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichloromethane3.00NDNDNDND1,4-Dichlorobenzene (handel)1.00NDNDNDND1,4-Dichlorobenzene (handel)1.00NDNDNDND1,4-Dichlorobenzene (handel)1.00NDNDNDND1,4-Dichlorobenzene (handel)1.00NDNDNDND1,4-Dichlorobenzene (handel)1.00NDNDNDND1,4-Dichlorobenzene (handel)1.00NDNDND <t< td=""><td>Chlorobenzene</td><td>1.00</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td></td></t<>	Chlorobenzene	1.00	ND	ND	ND	ND		
2-Chloroethyl vinyl ether5.00NDNDNDNDChloroform (Trichloromethane)1.002.871.141.47NDChloromethane (Methyl chloride)3.00NDNDNDND4-Chlorotoluene (p-Chlorotoluene)1.00NDNDNDND2-Chlorotoluene (o-Chlorotoluene)1.00NDNDNDND2-Chlorotoluene (o-Chlorotoluene)1.00NDNDNDND1,2-Dibromo-3-chloropropane (DBCP)5.00NDNDNDNDDibromochloromethane1.004.32ND2.43ND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDNDDibromoethane1.00NDNDNDND1,3-Dichlorobenzene (n-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (n-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (n-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (n-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (n-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (n-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (n-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (n-Dichlorobenzene)1.00ND<	Chloroethane	3.00	ND	ND	ND	ND		
Chloroform (Trichloromethane)1.002.871.141.47NDChloromethane (Methyl chloride)3.00NDNDNDND4-Chlorotoluene (p-Chlorotoluene)1.00NDNDNDND2-Chlorotoluene (o-Chlorotoluene)1.00NDNDNDND1,2-Dibromo-3-chloropropane (DBCP)5.00NDNDNDNDDibromochloromethane1.004.32ND2.43ND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDNDDibromoethane1.00NDNDNDND1,3-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.0	2-Chloroethyl vinyl ether	5.00	ND	ND	ND	ND		
Chloromethane (Methyl chloride)3.00NDNDNDND4-Chlorotoluene (p-Chlorotoluene)1.00NDNDNDND2-Chlorotoluene (o-Chlorotoluene)1.00NDNDNDND1,2-Dibromo-3-chloropropane (DBCP)5.00NDNDNDNDDibromochloromethane1.004.32ND2.43ND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDNDDibromoethane1.00NDNDNDND1,2-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDND1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00<	Chloroform (Trichloromethane)	1.00	2.87	1.14	1.47	ND		
4-Chlorotoluene (p-Chlorotoluene)1.00NDNDNDND2-Chlorotoluene (o-Chlorotoluene)1.00NDNDNDND1,2-Dibromo-3-chloropropane (DBCP)5.00NDNDNDNDDibromochloromethane1.004.32ND2.43ND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDNDDibromoethane1.00NDNDNDND1,2-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDND1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)3.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene3.00NDNDND	Chloromethane (Methyl chloride)	3.00	ND	ND	ND	ND		
2-Chlorotoluene (o-Chlorotoluene)1.00NDNDNDND1,2-Dibromo-3-chloropropane (DBCP)5.00NDNDNDNDNDDibromochloromethane1.004.32ND2.43ND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDNDDibromoethane1.00NDNDNDND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDND1,2-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDNDND1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (hance3.00NDNDNDND	4-Chlorotoluene (p-Chlorotoluene)	1.00	ND	ND	ND	ND		
1,2-Dibromo-3-chloropropane (DBCP)5.00NDNDNDNDDibromochloromethane1.004.32ND2.43ND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDNDDibromoethane1.00NDNDNDNDDibromoethane1.00NDNDNDND1,2-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDND1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)3.00NDNDND	2-Chlorotoluene (o-Chlorotoluene)	1.00	ND	ND	ND	ND		
Dibromochloromethane1.004.32ND2.43ND1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDNDDibromomethane1.00NDNDNDND1,2-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDNDND1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (hance3.00NDNDNDND	1,2-Dibromo-3-chloropropane (DBCP)	5.00	ND	ND	ND	ND		
1,2-Dibromoethane (EDB, Ethylene dibromide)1.00NDNDNDNDDibromomethane1.00NDNDNDND1,2-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDNDND1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)3.00NDNDNDND	Dibromochloromethane	1.00	4.32	ND	2.43	ND		
Dibromomethane1.00NDNDNDND1,2-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDNDND1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDNDDichlorodifluoromethane3.00NDNDNDND	1,2-Dibromoethane (EDB, Ethylene dibromide)	1.00	ND	ND	ND	ND		
1,2-Dichlorobenzene (o-Dichlorobenzene)1.00NDNDNDND1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDNDDichlorodifluoromethane3.00NDNDNDND	Dibromomethane	1.00	ND	ND	ND	ND		
1,3-Dichlorobenzene (m-Dichlorobenzene)1.00NDNDND1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDDichlorodifluoromethane3.00NDNDND	1,2-Dichlorobenzene (o-Dichlorobenzene)	1.00	ND	ND	ND	ND		
1,4-Dichlorobenzene (p-Dichlorobenzene)1.00NDNDNDDichlorodifluoromethane3.00NDNDND	1,3-Dichlorobenzene (m-Dichlorobenzene)	1.00	ND	ND	ND	ND		
Dichlorodifluoromethane 3.00 ND ND ND	1,4-Dichlorobenzene (p-Dichlorobenzene)	1.00	ND	ND	ND	ND		
	Dichlorodifluoromethane	3.00	ND	ND	ND	ND		
1,1-Dichloroethane 1.00 ND ND ND ND	1,1-Dichloroethane	1.00	ND	ND	ND	ND		



13

AMERICAN SCIENTIFIC LABORATORIES, LLC Environmental Testing Services

2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

ANALYTICAL RESULTS

Page:

Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: W-042611-2B							
Our Lab I.D.		267814	267815	267816	267817		
Client Sample I.D.		G-165-S	G-166-D	G-166-S	G-165-D		
Date Sampled		04/22/2011	04/22/2011	04/22/2011	04/22/2011		
Date Prepared		04/27/2011	04/27/2011	04/27/2011	04/27/2011		
Preparation Method							
Date Analyzed		04/27/2011	04/27/2011	04/27/2011	04/27/2011		
Matrix		Water	Water	Water	Water		
Units		ug/L	ug/L	ug/L	ug/L		
Dilution Factor		1	1	1	1		
Analytes	PQL	Results	Results	Results	Results		
1,2-Dichloroethane	1.00	ND	ND	ND	ND		
1,1-Dichloroethene (1,1-Dichloroethylene)	1.00	ND	ND	ND	ND		
cis-1,2-Dichloroethene	1.00	ND	ND	ND	ND		
trans-1,2-Dichloroethene	1.00	ND	ND	ND	ND		
1,2-Dichloropropane	1.00	ND	ND	ND	ND		
1,3-Dichloropropane	1.00	ND	ND	ND	ND		
2,2-Dichloropropane	1.00	ND	ND	ND	ND		
1,1-Dichloropropene	1.00	ND	ND	ND	ND		
cis-1,3-Dichloropropene	1.00	ND	ND	ND	ND		
trans-1,3-Dichloropropene	1.00	ND	ND	ND	ND		
Ethylbenzene	1.00	ND	ND	ND	ND		
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	3.00	ND	ND	ND	ND		
2-Hexanone	5.00	ND	ND	ND	ND		
Isopropylbenzene	1.00	ND	ND	ND	ND		
p-Isopropyltoluene (4-Isopropyltoluene)	1.00	ND	ND	ND	ND		
MTBE	2.00	ND	ND	ND	ND		
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	5.00	ND	ND	ND	ND		
Methylene chloride (Dichloromethane, DCM)	5.00	ND	ND	ND	ND		
Naphthalene	1.00	ND	ND	ND	ND		
n-Propylbenzene	1.00	ND	ND	ND	ND		
Styrene	1.00	ND	ND	ND	ND		
1,1,1,2-Tetrachloroethane	1.00	ND	ND	ND	ND		
1,1,2,2-Tetrachloroethane	1.00	ND	ND	ND	ND		
Tetrachloroethene (Tetrachloroethylene)	1.00	ND	ND	ND	ND		
Toluene (Methyl benzene)	1.00	ND	ND	ND	ND		
1,2,3-Trichlorobenzene	1.00	ND	ND	ND	ND		
1,2,4-Trichlorobenzene	1.00	ND	ND	ND	ND		
1,1,1-Trichloroethane	1.00	ND	ND	ND	ND		
1,1,2-Trichloroethane	1.00	ND	ND	ND	ND		
Trichloroethene (TCE)	1.00	ND	ND	ND	ND		
Trichlorofluoromethane	1.00	ND	ND	ND	ND		
1,2,3-Trichloropropane	1.00	ND	ND	ND	ND		
1,2,4-Trimethylbenzene	1.00	ND	ND	ND	ND		
1,3,5-Trimethylbenzene	1.00	ND	ND	ND	ND		
Vinyl acetate	5.00	ND	ND	ND	ND		



14

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ANALYTICAL RESULTS

Page:

Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: W-042611-2B							
Our Lab I.D.		267814	267815	267816	267817		
Client Sample I.D.		G-165-S	G-166-D	G-166-S	G-165-D		
Date Sampled		04/22/2011	04/22/2011	04/22/2011	04/22/2011		
Date Prepared		04/27/2011	04/27/2011	04/27/2011	04/27/2011		
Preparation Method							
Date Analyzed		04/27/2011	04/27/2011	04/27/2011	04/27/2011		
Matrix		Water	Water	Water	Water		
Units		ug/L	ug/L	ug/L	ug/L		
Dilution Factor		1	1	1	1		
Analytes	PQL	Results	Results	Results	Results		
Vinyl chloride (Chloroethene)	3.00	ND	ND	ND	ND		
o-Xylene	1.00	ND	ND	ND	ND		
m- & p-Xylenes	2.00	ND	ND	ND	ND		

Our Lab I.D.		267814	267815	267816	267817	
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	100	101	100	101	
Dibromofluoromethane	70-120	86	89	88	90	
Toluene-d8	70-120	96	97	96	98	

QC Batch No: W-042611-2B										
MS MS DUP RPD MS/MSD MS RPD										
Analytes	% REC	% REC	%	% Limit	% Limit					
Benzene	91	85	6.8	75-120	15					
Chlorobenzene	111	105	5.6	75-120	15					
1,1-Dichloroethene	80	76	5.1	75-120	15					
(1,1-Dichloroethylene)										
MTBE	102	103	<1	75-120	15					
Toluene (Methyl benzene)	109	103	5.7	75-120	15					
Trichloroethene (TCE)	98	91	7.4	75-120	15					



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Site

ANALYTICAL RESULTS

Ordered By

MACTE	C Engineering & Consulting Inc
5628 Ea	st Slauson Ave.
Los Ang	eles, CA 90040-
Telepho	ne: (323)889-5300
Attn:	Marty Hudson

241 Moreno Drive Beverly Hills, CA

Page:	15			
Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8260B, TPH GROs(Gasoline Range Organics)

QC Batch No: W-042611-2B

Our Lab I.D.		267814	267815	267816	267817	
Client Sample I.D.		G-165-S	G-166-D	G-166-S	G-165-D	
Date Sampled		04/22/2011	04/22/2011	04/22/2011	04/22/2011	
Date Prepared		04/27/2011	04/27/2011	04/27/2011	04/27/2011	
Preparation Method						
Date Analyzed		04/27/2011	04/27/2011	04/27/2011	04/27/2011	
Matrix		Water	Water	Water	Water	
Units		ug/L	ug/L	ug/L	ug/L	
Dilution Factor		1	1	1	1	
Analytes	PQL	Results	Results	Results	Results	
TPH GROs (C6 to C10)	50.0	ND	ND	ND	ND	

Our Lab I.D.		267814	267815	267816	267817	
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	100	101	100	101	
Dibromofluoromethane	70-120	86	89	88	90	
Toluene-d8	70-120	96	97	96	98	

QUALITY CONTROL REPORT

QC Batch No: W-042611-2B

	MS	MS DUP	RPD	MS/MSD	MS RPD			
Analytes	% REC	% REC	%	% Limit	% Limit			
Benzene	91	85	6.8	75-120	15			
Chlorobenzene	111	105	5.6	75-120	15			
1,1-Dichloroethene	80	76	5.1	75-120	15			
(1,1-Dichloroethylene)								
Toluene (Methyl benzene)	109	103	5.7	75-120	15			
Trichloroethene (TCE)	98	91	7.4	75-120	15			



2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

Site

ANALYTICAL RESULTS

Ordered By

Attn:

Page:

MACTEC Engineering & Consulting Inc	
5628 East Slauson Ave.	
Los Angeles, CA 90040-	
Telephone: (323)889-5300	

16

Marty Hudson

241 Moreno Drive Beverly Hills, CA

				a1 .
Project ID:	4953-10-1531 G165-66	ASL JOD Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8270C, Semivolatile Organics

QC Batch No: 042711-1							
Our Lab I.D.		267815	267816	267817			
Client Sample I.D.		G-166-D	G-166-S	G-165-D			
Date Sampled		04/22/2011	04/22/2011	04/22/2011			
Date Prepared		04/27/2011	04/27/2011	04/27/2011			
Preparation Method							
Date Analyzed		04/27/2011	04/27/2011	04/27/2011			
Matrix		Water	Water	Water			
Units		ug/L	ug/L	ug/L			
Dilution Factor		1	1	1			
Analytes	PQL	Results	Results	Results			
Acenaphthene	10.0	ND	ND	ND			
Acenaphthylene	10.0	ND	ND	ND			
Anthracene	10.0	ND	ND	ND			
Benz(a)anthracene (Benzo(a)anthracene)	10.0	ND	ND	ND			
Benzo(a)pyrene	10.0	ND	ND	ND			
Benzo(b)fluoranthene	10.0	ND	ND	ND			
Benzo(ghi)perylene	10.0	ND	ND	ND			
Benzo(k)fluoranthene	10.0	ND	ND	ND			
Benzidine	20.0	ND	ND	ND			
Benzoic acid	10.0	ND	ND	ND			
Benzyl alcohol	10.0	ND	ND	ND			
Bis(2-chloroethoxy)methane	10.0	ND	ND	ND			
Bis(2-chloroethyl)ether	10.0	ND	ND	ND			
Bis(2-chloroisopropyl) ether	10.0	ND	ND	ND			
Bis(2-ethylhexyl) phthalate	10.0	ND	ND	ND			
4-Bromophenyl phenyl ether	10.0	ND	ND	ND			
Butyl benzyl phthalate (Benzyl butyl phthalate)	10.0	ND	ND	ND			
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	1.00	ND	ND	ND			
4-Chloroaniline	10.0	ND	ND	ND			
2-Chloronaphthalene	10.0	ND	ND	ND			
2-Chlorophenol (o-Chlorophenol)	1.00	ND	ND	ND			
4-Chlorophenyl phenyl ether	10.0	ND	ND	ND			
Chrysene	10.0	ND	ND	ND			
Di-n-butyl phthalate	10.0	ND	ND	ND			
Di-n-octyl phthalate (Dioctyl ester)	10.0	ND	ND	ND			
Dibenz(a,h)anthracene	10.0	ND	ND	ND			
Dibenzofuran	10.0	ND	ND	ND		[
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND			
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND			



2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

ANALYTICAL RESULTS

Page:

Page:	17			
Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8270C, Semivolatile Organics

QC Batch No: 042711-1									
Our Lab I.D.		267815	267816	267817					
Client Sample I.D.		G-166-D	G-166-S	G-165-D					
Date Sampled		04/22/2011	04/22/2011	04/22/2011					
Date Prepared		04/27/2011	04/27/2011	04/27/2011					
Preparation Method									
Date Analyzed		04/27/2011	04/27/2011	04/27/2011					
Matrix		Water	Water	Water					
Units		ug/L	ug/L	ug/L					
Dilution Factor		1	1	1					
Analytes	PQL	Results	Results	Results					
1,4-Dichlorobenzene	10.0	ND	ND	ND					
3,3'-Dichlorobenzidine	20.0	ND	ND	ND					
2.4-Dichlorophenol	1.00	ND	ND	ND					
Diethyl phthalate (Diethyl ester)	10.0	ND	ND	ND					
2.4-Dimethylphenol	1.00	ND	ND	ND					
Dimethyl phthalate (Dimethyl ester)	10.0	ND	ND	ND					
2.4-Dinitrophenol	1.00	ND	ND	ND					
2 4-Dinitrotoluene	10.0	ND	ND	ND					
2 6-Dinitrotoluene (2 6-DNT)	10.0	ND	ND	ND					
1 2-Dinhenvlhydrazine	10.0	ND	ND	ND					
Fluoranthene	10.0	ND	ND	ND					
Fluorene	10.0	ND	ND	ND					
Hexachlorobenzene	10.0	ND	ND	ND					
Hexachlorobutadiene (1 3-Hexachlorobutadiene)	20.0	ND	ND	ND					
Hexachlorocyclopentadiene	10.0	ND	ND	ND					
Heyachloroethane	10.0	ND	ND	ND					
Indeno(1,2,3_cd)nyrene	10.0	ND	ND	ND					
Isophorope	10.0	ND	ND	ND					
2 methyl 4.6 Dinitronhenol	1.00	ND	ND	ND					
2 Mothylaanhtholono	10.0	ND	ND	ND					
2-Methylnaphthatelle	1 00	ND	ND	ND					
4 Methylphenol (n Cresol, 4 Cresol)	1.00	ND	ND	ND					
4-Methylphenol (p-Clesol, 4-Clesol)	10.0	ND	ND	ND					
N-Nitroso-Di-n-propylamine	10.0	ND	ND	ND					
N-Nitrosodimethylamine (NDMA)	10.0	ND	ND	ND					
N-Nitrosodipnenylamine	10.0	ND	ND	ND					
	10.0	ND ND	ND ND	ND ND					
	10.0		ND ND						
3-Nitroaniline	10.0		ND						
4-Nitroaniline	10.0	ND ND	ND						
Nitrobenzene (NB)	10.0	ND	ND	ND					
2-Nitrophenol (o-Nitrophenol)	1.00	ND	ND	ND					
4-Nitrophenol	1.00	ND	ND	ND					
Pentachlorophenol	1.00	ND	ND	ND					
Phenanthrene	10.0	ND	ND	ND					
Phenol	1.00	ND	ND	ND					



18

AMERICAN SCIENTIFIC LABORATORIES, LLC Environmental Testing Services

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ANALYTICAL RESULTS

Page:

Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: 8270C, Semivolatile Organics

QC Batch No: 042711-1									
Our Lab I.D.		267815	267816	267817					
Client Sample I.D.		G-166-D	G-166-S	G-165-D					
Date Sampled		04/22/2011	04/22/2011	04/22/2011					
Date Prepared		04/27/2011	04/27/2011	04/27/2011					
Preparation Method									
Date Analyzed		04/27/2011	04/27/2011	04/27/2011					
Matrix		Water	Water	Water					
Units		ug/L	ug/L	ug/L					
Dilution Factor		1	1	1					
Analytes	PQL	Results	Results	Results					
Pyrene	10.0	ND	ND	ND					
1,2,4-Trichlorobenzene	10.0	ND	ND	ND					
2,4,5-Trichlorophenol	1.00	ND	ND	ND					
2,4,6-Trichlorophenol	1.00	ND	ND	ND					

Our Lab I.D.		267815	267816	267817	
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	
Surrogate Percent Recovery					
2-Fluorophenol	21-105	27	35	29	
Phenol-d6	10-107	29	34	29	
2,4,6-Tribromophenol	10-123	69	77	59	
Nitrobenzene-d5	35-114	64	55	53	
2-Fluorobiphenyl	18-116	52	54	52	
Terphenyl-d14	33-141	93	102	99	

