



September 25, 2001

Mr. Tom Bauhs  
Chevron Products Company  
P.O. Box 6004  
San Ramon, California 94583

**RE: Transmittal of RBCA, Boring Logs, Geologic Cross-Section, and Utility Survey Map for Former Chevron Service Station No. 21-0208, 6006 International Boulevard, Oakland, California**

Dear Mr. Bauhs:

At the request of Chevron Products Company (Chevron), Gettler-Ryan Inc. (GR) has prepared a Risk Based Corrective Action (RBCA), boring logs, a geologic cross-section, and a subsurface utility map for the above referenced site (Figure 1). These documents were prepared in response to a verbal request on September 4, 2001, from Ms. Eva Chu of the Alameda County Health Care Services (ACHCS). Ms. Chu also requested that a well search be performed. GR has contacted the Alameda County Public Works Agency (ACPWA) and requested a 2,000-foot radius well search, however, the ACPWA has been unable to provide the well search results due to a computer virus. Once GR receives the well search data, the results of the well search will be forwarded under separate cover.

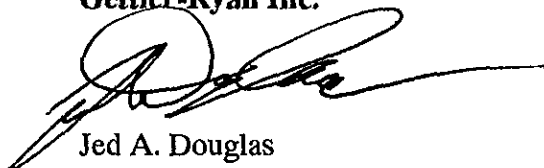
A description of each of the attached requested items follows:

- 1) RBCA – GR prepared a RBCA for the site on September 24, 2001. The results indicate that none of the Tier 2 risk limits have been exceeded.
- 2) Boring Logs – During the installation of the 17 soil borings at the site on July 17 and 18, 2001, a GR geologist described the encountered soil. The soil descriptions are presented on the attached boring logs.
- 3) Geologic Cross-Section – Due to the relative uniformity of the sediments encountered during the subsurface investigation conducted in July of 2001, a single cross-section of the subsurface lithology was prepared. The location of the cross-section is presented on Figure 2, and the cross-section is presented on Figure 3.

- 4) Subsurface Utility Map – GR contacted Pacific Gas and Electric (PG&E), Pacific Bell, East Bay Municipal Utility District (EBMUD), the City of Oakland, Kinder-Morgan Pipeline, MCI, Global West Network, Time-Warner and AT&T Broadband, to determine the presence of buried utilities in the immediate vicinity of the site. The companies which possess buried utilities in the site vicinity supplied GR with location maps, or allowed GR to view their maps. GR compiled the subsurface information into a single map. The utility map is attached as Figure 4.


If you have any questions or comments on the enclosed materials, please feel free to contact either of us at (707) 789-3255.

Sincerely,  
Gettler-Ryan Inc.



Jed A. Douglas  
Project Geologist

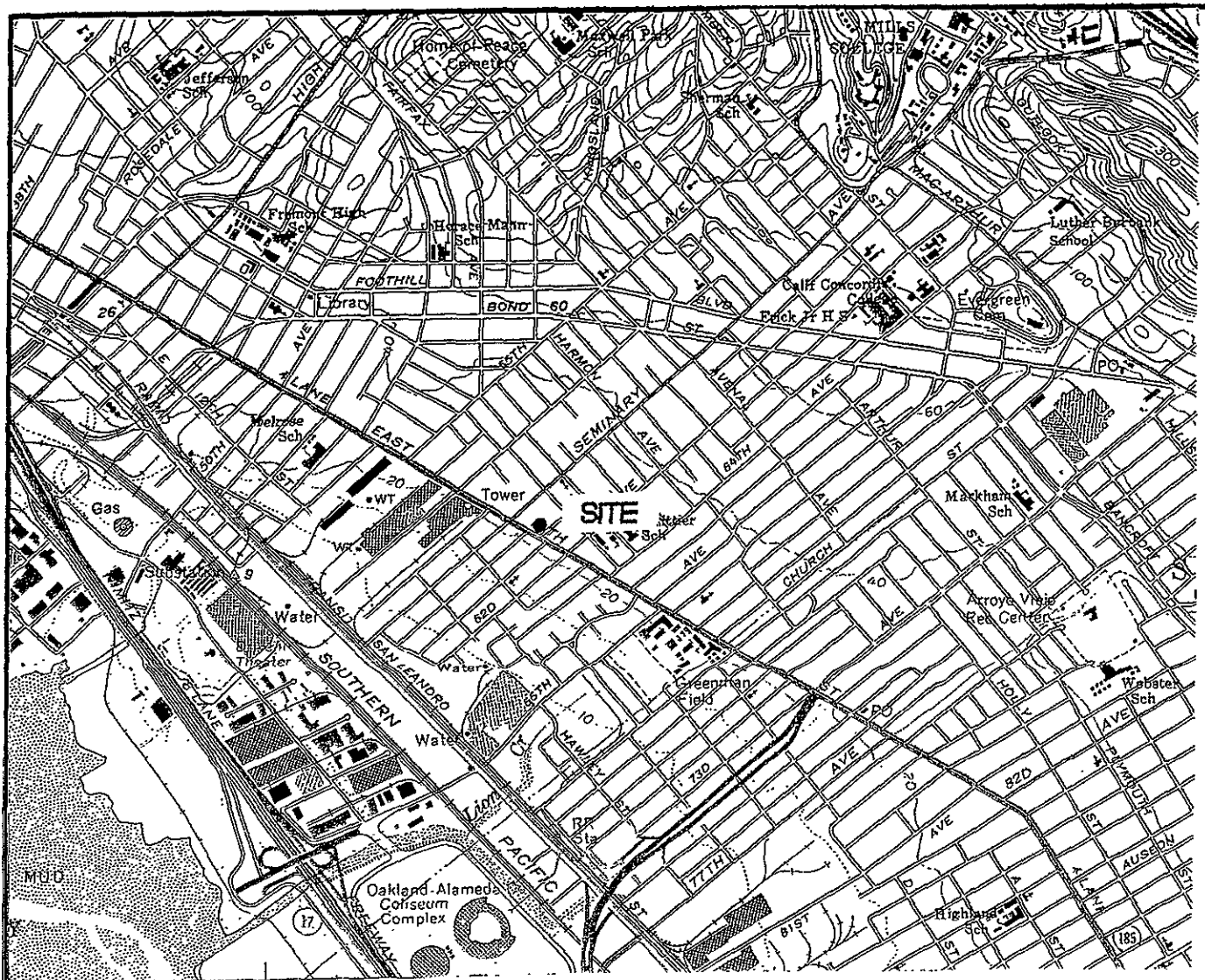
*dvossler@grinc.com*



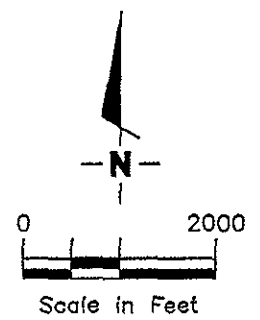
David J. Vossler  
Project Manager

Attachments: Figure 1: Site Vicinity Map  
Figure 2: Site Map  
Figure 3: Cross-Section  
Figure 4: Subsurface Utility Map  
Boring Logs  
Risk Based Corrective Action

Cc: Ms. Eva Chu – Alameda County Health Care Services



Source: USGS Quad Map



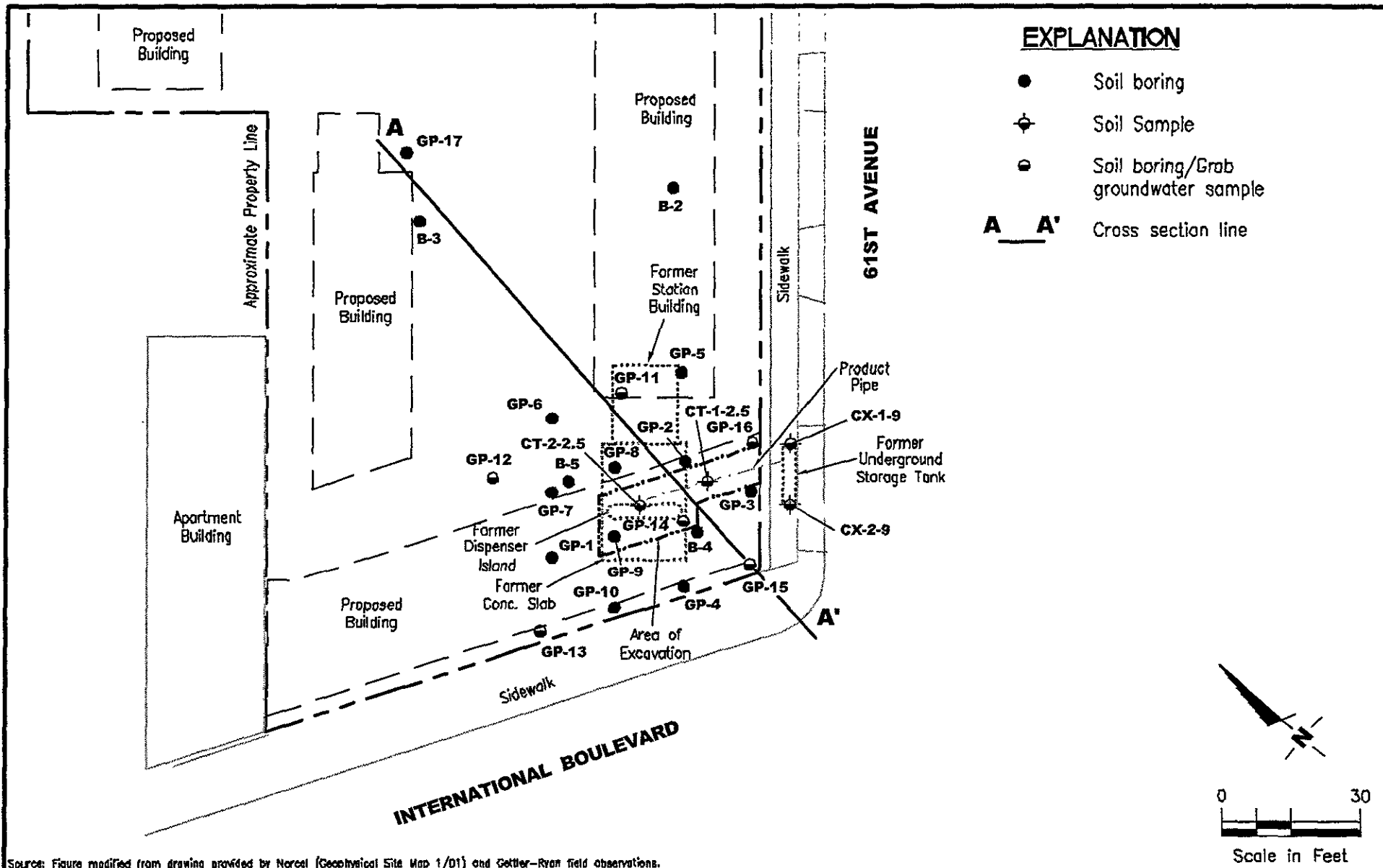
**Gettler - Ryan Inc.**

1364 North McDowell Boulevard Suite B2  
 Petaluma, CA 94954 (707) 789-3255

VICINITY MAP  
 Former Chevron Service Station #21-0208  
 6006 International Blvd.  
 Oakland, California

FIGURE  
**1**

JOB NUMBER DG20208C.4C01	REVIEWED BY	DATE 6/01	REVISED DATE
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**GETTLER - RYAN INC.**  
 8747 Sierra Ct., Suite J  
 Dublin, CA 94568 (925) 551-7555

**SOIL BORING LOCATION MAP**  
 Former Chevron Service Station No. 21-0208  
 6006 International Boulevard  
 Oakland, California

