CEMP Status - 2006

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National Nuclear Security Administration

Nevada Site Office

(NNSA/NSO)

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CEMP Network - 2006

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CEMP 2006

- **Network additions & upgrades**
- **Outreach activities**
- **NSO environmental reports**
- **Funding**

2006 CEMP Network Additions

New Stations added in:

- **Mesquite, Nevada**
- **Shoshone-Tecopa, California**

Total number of stations = 28

2006 CEMP Network Addition

Mesquite, Nevada

- Located on east side of Virgin Valley High School
- Location is very close to the Arizona border
- Began posting data to the CEMP Website in November 2005
- CEMs for Mesquite are Chris Vogel & Larry Hathhorn.

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2006 CEMP Network Addition

Mesquite, Nevada

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2006 CEMP Network Addition

Shoshone-Tecopa, California

- Continued difficulty in obtaining a permanent station location in Tecopa vicinity
- Station equipment currently mounted on a trailer parked on private land between Shoshone and Tecopa
- Began posting data to the Website in February 2006
- CEMs for Shoshone-Tecopa Station are Ken Smith and Brian Brown.

2006 CEMP Network Addition

Shoshone-Tecopa, California

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2006 CEMP Network Modifications

Changes in Data Display

- New digital data display boards at Boulder City, Delta, Henderson, Mesquite, & Milford
- Difficulties encountered with effects of sun on digital display panels
- A new type of glass tinting appears to solve most of the effects of sunlight on the digital displays, and installation will begin after the workshop
- Other community stations are expected to receive new display boards, with tinting, by fall.

2006 CEMP Network Modifications

Changes in Data Display

COMMUNITY ENVIRONMENTAL MONITORING PROGRAM

Introduction

The Community Environmental Monitoring Program (CEMP) is a network of 28 radiation and weather monitoring stations located in communities and ranches surrounding and downwind of the Nevada Test Site (NTS). The network monitors the airborne environment for manmade radioactivity resulting from past NTS activities. The primary missions of the program are to directly involve community members in the monitoring process, and to increase public accessibility to the monitoring data. The CEMP is a joint effort of the Department of Energy's National Nuclear Security Administration Nevada Operations Office (NNSA/NSO) and the Desert Research Institute (DRI) of the Nevada System of Higher Education.

The network stations, located in Nevada, Utah, and California (see map at right) are comprised of instruments that collect a variety of environmental data. DRI employs local citizens, many of them high school science teachers, to manage the stations. The routine tasks of these Community Environmental Monitors (CEMs) are to maintain the equipment, collect air filters, and route them to DRI for analysis. They also can discuss the monitoring results with the public, and are available to speak to community and school groups. Program funding and equipment are provided by NNSA/NSO. DRI administers the program, provides technical direction, employs and trains CEMs, conducts public outreach activities, and collects data to be analyzed by an independent laboratory for radioactivity.

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Environmental Monitoring

Instruments that measure the various data are connected to a datalogger, and real-time radiation levels and weather conditions can be observed on the digital displays at right. These data are also transmitted via telephone, satellite, or direct internet connection to DRI's Western Regional Climate Center in Reno, Nevada, and are updated every 10 minutes on the CEMP home page located at http://cemp.dri.edu/.

Community Environmental Monitors (CEMs)

The primary objective of the CEMP is to involve residents of the communities surrounding the NTS in offsite environmental monitoring. In addition to equipment operation responsibilities, the CEMs attend annual training courses conducted by DRI and the NNSA/NSO. This training enables them to participate more fully in public education, and to better answer questions about the monitoring program and data results from their area and throughout the network. The CEMs are trained to independently verify the results of the environmental monitoring and are knowledgeable spokespersons on subjects ranging from radiation detection to local environmental conditions. CEMs are effective liaisons between local and federal entities, helping to identify the environmental concerns of people in their communities. Current CEMs for this station are posted on the datalogger and the brochures in the mailbox (please take one!). The most recent summary of monthly data collected for the entire CEMP network is also posted on-site.

Boulder City CEMP Station Instrumentation

1. **Particulate Sampler.** This air sampler pulls about two cubic feet of air per minute through a paper filter, capturing airborne particles. The filter is collected weekly and analyzed by an independent laboratory for alpha, beta, and gamma radioactivity.

2. **Exposure Rate Recorder.** This piece of equipment, also called a pressurized ion chamber detector or PIC, makes continuous measurements of background gamma radiation exposure rates. The PIC is a basketball-sized sphere filled with pressurized argon gas. As gamma rays pass through the sphere, they interact with the argon gas and are measured as an electrical pulse by a sensor located in the center of the sphere. Natural background sources of gamma rays include cosmic radiation from outer space and the earth's geology.

3. **Thermoluminescent Dosimeter (TLD).** When heated in a special laboratory instrument, this small device releases absorbed energy in the form of light. The intensity of the light is directly related to the amount of energy initially absorbed through exposure to background radiation.

