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Energy & Environmental Research Center

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April 30, 2008

Ms. Karlene Fine
Executive Director
Industrial Commission of North Dakota
600 East Boulevard Avenue
Bismarck, ND 58505

Dear Ms. Fine:

Subject: EERC Plains CO_2 Reduction Partnership (PCOR) Phase II Deliverable D3 Quarterly Technical Progress Report for the Period January 1 – March 31, 2008; Agreement Nos. FY06-LV-143 and GO05-014; EERC Funds 9708 and 9709

Enclosed is a hard copy of the Quarterly Technical Progress Report for the PCOR Partnership Program for Phase II. Also enclosed is a disk containing the Quarterly Technical Progress Report. An electronic version is also being sent via e-mail.

If you have any questions, please call me at (701) 777-5279 or e-mail me at esteadman@undeerc.org.

Sincerely,

for Edward N. Steadman
PCOR Partnership Manager
EERC Senior Research Advisor

ENS/sah

Enclosures

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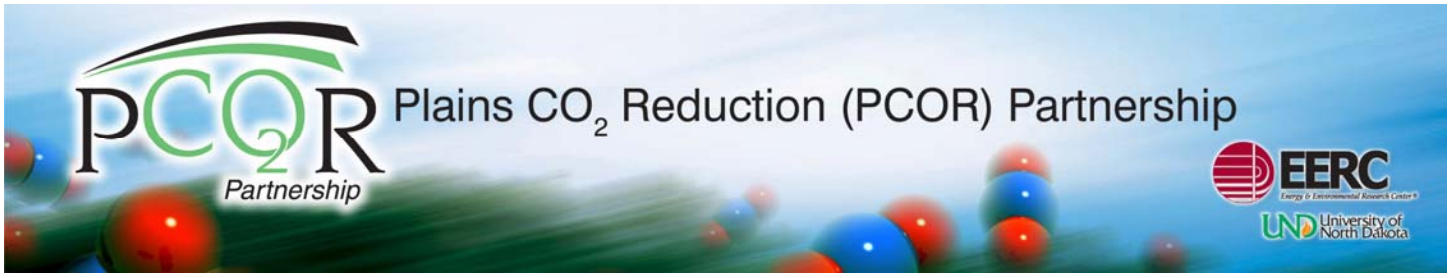
Rich Baker, NDIC Department of Mineral Resources, Oil and Gas Division
Lynn Helms, NDIC Department of Mineral Resources, Oil and Gas Division

c: Corey Irion, EERC



PLAINS CO_2 REDUCTION PARTNERSHIP (PHASE II)

Quarterly Technical Progress Report
(for the period January 1 – March 31, 2008)

Prepared for:

Karlene Fine

Industrial Commission of North Dakota
600 East Boulevard Avenue
Bismarck, ND 58505

Agreement Nos. FY06-LV-143 and GO05-014
EERC Funds 9708 and 9709

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April 2008

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PLAINS CO_2 REDUCTION PARTNERSHIP (PHASE II)
Quarterly Technical Progress Report
January 1 – March 31, 2008

INTRODUCTION

The Plains CO_2 Reduction (PCOR) Partnership has been established as a U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) Regional Carbon Sequestration Partnership (RCSP). The PCOR Partnership is managed by the Energy & Environmental Research Center (EERC) at the University of North Dakota (UND) in Grand Forks, North Dakota. The PCOR Partnership region includes all or part of nine states (Iowa, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming) and four Canadian provinces (Alberta, British Columbia, Manitoba, and Saskatchewan).

Phase II is a 4-year project, in two budget periods, that will run from October 1, 2005, to September 30, 2009. This progress report summarizes the activities for the reporting period (January 1 – March 31, 2008) for Phase II.

The activities for Phase II of the PCOR Partnership include four validation tests (Figure 1) along with regional characterization, regulatory and permitting activities, and outreach. Ten tasks have been developed; see Table 1 for the responsibility matrix.

Table 1. Phase II Responsibility Matrix

Phase II Task Description	Responsible Party
Task 1 – Project Management and Reporting	Ed Steadman
Task 2 – Field Validation Test in a Williston Basin Oil Field, North Dakota	Jim Sorensen
Task 3 – Field Validation Test at Zama, Alberta	Steve Smith
Task 4 – Field Validation Test of North Dakota Lignite	Lisa Botnen
Task 5 – Terrestrial Validation Test	Barry Botnen
Task 6 – Characterization of Regional Sequestration Opportunities	Erin O'Leary
Task 7 – Research Safety, Regulatory, and Permitting Issues	Lisa Botnen
Task 8 – Public Outreach and Education	Dan Daly
Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment	Melanie Jensen
Task 10 – Regional Partnership Program Integration	Ed Steadman

Figure 1. PCOR Partnership Phase II validation test sites.

SUMMARY OF SIGNIFICANT PHASE II ACCOMPLISHMENTS

Task 1 – Project Management and Reporting

Phase II of the PCOR Partnership grew from 72 partners in the reporting period October 1 – December 31, 2007, to 73 partners in the reporting period January 1 – March 31, 2008. Huntsman Corporation joined Phase II in March. The membership, as of March 31, 2008, is listed in Table 2.

The deliverable entitled "D3: Task 1 – Quarterly Progress Report/Milestone Quarterly Report" was submitted to DOE for approval on January 31, 2008.

Table 2. PCOR Partnership Membership, Phase II

UND EERC	Huntsman Corporation	North Dakota Industrial Commission Oil and Gas Research Council
Advanced Geotechnology, a division of Hycal Energy Research Laboratories, Ltd.	Interstate Oil and Gas Compact Commission	North Dakota Natural Resources Trust
Air Products and Chemicals	Iowa Department of Natural Resources	North Dakota Petroleum Council
Alberta Department of Energy	Lignite Energy Council	North Dakota State University
Alberta Energy and Utilities Board	MEG Energy Corporation	Otter Tail Power Company
Alberta Geological Survey	Melzer Consulting	Petroleum Technology Transfer Council
Ameren Corporation	Minnesota Geological Survey – University of Minnesota	Prairie Public Broadcasting
American Lignite Energy (ALE)	Minnesota Power	Pratt & Whitney Rocketdyne, Inc.
Apache Canada Ltd.	Minnkota Power Cooperative, Inc.	Ramgen Power Systems, Inc.
Basin Electric Power Cooperative	Missouri Department of Natural Resources	RPS Energy Canada Ltd. – APA Petroleum Engineering Inc.
Blue Source, LLC	Missouri River Energy Services	Saskatchewan Industry and Resources
British Columbia Ministry of Energy, Mines, and Petroleum Resources	Montana–Dakota Utilities Co.	SaskPower
Carbozyme, Inc.	Montana Department of Environmental Quality	Schlumberger
Center for Energy and Economic Development (CEED)	National Commission on Energy Policy	Shell Canada Energy
Dakota Gasification Company	Natural Resources Canada	Spectra Energy
Ducks Unlimited Canada	Nexant, Inc.	Strategic West Energy Ltd.
Ducks Unlimited, Inc.	North American Coal Corporation	Suncor Energy Inc.
Eagle Operating, Inc.	North Dakota Department of Commerce Division of Community Services	U.S. Department of Energy National Energy Technology Laboratory
Eastern Iowa Community College District	North Dakota Department of Health	U.S. Geological Survey Northern Prairie Wildlife Research Center
Enbridge Inc.	North Dakota Geological Survey	University of Alberta
Encore Acquisition Company	North Dakota Industrial Commission	Western Governors' Association
Environment Canada	Department of Mineral Resources, Oil and Gas Division	Westmoreland Coal Company
Excelsior Energy Inc.	North Dakota Industrial Commission Lignite Research, Development and Marketing Program	Wisconsin Department of Agriculture, Trade and Consumer Protection
Fischer Oil and Gas, Inc.		Xcel Energy
Great Northern Power Development, LP		
Great River Energy		
Hess Corporation		

Task 2 – Field Validation Test – Williston Basin Oil Field, North Dakota

Phase II – Task 2 continues to focus on evaluating the effectiveness of CO_2 sequestration in conjunction with enhanced oil recovery (EOR) operations in a deep carbonate reservoir in the Williston Basin. During this quarter, modeling efforts were focused on developing petrophysical models of potential sealing formations in southwestern North Dakota, where several candidate oil fields for EOR are located. A petrophysical model of an oil field in the north-central part of North Dakota was also constructed. Laboratory experiments were also conducted on limestone cores believed to be representative of the reservoirs being considered for CO_2 injection. The laboratory tests focused on injecting CO_2 at reservoir conditions into core plugs and testing the geochemical and geomechanical properties of the core plugs before and after injection. These tests were initiated during this past quarter, and results are anticipated in the late summer of 2008.

