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QUARTERLY TECHNICAL PROGRESS REPORT

ASSISTANCE TO THE STATES  
WITH RISK BASED DATA MANAGEMENT

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Submitted By:  
The Underground Injection Practices  
Research Foundation

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Principal Investigator: Michel J. Paque  
Technical Project Officer: Brent Smith  
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QUARTERLY TECHNICAL PROGRESS REPORT:

**ASSISTANCE TO THE STATES  
WITH RISK BASED DATA  
MANAGEMENT**

**INTRODUCTION AND PROJECT DESCRIPTION**

The following is a quarterly Technical Progress Report of the Risk Based Data Management Systems (RBDMS) project. The project, funded through a United States Department of Energy (DOE) grant is being administered by the Underground Injection Practices Research Foundation (UIPRF) which is the foundation to the Ground Water Protection Council (GWPC).

The Tasks of this project are as follows:

- Task I** Complete Implementation of a Risk Based Data Management System in the States of Alaska, Mississippi, Montana, and Nebraska.
- Task II** Conduct Area of Review (AOR) Workshops in the states of California, Oklahoma, Kansas, and Texas.

**PROJECT STATUS - TASK 1: Complete Implementation of a Risk Based Data Management System in the States of Alaska, Mississippi, Montana, and Nebraska**

**TASK DESCRIPTION**

This project extends the implementation of a Risk Based Data Management System (RBDMS) in four states. In general it provides assistance to the states of Alaska, Mississippi, Montana, and Nebraska with converting data from existing data management systems where applicable; coding and internal testing of the RBDMS; preparing documentation, training, and technology transfer; plus project management.

**DEVELOPMENT STATUS**

Development of *RBDMS* in the first grouping of states (AK, MS, MT, and NB) is complete. Participating states were provided with a final version of the UIPRF's RBDMS in March 1995. In addition, a comprehensive codes list was given to states which has provided standards for common terms and well construction details. Assistance has been provided to states with regards to data conversion from existing databases as well as training.

## Design Considerations

Long-term design considerations were used for the UIPRF's RBDMS. The system was designed to be a comprehensive database with ability to expand into multiple areas, including oil & gas production. During system design, applications such as GIS were anticipated so that adapting RBDMS to these and other applications could easily be initiated.

The system was also designed for general application nationally (i.e., not in just one state). This design premise was a critical objective and prompted the selection of Alaska, Mississippi, Montana, and Nebraska for initial participation in *RBDMS* development.

### *RBDMS* Features

- National standards are utilized for many fields, including API Well Number, DOE Operator Number, AAPG Field and Formation Codes, Geologic Naming Conventions, Well Status' and Types, Cement/Casing Descriptions, Well Location Descriptions, and others;
- Two Types of Environmental Risk Analysis Are Included (Risk Probability and Levels of Protection);
- *RBDMS* includes comprehensive well information for both producing and injection well types;
- Normalized and fully relational database;
- Access version 2.0 for Windows provide user friendly environment, quick learning curve, and allows users to self customize and expand the system. Access also uses Rushmore Technology (i.e., optimized queries) which facilitates high performance;
- *RBDMS* includes numerous automated features for performing functions related to Area-of-Review (AOR) Analyses, Environmental Risk Analyses, Well Evaluation, Permit Evaluation, Compliance Monitoring, Operator Bonding Assessments, Operational Monitoring/Tracking, and more;

- *RBDMS* contains more than 600 data fields, 40+ database tables, and 60+ standard reports (including fully automated EPA 7520 reports, several reports directed toward state field personnel, and form letter reports for such things as permit approvals, MIT notifications, etc.);
- *RBDMS* includes On-Line help formatted similar to a typical WINDOWS environment to facilitate quick response to users;
- *RBDMS* provides referential integrity to minimize errors in data entry and full security features so that only individuals with proper authorization can modify the database. Also, the system contains a host of update and edit criteria which serve to assist data entry personnel further avoid errors;
- *RBDMS* has a customized menu system allowing users to immediately and intuitively jump from one screen to any other in the database;
- *RBDMS* is Network compatible and upgradable to a Client/Server Platform; and
- Data Conversion from existing State and Industry databases can provide near instantaneous results.

