

PLAINS CO₂ REDUCTION PARTNERSHIP PHASE III

Quarterly Technical Progress Report

(for the period October 1 – December 31, 2009)

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EXECUTIVE SUMMARY

The Plains CO₂ Reduction (PCOR) Partnership is one of seven Regional Carbon Sequestration Partnerships (RCSPs) competitively awarded by the U.S. Department of Energy National Energy Technology Laboratory in 2003 as part of a national plan to mitigate greenhouse gas emissions. The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota and includes more than 80 stakeholders from the public and private sector in Phases II and III. The PCOR Partnership region includes all or part of nine U.S. states and four Canadian provinces.

Phase III, the development phase, a 10-year effort (2007–2017), is an extension of the characterization (Phase I) and validation (Phase II) phases. The Phase III efforts of the PCOR Partnership include two large-volume demonstration tests—one in Canada and one in the United States—that focus on injecting CO₂ into deep saline geologic formations for CO₂ storage. Other activities include the following: 1) continue regional characterization to verify the ability of the target formations to store CO₂, 2) facilitate the planning and development of the infrastructure required to transport CO₂ from the source to the injection site, 3) facilitate development of the rapidly evolving North American regulatory and permitting framework, 4) establish the data required for the eventual monetization of carbon credits for CO₂ stored in geologic formations, 5) collaborate with other RCSP Program partnerships, and 6) provide outreach and education for CO₂ storage stakeholders and the general public.

Budget Period 4 (Years 3–8 of Phase III) began October 1, 2009. Activities leading to the initiation of CO₂ injection in both demonstration sites during Year 3, Quarter 1 continued. Operational monitoring and modeling activities were initiated at the Canadian demonstration site to verify that injection operations do not adversely impact human health or the environment and that the CO₂ injected has been safely stored, with minimal risk of natural release. Unfortunately, because of delays related to the potential acquisition of our commercial partner for the U.S. test site, initiation of these efforts was delayed.

Efforts to characterize western Nebraska continued, as did expansion and data population of the partners-only Decision Support System (DSS, © 2007–2009 EERC Foundation). Service within the RCSP Outreach Working Group, as well as outreach and education activities focused on the PCOR Partnership region, continued. State and federal legislation, as well as proposed U.S. Environmental Protection Agency rulemakings, were followed closely. Future infrastructure

demands were calculated, and participation in an RCSP Pipeline Atlas Working Group was initiated. The 7th annual meeting of the PCOR Partnership, along with two premeeting workshops, was very successful and well attended. In addition, several new partners were welcomed to the PCOR Partnership, and all required deliverables were submitted. The RCSP Water Working Group held its required monthly conference calls, as well as planned future activities.

This progress report presents an update of Phase III PCOR Partnership activities from October 1, 2009, through December 31, 2009.



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INTRODUCTION

The Plains CO₂ Reduction (PCOR) Partnership is one of seven regional partnerships operating under the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) Regional Carbon Sequestration Partnership (RCSP) Program. The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota (UND) in Grand Forks, North Dakota, and includes stakeholders from the public and private sector. The membership as of December 31, 2009, is listed in Table 1. 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).

The RCSP Program is part of NETL's Carbon Sequestration Program and is a government–industry effort tasked with determining the most suitable technologies, regulations, and infrastructure needs for carbon capture and storage (CCS) on the North American continent.

The RCSP Program initiative is being implemented in three phases:

- Phase I – Characterization Phase (2003–2005): characterized opportunities for carbon sequestration
- Phase II – Validation Phase (2005–2009): conducted small-scale field validation tests
- Phase III – Development Phase (2007–2017): large-volume carbon storage demonstration tests

Phase III is divided into three budget periods (BPs), running from October 1, 2007, to September 30, 2017:

BP3: October 1, 2007 – September 30, 2009

BP4: October 1, 2009 – September 30, 2015

BP5: October 1, 2015 – September 30, 2017

Note: BP1 and BP2 were effective in Phase II.