FIGURE

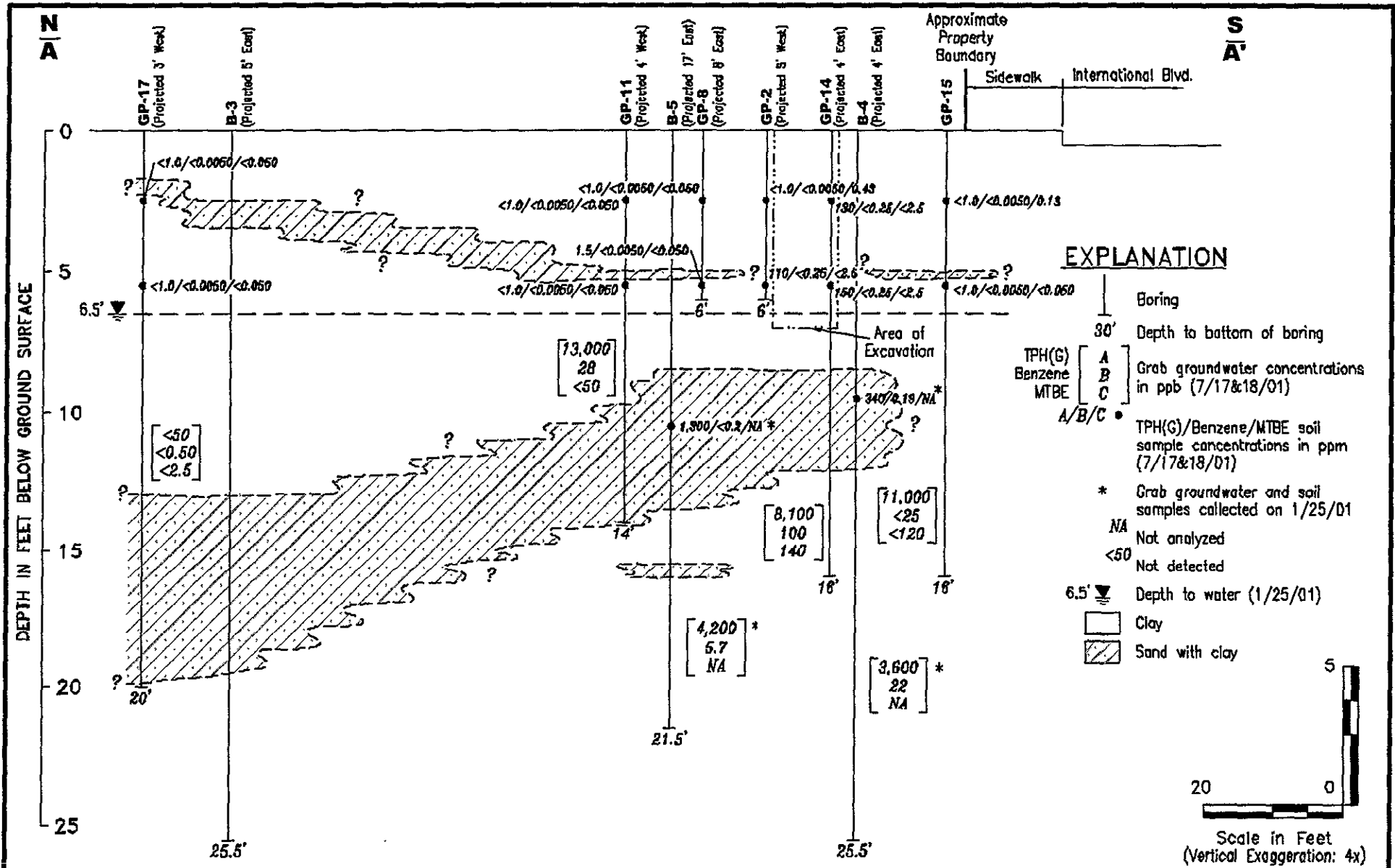
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PROJECT NUMBER  
 DG20208G.3C01

REVIEWED BY

DATE  
 9/01

REVISED DATE

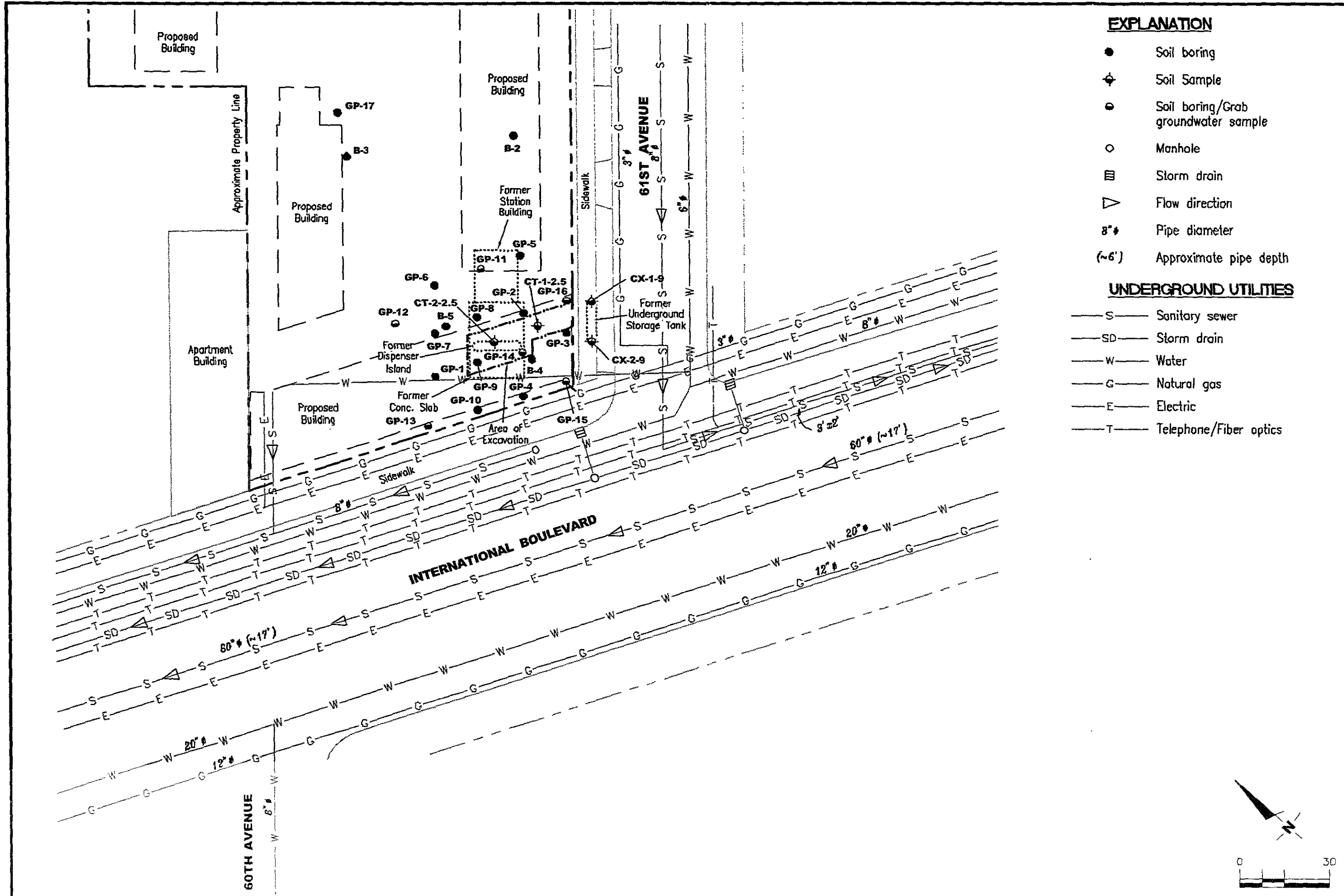


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 8747 Sierra Ct., Suite J  
 Dublin, CA 94568 (925) 551-7555

**CROSS SECTION A-A'**  
 Former Chevron Service Station No. 21-0208  
 6006 International Boulevard  
 Oakland, California

FIGURE  
**3**

PROJECT NUMBER: DG20208G.3C01      REVIEWED BY:      DATE: 9/01      REVISED DATE:



**EXPLANATION**

- Soil boring
- ⊕ Soil Sample
- ⊙ Soil boring/Grab groundwater sample
- Manhole
- ▣ Storm drain
- ▽ Flow direction
- 8" Pipe diameter
- (~6') Approximate pipe depth

**UNDERGROUND UTILITIES**

- S— Sanitary sewer
- SD— Storm drain
- W— Water
- G— Natural gas
- E— Electric
- T— Telephone/Fiber optics

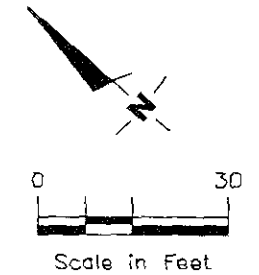


FIGURE **4**

**SUBSURFACE UTILITY MAP**  
 Former Chevron Service Station No. 21-0208  
 6006 International Boulevard  
 Oakland, California

DATE 9/01  
 REVISION DATE

**GETTLER-RYAN INC.**  
 6747 Sierra Ct., Suite J  
 Dublin, CA 94568  
 (925) 551-7555

PROJECT NUMBER  
**DG20208G.3C01**

REVIEWED BY  
 FILE NAME: P:\ENVIRO\CHEVRON\210208\A01-21-0208.DWG | Layout Tab: Utility 9-01

Source: Figure modified from drawing provided by Norcal (Geophysical Site Map 1/01), Gettler-Ryan field observations, PC&E, Pacific Bell, City of Oakland, EBWUD and Global West Network.

# Gettler-Ryan, Inc.

# Log of Boring GP-1

PROJECT: Former Chevron Service Station No. 21-0208

LOCATION: 6006 International Blvd., Oakland, CA

GR PROJECT NO.: DG202086.3C01

SURFACE ELEVATION:

DATE STARTED: 07/17/01

WL (ft. bgs):      DATE:      TIME:

DATE FINISHED: 07/17/01

WL (ft. bgs):      DATE:      TIME:

DRILLING METHOD: 3 in. Geoprobe (direct push)

TOTAL DEPTH: 6 feet

DRILLING COMPANY: Vironex Drilling

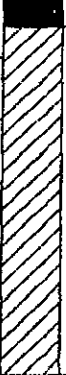
GEOLOGIST: Jed Douglas

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and baserock ~ 8 inches thick.	
3	GPI-2.5			CL	CLAY (CL) - dark greenish gray (10Y 3/1), dry, stiff, medium plasticity; 90% clay, 10% fine to coarse sand.	Boring backfilled with neat cement from the bottom to ground surface.  Hard auger to 5 feet.
6	GPI-5.5			SC CL	CLAYEY SAND (SC) - dark greenish gray (10Y 3/1), dry; 80% fine to coarse sand, 35% clay, 5% fine gravel. CLAY (CL) - dark greenish gray (10Y 3/1), dry, stiff, medium plasticity; 90% clay, 10% fine to coarse sand. Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						

Gettler-Ryan, Inc.				Log of Boring GP-2		
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>			LOCATION: <i>6006 International Blvd., Oakland, CA</i>			
GR PROJECT NO.: <i>DG202086.3C01</i>			SURFACE ELEVATION:			
DATE STARTED: <i>07/17/01</i>			WL (ft. bgs):	DATE:	TIME:	
DATE FINISHED: <i>07/17/01</i>			WL (ft. bgs):	DATE:	TIME:	
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>			TOTAL DEPTH: <i>6 feet</i>			
DRILLING COMPANY: <i>Vironex Drilling</i>			GEOLOGIST: <i>Jed Douglas</i>			
DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt - 6 inches thick.	
					Concrete slab - 6 inches thick.	
3	GP2-2.5			CL	CLAY (CL) - very dark gray (10YR 3/1) mottled with iron oxide staining, moist, soft, medium plasticity; 95% clay, 5% fine to coarse sand.  At 2.5 feet color changes to dark greenish gray (5GY 3/1).	Boring backfilled with neat cement from the bottom to ground surface.  Hand auger to 5 feet
6	GP2-6.5				SANDY CLAY (CL) - dark greenish gray (5GY 3/1), moist, soft, medium plasticity; 60% clay, 40% fine to coarse sand.  Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						



<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-3</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>6006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG202086.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DATE FINISHED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>6 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and baserock - 8 inches thick.	
3	GP3-2.5			CL	CLAY (CL) - very dark grayish brown (10YR 3/2), dry, stiff; 70% clay, 20% silt, 10% fine to coarse sand.	Boring backfilled with near cement from the bottom to ground surface.
6	GP3-6.5				Becomes 90% clay, 10% fine to coarse sand.	Hand auger to 2.6 feet.
					Color changes to brown (10YR 4/3) mottled with dark gray (N4).	
					Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						