Task 3 – Field Validation Test at Zama, Alberta

Injection of acid gas has continued during this reporting period. A cumulative total of 218 million cubic feet (approximately 12,000 tons) of gas has been injected. Injection rates throughout this reporting period were maintained at approximately 1 million cubic feet per day.

As expected at this stage of development, no incremental oil or gas has been produced from the "F" Pool; however, three of the five pinnacles receiving acid gas are in production. The field operator is investigating techniques to stimulate oil and gas production, including reperforating the production well and/or drilling an additional production well into the structure. Figure 2 illustrates the injection profile from inception through January 2008.

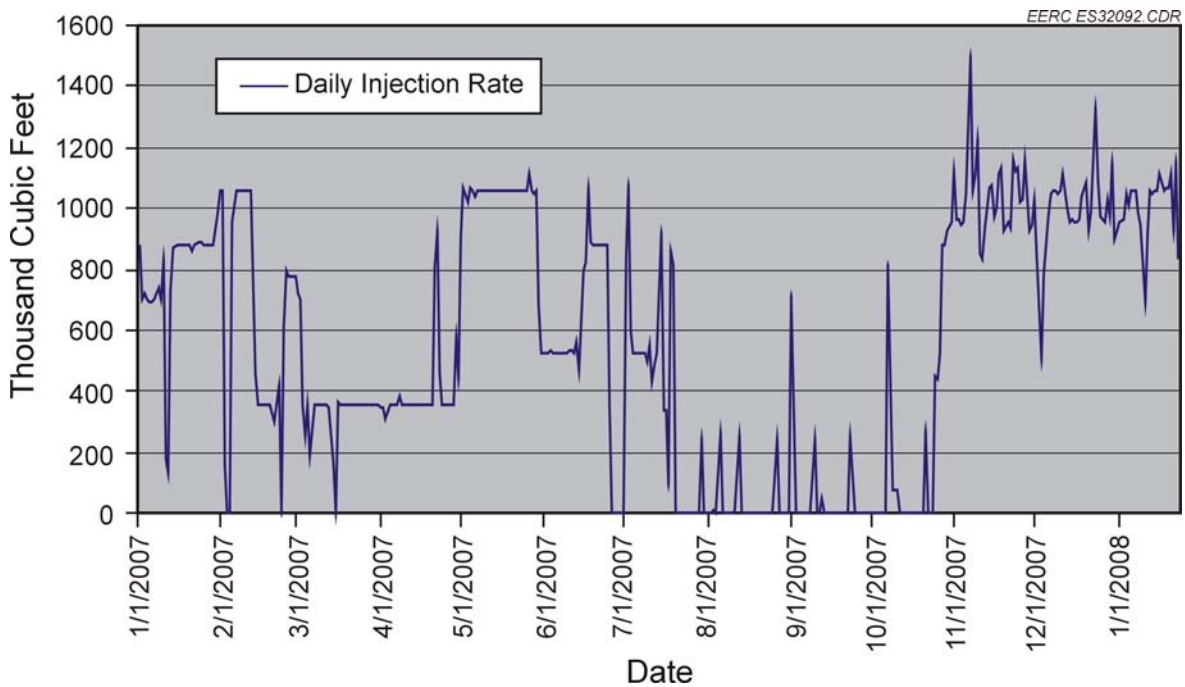

Figure 2. Zama F Pool acid gas injection profile.

Task 4 – Field Validation Test of North Dakota Lignite

During this quarter, field operations continued to be shut down because of cold weather. This pause was used to conduct a series of laboratory studies on cores, interpret geophysical logs, plan field operations for the upcoming season, and prepare necessary paperwork for the underground injection permit. During this period, the project had confidential status, thus no public outreach activities were conducted.

The following progress has been made in preparation to resuming field operations: the site now has electric service, two major providers of CO_2 and CO_2 services have been identified and negotiations with them are in progress, and a fact sheet for updating the public on the test progress is prepared and will be distributed as soon as confidential status ends.

Task 5 – Terrestrial Validation Test

Several accomplishments were made toward our business process products for the terrestrial task during this reporting period:

- The Oracle software-based carbon-tracking database was officially launched for internal review on March 6, 2008 (Figure 3).
- Field components and definitions are being evaluated and confirmed based on user input.
- Data entry flow has been finalized, and online documentation and use cases are currently being compiled.
- ArcSDE geoprocessing scripts that create table links between carbon unit polygons in the geodatabase and the tabular Oracle record are now implemented.
- Procedures for geographic information system (GIS) business units that connect to the central projects database to maintain upload as well as export carbon unit spatial features have been developed and tested.

During this reporting period, the terrestrial task also completed carbon analyses from benchmark sites in north-central and central South Dakota. The analyses of samples from western Minnesota are 95% complete. The analysis of different age groups of restored grasslands from central North Dakota, northern South Dakota, and central South Dakota are also complete.

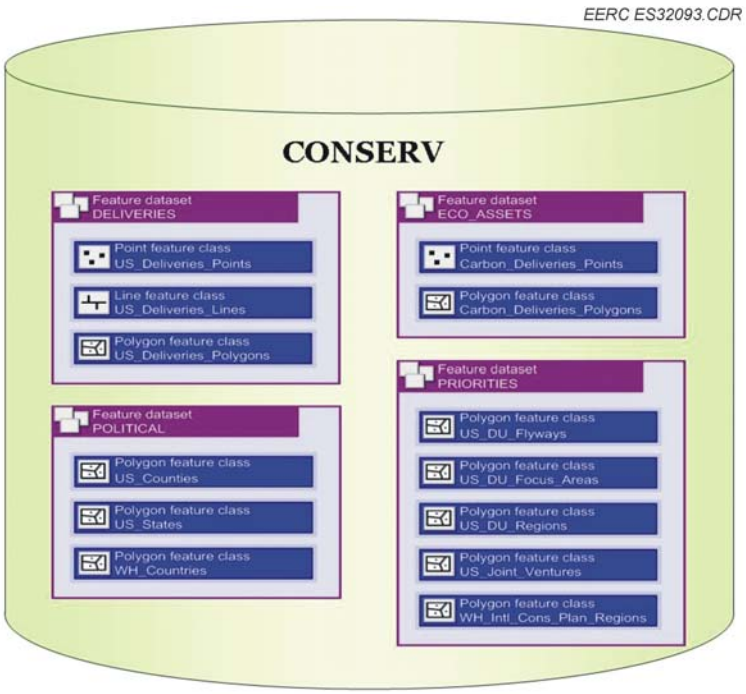

Figure 3. Oracle/SDE geodatabase schema.

The average C sequestration rate in restored grasslands studied to date is 0.407 Mg C/ha/30-cm depth/year (0.181 t C/ac/12-inch-depth/year).

Task 6 – Characterization of Regional Sequestration Opportunities

Work in Task 6 during this reporting period included the development of a secure method to allow North Dakota Industrial Commission (NDIC) subscription members to access the deep-gas analysis Web site. Work for the first phase of modeling has been completed for the Lower Cretaceous sequestration zone in the Washburn region of North Dakota. Basic stratigraphic work has been completed for the Ordovician sequestration intervals and has been initiated for the Mississippian Madison Formation.

Task 7 – Research Safety, Regulatory, and Permitting Issues

During this reporting period, the Interstate Oil and Gas Compact Commission (IOGCC) report entitled "Storage of Carbon Dioxide in Geologic Structures, A Legal and Regulatory Guide for States and Provinces" was reviewed by PCOR Partnership staff. Knowledge of this comprehensive document has facilitated and will continue to facilitate numerous discussions with partners and others as to the development of a regulatory framework for carbon sequestration activities.

The updated regulatory analysis section for the Excelsior Energy carbon management plan was completed. This analysis will assist Excelsior Energy as it moves forward with future development and expansion plans.

Task 8 – Public Outreach and Education

During the reporting period, the documentary "Reducing Our Carbon Footprint: The Role of Markets" was scheduled for an upcoming broadcast on Prairie Public Television (April 17, 2008). A draft of the documentary "Terrestrial Sequestration: Using Nature to Capture CO_2" was prepared, and an update of the public Web site was submitted to DOE for review on March 31, 2008.

Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment

During the reporting period, a draft report was prepared detailing the methodologies used to calculate the CO_2 emissions from various stationary point-source types in the PCOR Partnership region.

Task 10 – Regional Partnership Program Integration

Work continues on a regional partnership integration fact sheet to be submitted as a value-added product. We participated in conference calls for the Outreach, GIS, Geologic, and Modeling Work Groups.

