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ERA typically involves comparing species-specific estimates of dietary exposure to toxicity thresholds for selected ecological receptors. In some cases, however, risk managers may be willing to evaluate ecological risk from a habitat quality and landscape ecology perspective. This presentation compares and contrasts these approaches to ERA at two sites in the Saginaw River at Bay City, MI.

Site A is an active heavy industrial manufacturing facility. The ERA at Site A focuses on an undeveloped portion of the site that provides a fairly high quality habitat. Soils at site A contain elevated levels of metals and polychlorinated biphenyls (PCBs). Ecological risks associated with exposure to these compounds are evaluated in four ecological receptor species by comparing dietary exposure to toxicity thresholds. Dietary exposure is estimated using measured concentrations of metals and PCBs in food items of the receptors.

Site B consists of a municipal landfill, most of which is capped. Soils in uncapped areas contain moderately elevated concentrations of some metals and PCBs. Most of Site B provides a marginal or low quality habitat. Ecological risk at Site B is evaluated based on the extent and quality of habitat, likelihood of exposure, and potential future use.

The ERA at Site B relies on an evaluation of the potential for significant exposure, based on habitat characteristics. By contrast, the ERA at Site A relies on the evaluation of a quantitative estimate of risk based on exposure to substances measured in food items. Risk assessors are encouraged to pursue less costly habitat assessment approaches at sites that provide a marginal or poor habitat and are likely to remain disturbed due to future land uses.

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PATTERNS OF BODY WEIGHT CHANGES AND FLUID/FOOD CONSUMPTION IN A HOT WORKING ENVIRONMENT. S. Rose, J. Moore, J. Congleton, Texas A&M University, College Station, TX

During June through August 1998, daily body weight changes (in kg), fluid consumption (kg), and food consumption (kg) were measured and recorded for 17 aluminum smelter workers performing carbon setting, pulling jacks, crust breaking, and tapping. The TWA-WBGTs (°C) for these tasks were 35.3, 35.9, 37.6, and 38.6, respectively. Body weight was measured with a Cardinal DETECTO Electronic Physician Scale with the workers dressed in dry clothing. Fluid and food containers were weighed on an ACCULAB Electronic Balance.

Daily changes in body weight were calculated by subtracting postshift weights from preshift weights. Daily fluid/food consumption was calculated by subtracting preconsumption fluid/food container weights from postconsumption fluid/food container weights. Body weight changes and fluid/food were described and compared across shifts (day, swing, and graveyard) and days of the shifts (days 1-4 and 7) using ANOVA. Mean, maximum, and minimum daily body weight changes were -1.45 (loss), -5.21, and +1.13, and represented 1.6%, 5.9%, and 1.3% of preshift body weight, respectively.

Mean body weight changes were not significantly different across shifts; however, losses on days 4 and 7 were significantly greater (0.68) than on day 1. Mean daily fluid and food consumption were 3.08 and 0.50, respectively. Mean daily fluid consumption was significantly greater (+1.22) on the swing shift compared with the day shift. Mean fluid and

food consumption was not significantly different across days of the shifts. Mean food consumption was not significantly different across shifts.

Sweating and excretion reduce body weight while fluid and food consumption increases it.

Even though sweating and excretion were not directly measured, the results of this study suggest that fluid consumption may have prevented significant body weight losses across shifts.

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THE EFFECTIVENESS OF HEAT-REDUCING INTERVENTIONS USED IN WORK RECOVERY AREAS. S. Rose, J. Moore, J. Congleton, Texas A&M University, College Station, TX

A heat stress survey was conducted at an aluminum smelter between June and August 1998. The relationship between WBGTs at eight locations across the potrooms and the National Weather Service's heat index were evaluated using bivariate correlation.

The mean WBGT (°C) and correlation coefficient (r) for the eight locations were courtyard (32, 0.72), curtain wall at wide aisle (32.1, 0.63), center of wide aisle (32.9, 0.70), back riser of pot (40.8, 0.24), center of pot (50.3, 0.33), front riser of pot (42.9, 0.46), center of narrow aisle (34.4, 0.70), and curtain wall at narrow aisle (33.4, 0.72).

