October 31, 2008

AAD Document Control
U.S. Department of Energy
National Energy Technology Laboratory
PO Box 10940, MS 921-107
Pittsburgh, PA 15236-0940

Dear AAD Document Control:

Subject: EERC Plains CO_2 Reduction Partnership (PCOR) Phase III Deliverable D58/59 and Phase II Deliverable D3 Quarterly Technical Progress Report for the Period July 1 – September 30, 2008; DOE Cooperative Agreement No. DE-FC26-05NT42592; EERC Funds 9697 and 9850

Enclosed is a hard copy of the Quarterly Technical Progress Report, which includes the Request for Patent Clearance Form for the PCOR Partnership Program. The Quarterly Technical Progress Report is for Phases II and III. Also enclosed is a disk containing the 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,

Edward N. Steadman
PCOR Partnership Manager
EERC Senior Research Advisor

ENS/sah

Enclosures

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Sheryl Landis, EERC (patent clearance form)

c: Corey Irion, EERC

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U.S. DEPARTMENT OF ENERGY

REQUEST FOR PATENT CLEARANCE FOR RELEASE OF CONTRACTED RESEARCH DOCUMENTS

♦Award No. DE-FC26-98FT40321
Name & Phone No. of DOE COR Darin Damiani (304) 285-4398

TO: ■ For Technical Reports
AAD Document Control
MS 921-107
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A. AWARDEE ACTION (AWARDEE COMPLETES PART A. 1-5)

1. Document Title: Plains CO_2 Reduction Partnership Phases II and II

2. Type of Document: ■ Technical Progress Report ☐ Topical Report ☐ Final Technical Report

☐ Abstract ☐ Technical Paper ☐ Journal Article ☐ Conference Presentation
Other (please specify) _____

3. Date Clearance Needed: _____

♦4. Results of Review for Possible Inventive Subject Matter:

a. ■ No Subject Invention is believed to be disclosed therein.

b. ☐ Describes a possible Subject Invention relating to _____

i. Awardee Docket No.: _____

ii. A disclosure of the invention was submitted on _____

iii. A disclosure of the invention will be submitted by the following date: _____

iv. A waiver of DOE's patent rights to the awardee: ☐ has been granted, ☐ has been applied for, or

☐ will be applied for by the following date: _____

♦5. Signed _____ Date _____
(Awardee)

Name & Phone No. Sheryl E. Landis (701) 777-5124

Address Energy & Environmental Research Center, 15 North 23rd Street, Stop 9018, Grand Forks, ND, 58202-9018

B. DOE PATENT COUNSEL ACTION

☐ Patent clearance for release of the above-identified document is granted.

☐ Other: _____

Signed _____ Date _____
(Patent Attorney)

Must be completed by the awardee.

PLAINS CO_2 REDUCTION PARTNERSHIP PHASE II AND III

Quarterly Technical Progress Report
(for the period July 1 – September 30, 2008)

Prepared for:

AAD Document Control

U.S. Department of Energy
National Energy Technology Laboratory
PO Box 10940, MS 921-107
Pittsburgh, PA 15236-0940

Agreement No. DE-FC26-05NT42592; EERC Funds 9697and 9850
DOE Project Manager: Darin Damiani
Principal Investigator: Edward Steadman

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October 2008

DOE DISCLAIMER

EERC DISCLAIMER

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July 1 – September 30, 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 BPs, that will run from October 1, 2005, to September 30, 2009. The EERC was awarded a contract for Phase III activities in late September 2007. Phase III is a 10-year project, in three BPs, running from October 1, 2007, to September 30, 2017. This progress report summarizes the activities for the reporting period (July 1 – September 30, 2008) for Phases II and III.

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. The activities for Phase III of the PCOR Partnership include two large-volume sequestration demonstration tests (Figure 1) along with continued regional characterization and outreach. Thirteen tasks will be implemented; see Table 2 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	Wes Peck
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

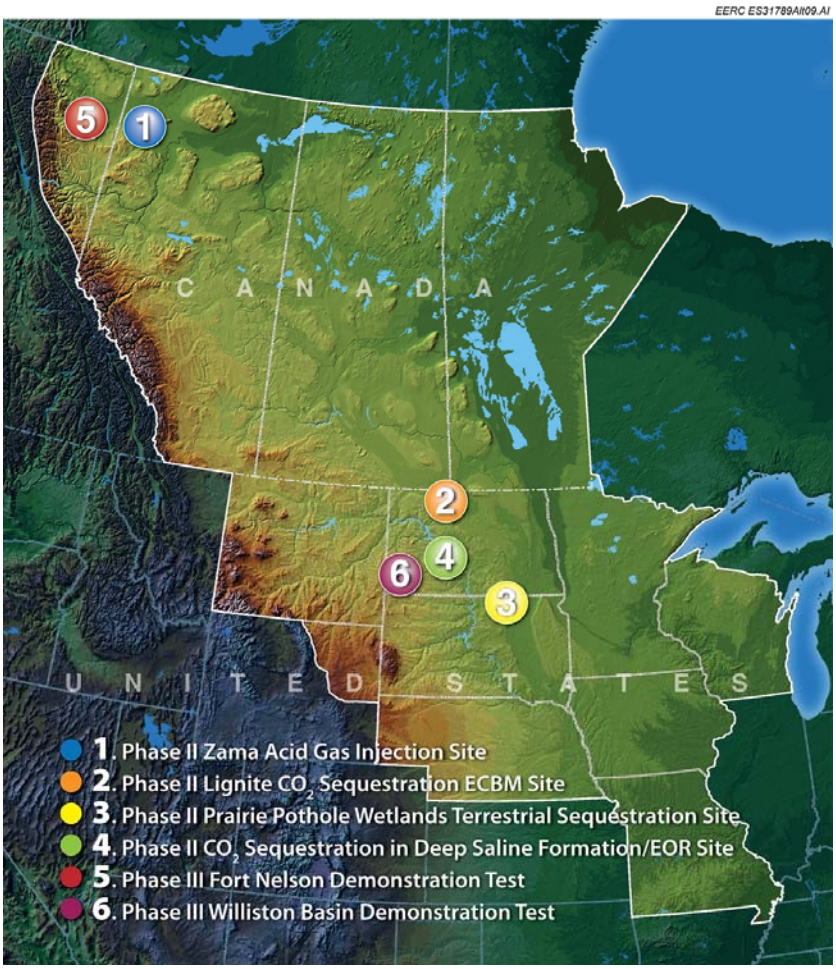

Figure 1. PCOR Partnership Phase II validation test sites and Phase III demonstration test sites.

Table 2. Phase III Responsibility Matrix

Phase III Task Description	Responsible Party
Task 1 – Regional Characterization	Wes Peck
Task 2 – Public Outreach and Education	Dan Daly
Task 3 – Permitting and Compliance (NEPA)	Lisa Botnen
Task 4 – Site Characterization and Modeling	Jim Sorensen
Task 5 – Well Drilling and Completion	TBA
Task 6 – Infrastructure Development	Melanie Jensen
Task 7 – CO_2 Procurement	John Harju
Task 8 – Transportation and Injection Operations	TBA
Task 9 – Operational Monitoring and Modeling	TBA
Task 10 – Site Closure	TBA
Task 11 – Postinjection Monitoring and Modeling	TBA
Task 12 – Project Assessment	Stephanie Wolfe
Task 13 – Project Management	Ed Steadman

SUMMARY OF SIGNIFICANT PHASE II ACCOMPLISHMENTS

Task 1 – Project Management and Reporting

Phase II of the PCOR Partnership grew from 76 partners in the reporting period April 1 – June 30, 2008, to 81 partners in the July 1 – September 30, 2008 reporting period. The latest partners include ALLETE; BNI Coal, Ltd.; Manitoba Geological Survey; Computer Modelling Group, Inc.; and Biorecro AB. Phase II members in good standing are automatically enrolled in Phase III for the first budget period (BP) that overlaps with the last 2 years of Phase II (October 1, 2007 – September 30, 2009).The membership, as of September 30, 2008, is listed in Table 3.

The deliverable entitled "D3: Task 1 – Quarterly Progress Report/Milestone Quarterly Report for Year 3 – Quarter 3" was submitted to DOE for approval on June 30, 2008.

Table 3. PCOR Partnership Membership, Phase II/Phase III

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

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, evaluation of oil fields in the Williston Basin that may be suitable candidates to host the Task 2 injection and monitoring, mitigation, and verification (MMV) activities continued. Efforts are focused on developing baseline characterization data for fields in the Cedar Creek Anticline area, the Billings Anticline–Dickinson area, along the Nesson Anticline, and the Northeast Flank. Specifically, efforts were focused on developing petrophysical models of the Rival oil field in the Northeast Flank area and a group of oil fields in the Dickinson area that are comprised of carbonate mud mounds. These oil fields have been determined to be potential host sites for the Phase II demonstration. Laboratory-based tests were also conducted. 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 the first quarter of 2008, and results were anticipated in the late summer of 2008. However, problems with equipment over the summer resulted in delays of the laboratory work, and final results are now expected to be available in December 2008.

Task 3 – Field Validation Test at Zama, Alberta

Injection of acid gas has continued during this reporting period. A cumulative total of 385 million cubic feet (approximately 20,000 tons) of gas has been injected, with an average composition of 80% CO_2 and 20% hydrogen sulfide (H_2S). This equates to approximately 16,000 tons of CO_2 sequestered throughout the 650-day operational period. Injection rates throughout this reporting period fluctuated because of operational maintenance shutdowns and reconfiguration of the production well. Following this work-over, a brief period of oil production was seen by the operator. Figure 2 illustrates the cumulative injection profile from inception through September 2008.

Task 4 – Field Validation Test of North Dakota Lignite

During this quarter, a formation water sample was submitted to the U.S. Environmental Protection Agency (EPA) in support of the aquifer exemption request. This is part of the underground injection control (UIC) application for CO_2 injection. Nitrogen fracture injection/fall-off tests (NFIT) were conducted on three of the wells to derive in situ aquifer parameters of the lignite. The results indicate an average initial reservoir pressure of p_i = 340 psia, which is significantly lower than the estimated hydrostatic pressure.

For the most part, well development is complete, and the wells are being readied for CO_2 injection and monitoring. Negotiations are complete with Praxair to supply and inject CO_2 at the site.

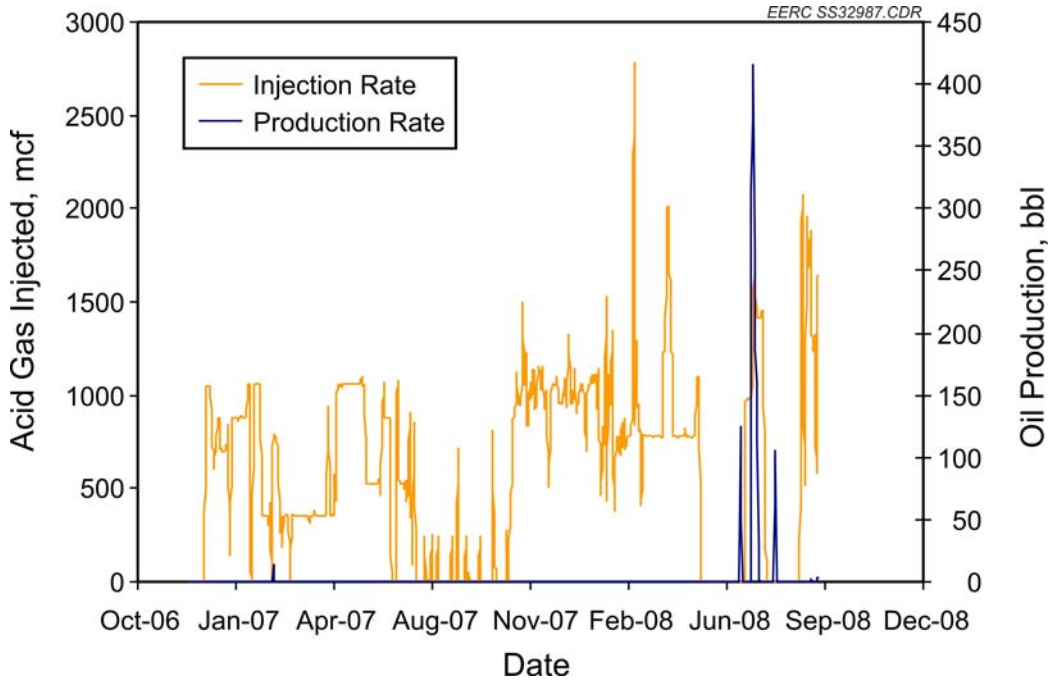

Figure 2. Zama "F" Pool acid gas injection profile.