PHASE II PROGRESS OF WORK

Task 1 – Project Management and Reporting

Task 1 includes all project management and reporting activities. This reporting period focused on the following activities: 1) managing overall project activities, 2) informing stakeholders about DOE's RCSP Program and the PCOR Partnership, 3) adding new partners to the PCOR Partnership, and 4) discussing existing and potential demonstration activities with prospective Phase II participants. Work in Task 1 also included the following:

- The second edition of the PCOR Partnership Regional Atlas is now available on the home page of the "Partners-Only" Web site.
- On March 18, 2008, the PCOR Partnership provided images on our field tests for inclusion in an upcoming article in "Popular Science."
- The PCOR Partnership testified at a hearing on the challenges to rapid deployment of carbon capture and storage (CCS) technologies on March 26, 2008, in Bismarck, North Dakota.
- Phase II activities were discussed with Marathon Oil, ConocoPhillips, City Utilities of Springfield, Kinder Morgan, Abengoa Bioenergy, and GE Global Research.

Task 2 – Field Validation Test – Williston Basin Oil Field, North Dakota

The goal of Task 2 is to conduct a field validation test in the Williston Basin oil field in northwestern North Dakota to evaluate the potential for geological sequestration of CO_2 in a deep carbonate reservoir for the dual purpose of CO_2 sequestration and EOR.

Throughout this reporting period, characterization activities on the Williston Basin project have continued. To date, the selection of the specific oil field in which the Phase II activities will be conducted has not yet been finalized. However, a group of oil fields in the vicinity of Dickinson, North Dakota, have been identified as being the primary potential sites for injection and EOR operations. Geological and hydrogeological investigations of those potential fields continue. Specifically, key well log data sets were acquired and the development of petrophysical models of a study area in southwestern North Dakota that includes several candidate oil fields was initiated. Also, laboratory efforts designed to examine the effects that CO_2 injection at reservoir conditions can have on the porosity, geochemistry, and geomechanical integrity of carbonate rocks were initiated. This work provides in-depth knowledge of the likely study region and will ultimately give insight into the long-term movement of fluids through this system.

Task 3 – Field Validation Test at Zama, Alberta

The goal of the field validation test in the Zama Field of Alberta is to evaluate the potential for geological sequestration of CO_2 as part of a gas stream that also includes high concentrations of H_2S acid gas being injected for the concurrent purposes of CO_2 sequestration, H_2S disposal, and EOR.

Throughout this reporting period, characterization activities on the Zama project have continued. Four kilograms of perfluorocarbon tracer were injected into the Keg River reservoir in March, 2008. This will be used to identify leakage from the reservoir should it occur. Geomechanical evaluations are also ongoing. The following work is in progress and is anticipated to be completed in the next quarter:

- Reports detailing lab work and stress analyses conducted for geomechanical characterization of the Zama site are being completed.
- A preliminary report on FLAC simulation of stress changes associated with production and injection at the Zama F Pool is being completed.
- Design and research plan of an extended leak-off test in the Muskeg Formation cap rock has been initiated. This will give an indication of cap rock thresholds under in situ conditions.
- Engineering work to determine pressure fluctuations in the reservoir and overlying formations has been initiated. A simple model will be developed to determine the magnitude of pressure fluctuation that will be needed to effectively say leakage from the target is occurring. This comparative analysis will be proposed as a monitoring tool should it prove effective.

Mineralogical and petrophysical evaluations of core that was collected in March 2007 (cap rock and reservoir) have been completed. Geochemical evaluations have been initiated. As part of this work, the core that was obtained in March 2007 is being evaluated and will be used in upcoming modeling activities.

Task 4 – Field Validation Test of North Dakota Lignite

In Task 4, the effectiveness of lignite seams to act as sinks for CO_2 during simultaneous CO_2 sequestration and enhanced coalbed methane (ECBM) production will be evaluated in the Williston Basin. The list below describes ongoing activities and accomplishments for the reporting period:

- Field operations continue to be shut down because of cold weather and will resume shortly.
- Electric line has been brought to the test site.
- Well development plan has been finalized.
- Formation stimulation design has been finalized. This may be modified in the process of well development.
- Monthly field-scale tests of water levels and pressures in the wells are ongoing.
- Three dimensional geomechanical analysis of the field data is in progress.
- Core and fluid analysis program is ongoing. The following aspects have been investigated: porosity and permeability of coal matrix, coal response to CO_2 exposure, and mechanical properties of coal.
- Study of the aquifer properties of the targeted coal is completed as part of complying with underground injection control (UIC) requirements for obtaining an injection permit. The study confirmed that producing water from the coal will be uneconomic.
- Creation of the detailed Petrel model of the target seam is initiated.
- The final monitoring, mitigation, and verification (MMV) design is in progress.

- Application for the UIC permit has been finalized.
- Information fact sheet for public outreach is issued.
- Meeting with NDIC Department of Mineral Resources Oil and Gas Director Lynn Helms and UIC coordinators was held to facilitate the UIC permitting process.
- A meeting with the field engineer and operator was held to coordinate the stimulation program.
- CO_2 sources for injection have been contacted, and various delivery methods are being evaluated.

Preliminary results from data analysis indicate the existence of multiple coal seams in the drilled wells, sufficient areal extent of the seams, and the existence of low-permeability clay layers above and below the target seam. The current state of PCOR Partnership knowledge suggests that the targeted coal seam (at approximately 1100 feet) is the best candidate for CO_2 injection. The next best candidate is the seam at 987 feet.

Task 5 – Terrestrial Validation Test

The objective of Task 5 is to develop the technical capacity to systematically identify, develop, and apply alternate land-use management practices to the prairie pothole ecosystem (at both a local and regional scale) that will result in greenhouse gas (GHG) reductions. Ongoing activities and accomplishments for the period are listed below:

- The Voluntary Carbon Standard (VCS) is a carbon offset standard that can add significant value to the PCOR Partnership region's terrestrial offsets. Currently, the VCS does not cover carbon offsets generated from native prairie preservation. PCOR Partnership members have been in discussions with the Standard's Board and Development Committee on the process needed to get this type of offset included in the VCS. Efforts are under way to submit the necessary methodological documents to get native prairie preservation offsets recognized. Results from PCOR Partnership soil sampling and grassland loss rates will be instrumental in these documents.
- Analysis of soils and plants from five grass species grown in central South Dakota is complete and is awaiting statistical analysis. One half of the 75 cores from the landscape study have been processed and are awaiting C analysis. All but 25 cores from benchmark characterization sites have been processed (out of approximately 240 cores). These are presently being milled for C analysis.
- A land-use change model for the U.S. and Canadian Prairie Pothole Region (PPR) is being constructed by the University of Wyoming. This model will assist in carbon easement acquisition. The model will predict the probability that a parcel of land with known characteristics (e.g., soil quality, rainfall, etc.) will remain in a particular land-use (e.g., row crops vs. pasture) given characteristics about each land-use (e.g., commodity prices, federal subsidy payments, conservation payment rates, carbon payments etc.). Thus, for each parcel of land in the PPR, the model will provide a probability that the land remains in its current use or converts to an alternative use given current characteristics (e.g., commodity prices).
- PCOR Partnership members completed the quality assurance/quality control (QA/QC) of the electronic databases containing GHG flux data. Additionally, topographic data of wetland catchments were processed to estimate the area of each landscape position

within catchments. These topographic data are being used to develop area-adjusted estimates of GHG fluxes. Preparation for the upcoming field season is ongoing and work is on schedule.

- As part of the wetlands study, an in situ experiment on nitrogen amendments on GHG emissions is being conducted that will quantify changes in the global warming potential (GWP) of wetlands in the PPR "before" and "after" restoration and will examine the GWP of nitrogen fertilizers on the soil.
- Initial study areas have been chosen (Kidder, Logan, and Stutsman Counties in North Dakota) to begin the economic modeling exercise. Data on soils and land-use practices as well as historic production of various crops are being assembled. Preparation of cost/return budgets for the area's major crops, as well as for potential bioenergy feedstock crops, is ongoing.

PCOR Partnership staff attended Carbon Forum America 2008 in San Francisco, California, February 26–27, 2008. Opportunities to meet with other carbon project developers, investors, and regulators garnered many market and policy insights, as well as new business tools that will help create and market high-end grassland carbon offsets.

Task 6 – Characterization of Regional Sequestration Opportunities

The goal of Task 6 is to characterize the PCOR Partnership region with respect to regional sequestration opportunities and to provide this information to our partners through our Web-based Decision Support System (DSS, ©2007 EERC Foundation). Progress within the period included the following:

- The development of an interactive help function for the DSS continued. The help document will include video clips to help new users navigate the GIS portion of the DSS.
- The deep-gas analysis Web site application and database is near completion and will be presented at the Williston Basin Petroleum Conference at the end of April. The database is being compiled from deep-gas analysis records provided to the PCOR Partnership from the NDIC Department of Mineral Resources Oil and Gas Division. These data may provide fundamental information with respect to the character of hydrocarbon-bearing zones and their potential to store CO_2.
- The conversion of the DSS site to a .NET framework continues. This development platform will allow for greater functionality and a more robust user experience in the GIS portion of the DSS.
- Review of the recently completed initial phase of modeling of the Lower Cretaceous sequestration zone in the Washburn region of North Dakota has been started.
- Basic stratigraphic work has been completed for the Ordovician sequestration intervals and has been initiated for the Mississippian Madison Formation.
- The regional partnership's Geologic and GIS Working Group conference calls and critical review of documents and data formats intended for the next version of the national atlas was provided.
- A draft report on the sequestration potential of saline formations in southwest Iowa is being prepared.

