

TITLE PAGE*

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ABSTRACT*

Much of the environmental and technical data useful to the oil and gas industry and regulatory agencies is now contained in disparate state and federal databases. Delays in coordinating permit approvals between federal and state agencies translate into increased operational costs and stresses for the oil and gas industry. Making federal lease stipulation and area restriction data available on state agency Web sites will streamline a potential lessors review of available leases, encourage more active bidding on unleased federal lands, and give third-party operators independent access to data who otherwise may not have access to lease restrictions and other environmental data.

As a requirement of the Energy Policy Conservation Act (EPCA), the Bureau of Land Management (BLM) is in the process of inventorying oil and natural gas resources beneath onshore federal lands and the extent and nature of any stipulation, restrictions, or impediments to the development of these resources.

The EPCA Phase 1 Inventory resulted in a collection of GIS coverage files organized according to numerous lease stipulation reference codes. Meanwhile, state agencies also collect millions of data elements concerning oil and gas operations. Much of the oil and gas data nationwide is catalogued in the Ground Water Protection Council's (GWPC's) successfully completed Risk Based Data Management System (RBDMS).

The GWPC and the states of Colorado, New Mexico, Utah, and Montana are implementing a pilot project where BLM lease stipulation data and RBDMS data will be displayed in a GIS format on the Internet. This increased access to data will increase bid activity, help expedite permitting, and encourage exploration on federal lands.

Linking environmental, lease stipulation, and resource inventory assessment data and making a GIS interface for the data available to industry and other agencies via the internet represents an important step in the GWPC strategy for all oil and gas regulatory e-commerce. The next step beyond mere data sharing for facilitating the permitting process is to make it possible for industry to file those permit applications electronically. This process will involve the use of common XML schemas.

TABLE OF CONTENTS*

Title Page.....	1
Disclaimer.....	1
Abstract.....	2
Table of Contents.....	3
Executive Summary.....	3
Experimental.....	3
Results and Discussion.....	3
Task 1.....	3
Task 2.....	4
Task 3.....	5
Task 4.....	5
Task 5.....	5
Task 6.....	6
Conclusions	7
Milestones ..	7
Cost & Schedule Status.....	7
Significant Accomplishments.....	7

Problems	7
Technology Transfer.....	7
References/Bibliography.....	8

Executive Summary

The proposed initiative will increase the production of oil and gas on federal lands by meeting two objectives. The objective of Phase 1 is to give industry access to the data needed to target exploration opportunities in the full light of existing lease stipulations, resource inventory assessments, and environmental data available for proposed geographic locations. Phase 2 work, which will have an ongoing, long-term effect, will develop an XML schema that conforms to the data requirements for oil and gas well regulation. This schema ultimately will be the underlying data format for future work to automate the permit application/review process over the Internet.

In Phase 1, GWPC and states will review the requirements for incorporating the EPCA data into COGIS. GWPC will format the EPCA data into a GIS-enabled layer available on the COGCC Web site. The GIS EPCA data layer will then be dynamically linked to resource assessment and state-collected data. Site visitors will enter a geographical location to look up resource assessments, lease stipulations, permit conditions, and water quality and other environmental data. GWPC will then install the EPCA GIS Web database application on agency Web servers in NM, UT, and MT. This Web application will be useful for both agencies and operators to evaluate federal lands available for lease.

In Phase 2, GWPC will use its existing task force of state agency, BLM, MMS, API, and POSC representatives to continue implementing the group's business case, which charts the development of an XML schema that will define the regulatory aspects of the lifecycle of oil and gas wells. The schema is a needed first step in opening the way for automating the permit application and review process in the data exchange between regulatory agencies and industry.

EXPERIMENTAL*

This research project does not involve the use of experimental methodology.

RESULTS & DISCUSSION OF WORK DURING REPORTING PERIOD*

Task 1. Determine Data Requirements. GWPC will evaluate the available data from the EPCA inventory project, the data structure of the COGIS database, and the optimum means of integrating the information at the COGCC portal at <http://oil-gas.state.co.us/>, which already hosts an online GIS application. Data dictionaries and entity relationship diagrams will be prepared and reviewed to determine how to integrate the data sets. In addition, the functional requirements for the first-phase implementation of the GIS-enabled Web application will be determined through customer use-case reviews. A scope of work document for the subsequent tasks in this phase will be developed from this analysis.

