

May 10, 2010

Ligia Mora-Applegate
Bureau of Waste Cleanup
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Alternative criteria for exposed creek banks and bottoms downstream from the Cabot Carbon/Koppers site

Dear Ms. Mora-Applegate:

At your request we have developed alternative cleanup target levels (CTLs) for exposed creek banks and bottoms downstream from the Cabot Carbon/Koppers site. These CTLs are based on protection of human health from direct contact. Sediment and soil in exposed creek banks and bottoms in Springstead and Hogtown Creeks are contaminated with dioxins and polycyclic aromatic hydrocarbons (PAHs) above residential soil CTLs. It is our understanding that residential property lines extend to the center of the creeks, and that residential soil CTLs (7 ng/kg (ppt) for dioxin and 0.1 mg/kg for PAHs) conceivably apply to these contaminated areas. However, the accessibility of the creeks varies significantly over the area of concern. In some areas, e.g. near samples SD and SC from the Alachua County Environmental Protection Department (ACEPD) sediment quality study, the banks have a gentle slope and the creek is easily accessed. In other areas (near samples SH and SI from the ACEPD study), the creek banks are comprised of a steep, approximately ten-foot vertical drop on either side that restricts access. Because the creeks are not easily accessible in some areas, the default residential assumptions may not be representative of the actual risk from exposed soil and sediments. In order to more accurately represent exposure to contaminants along the creek, we have developed an alternative scenario for creek visitors in Springstead and Hogtown Creeks.

The creek exposure scenario was created based on professional judgment, site visitation, and conversations with several residents along Springstead Creek. This scenario does not represent a specific creek exposure, but was intended to represent an upper-end estimate of exposure frequency and duration to exposed sediments and soil along creek banks. The scenario consists of a resident who visits the creek twice a week from ages 7-16 and once every other week from ages 17-36. The resident is assumed to spend four hours within the banks of the creek per visit. This type of exposure to creek banks and bottoms is assumed to last for a 30-year duration, which is an upper-end estimate of residence time utilized by the US EPA for calculating risk. The age range 7-36 was chosen because it represents a 30-year age range beginning with the most sensitive population (young children) that are likely to spend significant amount

of time in the creek. Alternative soil CTLs were calculated using the equation from Figure 4 of the *Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, F.A.C.* (FDEP, 2005). The exposure parameters utilized to calculate the alternative criteria are listed in the attached table. The alternative soil CTLs for exposed sediment in Cabot Carbon/Koppers off-site creeks are 57 ng/kg dioxin and 1.0 mg/kg PAHs.

Per Chapter 62-780, F.A.C., use of alternative CTLs requires apportionment if more than one chemical capable of producing the same type of effect is present. Dioxin and PAHs are both considered carcinogens, so the apportionment of the alternative CTLs is required. Although current data for dioxin and PAHs in the creeks suggest that they are not usually co-located, contamination levels exceeding residential soil CTLs for both chemicals can occur at the same location (e.g., sample SD from the ACEPD study). For locations where concentrations for both dioxin and PAHs are available, apportionment can be included in the analysis by considering the following relationship:

$$\frac{\text{Sample dioxin conc. (ng/kg)}}{57 \text{ ng/kg}} + \frac{\text{Sample PAH conc. (mg/kg)}}{1.0 \text{ mg/kg}} \leq 1$$

If the sum of the fractions is less than or equal to one, the cancer risk goal of 1×10^{-6} is met in that sample. If only the dioxin or PAH concentration is known at a location, the sample can be evaluated using simple apportionment, where one-half of the target risk is allocated to each chemical. Operationally, this is accomplished by comparing the concentration observed with one-half of the alternative CTL (i.e., 29 ng/kg for dioxin and 0.5 mg/kg for PAHs).

Note that these alternative CTLs apply only to the portion of residential property that is within the banks of the creek. For the rest of each property, the default residential SCTLs would apply (7 ng/kg for dioxin and 0.1 mg/kg for PAHs). Also, use of an alternative CTL on any portion of the property would require a voluntary institutional control. As a practical matter, an institutional control to address this situation might be difficult to craft and to obtain.

Please let us know if you have any questions regarding these alternative CTLs.

Sincerely,



Leah D. Stuchal, Ph.D.



Stephen M. Roberts, Ph.D.

Exposure Assumptions for Koppers Creek Scenario

Definition	Ages 7-16	Ages 17-36
Body Weight	45 (kg)	72.4 (kg)
Exposure Frequency	104 (d/y)	26 (d/y)
Exposure Duration	10 (y)	20 (y)
Exposure Time	4 (h/d)	4 (h/d)
Surface Area	4580 (cm ² /d)	7228 (cm ² /d)
Adherence Factor	0.3 (mg/cm ²)	0.3 (mg/cm ²)
Ingestion Rate	100 (mg/d)	100 (mg/d)
Inhalation Rate	1.2 (m ³ /h)	1.6 (m ³ /h)