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**CST-12 VOLATILE ORGANIC ANALYSIS
SUMMARY OF ANALYTICAL RESULTS****TO:** Dave Finnegan**DATE:** May 05, 1995**FROM:** Anthony Lombardo, CST-12 Organic Analysis Section *TL S/S/MS***MATRIX:** SOIL**REQUEST NUMBER:** 00006**Results Summary**

Attached is a tabulation of samples submitted for semivolatile analysis and their analytical results (Table 1.) Four samples were received for semivolatile analysis. Samples were collected on April 5, 1995. Sample extraction was started on April 10, 1995. Samples were analyzed on May 3 and 4, 1994. All hold times were met.

Method Summary

Samples were extracted by Sonication Extraction method. Approximately 30 grams of sample was mixed with 60 grams of sodium sulfate and sonicated with 100 ml of methylene chloride. The methylene chloride was separated from the solids and sonication was repeated with two additional 100 ml aliquot of methylene chloride. Sample extracts were combined and concentrated to 1.0 ml final volume. Appropriate surrogate standards were added prior to extraction. Analysis was performed by capillary column GC/MS methods. Extraction methods are consistent with EPA SW-846 methods 3550. Analytical column used was a J&W scientific DB5.MS 30 M X 0.25 mm ID or equivalent.

A GC/MS analysis was performed to determine if samples contained diesel fuel. *This was to be limited to a qualitative determination of the presence of diesel.* The instrument was calibrated using the following standards:

- "DRO" mix, from Restek, Inc. This standard contained 16 analytes at known concentrations which are major constituents of diesel. These 16 analytes were the C₁₀ through C₂₆ Straight chain aliphatic hydrocarbon series.
- Weathered diesel kit, from Restek, Inc. This set of standards (four total) were unweathered diesel #2, 25% weathered diesel #2, 50% weathered diesel #2 and 75% weathered diesel #2. The manufacturers weathering process is designed to model the effects of weathering on the fuel.

The DRO mix, unweathered and 75% weathered diesel standards were analyzed. The number of DRO mix compounds found in the diesel standards was determined. The samples were then analyzed. Identification was determined by identifying DRO compounds in the samples, and matching chromatographic patterns.

Results and conclusions

Identification of fuels by gas chromatography can be done by comparison of sample gas chromatographs with those of standard gas chromatographs, and by identifying specific analytes which are known to be in



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the fuel. This process is complicated by variations in commercially available fuels, weathering of fuels in the environment, chromatographic interferences and similarities between fuel types (i.e. diesel and kerosene). Therefore, a "perfect match" of fuel in an environmental sample to a standard was not expected.

1. Identification of DRO compounds:

| Sample/standard | # DRO compounds |
|--------------------|-----------------|
| Unweathered diesel | 15 |
| 75% weathered | 12 |
| 0121-95-0000 | 15 |
| 0121-95-0001 | 15 |
| 0121-95-0004 | 13 |
| 0121-95-0006 | 9 |

The 15 compounds seen in samples 0121-95-0000 and 0121-95-0001 were the same compounds seen in the unweathered diesel standard.

2. Gas chromatograph (GC) patterns:

Samples 0121-95-0000 and 0121-95-0001 GC patterns were very similar to the unweathered diesel GC pattern. Samples 0121-95-0004 and 0121-95-0006 GC patterns were similar to the 75% weathered diesel pattern.

3. Conclusions:

(waste drum)
drill cuttings
(tuff)

Samples 0121-95-0000 and 0121-95-0001 most likely contained fairly unweathered diesel fuel. Samples 0121-95-0004 and 0121-95-0006 most likely contained a "weathered" diesel fuel.

^ seep sediment (tuff)

If you have any questions regarding this data, please call Anthony Lombardo at 667-5889 or 665-7410.

Note:

That drill cuttings came from West Fill Stn (as reported) cannot be verified by sample collection log.

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