Also in Task 1, GWPC will establish a review committee whose members have the availability and willingness to be project testers. Individuals from BLM, COGCC, and industry will participate. In addition, GWPC will tap members of other state agencies who may wish to participate in later project phases as well as its own TAC members to ensure that the Phase 1 project receives national review and feedback.

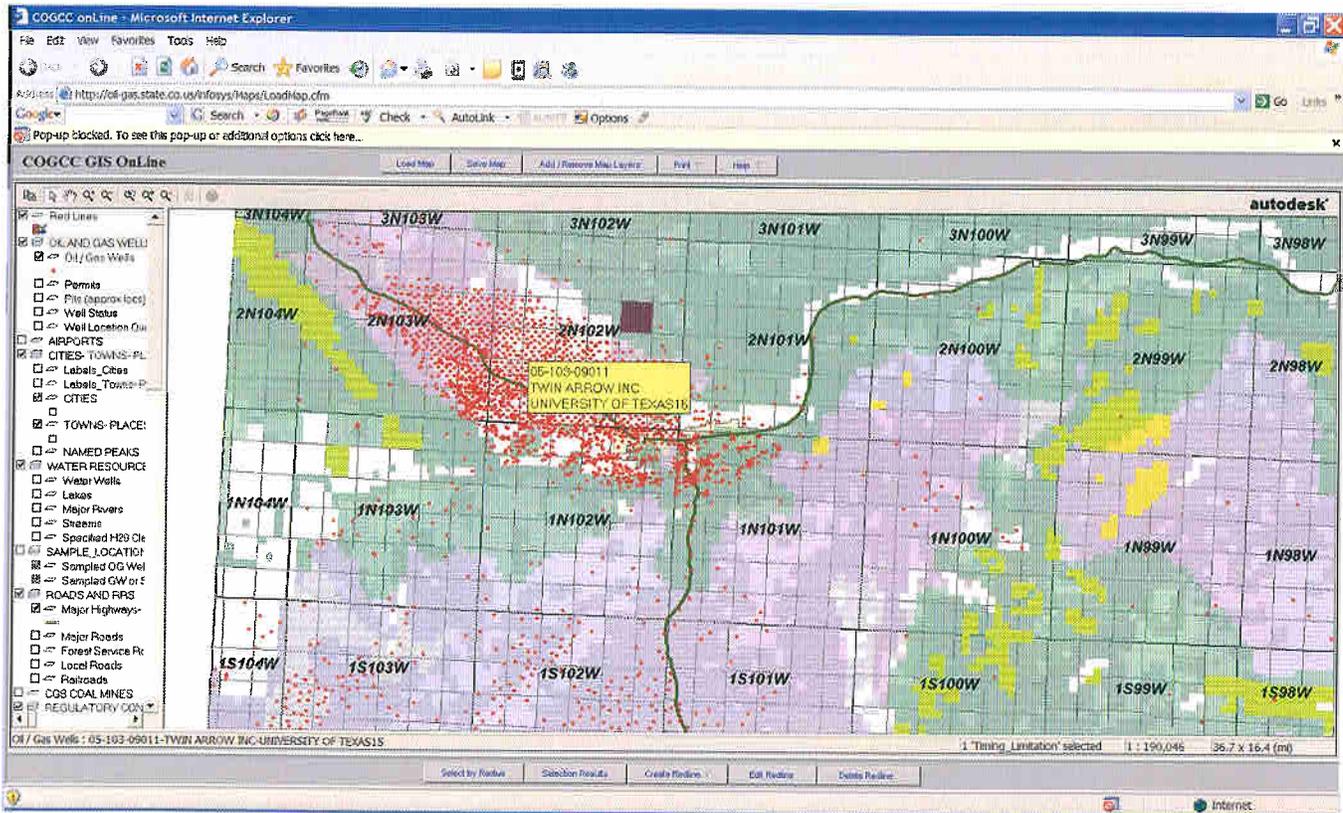
Accomplishments October 1, 2004 – February 28, 2005

The project team for the GIS portion of the work plan has been assembled. Team members include: Paul Jehn (GWPC), Stan Belieu (Nebraska), Thom Kerr (Colorado), Jim Milne (Colorado), Dan Jarvis (Utah), Dave Lowther (Consultant, SCI), Jim Gazewood (BLM), Diana Rech (BLM), Bob Johnson (Premier data services), Dave Taylor (BLM), and Duane Spencer (BLM). The project team met for a kickoff meeting in Denver on November 8-9 2004. The state members of the project work team meet for two days the GWPC UIC meeting in New Orleans, January '6-'7, 2005. Weekly conference calls are held every Thursday at 3:00 mountain time.

