ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT GROUNDWATER BRANCH

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ARBCA FOR USTs TIER 3 REPORT FORMS

(Revision 1.0, November 2001)

(Optional - to be used if using the same models as in Tier 1. Otherwise, the format is determined in workplan)

SITE NAME:
UST INCIDENT NO.:
FACILITY ID:
DATE FORM COMPLETED:
FORM COMPLETED BY:

ARBCA REPORT FORMS			
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Date Form Completed: Form Completed By: THE STYNE LETTER THE APPEN requires that the owner/operator submit a workplan for a Tier 3 evaluation. This workplan must be approved by the ADEM prior to mainciding a Tier 3 evaluation. Discuss previously conducted Tier 1 and Tier 2 analyses that led to a Tier 3 evaluation. In addition, discuss model in Tier 3 evaluation.	UST Incident No(s):		Fo -:1:4	TD		FORM N	VU.
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ARBCA SUMMARY REPORT	FORM NO. 32
UST Incident No(s):	Facility ID:
Date Form Completed:	Form Completed By:

TIER 3 FATE AND TRANSPORT PARAMETERS

Comparison Com	Parameter	Symbol	Unit	Tier 1 Default	Tier 3 Value	Source
Depth to Subsurface Soil Sources	SOIL PARAMETERS:			Value		
Lower Depth of Surficial Soil Zone	Length of Soil Source Area Parallel to Wind Direction	W _a	cm	1500		
Thickness of Capillary Fringe	Depth to Subsurface Soil Sources	L _s	cm	30.48		
Thickness of Vadose Zone	Lower Depth of Surficial Soil Zone	d	cm	30.48		
Dry Soil Bulk Density in the Vadose Zone	Thickness of Capillary Fringe	h _{cap}	cm	5		
Fractional Organic Carbon Content in the Vadose Zone	Thickness of Vadose Zone	$h_{\rm v}$	cm	295	7 A - Andrews	
Total Soil Porosity in the Vadose Zone	Dry Soil Bulk Density in the Vadose Zone	$\rho_{\rm s}$	g/cm ³	1.8		
Volumetric Water Content in Vadose Zone	Fractional Organic Carbon Content in the Vadose Zone	foc	g-C/g-soil	0.01		
Volumetric Air Content in Vadose Zone	Total Soil Porosity in the Vadose Zone	θ_{T}	cm³/cm³-soil	0.3		
Volumetric Water Content in Capillary Fringe	Volumetric Water Content in Vadose Zone	θ_{ws}	cm ³ /cm ³	0.1		
Volumetric Air Content in Capillary Fringe 0 _{supp} cm²/cm² 0.03 Volumetric Water Content in Foundation or Wall Cracks θ _{wenteck} cm²/cm² 0.1 Volumetric Air Content in Foundation/Wall Cracks θ _{wenteck} cm²/cm² 0.2 GROUNDWATER PARAMETERS: Upon the Groundwater Width of GW Source Area Perpendicular to GW Flow Direction Y cm 1500 Length of GW Source Area Parallel to GW Flow Direction W cm 1500 Length of GW Source Area Parallel to GW Flow Direction W cm 1500 Total Soil Porosity in the Saturated Zone θ ₁₈ cm²/cm³-soil 0.3 0.3 Dry Soil Bulk Density in the Saturated Zone p ₁₈ gcm³ 1.8 9 cm²-cm³-soil 0.0 Groundwater Mixing Zone Thickness δ ₂₀ cm cm 200 0.0 1 Hydraulic Conductivity in the Saturated Zone K cm/year 157.68 1 Hydraulic Gradient in the Saturated Zone i 0.005 Groundwater Darcy Velocity U ₂₀ cm/year 157.68	Volumetric Air Content in Vadose Zone	θ_{as}	cm ³ /cm ³	0.2	74.74.44.4	
Volumetric Water Content in Foundation or Wall Cracks	Volumetric Water Content in Capillary Fringe	θ_{weap}	cm ³ /cm ³	0.27		
Volumetric Air Content in Foundation/Wall Cracks	Volumetric Air Content in Capillary Fringe	θ_{acap}	cm ³ /cm ³	0.03		
Depth to Groundwater	Volumetric Water Content in Foundation or Wall Cracks	θ _{werack}	cm ³ /cm ³	0.1		
Depth to Groundwater	Volumetric Air Content in Foundation/Wall Cracks	θ_{acrack}	cm ³ /cm ³	0.2		
Width of GW Source Area Perpendicular to GW Flow Direction	GROUNDWATER PARAMETERS:					L
Length of GW Source Area Parallel to GW Flow Direction W	Depth to Groundwater	L _{gw}	cm	300		
Total Soil Porosity in the Saturated Zone θ _{TS} cm³/cm³-soil 0.3	Width of GW Source Area Perpendicular to GW Flow Direction	Y	cm	1500		
Dry Soil Bulk Density in the Saturated Zone	Length of GW Source Area Parallel to GW Flow Direction	W	cm	1500		
Fractional Organic Carbon Content in the Saturated Zone foc. g-C/g-soil 0.01	Total Soil Porosity in the Saturated Zone	θ_{rs}	cm ³ /cm ³ -soil	0.3		
Groundwater Mixing Zone Thickness δ _{gw} cm 200	Dry Soil Bulk Density in the Saturated Zone	ρ_{ss}	g/cm ³	1.8		· · · · · · · · · · · · · · · · · · ·