Task 5 – Terrestrial Validation Test

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

- The geodatabase for the Oracle Ecoasset Carbon Module was tested by directly loading existing polygon-based carbon units and using distributed geodatabase workflows. Tabular relationships were built between the polygon feature class and form-side tables to ensure the attribute data accuracy. Geometry accuracy was ensured by building topological rules. The first phase of development of an ArcGIS Server Web-based mapping application took place during the last quarter which will be integrated into the Oracle application (Figure 3). Queries can now be made that allow the user to view the carbon unit boundaries associated with a project number or carbon transaction. The application has been successfully deployed and tested in a development environment.
- Modifications were made to the carbon offset Bill of Sale/Greenhouse Gas (GHG) Conveyance legal document to clarify transfer of ownership of both GHG rights as well as carbon credits generated on properties.
- Approximately 130,000 tons of native grassland carbon offsets generated in the PCOR Partnership region by PCOR Partnership partners was sold to American International Group, Inc. (AIG) in September 2008. The legal instruments and database tools developed during Phase II of the PCOR Partnership grant were used to ensure a smooth transaction and efficient reporting.

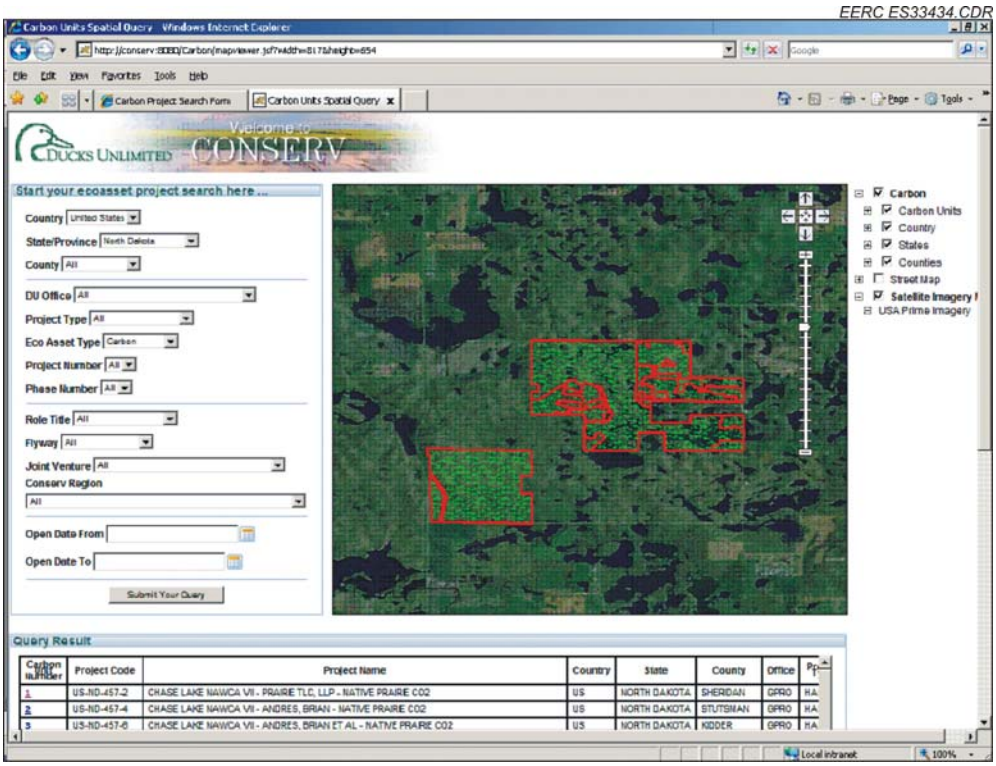

Figure 3. Carbon database module Web-mapping application.

Grassland sampling was completed in northeastern North Dakota study areas in Benson, Cavalier, Eddy, Nelson, Ramsey, and Towner Counties. A total of 278 soil samples were collected from 139 sampling sites representing 1390 acres. Sampling was also completed at sample sites located in northern Iowa and southern Minnesota. A total of 480 soil samples were collected from 240 sampling sites representing 2400 acres sampled. All samples were processed, and carbon analysis was completed for samples collected in northeastern Montana and northeastern North Dakota.

Task 6 – Characterization of Regional Sequestration Opportunities

Work in Task 6 during this reporting period included the initiation of a major remodel of the PCOR Partnership Decision Support System (DSS, © 2007 EERC Foundation).

Basic stratigraphic data collection was completed for reconnaissance-level evaluation of the Mississippian Mission Canyon Formation, the Ordovician Winnipeg Group, and the Cambrian Deadwood Formation in the Washburn region of North Dakota. These stratigraphic horizons represent the final saline sequestration zones that will be part of the overall Washburn area study. The Washburn study area focuses on zones of porosity/permeability amenable to CO_2 sequestration. The study uses a map-based approach coupled with Monte Carlo uncertainty analysis.

Iowa has completed the compilation, review, and creation of geographic information system (GIS) files for the Ordovician and Mississippian mapping unit isopach maps. This effort included reviewing key well cutting sets, cores, geophysical logs, and tests.

Task 7 – Research Safety, Regulatory, and Permitting Issues

During this reporting period, a formation water sample was submitted to EPA in support of the PCOR Partnership's request for an aquifer exemption for the lignite field validation test. Injection activities are on hold pending this approval from EPA.

Additionally, a thorough review of EPA's proposed rules for regulating geological sequestration under the UIC program was completed. A spreadsheet that compares and contrasts the EPA-proposed rules with World Resources Institute (WRI) Guidelines and Interstate Oil and Gas Compact Commission (IOGCC) model rules was developed, and a draft of this document was provided to interested PCOR Partnership members at the PCOR Partnership Annual Meeting. Draft comments on EPA's proposed rules have been developed and submitted to an ad hoc committee of PCOR Partnership members. As input from PCOR Partnership members is received, the comments continue to be refined.

Task 8 – Public Outreach and Education

During the reporting period, the documentary "Out of the Air – Into the Soil: Land Practices That Reduce Atmospheric Carbon Levels" was completed and broadcast; arrangements continued to obtain interviews and cover footage for the "Geologic Sequestration" documentary; planning continued for the final television documentary under this task; and activities were initiated for the PowerPoint update.

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

During the reporting period, a draft report providing a preliminary economic assessment of the most likely early regional sequestration opportunities in the PCOR Partnership was completed (submitted on July 31, 2008). The draft report (deliverable D44), "Phase II Best Practice Manual: Regional Sequestration Opportunities," covers the following topics:

- An overview of PCOR Partnership regional sources.
- Matches between regional source types and appropriate capture technologies.
- Cost and power requirements for various levels of CO_2 capture at the PCOR Partnership region electricity-generating plants.
- Cost and power requirement for CO_2 capture at the PCOR Partnership region ethanol facilities.
- Cost and possible route for a regional CO_2 pipeline network.

Task 10 – Regional Partnership Program Integration

Participation in conference calls for the Outreach, GIS, Geologic, and Modeling Work Groups also continued. On March 3 and 4, 2009, the 4th Annual Southeast Regional Carbon

Sequestration Partnership Stakeholders' Briefing is being held in College Park, Georgia. A representative from the PCOR Partnership is planning to attend this meeting to enhance relationships between the other RCSPs.

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 PCOR Partnership 2008 Annual Meeting was held September 16–18, 2008, in Maple Grove, Minnesota. We are currently constructing a link on the PCOR Partnership DSS that summarizes the meeting and posts the presentations from the meeting.
- The second edition (revised) of the PCOR Partnership Regional Atlas is complete and was distributed at the PCOR Partnership 2008 Annual Meeting. It is also being added to the PCOR Partnership DSS Web site.
- Prairie Public Broadcasting (PPB) premiered "Out of the Air – Into the Soil: Land Practices That Reduce Atmospheric Carbon Levels" on Friday, September 26, 2008, at 8:30 p.m. Central Daylight Time. The documentary was distributed at the PCOR Partnership 2008 Annual Meeting. It will also be added to the PCOR Partnership Web site as streaming video soon.
- We are currently reviewing the final draft document entitled "Monitoring, Verification, and Accounting (MVA) of CO_2 Stored in Deep Geologic Formations." Comments are due October 3.

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, laboratory tests continued to examine the geochemical interactions between CO_2, saline water, and rocks. Rock examined included carbonate rocks that are representative of reservoir rocks being considered as potential target injection zones for the Williston Basin demonstration. Anhydrites and shales that may act as cap rocks have also been examined. Preliminary results indicate that some changes in mineral composition can and do occur. It is anticipated that a series of these tests, using a variety of rock types, will continue to be conducted over the summer and fall of 2008, with the primary purpose being the development of rate of reaction data that can be used to refine geochemical models.

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.

Recent activities have also focused on further characterization of the overall strength of the cap rock and the likelihood of failure. In July 2008, an in situ stress test was conducted on the Muskeg anhydrite formation that acts as the sealing formation for the Keg River reservoir. The test utilized Schlumberger's Modular Formation Dynamics Tester wire line tool to inject approximately 5 liters of water into the formation to determine the maximum horizontal stress of the anhydrite. Three intervals were tested in the cap rock at pressures exceeding 5000 psi. This represents a pressure of approximately 3000 psi above the permitted injection pressure at the site. Preliminary results confirm that the cap rock is extremely competent as evidenced by the inability to fracture the first two anhydrite intervals tested. The third interval tested was a dolomite stringer (encased in anhydrite) within the cap rock that was fractured at the previously mentioned pressure. Final results will be used in the geomechanical modeling activities to better understand the maximum injection thresholds of the pinnacle.

During this reporting period, final planning was taking place for the acquisition of core from an acid gas disposal zone. This core will be utilized for analytical geochemical and geomechanical evaluations to better understand the effect of acid gas disposal on carbonate rocks. It is anticipated that core will be collected in early October 2008 from the Slave Point reservoir in the Zama Field. This is a dolomite and limestone gas-producing reservoir analogous to many injection targets found throughout the PCOR Partnership region.

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:

- Well development activities on all wells are nearly complete. All have been acidized and swabbed rigorously.
- Discussions are ongoing with Pinnacle and Schlumberger with regard to MMV activities. Pending equipment availability and injection schedule, it is anticipated Pinnacle will provide microseismic monitoring with tiltmeters. Schlumberger will conduct cross well seismic surveys prior to and after injection.
- Additional water samples have been taken from shallow groundwater wells in the vicinity of the project site. This activity will add to baseline data and bolster efforts to obtain an EPA aquifer exemption for the coal seam targeted for injection.
- Geophysical logs from the five test wells have been evaluated in detail to derive correlations for petrophysical properties for the numerical model of the coal seam. Field

test results have been critically reviewed to provide additional input data for the numerical model.

- Reservoir simulations have been initiated and have indicated that in the absence of reservoir heterogeneity, structure has the most pronounced effect on CO_2 plume migration.
- Additional laboratory tests have been conducted for the purpose of refining the model.
- Additional gas samples from the wells have been obtained and analyzed.
- Negotiations are complete with Praxair to supply and inject CO_2 at the site. A meeting was held on-site with Praxair and research staff to discuss the time line and logistics of injection.
- Nitrogen fracture NFIT was conducted on three of the wells, the injector, and two monitoring wells. The preliminary results indicate an average reservoir pressure of p_i = 340 psia, which is significantly lower than the estimated hydrostatic pressure.
- A formation water sample was submitted to EPA in support of the aquifer exemption request. This is part of the UIC application for CO_2 injection.
- Presentations on the progress of the project were given at the PCOR Partnership 2008 Annual Meeting in Maple Grove, Minnesota, and at the North Dakota Association of Oil and Gas Producing Counties Annual Meeting in Minot, North Dakota.
- Well and site preparation continues in order to get ready for CO_2 injection.
- Numerous meetings have been conducted with various partners and field service providers to discuss the logistics of CO_2 injection and MMV activities.
- Downhole monitoring equipment has been received. System deployment is ongoing. The system will collect temperature, pH, conductivity, and pressure data.

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 local and regional scale) that will result in GHG reductions. Ongoing activities and accomplishments for the period are listed below:

- Progress has been made toward community, climate, and biodiversity (CCB) verification of carbon offsets from native prairie preservation. PCOR Partnership partners are developing a project description document to submit for third-party approval by the CCB Alliance.
- Satellite imagery purchased for a land use change model for the U.S. and Canadian Prairie Pothole Region (PPR) is being processed. 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.).
- A comparison of soil carbon models applicable to the PCOR Partnership region continues to be performed. The models are CENTURY, DAYCENT, Comet-VR, and C-LOCK. Results are being compared with other published literature on soil carbon

sequestration rates and land use/conversion rates and their applicability to different carbon standards and registries. A draft fact sheet is undergoing internal review.