QUALITY CONTROL REPORT

QC Batch No: 042711-1

	LCS	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD			
Analytes	% REC	% REC	% REC	% Limit	% Limit			
Acenaphthene	64	68	6.1	43-118	<30			
4-Chloro-3-methylphenol	65	64	1.6	23-117	<30			
(p-Chloro-m-cresol)								
2-Chlorophenol (o-Chlorophenol)	49	54	9.7	27-113	<30			
1,4-Dichlorobenzene	50	55	9.5	36-105	<30			
2,4-Dinitrotoluene	102	102	<1	24-120	<30			
N-Nitroso-Di-n-propylamine	75	81	7.7	41-116	<30			
4-Nitrophenol	63	56	11.8	10-133	<30			
Pentachlorophenol	64	65	1.6	9-118	<30			
Phenol	35	40	13.3	12-110	<30			
Pyrene	115	113	1.8	26-127	<30			
1,2,4-Trichlorobenzene	64	71	10.4	39-98	<30			



2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

Site

ANALYTICAL RESULTS

Ordered By

Attn:

Page:

MACTEC Enginee	ering & Consulting Inc
5628 East Slauson	Ave.
Los Angeles, CA 9	00040-
Telephone: (323)	889-5300

19

Marty Hudson

241 Moreno Drive Beverly Hills, CA

0				
Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: RSKSOP-175, Dissolved Gases

QC Batch No: 042911-1 Our Lab I.D. 267814 267815 267816 267817 Client Sample I.D. G-165-S G-166-D G-166-S G-165-D 04/22/2011 04/22/2011 04/22/2011 04/22/2011 Date Sampled Date Prepared 04/29/2011 04/29/2011 04/29/2011 04/29/2011 Preparation Method 04/29/2011 04/29/2011 04/29/2011 04/29/2011 Date Analyzed Matrix Water Water Water Water Units ug/L ug/L ug/L ug/L **Dilution Factor** 1 1 1 1 Results Analytes PQL Results Results Results 1.00 ND 2.50 4.92 5.91 Methane

QUALITY CONTROL REPORT

QC Batch No: 042911-1

	LCS	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD			
Analytes	% REC	% REC	% REC	% Limit	% Limit			
Methane	90	93	3.3	70-130	<30			



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Site

ANALYTICAL RESULTS

Ordered By

Page:

MACTE	C Engineering & Consulting Inc
5628 Eas	t Slauson Ave.
Los Ange	eles, CA 90040-
Telephon	e: (323)889-5300
Attn:	Marty Hudson

20

241 Moreno Drive
Beverly Hills, CA

-				
Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: SM2540-D, Total Suspended Solids (TSS)

QC Batch No: 042711-1 Our Lab I.D. 267815 267816 267817 Client Sample I.D. G-166-D G-166-S G-165-D Date Sampled 04/22/2011 04/22/2011 04/22/2011 Date Prepared 04/27/2011 04/27/2011 04/27/2011 Preparation Method 04/27/2011 04/27/2011 04/27/2011 Date Analyzed Matrix Water Water Water Units mg/L mg/L mg/L **Dilution Factor** 1 1 1 PQL Results Analytes Results Results Conventionals 10.0 163000 164000 7970 Solids, Total Suspended (TSS)

QC Batch No: 042711-1										
	LCS	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD					
Analytes	% REC	% REC	% REC	% Limit	% Limit					
Conventionals										
Solids, Total Suspended (TSS)	104	101	2.9	80-120	20					



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Site

ANALYTICAL RESULTS

Ordered By

MACTE	C Engineering & Consulting Inc
5628 Ea	st Slauson Ave.
Los Ang	geles, CA 90040-
Telepho	ne: (323)889-5300
Attn:	Marty Hudson

241 Moreno Drive Beverly Hills, CA

Page:	21			
Project ID:	4953-10-1531 G165-66	ASL Job Number	Submitted	Client
Project Name:	MTA Westside Extension	49598	04/22/2011	MACTEC

Method: SM4500-S-2-D, Sulfide (Methylene Blue Method)

	QC Batch N	o: 042211-1			
Our Lab I.D.		267815	267816	267817	
Client Sample I.D.		G-166-D	G-166-S	G-165-D	
Date Sampled		04/22/2011	04/22/2011	04/22/2011	
Date Prepared		04/22/2011	04/22/2011	04/22/2011	
Preparation Method					
Date Analyzed		04/22/2011	04/22/2011	04/22/2011	
Matrix		Water	Water	Water	
Units		mg/L	mg/L	mg/L	
Dilution Factor		1	1	1	
Analytes	PQL	Results	Results	Results	
Conventionals					
Sulfide, total	0.0200	ND	ND	ND	

			QC Batc	h No: 0422	11-1			
	SM	SM DUP	RPD	SM RPD				
Analytes	Result	Result	%	% Limit				
Conventionals								
Sulfide, total	ND	ND	<1	20				



LABORATORY REPORT

May 6, 2011

Molky Brar American Scientific Laboratories 2520 North San Fernando Road Los Angeles, CA 90065

RE: 49598

Dear Molky:

Enclosed are the results of the samples submitted to our laboratory on April 25, 2011. For your reference, these analyses have been assigned our service request number P1101541.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-10-1; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager



Client:American Scientific LaboratoriesProject:49598

CAS Project No: P1101541

CASE NARRATIVE

The samples were received intact under chain of custody on April 25, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hydrogen Sulfide Analysis

The samples were analyzed for hydrogen sulfide using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD).

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.



			DE	ETAIL SUM	MARY REPORT
Client: Project ID:	American Scien 49598	tific Labo	ratories		Service Request: P1101541
Date Received: Time Received:	4/25/2011 11:10		Data	Time	ur Liq - Sulfur
Client Sample ID	Lab Code	Matrix	Collected	Collected	Sult
267814	P1101541-001	Water	4/22/2011	11:45	Х
267815	P1101541-002	Water	4/22/2011	12:35	Х
267816	P1101541-003	Water	4/22/2011	13:20	Х
267817	P1101541-004	Water	4/22/2011	14:35	Х

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	Time: Cooler / Ble			P C	(Signature) (Signature)	Received by	Time: linie:	Date:			elinquished by: (Signature) elinquished by (Signature)	тр др
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luírements (MRLs, QAPP)	Project Rec	EDD Units:	Yes / No	EDD required ` Type:		charge	ackage) 10% Sur	ita Validation Pa nt specified)	Tier III - (Da Tier V - (clier	, 9	eport Tier Levels - please sele ar 1 - (Results/Default if not specified ar II - (Results + QC)	7 7 2
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			Øiss Hyd	Sample Volume	Flow Controller (Bar Code - FC #)	Canister ID (Bar Code # - AC, SC, etc.)	Sample Type (Air/Tube/ Solid)	Time Collected	Date Collected	Laboratory ID Number	fient Sample {D	0
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e.g. Actual Preservative or specific instructions			Su							b- Com	hone 1F	τ,
Comments			4-			lion	lling Informa	P.O. # / Bi		Brar	roject Manager Molly	σ
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			CAS Contact				2m2	Droject No	mation	Deportion Infor	omnow Namo & Addrage ()	5
171591	tandard CAS Projec	es) please circle ay (25%) ¶0 Day - S	s Days (Surcharg 4 Day (35%) 5 D	h Busines 3 Day (50%)	naround Time 2 Day (75%) 3	equested Tur Day (100%)	- 7	CON	anionia es 526-7161 }-7270	Sillit valley, Ca Phone (805) (Fax (805) 526	1 Employee - Owned Company	2
								Suite A	nter Drive, 1	2655 Park Ce	Columbia Analytical	
Page of	St	vice Reque	alytical Ser	d & Ana	/ Record	Custody	nain of		P			

FIGURE F-11.30



Sample Acceptance Check Form

- Client Projec	t: American Scienter 49598	entific Laboratories				Work order:	P1101541			
Sample	e(s) received on	: 4/25/11			Date opened:	4/25/11	by:	SSTA	PLES	
Vote: Thi	is form is used for <u>all</u>	samples received by CAS.	The use of this for	rm for custody sea	ls is strictly mea	nt to indicate presence	/absence and not	as an indi	cation of	
complianc	e or nonconformity.	. Thermal preservation and r	H will only be ev	aluated either at th	ne request of the	client and/or as require	ed by the method/	/SOP.		
	_							Yes	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly m	narked with cl	ient sample ID)?			X		
2	Container(s) s	supplied by CAS?							X	
3	Did sample c	containers arrive in goo	od condition?					X		
4	Were chain-o	of-custody papers used	and filled out	<i>:</i> ?				X		
5	Did sample c	container labels and/or	r tags agree wi	ith custody par	pers?			X		
6	Was sample v	volume received adequ	late for analys	sis?				X		
7	Are samples v	within specified holdin	ig times?					X		
8	Was proper te	emperature (thermal r	preservation) c	of cooler at rec	eipt adhered	to?		X		
	C	Cooler Temperature	6	°C Blank 7	Гетрегаture		°C	X		
9	Was a trip bl	ank received?					1			X
10	Were custody	y seals on outside of cc	ooler/Box?						X	
		Location of seal(s)?					Sealing Lid?			X
	Were signatur	re and date included?					1			X
	Were seals in	itact?								X
	Were custody	seals on outside of sar	mple containe	r?					X	
	Location of seal(s)? Sealing Lid?									X
	Were signatur	re and date included?					1			X
	Were seals in	itact?								X
11	Do containe	ers have appropriate pr	eservation, a	ccording to me	ethod/SOP or	Client specified i	information?	X		
	Is there a clie	ent indication that the s	submitted sam	ples are pH p	reserved?	-				X
	Were VOA v	vials checked for prese	nce/absence o	of air bubbles?						X
	Does the clier	nt/method/SOP require	that the analy	vst check the st	ample pH and	d if necessary alte	er it?			X
12	Tubes:	Are the tubes cap	med and intact	19		• •••••••	1			
12		Do they contain r	noisturo?							
13	Rodaes	Do mey contain in Are the hadges p	101sture:	d and intact?						
15	Dauges.	Are dual hed had	concernated (and individual'	w conned and	1 intert?				
					y capped and					
Lab	o Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receir	pt / Pres	ervatior	1
1015		Description	рн	рн	рн	(Presence/Absence)		Comme	nts	
P110154	41-001.01	40mL VOA NP	└──── ┤	6	 '	Р	 			
P110154 P110152	<u>+1-001.02</u> 41.001.03	40mL VOA NP	 	├ ────┦	<u> </u> '	P P	 			
P110154	41-002.01	40mL VOA NP	·+	6	'	P I	t			
P110154	41-002.02	40mL VOA NP	(<u> </u>	'	P				
P110154	41-002.03	40mL VOA NP		[]		P	<u> </u>			
D11015	41 002 01	40mL VOA ND	· · · · · · · · · · · · · · · · · · ·	6		р				

Explain any discrepancies: (include lab sample ID numbers):

40mL VOA NP

Vials contained precipitate

P1101541-003.02

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

P1101541_American Scientific Laboratories_Sulfur Analysis _ 49598.xls - Page 1 of 2

Ρ



2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

Sample Acceptance Check Form

Client: American Scientific Laboratories Work order: P1101541
Project: 49598

Sample(s) received on:		Date opened:	4/25/11	by: SSTAPLES		
Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1101541-003.03	40mL VOA NP				Р	
P1101541-004.01	40mL VOA NP		6		А	
P1101541-004.02	40mL VOA NP	1	ĺ	ſ	А	
P1101541-004.03	40mL VOA NP	1	ĺ	ſ	А	
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Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)



267815

267816

267817

Method Blank

ND

ND

ND

ND

0.84

0.84

0.84

0.84

RESULTS OF ANALYSIS

Page 1 of 1

Client: Client Project ID:	American Scientific La 49598	aboratories			CAS Project ID	: P1101541	
		Hyd	rogen Sulfid	e			
Test Code: Instrument ID: Analyst: Matrix: Test Notes:	GC/SCD Reduced Sulfur A Agilent 6890A/GC13/SCE Wade Henton/Lauryn Kee Water	Analysis) ler			Date(s) Collected Date Received Date Analyzed	: 4/22/11 : 4/25/11 : 4/26/11	
Client Sample ID	I CAS Sample ID	Liquid Amount: Amount ml(s)	Purge Volume Liter(s)	Injection Volume ml(s)	Result µg/L	MRL μg/L	Data Qualifier
267814	P1101541-001	10.0	0.30	1.0	ND	0.84	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

P1101541-002

P1101541-003

P1101541-004

P110426-MB

10.0

10.0

10.0

10.0

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

0.30

0.30

0.30

0.30

1.0

1.0

1.0

1.0



LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Client Sample ID: Client Project ID:	American Scientific Laboratories Duplicate Lab Control Sample 49598	CAS Project ID: P1101541 CAS Sample ID: P110426-DLCS
Test Code:	GC/SCD Reduced Sulfur Analysis	Date Collected: NA
Instrument ID:	Agilent 6890A/GC13/SCD	Date Received: NA
Analyst:	Wade Henton/Lauryn Keeler	Date Analyzed: 4/26/11
Matrix:	Water	Liquid Amount: 10.0 ml(s)
Test Notes:		Purge Volume: 0.30 Liter(s)
		Injection Volume: 0.20 ml(s)

		Spike Amount	Re	sult			CAS			
CAS #	Compound	LCS / DLCS	LCS	DLCS	% Re	covery	Acceptance	RPD	RPD	Data
		ug/L	ug/L	ug/L	LCS	DLCS	Limits		Limit	Qualifier
7783-06-4	Hydrogen Sulfide	419	338	414	81	99	53-127	20	30	



FIGURES F-12.1 THROUGH F-12.10 ANALYTICAL TESTING OF TAR SANDS (PE PHASE)

WESTSIDE SUBWAY EXTENSION PROJECT



2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

Ordered By

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Job Number	Ordered	Client
49568	04/20/2011	MACTEC

Telephone (323)889-5300 Attn Hari Ponnaboyina

Project ID:	4953-10-1561 G-118
Project Name:	Westside Subway Extension

Site:

Los Angeles

Enclosed are the results of analyses on 2 samples analyzed as specified on attached chain of custody.

Wendy Lu Organics Supervisor

Rojert G. Araghi Laboratory Director

American Scientific Laboratories, LLC (ASL) accepts sample materials from clients for analysis with the assumption that all of the information provided to ASL verbally or in writing by our clients (and/or their agents), regarding samples being submitted to ASL, is complete and accurate. ASL accepts all samples subject to the following conditions: 1) ASL is not responsible for verifying any client-provided information regarding any samples submitted to the laboratory.

2) ASL is not responsible for any consequences resulting from any inaccuracies, omissions, or misrepresentations contained in client-provided information regarding samples submitted to the laboratory.

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American Scientific Laboratories, LLC

Environmental Testing Services

2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

ANALYTICAL RESULTS

Ordered By

MACTEC Engineering & Consulting Inc
5628 East Slauson Ave.
Los Angeles, CA 90040-

2

Site	
Los Angeles	

Telephone: (323)889-5300 Hari Ponnaboyina Attn:

Page:

Project ID:	4953-10-1561 G-118	ASL Job Number	Submitted	Client
Project Name:	Westside Subway Extension	49568	04/20/2011	MACTEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

	QC Batch N	o: S-042011-1P			
Our Lab I.D.		267662	267663		
Client Sample I.D.		G-118 @ 49'	G-118 @ 55'		
Date Sampled		04/20/2011	04/20/2011		
Date Prepared		04/20/2011	04/20/2011		
Preparation Method					
Date Analyzed		04/20/2011	04/20/2011	 	
Matrix		Solid	Solid		
Units		mg/Kg	mg/Kg		
Dilution Factor		1	1		
Analytes	PQL	Results	Results		
TPH DROs (C10 to C28)	10.0	47200	97000		
TPH OROs (C28+)	50.0	21700	23600		

Our Lab I.D.		267662	267663		
Surrogates	% Rec.Limit	% Rec.	% Rec.		
Surrogate Percent Recovery					
Chlorobenzene	70-120	117	116		

QUALITY CONTROL REPORT

QC Batch No: S-042011-1P

	MS	MS DUP	RPD	MS/MSD	MS RPD			
Analytes	% REC	% REC	%	% Limit	% Limit			
Diesel	100	100	<1	75-120	<20			


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ANALYTICAL RESULTS

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5628 East Slauson Ave.	
Los Angeles, CA 90040-	

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Site	•
Los Angeles	

Angeles		

Telephone: (323)889-5300 Attn: Hari Ponnaboyina

Page:

Project ID:4953-10-1561 G-118Project Name:Westside Subway Extension

ASL Job Number	Submitted	Client
49568	04/20/2011	MACTEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S-042011-1								
Our Lab I.D.		267662	267663					
Client Sample I.D.		G-118 @ 49'	G-118 @ 55'					
Date Sampled		04/20/2011	04/20/2011					
Date Prepared		04/20/2011	04/20/2011					
Preparation Method								
Date Analyzed		04/20/2011	04/20/2011			·		
Matrix		Solid	Solid					
Units		mg/Kg	mg/Kg					
Dilution Factor		5	5					
Analytes	PQL	Results	Results					
TPH GROs (C6 to C10)	2.50	85.7	51.9					

Our Lab I.D.		267662	267663		
Surrogates	% Rec.Limit	% Rec.	% Rec.		
Surrogate Percent Recovery					
Bromofluorobenzene	70-120	104	86		

QUALITY CONTROL REPORT

QC Batch No: S-042011-1									
	MS	MS DUP	RPD	MS/MSD	MS RPD				
Analytes	% REC	% REC	%	% Limit	% Limit				
Benzene	98	98	<1	75-120	<20				
Toluene	111	111	<1	75-120	<20				



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ANALYTICAL RESULTS

Ordered By

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MACTEC Engineering & Cons	sulting Inc
5628 East Slauson Ave.	
Los Angeles, CA 90040-	

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Los Angeles				
-				1.1

Telephone: (323)889-5300

Attn: Hari Ponnaboyina

Page:

Project ID:	4953-10-1561 G-118	ASL Job Number	Submitted	Client
Project Name:	Westside Subway Extension	49568	04/20/2011	MACTEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S-042011-1C									
Our Lab I.D.		267662	267663						
Client Sample I.D.		G-118 @ 49'	G-118 @ 55'						
Date Sampled		04/20/2011	04/20/2011						
Date Prepared		04/20/2011	04/20/2011						
Preparation Method									
Date Analyzed		04/20/2011	04/20/2011						
Matrix		Solid	Solid			· · · · · · · · · · · · · · · · · · ·			
Units		ug/kg	ug/kg						
Dilution Factor		5	5						
Analytes	PQL	Results	Results						
Acetone	250	ND	ND						
Benzene	10.0	ND	ND						
Bromobenzene (Phenyl bromide)	50.0	ND	ND						
Bromochloromethane (Chlorobromomethane)	50.0	ND	ND						
Bromodichloromethane (Dichlorobromomethane)	50.0	ND	ND						
Bromoform (Tribromomethane)	250	ND	ND						
Bromomethane (Methyl bromide)	150	ND	ND						
2-Butanone (MEK, Methyl ethyl ketone)	250	ND	ND						
n-Butylbenzene	50.0	ND	ND						
sec-Butylbenzene	50.0	ND	ND						
tert-Butylbenzene	50.0	ND	ND						
Carbon disulfide	50.0	ND	ND						
Carbon tetrachloride (Tetrachloromethane)	50.0	ND	ND						
Chlorobenzene	50.0	ND	ND						
Chloroethane	150	ND	ND						
2-Chloroethyl vinyl ether	250	ND	ND						
Chloroform (Trichloromethane)	50.0	ND	ND						
Chloromethane (Methyl chloride)	150	ND	ND						
4-Chlorotoluene (p-Chlorotoluene)	50.0	ND	ND						
2-Chlorotoluene (o-Chlorotoluene)	50.0	ND	ND						
1,2-Dibromo-3-chloropropane (DBCP)	250	ND	ND						
Dibromochloromethane	50.0	ND	ND						
1,2-Dibromoethane (EDB, Ethylene dibromide)	50.0	ND	ND						
Dibromomethane	50.0	ND	ND						
1.2-Dichlorobenzene (o-Dichlorobenzene)	50.0	ND	ND						
1.3-Dichlorobenzene (m-Dichlorobenzene)	50.0	ND	ND						
1.4-Dichlorobenzene (p-Dichlorobenzene)	50.0	ND	ND						
Dichlorodifluoromethane	150	ND	ND						
1,1-Dichloroethane	50.0	ND	ND						