## **Benefits to Significant Industry/Regulatory Efforts**

### **Federal Advisory Committee (FAC)**

As prompted by the U.S. Environmental Protection Agency, a Federal Advisory Committee was held to address issues of concern identified through EPA's mid-course correction effort in the Underground Injection Control Program. Resultant to the FAC will be new regulations for Class II injection well operators. Some of the most significant points will be a minimum construction standard for Class II wells (requiring more frequent testing on many wells) and requirements that all wells perform area of review (AOR) studies.

### **Construction Standards**

As pertains to construction standards, *RBDMS* facilitates tracking of comprehensive construction and completion information. *RBDMS* also includes automated functions that will automatically evaluate a well's construction and offer to assign a mechanical integrity testing frequency to either an individual well, multiple wells, or all wells. This evaluation is also included as part of *RBDMS*' environmental risk analysis in which the *Levels of Protection* for a specific well are evaluated pursuant to the new federal requirements.

## Area of Review

The UIPRF's RBDMS contains a "*Built-In*" Area of Review Module. This module allows for tracking all EPA required information for AORs. The module allows tracking AOR data either for a single well or multiple wells. RBDMS also includes numerous standard reports pertaining to AOR investigations, including:

- Listing wells with inadequate surface casing (i.e., surface casing is not set and fully cemented through the base of the lowermost USDW) for a particular AOR;
- Automated determination of wells in AOR by location;
- Determine wells in violation with State (UIC or Production) as well as listing/specifying types of violations;
- Wells in which there is sufficient hydrostatic pressure to initiate and sustain flow into a USDW;
- Environmental risk of well group making up wells in AOR;
- Assess levels of protection for wells in AOR;
- Generate a report showing the depth and name of lowermost USDW for all wells in AOR. If consistent, this will likely not create a problem. However, if delineated USDWs at other wells differ from well which AOR is being performed, further investigation could be initiated;
- Identification of wells with inadequate records in *RBDMS* which do not allow any or only a partial analysis to be done. This could provide states with a opportunity and perhaps a prompting to populate those well records; and
- Other reports area also being considered at the present time.

## Technology Transfer Efforts

One significant part of the existing *RBDMS* effort is technology transfer. Over the last several months, several meetings and presentations were made to various groups and organizations on the UIPRF's *RBDMS*. Some of these include:

- In June members of the RBDMS project team demonstrated the system to attendees of the Department of Energy's Contractors Review Conference. (The presentation was well received by many.);
- EPA in Regions IV, V, VIII, and IX;
- Texas Railroad Commission;
- Indiana Department of Natural Resources and Indiana State Geological Survey;
- EPA in Region VII with attendance from the states of Nebraska, Missouri, Kansas, and Iowa;
- Oklahoma Corporation Commission;
- Michigan Department of Natural Resources;
- New Mexico Oil & Gas Conservation Division;
- Kansas Corporation Commission;
- Interstate Oil & Gas Compact Commission Meeting in Colorado;
- Multiple Ground Water Protection Council Meetings;
- Colorado Oil & Gas Commission;
- Alaska Oil & Gas Conservation Commission;
- Mississippi State Oil & Gas Board;
- Montana Board of Oil & Gas Conservation;
- Nebraska Oil & Gas Conservation Commission;
- American Petroleum Institute;
- Various oil & gas producing companies, including Shell Oil; Company/Shell Western E&P, Phillips Petroleum, BP Exploration, Texaco, Exxon, Amoco; and
- Other miscellaneous groups/organizations.