- Analyses of grassland samples collected in North Dakota and Iowa continue. Approximately 90 deep cores were collected for soil characterization. The processing of theses cores has been initiated and is ongoing.
- PCOR Partnership partners are working on the development of a model to evaluate carbon sequestration in wetlands. The model will be developed at the field scale with specific landowner information used to set parameters and coefficients. Work continues to progress on development of area calculations and formulas for determining land units affected by various wetland restoration actions.
- Wetland catchment GHG flux sampling occurred biweekly on the Goebel Ranch and throughout the Ipswich Grasslands areas in South Dakota during the months of July and August 2008. There were 1800 gas samples collected from 17 wetland catchments over that period of time. These samples have been sent out for analysis. Additionally, information on soil moisture, soil and water temperature, water depth, and vegetative cover type of each catchment were obtained during each sampling event. In September, all gas-sampling and soil-monitoring equipment was removed from the catchments.
- 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.

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 DSS. Progress within the period included the following:

- Iowa Department of Natural Resources – Geological Survey (IGS) has completed the compilation, review, and creation of GIS files for the Ordovician and Mississippian mapping unit isopach maps. This effort included reviewing key well cutting sets, cores, geophysical logs, and tests.
- IGS completed a review of old publications and pre-WWII annual reports for information on water well production, quality, and heads for Paleozoic strata in the southwestern portion of the state.
- The IGS completed draft total dissolved solids (TDS) and potentiometric maps for Mississippian strata. Insufficient data and common dual-well completions do not allow mapping the Upper and Lower Mississippian separately for these parameters.
- IGS is continuing with the synthesis of Pennsylvanian coal strata and cumulative coal thickness, including digitizing stratigraphically key horizons.
- A major remodel of the PCOR Partnership DSS is under way.
- Review and collection of the latest oil field/pool information needed to calculate potential sequestration capacity and EOR potential are nearly complete for North Dakota.

- Updated cumulative oil, gas, and water production for the fields and pools in the states and provinces of the PCOR Partnership region, except for Alberta, is also nearly complete.

Basic stratigraphic data collection was completed for reconnaissance-level evaluation of the Mississipian Mission Canyon Formation, Ordovician Winnipeg Group, and Cambrian Deadwood Formation in the Washburn region of North Dakota. These stratigraphic horizons represent the final saline sequestration zones that will become part of the overall Washburn area study. The Washburn study area focuses on zones of porosity/permeability amenable to CO_2 sequestration. The study uses a map-based approach coupled with Monte Carlo uncertainty analysis.

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:

- Development of deliverable D40, the National Environmental Policy Act (NEPA) document for the Williston Basin Validation Test, is ongoing.
- Provided additional review of WRI Guidelines for the Carbon Capture and Sequestration document.
- Continued review of EPA's Advance Notice on Proposed Rulemaking (ANPR) for regulating GHG emissions under the Clean Air Act.
- Form 4, Sundry Notice has been submitted to the North Dakota Industrial Commission (NDIC) for the Lignite Field Validation Test to document work that has been completed on State of North Dakota Well 36-16.
- Completed a review of the regulatory and economics section of the International Energy Agency's (IEA's) "Draft Aquifer Storage – Development Issues" document.
- A thorough review of EPA's proposed rules for regulating geological sequestration under the UIC program was completed. A spreadsheet that compares and contrasts the EPA-proposed rules with WRI Guidelines and IOGCC model rules was developed, and a draft of this document was provided to interested PCOR Partnership members at the annual meeting. Draft comments on EPA's proposed rules have been developed, and submitted to an ad hoc committee of PCOR Partnership members. Participated in a conference call with a task force that is working on geologic sequestration legislation for the state of North Dakota.
- Reviewed Legal Barriers to Carbon Capture Report that was completed by Alston & Bird.
- A formation water sample was submitted to the NDIC in support of the aquifer exemption request for the Lignite Field Validation Test. This is part of the UIC application for CO_2 injection.
- Various state, provincial, and regional GHG reduction and carbon capture and sequestration (CCS) initiatives are being tracked and analyzed.
- Analysis of carbon market strategies continues.

- Legislative actions occurring in Congress continue to be followed.
- Review of recent publications relating to regulating CO_2 sequestration and MMV issues continues.

Task 8 – Public Outreach and Education

The goals of the PCOR Partnership's Public Outreach and Education task 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.

"Out of the Air – Into the Soil: Land Practices That Reduce Atmospheric Carbon Levels" was broadcast in the PPB region on September 26, 2008; and 1000 DVDs were prepared, complete with packaging and inserts. The 30-minute documentary contains segments on forest restoration in Brazil, forest restoration in the lower Mississippi Valley, fire management in California, wetland restoration, prairie preservation, and minimum till agriculture in the northern Great Plains.

Work continued on the documentary (deliverable D46) entitled "Geologic CO_2 Sequestration." During this period arrangements for additional interviews were made, and animation needs were refined. The documentary is scheduled for DOE review by December 31, 2008. Planning continued on the final documentary due to DOE for review at the end of August 2009. The documentary will contrast and compare the implications of reducing carbon emissions for families in the United States, a developing nation, and an underdeveloped nation.

Activities were initiated on an update of the Public Outreach PowerPoint. The PowerPoint is due for DOE review by December 31, 2008. Activities were initiated on the major update of the public Web site that is due to DOE for review at the end of February 2009. The update will include a new look for the homepage, video clips, and an expanded section on sequestration tests and demonstrations.

In addition, members of the outreach team took part in the monthly conference calls and related activities of the outreach working group.

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. During this reporting period, a draft report entitled "Phase II Best Practice Manual: Regional Sequestration Opportunities," which addresses all of the Task 9 goals and objectives, was prepared and submitted.

The accuracy of the latitudinal and longitudinal coordinates of the locations of each CO_2 source contained in the PCOR Partnership source database was verified to the extent possible using Google Earth.

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. The PCOR Partnership plans on attending the Southeast Regional Carbon Sequestration Partnership 4th Annual Stakeholders' Briefing on March 3 and 4, 2009. The PCOR Partnership continued participation in working group conference calls, including the following:

- GIS
- Capture and transportation
- Geologic (the PCOR Partnership Geologic Working Group meeting was also held September 17, 2008, in Maple Grove, Minnesota)
- Outreach

Activities during this reporting period also included the following:

- The PCOR Partnership submitted a proposal to the IEA's GHG Programme Storage Capacity Coefficients request. The proposal was chosen by IEA on July 22, 2008.
- The draft of WRI's Sequestration Guidelines was received on May 13, 2008, for review. Two rounds of comments were sent back in July.
- A poster presentation was completed for Marathon Oil. On July 22, 2008, Marathon showcased initiatives and research results that the PCOR Partnership is conducting in the Williston Basin.
- Preparations for the Regional Partnerships' Annual Review Meeting (October 6–8, 2008, in Pittsburgh, Pennsylvania) are currently under way.
  - Project fact sheets are being updated for submission by September 19, 2008.
  - Three poster boards (on the geologic sequestration projects and a summary of the terrestrial sequestration) are also being developed.
  - The PCOR Partnership will also give presentations on the following topics:
    - Williston Basin Coal Seam Injection Test (to be given on October 6, 2008)
    - Zama–Keg River Formation (to be given on October 6, 2008)
    - Overview of the PCOR Partnership (to be given on October 7, 2008)

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 4.

Table 4. Phase II Budget and Actual Costs Incurred

Organization	Approved Budget	Actual Costs Incurred
DOE Share – Cash	$15,913,178	$10,133,942
Nonfederal Share – Cash	$2,321,410	$1,420,400
Nonfederal Share – In-Kind	$7,825,301	$9,438,385
Total	$26,059,889	$20,992,727

PHASE II SCHEDULE STATUS

Table 5 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 deliverables and milestones have been extended and approved by DOE. See Tables 5 and 6 for a listing of all deliverables and milestones by quarter, with completion dates, for the duration of the project.

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

Efforts are under way to work with Encore Acquisition Company to conduct an injection project that would effectively replace the previously planned activities at the Beaver Lodge oil field. Other oil companies operating in North Dakota have also been contacted, and discussions regarding their ability to host the Phase II Williston Basin demonstration have been initiated. Efforts are focused on working with Encore and other oil companies to identify a site or sites where the injection project could be conducted.

Delays have also occurred with respect to some of 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 the first quarter of 2008, and results were anticipated in the late summer of 2008. However, problems with equipment over the summer resulted in delays of the laboratory work, and final results are now expected to be available in December 2008.

Task 3 – Field Validation Test at Zama, Alberta

Nothing to note at this time.

Task 4 – Field Validation Test of North Dakota Lignite

Injection activities are on hold for the lignite field validation test pending EPA approval of the PCOR Partnership's aquifer exemption request.

Table 5. 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 Earned Value Management (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
D22: Task 8 – Web Site Update	8/31/06	8/31/06

Continued…

Table 5. Phase II Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
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
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

Continued…

Table 5. Phase II Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 2 – Quarter 4 (July–September 2007), continued		
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 – Documentary: 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	4/30/08
D39: Task 8 – Documentary: Terrestrial CO_2 Sequestration	4/30/08	4/30/08
M10: Task 8 – Documentary: Terrestrial CO_2 Sequestration Reported	4/30/08	4/30/08
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	5/30/08	5/30/08
Year 3 – Quarter 4 (July–September 2008)		
D3: Task 1 – Quarterly Report	7/31/08	7/31/08
D44: Task 9 – Best Practice Manual: Regional Sequestration Opportunities	7/31/08	7/31/08
Year 4 – Quarter 1 (October–December 2008)		
D3: Task 1 – Quarterly Report	10/31/08	
D40: Task 2 – Williston Basin Field Validation Test Regulatory Permitting Action Plan	11/28/08	
D41: Task 2 – Williston Basin Field Validation Test NEPA Compliance Document	11/28/08	
M11: Task 2 – Williston Basin Field Validation Test NEPA Compliance Document	11/28/08	
D42: Task 2 – Williston Basin Field Validation Test Experimental Design Package	12/31/08	
D43: Task 2 – Williston Basin Field Validation Test Site Health and Safety Plan	12/31/08	
D46: Task 8 – Documentary: Geologic Sequestration	12/31/08	
D17: Task 8 – PowerPoint Presentation: General Audience CO_2 Sequestration Outreach	12/31/08	

Continued…

Table 5. Phase II Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 4 – Quarter 2 (January–March 2009)		
D3: Task 1 – Quarterly Report	1/31/09	
M12: Task 2 – Williston Basin Field Validation Test Outreach Action Plan	2/27/09	
D45: Task 2 – Williston Basin Field Validation Test Outreach Action Plan	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	
D47: Task 2 – Williston Basin Field Validation Test Sampling Protocols	4/29/09	
M13: Task 2 – Williston Basin Field Validation Test Sampling Protocols Completed	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	
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	
D51: Task 8 – Documentary: CO_2 Sequestration and Global Warming – Overview of Phase II Results for Regional Partnership	8/31/09	
D22: Task 8 – Web Site Update	8/31/09	
D55: Task 2 – Williston Basin Field Validation Test Regional Tech. Implementation Plan	8/31/09	
D56: Task 1 – Phase II Final Report	9/30/09	
D3: Task 1 – Quarterly Report	10/31/09	

Table 6. PCOR Partnership Phase II Milestones and Deliverables (Gantt chart)