- The Iowa Geologic Survey (IGS) continues the compilation and review of the Ordovician and Mississippian mapping units for isopach construction. This effort includes reviewing well cuttings and cores. The IGS has finalized its inventory of oil/gas storage wells and continues the synthesis of Pennsylvanian coal strata and cumulative coal thickness.

Task 7 – Research Safety, Regulatory, and Permitting Issues

The goal of Task 7 is to identify and track new and existing regulations with respect to the relevant regulatory agencies within each of the PCOR Partnership states and provinces and the relevant federal regulatory agencies of the United States and Canada. Activities in Task 7 included the following:

- A draft report on the sequestration potential of saline formations in southwest Iowa is being prepared.
- Sundry notices were submitted to the NDIC Department of Mineral Resources Oil and Gas Division for four wells for the Lignite Field Validation Test. The notices informed the state of the perforation activities that were conducted on the wells.
- Work continues on the underground injection control permit.
- The PGS Energy Training Phone and Web Seminar "Carbon Market Developments" was attended by PCOR Partnership staff.
- Analysis of carbon market strategies continued.
- Review of recent publications relating to regulating CO_2 sequestration and MMV issues continued.
- Developments of various state and regional initiatives continued to be followed, and an update of internal documents that outline these groups was completed.
- Review of the new Energy Bill began.
- PCOR Partnership staff met with a representative from Blue Source, LLC, to discuss CO_2 sequestration market and regulatory activities in the region.

Task 8 – Public Outreach and Education

The goals of the PCOR Partnership's Public Outreach and Education task (Task 8) are to provide 1) outreach and education mechanisms that raise the awareness of sequestration opportunities in the region and 2) outreach to interested stakeholders with information about existing and future sequestration efforts in the region.

"Reducing Our Carbon Footprint: The Role of Markets" was brought near completion during the quarter, and broadcast in the Prairie Public Broadcasting region was set for April 17, 2008. During the period, animation was revised and finalized, the opening and closing credits were finalized, the concluding section was finalized, and narration was finalized. The packaging for the DVD was also finalized.

Work proceeded on the draft of the documentary (milestone M10 and deliverable D39) entitled "Terrestrial Sequestration: Using Nature to Capture CO_2," scheduled for review by DOE on April 30, 2008. Work included laying the scratch narration and interview track to create a

preliminary time line, laying cover, laying draft maps and animation, and drafting opening and closing credits. Following a review at the EERC on March 7, 2008, the introduction and closing segments were revised, the cover was modified, and the connecting dialogue was reworked. A draft DVD cover sleeve and insert were developed and submitted for review (initial arrangements were made for a production run of 1000 DVDs). The documentary contains segments on forest restoration in Brazil, forest restoration in the lower Mississippi Valley, fire management in California, and wetlands restoration, prairie preservation, and minimum till agriculture in the northern Great Plains. The documentary is on track to be submitted on schedule for review by DOE.

Work was initiated on the documentary (deliverable D46) entitled "Geologic CO_2 Sequestration." During this period, a draft script was developed and approved, a list of interviews and locations was developed, and contacts for interviews were initiated. The documentary is scheduled for DOE review by September 30, 2008.

A public Web site update was prepared and submitted for review on schedule on March 31, 2008. The update consisted of new language and internal links on the home page, updated text and figures on the "Verification Test" page, a new look for the "Documentary" page featuring the DVD covers for the documentaries, a new look for the "Kids-Only" page, a separate "Educators" page, and other updates to language regarding changes and developments in the program.

In addition, materials were prepared for the peer review, and members of the outreach team took part in the monthly conference calls and related activities of the outreach working group. Provided comments on an abstract for a paper being developed by the members of the Outreach Working Group (OWG) for a group meeting in May.

Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment

The goal of Task 9 is to identify sequestration technologies and approaches that are suitable and available for large-scale deployment in the PCOR Partnership region and to estimate their economic viability. Maintaining a current emission database; enhancing the ability to identify good matches between CO_2 emission sources, capture/separation technologies, and appropriate geologic sinks; and accurately estimating the costs of capture, compression, and transportation are crucial aspects to meeting this goal. Activities during this reporting period include the following:

- The Excelsior Energy carbon management plan for the planned Mesaba One integrated gasification combined cycle plant was finalized by the inclusion of Excelsior Energy's comments.
- Issues raised about the capture, transportation, and cost sections of a carbon management plan that had been prepared during the last quarter were addressed to the satisfaction of the PCOR Partnership member company.
- Internet searches were performed as part of a quarterly review of developing capture technologies.

- A document describing the calculation methodologies used to estimate the PCOR Partnership region's CO_2 emissions from various sources was internally reviewed and the comments addressed. It will be submitted to DOE as a value-added product.

Task 10 – Regional Partnership Program Integration

Task 10 consists of the PCOR Partnership actively participating in and providing leadership to technical working groups to identify, discuss, and resolve common issues related to the deployment of sequestration technologies. Work continues on a regional partnership integration fact sheet to be submitted as a value-added product to DOE. The PCOR Partnership Phase II field validation test summaries have been revised and are now available on the private Web site. Further, the PCOR Partnership continued participation in working group conference calls, including the following:

- GIS
- Capture and transportation
- Geologic
- Outreach

Work also continued to increase the involvement of all PCOR Partnership partners and to continue participation in conferences/meetings for the betterment of the RCSPs. Preparations for the 2008 PCOR Partnership Annual Meeting continue. The tentative dates will be September 16–18, 2008, in Minneapolis, Minnesota.

PHASE II COST STATUS

The approved budget for Phase II, along with actual costs incurred and in-kind cost share reported, is shown in Table 3.

Table 3. Phase II Budget and Actual Costs Incurred

Organization	Approved Budget	Actual Costs Incurred
DOE Share – Cash	$15,913,178	$8,482,213
Nonfederal Share – Cash	$2,321,410	$1,157,524
Nonfederal Share – In-Kind	$7,825,301	$9,294,738
Total	$26,059,889	$18,934,475

PHASE II SCHEDULE STATUS

Table 4 contains all of the Phase II deliverables and milestones and the submission dates for this reporting period. Because negotiations are ongoing and still uncertain for our partners in the Williston Basin demonstration, various deliverable and milestone submission dates have been extended and are shown in Table 5. Subtask 2.3 (Project Operations) also delayed its start date, which is shown in Table 5.

See Tables 6 and 7 for a listing of all deliverables and milestones by quarter, with completion dates, for the duration of the project.

Table 4. Phase II Deliverables and Milestones for January 1 – March 31, 2008

Product	Date Submitted
D3: Task 1 – Quarterly Report	1/31/08
D22: Task 8 – Web Site Update	3/31/08

Table 5. Revised Due Dates for Selected Phase II Deliverables and Milestones

Title/Description	Original Due Date	Revised Due Date
D40: Task 2 – Williston Basin Field Validation Test Regulatory Permitting Action Plan	4/30/08	7/31/08
M11: Task 2 – Williston Basin Field Validation Test NEPA Compliance Document Completed	5/31/08	8/29/08
D41: Task 2 – Williston Basin Field Validation Test NEPA Compliance Document	5/31/08	8/29/08
D42: Task 2 – Williston Basin Field Validation Test Experimental Design Package	6/30/08	9/30/08
D43: Task 2 – Williston Basin Field Validation Test Site Health and Safety Plan	7/31/08	10/31/08
M12: Task 2 – Williston Basin Field Validation Test Outreach Action Plan Completed	8/31/08	11/28/08
D45: Task 2 – Williston Basin Field Validation Test Outreach Action Plan	8/31/08	11/28/08
D47: Task 2 – Williston Basin Field Validation Test Sampling Protocols	11/30/08	2/27/09
M13: Task 2 – Williston Basin Field Validation Test Sampling Protocols Completed	11/30/08	2/27/09
Subtask 2.3 (Project Operation)	Begin 12/1/08	Begin 3/1/09