It has been determined by the project advisory committee and BLM that EPCA data will be transferred electronically to the COGCC web site. Periodic updates will insure the accuracy of the data. A detailed work plan for data transfer, sharing and updating is under development.

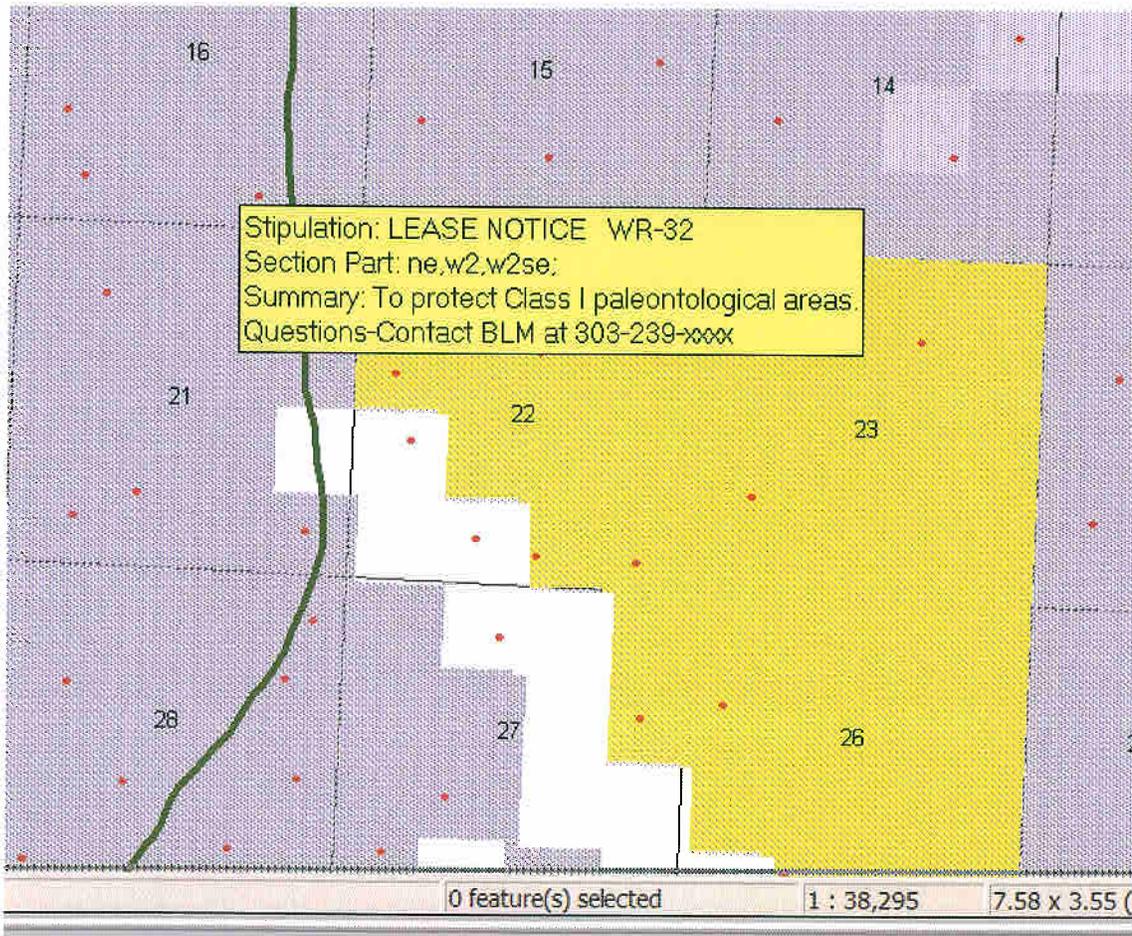
Accomplishments March 1 – September 31, 2005

The EPCA data for Colorado is now available on the Colorado Oil and Gas Commission Server at: <http://oil-gas.state.co.us/infosys/Maps/LoadMap.cfm>



To access lease stipulations, click on add remove layers and use “gwpc” as a password and then check the BLM lease stipulation boxes. Lease stipulations are mapped to the 40 acre parcel.

