

GETTLER-RYAN INC.

April 6, 1999

Ms. Juliet Shin Alameda County Health Services Agency Division of Environmental Protection 1131 Harbor Bay Parkway, 2nd Floor Alameda, California 94502

Subject:

Additional Risk Based Corrective Action Evaluations

Former Tosco Service Station No. 1871

96 MacArthur Boulevard, Oakland, California

Ms. Shin:

At the request of the Alameda County Health Services Agency (ACHSA), Gettler-Ryan Inc. (GR) has prepared this letter and attachments to document additional Risk-Based Corrective Action (RBCA) evaluations. During our telephone conversation on March 16, 1999, Ms. Madhulla Logan and you requested that the RBCA evaluation be modified to reflect the ACHSA comments discussed in our telephone conversation regarding the GR RBCA Evaluation dated February 25, 1999.

The first request was to use the soil data, although located in the subsurface (>3 feet below grade), in the surface soils evaluation for the construction worker Risk Based Screening Levels (RBSLs). The soil data used in this evaluation included analytical data from the waste oil and underground storage tank (UST) excavations, and product piping trenches, soil borings EB-1, EB-2 and EB-3, and from monitoring wells MW-1 through MW-5. These samples were collected between 3 and 10 feet below ground surface (bgs). The RBCA evaluation Output Worksheets and associated analytical concentrations used in the evaluation are attached in Attachment 1.

The second request was to evaluate the air inhalation potential using soil analytical data from the waste oil excavation, soil borings EB-1 through EB-3 and monitoring well MW-4; and groundwater (grab samples) analytical data from the waste oil excavation, soil borings EB-1 through EB-3, and MW-4 (using an arithmetic mean average concentrations from the last year of data). The RBCA evaluation Output Worksheets and associated data tables with analytical concentrations used in the evaluation are attached in Attachment 2.

(AT) (93-15/15~

RBCA Findings

RBSL's for Construction Worker: Modified Evaluation

GR applied the requested soil analytical data for a modified RBCA evaluation in order to establish RBSLs for construction workers. Two Chemicals of Concern (COC) were identified, benzene at a RSBL concentration of 1.1E+2 parts per million (ppm), and held promote Methyl t-Butyl Ether (MtBE) at a RBSL concentration of 2.4E+2 ppm. These calculated RBSLs are higher than the current site conditions (based on the mean concentrations of benzene and MtBE). Worksheet 6.1 lists the RBCA evaluation RBSL's for this modified evaluation.

RBSL's for Air Inhalation (indoor/enclosed space) Modified Data Set

GR applied the requested modified soil and groundwater analytical data set for the RBCA evaluation regarding the air inhalation potential. One exposure pathway, volatilization of groundwater to indoor air, was identified and RBSL's calculated. As shown in Worksheet 6.3 presented in Attachment 2, the COC for this pathway is benzene with a RBSL concentration of 4.6E+2 ppm. The representative concentration of benzene, based on the RBCA modeling program and the given data set is 3.0E-3 ppm, less than the RBSL.

Summary

Based on these two RBCA modified evaluations and the one previously submitted on February 25, 1999, the potential risk at the site is primarily air volatilization from groundwater to indoor air. The RBCA evaluation does illustrate that the representative concentrations are below the calculated RBSLs and therefore do not pose a health risk based on the ASTM E-1739 "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Sites" approved model. The construction worker pathway is also "complete" based on the modified data set (soil analytical data from below 3 feet bgs and the capillary fringe). The site is will be developed into another petroleum fuel storage and dispensing facility. The potential exposure to a construction worker will be minimal and limited to the time that the underground construction is conducted. The construction workers that will be employed should be properly trained and familiar with the exposure to petroleum hydrocarbons and implement appropriate precautionary measures.

The primary and secondary sources of petroleum hydrocarbons have been removed from the site. The analytical data used in this evaluation are conservative and considered to be the worst case scenario. With the removal of the source of hydrocarbons, the residual concentrations should naturally attenuate and continue to decrease any potential risk to the property occupant.

If you have any questions or comments regarding this document, please me at (415) 893-1515.

Sincerely

Gettler-Ryan Inc.

David J. Vossler

Project Manager

Stephen J. Carter Senior Geologist

R.G. No. 5577

Attachments: Attachment 1: RBCA Output/Worksheets-Construction Worker

No. 5577

Attachment 2: RBCA Output/Worksheets-Potential Air Inhalation

(Modified Data Set)

Cc: Mr. David B. DeWitt, Tosco Marketing Company

Ms. Barbara Bee, Property Owner

January 28, 1999

Ms. Juliet Shin Alameda County Health Agency Division of Environmental Protections 1131 Harbor Bay Parkway, 2nd Floor Alameda, California 94502

Re: Status Report for Former Tosco/76 Products Service Station No. 1871

96 MacArthur Boulevard, Oakland.

Dear Ms. Shin:

This letter is written to update you on the status of planned environmental work to be conducted at the site. In May 1998, all underground tanks and surface improvements were removed from the site. Additional contaminated soil was removed to the limits feasible. Four monitor wells (MW-2 through MW-5) were destroyed for the purposes of anticipated redevelopment of the property, but these wells will be replaced by three ACHCS approved wells in the City of Oakland right-of-way along MacArthur Boulevard. These wells are part of the approved Work Plan, which call for additional off-site wells/geoprobe locations as well as a Risk-Based Corrective Action (RBCA) evaluation of the site.

At the present time, Tosco, through its consultant, Gettler-Ryan, Inc. (GR) is in the process of completing the off-site access process and obtaining encroachment permits for the offsite work. Since this is an unpredictable process, we are requesting an extension of the reporting deadline. At your suggestion, we propose to complete the tasks in phases in the following manner:

- The initial RBCA evaluation to be submitted for your review by February 26, 1999. This evaluation will include several "runs" intended to test the sensitivity of input parameters. Discussion will concentrate on the most likely scenario.
- Installation of the replacement wells and geoprobe test borings in those areas under the jurisdiction of the City of Oakland. At present, the encroachment permit applications have been filed and the fees paid. We are in the process of obtaining the additional required information (Owner's permission, insurance and legal description of property) for the City of Oakland. We anticipate securing this permission within a month, to be followed by the actual well installation and summary report. Target completion date: March 31, 1999.

• Installation of GeoProbe installation in areas administered by California Department of Transportation (CalTrans). Our past experience has shown CalTrans' response to be quite variable. We intend to complete this process and install the necessary wells, Geoprobes and prepare reports within three months. Target completion date: April 30, 1999.

In the event these off-site access processes take longer than planned, we will request your help in expediting the necessary permits. If you have any questions or need further details on the site status, please call me at (415) 893-1515.

Sincerely,

Gettler-Ryan Inc.

David J. Vossler Project Manager

Cc: Mr. David B. DeWitt, Tosco marketing Company, San Ramon, Ca.

ATTACHMENT 1

Construction Worker: Modified Output files with Associated Analytical Tables

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Former Tosco (former Unocal) & didentification: 140165.05
Site Location: 96 MacArthur Blvd., Oakland, @ate Completed: 11/23/98
Completed By: David J. Vossler

Software: GSI RBCA Spreadsheet

Version: 1.0.1

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure			Residential		Commerci	al/Industrial	Surface				
exposure Parameter	Definition (Units)	Adult	(1-6yrs)	(1-16 yrs)	Chronic	Constrctn	Parameters		Residential	Constrctn	
Tc	Averaging time for carcinogens (yr)	70	<u> </u>			<u>.</u>	Ā	Contaminated soil area (cm^2)	2.8E+05		
	Averaging time for non-carcinogens (yr)	30	6	16	25	1	W	Length of affect, soil parallel to wind (cm)	<u>5.1E+02</u>		
ιΤn	-	70	15	35	70		W.gw	Length of affect, soil parallel to groundwater (cm)	6.1E+02		
W	Body Weight (kg)		6	16	25	1	Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02		
D	Exposure Duration (yr)	30	6	16	25	1	delta	Air mixing zone height (cm)	2.0E+02		
	Averaging time for vapor flux (yr)	30			250	180	Lss	Thickness of affected surface soils (cm)	1.0E+02		
F	Exposure Frequency (days/yr)	350				180		Particulate areal emission rate (g/cm²2/s)	6.9E-14		
F.Dem	Exposure Frequency for dermal exposure	350			250		Pe	Famiculate aleat emission rate (grow 2/3)	0.52-14		
Rgw	Ingestion Rate of Water (L/day)	2			1						
Rs	Ingestion Rate of Soil (mg/day)	100	200		50	100					
Radi	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01		****	r Definition (Units)	Value		
Ra.in	Inhalation rate indoor (m^3/day)	15			20		delta.gw	Groundwater mixing zone depth (cm)	2.0E+02		
Ra.out	Inhalation rate outdoor (m^3/day)	20			20	10	I	Groundwater infiltration rate (cm/yr)	3.0E+01		
		5.8E+03		2.0E+03	5.8E+03	5.8E+03	Ugw	Groundwater Darcy velocity (cm/yr)	5.8E-01		
SA	Skin surface area (dermal) (cm^2)	2.1E+03		2.00	1.7E+03		Ugw.tr	Groundwater seepage velocity (cπ/yr)	1.5E+00		
6Aadj	Adjusted dermal area (cm^2-yr/kg)						Ks	Saturated hydraulic conductivity(cm/s)	6.1E-07		
M	Soil to Skin adherence factor	1			FALSE		grad	Groundwater gradient (cm/cm)	3.0E-02		
AAFs	Age adjustment on soil ingestion	FALSE			FALSE		Sw	Width of groundwater source zone (cm)	*		
AAFd	Age adjustment on skin surface area	FALSE			FALSE		Sd	Depth of groundwater source zone (cm)			
ox	Use EPA tox data for air (or PEL based)?	<u>FALSE</u>							3.8E-01		
wMCL?	Use MCL as exposure limit in groundwater?	TRUE					phi.eff	Effective porosity in water-bearing unit	1.0E-03		
•	, -						foc.sat	Fraction organic carbon in water-bearing unit			
							BIO?	Is bioattenuation considered?	TRUE		
							BC	Biodegradation Capacity (mg/L)			
Releave of Evo	osed Persons to	Residential			Commerc	iai/Industriai					
	posure Pathways				Chronic	Constrctn	Soil	Definition (Units)	Value	-	
Outdoor Air F					•		hc	Capillary zone thickness (cm)	5.0E+00		
	Volatiles and Particulates from Surface Soils	FALSE			TRUE	TRUE	hν	Vadose zone thickness (cm)	3.4E+02		
v.22	Volatilization from Subsurface Soils	FALSE			TAUE		rho	Soil density (g/cm/3)	1.7		
S.v		FALSE			TRUE		foc	Fraction of organic carbon in vadose zone	0.01		
GW.v	Volatilization from Groundwater	FALSE			11102		phi	Soil porosity in vadose zone	<u>0.41</u>		
Indoor Air Pa		E 11 CE			TRUE		Lgw	Depth to groundwater (cm)	3.4E+02		
S.b	Vapors from Subsurface Soils	FALSE			TRUE		Ls	Depth to top of affected subsurface soil (cm)	2.7E+02		
GW.b	Vapors from Groundwater	FALSE			THUE		Lsubs	Thickness of affected subsurface soils (cm)	6.9E+01		
Soil Pathway			•		E 41 0E	TDUE		•	6.93		
SS.d	Direct Ingestion and Dermal Contact	FALSE			FALSE	TRUE	рН	Soil/groundwater pH	capillary	vadose	founda
Groundwater	Pathways:							The state of the s		0.13	0.12
GW.i	Groundwater Ingestion	FALSE			FALSE		phí.w	Volumetric water content	<u>0.369</u>		
S.I	Leaching to Groundwater from all Soils	FALSE			FALSE		phi.a	Volumetric air content	<u>0.041</u>	<u>0.28</u>	0.20
							Building	Definition (Units)	Residential	Commercial	
							Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02	
Idealu of Pea	eptor Distance	Resid	dential		Commerc	lal/Industrial	ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04	
		Distance	On-Site	-	Distance	On-Site	Lcrk	Foundation crack thickness (cm)	1.5E+01		
	On- or Off-Site	Distance	TRUE			TRUE	eta	Foundation crack fraction	0.01		
GW	Groundwater receptor (cm)		TRUE			TRUE					
S	Inhalation receptor (cm)		INUE			ITIOL					
							Transport				
							Parameters	Definition (Units)	Residential	Commercial	
Matrix of							Groundwate				
Target Risks		Individual	Cumulative	-							
TRab	Target Risk (class A&B carcinogens)	1.0E-06					ax	Longitudinal dispersivity (cm)			
TRC	Target Risk (class C carcinogens)	1.0E-05					ay	Transverse dispersivity (cm)			
THQ	Target Hazard Quotient	1.0E+00					az	Venical dispersivity (cm)			
	Calculation Option (1, 2, or 3)	1					Vapor				
Opt Tier	RBCA Tier	i					dcy	Transverse dispersion coefficient (cm)			
	DOVA US	,					dcz	Vertical dispersion coefficient (cm)			

RBCA CHEMICAL DATABASE

Physical Property Data

CAS		Moleci Weig (g/mo	ht		oeffi	ision icients in wate (cm2/s		log (Kod log(Ko (@ 20 - 2 log(l/k	i) 5 C)		_aw Consta 20 - 25 C)	nt	Vapor Pressur (@ 20 - 25 (mm Hg	C)	Solubility (@ 20 - 25 ((mg/L)	C)	acid	base	
Number Constituent	type	йW	ref	Dair	ref	Dwat	ref		ref	mol	(unitless)	ref		ref		ref	рКа	pKb	re
71-43-2 Benzene	A	78.1	5	9.30E-02	Α	1.10E-05	Α	1.58	A	5.29E-03	2.20E-01	Α	9.52E+01	4	1.75 E+03	Α			
100-41-4 Ethylbenzene	Α	106.2	5	7.60E-02	Α	8.50E-06	Α	1.98	Α	7.69E-03	3.20E-01	Α	1.00E+01	4	1.52E+02	5			
1634-04-4 Methyl t-Butyl	Ether O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	Α	5.77E-04	2.40E-02		2.49E+02		4.80E+04	Α			
108-88-3 Toluene	A A	92.4	5	8.50E-02	A	9.40E-06	Α	2.13	Α	6.25E-03	2.60E-01	Α	3.00E+01	4	5.15E+02	29			
1330-20-7 Xylene (mixed		106.2	5	7.20E-02	Α	8.50E-06	Α	2.38	Α	6.97E-03	2.90E-01	Α	7.00E+00	4	1.98E+02	5			

Site Name: Former Tosco (former Unocal) SS Site Location: 96 MacArthur Blvd., Oakl Completed By: David J. Vossler

Date Completed: 11/23/1998

Software version: 1.0.1

В	
C/	
A C	
HEN	
IICA	
T P	
ΑΊ	
ΑE	
IAS	
m	

Toxicity Data

		eferend Dose ig/kg/d				Slope Factors ng/kg/c	3		EPA Weight	Is
CAS Number Constituent	Oral RfD oral		nhalation RfD inhal	ref	Oral SF_oral	ref	Inhalation SF_inhal	ref	of Evidence	Constituent Carcinogenic ?
71-43-2 Benzene			1.70E-03	R	2.90E-02	Α	2.90E-02	Α	Α	TRUE
100-41-4 Ethylbenzene	1.00E-01	Α	2.86E-01	Α	-		-		D	FALSE
1634-04-4 Methyl t-Butyl Ether	5.00E-03	R	8.57E-01	R	-		•			FALSE
108-88-3 Toluene	2.00E-01	A,R	1.14E-01	A,R	-		-		D	FALSE
1330-20-7 Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	Α	-		-		D	FALSE

Site Name: Former Tosco (former UnocaSite Location: 96 MacArthur Blvd., Oa Completed By: David J. Vossler

Date Completed: 11/23/1998

Software version: 1.0.1

-		-	 	 BASE
=1	r• =	1		 1-7-5-1-

Miscellaneous Chemical Data

CAS	Maximum Contaminant Level		Permissible Exposure Limit PEL/TLV		Relative Absorption Factors		Detection Groundwater (mg/L)		Limits Soil (mg/kg)		Half Life (First-Order Decay) (days)		
Number Constituent	MCL (mg/L)	reference	(mg/m3)	ref	Oral	Dermal		ref		ref	Saturated	Unsaturated	ref
71-43-2 Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	С	0.005	S	720	720	н
100-41-4 Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	н
1634-04-4 Methyl t-Butyl Ether	1 /.552 5.	33 111 3425 (111 1111)	1.44E+02	ACGIH	1	0.5					360	180	H
108-88-3 Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	С	0.005	S	28	28	Н
1330-20-7 Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	С	0.005	S	360	360	Н

Site Name: Former Tosco (former UnocaSite Location: 96 MacArthur Blvd., Oakland, Ca.

