

October 21, 1992  
SCI 469.006

Mr. Robert Mibach  
Director, Physical Plant  
Peralta Community College District  
333 East 8th Avenue  
Oakland, California 94606

Quarterly Groundwater Monitoring  
Sampling Event 3, September 1992  
College of Alameda  
555 Atlantic Avenue  
Alameda, California

Dear Mr. Mibach:

This letter records the results of the third sampling event for the groundwater monitoring program at the referenced site. The program has been implemented in accordance with Regional Water Quality Control Board and Alameda County Health Care Services Agency (ACHCSA) guidelines due to the presence of petroleum hydrocarbons in the soil beneath previous underground fuel storage tanks.

#### Groundwater Level Measurements and Sampling

Groundwater level measurements are being obtained monthly, due to the widely fluctuating groundwater level readings. The depth to groundwater is measured in the wells using an electric well sounder. A summary of groundwater elevation data is presented in Table 1. The groundwater flow direction and contours for this event are shown on Plate 1.

On September 24, 1992, well MW-3 was purged by bailing dry with a disposable bailer. Groundwater level readings of all three wells were obtained on this day prior to purging. MW-3 was allowed to sit for 5 days in order to allow the well to recharge.

On September 29, 1992, all 3 wells were sampled. Prior to sampling, wells MW-1 and MW-2 were purged by bailing with a disposable bailer. Measurements of the temperature, pH, and conductivity of the purge water from all three wells are presented on the attached well sampling forms.

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After wells MW-1 and MW-2 had recharged to within approximately 80 percent of their initial volume, they were sampled using a disposable bailer. Due to the slow rate of recharge, MW-3 was not allowed to recharge to within 80% of its initial volume. The samples were retained in glass containers pre-cleaned by the supplier in accordance with EPA protocol. The samples were placed in an ice chest and transmitted to Curtis and Tompkins, LTD, a State of California Department of Health Services certified analytical laboratory.

The testing program for this event included analyses for total volatile hydrocarbons (TVH), total extractable hydrocarbons (TEH), benzene, toluene, ethylbenzene, and xylenes (BTEX), oil and grease, and purgeable halocarbons. The results of all analytical testing events are presented in Table 2. Analytical test reports and Chain-of-Custody forms are attached.

### Conclusions

#### A. Groundwater Flow Direction and Gradient

Groundwater level data obtained during this sampling event is consistent with data obtained during the last event. Groundwater appears to flow in the southeast direction under a gradient of 1.5 percent. However, as detailed in our letter dated August 3, 1992, we judge that this data is inconsistent with the general hydrology of the area due to varying subsurface conditions and well construction details.

#### B. Petroleum Hydrocarbon Concentrations

The analytical results indicate that no detectable concentrations of petroleum hydrocarbons are present in the groundwater at well locations MW-1 and MW-2, near the previous fuel oil and gasoline tanks. Extractable hydrocarbons were detected in the groundwater sample obtained from MW-3, near the former waste oil tank area.

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In accordance with the monitoring program, the next sampling event will be conducted during the month of December 1992.

If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.



R. William Rudolph  
Geotechnical Engineer 741 (expires 12/31/92)

MFW:JNA:RWR:sld

2 copies submitted

Attachments:    Table 1 - Groundwater Elevations  
                  Table 2 - Summary of Analytical Test Results  
                  Plate 1 Study Area Plan  
                  Analytical Test Report  
                  Chain-of-Custody Form  
                  Well Development Forms  
                  Well Sampling Forms

