

## TECHNICAL BACKGROUND DOCUMENT

### Statement of Basis for Remedy Selection and Corrective Action Complete Without Controls Determination

Rhone-Poulenc Inc., East Parcel

November, 2006

#### Explanation of the selected fish and shellfish consumption rate for children

Consistent with a 1997 Presidential Executive Order (The White House, 1997), EPA “shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks.” The risk assessment results of EPA’s 1994-1996 Columbia River Basin fish contaminant survey demonstrated that, for people eating fish harvested from the Columbia River, estimated noncancer health hazards to children were approximately twice those for adults (EPA, 2002a).

As noted in the Statement of Basis for the East Parcel, Tribal child fish and shellfish ingestion rates were assumed by EPA to be 40% of the adult consumption rate. While several children were included in the seafood consumption survey of the Tulalip Tribes (Toy et al., 1996), only 15 children were reported as consumers of fish or shellfish. Adult rates were determined by including only those who reported being consumers of fish or shellfish. The very small number of consumer children in this study, as well as the inexplicably low reported consumption rate by the 15 consumer children whose consumption rates were included in this study, was rejected by EPA as a reliable surrogate estimate of a Puget Sound/Strait of Georgia Tribal child fish consumption rate. The intra-population consumption rate for the Tulalip Tribes’ children relative to adults is inconsistent with other Tribal and non-Tribal population comparisons of adult and child consumption rates. Other studies involved greater numbers of child participants and included surveys of both Tribal and general U.S. populations (CRITFC, 1994; EPA, 2002b; The Suquamish Tribe, 2000). The use of 40% of the adult gram-per-day consumption rate as a surrogate for children in the respective populations appears to be a reasonable approach when reliable population-specific estimates for child seafood consumption rates are not available.

#### Consideration of risks associated with early-life exposures to carcinogenic PAHs

EPA recently published final guidance for consideration of additional risks that occur from exposure to carcinogens that act via a mutagenic mode of action. This guidance, [\*Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens\*](#) (EPA/630/R-03/003F) and clarifying information considering its implementation, are available on-line at <http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=116283>. In particular, [\*Communication II: Performing Risk Assessments That Include Carcinogens Described in the Supplemental Guidance as Having a Mutagenic Mode of Action\*](#), describes how

adjustment factors should be applied to the cancer potency of benzo(a)pyrene (BaP) as well as the six other cPAHs typically evaluated using relative potency factors. The cancer potency factor for BaP is multiplied by an adjustment factor of 10 for exposures between birth and two years of age, and by an adjustment factor of 3 between the ages of two and 16. The other cPAHs that may be present are then evaluated based on their potency relative to BaP. This results in lower soil cleanup levels for unrestricted use, i.e., where children may be exposed. The May 10, 2006 proposal of East Parcel cleanup numbers included a concentration of 0.1 mg/kg, which is the MTCA Method A soil cleanup level for unrestricted use, and is conservatively assumes that all of the cPAHs present are as carcinogenic as BaP. The value of 0.1 mg/kg is based on Equation 740-2 in MTCA, which includes children exposed to soil through incidental ingestion. EPA calculated the risk associated with 0.1 mg/kg when using the age-specific adjustment factors. The resulting excess individual lifetime cancer risk is  $3.9 \times 10^{-6}$ . This is well within EPA's acceptable risk range. Furthermore, the actual risk from a child's exposure via incidental ingestion to cPAHs in soils at the East Parcel are almost certainly considerably lower, since environmental mixtures of cPAHs are always comprised of multiple cPAHs, not just BaP. Therefore, EPA proposes to retain the MTCA Method A cPAH cleanup level of 0.1 mg/kg for these soils.

#### Protectiveness of the proposed toluene soil cleanup level for soil vapors

WAC 173-340-740(3)(c) (iv)(A)(V) requires that the soil to vapor pathway be evaluated for VOCs when the soil cleanup level is "significantly higher than a concentration derived for protection of drinking water beneficial used under WAC 173-340-747(4)." In this case, the soil cleanup level is based on protection of ground water for drinking water use, and it therefore is considered to be protective of the soil to vapor pathway.

#### Evaluation of the terrestrial ecological pathway for MTCA purposes

The soil cleanup level concentrations proposed for the East Parcel by EPA are as low or lower than the concentrations required for unrestricted land use in MTCA Table 749-2.

#### References

CRITFC, 1994. A Fish Consumption Survey of the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes of the Columbia River Basin. Report #94-3. October.  
<http://www.critfc.org/tech/94-3report.html>

EPA, 2002a. *Columbia River Basin Fish Contaminant Survey*. EPA 910-R-02-006. August.  
<http://www.google.com/search?hl=en&ie=UTF-8&q=Columbia+River+Basin+Fish+Contaminant+Survey+&btnG=Google+Search>

EPA. 2002b. *Estimated Per Capita Fish Consumption in the United States*. Section 5.1.1.1 Table 4. EPA-821-C-02-003. August 2002.  
[http://www.epa.gov/waterscience/fish/consumption\\_report.pdf](http://www.epa.gov/waterscience/fish/consumption_report.pdf)

The Suquamish Tribe. 2000. *Fish Consumption Survey of the Suquamish Indian Tribe of The Port Madison Indian Reservation, Puget Sound Region*. August.