Gettler-Ryan, Inc.				Log of Boring GP-4		
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>			LOCATION: <i>6006 International Blvd., Oakland, CA</i>			
GR PROJECT NO.: <i>DG20208G.3C01</i>			SURFACE ELEVATION:			
DATE STARTED: <i>07/17/01</i>			WL (ft. bgs):	DATE:	TIME:	
DATE FINISHED: <i>07/17/01</i>			WL (ft. bgs):	DATE:	TIME:	
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>			TOTAL DEPTH: <i>6 feet</i>			
DRILLING COMPANY: <i>Vironex Drilling</i>			GEOLOGIST: <i>Jed Douglas</i>			
DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and sand.	
3	GP4-2.5			CL	CLAY (CL) - very dark gray (N3), dry, stiff, low plasticity; 95% clay, 5% fine sand.	Boring backfilled with neat cement from the bottom to ground surface.  Hand auger to 5 feet.
					CLAY WITH SAND (CL) - dark greenish gray (10GY 3/1), dry, stiff; 75% clay, 25% fine to coarse sand.	
6	GP4-5.5				SANDY CLAY (CL) - dark greenish gray (10GY 3/1), dry, stiff; 50% clay, 40% fine to coarse sand, 10% fine gravel.	
					CLAY WITH SAND (CL) - dark greenish gray (10GY 3/1), dry, stiff; 75% clay, 25% fine to coarse sand.	
					Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						

<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-5</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>8006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG202086.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DATE FINISHED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>6 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and sand.	
				CL	CLAY (CL) - dark greenish gray (10Y 4/1), dry, stiff; 90% clay, 10% fine sand.	Boring backfilled with neat cement from the bottom to ground surface Hand auger to 2.5 feet.
3	GP5-2.5					
	GP5-4.5					
6	GP5-5.5					
					Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						

<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-6</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>6006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG20208G.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/17/01</i>		WL (ft. bgs): <i>2.8</i>	DATE: <i>07/17/01</i> TIME: <i>11:35</i>
DATE FINISHED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>6 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and sand.	
					Concrete slab.	Boring backfilled with neat cement from the bottom to ground surface.
3	GP6-2.5			CL	CLAY (CL) - dark brown (10YR 3/3), dry, soft, medium plasticity; 90% clay, 10% fine sand (perched groundwater zone).	Hand auger to 2.5 feet.
				SP	SAND (SP) - very dark grayish brown (10YR 3/2), saturated, loose; 95% fine sand, 5% medium sand.	
6	GP6-5.5				Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						

<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-7</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>8006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG202086.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DATE FINISHED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>6 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and sand.	
3	GP7-2.5			CL	CLAY (CL) - dark greenish gray (10BY 3/1), dry, stiff, low plasticity; 90% clay, 10% fine sand.	Boring backfilled with neat cement from the bottom to ground surface. Hang auger to 25 feet.
	GP7-4.5				Color changes to brown (10YR 4/3).	
6	GP7-5.5				Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						

<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-8</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>6006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG20208G.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/17/01</i>	WL (ft. bgs):	DATE:	TIME:
DATE FINISHED: <i>07/17/01</i>	WL (ft. bgs):	DATE:	TIME:
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>6 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
3	GP8-2.5			CL	Asphalt and sand. CLAY (CL) - very dark gray (N3), dry, medium stiff, medium plasticity; 90% clay, 10% fine sand.  Color changes to dark greenish gray (10Y 3/1).	Boring backfilled with neat cement from the bottom to ground surface.  Hand auger to 2.5 feet.
6	GP8-5.5				3 inch sand lens.  Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						

# Gettler-Ryan, Inc.

# Log of Boring GP-9

PROJECT: *Former Chevron Service Station No. 21-0208*

LOCATION: *6006 International Blvd., Oakland, CA*

GR PROJECT NO.: *DG202086.3C01*

SURFACE ELEVATION:

DATE STARTED: *07/17/01*

WL (ft. bgs):      DATE:      TIME:

DATE FINISHED: *07/17/01*



WL (ft. bgs):      DATE:      TIME:

DRILLING METHOD: *3 in. Geoprobe (direct push)*



TOTAL DEPTH: *6 feet*

DRILLING COMPANY: *Vironex Drilling*

GEOLOGIST: *Jed Douglas*

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and sand.	
					Concrete slab - 8 inches thick.	
3	GP9-2.5			CL	CLAY (CL) - dark greenish gray (56Y 3/1), dry, stiff, medium plasticity; 90% clay, 10% fine to medium sand, strong hydrocarbon odor.	Boring backfilled with neat cement from the bottom to ground surface Hand auger to 2.5 feet.
6	GP9-5.5				3 inch sand lens.	
					Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						

<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-10</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>6006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG202086.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DATE FINISHED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>6 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and gravel.	
3	GPI0-2.5			CL	CLAY (CL) - dark greenish gray (10Y 3/1), dry, medium stiff, medium plasticity; 90% clay, 10% fine to medium sand.	Boring backfilled with neat cement from the bottom to ground surface. Hand auger to 2.5 feet
6	GPI0-6.5				3 inch sand lens. Bottom of boring at 6 feet bgs.	
9						
12						
15						
18						
21						



# Gettler-Ryan, Inc.

# Log of Boring GP-11

PROJECT: *Former Chevron Service Station No. 21-0208*

LOCATION: *6008 International Blvd., Oakland, CA*

GR PROJECT NO.: *DG20208G.3C01*

SURFACE ELEVATION:

DATE STARTED: *07/17/01*

WL (ft. bgs): *12.0* DATE: *07/17/01* TIME: *14:00*

DATE FINISHED: *07/17/01*

WL (ft. bgs): DATE: TIME:

DRILLING METHOD: *3 in. Geoprobe (direct push)*

TOTAL DEPTH: *6 feet*

DRILLING COMPANY: *Vironex Drilling*

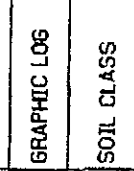
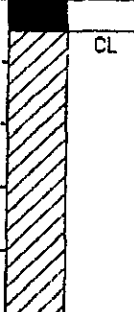
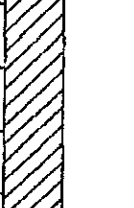
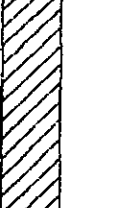

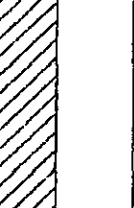
GEOLOGIST: *Jed Douglas*

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0					Asphalt and sand.	
3	GP11-2.5			CL	CLAY WITH SAND (CL) - very dark gray (10YR 3/1), dry, soft, medium plasticity; 80% clay, 20% fine to coarse sand.	Boring backfilled with neat cement from the bottom to ground surface.
4.5	GP11-4.5				At 2 feet color changes to dark greenish gray (10GY 3/1).	Hand auger to 2.5 feet
6	GP11-5.6				3 inch sand lens.	
6.5	GP11-6.5					
12	GP11-W					Grab groundwater sample GP11-W.
14					Bottom of boring at 14 feet bgs.	
15						
18						
21						

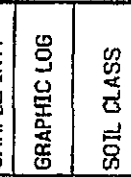
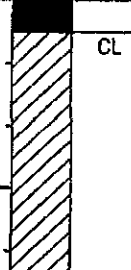
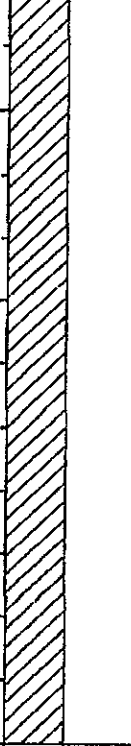
<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-12</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>6006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG20208G.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/17/01</i>		WL (ft. bgs): <i>13.0</i>	DATE: <i>07/17/01</i> TIME: <i>14:35</i>
DATE FINISHED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>6 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and sand.	
	GP12-1.5			CL	CLAY (CL) - brown (10YR 4/3) mottled with dark gray (N4), dry, stiff; 90% clay, 10% fine sand.	Boring backfilled with neat cement from the bottom to ground surface.
3	GP12-2.5				Color changes to dark greenish gray (10Y 4/1).	Hand auger to 2.5 feet.
6	GP12-5.5				3 inch sand lens. Color changes to dark grayish brown (10YR 4/2).	
9						
12						
	GP12-W				SANDY CLAY (CL) - dark grayish brown (10YR 4/2), dry, stiff; 50% clay, 40% fine to coarse sand, 10% fine gravel.	Grab groundwater sample GP12-W.
15					Bottom of boring at 14 feet bgs.	
18						
21						

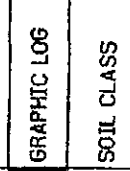
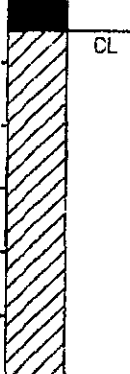

<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-13</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>6006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG20208G.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/17/01</i>		WL (ft. bgs): <i>8.9</i>	DATE: <i>07/17/01</i> TIME: <i>07:55</i>
DATE FINISHED: <i>07/17/01</i>		WL (ft. bgs):	DATE: TIME:
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>19 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and sand.	
3	GP13-2.5			CL	CLAY (CL) - dark greenish gray (5GY 3/1), dry, stiff, medium plasticity; 90% clay, 10% fine sand.	Boring back-filled with neat cement from the bottom to ground surface. Hand auger to 2.5 feet
6	GP13-5.5				SANDY CLAY (CL) - dark greenish gray (5GY 3/1), dry, stiff; 60% clay, 40% fine to coarse sand.	
9	GP13-W					Grab groundwater sample GP13-W.
12					Becomes 60% clay, 40% fine to coarse sand, 10% fine gravel.	
15					Becomes 60% clay, 40% fine to coarse sand.	
18						
21					Bottom of boring at 19 feet bgs.	

<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-14</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>6006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG202086.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/18/01</i>		WL (ft. bgs): <i>15.0</i>	DATE: <i>07/18/01</i> TIME: <i>08:45</i>
DATE FINISHED: <i>07/18/01</i>		WL (ft. bgs): <i>0.0</i>	DATE: <i>07/18/01</i> TIME: <i>10:30</i>
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>16 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and sand.	
3	GP14-2.5			CL	CLAY (CL) - dark greenish gray (5GY 4/1), dry, medium stiff, medium plasticity; 90% clay, 10% fine to medium sand.	Boring backfilled with neat cement from the bottom to ground surface.
6	GP14-5.5				SANDY CLAY (CL) - dark greenish gray (5GY 4/1), dry, medium stiff; 80% clay, 40% fine to coarse sand, strong hydrocarbon odor.	Hand auger to 2.5 feet
9					↓	
12						
15	GP14-W				Color changes to dark yellowish brown (10YR 4/4).	
					Bottom of boring at 16 feet bgs.	Grab groundwater sample GP14-W.
18						
21						

<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-15</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>6006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG202086.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/18/01</i>		WL (ft. bgs): <i>12.5</i>	DATE: <i>07/18/01</i> TIME: <i>09:25</i>
DATE FINISHED: <i>07/18/01</i>		WL (ft. bgs):	DATE: TIME:
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>16 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0					Asphalt and sand.	
3	GP15-2.5			CL	CLAY (CL) - very dark grayish brown (10YR 3/2), dry, medium stiff, medium plasticity; 90% clay, 10% fine sand.	Boring backfilled with neat cement from the bottom to ground surface
6	GP15-5.5				Color changes to dark greenish gray (10Y 3/1).	Hand auger to 2.5 feet
15	GP15-w				3 inch lens of SANDY CLAY (CL) - dark greenish gray (10Y 3/1), dry, medium stiff; 60% clay, 40% fine to coarse sand.	
15					Color changes to dark yellowish brown (10YR 4/4).	Grab groundwater sample GP15-w
16					Bottom of boring at 16 feet bgs.	

<b>Gettler-Ryan, Inc.</b>		<b>Log of Boring GP-16</b>	
PROJECT: <i>Former Chevron Service Station No. 21-0208</i>		LOCATION: <i>6006 International Blvd., Oakland, CA</i>	
GR PROJECT NO.: <i>DG20208G.3C01</i>		SURFACE ELEVATION:	
DATE STARTED: <i>07/18/01</i>		WL (ft. bgs): <i>14.0</i>	DATE: <i>07/18/01</i> TIME: <i>10:10</i>
DATE FINISHED: <i>07/18/01</i>		WL (ft. bgs): <i>6.0</i>	DATE: <i>07/18/01</i> TIME: <i>10:15</i>
DRILLING METHOD: <i>3 in. Geoprobe (direct push)</i>		TOTAL DEPTH: <i>16 feet</i>	
DRILLING COMPANY: <i>Vironex Drilling</i>		GEOLOGIST: <i>Jed Douglas</i>	

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and sand.	
				CL	CLAY (CL) - very dark grayish brown (10YR 3/2), dry, stiff, medium plasticity: 90% clay, 10% fine sand.	Boring back filled with neat cement from the bottom to ground surface.
3	GPI8-2.5				Color changes to dark greenish gray (10GY 4/1).	Hand auger to 2.5 feet
6	GPI8-5.5				3 inch sand lens.	
9	GPI8-W					Grab groundwater sample GPI8-W
12						
15					Color changes to dark yellowish brown (10YR 4/4).	
18						
21					Bottom of boring at 16 feet bgs.	