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ANALYTICAL RESULTS

Page:

5 4953-10-1561 G-1 Project ID: Project Name: Westside Subway

18	ASL Job Number	Submitted	Client
Extension	49568	04/20/2011	MACTEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S-042011-1C

Client Sample I.D. G-118 @ 49' G-118 @ 55' Image: Client Sample Clie
Date Sampled04/20/201104/20/201104/20/2011Date Prepared04/20/201104/20/201104/20/2011Preparation MethodDate Analyzed04/20/201104/20/2011MatrixSolidSolidSolidMatrixSolidSolidMatrixSolidSolidDilution FactorPQLResults1Dichloroethane50.0NDND1Dichloroethene50.0NDND1Dichloroethene50.0NDND1Dichloroethene50.0NDND1Dichloropropane50.0NDND1Dichloropropane50.0NDND1Dichloropropane50.0NDND1Dichloropropane50.0NDND1Dichloropropene50.0NDND1Dichloropropene50.0NDND1Dichloropropene50.0NDND1Dichloropropene50.0NDND1Dichloropropene50.0NDND1Dichloropropene50.0NDND1Dichloropropene50.0NDND1Dichloropropene50.0NDND1Dichloropropene50.0NDND1Dichloropropene50.0NDND </td
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Tetrachloroethene (Tetrachloroethylene) 50.0 ND ND
Toluene (Methyl benzene) 10.0 ND ND
1.2.3-Trichlorobenzene 50.0 ND ND
1.2.4-Trichlorobenzene 50.0 ND ND
1.1.1-Trichloroethane 50.0 ND ND
1.1.2-Trichloroethane 50.0 ND ND
Trichloroethene (TCE) 50.0 ND ND
Trichlorofluoromethane 50.0 ND ND
1.2.3-Trichloropropane 50.0 ND ND
1.2.4-Trimethylbenzene 50.0 ND ND
1.3.5-Trimethylbenzene 50.0 ND ND
Vinyl acetate 250 ND ND



6

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ANALYTICAL RESULTS

Page:

Project ID:	4953-10-1561 G-118.	ASL Job Number	Submitted	Client
Project Name:	Westside Subway Extension	49568	04/20/2011	MACTEC

Method: 8260B, Volatile Organic Compounds

	QC Batch No:	S-042011-1C			
Our Lab I.D.		267662	267663		
Client Sample I.D.		G-118 @ 49'	G-118 @ 55'		
Date Sampled		04/20/2011	04/20/2011		
Date Prepared		04/20/2011	04/20/2011		
Preparation Method					
Date Analyzed		04/20/2011	04/20/2011		
Matrix		Solid	Solid		
Units		ug/kg	ug/kg		
Dilution Factor		5	5		
Analytes	PQL	Results	Results		
Vinyl chloride (Chloroethene)	150	ND	ND		
o-Xylene	10.0	ND	ND		
m- & p-Xylenes	20.0	ND	ND		

Comment(s):

267662:267663: Raised DL due to matrix.

Our Lab I.D.		267662	267663		
Surrogates	% Rec.Limit	% Rec.	% Rec.		
Surrogate Percent Recovery					
Bromofluorobenzene	70-120	94	106		
Dibromofluoromethane	70-120	101	94		
Toluene-d8	70-120	98	96		

QUALITY CONTROL REPORT

			QC Batch	No: S-0420	11-1C		 -	
	MS	MS DUP	RPD	MS/MSD	MS RPD			
Analytes	% REC	% REC	%	% Limit	% Limit			
Benzene	86	88	2.3	75-120	15			
Chlorobenzene	89	92	3.3	75-120	15			
1,1-Dichloroethene	94	96	2.1	75-120	15			
(1,1-Dichloroethylene)						 		
MTBE	95	100	5.1	75-120	15			
Toluene (Methyl benzene)	85	89	4.6	75-120	15		•	
Trichloroethene (TCE)	96	98	2.1	75-120	15			



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ANALYTICAL RESULTS

Ordered By

MACTEC Engineering & Consulting Inc 5628 East Slauson Ave. Los Angeles, CA 90040-

7

Site		
Los Angeles		
	•	

Client

MACTEC

Telephone: (323)889-5300 Attn: Hari Ponnaboyina

Page:

Project ID:4953-10-1561 G-118ASL Job NumberSubmittedProject Name:Westside Subway Extension4956804/20/2011

Method: 8270C, Semivolatile Organics

QC Batch No: 042011-1								
Our Lab I.D.		267662	267663					
Client Sample I.D.		G-118 @ 49'	G-118 @ 55'					
Date Sampled		04/20/2011	04/20/2011					
Date Prepared		04/20/2011	04/20/2011					
Preparation Method								
Date Analyzed		04/20/2011	04/20/2011					
Matrix		Solid	Solid					
Units		ug/kg	ug/kg					
Dilution Factor		5	5					
Analytes	PQL	Results	Results					
Acenaphthene	1650	ND	ND					
Acenaphthylene	1650	ND	ND					
Anthracene	1650	ND	ND					
Benz(a)anthracene (Benzo(a)anthracene)	1650	ND	ND					
Benzo(a)pyrene	1650	ND	ND					
Benzo(b)fluoranthene	1650	ND	ND					
Benzo(ghi)perylene	1650	ND	ND					
Benzo(k)fluoranthene	1650	ND	ND					
Benzoic acid	8500	ND	ND					
Benzyl alcohol	3300	ND	ND .					
Bis(2-chloroethoxy)methane	1.650	ND	ND					
Bis(2-chloroethyl)ether	1650	ND	ND		-			
Bis(2-chloroisopropyl) ether	1650	ND	ND					
Bis(2-ethylhexyl) phthalate	1650	ND	ND	· .				
4-Bromophenyl phenyl ether	1650	ND	ND					
Butyl benzyl phthalate (Benzyl butyl phthalate)	1650	ND	ND					
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	3300	ND	ND					
4-Chloroaniline	3300	ND	ND					
2-Chloronaphthalene	1650	ND	ND					
2-Chlorophenol (o-Chlorophenol)	1650	ND	ND					
4-Chlorophenyl phenyl ether	1650	ND	ND					
Chrysepe	1650	ND	ND					
Di-n-butyl phthalate	1650	ND	ND					
Di-n-octyl phthalate (Dioctyl ester)	1650	ND	ND					
Dihenz(a h)anthracene	1650	ND	D					
Dibenzofuran	1650	ND	ND					
1 3-Dichlorobenzene (m-Dichlorobenzene)	1650	ND	ND					
1.2-Dichlorobenzene (o-Dichlorobenzene)	1650	ND	ND					
1 4-Dichlorobenzene	1650	ND	ND					
1,7 1,0000000000000000000000000000000000								



8

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ANALYTICAL RESULTS

Page:

Project Project

ID:	4953-10-1561 G-118	ASL Job Number	Submitted	Client
Name:	Westside Subway Extension	49568	04/20/2011	MACTEC

