Description of the MC 252 Crude Oil

Sample results from the Deepwater Horizon crude oil spill show that the crude oil type can be classified as a "light sweet crude". *Light sweet crude oil* is the form of petroleum that oil refineries prefer because it contains exceptionally high amounts of the chemicals needed to produce gasoline, kerosene, and high-quality crude oil. "Sweet" is a description of how much sulphur is in the oil. In the 19th century, oil workers would taste and smell small amount of oil to determine its quality. Crude oil with low sulphur content had a mildly sweet taste and pleasant smell. Therefore, "sweet" crude is a low sulfur crude oil.

When crude oil is released in the environment, its composition changes as a result of "weathering." Weathering processes include evaporation and others. Evaporation occurs mainly during the first 24-48 hours after release which greatly reduces the amount of volatile components. Some crude oils may lose up to 40% of their volume due to evaporation in the first few days after a release. The substance remaining after evaporation is called weathered crude oil. Thus, the composition of any released product remaining in the affected area is likely to be substantially different than the originally released crude oil. Due to the weathering process, the remaining product is generally considered to have less potential for causing adverse health effects.

A sample of MC252 weathered oil collected on April 27, 2010 was analyzed by Zymax Laboratory in Escondido, CA for whole oil analysis. The carbon range associated with the whole oil analysis is carbon-3 (C3) to carbon-44 (C44). In addition, the sample was analyzed by B&B Laboratories in College Station, Texas for polyaromatic hydrocarbons (PAHs).

The lowest molecular weight hydrocarbon detected in the whole oil analysis was the alkane *n*-C14 (labeled on the attached chromatogram). Naphthalene, a volatile PAH compound, elutes earlier than *n*-C14 and was not detected by Zymax but was present above detection limits at only 0.1 mg/kg oil using a more sensitive PAH method by B&B. More volatile compounds, including benzene, toluene, ethylbenzene, and xylenes were also undetected.

While hydrogen sulfide was not measured in the liquid weathered sample, it has been analyzed for and not detected hundreds of times in air immediately above both the fresh oil and weathered.

Zymax Laboratory Results

Results from Zymax Laboratories indicate the weathered oil is comprised of aliphatic and cyclic hydrocarbons greater than C14. The results indicate that carbon compounds smaller than C14 are not detected and indicates the volatile fraction of the oil was rapidly lost to evaporation prior to sampling.

The chromatogram presented in Figure 1 illustrates the distribution and relative abundance of aliphatic hydrocarbons in the weathered oil and that the lowest carbon number straight chain aliphatic hydrocarbon detected is C14. Lower carbon number aliphatics were analyzed for but not detected.

B&B Laboratories Results

Results from B&B Laboratories indicate that naphthalene, the lightest and most volatile cyclic hydrocarbon tested for in the PAH analysis, was detected slightly above the 0.1 mg/kg oil detection limit.

The chromatogram presented in Figure 2 illustrates the distribution and relative abundance of cyclic hydrocarbons in the weathered oil. Note that the concentration of naphthalene relative to the heavier cyclic hydrocarbons is so low that the bar graph for naphthalene does not appear.