# Gettler-Ryan, Inc.

# Log of Boring GP-17

PROJECT: *Former Chevron Service Station No. 21-0208*

LOCATION: *6006 International Blvd., Oakland, CA*

GR PROJECT NO.: *DG20208G.3C01*

SURFACE ELEVATION:

DATE STARTED: *07/18/01*

WL (ft. bgs): *14.5* DATE: *07/18/01* TIME: *11:10*

DATE FINISHED: *07/18/01*

WL (ft. bgs): *15.0* DATE: *07/18/01* TIME: *11:35*

DRILLING METHOD: *3 in. Geoprobe (direct push)*

TOTAL DEPTH: *20 feet*

DRILLING COMPANY: *Vironex Drilling*

GEOLOGIST: *Jed Douglas*

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0					Asphalt and sand.	
3	GP17-2.5			CL	SANDY CLAY (CL) - reddish brown (5YR 4/3), dry, stiff; 50% clay, 40% fine to coarse sand, 10% fine gravel.	Boring backfilled with neat cement from the bottom to ground surface. Hand auger to 2.5 feet.
6	GP17-5.5				CLAY WITH SAND (CL) - reddish brown (5YR 4/3), dry, stiff; 75% clay, 25% fine to medium sand.	
15	GP17-W				▼ SANDY CLAY (CL) - reddish brown (5YR 4/3), wet, stiff; 50% clay, 50% fine to coarse sand.	Grab groundwater sample GP17-w.
21					Bottom of boring at 20 feet bgs.	

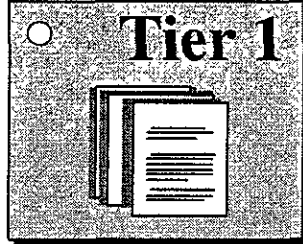
# Main Screen

RBCA Tool Kit for Chemical Releases  
Version 1.3a © 2000

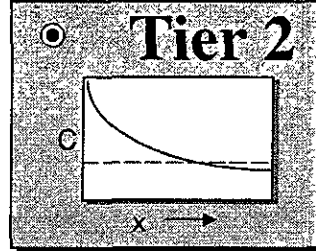
## 1. Project Information

Site Name:	Former Chevron SS No. 21-0208		
Location:	6006 International Blvd., Oakland, CA		
Compl. By:	J. Douglas		
Date:	24-Sep-01	Job ID:	DG20208G.3C01

## 2. Which Type of RBCA Analysis?



**Tier 1**  
Generic Values  
On-Site  
Exposure



**Tier 2**  
Site-Specific Values  
On- or Off-Site Exposure

## 3. Calculation Options

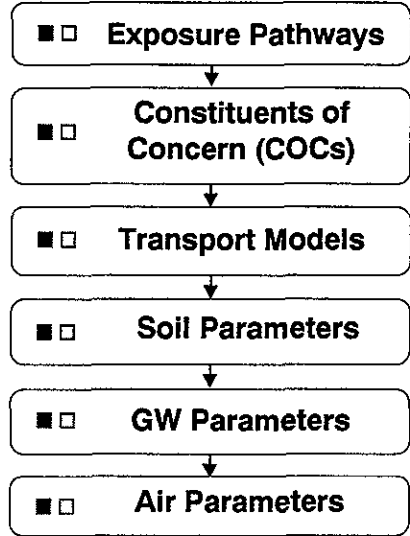
*Affects which input data are required*

- Baseline Risks (Forward mode)**
- RBCA Cleanup Standards (Backward mode)**

## 4. RBCA Evaluation Process

### Prepare Input Data

Data Complete? (  yes,  no)



### Review Output

- Exposure Flowchart
- COC Chem. Parameters
- Input Data Summary
- User-Spec. COC Data...
- Transient Domenico Analysis...
- Baseline Risks...
- Cleanup Standards...

## 5. Commands and Options

- New Site
- Load Data...
- Save Data As...
- Quit
- Print Sheet
- Set Units
- Custom Chem. Data...
- Help



# Exposure Pathway Identification

## 1. Groundwater Exposure ?

### Groundwater Ingestion/ Surface Water Impact

Receptor	None ▼	None ▼	None ▼
Type:	On-site	Off-site1	Off-site2

Distance to GW receptors

	0	0	0
	On-site	Off-site1	Off-site2
	0	0	0
			(ft)

Source Media:

Affected Groundwater

Affected Soils Leaching to Groundwater

**GW Discharge to Surface Water Exposure**

Swimming

Fish Consumption

Aquatic Life Protection

Enter ALP Criteria

## 2. Surface Soil Exposure ?

### Direct Ingestion and Dermal Contact

Receptor	None ▼	No off-site receptors
Type:	On-site	

Construction Worker

Site Name: Former Chevron SS No. 21-0208  
 Location: 6006 International Blvd., Oakland, CA  
 Compl. By: J. Douglas  
 Job ID: DG20208G.3C01  
 Date: 24-Sep-01

## 3. Air Exposure ?

### Volatilization and Particulates to Outdoor Air Inhalation

Receptor	Res. ▼	None ▼	None ▼
Type:	On-site	Off-site1	Off-site2
	0		
			(ft)

Construction worker

Affected Soils--Volatilization to Ambient Outdoor Air

Affected Groundwater--Volatilization to Ambient Outdoor Air

Affected Surface Soils--Particulates to Ambient Outdoor Air

### Volatilization to Indoor Air Inhalation

Receptor	Res. ▼	No off-site receptors
Type:	On-site	

Affected Soils--Volatilization to Enclosed Space

Affected Groundwater--Volatilization to Enclosed Space

## 4. Commands and Options

Main Screen

Print Sheet

Set Units

Help

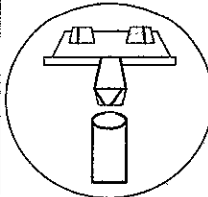
Exposure Factors & Target Risks

Exposure Flowchart

# Exposure Factors and Target Risk Limits

## 1. Exposure Parameters

Age Adjustment?	Residential		Commercial		
	Adult	(Age 0-6)	(Age 0-16)	Chronic	Construc.
Averaging time, carcinogens (yr)	70				
Averaging time, non-carcinogens (yr)	30			25	1
Body weight (kg)	70	15	35	70	
Exposure duration (yr)	30	6	16	25	1
Exposure frequency (days/yr)	350			250	180
Dermal exposure frequency (days/yr)	350			250	
Skin surface area, soil contact (cm <sup>2</sup> )	<input type="checkbox"/> 5800		2023	5800	5800
Soil dermal adherence factor (mg/cm <sup>2</sup> /day)	1				
Water ingestion rate (L/day)	2			1	
Soil ingestion rate (mg/day)	<input type="checkbox"/> 100	200		50	100
Swimming exposure time (hr/event)	3				
Swimming event frequency (events/yr)	12	12	12		
Swimming water ingestion rate (L/hr)	<input type="checkbox"/> 0.05	0.5			
Skin surface area, swimming (cm <sup>2</sup> )	<input type="checkbox"/> 23000		8100		
Fish consumption rate (kg/day)	0.025				
Contaminated fish fraction (unitless)	1				



Site Name: Former Chevron SS No. 21-0208  
 Location: 6006 International Blvd., Oakland, CA  
 Compl. By: J. Douglas  
 Job ID: DG20208G.3C01  
 Date: 24-Sep-01

## 2. Risk Goal Calculation Options

- Individual Constituent Risk Goals Only
- Individual and Cumulative Risk Goals

## 3. Target Health Risk Limits

	Individual	Cumulative
Target Risk (Class A/B carcins.)	1.0E-5	1.0E-5
Target Risk (Class C carcinogens)	1.0E-5	
Target Hazard Quotient	1.0E+0	
Target Hazard Index		1.0E+0

## 4. Commands and Options

Return to Exposure Pathways

Use Default Values

Print Sheet

Help

Site Name: Former Chevron SS No. 21-0208      Job ID: DG20208G.3C01  
 Location: 6006 International Blvd., Oakland, CA      Date: 24-Sep-01  
 Compl. By: J. Douglas

**Commands and Options**

Main Screen

Print Sheet

Help

**Source Media Constituents of Concern (COCs)**

**Selected COCs**

**COC Select:**      **Sort List:** (?)

Benzene*
Toluene
Ethylbenzene
Xylene (mixed isomers)
Methyl t-Butyl ether

\* = Chemical with user-specified data

**Representative COC Concentration** (?)

**Groundwater Source Zone**

    Enter Site Data

(mg/L)	note
1.4E-2	oral slope changed to 0.1
2.9E-3	
4.4E-2	
2.3E-2	
1.9E-2	

**Soil Source Zone**

    Enter Site Data

(mg/kg)	note
2.5E-3	
2.5E-3	
2.5E-3	
4.3E-3	
3.9E-2	

Apply Raoult's Law (?)

Moisture

in Soil

Water

0.1



<b>Commands and Options</b>				Site Name: Former Chevron SS No. 2b0208 DG20208G.3C01			
<input type="button" value="Return"/>	<input type="button" value="Print Sheet"/>	<input type="button" value="Help"/>	Location: 6006 International Blvd., Oakland, CA			Date: 24-Sep-01	
			Compl. By: J. Douglas				
<b>Groundwater Source Zone Concentration Calculator</b>							
			<input type="button" value="Paste Defaults"/>	<input type="button" value="Mean Option"/>		UCL Percentile <input type="text" value="95%"/>	
<b>Constituent</b>	Detection Limit <i>(mg/L)</i>	No. of Samples	No. of Detects	Estimated Distribution of Data	<b>Max. Conc.</b> <i>(mg/L)</i>	<b>Mean Conc.</b> <i>(mg/L)</i>	<b>UCL on Mean</b> <i>(mg/L)</i>
Benzene*	5.0E-4	7	7	Lognormal	1.0E-1	2.0E-3	1.4E-2
Toluene	5.0E-4	7	7	Lognormal	1.3E-2	8.4E-4	2.9E-3
Ethylbenzene	5.0E-4	7	7	Lognormal	1.8E-1	4.8E-3	4.4E-2
Xylene (mixed isomers)	5.0E-4	7	7	Lognormal	5.7E-2	3.5E-3	2.3E-2
Methyl t-Butyl ether	2.5E-3	7	7	Lognormal	1.4E-1	3.0E-3	1.9E-2

\* = Chemical with user-specified data

RBCA Tool Kit for Chemical Releases, Version 1.3a

Enter Analytical Data from  
Groundwater Source Zone  
(up to 50 Data Points)

Analytical Data

	1	2	3	4	5	6	7	8	9	10	11	12	13
ID	gp11-w	gp12-w	gp13-w	gp14-w	gp15-w	gp16-w	gp17-w						
Date	17-Jul-01	17-Jul-01	18-Jul-01	18-Jul-01	18-Jul-01	18-Jul-01	18-Jul-01						
	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>
	2.80E-2	2.50E-4	2.50E-4	1.00E-1	1.25E-2	2.50E-4	2.50E-4						
	5.00E-3	2.50E-4	2.50E-4	1.25E-3	1.25E-2	2.50E-4	2.50E-4						
	1.10E-1	2.50E-4	2.50E-4	1.80E-1	4.30E-2	4.70E-3	2.50E-4						
	5.70E-2	2.50E-4	2.50E-4	2.40E-2	4.80E-2	6.00E-3	2.50E-4						
	2.50E-3	2.50E-4	2.50E-4	1.40E-1	6.00E-2	1.25E-3	1.25E-3						

RBCA Tool Kit for Chemical Releases, Version 1.3a

											Analytical Data	
14	15	16	17	18	19	20	21	22	23	24	25	26
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)

RBCA Tool Kit for Chemical Releases, Version 1.3a

										Analytical Data			
27	28	29	30	31	32	33	34	35	36	37	38	39	
<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	

RBCA Tool Kit for Chemical Releases, Version 1.3a

40	41	42	43	44	45	46	47	48	49	50
<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>	<i>(mg/L)</i>



