

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

TRIP REPORT

SUBJECT: Groundwater Modeling with MODFLOW 2000 (20.01402.158.031)

DATE/PLACE: October 23–26, 2001
Washington, DC

AUTHORS: Melissa Hill and Chandrika Manepally

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PERSONS PRESENT:

A total of fourteen individuals, instructors included, participated in the workshop. There were representatives from Nebraska Public Power District, OES Environmental, Texas A&M, and Rummel, Klepper, & Kahl. The instructors were Dr. Evan R. Anderman, coauthor of some of the modules of MODFLOW 2000; Dr. John Doherty, author of PEST ASP; and James Rumbaugh, author of Groundwater Vistas.

BACKGROUND AND PURPOSE OF TRIP:

MODFLOW is a widely accepted code for saturated zone modeling. Currently, MODFLOW 1996 is being used to develop a site-scale saturated zone flow and transport model (Unsaturated and Saturated Flow Under Isothermal Conditions Key Technical Issue). The most recent version, MODFLOW 2000, has added capabilities including parameter estimation and sensitivity analysis, and may be used in the future stages of the saturated flow model development. The parameter estimation package, PEST, is model independent. This course included material about the basics of parameter estimation and an introduction to the most recent version of PEST with regularization and predictive analysis. These tools are likely to be used not only for the calibration of the saturated zone model, but also for other models being developed at CNWRA.

SUMMARY OF PERTINENT POINTS AND ACTIVITIES:

The training included an introduction to the new MODFLOW 2000 structure, with a strong emphasis on software application, limitations of groundwater simulations, the importance and methods of parameter estimation, and alternate conceptual models in groundwater simulations.

Activities included lectures and hands-on computer time. Both lectures and computer time focused on the new MODFLOW 2000 structure, practical application of three new packages (LPF, ADV, and HUF), and parameter estimation with PEST-ASP and MODFLOW 2000. The tutorial exercises included creation of input files based on an area to be modeled and interpretation of output files. There were presentation topics that included advanced parameter estimation tools with PEST-ASP and introduction to stochastic tools in MODFLOW 2000. There were demonstration sessions for two Graphical User Interfaces, GMS version 4.0 and Groundwater Vistas, that support MODFLOW 2000.

CONCLUSIONS:

This course is extremely beneficial for hydrologists and engineers involved in groundwater modeling. Some of the concepts and tools presented in this course may be used in the development of the site scale saturated zone model for Yucca Mountain.

PROBLEMS ENCOUNTERED:

None.

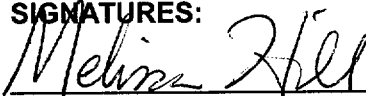
PENDING ACTIONS:

None.

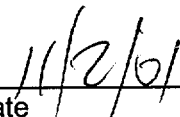
RECOMMENDATIONS:

Strongly recommend attendance by CNWRA staff at future Environmental Modeling Systems, Incorporated sponsored courses on advanced GMS.


SIGNATURES:



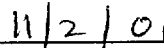
Melissa Hill
Geohydrology and Geochemistry



Date

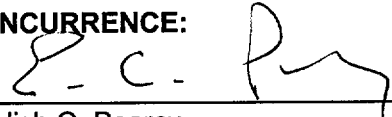


Chandrika Manepally
Geohydrology and Geochemistry

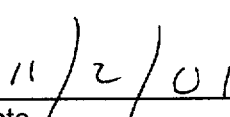


Date


CONCURRENCE:




English C. Percy
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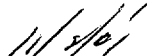
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Budhi Sagar
Technical Director



Henry Garcia
Director of Administration



Date

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October 31, 2001
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U.S. Nuclear Regulatory Commission
ATTN: Mr. John J. Linehan
Office of Nuclear Material Safety and Safeguards
Program Management, Policy Development & Analysis
TWFN 8 A23
Washington, DC 20555

Subject: Employment Opportunities and Practices Related to Historically Black Colleges and Universities and Hispanic Serving Institutions

Dear Mr. Linehan:

The purpose of this letter is to provide several items of information requested in the electronic-mail request of October 30, 2001, from Mrs. Deborah DeMarco. Her request included several items regarding employment opportunities and practices related to Historically Black Colleges and Universities (HBCU) and Hispanic Serving Institutions (HSI). These questions are addressed in the following paragraphs.

For Fiscal Year 2001, the Center for Nuclear Waste Regulatory Analyses (CNWRA) employed eleven students on a part-time basis (full-time in the summer months). Of these, six (55 percent) were selected from HSI schools.

The Southwest Research Institute (SwRI) Human Resources (HR) Department is responsible for recruitment of both students and regular employees. A list of HBCU and HSI schools from which the HR recruits was previously conveyed to the NRC Contracting Officer, and is attached for your information. The HR Department makes a conscientious effort to recruit students from these schools for part- and full-time employment opportunities throughout the year. Regularly scheduled visits are made by the HR Department staff to these schools. Because the CNWRA primarily employs graduate degrees in earth and materials science disciplines, recruitment of qualified individuals from these schools has been frustrated by the unavailability of students in these disciplines.

The CNWRA would be pleased to accept applications from qualified individuals that may be forwarded from the Oak Ridge Institute for Science and Education (ORISE). Table 2 of the Program Manager's Periodic Report identifies the areas where the CNWRA has current openings for full-time employment. In addition, we regularly consider student employees in each of the listed areas of concentration, with the exceptions of administration, quality assurance, and information management. We would be pleased to accept applications forwarded by ORISE (or others) in these areas.



