

DEVELOPMENT OF A DATA MANAGEMENT SYSTEM FOR
ASSISTANCE IN CONDUCTING AREA OF REVIEWS (AORS) ON
CLASS II INJECTION WELLS IN OKLAHOMA

Cooperative Agreement Grant No. DE-FG22-95MT95003

Oklahoma Corporation Commission

Date of Report: January 31, 1998

Grant Date: March 14, 1995

Anticipated Completion Date: March 13, 1998

Government Award: \$1,394,592.00

Program Manager: Michael S. Battles

Principal Investigator(s): Michael W. Schmidt

Contracting Officer's Representative (COR): David Alleman

Reporting Period: October 1 through December 31, 1997

“US/DOE PATENT CLEARING IS NOT REQUIRED BY
THE FEDERAL ASSISTANCE REPORTING CHECKLIST.”

Technical Report
Cooperative Agreement Grant No. DE-FG22-95MT95003
Oklahoma Corporation Commission
January 31, 1998

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 any of their employees, 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 any authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Technical Report

Cooperative Agreement Grant No. DE-FG22-95MT95003
Oklahoma Corporation Commission
January 31, 1998

Abstract: The purpose of this project is provide the resources and capabilities necessary to permit the State of Oklahoma to conduct Area of Review (AOR) variance analysis on a statewide level. The project allows for the analysis and identification of areas which may qualify for AOR variances, the correlation of information from various databases and automated systems to conduct AORs in area which do not qualify for variances, the evaluation of the risk of pollution, during permitting and monitoring, using risk based data analysis, and the ability to conduct spatial analysis of injection well data in conjunction with other geographically referenced information.

Table of Contents

- I. Executive Summary
- II. Introduction
- III. Results and Discussion
- IV. Conclusion

Technical Report
Cooperative Agreement Grant No. DE-FG22-95MT95003
Oklahoma Corporation Commission
January 31, 1998

I. Executive Summary

The Oklahoma Corporation Commission is committed to assisting the oil and gas exploration and production industry in our State. This project saves the State and the E&P industry much time, effort and resources in our environmental protection efforts. We are actively combining the various data base resources available at the state level and the private sector. This enables the state to review existing and new permit applications for compliance with existing standards.

The project is currently not on schedule for completion on the March 14, 1998 date. The commission has requested an extension until March 14, 1999 to ensure proper system development, testing and implementation.

Also, BDM Oklahoma, a DOE contractor, has been very helpful in our efforts. They provided resources needed to acquire well plugging data for the Geographical Information System (GIS) and digitizing the state's ground water protection maps. BDM Oklahoma did have to terminate assistance on these two projects due to their funding restrictions. The commission funded a substantial amount (more than \$70,000) toward the well plugging data acquisition during the state's 1997 fiscal year. More funding may be forthcoming this fiscal year as well. BDM was able to partially complete the remapping and digitizing of ground water data for five (5) counties. This work has subsequently been turned over to the Geoinformation Systems Department at the University of Oklahoma. The commission has also place one full-time employee on this project. Please note that neither the well plugging data nor the ground water project were part of the grant application but both are necessary to complete the system functions.

II. Introduction

This project has one primary objective. This objective is to provide the resources and capabilities to permit the State of Oklahoma to conduct Area of Review (AOR) variance analysis on a statewide level. This objective includes four primary tasks: 1) the analysis and identification of areas which may qualify for AOR variances; 2) the correlation of information from various databases and automation systems to conduct AORs in areas that do not qualify for variances; 3) the evaluation of the risk of pollution, during permitting and monitoring, using risk based data analysis; and 4) the ability to conduct spatial analysis of injection well data in conjunction with other geographically referenced information.

The Corporation Commission is completely rewriting its oil and gas data management system to meet this objective and perform the tasks stated. This is a long, complicated and often frustrating process. All the equipment and software have been purchased and most installed. The production server has been installed and is functioning. The servers and the personal computers for the district offices are being installed during the forth quarter of 1997. This will enhance the communication with our remote offices and speed the review of UIC test, report and inspection data.

Many data are being made available through the private sector and previously through a DOE contractor, BDM Oklahoma. The state has also contributed \$70,000 toward the well plugging data part of the project and has dedicated a full time employee to work on remapping the state's ground water resources. These data are required to fully implement the proposed operating system.

III. Results and Discussion

During this reporting quarter, the Oil and Gas Conservation Division employed only one professional to assist in the reconciliation of the UIC data base with that of the Well Data Maintenance System (WDMS), the division's main data base. The two systems were developed and maintained independently since UIC primacy was granted in 1982 and the well information maintained on the UIC data management system is incomplete. Progress toward achieving the goals of this project hinges on compatible data. This is the most integral portion of this process and is underway. A recent EPA audit of the UIC program revealed several deficiencies in the old Dbase III programming. The commission's Data Processing Division proposed to develop a quick fix to these deficiencies using Microsoft Access (this was reported in the last report). It was subsequently decided that the quick fix was not cost-effective and that our efforts were better spent in the completion of this project.