Hydraulic Conductivity in the Saturated Zone K cm/year 31536 Hydraulic Gradient in the Saturated Zone i 0.005 Groundwater Darcy Velocity Ugw cm/year 157.68 Infiltration Rate I cm/year 14.8 STREAM PARAMETERS: Stream Flow Rate (Calculated per Appendix C) Qsw ft²/day variable Site-specific AMBIENT AIR PARAMETERS: Breathing Zone Height \$\delta_{\begin{subarray}{cccccccccccccccccccccccccccccccccccc	Fractional Organic Carbon Content in the Saturated Zone	foc _s	g-C/g-soil	0.01		
Hydraulic Gradient in the Saturated Zone i	Groundwater Mixing Zone Thickness	δ_{gw}	cm	200		
Groundwater Darcy Velocity Ugw cm/year 157.68 Infiltration Rate I cm/year 14.8 STREAM PARAMETERS: Stream Flow Rate (Calculated per Appendix C) AMBIENT AIR PARAMETERS: Breathing Zone Height \$\delta_{\mathbb{a}}\$ cm 200 Wind Speed within the Breathing Zone Ua cm/s 225 ENCLOSED SPACE PARAMETERS: Enclosed Space Air Exchange Rate: Residential ER 1/sec 0.00014 Commercial/Construction Worker ER 1/sec 0.00023 Enclosed Space Volume/Infiltration Area Ratio: Residential LB cm 200	Hydraulic Conductivity in the Saturated Zone	K	cm/year	31536		
Infiltration Rate I cm/year 14.8 STREAM PARAMETERS: Stream Flow Rate (Calculated per Appendix C) AMBIENT AIR PARAMETERS: Breathing Zone Height Breathing Z	Hydraulic Gradient in the Saturated Zone	i		0.005		
STREAM PARAMETERS: Stream Flow Rate (Calculated per Appendix C) AMBIENT AIR PARAMETERS: Breathing Zone Height \$\text{\sigma}\$ cm 200 Wind Speed within the Breathing Zone U_u cm/s 225 ENCLOSED SPACE PARAMETERS: Enclosed Space Air Exchange Rate: Residential ER 1/sec 0.00014 Commercial/Construction Worker ER 1/sec 0.00023 Enclosed Space Volume/Infiltration Area Ratio: Residential L_B cm 200	Groundwater Darcy Velocity	U_{gw}	cm/year	157.68		
Stream Flow Rate (Calculated per Appendix C) AMBIENT AIR PARAMETERS: Breathing Zone Height \$\text{\sigma}_u\$ cm 200 Wind Speed within the Breathing Zone U_a cm/s 225 ENCLOSED SPACE PARAMETERS: Enclosed Space Air Exchange Rate: Residential ER 1/sec 0.00014 Commercial/Construction Worker ER 1/sec 0.00023 Enclosed Space Volume/Infiltration Area Ratio: Residential L_B cm 200	Infiltration Rate	I	cm/year	14.8	——————————————————————————————————————	
Stream Flow Rate (Calculated per Appendix C) AMBIENT AIR PARAMETERS: Breathing Zone Height \$\text{\Sigma}_4\$ cm 200 Wind Speed within the Breathing Zone U_a cm/s 225 ENCLOSED SPACE PARAMETERS: Enclosed Space Air Exchange Rate: Residential ER 1/sec 0.00014 Commercial/Construction Worker ER 1/sec 0.00023 Enclosed Space Volume/Infiltration Area Ratio: Residential L_B cm 200	STREAM PARAMETERS:					
Breathing Zone Height \$\[\text{\sigma}_{u} \] cm \ 200 Wind Speed within the Breathing Zone \$\[\text{U}_{u} \] cm/s \ 225 \[\text{ENCLOSED SPACE PARAMETERS:} \] Enclosed Space Air Exchange Rate: Residential \$\[\text{ER} \] 1/sec \ 0.00014 Commercial/Construction Worker \[\text{ER} \] 1/sec \ 0.00023 Enclosed Space Volume/Infiltration Area Ratio: Residential \$\[\text{L}_{B} \] cm \ 200 Commercial/Construction Worker						
Wind Speed within the Breathing Zone U _a cm/s ENCLOSED SPACE PARAMETERS: Enclosed Space Air Exchange Rate: Residential Commercial/Construction Worker ER 1/sec 0.00014 Commercial/Construction Worker ER 1/sec 0.00023 Enclosed Space Volume/Infiltration Area Ratio: Residential L _B cm 200	AMBIENT AIR PARAMETERS:					
ENCLOSED SPACE PARAMETERS: Enclosed Space Air Exchange Rate: Residential ER 1/sec 0.00014 Commercial/Construction Worker ER 1/sec 0.00023 Enclosed Space Volume/Infiltration Area Ratio: Residential L _B cm 200	Breathing Zone Height	δι	cm	200		
Enclosed Space Air Exchange Rate: Residential	Wind Speed within the Breathing Zone	U _a	cm/s	225		
Residential ER 1/sec 0.00014 Commercial/Construction Worker ER 1/sec 0.00023 Enclosed Space Volume/Infiltration Area Ratio: Residential L _B cm 200	ENCLOSED SPACE PARAMETERS:					
Commercial/Construction Worker	Enclosed Space Air Exchange Rate:					
Enclosed Space Volume/Infiltration Area Ratio: Residential L _B cm 200	Residential	ER	1/sec	0.00014		
Residential L _B cm 200	Commercial/Construction Worker	ER	1/sec	0.00023		
Commonsiel/Country at a W. L.	Enclosed Space Volume/Infiltration Area Ratio:					
Commercial/Construction Worker L _B cm 300	Residential	L _B	cm	200		
	Commercial/Construction Worker	L _B	cm	300		