The advisory committee has approved the workplan to continue mapping and posting EPCA phase 1 data for Montana, Utah, and New Mexico (see attached workplan).



These list stipulations are combined with COGCC oil and gas data. Internet users can now combine state and federal information in Colorado when applying for a permit to drill on federal land.

COGIS - WELL Information

[Home](#)
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[Wellbore](#)
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Interface Location Data for API # 05-103-09419

Status: PR

Well Name/No: [DRAGON TRAIL UNIT #1139](#) (click well name for production)
 Operator: ENCANA OIL & GAS (USA) INC - 100185
 Status Date: Federal or State Lease #: 44954
 County: RIO BLANCO #103 Location: SENE 19 2S 101W 6 PM
 Well ID: DRAGON TRAIL - #18700 Footages: 1749 FNL 688 FEL
 Well Log Contr #: Elevation: 6,591 ft.
 Well ID: 39.863654 Long: -108.766934

Wellbore Data for Sidetrack #00

Status: PR N/A

Wellbore Permit

Permit #: 900334 Expiration Date: 8/11/1990
 Comp Depth/Form: Surface Mineral Owner Same:
 General Owner: FEDERAL Surface Owner:
 Unit: Unit Number: C-015039
 Information and Spacing: Code: MNCSB , Formation: MANCOS B , Order: 0 , Unit Acreage: 80, Drill Unit: S2NE

Wellbore Completed

Completion Date: 7/31/1990
 Measured TD: 3130 Measured PB depth: 3083
 True Vertical TD: 3130 True Vertical PB depth:
 Logging: String Type: SURF , Hole Size: 12.25, Size: 8.625, Top: 0, Depth: 220, Weight:
 Cement: Sacks: 0, Top: 0, Bottom: , Method Grade:
 Logging: String Type: 1ST , Hole Size: 7.875, Size: 5.5, Top: 0, Depth: 3120, Weight:
 Cement: Sacks: 0, Top: 0, Bottom: , Method Grade:

Formation	Log Top	Log Bottom	Cored	DSTs
MANCOS	1352			

Completed information for formation MNCSB

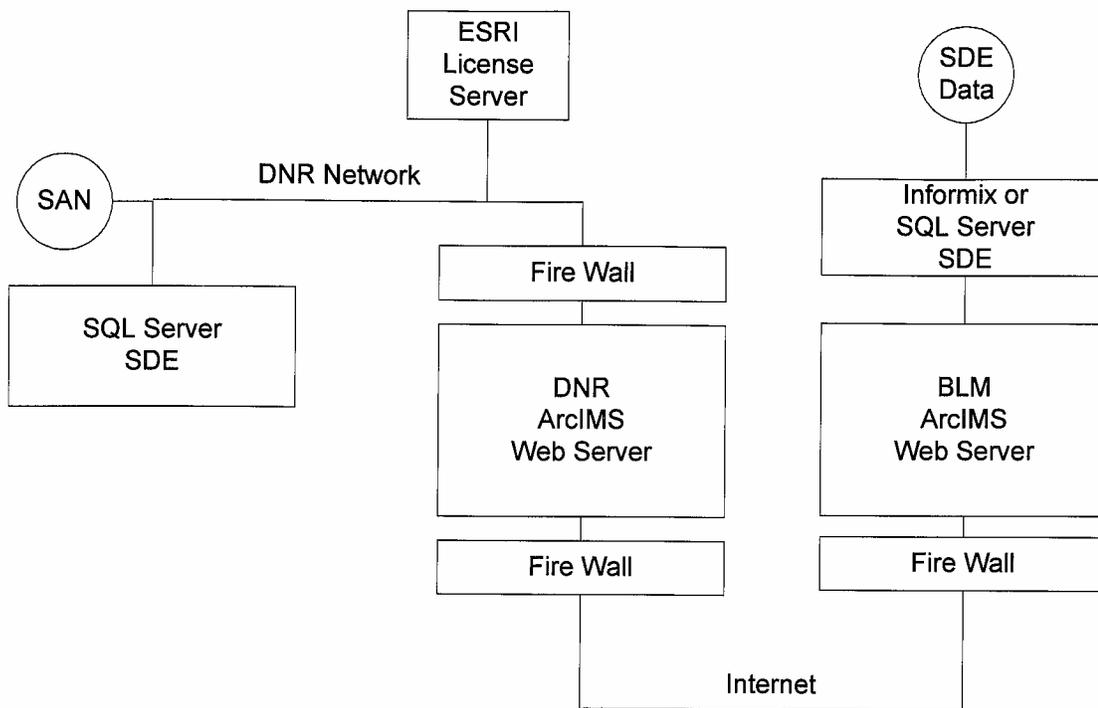
Completion Date: N/A Choke Size: 0.000
 Status Date: 10/2/2000 Hole Compl:
 Completion Method: Prod Method:
 Formation Name: MANCOS B Status: SI
 Completion Treatment:

Task 2. Establish GIS Application on Development Server. A Web site will be established on a development server, and site navigation controls, GIS functionality, and programming framework will be installed. The data will be provided in an Environmental Systems Research Institute (ESRI) standard shape file to ease downloading over the Internet. The COGCC will convert the shape file to a format used by AutoDesk MapGuide Server, which will be used for the initial deployment of the Web application.

Accomplishments October 1, 2004 – February 28, 2005

The web site/GIS application which will host the EPCA and state data in underdevelopment on a Colorado Oil and Gas Commission Server.

The following figure shows the proposed network connections for the Colorado Oil and Gas Data and the and BLM systems



Configuration of DNR and BLM ArcIMS and SDE servers.

Because of the uncertainty of the BLM connection, maximum flexibility needs to be maintained when designing the ArcIMS Data Share Application. The range of possible connections (in order of decreasing desirability) is:

1. *DNR ArcIMS server uses ArcMap Server (AMS) to load feature data from the BLM ArcIMS server. All SDE and external attribute data (Lease Stipulations) reside on the BLM servers. Down side is performance issues and availability. Requires web pages on BLM Web server to display Lease Stipulation details. Up side is a minimal maintenance and storage requirement for DNR/COGCC.*
2. *Automated SDE data replication from the BLM SDE server to the DNR SDE server. BLM data resides on DNR SDE and in SQL Server (Lease Stipulations text). Requires holes to be punched through 3 firewalls.*
3. *Provide SDE data replication via email, ftp, or CD. Requires manual intervention and scripts to export and import data. Both SDE data and Lease Stipulations text data must be exported/imported.*
4. *Transfer shapefiles via email. Data would be exported from the BLM system, transferred to COGCC and imported into SDE.*

Accomplishments March 1 – September 31, 2005

The web server has been established and can be viewed at <http://oil-gas.state.co.us/infosys/Maps/LoadMap.cfm>. The COGCC will receive periodic updates to the lease stipulation data which will keep the site current.

Task 3. Design Web Site Database. The GWPC and its contractor will design a SQL Server database that will power the Web site data delivery. The Phase 1 EPCA data will be stored in SQL Server, and the GIS polygons will be stored as static-layer spatial data files. The GWPC team will develop spatial queries that will link the map information to the database. The GIS database application will be developed in a multi-

tiered architecture that will keep MapGuide-specific code isolated to a single tier. This configuration will enable GWPC to easily modify the application to work with any GIS tool in future stages of work. The database design will be submitted to the review committee for evaluation, and recommended changes will be incorporated.

Accomplishments October 1, 2004 – February 28 2005

Work plan for this task is under development.

Accomplishments March 1 – September 31, 2005

Completed. See tasks 1 and 2 for more detail. This technology will be expanded to New Mexico in ffy2006

Task 4. Load Phase 1 EPCA Data and Test. GWPC will populate the SQL Server database with the Phase 1 EPCA data, which will be keyed from .pdf files and imported and reformatted from the dBase files available on the EPCA CD-ROMs. The site links will be enabled, and then the Web GIS application will be tested on the development server. Web site user help also will be developed as a part of this task. After any necessary de-bugging from in-house testing, the URL for the development site will be released for further testing by COGCC and other interested parties. Feedback from this round of testing will be used for further de-bugging the application and refining the user help. GWPC has found that several iterative cycles of programming-testing-refining are typically needed to produce a stable application.

Accomplishments October 1, 2004 – February 28, 2005

Work will begin on this task in April 2005

Accomplishments March 1 – September 31, 2005

Completed: See above descriptions

Task 5. Install Application on COGCC Server. Once the GIS Web application is found to be stable on the development server and meets the project requirements, GWPC will transfer the application to the COGCC server and provide follow-up help desk support. Since COGCC may choose to display data for only those geological basins in Colorado, the EPCA inventory and assessment data portions of the application will be made available nationally on the development server.