Completed By: David J. Vossler Date Completed: 11/23/1998

Software version: 1.0.1

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

	Representative COC Concentration								
CONSTITUENT	in Ground	water	in Surface	Soil	in Subsurface Soil				
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note			
Benzene	3.4E-3	mean	1.0E-2	mean	1.6E-2	mean			
Ethylbenzene	1.7E-3	mean	1.2E-2	mean	1.9E-2	mean			
Methyl t-Butyl Ether	8.0E-3	mean	8.3E-1	mean	4.9E+0	mean			
Toluene	1.9E-3	mean	1.3E-2	mean	1.8E-2	mean			
Xylene (mixed isomers)	2.5F-3	mean	1.6E-2	mean	3.6E-2	mean			

Site Name: Former Tosco (former Unocal) SS # 1871	Completed By: David J. Vossler
Site Location: 96 MacArthur Blvd., Oakland, Ca.	Date Completed: 11/23/1998

[©] Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Xylene (mixed isomers)

EXPOSURE LIMITS IN GROUNDWATER AND AIR

Exposure Limits Applied to Receptors Air (Comm. only) CONSTITUENT Groundwater (PEL/TLV) (mg/m^3) (MCL) (mg/L) 3.2E+0 5.0E-3 Benzene 7.0E-1 4.3E+2 Ethylbenzene 1.4E+2 Methyl t-Butyl Ether 1.5E+2 1.0E+0 Toluene

Site Name: Former Tosco (former Unocal) SS # 1871 Completed By: David J. Vossler Site Location: 96 MacArthur Blvd., Oakland, Ca. Date Completed: 11/23/1998

1.0E+1

4.3E+2

RECA	SITE	455	ESSI	//ENT

Tier 1 Worksheet 8.1

Site Name: Former Tosco (former Unocal) SS # 1871 Site Location: 96 MacArthur Blvd., Oakland, Ca. Completed By: David J. Vossler Date Completed: 11/23/1998

1 OF 9

		TIER 1 EXPOSURE CONC	ENTRATION AND INTAKE CALC	JLATION	
OUTDOOR AIR EXPOSURE PATH	WAYS		CHECKED IF PATHWAY IS ACTIVE)		
SURFACE SOILS: VAPOR AND	Exposure Concentration				
DUST INHALATION	1) <u>Source Medium</u>	2) <u>NAF Value (m^3/ko)</u> Receptor	3) Exposure Medium Outdoor Air: POE Conc. (mg/m^3) (1) / (2)	4) <u>Exposure Multiplier</u> ((BxEFxED)/(BWxAT) (m^3/kg-day)	5) <u>Average Daily Intake Rale</u> (mg/kg-day) (3) X (4)
Constituents of Concern	Surface Soil Conc. (mg/kg)	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial
Benzene	1.0E-2	3.4E+5	2.9E-8	7.0E-2	2.0E-9
Ethylbenzene	1.2E-2	3.4E+5	3.5E-8	2.0E-1	6.8E-9
Methyl t-Butyl Ether	8.3E-1	3.4E+5	2.4E-6	2.0E-1	4.7E-7
Toluene	1.3E-2	3.4E+5	3.8E-8	2.0E-1	7.4E-9
Xylene (mixed isomers)	1.6E-2	3.4E+5	4.6E-8	2.0E-1	9.0E-9

	NOTE:	ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) IR = Inhalation rate (m^3/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)
--	-------	---	---	--	---

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

5.0E+5

Tier 1 Worksheet 8.1

1.4E-8

Site Name: Former Tosco (former Unocal) SS # 1871	Site Location: 96 MacArthur Blvd., Oakland, Ca.	Completed By: David J. Vossler Da	te Completed: 11/23/1998	2 OF 9

	TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION					
OUTDOOR AIR EXPOSURE PATHWAY	S		CHECKED IF PATHWAY IS ACTIVE)			
SUBSURFACE SOILS: VAPOR	Exposure Concentration					
INHALATION	1) Source Medium	2) NAF Value (m^3/kg)	3) Exposure Medium	4) Exposure Multiplier	Average Daily Intake Rate	
İ		Receptor	Outdoor Air: POE Conc. (mg/m^3) (1) / (2)	(iAxEFxED)/(BWxAT) (m^3/kg-day)	(mg/kg-day) (3) X (4)	
	Subsurface Soil Conc.					
Constituents of Concern	(mg/kg)	On Sile Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	
Benzene	1.6E-2	5.0E+5	3.1E-8	7.0E-2	2.2E-9	
Ethylbenzene	1.9E-2	5.0E+5	3.8E-8	2.0E-1	7.4E-9	
Methyl t-Butyl Ether	4.9E+0	5.0E+5	9.7E-6	2.0E-1	1.9E-6	
Toluene	1.8E-2	5.0E+5	3.7E-8	2.0E-1	7.2E-9	

7.3E-8

NOTE: ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure Irequencey (days/yr) ET = Exposure lime (hrs/day) IR = Inhalation rate (m^3/day)	POE = Point of exposure SA = Skin exposue area (cm^2/day)
---	---	--	--

Sollware: GSI RBCA Spreadsheet Version: 1.0.1

2.0E-1

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997, All Rights Reserved.

3.6E-2

Xylene (mixed isomers)

Tier 1 Worksheet 8.1

1.9E-8

2.9E-8

Site Name: Former Tosco (fo	rmer Unocal) SS # 1871	Site Location: 96 MacArtho	y: David J. Vossler	Date Completed: 11/23/1998	3 OF 9			
	TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION							
OUTDOOR AIR EXPOSURE PATI	HWAYS		CHECKED IF PATHWAY IS ACTIV	E)				
GROUNDWATER: VAPOR	Exposure Concentration					TOTAL PATHWAY INTAKE (mg/kg-day)		
INHALATION	1) Source Medium	2) NAF Value (m^3/L) Receptor	3) Exposure Medium Outdoor Air: POE Conc. (mg/m^3) (1) / (2)	4) Exposure Multiplier (IFIXEFXED)/(BWXAT) (m^3/kg-day)	5) <u>Average Daily Intake Raté</u> (mg/kg-day) (3) X (4)	(Sum intake values from surface, subsurface & groundwater routes.)		
Constituents of Concern	Groundwater Conc. (mg/L)	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial		
Benzene	3.4E-3	8.4E+4	4.0E-8	7.0E-2	2.8E-9	7.0E-9		
Ethylbenzene	1.7E-3	8.2E+4	2.1E-8	2.0E-1	4.2E-9	1.8E-8		
Methyl t-Butyl Ether	8.0E-3	1.7E+5	4.7E-8	2.0E-1	9.2E-9	2.4E-6		
		· · · ·	0.000	0.05.4	4.45.0	11 10E.Q		

2.0E-1

2.0E-1

NOTE: ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days) BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) IR = Inhalation rate (m^3/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)
--	--	---

2.3E-8

2.8E-8

Software: GSI RBCA Spreadsheet

4.4E-9

5.5E-9

Serial: G-225-ZRX-486

@ Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

8.4E+4

9.1E+4

1.9E-3

2.5E-3

Toluene

Xylene (mixed isomers)

Tier 1 Worksheet 8.2 **RBCA SITE ASSESSMENT** 1 OF 4 Site Name: Former Tosco (former Unocal) SS Site Location: 96 MacArthur Blvd., Oakland, Ca. Completed By: David J. Vossler Date Completed: 11/23/1998 TIER 1 PATHWAY RISK CALCULATION OUTDOOR AIR EXPOSURE PATHWAYS TOXIC EFFECTS CARCINOGENIC RISK (6) Inhalation (7) Individual COC (4) Individual COC (5) Total Toxicant (2) Total Carcinogenic (3) Inhalation Reference Dose Hazard Quotient (5) / (6) Intake Rate (mg/kg/day) Risk (2) x (3) (1) EPA Intake Rate (mg/kg/day) Slope Factor On-Site On-Site On-Site On-Site Carcinogenic Commercial Commercial (mg/kg-day) Commercial Constituents of Concern Commercial (mg/kg-day)^-1 Classification 1.2E-5 1.7E-3 2.9E-2 2.0E-10 2.0E-8 7.0E-9 Benzene 1.8E-8 2.9E-1 6.4E-8 D Ethylbenzene 8.6E-1 2.8E-6 2.4E-6 Methyl t-Butyl Ether 1.1E-1 1.7E-7 1.9E-8 D Toluene 1.4E-8 2.9E-8 2.0E+0 D Xylene (mixed isomers) 1.5E-5 0.0E+0 0.0E+0 Total Pathway Hazard Index = 2.0E-10 Total Pathway Carcinogenic Risk =

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Tier 1 Worksheet 8.1

			ITRATION AND INTAKE CALCUL		
INDOOR AIR EXPOSURE PATHWA	YS		(CHECKED IF PATHWAY IS ACTIVE)		
SUBSURFACE SOILS:	Exposure Concentration				
YAPOR INTRUSION TO BUILDINGS	1) Source Medium	2) <u>NAF Value (m^3/kg)</u> Receptor	3) Exposure Medium Indoor Air: POE Conc. (mg/m^3) (1) / (2)	4) <u>Exposure Multiplier</u> (IRxEFxED)/(BWxAT) (m^3/kg-day)	5) Average Daily Intake Rate (mg/kg-day) (3) X (4)
Constituents of Concern	Subsurface Soil Conc. (mg/kg)	On-Site Commercial	On-Site Commercial	On-Site Commerciat	On-Site Commerci
Benzene	1.6E-2	4.7E+2	3.3E-5	7.0E-2	2.3E-6
Ethylbenzene	1.9E-2	4.7E+2	4.1E-5	2.0E-1	8.0E-6
Methyl t-Butyl Ether	4.9E+0	4.7E+2	1.0E-2	2.0E-1	2.0E-3
Toluene	1.8E-2	4.7E+2	3.9E-5	2.0E-1	7.7E-6
Xvlene (mixed isomers)	3.6E-2	4.7E+2	7.8E-5	2.0E-1	1.5E-5

NOTE:	ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) IR = Inhalation rate (m^3/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Xylene (mixed isomers)

Tier 1 Worksheet 8.1

Site Name: Former Tosco (former Unocal) SS # 1871 Site Location: 96 MacArthur Blvd., Oakland, Completed By: David J. Vossler

INDOOR AIR EXPOSURE PATHWAYS

Date Completed: 11/23/1998

5 OF 9

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION	
■ (CHECKED IF PATHWAY IS ACTIVE)	
	TOTAL PATHWAY INTAKE (n

GROUNDWATER:	Exposure Concentration					TOTAL PATHWAY INTAKE (mg/kg-day)
VAPOR INTRUSION TO BUILDINGS	1) Source Medium	2) NAF Value (m^3/L)	3) Exposure Medium	4) Exposure Multiplier	5) Average Daily Intake Rate	(Sum intake values from subsurface
ANDOR MINUSION 10 BUILDINGS	·// <u>svag</u>		Indoor Air: POE Conc. (mg/m^3) (1) / (2)	(IRxEFxED)/(BWxAT) (m^3/kg-day)	(mg/kg-day) (3) X (4)	& groundwater routes.)
	Groundwater Conc.					On-Site Commerciat
Constituents of Concern	(mg/L)	On-Site Commercial	On-Site Commercial			
Benzene	3.4E-3	1.4E+2	2.3E-5	7.0E-2	1.6E- <u>6</u>	4.0E-6
Ethylbenzene	1.7E-3	1.3E+2	1.3E-5	2.0E- <u>1</u>	2.6E-6	1.1E-5
Methyl t-Butyl Ether	8.0E-3	8.5E+2	9.4E-6	2.0E-1	1.8E-6	2.0E-3
	1.9E-3	1.4E+2	1.4E-5	2.0E-1	2.7E-6	1.0 E -5
Toluene Vulene (mixed isomers)		1.5E+2	1.7E-5	2.0E-1	3.3E-6	1.9E-5
Xylene (mixed isomers)	2.5E-3	1.5E+2	1.7E-5	2.0E-1	3.3E-6	1,9L-5

NOTE: ABS = Dermal absorption factor (dim) BW = Body weight (kg) EF = Exposure frequencey (days/yr) POE = Point of exposure AF = Adherance factor (mg/cm^2) CF = Units conversion factor ET = Exposure time (hrs/day) SA = Skin exposure area (cm^2/day) AT = Averaging time (days) ED = Exposure duration (yrs) IR = Inhalation rate (m^3/day)

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

@ Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

NDOOR AIR EXPOSURE PATHWAYS CARCINOGENIC RISK CARCINOGENIC RISK CARCINOGENIC RISK CARCINOGENIC RISK CARCINOGENIC RISK (2) Total Carcinogenic (3) Inhalation (4) Individual COC (5) Total Toxicant (6) Inhalation (7) Individual COC (1) EPA Intake Rate (mg/kg/day) Slope Factor Risk (2) x (3) Intake Rate (mg/kg/day) Reference Dose Hazard Quolient (5)
CARCINOGENIC RISK TOXIC EFFECTS (2) Total Carcinogenic (3) Inhalation (4) Individual COC (5) Total Toxicant (6) Inhalation (7) Individual COC (1) EPA Intake Rate (mg/kg/day) Slope Factor Risk (2) x (3) Intake Rate (mg/kg/day) Reference Dose Hazard Quolient (5)
CARCINOGENIC RISK CARCINOGENIC RISK (2) Total Carcinogenic (3) Inhalation (4) Individual COC (5) Total Toxicant (6) Inhalation (7) Individual COC (1) EPA Intake Rate (mg/kg/day) Slope Factor Risk (2) x (3) Intake Rate (mg/kg/day) Reference Dose Hazard Quolient (5)
(2) Intake Rate (mg/kg/day) Slope Factor Risk (2) x (3) Intake Rate (mg/kg/day) Reference Dose Hazard Quotient (5)
Carcinogenic On-Site O
A 4.0E-6 2.9E-2 1.2E-7 1.1E-5 1.7E-3 6.
1.1E-5 2.9E-1 3.
2.0E-3 8.6E-1 2.
1.0E-5 1.1E-1 9.
(ylene (mixed isomers) D 1.9E-5 2.0E+0 9.

@ Graundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Software: GSI RBCA Spreadsheet Version: 1.0.1 Serial: G-225-ZRX-486

Tier 1 Worksheet B.1

Site Name: Former Tosco (form	osco (forme Site Location: 96 MacArthur Blvd., Oakland, Ca. Completed By: David J. Vc Date Completed: 11/23/1998				
	TIER 1 EXPO	SURE CONCENTRATI	ON AND INTAKE CALCULA	TION	
SOIL EXPOSURE PATHWAYS		CHECKED IF PATHWAY IS A	CTIVE)		
SURFACE SOILS OR SEDIMENTS:	Exposure Concentration				
DERMAL CONTACT	1) Source Medium	2) Exposure Multiplier		3) Average Da	ily Intake Rate
		(SAxAFxABSxCFxEF	(SAxAFxABSxCFxEFxED)/(BWxAT) (kg/kg-day)		y) (1) x (2)
Constituents of Concern	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial
Benzene	1.0E-2				
Ethylbenzene	1.2E-2				
Methyl t-Butyl Ether	8.3E-1				
Toluene	1.3E-2				1
Yylana (miyad isomers)	1.6F-2		T		

AF = Adherance factor (mg/cm^2)	xposure Irequencey (days/yr POE = Point of exposure xposure time (hrs/day) SA = Skin exposure area (cm^2/day) take rate (mg/day)
---------------------------------	--

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

@ Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Tier 1 Worksheet 8.1

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION							
SOIL EXPOSURE PATHWAYS	ū.	(CHECKED IF PATH	(WAY IS ACTIVE)				
SURFACE SOILS OR SEDIMENTS:	Exposure Concentration					TOTAL PATHWAY	INTAKE (mg/kg-day)
INGESTION	1) <u>Source Medium</u>	2) <u>Exposure Multiplier</u> (IRxCFxEFxED)/(BWxAT) (kg/kg-day)		3) <u>Average Daily Intake Rate</u> (mg/kg-day) (1) x (2)		(Sum intake values from dermal & ingestion routes.)	
Constituents of Concern	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Sile Commercial	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercie
Benzene	1.0E-2						
Ethylbenzene	1.2E-2		<u> </u>				
Methyl t-Butyl Ether	8.3E-1		<u></u>				
Toluene	1.3E-2						
Xylene (mixed isomers)	1.6E-2						

NOTE:	ABS = Dermal absorption factor (dim AF = Adherance factor (mg/cm/2) AT = Averaging time (days)) BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) IR = Intake rate (mg/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

@ Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

		RBCA	SITE ASSESSI	MENT					Tier 1 Wo	rksheet 8.2	
Site Name: Former Tosco (fo	ormer Unocal) SS	Site Location: 9	96 MacArthur B	lvd., Oakland,	Ca.	Completed By:	David J. Vossle	r	Date Completed	1: 11/23/1998	3 OF 4
		-				CALCULATION	1				
SOIL EXPOSURE PATHWAYS					Ó	(CHECKED IF PAT	HWAYS ARE ACTIV	/E)			
			C.A	RCINOGENIC FI	SK				TOXIC EFFECTS		
Constituents of Concern	(1) EPA Carcinogenic Classification		arcinogenic (mg/kg/day) On-Site Commercial	(3) Oral Slope Factor (mg/kg-day)^-1		idual COC (2) x (3) On-Site Commercial	` '	Toxicant (mg/kg/day) On-Site Commercial	(6) Oral Reference Dose (mg/kg-day)		idual COC otient (5) / (6) On-Site Commercial
Benzene	А			2.9E-2							
Ethylbenzene	D								1.0E-1		
Methyl t-Butyl Ether									5.0E-3		
Toluene	D								2.0E-1		
Xylene (mixed isomers)	D		L					<u> </u>	2.0E+0		
		Total Patt	nway Carcinog	enic Risk = [0.0E+0	0.0E+0	To	otal Pathway H	lazard Index =	0.0E+0	0.0E+0
							***			•	
					· · · · · · · · · · · · · · · · · · ·						

Software: GSI RBCA Spreadsheet Version: 1.0.1

Serial: G-225-ZRX-486

	 SMENT

Tier 1 Worksheet 8.1

Site Name: Former Tosco (forme	er USite Location: 96 Mac		Completed By: David J. Vossler 1		8 (
		TIER 1 EXPOSURE CONC	ENTRATION AND INTAKE CALCUI	LATION	
GROUNDWATER EXPOSURE PATHS	11.40		(CHECKED IF PATHWAY IS ACTIVE)		
SOIL: LEACHING TO GROUNDWATER	Exposure Concentration				
GROUNDWATER INGESTION	1) Source Medium	2) NAF Value (L/kg) Receptor	3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)/(2)	4) Exposure Multiplier (IRxEFxED)/(BWxAT) (L/kg-day)	5) <u>Average Daily Intake Rate</u> (mg/kg-day) (3) x (4)
Constituents of Concern	Soil Concentration (mg/kg)				
Benzene	1.6E-2				
Ethylbenzene	1.9E-2				
Methyl t-Butyl Ether	4.9E+0				
Toluene	1.8E-2				· · · · · · · · · · · · · · · · · · ·
Xylene (mixed isomers)	3.6E-2	1			1

VI = Viginalia in a facility		NOTE:	ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body Weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure lime (hrs/day) IR = Intake rate (U/day)	POE = Point of exposure SA = Skin exposure area (cnr^2/day)
------------------------------	--	-------	---	---	--	--

Soltware: GSI RBCA Spreadsheet Version: 1.0.1

Serial: G-225-ZRX-486

	F	RBCA SITE ASSESSMEN	IT		Tier 1 W	orksheet 8.1
Site Name: Former Tosco (form	ner U Site Location: 96 Mac	Arthur Blvd., Oakland, Ca	<u> </u>	David J. Vossler	Date Completed: 11/23/1998	9 OF 9
	<u>, </u>	TIER 1 EXPOS	URE CONCENTRATION AND	NTAKE CALCULATION	····	
GROUNDWATER EXPOSURE PAT	IN/AVS		CHECKED IF PATHWAY IS ACTIVE)		
	Exposure Concentration					MAX. PATHWAY INTAKE (mg/kg-day)
GROUNDWATER: INGESTION	1) Source Medium	2) NAF Value (dim) Receptor	3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)/(2)	4) <u>Exposure Multiplier</u> (IRxEfxE0)(8WxAT) (L/kg-day)	5) <u>Average Daily Intake Rate</u> (mg/kg-day) (3) x (4)	(Maximum Intake of active pathways soil leaching & groundwater routes.)
Constituents of Concern	Groundwater Conc. (mg/L)					
Benzene	3.4E-3					
Ethylbenzene	1.7E-3				 	
Methyl t-Butyl Ether	8.0E-3				 	
Toluene	1.9E-3				 	
Xylene (mixed isomers)	2.5E-3		<u> </u>	<u> </u>		· · · · · · · · · · · · · · · · · · ·

	NOTE:	ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) IR = Intake rate (L/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)
- 1					

