

ENVIRONMENTAL
PROTECTION

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January 21, 2000

Mr. Barney Chan
Alameda County Health Care Services
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

**SUBJECT: ASTM Tier 2 RBCA Analysis
Amendment #2
New Genico Site
3927 East 14th Street, Oakland, California
ATC Project No. 61137.0007**

Dear Mr. Chan:

ATC Associates Inc. (ATC) is pleased to present this ASTM Tier 2 RBCA Analysis Amendment #2 summarizing the results of an additional American Society of Testing and Materials (ASTM) Tier 2 Risk Based Corrective Action (RBCA) evaluation, for the New Genico site (site) located at 3927 East 14th Street in Oakland, California.

This second amendment is submitted in response to additional comments from the Alameda County Health Care Services (ACHCS), dated August 3, 1999. The ACHCS's requests were made following the review of ATC's "ASTM Tier 2 RBCA Analysis Amendment and the Second Quarter 1999 Groundwater Monitoring Report for 3927 East 14th Street, Oakland, California."

ASTM TIER 2 RBCA EVALUATION

The ASTM Tier 2 RBCA evaluation was performed following Standard E 1739-95 and the ASTM Tier 2 Guidance Manual for Risk Based Corrective Action published by Groundwater Services, Inc. (GSI) of Houston, Texas.

At the request of ACHCS, ATC incorporated the most recent groundwater monitoring data. The RBCA analysis reflects the California slope factor for benzene of 0.1 and the acceptable risk of 1×10^{-5} . Other input parameters remained the same as the July 1999 evaluation presented in Amendment #1.

A7C
17321 Irvine Blvd
Suite 200
TUSTING # 92780-3010
Al Martinez

Representative Benzene Concentration

The constituent of concern for the ASTM Tier 2 RBCA evaluation was benzene. ATC used benzene concentrations from the last three quarterly monitoring events (1999) from groundwater monitoring wells HMW-1, ~~HMW-2~~, HMW-3, and ~~HMW-4~~ to estimate a representative concentration of 0.12 mg/L. The representative concentration was calculated using the RBCA software and is the 95th percentile Upper Confidence Limit of the calculated mean benzene concentration, based on data collected during the four quarterly groundwater sampling events in 1999.

Results of RBCA Modeling

\bar{x} of [B] from HMW-1 + HMW-3
0.24

Using the above referenced representative concentration, the indoor and outdoor air pathways were evaluated. Cleanup goals for the site, or Site Specific Target Levels (SSTL's) were estimated for soil and groundwater (results attached)

The groundwater SSTL's for benzene are presented below in comparison to the representative benzene concentration in groundwater.

Scenario	target risk	Exposure	SSTL (mg/L)	Representative Concentration (mg/L)
Volatilization from groundwater into on-site indoor air	1.0 E-5	Commercial	0.53	0.12 0.24
Volatilization from groundwater into on-site outdoor air	1.0 E-5	Commercial	61	0.12 0.24

The applicable SSTL would be the lowest calculated SSTL which is 0.53 mg/L. As shown on the table above this SSTL is higher than the representative groundwater concentration of 0.12 mg/L. Therefore, the representative concentration of benzene beneath the site is below the site-specific cleanup goal calculated using the ASTM Tier 2 RBCA methodology.

Based on the information presented in this report, current regulatory guidelines, and the judgment of ATC, the following conclusions are presented:

- Using a target risk of 1X10E-5, slope factor of 0.1, and representative benzene concentrations using site 1999 data, the representative concentration of benzene in groundwater is below the calculated SSTL.

- Because the representative concentration of benzene in groundwater is below the SSTL, the site may be considered a low risk groundwater case as described in the Regional Water Quality Control Board (RWQCB) memorandum which discusses low risk groundwater cases.

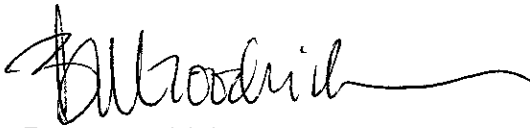
RECOMMENDATIONS

The results of this ASTM Tier 2 RBCA Analysis show that the concentration of benzene in groundwater at the site is below the calculated SSTL. In addition, the concentrations of petroleum hydrocarbon in the site groundwater are naturally attenuating, primarily as a result of intrinsic bioremediation. The total petroleum hydrocarbon (TPH) as gasoline (TPH-G) and benzene charts (see Agency Response Letter dated November 4, 1999) indicate that the overall concentrations of the contaminants at the site have declined since groundwater monitoring was initiated in August 1996. Therefore, ATC recommends that this site be granted regulatory site closure.

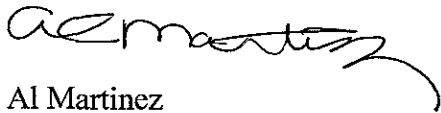
If you have any questions regarding this report please do not hesitate to call Al Martinez at (925) 460-5300.

Sincerely,

ATC ASSOCIATES INC.



