

# Additional Soil and Ground Water Quality Evaluation

Grand Marina Village Alameda, California

This report has been prepared for:

## **Encinal Marina, LTD**

P.O. Box 2453, Alameda, California 94501-0251

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ILVE OPP

Oakland

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#### ADDITIONAL SOIL AND GROUND WATER QUALITY EVALUATION GRAND MARINA VILLAGE ALAMEDA, CALIFORNIA

#### INTRODUCTION

#### 1.1 Purpose

In this report, we present the results of additional soil and ground water quality evaluation performed at the Grand Marina Village site located at 2033, 2039, 2041. 2043, 2045, 2047, and 2051 Grand Street in Alameda, California, as shown on Figures 1 and 2. This work was performed for Encinal Marina, LTD. Previous site sampling was performed for Ponderosa Homes and the results were presented in our report dated December 8, 2004. We understand that Ponderosa Homes is considering the purchase and redevelopment of the site. The planned development includes singlefamily homes.

#### 1.2 Site Background

Based on our previous Phase I report (Lowney Associates, 2004), the site was developed by 1839 as a fishing vessel fleet harbor by Alaska Packer Association (approximately 1839 to 1940). Subsequent uses at the site have included a lumberyard (Taylor and Company; approximately 1906 to 1917); auto repair, carpentry, blacksmith, and animal shelter facilities (City of Alameda Corporation Yard; approximately 1917 to 1983); aboveground storage tank (AST) farm and related facilities for the storage of gasoline, diesel fuel, fuel oil, kerosene, aviation fuel, and other petroleum compounds (Union Oil Company; approximately 1930 to 1952); and a ship repair vard (Marine Ship Repair Lessees; at least 1948). Continued use of the site as an AST farm and bunker fuel depot continued through approximately 1992 by Bay City Fuel Oil Company (approximately 1953 to 1959), HTB (approximately 1926 to 1979), and Encinal Fuel Depot (approximately 1987 to 1992). The site was also used for the storage of marine construction equipment by Healey-Tibbets Construction Company (approximately 1980 to 1986). The site was purchased by Grand Marina in 1986. Current activities at the site include the use of western portions of the site as parking areas associated with the Grand Marina, dry storage of outriggers and boats, office areas, boat building and repair, car restoration, production of marine canvas products, and locksmith activities.

Additionally, a 550-gallon gasoline underground storage tank (UST) was reportedly installed at 2041 Grand Street in April 1949; no records were found reporting the removal of the UST. A 1,000-gallon gasoline UST was reportedly installed at 2041 Grand Street (near the southeast corner of Building B) in November 1963 and removed in May 1988. A 10,000-gallon bilge water tank was reported at 2047 Grand Street from at least June 1996 until its removal in October 2000.

Currently, a 250-gallon waste oil AST on a raised platform is located on-site, southwest of Area E. A 12,000-gallon diesel UST and 12,000-gallon gasoline UST installed in April 1989 and currently in use by the Grand Marina fuel dock are located

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at an asphalt-paved driveway near the northern property boundary; based on observed site plans, the UST location appears partially located on-site.

Previous site investigation activities by others were conducted to investigate releases from the former 1,000-gallon gasoline UST and former AST farm. Cleanup activities at the site included removal of ASTs and USTs and over-excavation at the area of the former AST farm: no documentation was found reporting over-excavation activities at the former 1,000-gallon UST location. A Remedial Action Completion report for remediation activities at the former AST farm recommending no further action was issued June 25, 1998. A Remedial Action Completion letter reporting completion of site investigation and remedial action activities at the former 1,000 gallon UST release was issued March 16, 1999. This letter and an April 3, 1988 Case Closure Summary report documented concentrations in soil of up to 340 parts per million (ppm) total petroleum hydrocarbons in the gasoline range (TPHg), 4,700 ppm total petroleum hydrocarbons in the diesel range (TPHd), 0.15 ppm benzene, 0.87 ppm toluene, 1.0 ppm ethylbenzene, 5.8 ppm xylenes, and 12,000 ppm oil & grease. In ground water, reported concentrations were up to 110 parts per billion (ppb) TPHq, 300 ppb benzene, 15 ppb toluene, 7.6 ppb ethylbenzene, and 31 ppb xylenes in ground water. The closure summary recommended review of the closure action if future site-use changes were planned.

#### Scope of Work

The scope of work for this study included the following tasks.

- Drilling and logging of six exploratory borings.
- Collecting soil and ground water samples for laboratory analysis.
- Geophysical survey for undocumented UST.

#### SOIL AND GROUND WATER QUALITY EVALUATION

#### 2.1 Subsurface Investigation

On December 17, 2004, under the supervision of Principal Geologist Thomas McCloskey, R.G., C.HG., Staff Environmental Engineer Veronica Tiglao directed a subsurface exploration program and logged six borings (GWS-7 through GWS-12) to approximate depths of 8 to 16 feet at the locations shown on Figure 2. Boring GWS-1 through GWS-6 were completed during the previous Lowney Associates investigation. The exploratory borings were positioned to determine if elevated concentrations were present near the estuary and to evaluate the lateral extent of impacted areas.

Exploratory borings GWS-7, GWS-8 and GWS-9 were advanced down-gradient of the existing 12,000-gallon diesel UST and 12,000-gallon gasoline UST (assuming ground water flow is north/northwest toward the Alameda/Oakland Estuary) and boring GWS-1, which had elevated concentrations of petroleum hydrocarbons identified during the previous Lowney Associates Investigation. Exploratory boring GWS-10 was advanced up-gradient of boring GWS-1. Exploratory boring GWS-11 was advanced adjacent to the existing USTs. Exploratory boring GWS-12 was advanced down-



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gradient of the former 1.000-gallon UST location and boring GWS-6. Soil samples were obtained continuously from the borings for logging purposes. Ground water was encountered at approximate depths of 4 to 12 feet. Soil sampling protocol, horing logs, and permits are presented in Appendix A. Subsurface conditions encountered are presented on the boring logs.

#### Soil Sample Collection and Analyses

Soil samples with potentially elevated concentrations of contaminants were collected based on field observations and organic vapor meter readings. Three samples were selected and submitted to a California certified laboratory for analysis.

The soil samples were analyzed for TPHq, TPHd, and motor oil range (TPHmo) (EPA Test Method 8015M) and benzene, toluene, ethylbenzene, and xylenes (BTEX) (EPA Test Method 8021B/8260B). The sampling depths and the laboratory testing results are presented in Table 1, and the results are presented on Figure 2. Copies of the analytical reports and chain of custody documentation are presented in Appendix B.

Table 1. Laboratory Results of Selected Soil Samples (concentrations in parts per million)

Boring Number	Depth (feet)	ТРНд	TPHd	ŢPHmo	Benzene	Toluene	Ethyl- benzene	Xylenes
GWS-8	71/2-8	<1.0	170	680	< 0.005	< 0.005	<0.005	<0.005
GWS-11	71/2-8	<1.0	<1.0	<50	< 0.005	< 0.005	<0.005	<0.005
GWS-12	31/2-4	<5.0	28	<50	<0.025	<0.025	<0.025	<0.025
Residential E	SL*	100	100	500	0.044	2.9	3,3	1.5

- Residential ESL Indicates that the compound was not detected at or above the stated laboratory'
- Environmental Screening Level San Francisco Bay California Regional Water Quality Control Board. July 2003 for direct exposure to the compound in a residential setting.

The Environmental Screening Levels (ESLs) presented in Table 1 are published by the San Francisco Bay California Regional Water Quality Control Board (CRWOCB) (CRWOCB, 2003) to address environmental protection goals as presented in the Water Quality Control Plan for the San Francisco Bay Basin (CRWQCB, 1995). ESLs were developed to protect human and ecological health and to be protective of beneficial uses of ground water taking into account site-specific conditions. The presence of a chemical at a concentration above an ESL does not necessarily indicate that adverse impacts to human health or the environment are occurring; exceeding ESLs indicates that the potential for impacts may exist and that additional evaluation may be needed. The ESL limits in Table 1 are for protection of human health where there is direct exposure to the compound. In addition, the California Department of Toxic Substances (DTSC) control does not recognize ESLs.

#### **Ground Water Sample Collection and Analyses**

To evaluate ground water quality at the site, ground water grab samples were collected from each boring. A discussion of ground water sampling protocol is

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included in Appendix A. The ground water samples were analyzed for TPHg and TPHd (EPA Test Method 8015M) and BTEX compounds (EPA Test Method 8021B/8260B). These analyses were selected to help evaluate on-site ground water quality. Laboratory testing results for the ground water samples collected from exploratory borings GWS-7 through GWS-12 showed concentrations below the detection limits, with exception of TPHg (1,000 ppb) and TPHd (500 ppb) in GWS-12. The results of all recent ground water sampling for the exploratory borings are presented on Figure 3.

#### 2.4 Silica Gel Cleanup

The soil and ground water samples were passed through a silica gel column prior to the TPHd analysis (EPA Test method 8015) to help remove non-fuel hydrocarbons. The silica gel removes oxygenated organic compounds produced by biologic degradation of organic materials. Studies have shown that the silica gel filter does not significantly remove extractable range petroleum hydrocarbons, Including diesel, because the petroleum hydrocarbons are composed of non-polar substances (Zemo, 1997). Performing the silica gel filtration prior to analysis is important where the samples are collected from organic rich environments common to the shallow ground water-bearing zones in the San Francisco Bay Area; these environments contain significant concentrations of naturally-occurring hydrocarbons that can be detected in the EPA 8015 analysis and falsely quantified by the laboratory as diesel.

#### 3.0 GEOPHYSICAL SURVEY

To evaluate if buried fuel storage tanks and other buried metal debris may be still present in the western area of the site (Drawing 2, Appendix C), a registered geophysicist used a magnetometer to map the vertical magnetic gradient on accessible areas (Drawing 3, Appendix C).

The magnetic gradient is uniform throughout a site free of ferrous metal. Metal objects, however, will produce magnetic anomalies with characteristic shapes and magnitudes if not masked by overlying or nearby metallic debris. Magnetic data were collected on stations at 10-foot intervals along traverse lines spaced 10 feet apart. The data were downloaded to a computer and contoured.

The site contained numerous strong magnetic anomalies from surface metal and buried utilities. The magnetic anomalies will mask magnetic anomalies from buried metal structures in these areas. The geophysical survey did not locate any significant magnetic anomalies indicative of a UST in the area of investigation. Detailed results of the survey are presented in Appendix C.

#### 4.0 CONCLUSIONS AND RECOMMENDATIONS

#### 4.1 General Soil Quality

Laboratory analyses of soil samples did not detect benzene or toluene above laboratory reporting limits. Other petroleum hydrocarbons were not detected above laboratory reporting limits. Therefore, the hydrocarbons detected do not pose a vapor intrusion health threat to future residential occupants of the site.





TPHd and TPHmo concentrations were detected above residential ESLs at GWS-8 (170 ppm TPHd and 680 ppm TPHmo). The residential ESLs, assuming direct exposure in a residential setting, for TPHd and TPHmo are 100 ppm and 500 ppm, respectively. The elevated concentrations were detected at least 4- to 6-feet below ground surface and, therefore, direct exposure to these soils is not likely to occur on a regular basis, if at all, given the proposed high-density proposed site redevelopment. Therefore, the detected concentrations do not pose a threat to the proposed site reuse. Contaminated soil may be excavated during utility or foundation installation and would need to be handled appropriately to avoid future direct exposure. This can be controlled with a Soil Management Plan implemented during site redevelopment. Future deep excavations by homeowners, if any, would also need to be properly controlled to minimize direct exposure.