Software: GSI RBCA Spreadsheet Version: 1.0.1

Serial: G-225-ZRX-486

		RBCA SITE ASSESS	SMENT			Tier 1 Worl	rsheet 8.2	
Site Name: Former Tosco (for	mer Unocal) SSS	ite Location: 96 MacArthur	Blvd., Oakland, Ca	. Completed By:	David J. Vossler	Date Completed:	11/23/1998 4	
One realist services				WAY RISK CALCULATION	<u> </u>			
GROUNDWATER EXPOSURE PAT	THURAYS			(CHECKED IF PATI	HWAYS ARE ACTIVE)			
HOUNDWALER EXPOSURE PAI	IIIIAIO		ARCINOGENIC RISK			TOXIC EFFECTS		
		(2) Total Carcinogenic	(3) Oral	(4) Individual COC	(5) Total Toxicant	(6) Oral	(7) Individual COC	
Constituents of Concern	(1) EPA Intake Rate (mg/kg/day) Carcinogenic Classification			Risk (2) x (3)	Intake Rate (mg/kg/day)	Reference Dose (mg/kg-day)	Hazard Quotient (5) / (6)	
Benzene	A		2.9E-2					
Ethylbenzene	D					1.0E-1		
Methyl t-Butyl Ether						5.0E-3		
Toluene	D					2.0E-1		
Xylene (mixed isomers)	D					2.0E+0	<u> </u>	
		Total Pathway Carcino	genic Risk =	0.0E+0 0.0E+0	Total Pathway	Hazard Index =	0.0E+0 0.0E+0	

Software: GSI RBCA Spreadsheet Version: 1.0.1 Serial: G-225-ZRX-486

Tier 1 Worksheet 8.3

Serial: G-225-ZRX-486

Site Name: Former Tosco (former Unocal) SS # 1871 Site Location: 96 MacArthur Blvd., Oakland, Ca. Completed By: David J. Vossler Date Completed: 11/23/1998

1 of 1

		BASELINE	CARCINOGE	NIC RISK			BASELI	NE TOXIC E	FFECTS	
	Individual		Cumulative		Risk Limit(s) Exceeded?	Hazard	Quotient	Hazar	d Index	Toxicity Limit(s) Exceeded?
EXPOSURE	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
	EXPOSURE PATE	IWAYS						100000000000000000000000000000000000000		
Complete:	2.0E-10	1.0E-6	2.0E-10	N/A		1.2E-5	1.0E+0	1.5E-5	N/A	
INDOOR AIR EX	POSURE PATHW	AYS	HHEREIGH							
Complete:	1.2E-7	1.0E-6	1.2E-7	N/A		6.6E-3	1.0E+0	9.1E-3	N/A	
SOIL EXPOSUR	E PATHWAYS									
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	_
GROUNDWATE	R EXPOSURE PA	THWAYS								
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	=
							111111111111111111			
CRITICAL EXPO	SURE PATHWAY	Y (Select Max	imum Values Fr	om Complete	Pathways)			A 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		0111723333333
	1.2E-7	1.0E-6	1.2E-7	N/A		6.6E-3	1.0E+0	9.1E-3	N/A	

Software: GSI RBCA Spreadsheet

Version: 1.0.1

		RBCA SITE AS	SSESSMEN	IT						Tier 1 Work	sheet 6.1	
	rmer Tosco (former Unocal) SS # 18 96 MacArthur Blvd., Oakland, Ca.	71	Completed By	, David J. Vo								1 OF 1
	URFACE SOIL RBSL VA (< 3.3 FT BGS)	LUES	Target Risk (Class C) 1.0E-5 Target Hazard Quotient 1.0E+0		■ MCL exposure limit? ■ PEL exposure limit?		Calculation Option: 1					
	ITS OF CONCERN	Representative Concentration	Soil	Hall - South	s For Complete Ex Groundwater	Inhalati	ays ("x" if Comp on of Volatiles Particulates	x	Construction Worker	Applicable RBSL	FIRST Exceeded 7	Required CRF
		(mg/kg)	Residential: (on-site)		Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)(PEL)		ommercial: n-site) (PEL)	(mg/kg)		Only if "yes" let
QUITO TTIES	Name	1.0E-2	NA	NA	NA	NA	>Res		1.1E+2	1.1E+2		<1
	Benzene	1.2E-2	NA	NA	NA NA	NA	>Res		>Res	>Res		<1
1,212	Ethylbenzene	8.3E-1	NA.	NA	NA	NA	>Res		2.4E+2	2.4E+2		<1
1634-04-4	Methyl t-Butyl Ether	1.3E-2		NA.	NA.	NA	>Res		>Res	>Res		<1
	Toluene (Mixed isomers)	1.6E-2	NA NA	NA NA	NA NA	NA NA	>Res	L	>Res	>Res		<1

>Res_indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

@ Groundwater Services, Inc. (GSI), 1995-1997, All Rights Reserved.

Version: 1.0.1

. 01 ppm

KEI-P94-0601.R1 September 13, 1994

TABLE 1
SUMMARY OF LABORATORY ANALYSES
SOIL

<u>Date</u>	Sample	Depth (feet)	TPH as	TPH as Gasoline	Benzene	Toluene	<u>Ethylbenzene</u>	Xylenes	TOG
pace	D				0.12	0.11	0.12	0.47	1,400
8/03/94	WO1(9)	9	97♦	46	0.12			7.7	ИD
4,00,00	WO1(14)*	9				35.5			160
	WOSW1	9				2.6	9.5	22	17,000
	WOSW2	9	1,400+	960	2.2				2,200
	WOSW3	9							2,400
	WOSW4	9							
<u>Date</u>	<u>Sample</u>	Bromo	form 1.2	-Dichlorobe	enzene <u>1</u>	,3-Dichloro	benzene 1,4-	dichlorober	zene
		ND		22		ND		ND	
3/03/94 WO1(9)** WOSW2**	110 + (-)			1,800		63		540	
	Acena	phthene 1	Anthracene	Benzo(a)a	nthracene	Benzo(b) fluora	inthene		
			E00	9,900	5,3	00	5,000		
	WO1(9) WO5W2		500 300	6,100	4,0		3,300		
		Benzo	(a)pyrene	Chrysen	e Diber	nzofuran	Fluoranthene	Fluorene	
		70		7,500	3	,400	25,000	6,600	
	WO1(9)		1,300	4,800	_	ND	15,000	3,800	
	WOSW2		2,900	4,000		-			
		2-Me	thylnaphth	nalene Na	phthalene	Phenant	hrene Pyren	<u>e</u>	
	WO1(9) WOSW2		8,500 28,000		4,700 10,000	38,0			

KEI-P94-0601.R1 September 13, 1994

TABLE 1 (Continued)

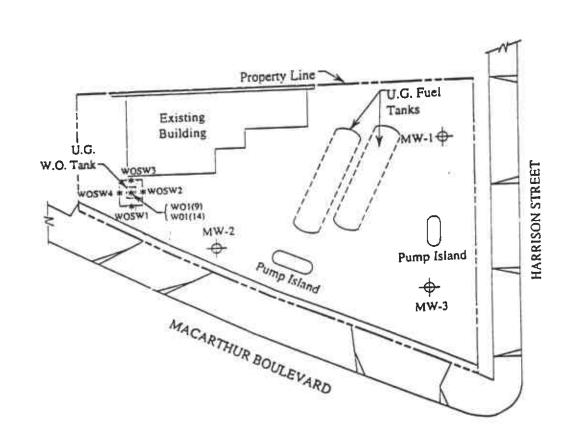
SUMMARY OF LABORATORY ANALYSES SOIL

		o-deium	Chromium	Lead	Nickel	Zinc
Date	Sample	Cadmium		2.1	31	34
8/03/94	WO1(9) WOSW2	ND 1.2	28 33	21 39	35	42

- All EPA method 8270 constituents were non-detectable.
- ** All other EPA methods 8010 and 8270 constituents were nondetectable.
- Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a diesel and non-diesel mixture.
- -- Indicates analysis was not performed.

ND = Non-detectable.

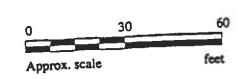
Results are in milligrams per kilogram (mg/kg), except for EPA methods 8010 and 8270 constituents, which were reported in micrograms per kilogram (μg/kg).



LEGEND

- Monitoring well

* Sample point location



SITE PLAN



UNOCAL SERVICE STATION # 1871 96 MACARTHUR BOULEVARD OAKLAND, CALIFORNIA FIGURE

1-

Table 1 - Chemical Analytical Data Former Tosco 76 Branded Facility No. 1871 96 Mac Arthur Boulevard Oakland, California

Sample	Date	Sample	TPHg	Benzene	Toluene	Ethyl- Benzene	Xylenes	MTBE	TPHd	O&G	HVOCs	SVOCs
ID	Collected	Depth (feet)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
GASOLINE UST	PIT EXCAVA	TION (SOI	<1.0	< 0.0050	< 0.0050	<0.0050	<0.0050	1.9	NR	NR	NR	NR
SWI	5/11/98	11.5	<1.0	0.031	<0.0050	< 0.0050	0 015	38	NR	NR	NR	NR
SW2	5/11/98	11.5		9.7	29	38	150	16	NR	NR	NR	NR
SW3	5/11/98	11.5	2,000	5.5	82	49	290	15	NR	NR	NR	NR
SW4	5/11/98	11.5	1,800			0.050	0 20	66	NR	NR	NR	NR
SW3-5	5/12/98	11.0	5.0 ⁴	0.049	0.051	< 0.0050	0.039	12	NR	NR	NR	NR
SW4-5	5/12/98	11.0	<1.0	0.080	<0.0050	V0.000.00	0.037					
GASOLINE UST	PIT EXCAVA	TION (WA	TER)				83	<0.0025	NR	NR	NR	NR
Water-FT	5/11/98	NA	620	<0.0005	18	13	0.3	\0.0023	1111	• • • •	5.000	
WASTE OIL US	T DIT EXCAV	ATION (SC	OIL)							140	ND	ND
WOI	5/11/98	11.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<1.0	140	ND	ND
WASTE OIL US	T PIT EXCAV	ATION (W	ATER)) ND²	ND
Water-WO	5/11/98		0.0904	<0.0005	<0.0005	<0.0005	<0.0005	<0.0025	0.890	<1.0	טא נ	ND
PRODUCT PU	MP ISLANDS	(SOIL)				4 2040	<0.00 <i>6</i> (0.74	NR	NE	NR.	NR
Pl	5/11/98		<1.0	< 0.0050	<0.0050	<0.0050	<0.0050			NI		
P2	5/11/98	4.0	153	<0.0050	0.056	0.10	0.19	<0.050	NR	NI	, m	
HOIST EXCAV	ATIONS (SO	IL)									s MD	NE
H-11	5/12/98		NR	NR	NR	NR	NR	NR	NR			
H-1	5/12/98		NR	NR	NR	NR	NR	NR	NR	N	R NR	NE
DISPOSAL CH	ABAOTERIA	ATION CA	MDI F (SOII	. FROM WA	STE OIL U	ST PIT)					9	20
			<1.0	<0.0050	<0.0050	<0.0050	0.014	NR	6.8	s 11	IO NI) NI
WO SPI	5/12/9	8 NA	1.0	-0.003		30 978555						

Table 1 - Chemical Analytical Data Former Tosco 76 Branded Facility No. 1871 96 Mac Arthur Boulevard Oakland, California

Sample ID	Date Collected	TPHg	Benzene	Toluene	Ethyl- Benzene	Xylenes	Total Lead	
	Concered	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	
SPOSAL CHAR	A <u>CTERIZAT</u>	ION SAMI	PLES					
SPI (A-D)	5/12/98	<1.0	<0.0050	<0.0050	<0.0050	0.015	19	
SPI (E-H)	5/12/98	1703	2.9	0.74	0.78	3.2	2.2	
SP1 (I-L)	5/12/98	60	1.5	5.5	6.6	27	5.9	
SP1 (M-P)	5/12/98	380	1.6	5.6	7.5	34	4.6	
	5/12/98	50	0,32	0.90	0.81	3.5	4.9	
SP1 (Q-T)	5/12/98	1,200	9.0	26	28	100	2. l	
SP1 (U-X)	5/12/98	130	0.94	2.8	2.3	12	3.5	
SPI (Y,Z,1,2) SPI (3,4,5,6)	5/12/98	13 ⁴	0.36	0.57	0,22	0.92	1.9	

Sample ID	Date Collected	Lead (ppm)	Chromium (ppm)	Nickel (ppm)	Zinc (ppm)	Cadmium (ppm)	
WO1	5/11/98	1.0	18	21	61	<0.50	
WO SP1	5/12/98	3.0	30	56	57	<0.50	
Water-WO	5/11/98	<0.020	0.053	0.055	0.065	<0.010	

EXPLANATION:

ND = none detected

NA = not applicable

ppm = parts per million

NR = analysis not requested

MTBE = methyl tert-butyl ether

ANALYTICAL LABORATORY;

Sequoia Analytical (ELAP # 1271)

Table 1 - Chemical Analytical Data

Former Tosco 76 Branded Facility No. 1871 96 Mac Arthur Boulevard Oakland, California

NOTES:

1 = TPH as hydraulic fluid was non-detectable.

- ² = None of the analytes detected except bromodichloromethane (0.0058 ppm), chloroform (0.014 ppm), dibromochloromethane (0.0019 ppm), 1,4-dichlorobenzene (0.00089 ppm 1,2-dichlorobenzene (0.0028 ppm), and tetrachloroethene (0.0017 ppm).
- 3 = Laboratory reports indicates gasoline and unidentified hydrocarbons >C8
- 4 = Laboratory reports indicates gasoline and discrete peaks
- 5 = Laboratory reports indicates unidentified hydrocarbons >C16
- ⁶ = Non of the analytes detected except for phenanthrene (0.350 ppm), pyrene (0.380 ppm), and fluoranthene (0380 ppm).
- ⁷ = Laboratory reports indicates unidentified hydrocarbons <C14

ANALYTICAL METHODS;

TPHg = Total Petroleum Hydrocarbons as gasoline according to EPA Method 8015 Modified.

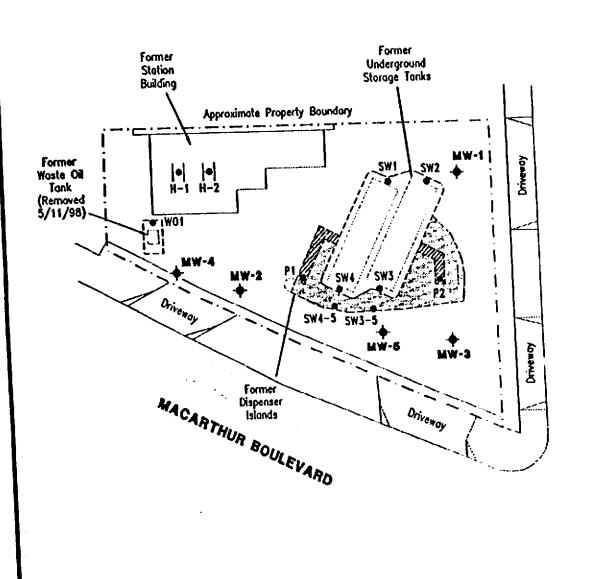
TPHd = Total Petroleum Hydrocarbons as diesel according to EPA Method 8015 Modified.

O&G = Total recoverable petroleum oil according to Standard Methods 5520 E&F(Gravimetric).

HVOCs = Halogenated volatile organic compounds according to EPA Method 8010.

SVOCs = Semi-volatile organic compounds according to EPA Method 8270.

Metals = EPA Method 6010.



EXPLANATION

Groundwater monitoring well

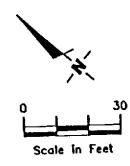
Soil sample location

Product piping trench

Tank excavation

Over excavation

HARRISON STREET



Source: Figure Modified From Drowing Provided By MPOS Services, Inc.



Gettler - Ryan Inc.

6747 Sierra Ct., Suite J Dublin, CA 94568

(925) 551-7555

SITE PLAN/SOIL SAMPLE LOCATION MAP Former Tosco 76 Branded Facility No. 1871 96 MacArthur Boulevard Oakland, California

DATE

REVISED DATE

JOB NUMBER 140165.02 REVIEWED BY

July, 1998

FIGURE



680 Chesapeake Drive 404 N, Wiget Lane 819 Striker Avenue, Suite 8 1455 McDowell Blvd. North, Ste. D Redwood City. CA 94063 Walnut Creek, CA 94598 Sacramento, CA 95834 Petaluma, CA 94954 (650) 364-9600 (925) 988-9600 (916) 921-9600 (707) 792-1865 FAX (650) 364-9233 FAX (925) 988-9673 FAX (916) 921-0100 FAX (707) 792-0342

Gettler Ryan/Geostrategies 6747 Sierra Court Suite J Dublin, CA 94568 Client Proj. ID: Unocal #140165.01 Sampled: 09/16/96

Sample Descript: EB3-9.5

Matrix: SOLID Analysis Method: 8015Mod/8020 Lab Number: 9809D14-01 Sampled: 09/16/98 Received: 09/18/98 Extracted: 09/23/98 Analyzed: 09/24/98 Reported: 09/29/98

Attention: Barbara Sieminsk
QC Batch Number: GC092398BTEXEXA

Instrument ID: GCHP22

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg N.D. N.D. N.D. N.D. N.D. N.D.	
TPPH as Gas Methyl t-Butyl Ether Benzene Toluene Ethyl Benzene Xylenes (Total) Chromatogram Pattern:	1.0 0.025 0.0050 0.0050 0.0050 0.0050		
Surrogates Trifluorotoluene 4-Bromofluorobenzene	Control Limits % 70 130 60 140	% Recovery 105 98	

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher Project Manager Page:

1



680 Chesapeake Drive 404 N. Wiget Lane 819 Striker Avenue, Suite 8 1455 McDowell Blvd, North, Ste. D Redwood City, CA 94063 Walnut Creek, CA 94598 Sacramento, CA 95834 Petaluma, CA 94954

(650) 364-9600 (925) 988-9600 (916) 921-9600 (707) 792-1865

FAX (650) 364-9233 FAX (925) 988-9673 FAX (916) 921-0100 FAX (707) 792-0342

Gettler Ryan/Geostrategies 6747 Sierra Court, Ste. J Dublin, CA 94568

Attention: Barbara Siminski

Client Project ID: Uncoal #141065.01

QC Sample Group: 9809D14

Reported: Sep 29, 1998

QUALITY CONTROL DATA REPORT

Matrix:

Solid

Method: Analyst: **EPA 8015** N.H.

ANALYTE

Gasoline

QC Batch #: GC092398BTEXEXA

Sample No.: 9809891-15

Date Prepared:

9/23/98 9/23/98

Date Analyzed: Instrument I.D.#:

GCHP01

Sample Conc., mg/Kg:

Conc. Spiked, mg/Kg:

N.D.