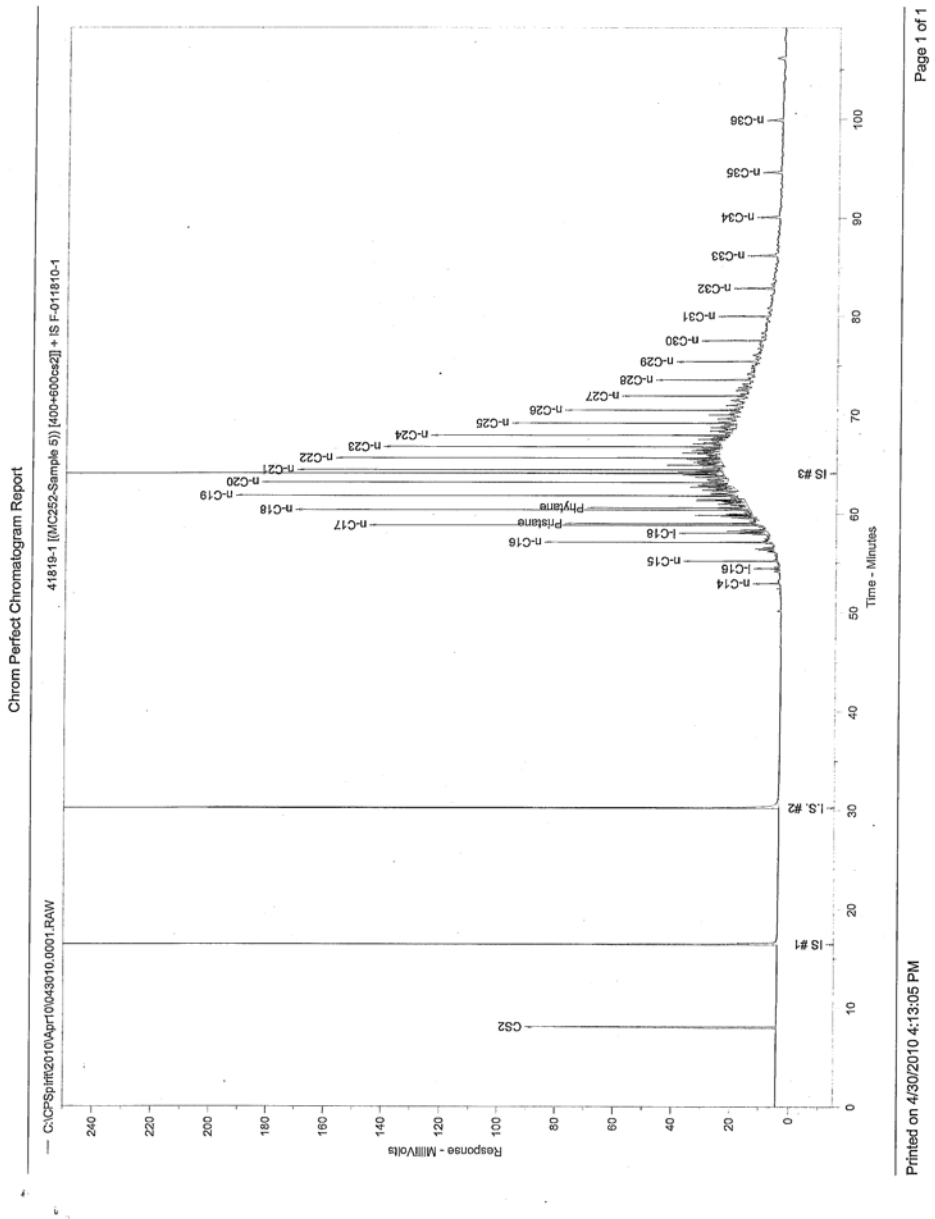

Figure 1
Zymax Laboratory Whole Oil Analysis Chromatogram

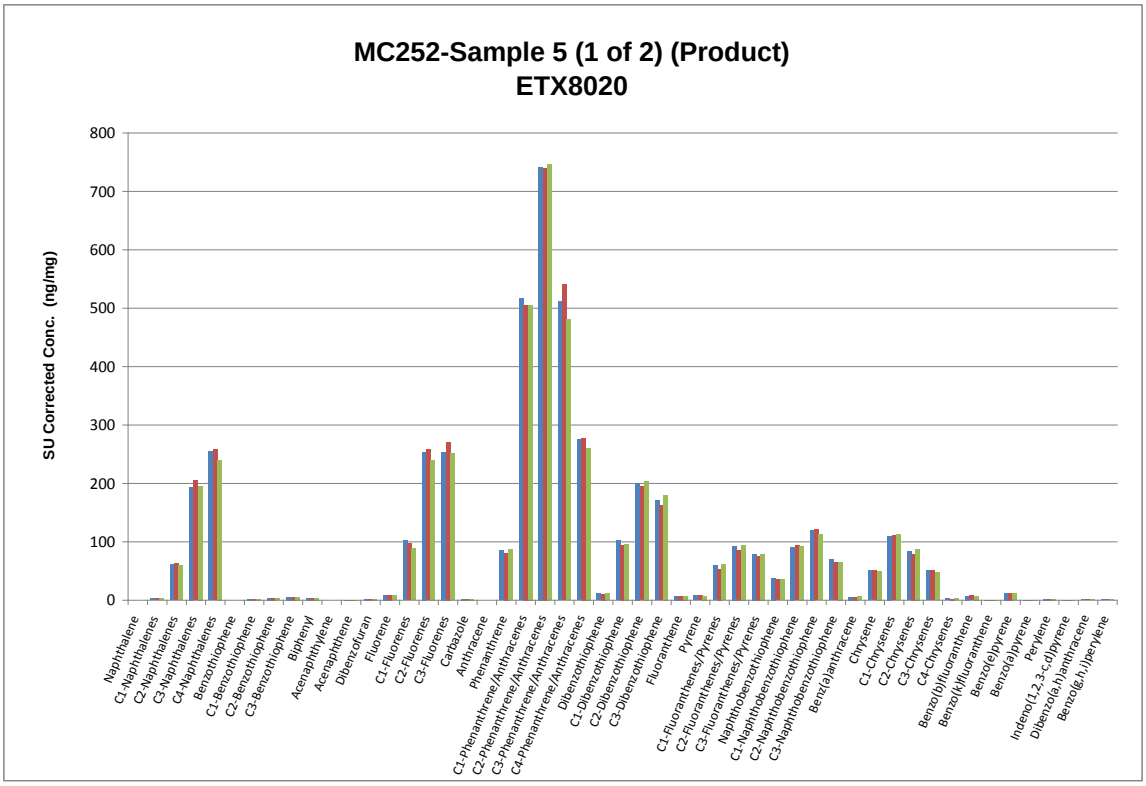

Figure 2
B&B Laboratories Quantitative PAH Analysis Chromatogram