#### 4.2 General Ground Water Quality

TPHg was detected in one of the six ground water samples collected. TPHg was detected at 1,000 ppb in boring GWS-12. TPHd was also detected in GWS-12 at 500 ppb. Elevated TPHg concentrations detected in the ground water sample collected from boring GWS-12 is likely associated with the release from the former 1,000-gallon UST located near this boring. These compounds and concentrations do not pose a threat to the proposed site reuse.

No contaminants were detected above the laboratory detection limits in GWS-7 through GWS-11. These borings are generally located in the area of boring GWS-1, which had elevated petroleum hydrocarbons identified in the previous site investigation. It appears that these contaminants do not extend to the estuary and represent an isolated release in the vicinity of GWS-1.

#### 4.3 Regulatory Agency Submittal

We recommend that a copy of this report be sent to the CRWQCB for their review,

#### 4.4 Geophysical Survey

The site contained several magnetic anomalies from surface metal and buried utilities. Such magnetic-anomalies mask magnetic-anomalies from buried metal structures. Therefore, it is possible that some ferrous objects will not produce an anomaly for several reasons; including if the object is buried too deep, is too small, is buried under something, or is near another ferrous object. As noted above, buried magnetic anomalies that did not appear to be caused by surface metal or buried utilities were not located within the geophysical investigation area.

#### 5.0 LIMITATIONS

This report was prepared for the use of Encinal Marina, LTD in evaluating soil and ground water quality at the Grand Marina Village at the time of this study. We make no warranty, expressed or implied, except that our services have been performed in accordance with environmental principles generally accepted at this time and location. The chemical and other data presented in this report can change over time and are

applicable only to the time this study was performed. We are not responsible for the data presented by others.

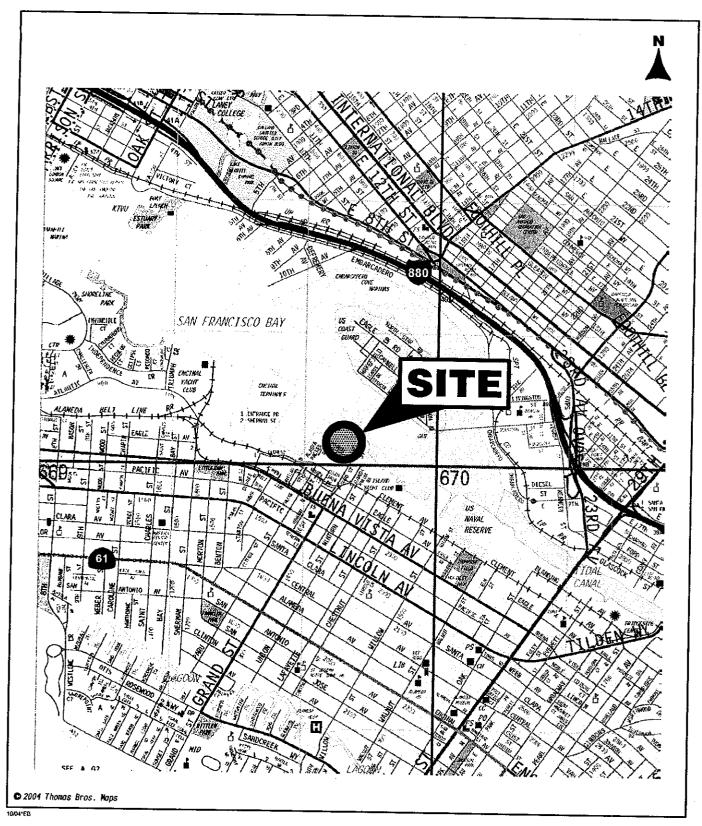
The accuracy and reliability of geo- or hydro-chemical studies are a reflection of the number and type of samples taken and extent of the analyses conducted, and are thus inherently limited and dependent upon the resources expended. Chemical analyses were performed for specific parameters during this investigation, as detailed in the scope of services. Please note that additional constituents not analyzed for during this evaluation may be present in soil and ground water at the site. Our sampling and analytical plan was designed using accepted environmental principles and our judgment for the performance of a soil and ground water quality evaluation and was based on the degree of investigation approved by you. It is possible to obtain a greater degree of certainty, if desired, by implementing a more rigorous soil and ground water sampling program or evaluating the risk posed by the contaminants detected, if any.

Magnetic methods locate ferrous objects from the anomalies they produce in the earth's magnetic field. Some ferrous objects may not produce an anomaly. Some possible reasons are that the object is buried too deep, the object is too small, the object is buried under or near another ferrous object, or an object is buried near a utility. The anomalies from metal on the ground surface can mask the anomalies from objects buried below them. It is possible buried objects were not detected due to interference from metal objects on the surface.

#### 6.0 REFERENCES

- San Francisco Bay Regional Water Quality Control Board, July 2003, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater.
- San Francisco Bay Regional Water Quality Control Board, June 1995, Water Quality Control Plan for the San Francisco Bay Basin.
- Lowney Associates, October 18, 2004, Phase I Environmental Site Assessment, Grand Marina Village, Alameda, California.
- Lowney Associates, December 8, 2004, Soil and Ground Water Evaluation, Grand Marina Village, Alameda, California.
- Zemo, D.A, 1997, Do Your Extractable TPH Concentrations Represent Dissolved Petroleum? An Update on Applied Research, Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water, 1997 Conference, NGWA/API, pp. 640-654.

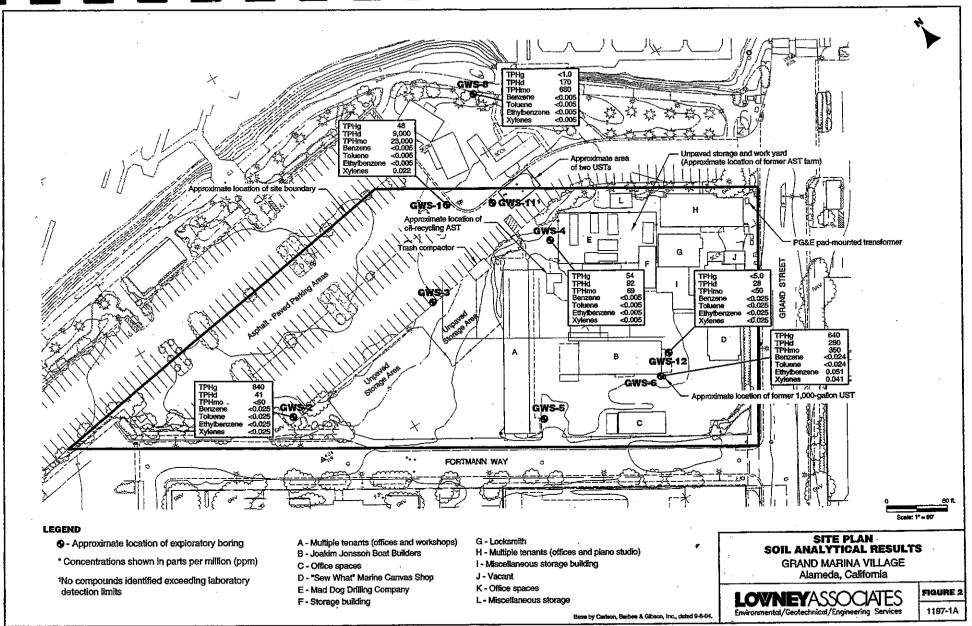


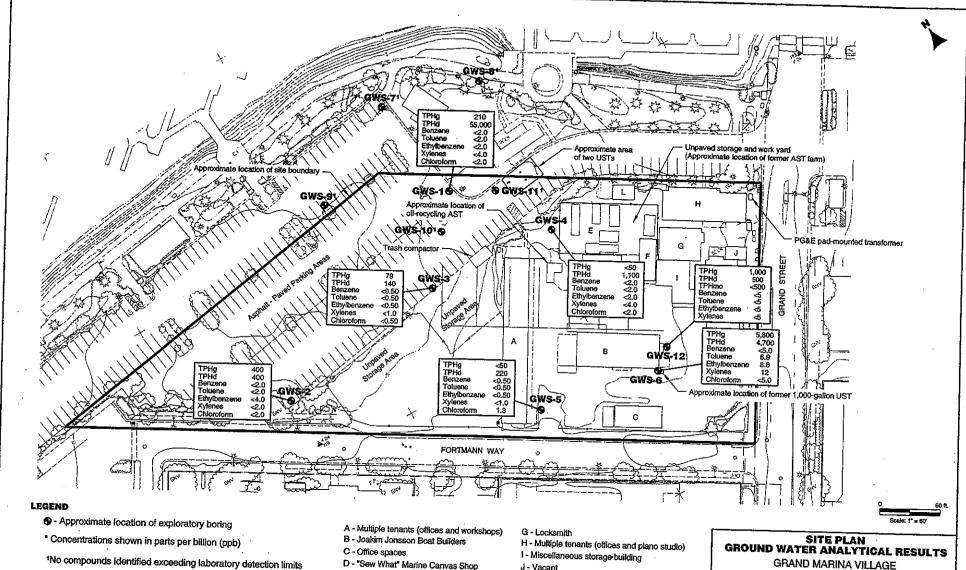


### VICINITY MAP

GRAND MARINA VILLAGE Alameda, California

# LOVNEYASSOCIATES Environmental/Geotechnical/Engineering Services





- D "Sew What" Marine Canvas Shop
- E Mad Dog Drilling Company
- F Storage building

- J Vacant
- K Office spaces
- L Miscellaneous storage

## GRAND MARINA VILLAGE

Alameda, California

Environmental/Geatechnical/Engineering Services

FIGURE 3 1197-1A

Base by Carlson, Barbee & Gibson, Inc., dated 9-8-04.

## APPENDIX A SOIL AND GROUND WATER SAMPLING PROTOCOL AND BORING LOGS

**Drilling:** The subsurface Investigation was performed on December 17, 2004, using a truck-mounted drill-rig equipped Direct Push Technology. Six soil borings (GWS-7 through GWS-12) were drilled to depths of approximately 8 to 16 feet.

Soils encountered in the borings were logged using the Unified Soil Classification System (ASTM D-2487). The logs of the borings, as well as a key to the classification of soil (Figure A-1), are included as part of this appendix. Permits obtained for the borings are also included.

**Soil Sampling:** Soil samples for laboratory analysis were collected in acetate or brass liners. The ends of the liners were covered in aluminum foil or Teflon film, fitted with plastic end caps, taped, and labeled with a unique identification number. The samples were then placed in an ice-chilled cooler, and transported to a state-certified analytical laboratory with chain of custody documentation. Soil vapors from each sample were also monitored with an OVM by first placing the soil in a Ziplock™ bag for several minutes. The OVM probe was then used to pierce the bag and record the organic vapor levels present.