5.0

Matrix Spike, mg/Kg:

6.5

% Recovery:

130

Matrix

Spike Duplicate, mg/Kg:

4.5 90

% Recovery:

Relative % Difference:

36

RPD Control Limits:

0-25

LCS Batch#: GC092398BTEXEXA

Date Prepared:

9/23/98

Date Analyzed: Instrument I.D.#:

9/23/98 GCHP01

Conc. Spiked, mg/Kg:

5.0

Recovery, mg/Kg:

5.9

LCS % Recovery:

118

Percent Recovery Control Limits:

MS/MSD

60-140

LCS

70-130

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

Please Note:

SEQUOIA ANALYTICAL

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

Tod Granicher Project Manager



680 Chesapeake Drive 404 N. Wiget Lane 819 Striker Avenue, Suite 8 1455 McDowell Blvd. North, Ste. D Redwood City, CA 94063 Walnut Creek, CA 94598 Sacramento, CA 95834 Petaluma, CA 94954

(650) 364-9600 (925) 988-9600 (916) 921-9600 (707) 792-1865 FAX (650) 364-9233 FAX (925) 988-9673 FAX (916) 921-0100 FAX (707) 792-0342

Gettler Ryan/Geostrategies 6747 Sierra Court Suite J

Client Proj. ID: Unocal #140165.01

Received: 09/18/98

Dublin, CA 94568 Attention:

Lab Proj. ID: 9809D14

Reported: 09/29/98

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Tod Granicher Project Manager

Page: 1

UNOCAL 76

Y	680 Chesapeake Drive • Redwood City, C.	A 94063 • (415) 364-9600
•	COO Chicoapeano Billa Processor Chip, C.	

- ☐ 819 Striker Ave., Suite 8 Sacramento, CA 95834 (916) 921-9600
- ☐ 404 N. Wiget Lane Walnut Creek, CA 94598 (510) 988-9600
- 18939 120th Ave., N.E., Suite 101 Bothell, WA 98011 (206) 481-9200
 - ☐ East 11115 Montgomery, Suite B Spokane, WA 99206 (509) 924-9200

0	15055 S.W. Sec	guoia Pkwy,	Suite 110 •	Portland, OR	97222 • (503)	624-980
---	----------------	-------------	-------------	--------------	-----------	------	---------

Consultant Company:	Gettler - R	jan	Jue			Project Na	me: 96	HacAr	thur 1	Blod, C	Odlan	4,70	st# 140169	5,01
Address: 6747 S						UNICAL	Project M	anager:	Tiv	a B	erry			
City: Dublin	State:	- 4	Z	ip Code: 9	4568	AFE #:								
Telephone: (925) 55	71-7555		FAX #: (9	125)551	-7888	Site #, Cit	y, State:	1871	, Oal	cland	, CA			Client
Report To: Barban						3				Level C	☐ Le	vel B	☐ Level A	<u></u>
Turnaround 110 V						rinking Wa	iter .	á			Requested	1		σ.
Time: ☐2W	ork Days 🔲 1 V	Vork Day	🛭 2-8	Hours	o v	Vaste Wate	r Kith	7	7		//			
CODE: 🗅 Misc. 🗅	Detect. 🔾 Eval.	☐ Reme	d. 🛭 De	mol. 🗅 Clo	sure 🚨 C	Other			/ /	/ /	///	/ /	/ <u> </u>	
Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laborato Sample	ry #	rice in			//			Commen	
1. EB3-9,5	09/16/98	Soil		tube	6	×								a protestory
2.								_						{
3.		<u> </u>				'								J,
4.				<u> </u>									 	
5.														\>
6.				<u> </u>									<u> </u>	18 6 3
7.			<u> </u>	<u> </u>										
8			<u> </u>	<u> </u>	 	_			<u> </u>					
9		<u> </u>	ļ	<u> </u>	<u> </u>				1	<u> </u>				
10.			ļ	<u> </u>	<u> </u>				<u>] </u>			لـــــــــــــــــــــــــــــــــــــ		
	(2 0	410	.7/=	m list	e 5. W	10 5		14.1	1. 0	/	D-1-4-	18-58	Time: 144	0
Relinquished By:	Borbon	- Orle	ai pai	e: <i>07 14 </i>	4\$1 ime: 7 7 7	Hec Hec	eived By?	recen	my	3 —	Date		Time: 4 4	
Relinquished By	Charles Con	Ston (Dat	e <i>9-18-</i> 56	Time:	Rec	eived By:				Date:		Time:	
Relinguished By	:		- Dat	e:	Time:	Rec	eived By	Lab: ${\cal U}$	lug l	r-	Date:	18/98	Time: 1834	1
Were Samples Rec		ndition? 🕅			amples on I					_	S		Page of	•
		<u> </u>	·		•						. <u>-</u>			
To be completed u 1) Were the a	nalyses requested	on the C	hain of C	ustody rep	orted? □ Ye	es 🗅 No If	no, what	analyses	s are stil	l needed	?			
2) Was the re	port issued within	the reque	sted turn	around tim	e? 🗆 Yes 🗆	No If no,	what was	the turn	around 1	time?	<u>.</u>	<u> </u>	Date: _	<u> </u>
Approved by:				Signature	•		Ų	Compan	V:				Date:	

TABLE 3: Summary of Soil Analyses: Monitoring Wells
UNOCAL Service Station No. 1871, Oakland, California

	The Was	t		BTEX Distinction						
Sample Designation	Date Sampled	Depth (feet bgs)	TPH-G	Benzene	Toluene	Ethylbenzene	Xylenes			
		F / E	ND	ND	ND	ND	ND			
MW-1(5-6.5')	10/5/92	5-6.5		ND	ND	ND	ND			
MW-1(8.5-10')	10/5/92	8.5-10	ND		ND	ND	ND			
MW-1(13.5-15')	10/5/92	13.5-15	ND	ND	ND					
		255	ND	ND	ND	ND	ND			
MW-2(3.5-5')	2(3.5-5') 10/5/92 3.5	3.5-5			ND	ND	ND			
MW-2(8.5-10')	10/5/92	8.5-10	ND	ND						
			ND.	ND	ND	ND	ND			
MW-3(4-5.5')	10/6/92	4-5.5	ND		0.0088	ND	0.0060			
MW-3(9-10.5')	10/6/92	9-10.5	ND	ND			0.26			
MW-3(12-13.5')	10/6/92	12-13.5	4.2	0.079	0.010	0.16	0.73			
Management of the last	10/6/92	13.5-15	10	0.040	0.013	0.40	0.73			
MW-3(13.5-15')	10/0//2									

FOOTNOTES

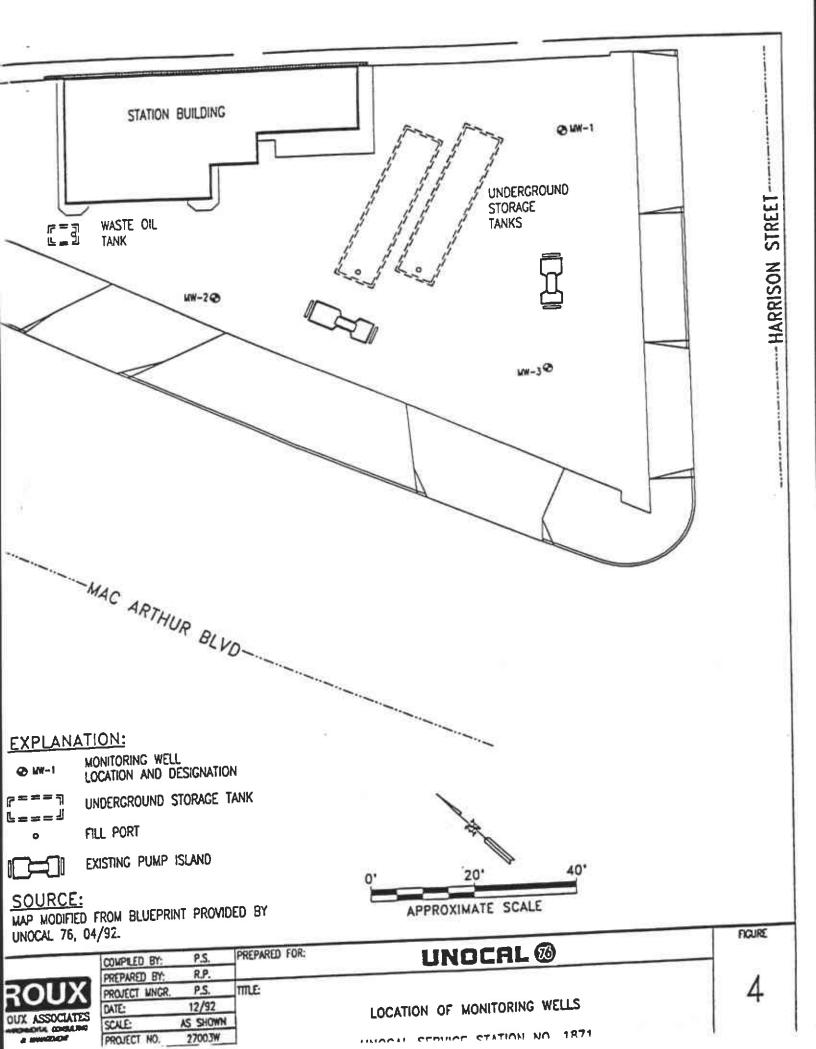
All concentrations reported in mg/kg (ppm)

TPH-G = Total Purgeable Petroleum Hydrocarbons (USEPA Method 8015)

BTEX Distinction (USEPA Method 8020)

ND = Not Detected (for detection limits see laboratory reports in Appendix C)

bgs = Below ground surface



27003W

PROJECT NO.

KEI-P94-0601.R4 May 17, 1996

TABLE 4
SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected by KEI on March 20, 1996)

Sample Number	TPH as Diesel	TPH as Gasoline	<u>Benzene</u>	Toluene	Ethyl- benzene	Xylenes	TOG	EPA Method 8010 Constituents	EPA Method 8270 Constituents
	***	VID	ND	ND	ND	ND	ND	ND(5)	ND
EB1(5)	ND	ND			ND	ND	ND	ND	ND
EB1(10)	ND	ИD	ND	ND			ИD	ND	ND
EB2 (5)	ND	ND	ND	ND	ND	ND			ND(5)
EB2(10)	73(1)	5.7	ND	0.0094	ND	0.035	540	ND	
	1.1(1)	ND	ND	ND	0.0052	0.019	ND	ND(3)	ND (6)
MW4 (5)			ND	0.74	0.15	0.48	1,000	ND(4)	ND(6)
MW4 (9.5)	350 ⁽¹⁾	24			ND	ND			77.6
MW5 (5)		ND	ИD	ND		ND			
MW5 (9)		ND	0.023	ND	ND	ND			

NOTE: The soil samples were collected at the depths below grade indicated in the () of the respective sample number.

ND = Non-detectable.

-- Indicates analysis was not performed.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

TABLE 4 (Continued)

SUMMARY OF LABORATORY ANALYSES SOIL

FOOTNOTES

(1) Sequoia Analytical Laboratory reported that the extractable hydrocarbons detected were "unidentified hydrocarbons."

(2) 1,1-dichloroethene was detected at a concentration of 6.0 micrograms per kilogram (μg/kg).

(3) 1,1-dichloroethene and tetrachloroethene were detected at concentrations of 11 and 8.7 μg/kg, respectively.

(4) 1,2-dichlorobenzene and 1,4-dichlorobenzene were detected at concentrations of 37 and 12 μg/kg, respectively.

(5) All EPA method 8270 constituents were non-detectable, except for the following five compounds:

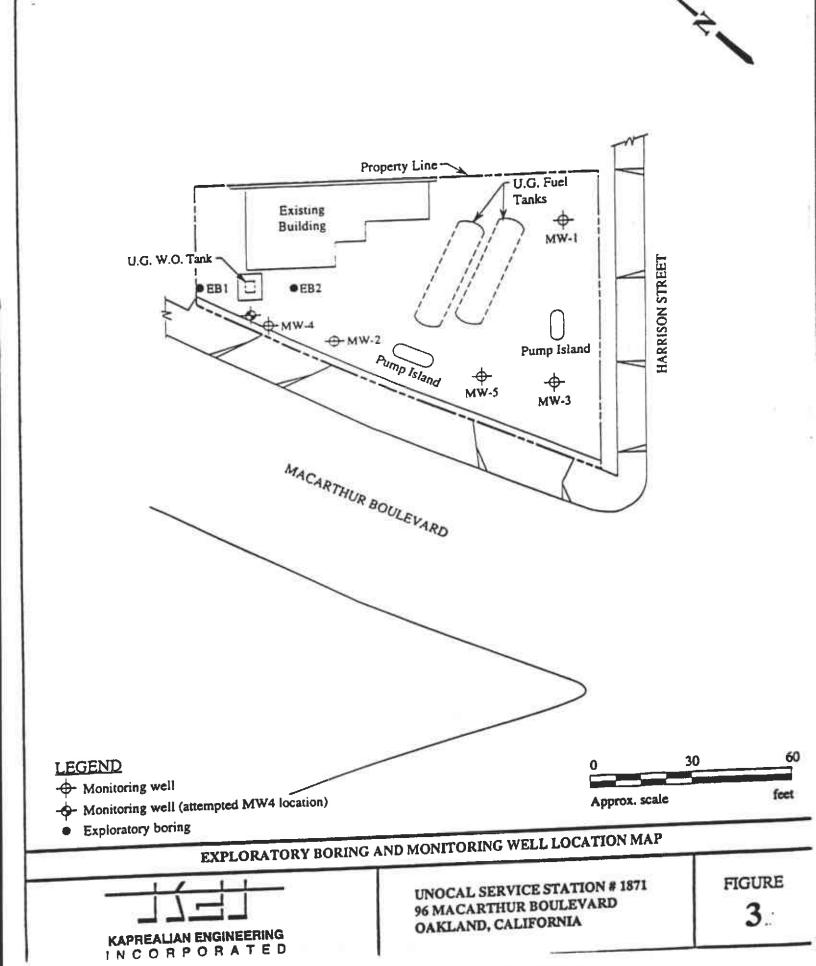
Compound	Concentration (µg/kg)
Benzo(k) fluoranthene	190
Chrysene	180
Fluoranthene	610
Phenanthrene	100
Pyrene	690

(6) All EPA method 8270 constituents were non-detectable, except for the following 11 compounds:

Concentration

Concentration

compounds:	Concentration		Concentration
Compound	(µg/kg)	Compound	(µg/kg)
Acenaphthene	170	Fluoranthene	860
Anthracene	350	Fluorene	190
Benzo(a) anthracene	260	Naphthalene	150
Benzo(b) fluoranthene	240	Phenanthrene	1,300
Benzo(a) pyrene	160	Pyrene	960
Chrysene	290		



ATTACHMENT 2

Air Inhalation: Modified Data Set

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Former Tosco (former Unocal) July Identification: 140165.05 Site Location: 96 MacArthur Bivd., Oakland, Cate Completed: 11/23/98

Completed By: David J. Vossler

Software: GSI RBCA Spreadsheet Version: 1.0.1

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

			Residential		Commerci	al/Industrial	Surface				
xposure arameter	Definition (Units)	Adult	(1-6yrs)	(1-16 yrs)	Chronic	Constrctn	Parameters	Definition (Units)	Residential	Constrctn	
Tç	Averaging time for carcinogens (yr)	70	3=-77	· · · · · · ·	•		A	Contaminated soil area (cm^2)	2.8E+05		
Tn	Averaging time for non-carcinogens (yr)	30	6	16	25	1	W	Length of affect, soil parallel to wind (cm)	6.1E+02		
	Body Weight (kg)	70	15	35	70		W.gw	Length of affect, soil parallel to groundwater (cm)	6.1E+02		
W	Exposure Duration (yr)	30	6	16	25	1	Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02		
D		30	J		25	1	delta	Air mixing zone height (cm)	2.0E+02		
_	Averaging time for vapor flux (yr) Exposure Frequency (days/yr)	350			250	180	Lss	Thickness of affected surface soils (cm)	1.0E+02		
F		350			250		Pe	Particulate areal emission rate (g/cm^2/s)	6.9E-14		
F.Derm	Exposure Frequency for dermal exposure	2			1						
łgw	Ingestion Rate of Water (L/day)	100	200		50	100					
is	Ingestion Rate of Soil (mg/day)	1.1E+02	200		9.4E+01	100	Groundwater	r Definition (Units)	Value		
ladj	Adjusted soil ing. rate (mg-yr/kg-d)	1.15			20		delta.gw	Groundwater mixing zone depth (cm)	2.0E+02	•	
la.in	Inhalation rate indoor (m^3/day)	20			20	10	I	Groundwater infiltration rate (cm/yr)	3.0E+01		
la.out	Inhalation rate outdoor (m^3/day)	5.8E+03		2.0E+03	5.8E+03	5.8E+03	Ugw	Groundwater Darcy velocity (cm/yr)	5.8E-01		
Α	Skin surface area (dermal) (cm^2)	2.1E+03		2.02403	1.7E+03	3,00,100	Ugw.tr	Groundwater seepage velocity (cm/yr)	1.5E+00		
Aadj	Adjusted dermal area (cm^2-yr/kg)	2.16+03			1.72400		Ks	Saturated hydraulic conductivity(cm/s)	6.1E-07		
l 	Soil to Skin adherence factor	FALSE			FALSE		grad	Groundwater gradient (cm/cm)	3.0E-02		
AFs	Age adjustment on soil ingestion	FALSE			FALSE		Sw	Width of groundwater source zone (cm)			
AFd	Age adjustment on skin surface area	FALSE			1 1101		Sd	Depth of groundwater source zone (cm)			
X	Use EPA tox data for air (or PEL based)?	<i>FALSE</i> TRUE					ohi.eff	Effective porosity in water-bearing unit	3.8E-01		
wMCL?	Use MCL as exposure limit in groundwater?	INUE					foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03		
							BIO?	Is bioattenuation considered?	TRUE		
							BC	Biodegradation Capacity (mg/L)			
lately of Ever	and Domone to	Residential			Commerc	ial/Industrial					
	osed Persons to osure Pathways	Ticataci Nat			Chronic	Constrctn	Soil	Definition (Units)	Value		
utdoor Air P							ho	Capillary zone thickness (cm)	5.0E+00	•	
-	Volatiles and Particulates from Surface Soils	FALSE			FALSE	TRUE	hv	Vadose zone thickness (cm)	3.4E+02		
iS.v i.v	Volatilization from Subsurface Soils	FALSE			TRUE		rho	Soil density (g/cm^3)	1.7		
s.v SW.v	Volatilization from Groundwater	FALSE			TRUE		foc	Fraction of organic carbon in vadose zone	0.01		
avv.v ndoor Air Pet	, , , , , , , , , , , , , , , , , , , ,	171000					phi	Soil porosity in vadose zone	<u>0.41</u>		
	Vapors from Subsurface Soils	FALSE			TRUE		Ĺgw	Depth to groundwater (cm)	3.4E+02		
S.b SW.b	Vapors from Groundwater	FALSE			TRUE		Ls	Depth to top of affected subsurface soil (cm)	2.7E+02		
ov.u Soil Pathways	,						Lsubs	Thickness of affected subsurface soils (cm)	6.9E+01		
SS.d	Direct Ingestion and Dermal Contact	FALSE			FALSE	TRUE	ρH	Soil/groundwater pH	<u>6.93</u>		
so.u Groundwater									capillary	vadose	found
andunamaren SW.i	Groundwater Ingestion	FALSE			FALSE		phi.w	Volumetric water content	0.369	0.13	0.
314.1 5.1	Leaching to Groundwater from all Soils	FALSE			FALSE		phi.a	Volumetric air content	0.041	<u>0.28</u>	0.
J.1	Educating to disconditions are as a second										
							Building	Definition (Units)	Residential	Commercial	
							Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02	
Matrix of Rec	eptor Distance	Resid	entlal		Commerc	lal/Industrial	ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04	
	On- or Off-Site	Distance	On-Site		Distance	On-Site	Lork	Foundation crack thickness (cm)	1.5E+01		
GW	Groundwater receptor (cm)		TRUE			TRUE	ela	Foundation crack fraction	0.01		
5	Inhalation receptor (cm)		TRUE			TRUE					
•											
							Transport				
Matrix of							Parameters		Residential	Commercial	
arget Risks		Individual	Cumulative	_			Groundwate				
Rab	Target Risk (class A&B carcinogens)	1.0E-06		•			ax	Longitudinal dispersivity (cm)			
rrac rrac	Target Risk (class C carcinogens)	1.0E-05					ay	Transverse dispersivity (cm)			
THQ	Target Hazard Quotient	1.0E+00					az	Vertical dispersivity (cm)			
Opt	Calculation Option (1, 2, or 3)	1					Vapor				
Tier	RBCA Tier	i					dcy	Transverse dispersion coefficient (cm)			
1 161	1100111141	=					dcz	Vertical dispersion coefficient (cm)			

