Subsurface Consultants, Inc.

FAX TRANSMITTAL

Date: July 3, 2000

Number of pages (including cover sheet): 4

To: Eva Chu

Phone:
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cc:

From: Gene Ng

Sent From: Lafayette
SCI Job #: 838.006
Re: 2801 MacArthur Blvd.
Oakland RBCA

REMARKS: ☐ Urgent ☒ For your review ☐ Reply ASAP ☒ Please comment
☐ For your use ☐ Original in mail ☐ As requested

Eva:

Please find attached the input parameters and the output table generated from the latest version of the Oakland RBCA spreadsheet, for the above-referenced project. The same input parameters used in the August 13, 1999 CAP were entered, with the exception of changing the foundation air content from 0.25 to the new default of 0.26. As you can see, the generated soil benzene concentration that would protect commercial workers from exposure via the indoor inhalation pathway is 43 mg/kg (for soil sources at 15 feet bgs). This value is close to the benzene SSTL of 51 mg/kg generated in the CAP. Please feel free to call Jeriann or myself with any comments or questions regarding our results.

--Gene Ng

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2801 MacArthur Boulevard
Oakland Tier 3 RBSLs (15.0 feet bgs)

Medium	Exposure Pathway	Land Use	Type of Risk	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Arsenic	Barium	Benz(a)anthracene	Benzene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
Surficial Soil [mg/kg]	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic					3.2E+00		2.5E+00	2.7E+01	2.5E-01	2.5E+00		2.5E+00
			Hazard	3.1E+03	3.1E+03	4.7E+03	1.6E+04	2.0E+01	5.2E+03		*8.0E+01*			2.1E+02	
		Commercial / Industrial	Carcinogenic					1.6E+01		8.3E+00	8.8E+01	8.3E-01	8.3E+00		8.3E+00
			Hazard	2.0E+04	2.0E+04	3.0E+04	1.0E+05	2.5E+02	9.4E+04		5.1E+02			1.4E+03	
Subsurface Soil [mg/kg]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic							SAT	1.3E+00	SAT	SAT		SAT
			Hazard	SAT	SAT	3.8E+03	SAT				4.2E+00			SAT	
		Commercial / Industrial	Carcinogenic							SAT	4.3E+01	SAT	SAT		SAT
			Hazard	SAT	SAT	SAT	SAT				2.5E+02			SAT	
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic							SAT	7.6E+01	SAT	SAT		SAT
			Hazard	SAT	SAT	SAT	SAT				3.0E+02			SAT	
		Commercial / Industrial	Carcinogenic							SAT	3.4E+02	SAT	SAT		SAT
			Hazard	SAT	SAT	SAT	SAT				SAT			SAT	
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic					*3.8E+00*	*1.1E+02*	8.8E+00	*2.8E-03*	*8.1E+00*	2.7E+01		SAT
			Hazard	2.6E+02	1.8E+02	6.9E-01	SAT	*3.8E+00*	*1.1E+02*		*2.8E-03*	*8.1E+00*		SAT	
		Commercial / Industrial	Carcinogenic					*3.8E+00*	*1.1E+02*	3.9E+01	*2.8E-03*	*8.1E+00*	SAT		SAT
			Hazard	SAT	SAT	4.5E+00	SAT	*3.8E+00*	*1.1E+02*		*2.8E-03*	*8.1E+00*		SAT	
Groundwater [mg/l]	Inhalation of Indoor Air Vapors	Residential	Carcinogenic							>SOL	3.6E+00	>SOL	>SOL		>SOL
			Hazard	>SOL	>SOL	2.5E+04	>SOL				1.2E+01			>SOL	
		Commercial / Industrial	Carcinogenic							>SOL	1.2E+02	>SOL	>SOL		>SOL
			Hazard	>SOL	>SOL	>SOL	>SOL				7.1E+02			>SOL	
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic							>SOL	9.0E+02	>SOL	>SOL		>SOL
			Hazard	>SOL	>SOL	>SOL	>SOL				>SOL			>SOL	
		Commercial / Industrial	Carcinogenic							>SOL	>SOL	>SOL	>SOL		>SOL
			Hazard	>SOL	>SOL	>SOL	>SOL				>SOL			>SOL	
	Ingestion of Groundwater	Residential	Carcinogenic					*5.0E-02*	*1.0E+00*	5.6E-04	*1.0E-03*	*2.0E-04*	5.6E-04		5.6E-04
			Hazard	9.4E-01	9.4E-01	1.6E+00	>SOL	*5.0E-02*	*1.0E+00*		*1.0E-03*	*2.0E-04*		>SOL	
		Commercial / Industrial	Carcinogenic					*5.0E-02*	*1.0E+00*	2.5E-03	*1.0E-03*	*2.0E-04*	>SOL		>SOL
			Hazard	>SOL	>SOL	1.0E+01	>SOL	*5.0E-02*	*1.0E+00*		*1.0E-03*	*2.0E-04*		>SOL	
Water Used for Recreation [mg/l]	Ingestion/ Dermal	Residential	Carcinogenic					2.0E-02		1.6E-04	6.3E-02	1.1E-05	1.1E-04		1.2E-04
			Hazard	*1.1E+00*	*1.7E+00*	4.2E+01	>SOL	1.2E-01	2.8E+01		1.8E-01			>SOL	