Method: 8270C, Semivolatile Organics

Our Lab LD2.76632.676632.67663Client Sample LD.06/18/29/0/18/3951Date Sample LD.0.4/20/20110/4/20/201111Date Sample CD0.4/20/20110/4/20/201111Date Sample CD0.4/20/20110/4/20/201111Date Sample CD0.4/20/20110/4/20/201111Date Analyzed0.4/20/20110/20/201111MatrixSolidSolid11Date Analyzed0.9/26/20100/20/201111MatrixSolidSolid111Date InformationSolidSolid111AnalytesPQLResultsResults11Salytoincohenzidine3300NDND111Alphichorobenzidine3500NDND111J-Dichlorobenzidine1650NDND111J-Dichlorobenzidine1650NDND111J-Dintrobhenel1650NDND111J-Dintrobhenel1650NDND111J-Dintrobhenel1650NDND111J-Dintrobhenel1650NDND111J-Dintrobhenel1650NDND111Hexachlorobhanene1650NDND111 <th colspan="8">QC Batch No: 042011-1</th>	QC Batch No: 042011-1							
Client Sample LD. 0-118 @ 49 0-118 @ 57 0 Date Sampled 0-4/20/2011 0 0 Date Prepared 0 0/4/20/2011 0 0 Date Analyzed 0-4/20/2011 0/4/20/2011 0 0 Date Analyzed 0-0/20/2011 0/4/20/2011 0 0 Matrix 0-0/20/2011 0/4/20/2011 0 0 0 Matrix 0-0/20/2011 0/4/20/2011 0	Our Lab I.D.		267662	267663		a sa	A State of the second sec	
Date Sampled04/20/2011 04/20/2011Date Propared04/20/201104/20/20110Preparation Method004/20/201104/20/20110Date Analyzed04/20/201104/20/201100MatrixSolidSolidSolid00UnitsNg/kgug/kg000Dilution Factor550003.3'Dichlorobenzidine3300NDNDND02.4-Dichlorophenol8500NDND00Diethyl phthalae (Direthyl ester)1650NDND002.4-Dinterbylphenol1650NDND002.4-Dinterbylphanel1650NDND0002.4-Dinterbylphanel1650NDND0002.4-Dinterbylphanel1650NDND0002.4-Dinterbylphanel1650NDND0002.4-Dinterbulene1650NDND0002.4-Dinterbulene1650NDND0001.4-Dinterbulene1650NDND0001.4-Dinterbulene1650NDND0001.4-Dinterbulene1650NDND0001.4-Dinterbulene1650NDND0001.4-Dinterbulene1650NDND0 </td <td>Client Sample I.D.</td> <td></td> <td>G-118 @ 49'</td> <td>G-118 @ 55'</td> <td></td> <td></td> <td></td>	Client Sample I.D.		G-118 @ 49'	G-118 @ 55'				
Date Prepared04/20/201104/20/201104/20/2011Preparation Method004/20/201104/20/201104/20/2011Matrix0SolidSolid0Matrix0Vg/KgUg/Kg0Units0Vg/KgVg/Kg0Dilution Factor1Vg/KgVg/Kg03/3 Dichlorophenol8500NDND02,4-Dichtorophenol1650NDND02,4-Dinterylphthalter (Dietryl ester)1650NDND02,4-Dinterylphthalter (Dietryl ester)1650NDND02,4-Dinterylphthalter (Dietryl ester)1650NDND02,4-Dinterylphthalter (Dietryl ester)1650NDND02,4-Dinterylphthalter (Dietryl ester)1650NDND002,4-Dinterylphthalter (Dietryl ester)1650NDND002,4-Dinterylphthalter (Dietryl ester)1650NDND002,6-Dintirotoluene (2,6-DNT)1650NDND001400001650NDND0001400001650NDNDND001400001650NDND0001400001650NDNDND001400001650NDND00014000001650NDND0001500	Date Sampled		04/20/2011	04/20/2011				
Preparation MethodImage: Section of the s	Date Prepared		04/20/2011	04/20/2011				
Date Analyzed04/20/201104/20/2011MatrixSolidSolidUnitsug/kgug/kgDilution FactorS5AnalytesPQLKexultsKevults3.3-Dichlorobenzidine3500NDND3.4-Dichlorobenzidine6500NDND2.4-Diintpathate (Direkt) ester)1650NDND2.4-Diintpathate (Direkt) ester)1650NDND2.4-Diintpathate (Dinekt) ester)1650NDNDPluoranthene1650NDNDFluoranthene1650NDNDHexachlorobutatiene (1.530NDNDHexachlorobutatiene1650NDNDLexachlorobutatiene1650NDNDJontpathatene1650NDND2.4-Diintpathatene1650NDND2.4-Mittyhinghithatene1650NDND	Preparation Method							
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Unisucylkgug/kgug/kgug/kgDilution Factor55AnalytesPQLResultsResults3.3-Dichlorobenzidine3300NDNDND3.4-Dichlorobenzidine6500NDND2.4-Dintrohlutate (Dicthyl ester)1650NDND2.4-Dintrohlutate (Dicthyl ester)1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND2.4-Dintrohlutene1650NDND1.4-Dintrohlutene1650NDND1.4-Startene1650NDND1.4-Startene1650NDND1.4-Startene1650NDND1.4-Startene1650NDND1.4-Startene1650NDND <td< td=""><td>Matrix</td><td></td><td>Solid</td><td>Solid</td><td></td><td></td><td></td></td<>	Matrix		Solid	Solid				
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AnalytesPC4ResultsR	Dilution Factor		5	5				
3.3'Dichlorobenzidine3200NDNDNDI2.4-Dicklorophenol650NDNDNDI2.4-Dinkta (Dickly elster)1650NDNDNDI2.4-Dinkta (Dickly elster)1650NDNDNDI2.4-Dinktooluene6500NDNDNDII2.4-Dinktrooluene1650NDNDNDII2.4-Dinktooluene1650NDNDNDII2.4-Dinktooluene1650NDNDNDII2.4-Dinktooluene1650NDNDNDII2.4-Dinktooluene1650NDNDIII2.4-Dinktooluene1650NDNDIII2.4-Dinktooluene1650NDNDIII2.6-Dinktooluene1650NDNDIIIHexachlorobtatiene1650NDNDIIIHexachlorobtatiene1650NDNDIIIIndeno(1,2,3-cdlytrene1650NDNDIII1.5ophorone1650NDNDIIII2-methylhaphtalene1650NDNDIIII2-methylhaphtalene1650NDNDIIII2-Methylphenol (p-Cresol, 4-Cresol)1650NDNDIIII <td>Analytes</td> <td>PQL</td> <td>Results</td> <td>Results</td> <td></td> <td></td> <td></td>	Analytes	PQL	Results	Results				
2.4-Dicklorophenol9500NDNDNDDiethyl phthalate (Diethyl ester)1650NDNDND2.4-Dinethylphenol1650NDNDND2.4-Dinitryphenol1650NDNDND2.4-Dinitrophenol1650NDNDND2.4-Dinitroholene1650NDNDND2.4-Dinitroholene1650NDNDND2.4-Dinitroholene1650NDNDND2.4-Dinitroholene1650NDNDND2.4-Dinitroholene1650NDNDND2.4-Dinitroholene1650NDNDND1.4-Dinitroholene1650NDNDI1.4-Dinitroholene1650NDNDI1.4-Dinitroholene1650NDNDI1.4-Dinitroholene1650NDNDI1.4-Santorobutadiene (1,3-Hexachlorobutadiene)1650NDND1.4-Santorobutadiene1650NDNDI1.4-Santorobutadiene1650NDNDI1.5-Sontorobutadiene1650NDNDI1.5-Sontorobutadiene1650NDNDI2Methylphenol (c-Cresol, 2-Cresol)1650NDNDI2Methylphenol (p-Cresol, 2-Cresol)1650NDNDI2Nitrosoliphenol1650NDNDII2Nitrosoliphenol1650NDNDII <td>3,3'-Dichlorobenzidine</td> <td>3300</td> <td>ND</td> <td>ND</td> <td></td> <td></td> <td></td>	3,3'-Dichlorobenzidine	3300	ND	ND				
Diethyl phthalate (Diethyl ester)1650NDNDNDI2,4-Dimethyl phthalate (Dimethyl ester)1650NDNDNDI2,4-Dinitrophenol6500NDNDNDII2,4-Dinitrotoluene1650NDNDNDII2,4-Dinitrotoluene (2,6-DNT)1650NDNDNDIIFluorantene1650NDNDIIIFluorantene1650NDNDIIIFluorantene1650NDNDIIIHexachlorobutatiene (1,3-Hexachlorobutatiene)1650NDNDIIHexachlorobutatiene1650NDNDIIIIndeno (1,2,3-cdpyrene1650NDNDIIIIsophorone1650NDNDIIII2-methylphenol (p-Cresol, 2-Cresol)1650NDNDIIIIN-Nitroso-Din-propylamine1650NDNDIII <t< td=""><td>2,4-Dichlorophenol</td><td>8500</td><td>ND</td><td>ND</td><td></td><td></td><td></td></t<>	2,4-Dichlorophenol	8500	ND	ND				
2,4-Dimethylphenol1650NDNDNDADimethyl phthalate (Dimethyl ester)1650NDNDNDA2,4-Dinitrobleneol1650NDNDNDA2,4-Dinitroblenee1650NDNDNDA2,6-Dinitroblene (2,6-DNT)1550NDNDNDAFluoranthene1650NDNDNDAAFluoranthene1650NDNDNDAAHexachlorobutadiene (1,3-Hexachlorobutadiene)1650NDNDNDAHexachlorobutadiene (1,3-Hexachlorobutadiene)1650NDNDNDAHexachlorobutadiene (1,3-Hexachlorobutadiene)1650NDNDNDAHexachlorobutadiene (1,3-Hexachlorobutadiene)1650NDNDNDAHexachlorobutadiene (1,3-Hexachlorobutadiene)1650NDNDAAIndeno(1,2,3-cd)pyrene1650NDNDNDAA2-methyl 4,6-Dinitrophenol1650NDNDAA2-Methylphenol (p-Cresol, 2-Cresol)1650NDNDAAA-Mitrosodiphenylamine1650NDNDAAN-Nitroso-Di-neproglamine1650NDNDAAA-Nitrosoliphenylamine1650NDNDAAA-Nitrosoliphenol(o-Cresol, 2-Cresol)1650NDNDAAA-Nitrosoliphenol (p-Cresol, 3-Cresol)16	Diethyl phthalate (Diethyl ester)	1650	ND	ND				
Dimethyl phhalate (Dimethyl ester)1650NDNDNDND2,4-Dinitrophenol8500NDNDNDND2,4-Dinitrobluene (2,6-DNT)1650NDNDNDNDFluoranthene1650NDNDNDNDFluoranthene1650NDNDNDNDFluoranthene1650NDNDNDNDHexachlorobenzene1650NDNDNDNDHexachlorobenzene1650NDNDNDNDHexachlorobenzene1650NDNDNDNDIndeno(1,2,3-cd)pyrene1650NDNDNDIndeno(1,2,3-cd)pyreneIsophorone1650NDNDNDIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyrene2-methyl-4,6-Dinitrophenol8500NDNDNDIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyrene2-Methylphenol (p-Cresol, 2-Cresol)1650NDNDIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyrene2-Methylphenol (p-Cresol, 4-Cresol)1650NDNDIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyrene2-Methylphenol (p-Cresol, 4-Cresol)1650NDNDIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyrene2-Methylphenol (p-Cresol, 4-Cresol)1650NDNDIndeno(1,2,3-cd)pyreneIndeno(1,2,3-cd)pyrene2-Methylphenol (p-Cresol, 4-Cr	2,4-Dimethylphenol	1650	ND	ND				
2,4-Dinitrophenol8500NDNDNDI2,4-Dinitrophenol1650NDNDNDI2,6-Dinitrophenol1650NDNDNDI2,6-Dinitrophenol1650NDNDNDIFluorene1650NDNDNDIIFluorene1650NDNDNDIIHexachlorobutadiene (1,3-Hexachlorobutadiene)1650NDNDNDIHexachlorocyclopentadiene3300NDNDIIIndeno(1,2,3-cd)prene1650NDNDNDIIndeno(1,2,3-cd)prene1650NDNDII2-methyl-4,6-Dinitrophenol8500NDNDII2-Methylphenol (o-Cresol, 2-Cresol)1650NDNDII2-Methylphenol (o-Cresol, 4-Cresol)1650NDNDIIN-Nitrosod-Di-n-propylamine1650NDNDIIIN-Nitrosod-Iphenol1650NDNDIII2-Nitroaniline8500NDNDIII3-Nitroaniline8500NDNDIII2-Nitroaniline8500NDNDIII2-Nitroaniline8500NDNDIII3-Nitroaniline8500NDNDIII2-Nitrophenol1650NDNDI <t< td=""><td>Dimethyl phthalate (Dimethyl ester)</td><td>1650</td><td>ND</td><td>ND</td><td></td><td></td><td></td></t<>	Dimethyl phthalate (Dimethyl ester)	1650	ND	ND				
2,4-Dinitrotoluene1650NDNDNDImage: constraint of the second	2,4-Dinitrophenol	8500	ND	ND		•		
2,6-Dinitrotoluene (2,6-DNT) 1650 ND ND ND Fluoranthene 1650 ND ND Image: Constraint of the second se	2,4-Dinitrotoluene	1650	ND	ND				
Fluoranthene1650NDNDNDFluorene1650NDNDNDHexachlorobutadiene1650NDNDNDHexachlorobutadiene1650NDNDNDHexachlorobutadiene3300NDNDNDHexachlorobutadiene1650NDNDNDHexachlorocyclopentadiene1650NDNDNDHexachlorocyclopentadiene1650NDNDIdentifiedHexachlorochane1650NDNDIdentifiedIdentifiedIndenc(1,2,3-cd)pyrene1650NDNDIdentifiedIsophorone1650NDNDIdentifiedIdentified2-Methylnaphthalene1650NDNDIdentified2-Methylphenol (o-Cresol, 2-Cresol)1650NDNDIdentifiedN-Nitroso-Di-n-propylamine1650NDNDIdentifiedN-Nitroso-Di-n-propylamine1650NDNDIdentifiedN-Nitroso-Di-n-propylamine1650NDNDIdentifiedN-Nitrosoliphenylamine1650NDNDIdentifiedNitrohenzene (NB)1650NDNDIdentified2-Nitrophenol (o-Nitrophenol)1650NDNDIdentified2-Nitrophenol (o-Nitrophenol1650NDNDIdentified2-Nitrophenol (o-Nitrophenol1650NDNDIdentified2-Nitrophenol (o-Nitrophenol1650NDNDIdentified	2,6-Dinitrotoluene (2,6-DNT)	1650	ND	ND				
Fluorene1650NDNDNDHexachlorobenzene1650NDNDNDHexachlorobenzene1650NDNDNDHexachlorobenzene3300NDNDNDHexachlorobenzene1650NDNDNDHexachlorobenzene1650NDNDNDHexachlorobenzene1650NDNDNDIndeno(1,2,3-cd)pyrene1650NDNDNDIsophorone1650NDNDND2-methyl-4,6-Dinitrophenol8500NDNDND2-Methylphenol (o-Cresol, 2-Cresol)1650NDNDND2-Methylphenol (p-Cresol, 4-Cresol)1650NDNDNDN-Nitroso-Din-propylamine1650NDNDNDN-Nitroso-Din-propylamine1650NDNDNDN-Nitroso-Din-propylamine1650NDNDNDN-Nitroso-Din-propylamine1650NDNDNDN-Nitroso-Din-propylamine1650NDNDIdN-Nitroso-Din-propylamine1650NDNDIdN-Nitroso-Din-propylamine1650NDNDIdN-Nitroso-Din-propylamine1650NDNDIdN-Nitroso-Din-propylamine1650NDNDId2-Nitroniline8500NDNDIdIdNitrobenzene (NB)1650NDNDIdId2-Nitrophenol8500ND<	Fluoranthene	1650	ND	ND				
Hexachlorobenzene1650NDNDNDHexachlorocyclopentadiene1650NDNDNDHexachlorocyclopentadiene3300NDNDNDHexachlorocyclopentadiene1650NDNDNDHexachlorocyclopentadiene1650NDNDNDHexachlorocyclopentadiene1650NDNDNDIndeno(1,2,3-cd)pyrene1650NDNDND2-methyl-4,6-Dinitrophenol8500NDNDND2-methyl-4,6-Dinitrophenol1650NDNDND2-Methylphaphtalene1650NDNDND2-Methylphenol (p-Cresol, 2-Cresol)1650NDNDND2-Methylphenol (p-Cresol, 4-Cresol)1650NDNDNDN-Nitroso-Di-n-propylamine1650NDNDNDN-Nitrosodiphenylamine1650NDNDND2-Nitroaniline8500NDND2-Nitroaniline8500NDND2-Nitroaniline8500NDND2-Nitrophenol1650NDND2-Nitrophenol1650NDND2-Nitrophenol1650NDND2-Nitrophenol1650NDND2-Nitrophenol1650NDND2-Nitrophenol1650NDND19-<	Fluorene	1650	ND	ND				
Hexachlorobutadiene (1,3-Hexachlorobutadiene)1650NDNDNDHexachlorocyclopentadiene3300NDNDNDHexachlorocthane1650NDNDNDIndeno(1,2,3-cd)pyrene1650NDNDNDIsophorone1650NDNDND2-methyl-4,-5-Dinitrophenol8500NDNDND2-methyl-4,-Gorone1650NDNDND2-Methylphenol (o-Cresol, 2-Cresol)1650NDNDND4-Methylphenol (p-Cresol, 4-Cresol)1650NDNDNDN-Nitroso-Di-n-propylamine1650NDNDNDN-Nitrosodiphenylamine1650NDNDND2-Nitroaniline8500NDNDIdeno3-Nitroaniline8500NDNDIdeno4-Nitrophenol1650NDNDIdeno2-Nitroaniline8500NDNDIdeno3-Nitroaniline8500NDNDIdeno2-Nitrophenol1650NDNDIdeno2-Nitrophenol1650NDNDIdeno2-Nitrophenol1650NDNDIdeno2-Nitrophenol1650NDNDIdeno2-Nitrophenol1650NDNDIdeno2-Nitrophenol1650NDNDIdeno2-Nitrophenol1650NDNDIdeno2-Nitrophenol1650NDNDIdenoP	Hexachlorobenzene	1650	ND	ND				
Hexachlorocyclopentadiene3300NDNDNDHexachlorocethane1650NDNDNDIndeno(1,2,3-cd)pyrene1650NDNDNDIsophorone1650NDNDND2-methyl-4,6-Dinitrophenol8500NDNDND2-methyl-4,6-Dinitrophenol1650NDNDND2-Methylaphthalene1650NDNDND2-Methylaphthalene1650NDNDND2-Methylaphthalene1650NDNDND4-Methylphenol (p-Cresol, 4-Cresol)1650NDNDNDN-Nitroso-Di-n-propylamine1650NDNDNDN-Nitrosodiphenylamine1650NDNDIdN-Nitrosodiphenylamine1650NDNDIdNaphthalene1650NDNDIdId3-Nitroaniline8500NDNDIdId3-Nitroaniline8500NDNDIdId2-Nitrophenol (o-Nitrophenol)1650NDNDIdId2-Nitrophenol8500NDNDIdId2-Nitrophenol1650NDNDIdId2-Nitrophenol1650NDNDIdId2-Nitrophenol1650NDNDIdId2-Nitrophenol1650NDNDIdId2-Nitrophenol1650NDNDIdId2-Nitrophenol <td>Hexachlorobutadiene (1,3-Hexachlorobutadiene)</td> <td>1650</td> <td>ND</td> <td>ND</td> <td></td> <td></td> <td></td>	Hexachlorobutadiene (1,3-Hexachlorobutadiene)	1650	ND	ND				
Hexachloroethane 1650 ND ND ND Indeno(1,2,3-cd)pyrene 1650 ND ND ND Isophorone 1650 ND ND ND 2-methyl-4,6-Dinitrophenol 8500 ND ND	Hexachlorocyclopentadiene	3300	ND	ND				
Indeno(1,2,3-cd)pyrene 1650 ND ND ND Isophorone Isophorone 1650 ND ND ND ND Isophorone 1650 ND ND Isophorone 1650 ND ND Isophorone 1650 ND ND Isophorone 1650 ND ND 1650 ND ND 1650 ND ND 1650 1650 ND ND 1650 ND ND 1650 1650 1650 ND ND 1650 1650 ND ND 1650 1650 ND 1650 1650 ND ND 1650 1650 1650 ND <t< td=""><td>Hexachloroethane</td><td>1650</td><td>ND</td><td>ND</td><td></td><td></td><td></td></t<>	Hexachloroethane	1650	ND	ND				
Isophorone 1650 ND ND ND Image: constraint of the state of the sta	Indeno(1.2.3-cd)pyrene	1650	ND	ND				
2-methyl-4,6-Dinitrophenol8500NDNDND2-Methylnaphthalene1650NDNDND2-Methylphenol (o-Cresol, 2-Cresol)1650NDNDND4-Methylphenol (p-Cresol, 4-Cresol)1650NDNDNDN-Nitroso-Di-n-propylamine1650NDNDNDN-Nitrosodiphenylamine1650NDNDNDNaphthalene1650NDNDND2-Nitroaniline8500NDNDND3-Nitroaniline8500NDNDND3-Nitroaniline6500NDNDND2-Nitroaniline8500NDNDND2-Nitroaniline8500NDNDND2-Nitroaniline8500NDNDND2-Nitroaniline1650NDNDND2-Nitroaniline8500NDNDND2-Nitrohenol (o-Nitrophenol)1650NDNDIdentified2-Nitrophenol (o-Nitrophenol)1650NDNDIdentified2-Nitrophenol8500NDNDIdentifiedPentachlorophenol8500NDNDIdentifiedPhenol1650NDNDIdentifiedPhenol1650NDNDIdentifiedPyrene1650NDNDIdentifiedPyrene1650NDNDIdentified2-A-Strichlorophenol1650NDNDIdentifiedPyren	Isophorone	1650	ND	ND				
2-Methylnaphthalene1650NDNDND2-Methylphenol (o-Cresol, 2-Cresol)1650NDNDND4-Methylphenol (p-Cresol, 4-Cresol)1650NDNDNDN-Nitroso-Di-n-propylamine1650NDNDNDN-Nitrosodiphenylamine1650NDNDNDNaphthalene1650NDNDND2-Nitroaniline8500NDNDND3-Nitroaniline8500NDNDND4-Nitrobenzene (NB)1650NDNDND2-Nitrophenol (o-Nitrophenol)1650NDNDND4-Nitrophenol8500NDNDND2-Nitrophenol1650NDNDND2-Nitrophenol1650NDNDND2-Nitrophenol1650NDNDND2-Nitrophenol1650NDNDND2-Nitrophenol1650NDNDND2-Nitrophenol1650NDNDND2-Nitrophenol1650NDNDND2-Nitrophenol1650NDNDNDPhenathrene1650NDNDNDPhenol1650NDNDNDPyrene1650NDNDND2-A.5-Trichlorobenzene1650NDNDND2-A.5-Trichlorophenol1650NDNDND	2-methyl-4,6-Dinitrophenol	8500	ND	ND				
2-Methylphenol (o-Cresol, 2-Cresol) 1650 ND ND ND 4-Methylphenol (p-Cresol, 4-Cresol) 1650 ND ND ND ND N-Nitroso-Di-n-propylamine 1650 ND ND ND ND N-Nitrosodiphenylamine 1650 ND ND ND ND Naphthalene 1650 ND ND ND ND ND 2-Nitroaniline 8500 ND ND <td>2-Methylnaphthalene</td> <td>1650</td> <td>ND</td> <td>ND</td> <td></td> <td></td> <td></td>	2-Methylnaphthalene	1650	ND	ND				
4-Methylphenol (p-Cresol, 4-Cresol) 1650 ND ND ND N-Nitroso-Di-n-propylamine 1650 ND ND ND ND N-Nitrosodiphenylamine 1650 ND ND ND ND ND Naphthalene 1650 ND	2-Methylphenol (o-Cresol, 2-Cresol)	1650	ND	ND				
N-Nitroso-Di-n-propylamine 1650 ND ND Image: Nitroso-diphenylamine 1650 ND ND Image: Nitroso-diphenylamine 1650 ND ND ND Image: Nitroso-diphenylamine ND	4-Methylphenol (p-Cresol, 4-Cresol)	1650	ND	ND				
N-Nitrosodiphenylamine1650NDNDNDNaphthalene1650NDNDND2-Nitroaniline8500NDNDND3-Nitroaniline8500NDNDND4-Nitroaniline8500NDNDND4-Nitrobenzene (NB)1650NDNDIdentified2-Nitrophenol (o-Nitrophenol)1650NDNDIdentified4-Nitrophenol8500NDNDIdentifiedPentachlorophenol8500NDNDIdentifiedPhenol1650NDNDIdentifiedPhenol1650NDNDIdentifiedPhenol1650NDNDIdentifiedPyrene1650NDNDIdentified1,2,4-Trichlorobenzene1650NDNDIdentified2,4,5-Trichlorophenol1650NDNDIdentified2,4,5-Trichlorophenol1650NDNDIdentified2,4,5-Trichlorophenol1650NDNDIdentified	N-Nitroso-Di-n-propylamine	1650	ND	ND				
Naphthalene1650NDNDND2-Nitroaniline8500NDNDND3-Nitroaniline8500NDNDND4-Nitroaniline8500NDNDNDNitrobenzene (NB)1650NDNDND2-Nitrophenol (o-Nitrophenol)1650NDNDND4-Nitrophenol8500NDNDNDPentachlorophenol8500NDNDNDPentachlorophenol1650NDNDNDPhenol1650NDNDNDPhenol1650NDNDNDPyrene1650NDNDND1,2,4-Trichlorobenzene1650NDND2,4,5-Trichlorophenol1650NDND	N-Nitrosodiphenylamine	1650	ND	ND				
2-Nitroaniline8500NDNDND3-Nitroaniline8500NDNDND4-Nitroaniline8500NDNDNDNitrobenzene (NB)1650NDNDND2-Nitrophenol (o-Nitrophenol)1650NDNDND4-Nitrophenol8500NDNDNDPentachlorophenol8500NDNDNDPentachlorophenol8500NDNDIdentifiedPhenol1650NDNDIdentifiedPhenol1650NDNDIdentifiedPyrene1650NDNDIdentified1,2,4-Trichlorobenzene1650NDNDIdentified2,4,5-Trichlorophenol1650NDNDIdentified	Naphthalene	1650	ND	ND				
3-Nitroaniline8500NDNDI4-Nitroaniline8500NDNDNDNitrobenzene (NB)1650NDNDI2-Nitrophenol (o-Nitrophenol)1650NDNDI4-Nitrophenol8500NDNDIPentachlorophenol8500NDNDIPentachlorophenol8500NDNDIPhenanthrene1650NDNDIPhenol1650NDNDIPyrene1650NDNDI1,2,4-Trichlorobenzene1650NDNDI2,4,5-Trichlorophenol1650NDNDI	2-Nitroaniline	8500	ND	ND				
4-Nitroaniline8500NDNDNDNitrobenzene (NB)1650NDNDND2-Nitrophenol (o-Nitrophenol)1650NDNDND4-Nitrophenol8500NDNDNDPentachlorophenol8500NDNDNDPhenanthrene1650NDNDNDPhenol1650NDNDNDPhenol1650NDNDNDPyrene1650NDNDND1,2,4-Trichlorobenzene1650NDNDND2,4,5-Trichlorophenol1650NDNDND	3-Nitroaniline	8500	ND	ND				
Nitrobenzene (NB)1650NDNDImage: constraint of the state o	4-Nitroaniline	8500	ND	ND				
2-Nitrophenol (o-Nitrophenol)1650NDNDI4-Nitrophenol8500NDNDIIPentachlorophenol8500NDNDIIPhenanthrene1650NDNDIIPhenol1650NDNDIIPyrene1650NDNDII1,2,4-Trichlorobenzene1650NDNDI2.4,5-Trichlorophenol1650NDNDI	Nitrobenzene (NB)	1650	ND	ND				
4-Nitrophenol8500NDNDNDPentachlorophenol8500NDNDNDPhenanthrene1650NDNDNDPhenol1650NDNDNDPyrene1650NDNDND1,2,4-Trichlorobenzene1650NDND2,4,5-Trichlorophenol1650NDND	2-Nitrophenol (o-Nitrophenol)	1650	ND	ND				
Pentachlorophenol8500NDNDIPhenanthrene1650NDNDIPhenol1650NDNDIPyrene1650NDNDIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	4-Nitrophenol	8500	ND	ND				
Phenanthrene 1650 ND ND ND Image: Marcon State S	Pentachlorophenol	8500	ND	ND				
Phenol 1650 ND ND ND Pyrene 1650 ND ND Image: ND Ima	Phenanthrene	1650	ND	ND				
Pyrene 1650 ND ND ND 1,2,4-Trichlorobenzene 1650 ND ND Image: ND	Phenol	1650	ND	ND				
1,2,4-Trichlorobenzene 1650 ND ND 2,4,5-Trichlorophenol 1650 ND ND	Pyrene	1650	ND	ND				
2.4.5-Trichlorophenol 1650 ND ND	1.2.4-Trichlorobenzene	1650	ND	ND				
	2.4.5-Trichlorophenol	1650	ND	ND				



9

American Scientific Laboratories, LLC

Environmental Testing Services

2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

ANALYTICAL RESULTS

Page:

Project ID:	4953-10-1561 G-118	ASL Job Number	Submitted	Client
Project Name:	Westside Subway Extension	49568	04/20/2011	MACTEC

Method: 8270C, Semivolatile Organics

QC Batch N	0: 042011-1				
	267662	267663			
	G-118 @ 49'	G-118 @ 55'			
	04/20/2011	04/20/2011			
	04/20/2011	04/20/2011			
	04/20/2011	04/20/2011			
	Solid	Solid			
	ug/kg	ug/kg			
	5	-5			
PQL	Results	Results			
1650	ND	ND			
	PQL 1650	267662 G-118 @ 49' 04/20/2011 04/20/2011 04/20/2011 Solid ug/kg 5 PQL Results 1650	267662 267663 G-118 @ 49' G-118 @ 55' 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 Solid Solid ug/kg ug/kg 5 5 PQL Results 1650 ND ND	267662 267663 G-118@49' G-118@55' 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 Solid Solid ug/kg ug/kg 5 5 PQL Results 1650 ND	267662 267663 G-118@49' G-118@55' 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 04/20/2011 Solid Solid ug/kg ug/kg 5 5 PQL Results Results ND

Comment(s):

Elevated PQLs due to matrix.