Beata Goodrich, PE
Project Engineer



Al Martinez
Project Manager

Attachments

cc: Mr. Tommy Conner, Conner Bak

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Hausauer Job Identification: 61137.0004 Software: GSI RBCA Spreadsheet
 Site Location: Oakland, CA Date Completed: 1/7/00 Version: 1 0 1
 Completed By: Beata Goodrich

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

Exposure Parameter	Definition (Units)	Residential			Commercial/Industrial	
		Adult	(1-5yrs)	(1-16 yrs)	Chronic	Constrctn
A1c	Averaging time for carcinogens (yr)	70				
A1n	Averaging time for non carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF Dermal	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRS	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soiling rate (mg y/r/kg d)	1.1E+02			9.4E+01	
IRa in	Inhalation rate indoor (m ³ /day)	15			20	
IRa out	Inhalation rate outdoor (m ³ /day)	20			20	10
SA	Skin surface area (dermal) (cm ²)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm ² y/r/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAF s	Age adjustment on soil ingestion	FALSE			FALSE	
AAF d	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEF based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm ²)	<u>4.6E+04</u>	<u>4.6E+04</u>
W	Length of affect. soil parallel to wind (cm)	1.5E+03	1.0E+03
Wgw	Length of affect. soil parallel to groundwater (cm)	1.5E+03	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)		
Pe	Particulate areal emission rate (g/cm ² /s)	6.9E-14	

Groundwater Parameters	Definition (Units)	Value
delta gw	Groundwater mixing zone depth (cm)	2.0E+02
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	2.5E+03
Ugw tr	Groundwater seepage velocity (cm/yr)	6.6E+03
Ks	Saturated hydraulic conductivity (cm/s)	
grad	Groundwater gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi eff	Effective porosity in water-bearing unit	3.8E-01
foc sat	Fraction organic carbon in water-bearing unit	1.0E-03
ts bio?	ts bioattenuation considered?	FALSE
BC	Biodegradation Capacity (mg/L)	

Soil Parameters	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	<u>6.1E+00</u>		
hv	Vadose zone thickness (cm)	<u>2.4E+02</u>		
rho	Soil density (g/cm ³)	1.7		
foc	Fraction of organic carbon in vadose zone	0.01		
phi	Soil porosity in vadose zone	0.38		
Lgw	Depth to groundwater (cm)	<u>2.5E+02</u>		
Ls	Depth to top of affected subsurface soil (cm)	<u>2.1E+02</u>		
Lsubs	Thickness of affected subsurface soils (cm)	<u>3.7E+01</u>		
pH	Soil/groundwater pH	6.5		
		capillary vadose foundation		
phi w	Volumetric water content	0.342	0.12	0.12
phi a	Volumetric air content	0.038	0.26	0.26

Building Parameters	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	<u>1.1E+03</u>
ER	Building air exchange rate (s ⁻¹)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	<u>0.204</u>	

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

Matrix of Exposed Persons to Complete Exposure Pathways	Residential		Commercial/Industrial	
	Distance	On-Site	Distance	On-Site
Outdoor Air Pathways				
SS v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	TRUE
S v	Volatilization from Subsurface Soils	FALSE	TRUE	TRUE
GW v	Volatilization from Groundwater	FALSE	TRUE	TRUE
Indoor Air Pathways				
S b	Vapors from Subsurface Soils	FALSE	TRUE	TRUE
GW b	Vapors from Groundwater	FALSE	TRUE	TRUE
Soil Pathways				
SS d	Direct Ingestion and Dermal Contact	FALSE	FALSE	FALSE
Groundwater Pathways				
GW i	Groundwater Ingestion	FALSE	FALSE	FALSE
S l	Leaching to Groundwater from all Soils	FALSE	FALSE	FALSE

Matrix of Receptor Distance and Location On- or Off-Site	Residential		Commercial/Industrial	
	Distance	On-Site	Distance	On-Site
GW	Groundwater receptor (cm)	FALSE	FALSE	FALSE
S	Inhalation receptor (cm)	FALSE	TRUE	TRUE

Matrix of Target Risks	Individual	Cumulative
TRab	Target Risk class A&B carcinogens)	<u>1.0E-05</u>
TRc	Target Risk class C carcinogens)	1.0E-05
THQ	Target Hazard Quotient	1.0E+00
Opt	Calculation Option (1, 2, or 3)	2
Tier	RBCA Tier	2

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: Hausauer
 Site Location: Oakland, CA

Completed By: Beata Goodrich
 Date Completed: 1/7/2000

1 OF 1

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-5 MCL exposure limit?
 Target Risk (Class C) 1.0E-5 PEL exposure limit?
 Target Hazard Quotient 1.0E+0

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration (mg/L)	Groundwater Ingestion			Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL (mg/L)	SSTL Exceeded? "■" If yes	Required CRF
CAS No	Name		Residential (on-site)	Commercial (on-site)	Regulatory (MCL) (on-site)	Residential (on-site)	Commercial (on-site)	Residential (on-site)	Commercial (on-site)			
71-43-2	Benzene	1.2E-1 2.9E-1	NA	NA	NA	NA	5.3E-1	NA	6.1E+1	5.3E-1	<input type="checkbox"/>	<1

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

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name Hausauer
 Site Location Oakland, CA

Completed By: Beata Goodrich
 Date Completed: 1/7/2000

1 OF 1

**SUBSURFACE SOIL SSTL VALUES
 (> 0 FT BGS)**

Target Risk (Class A & B) 1 0E-5 MCL exposure limit?
 Target Risk (Class C) 1 0E-5 PEL exposure limit?
 Target Hazard Quotient 1 0E+0

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No	Name		Residential (on-site)	Commercial (on-site)	Regulatory(MCL) (on-site)	Residential (on-site)	Commercial (on-site)	Residential (on-site)	Commercial (on-site)			
71-43-2	Benzene	2.2E-1	NA	NA	NA	NA	4.6E+0	NA	5.4E+2	4.6E+0	<input type="checkbox"/>	<1

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