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ARBCA SUMMARY REPORT FORM NO. 32 UST Incident No(s): Facility ID: **Date Form Completed:** Form Completed By: TIER 3 FATE AND TRANSPORT PARAMETERS Parameter Symbol Unit Tier 3 Value Source Value ENCLOSED SPACE PARAMETERS continued: Enclosed Space Foundation or Wall Thickness: Residential L_{crack} cm 15 Commercial/Construction Worker L_{crack} cm 15 Areal Fraction of Cracks in Foundation/Walls: 0.01 η cm²/cm² Commercial/Construction Worker η cm²/cm² 0.01 PARTICULATE EMISSION RATE; Residential and Commercial Pe g/cm²-sec 6.90E-14 Construction Worker Pe g/cm²-sec 6.90E-09 AVERAGING TIME FOR VAPOR FLUX: Resident Child sec 1.89E+08 Resident Adult 9.46E+08 τ sec Commercial Worker τ 7.88E+08 sec Construction Worker 3.15E+07 GROUNDWATER RESOURCE PROTECTION PARAMETERS: Distance from the Downgradient Edge of the Groundwater Source Xpoe ft variable to the Point of Exposure Site-specific Longitudinal Dispersivity α_{x} ft Xpoe/10 Site-specific Transverse Dispersivity α_{y} ft Xpoe/30 Site-specific Vertical Dispersivity $\alpha_{z} \\$ ft Xpoe/200 Site-specific Distance from the Downgradient Edge of the Groundwater Source Xpoc ft variable to the Point of Compliance Site-specific Longitudinal Dispersivity ft α_{x} Xpoc/10 Site-specific Transverse Dispersivity ft α_{y} Xpoc/30 Site-specific Vertical Dispersivity ft α_{z} Xpoc/200 Site-specific STREAM PROTECTION PARAMETERS: Distance from the Downgradient Edge of the Groundwater Source Xs ft variable to the Stream Site-specific Longitudinal Dispersivity α_{x} ft Xs/10 Site-specific Transverse Dispersivity ft α_{y} Xs/30 Site-specific Vertical Dispersivity α_{z} ft Xs/200 Site-specific Distance from the Downgradient Edge of the Groundwater Source Xspoc ft variable to the Point of Compliance Site-specific Longitudinal Dispersivity $\alpha_{\rm x}$ ft Xspoc/10 Site-specific Transverse Dispersivity