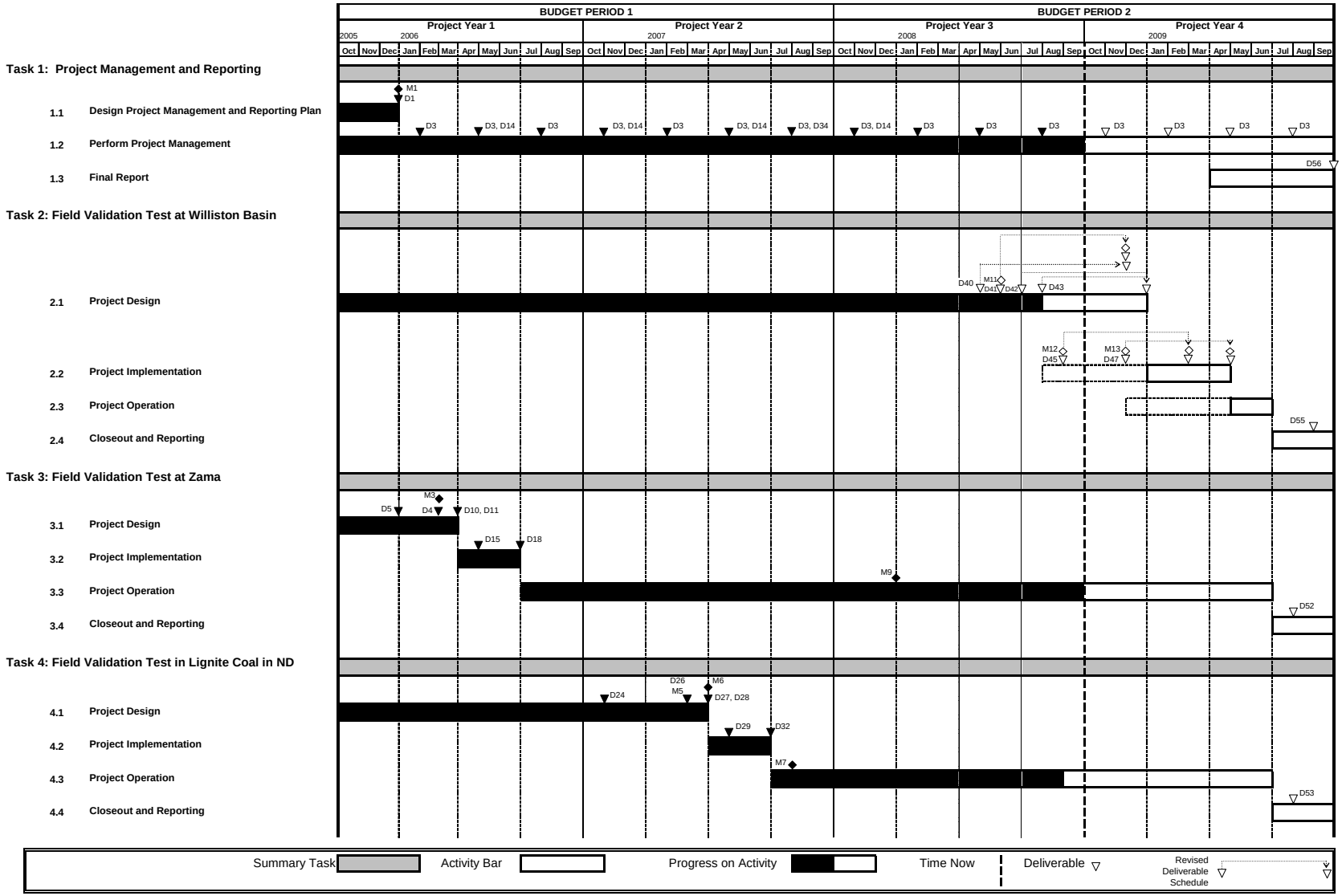

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Table 6. PCOR Partnership Phase II Milestones and Deliverables (Gantt chart) (continued)

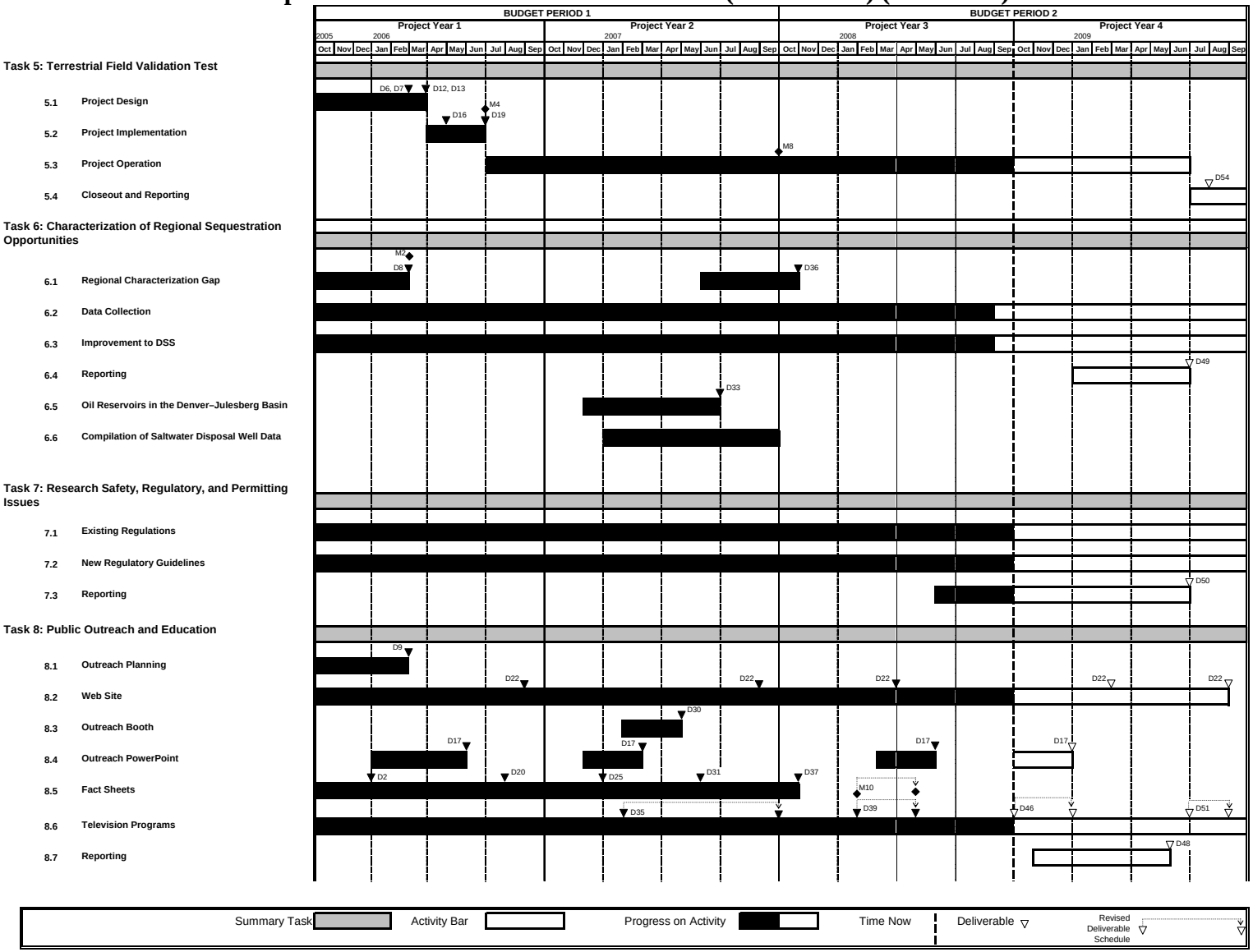

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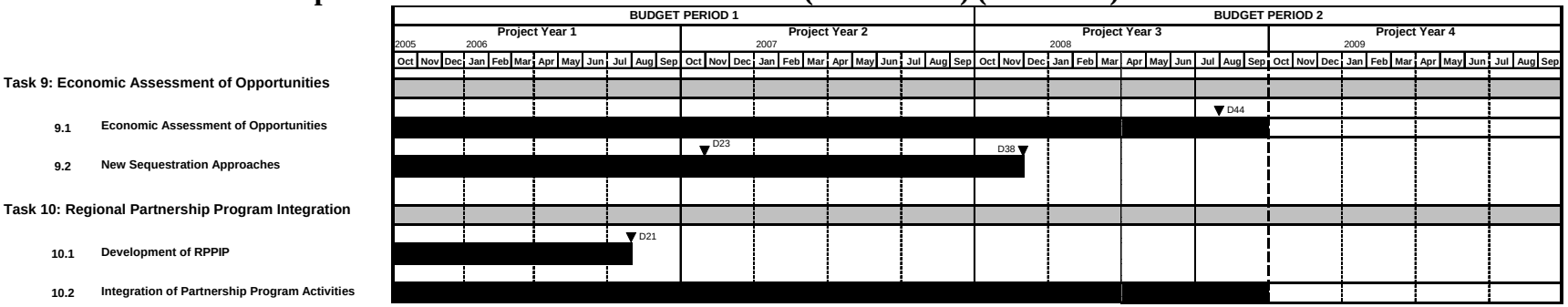
Table 6. PCOR Partnership Phase II Milestones and Deliverables (Gantt chart) (continued)



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 6 – Regional CO_2 Sequestration Potential – Field Validation Tests	D31 Fact Sheet 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 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 12 – CO_2 Sequestration Validation Test in a Deep Oil Field in the Williston Basin	M8 Fact Sheet 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 & Safety Plan	D39 Video 2 – Terrestrial CO_2 Sequestration	M10 Video 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 & 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 & 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 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 7 – Zama Acid Gas Project	D49 Regional Atlas	
D21 Regional Partnership Program Integration Plan	D50 Road Map Document	
D22 Web Site Update	D51 Video 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 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 & Safety Plan	D56 Final Report	
D28 Lignite Field Validation Test Site – Regulatory Permitting Action Plan		
D29 Lignite Field Validation Test Site – Outreach Action Plan		

Task 5 – Terrestrial Validation Test

Nothing to note at this time.

Task 6 – Characterization of Regional Sequestration Opportunities

The conversion effort of the interactive GIS portion of the DSS to a .NET-based framework has been on hold pending the acquisition of the necessary software. The software was finally secured in late September; thus this activity can begin in earnest.

Task 7 – Research Safety, Regulatory, and Permitting Issues

Injection activities are on hold for the lignite field validation test pending EPA approval of the PCOR Partnership's aquifer exemption request.

Task 8 – Public Outreach and Education

Difficulty was encountered in scheduling interviews and filming locations. As a result, the remainder of the interviews and location work will be scheduled for the late fall for the "Geologic Sequestration" documentary (deliverable D46).

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 June 30, 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" has been submitted as an American Association of Petroleum Geologists (AAPG) paper and is scheduled to be published in the fourth quarter of 2008. 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 PCOR Partnership Annual meeting in September.

Task 4 – Field Validation Test of North Dakota Lignite

Presentations on the progress of the project were given at the PCOR Partnership 2008 Annual Meeting in Maple Grove, Minnesota, and at the North Dakota Association of Oil and Gas-Producing Counties Annual Meeting in Minot, North Dakota.

Task 5 – Terrestrial Validation Test

PCOR Partnership partners presented a paper at the Association of State Wetland Managers meeting in Portland, Oregon, on September 16. The paper covered information on carbon sequestration and market potential for wetlands, entitled "Technical, Regulatory, and Economic Feasibility of Wetlands as a Greenhouse Gas Mitigation Strategy." The presentation featured results of the PCOR Partnership field test sites and a comparison of other wetland sequestration rates and references available to date. This paper will be submitted for peer review to either the *Journal of Environmental Management* or *Wetlands (Society of Wetland Scientists Journal)* early next year. The paper reviews the existing carbon market rules and project methods for terrestrial carbon offsets and relates these to wetland management and sequestration characteristics.

PCOR Partnership partners continue to market carbon offsets to potential investors and will develop a communications and marketing strategy related to a new campaign "Rescue the Duck Factory" that will include promoting PCOR Partnership region grassland carbon offset opportunities to corporations and business partners.

Task 6 – Characterization of Regional Sequestration Opportunities

The third PCOR Partnership geology work group meeting was held in September in conjunction with the PCOR Partnership 2008 Annual Meeting. The meeting was an opportunity for EERC researchers and PCOR Partnership subcontractors working on geologic sequestration assessments to share recent findings with other geologists and geologic and petroleum engineers.

Task 7 – Research Safety, Regulatory, and Permitting Issues

A spreadsheet that compares and contrasts the EPA-proposed rules for geologic sequestration with WRI Guidelines and IOGCC model rules was developed, and a draft of this document was provided to interested PCOR Partnership members at the annual meeting. Draft comments on EPA's proposed rules have been developed and submitted to an ad hoc committee of PCOR Partnership members.

Task 8 – Public Outreach and Education

A presentation on the task activities was given at the PCOR Partnership 2008 Annual Meeting in September.

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

The deliverable D44 draft report "Phase II Best Practice Manual: Regional Sequestration Opportunities" was prepared and submitted to DOE for approval on July 31, 2008.

