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JOBNO. 87/57.2

435 Tesconi Circle Santa Rosa, CA 95401 707-526-7200 Fax 707-526-9623

John Bajsarowicz Aqua Resources 2030 Addision Way Berkeley, CA 94704 December 27, 1987

ANATEC Log No: 1871 (1-5)

Series No: 424/007 Client Ref: Job 87157.2

Subject: ASAP Priority Analysis of Five Samples Received December

18, 1987.

Dear Mr. Bajsarowicz:

Analysis of the samples referenced above has been completed. This report is written to confirm results transmitted verbally on December 22, 1987.

Delivery to the laboratory was conducted under documented chain-of-custody. On receipt at the laboratory, sample custody was transferred to ANATEC sample control personnel who subsequently documented receipt and condition of the samples and placed them in secured storage at 4°C until analysis commenced.

In preparation for benzene, toluene, xylene ("volatile aromatics") and volatile hydrocarbons measurements, aliquots of samples were taken from core centers with stainless steel implements, immediately weighed, and sealed in septum-capped vials. Additionally, vials were prepared in essentially the same fashion to represent method blanks, commercial gasoline standards, gasoline-fortified sample spikes and sample replicates. Each vial was heated at 90°C during which light hydrocarbons (such as gasoline) were expected to equilibrate in distribution between sample and headspace. Headspace gases were subsequently analyzed by gas chromatography to measure total light hydrocarbons. Response of the chromatographic system to samples was compared with response to standards prepared with commercial gasoline, and from reagent grade volatile aromatics for purposes of qualitative and quantitative interpretation.

Samples were prepared for extractable hydrocarbons measurements by thorough mixing and subsequent extraction with methylene chloride; extraction, aided by sonication, was performed three successive times for each sample. Extracts were then combined, dried over sodium sulfate and concentrated in Kuderna-Danish apparatus.





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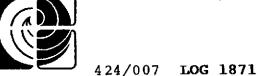
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Extracts were then analyzed by capillary column gas chromatography with flame ionization detection. Preparation and analysis of samples was accompanied by similar treatment of a method blank and a diesel-fortified sample. Response of the chromatographic system to calibration standards prepared with commercial diesel was compared with system response to samples for purposes of qualitative and quantitative interpretation.

Details of the analytical methodologies are consistent with requirements specified in Methods "I" and "II" ("Total Fuel Hydrocarbons, Low-to-Medium Boiling Point Hydrocarbons" and "Total Fuel Hydrocarbons, Medium-to-High Boiling Point Hydrocarbons," respectively) in "Guidelines for Addressing Fuel Leaks," Regional Water Quality Control Board, San Francisco Bay Region, revised 1986; the preparation procedures used are described in detail in "Headspace Method," Method 5020 for gasoline, and "Sonication Extraction," Method 3550 for diesel, in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," U.S. EPA, SW-846, 2nd edition, revised 1984.

To measure "total" (acid-recoverable) lead, portions of the samples were digested with appropriate mineral acids and heat and subsequently diluted with reagent water. The digests were analyzed using inductively coupled argon plasma atomic emission spectroscopy following Method 6010 available in "Test Methods for Evaluating Solid Waste," U.S. EPA SW-846, Volume 1A: Laboratory Manual Physical/Chemical Methods, Third Edition, November 1986.

Results of analyses are summarized in Table 1. Please feel welcome to contact us should you have questions regarding procedures or results.

Submitted by:

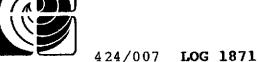
Project Chemist

Approved by:

Anderson, Director Analytical Laboratories

/m1





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LOG 1871





TABLE 1. SUMMARIZED ANALYTICAL RESULTS

	Descriptor, Lab No. & Results (mg/Kg)a										
Parameter	L-1 6' 12/18 (2951)	L-2 4' 12/18 (2952)	L-3 4' 12/18 (2953)	L-4 4' 12/18 (2954)	L-6 10' 12/18 (2955)						
Volatile petroleum hydro- carbons, as gasoline	<10	<10	<10	<10	<10						
Extractable petroleum hydrocarbons, as diesel	<10	<10	<10	. 71	<10						
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005						
Toluene	<0,005	<0.005	<0.005	0.006	<0.005						
Xylenes	<0.015	<0.015	<0.015	<0.015	<0.015						
Lead	49	57	46	49	65						

^amg/Kg--Data are expressed as milligrams analyte per kilogram sample, as-received basis.