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS		Maximum taminant Level	Permiss Exposi Limit PEI	ure	Abs	lative orption ictors	Dete Groundw (mg/L	ater	Limits Soi (mg/k	i	(First-O	lf Life der Decay) lays)	
Number Constituent	MCL (mg/L)	reference	(mg/m3)	ref	Oral	Dermal		ref		ref	Saturated	Unsaturated	ref
71-43-2 Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	С	0.005	S	720	720	- H
100-41-4 Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	С	0.005	S	228	228	H]
1634-04-4 Methyl t-Butyl Ether	/.002 07	(20 00000000000000000000000000000000000	1.44E+02	ACGIH	1	0.5					360	180	Н
108-88-3 Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	С	0.005	S	28	28	Н
1330-20-7 Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	С	0.005	s	360	360	Н
	1												

Site Name: Former Tosco (former UnocaSite Location: 96 MacArthur Blvd., Oakland, Ca.

Completed By: David J. Vossler Date Completed: 11/23/1998

Software version: 1.0.1

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

		Representative COC Concentration										
CONSTITUENT	in Ground	water	in Surface	Soil	in Subsurface Soi							
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note						
Benzene	3.0E-3	mean			1.6E-2	mean						
Ethylbenzene	1.3E-3	mean			1.9E-2	mean						
Methyl t-Butyl Ether	7.2E-3	mean			4.9E+0	mean						
Toluene	1.5E-3	mean			1.8E-2	mean						
Yvlene (mixed isomers)	2 1F-3	mean			3.6E-2	mean						

Site Name: Former Tosco (former Unocal) SS # 1871 Site Location: 96 MacArthur Blvd., Oakland, Ca. Completed By: David J. Vossler Date Completed: 11/23/1998

[©] Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Input Screen 9.4

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

Dilution Attenuation Factor

(DAF) in Groundwater

	(001)1110	1 Gariawater
CONSTITUENT	Residential	Comm./Ind.
	Receptor	Receptor
Benzene	1.0E+0	1.0E+0
Ethylbenzene	1.0E+0	1.0E+0
Methyl t-Butyl Ether	1.0E+0	1.0E+0
Toluene	1.0E+0	1.0E+0
Xvlene (mixed isomers)	1.0E+0	1.0E+0

Site Name: Former Tosco (former Unocal) SS # 1871 Completed By: David J. Vossler Site Location: 96 MacArthur Blvd., Oakland, Ca. Date Completed: 11/23/1998

[©] Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Input Screen 9.1

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

	Half-Life of					
CONSTITUENT	Constituent					
	(day)					
Benzene	720					
Ethylbenzene	228					
Methyl t-Butyl Ether	360					
Toluene	28					
Xvlene (mixed isomers)	360					

Site Name; Former Tosco (former Unocal) Completed By: David J. Vossler Site Location: 96 MacArthur Blvd., Oaklan Date Completed: 11/23/1998

[©] Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

EXPOSURE LIMITS IN GROUNDWATER AND AIR

Exposure Limits
Applied to Receptors

	Applied to Fledeplars				
CONSTITUENT	Groundwater	Air (Comm. only)			
	(MCL) (mg/L)	(PEL/TLV) (mg/m^3)			
Benzene	5.0E-3	3.2E+0			
Ethylbenzene	7.0E-1	4.3E+2			
Methyl t-Butyl Ether		1.4E+2			
Toluene	1.0E+0	1.5E+2			
Xvlene (mixed isomers)	1.0E+1	4.3E+2			

Site Name: Former Tosco (former Unocal) SS # 1871 Site Location: 96 MacArthur Blvd., Oakland, Ca. Completed By: David J. Vossler Date Completed: 11/23/1998

[©] Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Tier 1 Worksheet 8.1

		TIER 1 EXPOSURE CONC	ENTRATION AND INTAKE CALCU	LATION		
OUTDOOR AIR EXPOSURE PATH	WAYS		CHECKED IF PATHWAY IS ACTIVE)			
SURFACE SOILS: VAPOR AND	Exposure Concentration					
DUST INHALATION	1) Source Medium	2) <u>NAF Value (m^3/kg)</u> Receptor	Exposure Medium Outdoor Air: POE Conc. (mg/m^3) (1) / (2)	4) <u>Exposure Multiplier</u> (IRXEFXED)/(BWXAT) (m^3/kg-day)	5) <u>Average Daily Intake Rate</u> (mg/kg-day) (3) X (4)	
	Surface Soil Conc.					
Constituents of Concern	(mg/kg)					
Benzene	0.0E+0					
Ethylbenzene	0.0E+0					
Methyl t-Butyl Ether	0.0E+0					
Toluene	0.0E+0					
Xylene (mixed isomers)	0.0E+0					

		ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) tR = Inhalation rate (m^3/day)	POE = Point of exposure SA = Skin exposure area (cm/2/day)
--	--	---	---	--	---

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Tier 1 Worksheet 8.1

Site Name: Former Tosco (former Unocal) SS # 1871 Site Location: 96 MacArthur Blvd., Oakland, Ca. Completed By: David J. Vossler Date Completed: 11/23/1998 2 OF 9

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SUBSURFACE SOILS: VAPOR	Exposure Concentration					
INHALATION	1) Source Medium 2) NAF Value (m^3/kg)		3) Exposure Medium	4) Exposure Multiplier	5) Average Daily Intake Rate	
Constituents of Concern	Subsurface Soil Conc. (mg/kg)	Receptor On-Sile Commercial	Outdoor Air: POE Conc. (mg/m^3) (1)7 (2) On-Site Commercial	(iRxEFxED)/(6WxAT) (m^3/kg-day) On-Site Commercial	(mg/kg-day) (3) X (4) On-Site Commercial	
Benzene	1.6E-2	5.0E+5	3.1E-8	7.0E-2	2.2E-9	
Ethylbenzene	1.9E-2	5.0E+5	3.8E-8	2.0E-1	7.4E-9	
Methyl t-Butyl Ether	4.9E+0	5.0E+5	9.7E-6	2.0E-1	1.9E-6	
Toluene	1.8E-2	5.0E+5	3.7E-8	2.0E-1	7.2E-9	
Xylene (mixed isomers)	3.6E-2	5.0E+5	7.3E-8	2.0E-1	1.4E-8	

NOTE	: ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) IR = Inhalation rate (m^3/day)	POE = Point of exposure SA = Skin exposue area (cm^2/day)

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

@ Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Tier 1 Worksheet 8.1

Site Name: Former Tosco (former Unocal) SS # 1871 Site Location: 96 MacArthur Blvd., Oakland, Completed By: David J. Vossler

Date Completed: 11/23/1998

3 OF 9

TIER 1	EXPOSURE CONCENTRATION	AND INTAKE CALCULATION
--------	------------------------	------------------------

GROUNDWATER: VAPOR	Exposure Concentration					TOTAL PATHWAY INTAKE (mg/kg	
NHALATION	1) Source Medium 2) NAF Value (m^3/L) Receptor		3) Exposure Medium Outdoor Air: POE Conc. (mg/m^3) (1) / (2)	4) <u>Exposure Multiplier</u> (IBxEFxED)(BWxAT) (m^3/kg-day)	5) Average Daily Intake Rate (mg/kg-day) (3) X (4)	(Sum intake values from surface subsurface & groundwater route	
	Groundwater Conc.		1			On-Site Commercial	
Constituents of Concern	(mg/L)	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commercial		
Benzene	3.0E-3	8.4E+4	3.6E-8	7.0E-2	2.5E-9	4.7E-9	
Ethylbenzene	1.3E-3	8.2E+4	1.6E-8	2.0E-1	3.2E-9	1.1E-8	
Methyl t-Butyl Ether	7.2E-3	1.7E+5	4.2E-8	2.0E-1	8.2E-9	1.9E-6	
Toluene	1.5E-3	8.4E+4	1.8E-8	2.0E-1	3.5E-9	1.1E-8	
Xylene (mixed isomers)	2.1E-3	9.1E+4	2.4E-8	2.0E-1	4.6E-9	1.9E-8	

NOTE:	ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) IR = Inhalation rate (m^3/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

	vmar I Inagal) CC	Site Legation: 06 MagArthu	r Blud Oakland	Co	Completed By:	David J. Vosste	r	Date Completed	l: 11/23/1998	10
ite Name: Former Tosco (n	ormer Unocal) Sa	Site Location: 96 MacArthu					<u> </u>	Bute completes	. 11/20/1000	
			TIER 1 PAT	THWAY RISK	CALCULATIO	<u> </u>		.		
UTDOOR AIR EXPOSURE PAT	HWAYS				(CHECKED IF PA	HWAYS ARE ACT	/E)	_		
			CARCINOGENIC R	ISK				TOXIC EFFECTS		
	(1) EPA	(2) Total Carcinogenic Intake Rate (mg/kg/day)	(3) Inhalation Slope Factor	1''		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Inhalation Reference Dose	(7) Individual COC Hazard Quotient (5) / (6)	
onstituents of Concern	Carcinogenic Classification		(mg/kg-day)^-1	On-Site Commercial		On-Site Commercial		(mg/kg-day)		
Benzene	A	4.7E-9	2.9E-2	1.4E-10		1.3E-8		1.7E-3	7.8E-6	
thylbenzene	D					1.1E-8		2.9E-1	3.7E-8	
lethyl t-Butyl Ether						1.9E-6		8.6E-1	2.2E-6	
oluene	D					1.1E-8	_	1,1E-1	9.4E-8	
(ylene (mixed isomers)	D					1.9E-8		2.0E+0	9.4E-9	
		Total Pathway Carcin	ogenic Risk =	1.4E-10	0.0E+0) ra	otal Pathway	Hazard Index =	1.0E-5	0.0E+0
		, , , , , , , , , , , , , , , , , , , ,				4	,	•		