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:

- June 29 – July 2, 2008: 4th International Symposium on Energy, Informatics, and Cybernetics: EIC '08 in Orlando, Florida
- July 7–11, 2008: Meeting with partners to discuss Phase III demonstration and Zama project in Calgary, Alberta
- July 8–11, 2008: Computer Modeling Group Ltd. Technical Symposium in Calgary, Alberta
- August 5, 2008: Project meeting with Praxair in Minot, North Dakota
- August 5–8, 2008: Meeting with partners to discuss the Fort Nelson and Zama Projects in Calgary, Alberta
- August 13–15, 2008: Coal-Gen in Louisville, Kentucky
- August 25–28, 2008: Power Plant Air Pollutant Control "Mega" Symposium in Baltimore, Maryland
- September 16–18, 2008: PCOR Partnership Annual Meeting in Maple Grove, Minnesota
- September 24, 2008: UIC and CO_2 Geosequestration Seminar, Cincinnati, Ohio

- September 25, 2008: Presented to the North Dakota Association of Oil and Gas Producing Counties Annual Meeting in Minot, North Dakota
- September 30, 2008: Attended EPA public meeting on proposed rules for geologic sequestration in Chicago, Illinois
- September 29 – October 2, 2008: Pittsburgh Coal Conference in Pittsburgh, Pennsylvania

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

REFERENCES

None.

SUMMARY OF SIGNIFICANT PHASE III ACCOMPLISHMENTS

Task 1 – Regional Characterization

A recent evaluation of the location accuracy of the CO_2 sources in the PCOR Partnership DSS database was conducted. The objective of this task was to verify the reported latitude/longitude location of each CO_2 source in the current PCOR Partnership database. The original location information was obtained from federal, state, and provincial sources (e.g., the U.S. EPA, Environment Canada). To meet this objective and ensure that the location information originally obtained from various public data sets was indeed valid, work study students were assigned the task of verifying the latitude/longitude values of each source facility plotted on an appropriate feature in an aerial photograph through the use of online global mapping applications, such as Google Earth. If the plotted location on the Web application was nowhere near a facility, the students were instructed to search a relatively local area. If, again, no facility could be found in the area, further online research was conducted to determine where the facility was located. This effort resulted in the repositioning of 755 locations. Of these modified locations, 525 were shifted by more than 0.5 kilometers; the minimum offset distance that we considered to be significant.

A prototype for the Demonstration Project Reporting System (DPRS) has been compiled. Information (e.g., reports, summaries, tables, maps, etc.) generated in conducting the Phase III demonstration tests will be managed and reported to DOE and partners through the DPRS. The DPRS will be a Web-based interface designed to provide structured access to data by all demonstration participants and other partners to facilitate communication and interpretation of these data and to allow for efficient replication of additional or related demonstration projects.

Task 2 – Public Outreach and Education

During this reporting period, work proceeded on the Outreach Information System; a general Phase III fact sheet (deliverable D14) was completed and approved; Web pages were

completed and approved for the Phase III demonstrations; and materials were completed for the Outreach Working Group (OWG).

Task 3 – Permitting and NEPA Compliance

During this reporting period, a thorough review of EPA's proposed rules for regulating geological sequestration under the UIC program was completed. A spreadsheet that compares and contrasts the EPA proposed rules with WRI Guidelines and IOGCC model rules was developed, and a draft of this document was provided to interested PCOR Partnership members at the annual meeting. Draft comments on EPA's proposed rules have been developed and submitted to an ad hoc committee of PCOR Partnership members. As input from PCOR Partnership members is received, the comments continue to be refined.

Analysis of regulatory risks is currently being conducted for the Fort Nelson project.

Task 4 – Site Characterization and Modeling

During this quarter, work began on the development of a Project Risk Assessment Plan for the Fort Nelson demonstration. Participants in the Fort Nelson Risk Assessment will include the EERC, Spectra Energy, Schlumberger, RPS Energy, Advanced Geotechnology, and Alberta Research Council. Development of deliverable D42 entitled "Williston Basin Field Validation Test Experimental Design Package" continued. Efforts were primarily focused on using well log data and field-based observations to characterize the general geological conditions of an area in southwestern North Dakota that includes several oil fields being considered for CO_2-based enhanced oil recovery activities under Phase III.

Task 5 – Well Drilling and Completion

This task has not begun (begins Quarter 2 – BP3, Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 6 – Infrastructure Development

Work on this task has been delayed while the plans for the CO_2 capture and geologic sequestration for the demonstration projects are finalized. Once the specific carbon capture and sequestration strategy for the demonstration project has been finalized, planned task activities related to CO_2 capture, compression, and pipeline design and routing can begin. In the interim, activities are being undertaken in support of the planned actions. Primary among these activities is the completion of the first year of the Ramgen Power Systems ("Ramgen") subcontract. It is hoped that Ramgen's novel shockwave-based CO_2 compression technology will be evaluated during one of the PCOR Partnership demonstration projects. Under the subcontract, Ramgen engineers have identified the specific parameters and characteristics that must be measured during such a demonstration and which will serve as guidelines for setting up the testing infrastructure as well as developing the test plan during the demonstration. Ramgen personnel also completed and verified a compression cost model that estimates increases in cost of electricity (COE) that would occur because of CO_2 capture and compression activities.

Task 7 – CO_2 Procurement

Numerous discussions with potential CO_2 suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

Task 8 – Transportation and Injection Operations

This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 9 – Operational Monitoring and Modeling

This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 10 – Site Closure

This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 11 – Postinjection Monitoring and Modeling

This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 12 – Project Assessment

This task has not begun (begins Quarter 1 – BP3, Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly and annual progress reports.

Task 13 – Project Management

Phase III of the PCOR Partnership started October 1, 2007. Phase II members in good standing are automatically enrolled in Phase III for the first BP that overlaps with the last 2 years of Phase II (October 1, 2007 – September 30, 2009). As was denoted in Table 3, the PCOR Partnership currently has 81 partners. Activities in this reporting period include the following:

- A risk management plan (RMP) outline is due within BP3. An initial draft of the RPM has been started. The risk management database research has also begun; initial contact has been made with consulting services.
- Current and pending CO_2-related projects within the PCOR Partnership region are continuously changing. To better inform our partners, a Web site is presently being developed to exhibit CO_2 projects by location, parties involved, and Web site links to learn more about them.
- Work is under way to provide our partners with a topical report on past, present, and future carbon market activities.

- Preparations for the Carbon Sequestration Development and Finance Summit (October 22–24, 2008, in Houston, Texas) are currently under way.
  - The PCOR Partnership is participating in a carbon capture and technology showcase panel discussion (October 22, 2008).
- The PCOR Partnership participated in the Carbon Management Council's Webinar on Carbon Capture and Storage on August 21, 2008.
- The project management plan (PMP) (deliverable D63) has been revised to include updates on deliverable/milestone submissions and planned risk management activities. The PMP and statement of project objectives were originally submitted to DOE in December 2007; they were both updated and submitted on September 26, 2008.

PHASE III PROGRESS OF WORK

Task 1 – Regional Characterization

The Regional Characterization task entails the review, characterization, and update of the PCOR Partnership region's CO_2 sinks and sources for inclusion in the DSS. Activities in this reporting period include the following:

- The Missouri Department of Natural Resources Division of Geology and Land Survey (MDNR/DGLS) has completed a preliminary summary of the 14 principal coal seams of Missouri.
- Bedrock saline formations in the Cambrian, Ordovician, Mississippian, and Pennsylvanian strata are expected to exist in 53 Missouri counties along and northwest of a freshwater–saline water transition zone. Water quality maps and well logs from MDNR/DGLS, the U.S. Geological Survey (USGS), and EPA sources used to delineate the transition zone will be scanned and reviewed for pertinent water quality information such as potentiometric surfaces, porosity, and permeability.
- A bibliographic and literature review has been completed for historic and current reports on saline aquifers in Missouri located at MDNR/DGLS. These data include depth of well, casing amount, primary aquifer, geologic unit, and water quality. Parameters from these data being considered for the project include levels of total dissolved solids, residue on evaporation, chloride, sulfate, calcium, sodium, pH, conductance, and temperature. An ACCESS database has been designed for data entry and will be used to generate GIS layers.
- To supplement earlier data delivery products, the MDNR/DGLS provided information regarding produced water and GIS coverage of known oil/gas pools.
- A major remodel of the PCOR Partnership DSS is under way.
- A recent evaluation of the locational accuracy of the CO_2 sources in the PCOR Partnership DSS database was conducted. The objective of this task was to verify the reported latitude/longitude location of each CO_2 source in the current PCOR Partnership database. The original location information was obtained from federal, state, and provincial sources (e.g., the U.S. EPA, Environment Canada). To meet this objective and ensure that the location information originally obtained from various public data sets was indeed valid, work study students were assigned the task of verifying the

latitude/longitude values of each source facility plotted on an appropriate feature in an aerial photograph through the use of online global mapping applications, such as Google Earth. If the plotted location on the Web application was nowhere near a facility, the students were instructed to search a relatively local area. If, again, no facility could be found in the area, further online research was conducted to determine where the facility was located. This effort resulted in the repositioning of 755 locations. Of these modified locations, 525 were shifted by more than 0.5 kilometers; the minimum offset distance that we considered to be significant.

- A prototype for the DPRS has been compiled. Information (e.g., reports, summaries, tables, maps, etc.) generated in conducting the Phase III demonstration tests will be managed and reported to DOE and partners through the DPRS. The DPRS will be a Web-based interface designed to provide structured access to data by all demonstration participants and other partners to facilitate communication and interpretation of these data and to allow for efficient replication of additional or related demonstration projects.

Task 2 – Public Outreach and Education

Task 2 will provide stakeholders and the general public with information on sequestration methods, opportunities, and developments, including updates on the demonstration projects. Activities in this reporting period include the following:

- Draft Web pages for the field demonstrations for the public Web site (deliverable D12) were completed, submitted on schedule at the end of July, and approved. This activity included an updated field test page in the Web site, new geologic columns, and an updated map.
- Efforts continued to populate the Outreach Information System, which will contain a record of outreach activities as well as provide a basis for assessing audience exposure to outreach activities. Demographic information was obtained for the U.S. portion from the region, and an information request was developed for the Canadian portion of the area; information on school districts and contacts was obtained; information on public broadcasting market areas was obtained; draft maps were developed; extension service contacts and meeting schedules were obtained; and an assessment of outreach (visits to public Web site, newspaper articles, and other outreach activities) was conducted for the period July 1, 2007, to June 30, 2008.
- A pro-sumer-grade videocamera, capable of taking high-definition images, was purchased, along with supporting components. The camera will provide the capability to obtain video for use on the public Web site and to provide supplementary material to the PPB documentary productions.
- A scope of work was completed for the development of an education packet on sequestration in the region to be made available to teachers in the spring of 2009.
- A preliminary list of video clips was prepared based on the documentary products and other materials. The clips range from a half minute to 5 minutes in length and are intended to supplement the PowerPoints and public Web site.

In addition, members of the outreach team took part in the monthly conference calls and related activities of the OWG.

Task 3 – Permitting and NEPA Compliance

The goal of Task 3 is to obtain all the permits and approvals that are needed to comply with state, provincial, and federal requirements. Activities for the reporting period included the following:

- Analysis of carbon market strategies continued.
- A thorough review of EPA's proposed rules for regulating geological sequestration under the UIC program was completed. A spreadsheet that compares and contrasts the EPA-proposed rules with WRI Guidelines and IOGCC model rules was developed, and a draft of this document was provided to interested PCOR Partnership members at the annual meeting. Draft comments on EPA's proposed rules have been developed and submitted to an ad hoc committee of PCOR Partnership members. As input from PCOR Partnership members is received, the comments continue to be refined.
- PCOR Partnership staff continued to follow legislative actions occurring in Congress.
- Review continued of recent publications relating to regulating CO_2 sequestration and MMV issues.
- Participated in a conference call with a task force that is working on geologic sequestration legislation for the state of North Dakota.
- Frequent updates are provided to task leaders with regard to federal, state, and provincial actions.
- Completed a review of the regulatory and economics section of IEA's "Draft Aquifer Storage – Development Issues" document.
- Analysis of regulatory risks is currently being conducted for the Fort Nelson project.
- Actions by the province of British Columbia are continually monitored for the effect they may have on the Fort Nelson demonstration project.

Task 4 – Site Characterization and Modeling

Task 4 is focused on evaluating the effectiveness of large-scale CO_2 sequestration in geological formations at two different sites. The first site will examine CO_2 sequestration in conjunction with EOR operations in a deep carbonate reservoir in the Williston Basin. The second will examine CO_2 sequestration in a carbonate brine-saturated formation basin in northwestern Canada.

The EERC met with Spectra Energy, Natural Resources Canada, and Schlumberger in Calgary, Alberta, July 8–11, 2008, to discuss the key elements of the MMV plan for the Fort Nelson Demonstration. Regional characterization activities included:

- Continued development of a petrophysical model of saline formation systems in the Washburn study area.

