

exposure temperatures, and intermittent sampling. The experimental sampling rate of this sampler for valeraldehyde vapor was 4.52 +/- 0.14 mL/min (from 8 degrees C to 50 degrees C.) The mass collected was independent of face velocities in the range of 20 to 70 fpm.

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**RESULTS OF THE PRACTICE ROUNDS OF THE PASSIVE MONITOR PROFICIENCY ANALYTICAL TESTING PROGRAM.** C.A. Esche, J.H. Groff, P.C. Schlecht, National Institute for Occupational Safety and Health, Robert A. Taft Laboratories, Cincinnati, OH

The Passive Monitor Proficiency Analytical Testing Program began in July 1996 to evaluate the ability of laboratories to analyze passive monitors. The program provides each participating laboratory a passive monitor sample kit containing two samples and a blank twice a year. The first year of the program will be used to establish proficiency testing performance criteria and will not affect accreditation status of participating laboratories with the American Industrial Hygiene Association (AIHA). On the first round, 164 passive monitors containing benzene, toluene, and o-xylene were sent to 148 participating laboratories. One-hundred thirty-five (83%) were 3M monitors, 17 (10%) were SKC monitors, and 12 (7%) were Assay Technology monitors. Passive monitor reference values are calculated values based upon the vapor pressure of the organic solvent and generator temperature, and are compared with active sampler results conducted prior to shipping samples to participants. A 6% relative standard deviation (RSD) is used to establish three sigma acceptable performance limits of plus or minus 18% of the corresponding reference value. This compares with an average 5% RSD over the last five years in the Proficiency Analytical Testing Program for active charcoal tube samplers. Approximately 66 to 87% of reported results on the first round were within acceptable performance limits calculated by the National Institute for Occupational Safety and Health (NIOSH). The first round demonstrated no important differences in performance among the three passive monitor types. However, problems were encountered with all three monitors regarding the information that is provided by monitor manufacturers to calculate correct air concentrations.

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**AUDITING ON SITE AIR-MONITORING SYSTEMS.** R. Turpin, R. Singhvi, P. Campagna, D. Mickunas, U.S. Environmental Protection Agency, Edison, NJ; J. Meyer, M. Hansen, U.S. Environmental Protection Agency, Dallas, TX; G. Ball, REAC Contract, Edison, NJ

In order to assure the quality of the data obtained by air monitoring systems (AMSs) at various hazardous waste sites, the USEPA/ERTC conducted audits of the AMS

systems. Coupled with the increasing demands on the AMS, the auditing protocols and equipment have also required increasing sophistication and flexibility. Many hazardous waste sites require a perimeter AMS in order to assure that fugitive emissions from the site are within site-specified limits. Increasing demands on the AMS are straining the resources of even the most sophisticated and up-to-date equipment. The need to provide instantaneous, or near instantaneous results, at detection levels in the parts-per-billion (ppb) and even in the parts-per-trillion (ppt) range is pushing the technological envelope. More exotic and unusual analytes present greater challenges to the sampling and analytical systems. All too often, appropriate standards and quality control protocols may not be available. Generally, an ERTC audit will consist of a review of the site-monitoring equipment, site quality assurance/quality control (QA/QC) plans and documents. The site stations are challenged with known certified standards at several concentration levels. Preferably, the challenges are conducted through the station sampling port in order to mimic, as closely as possible, actual site-sampling conditions. In order to easily adjust challenge concentrations, a dilution apparatus setup was built which allows easy and accurate changes in the challenge gases. The purpose of this paper is to demonstrate the need of a site audit program based on ERTC site audits.

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**A DIRECT READING, REAL-TIME SITE PROPERTY LINE AIR MONITORING SYSTEM FOR PM-10 AND SULFUR DIOXIDE AT A FORMER REFINERY CLEAN-UP SITE.** J. Olcott, K. Kratochvil, T. Polini, Envirogenics, Mercerville, NJ

The need for sophisticated, real-time, direct reading instrumentation at hazardous waste sites requires innovative technologies, to demonstrate compliance with EPA national air quality standards to protect the surrounding populations at risk. Given this need, a state-of-the-art air monitoring program was designed and implemented to assess personnel exposures and site property line air monitoring. The project includes remediation of five hydrocarbon/acid sludge lagoons containing 330,000 cubic yards of refinery waste sludge at this closed refinery site. Contaminants of concern include benzene, petroleum hydrocarbons, asbestos, sulfur dioxide, sulfuric acid, uranium, and thorium. The property line air monitoring program incorporates real time, remote, direct reading air monitoring stations at up to 12 locations. Beta-attenuation, direct reading PM-10 monitors are used to assess airborne particulates, while direct reading, pulsed fluorescence sulfur dioxide monitors are used for sulfur dioxide. Data is collected and captured with data loggers at remote stations, and transmitted via a radio frequency telemetry system to a central computer data acquisition system. The system provides graphic displays of air monitoring data acquisition system. The system provides graphic displays of air monitoring data (pollution roses) and activates audio and visual alarms

when action levels are exceeded. During off-hours a modem summons personnel by a beeper system if action levels are exceeded at any station, to enable prompt remedial action. The details of the system are presented, with presentation of monitoring data based on site activities. By availing themselves of currently available technology, industrial hygienists can play a major role in hazardous waste site clean-up activities, while protecting employees and the public from hygienically significant airborne contaminants.

