0.002 (the limit of quantitation) to 0.020 f/cc as an 8-hour TWA concentration, with an average result of 0.005 f/cc. Personal air sample results ranged from < 0.003 (the limit of quantitation) to 0.018 f/cc as an 8-hour TWA concentration, with an average result of 0.007 f/cc. Personal air samples collected and analyzed for comparison with the OSHA Short Term Exposure Limit (STEL) ranged from < 0.045 (the limit of quantitation) to 0.053 f/cc.

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POTENTIAL ENVIRONMENTAL HEALTH RISK FROM JOHANNESBURG GOLD MINE TAILING DUMPS. V. Yousefi, Department of Health, NCOH, Johannesburg, South Africa

This report summarizes the measurements of the dust level at dwelling environments in the vicinity of gold mine dumps in Johannesburg. Measurements were conducted to investigate the complaints made by both the community and industries located nearby the mine dump. The acute and chronic health effects and the environmental impact of gold mines dumps in Johannesburg, Soweto, Meadowlands, and Kagiso are classic examples of the inevitable problems caused by man-made activities such as gold mining.

Unplanned and fast urbanization resulted in the settlement and establishment of industries around numerous mine dump sites in Johannesburg. Wind erosion of mine dumps caused a number of complaints both by people living there and by industries sited at or nearby the mine dumps. Measurement of inhalable airborne concentrations of suspended particles both outside and inside a few houses in the vicinity of dumps was undertaken. Battery and main operated sampling pumps and single bucket gravity settling sampling devices were used for airborne particle sampling. It was found that (1) the airborne dust level has been rising above the national (and international) recommended safe levels, (2) the mine dump dusts contained high concentrations of quartz (crystalline silica), (3) a significant percentage of the dust was of an inhalable size, and (4) the inhalation of respirable dust containing quartz (which is practically insoluble) can cause pulmonary disease (i.e., silicosis, a type of pneumoconiosis). Anticipation is that continuous exposure to this dust containing alpha quartz as biologically active minerals leads to ill health. A general practitioner in this area reported that the attendance to local clinics is higher during windy seasons than during other times. On one of the mine dump sites, young bikers are allowed to ride their motorcycles for recreation. This loosens sand which is easily picked up by the wind and is transported to the residential areas. Large numbers of persons in nearby houses and industries are affected by this airborne dust, particularly during windy seasons. The wind erosion of this type of mine dump sand is high. Despite the existence of legislation, authorities and mining houses/companies have not committed themselves fully to the requirements of the law. Also, proper measures are not being taken to address the problem.

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SAMPLING AND ANALYSIS OF AIRBORNE ENVIRONMENTAL ALDEHYDES AND KETONES. Y. Shen, UCLA, Los Angeles, CA; S. Que Hee, UCLA, School of Public Health, Los Angeles, CA

A high flow solid sorbent dynamic sampling method for ppb (v/v) airborne aldehydes and ketones was based on their chemisorption to 10% (w/w) O-(2,3,4,5,6-pentafluorobenzyl) hydroxylamine hydrochloride (PFBHA) on Tenax TA. The method is to be used for both ambient outdoor and indoor air. Fifteen carbonyl compounds were studied as target chemicals (acetaldehyde, acetophenone, acrolein, formaldehyde, isophorone, 2-butanone, hexone, propionaldehyde, benzaldehyde, butanal, 2-furaldehyde, isovaleraldehyde, n-valeraldehyde, acetone, and n-hexaldehyde). Temperature and RH had no influence on the sampling efficiency. The PFBHA O-oximes of the target carbonyl compounds were synthesized. An optimal gas chromatography (GC) temperature program was developed to separate the PFBHA O-oximes mixture of all the target carbonyl compounds.