- Updating the oil field data in the DSS continued. Information for the state of North Dakota has been completely updated. Working with relevant agencies in other states and provinces to facilitate the updating process continued.
- Estimates of storage capacity of several saline formation systems in the Washburn Study Area of central North Dakota were finalized.

Development of the MMV plan for the Fort Nelson demonstration continued. Efforts were focused on gathering and evaluating subsurface geological data, including historical seismic data. The EERC met with Spectra Energy, Natural Resources Canada, and Schlumberger in Minneapolis, Minnesota, September 9–11, 2008, to discuss the key elements of site characterization and the MMV plan for the Fort Nelson demonstration.

Task 5 – Well Drilling and Completion

Task 5 will develop the engineering designs for the installation of necessary injection, production, and monitoring wells. This task has not begun (begins Quarter 2 – BP3; Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 6 – Infrastructure Development

During Task 6, the infrastructure associated with the capture, dehydration, compression, and pipeline transportation required moving the CO_2 from the source to the oil field will be developed. Activities performed during the reporting period included:

- Ramgen Power Systems completed its compression cost model. Ramgen's cost model is based upon the simplified DOE calculations for COE, as referenced in a number of DOE publications. The model was validated through comparison of the cost penalties calculated by the model with the results of several pulverized coal studies with and without CCS capability. Ramgen then enhanced the model to differentiate the financial penalty of CCS between the contribution from capture and compression, and capital and operating costs. The model indicates that compression contributes one-third of the cost penalty and capture contributes the other two-thirds. Operating costs and efficiency are widely believed to drive COE more than capital outlay. The Ramgen model shows that capital costs make up roughly 40%–43% of the increase in COE while operating costs make up 57%–60% of the increase in COE.
- As required for the Ramgen subcontract on this task, Ramgen engineers have identified the specific parameters and characteristics that must be measured during a small-scale, single-stage, high-pressure-ratio Rampressor demonstration at a coal-fired power plant. These requirements, which Ramgen considers to be proprietary at this time, will serve as guidelines for setting up the testing infrastructure as well as developing the test plan at the demonstration site.
- Aaron Koopman of Ramgen Power Systems presented material about both CO_2 compression in general and the Rampressor technology at the PCOR Partnership Annual Meeting and its associated capture workshop.

During the reporting period, a CO_2 Capture, Separation, and Compression Workshop was planned, organized, and presented on September 16, 2008, in conjunction with the PCOR Partnership 2008 Annual Meeting held in Maple Grove, Minnesota.

A table of capture technologies with links to Web-based information about each of them was prepared for inclusion in the PCOR Partnership DSS "Partners Only" Web site. Following project management review, it will be placed on the DSS "Partners-Only" Web site.

The detailed information gathered while preparing the capture technologies table is being used to prepare an updated PCOR Partnership CO_2 capture technology overview.

Task 7 – CO_2 Procurement

This task involves the documentation of the procedures to procure CO_2 for EOR activities. Numerous discussions with potential CO_2 suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

Task 8 – Transportation and Injection Operations

This task will consist of monitoring and documenting commercial partner activities related to the CO_2 pipeline for leaks and corrosion, as well as performing inspections and security checks. This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 9 – Operational Monitoring and Modeling

Task 9 will develop site characterization, modeling, and monitoring for the Williston Basin and the Fort Nelson test sites. This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 10 – Site Closure

Task 10 will require research to be conducted with regard to those site closure practices and procedures that would be applicable for this type of operation. This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 11 – Postinjection Monitoring and Modeling

Postinjection monitoring and modeling will use the data generated by the site characterization and monitoring activities to provide the technical basis for the formal establishment of carbon credits that are directly linked to the volume of CO_2 injected into the site and a third-party carbon-trading entity to validate and ultimately monetize the credits derived for the Phase III tests. This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 12 – Project Assessment

This task has not begun (begins Quarter 1 – BP3, Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly and annual progress reports. The Project Assessment Annual Reports (D57) will summarize project progress, accomplishments, and goals. The first project assessment report is due December 31, 2008.

Task 13 – Project Management

Project management involves the development and distribution of required project reports, as well as overall project management duties. The project manager (PM) and task leaders meet on a monthly basis to report the progress of their tasks and discuss any issues and corrective actions necessary. Each task leader is also responsible to communicate and keep track of any subcontractors they may have in their respective tasks. Task leaders are also responsible to provide the PM with written weekly updates. These updates include highlights (including trip reports), issues (i.e., budget, staffing, technical issues, etc.), opportunities, and travel plans. The monthly updates can be found on the PCOR Partnership DSS homepage.

The deliverable entitled "D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report" was submitted to DOE for approval on June 30, 2008.

PHASE III COST STATUS

The approved BP3 budget along with actual costs incurred and in-kind cost share reported is shown in Table 7. An expected spending plan by quarter of cash funds for BP3 is provided in Figure 4 and Table 8.

PHASE III SCHEDULE STATUS

Table 9 contains all of the Phase III deliverables, milestones, and submission dates for the reporting period. Because negotiations are ongoing and still uncertain for our partners in the Williston Basin demonstration, various deliverables and milestones have been extended and approved by DOE.

Table 7. Phase III Budget – BP3

Organization	Approved Budget	Actual Costs Incurred
DOE Share – Cash	$5,300,000	$1,516,008
Nonfederal Share – Cash	$2,808,847	$204,037
Nonfederal Share – In-Kind	$5,577,212	$0
Total	$13,686,059	$1,720,045

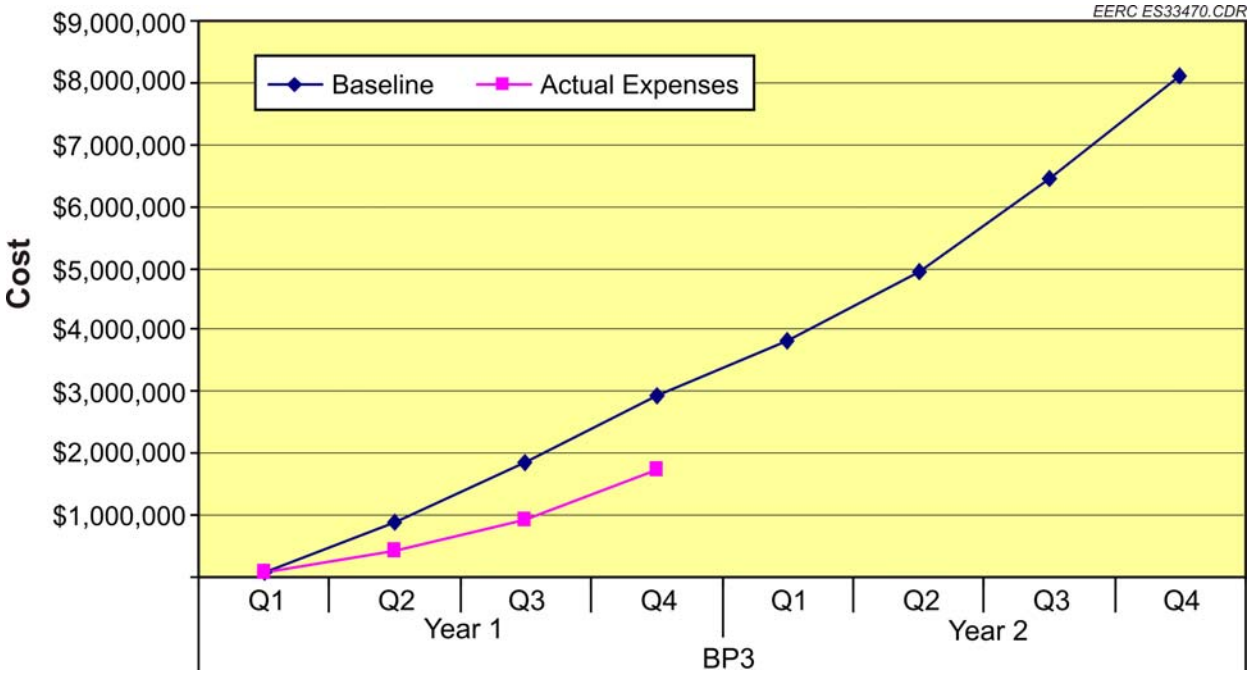


Figure 4. PCOR Partnership Phase III BP3 funding (cash only).

See Table 9 for a listing of all deliverables and milestones by quarter, with completion dates, for the duration of the project. See Table 10 for a listing of deliverables and milestones by quarter for BP3.

ACTUAL OR ANTICIPATED PHASE III PROBLEMS OR DELAYS

Task 1 – Regional Characterization

Nothing to note at this time.

Task 2 – Public Outreach and Education

As stated in the Schedule Status section of this report, the PCOR Partnership is still seeking a specific location for the Williston Basin demonstration site and is currently waiting for information from a participating partner. As a result, Deliverable D15 (Williston Basin Test Fact Sheet) will be conceptual in nature and will be revised as the demonstration develops.

Task 3 – Permitting and NEPA Compliance

As stated in the Schedule Status section of this report, because negotiations are ongoing and still uncertain for PCOR Partnership partners in the Williston Basin demonstration, attendant deliverables and milestones were approved for extension by DOE:

Table 8. BP3 Spending Plan

Budget Period 3

Baseline Reporting Quarter	Year 1								Year 2							
	Q1		Q2		Q3		Q4		Q1		Q2		Q3		Q4	
	Q1	Cum. BP Total	Q2	Cum. BP Total	Q3	Cum. BP Total	Q4	Cum. BP Total	Q1	Cum. BP Total	Q2	Cum. BP Total	Q3	Cum. BP Total	Q4	Cum. BP Total
Baseline Cost Plan																
Federal Share	$ 88,728	$ 88,728	$ 318,976	$ 407,704	$ 510,620	$ 918,324	$ 600,000	$ 1,518,324	$ 567,251	$ 2,085,575	$ 756,335	$ 2,841,911	$ 1,134,503	$ 3,976,413	$ 1,323,587	$ 5,300,000
Non-Federal Share	$ -	$ -	$ 467,179	$ 467,179	$ 467,180	$ 934,359	$ 467,180	$ 1,401,539	$ 351,827	$ 1,753,366	$ 351,827	$ 2,105,193	$ 351,827	$ 2,457,020	$ 351,827	$ 2,808,847
Total Planned	$ 88,728	$ 88,728	$ 786,155	$ 874,883	$ 977,800	$ 1,852,683	$ 1,067,180	$ 2,919,863	$ 919,078	$ 3,838,941	$ 1,108,162	$ 4,947,104	$ 1,486,330	$ 6,433,433	$ 1,675,414	$ 8,108,847
Actual Incurred Cost																
Federal Share	$ 88,728	$ 88,728	$ 318,976	$ 407,704	$ 510,620	$ 918,324	$ 597,684	$ 1,516,008								
Non-Federal Share	$ -	$ -	$ -	$ -	$ -	$ -	$ 204,037	$ 204,037								
Total Incurred Cost	$ 88,728	$ 88,728	$ 318,976	$ 407,704	$ 510,620	$ 918,324	$ 801,721	$ 1,720,045								
Variance																
Federal Share	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ 2,316	$ 2,316								
Non-Federal Share	$ -	$ -	$ 467,179	$ 467,179	$ 467,180	$ 934,359	$ 263,143	$ 1,197,502								
Total Variance	$ (0)	$ (0)	$ 467,179	$ 467,179	$ 467,180	$ 934,359	$ 265,459	$ 1,199,818								

