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September 6, 2001  
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Account No. 20-01402-871

U.S. Nuclear Regulatory Commission  
ATTN: Mrs. Deborah A. DeMarco  
Two White Flint North  
11545 Rockville Pike  
Mail Stop T8A23  
Washington, DC 20555

Subject: Programmatic Review of Abstract

Dear Mrs. DeMarco:

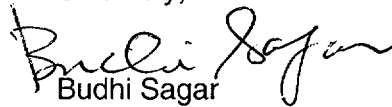
The enclosed abstract is being submitted for programmatic review. This abstract will be submitted for presentation at the Synchrotron Environmental Science II Conference, to be held September 21-22, 2001, in Argonne, Illinois. The title of this abstract is:

"XAFs Study of Uranium (VI) Sorbed on Montmorillonite and Clinoptilolite"  
by Richard J. Reeder, Melissa Nugent, and **Roberto T. Pabalan**

This abstract is a product of the CNWRA and does not necessarily reflect the view(s) or regulatory position of the NRC.

Please advise me of the results of your programmatic review. Your cooperation in this matter is appreciated.

Sincerely,

  
Budhi Sagar  
Technical Director

BS: ar

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Enclosure

cc:	J. Linehan	J. Bradbury	R. Reeder
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**Abstract to be submitted to Synchrotron Environmental Science II Conference,  
September 21-22, 2001, Argonne National Laboratory, Argonne, IL**

**XAFS Study of Uranium(VI) Sorbed on Montmorillonite and Clinoptilolite**

Richard J. Reeder

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Melissa Nugent\* and Roberto T. Pabalan

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X-ray absorption fine structure spectroscopy was used to determine the structure and oxidation state of uranium species sorbed onto the clay montmorillonite and the zeolite clinoptilolite. Samples were prepared at solution pH ~3 and ~6 to evaluate the effect of pH on the sorption mechanism. The results demonstrate a difference in the equatorial coordination of the uranyl sorbate as a function of pH for both minerals. Split equatorial shells are evident for both samples at pH ~6, whereas primarily a single shell exists at pH ~3. The split equatorial shells probably indicate that discrete equatorial oxygens form chemical bonds at surface functional groups, as would be expected for an inner-sphere-type surface complex. In contrast, the single equatorial shell for samples at pH ~3 suggests a more uniform bonding environment for the oxygens as would be expected for an outer-sphere-type complex. Such an environment is consistent with ion exchange at cation-exchange sites of the sorbents.

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\*Currently employed in Austin, Texas