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John J. Linehan
October 31, 2001
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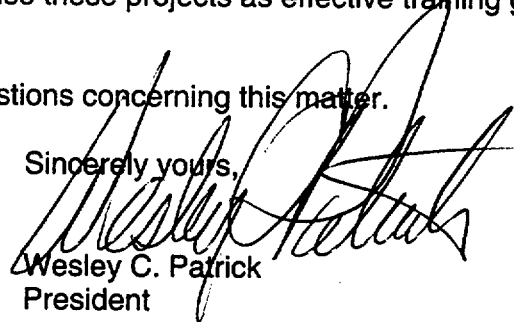
Mrs. DeMarco also stated that NRC has determined that if HBCU participants who directly work on Nuclear Waste Fund (NWF) funded program activities at the CNWRA and charge the NRC general expense funds for such effort, it may be viewed as an improper augmentation of the Congressionally earmarked NWF account. As described in the following paragraph, most of the opportunities for HBCU participants is in NWF-funded programs. Consequently, this determination could severely restrict employment of HBCU program participants. After careful consideration, however, it appears that there are several ways in which students or visiting professors could benefit from association with the CNWRA without violating constraints on the NWF. These are outlined as follows, for your consideration.

- Use HBCU program funds to advertise opportunities, recruit students, and underwrite the cost of incidental expenses. Pay wages related to work on NWF activities using NWF funds.
- Use HBCU program funds to pay for wages and associated expenses for those cases where a student is in a training mode and no direct benefit accrues to the NWF-funded program.
- Use HBCU program funds to offset the costs of sabbatical activities at the CNWRA. To the extent that the work of a professor directly benefits an NWF-funded program, compensation would be made from an NWF account. Note that this practice has been approved by NRC for temporary staff assigned to the CNWRA where costs/payments were paid proportionately from up to three separate sources of funds.

Opportunities for student employees from HBCU and HSI schools to work on NRC-sponsored non-HLW programs are quite limited. Most tasks in these areas are of short duration, limited budget, and licensing oriented, where extensive expertise and regulatory knowledge are needed. These three factors make use of student assistants difficult if not impossible. As a result, the CNWRA has been able to employ few students in these programs. The HBCU/HSI employment program you have described, however, may provide new opportunities to use these projects as effective training grounds for student interns.

Please contact me or Henry Garcia if you have any questions concerning this matter.

Sincerely yours,



Wesley C. Patrick
President

/bsc

attachment

cc: D. DeMarco
E. Whitt
B. Meehan
CNWRA Directors
CNWRA Element Managers

SOUTHWEST RESEARCH INSTITUTE

Recruiting Efforts at Minority
Colleges and Universities
Fiscal Years 2001 and 2002

Fall 2000 Recruiting Events/Activities

Includes College On-Campus Interviews, Testing, Information Sessions, Technical Presentations and Career Fair Attendance.

Historically Black Colleges & Universities

- Morgan State University
- North Carolina A&T University
- North Carolina State University
- University of Arkansas-Pine Bluff
- University of Oklahoma Multicultural Club Career Fair
- Morgan State University Career Day

Hispanic Serving Institutions

- New Mexico Tech University
- Texas A&M-Corpus Christi University
- New Mexico State University
- University of Texas San Antonio
- Texas A&M-Kingsville University
- St. Mary's University
- ITT San Antonio
- Texas State Technical College
- Palo Alto College
- University of Oklahoma Engineering Programming
- University of Texas San Antonio Career Fair
- St. Mary's University Hi-Tech
- San Antonio Colleges/Universities Placement Association
- Alamo Career Transition Center Career Fair (Kelly AFB)

Spring 2001 Recruiting Events/Activities

Includes College On-Campus Interviews, Testing, Information Sessions, Technical Presentations and Career Fair Attendance.

Historically Black Colleges & Universities

- Alabama A&M University
- Southern University
- University of Arkansas-Pine Bluff
- University of Oklahoma Martin Luther King Career Fair
- Southwest Texas National Minority EXPO and Career Fair
- Black College National Spring Break Job Fair
- Arkansas Employment Security Office- Pine Bluff
- Arkansas Employment Security Office- Monticello
- Arkansas Employment Security Office- Pine Bluff
- Arkansas Employment Security Office- Malvern

Hispanic Serving Institutions

- Texas A&M University-Corpus Christi
- Texas A&M University- Kingsville
- St. Mary's University
- University of Texas San Antonio
- Texas State Technical College
- University of Texas San Antonio
- PG&E Career Fair
- St. Mary's Companies on the Guad Career Fair
- Southwest Texas National Minority Expo

Fall 2001 Recruiting Events/Activities

Includes College On-Campus Interviews, Testing, Information Sessions, Technical Presentations and Career Fair Attendance.

Historically Black Colleges & Universities

- Jackson State University
- North Carolina A&T University
- University of Arkansas- Pine Bluff
- Houston Area Minority Job Expo
- Prairie View A&M University
- National Society of Black Engineers Region 5 Meeting and Career Fair

Hispanic Serving Institutions

- New Mexico Tech University
- New Mexico State University
- University of Texas San Antonio
- Texas A&M University-Kingsville
- Texas A&M University-Corpus Christi
- St. Mary's University
- Texas State Technical College-Harlingen
- ITT San Antonio
- Houston Area Minority Job Expo
- University of Texas San Antonio Career Fair
- San Antonio Colleges/Universities Placement Association

Spring 2002 Recruiting Events/Activities

Includes College On-Campus Interviews, Testing, Information Sessions, Technical Presentations and Career Fair Attendance.

Historically Black Colleges & Universities

- University of Arkansas-Pine Bluff
- Alabama A&M University
- Southwest Texas National Minority Expo

Hispanic Serving Institutions

- St. Mary's University
- Texas A&M University-Kingsville
- Texas A&M University-Harlingen
- Southwest Texas National Minority EXPO
- University of Texas-San Antonio
- Texas A&M – Corpus Christi
- Texas State Technical College- Harlingen