Table 1.  
Groundwater Elevations

<u>Well</u>	<u>TOC<sup>1</sup> Elevation</u>	<u>Date</u>	<u>Groundwater Depth<sup>2</sup> (feet)</u>	<u>Groundwater Elevation (feet)</u>
MW-1	100.72	2/24/92	1.64	92.68
		3/09/92	4.28	96.44
		3/24/92	4.33	96.39
		4/28/92	4.54	96.18
		6/29/92	5.92	94.80
		7/27/92	5.74	94.98
		8/27/92	6.04	94.68
		9/24/92	6.16	94.56
MW-2	99.54	2/24/92	4.45	95.09
		3/09/92	3.70	95.84
		3/24/92	3.73	95.81
		4/28/92	4.25	95.29
		6/29/92	4.40	95.14
		7/27/92	4.00	95.54
		8/27/92	4.33	95.21
		9/24/92	4.36	95.18
MW-3	101.19	2/24/92	13.12	88.07
		3/09/92	8.75	92.44
		3/24/92	6.87	94.32
		4/28/92	6.31	94.88
		6/04/92	7.10	94.09
		6/29/92	10.78	90.41
		7/27/92	6.88	94.31
		8/27/92	6.75	94.44
		9/24/92	7.38	93.81

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<sup>1</sup> TOC = Top of Casing elevation relative to an assumed project datum.

<sup>2</sup> Measured below TOC

**Table 2.**  
**Contaminant Concentrations in Groundwater**

<u>Tank Area</u>	<u>Sampling Date</u>	<u>TVH<sup>1</sup></u> <u>(ug/l)<sup>4</sup></u>	<u>TEH<sup>2</sup></u>		<u>TOG<sup>3</sup></u> <u>(mg/l)<sup>5</sup></u>	<u>Benzene</u> <u>(ug/l)</u>	<u>Toluene</u> <u>(ug/l)</u>	<u>Ethyl-</u> <u>Benzene</u> <u>(ug/l)</u>	<u>Total</u> <u>Xylenes</u> <u>(ug/l)</u>	<u>EPA 8010</u> <u>Chemicals</u>
			<u>Kerosene</u> <u>Range</u> <u>(ug/l)</u>	<u>Diesel</u> <u>Range</u> <u>(ug/l)</u>						
Fuel Oil MW-1	2/19/92	-- <sup>6</sup>	<50	<b>94</b>	--	<0.5	<0.5	<0.5	<0.5	--
	6/29/92	--	<50	<b>110</b>	--	<0.5	<0.5	<0.5	<0.5	--
	9/29/92	--	<50	<50	--	<0.5	<0.5	<0.5	<0.5	--
Gasoline MW-2	2/19/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	6/29/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	9/29/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
Waste Oil MW-3	2/19/92	<5000 <sup>7</sup>	<b>680</b>	<50	<5	<50	<50	<50	<b>84</b>	ND <sup>8</sup>
	6/29/92	<50	*	<b>190</b>	<5	<0.5	<0.5	<0.5	<0.5	ND
	9/29/92	<50	*	<b>410</b>	<5	<0.5	<0.5	<0.5	<0.5	ND

<sup>1</sup> Total volatile hydrocarbons as gasoline, EPA 8015/5030 modified

<sup>2</sup> Total extractable hydrocarbons, EPA 3550/8015 modified

<sup>3</sup> Total oil and grease, EPA 3550 and SMWW 17:5520 E&F

<sup>4</sup> Micrograms per liter or parts per billion (ppb)





<sup>5</sup> Milligrams per liter or parts per million (ppm)