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Site-specific

Site-specific

Vertical Dispersivity

 α_{y}

 $\alpha_{z} \\$

ft

ft

Xspoc/30

Xspoc/200

AR	BCA SUMMARY REPORT		FORM NO. 3.
U	ST Incident No(s):	Facility ID:	
D	ate Form Completed:	Form Completed By	y:
	JUSTIFICATION FOR TIER 3	FATE AND TRANSPORT	PARAMETERS
1.	Length of soil source area parallel to wind direction (Wa) [cm]		
2.	Depth to subsurface soil sources (L _s) [cm]		
			• .
3.	Lower depth of surficial soil zone (d) [cm]		
	- Source (d) [cm]		
4.	Thickness of capillary fringe (h _{cap}) [cm]		
5.	Thickness of vadose zone (h _v) [cm]	44	
6.	Dry sail bull, density is at 1 1 2 2 3		
	Dry soil bulk density in the vadose zone (ρ_s) [g/cm 3]		
Ì			
7.	Fractional organic carbon content in the vadose zone (foc) [g-C/§	z-soil]	
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AND	CA SUMMARY REPORT		FORM NO. 33
US	T Incident No(s):	Facility ID:	
Da	te Form Completed:	Form Completed By:	
	JUSTIFICATION FOR TIE	CR 3 FATE AND TRANSPORT PARAM	ETERS
8.	Total soil porosity in the vadose zone (θ_T) [cm ³ /cm ³ -soil]		
			- Marie - Mari
9.	Valuedai	3	
,	Volumetric water content in the vadose zone (θ_{ws}) [cm ³ /cm	a°]	
10.	Volumetric air content in the vadose zone (θ _{as}) [cm ³ /cm ³]		
11.	Volumetric water content in the capillary fringe (θ_{weap}) [ci	3/_31	
-	Volumetric water content in the capinary fringe (Θ _{weap}) [ci	n /cm	
12.	Volumetric air content in the capillary fringe (θ_{acap}) [cm $^3/\phi$:m³J	
	•		
13.	Volumetric water content in foundation or wall cracks (θ_{w})	opport) [cm³/cm³]	
-			
14.		,	
	Volumetric air content in foundation or wall cracks $(\theta_{\text{acrack}}$) [cm ³ /cm ³]	
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ARI	SCA SUMMARY REPORT		FORM NO. 33
US	ST Incident No(s):	Facility ID:	
Da	ite Form Completed:	Form Completed By:	
	JUSTIFICATION FOR TIER 3 FAT	E AND TRANSPORT PARA	METERS
15.	Depth to groundwater (L _{gw}) [cm]		
16.	Width of GW source area perpendicular to GW flow direction (Y)		
	which of GW source area perpendicular to GW now direction (Y)	emj	
17.	Length of GW source area parallel to GW flow direction (W) [cm]		
	•		
18.	Total soil porosity in the saturated zone (θ_{TS}) [cm ³ /cm ³ -soil]		
	Total son porosity in the saturated zone (8 _{TS}) [cm ⁻ /cm ⁻ -soil]		
	•		
19.	Dry soil bulk density in the saturated zone (ρ_{ss}) [g/cm 3]		
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20.	Fractional organic carbon content in the saturated zone (foc _s) [g-C/g-	soill	
21.	Groundwater mixing zone thickness (δ_{gw}) [cm]		