Table 9. Phase III Milestones and Deliverables

Title/Description	Due Date	Actual Completion Date
Year 1 – Quarter 1 (October–December 2007)		
M17: Task 4 – Fort Nelson Test Site Selected	12/31/07	12/28/07
D37: Task 4 – Fort Nelson Test Site – Site Geological Characterization Experimental Design Package	12/31/07	12/28/07
D63: Task 13 – Project Management Plan	12/31/07	12/28/07
Year 1 – Quarter 2 (January–March 2008)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/08	1/31/08
D38: Task 4 – Fort Nelson Test Site – Geomechanical Experimental Design Package	1/31/08	1/31/08
M1: Task 1 – Three Target Areas Selected for Detailed Characterization	3/31/08	3/20/08
M18: Task 4 – Fort Nelson Test Site Geochemical Work Initiated	3/31/08	3/19/08
D11: Task 2 – Outreach Plan	3/31/08	3/31/08
D30: Task 4 – Williston Basin Test Site – Geomechanical Experimental Design Package	3/31/08	3/31/08
D27: Task 3 – Environmental Questionnaire – Fort Nelson Test Site	3/31/08	4/2/08
Year 1 – Quarter 3 (April–June 2008)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/08	4/30/08
D14: Task 2 – General Phase III Fact Sheet	4/30/08	4/30/08
D17: Task 2 – General Phase III Information PowerPoint Presentation	5/30/08	5/30/08
M3: Task 3 – Start Environmental Questionnaire for Williston Basin Test Site	6/30/08	6/27/08
M6: Task 4 – Williston Basin Test Site Geochemical Work Initiated	6/30/08	6/30/08
M7: Task 4 – Williston Basin Test Site Geological Characterization Data Collection Initiated	6/30/08	6/30/08
Year 1 – Quarter 4 (July–September 2008)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/08	7/31/08
D12: Task 2 – Demonstration Web Pages on the Public Site	7/31/08	7/31/08
M2: Task 1 – Demonstration Project Reporting System Prototype Completed	9/30/08	9/26/08
D1: Task 1 – Review of Source Attributes	9/30/08	9/26/08
Year 2 – Quarter 1 (October–December 2008)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/08	
M4: Task 4 – Williston Basin Test Site Selected	12/31/08	
M5: Task 4 – Data Collection Initiated for Williston Basin Test Site	12/31/08	
D20: Task 2 – Documentary Support to PowerPoint and Web Site	12/31/08	
D57: Task 12 – Project Assessment Annual Report	12/31/08	

Continued…

Table 9. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 2 – Quarter 2 (January–March 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/09	
D28: Task 3 – Environmental Questionnaire – Williston Basin Test Site	1/31/09	
D31: Task 4 – Williston Basin Test Site – Geological Characterization Experimental Design Package	2/28/09	
D15: Task 2 – Williston Basin Test Site Fact Sheet	2/28/09	
D2: Task 1 – First Target Area Completed	3/31/09	
D24: Task 2 – PCOR Partnership Region Sequestration General Poster	3/31/09	
D29: Task 3 – Permitting Action Plan	3/31/09	
Year 2 – Quarter 3 (April–June 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/09	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	4/30/09	
M8: Task 4 – Williston Basin Test Site Wellbore Leakage Data Collection Initiated	5/29/09	
D16: Task 2 – Fort Nelson Test Site Fact Sheet	5/29/09	
D66: Task 4 – Williston Basin Test Site – Simulation Report	6/30/09	
Year 2 – Quarter 4 (July–September 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/09	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	7/31/09	
D67: Task 4 – Fort Nelson Test Site – Simulation Report	7/31/09	
D42: Task 5 – Williston Basin Test Site – Injection Experimental Design Package	8/31/09	
M9: Task 4 – Williston Basin Test Site B – Version Geological Model Development Initiated	9/30/09	
M10: Task 4 – Williston Basin Test Site Wellbore Leakage Data Collection Completed	9/30/09	
M11: Task 4 – Williston Basin Test Site Baseline Hydro Data Collection Completed	9/30/09	
M12: Task 4 – Williston Basin Test Site Geochemical Work Completed	9/30/09	
M19: Task 6 – Capture, Dehydration, and Compression Technology Selected	9/30/09	
D9: Task 1 – Updated DSS	9/30/09	
D1: Task 1 – Review of Source Attributes	9/30/09	
D3: Task 1 – Permitting Review – One State and One Province	9/30/09	
D40: Task 4 – Fort Nelson Test Site – Geomechanical Final Report	9/30/09	
D43: Task 5 – Williston Basin Test Site – Monitoring Experimental Design Package	9/30/09	

Continued…

Table 9. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 2 – Quarter 4 (July–September 2009), continued		
D47: Task 6 – Topical Report on the Preliminary Design of Advanced Compression Technology	9/30/09	
D60: Task 13 – Site Development, Operations, and Closure Plan	9/30/09	
D61: Task 13 – Site Commercialization Plan	9/30/09	
D64: Task 4 – Williston Basin Test Site – Site Characterization Report	9/30/09	
D65: Task 4 – Fort Nelson Test Site – Site Characterization Report	9/30/09	
D77: Task 13 – Risk Management Plan Outline	9/30/09	
Year 3 – Quarter 1 (October–December 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/09	
M13: Task 4 – Williston Basin Test Site B – Version Geological Model Development Completed	12/31/09	
M14: Task 4 – Williston Basin Test Site Geological Characterization Data Collection Completed	12/31/09	
M15: Task 4 – Williston Basin Test Site Baseline Hydro B – Model Completed	12/31/09	
D41: Task 4 – Fort Nelson Test Site – Geochemical Final Report	12/31/09	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/09	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/09	
D57: Task 12 – Project Assessment Annual Report	12/31/09	
Year 3 – Quarter 2 (January–March 2010)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/10	
D11: Task 2 – Outreach Plan	3/31/10	
D32: Task 4 – Williston Basin Test Site – Geomechanical Final Report	3/31/10	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/10	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/10	
Year 3 – Quarter 3 (April–June 2010)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/10	
D13: Task 2 – Public Site Updates	6/30/10	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/10	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/10	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/10	

Continued…

Table 9. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 3 – Quarter 3 (April–June 2010), continued		
D25: Task 2 – Williston Basin Test Site Poster	6/30/10	
D33: Task 4 – Williston Basin Test Site – Geochemical Final Report	6/30/10	
D34: Task 4 – Williston Basin Test Site – Baseline Hydrogeological Final Report	6/30/10	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/10	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/10	
Year 3 – Quarter 4 (July–September 2010)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/10	
D70: Task 4 – Fort Nelson Test Site – Best Practices Manual – Simulation Report	8/31/10	
M16: Task 4 – Williston Basin Test Site Final Geological Model Development Completed	9/30/10	
D1: Task 1 – Review of Source Attributes	9/30/10	
D10: Task 1 – Demonstration Project Reporting System Update	9/30/10	
D26: Task 2 – Fort Nelson Test Site Poster	9/30/10	
D35: Task 4 – Williston Basin Test Site – Best Practices Manual – Site Characterization	9/30/10	
D36: Task 4 – Williston Basin Test Site – Wellbore Leakage Final Report	9/30/10	
D48: Task 7 – Procurement Plan and Agreement Report	9/30/10	
D50: Task 9 – Williston Basin Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/10	
D52: Task 9 – Fort Nelson Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/10	
D68: Task 4 – Fort Nelson Test Site – Best Practices Manual – Site Characterization	9/30/10	
D69: Task 4 – Williston Basin Test Site – Best Practices Manual – Simulation Report	9/30/10	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/10	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/10	
Year 4 – Quarter 1 (October–December 2010)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/10	
M20: Task 6 – Capture, Dehydration, and Compression Technology Design Completed	10/31/10	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/10	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/10	
D57: Task 12 – Project Assessment Annual Report	12/31/10	

Continued…

Table 9. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 4 – Quarter 2 (January–March 2011)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/11	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/11	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/11	
Year 4 – Quarter 3 (April–June 2011)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/11	
D21: Task 2 – Williston Basin Test Site 15-minute Documentary	6/30/11	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/11	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/11	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/11	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/11	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/11	
Year 4 – Quarter 4 (July–September 2011)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/11	
D1: Task 1 – Review of Source Attributes	9/30/11	
D4: Task 1 – Permitting Review – Two Additional States	9/30/11	
D9: Task 1 – Updated DSS	9/30/11	
D45: Task 6 – Topical Report on the Integrated Capture Plant and Its Shakedown	9/30/11	
D46: Task 6 – Topical Report on Pipeline Route Selection, Design, and Construction	9/30/11	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/11	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/11	
Year 5 – Quarter 1 (October–December 2011)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/11	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/11	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/11	
D57: Task 12 – Project Assessment Annual Report	12/31/11	
Year 5 – Quarter 2 (January–March 2012)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/12	
D5: Task 1 – Second Target Area Completed	3/31/12	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/12	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/12	

Continued…

Table 9. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 5 – Quarter 3 (April–June 2012)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/12	
D13: Task 2 – Public Site Updates	6/30/12	
D22: Task 2 – Fort Nelson Test Site 15-minute Documentary	6/30/12	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/12	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/12	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/12	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/12	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/12	
Year 5 – Quarter 4 (July–September 2012)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/12	
D1: Task 1 – Review of Source Attributes	9/30/12	
D10: Task 1 – DPRS Update	9/30/12	
D44: Task 5 – Williston Basin Test Site – Drilling and Completion Activities Final Report	9/30/12	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/12	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/12	
Year 6 – Quarter 1 (October–December 2012)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/12	
D14: Task 2 – General Phase III Fact Sheet	12/31/12	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/12	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/12	
D57: Task 12 – Project Assessment Annual Report	12/31/12	
Year 6 – Quarter 2 (January–March 2013)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/13	
D15: Task 2 – Williston Basin Test Site Fact Sheet	3/31/13	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/13	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/13	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/13	
D16: Task 2 – Fort Nelson Test Site Fact Sheet	6/30/13	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/13	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/13	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/13	

Continued…

Table 9. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 6 – Quarter 2 (January–March 2013), continued		
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/13	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/13	
Year 6– Quarter 4 (July–September 2013)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/30/13	
D1: Task 1 – Review of Source Attributes	9/30/13	
D6: Task 1 – Permitting Review – Three States and Two Provinces	9/30/13	
Year 6– Quarter 4 (July–September 2013), continued		
D9: Task 1 – Updated DSS	9/30/13	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/13	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/13	
Year 7 – Quarter 1 (October–December 2013)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/13	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/13	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/13	
D57: Task 12 – Project Assessment Annual Report	12/31/13	
Year 7 – Quarter 2 (January–March 2014)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/14	
D24: Task 2 – PCOR Partnership Region Sequestration General Poster	3/31/14	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/14	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/14	
Year 7 – Quarter 3 (April–June 2014)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/14	
D13: Task 2 – Public Site Updates	6/30/14	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/14	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/14	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/14	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/14	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/14	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/14	
D1: Task 1 – Review of Source Attributes	9/30/14	
D7: Task 1 – Third Target Area Completed	9/30/14	

Continued…

Table 9. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 7 – Quarter 4 (July–September 2014), continued		
D10: Task 1 – Demonstration Project Reporting System Update	9/30/14	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/14	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/14	
Year 8 – Quarter 1 (October–December 2014)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/14	
D75: Task 3 – Updated Permitting Action Plan	10/30/14	
D25: Task 2 – Williston Basin Test Site Poster	12/31/14	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/14	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/14	
D57: Task 12 – Project Assessment Annual Report	12/31/14	
Year 8 – Quarter 2 (January–March 2015)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/15	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/15	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/15	
Year 8 – Quarter 3 (April–June 2015)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/15	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/15	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/15	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/15	
D26: Task 2 – Fort Nelson Test Site Poster	6/30/15	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/15	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/15	
Year 8 – Quarter 4 (July–September 2015)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/15	
D1: Task 1 – Review of Source Attributes	9/30/15	
D8: Task 1 – Permitting Review – Three States and One Province	9/30/15	
D9: Task 1 – Updated DSS	9/30/15	
D49: Task 8 – Transportation and Injection Operations Final Report	9/30/15	
D51: Task 9 – Williston Basin Test Site – Monitoring for CO_2, EOR, and Sequestration Best Practices Manual	9/30/15	

Continued…

Table 9. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 8 – Quarter 4 (July–September 2015), continued		
D53: Task 9 – Fort Nelson Test Site – Monitoring for CO_2 Sequestration in a Brine Formation Best Practices Manual	9/30/15	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/15	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/15	
Year 9 – Quarter 1 (October–December 2015)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/15	
D14: Task 2 – General Phase III Fact Sheet	12/31/15	
D23: Task 2 – Sequestration in Carbon Management – 30-minute Documentary	12/31/15	
D57: Task 12 – Project Assessment Annual Report	12/31/15	
Year 9 – Quarter 2 (January–March 2016)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/16	
D11: Task 2 – Outreach Plan	3/31/16	
D15: Task 2 – Williston Basin Test Site Fact Sheet	3/31/16	
D55: Task 11 – Report on Cost-Effective Long-Term Monitoring Strategies for the Williston Basin Test Site	3/31/16	
D56: Task 11 – Report on Cost-Effective Long-Term Monitoring Strategies for the Fort Nelson Test Site	3/31/16	
Year 9– Quarter 3 (April–June 2016)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/16	
D13: Task 2 – Public Site Updates	6/30/16	
D16: Task 2 – Fort Nelson Test Site Fact Sheet	6/30/16	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/16	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/16	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/16	
Year 9 – Quarter 4 (July–September 2016)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/16	
D1: Task 1 – Review of Source Attributes	9/30/16	
D10: Task 1 – Demonstration Project Reporting System Update	9/30/16	