Soltware: GSI RBCA Spreadsheet Version: 1.0.1

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

	_	ASS		1.1	133	
	 -		~~~	- 1 L		

Tier 1 Worksheet 8.1

Site Name: Former Tosco (former Unocal) SS # 1871	Site Location: 96 MacArthur Blvd., Oakland, Ca. Completed By: David J. Vossler Date Completed: 11/23/1998	4 OF 9
	TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION	

SUBSURFACE SOILS:	Exposure Concentration					
YAPOR INTRUSION TO BUILDINGS	1) <u>Source Medium</u>	2) <u>NAF Value (m^3/kg)</u> Receptor	3) Exposure Medium Indoor Air: POE Conc. (mg/m²3) (1) / (2)	4) <u>Exposure Multiplier</u> (IRxEFxED)/(BWxAT) (m^3/kg-day)	5) <u>Average Daily Intake Rate</u> (mg/kg-day) (3) X (4)	
Constituents of Concern	Subsurface Soil Conc. (mg/kg)	On-Site Commercial	On-Site Commercial	On-Site Commercial	On-Site Commerc	
Benzene	1.6E-2	4.7E+2	3.3E-5	7.0E-2	2.3E-6_	
thylbenzene	1.9E-2	4.7E+2	4.1E-5	2.0E-1	8.0E-6_	
Methyl t-Butyl Ether	4.9E+0	4.7E+2	1.0E-2	2.0E-1	2.0E-3	
Toluene	1.8E-2	4.7E+2	3.9E-5	2.0E-1	7.7E-6	
Xylene (mixed isomers)	3.6E-2	4.7E+2	7.8E-5	2.0E-1	1.5E-5	

NOTE:	ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) IR = Inhalation rate (m^3/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)

Software: GSI RBCA Spreadsheet Version: 1.0.1

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

		Tier 1 W	orksheet 8.1						
Site Name: Former Tosco (form	Site Name: Former Tosco (former Unocal) SS # 1871 Site Location: 96 MacArthur Blvd., Oakland, Completed By: David J. Vossler Date Completed: 11/23/1998 5 OF 9								
	TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION								
INDOOR ARE EXPOSURE PATHWAY	INDOOR AIR EXPOSURE PATHWAYS								
GROUNDWATER:	Exposure Concentration					TOTAL PATHWAY INTAKE (mg/kg-day)			
VAPOR INTRUSION TO BUILDINGS	1) Source Medium	2) NAF Value (m^3/L)	3) Exposure Medium	4) Exposure Multiplier	5) <u>Average Daily Intake Rate</u> (mg/kg-day) (3) X (4)	(Sum intake values from subsurface & groundwater routes.)			
	Groundwater Conc.	Receptor	Indoor Air: POE Conc. (mg/m^3) (1) / (2)	((RxEFxED)/(BWxAT) (m^3/kg-day)	(mg/kg-cay) (5) × (4)	a giotificação fotica.			
Constituents of Concern	(mg/L.)	On Site Commercial	On-Site Commercial	On-Site Commercial	On-Sile Commercial				
Benzene	3.0E-3	1.4E+2	2.1E-5	7.0E-2	1,5E-6	3.8E-6			
Ethylbenzene	1.3E-3	1.3E+2	1.0E-5	2.0E-1	2.0E-6	9.9E-6			
Methyl t-Butyl Ether	7.2E-3	8.5E+2	8.4E-6	2.0E-1	1.6E-6	2.0E-3			
Toluene	1.5E-3	1.4E+2	1.1E-5	2.0E-1	2.1E-6	9.8E-6			
Xylene (mixed isomers)	2.1E-3	1,5E+2	1.4E-5	2.0E-1	2.8E-6	1.8E-5			

NOTE:	ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day) IR = Inhalation rate (m^3/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)

Software: GSI RBCA Spreadsheet Version: 1.0.1

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997, All Rights Reserved.

		RBCA SITE ASSESSI	MENT			Tier 1 Work	sheet 8.2	
Site Name: Former Tosco (f	ormer Unocal) SSS	ite Location: 96 MacArthur B	lvd., Oakland, Ca	a. Completed By: I	David J. Vossler	Date Completed:	11/23/1998	20
				WAY RISK CALCULATION				
DOVID AID EVENSURE PATH	WAYS			■ (CHECKED IF PATE	WAYS ARE ACTIVE)			
MODE WHICE CODIES WITH			RCINOGENIC RISI			TOXIC EFFECTS		
	(1) EPA Carcinogenic	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site	(3) Inhalation Slope Factor	(4) Individual COC Risk (2) x (3) On-Site	(5) Total Toxicant Intake Rate (mg/kg/day) On-Site	(6) Inhalation Reference Dose	(7) Individ Hazard Quo	
onstituents of Concern	Classification	Commercial	(mg/kg-day)^-1	Commercial	Commercial	(mg/kg-day)		Commercial
enzene	A	3.8E-6	2.9E-2	1.1E-7	1.1E-5	1.7E-3		6.3E-3
thylbenzene	D		<u> </u>		9.9E-6	2.9E-1		3.5E-5
ethyl t-Butyl Ether					2.0E-3	8.6E-1		2.4E-3
oluene	D				9.8E-6	1.1E-1		8.6E-5
ylene (mixed isomers)	D				1.8E-5	2.0E+0		9.0E-6
		Total Pathway Carcinog	enic Risk =	0.0E+0 1.1E-7	Total Pathway I	Hazard Index =	0.0E+0	8.8E-3
		, ·	_			_		
		· · · · · · · · · · · · · · · · · · ·						

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Software: GSI RBCA Spreadsheet Version: 1.0.1 Serial: G-225-ZRX-486

Site Name: Former Tosco (former Site Location: 96 MacArthur Blvd., Oakland, Ca.

Completed By: David J. Vc Date Completed: 11/23/1998

6 OF 9

	TIER 1 EXPO	SURE CONCENTRATION	I AND INTAKE CALCULAT	TION	
SOIL EXPOSURE PATHWAYS	Ω,	CHECKED IF PATHWAY IS ACT	IVE)		100
SURFACE SOILS OR SEDIMENTS:	Exposure Concentration				
DERMAL CONTACT	1) <u>Source Medium</u>	2) <u>Exposure Multiplier</u> (SAXAFXABSXCFXEFXED)/(BWXAT) (kg/kg-day)		3) <u>Average Daily Intake Rate</u> (mg/kg-day) (1) x (2)	
Constituents of Concern	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial
Велгене	0.0E+0				
Ethylbenzene	0.0E+0				
Methyl t-Butyl Ether	0.0E+0			<u></u> ,	
Toluene	0.0E+0				
Xylene (mixed isomers)	0.0E+0				

NOTE:	ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure frequencey (days/yr ET = Exposure time (hrs/day) IR = Intake rate (mg/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Tier 1 Worksheet 8.1

Site Name: Former Tosco (former U Site Location: 96 MacArthur Blvd., Oakland Completed By: David J. Vossler Date Completed: 11/23/1998 7 OF 9

SOIL EXPOSURE PATHWAYS	(C)	(CHECKED IF PATE	(WAY IS ACTIVE)				
SURFACE SOILS OR SEDIMENTS:	Exposure Concentration					TOTAL PATHWAY	
INGESTION	1) Source Medium 2) Exposure Multiplier 3) Average Daily Intake Rate (IRXCFXEFXED)/(BWXAT) (kg/kg-day) (mg/kg-day) (1) x (2)				(Sum intake dermal & inge		
Constituents of Concern	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercia
Вепzеле	0.0E+0						
Ethylbenzene	0.0E+0		_				
Methyl t-Butyl Ether	0.0E+0]		
Toluene	0.0E+0						
Xylene (mixed isomers)	0.0E+0					II	

NOTE: ABS = Dermal absorption factor (dim) BW = Body weight (kg) AF = Adherance factor (mg/cm^2) CF = Units conversion factor AT = Averaging time (days) ED = Exposure duration (yrs)	EF = Exposure Irequencey (days/yr) ET = Exposure time (hrs/day) tR = Intake rate (mg/day)	POE = Point of exposure SA = Skin exposure area (cπγ/2/day)
---	---	--

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

		RBCA	SITE ASSESSI	MENT					Tier 1 Wor	ksheet 8.2	
Site Name: Former Tosco (fo	rmer Unocal) SSS	Site Location: 9	6 MacArthur B	ivd., Oakland,	Ca.	Completed By:	David J. Vossle	г	Date Completed	: 11/23/1998	3 OF
						CALCULATION	1				
SCIL EXPOSURE PATHWAYS					О	(CHECKED IF PAT	HWAYS ARE ACTIV	/E)			
			C#	RCINOGENIC R	ISK				TOXIC EFFECTS	-	
	(1) EPA Carcinogenic		arcinogenic (mg/kg/day) On-Site	(3) Oral Slope Factor	• •	dual COC 2) x (3) On-Site	, ,	Toxicant (mg/kg/day) On-Site	(6) Oral Reference Dose	Hazard Quo On-Site	dual COC otient (5) / (6) On-Site
Constituents of Concern	Classification	Residential	Commercial	(mg/kg-day)^-1	Residential	Commercial	Residential	Commercial	(mg/kg-day)	Residential	Commercial
Benzene	A			2.9E-2					<u> </u>		
Ethylbenzene	D						<u> </u>		1.0E-1		ļ
Methyl t-Butyl Ether									5.0E-3		ļ
Toluene	D							.	2.0E-1	<u> </u>	ļ <u></u>
Xylene (mixed isomers)	D		<u> </u>	<u> </u>		<u> </u>	L		2.0E+0		
		Total Pati	nway Carcinog	enic Risk =	0.0E+0	0.0E+0] 7	otal Pathway I	lazard Index =	0.0E+0	0.0E+0
			-	•			_			•	
		-									
1											

@ Groundwater Services, Inc. (GSI), 1995-1997. All Righls Reserved.

Software: GSI RBCA Spreadsheet Version: 1.0.1

Serial: G-225-ZRX-486

Tier 1 Worksheet 8.1

	•	TIER 1 EXPOSURE CONC	ENTRATION AND INTAKE CALCU	LATION		
GROUNDWATER EXPOSURE PATH	WAYS		CHECKED IF PATHWAY IS ACTIVE)			
SOIL: LEACHING TO GROUNDWATER/	Exposure Concentration		-			
GROUNDWATER INGESTION	1) Source Medium	2) NAF Value (L/kg)	ue (L/kg) 3) Exposure Medium 4) Exposure Multiplier		5) <u>Average Daily Intake Rate</u>	
		Receptor	Groundwaler: POE Conc. (mg/L) (1)/(2)	(IRxEFxED)/(BWxAT) (L/kg-day)	(mg/kg-day) (3) x (4)	
	Soil Concentration	·	1			
Constituents of Concern	(mg/kg)					
Benzene	1.6E-2				<u> </u>	
Ethylbenzene	1.9E-2					
Methyl I-Butyl Ether	4.9E+0					
Toluene	1.8E-2					
Xylene (mixed isomers)	3.6E-2				I	

	ABS = Dermal absorption factor (dim) AF = Adherance factor (mg/cm^2) AT = Averaging time (days)	BW = Body Weight (kg) CF = Units conversion factor ED = Exposure duration (yrs)	EF = Exposure Irequencey (days/yr) ET = Exposure time (hrs/day) !A = Intake rate (L/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)

Software: GSI FIBCA Spreadsheet

Serial: G-225-ZAX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

		Tier 1 W	orksheet 8.1						
Site Name: Former Tosco (forme	Site Name; Former Tosco (former U Site Location: 96 MacArthur Blvd., Oakland, Ca. Completed By: David J. Vossler Date Completed: 11/23/1998								
		TIER 1 EXPOS	URE CONCENTRATION AND	NTAKE CALCULATION					
GROUNDWATER EXPOSURE PATHY	VAYS	Œ	CHECKED IF PATHWAY IS ACTIVE)					
GROUNDWATER: INGESTION	Exposure Concentration					MAX. PATHWAY INTAKE (mg/kg-day)			
	1) Source Medium	2) NAF Value (dim)	3) Exposure Medium	4) Exposure Multiplier	5) Average Daily Intake Flate	(Maximum intake of active pathways			
	<u> </u>	Receptor	Groundwater: POE Conc. (mg/L) (1)/(2)	(IRxEFxED)/(BWxAT) (L/kg-day)	(mg/kg-day) (3) x (4)	soil leaching & groundwater routes.)			
	Groundwater Conc.		1						
Constituents of Concern	(mg/L)								
Benzene	3.0E-3								
Ethylbenzene	1.3E-3								
Methyl t-Butyl Ether	7.2E-3								
Toluene	1.5E-3								
Xylene (mixed isomers)	2.1E-3				<u> </u>				

NOTE:	ABS = Dermat absorption factor (dim) AF = Adherance factor (mg/cm^2)	BW = Body weight (kg) CF = Units conversion factor	EF = Exposure frequencey (days/yr) ET = Exposure time (hrs/day)	POE = Point of exposure SA = Skin exposure area (cm^2/day)
	AT = Averaging time (days)	ED = Exposure duration (yrs)	IR = Intake rate (L/day)	

Software: GSI RBCA Spreadsheet Version: 1.0.1 Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

		RBCA S	SITE ASSESS	MENT					Tier 1 Worl	(sheet 8.2	
Site Name: Former Tosco (fo	ormer Unocal) SSS	ite Location: 9	6 MacArthur E	Blvd., Oakland, C	a.	Completed By:	David J. Vossle	er	Date Completed:	11/23/1998	4 OF 4
						CALCULATION	l				
GROUNDWATER EXPOSURE P	ATHWAYS					(CHECKED IF PAT	HWAYS ARE ACTIV	VE)			
				ARCINOGENIC RIS					TOXIC EFFECTS		
		(2) Total C	arcinogenic	(3) Oral	(4) Indiv	idual COC	(5) Total	l Toxicant	(6) Oral	(7) Individ	ual COC
	(1) EPA Carcinogenic	Intake Rate	(mg/kg/day)	Slope Factor	Aisk	⟨2⟩ × (3)	Intake Rate	(mg/kg/day)	Reference Dose	Hazard Quot	ient (5) / (6)
Constituents of Concern	Classification			(mg/kg-day)^-1					(mg/kg-day)		
Benzene	A			2.9E-2							
Ethylbenzene	D								1.0E-1		
Methyl t-Butyl Ether									5.0E-3		
Toluene	D								2.0E-1		
Xylene (mixed isomers)	D						<u> </u>		2.0E+0		
		Total Path	nway Carcino	genic Risk =	0.0E+0	0.0E+0	Τ.	otal Pathway	Hazard Index =	0.0E+0	0.0E+0
				_			•		_		
								: GSI RBCA Spr	eadsheel	Serial:	G-225-ZRX-486
	© Groundwater Se	ervices, Inc. (GSI	l), 1995-1 <mark>99</mark> 7. All	Rights Reserved.			Version	: 1.0.1			

Tier 1 Worksheet 8.3

Site Name: Former Tosco (former Unocal) SS # 1871 Site Location: 96 MacArthur Blvd., Oakland, Ca.

Completed By: David J. Vossler Date Completed: 11/23/1998

1 of 1

		BASELIN	E CARCINOGE	NIC RISK			BASEL	INE TOXIC E	FFECTS	
	Individual	COC Risk	Cumulative	e COC Risk	Risk Limit(s) Exceeded?	Hazard	Quotient	Hazar	d Index	Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR E	XPOSURE PAT	HWAYS								
Complete:	1.4E-10	1.0E-6	1.4E-10	N/A		7.8E-6	1.0E+0	1.0E-5	N/A	口
NDOOH AIR EXP	OSURE PATHY	/AYS							1	
Complete:	1.1E-7	1.0E-6	1.1E-7	N/A		6.3E-3	1.0E+0	8.8E-3	N/A	П
SOIL EXPOSURE	PATHWAYS									
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	
GROUNDWATER	EXPOSURE PA	THWAYS								
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	
	· · · · · · · · · · · · · · · · · · ·								· · · · · · · · · · · · · · · · · · ·	
ORITICAL EXPOS	URE PATHWA	Y (Select Maxi	mum Values Fr	om Complete F	Pathways)					
	1.1E-7	1.0E-6	1.1E-7	N/A		6.3E-3	1.0E+0	8.8E-3	N/A	

Software: GSI RBCA Spreadsheet

Version: 1.0.1

Serial: G-225-ZRX-486

© Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Tier 1 Worksheet 6.2 **RBCA SITE ASSESSMENT** Completed By: David J. Vossler Site Name: Former Tosco (former Unocal) SS # 1871 1 OF 1 Date Completed: 11/23/1998 Site Location: 96 MacArthur Blvd., Oakland, Ca. Calculation Option: 1 Target Risk (Class A & B) 1.0E-6 ■ MCL exposure limit? SUBSURFACE SOIL RBSL VALUES ■ PEL exposure limit? Target Risk (Class C) 1.0E-5 (> 3.3 FT BGS) Target Hazard Quotient 1.0E+0 RBSL Results For Complete Exposure Pathways ("x" if Complete) RBSL Representative Soil Volatilization to Soil Volatilization to Concentration Applicable Exceeded Required CRF Outdoor Air RBSL Soil Leaching to Groundwater Indoor Air CONSTITUENTS OF CONCERN Commercial: Regulatory(MCL): Residential: Commercial: Residential: Commercial: Residential: (on-site)(PEL) ■* If yes Only if "yes" left (on-site) (PEL) (on-site) (on-site) (on-site) (on-site) (on-site) (mg/kg) CAS No. Name (mg/kg) 1.6E-2 >Res <1 NA >Res NΑ >Res 71-43-2 Benzene NA NA NA 1.9E-2 NA >Res >Res <1 NA NA NA NA >Res 100-41-4 Ethylbenzene 4.9E+0 >Res <1 NA NA NA NΑ >Res NA >Res 1634-04-4 Methyl t-Butyl Ether 1.8E-2 <1 NA NA NA >Res NA >Res >Res NA 108-88-3 Toluene 3.6E-2 NA NA >Res NA >Res >Res <1 NA NA 1330-20-7 Xylene (mixed isomers)

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet

Serial: G-225-ZRX-486

@ Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

Version: 1.0.1

1016

		RBCA	SITE ASS	ESSMENT						Tier 1 Wo	rksheet 6.3	í
	ormer Tosco (former Unocal) SS # 18 : 96 MacArthur Blvd., Oakland, Ca.	371	•	ly: David J. Vo sted: 11/23/19								1 OF 1
G	ROUNDWATER RBSL V	ALUES	Targel	k (Class A & B) t Risk (Class C) lazard Quotient	1.0E-5	■ MCL expo			Ca	lculation Option	: 1	
CONSTITUE	NTS OF CONCERN	Representative Concentration		RBS Groundwater	L Results For Com	Gre	Pathways ("x" if oundwater tion to Indoor Air	Groundwa	er Volatilization	Applicable RBSL	RBSL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site) (PEL)	Residential (on-site)	Commercial: (on-site) (PEL)	(mg/L	•■• If yes	Only if "yes" lef
71-43-2	2 Benzene	3.0E-3	NA	NA	NA	NA	4.6E+2	NA	>Sol	4.6E+2		<1