Table 6. Phase II Milestones and Deliverables

Title/Description	Due Date	Actual Completion Date
Year 1 – Quarter 1 (October–December 2005)		
M1: Task 1 – Project Management Plan Completed	12/31/05	12/30/05
D1: Task 1 – Project Management Plan	12/31/05	12/30/05
D2: Task 8 – Regional CO_2 Sequestration Potential – Field Validation Tests (Fact Sheet 6)	12/31/05	12/29/05
D5: Task 3 – Zama Field Validation Test NEPA Compliance Document	2/28/06	12/21/05
Year 1 – Quarter 2 (January–March 2006)		
D3: Task 1 – Quarterly and EVM Report	1/31/06	1/30/06
M3: Task 3 – Zama Field Validation Test Experimental Design Package Completed	2/28/06	2/28/06
M2: Task 6 – First Regional Characterization Data Gap Assessment Completed	2/28/06	2/28/06
D4: Task 3 – Zama Field Validation Test Experimental Design Package	2/28/06	2/28/06
D6: Task 5 – Terrestrial Field Validation Test Experimental Design Package	2/28/06	2/28/06
D7: Task 5 – Terrestrial Field Validation Test NEPA Compliance Document	2/28/06	2/14/06
D8: Task 6 – First Regional Characterization Data Gap Assessment	2/28/06	2/28/06
D9: Task 8 – Outreach Action Plan – Carbon Sequestration	2/28/06	2/28/06
D10: Task 3 – Zama Field Validation Test Site Health and Safety Plan	3/31/06	3/31/06
D11: Task 3 – Zama Field Validation Test Regulatory Permitting Action Plan	3/31/06	3/28/06
D12: Task 5 – Terrestrial Field Validation Test Site Health and Safety Plan	3/31/06	2/2/06
D13: Task 5 – Terrestrial Field Validation Test Regulatory Permitting Action Plan	3/31/06	3/27/06
Year 1 – Quarter 3 (April–June 2006)		
D3: Task 1 – Quarterly and EVM Report	4/30/06	4/28/06
D14: Task 1 – Semiannual Report	4/30/06	4/28/06
D15: Task 3 – Zama Field Validation Test Outreach Action Plan	4/30/06	4/28/06
D16: Task 5 – Terrestrial Field Validation Test Outreach Action Plan	4/30/06	4/28/06
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	5/31/06	5/31/06
D18: Task 3 – Zama Field Validation Test Sampling Protocols	6/30/06	6/29/06
M4: Task 5 – Terrestrial Field Validation Test Sampling Protocols Completed	6/30/06	6/21/06
D19: Task 5 – Terrestrial Field Validation Test Sampling Protocols	6/30/06	6/21/06
Year 1 – Quarter 4 (July–September 2006)		
D3: Task 1 – Quarterly and EVM Report	7/31/06	7/26/06
D20: Task 8 – Zama Acid Gas Project (Fact Sheet 7)	7/31/06	7/28/06
D21: Task 10 – Regional Partnership Integration Plan	7/31/06	7/18/06

Continued…

Table 6. Phase II Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 1 – Quarter 4 (July–September 2006), continued		
D22: Task 8 – Web Site Update	8/31/06	8/31/06
Year 2 – Quarter 1 (October–December 2006)		
D3: Task 1 – Quarterly and EVM Report	10/31/06	10/31/06
D14: Task 1 – Semiannual Report	10/31/06	10/31/06
D23: Task 9 – Best Practice Manual: Using Wind Power to Offset the Energy Requirements of CO_2 Compression for Sequestration	10/31/06	10/31/06
D24: Task 4 – Lignite Field Validation Test NEPA Compliance Document	10/31/06	10/13/06
D25: Task 8 – CO_2 Sequestration Through Habitat Restoration – Defining Best Terrestrial Sequestration Practices for Landowners (Fact Sheet 8)	12/31/06	12/29/06
Year 2 – Quarter 2 (January–March 2007)		
D3: Task 1 – Quarterly and EVM Report	1/31/07	1/31/07
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	2/28/07	2/28/07
D26: Task 4 – Lignite Field Validation Test Experimental Design Package	2/28/07	2/28/07
M5: Task 4 –Specific Well Location at the Lignite Field Validation Test Identified	2/28/07	2/28/07
M6: Task 4 – Finalized Drilling Prognosis for the Five-Spot Research Wells for the Lignite Field Validation Test	3/30/07	3/30/07
D27: Task 4 – Lignite Field Validation Test Site Health and Safety Plan	3/30/07	3/29/07
D28: Task 4 – Lignite Field Validation Test Regulatory Permitting Action Plan	3/30/07	3/30/07
Year 2 – Quarter 3 (April–June 2007)		
D3: Task 1 – Quarterly and EVM Report	4/31/07	4/25/07
D14: Task 1 – Semiannual Report	4/30/07	4/30/07
D29: Task 4 – Lignite Field Validation Test Outreach Action Plan	4/30/07	4/27/07
D30: Task 8 – Outreach Booth	4/30/07	4/30/07
D31: Task 8 – CO_2 Sequestration Validation Test in a Deep, Unminable Lignite Seam in Western North Dakota (Fact Sheet 10)	5/31/07	5/31/07
D32: Task 4 – Lignite Field Validation Test Sampling Protocols	6/29/07	6/29/07
D33: Task 6 – Denver–Julesberg Basin EOR Potential Report	6/29/07	4/30/07

Continued…

Table 6. Phase II Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 2 – Quarter 4 (July–September 2007)		
D3: Task 1 – Quarterly and EVM Report	7/31/07	7/25/07
D34: Task 1 – Phase II Continuation Application/Progress Report	7/31/07	7/31/07
M7: Task 4 – White Paper on CO_2 Flood Design for Simultaneous Evaluation of Carbon Sequestration and ECBM Recovery – Lignite Field Validation Test Site Completed	7/31/07	7/16/07
D22: Task 8 – Web Site Update	8/31/07	8/31/07
M8: Task 5 – Best Management Practices for Terrestrial Carbon Sequestration on Private Lands in the Prairie Pothole Region (Fact Sheet 11) Completed	9/30/07	9/28/07
D35: Task 8 – Video: Carbon Trading	9/30/07	9/28/07
Year 3 – Quarter 1 (October–December 2007)		
D3: Task 1 – Quarterly Report	10/31/07	10/31/07
D14: Task 1 – Semiannual Report	10/31/07	10/31/07
D36: Task 6 – Regional Characterization Data Gap Assessment Update	10/31/07	10/31/07
D37: Task 8 – CO_2 Sequestration Validation Test in a Deep Oil Field in the Williston Basin (Fact Sheet 12)	10/31/07	10/30/07
D38: Task 9 – Best Practice Manual: Excelsior Energy	11/30/07	11/30/07
M9: Task 3 – Progress of Geomechanical Evaluation Reported	12/31/07	12/28/07
Year 3 – Quarter 2 (January–March 2008)		
D3: Task 1 – Quarterly Report	1/31/08	1/31/08
D22: Task 8 – Web Site Update	3/31/08	3/31/08
Year 3 – Quarter 3 (April–June 2008)		
D3: Task 1 – Quarterly Report	4/30/08	
D39: Task 8 – Video: Terrestrial CO_2 Sequestration	4/30/08	
M10: Task 8 – Video: Terrestrial CO_2 Sequestration Reported	4/30/08	
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	5/31/08	
Year 3 – Quarter 4 (July–September 2008)		
D3: Task 1 – Quarterly Report	7/31/08	
D40: Task 2 – Williston Basin Field Validation Test Regulatory Permitting Action Plan	7/31/08	
D44: Task 9 – Best Practice Manual: Regional Sequestration Opportunities	7/31/08	
M11: Task 2 – Williston Basin Field Validation Test NEPA Compliance Document Completed	8/29/08	

Continued…

Table 6. Phase II Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 3 – Quarter 4 (July–September 2008), continued		
D41: Task 2 – Williston Basin Field Validation Test NEPA Compliance Document	8/29/08	
D42: Task 2 – Williston Basin Field Validation Test Experimental Design Package	9/30/08	
D46: Task 8 – Video: Geologic Sequestration	9/30/08	
Year 4 – Quarter 1 (October–December 2008)		
D3: Task 1 – Quarterly Report	10/31/08	
D43: Task 2 – Williston Basin Field Validation Test Site Health and Safety Plan	10/31/08	
M12: Task 2 – Williston Basin Field Validation Test Outreach Action Plan Completed	11/28/08	
D45: Task 2 – Williston Basin Field Validation Test Outreach Action Plan	11/28/08	
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	12/31/08	
Year 4 – Quarter 2 (January – March 2009)		
D3: Task 1 – Quarterly Report	1/31/09	
D47: Task 2 – Williston Basin Field Validation Test Sampling Protocols	2/27/09	
M13: Task 2 – Williston Basin Field Validation Test Sampling Protocols Completed	2/27/09	
D22: Task 8 – Web Site Update	2/27/09	
Year 4 – Quarter 3 (April–June 2009)		
D3: Task 1 – Quarterly Report	4/29/09	
D48: Task 8 – Best Practices Manual: Outreach	5/31/09	
D49: Task 6 – Regional Atlas	6/30/09	
D50: Task 7 – Roadmap Document	6/30/09	
D51: Task 8 – Video: CO_2 Sequestration and Global Warming – Overview of Phase II Results for Regional Partnership	6/30/09	
Year 4 – Quarter 4 (July–September 2009)		
D3: Task 1 – Quarterly Report	7/31/09	
D52: Task 3 – Zama Field Validation Test Regional Technology Implementation Plan	7/31/09	
D53: Task 4 – Lignite Field Validation Test Regional Technology Implementation Plan	7/31/09	
D54: Task 5 – Terrestrial Field Validation Test Regional Technology Implementation Plan	7/31/09	
D22: Task 8 – Web Site Update	8/31/09	
D55: Task 2 – Williston Basin Field Validation Test Regional Technology Implementation Plan	8/31/09	
D56: Task 2 – Phase II Final Report	9/30/09	
D3: Task 1 – Quarterly Report	10/31/09	