Our Lab I.D.		267662	267663		
Surrogates	% Rec.Limit	% Rec.	% Rec.		
Surrogate Percent Recovery					
2-Fluorophenol	21-105	43	43		
Phenol-d6	10-107	46	40		
2,4,6-Tribromophenol	10-123	47	28		
Nitrobenzene-d5	35-114	71	56		
2-Fluorobiphenyl	18-116	59	70		
Terphenyl-d14	33-141	57	70		

QUALITY CONTROL REPORT

QC Batch No: 042011-1									
	LCS	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD		· ·		
Analytes	% REC	% REC	% REC	% Limit	% Limit			 •	
Acenaphthene	91	105	14.3	43-118	<30				
4-Chloro-3-methylphenol	79	94	17.3	23-117	<30				
(p-Chloro-m-cresol)								 	
2-Chlorophenol (o-Chlorophenol)	81	97	18.0	27-123	<30				
1,4-Dichlorobenzene	69	67	2.9	36-105	<30			 	
2,4-Dinitrotoluene	51	. 58	12.8	24-120	<30			 	
N-Nitroso-Di-n-propylamine	90	109	19.1	41-116	<30				
4-Nitrophenol	51	58	12.8	10-133	<30			·	
Pentachlorophenol	53	48	9.9	9-118	<30			 	
Phenol	84	101	18.4	12-110	<30			 	
Pyrene	104	108	3.8	26-127	<30				
1,2,4-Trichlorobenzene	75	76	1.3	39-98	<30				



FIGURES F-13.1 THROUGH F-13.51 ABRASION TESTING (PE PHASE)

WESTSIDE SUBWAY EXTENSION PROJECT

(SAT: NTNU's new soil abrasion test, Tunnels & Tunnelling International, May 2006, 43-45)



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Geotechnical Engineering Center Department of Civil, Architectural and Environmental Engineering

Project Name	Westside Subway Extension
Client project NO.	4953-10-1561
Location	Los Angeles, California
UT reference	2011_ MACTEC_001_001

Test Date	7/8/11-7/18/11
Tested by	Moo Yeon Kim
Checked by	Mahdi Heidari
Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Steel test piece condition	Ground and polished by bench grinder

Summary

Boring No.	Test Depth (ft)	AVS
S-101	60-61	31
S-102	67-68	22.5
S-104	59.5-60.5	14.5
S-104	81-82	35
S-107	57-57.9	23.5
S-108	91-92	13.5
S-109	80-81	11.5
S-110	40.5-41.5	10
S-110	44-45	5
S-111	65-66	27.5
S-114	67-68	38
S-115	89-90 (GM)	5.5
S-115	89-90	8

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Project Name	Westside Subway Extension	Те
Client project NO.	4953-10-1561	Ch
Location	Los Angeles, California	St
UT reference	2011_MACTEC_001_001	
Sample ID.		Sa
Boring No.	S-101	Ge
Depth Interval	60-61 ft	
Sample received	7/8/2011	So
Test date	7/18/2011	

Tested by	Moo Yeon Kim
Checked by	Mahdi Heidari
Steel test piece condition	Ground and polished by bench grinder
Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Geologic unit	N/A
Soil type description	SP/SW

Test no.	Test 1	Test 2	AVS
Weight loss in mg	33	29	31

Photograph of the test sample



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oven at 30°C for 3

Project Name	Westside Subway Extension	Tested by	Moo Yeon Kim	
Client project NO.	4953-10-1561	Checked by	Mahdi Heidari	
Location	Los Angeles, California	Steel test piece condition	Ground and polished by bench grinder	
UT reference	2011_ MACTEC_001_001		Dried in ventilated oven at 30°C for days	
Sample ID.		Sample moisture condition		
Boring No.	S-102	Geologic unit	N/A	
Depth Interval	67-68 ft			
Sample received	7/8/2011	Soil type description	SP-SM	
Test date	7/17/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	22	23	22.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	
Client project NO.	4953-10-1561		Checked by	
Location	Los Angeles, California		Steel test piece condition	
UT reference	2011_ MACTEC_001_001			
Sample ID.			Sample moisture condition	
Boring No.	S-104		Geologic unit	
Depth Interval	59.5-60.5 ft			
Sample received	7/8/2011		Soil type description	
Test date	7/17/2011			

Tested by	Moo Yeon Kim
Checked by	Mahdi Heidari
Steel test piece condition	Ground and polished by bench grinder
Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Geologic unit	N/A
Soil type description	SP-SM

Test no.	Test 1	Test 2	AVS
Weight loss in mg	13	16	14.5

Photograph of the test sample



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h grinder
Dried in ventilated oven at 30°C for 3 days

Test no.	Test 1	Test 2	AVS
Weight loss in mg	36	34	35

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by
Client project NO.	NO. 4953-10-1561		Checked by
Location	Los Angeles, California		Steel test piece c
UT reference	2011_ MACTEC_001_001		
Sample ID.			Sample moisture
Boring No.	S-107		Geologic unit
Depth Interval	57-57.9 ft		
Sample received	7/8/2011		Soil type descript
Test date	7/18/2011		

Tested by	Moo Yeon Kim
Checked by	Mahdi Heidari
Steel test piece condition	Ground and polished by bench grinder
Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Geologic unit	N/A
Soil type description	SP

Test no.	Test 1	Test 2	AVS
Weight loss in mg	24	23	23.5

Photograph of the test sample



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at 30°C for 3

Project Name	Westside Subway Extension	Tested by	Moo Yeon Kim	
Client project NO.	4953-10-1561	Checked by	Mahdi Heidari	
Location	Los Angeles, California	Steel test piece condition	Ground and polished by bench grinder	
UT reference	2011_ MACTEC_001_001		Dried in ventilated oven at 30°C for days	
Sample ID.		Sample moisture condition		
Boring No.	S-108	Geologic unit	N/A	
Depth Interval	91-92 ft			
Sample received	7/8/2011	Soil type description	SC/SM	
Test date	7/18/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	15	12	13.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_001		Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-109		Geologic unit	N/A
Depth Interval	80-81 ft		Soil type description	SC/CL
Sample received	7/8/2011			
Test date	7/17/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	13	10	11.5

Photograph of the test sample



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		-	
Project Name	Westside Subway Extension		Tested by
Client project NO.	4953-10-1561		Checked by
Location	Los Angeles, California		Steel test piece cond
UT reference	2011_ MACTEC_001_001		
Sample ID.			Sample moisture con
Boring No.	S-110		Geologic unit
Depth Interval	40.5-41.5 ft		
Sample received	7/8/2011]	Soil type description
Test date	7/18/2011		

Tested by	Moo Yeon Kim
Checked by	Mahdi Heidari
Steel test piece condition	Ground and polished by bench grinder
Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Geologic unit	N/A
Soil type description	CH/GC

Test no.	Test 1	Test 2	AVS
Weight loss in mg	11	9	10

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_001		Sample moisture condition Geologic unit Soil type description	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-110			N/A
Depth Interval	44-45 ft			
Sample received	7/8/2011			N/A
Test date	7/18/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	5	5	5

Photograph of the test sample



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30°C for 3

Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_001		Sample moisture condition	Dried in ventilated oven at 30°C for a days
Sample ID.				
Boring No.	S-111		Geologic unit	N/A
Depth Interval	65-66 ft		Soil type description	SP
Sample received	7/8/2011			
Test date	7/17/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	28	27	27.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_001		Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-114		Geologic unit	N/A
Depth Interval	67-68 ft			
Sample received	7/8/2011		Soil type description	SM
Test date	7/17/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	38	38	38

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_001			Dried in ventilated oven at 30°C for 3 days
Sample ID.			Sample moisture condition	
Boring No.	S-115		Geologic unit	N/A
Depth Interval	89-90 ft			
Sample received	7/8/2011		Soil type description	GM
Test date	7/18/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	5	6	5.5

Photograph of the test sample



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for 3

Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_001			Dried in ventilated oven at 30°C for a days
Sample ID.			Sample moisture condition	
Boring No.	S-115		Geologic unit	N/A
Depth Interval	89-90 ft			
Sample received	7/8/2011		Soil type description	N/A
Test date	7/18/2011			
Sample ID. Boring No. Depth Interval Sample received Test date	S-115 89-90 ft 7/8/2011 7/18/2011		Sample moisture condition Geologic unit Soil type description	Dried in ventilated oven at 30° days N/A N/A

Test no.	Test 1	Test 2	AVS
Weight loss in mg	9	7	8

Photograph of the test sample



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Project Name	Westside Subway Extension	
Client project NO.	4953-10-1561	
Location	Los Angeles, California	
UT reference	2011_ MACTEC_001_002	

Test Date	7/18/11-7/20/11
Tested by	Moo Yeon Kim
Checked by	Mahdi Heidari
Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Steel test piece condition	Ground and polished by bench grinder

Summary

Boring No.	Test Depth (ft)	AVS
S-103A	71-72	21
S-103A	91-92	1.5
S-103A	113-114	2
S-106	45-46	31

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Project Name	Westside Subway Extension	Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561	Checked by	Mahdi Heidari
Location	Los Angeles, California	Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_001		Dried in ventilated oven at 30°C for 3 days
Sample ID.		Sample moisture condition	
Boring No.	S-103A	Geologic unit	N/A
Depth Interval	71-72 ft		
Sample received	7/18/2011	Soil type description	SM
Test date	7/20/2011		

Test no.	Test 1	Test 2	AVS
Weight loss in mg	19	23	21

Photograph of the test sample



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Project Name	Westside Subway Extension	Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561	Checked by	Mahdi Heidari
Location	Los Angeles, California	Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_002		Dried in ventilated oven at 30°C for 3
Sample ID.		Sample moisture condition	days
Boring No.	S-103A	Geologic unit	N/A
Depth Interval	91-92 ft		
Sample received	7/18/2011	Soil type description ML	ML
Test date	7/20/2011		

Test no.	Test 1	Test 2	AVS
Weight loss in mg	1	2	1.5

Photograph of the test sample



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Project Name	Westside Subway Extension	Teste
Client project NO.	4953-10-1561	Check
Location	Los Angeles, California	Steel
UT reference	2011_ MACTEC_001_002	_
Sample ID.		Samp
Boring No.	S-103A	Geolo
Depth Interval	113-114 ft	
Sample received	7/18/2011	Soil ty
Test date	7/20/2011	

Tested by	Moo Yeon Kim
Checked by	Mahdi Heidari
Steel test piece condition	Ground and polished by bench grinder
Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Geologic unit	N/A
Soil type description	ML

Test no.	Test 1	Test 2	AVS
Weight loss in mg	2	2	2

Photograph of the test sample



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Project Name	Westside Subway Extension	Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561	Checked by	Mahdi Heidari
Location	Los Angeles, California	Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_002	Dried in ventilated oven at 3	
Sample ID.		Sample moisture condition	days
Boring No.	S-106	Geologic unit	N/A
Depth Interval	45-46 ft		
Sample received	7/18/2011	Soil type description SM/ML w/ tar	
Test date	7/20/2011		

Test no.	Test 1	Test 2	AVS
Weight loss in mg	32	30	31

Photograph of the test sample



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Project Name	Westside Subway Extension
Client project NO.	4953-10-1561
Location	Los Angeles, California
UT reference	2011_ MACTEC_001_003

Test Date	8/19/11-8/23/11
Tested by	Moo Yeon Kim
Checked by	Mahdi Heidari
Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Steel test piece condition	Ground and polished by bench grinder

Boring No.	Test Depth (ft)	AVS
S-101	42.6-43.6	20
S-101	53-54	38
S-102	64-65	25.5
S-102	71-72	31.5
S-103A	96-97	2.5
S-103A	101-102	1.5
S-105	96-97	6.5
S-106	52-53	22
S-108	69-70	2.5
S-108	82-83	5
S-108	86-87	8
S-110	71-71.8	7
S-110	81-82	4.5
S-111	59-60	25.5
S-111	78.5-79.5	16
S-116	76-77	2
S-116	91-92	5.5
S-117	64-65	27
S-118	89-90	4

Summary

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Project Name	Westside Subway Extension	Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561	Checked by	Mahdi Heidari
Location	Los Angeles, California	Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003		Dried in ventilated oven at 30°C for 3 days
Sample ID.		Sample moisture condition	
Boring No.	S-101	Geologic unit	
Depth Interval	42.6-43.6 ft		
Sample received	8/19/2011	Soil type description	SM
Test date	8/23/2011		

Test no.	Test 1	Test 2	AVS
Weight loss in mg	19	21	20

Photograph of the test sample



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3

Project Name	Westside Subway Extension	Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561	Checked by	Mahdi Heidari
Location	Los Angeles, California	Steel test piece condition	Ground and polished by bench grinde
UT reference	2011_ MACTEC_001_003		Dried in ventilated oven at 30°C for days
Sample ID.		Sample moisture condition	
Boring No.	S-101	Geologic unit	
Depth Interval	53-54 ft		
Sample received	8/19/2011	Soil type description	SP-SM
Test date	8/23/2011		

Test no.	Test 1	Test 2	AVS
Weight loss in mg	37	39	38

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003		Sample moisture condition Geologic unit	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-102			
Depth Interval	64-65 ft			
Sample received	8/19/2011		Soil type description	SP-SM
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	25	26	25.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003			Dried in ventilated oven at 30°C for 3 days
Sample ID.			Sample moisture condition	
Boring No.	S-102		Geologic unit Soil type description	
Depth Interval	71-72 ft			
Sample received	8/19/2011			SM
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	30	33	31.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_MACTEC_001_003			Dried in ventilated oven at 30°C for 3 days
Sample ID.			Sample moisture condition	
Boring No.	S-103A		Geologic unit	
Depth Interval	96-97 ft			
Sample received	8/19/2011		Soil type description	ML
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	2	3	2.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003		Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-103A		Geologic unit	
Depth Interval	101-102 ft			
Sample received	8/19/2011		Soil type description	ML
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	1	2	1.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003		Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-105		Geologic unit	
Depth Interval	96-97 ft			
Sample received	8/19/2011		Soil type description	ML w/ tar
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	6	7	6.5

Photograph of the test sample



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(SAT: NTNU's new soil abrasion test, Tunnels & Tunnelling International, May 2006, 43-45)



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003		Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-106		Geologic unit	
Depth Interval	52-53 ft			
Sample received	8/19/2011		Soil type description	SM/GM w/ tar
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	21	23	22

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003		Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-108		Geologic unit	
Depth Interval	69-70 ft			
Sample received	8/19/2011		Soil type description	CL/CH
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	3	2	2.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_MACTEC_001_003		Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-108		Geologic unit	
Depth Interval	82-83 ft			
Sample received	8/19/2011		Soil type description	ML/CL
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	5	5	5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003		Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-108		Geologic unit	
Depth Interval	86-87 ft			
Sample received	8/19/2011	Soi	Soil type description	GC
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	8	8	8

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003		Sample moisture condition	Dried in ventilated oven at 30°C for 3 days
Sample ID.				
Boring No.	S-110		Geologic unit	
Depth Interval	71-71.8 ft			
Sample received	8/19/2011		Soil type description	GM
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	7	7	7

Photograph of the test sample



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Project Name Westside Subway Extension Tested by Moo Yeon Kim	
Client project NO. 4953-10-1561 Checked by Mahdi Heidari	
Location Los Angeles, California Steel test piece condition Ground and polished by bench	grinder
UT reference 2011_MACTEC_001_003 Dried in ventilated oven at 3	Dried in ventilated oven at 30°C for 3 days
Sample ID. Sample moisture condition days	
Boring No. S-110 Geologic unit	
Depth Interval 81-82 ft	
Sample received 8/19/2011 Soil type description SC/GC	
Test date 8/23/2011	

Test no.	Test 1	Test 2	AVS
Weight loss in mg	5	4	4.5

Photograph of the test sample



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30°C for 3

Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003		Sample moisture condition	Dried in ventilated oven at 30°C for days
Sample ID.				
Boring No.	S-111		Geologic unit	
Depth Interval	59-60 ft			
Sample received	8/19/2011	-	Soil type description	SP
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	26	25	25.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003			Dried in ventilated oven at 30°C for 3 days
Sample ID.			Sample moisture condition	
Boring No.	S-111		Geologic unit	
Depth Interval	78.5-79.5 ft			
Sample received	8/19/2011		Soil type description	SM
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	15	17	16

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder
UT reference	2011_ MACTEC_001_003			Dried in ventilated oven at 30°C for 3 days
Sample ID.			Sample moisture condition	
Boring No.	S-116		Geologic unit	
Depth Interval	76-77 ft			
Sample received	8/19/2011		Soil type description	ML
Test date	8/23/2011			

Test no.	Test 1	Test 2	AVS
Weight loss in mg	2	2	2

Photograph of the test sample



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h grinder
Dried in ventilated oven at 30°C for 3 days

Test no.	Test 1	Test 2	AVS
Weight loss in mg	6	5	5.5

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim	
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari	
Location	Los Angeles, California		Steel test piece condition	Ground and polished by bench grinder	
UT reference	2011_ MACTEC_001_003			Dried in ventilated oven at 30°C for 3	
Sample ID.			Sample moisture condition	days	
Boring No.	S-117		Geologic unit		
Depth Interval	64-65 ft				
Sample received	8/19/2011		Soil type description	SP w/ tar	
Test date	8/23/2011				

Test no.	Test 1	Test 2	AVS
Weight loss in mg	28	26	27

Photograph of the test sample



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Project Name	Westside Subway Extension		Tested by	Moo Yeon Kim	
Client project NO.	4953-10-1561		Checked by	Mahdi Heidari	
Location	Los Angeles, California	ļ	Steel test piece condition	Ground and polished by bench grinder	
UT reference	2011_MACTEC_001_003			Dried in ventilated oven at 30°C for 3 days	
Sample ID.			Sample moisture condition		
Boring No.	S-118		Geologic unit		
Depth Interval	89-90 ft				
Sample received	8/19/2011		Soil type description	ML	
Test date	8/23/2011				

Test no.	Test 1	Test 2	AVS
Weight loss in mg	3	5	4

Photograph of the test sample



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Soil Abrasion Test

Westside Subway Extension

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Summary of Abrasion Value Steel Test Results

Boring Name	Depth (ft)	Test 1	Test 2	AVERAGE
S-107	64.0-65.0	6.3	5.4	5.9
S-109	68.0-69.0	2.1	1.0	1.6
S-114	61.0-62.0	8.8	7.6	8.2
S-115	68.0-69.0	4.5	3.5	4.0
S-104	73.0-74.0	27.8	29.9	28.9
S-104	64.5-65.5	28.8	28.0	28.4
S-107	48.0-49.0	10.4	8.4	9.4
S-115	62.0-63.0	10.4	10.5	10.5
S-109	61.0-62.0	4.1	3.0	3.6
S-114	53.0-54.0	8.5	7.4	8.0

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3

Project Name	Westside Subway Extension	Test Date	09/1/11	
Client project NO.	4953-10-1561	Tested by	Mahdi Heidari	
Location	Los Angeles, CA	Checked by	Fulvio Tonon	
UT reference	2011_ MACTEC_001_004	Comple mainture condition	Dried in ventilated oven at 30°C fo	
Sample ID.	S-107@ 64.5	sample moisture condition	days	
Boring No.	S-107	Steel test piece condition	Ground and polished by bench grinder	
Depth Interval	64.0-65.0	Rock type	SM/SC	

Test no.	Test 1	Test 2	AVS
Weight loss in mg	6.3	5.4	5.9

Photograph of the tested sample



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Project Name	Westside Subway Extension	Test Date	09/1/11
Client project NO.	4953-10-1561	Tested by	Mahdi Heidari
Location	Los Angeles, CA	Checked by	Fulvio Tonon
UT reference	2011_ MACTEC_001_004	Comple moisture condition	Dried in ventilated oven at 30°C for 3
Sample ID.	S-109@ 68.5	sample moisture condition	days
Boring No.	S-109	Steel test piece condition	Ground and polished by bench grinder
Depth Interval	68.0-69.0	Rock type	ML

Test no.	Test 1	Test 2	AVS
Weight loss in mg	2.1	1.0	1.6

Photograph of the tested sample



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3

Project Name	Westside Subway Extension	Test Date	09/1/11
Client project NO.	4953-10-1561	Tested by	Mahdi Heidari
Location	Los Angeles, CA	Checked by	Fulvio Tonon
UT reference	2011_ MACTEC_001_004		Dried in ventilated oven at 30°C for
Sample ID.	S-114@ 61.5	sample moisture condition	days
Boring No.	S-114	Steel test piece condition	Ground and polished by bench grinde
Depth Interval	61.0-62.0	Rock type	CL/ML

Test no.	Test 1	Test 2	AVS
Weight loss in mg	8.8	7.6	8.2

Photograph of the tested sample



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Geotechnical Engineering Center Department of Civil, Architectural and Environmental Engineering

