Final Technical Report—Cover Page
Award No. 08HQGR0114
Title: Metadata Entry and Long-Range Data Preservation Plan

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Final Technical Report—Abstract
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During the term of the award, the Missouri Department of Natural Resources (DNR), Division of Geology and Land Survey (DGLS), fulfilled its commitments in regard to deliverables rendered to the United States Geological Survey (USGS) as enumerated below.

1. Metadata for DGLS collections of drill core and drill cuttings was successfully entered into the National Catalog. This was done for the entireties of the two collections.

2. DGLS has developed a long-range data preservation plan that addresses continued maintenance of its collections of drill core and drill cuttings, as described in the Main Body portion of this Final Technical Report. Moreover, DGLS has created a four-member Data Preservation Advisory Committee whose responsibility shall be to conduct annual reviews and evaluations of the collections to identify and address issues involving protection and preservation of the collections, as well as assessing immediate and future needs for equipment repair, equipment replacement, new equipment, maintenance of the present physical facility that houses the collections, and any "growing pains" that may signal the need for expanding the space of the present physical facility.

3. DGLS submitted this Final Technical Report to USGS.

Final Technical Report—Main Body of Report
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Historical Background

In 2007, the USGS, via Award No. 07HQGR0131, granted DGLS $5,000 for the express purpose of DGLS conducting an inventory of its collections of geologic data and report the findings to USGS by way of an on-line survey. The term of the award was from July 1, 2007, through June 30, 2008. During that time DGLS successfully completed both the inventory and the on-line survey. Also, DGLS submitted a Final Report that summarized the work that had been done during the term of the award.

This initial work set the stage for USGS granting DGLS Award No. 08HQGR0114, in which DGLS committed to entering metadata about its collections of geologic data into the National Catalog and to preparing a long-range data preservation plan.

The remainder of this report describes the work that was done to successfully complete the task of entering metadata into the National Catalog. It also presents the long-range data preservation plan.

Metadata Entry

It was apparent at the onset that considerable preliminary work would be required before metadata about the collections of drill core and drill cutting could be entered into the National Catalog.

First, some core that had resided for many years at other locations in the state had to be transported to Rolla, re-boxed, and cataloged into the McCracken Core Library, which is DGLS' main repository for drill core and drill cuttings. Included were approximately 1500 boxes of oil and gas well drill core that had been in temporary storage in a shed near the town of Vichy and drill core that was recovered from a dilapidated wood shed near the town of Decaturville. The latter pertained to 45 mineral exploration boreholes that had been drilled in the Decaturville impact structure over fifty years ago.

Second, the entire collection of drill core and drill cuttings was re-inventoried in minute detail to determine exactly the number of drill core boreholes represented (3,428) and the number of drill cuttings boreholes represented (15,048) and the sample footages for each of the drill core boreholes. Total drill core footage is 1,500,000 feet. Total cuttings borehole footage is not known; however, the per-well data for deriving that statistic do exist in DGLS' Logmain database, but it would require inordinate time and effort to extract the information and sum it.

Third, the data were used to update DGLS' in-house Access databases for drill core and drill cuttings, which have been maintained by the agency for over one decade.

Fourth, the appropriate metadata was extracted from the Access databases.

Finally, the metadata was successfully entered into the National Catalog. This task was greatly facilitated and probably could not have been accomplished without the gracious and expert help provided by Mr. Richard E. Brown, Geographic Information Office, USGS, Rolla, Missouri.

Data Preservation Advisory Committee

DGLS has created a four-member Data Preservation Advisory Committee (DPAC), whose responsibility shall be to implement the long-range data preservation plan that is presented in the next section of this report.

The committee comprises Mr. Jerry Prewett, Geological Survey Program Director, Dr. Cheryl M. Seeger, Geologist IV, Dr. Patrick S. Mulvany, Geologist IV, and Mr. Hairl Dayton, Technician, IV. All have working knowledge of DGLS' collections of drill core and drill cuttings and the spacious McCracken Core Library that houses the collections.

DPAC will be required to convene meetings at least one time per year, starting in the 2010 calendar year.

Long-Range Data Preservation Plan

DGLS' drill core and drill cuttings are stored systematically in the division's McCracken Core Library, a 21,000 square-feet facility that was purchased in 1989 and which is located in the northeastern part of the City of Rolla, Missouri.