Table 7. PCOR Partnership Phase II Milestones and Deliverables (Gantt chart)

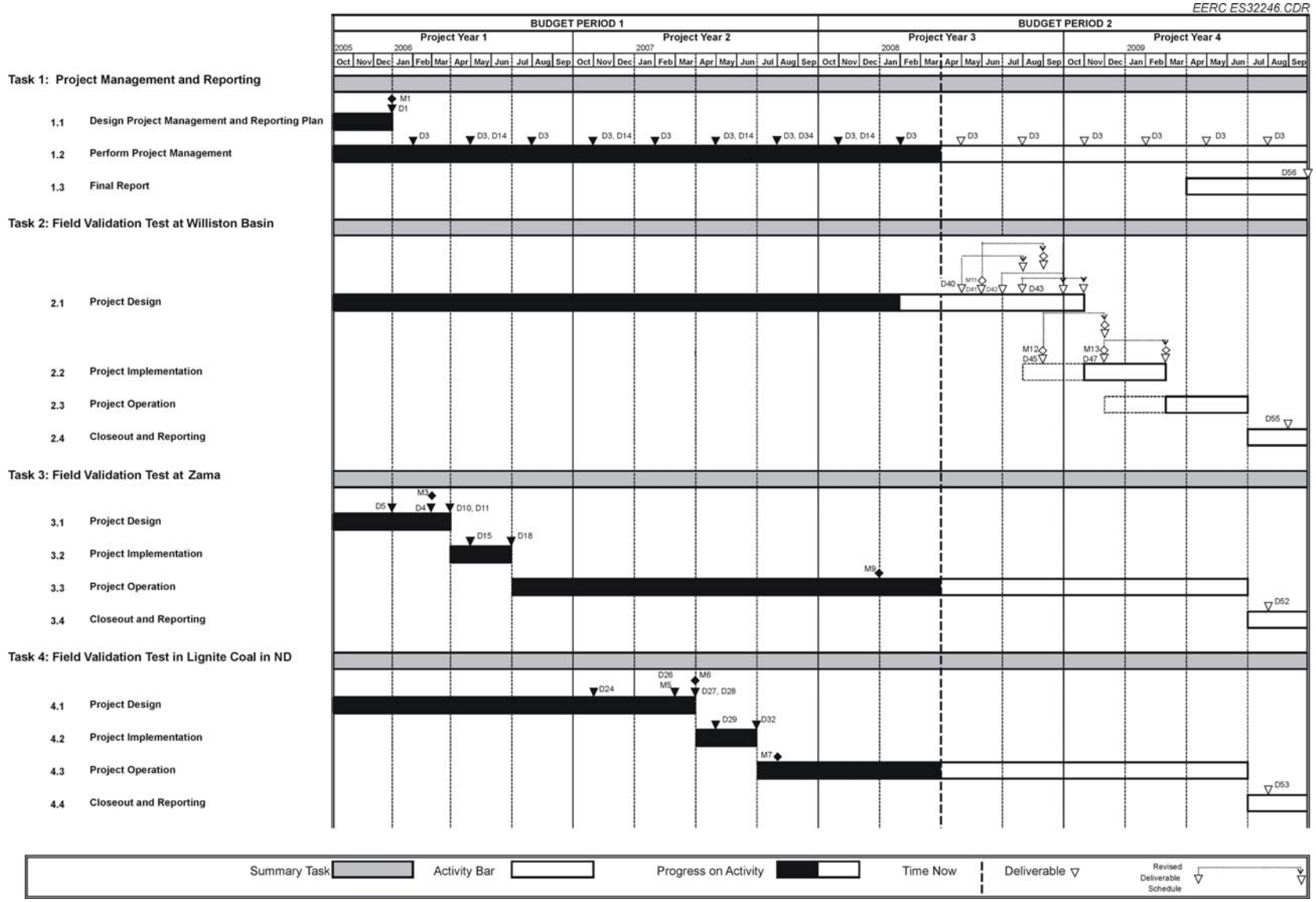

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Table 7. PCOR Partnership Phase II Milestones and Deliverables (Gantt chart) (continued)

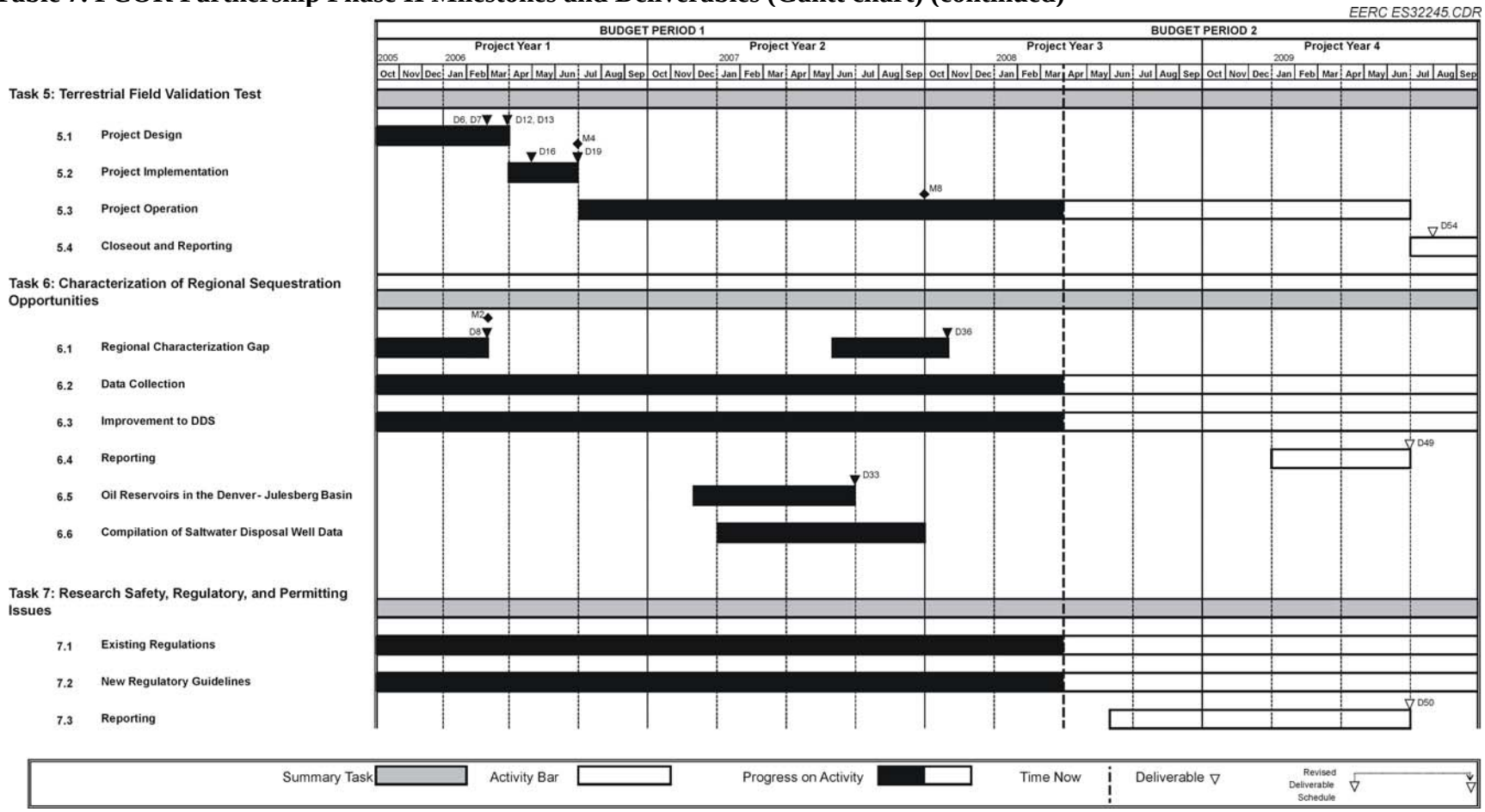

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Table 7. PCOR Partnership Phase II Milestones and Deliverables (Gantt chart) (continued)