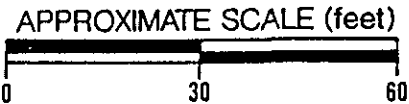
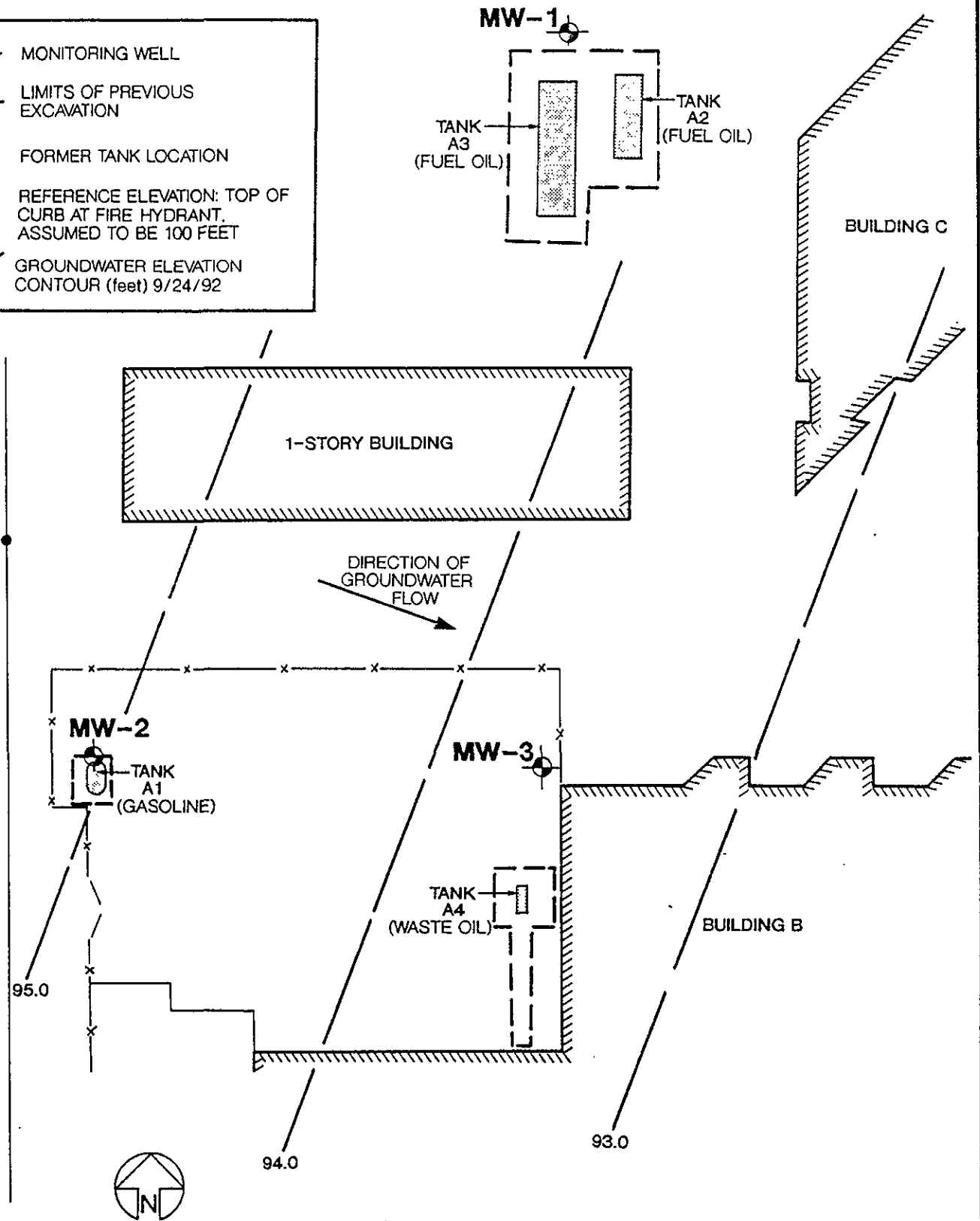
<sup>6</sup> Test not requested

<sup>7</sup> Sample diluted due to foaming during purge and trap extraction

<sup>8</sup> Not detected at or above reporting limits. Reporting limits vary from 1.0 to 20 ug/l. See test reports for individual reporting limits.

\* Quantitated as diesel

 MONITORING WELL  
 LIMITS OF PREVIOUS EXCAVATION  
 FORMER TANK LOCATION  
 REFERENCE ELEVATION: TOP OF CURB AT FIRE HYDRANT, ASSUMED TO BE 100 FEET  
 94.0 GROUNDWATER ELEVATION CONTOUR (feet) 9/24/92



<b>STUDY AREA PLAN</b>		
COLLEGE OF ALAMEDA - ALAMEDA, CA		PLATE
JOB NUMBER 469.006	DATE 10/2/92	APPROVED <i>MW</i>
		<b>1</b>

Subsurface Consultants



Curtis & Tompkins, Ltd., Analytical Laboratories. Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