## What's Ahead?

The UIPRF has submitted a proposal to the USDOE containing three tasks which involve further enhancements to the RBDMS. Tasks 1 and 3 pertain to the RBDMS project and are as follows:

### (Proposed) Task 1: Continue Implementation of the RBDMS

This task is designed to continue implementation of the RBDMS. Rather than the UIPRF providing full implementation in a small group of states as in the just completed UIPRF DOE grant funded project, this project will continue the earlier UIPRF/DOE effort to assistance to all

interested oil and gas producing states and the oil and gas industry with data management needs.

This task will lead to enhancements to the capabilities of the system such as; including tracking production accounting, surface facilities, water tracking, and enhancements to the RBDMS's AOR Module.

This task will assist states with the decision to utilize other available funding to invest in RBDMS implementation in their state. The effort will expanded technology transfer to states interested in the system but are not yet fully aware of the systems capabilities. This will include the development of automated demonstration software, as well as, the publishing of outreach materials such as a brochure, manual and/or poster explaining the components of the system. These new outreach materials will be introduced at a nationwide workshop on the RBDMS to be funded through the project (task 3).

This task will allow additional consultation with states that have implemented RBDMS, as well as provide funding for members of the project team to go the interested states to make a demonstration and give that project team member an opportunity to further understand the specific needs of that state.

**(Proposed)Subtask 1.1 Coordination of UIPRF/AIP AOR and UIPRF RBDMS Projects and Development of a Detailed Plan to Enhance the AOR Capabilities Within the RBDMS:** For this subtask, an RBDMS Team Member shall attend each of the initial for AOR Workshops in California, Oklahoma, Kansas, and Texas. Specific AOR related needs shall be identified, as well as differences among states. The resultant plan shall also address specific enhancements to the existing RBDMS AOR Module and an approach for implementing the plan.

**(Proposed)Subtask 1.2 Expand RBDMS Presentations and Consultations:** This subtask will expand RBDMS presentations and provide consultations to States Oil & Gas and other pertinent state agencies, as well as EPA and other federal agencies such as Bureau of Land Management (BLM and tribal organizations. This subtask will also include consultation with states that have RBDMS already implemented to provide maintenance and enhancements, as well as, additional training necessary to maintain the system.

**(Proposed)Subtask 1.3. Expansion of the RBDMS to Include New System Modules:** This subtask includes the expansion of RBDMS to include new system modules for production accounting for states and industry), surface facilities (pits, tanks, etc.), and water tracking (from source to disposal); and testing these modules in one state.

**(Proposed)Subtask 1.4. Development of RBDMS Outreach Materials:** This subtask involves the development of RBDMS outreach materials, including displays, brochures, and a limited automated demonstration version of the RBDMS.

### **(Proposed)Task 3: Conduct an RBDMS Workshop**

#### **Task Description**

This task involves conducting a one-day RBDMS workshop for state and Federal regulatory agencies, tribal organizations, and oil and gas industry personnel. Outreach materials developed as a result of Subtask 1.4 shall be utilized in the Workshop. If possible, this workshop shall be scheduled around a Ground Water Protection Council Conference. The objective of this task is to increase awareness of the RBDMS and to encourage its increased use by state and federal regulatory agencies, tribal organizations, and the oil and gas industry. One result of this workshop may be increased cooperative agreements between the UIPRF and the states for future RBDMS implementation.

## **PROJECT STATUS - TASK II: Conduct Area of Review (AOR) Training Seminars**

### **PROJECT STATUS**

The purpose of these workshops is to acquaint state agency and industry personnel with the AOR variance methodology that has been developed and to seek input from the attendees concerning application of variance methods to injection fields in the state.

The benefits of these workshops are as follows:

- Assist both Direct Implementation and primacy State Class II UIC Directors in establishing workable AOR variance programs.
- Assist operators of both small and large oil and gas producing companies with Class II injection well AOR background and investigative methodologies for conducting AOR's and providing justification for seeking a variance from AOR requirements where applicable.