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NEW ANALYTICAL METHOD FOR DETERMINING ALDEHYDES IN AQUEOUS SAMPLES. Ju Chien Tso,UCLA, Los Angeles, CA; S. Que Hee, UCLA, School of Public Health, Los Angeles, CA

Carbonyl compounds (especially low molecular weight aldehydes) are receiving increasing attention in workplace air exposures and water pollution. Formaldehyde, acetaldehyde, furfural, and crotonaldehyde are known animal carcinogens. There is need to have a method that can be utilized to analyze trace amounts of aldehydes, particularly in ground water from hazardous waste sites and waste streams after oxidation or combustion treatments. The reagent O-(2,3,4,5,6-pentafluorophenyl) methylhydroxylamine hydrochloride (PFBHA) is a promising reagent to analyze carbonyl compounds. A batch method to form derivatives is the only method type for aqueous samples; however, it is time consuming. A new analytical method with solid phase extraction (SPE) has been developed by using a cation exchange cartridge to hold PFBHA ions to react with aldehyde in the aqueous sample. The cation exchange cartridge was activated by 10 mL of 0.5 M sulfuric acid and charged with 10 ml of 1% (w/v) PFBHA aqueous solution at a flow rate of 1 mL/min. After loading aldehyde aqueous samples and a microwave heating treatment, the oxime product was eluted from the SCX cartridge by 5 ml of hexane and analyzed qualitatively and quantitatively by gas chromatography/electron capture detection (GC/ECD) and gas chromatography/mass spectrometry (GC/MS) using a nonpolar capillary column. The recovers of 20 mL formaldehyde solution in the concentration range 100 ppb–10 ppm were > 83%. This method is suitable for field sampling.

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INTEGRATED RISK ASSESSMENT HELPS INTEGRATE OEH&S AND BUSINESS. L. Bendixen, Arthur D. Little, Cambridge, MA; E. Alp, Arthur D. Little of Canada Limited, Toronto, Ontario, Canada; S. Mansdorf, Arthur D. Little, Cambridge, MA

All forms of risk assessment have been hindered not only by the difficulty in presenting the concept of risk to decision makers, but also by the insistence of technical experts on having methodologies and formats for results that uniquely match their disciplines. This includes predicted injury and illness rates, estimates of changes in life expectancy, predicted numbers of fatalities, barrels of oil spilled, etc. We have further damaged our common purpose of making good decisions about risk by submitting many separate reports on different types of risk associated with the same project or activity. Fortunately, things are starting to change. In studies ranging from quick reviews of transportation-related risks for hazardous materials to detailed evaluations of new projects covering site selection through operations and transportation, methodologies and approaches are being developed that help unify not only the results of OEH&S risk assessments, but also financial and project risk assessments. The selected approaches retain the evaluation of factors critical to each type of risk, but bring the results of all the individual risk assessments down to financial terms—the common basis for other decisions within an organization. When brought together in this manner, decision makers recognize the uncertainty and do not inappropriately latch onto specific values. These studies have brought OEH&S practitioners and business analysts together and have allowed the consideration of OEH&S risks on a common ground with other business-oriented or financial risks. The results have included better decisions about the project or activity being reviewed, treatment of OEH&S issues as a cost of doing business rather than a tax, and earlier involvement of OEH&S staff in subsequent decision processes.

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HEALTH AND SAFETY ISSUES ADDRESSED DURING PROPERTY ACQUISTION: EXPANDING THE SCOPE OF TRADITIONAL ENVIRONMENTAL SITE ASSESSMENTS. S. M. Burrill, D. Salmond, Arthur D. Little, Cambridge, MA

Environmental assessments have become a routine step in the corporate merger and acquisition process. Too often, however, health and safety issues are not considered. The purpose of the Environmental Site Assessment (as described in ASTM Standard E-1527-94) is to identify certain types of environmental risks associated with property or facilities before the transaction takes place. This protects buyers from future liabilities as the new owner. However, by limiting the assessment to environmental issues, many other health and safety–related factors that could add to future liability are often overlooked. In fact, depending on the nature of the transactions, the health and safety concerns often outweigh environmental concerns. For example, safety issues pertaining to facility fire protection systems, industrial hygiene issues pertaining to chronic exposures of staff to hazardous substances, ventilation issues that contribute to indoor air quality problems, etc., may not be detected in a routine environmental assessment. This paper provides a framework for the EHS manager to use in expanding the scope of the environmental assessment to include important health and safety risks that may be associated with an acquisition candidate.

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DEVELOPMENT OF A QUESTIONNAIRE TO EXAMINE WORKER RISK PERCEPTION OF NOISE AND USE OF HEARING PROTECTIVE DEVICES. D. Nelson, B. Aylor, R. Nelson, University of Oklahoma, Norman, OK

The purpose of this study was to develop a questionnaire to research worker perception of risk of occupational noise exposure. The objectives were to (1) develop a model relating the factors to be studied, (2) develop a draft questionnaire to test the model, (3) administer the draft questionnaire to a pilot group, and (4) refine the questionnaire.