DATE RECEIVED: 09/29/92  
DATE REPORTED: 10/07/92

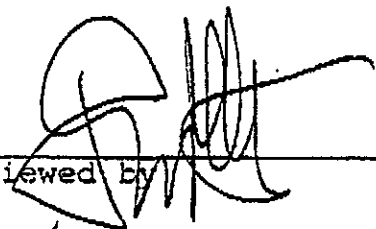
LABORATORY NUMBER: 108792

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 469.006

LOCATION: COLLEGE OF ALAMEDA

RESULTS: SEE ATTACHED

Reviewed by 

Reviewed by 



LABORATORY NUMBER: 108792-3  
CLIENT: SUBSURFACE CONSULTANTS  
PROJECT ID: 469.006  
LOCATION: COLLEGE OF ALAMEDA  
SAMPLE ID: MW-3

DATE SAMPLED: 09/29/92  
DATE RECEIVED: 09/29/92  
DATE ANALYZED: 10/03/92  
DATE REPORTED: 10/07/92

EPA 8010  
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
Chloromethane	ND	2
Bromomethane	ND	2
Vinyl chloride	ND	2
Chloroethane	ND	2
Methylene chloride	ND	30
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
cis-1,2-Dichloroethene	ND	1
trans-1,2-Dichloroethene	ND	1
Chloroform	ND	1
Freon 113	ND	30
1,2-Dichloroethane	ND	1
1,1,1-Trichloroethane	ND	1
Carbon tetrachloride	ND	1
Bromodichloromethane	ND	1
1,2-Dichloropropane	ND	1
cis-1,3-Dichloropropene	ND	1
Trichloroethene	ND	1
1,1,2-Trichloroethane	ND	1
trans-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
2-Chloroethylvinyl ether	ND	2
Bromoform	ND	2
Tetrachloroethene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
Chlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Surrogate Recovery, %	99
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LABORATORY NUMBER: 108792  
CLIENT: SUBSURFACE CONSULTANTS  
PROJECT ID: 469.006  
LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 09/29/92  
DATE RECEIVED: 09/29/92  
DATE ANALYZED: 10/01/92  
DATE REPORTED: 10/07/92

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions  
TVH by California DOHS Method/LUFT Manual October 1989  
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
108792-2	MW-2	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
108792-3	MW-3	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	110

LABORATORY NUMBER: 108792  
 CLIENT: SUBSURFACE CONSULTANTS  
 PROJECT ID: 469.006  
 LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 09/29/92  
 DATE RECEIVED: 09/29/92  
 DATE ANALYZED: 10/02/92  
 DATE REPORTED: 10/07/92

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020  
 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	REPORTING LIMIT * (ug/L)
108792-1	MW-1	ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

\* Reporting Limit applies to all analytes.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	97

LABORATORY NUMBER: 108792  
 CLIENT: SUBSURFACE CONSULTANTS  
 PROJECT ID: 469.006  
 LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 09/29/92  
 DATE RECEIVED: 09/29/92  
 DATE EXTRACTED: 10/01/92  
 DATE ANALYZED: 10/01/92  
 DATE REPORTED: 10/07/92

Extractable Petroleum Hydrocarbons in Aqueous Solutions  
 California DOHS Method  
 LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
108792-1	MW-1	ND	ND	50
108792-3	MW-3	**	410	50

ND = Not detected at or above reporting limit.

\* Reporting limit applies to all analytes.

\*\* Quantitated as diesel range.

QA/QC SUMMARY

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RPD, %                                     3
RECOVERY, %                               114
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Client: Subsurface Consultants  
 Project Name: College of Alameda  
 Project Number: 469.006

Laboratory Login Number: 108792  
 Report Date: 07 October 92

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)      METHOD: SMWW 17:5520BF

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
108792-003	MW-3	Water	29-SEP-92	29-SEP-92	02-OCT-92	ND	mg/L	5	TR	6918

ND = Not Detected at or above Reporting Limit (RL).