Project Name	Westside Subway Extension	Test Date	09/1/11
Client project NO.	4953-10-1561	Tested by	Mahdi Heidari
Location	Los Angeles, CA	Checked by	Fulvio Tonon
UT reference	2011_ MACTEC_001_004	Comple mainture condition	Dried in ventilated oven at 30°C for 3
Sample ID.	S-115@ 68.5	Sample moisture condition	days
Boring No.	S-115	Steel test piece condition	Ground and polished by bench grinder
Depth Interval	68.0-69.0	Rock type	ML

Test no.	Test 1	Test 2	AVS
Weight loss in mg	4.5	3.5	4.0

Photograph of the tested sample



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Westside Subway Extension		Test Date	09/1/11
4953-10-1561		Tested by	Mahdi Heidari
Los Angeles, CA		Checked by	Fulvio Tonon
2011_ MACTEC_001_004			Dried in ventilated oven at 30°C for 3
S-104@ 73.5		sample moisture condition	days
S-104		Steel test piece condition	Ground and polished by bench grinder
73.0-74.0		Rock type	SM
	Westside Subway Extension 4953-10-1561 Los Angeles, CA 2011_ MACTEC_001_004 S-104@ 73.5 S-104 73.0-74.0	Westside Subway Extension 4953-10-1561 Los Angeles, CA 2011MACTEC_001_004 S-104@73.5 S-104 73.0-74.0	Westside Subway ExtensionTest Date4953-10-1561Tested byLos Angeles, CAChecked by2011_ MACTEC_001_004Sample moisture conditionS-104@ 73.5Steel test piece condition73.0-74.0Rock type

Test no.	Test 1	Test 2	AVS
Weight loss in mg	27.8	29.9	28.9

Photograph of the tested sample



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Project Name	Westside Subway Extension		Test Date	09/1/11
Client project NO.	4953-10-1561		Tested by	Mahdi Heidari
Location	Los Angeles, CA		Checked by	Fulvio Tonon
UT reference	2011_ MACTEC_001_004		Sample moisture condition	Dried in ventilated oven at 30°C for 3
Sample ID.	S-104@ 65.0			days
Boring No.	S-104		Steel test piece condition	Ground and polished by bench grinder
Depth Interval	64.5-65.5		Rock type	SM

Test no.	Test 1	Test 2	AVS
Weight loss in mg	28.8	28.0	28.4

Photograph of the tested sample



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Project Name	Westside Subway Extension	Test Date	09/1/11
Client project NO.	4953-10-1561	Tested by	Mahdi Heidari
Location	Los Angeles, CA	Checked by	Fulvio Tonon
UT reference	2011_ MACTEC_001_004	Comple mainture condition	Dried in ventilated oven at 30°C for 3
Sample ID.	S-107@ 48.5	Sample moisture condition	days
Boring No.	S-107	Steel test piece condition	Ground and polished by bench grinder
Depth Interval	48.0-49.0	Rock type	ML

Test no.	Test 1	Test 2	AVS
Weight loss in mg	10.4	8.4	9.4

Photograph of the tested sample



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Project Name	Westside Subway Extension	Test Date	09/1/11
Client project NO.	4953-10-1561	Tested by	Mahdi Heidari
Location	Los Angeles, CA	Checked by	Fulvio Tonon
UT reference	2011_ MACTEC_001_004	Comple meioture condition	Dried in ventilated oven at 30°C for 3
Sample ID.	S-115@ 62.5	Sample moisture condition	days
Boring No.	S-115	Steel test piece condition	Ground and polished by bench grinder
Depth Interval	62.0-63.0	Rock type	SM

Test no.	Test 1	Test 2	AVS
Weight loss in mg	10.4	10.5	10.5

Photograph of the tested sample



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3

Project Name	Westside Subway Extension	Test Date	09/1/11
Client project NO.	4953-10-1561	Tested by	Mahdi Heidari
Location	Los Angeles, CA	Checked by	Fulvio Tonon
UT reference	2011_ MACTEC_001_004	Comple mainture condition	Dried in ventilated oven at 30°C for
Sample ID.	S-109@ 61.5	sample moisture condition	days
Boring No.	S-109	Steel test piece condition	Ground and polished by bench grinde
Depth Interval	61.0-62.0	Rock type	ML

Test no.	Test 1	Test 2	AVS
Weight loss in mg	4.1	3.0	3.6

Photograph of the tested sample



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Project Name	Westside Subway Extension	Test Date	09/1/11
Client project NO.	4953-10-1561	Tested by	Mahdi Heidari
Location	Los Angeles, CA	Checked by	Fulvio Tonon
UT reference	2011_ MACTEC_001_004		Dried in ventilated oven at 30°C for 3
Sample ID.	S-114@ 53.5	sample moisture condition	days
Boring No.	S-114	Steel test piece condition	Ground and polished by bench grinder
Depth Interval	53.0-54.0	Rock type	CL

Test no.	Test 1	Test 2	AVS
Weight loss in mg	8.5	7.4	8.0

Photograph of the tested sample



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FIGURES F-14.1 THROUGH F-14.12 UNCONFINED COMPRESSION TEST DATA (PE PHASE)

WESTSIDE SUBWAY EXTENSION PROJECT



		AS	TM D 2166	
Project Name:	Westside Subwa	y Extension	Sample Type:	Mod Cal
Project No.:	4953-10-1561		Soil Description	Siltstone
Boring No.:	G-105		Dry Density (pcf):	85.0
Depth (feet):	85.5		Moisture Content (%)	32.6
			Test Date:	10/13/11
Sample Diamet	er (inch): 2	.617	Wt. Wet Soil+Container(gms)	929.6
Sample Height	(inch): 4	.959	Wt. Dry Soil+Container(gms)	737.52
Sample Weight	(gms): 78	39.47	Wt. Container (gms)	148.68



	20.0						
(ksf)	15.0						
Stress	10.0						
eviator	5.0						
ă							
	0.0	1 2	3 4	5 Axial Strain (%	67 6)	8	9 10



Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
0	0.000	5.38	0.00	0.00
9	0.005	5.38	0.24	0.10
16	0.010	5.39	0.43	0.20
28	0.020	5.40	0.75	0.40
37	0.025	5.41	0.99	0.50
43	0.030	5.41	1.14	0.60
106	0.060	5.44	2.80	1.21
179	0.090	5.48	4.71	1.81
250	0.120	5.51	6.53	2.42
307	0.150	5.55	7.97	3.02
410	0.200	5.61	10.53	4.03
493	0.250	5.66	12.53	5.04
589	0.300	5.73	14.81	6.05
659	0.350	5.79	16.40	7.06
464	0.400	5.85	11.42	8.07



		AS	TM D 2166	
Project Name:	Westside Su	bway Extension	Sample Type:	Mod Cal
Project No.:	4953-10-156	1	Soil Description	Siltstone
Boring No.:	G-105		Dry Density (pcf):	89.1
Depth (feet):	105.5		Moisture Content (%)	29.3
			Test Date:	10/13/11
Sample Diamete	er (inch):	2.613	Wt. Wet Soil+Container(gms)	979.65
Sample Height	(inch):	4.947	Wt. Dry Soil+Container(gms)	798.45
Sample Weight	(gms):	802.64	Wt. Container (gms)	180.64



: (ksf)	15.0			••	
eviator Stress	5.0				
Ō	0.0 0 1	2 3	4 5 Axial Strain (%	6 7)	8 9 10



Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
0	0.000	5.36	0.00	0.00
9	0.005	5.37	0.24	0.10
14	0.010	5.37	0.38	0.20
22	0.020	5.38	0.59	0.40
27	0.025	5.39	0.72	0.51
31	0.030	5.40	0.83	0.61
75	0.060	5.43	1.99	1.21
141	0.090	5.46	3.72	1.82
209	0.120	5.50	5.48	2.43
290	0.150	5.53	7.55	3.03
380	0.200	5.59	9.79	4.04
479	0.250	5.65	12.21	5.05
549	0.300	5.71	13.85	6.06
553	0.311	5.72	13.92	6.28
382	0.350	5.77	9.53	7.07
77	0.400	5.83	1.90	8.09



		AS	TM D 2166	
Project Name:	Westside S	ubway Extension	Sample Type:	Mod Cal
Project No.:	4953-10-15	61	Soil Description	Siltstone
Boring No.:	G-106		Dry Density (pcf):	73.2
Depth (feet):	89.5		Moisture Content (%)	40.9
			Test Date:	10/13/11
Sample Diamet	ter (inch):	2.614	Wt. Wet Soil+Container(gms)	842.52
Sample Height	(inch):	4.811	Wt. Dry Soil+Container(gms)	640.94
Sample Weight	t (gms):	699.38	Wt. Container (gms)	147.67



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		•		- ``		Axial St	rain (%)				5	.0



Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
0	0.000	5.37	0.00	0.00
9	0.005	5.37	0.24	0.10
18	0.010	5.38	0.48	0.21
32	0.020	5.39	0.86	0.42
42	0.025	5.39	1.12	0.52
50	0.030	5.40	1.33	0.62
110	0.060	5.43	2.91	1.25
203	0.090	5.47	5.35	1.87
249	0.120	5.50	6.51	2.49
319	0.150	5.54	8.29	3.12
431	0.200	5.60	11.08	4.16
514	0.250	5.66	13.08	5.20
560	0.300	5.72	14.09	6.24
561	0.306	5.73	14.10	6.35
206	0.350	5.79	5.13	7.27



		A	STM D 2166	
Project Name:	Westside Sub	way Extension	Sample Type:	Mod Cal
Project No.:	4953-10-1561		Soil Description	Siltstone
Boring No.:	G-107		Dry Density (pcf):	91.9
Depth (feet):	90.5		Moisture Content (%)	26.6
			Test Date:	10/13/11
Sample Diamete	er (inch):	2.610	Wt. Wet Soil+Container(gms)	934.28
Sample Height	(inch):	4.854	Wt. Dry Soil+Container(gms)	768.83
Sample Weight	(gms):	793.19	Wt. Container (gms)	147.88



Deviator Stress (ksf)	20.0 18.0 16.0 14.0 12.0 10.0 8.0 6.0 4.0 2.0 0.0 0			2	3			5	6	7	8	9	10
	0	1	1	2	3	4 A	xial S	5 train (%	6)	7	8	9	10



Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
0	0.000	5.35	0.00	0.00
9	0.005	5.36	0.24	0.10
15	0.010	5.36	0.40	0.21
27	0.020	5.37	0.72	0.41
38	0.025	5.38	1.02	0.52
47	0.030	5.38	1.26	0.62
123	0.060	5.42	3.27	1.24
232	0.090	5.45	6.13	1.85
344	0.120	5.49	9.03	2.47
433	0.150	5.52	11.29	3.09
569	0.200	5.58	14.68	4.12
675	0.250	5.64	17.23	5.15
724	0.286	5.68	18.34	5.88
687	0.300	5.70	17.35	6.18
190	0.350	5.77	4.75	7.21
72	0.400	5.83	1.78	8.24



		AS	TM D 2166	
Project Name:	Westside Su	bway Extension	Sample Type:	Mod Cal
Project No.:	4953-10-156	1	Soil Description	Siltstone
Boring No.:	G-109		Dry Density (pcf):	83.9
Depth (feet):	70.5		Moisture Content (%)	33.5
			Test Date:	10/13/11
Sample Diamete	er (inch):	2.599	Wt. Wet Soil+Container(gms)	912.92
Sample Height	(inch):	4.920	Wt. Dry Soil+Container(gms)	720.86
Sample Weight	(gms):	767.94	Wt. Container (gms)	147.63



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	0	1	2	3 4	4 Axial St	5 tr ain (%)	6 ·	7	8	9	10



Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
0	0.000	5.31	0.00	0.00
6	0.005	5.31	0.16	0.10
12	0.010	5.32	0.33	0.20
20	0.020	5.33	0.54	0.41
24	0.025	5.33	0.65	0.51
28	0.030	5.34	0.76	0.61
55	0.060	5.37	1.47	1.22
97	0.090	5.40	2.58	1.83
125	0.120	5.44	3.31	2.44
162	0.150	5.47	4.26	3.05
225	0.200	5.53	5.86	4.07
285	0.250	5.59	7.34	5.08
338	0.300	5.65	8.61	6.10
354	0.326	5.68	8.97	6.63
330	0.350	5.71	8.32	7.11
208	0.400	5.77	5.19	8.13



		ASTM D 2166	
Project Name:	Westside Subway Exte	ension Sample Type:	Mod Cal
Project No.:	4953-10-1561	Soil Description	Siltstone
Boring No.:	G-110	Dry Density (pcf):	82.9
Depth (feet):	125.5	Moisture Content (%)	34.9
		Test Date:	10/13/11
Sample Diamet	er (inch): 2.615	Wt. Wet Soil+Container(gms)	949.97
Sample Height	(inch): 4.905	Wt. Dry Soil+Container(gms)	750.82
Sample Weight	(gms): 773.43	Wt. Container (gms)	179.99



Deviator Stress (ksf)	16.0 14.0 12.0 10.0 8.0 6.0 4.0					•	•				
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Deviat	4.0										
	0.0	1	2 3	. 4	Axial St	5 6 rain (%)	6 7	7 8	8 9	9	10



Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
3	0.000	5.37	0.08	0.00
10	0.005	5.38	0.27	0.10
15	0.010	5.38	0.40	0.20
28	0.020	5.39	0.75	0.41
37	0.025	5.40	0.99	0.51
45	0.030	5.40	1.20	0.61
130	0.060	5.44	3.44	1.22
229	0.090	5.47	6.03	1.83
312	0.120	5.51	8.16	2.45
390	0.150	5.54	10.14	3.06
503	0.200	5.60	12.94	4.08
560	0.235	5.64	14.30	4.79
509	0.250	5.66	12.95	5.10
310	0.300	5.72	7.80	6.12
1			1	



		AS	TM D 2166	
Project Name: Westside Subway Extension			Sample Type:	Mod Cal
Project No.:	4953-10-156	1	Soil Description	Siltstone
Boring No.:	G-111		Dry Density (pcf):	83.8
Depth (feet):	105.5		Moisture Content (%)	34.0
			Test Date:	10/13/11
Sample Diamete	er (inch):	2.605	Wt. Wet Soil+Container(gms)	875.16
Sample Height ((inch):	4.697	Wt. Dry Soil+Container(gms)	691
Sample Weight	(gms):	738.60	Wt. Container (gms)	150.09



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Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
0	0.000	5.33	0.00	0.00
16	0.005	5.34	0.43	0.11
45	0.010	5.34	1.21	0.21
82	0.020	5.35	2.21	0.43
97	0.025	5.36	2.61	0.53
122	0.030	5.36	3.28	0.64
227	0.060	5.40	6.05	1.28
301	0.090	5.43	7.98	1.92
361	0.120	5.47	9.50	2.55
423	0.150	5.51	11.06	3.19
528	0.200	5.57	13.66	4.26
546	0.216	5.59	14.07	4.60
436	0.250	5.63	11.15	5.32
249	0.300	5.69	6.30	6.39



		AS	TM D 2166	
Project Name:	Westside Su	Ibway Extension	Sample Type:	Mod Cal
Project No.:	4953-10-156	61	Soil Description	Siltstone
Boring No.:	G-114		Dry Density (pcf):	89.3
Depth (feet):	98.5		Moisture Content (%)	28.9
			Test Date:	11/29/11
Sample Diamet	er (inch):	2.585	Wt. Wet Soil+Container(gms)	931.68
Sample Height	(inch):	5.000	Wt. Dry Soil+Container(gms)	756.48
Sample Weight	(gms):	792.38	Wt. Container (gms)	149.23



Deviator Stress (ksf)	10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0 1.0 0.0								•		•
	0.0 0	1	2	3	4 Axia	⁵ Il Strain ('	6 %)	7	8	9 10	0



Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
8	0.000	5.25	0.22	0.00
20	0.005	5.25	0.55	0.10
27	0.010	5.26	0.74	0.20
40	0.020	5.27	1.09	0.40
45	0.025	5.27	1.23	0.50
50	0.030	5.28	1.36	0.60
80	0.060	5.31	2.17	1.20
112	0.090	5.34	3.02	1.80
144	0.120	5.38	3.86	2.40
179	0.150	5.41	4.76	3.00
234	0.200	5.47	6.16	4.00
280	0.250	5.52	7.30	5.00
318	0.300	5.58	8.20	6.00
340	0.350	5.64	8.68	7.00
286	0.400	5.70	7.22	8.00
280	0.450	5.77	6.99	9.00
255	0.500	5.83	6.30	10.00



		AS	5TM D 2166	
Project Name:	Westside Sub	way Extension	Sample Type:	Mod Cal
Project No.:	4953-10-1561		Soil Description	Siltstone
Boring No.:	G-118		Dry Density (pcf):	83.9
Depth (feet):	82.5		Moisture Content (%)	15.9
			Test Date:	10/13/11
Sample Diamete	er (inch):	2.611	Wt. Wet Soil+Container(gms)	723.86
Sample Height	(inch):	4.200	Wt. Dry Soil+Container(gms)	645.29
Sample Weight	(gms):	574.01	Wt. Container (gms)	149.85



Deviator Stress (ksf)	9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0 1.0 0.0	•	*								
		1 2	2 :	3 4	4 Axial St	5 6 i rain (%)	3	7	8	9	10



Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
4	0.000	5.35	0.11	0.00
13	0.005	5.36	0.35	0.12
20	0.010	5.37	0.54	0.24
37	0.020	5.38	0.99	0.48
50	0.025	5.39	1.34	0.60
57	0.030	5.39	1.52	0.71
122	0.060	5.43	3.23	1.43
190	0.090	5.47	5.00	2.14
254	0.120	5.51	6.64	2.86
310	0.150	5.55	8.04	3.57
327	0.169	5.58	8.44	4.02
288	0.200	5.62	7.38	4.76
218	0.250	5.69	5.51	5.95
139	0.300	5.77	3.47	7.14



		AS	5TM D 2166	
Project Name:	Westside S	Subway Extension	Sample Type:	Mod Cal
Project No.:	4953-10-15	561	Soil Description	Siltstone
Boring No.:	G-118		Dry Density (pcf):	80.1
Depth (feet):	88.5		Moisture Content (%)	20.8
			Test Date:	10/13/11
Sample Diame	ter (inch):	2.608	Wt. Wet Soil+Container(gms)	817.09
Sample Height	(inch):	4.970	Wt. Dry Soil+Container(gms)	702.02
Sample Weight	t (gms):	674.26	Wt. Container (gms)	148.09



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ess (ksf)	8.0										
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Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
3	0.000	5.34	0.08	0.00
9	0.005	5.35	0.24	0.10
13	0.010	5.35	0.35	0.20
21	0.020	5.36	0.56	0.40
26	0.025	5.37	0.70	0.50
30	0.030	5.37	0.80	0.60
59	0.060	5.41	1.57	1.21
93	0.090	5.44	2.46	1.81
129	0.120	5.47	3.39	2.41
164	0.150	5.51	4.29	3.02
230	0.200	5.57	5.95	4.02
303	0.250	5.62	7.76	5.03
372	0.300	5.69	9.42	6.04
412	0.349	5.75	10.33	7.02
411	0.350	5.75	10.30	7.04
126	0.400	5.81	3.12	8.05



		AS	TM D 2166	
Project Name:	Westside Sub	way Extension	Sample Type:	Mod Cal
Project No.:	4953-10-1561		Soil Description	Siltstone
Boring No.:	G-118		Dry Density (pcf):	84.3
Depth (feet):	100.5		Moisture Content (%)	25.9
			Test Date:	10/13/11
Sample Diamete	er (inch):	2.615	Wt. Wet Soil+Container(gms)	916.55
Sample Height	(inch):	5.103	Wt. Dry Soil+Container(gms)	759.75
Sample Weight	(gms):	763.28	Wt. Container (gms)	154.33