<b>Commands and Options</b>				Site Name: Former Chevron SS No. J08-10208G20208G.3C01			
<input type="button" value="Return"/>	<input type="button" value="Print Sheet"/>	<input type="button" value="Help"/>		Location: 6006 International Blvd., Oakland, CA		Date: 24-Sep-01	
				Compl. By: J. Douglas			
<h2>Soil Source Zone Concentration Calculator</h2>							UCL Percentile <input type="text" value="95%"/>
				<input type="button" value="Paste Defaults"/>	<input type="button" value="Mean Option"/>		
<b>Constituent</b>	Detection Limit	No. of Samples	No. of Detects	Estimated Distribution of Data	Max. Conc.	Mean Conc.	UCL on Mean
	<i>(mg/kg)</i>				<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>
Benzene*	5.0E-3	28	28	Normal	2.5E-3	2.5E-3	2.5E-3
Toluene	5.0E-3	28	28	Normal	2.5E-3	2.5E-3	2.5E-3
Ethylbenzene	5.0E-3	28	28	Normal	2.5E-3	2.5E-3	2.5E-3
Xylene (mixed isomers)	5.0E-3	28	28	Lognormal	4.0E-1	3.1E-3	4.3E-3
Methyl t-Butyl ether	5.0E-2	28	28	Lognormal	4.3E-1	3.1E-2	3.9E-2
* = Chemical with user-specified data							

RBCA Tool Kit for Chemical Releases, Version 1.3a

Enter Analytical Data from  
Soil Source Zone  
(up to 50 Data Points)

											Analytical Data		
											12	13	
	1	2	3	4	5	6	7	8	9	10	11	12	13
ID	gp1-2.5	gp1-5.5	gp2-2.5	gp2-5.5	gp3-2.5	gp3-5.5	gp4-2.5	gp4-5.5	gp5-2.5	gp5-5.5	gp7-2.5	gp7-5.5	gp8-2.5
Date	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01
	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>
	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3
	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3
	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3
	2.50E-3	2.50E-3	2.50E-3	4.00E-1	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	7.30E-3	2.50E-3
	2.50E-2	2.50E-2	4.30E-1	1.25E-1	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2

RBCA Tool Kit for Chemical Releases, Version 1.3a

												Analytical Data		
14	15	16	17	18	19	20	21	22	23	24	25	26		
gp8-5.5	gp10-2.5	gp10-5.5	gp11-2.5	gp11-5.5	gp12-2.5	gp12-5.5	gp13-2.5	gp13-5.5	gp15-2.5	gp15-5.5	gp16-2.5	gp16-5.5		
17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	17-Jul-01	18-Jul-01	18-Jul-01	18-Jul-01	18-Jul-01		
<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	
2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	
2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	
2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	
2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	2.50E-3	
2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	2.50E-2	1.30E-1	2.50E-2	2.50E-2	2.50E-2	

RBCA Tool Kit for Chemical Releases, Version 1.3a

Analytical Data												
27	28	29	30	31	32	33	34	35	36	37	38	39
gp17-2.5	gp17-5.5											
18-Jul-01	18-Jul-01											
<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>	<i>(mg/kg)</i>
2.50E-3	2.50E-3											
2.50E-3	2.50E-3											
2.50E-3	2.50E-3											
2.50E-3	2.50E-3											
2.50E-2	2.50E-2											

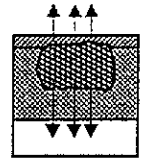


# Transport Modeling Options

## 1. Vertical Transport, Surface Soil Column

### Outdoor Air Volatilization Factors

- Surface soil volatilization model only
- Combination surface soil/Johnson & Ettinger models
- Thickness of surface soil zone  (ft)
- User-specified VF from other model



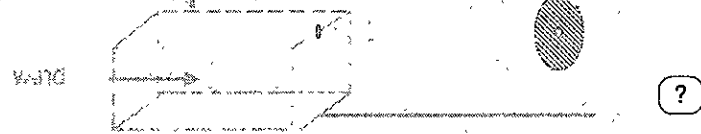
### Indoor Air Volatilization Factors

- Johnson & Ettinger model
- User-specified VF from other model

### Soil-to-Groundwater Leaching Factor

- ASTM Model
  - Apply Soil Attenuation Model (SAM)
  - Allow first-order biodecay
- User-specified LF from other model

## 2. Lateral Air Dispersion Factor



- 3-D Gaussian dispersion model
- User-specified ADF
- Off-site 1
- Off-site 2  (-)

Site Name: Former Chevron SS No. 21-0208 Job ID: DG20208G.3C01  
 Location: 6006 International Blvd., Oakland, CA Date: 24-Sep-01  
 Compl. By: J. Douglas

Calculate DAF using Domenico Model

- Domenico equation with dispersion and no biodecay
- Domenico equation first-order decay
- Modified Domenico equation using section accessor superposition
- Enter Directly Biodegradation Capacity  (mg/L)

— or —

### User-Specified DAF Values

- DAF values from other model or site data

## 4. Commands and Options

# Site-Specific Soil Parameters

## 1. Soil Source Zone Characteristics (?)

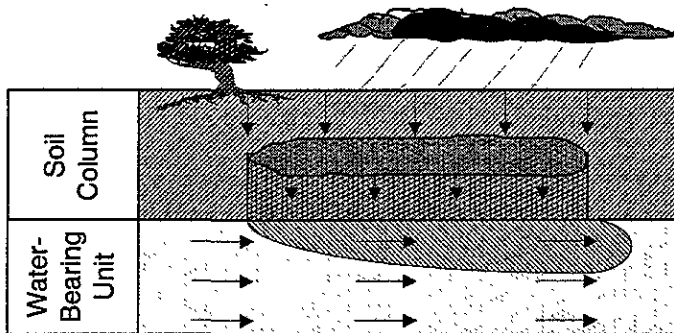
### Hydrogeology

General Case Construction

Depth to water-bearing unit	7	(ft)
Capillary zone thickness	0.2	(ft)
Soil column thickness	6.8	(ft)

### Affected Soil Zone

Depth to top of affected soils	0	(ft)	
Depth to base of affected soils	7	(ft)	
Affected soil area	100	100	(ft <sup>2</sup> )
Length of affected soil parallel to assumed wind direction	10	10	(ft)
Length of affected soil parallel to assumed GW flow direction			(ft)



Site Name: Former Chevron SS No. 21-0208 Job ID: DG20208G.3C01  
 Location: 6006 International Blvd., Oakland, CA Date: 24-Sep-01  
 Compl. By: J. Douglas

## 2. Surface Soil Column (?)

Vadose Zone Capillary Fringe

System name USGS Soil Type or Total porosity <input type="button" value="Calculate"/>		
Volumetric water content	0.2321	0.2493 (-)
Volumetric air content	0.1729	0.1557 (-)
Dry bulk density	7.7787	(kg/L)
Vertical hydraulic conductivity	1.9E-3	(cm/d)
Vapor permeability	1.1E-11	(ft <sup>2</sup> )
Capillary zone thickness	2.0E-1	(ft)

### Net Rainfall Infiltration

Net infiltration estimate		(in/y)
or	NA	
Average annual precipitation		(in/y)

### Partitioning Parameters

Fraction organic carbon	0.01	(-)
Soil/water pH	6.8	(-)

## 3. Commands and Options

## Site-Specific Groundwater Parameters

**1. Water-bearing Unit** ?

Hydrogeology

(cm/d)  
 Groundwater storage coefficient  
 or **NA** ↑ or  (cm/d)  
 Hydraulic conductivity  
 Hydraulic gradient  
 Effective porosity

**Sorption**

Fraction organic carbon saturation zone  (f)  
 Groundwater oil  (f)

---

**2. Groundwater Source Zone** ?

Groundwater plume width at source  (ft)  
 Plume (mixing zone) thickness at source  (ft)  
 or **NA** ↑ or  (ft)  
 Saturated thickness  (ft)  
 Length of source zone  (ft)

Site Name: Former Chevron SS No. 21-0208    Job ID: DG20208G.3C01  
 Location: 6006 International Blvd., Oakland, CA    Date: 24-Sep-01  
 Compl. By: J. Douglas

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**3. Groundwater Discharge** ?

Mode:  ↓    Discharge rate  (ft<sup>3</sup>/d)    Hydraulic conductivity  (cm/d)  
 Distance to GW receipt  (ft)     (ft)     (ft)     (ft)  
 or **NA** ↓ or ↓    ↓ or ↓    ↓ or ↓    ↓ or ↓  
 Length of water source zone  (ft)  
 Transverse dispersivity  (ft)  
 Vertical dispersivity  (ft)

---

**4. Groundwater Discharge to Surface Water** ?

Distance to GW/SW discharge point  (ft)  
 Plume width at GW/SW discharge  (ft)  
 Plume thickness at GW/SW discharge  (ft)  
 Surface water flowrate at GW/SW discharge  (ft<sup>3</sup>/s)

---

**5. Commands and Options**

Main Screen

Use Default Values

Print Sheet

Set Units

Help



# Site-Specific Air Parameters

Site Name: Former Chevron SS No. 21-0208 Job ID: DG20208G.3C01  
 Location: 6006 International Blvd., Oakland, CA Date: 24-Sep-01  
 Compl. By: J. Douglas

### 1. Outdoor Air Pathway

*Dispersion in Air*

Distance to plume edge downwind:  or  (ft)

or

Distance to plume edge upwind:  or  (ft)

Vertical dispersion:  (ft)

### Air Source Zone

Air mixing zone height:  6.56167979 (ft)

Ambient air velocity in mixing zone:  7.381889764 (ft/s)

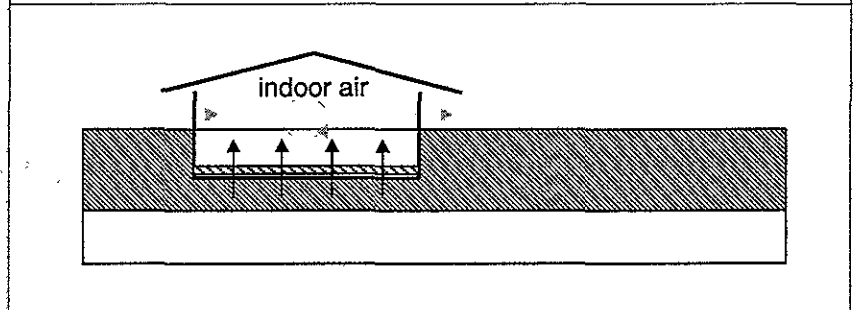
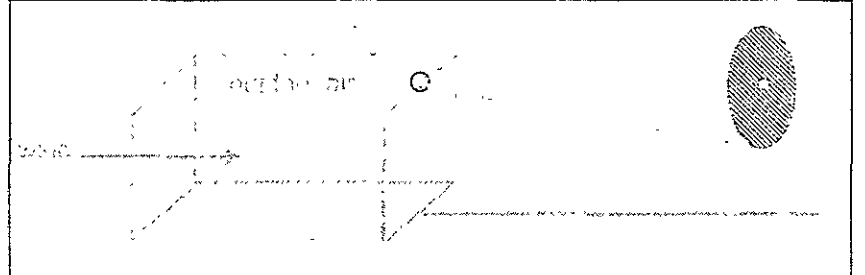
Areal particulate emission flux:  5.9E+14 (g/cm<sup>2</sup>s)

