

# Environmental Training Means Jobs

In the fall of 1992, 93 experienced geologists, engineers, chemists, and geophysicists, recently displaced from the declining domestic oil industry, assembled for the beginning of the inaugural semester of a course designed specifically to cross-train petroleum geologists, reservoir engineers, and other scientists and engineers. Since then, environmental professionals and recent graduates have been attracted to the course as a way to broaden their industrial training and awareness of various activities within the environmental field. Since that first semester, many graduates of the class have obtained jobs in the environmental field with regulatory agencies, industry, and consulting companies.

The course was designed and is produced by Michael D. Campbell, P.G., P.H., corporate hydrogeological consultant and former regional technical manager and chief hydrogeologist for

DuPont Environmental Remediation Services Inc. and other environmental engineering consulting companies in Houston, Texas. Campbell, with more than 28 years of professional experience in the environmental and mining fields, is known for his work (including the text published by the Houston Geological Society in 1977: *Geology of Alternate Energy Resources*, as well as the text published by McGraw Hill: *Water Well Technology*) and other publications and contributions. The course has evolved as an outgrowth of the many short courses he has either supported, arranged, or presented during the last 15 years in cooperation with his extensive network of industry, university, and regulatory associates.

The course will be presented again in the Fall semester 1995 on Tuesday and Thursday evenings and Saturday mornings for approximately 200 lecture and field hours over a four-

month period. Although Campbell is the principal instructor, primary and guest lecturers provide coverage of special topics such as health and safety, environmental chemistry, and a range of perspectives by industry and government leaders. Field trips and hands-on demonstrations of various activities and equipment are supervised by veterans from the environmental field.

Topics covered during the course introduce the participant to the realities of the environmental field. Each class begins with class discussions over a period of 15 minutes on "what's new" on environmental topics. These are pursued by the students as regular homework assignments, as Campbell and guest lecturers comment or stimulate point and counterpoint discussions. The main lecture of the evening then follows.

The first few weeks of the class are spent on state and federal regulations, and the reasons for



The class in the field practicing measuring water levels in a monitoring well.

the existence of the environmental field. The principal objective of the course is to prepare the individual for obtaining employment in the field. To accomplish this, the individual must know the salient features of the regulations that drive all environmental projects. The "where, what, when, how, and why" of the regulations must be understood if the individual is going to be useful to a prospective employer, whether geologist, geophysicist, engineer, chemist, accountant, or other professional (astronomer, physicist, landperson, etc.).

After the regulations have been introduced and discussed in some detail, the principal elements of the field are presented. This includes coverage of health and safety issues that are involved in all environmental projects. When dealing with society's hazardous wastes, exploration activities are potentially dangerous, and the course is based on a sound foundation of health and safety education. This is followed by an introduction to the elements of environmental chemistry, both inorganic and organic chemistry as they relate to EPA protocol concerning sampling

and data analysis and validation.

Because potential contamination of ground water is a primary concern of EPA and the general public, the subject of hydrogeology is treated in considerable detail. Ground water flow net analysis, aquifer testing, drilling demonstrations, site assessment procedures, ground water modeling, ground water statistics, and problem solving are all included. Monitoring wells will be drilled and completed for use by the class members to practice taking ground water level measurements, and conducting

pumping tests and slug tests for the purpose of meeting state and federal environmental requirements (and regulations).

After discussions have been completed on the fundamentals of the field procedures used in assessing the horizontal and vertical extent of contamination, topics such as conceptual engineering, remedial assessment, equipment selection, system design, project management, and environmental marketing are introduced in terms of how the field procedures come together to create a system designed to remediate (or clean up) a con-



aminated site. During this part of the course, a field trip is made to selected Superfund sites around Houston. Texas Natural Resource Conservation Commission (TNRCC) and EPA personnel present special lectures on topical subjects of interest, including lectures on air quality control, permitting, and management.

A take-home midterm examination is given to the class to test the individual's ability to research and locate required information. Presentations are made by students during the latter part of the course in an opportunity to practice giving 20-minute technical presentations and to familiarize the individual and the class with technical case histories and recent technological developments.

Near the end of the course, a "Hazwoper" Saturday session is conducted to meet the final requirements for 40-hour OSHA certification, which is required of all

individuals who wish to work in the environmental field. In final preparation for beginning the search for employment, job searching and interviewing techniques are discussed by human resource recruiting personnel and senior management consultants.

Each student has the option to compete for class ranking by being scored according to weighted average criteria. If an individual meets all testing, attendance, and other requirements, course completion certificates will be awarded. Those of the 10 top ranking will receive special recognition on their certificates. The OSHA 40-hour certificate will also be presented if the individual meets all requirements.

Technical personnel who have supported the course include industry representatives from companies such as DuPont Environmental (Rae Eklund, C.I.H., Dr. Bill Hitchcock, Dr. Ted Foss, P.G.); ERM-Southwest (Richard C. Bost, P.E., Gary Donnan, P.G., Angela LeVert, Tom Whitehurst, P.G., Guy Swinford, P.G.); ENSR Consulting and Engineering Inc. (Chris Boyce, P.G.); ENVIRON (Dr. Ben Thomas); IT Corp. (Dr. George Losonsky, P.E.); AWD Inc. (Dr. Chi-Chung Chang, P.G.); Law Engineering (Keith Dodds); Fugro-McClelland (Andrew Taer); Techsas Inc. (Bob Pearl); and National Well Supplies (Joe Jewell).

Dr. Dick Flannery and Steve Hamm from TNRCC and others have contributed materially to



Class members are shown field safety practices.

the success of the course to date. They include James Grace, CPG; Nancy Alyanak, CPG; Carl Brassow, P.E., J.D.; Dr. Don Flory, QA Associates Inc.; Dick Woodward, Sierra Services; Steve Zarvos, P.E., Team Environmental Inc.; Michael Solomon, Argo Environmental Training & Consulting; Karl Leger, Compliance Solutions Inc.; and Robert M. Graziano, Graziano & Partners.

Dr. Herb Ward and Dr. H.C. Clark, of Rice University, Dr. Wayne A. Pettyjohn, P.G., of Oklahoma State University,

and others present special lectures from time to time, depending upon their availability.

Registration for Fall semester begins August 1 and will continue until course capacity has been reached. Classes are now scheduled to begin after September 1 at the Houston Engineering and Scientific Society facilities. Hazwoper certification is available if required. Scholarships are available for qualified individuals. For further information on registration and the scholarship program, call (713) 440-7665. **WWJ**

**“ The course is designed specifically to cross-train geologists and others for the environmental field.”**