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Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
4	0.000	5.37	0.11	0.00
11	0.005	5.38	0.29	0.10
14	0.010	5.38	0.37	0.20
20	0.020	5.39	0.53	0.39
22	0.025	5.40	0.59	0.49
24	0.030	5.40	0.64	0.59
33	0.060	5.43	0.87	1.18
49	0.090	5.47	1.29	1.76
70	0.120	5.50	1.83	2.35
94	0.150	5.53	2.45	2.94
149	0.200	5.59	3.84	3.92
205	0.250	5.65	5.23	4.90
265	0.300	5.71	6.69	5.88
224	0.350	5.77	5.59	6.86
72	0.400	5.83	1.78	7.84



		AS	TM D 2166	
Project Name:	Westside Su	bway Extension	Sample Type:	Mod Cal
Project No.:	4953-10-156	1	Soil Description	Siltstone
Boring No.:	G-207		Dry Density (pcf):	91.0
Depth (feet):	100-101		Moisture Content (%)	29.3
			Test Date:	12/02/11
Sample Diamete	er (inch):	2.604	Wt. Wet Soil+Container(gms)	420.41
Sample Height ((inch):	5.054	Wt. Dry Soil+Container(gms)	404
Sample Weight	(gms):	831.55	Wt. Container (gms)	348.02



Deviator Stress (ksf)	12.0 10.0 8.0 6.0 4.0											
Devia	4.0 2.0 0.0	.	1 2	2 3	3 4	4 (Axial St	5 6 rain (%)	6	7 {	8	9	10



Load	Deformation	Area	Compressive Stress	Axial Strain
(lbs)	(inch)	(sq.in)	(ksf)	(%)
7	0.000	5.33	0.19	0.00
20	0.005	5.33	0.54	0.10
29	0.010	5.34	0.78	0.20
44	0.020	5.35	1.19	0.40
52	0.025	5.35	1.40	0.49
60	0.030	5.36	1.61	0.59
113	0.060	5.39	3.02	1.19
166	0.090	5.42	4.41	1.78
217	0.120	5.46	5.73	2.37
267	0.150	5.49	7.01	2.97
356	0.200	5.55	9.24	3.96
421	0.248	5.60	10.82	4.91
420	0.250	5.60	10.79	4.95
176	0.300	5.66	4.48	5.94




WESTSIDE SUBWAY EXTENSION PROJECT



FIGURES G-1.1 THROUGH G-1.43 ANALYTICAL TEST RESULTS (ACE PHASE)

WESTSIDE SUBWAY EXTENSION PROJECT



31 August 2009

Mr. Curt Welty MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922 RE: MAC081909-11

Enclosed are the results of analyses for samples received by the laboratory on 18-Aug-09. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

CNARC

Janis Villarreal Laboratory Director

H&P Mobile Geochemistry operates under CA Environmental Lab Accreditation Program Numbers 1317, 1561, 1667, 1745, 1746, 2088, 2278, 2543, 2579 and 2595. National Environmental Laboratory Accreditation Conference (NELAC) Standards Lab #11845



Hz Robile Geochemistry Inc.

MACTEC Engineering & Consulting	Project:	MAC081909-11	
5628 East Slauson Avenue	Project Number:	Westside Extension	Reported:
Los Angeles, CA 90040-2922	Project Manager:	Mr. Curt Welty	31-Aug-09 09:58

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
M-2-15	E908058-01	Vapor	18-Aug-09	18-Aug-09
M-2-25	E908058-02	Vapor	18-Aug-09	18-Aug-09
M-3-15	E908058-03	Vapor	18-Aug-09	18-Aug-09
M-14-15	E908058-04	Vapor	18-Aug-09	18-Aug-09
M-14-25	E908058-05	Vapor	18-Aug-09	18-Aug-09
M-15-15	E908058-06	Vapor	18-Aug-09	18-Aug-09
M-15-25	E908058-07	Vapor	18-Aug-09	18-Aug-09
M-17-15	E908058-08	Vapor	18-Aug-09	18-Aug-09
M-25-15	E908058-09	Vapor	18-Aug-09	18-Aug-09
M-21-15	E908058-10	Vapor	18-Aug-09	18-Aug-09
M-21-25	E908058-11	Vapor	18-Aug-09	18-Aug-09

Reochemistry Inc.

MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922		Pr Project Nu: Project Mar	roject: MA mber: We nager: Mr	Reported: 31-Aug-09 09:58					
		Soil Gas a	nd Vap	or Analy	ysis				
		H&P Mo	bile Ge	ochemist	ry				
Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
M-2-15 (E908058-01) Vapor Sampled: 18-Aug	g-09 Received:	18-Aug-09				*	-		
Methane	15	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	
M-2-25 (E908058-02) Vapor Sampled: 18-Aug	g-09 Received:	18-Aug-09							
Methane	ND	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	
M-3-15 (E908058-03) Vapor Sampled: 18-Aug	g-09 Received:	18-Aug-09							
Methane	3500	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	
M-14-15 (E908058-04) Vapor Sampled: 18-Au	1g-09 Received	: 18-Aug-09							
Methane	280	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	
M-14-25 (E908058-05) Vapor Sampled: 18-Au	1g-09 Received	: 18-Aug-09							
Methane	7100	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	
M-15-15 (E908058-06) Vapor Sampled: 18-Au	1g-09 Received	: 18-Aug-09							
Methane	ND	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	
M-15-25 (E908058-07) Vapor Sampled: 18-Au	1g-09 Received	: 18-Aug-09							
Methane	15	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	
M-17-15 (E908058-08) Vapor Sampled: 18-Au	1g-09 Received	: 18-Aug-09							
Methane	410	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	
M-25-15 (E908058-09) Vapor Sampled: 18-Au	1g-09 Received	: 18-Aug-09							
Methane	12	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	

High Republic Mobile Geochemistry Inc.

MACTEC Engineering & Consult 5628 East Slauson Avenue Los Angeles, CA 90040-2922	ing		Pro Project Nun Project Mana	oject: M nber: V ager: M	/AC081909-11 Vestside Extens /Ir. Curt Welty	l sion			Reported: 31-Aug-09 09:58	
			Soil Gas ar	nd Va	por Analy	ysis				
			H&P Mol	oile G	eochemist	ry				
Analyte		Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
M-21-15 (E908058-10) Vapor Sa	mpled: 18-Aug-09	Receive	ed: 18-Aug-09							
Methane		ND	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	
M-21-25 (E908058-11) Vapor Sa	mpled: 18-Aug-09	Receive	ed: 18-Aug-09							
Methane		ND	10	ppmv	1	EH91909	19-Aug-09	19-Aug-09	EPA 8015M	

Received to the second second

MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922	Project:MAC081909-11Project Number:Westside ExtensionReported:Project Manager:Mr. Curt Welty31-Aug-09 09:58										
Soil Gas and Vapor Analysis - Quality Control H&P Mobile Geochemistry											
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Batch EH91909 - GC											
Blank (EH91909-BLK1)				Prepared &	Analyzed:	19-Aug-09)				

Methane

ND 10

ppmv

Hz Reochemistry Inc.

MACTEC Engineering & Consulting	Project:	MAC081909-11	
5628 East Slauson Avenue	Project Number:	Westside Extension	Reported:
Los Angeles, CA 90040-2922	Project Manager:	Mr. Curt Welty	31-Aug-09 09:58

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Client: MACTEC Address: 5628 E	and the second second	MOBILE GEOCHEMISTRY Chain of Cha								699	5				ŀ	-1&P P ⊃utsid	Projec	t # :	NAC	081	909	-11	
Email: CMWelty@m	Engineerily Seles CA 9 actec. Com phor	4 (1 tue. 10042 32	0154 D 23-91	1 tiy	, Inc		Collec Client Locat Fax:	ctor: _ Projection:	ct # _	Nest	K. tsid	e f	Ex Ø	nsi	01 F	Projec	t Con	tact:	F (4) 2	² age: FF 4 Hk	l Wel aur	of _	2
EDF: Yes No			Sampl	e Recei	pt] No	,] NI/A					82	260	B		ТО	-15				N2			
		_	Cold:	Yes [] eceived	No RT on Site)] N/A	ext] TO-15		02			
Special Instructions:							H	1 TRPH	1 for BTEX/MTBE	EX / Oxygenates	H gas	ŝ	SC/LARWQCB	ones	List	EX/MTBE	(specify)	hthalene 3260B	hane	d Gases CO2			il # of containers
Sample Name	Field Point Name	Purge Vol	Time	Date	Sample Type	Containe Type	r dL	418	802	BTE	TPF	VOO	DTS	Keto	Full	BTE	LCC	Nap	Met	Fixe			Tota
M-2-15			1001	5/18	VAPOR	TROLA	R												X	')
M-2-25			1010	1		i	_																1
M-3-15			1045																				1
M-14-15			1155																				1
M-14-25			1200																				1
M-15-15			1221																				1
M-15-25			1225																				1
M-17-15			1305															1)
M-25-15			1426																1)
M-21-15	11		1540	1	V	V													U				1
Relinquisted by: Signature	11/4	MAI	(company)	2	Received b	y: (Signature	5 -	Te	_			1	hop	2	(compa	any)	the second	Date:			Time:	ŝ	
Relinquished by: (Signature)	wj	. ,,,,,	(company)		Received b	(Signature	il.	lei	d	1			FI Z	P	(compa	any)	- (Date:	[9]	69	Time:	300	

Figure G-1.7

HQ P	2470 Impala Dr. 3825 Industry A	, Carlsba venue, La	d, CA 92 akewood	2010 • pł , CA 907	n 760.804. 712 • ph 56	9678 • fax 52.426.699	760.8 91 • fa	804.9 ax 56	9159 2.426	6.699	5				l Carol	H&P F Outsic	Projec de Lat	et #_ N	AC	081	909-	II
Client: MACTEC Address: 5628 605 Email: Cmwely@m	Engineering E. Slayson Angeles CA nactec. con Phon	1 Cm Ave. 9007 10: 32	Sult D 3-91	ing, - 9-10	Inc. BD	(Collec Client Locatio	etor: Projec	ct # 🛛	Kest.	side	Ę	(ten	Sion	9_ F	Projec	t Con	tact:	C4 2	'age: _ ≁ (+ H	2 NC/4 Dut	2
EDF: Yes No D			Samp Intact: Seal In Cold: [N/A (R	Ie Receip M Yes □ tact: □ Yes] Yes □ Received	ot No es □ No 🗹 No 🗭 on Site)	N/A	ext				8	260	B		ТО	-15		T0-15		02 N2		
m - 21 - 25 · MINAMA	L.SAMPLE IN TEOLAR	-					H 🗌 gasoline 📋 diesel	3.1 TRPH	21 for BTEX/MTBE	EX / Oxygenates	H gas	C's	SC/LARWQCB	ones	List	EX/MTBE	C (specify)	ohthalene 3260B	thane	ed Gases		
Sample Name	Field Point Name	Purge Vol	Time 1545	Date	Sample Type	Container Type	TP	418	802	BT	TP	0V	DT	Ket	Ful	BTI	LO	Nat	X). Xil		
inquished by: (Signature)	milte	MA	(company)		Received by	: (Signature)	e							t	(compa typ	any)		Date:	8(2	læn	Time:	

Figure G-1.8



31 August 2009

Mr. Curt Welty MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922 RE: MAC081909-14

Enclosed are the results of analyses for samples received by the laboratory on 19-Aug-09. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Janis Villarreal Laboratory Director

H&P Mobile Geochemistry operates under CA Environmental Lab Accreditation Program Numbers 1317, 1561, 1667, 1745, 1746, 2088, 2278, 2543, 2579 and 2595. National Environmental Laboratory Accreditation Conference (NELAC) Standards Lab #11845



Hz Robile Geochemistry Inc.

MACTEC Engineering & Consulting	Project:	MAC081909-14	
5628 East Slauson Avenue	Project Number:	Westside Extension	Reported:
Los Angeles, CA 90040-2922	Project Manager:	Mr. Curt Welty	31-Aug-09 10:15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
M-1-15	E908062-01	Vapor	19-Aug-09	19-Aug-09
M-4-15	E908062-02	Vapor	19-Aug-09	19-Aug-09
M-6-15	E908062-03	Vapor	19-Aug-09	19-Aug-09
M-7-25	E908062-04	Vapor	19-Aug-09	19-Aug-09
M-10-15	E908062-05	Vapor	19-Aug-09	19-Aug-09
M-11-100	E908062-06	Vapor	19-Aug-09	19-Aug-09
M-11-65	E908062-07	Vapor	19-Aug-09	19-Aug-09
M-11-15	E908062-08	Vapor	19-Aug-09	19-Aug-09
M-16-15	E908062-09	Vapor	19-Aug-09	19-Aug-09
M-16-25	E908062-10	Vapor	19-Aug-09	19-Aug-09

High Republic Mobile Geochemistry Inc.

MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922		Pr Project Nu: Project Mar	oject: MA mber: We nager: Mr	AC081909-14 estside Exten 7. Curt Welty	Reported: 31-Aug-09 10:15				
		Soil Gas a	nd Vap	or Analy	ysis				
		H&P Mo	bi	st	ry				
Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
M-1-15 (E908062-01) Vapor Sampled: 19-Au	ig-09 Received	: 19-Aug-09							
Methane	ND	10	ppmv	1	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	
M-4-15 (E908062-02) Vapor Sampled: 19-Au	ig-09 Received	19-Aug-09							
Methane	5700	10	ppmv	1	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	
M-6-15 (E908062-03) Vapor Sampled: 19-Au	ig-09 Received	19-Aug-09							
Methane	19000	50	ppmv	5	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	
M-7-25 (E908062-04) Vapor Sampled: 19-Au	ig-09 Received	19-Aug-09							
Methane	600000	5000	ppmv	500	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	
M-10-15 (E908062-05) Vapor Sampled: 19-A	ug-09 Received	l: 19-Aug-09							
Methane	750000	5000	ppmv	500	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	
M-11-100 (E908062-06) Vapor Sampled: 19-	Aug-09 Receive	ed: 19-Aug-09							
Methane	580000	1200	ppmv	125	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	
M-11-65 (E908062-07) Vapor Sampled: 19-A	ug-09 Received	l: 19-Aug-09							
Methane	370000	1200	ppmv	125	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	
M-11-15 (E908062-08) Vapor Sampled: 19-A	ug-09 Received	l: 19-Aug-09							
Methane	860000	1200	ppmv	125	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	
M-16-15 (E908062-09) Vapor Sampled: 19-A	ug-09 Received	l: 19-Aug-09							
Methane	22	10	ppmv	1	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	

High Recochemistry Inc.

MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922		Pr Project Nur Project Mar	oject: M. mber: W nager: Mi	AC081909-14 estside Exten r. Curt Welty	4 sion			Reported: 31-Aug-09 10:15	
		Soil Gas a H&P Mo	nd Vap bile Ge	oor Analy cochemist	ysis rv				
Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
M-16-25 (E908062-10) Vapor Sampled: 1	9-Aug-09 Received	l: 19-Aug-09							
Methane	27	10	ppmv	1	EH92104	20-Aug-09	20-Aug-09	EPA 8015M	

Received to the second second

MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922		Pr Project Nu Project Mar	roject: M. mber: We nager: Mi	AC081909-14 estside Exten r. Curt Welty	4 sion			Repo 31-A	orted: .ug-09 10:1:	5
Soil Gas and Vapor Analysis - Quality Control H&P Mobile Geochemistry										
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EH92104 - GC										
Blank (EH92104-BLK1)				Prepared &	Analyzed:	20-Aug-09)			

Methane

ND 10 ppmv

Hz Reochemistry Inc.

MACTEC Engineering & Consulting	Project:	MAC081909-14	
5628 East Slauson Avenue	Project Number:	Westside Extension	Reported:
Los Angeles, CA 90040-2922	Project Manager:	Mr. Curt Welty	31-Aug-09 10:15

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Hi Reocher Inc.	oile mistry 🗆 24 🗔 18	70 Impala 55 Corona	Dr., Carlsb do Ave., Sig	Cha ad, CA § gnal Hill	in of 92010 • p , CA 9075	Custo h 760.804.9 i5 • ph 800.8	dy 9678 834.9	• fax	COI 760.8	'd :04.91	59				D H O	ate: _ &P Pri	oject # Lab:		11 2 1 A	200	81	900	7-10
Iient: MACTE ddress: Sbzb E.S Cos Amp mail: CmuClyy (1)	C Engineeri Vanson Ave. Les CA 90 mactec.co2	Ny 4(1070	In sylti	ng,]1	2 C Co Cli Lo Pr	Ilector: ent Project # cation: ione: 323-	KT WCS 919	-10	le (187	C×4	En_() Fax	10	7	i viqu	F	Project	Conta	ct: _<	F Cyr time:	Page:	hel.	of	1
Seotracker EDF: Yes ING		are subje analysis e is the right tatedue	Sample Intact: Seal Intac Cold: Tempera	Receipt Yes N t: Yes Yes N Yes N	No N No N N/A	A be obtaine A Chenis are the based the	(pm ned)		OXY 🗌 TPH gas	d ext		30B 🗌 TO-15	82608 010-15	SAM A SAM B	30B [] TO-15	30B TO-15	30B TO-15	30B TO-15	8260B T0-15	1,1 DFA CTHER	Res Term N ho	02 DN2	Rep Pay opp
pecial instructions:								ectio	D BTEX	g	gard	826	st/DTSC	260B	826	826	826	826	1.81	punodu	olle	□ C02	San
ab Work Order #	e the services are rem pled methods, if analy roede all clauses to th	of the tim rolly occe shall supe of H&P.					# of containers	3260B Full Lis	3260B	3015M TPH	418.1 TRPH	/OC's: Full List	/OC's: Short Lis	VOC'S: SAM, 82	Naphthalene	Oxygenates	TPHv gas	Ketones	Other	Leak Check Co	Methane	Fixed Gases	tim reco tul, offse
Sample Name	Field Point Name	Purge	Time	Date	Sample Type	Container Type	Total		SOIL	/GW	7	-	-	S	OIL V	/APO	R/AIF	ANA	LYSI	S			
M-1-15	10001011110		0944	2/14	VAPOR	TERAR	1														X		
M-4- 15			1015	1	1)	1														×		
M-6-15			1105				1														x		
11-7-25			11.45				1														X		
M-10-15			1310				1														X		
M-11-100			1343				(X		
M-11-65			13-11				(X		
M-11-15			1355	(1														X		
M-16-15			1450)		11	(X		
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linquished by: (Signature)			(company)		Received by	r: (Signature)									(compa	iny)		Date:			Т	me:	



31 August 2009

Mr. Curt Welty MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922 RE: MAC082109-10

Enclosed are the results of analyses for samples received by the laboratory on 21-Aug-09 . If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Janis Villarreal Laboratory Director

H&P Mobile Geochemistry operates under CA Environmental Lab Accreditation Program Numbers 1317, 1561, 1667, 1745, 1746, 2088, 2278, 2543, 2579 and 2595. National Environmental Laboratory Accreditation Conference (NELAC) Standards Lab #11845



2470 Impala Drive, Carlsbad, California 92010 г 760.804.9678 — Fax 760.804.9159 1855 Coronado Avenue, Signal Hill, California 90755 www.HandPmg.com г 1-800-834-9888

Hz Robile Geochemistry Inc.