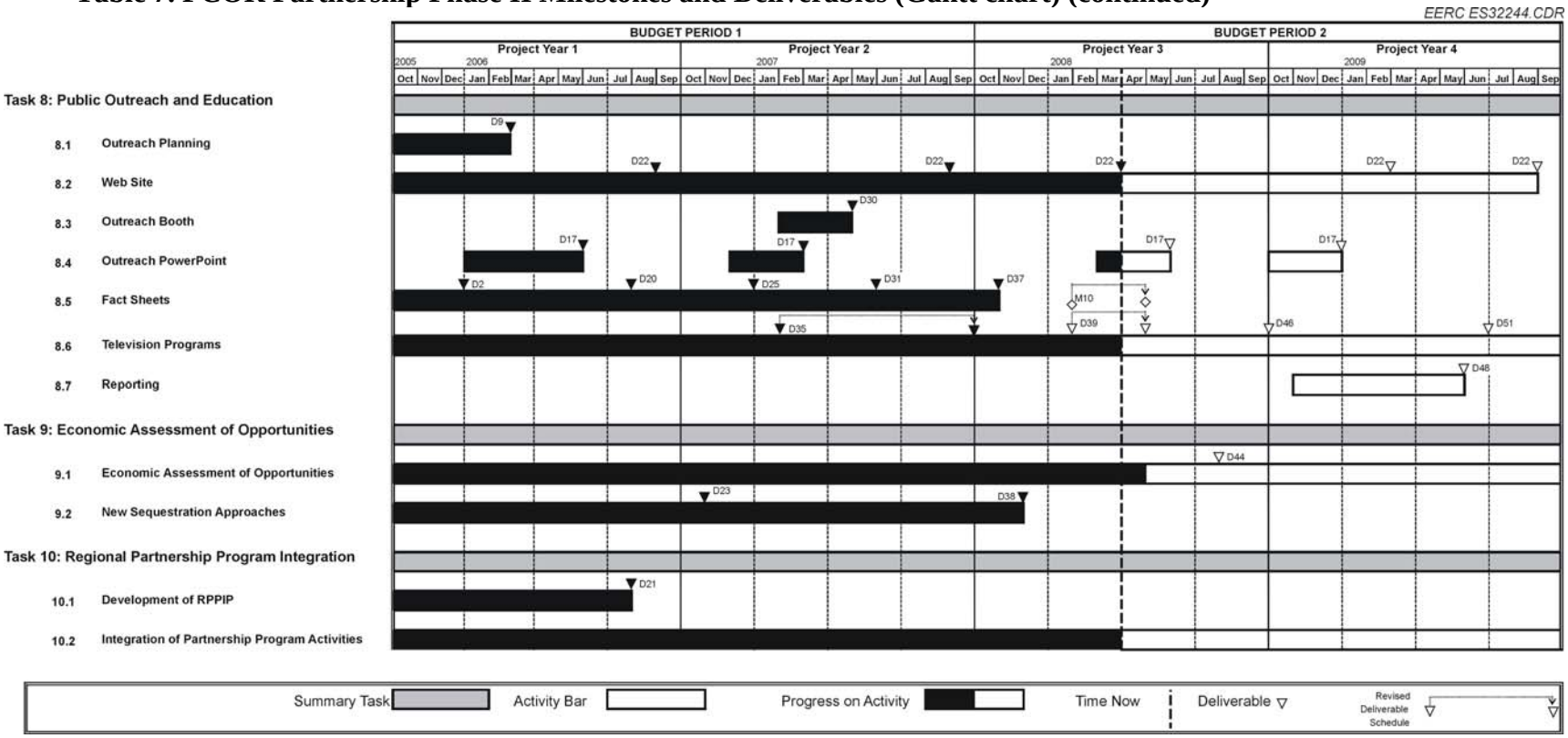

Table 7. PCOR Partnership Phase II Milestones and Deliverables (Gantt chart) (continued)

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Key for Phase II Deliverables		Key for Phase II Milestones
D1 Project Management Plan	D30 Outreach Booth	M1 Project Management Plan Completed
D2 Fact Sheet No. 6 – Regional CO_2 Sequestration Potential – Field Validation Tests	D31 Fact Sheet No. 10 – CO_2 Sequestration Validation Test in a Deep, Unminable Lignite Seam in Western North Dakota	M2 Regional Characterization Data Gap Assessment Completed
D3 Quarterly Progress Reports	D32 Lignite Field Validation Test Site – Sampling Protocols	M3 Zama Field Validation Test Site – Experimental Design Package Completed
D4 Zama Field Validation Test Site – Experimental Design Package	D33 Denver–Julesberg Basin EOR Potential Report	M4 Terrestrial Field Validation Test Site – Sampling Protocol Completed
D5 Zama Field Validation Test Site – NEPA Compliance Document	D34 Continuation Application	M5 Identification of Specific Well Location at the Lignite Field Validation Test
D6 Terrestrial Field Validation Test Site – Experimental Design Package	D35 Video No. 1: Carbon Trading	M6 Finalized Drilling Prognosis for the Five-Spot Research Wells for the Lignite Field Validation Test
D7 Terrestrial Field Validation Test Site – NEPA Compliance Document	D36 Regional Characterization Data Gap Assessment Update	M7 White Paper on CO_2 Flood Design for CO_2 Sequestration and ECBM Recovery Completed
D8 Regional Characterization Data Gap Assessment	D37 Fact Sheet No. 12 – CO_2 Sequestration Validation Test in a Deep Oil Field in the Williston Basin	M8 Fact Sheet No. 11 – Best Management Practices for Terrestrial Carbon Sequestration on Private Lands in the Prairie Pothole Region
D9 Outreach Action Plan – Carbon Sequestration	D38 Best Practices Manual – Excelsior Energy	M9 Progress of Geomechanical Evaluation Reported
D10 Zama Field Validation Test Site – Site Health and Safety Plan	D39 Video No. 2 – Terrestrial CO_2 Sequestration	M10 Video No. 2 Completed – Terrestrial CO_2 Sequestration
D11 Zama Field Validation Test Site - Regulatory Permitting Action Plan	D40 Williston Basin Field Validation Test Site – Regulatory Permitting Action Plan	M11 Williston Basin Field Validation Test Site – NEPA Compliance Document Completed
D12 Terrestrial Field Validation Test Site – Site Health and Safety Plan	D41 Williston Basin Field Validation Test Site – NEPA Compliance Document	M12 Williston Basin Field Validation Test Site – Outreach Action Plan Completed
D13 Terrestrial Field Validation Test Site - Regulatory Permitting Action Plan	D42 Williston Basin Field Validation Test Site – Experimental Design Package	M13 Williston Basin Field Validation Test Site – Sampling Protocol Completed
D14 Semiannual Progress Report	D43 Williston Basin Field Validation Test Site – Site Health and Safety Plan	
D15 Zama Field Validation Test Site – Outreach Action Plan	D44 Best Practices Manual – Regional Sequestration Opportunities	
D16 Terrestrial Field Validation Test Site – Outreach Action Plan	D45 Williston Basin Field Validation Test Site – Outreach Action Plan	
D17 PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	D46 Video No. 3: Geologic Sequestration	
D18 Zama Field Validation Test Site – Sampling Protocols	D47 Williston Basin Field Validation Test Site – Sampling Protocols	
D19 Terrestrial Field Validation Test Site – Sampling Protocols	D48 Best Practices Manual – Outreach and Education	
D20 Fact Sheet No. 7 – Zama Acid Gas Project	D49 Regional Atlas	
D21 Regional Partnership Program Integration Plan	D50 Road Map Document	
D22 Web Site Update	D51 Video No. 4: CO_2 Sequestration and Global Warming	
D23 Best Practices Manual – Using Wind Power to Offset the Energy Requirements of CO_2 Compression for Sequestration	D52 Zama Field Validation Test Site – Regional Technology Implementation Plan	
D24 Lignite Field Validation Test Site – NEPA Compliance Document	D53 Lignite Field Validation Test Site – Regional Technology Implementation Plan	
D25 Fact Sheet No. 8 – CO_2 Sequestration Through Habitat Restoration	D54 Terrestrial Field Validation Test Site – Regional Technology Implementation Plan	
D26 Lignite Field Validation Test Site – Experimental Design Package	D55 Williston Basin Field Validation Test Site – Regional Technology Implementation Plan	
D27 Lignite Field Validation Test Site – Site Health and Safety Plan	D56 Final Report	
D28 Lignite Field Validation Test Site – Regulatory Permitting Action Plan		
D29 Lignite Field Validation Test Site – Outreach Action Plan		

ACTUAL OR ANTICIPATED PHASE II PROBLEMS OR DELAYS

Task 1 – Project Management and Reporting

Nothing to note at this time.