**Ground Water Sampling:** Borings GWS-7 through GWS-12 were converted into "temporary" wells with the installation of 1-inch I.D. flush-threaded, Schedule 40 PVC casing. The casing in the lower portion of the well had 0.02-inch factory machined slots. Ground water grab samples were collected from the temporary wells with a bailer. Samples were collected in appropriate sampled bottles, labeled, and immediately placed into an ice-chilled chest for delivery to a state-certified analytical laboratory for analysis.

**Equipment Decontamination:** All drilling and sampling equipment was cleaned in a solution of laboratory grade detergent and distilled water or steam cleaned before use at each sampling point.

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LOWNEYASSOCIATES Environmental/Geotechnical/Engineering Services Appendix A 1197-1A LOVNEYASSOCIATES Environmental/Geotechnical/Engineering Services

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<b>LOWNEY</b> ASSOCIATES	
Environmental/Geotechnical/Engineering Services	

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ξ.	EPTH (FT)	8	actual conditions encountered. Transitions between soil types may be o	patal.	SOILTYPE	25.8 EXE	문	慧	SE F	₽Ê	Δ7	orvane			
ELEVATION (FT)	<u> </u>	SOIL LEGEND	MATERIAL DESCRIPTION AND REMAI	RKS	SOL	PENETRATION RESISTANCE (BLOWS/FT.)	3	32	5	e-Œ	<b>•</b> u	noonlin	ed Com	pressio	n
		<b>"</b>							ľ		ا ▲ ا	-U Trian	dail Corr	pressio	tı
	0-		SURFACE ELEVATION: \2 inches asphalt and aggregate base					_	<u> </u>		. 1	0 2	o a	9 4	.0
		₩	SANDY CLAYEY GRAVEL (GC) [FILL]		GC, FILL		П				1			1.	
	-	₩	very stiff, dry, orange	-	اللام وحد		П								
1		₩	CLAYEY SILT (ML) [FILL]	G			П		ĺ	Ì					
		₩	very stiff, slightly moist, olive green, with trace sand	nne	ML, FILL		П	· '							
	4	₩		-			П		ĺ	0.1					
1			SANDY LEAN CLAY (CL) [FILL]			ŀ	П								
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	5-	₩	SANDY CLAYEY GRAVEL (GC) [FILL] medium dense, slightly moist, orange	_			П				ļ		4	i.	H
1	,	₩			GC, FILL		П		Į						
4	4	$\infty$	SAND (SP)			Ì	П								
1			medium dense, very moist, fine to medium sar	кď _	se		П		ĺ		}	1			}
	-				~		П								[
4	-	,,,,	CLAY (CL)			ŀ	П	ľ							}
			stiff, very moist, olive green, with some mediur	n	α.	ľ	П		ĺ				1		
Ī	1		Subangular gravel CLAYEY SAND (SC)			1	П				} }		:		
}	10-		dense, very moist, olive green	-	sc		П				ļ.	H			H
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1		m	CLAY (CH)			İ	H	ľ							
			stiff, moist, olive green		СН		Ц			1				1	
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GR	OUN	) WA	TER OBSERVATIONS:												



(			EXPLORATORY	BORI	NG:	G	V	S-:	10			Shee	t 1 :	of 1	
DRILL	RIG	: VI	RONEX	PROJEC											
BORIN	ŧG T	YPE:	DIRECT PUSH	PROJEC	T: GR/	ND M	AR	INA							
LOGG	ED E	3Y: '	/MT	LOCATIO	N: AL	AMED.	Α, (	CA							
STAR	T DA	TE:	12-1-04 FINISH DATE: 12-1-04	COMPLE	ם אסוד	EPTH:	1	2.01	FT.						
ELEVATION (FT)	HL (T-)	SOILLEGEND	This top is a part of a report by Lowery Associates, and should not be identified and account. This description applies only by the location of the six between the three of disting, Substantian conditions they differ at other bookers change at the location with time. The description reported is a series continue of the location with time. The description reported is a series of the location and continues are consistent. Translations between end types may be MATERIAL DESCRIPTION AND REMA.  SURFACE ELEVATION:		SOLTME	PENETRATION RESISTANCE (BLOWS/FT.)	SAMPLER	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	(week)	O #	Pociost I Forvans Proonfi LLI Tris	ed Con	meter nçressik nçressik	m m
=	0-	XXX	2 Inches senhalt and accreasts have		┾──		Н		<del> </del>		;	: 0   	<u> </u>	1.0 4	ا
-	-		SANDY CLAYEY GRAVEL (GC) [FILL] dense, dry, orange, with medium sand, fine to grave! CLAYEY SILT (ML) [FILL]	medium	GC, FILL										
-	_	▓	very stiff, slightly moist, oilve green, with trace sand, SANDY CLAY (CL) [FILL]	fine	ML, FILL		ll								
-	_	▩	medium stiff, moist, olive green, with fine sand SANDY CLAYEY GRAVEL (GC) [FILL]		CL, FILL		H								
	5-	▓	medium dense, moist, orange	•										_	
4	7			-	GC, FILL										
]	_		CLAYEY SAND (SC) medium dense, very moist, olive green, fine sa	ınd	sc										
	10		CLAY (CH) soft, very moist, gray medium stiff, moist	-	ᅄ										
-			2 inch layer fine to medium sand, medium den moist, gray CLAY (CH) soft, very moist, gray	se, very	CH										
	15-		Bottom of Boring at 12 feet	-						-				***************************************	
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	SURFACE ELEVATION:  2 inches asphalt and aggregate base SANDY CLAYEY GRAVEL (GC) [FILL] dense, dry, dark brown, with medium sand and fine to medium angular gravel  CLAYEY SILT (ML) [FILL] Very stiff, slightly moist, olive green SANDY CLAYEY GRAVEL (GC) [FILL] medium dense, moist, orange SILTY CLAY (CL) stiff, moist, olive green, with trace fine sand trace shells CLAYEY SAND (SC) dense, moist, olive green medium dense, light brown CLAY (CH) stiff, moist, gray soft, very moist stiff, moist, olive with black mottles  CH  10-  gray, soft, moist  visible wood/organics  Bottom of Boring at 12 feet				_										
		١_	stand-where document. This description expiles only to the incestion of a 48 fee time of drilling. Substrates conditions may differ at other local	te uses as a he exploration transmit may		l	H					noran	(icpl)	- 504	9
₫_	#_	<del>Š</del>	change at this location with time. The description presented is a star actual conditions encountered. Transitions between soil types may	pellication of se gredual.	₩	ESE.	l <sub>6</sub>	ᄣᄚ	E .		OP	ocket i	Penatro	meter.	
ELEVATION (FT)	2E	Ä	·		1 5	F 2 5	덻	홠	195	₽.€	Δτ	or the	•		
<u></u>	-	8	MATERIAL DESCRIPTION AND REM	ARKS	SS.	찙찞	3	<b>≅</b> ह	瓷	~	<b>●</b> u	Incomili	ned Co	press	on
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	Ι.	-888	SANDY CLAYEY GRAVEL (GC) [FILL]	nd fine to			Н								l
	į	<b>***</b>		ING ISING LO	GC, FILL	1	П								l
•	ሳ .	₩	CLAYEY SILT (ML) IFILLI		AC EN	1	11								١
-	1	<b>***</b>	very stiff, slightly moist, olive green	/		1	П								١
-	] '		SANUY CLAYEY GRAVEL (GC) [FILL]	-/		1	П			ĺ				П	
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7	<b>Σ:F</b> Ε	REE G	ROUND WATER MEASURED DURING DRILLING	AT 6.0 FEET											

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GWS-10 1197-1A

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Ĺ			EXPLORATORY	BORI	NG:	G۱	W	<b>S-</b> :	12			Shee	xt 1	of 1	
DRILL	RIG	: VII	RONEX	PROJECT	FNO:	1197-	1A								
BORIN	IG T	YPE:	DIRECT PUSH	PROJECT	r: GR/	AND M	<b>I</b> AR	INA							
LOGG	ED E	Y: '	<b>л</b> мт	LOCATIO	N: AL	AMED	Α, (	CA							
STAR	T DA	TE:	12-1-04 FINISH DATE: 12-1-04	COMPLET	TION D	EPTH	: 8.	0 F	T.						1
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ELEVATION (FT)	ÆE	30   LEGEND	women on service entrantement transfer and photograph and photogra	дини.	SOIL TYPE	PENETRATION RESISTANCE (BLOWS/FT.)	SAMPLER	E.S.	38	Old (mold)	Δ1	Torvane	,		
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	0-	XX	CLAYEY SANDY GRAVEL (GC) [FILL]			-				<u> </u>		1.0 :	2.0 :	1.0 4	1.0
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	4	$\mathscr{U}$	sand	coarse		ļ ,	H				1	1			
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]			CLAY (CH)				H				į				
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			ROUND WATER MEASURED DURING DRILLING A	T 4.0 FEET											- 1

 $(x_1, x_2, \dots, x_n) = (x_1, x_2, \dots, x_n) + (x_1, x_1, \dots, x_n) + (x_1, x$ 

#### APPENDIX B ANALYTICAL RESULTS

The chilled samples were delivered to a state-certified analytical laboratory. Chain of custody documentation was maintained for all samples. Attached are copies of the analytical results and the chain of custody forms.

LOWNEYASSOCIATES

Appendix B 1197-1A



Lowney & Associates Oakland

December 30, 2004

167 Filbert Street Oakland, CA 94607

Attn.: Tom McCloskey

Project#: C14363 (1197-1A)

Project: Grand Marina

Attached is our report for your samples received on 12/20/2004 16:50

This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety.

Please note that any unused portion of the samples will be discarded after 02/03/2005 unless you have requested otherwise.

We appreciate the opportunity to be of service to you. If you have any questions. please call me at (925) 484-1919.