MACTEC Engineering & Consulting	Project: MAC082109-10	
5628 East Slauson Avenue	Project Number: Westside Extension	on Reported:
Los Angeles, CA 90040-2922	Project Manager: Mr. Curt Welty	31-Aug-09 10:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
M-23-15	E908067-01	Vapor	20-Aug-09	21-Aug-09
M-24-15	E908067-02	Vapor	20-Aug-09	21-Aug-09
M-18-15	E908067-03	Vapor	20-Aug-09	21-Aug-09
M-18-25	E908067-04	Vapor	20-Aug-09	21-Aug-09
M-19-20	E908067-05	Vapor	20-Aug-09	21-Aug-09
M-19-40	E908067-06	Vapor	20-Aug-09	21-Aug-09
M-22-15	E908067-07	Vapor	20-Aug-09	21-Aug-09
M-20-15	E908067-08	Vapor	20-Aug-09	21-Aug-09
M-20-25	E908067-09	Vapor	20-Aug-09	21-Aug-09
M-20-65	E908067-10	Vapor	20-Aug-09	21-Aug-09
M-20-90	E908067-11	Vapor	20-Aug-09	21-Aug-09

Reochemistry Inc.

MACTEC Engineering & Con 5628 East Slauson Avenue Los Angeles, CA 90040-2922	ConsultingProject:MAC082109-10IeProject Number:Westside Extension2922Project Manager:Mr. Curt Welty				Reported: 31-Aug-09 10:46					
			Soil Gas a	nd Vap						
			H&P Mo	bile Ge	ochemist	ry				
Analyte		Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
M-23-15 (E908067-01) Vapor	Sampled: 20-Aug-09	Received	: 21-Aug-09							
Methane		ND	10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	
M-24-15 (E908067-02) Vapor	Sampled: 20-Aug-09	Received	: 21-Aug-09							
Methane		53	10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	
M-18-15 (E908067-03) Vapor	Sampled: 20-Aug-09	Received	: 21-Aug-09							
Methane		ND	10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	
M-18-25 (E908067-04) Vapor	Sampled: 20-Aug-09	Received	: 21-Aug-09							
Methane		ND	10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	
M-19-20 (E908067-05) Vapor	Sampled: 20-Aug-09	Received	: 21-Aug-09							
Methane		2900	10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	
M-19-40 (E908067-06) Vapor	Sampled: 20-Aug-09	Received	: 21-Aug-09							
Methane		310	10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	
M-22-15 (E908067-07) Vapor	Sampled: 20-Aug-09	Received	: 21-Aug-09							
Methane		40	10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	
M-20-15 (E908067-08) Vapor	Sampled: 20-Aug-09	Received	: 21-Aug-09							
Methane		ND	10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	
M-20-25 (E908067-09) Vapor	Sampled: 20-Aug-09	Received	: 21-Aug-09							
Methane		ND	10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	

High Republic Mobile Geochemistry Inc.

MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922	2	P Project Nu Project Ma	Project: 1 umber: V unager: 1	MAC082109-1 Westside Exten Mr. Curt Welty	0 Ision			Reported: 31-Aug-09 10:46	
		Soil Gas a	and Va	apor Analy	ysis				
		H&P Mo	obile (Geochemist	ry				
Analyte	Resul	Reporting t Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
M-20-65 (E908067-10) Vapor Sam	pled: 20-Aug-09 Rec	eived: 21-Aug-09							
Methane	ND) 10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	
M-20-90 (E908067-11) Vapor Samj	pled: 20-Aug-09 Rec	eived: 21-Aug-09							
Methane	ND) 10	ppmv	1	EH92404	21-Aug-09	21-Aug-09	EPA 8015M	

Reochemistry Inc.

MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922		Pr Project Nu Project Mar	oject: MA mber: We nager: Mr	AC082109-10 estside Exten . Curt Welty) sion			Repo 31-A	orted: .ug-09 10:46	6
Soil Gas and Vapor Analysis - Quality Control H&P Mobile Geochemistry										
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EH92404 - GC										
Blank (EH92404-BLK1)				Prepared &	Analyzed:	21-Aug-09)			

Methane

ND 10

ppmv

Hz Reochemistry Inc.

MACTEC Engineering & Consulting	Project:	MAC082109-10	
5628 East Slauson Avenue	Project Number:	Westside Extension	Reported:
Los Angeles, CA 90040-2922	Project Manager:	Mr. Curt Welty	31-Aug-09 10:46

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Inc.	emistry 24	55 Corono	a Dr., Carls ado Ave., S	sbad, CA Signal Hil	92010 • p II, CA 9075	h 760.804. 55 • ph 800	9678 .834.9	• fax 9888	760.8	04.91	59				C	utside	Lab:	-11-		006	210	1 10	
Idress: <u>5628</u> Los Ame	EC E, Slawson oles (A 900	AVC DYO			Co Clie Loo	Ilector: ent Project # cation:	west	1side	5 E	s x tea	SiDN	1		13		Project	Conta	ct:	F	Page:	1	of	_
nail: Cmwelty @m	ncta, com				Ph	ione: 323	-96	1-1	000	2	_ Fax	:					Turn o	iround	time:				_
eotracker EDF: Yes IN Iobal ID: xcel EDD: Yes IN	0 🗆		Sample Intact: Seal Inte Cold: Temper	e Receipt	No No 🖄 N/ Io 🔽 N/A 🏠	/A オ	1		/OXY 🗌 TPH gas	d d ext		30B 🗌 TO-15	8260B T0-15	SAM A SAM B	60B 🗌 TO-15	60B 🗌 TO-15	60B 🗌 TO-15	60B T0-15	8260B	1,1 DFA OTHER		02 0N2	
M-24-15: MINAMALS	AMPLE IN TEDLAR	BAG.					ers	List	D BTEX	0 		ist 🛛 82(List/DTSC	8260B	82	82	82	82		Dompound		□ CO2	
b Work Order #		-	t				# of containe	8260B Full 1	8260B	8015M TPH	418.1 TRPH	VOC's: Full L	VOC's: Short	VOC'S: SAM,	Naphthalene	Oxygenates	TPHv gas	Ketones	Other	Leak Check (Methane	Fixed Gases	
Sample Name	Field Point Name	Purge Vol	Time	Date	Sample Type	Container Type	Total		SOIL	/GW				S	OIL V	APOI	R/AIR	ANA	LYSI	S			
M-23-15			0914	2/20	VAPER	TERLAN	1														×		
M-24-18			(000	1	1		1														X		
M-18-15			1037			1	(\times		L
4-18-25			1049				1														X		L
M-19-20			1104				1														\times		L
M- 19-40			1107				(X		L
			1132				1														X		L
M-22-15			noi				1														X		
M-20-15			1205	11			1														X	_	
M-20-15 M-20-25				1 1/		V	11								(compa			Data			N		

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ient: <u>MACTE</u> Idress: <u>5628</u> <u>LACA</u> nail: CAWEILU BA	C E. Slauson 90040 Vortec.com	AVC			Co Cli Loc	Ilector: ent Project # cation: one: 323	West -Gr	KD. Iside 9-1	3 Ex 10 9	En.	Sin Fax				F	Project	Conta Turn a	ct:	fime:	Page:	2 ietr	of
eotracker EDF: Yes 🗆 N lobal ID: kcel EDD: Yes 🗆 N			Sample Intact: [Seal Inte Cold: [Temper	e Receipt Yes Yes Yes Yes Nes Nes	No No N/ o N/A	/A	1		XY 🗆 TPH gas	🗆 d 🗆 ext		JB 🗌 TO-15	32608 70-15	SAM A SAM B	3B 🗌 TO-15	DB []TO-15	DB []TO-15	DB []TO-15	3260B □T0-15	1,1 DFA CTHER		□02 □N2
pecial Instructions:							S	st	BTEX/	g		st 🗌 826(ist/DTSC []	260B	826	826	826	826		D punoduc		□ co2 [
ab Work Order #							# of container	8260B Full Li	8260B	8015M TPH	418.1 TRPH	VOC's: Full Lis	VOC's: Short Li	VOC'S: SAM, 8	Naphthalene	Oxygenates	TPHv gas	Ketones	Other	Leak Check Co	Methane	Fixed Gases
Sample Name	Field Point Name	Purge Vol	Time	Date	Sample Type	Container Type	Total		SOIL	/GW	-	-	-	S	OIL V	APO	R/AIR	ANA	LYSI	S		
M-20-90			1213	eno	VAPON	TROLM	-1														X	
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Lindoy: (gignature)	th.	MA	(company)	2	Received by:	(Signature)	6	Se		_				14	compar	(Vr 2		Date:	20	fzer	Tin	ne: 12

helac

November 05, 2009

Curt Welty MACTEC 5628 E. Slauson Ave. Los Angeles, CA 90040-2922

Subject: Calscience Work Order No.: Client Reference:

09-11-0214 Metro Westside Ext.

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 11/4/2009 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,

Ranjit F. J. Clarke

Calscience Environmental Laboratories, Inc. Ranjit Clarke Project Manager

 CA-ELAP ID: 1230
 NELAP ID: 03220CA
 CSDLAC ID: 10109
 SCAQMD ID: 93LA0830

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



Analytical Report



MACTEC	Date Received:
5628 E. Slauson Ave.	Work Order No:
Los Angeles, CA 90040-2922	Preparation:
	Method:

Page 1 of 1

11/04/09 09-11-0214

> N/A EPA 16

Project: Metro Westside Ext.

Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
M7-25		09-11-0214-1-A	11/04/09 10:36	Air	GC 54	N/A	11/04/09 00:00	091104L01
Parameter	Result	RL	DF	Qual	<u>Units</u>			
Hydrogen Sulfide	1.5	1.0	1		ppm (v/v	/)		
M13-65		09-11-0214-2-A	11/04/09 12:10	Air	GC 54	N/A	11/04/09 00:00	091104L01
Parameter	Result	RL	DF	Qual	Units			
Hydrogen Sulfide	1000	250	250		ppm (v/v	/)		
Method Blank		099-12-166-330	N/A	Air	GC 54	N/A	11/04/09 00:00	091104L01
Parameter	Result	RL	DE	Qual	<u>Units</u>			
Hydrogen Sulfide	ND	1.0	1		ppm (v/v	/)		

M



12 November 2009

Mr. Curt Welty MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922 RE: MAC110409-11

Enclosed are the results of analyses for samples received by the laboratory on 04-Nov-09. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Janis Villarreal Laboratory Director

H&P Mobile Geochemistry operates under CA Environmental Lab Accreditation Program Numbers 1317, 1561, 1667, 1745, 1746, 2088, 2278, 2543, 2579 and 2595. National Environmental Laboratory Accreditation Conference (NELAC) Standards Lab #11845



2470 Impala Drive, Carlsbad, California 92010 Γ 760.804.9678 — Fax 760.804.9159 1855 Coronado Avenue, Signal Hill, California 90755 www.HandPmg.com Γ 1-800-834-9888



MACTEC Engineering & Consulting	Project:	MAC110409-11	
5628 East Slauson Avenue	Project Number:	Metro Westside Ext. / Wilshire Blvd.	Reported:
Los Angeles, CA 90040-2922	Project Manager:	Mr. Curt Welty	12-Nov-09 14:21

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
M7-25	E911016-01	Vapor	04-Nov-09	04-Nov-09
M13-65	E911016-02	Vapor	04-Nov-09	04-Nov-09



MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922		Pro Project Nun Project Mana	nject: Ma nber: Me ager: Mi	AC110409-11 etro Westside Curt Welty	l Ext. / Wils	hire Blvd.		Reported: 12-Nov-09 14:21	
	<u> </u>	Soil Gas ar	nd Vap	or Analy	ysis				
		H&P Mol	oile Ge	ochemist	ry				
Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
M7-25 (E911016-01) Vapor Sampled:	04-Nov-09 Received: 0	4-Nov-09							
Methane	930000	1200	ppmv	125	EK90608	05-Nov-09	05-Nov-09	EPA 8015M	
M13-65 (E911016-02) Vapor Sampled	: 04-Nov-09 Received:	04-Nov-09							А
Methane	1000000	1200	ppmv	125	EK90608	05-Nov-09	05-Nov-09	EPA 8015M	



MACTEC Engineering & Consulting 5628 East Slauson Avenue Los Angeles, CA 90040-2922		Pr Project Nu Project Mai	roject: MA mber: Me nager: Mr	AC110409-1 etro Westside Curt Welty	1 e Ext. / Wils	hire Blvd.		Repo 12-N	orted: Jov-09 14:2	1
	Soil Gas	and Vapo H&P Mo	r Analy bile Ge	ysis - Qua cochemist	ality Cor ry	itrol				
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK90608 - GC										
Blank (EK90608-BLK1)				Prepared &	k Analyzed:	05-Nov-09)			

Methane

ND 10 ppmv



MACTEC Engineering & Consulting	Project:	MAC110409-11	
5628 East Slauson Avenue	Project Number:	Metro Westside Ext. / Wilshire Blvd.	Reported:
Los Angeles, CA 90040-2922	Project Manager:	Mr. Curt Welty	12-Nov-09 14:21

Notes and Definitions

- A The determined value was 1100000 ppmv but the value was changed to 1000000 ppmv since it is assumed to be pure methane.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

MACTEC ENGINEERING & CONSULTING INC. PROJECT METRO WESTSIDE EXTENSION WILSHIRE BOULEVARD LOS ANGELES, CA

H&P Project #MAC110409 TECH LANDTEC

METHANE, CARBON DIOXIDE, OXYGEN, PROBE PRESSURE & BAROMETERIC PRESSURE ANALYSES OF SOIL VAPOR

Sample ID	DATE	TIME	DEPTH	METHANE	CO2	OXYGEN	PROBE PRESSURE	BAROMETRIC PRESSURE
			(feet)	(%)	(%)	(%)	" of Water	" of Hg
M-6-15'	11/04/09	10:04	15'	1.2	1.4	4.0	0.0	29.75
M-6-25'	11/04/09	9:58	25'	0.3	0.2	17.5	0.0	29.75
M-6-65'	11/04/09	10:00	65'	0.4	0.3	18.4	0.1	29.75
M-6-80'	11/04/09	10:02	80'	0.4	0.3	18.6	0.1	29.75
M-6-80' W	11/04/09	10:12	80'	14.1	4.5	15.0	1.4	29.75
M-7-25'	11/04/09	10:42	25'				>100.0	29.75
M-7-15'	11/04/09	10:44	15'				1.0	29.75
M-8-15'	11/04/09	11:00	15'				3.9	29.75
M-8-25'	11/04/09	11:02	25'				32.0	29.75
M-8-65'	11/04/09	11:04	65'				0.0	29.75
M-8-95'	11/04/09	11:06	95'				0.0	29.75
M-12-15'	11/04/09	11:36	15'				0.0	29.75
M-12-30'	11/04/09	11:38	30'				0.0	29.75
M-2-65'	11/04/09	11:40	65'				>5.0	29.75
M-12-100'	11/04/09	11:42	100'				>5.0	29.75
M-13-65'	11/04/09	12:01	65'	*	8.0	5.0	16.0	29.79
MDL				0.1	0.1	0.1		

* - OVER LANDTEC METER LIMITS

METHANE, CARBON DIOXIDE, OXYGEN, PROBE PRESSURE, AND BAROMETERIC PRESSURE MEASURED BY LANDTEC MODEL GEM 2000

ANALYSES PERFORMED BY: MR. KURT SCHINDLER

DATA REVIEWED BY: MS. JANIS VILLARREAL

MACTEC ENGINEERING & CONSULTING INC. PROJECT METRO WESTSIDE EXTENSION WILSHIRE BOULEVARD LOS ANGELES, CA

H&P Project #MAC110409 TECH H2S

H2S ANALYSES OF SOIL VAPOR

Sample ID	DATE	TIME	DEPTH	H2S
			(feet)	(ppmv)
14.0.05	11/01/00	10.05	0.51	
M-6-25	11/04/09	10:05	25	ND
M-13-65'	11/04/09	12:05	65'	*
MDL				0.1
* - OVER JEROME MET	ER LIMITS			

H2S MEASURED BY JEROME MODEL 631-X ANALYSES PERFORMED BY: MR. KURT SCHINDLER DATA REVIEWED BY: MS. JANIS VILLARREAL



Hi Peoche Inc	bile emistry24	70 Impala 355 Corona	Dr., Carls do Ave., S	Cha sbad, CA Signal Hil	in of 92010 • p I, CA 907	Custo ph 760.804.9 55 • ph 800.	dy 9678 .834.	Re 3 • fax .9888	COI 760.8	r d 804.9	159				l H	Date: . H&P Pr Dutside	roject # Lab:	111 1 1	41 1A	09	350	9-1	1
ent: <u>MAC7</u> dress: <u>5628</u>	E. Slauson A	ve.	onshain	og time o	nibion i co	ollector:	м	ETR	0 W	S EST	51D	E	ĒΧ	т. Г.	to a	Project	t Conto	ict:	 20.00	Page:	1 12/5	of	
L.A. ,	CA 90010			ion sh	Lo	ocation:	Wil	shir	c B	100	. 1 4	A.	9193	H (1	nen	and	ono	dite	i su t	-		et urei	n ed
ail: \$ # 15%	. COW				PI	hone: 323	- 8	89-	230	0	_ Fax						Turn (around	time:	2	y the	5-	co H
otracker EDF: Yes IN	lo 🗆		Sample Intact: Seal Inte Cold: Temper		NO NO X N/A 20° C	N/A			(Y 🗌 TPH gas	🗆 d 🔲 ext		3 🗌 TO-15	60B TO-15	M A SAM B	3 10-15	5- 🗌 TO-15	3 TO-15	TO-15	60B T0-15	I DFA C OTHER		02 🗌 N2	0.59
cial Instructions: SENP DATA®	SUZIKRES	ed - SR	NELT LEED(YQ MA Q HAN	CTEC.	com . Com	ars	ist				st 🗌 8260E	ist/DTSC 32	3260B	□ 8260E	□ 826ÒE	□ 8260E	□ 8260E	82	, L 🗌 punoduc		CO2	
Work Order # Eq 11	2 H+P, INC. 016	CARLSB UPS+	AD	# 12 -78	16:374 3130	-20397-	II # of containe	8260B Full L	8260B	8015M TPH	418.1 TRPH	VOC'S: Full Li	VOC's: Short L	VOC'S: SAM, 8	Naphthalene	Oxygenates	TPHv gas	Ketones	Other	Leak Check Co	Methane	Fixed Gases	
Sample Name	Field Point Name	Purge Vol	Time	Date	Sample Type	Container Type	Tota		SOIL	/GW				S	OIL \	/APO	R/AIR	ANA	LYSI	S			
M7-25			1036	WA/4	VAPOR	TEDLAN	1														\times		
M13-65			1210	Ŷ	J																\times		
quished by: (Signature)			(company)		Received by:	: (Signature)		10							compar	1y)		Date:			Tim	ne:	
uished by: (Signature)			(company)		Received by:	(Signature)	2		W	_				(H. compar	4 p 1))		U Date:	14[09	Tim	124 10:	15
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AMERICAN SCIENTIFIC LABORATORIES, LLC Environmental Testing Services 2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

Ordered By

Mactec 1	actec Engineerig & Cosulting			
2171 Car	mpus Dr.	Suite #	100	
Irvine,	CA 9261	2-1422		

Telephone (949)224-0050 Attn Jay Neuhaus

Number of Pages	2
Date Received	09/22/2010
Date Reported	09/23/2010

Job Number	Ordered	Client
47126	09/22/2010	MACIRV

Project ID: 4953090473 Project Name: Site: Wilshire Blvd. / Fairfax Ave. L.A., CA

Enclosed are the results of analyses on 3 samples analyzed as specified on attached chain of custody.

Amolk MOLKY Brar Laboratory Manager

Rojert G. Araghi Laboratory Director

American Scientific Laboratories, LLC (ASL) accepts sample materials from clients for analysis with the assumption that all of the information provided to ASL verbally or in writing by our clients (and/or their agents), regarding samples being submitted to ASL, is complete and accurate. ASL accepts all samples subject to the following conditions:
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 ASL is not responsible for any consequences resulting from any inaccuracies, omissions, or misrepresentations contained in client-provided information regarding samples submitted to the laboratory.