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TO: C-8 FILE

FROM: R. J. ZIPPEL

C-8 INTERLABORATORY MEETING

Meeting Aim

An interlaboratory meeting with the Experimental Station, CH2M-Hill and Washington Works laboratories was held on November 7, 1991. The purpose of the meeting was to gain an increased understanding of the laboratory differences and to decide which laboratory will be used in the future for routine C-8 in water analyses.

Meeting Conclusion

- All three laboratories have good analytical procedures to measure low levels of C-8 levels in water. However, the CH2M-Hill methods are more "robust" resulting in a lower detection limit and reduced variability. Results from CH2MHILL and the Exp. Sta. are in good agreement.
- CH2M-Hill costs per sample are lower than those of the Experimental Station. Washington Works costs were not presented.
- The Washington Works practice to increase the analytical results from the Experimental Station by a factor of 1.4 will be discontinued.

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- CH2M-Hill procedures will be upgraded to more carefully utilize C-8 recoveries from the C-8 in water blanks.
- The use of a non-DuPont laboratory is of advantage if C-8 in water results are published to any public organization.
- CH2M-Hill will be used for future routine C-8 in water determinations. Washington Works will continue to analyze C-8 in soil samples (required by EPA VI procedures).

Discussions

Both CH2M-Hill and the Experimental Station presented their laboratory analytical procedures (both procedures currently on file) for peer review. The Washington Works Analytical Laboratory uses the Experimental Station procedure.

Major procedural differences were:

(1) The CH2M-Hill Laboratory fully complies with the sampling protocol set by the EPA for environmental sampling. This protocol includes good QA/QC practices, improved sample container control, rigorous documentation of equipment calibrations, reduced ambient impurity contamination and the use of control samples. The Experimental Station laboratory does not have the volume of work to justify the increased expense fo the EPA procedures.

(2) The CH2M-Hill Laboratory procedure includes an extraction/sample wash step to remove impurities which could interfere with C-8 detection. In addition, in the extraction procedure CH2MHILL uses a 1000 ml sample vs. 10 ml by the Exp. Sta. which allows the minimum detection limit to be improved by a factor of 10.

(3) The CH2M Hill procedure uses perfluorononanoic acid (C-9), perfluoro-decanoic acid (C-10) & 11H-eicosafluoroundecanoic acid (C-11) as sample surrogates. CH2MHILL uses perfluoroheptanoic acid (C-7), 1,2-dichloro-benzene and 1,2,4-trichloro benzene as internal standards.The Experimental Station uses C-10 as an internal standard, and does not use surrogates. CH2M-Hill reports surrogate recovery results.

(4) The Experimental Station results are corrected for surrogate recovery where CH2M-Hill's results are not corrected. EPA prefers uncorrected results along with surrogate recovery results.

(5) The Experimental Station procedures uses C-8 in water blanks for procedure calibration. CH2M-Hill will add this to their method.

(6) Laboratory sample turnaround times are essentially equivalent.

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CH2M-Hill reported that their overall recovery of surrogates (C-9 & C-11) to be approximately 60% (this includes variabilities from sample preparation, sampling, sample transportation, analytical procedure and sample analyses). Laboratory procedure variability at 3 sigma was 0.0066 parts per billion. Detection limit is 0.1 PPB

The Experimental Station reported their oveall recovery for a C-8 spiking at 5.0 PPB to be 95%. They reported a laboratory procedure variability at 3 sigma of 1.4 parts per billion. Detection limit is 1.0 PPB.

A discussion was held on the reasons why the Washington Works increases the Experimental Station results by a factor of 1.4. This was done to account for the isomers of C-8 that were not reported with the main C-8 peak. It was reported that we have no knowledge of how the isomers behave in the environment and any attempt to correct would be misleading. It was also pointed out that CH2M-Hill, and all other previously reported C-8 in water results utilized only the main straight chain peak.

Therefore, to keep all of the data consistent and not make assumptions about unknown peaks, it was concluded that the Washington Works 1.4 factor was misleading and would not be used. All previously reported data using the 1.4 factor will be corrected.

Dan Weber presented our future C-8 in water and soil sampling needs for our VI plan and maintained planning (see attachment). This plan clearly showed that C-8 in water sampling would be high in 1992. The Experimental Station could not support this high level of sampling.

CH2M-Hill indicated sample costs would be in the range of $300.00 per sample. The Experimental Station reported that their costs would be higher than this. CH2M-Hill further stated that C-8 in soil samples would cost an additional $50.00 per sample. The Washington Works Process Laboratory will examine their costs vs CH2M-Hill's.

A discussion was held on the laboratory results of the last round of sampling. Each laboratory was given 8 samples with four of these being unlabeled duplicates. Laboratory results are attached.

As can be seen, the laboratories reported values for their unlabeled samples close to the values of the duplicate known sample. If one corrects the CH2M-Hill results for surrogate recovery, their results are close to those reported by the Experimental Station. Variability of CH2M-Hill's data is significantly less than the Experimental Station data.

Meeting attendees concluded that the results from both laboratories are valid and should be used.

It was decided by all to use the CH2M-Hill Lab to analyze all future routine C-8 in water samples. The Experimental Station would be used to occasionally cross check CH2M-Hill or for special samples. The Washington Works Laboratory has been given to the EPA as the lab to analyze the C-8 in soil samples for the sites VI. Future routine C-8 in soil samples may be transferred to CH2M-Hill if Washington Works costs are too high.