You can also contact me via email. My email-address is: asalimpour@stl-inc.com

Sincerely,

Afsaneh Salimpour Project Manager

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1096 \* www.stl-inc.com \* CA DHS ELAP# 2496

Atanh. Salinpoe

Page 1 of 1



Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

#### Samples Reported

Sample Name	Date Saprofed			lab#_i	
GWS-11 @ 7 1/2-8	12/17/2004 ^	ŀ	Soil	8	ı

12/29/2004 16:40



#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina Received: 12/20/2004 16:50

Prep(s):	3550/8015M	
Sample ID:	GWS-11-@7	1/2-8

Test(s): 8015M

Lab ID: 2009-12-07-10-8

Extracted: 12/27/2004 16:26 QC Batch#: 2904/12/27-02:10

Compound	Conc.	RL	Unit	Dilution	Analyzed	·Flag
Diesel	ND	1.0	mg/Kg	1.00	12/28/2004 17:38	
Motor Oil	ND	50	mg/Kg	1.00	12/28/2004 17:38	
· Surrogate(s)		1	' '			
o-Terphenyl	48.7	60-130	%	1.00	12/28/2004 17:38	\$6



Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina Received: 12/20/2004 16:50

· ·		Satch QC Report		
Prep(s):	3550/8D#5M		•	Tesksy:8006M
Method	Blank	Soil		GC Batch # 2004/12/27-02:10
MB: 200	4/12/27-02:10-001		•	Date Extracted: 12/2/12/04 16:26

				A STATE OF THE STA	many of additional
Compound	Conc.	RL	Unit	Analyzed	Flag
Diesel Motor Oil	· ND	1 50	mg/Kg mg/Kg	12/28/2004 10:57 12/28/2004 10:57	
Surrogates(s) o-Terphenyl	79.8	60-130	%	12/28/2004 10:57	

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94666 Tel 925 484 1919 Fax 925 484 1096 \* www.stHnc.com \* CA DHS ELAP# 2496 12/29/2004 16:40

Page 2 of 5

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1086 \* www.stl-Inc.com \* CA DHS ELAP# 2496 12/29/2004 16:40

Page 3 of 5

A part of Severn Trent Plo

A part of Severn Treal Plo



#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Received: 12/20/2004 16:50

Grand Marina

Prep(s): 3550/801	<b>30</b>		iateh die Ri	port.			ing a selection of the		estins)	
Laboratory Contr	redución de la		Soil			(a)	S Batel		el de	S ÉZ
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	/27-02.10-002 /27-02.10-003		Extracted: Extracted:		37.		Analyzi Analyzi		From States	
LCSD 2004/12		mg/Kg		12/27/2	37.		Anallyze	d. 12	28/200	
LCSD 2004/12	727-02:10-003	mg/Kg	Extracted:	12/27/2	004		Attalyze	d. 12	28/200	OP155 ags
	727-92,10-093 Conc.		Extracted:	12/27/2 Reco	964 wery %	RPD	Atriality ze Ctrl.Lin	d: 10 nits % RPD	28/200 Fl	r re5



Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskev

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Legend and Notes

Result Flag

S6

Surrogate recoveries lower than acceptance limits. Matrix interference suspected

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1096 \* www.stl-inc.com \* CA DHS ELAP# 2496 12/29/2004 16:40

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1096 \* www.sti-inc.com \* CA DHS ELAP# 2498 12/29/2004 16:40

17 1



#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

#### Samples Reported

Sample Name	Date Sampled	Matrix	加速
GWS-8 @ 7 1/2-8	12/17/2004	Soil	7
GWS-12 @ 3 1/2-4	12/17/2004	Soil	9



Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

	Prep(s):	3550/80/19M Fe5t(s):	8075M
ċ	Sample ID:	GWS-8:@71/2-8 Lab ID:	2004-12-0710 - 7
:	Sampled:		12/27/2004 16/86
	Matrix:	Soil OE Batch#:	2004/1/2/27=02:10:

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	170	2.0	mg/Kg	2.00	12/28/2004 18:31	
Motor Oil	. 680	100	mg/Kg	2.00	12/28/2004 18:31	Q3
Surrogate(s)					· ·	
o-Terphenyl	78.5	60-130	%	2.00	12/28/2004 18:31	

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1096 \* www.stHnc.com \* CA DHS ELAP# 2498 12/29/2004 16:24

Page 1 of 6

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 / Tel 925 484 1919 Fax 925 484 1096 \* www.sti-inc.com \* CA DHS ELAP# 2496 12/29/2004 16:24

Page 2 of 6



#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Matrix:

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

Prep(s); 3556/804<del>510</del> Test(s): Sample ID: 6WS-12-0-3 12-4 Lab ID: Sampled: 12/17/2004 Extracted: 12/27/2004 #5/26

QC Batch#: 2064772927 02 to

€015W

2004-12-0710 -9

						a Branch Contra
Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	28	1.0	mg/Kg	1.00	12/28/2004 18:04	
Motor Oil	ND	50	mg/Kg		12/28/2004 18:04	
Surrogate(s)			' '			
o-Terphenyl	74.6	60-130	%	1.00	12/28/2004 18:04	



Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland Attn.: Tom McCloskev

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Prep(s): 3550/8035M

Method Black

MB: 2004/12/27-02.10-001

Compound .	Conc.	RL	Unit	Analyzed	Flag
Diesel	· ND	1	mg/Kg	12/28/2004 10:57	
Motor Oil	ND	50	mg/Kg	12/28/2004 10:57	
Surrogates(s)			i l		
o-Terphenyl	79.8	60-130	%	12/28/2004 10:57	

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1096 \* www.stl-inc.com \* CA DHS ELAP# 2496 12/29/2004 16:24

Page 3 of 6

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#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

*-										
	uning sayah sada	الا فالكروبية	Batch:QC R	port		· .				100
Prep(s): 3550/8915	IM					* * *		ž	resi(s):	8015W
Laboratory Contro	i Spike		Soli	1.2	•	Q	S Batch	#20	04/102/27	02.40
22.	27-62.10-002 27-02.10-003		Extracted: Extracted:	2/27/2	004		Analyze	<b>B</b> 12	28/2004 28/2004	111650
Compound	Conc.	mg/Kg	Exp.Conc.	Reco	уегу %	RPD	Ctrl.Lin	uts %	Fla	gs
	LCS	LCSD		LCS	LCSD	%	Rec.	RPD	LCS	LCSD
Diesel	29.4	29.1	41.5	70.8	70.1	1.0	60-130	25		
Surrogates(s)	29.4	23.1	41.5	10.6	10.1	1.0	00-100	25		

Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

#### Legend and Notes

#### Result Flag

Q2

Quantit, of unknown hydrocarbon(s) in sample based on dieset.

O3

Quantit. of unknown hydrocarbon(s) in sample based on motor oil.

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#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

#### Samples Reported

Sample Name	Date Sampled Mains	1,36#
GWS-7	12/17/2004 1 Water	1
GWS-8 · .	12/17/2004 Water	
GWS-9	12/17/2004 Water	3
GWS-10	12/17/2004 Water	4
GW\$-11	12/17/2004 Water	5
GWS-12	12/17/2004 Water	6



Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

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Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

	Prep(s):	3510/8615M Fest(s) 8615M
	Sample ID:	ENIST Lab (D: 2604-12-670)
	Sampled:	12/17/2004 Extracted: 12/2/2/2004-05/30
:	Matrix:	Water QC Batch#: 2000/12/22/01/10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	12/22/2004 18:09	
Motor Oil	, ND	500 ·	ug/L		12/22/2004 18:09	
Surrogate(s)	•		1-3-1		1525504 10:00	
o-Terphenyl	79.1	60-130	%	1.00	12/22/2004 18:09	



#### TEPH w/ Silica Gel Clean-up

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Grand Marina

Received: 12/20/2004 16:50

Prep(s):	3510/8015M			Test(s):	8015M	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Sample ID	GWS-8			Lab ID:	2004-12-0	71 <del>0</del> -12
Sampled:	12/17/2004		e gasteter	Extracted:	12/22/2004	<b>⊭05130</b> 0
Matrix:	Water			QC Batch#:	2004/12/23	207 10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	12/22/2004 17:42	
Motor Oil	ND	500	ug/L		12/22/2004 17:42	
Surrogate(s)		,	1			l
o-Terphenyl	82.5	60-130	%	1.00	12/22/2004 17:42	



Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

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Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Prep(s):	3510/8015M Test(s):	8015M
Sample ID:	GNIS-9 trab ID:	2004-12-0710-3
Sampled:	12/17/2004 Extracted:	12722/2004 05:30
Matrix:		2004/12/22-01:10

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	12/22/2004 19:14	
Motor Oil	ND	500	ug/L	1.00	12/22/2004 19:14	
Surrogate(s)		•	-			
o-Terphenyl	82.1	60-130	%	1.00	12/22/2004 19:14	

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#### TEPH w/ Silica Gel Clean-up

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Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

_	Prep(s):	3616(801510) Test(s) 8015(4)	
	Sample ID:	<b>GMS-ID Eab-ID</b> : 200年12-0710-本	
-	Sampled:	12/1772004 Extracted: 12/22/2004-05:30	
	Matrix:	Water QC Batch#: 2604/12/22-01:10	<b>李州学习</b> 。1994年

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	12/22/2004 19:41	
Motor Oil	ND	500	ug/L	1.00	12/22/2004 19:41	
Surrogate(s)	1	1	1			
o-Terphenyl	75.8	60-130	<b>%</b>	. 1.00	12/22/2004 19:41	



Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street

Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

	Prep(s):	3510/80.1 <del>3</del> )M				Test(s):	89159	
re Z	Sample ID:	GWS-11				Lab 10:	2004-125-97	DB-48
	Sampled:	12/17/2004	100	Sugar St.	$x_{i+1} = -\epsilon f_i^{\alpha}$	Edrasted;		blestr
	Matrix:	Water	基件數		1.7	GC Batch#	2004/12/22	triato (**)

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag	]
Diesel	ND	50 .	ug/L	1.00	12/22/2004 20:08	٠.	]
Motor Oil	, ND	500	ug/L	1.00	12/22/2004 20:08	·	ŀ
Surrogate(s)		1 .		†		1	
o-Terphenyl	82.1	60-130	%	1.00	12/22/2004 20:08	<b>{</b>	



#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

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Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

_	Prep(s):	3510/8015M			Test(s):	801 <b>5</b> 1/4
٠.٠	Sample ID:	GWS-f2			Lab ID:	2004-12-0710 -6
	Sampled:	12/17/2004	tanan dari dari dari dari dari dari dari dari	8 T W	Extracted:	12/22/2004-05:30
÷	Matrix:	Water			QC Batch#;	<ul> <li>And Control State of the Control of th</li></ul>

Compound	Conc.	RL.	Unit	Dilution	Analyzed	Flag
Diesel	500	50	ug/L	1.00	12/22/2004 20:36	Q2
Motor Oil	ND	500	ug/L		12/22/2004 20:36	
Surrogate(s)		•	ľ			
o-Terphenyl	72.0	60-130	%	1.00	12/22/2004 20:36	



Submission: 2004-12-0710

#### TEPH w/ Silica Gel Clean-up

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Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

			Batch QC Rep	ort	
	Prep(s):	3510/8015M			Test(s): 8045M
٠.	Method	Blank	Water		QC Batch #-2004/12/22/06/40
	MB: 200	4/12/22-01.10-004			Date Extracted: 12/22/2004/05/30

				The Company of the Company	
Compound	Conc.	RL	Unit	Analyzed .	Flag
Diesel	· ND	50	ug/L	12/22/2004 14:29	
Motor Oil	ND	500	ug/L	12/22/2004 14:29	
Surrogates(s)					
o-Terphenyl	77.8	60-130	%	12/22/2004 14:29	



#### TEPH w/ Silica Gel Clean-up

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o-Terphenyl

Phone: (510) 267-1970 Fax: (510) 267-1972

16.2

14.8

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

· Section 1		F. N. P. Strike		de la de	. 14 j.	5 65	o contra	-50.65	<sub>e</sub> rijonagada	e Marke
Prep(s): 3510/80/15	MA		faich oir ri	port	<u> </u>				Fest(s):	80 ISM
Laboratory Contro	ol Spike		Wate			Q	C Batch	# <b>Z</b> Ű	0471212	
	22-01.10-002 22-01.10-003	66 (1) 12 1888 -	Extracted:	- प्रस्त	7		Analyze			
Compound	Conc.	ug/L	Exp.Conc.	Reco	very %	RPD	Ctrl.Lin	nits %	Fk	ags
	LCS	LCSD		LCS	LCSD	%	Rec.	RPD	LCS	LCSD
Diesel Surrogates(s)	711	633	1000	71.1	63.3	11.6	60-130	25		

20.0

81.0

60-130 0

TRENT STL

Submission: 2004-12-0710

i :