These results suggested that WBGTs on or immediately adjacent to the pots were not particularly related to ambient conditions; however, areas where workers recover from heat strain (curtain wall at wide aisle and center of wide aisle) were related significantly to ambient conditions.

During the summer of the study, the smelter implemented four engineering controls (dry fans, cool zone fans, garden hoses without fans, and garden hoses with fans) to reduce heat stress levels in the recovery areas. The effectiveness of these interventions in terms of their effects on WBGTs in the recovery areas is reported.

At the curtain wall, mean WBGTs for garden hoses without fans and cool zone fans were significantly lower than the control condition (31.2, 31.4, and 33.5, respectively). At the center of wide aisle, only the mean WBGT for garden hoses with fans was significantly lower than the control condition (31.6 and 33.9, respectively). The mean WBGTs for dry fans were not significantly different from the control conditions at either location.

In this study, cool zone fans, garden hoses without fans, and garden hoses with fans resulted in significant reductions in mean WBGTs in areas used for physiological recovery from heat strain.

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SCHOOL VOCATIONAL SAFETY AND HEALTH TRAINING NEEDS ASSESSMENT. B. Schlegel, P. Kamarinos, EOHHSI-CET, New Brunswick, NJ

The Environmental and Occupational Health Sciences Institute (EOHSI), through a grant from the New Jersey Department of Education, Office of School-to-Career & College Initiatives, conducted a training needs assessment of New Jersey school safety and health designees and other individuals involved in vocational programs. Safety and health designees are positions in school districts required by regulation. They are school board appointed per-

sonnel who are responsible for implementing a health and safety program for vocational programs in their school district.

Surveys were mailed to 952 individuals in April of 1999; 139 were returned for a response rate of 14.6%. Respondents, in general, indicated a high level of concern about occupational health and safety and expressed interest in attending a training course or workshop. The three topics of greatest interest were 1) legal liability issues; 2) how to prepare students to meet the State "Cross-Content Workplace Readiness Standard - All students will apply safety principles;" and 3) general safety and health regulations and workplace code compliance.

The two resources identified as having the highest level of need were continuing to have free training provided throughout the year on occupational health and safety issues associated with vocational programs, and having some type of certificate available for personnel who have completed a series of courses preparing them to handle or teach occupational health and safety issues at schools.

Additional training and resource needs were also identified. A new two-day course is being developed for teachers to help them improve their teaching of vocational safety and health in their schools.

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NATIONAL SKILL STANDARDS FOR WORKERS. J. Palassis, P. Schulte, M. Sweeney Haring, NIOSH, Cincinnati, OH

The National Skills Standards Board (NSSB) was established by Congress (Public Law 103-227) to address the future needs of a fast-changing technology and to keep the United States competitive in a global economy. Subsequently, NSSB established guidelines for voluntary, nationwide, unified national skill standards for use in education and the workplace. The standards can be used by employers, employees, communities, teachers, students, and state and federal agencies.

Although the majority of the standards address competency in specific technical areas, occupational health and safety is an integral part of each standard. The standards are being developed through "voluntary partnerships" of labor, industry, academia, and government. NIOSH formed a voluntary partnership with NSSB and is working to ensure that occupational health and safety factors are integrated into the national skill standards.

The first standards developed are for the manufacturing sector representing the largest U.S. economic sector in terms of employees, and the first of 15 sectors that divide the U.S. economy. High schools, community colleges, universities, union, trade, and apprenticeship schools may choose to upgrade their curricula and instructional methods to meet the high level of competencies of the national skill standards.

Workers meeting the criteria and competencies, which include occupational health and safety, will be able to take written and skill tests and receive certification in their trade. The training and academic institutions that meet the high requirements of the national skill standards, consequently, will have to increase their emphasis in occupational health and safety. As a result, workers entering the workplace will be knowledgeable about health and safety practices. We expect that the National Skill Standards to contribute to a reduction in the number of occupational injuries, illnesses, and deaths in the United States.

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