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AKB	CA SUMMARY REPORT		FORM NO. 33
US	T Incident No(s):	Facility ID:	
Da	te Form Completed:	Form Completed By:	11.1
	JUSTIFICATION FOR TIER 3 FA	TE AND TRANSPORT PARAMET	ERS
22.	Hydraulic conductivity in the saturated zone (K) [cm/year]		
23.	Hydraulic gradient in the saturated zone (i) []		
24.	Groundwater Darcy Velocity (Ugw) [cm/year]		
24.	Groundwater Dailey Velocity (Ugw) [cin/year]		
		·	•
25.	Infiltration rate (I) [cm/year]		
26.	Stream flow rate (Q _{sw}) [ft ³ /day]. If calculated using Bingham (1982,	Appendix C), show calculations and justify	input values used.
ŀ			
27.	Breathing zone height (δ_a) [cm]		•
	Steaming 20th Height (6 ₃) [cm]		
			·
28.	Wind speed within the breathing zone (U _a) [cm/s]		
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ARB	CA SUMMARY REPORT	FO	RM NO. 33
US	T Incident No(s):	Facility ID:	
Da	te Form Completed:	Form Completed By:	
	JUSTIFICATION FOR T	IER 3 FATE AND TRANSPORT PARAMETERS	
29.	Enclosed space air exchange rate: residential (ER) [1/se	ee]	
ł			
	•		
20			
30.	Enclosed space air exchange rate: commercial/construc	tion worker (ER) [1/sec]	·
31.	Enclosed space volume-infiltration area ratio: residentia	al (L _B) [cm]	
		· .	
32.	Enclosed space volume-infiltration area ratio: commerc	ial/construction worker (L _B) [cm]	
ŀ			
33.	Enclosed space foundation or wall thickness: residential	(I) [cm]	
		(~Crack) [cm]	
34.	Enclosed space foundation or wall thickness: commercia	ıl/construction worker (L _{crack}) [cm]	
-			
	•		
35.			
33.	Areal fraction of cracks in foundation/walls: residential ((η) [cm²/cm²]	
			,
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ARB	SCA SUMMARY REPORT	FORM NO. 3:
US	T Incident No(s):	Facility ID:
Da	te Form Completed:	Form Completed By:
	JUSTIFICATION FOR TIER 3 FAT	TE AND TRANSPORT PARAMETERS
36.	Areal fraction of cracks in foundation/walls: commercial/construct	ion worker (η) [cm²/cm²]
37.	Particulate emission rate: residential and commercial (Pe) [g/cm ² -se	ec]
38.	Posticulate out in it.	
	Particulate emission rate: construction worker (Pe) [g/cm²-sec]	
39.	Averaging time for vapor flux: resident child (τ) [sec]	
40.	Averaging time for vapor flux: resident adult (τ) [sec]	
f		
		•
41.	Avonaging time for	
41.	Averaging time for vapor flux: commercial worker (τ) [sec]	
42.	Averaging time for vapor flux: construction worker (\tau) [sec]	
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ARB	CA SUMMARY REPORT		FORM NO. 33	
US	Г Incident No(s):	Facility ID:		
Dat	te Form Completed:	Form Completed By:		
	JUSTIFICATION FOR TIER 3 FA	ATE AND TRANSPORT PARAMETERS		
43.	Distance from the downgradient edge of the groundwater source	to the point of exposure (Xpoe) [ft]		
İ				
1				
43a.	Longitudinal dispersivity (α_x) [ft]			
43a.	Longitudinal dispersivity (α_x) [II]			
43b.	Transverse dispersivity (α _y) [ft]			
}			′	
43c.	Vostical disconsister () V(s)			
436.	Vertical dispersivity (α _z) [ft]			
	•			
44.	Distance from the downgradient edge of the groundwater source t	o the point of compliance for protection of POC (?	(poc) [ft]	
-				
14a.	Longitudinal dispersivity (α_x) [ft]			
	The state of the s			
İ				
4b.	Transverse dispersivity (α_y) [ft]			
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ARBCA SUMMARY REPORT			FORM NO.		
US	ST Incident No(s):	Facility ID:	Facility ID:		
Da	ite Form Completed:	Form Completed By:			
	JUSTIFICATION FOR TIER	3 FATE AND TRANSPORT PARA	METERS		
44c.	Vertical dispersivity (α _z) [ft]				
45.	Distance from the downgradient edge of the groundwater so	ource to the stream (Xs) [ft]			
		() []			
45a.	Longitudinal dispersivity (α_x) [ft]				
45b.	Transverse dispersivity (α_y) [ft]				
45c.	Vertical dispersivity (α_z) [ft]				
46.	Distance from the downgradient edge of the groundwater sou	irce to the point of compliance for stream p	rotection (Xspoc) [ft]		
ſ					
46a.	Longitudinal dispersivity (α_x) [ft]				
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	CA SUMMARY REPORT	FORM NO. 3
	T Incident No(s):	Facility ID:
Da	te Form Completed:	Form Completed By:
		FATE AND TRANSPORT PARAMETERS
46b.	Transverse dispersivity (α_y) [ft]	
46c.	Vertical dispersivity (α _z) [ft]	
47.		
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48.		
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49.		
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50.		
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51.		
51.		
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ARBCA SUMMARY REPORT UST Incident No(s): Facility ID:

Date Form Completed: Form Completed By:

TIER 3 EXPOSURE FACTORS

Parameter	Symbol	Unit	Tier 1 Default Value	Tier 3 Value	Source
Averaging Time					
Carcinogen	AT _c	years	70		
Non-Carcinogen	AT _n	years	=Exposure Duration	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	
Body Weight					
Child Receptors	BW	kg	15		
Adult Receptors	BW	kg	70		
Exposure Duration					
Resident Child	ED	years	6		
Resident Adult	ED	years	30	7.1	
Commercial Worker	ED	years	25	1900 N	
Construction Worker	ED	years	1	////	
Exposure Frequency					L
Resident Child	EF	days/year	350		
Resident Adult	EF	days/year	350		
Commercial Worker	EF	days/year	250		
Construction Worker	EF	days/year	250		
Soil Ingestion Rate		Line			
Resident Child	IR _{soil}	mg/day	200		
Resident Adult	IR _{soil}	mg/day	100		
Commercial Worker	IR _{soil}	mg/day	50	,	
Construction Worker	IR _{soil}	mg/day	100		
Groundwater Ingestion Rate (IRW)					
Resident Adult	IR _w	L/day	2		
Hourly Indoor Inhalation Rate					
Resident Child	IR _{air-indoor}	m³/hr	0.417		
Resident Adult	IR _{air-indoor}	m³/hr	0.633		
Commercial Worker	IR _{air-indoor}	m³/hr	1.5		
Construction Worker	IR _{air-indoor}	m³/hr	1.5		

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ARBCA SUMMARY REPORT UST Incident No(s): Date Form Completed: Form Completed By: TIER 3 EXPOSURE FACTORS Parameter Symbol Unit Tier 1 Default Value Tier 3 Value Source