#### TEPH w/ Silica Gel Clean-up

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

Legend and Notes

Result Flag

Q2

Quantit, of unknown hydrocarbon(s) in sample based on diesel,

Severn Trent Laboratories, Inc.
STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94568
Tel 925 484 1919 Fax 925 484 1096 \* www.stl-inc.com \* CA DHS ELAP# 2496

12/29/2004 16:24

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#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskev

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

#### Samples Reported

Sample Name	Date Sampled	Matrix	lab#
GW\$-7	12/17/2004	Water	1
GWS-8	12/17/2004	Water	. 2
GWS-9	12/17/2004	Water	3
GWS-10	12/17/2004	Water	4
GWS-11 .	12/17/2004	Water	5
GWS-12	12/17/2004	Water	6
GWS-8 @ 7 1/2-8	12/17/2004	Soil	7
GWS-11 @ 7 1/2-8	12/17/2004	Soil	8
GWS-12 @ 3 1/2-4	12/17/2004	Soil	9



Submission: 2004-12-0746

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Prep(s):	5030 5030		Test(s):	8045IV
Sample ID:			Eab ID:	8021B 2004-12-0710 - 1
Sampled:	12/17/2004		Extracted:	12/28/2004 (6:52
Matrix:	Water		OO Batakii	2004/40/20 04 05

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00		
Benzene	ND.	0.50	ug/L	1.00	12/28/2004 16:52	
Toluene	ND	0.50	ug/L		12/28/2004 16:52	
Ethyl benzene	ND	0.50	ug/L		12/28/2004 16:52	
Xylene(s)	ND	0.50	ug/L		12/28/2004 16:52	
Surrogate(s)						
Trifluorotoluene	109.5	58-124	%	1.00	12/28/2004 16:52	
4-Bromofluorobenzene-FID	85.9	50-150	%	1.00		

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#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskev

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Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

Prep(s): 5030 5030

Test(s):

8015M 8021B

Sample ID: GWS-8

Lab ID: 2004-12-0710-2

Sampled: 12/17/2002 Matrix

Extracted: 12/28/2004 17:24

pH: 3

GC Batch#: 2004/12/28 04:05

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/28/2004 17:24	
Benzene	ND	0.50	ug/L	1.00		
Toluene	ND	0.50	ug/L	1.00	12/28/2004 17:24	
Ethyl benzene	ND	0.50	ug/L	1.00	12/28/2004 17:24	
Xylene(s)	ND	0.50	ug/L	1.00	12/28/2004 17:24	
Surrogate(s)	1					
Trifluorotoluene	107.7	58-124	%	1.00	12/28/2004 17:24	
4-Bromofluorobenzene-FID	87.4	50-150	%	1.00	12/28/2004 17:24	



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone; (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Lab ID:

Prep(s): 5030 5030 Sample ID: GWS-9

Sampled: 12/17/2004

Water

8015M Test(s):

802113

2004-12-0710 - 3

Extracted: 12/28/2004 17/97 GC Batch#: 2004/12/26-94-05

Matrix pH: 4

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/28/2004 17:57	
Benzene	ND	0.50	ug/L	1.00	12/28/2004 17:57	
Toluene	ND	0.50	ug/L	1.00	12/28/2004 17:57	
Ethyl benzene	ND	0.50	ug/L	1.00	12/28/2004 17:57	
Xylene(s)	ND	0.50	ug/L	1.00	12/28/2004 17:57	
Surrogate(s)	- 1	1				
Trifluorotoluene	107.2	58-124	%	1.00	12/28/2004 17:57	
4-Bromofluorobenzene-FID	85.7	50-150	%	1.00	12/28/2004 17:57	



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

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Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

Prep(s):	5030		Test(s):	8015M
	5080		file and	8021B
Sample ID:	GWS-10		Lab ID:	2004-12-0710-4
Sampled:	12/17/2004		Extracted:	12/28/2004-18:29
Matrix	Mater	 	OO BALLINE	ODD THE STORE OF

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/28/2004 18:29	- 7
Benzene	ND	0.50	ug/L	1.00	12/28/2004 18:29	
Toluene	ND	0.50	ug/L	1.00	12/28/2004 18:29	
Ethyl benzene	ND	0.50	ug/L	1.00	12/28/2004 18:29	
Xylene(s)	ND	0.50	ug/L	1.00	12/28/2004 18:29	
Surrogate(s)			-			
Trifluorotoluene	107.3	58-124	%	1.00	12/28/2004 18:29	
4-Bromofluorobenzene-FID	83.4	50-150	%	1.00	12/28/2004 18:29	



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

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Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Prep(s):	5030 5080		Test(s):	8075M 8021B
Sample ID:	GWS-11		Lab ID:	2004-12-0710 - 5
Sampled:	12/17/2004		Extracted:	12/28/2004 19:01
Matrix:	Water	ing terminal and the contract of the contract	QC Batch#:	2004/12/28:01:05

Compound	Conc.	RL ·	Unit	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	12/28/2004 19:01	
Benzene	ND.	0.50	ug/L	1.00	12/28/2004 19:01	
Toluene	ND	0.50	ug/L	1.00	12/28/2004 19:01	
Ethyl benzene	ND	0.50	ug/L	1.00	12/28/2004 19:01	
Xylene(s)	ND	0.50	ug/L	1.00	12/28/2004 19:01	
Surrogate(s)						
Trifluorotoluene	108.4	58-124	%	1.00	12/28/2004 19:01	
4-Bromofluorobenzene-FiD	87.8	50-150	%	1.00		

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#### Gas/BTEX by 8015M/8021

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Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Prepisi: 5030

5039

Test(s):

8015M 8021B

Sample ID. GWS-12

Leb ID: Extracted: 2604-12-0716 - 6

10.00 12/29/2004 14:22

Sampled: 12/17/2004 Matrix:

12/29/2004 14:22 QC Batch#: 2004/12/29 07:05

Analysis Flag: L2 (See Legend and Note Section )

Compound	10	150	1		i	
	Conc.	RL	Unit	Dilution	Analyzed -	Flag
Gasoline	1000	500	ug/L	10.00	12/29/2004 14:22	
Benzene	ND	5.0	ug/L	10.00	12/29/2004 14:22	
Toluene	ND	5.0	ug/L		12/29/2004 14:22	
Ethyl benzene	ND	5.0	ug/L			
Xylene(s)	ND	5.0	ug/L		12/29/2004 14:22	
Surrogate(s)		1			1222	
Trifluorotoluene	98.4	58-124	1%	10.00	12/29/2004 14:22	
4-Bromofluorobenzene-FID	83.8	50-150	%		12/29/2004 14:22	



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street

Prep(s):

Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

5035 Sample ID: 151VS-8:00 7:172-8 Test(s):

801514

80218

Extracted

2004-12-0710 - 7

OC Barchill 2002/12097-05 84

Compound	Conc.	RL ·	Unit	Dilution	Analyzed	Flag
Gasoline	ND	1.0	mg/Kg	1.00	12/22/2004 00:07	-
Benzene	ND.	0.0050	mg/Kg	1.00	12/22/2004 00:07	
Toluene	ND	0.0050	mg/Kg	1.00	12/22/2004 00:07	
Ethyl benzene	ND	0.0050	mg/Kg	1.00	12/22/2004 00:07	
Xylene(s)	ND	0.0050	mg/Kg	1.00	12/22/2004 00:07	
Surrogate(s)						
Trifluorotoluene	89.8	53-125	<b>%</b>	1.00	12/22/2004 00:07	
4-Bromofluorobenzene-FID	71.9	58-124	%	1.00	12/22/2004 00:07	



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Prep(s): 5035

5035

Test(s): 80 F5791

Sample ID: 6WS-11 @ 7 1/2-8

Lab ID: 2004 12-0716 - 8

Sampled: 12/17/2004

Extracted: 12/22/2004:00:41

Matrix: Skil

QC Batch#: 2064/12/21/91/01

Compound	Conc.	RL	Unit	Dilution	Analyzed	Flag
Gasoline	ND	1.0	mg/Kg			ı lay
Benzene	ND	0.0050	mg/Kg	1.00		
Toluene	ND	0.0050	mg/Kg	1.00		
Ethyl benzene	ND	0.0050	mg/Kg	1.00		
(ylene(s)	ND	0.0050	mg/Kg		12/22/2004 00:41	
Surrogate(s)	i				7-2-2-2-00:41	
Trifluorotoluene	89.4	53-125	1%	1.00	12/22/2004 00:41	
4-Bromofluorobenzene-FID	60.2	58-124	%		12/22/2004 00:41	



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Prep(s): 5035

Matrix:

Sampled: 12/17/2004

5635 Sample ID: GWS-12/@3 1/2-4 Test(s):

8015M

8021B

Lab ID: 2004-12-0710 - 9

Extracted; 12/28/2064 16:17

Analysis Flag: L2. ( See Legend and Note Section)

Compound	Conc.	RL	Unit	Dilution	Analyzed .	Flag
Gasoline	ND	5.0	mg/Kg	5.00	12/28/2004 16:17	
Benzene	ND	0.025	mg/Kg	5.00	12/28/2004 16:17	
Toluene	ND	0.025	mg/Kg	5.00	12/28/2004 16:17	
Ethyl benzene	ND	0.025	mg/Kg	5.00	12/28/2004 16:17	
Xylene(s)	ND	0.025	mg/Kg		12/28/2004 16:17	
Surrogate(s)	. [				12222200 1 2011	
Trifluorotoluene	92.4	53-125	%	5.00	12/28/2004 16:17	
Trifluorotoluene-FID	100.5	53-125	%		12/28/2004 16:17	



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

		4 44 44						
·	1- 1-			· · · · · · · · · · · · · · · · · · ·	Batch	QC Report		and the second s
	Prep(s):	5035						Fesi(s) 30 fem
÷	Method	5035 Blank		·		Soil		OG Barch #2002002200001
	MB: 200	4/12/21	01.01-6	04			- A	Date Extension 12/2/19/00/29/00/05

Compound	Conc.	RL	Unît	Analyzed	Flag
Gasoline	ND	1.0	ma/Ka	12/21/2004 10:05	
Benzene	ND	0.0050	mg/Kg	12/21/2004 10:05	
Toluene	ND	0.0050	mg/Kg	12/21/2004 10:05	
Ethyl benzene	ND	0.0050	mg/Kg	12/21/2004 10:05	
Xylene(s)	ND	0.0050	mg/Kg	12/21/2004 10:05	
Surrogates(s)	l l		" "		
Trifluorotoluene	101.4	53-125	%	12/21/2004 10:05	
4-Bromofluorobenzene-FID	104.6	58-124	%	12/21/2004 10:05	



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

***	The second secon	Date	li CIC Report	A Secretary of the Control of the Co
Prep(s):	5035			Telson acres a
Method	5035 Bizirk		Still	GC Cattin#200#12/2000ing
MB: 200	4/12/28-01-01-0	<b>303</b>		Date Extracted: 12/25/2014 60431

	1 2 1 2 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
Compound	Conc.	RL	Unit	Analyzed	Flag	
Gasoline	ND	1.0	mg/Kg	12/28/2004 09:31		
Benzene	ND	0.0050	mg/Kg	12/28/2004 09:31		
Toluene	ND	0.0050	mg/Kg	12/28/2004 09:31		
Ethyl benzene	ND	0.0050	mg/Kg	12/28/2004 09:31		
Xylene(s)	ND	. 0.0050	. mg/Kg	12/28/2004 09:31		
Surrogates(s)	ŀ	- 1	i l	1		
Trifluorotoluene	89.7	53-125	%	12/28/2004 09:31		
4-Bromofluorobenzene-FID	101.9	58-124	%	12/28/2004 09:31		

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1096 " www.stl-inc.com " CA DHS ELAP# 2496 12/29/2004 16:45

Page 11 of 31

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Page 12 of 31 ....