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Xylenes	<0.015	<0.015	<0.015	<0.015	<0.015						
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RORING LOCATI DRILE CONTRA DRILL	on L-1	KRIII PR	AND D	HIGH		101	 1	10 /1 c	. / 0.7
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PORTING LOCATION L-1 DRIVING HEW Drilling Co	DRILLER	AND DA DATE		12/	18/8	17 1	MIE 12/19	/87
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PURPUSE DE BORING		DEP1H.		TRST			COMPL, 24 1	m(S .
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COMPENTS		Dav		Chu:				
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BURING LOCATI	ON L-4		AND D		4 7 7	1 7 7 7	-9 1	HAIL IN/T	5755-
BORING LOCATI DRILLI CONTRA DRILLI	ACTOR HEW Drilling Co.	DRILLER	DATE START COMPL DEPTH NO. 0 SAMPL WATER DEPTH LUGGE	7777	12/	18/8 -	/	DATE 12/I FINISHED 12/I ROCK DEPIH (FI) UNDIST. 2 CON	8/87
DRTCT!) EQUIPA	NG ENI CME-55 Solid Flight Auger	· · · · · · · · · · · · · · · · · · ·	DEPTH	C LEU!	1	0		DEPTH (FT) UNDIST: 2 CON	
EQUIPA DIAME OF BOT	en 6-inch		SAMPL	ES U	191.	0			TIRS.
PURPÖS OF BOE	SE RING		WATER DEPTH	(FI)	IKST			1	161/0+
PURPOS OF BOI SAMPLI EQUIPA COMMEN	NG 2½-inch split barrel		1					CHECKED BY:	
Commen	VIS		Davi						
			GRAPHIC LOG LITHOLOGY		SAM				
DEPTH (FEET)	DESCRIPTION	·	いる		TYPE	SCOUNT COUNT	∐;j⊒	REMARKS	
2 2			5 5	NO.	<u>~</u>	2 2	RAN TITI		
	Gravel		1		1			BL-Brass Li	ner
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	Clay		+						
			'	1	BL				
_	Clayey gravel						[]		
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				2	BI	1			
10	Boring terminated at 10 feet			_] "	1			٠.
†	No free water encountered		1			ļ			
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Proj	*		OG	OF	В	OF	RIN	G	, ig.
Proj	ect No. 87157.2	_							

RURIN LOCAT	ION L-3	KRILIPK	AND D	TION			 .	- MATE	- 7
- GOVIE - GOVIE	I N.I.	DRILLER	DATE SIARI COMPL DEPIH NO. (I SAMPL WATER DEPIH LUGGE	Frin	12/	18/8		PATE 12/1 RUCK	8/87
EQUAD	<u> ENI CME-55 Solid Flight Auger</u>		- Přěpů) No. (F D) 1 ST.	υ <u> </u>		_ } <u> </u>	
OF BOI PURFO	NG 6-inch		SAMPL	ES	IRST	U		- Z I	TIRS.
PURPO OF BO SAMPE EQUIP	RING 21. 4-ch14. L1		DEP 14 LOGGE	D BY	•			CHECKED BY:	
COMPLE	FNI 2½-inch split barrel					rch			
 1					SAM		ور		
DEPTH (FEET)	DESCRIPTION		GRAPHIC LOG LITHOLOGY	١.	ы	34		REMARKS	
뭐뜨			[E]	皇	TYPE	SOUNT SOUNT	PATEC TIME	<u>.</u>	
	Grave1		'		1			BL=Brass Li	ner
1	Clayey gravel								
1	Clay		<u> </u>		Ì				
-	,		1	1	BL				
-					[1			
5 -	Clayey sand, trace fine size	graveı							
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	Clayey gravel	•	1						
10-	_			2	BL				
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30 - Proj	ect Livermore Superblock								Flg.
l		L	.OG	OF	В	OF	IN	3	
Proj	ect No. 87157.2								

RUR ING LOÇAT	ON L-5			VND D					TATE:	- 15 =
CONTRA	CLOR HEW Drilling Co.	DRILLER		DATE SLARII COMPL DEPLII	Y 1 M	12/	18/8	7	DATE 12/1 ROCK	8/87
DITTE:	NG <u>FNI CME-55 Solid Flight Auger</u>			DEPIH.		10	0		INDIST 2 CO	
OF BO	ing 6-inch			SAMPLI	ES_	ioi. Her	0		COMPL. 120	HRS.
PURFÖ OF BO	TING			NO. (N SAMPL WATER DEPIH LUGGE	(FT)				CHECKED BY:	
EOUIPI	ENT 2½-inch split barrel								OHLONED DIT	
COMME	113			Dav	1d (
_{≠ €}	nceen to take			2141C		SAM		ING ING	DEMARKO	
DEPTH (FEET)	DESCRIPTION		_	GRAPHIC LOG LITHOLOGY	0,	TYPE	COUNT	DRILL RATE/ FIME	REMARKS	
			· · · · · · · · · · · · · · · · · · ·		=	- -	30	251	BL=Brass Li	nor
	Gravel			-					ph-brass rl	HET
	Clayey gravel			-			!			
	Clay									
·	-				1	BL				
-	Clayey sand, trace fine size	 eravel				· .				
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	_ Clayey gravel	•	-	↓						
4.5	_			_	2	BL				
10-	Boring terminated at 10 feet				_	րե				
	No free water encountered		_	Γ						
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			LC)G (OF	В	OR	IN	G	
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CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR COME-55 Solid Flight Auger CONTROL CONTR	DRILLER	David	lst. 0	DATE 12/18/87 RUCK 161) RUCK 161) CORPT. 2 124 INUS.
DESCRIPTION		GRAPHIC LOG LITHOLOGY NO.	TYPE COUNT DRILLIN	REMARKS
Gravel (ballast) Gravelly silt, light brown Sandy, silty gravel, dry Boring terminated at 10 feet No free water encountered		1 2	BI BI	BL=Brass Liner
Project No. 87157.2	LC	G OF	BORIN	IG Fig.