Continued…

Table 9. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 9 – Quarter 4 (July–September 2016), continued		
D73: Task 11 – Williston Basin Test Site – Progress Report on Monitoring and Modeling Fate of CO_2	9/30/16	
D74: Task 11 – Fort Nelson Test Site – Progress Report on Monitoring and Modeling Fate of CO_2	9/30/16	
Year 10 – Quarter 1 (October–December 2016)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/16	
D57: Task 12 – Project Assessment Annual Report	12/31/16	
Year 10 – Quarter 2 (January–March 2016)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/17	
Year 10 – Quarter 3 (April–June 2017)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/17	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/17	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/17	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/17	
Year 10 – Quarter 4 (July–September 2017)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/17	
D54: Task 10 – Site Closure Report	9/30/17	
D73: Task 11 – Williston Basin Test Site – Progress Report on Monitoring and Modeling Fate of CO_2	9/30/17	
D74: Task 11 – Fort Nelson Test Site – Progress Report on Monitoring and Modeling Fate of CO_2	9/30/16	
D76: Task 3 – Best Practices Manual – Permitting	9/30/17	
D62: Task 13 – Final Report	9/30/17	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/17	

Table 10. PCOR Partnership Phase III BP3 Milestones and Deliverables (Gantt chart)

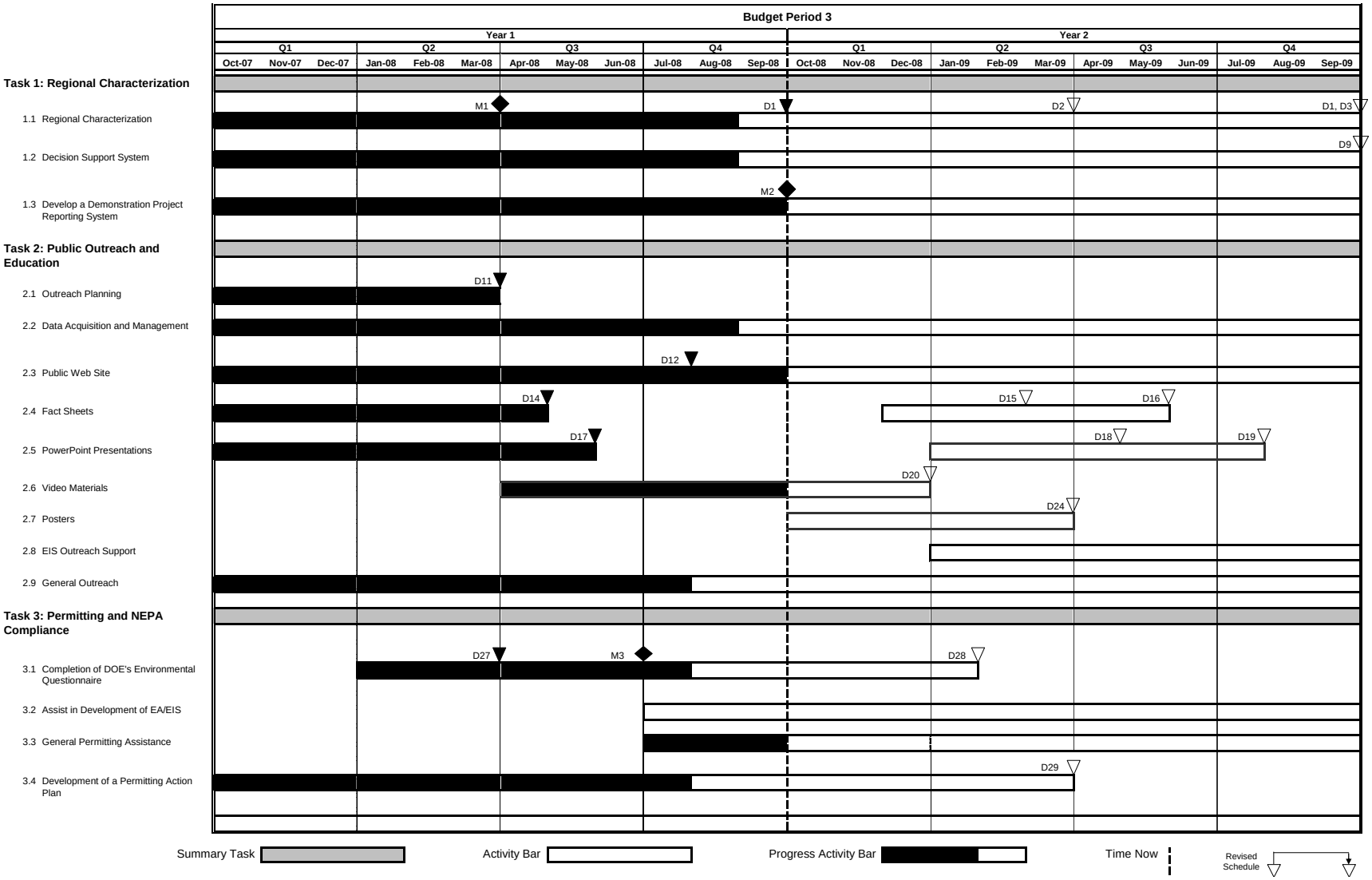


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Table 10. PCOR Partnership Phase III BP3 Milestones and Deliverables (Gantt chart) (continued)

Key for Phase III Deliverables (D)

D1	Review of Source Attributes
D2	First Target Area Completed
D3	Permitting Review – One State and One Province
D9	Updated DSS
D11	Outreach Plan
D12	Demonstration Web Pages on the Public Site
D14	General Phase III Fact Sheet
D15	Williston Basin (WB) Test Site Fact Sheet
D16	Fort Nelson Test Site Fact Sheet
D17	General Phase III Information PowerPoint Presentation
D18	WB Test Site PowerPoint Presentation
D19	Fort Nelson (FN) Test Site PowerPoint Presentation
D20	Video Support to PowerPoint and Web Site
D24	PCOR Region Sequestration General Poster
D27	FN Test Site – Environmental Questionnaire
D28	WB Test Site – Environmental Questionnaire
D29	Permitting Action Plan
D30	WB Test Site – Geomechanical Experimental Design Package
D31	WB Test Site – Site Geological Characterization Experimental Design Package
D37	FN Test Site – Site Geological Characterization Experimental Design Package
D38	FN Test Site – Geomechanical Experimental Design Package
D40	FN Test Site – Geomechanical Final Report
D42	WB Test Site – Injection Experimental Design Package
D43	WB Test Site – Monitoring Experimental Design Package
D47	Topical Report on the Preliminary Design of Advanced Compression Technology
D57	Project Assessment Annual Report
D58	Quarterly Progress Report
D59	Milestone Quarterly Report
D60	Site Development, Operations, and Closure Plan
D61	Site Commercialization Plan
D63	Project Management Plan
D64	WB Test Site – Site Characterization Report
D65	FN Test Site – Site Characterization Report
D66	WB Test Site – Simulation Report
D67	FN Test Site – Simulation Report
D77	Risk Management Plan Outline

Key for Phase III Milestone (M)

M1	Three Target Areas Selected
M2	DPRS Prototype
M3	Start Environmental Questionnaire for WB Test Site
M4	WB Test Site Selected
M5	Data Collection Initiated for WB Test Site
M6	WB Test Site Geochemical Work Initiated
M7	WB Test Site Geological Characterization Data Collection Initiated
M8	WB Test Site Wellbore Leakage Data Collection Initiated
M9	WB Test Site B - Version Geological Model Development Initiated
M10	WB Test Site Wellbore Leakage Data Collection Completed
M11	WB Test Site Baseline Hydro Data Collection Completed
M12	WB Test Site Geochemical Work Completed
M17	FN Test Site Selected
M18	FN Test Site Geochemical Work Initiated
M19	Capture, Dehydration, and Compression Technology Selected

Task 4 – Site Characterization and Modeling

The selection of a site for the Williston Basin Phase III demonstration has been delayed for two quarters. This will also cause delays in other site-specific activities, such as the development of a NEPA document, site-specific characterization activities, site-specific MMV planning, and site-specific public outreach activities.

Negotiations between Basin Electric Power Cooperative (the company providing the CO_2 for the Williston Basin project) and the oil companies continue to be ongoing. No deals have been completed; therefore, no site has been formally accepted or schedule of activities set.

Task 5 – Well Drilling and Completion

As stated in the Schedule Status section of this report, because of delays in the Williston Basin demonstration, Task 5 activities will be initiated January 1, 2009 (original start date was October 1, 2008).

Task 6 – Infrastructure Development

Some of the work on this task has been delayed while the plans for the CO_2 capture and geologic sequestration for the demonstration projects are finalized. Once the specific carbon capture and sequestration strategy for the demonstration project has been finalized, planned task activities related to CO_2 capture, compression, and pipeline design and routing can begin. In the interim, activities are being undertaken in support of the planned actions.

Task 7 – CO_2 Procurement

Numerous discussions with potential CO_2 suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

Task 8 – Transportation and Injection Operations

Nothing to note at this time.

Task 9 – Operational Monitoring and Modeling

Nothing to note at this time.

Task 10 – Site Closure

Nothing to note at this time.

Task 11 – Postinjection Monitoring and Modeling

Nothing to note at this time.

Task 12 – Project Assessment

Nothing to note at this time.

Task 13 – Project Management

Nothing to note at this time.

PHASE III PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES

Task 1 – Regional Characterization

The third PCOR Partnership geology work group meeting was held in September in conjunction with the PCOR Partnership 2008 Annual Meeting. The meeting was an opportunity for EERC researchers and PCOR Partnership subcontractors working on geologic sequestration assessments to share recent findings with other geologists and geologic and petroleum engineers.

Task 2 – Public Outreach and Education

A presentation on the task activities and accomplishments was prepared and given at the PCOR Partnership Annual Meeting in September.

Task 3 – Permitting and NEPA Compliance

A spreadsheet that compares and contrasts the EPA-proposed rules for geologic sequestration with WRI Guidelines and IOGCC model rules was developed, and a draft of this document was provided to interested PCOR Partnership members at the annual meeting. Draft comments on EPA's proposed rules have been developed and submitted to an ad hoc committee of PCOR Partnership members.

Task 4 – Site Characterization and Modeling

No deliverables were due for Task 4 during this quarter.

Task 5 – Well Drilling and Completion

This task has not begun (begins Quarter 2 – BP3, Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 6 – Infrastructure Development

A capture and transportation workshop was held in conjunction with the PCOR Partnership Annual Meeting. Workshop topics included an overview of capture technologies, with specific information on monoethanolamine (MEA) scrubbing, chilled ammonia process, membrane technologies, and CO_2 capture from integrated gasification combined-cycle systems. The issues associated with applying CO_2 capture to a coal-fired power plant were discussed, as were both

utility and nonutility perspectives on the need for CO_2 capture. Finally, information about CO_2 compression, pipelines, and the economics of CO_2 capture was presented.

Task 7 – CO_2 Procurement

Numerous discussions with potential CO_2 suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

Task 8 – Transportation and Injection Operations

This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 9 – Operational Monitoring and Modeling

This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 10 – Site Closure

This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 11 – Postinjection Monitoring and Modeling

This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 12 – Project Assessment

This task has not begun (begins Quarter 1 – BP3, Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly and annual progress reports.

Task 13 – Project Management

The deliverable entitled "D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report" was submitted to DOE for approval on June 30, 2008.

MEETINGS/TRAVEL

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

- June 29 – July 2, 2008: 4th International Symposium on Energy, Informatics and Cybernetics: EIC '08 in Orlando, Florida

- July 7–11, 2008: meeting with partners to discuss Phase III demonstration and Zama project in Calgary, Alberta
- July 8–11, 2008: Computer Modeling Group Ltd. Technical Symposium in Calgary, Alberta
- August 4–8, 2008: attended the ESRI International Users Conference in San Diego, California
- August 13–15, 2008: Coal-Gen in Louisville, Kentucky
- August 25–28, 2008: attended the Power Plant Air Pollutant Control "Mega" Symposium in Baltimore, Maryland
- September 16–18, 2008: PCOR Partnership Annual Meeting in Maple Grove, Minnesota
- September 24, 2008: UIC and CO_2 Geosequestration Seminar, Cincinnati, Ohio
- September 30, 2008: Attended EPA public meeting on proposed rules for geologic sequestration in Chicago, Illinois
- September 29 – October 2, 2008: Pittsburgh Coal Conference in Pittsburgh, Pennsylvania

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

REFERENCES

None.