Table 1. PCOR Partnership Membership, Phase II/Phase III

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

* Phase II members in good standing were automatically enrolled in Phase III for overlapping years (October 1, 2007 – December 31, 2009).

The overall mission of the Phase III program is to 1) build upon Phase I and II assessments of regional sequestration data to verify the ability of target formations to store CO₂, 2) facilitate the development of the infrastructure required to transport CO₂ from the source to the injection site, 3) monitor and facilitate development of the rapidly evolving North American regulatory and permitting framework for CO₂ storage, 4) develop opportunities for PCOR Partnership partners to capture and store CO₂, 5) establish a means by which carbon markets can facilitate CCS/EOR (enhanced oil recovery) project development in the region, 6) develop the technical expertise that will allow carbon credits to be monetized for CO₂ sequestered in geologic formations, 7) continue collaboration with the other RCSP Program partnerships, and 8) provide outreach and education for CO₂ sequestration stakeholders and the general public.

In Phase III, the PCOR Partnership is building on the information generated in its characterization (Phase I) and validation (Phase II) phases. A programmatic RCSP Phase III goal is the injection of approximately 1 million tons of CO₂ a year into at least one regionally significant geologic formation. Each of the RCSP's large-volume injection tests is designed to

demonstrate that CO₂ storage sites have the potential to store regional CO₂ emissions safely, permanently, and economically for hundreds of years.

The PCOR Partnership is working toward the establishment of two demonstration sites. The sites are located in 1) the Bell Creek oil field in Powder River County, southeastern Montana and 2) near Spectra Energy's Fort Nelson gas-processing facility, situated near Fort Nelson, British Columbia, Canada (Figure 1).

The PCOR Partnership's objectives for the demonstration projects are as follows: 1) conduct a successful U.S. field demonstration to verify that the region's large number of oil fields have the potential to store significant quantities of CO₂ in a safe, economical, and environmentally responsible manner and 2) conduct a successful Fort Nelson demonstration to verify the economic feasibility of using the region's carbonate saline formations for safe, long-term CO₂ storage. During Phase III, the PCOR Partnership will continue to refine storage resource estimates and evaluate other factors relevant to regional storage goals.

The PCOR Partnership plans to achieve its Phase III mission through a series of 14 tasks: 1) Regional Characterization, 2) Public Outreach and Education, 3) Permitting and National Environmental Policy Act (NEPA) Compliance, 4) Site Characterization and Modeling,



Figure 1. PCOR Partnership Phase III demonstration sites.

5) Well Drilling and Completion, 6) Infrastructure Development, 7) CO₂ Procurement, 8) Transportation and Injection Operations, 9) Operational Monitoring and Modeling, 10) Site Closure, 11) Postinjection Monitoring and Modeling, 12) Project Assessment, 13) Project Management, and 14) RCSP Water Working Group Coordination. See Table 2 for the responsibility matrix of these fourteen tasks.

It should be noted that Tasks 10 and 11 will not be initiated until BP5.

PROGRESS OF WORK

Task 1 – Regional Characterization

Significant accomplishments for Task 1 for the reporting period included the following:

- Sent e-mails to all current partners on October 7 to announce that the updated and redesigned Decision Support System (DSS, © 2007–2009 EERC Foundation) went live. In order to encourage visits to the site, each user name and password were included in each partner's e-mail.
- Completed modifications for a 6-month no-cost extension to the Missouri Department of Natural Resources Division of Land and Geological Survey subcontract.
- Continued efforts to compile geographic information system (GIS) metadata for sources, saline formations (Madison, Maha, and Viking), sedimentary basins, Prairie Pothole Region, coal basins, and coal basin assessment areas (Ardley, Hanson–Hanson, and Wyodak–Anderson).