Parameter	Symbol	Unit	Tier 1 Default Value	Tier 3 Value	Source
Exposure Time for Indoor Inhalation		1444			
Resident Child	ETin	hr/day	24		
Resident Adult	ET _{in}	hr/day	24		
Commercial and Construction Workers	ET _{in}	hr/day	10		
Hourly Outdoor Inhalation Rate			Same Control		
Resident Child	IR _{air-outdoor}	m³/hr	1.0		
Resident Adult	IR _{air-outdoor}	m³/hr	1.5	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	
Commercial and Construction Workers	IR _{air-outdoor}	m³/hr	1.5		
Exposure Time for Outdoor Inhalation		11			
Resident Child	ET _{out}	hr/day	10		
Resident Adult	ET _{out}	hr/day	10		WALLEST OF ALL MINISTERS IN L. L. L. L. L. L. L. L. L. L. L. L. L.
Commercial and Construction Workers	ET _{out}	hr/day	10	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	7.00
Skin Surface Area					
Resident Child	SA	cm²/day	2500		
Resident Adult	SA	cm²/day	5000		
Commercial Worker	SA	cm²/day	5000		
Construction Worker	SA	cm ² /day	5000		
Relative Absorption Factors					
Oral Relative Absorption Factor	RAF _o		1		
Dermal Relative Absorption Factor					
Volatiles	RAF _d		0.5		
PAHs	RAF_d		0.05		
Metals	RAF_d		0.001		
Soil to Skin Adherence Factor					
Resident Child	М	mg/cm ²	0.5		
Resident Adult	М	mg/cm²	0.5	-	
Commercial Worker	М	mg/cm²	0.5		
Construction Worker	М	mg/cm²	0.5		
Target Risk Level	TR		1x10 ⁻⁵		
Target Hazard Quotient	THQ		1		

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	BCA SUMMARY REPORT ST Incident No(s):		FORM NO. 3:
		Facility ID:	
ע	ate Form Completed:	Form Completed By:	
		OR TIER 3 EXPOSURE FACTORS	
1.	Averaging time for carcinogens (AT _c) [years]		
			. 1400 (F. St.)
2.	Averaging time for non-carcinogens (ATn) [years]		
3.	Body weight: child receptors (BW) [kg]		
4.	Body weight: adult receptors (BW) [kg]		
	Sody Weight: addit receptors (DW) [ag]		
	·		
5.	Exposure duration: resident child (ED) [years]		
6.	Exposure duration: resident adult (ED) [years]		
7.	Exposure duration: commercial worker (ED) [years]		
			Page I of
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ARI	BCA SUMMARY REPORT		FORM NO. 35
U	ST Incident No(s):	Facility ID:	
D	ate Form Completed:	Form Completed By:	
	JUSTIFICATION FOR T	IER 3 EXPOSURE FACTORS	
8.	Exposure duration: construction worker (ED) [years]		
9.	Exposure frequency: resident child (EF) [days/year]		
			· · · · · · · · · · · · · · · · · · ·
10.	Exposure frequency: resident adult (EF) [days/year]		
11.	Exposure frequency: commercial worker (EF) [days/year]		
	·		
12.	Exposure frequency: construction worker (EF) [days/year]		
13.	Soil ingestion rate: resident child (IR _{soil}) [mg/day]		
1.1			
14.	Soil ingestion rate: resident adult (IR _{soil}) [mg/day]		
			,
		Pag	ge 2 of

	SCA SUMMARY REPORT		FORM NO. 35
U	ST Incident No(s):	Facility ID:	
Da	ate Form Completed:	Form Completed By:	
	JUSTIFICATION FOR THE	ER 3 EXPOSURE FACTORS	
15.	Soil ingestion rate: commercial worker (IR _{soil}) [mg/day]		
16.	Soil ingestion rate: construction worker (IR _{soil}) [mg/day]	44-47	
		,	
17.	Groundwater ingestion rate: resident adult (IR _w) [L/day]		
18.			
10.	Hourly indoor inhalation rate: resident child (IR _{air-indoor}) [m ³ /hr]		
19.	Hourly indoor inhalation rate: resident adult (IR _{air-indoor}) [m ³ /hr]		
	Trouting indoor initiation face. Testdent addit (IR _{air-indoor}) [m /nr]		
20.	Hourly indoor inhalation rate: commercial worker ($ ext{IR}_{ ext{air-indoor}}$) [$ ext{m}^3$ /h	rì	
			. •
21.	Hourly indoor inhalation rate: construction worker (IR _{air-indoor}) [m ³ /l	ır]	
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			Page 3 of

