Argonne National Laboratory, a U.S. Department of Energy Office of Science laboratory, is operated by The University of Chicago under contract W-31-109-Eng.38.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor The University of Chicago, nor any of their employees or officers, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of document authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, Argonne National Laboratory, or The University of Chicago.

Available electronically at <u>http://www.doe.gov/bridge</u>

Available for processing fee to U. S. Department of Energy and its contractors, in paper, from:

U.S. Department of Energy Office of Scientific and Technical Information P.O. Box 62 Oak Ridge, TN 37831-0062 phone: (865) 576-8401 fax: (865) 576-5728 email: reports@adonis.osti.gov

ABOUT THE COVER:

The Atom Trap Trace Analysis technique, developed in the Physics Division, has been used to map the flow of one million-year-old groundwater in the Nubian Aquifer under the Western Desert of Egypt. This map shows the locations of samples taken from deep wells and the age of the ⁸¹Kr in the groundwater (blue in units of 100,000 years). Oasis areas are shaded green and Precambrian basement outcrops are patterned. The groundwater flow was determined to be toward the northeast and the likely source of the groundwater was identified.