Table 2. Phase III Responsibility Matrix

Phase III Task Description	Task Leader
Task 1 – Regional Characterization	Wesley D. Peck
Task 2 – Public Outreach and Education	Daniel J. Daly
Task 3 – Permitting and NEPA Compliance	Lisa S. Botnen
Task 4 – Site Characterization and Modeling	James A. Sorensen
Task 5 – Well Drilling and Completion	Steven A. Smith
Task 6 – Infrastructure Development	Melanie D. Jensen
Task 7 – CO ₂ Procurement	John A. Harju
Task 8 – Transportation and Injection Operations	Steven A. Smith
Task 9 – Operational Monitoring and Modeling	Charles D. Gorecki
Task 10 – Site Closure	TBA
Task 11 – Postinjection Monitoring and Modeling	TBA
Task 12 – Project Assessment	Katherine K. Anagnost
Task 13 – Project Management	Edward N. Steadman
Task 14 – RCSP Water Working Group Coordination	Charles D. Gorecki

- Continued efforts to compile base map features for the Fort Nelson project. This information will be used to create planning and discussion maps for the Phase III project.
- Continued efforts to revise the core files for the new GIS portion of the PCOR Partnership Web site.
- Finished formatting a list of articles and studies on pertinent terrestrial studies conducted in the PCOR Partnership region. This list will be included on the DSS Web site.
- Continued efforts to collect oil and gas well data for the PCOR Partnership region by state and province.
- Continued efforts to develop a preliminary report on the Cedar Hills Formation in western Nebraska—the geologic horizon is a promising saline formation target for CO₂ storage.
- Attended the North Dakota GIS Conference on November 3–4, 2009, in Grand Forks, North Dakota. The conference was attended by nearly 200 people from around the region and consisted of presentations and workshops. The conference also provided an opportunity to meet with several industry representatives. These meetings proved to be very helpful and contributed greatly to addressing some current challenges with regard to the PCOR Partnership DSS and with issues being discussed with the RCSP GIS working group.
- Attended and participated in the GIS Working Group Meeting on November 19, 2009, in Pittsburgh, Pennsylvania.
- Coordinated efforts for production of displays and posters at the PCOR Partnership annual meeting and workshops.
- Presented an update on characterization activities and the DSS remodel on December 3, 2009, at the PCOR Partnership annual meeting.
- Prepared an exhibit booth, including demonstration of the DSS site, at the annual meeting.
- At the request of a partner, assembled data related to EOR potential for Wyoming oil fields in the Powder River Basin.
- Initiated the selection, processing, and cataloging of images to be used in the DSS image gallery.
- Spoke at the UND Geography Department December Forum on December 11, 2009.
- Participated in a conference call on December 17, 2009, with the Missouri Department of Natural Resources regarding a potential project to characterize the Forest City Basin.
- Coordinated discussions regarding a potential carbon management plan for the Nebraska Public Power District.

Task 2 – Public Outreach and Education

Significant accomplishments for Task 2 for the reporting period included the following:

- Finalized a speaker agreement for the PCOR Partnership annual meeting and workshops, held December 1–3, 2009, in St. Louis, Missouri.