QC Batch Report

Client: Subsurface Consultants  
Project Name: College of Alameda  
Project Number: 469.006

Laboratory Number: 108792  
Report Date: 07 October 92

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) QC Batch: 6918

Blank Results

Sample ID	Result	MDL	Units	Method	Analysis Date
BLANK	ND	5	mg/L	SMWW 17:5520BF	02-OCT-92

Spike/ Duplicate Results

Sample ID	Recovery	Method	Analysis Date
BS	85 %	SMWW 17:5520BF	02-OCT-92
BSD	87 %	SMWW 17:5520BF	02-OCT-92

		Limits
Average Spike Recovery	86 %	80%-120%
Relative Percent Difference	2 %	<20 %

LABORATORY NUMBER: 108792  
 CLIENT: SUBSURFACE CONSULTANTS  
 PROJECT ID: 469.006  
 LOCATION: COLLEGE OF ALAMEDA  
 SAMPLE ID: METHOD BLANK

DATE ANALYZED: 10/02/92  
 DATE REPORTED: 10/07/92

EPA 8010  
 Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
Chloromethane	ND	2
Bromomethane	ND	2
Vinyl chloride	ND	2
Chloroethane	ND	2
Methylene chloride	ND	30
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
cis-1,2-Dichloroethene	ND	1
trans-1,2-Dichloroethene	ND	1
Chloroform	ND	1
Freon 113	ND	30
1,2-Dichloroethane	ND	1
1,1,1-Trichloroethane	ND	1
Carbon tetrachloride	ND	1
Bromodichloromethane	ND	1
1,2-Dichloropropane	ND	1
cis-1,3-Dichloropropene	ND	1
Trichloroethene	ND	1
1,1,2-Trichloroethane	ND	1
trans-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
2-Chloroethylvinyl ether	ND	2
Bromoform	ND	2
Tetrachloroethene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
Chlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Surrogate Recovery, %	99
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# CHAIN OF CUSTODY FORM

PROJECT NAME: College of Alameda  
 JOB NUMBER: 469,006 LAB: Curtis & Tompkins  
 PROJECT CONTACT: Marianne Watada TURNAROUND: normal  
 SAMPLED BY: J. BERMUDEZ REQUESTED BY: M. Watada

ANALYSIS REQUESTED							

LABORATORY ID. NUMBER	SCI SAMPLE NUMBER	MATRIX				CONTAINERS				METHOD PRESERVED					SAMPLING DATE				NOTES
		WATER	SOIL	WASTE	AIR	VOA	LITER	PINT	TUBE	HCL	H2SO4	HNO3	ICE	NONE	MONTH	DAY	YEAR	TIME	
	MW-1	X				N	N			X			X		09	29	92		
	MW-2	X				N				X			X						
	MW-3	X				A	R			X			X						
													X						
													X						

COMMENTS & NOTES:

CHAIN OF CUSTODY RECORD			
RELEASED BY: (Signature) <i>J. Bermudez</i>	DATE/TIME 9/29 2:17 <sup>pm</sup>	RECEIVED BY: (Signature)	DATE/TIME
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature) <i>M. Watada</i>	DATE/TIME 9/29 2:17 <sup>pm</sup>

WELL DEVELOPMENT FORM

WELL (1) 6

Project Name: College of Palms Well Number: 3  
 Project Number: 467.006 Well Casing Diameter: 2 inches  
 Developed By: J. Bermudez Date: 9/24/22  
 TOC Elevation: \_\_\_\_\_ Weather: SUNNY  
 Depth to Casing Bottom (below TOC) 5 feet  
 Depth to Groundwater (below TOC) 7 38 feet  
 Feet of water in Well \_\_\_\_\_ feet  
 Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408) \_\_\_\_\_ gallons  
 Depth Measurement Method Tape & Paste/ Elect. Sounder/ Other \_\_\_\_\_  
 Development Method discovery pump

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)		Comments
<u>1/2</u>	<u>6.65</u>	<u>22.1</u>	<u>380</u>	<u>x100</u>	<u>WATER DIRTY</u> <u>ODOR</u>
<u>2</u>	<u>6.69</u>	<u>21.7</u>	<u>385</u>	<u>x100</u>	
<u>3</u>	<u>6.67</u>	<u>21.2</u>	<u>400</u>	<u>x100</u>	↓
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Total Gallons Removed 3 gallons  
 Depth to Groundwater After Development (below TOC) Dry feet