100-41-4	4 Ethylbenzene	1.3E-3	NA	NA	NA	NA	>Sol	NA	>Sol	>Sol		<1
1634-04-4	4 Methyl t-Butyl Ether	7.2E-3	NA	NA	NA	NA	>Sol	NA	>Sol	>Sol		<1
108-88-3	3 Toluene	1.5E-3	NA	NA	NA	NA	>\$ol	NA	>Sol	>Sol		<1
1330-20-7	7 Xylene (mixed isomers)	2.1E-3	NA	NA	NA	NA	>Sol	NA	>Sol	>Sol		<1

>Sol indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet Version: 1.0.1

Serial: G-225-ZRX-486

@ Groundwater Services, Inc. (GSI), 1995-1997. All Rights Reserved.

KEI-P94-0601.R1 September 13, 1994

TABLE 1
SUMMARY OF LABORATORY ANALYSES
SOIL

<u>Date</u> ∧	<u>Sample</u>	Depth <u>(feet)</u>	TPH as <u>Diesel</u>	TPH as <u>Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	Ethylbenzene	<u>Xylenes</u>	<u>TOG</u>
8/03/94	WO1(9)	9	97♦	46	0.12	0.11	0.12	0.47	1,400 ND
	WO1(14)*	14							160
	WOSW1_	9		960	2.2	2.6	9.5	22	17,000
•	WOSWZ	9	1,400+	960	2 · £				2,200
	WOSW3	9 9							2,400
	WOSW4	-	. 4						
	mys	hing skept	in pla						
<u>Date</u>	Sample (Bromof		-Dichlorob	<u>enzene</u> <u>1</u>	,3-Dichloro	benzene 1.4-c	lichlorober	<u>izene</u>
				22		ND		ND	
B/03/94	WO1(9)** WOSW2**	ND 220		1,800		63		540	
	WUSWZ ~ ~	220							
		<u>Acena</u>	phthene A	<u>inthracene</u>	<u>Benzo(a)</u> a	inthracene	Benzo(b)fluora	<u>nthene</u>	
		•	E00	9,900	5.3	300	5,000		
·	WO1(9)		500	6,100		000	3,300		
	WOSW2	3,	300	0,100	• •		•		
		<u>Benzo</u>	(a)pyrene	Chryse	ne <u>Dibe</u>	nzofuran	<u>Fluoranthene</u>	<u>Fluorene</u>	<u> </u>
				7,500	3	,400	25,000	6,600	
	WO1(9)		1,300	4,800		ND	15,000	3,800	
	WOSW2	-	2,900	4,800		•••	•		
		<u>2-Met</u>	thylnaphth	<u>alene</u> N	aphthalene	<u>Phenant</u>	hrene <u>Pyrene</u>	2	
	**** (0)		8,500		4,700	38,0	000 24,000		
	WO1(9)		28,000		10,000	22,0)	
	WOSW2		20,000		,	•			

KEI-P94-0601.R1 September 13, 1994

TABLE 1 (Continued)

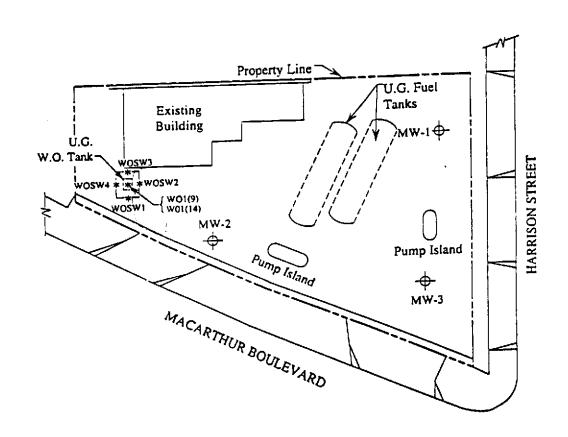
SUMMARY OF LABORATORY ANALYSES SOIL

D- # 4	Sample	Cadmium	Chromium	Lead	Nickel	<u>Zinc</u>
<u>Date</u>	WO1(9)	ND	28	21	31	34
8/03/94	WOSW2	1.2	33	39	35	42

- * All EPA method 8270 constituents were non-detectable.
- ** All other EPA methods 8010 and 8270 constituents were non-detectable.
- Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a diesel and non-diesel mixture.
- -- Indicates analysis was not performed.

ND = Non-detectable.

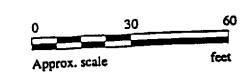
Results are in milligrams per kilogram (mg/kg), except for EPA methods 8010 and 8270 constituents, which were reported in micrograms per kilogram (μ g/kg).





→ Monitoring well

* Sample point location



SITE PLAN

KAPREALIAN ENGINEERING INCORPORATED UNOCAL SERVICE STATION # 1871 96 MACARTHUR BOULEVARD OAKLAND, CALIFORNIA FIGURE 1

Table 1 - Chemical Analytical Data

Former Tosco 76 Branded Facility No. 1871 96 Mac Arthur Boulevard Oakland, California

	Date	Sample	TPHg	Benzene	Toluene	Ethyl-	Xylenes	MTBE	TPHd	O&G	HVOC:	SVOC ₃
Sample ID	Collected	Depth (feet)	(ppm)	(ppm)	(ppm)	Benzene (ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
GASOLINE UST I	PIT FYCAVA	TION (SOII	L)							L I D	NID	NR
SW1	5/11/98	11.5	<1.0	<0.0050	< 0.0050	< 0.0050	< 0.0050	1.9	NR	NR	NR NR	NR NR
SW2	5/11/98	11.5	<1.0	0.031	< 0 0050	<0.0050	0 015	3.8	NR	NR	NR	NR
SW3	5/11/98	11.5	2,000	9.7	29	38	150	16	NR	NR NR	NR NR	NR
SW4	5/11/98	11.5	1,800	5.5	82	49	290	15	NR		NR NR	NR
SW3-5	5/12/98	11.0	5.0 ⁴	0.049	0.051	0.050	0 20	66	NR	NR	NR NR	NR NR
SW4-5	5/12/98	11.0	<1.0	0.080	<0.0050	< 0.0050	0.039	12	NR	NR	NR	MK
GASOLINE UST	PIT EXCAV	ATION (WA	TER)					-0.0026	NR	NR	NR	NR
Water-FT	5/11/98	NA	620	<0.0005	18	13	83	<0.0025	NK	NK	IVIC	****
WASTE OIL UST	r pit ex <u>cav</u>	ATION (SC	OIL)				-0.0050	40.050	<1.0	140	ND	ND
WOI	5/11/98	11.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	~1.0	140	ND	•••
WASTE OIL US	T PIT EXCA	ATION (W	ATER)					-0.0074	0.890 ¹	, <1.0) ND²	ND
Water-WO	5/11/98		0.090 ⁴	<0.0005	<0.0005	<0.0005	<0.0005	<0.0025	U88,U (~1. (טא נ	ND
PRODUCT PU	MP ISLANDS	(SOIL)				-	<0.0050	0.74	NR	NR	. NR	NR
Pl	5/11/98		<1.0	<0.0050		<0.0050				NE	_	NR
P2	5/11/98	4.0	15 ³	<0.0050	0.056	0.10	0.19	<0.050	NR.	IAL	, MX	1410
HOIST EXCAV	ATIONS (SC	<u>)IL)</u>) [70	N D	NR	NI	R NR	NR
H-11	5/12/9		NR	NR	NR	NR	NR	NR			_	
H-21	5/12/9	8.0	NR	NR	NR	NR	NR	NR	NR	NI	K NK	, MK
DISPOSAL CH	ARACTERIZ	ATION SA	MPLE (SOII	FROM WA	STE OIL U	ST PIT)		.	6.8	s 11	0 NE	ND ⁶
. WO SPI	5/12/9		<1.0	<0.0050	0.0050	(0.0050	0.014	NR	5.8	11	O NL	, ND

Table 1 - Chemical Analytical Data

Former Tosco 76 Branded Facility No. 1871

96 Mac Arthur Boulevard Oakland, California

Sample ID	Date Collected	TPHg	Benzene	Toluene	Ethyl- Benzene	Xylenes	Total Lead	
	Conected	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	
POSAL CHAR	ACTERIZAT	ION SAMI	PLES				10	
SPI (A-D)	5/12/98	<1.0	<0.0050	<0.0050	<0.0050	0.015	19	
SPI (E-H)	5/12/98	1703	2.9	0.74	0.78	3.2	2.2	
SPI (I-L)	5/12/98	60	1.5	5.5	6.6	27	5.9	
SP1 (M-P)	5/12/98	380	1.6	5.6	7.5	34	4.6	
SP1 (Q-T)	5/12/98	50	0.32	0.90	0.81	3.5	4.9	
SP1 (U-X)	5/12/98	1,200	9.0	26	28	100	2.1	
	5/12/98	130	0.94	2.8	2.3	12	3.5	
SPI (Y,Z,1,2) SPI (3,4,5,6)	5/12/98	134	0.36	0.57	0.22	0.92	1.9	
SP1 (3,4,5,6)	5/12/98	13	0.30	0,51	0.22	V.,,2	•••	

Sample	Date	Lead	Chromium	Nickel	Zinc	Cadmium
ID	Collected	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
WO1	5/11/98	1.0	18	21	61	<0.50
WO SP1	5/12/98	3.0	30	56	57	<0.50
Water-WO	5/11/98	<0.020	0.053	0.055	0.065	<0.010

EXPLANATION:

ND = none detected

NA = not applicable

ppm = parts per million

NR = analysis not requested

MTBE = methyl tert-butyl ether

ANALYTICAL LABORATORY;

Sequoia Analytical (ELAP # 1271)

Table 1 - Chemical Analytical Data

Former Tosco 76 Branded Facility No. 1871 96 Mac Arthur Boulevard Oakland, California

NOTES:

1 = TPH as hydraulic fluid was non-detectable.

- ² = None of the analytes detected except bromodichloromethane (0.0058 ppm), chloroform (0.014 ppm), dibromochloromethane (0.0019 ppm), 1,4-dichlorobenzene (0.00089 ppm 1,2-dichlorobenzene (0.0028 ppm), and tetrachloroethene (0.0017 ppm).
- 3 = Laboratory reports indicates gasoline and unidentified hydrocarbons >C8
- 4 = Laboratory reports indicates gasoline and discrete peaks
- 5 = Laboratory reports indicates unidentified hydrocarbons >C16
- Non of the analytes detected except for phenanthrene (0.350 ppm), pyrene (0.380 ppm), and fluoranthene (0380 ppm).
- 7 = Laboratory reports indicates unidentified hydrocarbons <C14

ANALYTICAL METHODS:

TPHg = Total Petroleum Hydrocarbons as gasoline according to EPA Method 8015 Modified.

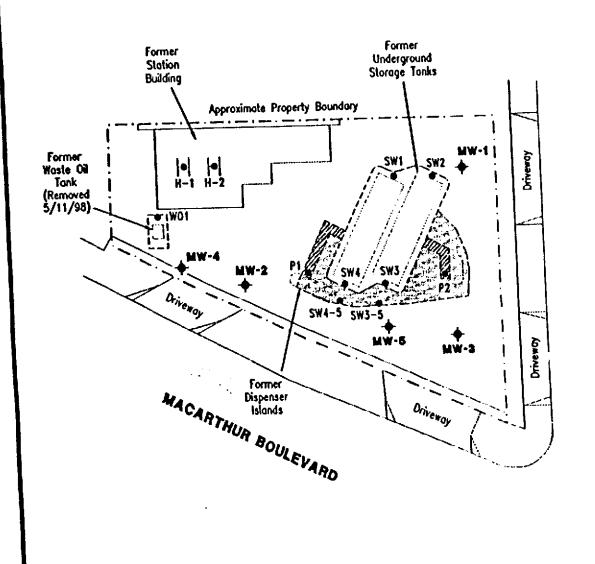
TPHd = Total Petroleum Hydrocarbons as diesel according to EPA Method 8015 Modified.

O&G = Total recoverable petroleum oil according to Standard Methods 5520 E&F(Gravimetric).

HVOCs = Halogenated volatile organic compounds according to EPA Method 8010.

SVOCs = Semi-volatile organic compounds according to EPA Method 8270.

Metals = EPA Method 6010.



EXPLANATION

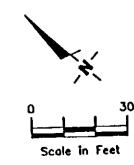
- Groundwater monitoring well
- Soil sample location

Product piping trench

Tank excavation

HARRISON STREET

Over excavation



Source: Figure Modified From Drawing Provided By MPDS Services, Inc.



Gettler - Ryan Inc.

REVIEWED BY

4747 Sierra Ct., Suite J Dubin, CA 94568

(925) 551-7555

SITE PLAN/SOIL SAMPLE LOCATION MAP Former Tosco 76 Branded Facility No. 1871 96 MacArthur Boulevard

DATE

July, 1998

REVISED DATE

Oakland, California

JOB HUMBER 140165.02

FIGURE

KEI-P94-0601.R4 May 17, 1996

TABLE 4
SUMMARY OF LABORATORY ANALYSES
SOIL

(Collected by KEI on March 20, 1996)

	TPH as <u>Diesel</u>	TPH as <u>Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	Ethyl- <u>benzene</u>	<u>Xylenes</u>	TOG	EPA Method 8010 Constituents	EPA Method 8270 Constituents
EB1(5) EB1(10) EB2(5) EB2(10) MW4(5) MW4(9.5) MW5(5)	ND ND ND 73 ⁽¹⁾ 1.1 ⁽¹⁾ 350 ⁽¹⁾	ND ND ND 5.7 ND 24 ND ND	ND ND ND ND ND ND ND	ND ND ND 0.0094 ND 0.74 ND	ND ND ND ND 0.0052 0.15 ND	ND ND ND 0.035 0.019 0.48 ND ND	ND ND ND 540 ND 1,000	ND ⁽²⁾ ND ND ND ND ⁽³⁾ ND ⁽⁴⁾	ND ND ND ⁽⁵⁾ ND ND ⁽⁶⁾

NOTE: The soil samples were collected at the depths below grade indicated in the () of the respective sample number.

ND = Non-detectable.

-- Indicates analysis was not performed.

Results are in milligrams per kilogram (mg/kg), unless otherwise indicated.

.0050

TABLE 4 (Continued)

SUMMARY OF LABORATORY ANALYSES SOIL

FOOTNOTES

(1) Sequoia Analytical Laboratory reported that the extractable hydrocarbons detected were "unidentified hydrocarbons."

(2) 1,1-dichloroethene was detected at a concentration of 6.0 micrograms per kilogram (µq/kq).

(3) 1,1-dichloroethene and tetrachloroethene were detected at concentrations of 11 and 8.7 µg/kg, respectively.

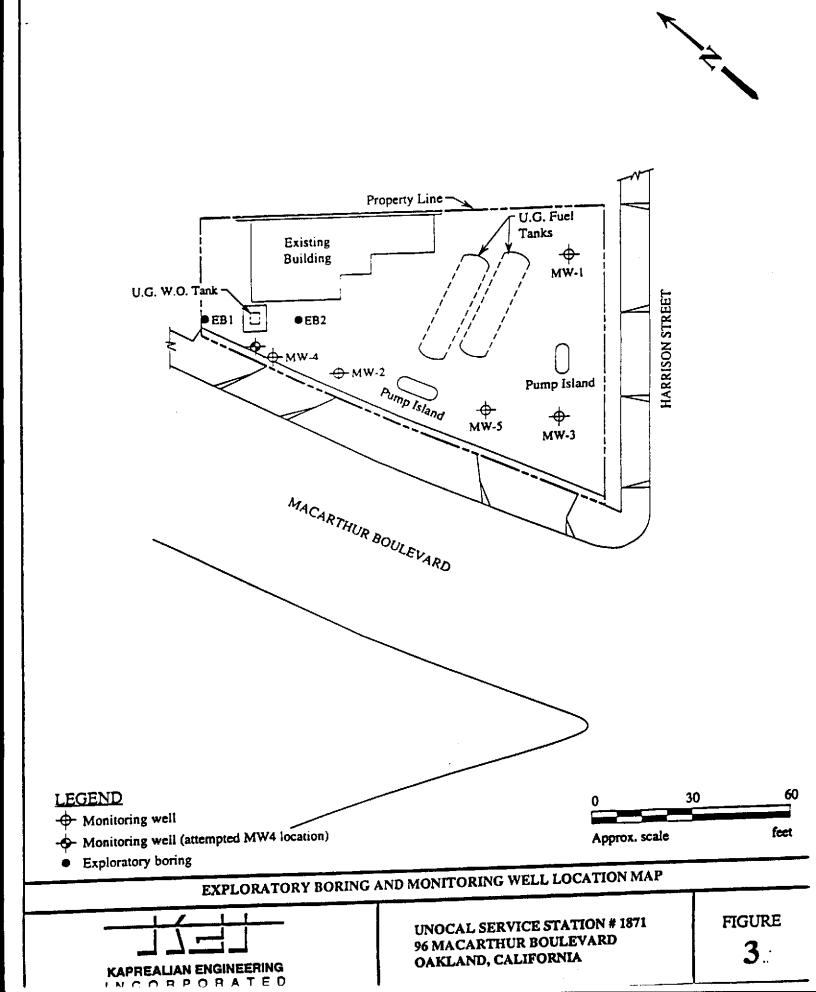
(4) 1,2-dichlorobenzene and 1,4-dichlorobenzene were detected at concentrations of 37 and $12 \mu g/kg$, respectively.

(5) All EPA method 8270 constituents were non-detectable, except for the following five compounds:

Compound	Concentration (µg/kg)			
Benzo(k) fluoranthene	190			
Chrysene	180			
Fluoranthene	610			
Phenanthrene	100			
Pyrene	690			

(6) All EPA method 8270 constituents were non-detectable, except for the following 11 compounds:

Compound	Concentration (µg/kg)	Compound	Concentration (µg/kg)
Acenaphthene	170	Fluoranthene	860
Anthracene	350	Fluorene	190
Benzo(a)anthracene	260	Naphthalene	150
Benzo(b)fluoranthene	240	Phenanthrene	1,300
Benzo (a) pyrene	160	Pyrene	960
Chrysene	290	•	





Redwood City, CA 94063 Walnut Creek, CA 94598 Sacramento, CA 95834 Petaluma, CA 94954

(650) 364-9600 (925) 988-9600 (916) 921-9600 (707) 792-1865

FAX (650) 364-9233 FAX (925) 988-9673 FAX (916) 921-0100 FAX (707) 792-0342

Gettler Ryan/Geostrategies 6747 Sierra Court Suite J

Unocal #140165.01 Client Proj. ID: Sample Descript: EB3-9.5

Sampled: 09/16/98 Received: 09/18/98

Dublin, CA 94568

Matrix: SOUD

Extracted: 09/23/98 Analyzed: 09/24/98

Analysis Method: 8015Mod/8020

Reported: 09/29/98

Attention: Barbara Sieminsk

Lab Number: 9809D14-01

QC Batch Number: GC092398BTEXEXA

Instrument ID: GCHP22

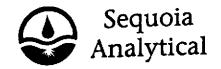
Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas Methyl t-Butyl Ether Benzene Toluene Ethyl Benzene Xylenes (Total) Chromatogram Pattern:	1.0 0.025 0.0050 0.0050 0.0050 0.0050	N.D. N.D. N.D. N.D. N.D.
Surrogates Trifluorotoluene 4-Bromofluorobenzene	Control Limits % 70 130 60 140	% Recovery 105 98

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL -ELAP #1210

Tod Granicher Project Manager



Redwood City, CA 94063 Walnut Creek, CA 94598 Sacramento, CA 95834 Petaluma, CA 94954

(650) 364-9600 (925) 988-9600 (916) 921-9600 (707) 792-1865

FAX (650) 364-9233 FAX (925) 988-9673 FAX (916) 921-0100 FAX (707) 792-0342

Gettler Ryan/Geostrategies 6747 Sierra Court, Ste. J. **Dublin, CA 94568**

Attention: Barbara Siminski

Client Project ID: Uncoal #141065.01

QC Sample Group: 9809D14

Reported: Sep 29, 1998

QUALITY CONTROL DATA REPORT

Matrix:

Solid

Method:

EPA 8015

Analyst:

N.H.

ANALYTE

Gasoline

QC Batch #: GC092398BTEXEXA

Sample No.: 9809891-15

Date Prepared:

9/23/98

Date Analyzed: instrument i.D.#: 9/23/98 GCHP01

Sample Conc., mg/Kg:

N.D.

Conc. Spiked, mg/Kg:

5.0

Matrix Spike, mg/Kg:

6.5

% Recovery:

130

Matrix

Spike Duplicate, mg/Kg:

4.5

% Recovery:

90

Relative % Difference:

36

RPD Control Limits:

0-25

LCS Batch#: GC092398BTEXEXA

Date Prepared:

9/23/98

Date Analyzed:

9/23/98

Instrument I.D.#:

GCHP01

Conc. Spiked, mg/Kg:

5.0

Recovery, mg/Kg:

5.9

LCS % Recovery:

118

Percent Recovery Control Limits:

MS/MSD

60-140

LCS

70-130

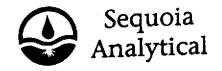
Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

Please Note:

SEQUOIA ANALYTICAL

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

Tod Granicher Project Manager



Redwood City, CA 94063 Walnut Creek, CA 94598 Sacramento, CA 95834 Petaluma, CA 94954

(650) 364-9600 (925) 988-9600 (916) 921-9600 (707) 792-1865

FAX (650) 364-9233 FAX (925) 988-9673 FAX (916) 921-0100 FAX (707) 792-0342

Gettler Ryan/Geostrategies
6747 Sierra Court Suite J Dublin, CA 94568 Barbara Sieminsk Attention:

Client Proj. ID: Unocal #140165.01

Received: 09/18/98

Lab Proj. ID: 9809D14

Reported: 09/29/98

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. report contains a total of pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data,

SEQUOIA ANALYTICAL

Tod Granicher Project Manager

	٠		
L	J	NOCAL	76

680 Chesapeake Drive неdwood City, CA 94063 €	(415) 364-9600
☐ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600

Q 404 N. Wiget Lane • Walnut Creek, CA 94598 • (510) 988-9600

t は 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200
☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200

☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: Gettler - Ry	an:	Jue			Project Name	: 96 H	acArt	hur Bl	vd,0	aklai	nd,	Job # 14016	5.01
Address: 6747 Sierra Ct, S			<u> </u>		b MOCA L Pro							<u></u>	
City: Dublin State:	CA	Z	ip Code: 9	4568	AFE #:								_
Telephone: (925) 551-7555	F	AX #: (9	125)551	-1888	Site #, City, S	State: 1	871,	Oakli	and,	CA			
Report To: Barbara Sieminski	Sampler:	Bark	para Si	eminski	QC Data: 0	Level D	(Standar	al Dia	vel C		evel B	☐ Level A	1
Turnaround 10 Work Days 5 Wo	ork Days	Qзw	ork Days		rinking Water		(Charlos)			equeste		G Level A	
Time: 2 Work Days 1 W	ork Day	2 -8	Hours			<u> </u>		7	/	7		77	
CODE: Misc. Detect. Deval.	Remed	I. 🖸 De	mol. 🖵 Clo	sure 🔾 C	Other	Mr.	/ ,	/ /					
Sample I.D. Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laborator Sample					//	//		Commen	ts
1. EB3-9.5 09/16/98	Soil		tube	6	X				<u> </u>			<u> </u>	
2.										1			
3.					•								
4.		_											
5.											† †		
6.									<u> </u>		1	Q.	
7.													18 - <u>6</u> -
8.										1		****	
9													
10.				_									
	1	71~		IS		4 :		, ,					
Relinquished By: Bolone	19'eur	Date	: 09 18/9.	Time: 144	O Receive	d By	elali	mitter		Date:9	18-98	Time: 144	2
Relinquished By: Charles Com	for 1	Date	9-18-96	Time:	Receive	d By:				Date:		Time:	
Relinguished By:		Date) <u> </u>	Time:	Receive	d By Lat	: Ulu	m hu		ි Date: '	18/98	Time: 1834	
Were Samples Received in Good Condi	lion? XLY	es 🗅 No	Sa	mples on Ic	e? 192(Yes □ 1	lo Met	hod of S	Shipment_				Page of	