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### 2. Indoor Air Pathway

*Building Parameters*

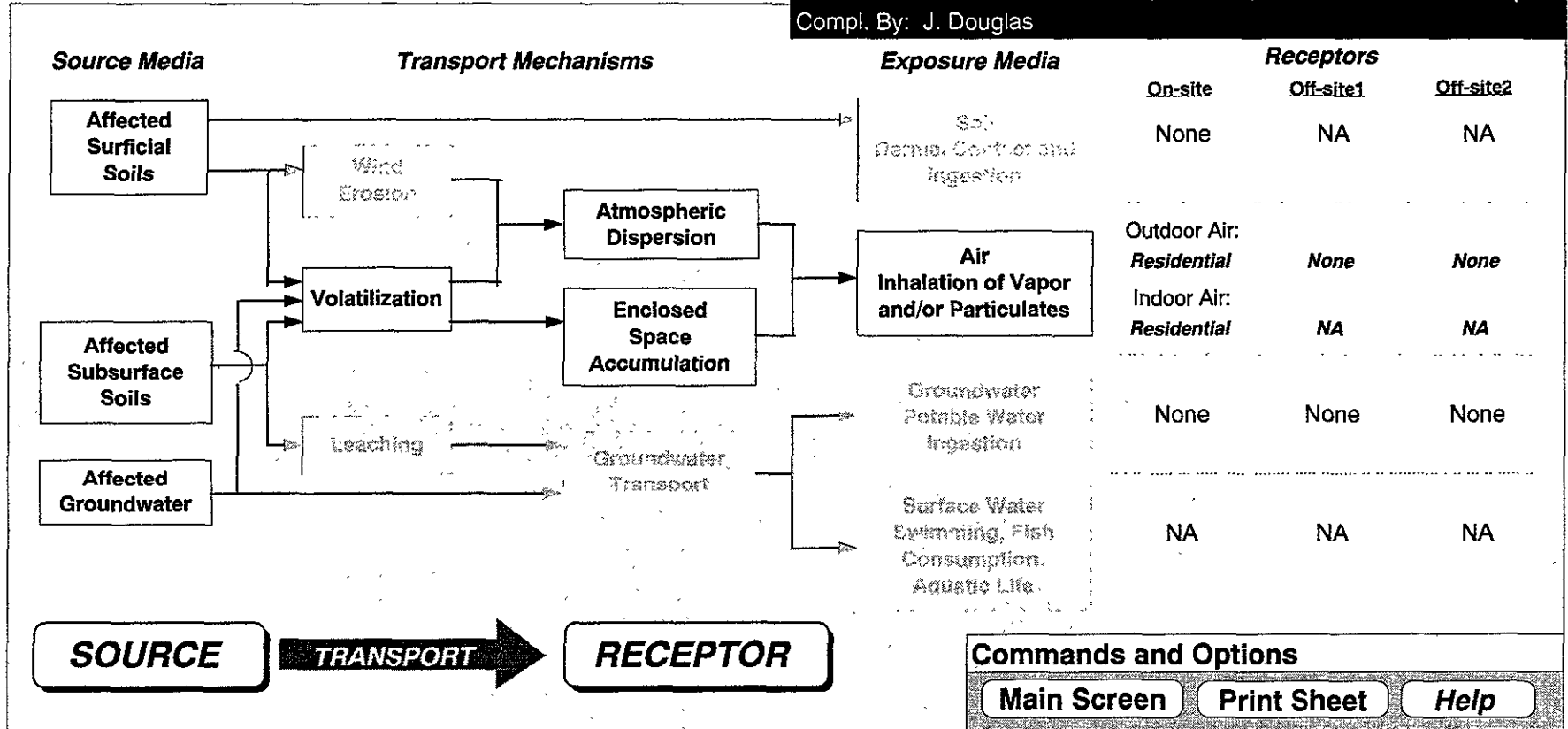
	Residential	Commercial	
Building volume/area ratio	6.56168	0.84252	(ft)
Foundation area	7625	753.474	(ft <sup>2</sup> )
Foundation perimeter	684	111.549	(ft)
Building air exchange rate	1.4E-4	2.3E-4	(1/s)
Depth to bottom of foundation slab	0.49213	0.49213	(ft)
Convective air flow through cracks	0.0E+0	0.0E+0	(ft <sup>3</sup> /s)
Foundation thickness	0.492125984		(ft)
Foundation crack fraction	0.01		(-)
Volumetric water content of cracks	0.12		(-)
Volumetric air content of cracks	0.26		(-)
Indoor/Outdoor differential pressure	0		(g/cm/s <sup>2</sup> )



### 3. Commands and Options

# Exposure Pathway Flowchart

Site Name: Former Chevron SS No. 21-0208 Job ID: DG20208G.3C01  
 Location: 6006 International Blvd., Oakland, CA Date: 24-Sep-01  
 Compl. By: J. Douglas



## CHEMICAL DATA FOR SELECTED COCs

## Physical Property Data

Constituent	CAS Number	type	Molecular Weight (g/mole)		Diffusion Coefficients				log (Koc) or log(Kd) (@ 20 - 25 C)			Henry's Law Constant (@ 20 - 25 C)			Vapor Pressure (@ 20 - 25 C)		Solubility (@ 20 - 25 C)		acid pKa	base pKb	ref
			MW	ref	in air (cm <sup>2</sup> /s)	ref	in water (cm <sup>2</sup> /s)	ref	log(L/kg) partition	ref	(atm-m <sup>3</sup> ) mol	(unitless)	ref	(mm Hg)	ref	(mg/L)	ref				
Benzene*	71-43-2	A	78.1	PS	8.80E-02	PS	9.80E-06	PS	1.77	Koc	PS	5.55E-03	2.29E-01	PS	9.52E+01	PS	1.75E+03	PS	-	-	-
Toluene	108-88-3	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	Koc	A	6.30E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29	-	-	-
Ethylbenzene	100-41-4	A	106.2	PS	7.50E-02	PS	7.80E-06	PS	2.56	Koc	PS	7.88E-03	3.25E-01	PS	1.00E+01	PS	1.69E+02	PS	-	-	-
Xylene (mixed isomers)	1330-20-7	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	Koc	A	7.03E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5	-	-	-
Methyl t-Butyl ether	1634-04-4	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	Koc	A	5.77E-04	2.38E-02	-	2.49E+02	-	4.80E+04	A	-	-	-

\* = Chemical with user-specified data

Site Name: Former Chevron SS No. 21-0208

Completed By: J. Douglas

Job ID: DG20208G.3C01

Site Location: 6006 International Blvd., Oakland, CA

Date Completed: 24-Sep-01

<b>CHEMICAL DATA FOR SELECTED COCs</b>	<b>Toxicity Data</b>
--	----------------------

Constituent	Reference Dose				Reference Conc.				Slope Factors				Unit Risk Factor		EPA Weight of Evidence	Is Constituent Carcinogenic ?
	(mg/kg/day)		(mg/m3)		1/(mg/kg/day)		1/(pg/m3)									
	(mg/kg/day)		(mg/m3)		1/(mg/kg/day)		1/(pg/m3)									
	Oral RfD	ref	Dermal RfD	ref	Inhalation RfC	ref	Oral SF	ref	Dermal SF	ref	Inhalation URF	ref				
Benzene*	3.00E-03	R	-	-	5.95E-03	R	1.00E-01	PS	2.99E-02	TX	8.29E-06	PS	A	TRUE		
Toluene	2.00E-01	A,R	1.60E-01	TX	4.00E-01	A,R	-	-	-	-	-	-	D	FALSE		
Ethylbenzene	1.00E-01	PS	9.70E-02	TX	1.00E+00	PS	-	-	-	-	-	-	D	FALSE		
Xylene (mixed isomers)	2.00E+00	A,R	1.84E+00	TX	7.00E+00	A	-	-	-	-	-	-	D	FALSE		
Methyl t-Butyl ether	1.00E-02	31	8.00E-03	TX	3.00E+00	R	-	-	-	-	-	-	-	FALSE		

\* = Chemical with user-specific

Site Name: Former Chevron SS

Site Location: 6006 Internatio

**Miscellaneous Chemical Data**

Constituent	Maximum Contaminant Level		Time-Weighted Average Workplace Criteria		Aquatic Life Prot. Criteria		Bioconcentration Factor (L-wat/kg-fish)
	MCL (mg/L)	ref	TWA (mg/m3)	ref	AQL (mg/L)	ref	
Benzene*	5.00E-04	-	3.25E+00	-	-	-	12.6
Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	-	-	70
Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.35E+02	PS	-	-	1
Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	-	-	1
Methyl t-Butyl ether	-	-	6.00E+01	NIOSH	-	-	1

\* = Chemical with user-specific

Site Name: Former Chevron SS

Site Location: 6006 Internatio

<b>CHEMICAL DATA FOR SELECTED COCs</b>	<b>Miscellaneous Chemical Data</b>
--	------------------------------------

Constituent	Dermal		Water Dermal Permeability Data					Detection Limits				Half Life		
	Relative Absorp. Factor (unitless)	Dermal Permeability Coeff. (cm/hr)	Lag time for Dermal Exposure (hr)	Critical Exposure Time (hr)	Relative Contr of Derm Perm Coeff (unitless)	Water/Skin Derm Adsorp Factor (cm/event)	Groundwater (mg/L)		Soil (mg/kg)		(First-Order Decay) (days)			
							ref	ref	ref	ref	Saturated	Unsaturated	ref	
Benzene*	0.5	0.021	0.26	0.63	0.013	7.3E-2	D	0.002	S	0.005	S	720	720	H
Toluene	0.5	0.045	0.32	0.77	0.054	1.6E-1	D	0.002	S	0.005	S	28	28	H
Ethylbenzene	0.5	0.074	0.39	1.3	0.14	2.7E-1	D	0.002	S	0.005	S	228	228	H
Xylene (mixed isomers)	0.5	0.08	0.39	1.4	0.16	2.9E-1	D	0.005	S	0.005	S	360	360	H
Methyl t-Butyl ether	0.5	-	-	-	-	-	-	-	-	-	-	360	180	H

\* = Chemical with user-specific

Site Name: Former Chevron SS

Site Location: 6006 Internatio

# RBCA SITE ASSESSMENT

## Input Parameter Summary

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 5006 International Blvd., Oakland, CA

Completed By: J Douglas  
 Date Completed: 24-Sep-01

Job ID: DG20208G.3C01

1 OF 1

Exposure Parameters	Residential		Commercial/Industrial	
	Adult (L/yr)	(1-18 yrs)	Chronic	Construction
AT <sub>c</sub> Averaging time for carcinogens (yr)	70			
AT <sub>n</sub> Averaging time for non-carcinogens (yr)	30		25	1
BW Body weight (kg)	70	15	70	
ED Exposure duration (yr)	30	8	25	1
τ Averaging time for vapor flux (yr)	30		25	1
EF Exposure frequency (days/yr)	350		250	180
EF <sub>D</sub> Exposure frequency for dermal exposure	350		250	
IR <sub>w</sub> Ingestion rate of water (L/day)	2		1	
IR <sub>s</sub> Ingestion rate of soil (mg/day)	100	200	50	100
SA Skin surface area (dermal) (cm <sup>2</sup> )	5800		5800	5800
M Soil to skin adherence factor	1			
ET <sub>swim</sub> Swimming exposure time (hr/event)	3			
EV <sub>swim</sub> Swimming event frequency (events/yr)	12	12	12	
IR <sub>swim</sub> Water ingestion while swimming (L/hr)	0.05	0.5		
SA <sub>swim</sub> Skin surface area for swimming (cm <sup>2</sup> )	23000		8100	
IR <sub>fish</sub> Ingestion rate of fish (kg/yr)	0.025			
F <sub>fish</sub> Contaminated fish fraction (unitless)	1			

Complete Exposure Pathways and Receptors	On-site	Off-site 1	Off-site 2
<b>Groundwater:</b>			
Groundwater Ingestion	None	None	None
Soil Leaching to Groundwater Ingestion	None	None	None
<b>Applicable Surface Water Exposure Routes:</b>			
Swimming			NA
Fish Consumption			NA
Aquatic Life Protection			NA
<b>Soil:</b>			
Direct Ingestion and Dermal Contact	None		
<b>Outdoor Air:</b>			
Particulates from Surface Soils	None	None	None
Volatilization from Soils	Residential	None	None
Volatilization from Groundwater	Residential	None	None
<b>Indoor Air:</b>			
Volatilization from Subsurface Soils	Residential	NA	NA
Volatilization from Groundwater	Residential	NA	NA

Receptor Distance from Source Media	On-site	Off-site 1	Off-site 2	(Units)
Groundwater receptor	NA	NA	NA	(ft)
Soil leaching to groundwater receptor	NA	NA	NA	(ft)
Outdoor air inhalation receptor	0	NA	NA	(ft)

Target Health Risk Values	Individual	Cumulative
TR <sub>10<sup>-6</sup></sub> Target Risk (class A&B carcinogens)	1.0E-5	1.0E-6
TR <sub>c</sub> Target Risk (class C carcinogens)	1.0E-5	
THQ Target Hazard Quotient (non-carcinogenic risk)	1.0E+0	1.0E+0

Modeling Options	
RBCA tier	Tier 2
Outdoor air volatilization model	Surface & subsurface models
Indoor air volatilization model	Johnson & Ettinger model
Soil leaching model	NA
Use soil attenuation model (SAM) for leachate?	NA
Air dilution factor	NA
Groundwater dilution-attenuation factor	NA