Accomplishments October 1, 2004 – February 28, 2005

To this point the effort on GIS has focused on development of a GIS Client that will allow multiple states to mesh BLM Lease Stipulation Data with RBDMS Data. Conversations about server-side infrastructure requirements have occurred leading to decisions to use ArcIMS and ArcSDE as the server side components of this project. Groundwork has been laid for rapid dissemination of BLM Lease Stipulation once data sharing agreements are in place.

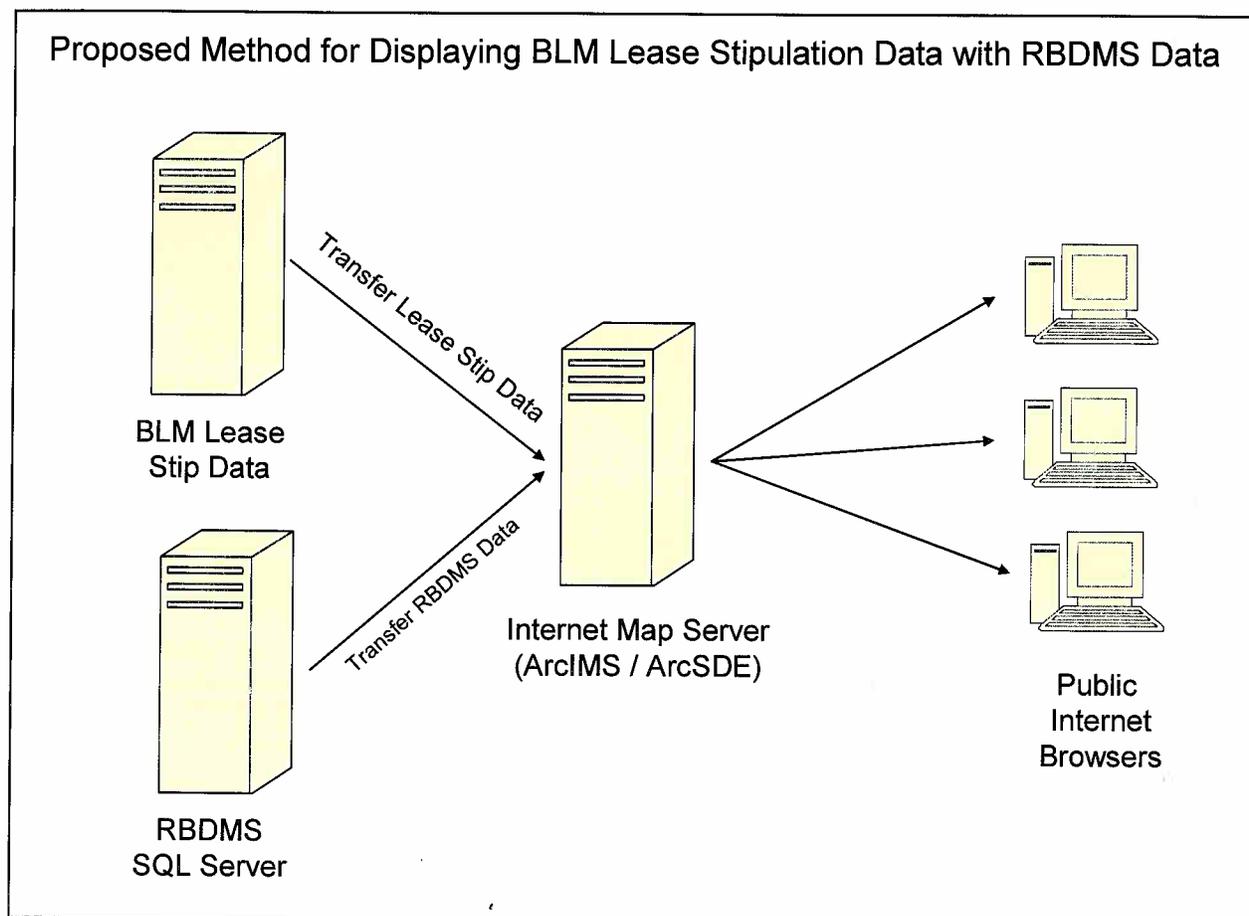
The project advisory committee is exploring several ways of transferring and maintaining the EPCA data. Potential methodology includes:

- *Periodic transfer of shapefile(s).*
 - *Preferred method to coincide with Iteration I of RBDMS Online GIS Module development.*
- *Automated replication of SQL Servers.*
- *Real time use of Lease Stip data via ArcIMS service or SDE Instance on BLM servers*

The following conceptual flow diagram depicts how data will be transferred from the BLM server to the Colorado Web Site.