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Received: 12/20/2004 16:50

Grand Marina

		Batch OC Report	
Prep(s): 5030 5030			Postor BD/TSA
Method Blank		Wäter	- 892/18 06 Batch:#2004/12/28/04(05
MB: 2004/12/28	P01.05-001		Date Extracted: 12/28/2004/97 44

				the second secon			
Compound	Conc.	onc. RL Un		Analyzed	Flag		
Gasoline	ND	50	ug/L	12/28/2004 07:44			
Benzene	ND	0.5	ug/L	12/28/2004 07:44			
Toluene	ND	0.5	ug/L	12/28/2004 07:44			
Ethyl benzene	ND	0.5	ug/L	12/28/2004 07:44			
Xylene(s)	ND	0.5	ug/L	12/28/2004 07:44			
Surrogates(s)		•	-	-			
Trifluorotoluene	110.9	58-124	%	12/28/2004 07:44			
4-Bromofluorobenzene-FID	88.0	50-150	%	12/28/2004 07:44			



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

	Batch GC Report	
Prep(s): 5030		Testes) +eochstv
5939. Method Blank	Water	302/B QC Batch # 2004/12/29/04/05
MB: 2004/12/29-01.05-004		Date Extracted: 12/29/2004/09/56

				and the second of the second	the Company
Compound	Conc.	RL	Unit	Analyzed	Flag
Gasoline	ND	50	ug/L	12/29/2004 09:56	
Benzene	ND	0.5	ug/L	12/29/2004 09:56	
Toluene	ND	0.5	ug/L	12/29/2004 09:56	
Ethyl benzene	ND	0.5	ug/L	12/29/2004 09:56	
Xylene(s)	ND	0.5	ug/L	12/29/2004 09:56	
Surrogates(s)		į	1	. !	
Trifiuorotoluene	102.0	58-124	1 %	12/29/2004 09:56	
4-Bromofluorobenzene-FID	87.7	50-150	%	12/29/2004 09:56	



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street , Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Received: 12/20/2004 16:50

Grand Marina

		in the Cont	Sec. Sec.	Batch GC Re	port			-V. 600.	77. 1	albera z	
Prep(s): 50:	15								130	Festisi	802 FB
Laboratory	Control Spi	ke		Son			Q	C Bate	h#20	1 <b>4</b> 01/202	ode ox
LCS 2 ECSD	004/12/21-01	01-005		Extracted: 1	2/21/2	904		Analy.	zéd. 12	21/2613	4.1668
Compound		Сопс.	mg/Kg	Exp.Conc.	Reco	very %	RPD	Ctrl.L	imits %	FI	ags
		LCS	LCSD		LCS	LCSD	%	Rec	RPD	LCS	Leen

Compound	Conc.	Conc. mg/Kg Exp		Exp.Conc. Recovery %		RPD	RPD Ctrl.Limits %		Flags	
	LCS	LCSD		LCS	LCSD	%	Rec.	RPD	LCS	LCSD
Benzene Toluene Ethyl benzene Xylene(s)	0.105 0.0977 0.103 0.310		0.1000 0.1000 0.1000 0.300	105.0 97.7 103.0 103.3			77-123 78-122 70-130 75-125	35 35 35 35		
Surrogates(s) Triftuorotoluene	523		500	104.6			53-125			



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina Received: 12/20/2004 16:50

Bateli QC Report

Prep(s): 5035

Laboratory Control Spike

LCS 2004/12/21-01301-068

Extracted: 12/21/2004

Me Baren # Zurastarandi

100

LESD

	Conc	mg/Kg	I Eve Cono	Poor		RPD	~41.5			
Compound	00170	myrty	Kg Exp.Conc.		Recovery %		Ctrl.Limits %		Flags	
	LCS	LCSD		LCS	LCSD	%	Rec	RPD	LCS	LCSD
Gasoline	0.435		0.500	87.0			75-125	35		
Surrogates(s) 4-Bromofluorobenzene-FID	491		500	98.2			58-124			

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Page 15 of 31 - A

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#### Gas/BTEX by 8015M/8021 ·

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

Ratel PC Report

Prep(s): 5035

Pesitisk 8

Laboratory Control Spike

Soil

QC Batch #2000/02/28504

LCS 2004/1/2/ LCSD

2004/12/28-01:01-004

Extracted: 12/26/2004

Analiszer szezezetek jolok

Compound	Conc.	mg/Kg	Exp.Conc.	Reco	very %	RPD	Ctrl.Lin	nits %	Fl	ags
·	LCS	LCSD		LCS	LCSD	%	Rec.	RPD	LCS	LCSD
Benzene Toluene Ethyl benzene Xylene(s)	0.101 0.105 0.101 0.314		0.1000 0.1000 0.1 0.300	101.0 105.0 101.0 104.7			77-123 78-122 70-130 75-125	35 35 35		
Surrogates(s) Trifluorotoluene	469		500	93.8			53-125			



Submission: 2004-12-0710

### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

Batch QC Report

Prep(s): 5035

Posited Cousin

Laboratory Control Spike

Soli

C Barels #2000##200####

LCS 2004/12/28-61:01-005 LCSD

Fafracted: 42/28/2004

Analyzed: 12/28/2004 10:5

\_\_\_\_\_

Compound	Conc. mg/Kg		Exp.Conc.	Reco	very %	RPD	D Ctrl.Limits %		Fl	Flags	
<del></del>	LCS	LCSD	•	LCS	LCSD	%	Rec.	RPD	LCS	LCSD	
Gasoline	0.442		0.500	88.4		П	75-125	35			
Surrogates(s) 4-Bromofluorobenzene-FID	467		500	93.4			58-124				



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Batch QC Report

Prep(s): 5030

Laboratory Control Spike

LCS 2004/12/28-01.05-092

Analyzea: 12/28/2604 08:17 

LCSD

Compound	Conc.	Conc. ug/L		Reco	very %	RPD	RPD Ctrl.Lin		,Fi	ags
· 	LCS	LCSD		LCS	LCSD	%	Rec	RPD	LCS	LCSD
Benzene Toluene Ethyl benzene Xylene(s)	50.6 49.1 47.5 144		50.0 50.0 50 150	101.2 98.2 95.0 96.0			77-123 78-122 70-130 75-125	20 20 20 20		
Surrogates(s) Trifluorotoluene	550		500	110.0			58-124	·		



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskev

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

Batch QC Report

Prep(s): 5030

Laboratory Control Spike

LCS 2004/12/28-01.05-098 Extracted: 12/28/2004

LCSD

										- Jan 400-1-17
Compound	Conc. ug/L		Exp.Conc.	Recov	very %	RPD	RPD Ctrl.Limits % F			igs
	LCS	LCSD		LCS	LCSD	%	Rec.	RPD	LCS	LCSD
Gasoline	257	· .	250	102.8			75-125	20		
Surrogates(s) 4-Bromofluorobenzene-FID	455		500	91.0			50-150			

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Page 20 of 31



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Preprist: 5030

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Received: 12/20/2004 16:50

Grand Marina

Laboratory Control Spike

Batch QC Report

Testing E0276

Water QC Batch # 2007/3/2/26-04-05

LCSD

Compound	Conc.	Conc. ug/L		Reco	very %	RPD	RPD Ctrl.Limits % Fi			
	LCS	LCSD		LCS	LCSD	%	Rec.	RPD	LCS	LCSD
Benzene	49.4		50.0	98.8		T	77-123	20		
Toluene	48.5	1	50.0	97.0	1		78-122	20		İ
Ethyl benzene	46.8	1	50	93.6	1		70-130	20		
Xylene(s)	143		150	95.3	1		75-125	20		
Surrogates(s)			į		1	1	1			
Trifluorotoluene	524		500	104.8	1	1	58-124			1



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

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Prep(s): 5030

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina Received: 12/20/2004 16:50

Batch QC Report

Testes Borso

Water QC Batch # 2004/17/29:01:05

LCS 2004/12/29-01:05-006 LCSD

Laboratory Control Spike

Extracted: 12/29/2004

Analyzed: 12/29/2004 1:1:01

Conc. ug/L Exp.Conc. Recovery % RPD Ctrl.Limits % Flags Compound LCS LCSD LCS LCSD Rec. RPD LCS LCSD Gasoline 256 250 102.4 75-125 20 Surrogates(s)
4-Bromofluorobenzene-FID 461 92.2 500 50-150

Severn Trent Laboratories, Inc.
STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94568
Tel 925 484 1919 Fax 925 484 1096 \* www.stl-inc.com \* CA DHS ELAP# 2496

12/29/2004 16:45

Page 21 of 31

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Page 22 of 31

Apart of Bevern Trent Plp -



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskev

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

	Batch-GC Report	
Prep(s)	): 5035	Test(a): 002/15
Matrix	(Spike (MS-/MSD-)	QG Barch # 200402/24001-01
MIS/W	SD CONTRACTOR	Lab 10: 2004-1256-2002
MS:	2004/12/21-01-01-1 Extracted: 12/21/2004	Analyzed: 22/24/2004 (4)
MSD:	2064/12/21-01:01-012 Extracted: 12/210/00/2	Dijusion: 4:00
IVIOD.	2064/12/21-01:01-012 Extracted: 12/21/2004	Analyzed 1972/1/2004 by 52

Compound .	Conc.	Conc. mg/Kg		Spk.Level	R	ecovery	%	Limit	s %	FI	ags
. <u> </u>	MS	MSD	Sample	mg/Kg	MS	MSD	RPD	Rec	RPD	MS	MSD
Benzene Toluene Ethyl benzene Xylene(s)	0.100 0.0960 0.0980 0.290	0.103 0.0973 0.100 0.299	ND ND ND ND	0.1000 0.1000 0.1000 0.3	100.0 96.0 98.0 98.7	97.3	3.0 1.3 2.0 3.1	65-135 65-135 65-135 65-135	.35 35 35 35		
Surrogate(s) Trifluorotoluene	539	517		500	107.8	103,4		53-125			



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Hill wisher all a court is because it is a parent common to the facilities and individual residence in

Lowney & Associates Oakland

Attn.: Tom McCloskev

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

	Statich old Report
Prep(s	) 5035
Matrix	Spike (MS/MSD) Soil QC Barch # 2007(120210E)
MS/M	SD Lab ID: 2004 to 65% of the
Ms:	2064/12/21-01:01-015 Extracted 12/21/2004 Analyzed 12/21/2004
MSD:	2004/12/23*01-016 Estracted: 12/23/2004 Analyzet Libertolia 17/2
37.	Directi: Property