Toy, K.A., N.L. Polissar, S. Liao, and G.D. Mittelstaedt. 1996. *A Fish Consumption Survey of the Tulalip and Squaxin Island Tribes of the Puget Sound Region*. Tulalip Tribes, Department of Environment, Marysville, WA.

The White House. 1997. *Executive Order 13045--Protection of Children From Environmental Health Risks and Safety Risks*. 62 Fed. Reg. 19,883. April 23.  
<http://www.epa.gov/fedrgstr/eo/eo13045.htm>



**Former R-P Facility  
East Parcel  
Toluene Soil CUL options**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1	<b>Soil</b>										EPA, Industrial Soil <sup>c</sup>	EPA, Unrestricted Soil <sup>c</sup>	Modified MTCA C Industrial Soil <sup>d</sup>	Modified MTCA B Unrestricted Soil <sup>d</sup>	MTCA Soil to GW, no contam. at or below water table <sup>e</sup>	MTCA Soil to GW, contam. exists at or below water table <sup>f</sup>	MTCA Soil to GW, no contam. at or below water table <sup>e</sup>	MTCA Soil to GW, contam. exists at or below water table <sup>f</sup>	
2								Vapor Pressure at	Koc, L/kg	Henry's Law dimensionless	HQ<1	HQ<1	HQ=1	HQ=1	foc=.001g/g(MTCA)	foc=.001g/g(MTCA)	foc=.0025	foc=.0025	
3								20 C (mm) <sup>b</sup>				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
4			RfD <sub>oral</sub>		RfD <sub>dermal</sub>		RfD <sub>inhal</sub>												
5			mg/kg-day	Source	mg/kg-day	Source	mg/kg-day	Source											
6																			
7	<b>Toluene</b>	8.0E-02	IRIS	6.4E-02	footnote a	1.4E+00	IRIS	<b>21.86</b>	<b>140.00</b>	<b>0.27</b>	5.2E+02	5.2E+02	<b>1.2E+05</b>	<b>5.9E+03</b>	<b>9.45E+00</b>	<b>5.55E-01</b>	<b>1.49E+01</b>	<b>8.28E-01</b>	
8																			
9	<sup>a</sup> Dermal RfD derived by multiplying oral RfD by GI absorption conversion factor (GI) default of 0.8 for VOCs [WAC 173-340-740 and -745; Equations 740-4 and 745-4]																		
10	<sup>b</sup> Dermal absorption in modified MTCA B and C is 0.03 for VOCs with VP less than that for benzene (80.85 mm).																		
11	<sup>c</sup> Based on Region 6 screening levels for ingestion, dermal and inhalation pathways. The CULs for soil uses are the same because they are limited by soil saturation levels of toluene.																		
12	<sup>d</sup> Modified MTCA C and B include dermal contact with soil in addition to ingestion. Soil saturation limits are not used in these values.																		
13	<sup>e</sup> Based on WAC 173-340-747, fixed parameter three-phase partitioning model, assuming no soil contamination at or below the water table and no NAPL present.																		
14	<sup>f</sup> Based on WAC 173-340-747, fixed parameter three-phase partitioning model, assuming presence of soil contamination at or below the water table and no NAPL present.																		
15	<sup>g</sup> Screening level J-E model using assumptions of loamy sand and a depth below grade to contamination of 183 cm.																		
16	<sup>h</sup> Soil CULs should be based on area-specific circumstances, but in any case will be based on the protection of groundwater (and by inference, surface water).																		
17	Where NAPL is present in a given area, soil CULs should be developed using the volume of the total soil porosity occupied by NAPL and water [WAC 173-340-747(6)].																		
18																			
19																			
20	NC = Non cancer; C = Cancer																		
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23																			
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	S	T	U	V	W	X	Y
1	<b>MTCA Soil to GW, no contam. at or below water table<sup>e</sup> foc=.00358 mg/kg 1.45E+01</b>	<b>MTCA Soil to GW, no contam. at or below water table<sup>e</sup> foc=.00358 mg/kg 1.88E+01</b>	<b>MTCA Soil to GW, contam. exists at or below water table<sup>f</sup> foc=.00358 mg/kg 7.87E-01</b>	<b>MTCA Soil to GW, contam. exists at or below water table<sup>f</sup> foc=.00358 mg/kg 1.02E+00</b>	<b>Soil to Indoor Air Unrestricted<sup>g</sup> HQ=1 mg/kg 7.2E+03</b>	<b>Soil CUL mg/kg footnote h</b>	<b>NC</b>
2							
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11	<a href="#">Results using Method A GW CUL</a> for comparison purposes						
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