LUCATION L-6	KAITIEN	DVIE VND DV	_		201	I	DATE	
rinking ting tiew britishing co.	DRILLER	SIABI DECIN NO. SAMPL PEPIN DEPIN LUGGE	ED TOK	$\frac{12}{1}$	$\frac{18/3}{0}$	8/	PATE 12/1 ROCK ROCK INDIST (EL) CORT	8/8/
FONTEMENT		1 18601	Œij	ST.	<u>U</u>		-APPIAL(ET) i com	
of Boring 6-inch		SAMPL	ES F	RST	0		conru. 2 2111	
PURPUSE OF BORING SANPLING		- DELTH	(FT) D- B 7;	;			CHECKED DYE	
EOUTPHENT 25-inch split barrel		− ł						
		<u> ၂</u> ၁ န	10	SVM	rch LES			
표 DESCRIPTION		GRAPHIC LOG LITHOLOGY		ա	뇶		REMARKS	
130 FT		GA, LIT	8	<u> </u>	SCOUNT COUNT	DRI		
Gravel (ballast)		,					BL=Brass Li	ner
Gravelly silt, light brown		7						
Graverry Sire, right brown		1						
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<u> </u>	4	1						
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Sandy, silty gravel, dry	<u></u>	1	_					
Boring terminated at 10 feet		-	2	BI	1			
- No free water encountered								•
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Project Livermore Superblock		OG	OE	D	ΔĐ	181	G	Fig.
Project No. 87157.2	-	UG	υr	D	Ur	1111	٧	
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	GIOR HEW Drilling Co. IN CME-55 Solid Flight Auger IN 6-inch	DRILLER		AND DATE SOMPL SAMPL RATER PEPIN	FOION PES FI	2/1 S1, RST	8/8 11 0	7	TALE SHED 12/1 ROLE HANDSHED 12/1 ROPEL 2 124 COPPL 2 124	8/87 nr 11ns
EQUIP CUNIE	ilig 2½-inch split barrel [N]		<u></u>		rid		rch			
DEPTH (FEET)	DESCRIPTION			GRAPHIC LOG LITHOLOGY	NO.	SAMI B.	_=	DRILLING RATE/ TIME	REMARKS	
	Silty gravel			'					BL=Brass L	iner
- + 	Clay, red Gravelly clay			- <u> </u> - ! - 	1	BI				
5 -	Graverly clay			1	1	ВL	,			
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10-	Boring terminated at 11 feet	· · · · · · · · · · · · · · · · · · ·	·	-	2	BI				
-	- No free water encountered -			-						
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i .	ect Livermore Superblock	٠	L	.OG	l OF	В	OF	I IN	G	Flg.
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PURING L-7			AND DAT			b tra 1 to	
PURITY L-7 LUCATION L-7 LUCATION L-7 ENTITLING CONTRACTOR HEW Drilling Co. DIVILING CME-55 Solid Flight	DRILLER		INVIE		8/87	FINISHED 12/	18/87
	Auger		STARTED DECITE 1 SAMPLES RATER	IUN E <u>i</u> l	11	TROCK (ED)	
BYX/EYER 6-inch			NU. OF SAMPLES	9151. 	0	1 7 1	Ano: !#THRS.
PURPUSE OF BORING			NATER DEPTHOE LUGGED	+ 1881 1)		CHECKED TY:	
SAN LING 2½-inch split barre	e1		1		_	CHECKED BILL	
CUM/ENTS'			l .	d Chu			
			GRAPHIC LOG LITHOLOGY	SAM		-{	
DESCRIPTION			홅긇털	NO. TYPE	BLOW COUNT RTECT	REMARKS	3
8 to	<u> </u>	<u>,,</u>	<u> </u>	모두	BLO COUNT RATE		
Silty gravel			l'			BL=Brass	Liner
		=					
Clay, red		ĺ	† [
Gravelly clay			+	1 BI			
Graverry Clay			1 1	- . ^{DL}			
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Boring terminated at	11 feet	<u>, ,</u>	+	2 BI	{		
No free water encount			4				
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30 L	ok						Fig.
Project Livermore Superblo	···	L	og c	F B	ORIN	IG	
Project No. 87157.2	<u> l</u> .			, <u> </u>			