The Commission programming and technical staff have completed all but one Oracle database software training courses. The last class is scheduled the first week in March. The on-site training reduced costs and allowed more staff to attend. A new application specialists is being hired and will be trained at the new Oracle training facility which opened in Oklahoma City in December 1997.

The ArcView GIS software training is scheduled in March 1998. The training will be conducted for some of the application development staff and several of the oil and gas staff including many of the field personnel.

We are using some of the training units purchased to acquire computer based training (CBT) packages for Windows 95, and the entire Microsoft Office 95 and 97 suite for the oil and gas staff. This will provide training on-site and be made available on the network to the oil and gas staff in the District Offices.

The Commission has three full time programmer/analysts in the Data Processing Division and one technical person in Oil and Gas Conservation Division assigned to the DOE project. The Commission is in the process of hiring another full time application specialists for this project. In addition, partial tasks are being assigned to administrative assistants, staff equipment specialists and branch managers. The total hours expended in support of this project equals 28,979 hours. The DOE funded staff expended 12,260 hours and the Commission state staff has expended approximately 16,719 hours.

The application development staff completed interviewing and collecting data from the various sections and departments of the Oil and Gas Conservation Division. This also included interviewing and collecting data from all four of the district offices. In addition, the project staff completed developing a portion of the new database that includes basic well information and dates for well milestones such as completion and plugging dates. The project staff also completed developing a portion of the new database that includes company name and address information and required surety information. These two new portions of the overall database is scheduled for implementation in the April 1998. The production database server is in production mode, ensuring backups and security are in place. Training for the Oil and Gas staff in the new programming will occur prior to implementation.

The project staff is also developing all the UIC functions and requirements. The new database dictionary design is completed. The project staff is now working on creating the

forms (screens) and reports for the UIC functions. The old database used by UIC since 1986 suffered major problems. Program design and the lack of any interrelationships between the various data files cause many problems. The new design will correct these problems. Project staff has developed several small applications and reports which allow the UIC staff to "clean-up" its existing data. This is a critical piece of the project and must be completed before these data can be converted into the new consolidated database.

The plan is to have the first portion of the UIC functions which includes the well inventory, mechanical integrity tests (MIT), and the annual reporting, completed and implemented by April 1998. The remaining functions are to be added soon after. The GIS software applications will provide the basis for displaying maps that highlight the required data within the zone of influence. This will provide the area of review capability to the UIC staff.

BDM Oklahoma has completed creating and mapping of water tables data for five counties. These data are being converted into the Commission's GIS format by the University of Oklahoma. In addition, we received plugging data on another five counties from the University of Oklahoma. The commission and BDM Oklahoma contracted with OU to provide these data which are essential for performing area of reviews.

The commission has recently obtained approval from Petroleum Information/Dwight's for receiving a file consisting of all assigned API numbers and related basic well information. Upon receipt of this file, the project staff will reconcile it to our existing information. This will allow us to complete and use the NRIS data file which contains all known well completion records.

The commission completed its upgrade of the telecommunication software and equipment for all of the district offices. The data lines are now T1 lines. The response time for district office staff has improved greatly. With high speed communication now in place, we can begin installing of the district office database servers.

The last portion of the Oracle database software will be purchased in March 1998 from the state contract. This last piece is to enable the web server to run Oracle HTML applications. This allows use of internet services and the actually query of on-line oil and gas information.

The Oil and Gas Conservation Division began imaging the previous year well records files. In addition, there is a competitive bid that will close on February 20, 1998, concerning the imaging of all historical well records maintained at the Commission. The historical imaging project is estimated to be completed in two years. The plan is to incorporate the images into the new Oracle consolidated oil and gas database.

Technical Report, Cooperative Agreement Grant No. DE-FG22-95MT95003
Oklahoma Corporation Commission, January 31, 1998

IV. Conclusion

The computer programming is taking longer to achieve than previously believed and the completion of the programming phase is anticipated to be in October 1998. The commission then must test and implement the programming changes to ensure that all are functioning as planned. All the necessary hardware has been ordered and received, most of it has been installed and is functioning according to specifications. All the software has been ordered and received, most likewise has been installed. Data acquisition and reconciliation issues are still unsolved but possible solutions are being developed. The commission has requested an extension of the project completion date to accommodate the revised schedule. The projected completion date is now March 14, 1999.

Technical Report
Cooperative Agreement Grant No. DE-FG22-95MT95003
Oklahoma Corporation Commission
January 31, 1998