To be completed upon receipt of report: 1) Were the analyses requested or 2) Was the report issued within the	n the Cha	nin of Cu	stody repor	ted? 🖸 Yes	S □ No If no, v	vhat ana	lyses a	re still nee	eded? _				
Approved by:							iumarc ipany:		·	•		Date:	

TABLE 5

SUMMARY OF LABORATORY ANALYSES WATER

(Collected by KEI on March 20, 1996)

Sample <u>Number</u>	TPH as <u>Diesel</u>	TPH as <u>Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	Ethyl- benzene	Xylenes	TOG (mg/L)	EPA Method 8010 Constituents	EPA Method 8270 Constituents
EB1	ND	ND	ND	ND	ND	1.3	ND	ND ⁽¹⁾	ND
EB2	410	1,400	690	41	25	64	ND	ND	ND ⁽²⁾

ND = Non-detectable.

mg/L = milligrams per liter.

Results are in micrograms per liter ($\mu g/L$), unless otherwise indicated.

FOOTNOTES:

- (1) 1,1-dichloroethane was detected at a concentration of 0.54 μ g/L.
- (2) All EPA method 8270 constituents were non-detectable, except for the following four compounds: fluoranthene at 2.2 μ g/L, naphthalene at 26 μ g/L, pyrene at 2.4 μ g/L, and 2-methylnaphthalene at 2.2 μ g/L.



Redwood City, CA 94063 Walnut Creek, CA 94598 Sacramento, CA 95834 Petaluma, CA 94954

FAX (650) 364-9233 (650) 364-9600 (925) 988-9600 (916) 921-9600 (707) 792-1865

FAX (925) 988-9673 FAX (916) 921-0100 FAX (707) 792-0342

Gettler Ryan/Geostrategies 6747 Sierra Court Suite J Dublin, CA 94568

96 MacArthur Blvd #140165.01 Client Proj. ID: Sample Descript: EB3-W

Sampled: 09/16/98 Received: 09/18/98

Matrix: LIQUID

Analysis Method: 8015Mod/8020 Lab Number: 9809D94-01

Analyzed: 09/28/98 Reported: 10/01/98

Attention: Deanna Harding

QC Batch Number: GC092898BTEX21A

Instrument ID: GCHP21

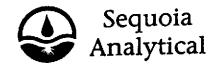
Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas Methyl t-Butyl Ether Benzene Toluene Ethyl Benzene Xylenes (Total) Chromatogram Pattern:	50 2.5 0.50 0.50 0.50 0.50	N.D. 3.6 N.D. N.D. N.D. N.D.
Surrogates Trifluorotoluene	Control Limits % 70 130	% Recovery 92

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL -ELAP #1210

Tod Granicher Project Manager



Redwood City, CA 94063 Walnut Creek, CA 94598 Sacramento, CA 95834 Petaluma, CA 94954

(650) 364-9600 (925) 988-9600 (916) 921-9600 (707) 792-1865

FAX (650) 364-9233 FAX (925) 988-9673 FAX (916) 921-0100 FAX (707) 792-0342

Gettler Ryan/Geostrategies 6747 Sierra Court, Ste. J Dublin, CA 94568

Attention: Deanna Harding

Client Project ID: 96 MacArthur Blvd. #140165.01

QC Sample Group: 9809D94

Reported: Oct 1, 1998

QUALITY CONTROL DATA REPORT

Matrix:	Liquid					
Method:	EPA 8020					
Analyst:	GR/DB					
Allaiyst.	0.4,55					
ANALYTE	Benzene	Taluene	Ethylbenzene	Xylenes		
QC Batch #:	GC092898BTE	(21A				
	GW9809917-2	0.100.00	0120100	9/28/98		
Date Prepared:	9/28/98	9/28/98	9/28/98			
Date Analyzed:	9/28/98	9/28/98	9/28/98	9/28/98		
Instrument I.D.#:	GCGP21	GCGP21	GCGP21	GCGP21		
Sample Conc., ug/L:	N.D.	N.D.	N.D.	N.D.		
	10	10	10	30		
Conc. Spiked, ug/L:	10	10	10	, 00		
Matrix Spike, ug/L:	9.7	9.8	9.9	30		
% Recovery:	97	98	99	101		
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
Matrix			_	-4		
Spike Duplicate, ug/L:	10	10	10	31		
% Recovery:	100	100	101	102		
Relative % Difference:	3.0	2.0	2.0	0.99		
Lighting to Principle.	3 70					
RPD Control Limits:	0-25	0-25	0-25	0-25	<u> </u>	
LCS Batch#:	GWLCS092898/	4				
Date Prepared:	9/28/98	9/28/98	9/28/98	9/28/98		
	9/28/98	9/28/98	9/28/98	9/28/98		
Date Analyzed:			GCGP21	GCGP21		
Instrument I.D.#:	GCGP21	GCGP21	GCGFZT	GCGI 21		
Conc. Spiked, ug/L:	10	10	10	30		
LCS Recovery, ug/L:	10	10	10	30		
LCS % Recovery:	100	100	101	101		
Percent Recovery Cont	rol Limite:					
Leicelle Vacoasià Colle	i yi kilima.		00.140	60.140		

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

60-140

70-130

Please Note:

60-140

70-130

60-140

70-130

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

60-140

70-130

SEQUOIA ANALYTICAL

MS/MSD

LCS

Tod Granicher Project Manager



Redwood City, CA 94063 Walnut Creek, CA 94598 Sacramento, CA 95834 Petaluma, CA 94954

(650) 364-9600 (925) 988-9600 (916) 921-9600 (707) 792-1865

FAX (650) 364-9233 FAX (925) 988-9673 FAX (916) 921-0100 FAX (707) 792-0342

Gettler Ryan/Geostrategies 6747 Sierra Court Suite J ttention: Deanna Harding Dublin, CA 94568 Attention:

Client Proj. ID: 96 MacArthur Blvd #140165.01

Lab Proj. ID: 9809D94

Reported: 10/01/98

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of ______ pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Tod Granicher Project Manager

UNOCAL 76

V680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600

- ☐ 819 Striker Ave., Suite 8 Sacramento, CA 95834 (916) 921-9600
- 의 404 N. Wiget Lane Walnut Creek, CA 94598 (510) 988-9600

U 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200

- ☐ East 11115 Montgomery, Suite B Spokane, WA 99206 (509) 924-9200
- U 15055 S.W. Sequoia Pkwy, Suite 110 Portland, OR 97222 (503) 624-9800

Consultant Company:		4	-			Project Name: 96 Mac Arthur Blod, Oakband, Job#14	016
Address: 6747	n'erra Ct	Ste	- y			UNICOAL Project Manager: Tina Berry	
city: Dublin	State:			Zip Code:	94568		
Telephone: (925)5			FAX #: (925)55	71-7888	Sile #, Cily, State: 1871, Dakund, CA	
Report To: Barbana	. Sieminski	Sampler	r:Barl	burá S	l'eminsk	QC Data: Level D (Standard) Level C Level B Level A	
Turnaround (¥ 10 Wo	ork Days 🚨 5 W rk Days 🔲 1 W	Vork Days Vork Day	s 🗀 3 V	Vork Days 3 Hours	O v	Drinking Water W	F
CODE: Misc. D					osure 🔾 C	Other Note on approx	
Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laborator Sample i	W 19 1 1 1 Common	s
1. EB3-W	09/16/98	water	4 UJAS	VOA			
2.				<u> </u>	<u> </u>	07/70/98 Rua per	<u> </u>
3.		ļ		 		dov. Lee at	
4. 15.			 	 		augher Rua	
6.						912448	10 E
7.			 		 	№ "	
8.		 					
9.				 			
10.			 				
	7 4	 -	711		T		
Relinquished By:						O Received By: Chala Ching Date 9-18-98 Time: 1440	
Relinquished By:	hanfact for	ustran	Date	: 9-18-98	Time:	Received By: Date: Time:	<u>.</u>
Relinquished By:			Date):	Time:	Received By Lab Date: 1534	1
Were Samples Receive		•	res □ No	o Sa	amples on Ice	ce? ⊠Yes □ No Method of Shipment FS Page of	_
e completed upor Were the analy the report	ses requested o	n the Cha	ain of Cu ed turna	islody repo round time	rted? 🖸 Yes ? 🖸 Yes 🗅 N	s 🔾 No. If no, what analyses are still needed?No. If no, what was the turnaround time?	

Table 1
Groundwater Monitoring Data and Analytical Results
Tosco (Former Unocal) Service Station #1871

96 MacArthur Boulevard Oakland, California

	Dete	DTW	GWE	TPH(G)	В	Ţ	E	Х	MTBE
Well ID/	Date	· ·	(msl)	<	<u> </u>		ррЬ		<u>></u>
TOC*	·	<u>(ft.)</u>	(rust)					. –	
	11/03/92			260,000	2,300	4,600	3,700	17,000	
MW-1	01/25/93			120,000	2,100	4,600	4,900	22,000	
	04/29/93	13.71	67.47	100,000	850	2,000	4,300	19,000	
81.18		14.51	66.67	29,000	590	560	980	4,200	
	07/16/93 10/19/93	15.20	65.98	67,000	1,400	2,600	2,900	5,000	••
	01/20/94	15.20 15.17	66.01	92,000	1,200	3,000	3,400	17,000	
	01/20/94	14.44	66.74	51,000	1,000	2,600	3,200	15,000	
	07/13/94	14.88	66.30	35,000	550	150	1,400	5,700	
	10/10/94	15.55	65.63	52,000	1,000	810	3,300	12,000	••
	01/10/95	12.44	68.74	810	16	18	59	250	
	04/17/95	12.68	68.50	48,000	880	530	2,500	11,000	
	07/24/95	13.97	67.21	48,000	1,500	420	2,700	9,700	
•	10/23/95	14.85	66.33	47,000	780	210	2,100	11,000	270
	01/18/96	14.21	66.97	30,000	1,500	500	3,500	13,000	2,400
86.24	04/18/96	13.40	72.84	66,000	2,700	2,200	3,100	13,000	57,000
80.24	07/24/96	14.15	72.09	5,600	2,100	ND	160	160	24,000
	10/24/96	14.85	71.39	110,000	7,500	8,000	3,300	14,000	58,000
	01/28/97	11.25	74.99	94,000	7,700	19,000	3,100	15,000	120,000
	01/29/97	14.67	71.57	ND	ND	ND	ND	ИD	70,000
	01/23/37	12.27	13.97	85,000	6,100	10,000	3,000	17,000	110,000
	07/01/98	14.32	71.92	110,000	8,700	12,000	2,700	15,000	110,000
	07/01/70	14.55	12.72	2	•				
MW-2	11/03/92	••		140	2.2	ND	ND	2.0	
MIAA-7	01/25/93			2,100	56	1.1	90	140	
76.61	04/29/93	9.73	66.88	1,500	290	ND	33	11	
70.01	07/16/93	10.17	66.44	510 ¹	17	0.60	3,2	2.5	
	10/19/93	11.18	65.43	670	24	1.1	7.7	23	
	01/20/94	11.12	65.49	820	97	ND	12	ND	
	04/13/94	10.12	66.49	550	71	- ND	5.1	1.3	
	07/13/94	10.86	65.75	2,000	490	ND	17	13	
	10/10/94	11.48	65.13	2,300	340	ND	25	ND	
	01/10/95	8.71	67.90	850	3.8	ND	8.5	1.3	**
	04/17/95	8.90	67.71	1,300	4.7	ND	8.3	1.2	
	07/24/95		66.67	960	20	ND	4.2	6.2	

Table 1
Groundwater Monitoring Data and Analytical Results
Tosco (Former Unocal) Service Station #1871

96 MacArthur Boulevard Oakland, California

Well ID/	Date : : : :	DTW	GWE	TPH(G)	В	T	E	X	MTBE >
TOC•		(ft.)	(msl)	<u> </u>			ppb		
	-					MD.	ND	ND	19
MW-2	10/23/95	10.70	65.91	ND	ND	ND	7.6	18	4,300
(cont)	01/18/96	10.11	66.50	900	300	86	7.6 890	4,100	19,000
81.66	04/18/96	9.27	72.39	18,000	3,600	680			120,000
	07/24/96	10.02	71.64	100,000	13,000	21,000	2,700	16,000 20	20,000
	10/24/96	10.78	70.88	800	110	17	11		29,000
	01/28/97	7.70	73.96	45,000	2,400	2,900	2,000	7,600	29,000 17,000
	07/29/97	10.28	71.38	ND	1.2	0.72	0.63	0.62	23,000
	01/14/98	8.63	73.03	14,000	1,000	150	790	3,300	
	07/01/98	9.53	72.13	2,700	100	ND3	180	78	7,100
_	- 2 · · -			2,100	120	15	38	200	
MW-3	11/03/92			2,100	80	13	55	52	-
	01/25/93	11.27	 66 11	2,300 4,500	1,700	ND	200	140	**
77.48	04/29/93	11.37	66.11	· ·	1,700	28	52	70	
	07/16/93	12.09	65.39	4,000 ¹	1,100 42	ND	50	56	••
	10/19/93	12.69	64.79	3,800	42 11	ND	21	15	••
	01/20/94	12.65	64.83	4,200		ND	36	53	
	04/13/94	12.02	65.46	4,200	210		ND	21	
	07/13/94	12.46	65.02	1,800 ²	16	16		ND	4=
	10/10/94	12.98	64.50	4,300	11	ND	12	2.1	
	01/10/95	10.42	67.06	310	4.6	ND	3.5	2.1 450	
	04/17/95	10.42	67.06	7,800	ND	4.6	300		••
	07/24/95	11.76	65.72	3,200	170	ND	22	16 11	4,500
	10/23/95	12.50	64.98	3,900	55	ND	19		4,500 5,500
	01/18/96	11.79	65.69	2,200	270	33	26	18	48,000
82.55	04/18/96	11.30	71.25	6,000	1,800	ИĎ	100	230	
	07/24/96	12.17	70.38	ИО	2,500	ND	ND	ND	71,000
	10/24/96	12.65	69.90	3,800	660	ND	15	ND	65,000
	01/28/97	9.50	73.05	4,400	250	13	87	47	54,000
	07/29/97	11.99	70.56	ND	3,500	ND	220	ND	75,000
	01/14/98	10.30	72.25	ND3	430	ND ₂	100	380	37,000
	07/01/98	11.70	70.85	ND	430	ND,	ND3	ND3	45,000

Table 1
Groundwater Monitoring Data and Analytical Results
Tosco (Former Unocal) Service Station #1871

96 MacArthur Boulevard Oakland, California

	D-4-	DTW	GWE	TPH(G)	В	T	E	Х	MTBE	
Well ID/ TOC*	- Date	(n.)	(msl)	<			—ррь			_1
NIW-4 82.04	04/18/96 07/24/96 10/24/96 01/28/97 07/29/97	9.83 10.47 11.14 7.94 10.86 8.73	72.21 71.57 70.90 74.10 71.18 73.31	ND ND ND 1,200 50 ND ³	630 ND ND 490 1.5	ND ND ND ND 0.61	ND ND ND 17 0.73 ND ³	ND 5.2 ND 6.8 0.78 ND ³	18,000 3,900 6,300 16,000 15,000 5,200 640	1998
	07/01/98	10.51	71.53	ND	0.005	0.005	0.005	0.005		Average last Year
MW-5 81.80	04/18/96 07/24/96 10/24/96 01/28/97 07/29/97 01/14/98 07/01/98	9.65 10.80 11.40 7.76 11.58 9.08 11.25	72.15 71.00 70.40 74.04 70.22 72.72 70.55	31,000 32,000 17,000 19,000 ND ND ³ 6,400	5,500 6,400 6,900 6,100 ND 3,600 2,100	1,400 ND ND 62 ND ND ³ 21	1,700 1,600 970 82 ND ND ³ 120	8,100 6,100 130 310 ND ND ³ 330	66,000 120,000 84,000 160,000 71,000 80,000 61,000	
Trip Blank TB-LB	01/14/98 07/01/98	 -	. 	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	

Table 1

Groundwater Monitoring Data and Analytical Results

Tosco (Former Unocal) Service Station #1871

96 MacArthur Boulevard Oakland, California

EXPLANATIONS:

Groundwater monitoring data and laboratory analytical results prior to January 14, 1998, were compiled from reports prepared by MPDS Services, Inc.

TOC = Top of Casing elevation

B = Benzene

ppb = Parts per billion

DTW = Depth to Water

T = Toluene

ND = Not Detected

(ft.) = Feet

E = Ethylbenzene

-- = Not Measured/Not Analyzed

GWE = Groundwater Elevation
(msi) = Referenced relative to mean sea level

X = Xylenes

MTBE = Methyl tertiary butyl ether

TPH(G) = Total Petroleum Hydrocarbons as Gasoline

- * TOC elevations were re-surveyed by Kier & Wright in May, 1996, per City of Oakland Benchmark No. 2310, a cut square in concrete curb at mid point of return at the northeast corner of El Dorado and Fairmont Street. (Elevation = 77.53 feet msl).
- Laboratory report indicates the presence of discrete peaks not indicative of gasoline.
- 2 Laboratory report indicates the hydrocarbons detected appeared to be a gasoline and non-gasoline mixture.
- 3 Detection limit raised. Refer to analytical results.

Table 2

Groundwater Analytical Results

Tosco (Former Unocal) Service Station #1871

96 MacArthur Boulevard Oakland, California

				NOC	SVOC
Well	Date	TPH(D)	TOG	PPB-	> ``.
D MW-4	04/18/96 07/24/96 10/24/96 01/28/97 07/29/97 01/14/98 07/01/98	110 ¹ ND ND 210 ³ ND ND	XD XD XD XD XD XD XD	ND ND ND ND ND ND	- 22 22 22 22 22 22 22 22 22 22 22 22 22

EXPLANATIONS:

Groundwater analytical results prior to January 14, 1998, were compiled from reports prepared by MPDS Services, Inc.

TPH(D) = Total Petroleum Hydrocarbons as Diesel

TOG = Total Oil and Grease

VOC = Volatile Organic Compounds by EPA Method 8010

SVOC = Semi-Volatile Organic Compounds by EPA Method 8270

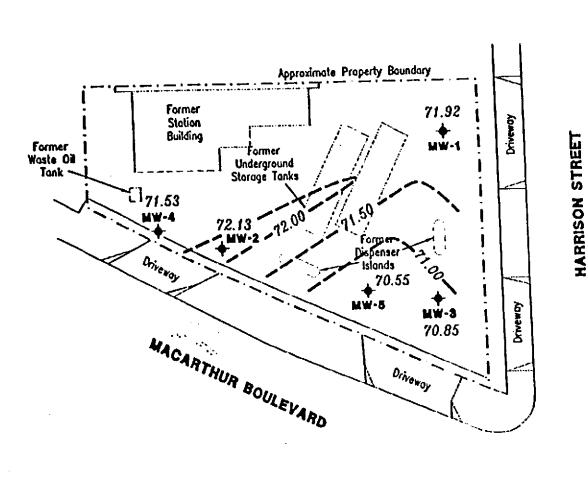
ppb = Parts per billion

- = Not Analyzed

ND = Not Detected

- Laboratory report indicates the hydrocarbons detected did not appear to contain diesel.
- Bis (2-ethylhexyl) phthalate was detected at a concentration of 14 ppb.
- Laboratory report indicates the hydrocarbons detected appeared to be a diesel and non-diesel mixture.
- Naphthalene was detected at a concentration of 17 ppb.

All EPA Method 8010 and 8270 constituents were ND, unless noted.



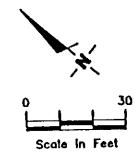
EXPLANATION

Groundwater monitoring well

Groundwater elevation in feet 99.99 referenced to Mean Sea Level (MSL)

Groundwater elevation contour, dashed where inferred.

Approximate groundwater flow direction at a gradient of 0.03 FL/Ft.



FIGURE

Source: Figure Modified From Draving Provided By MFOS Services, Inc.



Gettler - Ryan Inc.

6747 Slorre Ct., Suite J Dublin, CA 84565

REVIEWED BY

(925) 551-7555

POTENTIOMETRIC MAP Tosco (Former Unocal) Service Station No. 1871 96 MacArthur Boulevard Oakland, California

DATE July 1, 1998 REMSED DATE

JOB NULIBER

180068