The first step was formulation of a knowledge-attitude-behavior model relating the following: (1) knowledge about noise and noise-induced hearing loss (NIHL); (2) attitudes about noise, perception of

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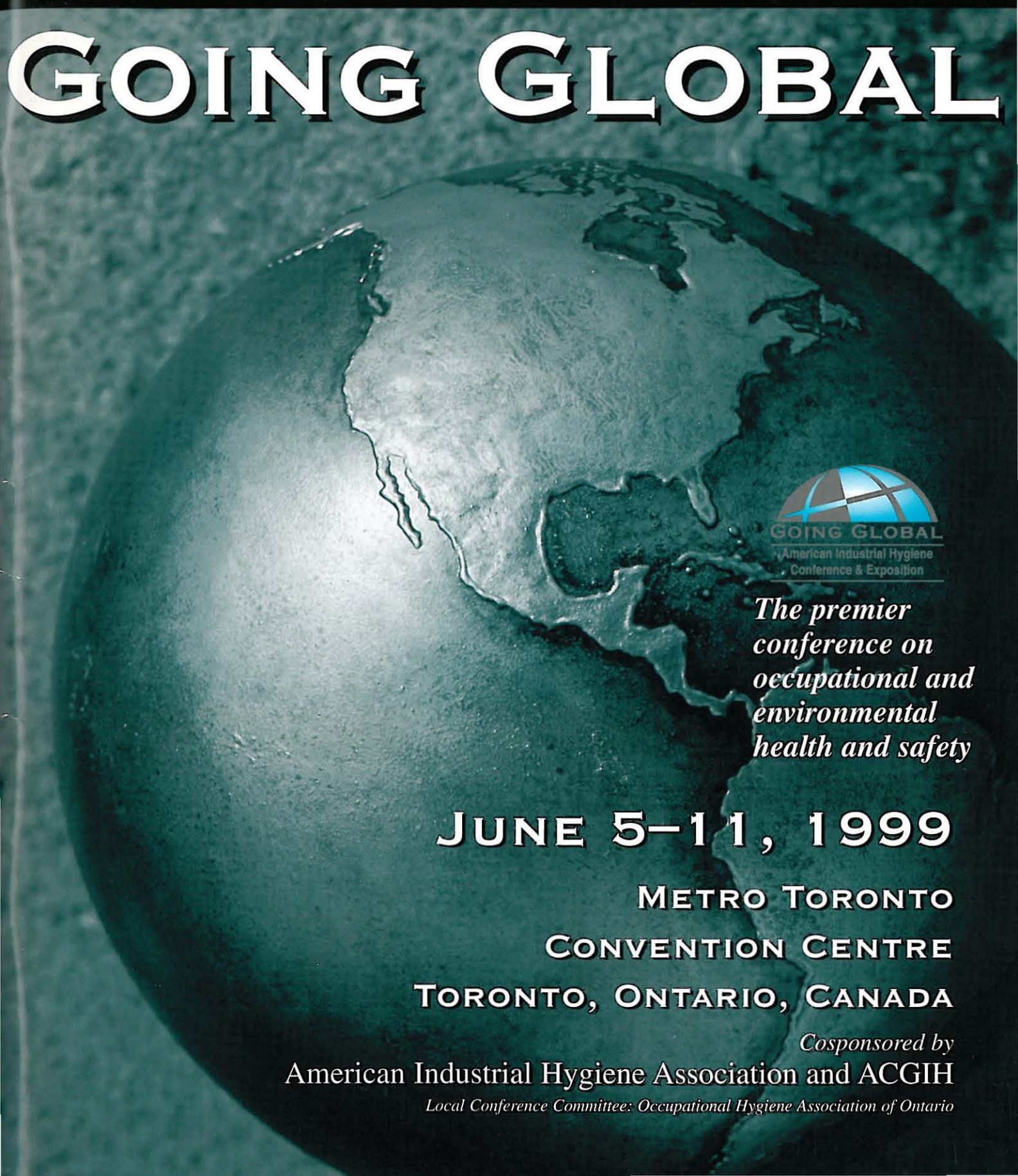

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