Compound	Conc. mg/Kg		Spk_Level	Recovery %		%	Limits %		Flags		
	MS	MSD	Sample	mg/Kg	MS	MSD	RPD	Rec.	RPD	MS	MSD
Gasoline	0.343	0.407	ND	0.500	68.6	81.4	17.1	65-135	35		
Surrogate(s)			[						1 1		
4-Bromofluorobenzene-FID	420	478	1	500	84.0	95.6		58-124	1 1		l



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

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Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

Batch QC Report	
Prep(e): 5035	Tesis radgus
Matrix Spike (MS/MSD)	QC Batch #2004/k2/28:01:01.
MS/MSD	Lab10: 2004-12-0674-007
MS: 2004/12/28-01.01-007 Extracted: 12/28/2004	Analyzed: 12/25/2004:10:05
MSD: 2004/12/28-01.01-068 Extracted 12/28/2004	Dilution: 1500 Analyzed: 1525,2000 1238
	Dilution: 1809

Compound	Conc	Cong. mg/Kg		Spk.Level		Recovery	%	Limits %		F	lags
	MS	MSD	Sample	mg/Kg	MŚ	MSD	RPD	Rec.	RPD	MS	MSD
Benzene	0.0871	0.0875	ND	0.0952	91.5	96.0	4.8	65-135	35		
Tokiene	0.0832	0.0863	ND	0.0952	87.4	94.7	8.0	65-135	35		
Ethyl benzene	0.0726	0.0769	ND	0.0952	76.3	84.4	10.1	65-135	35		ł
Xylene(s)	0.222	0.232	ND	0.2856	77.7	84.9	8.9	65-135	35		1
Surrogate(s)			1	1	ŀ	i		1	1 1		i
Triffuorotoluene	404	402	1	500	80.8	80.4		53-125	1 1		



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

			Batch C	€ Report	- 100	
Prep(s):	5035		4.4			Test(s)+8615M
Matrix S	olke (MS/MSD)		<b>.</b>	Ol-	QCBatch	#2004/12/28601-01
MS/MSD				turk de L Legis de Laboration (1986) Communication	Lab (D:	2004-12-0674 - 007
MS: 2	004/12/28-01.01-00		Extracted: 12	/28/2004	Analyzed:	12/88/2004-13:12
MSD: 2	004/12/28-01:01-01	)	Extracted: 12	28/2004	Dilution: Analyzed:	1200 122806044845
The second					Dilution	1600

	-1.7			1. 64.		1 - 2	7		0.25		
Compound	Conc.		ıg/Kg	Spk.Level Reco		Recovery	%	Limits %		Flags	
	MS ·	MSD	Sample	mg/Kg	MS	MSD	RPD	Rec.	RPD	MS	MSD
Gasoline	0.685	0.615	0.4317	0.479	52.9	40.4	26.8	65-135	35	M5	M5
Surrogate(s)	1	1 .				1					''''
4-Bromofluorobenzene-FID	427	396		500	85.5	79.2	1	58-124	,		



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskev

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Received: 12/20/2004 16:50

Grand Marina

	44*		Batel	₁QC Repor	V-	Control of the Control		
Prep(s):	5030			1975 - 1975 1975 - 1975 1975 - 1975			<b>16</b>	(50/2007B
Matrix	Spike (MS	/MSD)		Water		QC Ba	cn#20041	2/289CN (75
MS/MS	Ð			्राच्या । इत्यासम्बद्धाः		.Lab (Ď∴	2004-124	1669-001
MS:	2004/12/284	01.054005	Extracted:	12/28/2004		Analyzed	12828	aline dichi
MSD:	2004/12/28	ort.05-006	Extracted	12/28/2004		Diletton: Analyzed:	12.71	19900 2004 ft st
						Dilutton:	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10000

Compound	Сопс	Conc. ug/L		Spk.Level Recovery %			Limit	s %	Flags		
	MS	MSD	Sample	ug/L	MS	MSD	RPD	Rec.	RPD	MS	MSD
Benzene	607	611	137	500	94.0	94.8	0.8	65-135	20		
Toluene	500	504	34.6	500	93.1	93.9	0.9	65-135	20		i
Ethyl benzene	533	527	70.45	500	92.5	91.3	1.3	65-135	20		ľ
Xylene(s)	1620	1600	187	1500	95.5	94.2	1.4	65-135	20		
Surrogate(s)	i i	ŀ		i	ļ			1	1 1		ŀ
Trifluorotoluene	501	518		500	100.2	103.6		58-124			1



Submission: 2004-12-0710

100

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskev

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

	Sately 9	C Report	
Prep(s):	5030		Test(#): WFR/M
Matrix	Spike (MS//MSD)	ater QC Bate	n #200406223:04 05
MS/MS	9	Lab/ID:	2004-1 <b>210030</b> -1001
MS:	2004/12/28-01:05/607 Extracted: 12/	10 m 10 m 10 m 10 m 10 m 10 m 10 m 10 m	1000000100471223
MSD:	2004/12/28-01.05-008 Extracted: 12/	Dilulish: 28/2004 Analyzeit	1280 (2004 - 12 14).
<i>!</i>		Dilation;	1000

							,			3 11 196.5 2.	d American
Compound	Conc. ug/L		Spk.Level	Recovery %			Limits	<b>%</b>	Flags		
	MS	MSD	Sample	ug/L	MS	MSD	RPD	Rec.	RPD	MS	MSD
Gasoline	4670	4580	2440	2500	89.2	85.6	4.1	65-135	20		
Surrogate(s)	f	İ	1		<b>i</b>	ļ	ĺ	İ			l - :
4-Bromofluorobenzene-FID	453	454	Ì	500	90.5	90.9		50-150		1	

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1096 \* www.stl-inc.com \* CA DHS ELAP# 2496 12/29/2004 16:45

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Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1096 \* www.sti-inc.com \* CA DHS ELAP# 2496 12/29/2004 16:45



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

	Battch QC Report	
Prep(s): 5030	THE REAL PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDR	24B
Matrix Spike ( Mi	MSD) Water QC Batch # 2004/1/22550	1:05
GWS-12 >> M/s	Lab\0: 2604√(2/67/16/≤)	006
MS: 2004/12/25	01.05-008 Extracted: 12/29/2004 Analyzed 12/29/2004 to	213
MSD: 2004/12/29		)160 2145

Compound	Conc.	Conc. ug/L		Spk.Leve	k.Level Recovery %			Limit	s %	Flags	
	M\$	MSD	Sample	ug/L	мѕ	MSD	RPD	Rec.	RPD	MS	MSD
Велделе	2450	2470	ND	2500	98.0	98.8	0.8	65-135	20		
Toluene	2350	2420	2.29	2500	93.9	98.7	2.9	65-135	20		
Ethyl benzene	2230	2330	2.57	2500	89.1	93.1	4.4	65-135	20		
Xylene(s)	6930	7260	5.66	7500	92.3	96.7	4.7	65-135	20		
Surrogate(s)	i	1	1	1	ļ		ŀ		1 1		1
Trifluorotoluene	508	520	.]	500	101.5	104.0		58-124			



Submission: 2004-12-0710

#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskey

167 Filbert Street Oakland, CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A)

Grand Marina

Received: 12/20/2004 16:50

	Batch QC Report	
Prep(s): 5030		Tesus):801.5M
Matrix Spike ( MS / MSD )	Water	QG-Batch#2004/12/29:01/05
GWS-12 >>1/18		Lab ID: 2004-12:07:10-2006
MS: 2004/12/29-01.05-010	Extracted: 12/29/2004	Analyzed: 12/29/2004 13/18
		Dilution 5600
MSD: 2004/12/29-01:05-011	Extracted: 12/29/2004	Analyzed: 12/25/2004/16/50

			- 5.5				Y 1	A. 25 A. 17	5,000	of Carathyre	4. 24.00°C	
Compound	Conc. ug/L		/L	Spk.Level	Recovery %			Umits	%	Flags		
	мѕ	MSD	Sample	ug/L	MS	MSD	RPD	Rec.	RPD	MS	MSD	
Gasoline	13100	14800	2310	12500	86.3	99,9	14.5	65-135	20			
Surrogate(s)						1					i	
4-Bromofluorobenzene-FID	448	469	F	500	89.6	93.8		50-150				

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1098 \* www.stHnc.com \* CA DHS ELAP# 2496 12/29/2004 16:45

A part of Severa Trent Pic

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94566 Tel 925 484 1919 Fax 925 484 1096 \* www.stl-Inc.com \* CA DHS ELAP# 2496 12/29/2004 16:45

Page 30 of 31



#### Gas/BTEX by 8015M/8021

Lowney & Associates Oakland

Attn.: Tom McCloskev

167 Filbert Street Oakland CA 94607

Phone: (510) 267-1970 Fax: (510) 267-1972

Project: C14363 (1197-1A) Grand Marina

Received: 12/20/2004 16:50

#### Legend and Notes

#### Analysis Flag

L2

Reporting limits were raised due to high level of analyte present in the sample.

#### Result Flag

М5

MS/MSD spike recoveries were below acceptance limits. See blank spike (LCS).

521

7001

•

0

Oakland Office 167 Filbert St. Oakland 94607 Tel: 510.267,1970 Fax: 510.267,1972

**NALYSES** 

3 Working Days

58 •

□

LOWNEYASSOCIATES Intronmental Georgeouth Services CHAIN OF CUSTODY RECOR

C14363 (1197-1A)

2-3 Hours 24 Hours

S E

Lab I.D.

Global 1D #:

ПОТВ

(0628) supxoid

Paragust dichloride (Chevron RM-810)

Metals: Elbs, Pb, Hg Ell7 CAM (Filter water semples before preserve)

(TSTR) sepponen perculony

(1909) sappysad anhomometro

Method: C18021 C18250 Cladd STEX

(MZIOS) lio xclorn bns lesels as HqT

श्रेष्ट्राभ्यः स्था

(S808) \$804

(OIE8) sHA9

estraig pue BO

No. of Cont.