A long-range data preservation plan has been developed that focuses on ten main issues: 1) maintenance of the existing building to ensure that the collections and equipment are—and continue to be—adequately protected from the natural elements, 2) evaluation of building storage capacity to ensure that sufficient space is available for the collections to grow, 3) maintenance and replacement of equipment that is used to retrieve and return boxes of core and cuttings to their storage racks, 4) maintenance and replacement of equipment that is used to prepare core for scientific studies, 5) maintenance of two study rooms in which researchers may comfortably examine cores and cuttings, 6) policies concerning the acceptance or rejection of core and cuttings that are offered as donations, 7) policies regarding the extent to which core and cuttings materials may be sampled and subsequently sacrificed for purpose of legitimate studies, 8) policies regarding submittal of data, papers, theses and dissertations that outside researchers generate through the study of DGLS' collection of cores and cuttings, 9) building security measures that would reduce the probability of theft and vandalism, and 10) maintenance of adequately-trained

staff whose responsibility is to ensure efficient day-to-day operation of the facility. The DPAC shall evaluate these issues on an annual basis and make recommendations to the DGLS director. Each of the issues is discussed in greater detail below.

The McCracken Core library is of steel construction on a concrete slab. The building has remained in good, serviceable condition and has been well maintained since DGLS assumed ownership in 1989. Continuation and quality of building maintenance is contingent on future availability of state general revenues dollars as appropriated yearly by the state legislature. In this regard, DGLS must continue to stress the importance of the core library to state legislators in order to nurture their long-term commitment.

The library receives about 60,000 feet of drill core annually. At this rate, the library should be filled completely in less than ten years. Before that happens, a decision needs to be made on how additional storage space should be realized. There are three possibilities in this regard. First, the present building could be expanded in size. Second, the existing storage racks could be track mounted, and this would essentially double the amount of floor space available for storage in the present facility. Third, the collections could be evaluated for what is essential and must be kept and what is not essential and could be discarded without compromising the inclusiveness or usefulness of the collections.

A gas-powered forklift and several manually-operated, hydraulic-lift dollies are use to move boxes of core and cuttings within the library. These pieces of equipment require infrequent maintenance and rarely need to be replaced. Relatively recently, however, the forklift had to be replaced.

Equipment used to prepare study samples of core materials include rock saws and splitters. The rock saws are in need of repair and probably should be replaced. Purchase of a small-diameter coring tool for removing samples from the sides of cores is something that should be considered in the future. Also consideration should be given to the acquisition of an XRF core scanner and possibly equipment with which to determine permeability.

The library has two heated and lighted study rooms in which researchers may lay out core and cuttings for examine and study. Each room contains a binocular microscope, both of which are old and worn out. They need to be replaced with newer and better microscopes.

DGLS's acceptance of donated core and cuttings is contingent on whether proof of the geographic location of origin can be submitted along with the material. Otherwise, DGLS will not accept the donation. It is doubtful that this policy will ever be subject to change.

Current policy, though unwritten, stipulates that any sampling of core must be performed parallel with the length of the core and that not more than one-half of the core may be sampled in this manner. This ensures that one-half of the core remains as archival

material. Under special circumstances, however, the DGLS director may authorize further sampling that entails taking up to one-half of the archival one-half, leaving not less than a one-quarter longitudinal section that may not be sampled further. Transverse sampling is prohibited because such practice leaves missing gaps in the length of the core. One task of DPAC should be to put core library policies into writing.

It has been a long-standing policy that researchers whose studies involve the use of DGLS core and cuttings must submit their results to DGLS. Results include raw data, unpublished papers, reprints of published papers, undergraduate research papers, Master's theses, and Doctoral dissertations. These written materials are catalogued into DGLS' geological library. Requests to hold certain proprietary data confidential for certain lengths of time are honored. DGLS must make a concerted effort to ensure that researches know the policy and that DGLS receives all results. A simple database could be built that would allow DGLS to better keep track of what has been submitted and what has not.

A couple years ago, the library was burglarized. One rock saw was stolen. A small sum of money was removed from a vending machine. Fortunately, the intruders ignored the core and cuttings collections. Installation of a security system should be considered.

Currently, one person, a technician, oversees day-to-day operation of the library. Several other DGLS staff members are sufficiently knowledgeable about the library so as to substitute temporarily when the technician is not available. Serious consideration should be given to grooming a replacement in the event that the current overseer is no longer employed by the agency.