*Italicized concentrations based on California MCLs

SAT = RBSL exceeds saturated soil concentration of chemical

>SOL = RBSL exceeds solubility of chemical in water

2801 MacArthur Boulevard
Tier 3 Input Parameters (Oakland RBCAb)

Input Parameters	Units	Residential		Commercial / Industrial
		Child	Adult	Worker
Soil-Specific Parameters				
Capillary fringe thickness	cm	=adult residential	60.1	=adult residential
Capillary fringe air content	cm^3/cm^3		0.020	
Capillary fringe water content	cm^3/cm^3		0.38	
Fraction organic carbon (FOC*)	g oc/g soil		0.015	
Groundwater Darcy velocity	cm/yr		60	
Groundwater mixing zone thickness	cm		300	
Infiltration rate through the vadose zone	cm/yr		6	
Soil bulk density	g/cm^3		1.59	
Soil to skin adherence factor	mg/cm^2	0.5	0.5	0.5
Total soil porosity	cm^3/cm^3	=adult residential	0.4	=adult residential
Vadose zone air content	cm^3/cm^3		0.15	
Vadose zone water content	cm^3/cm^3		0.25	
Vadose zone thickness	cm		759.9	
Structural and Climatic Parameters				
Areal fraction of cracks in building foundation	cm^2/cm^2	=adult residential	0.001	0.001
Foundation air content	cm^3/cm^3		0.26	=adult residential
Foundation water content	cm^3/cm^3		0.12	
Foundation thickness	cm		15	15
Lower depth of surficial soil zone	cm		100.0	=adult residential
Depth to subsurface soil sources	cm		457.2	
Depth to groundwater	cm		820	
Width of source area parallel to wind or groundwater flow direction	cm		1830	
Outdoor air mixing zone height	cm		200	
Particulate emission rate	g/cm^2-s		1.38E-11	1.38E-11
Wind speed above ground surface in outdoor air mixing	cm/s		322	=adult residential

15' 26.9'

2801 MacArthur Boulevard
Tier 3 Input Parameters (Oakland RBCAb)

Input Parameters	Units	Residential		Commercial / Industrial
		Child	Adult	Worker
Exposure Parameters				
Averaging time for carcinogens	yr	=adult residential	70	=adult residential
Averaging time for non-carcinogens	yr	6	24	24
Averaging time for vapor flux	s	=adult residential	9.46E+08	7.88E+08
Body weight	kg	15	70	70
Building air volume/floor area	cm^3/cm^2	=adult residential	229	305
Exposure duration	yr	6	24	24
Exposure frequency	d/yr	350	350	250
Exposure frequency to water used for recreation	d/yr	120	120	0
Exposure time to indoor air	hr/d	24	24	8
Exposure time to outdoor air	hr/d	16	16	8
Exposure time to water used for recreation	hr/d	2	1.0	0
Groundwater ingestion rate	L/d	1	2	1
Indoor air exchange rate	1/s	=adult residential	5.60E-04	1.40E-03
Indoor inhalation rate	m^3/d	10	15	11
Ingestion rate of water used for recreation	L/hr	0.05	0.05	0
Outdoor inhalation rate	m^3/d	10	20	20
Skin surface area exposed to soil	cm^2	2000	5000	5000
Skin surface area exposed to water used for recreation	cm^2	8000	20000	0
Soil ingestion rate	mg/d	200	100	50
TARGET RISK LEVELS				
Individual Excess Lifetime Cancer Risk	unitless	=adult residential	1.0E-05	1.0E-05
Hazard quotient	unitless		1.0	1.0