Rigida Silica gel column

Method: E8015/8021

12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 3WS-8@7 1/2 -8

GWS-11

Water

Water

50

12/17/04

GWS-11@7 1/2 -8

GWS-12@3 1/2

Date: 12/17/04

> Relluquished By: Relinquished By:

telinquished By:

Time:

Date:

PM Initial:

Date Date emp.@(

Tostel (190) Petime: 1 to 50

Severn Trent Laboratories, Inc. STL San Francisco \* 1220 Quarry Lane, Pleasanton, CA 94568 Tel 925 484 1919 Fax 925 484 1096 \* www.stl-inc.com \* CA DHS ELAP# 2496 12/29/2004 16:45

STL San Francisco Sample Receipt Checklist Submission #:2004	I/Engineering S	Chain of custody signed when relinquished and received?	Samples in proper container/bottle / Sample containers intact?	105 Cly	ndices, et al. (1997) in the control of the control	Water - VOA vials have zero headspace?  No VOA vials submitted	167 F	्रा के लोडा obeyone water - pH acceptable upon receipt? ☐ Yes ☐ No obeyone of the company of t	St	970	2 F , 1		Imper n 92 14.44	(I/spr) As indicated a second	lwy. i	Summary of discussion:		<b>San</b> 225	8 Cam	on Office lino Ramon in: 94583 .275.2555
CHAIN OF CUS' Project Name: Grand Marina		CORD	000	<u> </u>	Turnaround R	tequirements					<u>.</u>	······	14.44 ALYSE			STED		96		R
Job No.: C14363 (119						ing Days		1				(e)						, <del>v</del>		
Report To: Tom McCloskey/Ver		0			□ 48 Hou			SM)		list) BTEX						(-810)				
Sampler (print); Veronica Tiglao Sampler (signature) Electronic Delharable	Format-Requ	ilred: 🗆 YES	;— ⊠ N	10	1	urs RUSH	3021	motor oil (8015M) umn		8010 Dado	sticides (8081)	Hg □17 CAM	ides (8151)			Paraquat dichloride (Chevron RM-810)		. ·		
EDF LOGCODE: Global ID #:	<u> </u>	MV DLAG	) <u>- L</u>	AF	2200.71	standard)	s gas/BTEX d: E78015/8	s diesel and silica gel coli	d Grease	enated VOCs d: \$021	ochlorine Pe	n: ⊡As, Pb, l rwater san	nated Herbic	(8310)	(8082)	sat dichlo	netals	s (8290)	۵	-
Sample I.D. (Field Point Name)	Date	MV □ LAC	Lab I		Sample Matrix	No. of Cont.	TPH as gas/BTEX Method: E/8015/8021	TPH as diesel and motor Eadd silica gel column	Oil and Grease	Halogenated VOCs (former Method: □8021 □8260	Organochlorine Pesticides (8081)	Metals: CAS, Pb, Hg C17 CAM (Filter water samples before preser	Chlorinated Herbicides (8151)	PAHs (8310)	PCBs (8082)	Paraquat dichlo	LUFT metals	Dioxins (8290)	НОГР	Remarks
Sample I.D.  (Field Point Name)  GWS-7	Date 12/17/04		<u>—</u>		Sample Matrix Water	No. of Cont.	×	×	Oil and Grease	Halogenated VOCs Method: D8021	Organochlorine Pe	Metals: GAs, Pb, I	Chlorinated Herbic	PAHs (8310)	PCBs (8082)	Paraquat dichlo	LUFT metals	Dioxins (8290)	НОГР	Remarks
Sample I.D.  (Field Point Name)  GWS-7  GWS-8	Date 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water	No. of Cont.	×	×	Oil and Grease	Halogenated VOCs Method: 🗆 8021	Organochlorine Pe	Metals: CAs, Pb, (Filter water san	Chlorinated Herbic	PAHs (8310)	PCBs (8082)	Paraquat dichlo	LUFT metals	Dloxins (8290)	HOLD	Remarks
Sample I.D.  (Field Point Name)  GWS-7  GWS-9	Date 12/17/04 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water Water	No. of Cont. 6	× ×	x x	Oil and Grease	Halogenated VOCs Method: □8021	Organochlorine Pe	Metals: GAs, Pb, I	Chlorinated Herbic	PAHs (8310)	PCBs (8082)	Paraquat dichlo	LUFT metals	Dloxins (8290)	НОГР	Remarks
Sample I.D. (Field Point Name) GWS-7 GWS-8 GWS-9	Date 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water Water Water	No. of Cont.	x x x	x x x	Oil and Grease	Halogenated VOCs	Organochlorine Pe	Metals: CAS, Pb, I	Chlorinated Herbic	PAHs (8310)	PCBs (8082)	Paraquat dichlo	LUFT metals	Dloxins (8290)	НОГР	Remarks
Sample I.D. (Field Point Name) GWS-7 GWS-8 GWS-9 GWS-10	Date 12/17/04 12/17/04 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water Water Water Water	No. of Cont. 6 6 6	x x x x	x x x x	Oil and Grease	Halogenated VOCs Method: B021	Organochlorine Pe	Metals: □As, Pb, I (Filter water san	Chlorinated Herbic	PAHs (8310)	PCBs (8082)	Paraquat dichlo	LUFT metals	Dioxins (8290)	HOLD	Remarks
Sample I.D. (Field Point Name) GWS-7 GWS-8 GWS-9 GWS-10 GWS-11	Date 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water Water Water Water Water	No. of Cont. 6 6 6 6	x x x	x x x	Oil and Grease	Halogenated VOC3 Method: D8021	Organochlorine Pe	Metals: 🗆 As, Pb, I	Chlorinated Herbic	PAHs (8310)	PCBs (8082)	Paraquat dichlo	LUFT metals	Dioxins (8290)		Remarks
Sample I.D.  (Fleid Point Name) GWS-7 GWS-8 GWS-9 GWS-10 GWS-11 GWS-12 GWS-8@7 ½ -8	Date 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water Water Water Water Water Soil	No. of Cont. 6 6 6 6 6	x x x x	x x x x	Oil and Grease	Halogenated VOC3 Method: □8021	Organochlorine Pe	Metals: 🗆 As, Pb, I	Chlorinated Herbic	PAHS (8310)	PCBs (8082)	Paraquat dichlo	LUFT metals	Dloxins (8290)	×	Remarks
Głobal ID # : Sample I.D.	Date 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water Water Water Water Water	No. of Cont. 6 6 6 6 6 1	x x x x	x x x x	Oil and Grease	Halogenated VOC: Method: □8021	Organochlorine Pe	Metals: CAS, Pb, 1 (Filter water san	Chlorinated Herbic	PAHs (8310)	PCBs (8082)	Paraquat dichlo	LUFT metals	Dloxins (8290)		Remarks
Sample I.D.  (Field Point Name)  GWS-7  GWS-8  GWS-9  GWS-10  GWS-11  GWS-12  GWS-8@7 ½ -8  GWS-11@7 ½ -8	Date 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water Water Water Water Water Water Soil Soll	No. of Cont. 6 6 6 6 6 1	x x x x	x x x x	Oil and Grease	Halogenated VOCS		Metals: GAS, Pb, (Filter water san	Chlorinated Herbic	PAHs (8310)	PCBs (8082)		LUFT metals	Dioxins (8290)	×	Remarks
Global ID #:  Sample I.D.  (Field Point Name)  GWS-7  GWS-8  GWS-9  GWS-10  GWS-11  GWS-12  GWS-8@7 ½ -8  GWS-11@7 ½ -8	Date 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water Water Water Water Water Water Soil Soll	No. of Cont. 6 6 6 6 6 1	x x x x	x x x x	Oil and Grease	Halogenated VOCS Method: □8021		Metals: Clas, Pb. (Filter water san	Chlorinated Herbic	PAHs (8310)	PCBs (8082)		LUFT metals	Dloxins (8290)	×	Remarks
Global ID #:  Sample I.D.  (Field Point Name)  GWS-7  GWS-8  GWS-9  GWS-10  GWS-11  GWS-12  GWS-8@7 ½ -8  GWS-11@7 ½ -8	Date 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04		<u>—</u>		Sample Matrix Water Water Water Water Water Water Soil Soil	No. of Cont. 6 6 6 6 1 1	x x x x x	x x x x		Halogenated VOCS Method: □8021		Metals: ☐As, Pb, I				:			×	Remarks
Sample I.D.  (Field Point Name)  GWS-7  GWS-8  GWS-9  GWS-10  GWS-11  GWS-12  GWS-12  GWS-12  GWS-12-8  GWS-12-8  GWS-12-8	Date 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04 12/17/04		Lab I		Sample Matrix Water Water Water Water Water Water Soil Soil Time:	No. of Cont. 6 6 6 6 1 1	x x x x x	x x x x		Halogenated VOCS		Metals: □As, Pb. (Filter water san		1/2:		:	: /	(8280) Dloxins (8290)	×	

#### APPENDIX C GEOPHYSICAL SURVEY

#### J R ASSOCIATES

Engineering Geophysics 1886 Emory Street San Jose, CA 95126 (408) 293-7390

GEOPHYSICAL INVESTIGATION AT THE GRAND MARINA VILLAGE ALAMEDA, CALIFORNIA

January 6, 2005

For

Lowney Associates 405 Clyde Avenue Mountain View, CA 94043

Ву

James Rezowalli, GP-921

LOWNEYASSOCIATES

Appendix C 1197-1A

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#### LIST OF ILLUSTRATIONS

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Drawing 2 Site Map

Drawing 3 Magnetic Contour Map

#### I INTRODUCTION

This report presents the results of a geophysical investigation performed at the Grand Marina Village in Alameda, California (Drawing 1). The investigation was performed for Lowney Associates by J R Associates. The purpose of the investigation was to look for geophysical indications of buried fuel storage tanks and buried metal debris. James Rezowalli, Principal Geophysicist, and Bob Wing, Technician, of J R Associates performed the field work in December of 2004.

#### A. Site

The site is located at 2041, 2043, 2045, 2047 and 2051 Grand Street in Alameda. The site presently consists of parking and boat storage lots, several buildings and paved driveways (Drawing 2). In November of 2004 we performed a geophysical investigation near Building D. There was concern that a fuel storage tank may have been buried near building D. In December of 2004 we collected additional geophysical data in a larger portion of the site (Drawing 2). The purpose of the additional investigation was to look for geophysical indications of buried fuel storage tanks and buried metal.

#### II METHODS

We performed a magnetic investigation to look for magnetic anomalies indicative of buried tanks. A magnetic investigation maps the earth's magnetic field. The magnetic field is uniform throughout a site free of metal. The magnetic field at a site that contains ferrous metal is not uniform. Metal objects produce magnetic anomalies with characteristic shapes and magnitudes. For example, an anomaly caused by a buried tank consists of a strong magnetic low just south of the center of the tank and a weaker magnetic high just north of the tank's center. This type of anomaly is what we use to locate buried tanks.

#### A. Magnetic Instrumentation

We used a Geometrics model 856 proton precession magnetometer to collect magnetic data at the site. The magnetometer had two sensors and an electronics package. The magnetometer collected both total field data and vertical gradient data. The magnetometer can discriminate to 0.1 gammas in a total field of 40,000 to 60,000 gammas. Magnetic readings were stored in memory with the time of day, station numbers and line numbers of the readings. The data were downloaded to a computer and contoured.

#### B. Magnetic Field Procedures

The area where magnetic data were collected is shown on Drawing 2. Magnetic data were collected at ten-foot intervals throughout the area investigated. At the end of the field day the magnetic data were downloaded and contoured. An anomaly is indicated by a series of concentric magnetic contours.

#### IV DRAWINGS

#### III RESULTS

#### A. Magnetic Data

Drawing 3 shows the contour map of the magnetic data. There are many magnetic anomalies at the site. All the anomalies appear to be caused by surface metal, the known fuel storage tanks and buried pipes. The surface metal included parked cars, street posts, buildings and parked boat trailers. There were anomalies over the two known fuel storage tanks. The tanks are in the northern part of the area investigated and feed the pump at the fuel dock. The buried pipes appear to be electrical, telephone, gas and water lines. Parts of the area we wanted to investigate were blocked by surface metal. There were no geophysical indications of a buried tank in the area we could investigate.

#### B. Limitations

Magnetic methods locate ferrous objects from the anomalies they produce in the earth's magnetic field. It is possible some ferrous objects will not produce an anomaly. Some possible reasons are that the object is buried too deep, the object is too small, the object is buried under or near another ferrous object or an object is buried near a utility. It is possible there are materials buried at the site that were not detected by the magnetometer. Because parts of the area we wanted to collect data in were blocked by surface metal, we recommend performing a geophysical investigation after the boats, buildings and other surface metal have been removed.