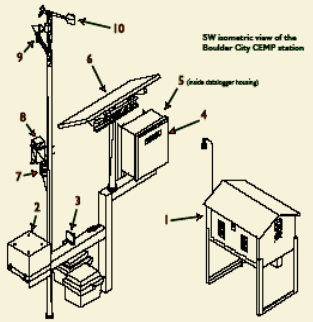
4. **Datalogger.** The datalogger collects real-time measurements from all the instruments at the station with the exception of the particulate sampler and thermoluminescent dosimeter, which require further laboratory analysis. These data are then uploaded regularly to the CEMP web site at http://cemp.dri.edu/. The data-logger is also capable of storing the collected data for several weeks in the event of a communications outage.

5. **Electronic Barometer.** This instrument provides a measure of the barometric pressure at the station. These measurements are useful in interpreting the radiation exposure rate records. At lower atmospheric pressures, more naturally occurring radioactive gases like radon and thoron emit from the earth's surface, contributing to the background radiation exposure.

6. **Solar Panels.** The solar panels mounted on the tower generate power to run all the equipment at the station, with the exception of the particulate air sampler, which requires AC power to run.

7. **Temperature and Humidity Probe.** This probe measures the ambient air temperature and relative humidity. The probe itself is housed in a beehive-like structure that provides shielding from solar radiation and adequate ventilation for accurate readings.

8. **Tipping Bucket Rain Gauge.** This instrument measures precipitation received at the station. The lid on top of the bucket tips for each .01 inch of precipitation that falls on it. Each time the lid tips, this information is transmitted to the datalogger.



SW isometric view of the Boulder City CEMP station

9. **Pyranometer.** This instrument, consisting of a flat panel mounted on the tower, measures the amount of solar radiation being received at the station.

10. **Anemometer/Wind Vane.** These two instruments provide measurements of wind speed and direction respectively.

Current Station Readings for the Boulder City CEMP station

The digital displays below are current readings from the instruments at this station. There is a scrolling display on the datalogger that also displays readings of maximum and minimum air temperatures, wind gust, and precipitation since midnight and for yesterday. Near real-time and archived readings for all the stations in the CEMP network can be found on the web site at http://cemp.dri.edu/.

Ambient Air Temperature (F)	Wind Speed (mph)	Wind Direction (deg. True N.)	Background Gamma (mRem/hr)

Station Barometric Pressure (inches Hg)	Solar Radiation (ly)	Soil Temperature (F)	Relative Humidity (%)

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2006 CEMP Network Modifications

Current Station Connections to Website

<u>Satellite Telephone (one-way communications) - 6</u>
Garden Valley, Medlins Ranch, Nyala, Stone Cabin, Shoshone-Tecopa & Twin Springs

<u>Cellular Telephone - 2</u>
Tonopah & Warm Springs Summit

<u>Land Line - 2</u>
Goldfield & Sarcobatus Flat

2006 CEMP Network Modifications

Current Station Connections to Website (Continued)

Code Division Multiple Access (CDMA) - 4

Boulder City, Henderson, Mesquite & Pahrump
(These are a two-way data only transmitter.)

Direct Service Line (DSL) - 8

Alamo, Caliente, Delta, Indian Springs, Las Vegas, Pioche, Overton & Rachel

Wireless Internet - 6

Amargosa Valley, Beatty, Cedar City, Ely, Milford & & St. George

2006 CEMP Network Modifications

Current Station Connections to Website (Continued)

- Satellite transmitters upgraded from 300-baud to 1200-baud modems
- Faster modems allow hourly updating of website information, instead of every three to four hours.

2006 CEMP Outreach Activities
(Since July 2005)

- **Presentations at events: two**
- **Presentations at schools: six**
- **Presentation at community center: one**
- **Presentations at professional meetings: three**

2006 NSO Environmental Reports

- National Emission Standards For Hazardous Air Pollutants (NESHAPs) Report
- Nevada Test Site Environmental Report (NTSER)
- NTSER Summary

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2006 NSO Environmental Reports (Continued)

- **NESHAPs Report documents Nevada Test Site (NTS) compliance with Environmental Protection Agency (EPA) air quality standards**
- **NESHAPs is now regulated by the Nevada Bureau of Air Pollution Control for EPA**
- **CEMP Quarterly Reports provide confirmation of NTS onsite regulatory compliance with offsite data**

2006 NSO Environmental Reports (Continued)

- **NTSER documents all environmental aspects of NTS, including on and offsite monitoring data**
- **NTSER Summary is basically an "abstract" of the NTSER, intended to convey its most essential information in a brief, user-friendly format**

2006 CEMP Funding

- **FY 2006 budget is $1,950,000, as requested**
- **In FY 2006, CEMP is entirely funded under "common site support"**
- **FY 2007 budget expected to be approximately the same as for FY 2006**