## WELL SAMPLING FORM

Project Name: COLLEGE OF ALAMEDA Well Number: 1  
 Job No.: 469.006 Well Casing Diameter: 2 inch  
 Sampled By: JOSE BERMUDEZ Date: 9/29/92  
 TOC Elevation: 100.72 Weather: SUNNY

Depth to Casing Bottom (below TOC) 12 feet  
 Depth to Groundwater (below TOC) 5.57 feet  
 Feet of Water in Well 6.43 feet  
 Depth to Groundwater When 80% Recovered 6.86 feet  
 Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408) 1.05 gallons  
 Depth Measurement Method  Tape & Paste  Electronic Sounder  Other  
 Free Product NONE  
 Purge Method Disposable Bailer

### FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>1</u>	<u>6.62</u>	<u>22.7</u>	<u>170 x 100</u>		
<u>3</u>	<u>6.79</u>	<u>25.0</u>	<u>220 x 100</u>		

Total Gallons Purged 3 gallons  
 Depth to Groundwater Before Sampling (below TOC) \_\_\_\_\_ feet  
 Sampling Method Disposable Bailer  
 Containers Used 2 40 ml 2 liter \_\_\_\_\_ pint

<b>Subsurface Consultants</b>	COLLEGE OF ALAMEDA - ALAMEDA, CA		PLATE
	JOB NUMBER 469.006	DATE 9/30/92	

## WELL SAMPLING FORM

Project Name: COLLEGE OF ALAMEDA Well Number: 2  
 Job No.: 469.006 Well Casing Diameter: 2 inch  
 Sampled By: JOSE BERMUDEZ Date: 9/29/92  
 TOC Elevation: 99.54 Weather: SUNNY

Depth to Casing Bottom (below TOC) 14' 5" feet  
 Depth to Groundwater (below TOC) 4.47 feet  
 Feet of Water in Well 9.95 feet  
 Depth to Groundwater When 80% Recovered 6.46 feet  
 Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408) 1.62 gallons  
 Depth Measurement Method Tape & Paste / Electronic Sounder / Other  
 Free Product NONE  
 Purge Method disposable Bailer

### FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>2</u>	<u>6.77</u>	<u>24.3</u>	<u>45 x 10<sup>0</sup></u>		<u>Water semi clear</u>
<u>4</u>	<u>6.82</u>	<u>24.2</u>	<u>50 x 10<sup>0</sup></u>		<u>Water semi clear</u>

Total Gallons Purged \_\_\_\_\_ gallons  
 Depth to Groundwater Before Sampling (below TOC) \_\_\_\_\_ feet  
 Sampling Method \_\_\_\_\_  
 Containers Used 3  
                                     40 ml                                      liter                                      pint

<h1 style="margin: 0;">Subsurface Consultants</h1>	COLLEGE OF ALAMEDA - ALAMEDA, CA		PLATE
	JOB NUMBER <u>469.006</u>	DATE <u>9/30/92</u>	APPROVED

## WELL SAMPLING FORM

Project Name: COLLEGE OF ALAMEDA Well Number: 3  
 Job No.: 469.006 Well Casing Diameter: 2 inch  
 Sampled By: JOSE BERMUDEZ Date: 9/29/92  
 TOC Elevation: 101.19 Weather: SUNNY

Depth to Casing Bottom (below TOC) 14' 11" feet  
 Depth to Groundwater (below TOC) 10.79 feet  
 Feet of Water in Well 4.13 feet  
 Depth to Groundwater When 80% Recovered \_\_\_\_\_ feet  
 Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408) \_\_\_\_\_ gallons  
 Depth Measurement Method Tape & Paste / Electronic Sounder / Other  
 Free Product \_\_\_\_\_  
 Purge Method disposable Bailer

### FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Total Gallons Purged \_\_\_\_\_ gallons  
 Depth to Groundwater Before Sampling (below TOC) 10.79 feet  
 Sampling Method Disposable Bailer  
 Containers Used 4 40 ml 3 liter \_\_\_\_\_ pint

**Subsurface Consultants**

COLLEGE OF ALAMEDA - ALAMEDA, CA

PLATE

JOB NUMBER  
469.006

DATE  
9/30/92

APPROVED