NOTE NA = Not applicable

Surface Parameters	General	Construction	(Units)
A Source zone area	1.0E+2	NA	(ft <sup>2</sup> )
W Length of source-zone area parallel to wind	1.0E+1	NA	(ft)
W <sub>gw</sub> Length of source-zone area parallel to GW flow	NA		(ft)
U <sub>air</sub> Ambient air velocity in mixing zone	7.4E+0		(ft/s)
δ <sub>gw</sub> Air mixing zone height	6.6E+0		(ft)
P <sub>a</sub> Areal particulate emission rate	NA		(g/cm <sup>2</sup> /s)
L <sub>soil</sub> Thickness of affected surface soils	3.3E+0		(ft)

Surface Soil Column Parameters	Value	(Units)
h <sub>cap</sub> Capillary zone thickness	2.0E-1	(ft)
h <sub>v</sub> Vadose zone thickness	6.8E+0	(ft)
ρ <sub>s</sub> Soil bulk density	7.8E+0	(g/cm <sup>3</sup> )
f <sub>oc</sub> Fraction organic carbon	1.0E-2	(-)
θ <sub>v</sub> Soil total porosity	4.1E-1	(-)
K <sub>ov</sub> Vertical hydraulic conductivity	1.9E-3	(cm/d)
k <sub>v</sub> Vapor permeability	1.1E-11	(ft <sup>2</sup> )
L <sub>gw</sub> Depth to groundwater	7.0E+0	(ft)
L <sub>soil</sub> Depth to top of affected soils	0.0E+0	(ft)
L <sub>base</sub> Depth to base of affected soils	7.0E+0	(ft)
L <sub>soil</sub> Thickness of affected soils	7.0E+0	(ft)
pH Soil/groundwater pH	6.8E+0	(-)
θ <sub>w</sub> Volumetric water content	0.2493	(-)
θ <sub>a</sub> Volumetric air content	0.1557	(-)

Building Parameters	Residential	Commercial	(Units)
V <sub>b</sub> Building volume/area ratio	6.56E+0	NA	(ft)
A <sub>b</sub> Foundation area	7.63E+3	NA	(ft <sup>2</sup> )
X <sub>ext</sub> Foundation perimeter	6.84E+2	NA	(ft)
ER Building air exchange rate	1.40E-4	NA	(1/s)
L <sub>ext</sub> Foundation thickness	4.92E-1	NA	(ft)
Z <sub>ext</sub> Depth to bottom of foundation slab	4.92E-1	NA	(ft)
η Foundation crack fraction	1.00E-2	NA	(-)
dP Indoor/outdoor differential pressure	0.00E+0	NA	(g/cm/s <sup>2</sup> )
Q <sub>h</sub> Convective air flow through slab	0.00E+0	NA	(ft <sup>3</sup> /s)

Groundwater Parameters	Value	(Units)
δ <sub>gw</sub> Groundwater mixing zone depth	NA	(ft)
i <sub>f</sub> Net groundwater infiltration rate	NA	(in/yr)
U <sub>gw</sub> Groundwater Darcy velocity	NA	(cm/d)
V <sub>gw</sub> Groundwater seepage velocity	NA	(cm/d)
K <sub>s</sub> Saturated hydraulic conductivity	NA	(cm/d)
i Groundwater gradient	NA	(-)
S <sub>w</sub> Width of groundwater source zone	NA	(ft)
S <sub>d</sub> Depth of groundwater source zone	NA	(ft)
θ <sub>eff</sub> Effective porosity in water-bearing unit	NA	(-)
f <sub>oc-wat</sub> Fraction organic carbon in water-bearing unit	NA	(-)
pH <sub>gw</sub> Groundwater pH	NA	(-)
Biodegradation considered?	NA	(-)

Transport Parameters	Off-site 1	Off-site 2	Off-site 1	Off-site 2	(Units)
<b>Lateral Groundwater Transport</b>	<b>Groundwater Ingestion</b>	<b>Soil Leaching to GW</b>			
α <sub>x</sub> Longitudinal dispersivity	NA	NA	NA	NA	(ft)
α <sub>y</sub> Transverse dispersivity	NA	NA	NA	NA	(ft)
α <sub>z</sub> Vertical dispersivity	NA	NA	NA	NA	(ft)
<b>Lateral Outdoor Air Transport</b>	<b>Soil to Outdoor Air Inhal.</b>	<b>GW to Outdoor Air Inhal.</b>			
α <sub>y</sub> Transverse dispersion coefficient	NA	NA	NA	NA	(ft)
α <sub>z</sub> Vertical dispersion coefficient	NA	NA	NA	NA	(ft)
ADF Air dispersion factor	NA	NA	NA	NA	(-)

Surface Water Parameters	Off-site 2	(Units)
Q <sub>sw</sub> Surface water flowrate	NA	(ft <sup>3</sup> /s)
W <sub>pl</sub> Width of GW plume at SW discharge	NA	(ft)
δ <sub>pl</sub> Thickness of GW plume at SW discharge	NA	(ft)
D <sub>fsw</sub> Groundwater-to-surface water dilution factor	NA	(-)

**RBCA SITE ASSESSMENT**

**User-Specified COC Data**

**REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA**

CONSTITUENT	Representative COC Concentration			
	Groundwater		Soils (0 - 7 ft)	
	value (mg/L)	note	value (mg/kg)	note
Benzene*	1.4E-2	oral slope changed to 0.1	2.5E-3	
Toluene	2.9E-3		2.5E-3	
Ethylbenzene	4.4E-2		2.5E-3	
Xylene (mixed isomers)	2.3E-2		4.3E-3	
Methyl t-Butyl ether	1.9E-2		3.9E-2	

\* = Chemical with user-specified data

Site Name: Former Chevron SS No. 21-0208

Date Completed: 24-Sep-01

Site Location: 6006 International Blvd., Oakland, CA

Job ID: DG20208G.3C01

Completed By: J. Douglas



**RBCA SITE ASSESSMENT**

Site Name: Former Chevron SS No. 21-0208      Completed By: J. Douglas  
 Site Location: 6006 International Blvd., Oakland, CA      Date Completed: 24-Sep-01

1 of 1

**TIER 2 SOIL CONCENTRATION DATA SUMMARY**

CONSTITUENTS DETECTED		Analytical Method			Detected Concentrations		
		Typical Detection Limit (mg/kg)	No. of Samples	No. of Detects	Maximum Conc. (mg/kg)	Mean Conc. (mg/kg)	UCL on Mean Conc. (mg/kg)
CAS No.	Name						
71-43-2	Benzene*	5.0E-03	28	28	2.5E-03	2.5E-03	2.5E-03
108-88-3	Toluene	5.0E-03	28	28	2.5E-03	2.5E-03	2.5E-03
100-41-4	Ethylbenzene	5.0E-03	28	28	2.5E-03	2.5E-03	2.5E-03
1330-20-7	Xylene (mixed isomers)	5.0E-03	28	28	4.0E-01	3.1E-03	4.3E-03
1634-04-4	Methyl t-Butyl ether	5.0E-02	28	28	4.3E-01	3.1E-02	3.9E-02

\* = Chemical with user-specified data

**RBCA SITE ASSESSMENT**

Site Name: Former Chevron SS No. 21-0208      Completed By: J. Douglas  
 Site Location: 6006 International Blvd., Oakland, CA      Date Completed: 24-Sep-01

1 of 1

**TIER 2 GROUNDWATER CONCENTRATION DATA SUMMARY**

CONSTITUENTS DETECTED		Analytical Method			Detected Concentrations		
		Typical Detection Limit (mg/L)	No. of Samples	No. of Detects	Maximum Conc. (mg/L)	Mean Conc. (mg/L)	UCL on Mean Conc. (mg/L)
CAS No.	Name						
71-43-2	Benzene*	5.0E-04	7	7	1.0E-01	2.0E-03	1.4E-02
108-88-3	Toluene	5.0E-04	7	7	1.3E-02	8.4E-04	2.9E-03
100-41-4	Ethylbenzene	5.0E-04	7	7	1.8E-01	4.8E-03	4.4E-02
1330-20-7	Xylene (mixed isomers)	5.0E-04	7	7	5.7E-02	3.5E-03	2.3E-02
1634-04-4	Methyl t-Butyl ether	2.5E-03	7	7	1.4E-01	3.0E-03	1.9E-02

\* = Chemical with user-specified data

<b>RBCA SITE ASSESSMENT</b>	<b>Baseline Risk Summary-All Pathways</b>
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Site Name: Former Chevron SS No. 21-0208

Completed By: J. Douglas

Site Location: 6006 International Blvd., Oakland, CA

Date Completed: 24-Sep-01

<b>TIER 2 BASELINE RISK SUMMARY TABLE</b>										
EXPOSURE PATHWAY	<b>BASELINE CARCINOGENIC RISK</b>					<b>BASELINE TOXIC EFFECTS</b>				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
<b>OUTDOOR AIR EXPOSURE PATHWAYS</b>										
Complete:	2.9E-9	1.0E-5	2.9E-9	1.0E-5	<input type="checkbox"/>	1.4E-4	1.0E+0	1.4E-4	1.0E+0	<input type="checkbox"/>
<b>INDOOR AIR EXPOSURE PATHWAYS</b>										
Complete:	1.6E-6	1.0E-5	1.6E-6	1.0E-5	<input type="checkbox"/>	7.6E-2	1.0E+0	7.8E-2	1.0E+0	<input type="checkbox"/>
<b>SOIL EXPOSURE PATHWAYS</b>										
Complete:	NA	NA	NA	NA	<input type="checkbox"/>	NA	NA	NA	NA	<input type="checkbox"/>
<b>GROUNDWATER EXPOSURE PATHWAYS</b>										
Complete:	NA	NA	NA	NA	<input type="checkbox"/>	NA	NA	NA	NA	<input type="checkbox"/>
<b>SURFACE WATER EXPOSURE PATHWAYS</b>										
Complete:	NA	NA	NA	NA	<input type="checkbox"/>	NA	NA	NA	NA	<input type="checkbox"/>
<b>CRITICAL EXPOSURE PATHWAY (Maximum Values From Complete Pathways)</b>										
	1.6E-6	1.0E-5	1.6E-6	1.0E-5	<input type="checkbox"/>	7.6E-2	1.0E+0	7.8E-2	1.0E+0	<input type="checkbox"/>
	<i>Indoor Air</i>		<i>Indoor Air</i>			<i>Indoor Air</i>		<i>Indoor Air</i>		

**RBCA SITE ASSESSMENT**

**TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION**

**OUTDOOR AIR EXPOSURE PATHWAYS**

■ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS (0 - 3.3 ft):

VAPOR INHALATION

Constituents of Concern	1) Source Medium	2) NAF Value (m <sup>3</sup> /kg) Receptor				3) Exposure Medium Outdoor Air: POE Conc. (mg/m <sup>3</sup> ) (1) / (2)			
	Soil Conc. (mg/kg)	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
		Residential	Construction Worker	None	None	Residential	Construction Worker	None	None
Benzene*	2.5E-3	1.8E+5				1.4E-8			
Toluene	2.5E-3	1.8E+5				1.4E-8			
Ethylbenzene	2.5E-3	1.8E+5				1.4E-8			
Xylene (mixed isomers)	4.3E-3	1.8E+5				2.4E-8			
Methyl t-Butyl ether	3.9E-2	1.8E+5				2.1E-7			

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA  
 Completed By: J. Douglas

Date Completed: 24-Sep-01  
 Job ID: DG20208G.3C01

**RBCA SITE ASSESSMENT**

**TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION**

**OUTDOOR AIR EXPOSURE PATHWAYS**

SURFACE SOILS (0 - 3.3 ft):

VAPOR INHALATION (cont'd)

Constituents of Concern	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)				5) Average Inhalation Exposure Concentration (mg/m <sup>3</sup> ) (3) X (4)			
	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	Construction Worker	None	None	Residential	Construction Worker	None	None
Benzene*	4.1E-1				5.7E-9			
Toluene	9.6E-1				1.3E-8			
Ethylbenzene	9.6E-1				1.3E-8			
Xylene (mixed isomers)	9.6E-1				2.3E-8			
Methyl t-Butyl ether	9.6E-1				2.1E-7			

\* = Chemical with user-specified data

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Former Chevron SS No. 21-0208