Each workshop attendee receives a copy of the document developed by a committee of the UICPRF entitled "Technical Criteria for an AOR Variance Methodology. This document includes the background information on UIC program requirements for AOR investigations; general methodologies for performing AOR investigations; data acquisition; alternative methods for evaluating a Class II injection well's AOR; criteria for obtaining exemptions from AOR requirements; and additional, more specific technical and regulatory material. Additional materials specific to each state where the workshops are held are added accordingly.

The California Area-of-Review Workshop was held on January 11, in Bakersfield. The workshop was attended by 33 people including; at least one representative from each of the six California oil and gas state agency district offices and the main office along with representation from the California Bureau of Land Management. Industry was also well represented. The California Independent Petroleum Association, the Conservation Committee of California Oil & Gas Producers, the Western States Petroleum Association, and the Independent Oil Producers' Agency were represented along with several companies including; Mobil, Chevron, Exxon, Shell, Texaco, AMOCO and Cal Resources.

The Oklahoma AOR Workshop was held on March 22 in Oklahoma City. This workshop was similarly attended both by number and type of participants as the California workshop. The Oklahoma workshop attendees were asked to fill out evaluation forms. The response was favorable.

The Kansas and Texas workshops are tentatively scheduled for September and will be similar to the Oklahoma the California workshops .

## **What's Ahead?**

The UIPRF has submitted a proposal to the USDOE containing three tasks in which Task 2 involves additional workshops.

### **(Proposed)Task 2: Conduct Class II Injection Well Area of Review (AOR) Workshops**

As part of this task, regional workshops shall be held related to AOR investigations and environmental compliance. These workshop shall be co-sponsored by the Ground Water Protection Council (GWPC), DOE, and state, regional and national oil and gas associations. This task consists of assembling a technical workshop and an associated manual or handbook geared toward the regulator and the independent producer. The training shall focus on Class II Injection well AOR methodologies: conducting AORs and providing justification for seeking a variance from AOR requirements where appropriate.

A committee established by the UIPRF has developed a manual that includes model variance plan guidelines for use in decisions related to AORs for Class II injection wells. The Committee consists of five members representing state programs, industry, the API, the UIPRF, and EPA Region, and EPA headquarters.

These hands-on workshops shall bring together state and Federal regulatory agencies (and, where appropriate, tribal organizations) and industry representatives to work cooperatively in the implementation of the new EPA regulations concerning AOR requirements. The proposed regulations contain provisions for the granting of variances from AOR requirements where appropriate. Details as to how the variance process shall be applied and what technological requirements for an AOR variance shall also be discussed.

**(Proposed)Subtask 2.1 Conduct AOR Workshops in 19 Additional States:** This subtask involves conducting a one-day AOR Workshop in each of 19 additional states that have not been addressed in the previous DOE grant to the UIPRF. These states include Illinois, Pennsylvania, Kentucky, Indiana, Nebraska, Alabama, Wyoming, Arkansas, West Virginia, and New Mexico in 1995 and 1996, and Louisiana, Alabama, Michigan, Missouri, North Dakota, Colorado, Mississippi, Florida, and South Dakota in 1997. These workshops shall integrate presentations on the GWPC/API AOR variance methodology as well as the UIPRF RBDMS.

**(Proposed)Subtask 2.2 Conduct Follow-Up AOR Workshops in 3 States:** This subtask involves conducting follow-up AOR workshops in California, Oklahoma, and Kansas; coordination with the API and its contractor (the University of Missouri - Rolla); integration of API/University of Missouri - Rolla project results; and, as appropriate, integration RBDMS presentations within these workshops. These follow-up workshops shall include state agency and industry personnel in each state. Participants are important to an effort to determine the probable approaches to each individual state's AOR variance process and to review these strategies.

## SUMMARY

- \* Project consultants have completed the design and installation of the only comprehensive, fully relational PC-Based Oil & Gas regulatory data management system (the Risk Based Data Management System) in the country. The implementation is complete in the states of Alaska, Mississippi, Montana, and Nebraska. Training, data conversion and technology transfer are ongoing.
  
- \* The Area-Of-Review (AOR) workshop series has begun with workshops having been completed in California and Oklahoma.