**Memorandum**

To: Professor Sills

From: Allie Partridge

Date: September 17, 2013

Re: Estimating Isotherm Parameters

**OBJECTIVE**

The objective of the lab was to take data from a drinking water plan in Ames, Iowa that was contaminated with insecticide chlordane and assess the treatment of the water with granulated activated carbon (GAC). The final step was to determine the appropriate fit for the data to a sorption isotherm.

**METHOD**

In order to do so we graphed the collected data of the concentration of adsorbate in aqueous phase at equilibrium in mg/L and the mass of adsorbed per mass of adsorbent at equilibrium in (mg/g). We determined that the Freundlich isotherm coefficient that best fit the line was 0.1 and the Freundlich isotherm intensity parameter was 1/n=1/0.5.

Linear Sorption Isotherm

q=KC

Freundlich Sorption Isotherm

q=KC1/n

q= mass of absorbate absorbed per mass of adsorbent at equilibrium (mg/g)

C= concentration of absorbate in the aqueous phase at equilibrium (mg/L)

K=Freundlich isotherm soil-water partition coefficient ((mg/g)(L/mg)

1/n= Freundlich isotherm intensity parameter (unit less)

**RESULTS AND DISCUSSION**

Based on the fit we determined that Freundlich sorption isotherm was the correct selection. As you can see in figure 1 the data fits the fit perfectly.

q=KC1/n 🡪 K=0.1 and n=0.5

Figure 1. Concentration of adsorbate

Figure 1 shows the mass of adsorbate adsorbed per mass of adsorbent at equilibrium vs. concentration of adsorbate in the aqueous at equilibrium. Circles represent data points and lines represent fitted sorption isotherm.