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**EVALUATION OF HAZARDOUS AIR EMISSIONS AT A PETROLEUM RECOVERY HAZARDOUS WASTE SITE AS ANALYZED BY THE TAGA 6000E.** R. Turpin, U.S. Environmental Protection Agency, Edison, NJ; H. Schmidt, G. Zarus, A. Mignone, Roy F. Weston, Inc., Edison, NJ; L. Wilder, T. Forrester, Agency for Toxic Substances and Disease Registry, Atlanta, GA

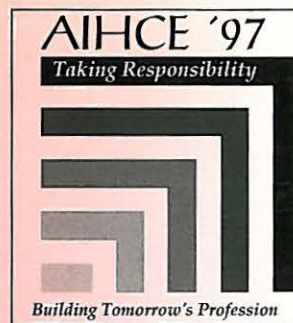
The U.S. Environmental Protection Agency's Environmental Response Team Center (U.S. EPA/ERTC) was requested by Region VI of the U.S. EPA to quantify the amounts of methane, BTEX compounds (benzene, toluene, ethyl benzene, and xylene), volatile organic compounds, and polycyclic aromatic hydrocarbons at a petroleum recovery hazardous waste site. Several environmental protection and public health organizations inevitably became involved with evaluation and quantification, including Region VI of the U.S. EPA, the Agency for Toxic Substances and Disease Registry, and the U.S. EPA/ERTC. Specific expertise was provided by each group that allowed for the determination of ambient air concentrations and for evaluation of the health impact on the local population.

Mobile ambient air and soil gas monitoring was performed by the Trace Atmospheric Gas Analyzer (TAGA) to provide a comparison and possible correlation in the contaminant concentrations between outdoor ambient air, soil, gas, and indoor environments. The objectives of this technique are to determine if levels of contaminants are exceeding prescribed levels and to ascertain whether additional testing of the area in question is necessary. In addition, gross air monitoring was performed at each location to determine total VOCs, hydrogen sulfide, and methane. This provided additional insight into the extent of the impact and assisted with the assessment of the impact on human health.

In order to accurately calculate the position of each location tested by the TAGA, a global positioning system (GPS) was employed. During testing, one GPS was used to acquire data at the location in question while a second was set up as a base station at known control points. This system is utilized during mobile monitoring to afford the opportunity to imitate the sampling run with validated data after the data collection process is completed. This report illustrates the successful techniques used at the petroleum recovery hazardous waste site and a percentage of the results procured.

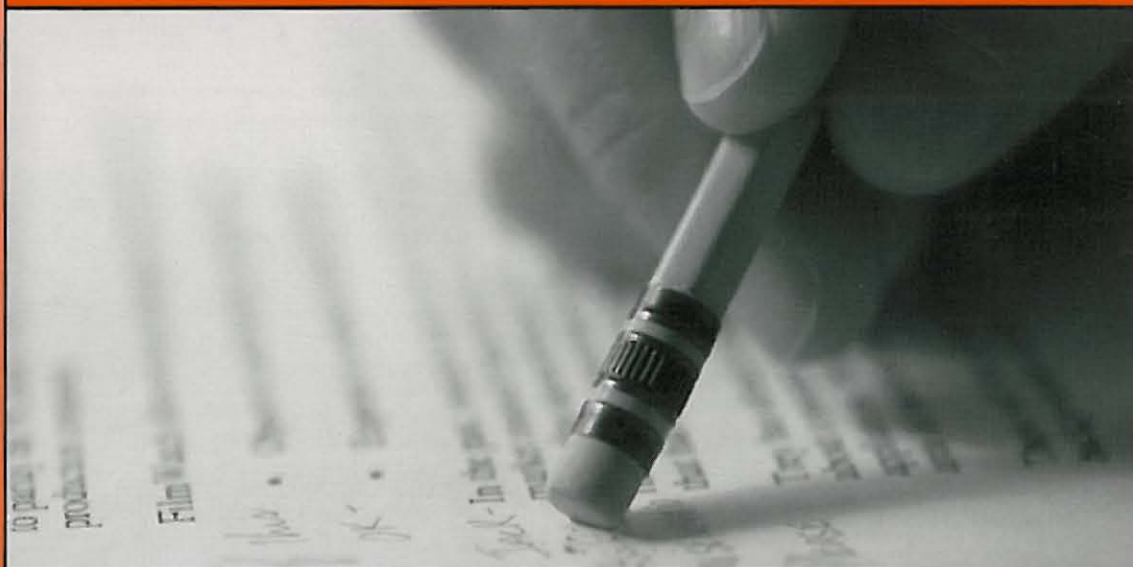
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## **Abstracts**

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