Task 2 – Field Validation Test – Williston Basin Oil Field, North Dakota

Site-specific activities cannot be initiated until negotiations between the oil field operator and the source of the CO_2 are finalized and an official announcement is made. This has resulted in a delay of site-specific baseline characterization activities, injection scheme design, and MMV plan development. It is anticipated that such an announcement will be made during the second quarter of 2008. When the official announcement is made, it is anticipated that enough data have been gathered and evaluated that the injection scheme and MMV plans can be developed in a compressed time frame.

Task 3 – Field Validation Test at Zama, Alberta

Nothing to note at this time.

Task 4 – Field Validation Test of North Dakota Lignite

In the course of the development of the wells and as more information on the coal properties becomes available, changes can be made to the injection program. This may involve considering another coal interval for injection.

Task 5 – Terrestrial Validation Test

Nothing to note at this time.

Task 6 – Characterization of Regional Sequestration Opportunities

The PCOR Partnership is working with Alf Hartling of the British Columbia Ministry of Energy, Mines, and Petroleum Resources to obtain reservoir oil and gas data for northeastern British Columbia, Canada. The request for the data was made at the last PCOR Partnership Annual Meeting in October 2007. Although Mr. Hartling is still running into unspecified provincial-level roadblocks in British Columbia, he anticipates that these data may be made available to the PCOR Partnership before May 2008.

Task 7 – Research Safety, Regulatory, and Permitting Issues

Nothing to note at this time.

Task 8 – Public Outreach and Education

Difficulty was encountered in scheduling interviews and location filming in west Texas and New Mexico for the “Geologic Sequestration” documentary. The preliminary schedule will

be revised to focus on filming in the northern Great Plains, and the west Texas filming will occur later in the spring.

Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment

Nothing to note at this time.

Task 10 – Regional Partnership Program Integration

Nothing to note at this time.

PHASE II PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES

Task 1 – Project Management and Reporting

A number of publications, papers, and public releases were submitted during this reporting period. See the Meetings/Travel section for a complete listing of presentations given to research stakeholders and technology users. Further information on activities and progress on these can be found in their respective sections within this report.

The deliverable entitled "D3: Task 1 – Quarterly Progress Report/Milestone Quarterly Report" was submitted to DOE for approval on January 31, 2008.

Task 2 – Field Validation Test – Williston Basin Oil Field, North Dakota

A report entitled "Utilization of Geologic Media for the Purpose of Monetizing Geologic Sequestration Credits" was submitted as an American Association of Petroleum Geologists (AAPG) paper. Once the report is published, it will also be included as a PCOR Partnership Phase II value-added topical report.

Task 3 – Field Validation Test at Zama, Alberta

A presentation on the Zama project was given at the IEA Monitoring Network Meeting in Edmonton, Alberta.

Task 4 – Field Validation Test of North Dakota Lignite

A fact sheet on the progress of the field validation test of North Dakota lignite has been prepared for public outreach purposes and will be distributed after confidential status is lifted.

Task 5 – Terrestrial Validation Test

PCOR Partnership staff authored an article for Ducks Unlimited Magazine on ecosystem services titled "Natural Assets." The article discusses biological carbon sequestration and the

development of voluntary trading markets. PCOR Partnership staff participated in the second survey of the voluntary carbon market, conducted by the Ecosystem Marketplace. Results will be published in *State of the Voluntary Carbon Markets 2008,* available at www.ecosystemmarketplace.com. Ducks Unlimited will be listed as a project developer in the appendix, providing further exposure to potential investors interested in PCOR area terrestrial offsets. A new Web page for landowners interested in selling grassland carbon credits was launched at www.ducks.org/Conservation/GrasslandsforTomorrow/3466/DUbuyingcarbon creditsfromlandowners.html.

Task 6 – Characterization of Regional Sequestration Opportunities

The PCOR Partnership has recently played a prominent role in the GIS Working Group through determining the data needs and reviewing documentation with regard to the upcoming version of the national atlas. The PCOR Partnership poster created for the 2007 Annual Meeting and the 2007 ESRI GIS Users Conference was accepted to be published as part of the 23rd edition of the ESRI Map Book. This book will be distributed to nearly 20,000 people at the next GIS Users Conference.

Task 7 – Research Safety, Regulatory, and Permitting Issues

Development of a permitting flow chart was completed for the PCOR Partnership Phase II field validation tests. Once the flowcharts are finalized, they will be incorporated into the DSS system.

Task 8 – Public Outreach and Education

The deliverable entitled "D22: Task 8 – Web Site Update" was submitted to DOE for approval on March 31, 2008.

Task 9 – Identification of the Commercially Available Sequestration Technologies Ready for Large-Scale Deployment

A document detailing the methodologies used to calculate CO_2 emissions from various regional source types was prepared. Overviews of CO_2 capture were presented at the Edison Foundation's Carbon Capture and Storage: Key Issues and Challenges conference in Washington, D.C., and the Gasification Workshop held in Denver, Colorado. Information about the impact of CO_2 capture on coal ash/residuals was presented at the Coal Ash Professionals Training Course in San Antonio, Texas.

Task 10 – Regional Partnership Program Integration

See the Accomplishments Section of this report for a complete listing of the topics of presentations given by the PCOR Partnership.

MEETINGS/TRAVEL

Representatives from the PCOR Partnership participated in and/or presented at the following meetings and conferences in this reporting period:

- January 2008: Grassland/wetland restoration update meeting in Bismarck, North Dakota.
- January 2008: Field site to collect water level data and gas samples from wells in Kenmare, North Dakota.
- January 17, 2008: Met with NDIC to discuss the gas analysis Web site and the paper for the Williston Basin Conference in Bismarck, North Dakota.
- January 23–31, 2008: Energy Generation Conference in Bismarck, North Dakota.
- January 24–25, 2008: Platts Carbon Trading Conference in Houston, Texas.
- January 27–30, 2008: 11th Annual Conference on Clean Air, Mercury, Global Warming, and Renewable Energy in Tucson, Arizona.
- January 28–29, 2008: Attended a meeting with Ducks Unlimited for a grassland/wetland restoration update in Bismarck, North Dakota.
- January 30, 2008: Presented at the Energy Generation Conference in Bismarck, North Dakota.
- February: Presented to a group of college science students at the campus of Minnesota State University in Moorhead, Minnesota.
- February 14, 2008: Missouri River Energy Services Board Meeting.
- February 25–27, 2008: Attended the Environmental Systems Research Institute GIS Petroleum Users Group meeting in Houston, Texas.
- February 25–27, 2008: ESRI Petroleum User's Group Meeting in Houston, Texas.
- February 26–27, 2008: Environmental Protection Agency's second public workshop to discuss the development of proposed regulations for the underground injection of carbon dioxide for geologic sequestration under the Safe Drinking Water Act in Arlington, Virginia.
- February 26–27, 2008: Carbon Forum America 2008, San Francisco, California.
- February 26–29, 2008: Attend a training class for developing GIS applications using .NET in GIS Server 9.2 in Phoenix, Arizona.
- February 27, 2008: EmPower North Dakota Meeting in Minot, North Dakota.
- March 2008: Terrestrial Team Meeting in Bismarck, North Dakota.
- March 11–13, 2008: Coal Ash Professionals Training Course in San Antonio, Texas.
- March 11–14, 2008: Calgary–Zama meeting/Hycal Lab tour.
- March 12–13, 2008: World Resources Institute CCS Stakeholder Workshop in Washington, D.C.
- March 12–14, 2008: Office of Science Basic Energy Sciences Annual Geosciences Symposium, Courtyard Marriott Gaithersburg Washingtonian Center, Maryland, located northwest of Washington, D.C.
- March 17–20, 2008: Gasification Workshop in Denver, Colorado.
- March 18, 2008: North Dakota Climate Change Dialogue in Fargo, North Dakota.
- March 18–20, 2008: Gasification 2008 The Path Forward in Denver, Colorado.
- March 25, 2008: Met with Lynn Helms and UIC staff in Bismarck, North Dakota.
- March 25–28, 2008: 2008 RCSP Peer Review (IEA GHG Review) in Washington, D.C.

- March 26, 2008: Hearing on the challenges to rapid deployment of carbon capture and storage technologies in Bismarck, North Dakota.
- March 28, 2008: North Dakota Science Teacher Meeting in Minot, North Dakota.

Materials presented at these meetings are available to partners on the PCOR Partnership DSS Web site (http://gis.undeerc.org/website/pcorp/).

REFERENCES

None.