**Memorandum**

To: Deborah Sills, Ph.D.

From: CENG 340 Student, Aradhana Agarwal

Date: September 24, 2013

Re: Non-linear Curve Fitting for Sorption Data

**OBJECTIVE**

The objective is to determine the best fit model- Linear or Freundlich- for the chlordane sorption data collected for the treatment method utilizing granulated activated carbon or GAC.

**METHODS**

In order to determine the best fit model isotherm for chlordane on GAC, the data collected is fit to both, Linear and Freundlich, sorption isotherms and the most appropriate model is selected. The Linear and Freundlich isotherms are described by Eq.1 and Eq.2, respectively. The data was plotted using the KaleidoGraph software and the data was fit to the two isotherm models mentioned earlier. The best fit model was chosen based on visual assessment and not statistical tests.

q = KC (1) q = K (2)

where q = mass of adsorbate adsorbed per mass of adsorbent at equilibrium C = concentration of adsorbate in the aqueous phase at equilibrium K = Freunlich isotherm soild-water partition coefficient 1/n = Freundlich isotherm intensity parameter

**RESULTS AND DISCUSSION**

From the results, it is concluded that the Freundlich isotherm is the best fit for chlordane sorption on GAC. This fit, along with the data points, is shown in Figure 1. below.



Figure 1. A plot of the adsorbed mass, q, versus the aqueous concentration, C. The circles represent data points while the line corresponds to the best fit curve.

The model parameters were determined to be as follows:

K = 245 n = 2.5

Thus, the equation of the curve is as follows:

q = 245

**REFERENCES**

Sills, D.L. (2013) Week 3 Laboratory Handout. – Non-linear Curve Fitting. Bucknell University. CENG 340 Course Notes, Fall, 2013.