Accomplishments March 1 – September 31, 2005

Completed for Colorado See above descriptions



Task 6. Expand Agency Participation. GWPC proposes to install the EPCA GIS Web database and support application on agency Web servers in NM, UT, and MT. The requirements for integrating the EPCA and agency data will be assessed, and the Web application will be tailored to fit any changed operational conditions of the hosting agency on a development server. The application will be tested and, when deemed stable on a development server, it will be installed on the agency's server. GWPC will provide help desk support.

Accomplishments October 1, 2004 – February 28, 2005

Utah, Montana and New Mexico are participating in the project advisory committee. After the system is installed in Colorado, the same technology will be used in the other EPCA states

Accomplishments March 1 – September 31, 2005

The attached workplan describes the efforts which will be undertaken in ffy06

CONCLUSION*

This project is on schedule. We anticipate being able to post a preliminary version of the EPA EPCA lease stipulation data on the Colorado web site in late April or early May. The interagency cooperation between, GWPC, States and BLM is working very well. The BLM has developed an interagency data sharing MOU which is in the process of being finalized. Once this is signed the electronic transfer of data will begin.

MILESTONES*

COST & SCHEDULE STATUS*

As of April 30, 2005 the DOE total costs were \$64,789. At that time, only \$50,000 had been drawn. We anticipate that project costs will accelerate and that the entire year-one DOE funds totaling \$450,000 will be utilized. Additionally at this time, approximately 25% of the \$125,000 year-one in-kind contributions have been utilized.

As of October 1, 2005, the project is on schedule and year one funds (federal and state match) have been completely expended.

SUMMARY OF SIGIFICANT ACCOMPLISHMENTS*

EPCA Phase I data for Colorado is available on the Internet at <http://oil-gas.state.co.us/infosys/Maps/LoadMap.cfm>. The federal EPCA data has been combined with state oil and gas data. This is the first time federal and state data of this type has been combined and made available for use over the internet. This technology will now be transferred to Utah, New Mexico and Montana.

ACTUAL OR ANTICIPATED PROBLEMS OR DELAYS*

TECHNOLOGY TRANSFER ACTIVITIES*

GWPC will present detailed briefings to the Contracting Officer's Representative (COR). The GWPC team will give a briefing that explains the plans, progress, and results of the technical products. At a minimum, the GWPC team will have a project kickoff briefing and a final project review briefing. For costing purposes, the GWPC assumes that these briefings will be held at National Energy Technology Laboratory's (NETL's) Tulsa, OK, office site. Additional briefings and technical presentations will be made to ensure the participation of existing stakeholders, other federal and state agencies, standards bodies, and industry associations.

Accomplishments October 1, 2004 – February 28, 2005

The following technical briefings and presentations have been made:

- 1. Project presented to the Ground Water Protection Research Foundation at the January UIC meeting in New Orleans, 2005*
- 2. Society of Petroleum Engineers March 2005: SPE Paper Number 94371, Increased Access to Federal Lands Through Data Sharing, S.D. Belieu, SPE, Nebraska Oil and Gas Conservation Commission, P.J. Jehn, Ground Water Protection Council, M.F. Bohrer, North Dakota Industrial Commission*
- 3. Project presented at the Ground Water Protection Research Foundation Board of Directors meeting in March in Washington, DC*

Accomplishments March 1, 2005 – September 30, 2005

- 1. Project presented at the GWPC Annual Forum, September 2005, Portland Oregon*
- 2. Project presented at the International Petroleum Environmental Conference (IPEC), November 2005, Houston Texas.*

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S.D. Belieu, SPE, Nebraska Oil and Gas Conservation Commission, P.J. Jehn, Ground Water Protection Council, M.F. Bohrer, North Dakota Industrial Commission Society of Petroleum Engineers March 2005: SPE Paper Number 94371, Increased Access to Federal Lands Through Data Sharing

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