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=	BCA SUMMARY REPORT	14.	FORM NO. 3
	ST Incident No(s):	Facility ID:	
Γ	ate Form Completed:	Form Completed By:	
		R 3 EXPOSURE FACTORS	
22	Exposure time for indoor inhalation: resident child (ET _{in}) [hrs/day]		
22	P		
23.	Exposure time for indoor inhalation: resident adult (ETin) [hrs/day]		
24.	Exposure time for indoor inhalation: commercial and construction w		
	The same sor indeed inhalation. Commercial and construction w	vorkers (ET _{in}) [hrs/day]	
	·		
25.	Hourly outdoor inhalation rate: resident child (IR _{air-outdoor}) [m ³ /hr]		
	(In air-outdoor) [III / III]		
26.	Hourly outdoor inhalation rate: resident adult (IR _{air-outdoor}) [m ³ /hr]		
27.	Hourly outdoor inhalation rate: commercial and construction worker	s (IR _{air-outdoor}) [m³/hr]	
28.	Evnogues time for and a stable		
20.	Exposure time for outdoor inhalation: resident child (ET_{out}) [hrs/day]	,	
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			Page 4 of

AKI	SCA SUMMARY REPORT		FORM NO. 35
U	ST Incident No(s):	Facility ID:	
D	ate Form Completed:	Form Completed By:	
		ER 3 EXPOSURE FACTORS	
29.	Exposure time for outdoor inhalation: resident adult (ET _{out}) [hrs/d	ay]	1975
30.	Exposure time for outdoor inhalation: commercial and constructio	n workers (ET _{out}) [hrs/day]	
31.	Skin surface area: resident child (SA) [cm²/day]		
			·
32.	Skin annface and skill the latest the skill the latest the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill the skill t		·
·	Skin surface area: resident adult (SA) [cm ² /day]		
33.	Skin surface area: commercial worker (SA) [cm²/day]	:	
34.	Skin surface area: construction worker (SA) [cm²/day]		
35.	Oral relative absorption factor (RAF _o) []		
-			
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AR	BCA SUMMARY REPORT	FORM NO. 35
U	ST Incident No(s):	Facility ID:
D	ate Form Completed:	Form Completed By:
		ER 3 EXPOSURE FACTORS
36.	Dermal relative absorption factor: volatiles (RAF _d) []	
	· · · · · · · · · · · · · · · · · · ·	
37.	Dermal relative absorption factor: PAHs (RAF _d) []	
38.	Dermal relative absorption factor: metals (RAF _d) []	
39.	Soil-skin adherence factor: resident child (M) [mg/cm²]	
40.	Soil-skin adherence factor: resident adult (M) [mg/cm ²]	
41.	Soil-skin adherence factor: commercial worker (M) [mg/cm ²]	
42.	Soil-skin adherence factor: construction worker (M) [mg/cm ²]	
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	BCA SUMMARY REPORT		FORM NO. 35		
US	ST Incident No(s):	Facility ID:			
Da	ate Form Completed:	Form Completed By:			
	JUSTIFICATION FOR T	IER 3 EXPOSURE FACTORS	and the second		
43.	Taget risk level (TR) []				
	·				
44.	Taget hazard quotient (THQ) []	-			
	·				
45.					
			•		
		Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of th			
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ARE	BCA SUMMARY REPORT		FORM NO. 36
US	ST Incident No(s):	Facility ID:	
Da	ate Form Completed:	Form Completed By:	
	-UER	3 CONCLUSIONS AND RECOMMENDATION	DNS
1.	Are on-site soil and groundwater concentration	ons protective of current and reasonable future	e on-site receptors?
2.	Are off-site soil and groundwater concentration	ons protective of current and reasonable future	e off-site receptors?
			•
3.	Are source soil concentrations protective of gr	roundwater at a POF9	
	one control and a protective of gr	oundwater at a 1 OE;	
		•	
_			
4.	Are source groundwater concentrations prote	ctive of groundwater at a POE?	
			·
5.	Are the source soil and groundwater concentr	ations protective of a stream?	
-			
6.	Is site recommended for NFA status?		
-			

ARI	BCA SUMMARY REPORT		FORM NO. 3	
U	ST Incident No(s):	Facility ID:		
Date Form Completed:		Form Completed By:		
	TIER 3 CONCLUSIONS	AND RECOMMENDATIONS		
7.	Is compliance monitoring of groundwater recommended?			
			-	
8.	Are interim remediation and reevaluation recommended?			
•	•		•	
9.	Is remediation to applicable Tier 3 standards recommended?		·	
10.	Other relevant information:			
		•		
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