A. Header

Date:       June 27, 2011
Amount:    $44,929
Instrument: Perkin-Elmer Model A307 Sample Oxidizer (new purchase)

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          Carol Mallory-Smith, Crop and Soil Science, CAS

B. Final Budget

The cost of the instrument was as follows:

- Model A307 Sample Oxidizer: $53,100
- Supplies: $3,061
- Shipping: $2,200
- Total: $58,361

The proposal was awarded a total of $44,929 for the purchase of the Perkin-Elmer Oxidizer, with the balance covered by collaborators. The break-down is as follows:

- RIP251 (RERF): $44,929
- RIP031 (RadCenter): $2,808
- ENE007 (NE-RHP): $5,008
- FSO890 (Anthropology): $2,808
- FA5250 (AgSciences): $2,808

C. Brief summary of the scholarly work/activities made possible.

The instrument was installed in lab A136 in the Radiation Center in August, 2011, and has been utilized by faculty and graduate students from both Anthropology and NE-RHP. Anthropology faculty are exploring the use of oxidizer to trap carbon for C-14 dating via liquid scintillation counting (LSC). This has proved somewhat more challenging than anticipated, and we have consulted with Perkin-Elmer technical staff concerning oxidation protocols that will not introduce ‘young’ carbon into the sample. A graduate student in Anthropology will be working intensively on calibrations Spring term. We are confident that the oxidizer will allow OSU archaeologists to prepare carbon samples for radiocarbon dating at a greatly reduced cost, and enable the analysis of large projects that would otherwise be cost prohibitive.

Faculty and graduate students in NE-RHP have used the oxidizer to prepare vegetation samples collected near operating nuclear facilities as part of a pilot project funded by the Electric Power Research Institute (EPRI) to investigate C-14 emissions from these facilities. The results were compared with a much more expensive analytical technique (AMS) and the results were
consistent with that found by the other laboratory in Florida. EPRI was very happy with OSU’s responsiveness to their request, and they have since expanded their engagement with NE-RHP to examine other radionuclides of concern in the nuclear industry.

The instrument has also been used in graduate-level methods classes in both Anthropology and NE-RHP.

**D. A brief summary of any additional scholarly activities made possible for the RERF funding.**
Because of the good relationship NE-RHP is developing with Electric Power Research Institute, we are preparing to participate in a bench top and/or field testing of radionuclide decontamination methods. In addition, our experience with C-14 has now allowed us to submit a preproposal to the Atomic Energy of Canada Limited’s Chalk River Laboratory to conduct field work at their site. The oxidizer has thus expanded our capabilities and allowed us to venture into new areas of radionuclide analysis and modeling.

**E. External funding requests developed and submitted as a result of the RERF funding**
No proposals have been submitted to date, although NE-RHP has one in the preproposal stage.