Date Completed: 24-Sep-01

Site Location: 6006 International Blvd., Oakland, CA

Job ID: DG20208G.3C01

Completed By: J. Douglas

**RBCA SITE ASSESSMENT**

**TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION**

**OUTDOOR AIR EXPOSURE PATHWAYS**

(CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS (3.3 - 7 ft):

VAPOR INHALATION

Constituents of Concern	1) Source Medium	2) NAF Value (m <sup>3</sup> /kg) Receptor			3) Exposure Medium Outdoor Air: POE Conc. (mg/m <sup>3</sup> ) (1) / (2)		
	Soil Conc. (mg/kg)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)
		Residential	None	None	Residential	None	None
Benzene*	2.5E-3	8.4E+4			3.0E-8		
Toluene	2.5E-3	8.4E+4			3.0E-8		
Ethylbenzene	2.5E-3	8.4E+4			3.0E-8		
Xylene (mixed isomers)	4.3E-3	8.4E+4			5.1E-8		
Methyl t-Butyl ether	3.9E-2	8.4E+4			4.6E-7		

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA  
 Completed By: J. Douglas

Date Completed: 24-Sep-01  
 Job ID: DG20208G.3C01

**RBCA SITE ASSESSMENT**

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**TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION**

**OUTDOOR AIR EXPOSURE PATHWAYS**

SUBSURFACE SOILS (3.3 - 7 ft):  
 VAPOR INHALATION (cont'd)

Constituents of Concern	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)			5) Average Inhalation Exposure Concentration (mg/m <sup>3</sup> ) (3) X (4)		
	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	None	None	Residential	None	None
Benzene*	4.1E-1			1.2E-8		
Toluene	9.6E-1			2.8E-8		
Ethylbenzene	9.6E-1			2.8E-8		
Xylene (mixed isomers)	9.6E-1			4.9E-8		
Methyl t-Butyl ether	9.6E-1			4.4E-7		

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA  
 Completed By: J. Douglas

Date Completed: 24-Sep-01  
 Job ID: DG20208G.3C01

**RBCA SITE ASSESSMENT**

**TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION**

**OUTDOOR AIR EXPOSURE PATHWAYS**  (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR  
INHALATION

Exposure Concentration

Constituents of Concern	1) Source Medium	2) NAF Value (m <sup>3</sup> /L) Receptor			3) Exposure Medium Outdoor Air: POE Conc. (mg/m <sup>3</sup> ) (1) / (2)		
	Groundwater Conc. (mg/L)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)
		Residential	None	None	Residential	None	None
Benzene*	1.4E-2	1.8E+4			8.0E-7		
Toluene	2.9E-3	1.6E+4			1.7E-7		
Ethylbenzene	4.4E-2	1.5E+4			3.0E-6		
Xylene (mixed isomers)	2.3E-2	1.7E+4			1.3E-6		
Methyl t-Butyl ether	1.9E-2	1.7E+5			1.1E-7		

NOTE: NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former Chevron SS No. 21-0208  
Site Location: 6006 International Blvd., Oakland, CA  
Completed By: J. Douglas

Date Completed: 24-Sep-01  
Job ID: DG20208G.3C01



**RBCA SITE ASSESSMENT**

**TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION**

**OUTDOOR AIR EXPOSURE PATHWAYS**

GROUNDWATER: VAPOR  
 INHALATION (cont'd)

Constituents of Concern	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)			5) Average Inhalation Exposure Concentration (mg/m <sup>3</sup> ) (3) X (4)		
	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)	On-site (0 ft)	Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	None	None	Residential	None	None
Benzene*	4.1E-1			3.3E-7		
Toluene	9.6E-1			1.7E-7		
Ethylbenzene	9.6E-1			2.8E-6		
Xylene (mixed isomers)	9.6E-1			1.3E-6		
Methyl t-Butyl ether	9.6E-1			1.1E-7		

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr)

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA  
 Completed By: J. Douglas

Date Completed: 24-Sep-01  
 Job ID: DG20208G.3C01

**RBCA SITE ASSESSMENT**

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**TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION**

**OUTDOOR AIR EXPOSURE PATHWAYS**

TOTAL PATHWAY EXPOSURE (mg/m<sup>3</sup>)

*(Sum average exposure concentrations from soil and groundwater routes.)*

Constituents of Concern	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	Construction Worker	None	None
Benzene*	3.5E-7			
Toluene	2.1E-7			
Ethylbenzene	2.9E-6			
Xylene (mixed isomers)	1.3E-6			
Methyl t-Butyl ether	7.5E-7			

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA  
 Completed By: J. Douglas

Date Completed: 24-Sep-01  
 Job ID: DG20208G.3C01

**RBCA SITE ASSESSMENT**

**TIER 2 PATHWAY RISK CALCULATION**

**OUTDOOR AIR EXPOSURE PATHWAYS**

(CHECKED IF PATHWAYS ARE ACTIVE)

**CARCINOGENIC RISK**

Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Exposure (mg/m <sup>3</sup> )				(3) Inhalation Unit Risk Factor (µg/m <sup>3</sup> ) <sup>-1</sup>	(4) Individual COC Risk (2) x (3) x 1000			
		On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)		On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
		Residential	Construction Worker	None	None		Residential	Construction Worker	None	None
Benzene*	A	3.5E-7				8.3E-6	2.9E-9			
Toluene	D									
Ethylbenzene	D									
Xylene (mixed isomers)	D									
Methyl t-Butyl ether	-									

**Total Pathway Carcinogenic Risk =**

**2.9E-9**

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA

Completed By: J. Douglas  
 Date Completed: 24-Sep-01

Job ID: DG20208G.3C01

**RBCA SITE ASSESSMENT**

**TIER 2 PATHWAY RISK CALCULATION**

**OUTDOOR AIR EXPOSURE PATHWAYS**

(CHECKED IF PATHWAYS ARE ACTIVE)

**TOXIC EFFECTS**

Constituents of Concern	(5) Total Toxicant Exposure (mg/m <sup>3</sup> )				(6) Inhalation Reference Conc. (mg/m <sup>3</sup> )	(7) Individual COC Hazard Quotient (5) / (6)			
	On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)		On-site (0 ft)		Off-site 1 (0 ft)	Off-site 2 (0 ft)
	Residential	Construction Worker	None	None		Residential	Construction Worker	None	None
Benzene*	8.1E-7				6.0E-3	1.4E-4			
Toluene	2.1E-7				4.0E-1	5.2E-7			
Ethylbenzene	2.9E-6				1.0E+0	2.9E-6			
Xylene (mixed isomers)	1.3E-6				7.0E+0	1.9E-7			
Methyl t-Butyl ether	7.5E-7				3.0E+0	2.5E-7			

**Total Pathway Hazard Index =**

**1.4E-4**

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA

Completed By: J. Douglas  
 Date Completed: 24-Sep-01

Job ID: DG20208G.3C01

**RBCA SITE ASSESSMENT**

**TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION**

**INDOOR AIR EXPOSURE PATHWAYS**

(CHECKED IF PATHWAY IS ACTIVE)

SOILS (0 - 7 ft): VAPOR

INTRUSION INTO ON-SITE BUILDINGS

Constituents of Concern	1) Source Medium	2) NAF Value (m <sup>3</sup> /kg) Receptor	3) Exposure Medium Indoor Air: POE Conc. (mg/m <sup>3</sup> ) (1) / (2)	4) Exposure Multiplier (EF×ED)/(AT×365) (unitless)	5) Average Inhalation Exposure Concentration (mg/m <sup>3</sup> ) (3) X (4)
	Soil Conc. (mg/kg)	Residential	Residential	Residential	Residential
Benzene*	2.5E-3	1.7E+1	1.4E-4	4.1E-1	5.9E-5
Toluene	2.5E-3	3.5E+1	7.1E-5	9.6E-1	6.8E-5
Ethylbenzene	2.5E-3	8.5E+1	3.0E-5	9.6E-1	2.8E-5
Xylene (mixed isomers)	4.3E-3	6.6E+1	6.5E-5	9.6E-1	6.2E-5
Methyl t-Butyl ether	3.9E-2	4.5E+1	8.7E-4	9.6E-1	8.3E-4

\* = Chemical with user-specified data

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA  
 Completed By: J. Douglas

Date Completed: 24-Sep-01  
 Job ID: DG20208G.3C01

RBCA SITE ASSESSMENT

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS

(CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INTRUSION  
INTO ON-SITE BUILDINGS

Exposure Concentration

Constituents of Concern	1) Source Medium	2) NAF Value (m <sup>3</sup> /L) Receptor	3) Exposure Medium Indoor Air: POE Conc. (mg/m <sup>3</sup> ) (1) / (2)	4) Exposure Multiplier (EFxED)/(ATx365) (unitless)	5) Average Inhalation Exposure Concentration (mg/m <sup>3</sup> ) (3) X (4)
	Groundwater Conc. (mg/L)	Residential	Residential	Residential	Residential
Benzene*	1.4E-2	4.4E+1	3.3E-4	4.1E-1	1.4E-4
Toluene	2.9E-3	4.0E+1	7.2E-5	9.6E-1	6.9E-5
Ethylbenzene	4.4E-2	3.6E+1	1.2E-3	9.6E-1	1.2E-3
Xylene (mixed isomers)	2.3E-2	4.2E+1	5.4E-4	9.6E-1	5.2E-4
Methyl t-Butyl ether	1.9E-2	4.4E+2	4.2E-5	9.6E-1	4.0E-5

NOTE: AT = Averaging time (days) EF = Exposure frequency (days/yr) ED = Exposure duration (yr) NAF = Natural attenuation factor POE = Point of exposure

Site Name: Former Chevron SS No. 21-0208  
Site Location: 6006 International Blvd., Oakland, CA  
Completed By: J. Douglas

Date Completed: 24-Sep-01  
Job ID: DG20208G.3C01

**RBCA SITE ASSESSMENT**

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**TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION**

**INDOOR AIR EXPOSURE PATHWAYS**

**TOTAL PATHWAY EXPOSURE (mg/m<sup>3</sup>)**  
*(Sum average exposure concentrations  
 from soil and groundwater routes.)*

Constituents of Concern	Residential
Benzene*	1.9E-4
Toluene	1.4E-4
Ethylbenzene	1.2E-3
Xylene (mixed isomers)	5.8E-4
Methyl t-Butyl ether	8.7E-4

Site Name: Former Chevron SS No. 21-0208      Date Completed: 24-Sep-01  
 Site Location: 6006 International Blvd., Oakland, C      Job ID: DG20208G.3C01  
 Completed By: J. Douglas

**RBCA SITE ASSESSMENT**

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**TIER 2 PATHWAY RISK CALCULATION**

**INDOOR AIR EXPOSURE PATHWAYS**  (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK		
		(2) Total Carcinogenic Exposure (mg/m <sup>3</sup> ) Residential	(3) Inhalation Unit Risk Factor (µg/m <sup>3</sup> ) <sup>-1</sup>	(4) Individual COC Risk (2) x (3) x 1000 Residential
Benzene*	A	1.9E-4	8.3E-6	1.6E-6
Toluene	D			
Ethylbenzene	D			
Xylene (mixed isomers)	D			
Methyl t-Butyl ether	-			

**Total Pathway Carcinogenic Risk = 1.6E-6**

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA  
 Completed By: J. Douglas

Date Completed: 24-Sep-01  
 Job ID: DG20208G.3C01



**RBCA SITE ASSESSMENT**

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**TIER 2 PATHWAY RISK CALCULATION**

**INDOOR AIR EXPOSURE PATHWAYS**  (CHECKED IF PATHWAYS ARE ACTIVE)

**TOXIC EFFECTS**

Constituents of Concern	(5) Total Toxicant Exposure (mg/m <sup>3</sup> )	(6) Inhalation Reference Concentration (mg/m <sup>3</sup> )	(7) Individual COC Hazard Quotient (5) / (6)
	Residential		Residential
Benzene*	4.5E-4	6.0E-3	7.6E-2
Toluene	1.4E-4	4.0E-1	3.4E-4
Ethylbenzene	1.2E-3	1.0E+0	1.2E-3
Xylene (mixed isomers)	5.8E-4	7.0E+0	8.3E-5
Methyl t-Butyl ether	8.7E-4	3.0E+0	2.9E-4

**Total Pathway Hazard Index = 7.8E-2**

Site Name: Former Chevron SS No. 21-0208  
 Site Location: 6006 International Blvd., Oakland, CA  
 Completed By: J. Douglas

Date Completed: 24-Sep-01  
 Job ID: DG20208G.3C01