- Accepted an advisory role for outreach for sequestration projects to be developed through the Petroleum Technology Research Centre in Regina, Saskatchewan, Canada; attended a meeting with the Petroleum Technology Research Centre on October 26, 2009, in Regina to help lay the groundwork for select Saskatchewan sequestration projects (representatives of the Midwest Geological Carbon Sequestration Consortium and Schlumberger also attended); and continued to review materials and participate in conference calls.
- Finalized content and format for 23 video clips from the documentaries *Reducing Our Carbon Footprint* and *Out of the Air – Into the Soil*.
- Prepared a presentation for the initial meeting of the International Energy Agency (IEA) Greenhouse Gas R&D Programme, Social Research Network, in Paris, France, November 2–3, 2009. The PCOR Partnership presentation was given by the RCSP Outreach Working Group Coordinator.
- Provided written comments to the RCSP Outreach Working Group Coordinator regarding the draft of the Outreach Working Group's Best Practices Manual.
- Continued efforts toward an update to the public Web site (D13), including draft revisions to the fact sheet information page and the home page as well as the preparation of three new pages regarding the natural occurrence of CO₂ accumulations in the subsurface and the changing level of CO₂ in the atmosphere over geologic time.
- Provided review comments for the draft Web site for the Weyburn-Midale project as part of duties as a member of the Weyburn-Midale Outreach Advisory Panel.
- Sent an advanced draft final copy of the geologic documentary on October 21, 2009, for use at an interim legislative committee meeting in New Mexico to help educate legislators.
- Held discussions with the Indian Land Tenure Foundation (ILTF) regarding potential opportunities for collaboration on activities in Indian Country.
- Presented an update on outreach and education activities at the PCOR Partnership annual meeting as well as a presentation during the Outreach Workshop held prior to the meeting.
- Assumed a lead role in the RCSP Outreach Working Group to finalize and submit an abstract for a presentation at the 10th International Conference on Greenhouse Gas Control Technologies (GHGT-10) in Amsterdam in September 2010.
- Participated in the development of a press release and e-mail blast sent on November 9, 2009, to the membership with respect to the broadcast of the geologic documentary scheduled to air on Tuesday evening, November 10, at 8:00 p.m. (CST) in the Prairie Public Broadcasting (PPB) area (North Dakota, Manitoba, northwestern Minnesota) and submitted the order for 1000 DVDs of the documentary for distribution at the annual meeting and thereafter.

Task 3 – Permitting and NEPA Compliance

Significant accomplishments for Task 3 for the reporting period included the following:

- Continued ongoing review of recent publications relating to regulating CO₂ sequestration and monitoring, verification, and accounting (MVA) issues.
- Continued analyses of carbon market strategies.

- Submitted comments on October 15, 2009, to the U.S. Environmental Protection Agency's (EPA's) recent release of additional data relating to the geologic sequestration of carbon dioxide under the "Federal Requirements under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO₂) Geologic Sequestration (GS) Wells; Notice of Data Availability and Request for Comment" announced August 24, 2009.
- Participated in conference calls of the Interstate Oil and Gas Compact Commission's (IOGCC's) Pipeline Transportation Task Force.
- Submitted comments regarding North Dakota's proposed geologic sequestration rules.
- Participated in a conference call with the Outreach Working Group and EPA to discuss EPA's outreach strategies regarding geologic sequestration.
- Continued to follow committee hearings and actions on the Boxer–Kerry Climate Change bill.
- Attended and participated in the PCOR Partnership annual meeting in St. Louis, Missouri, December 1–3, 2009.
- Reviewed EPA findings document entitled "Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act" signed by the EPA Administrator on December 7, 2009.
- Followed the activities of the climate talks in Copenhagen (COP 15).
- Worked with British Columbia regulators on the development of a comprehensive review of acid gas and potential CCS regulations.

Task 4 – Site Characterization and Modeling

Significant accomplishments for Task 4 for the reporting period included the following:

- Hosted a meeting with a representative of Spectra Energy on October 15, 2009, in order to discuss the next steps for Fort Nelson CCS project modeling, risk management, and MVA activities.
- Created a draft "value-added" fact sheet on the PCOR Partnership's approach to risk management of CCS projects.
- Continued work on the Fort Nelson simulations.
- Initiated efforts on a general CCS risk management document for the partners-only DSS Web site.
- Initiated an outline for the Fort Nelson MVA plan.
- Attended and participated in the PCOR Partnership annual meeting in St. Louis, Missouri, December 1–3, 2009.
- In coordination with Spectra Energy, submitted on December 15, 2009, the December 2009 project status report for the Fort Nelson CCS project to the Carbon Sequestration Leadership Forum (CSLF) Secretariat.
- Continued iterative modifications to the static geological model of the Fort Nelson CCS project area of review.
- Initiated the development of dynamic injection simulations for the Fort Nelson CCS project using specific potential injection well locations recently provided by Spectra Energy.

- Continued modification of the first-round risk assessment report for the Fort Nelson CCS project based on comments provided by Spectra Energy.
- Prepared and submitted two abstracts for presentation at GHGT-10. One abstract presents a general overview of the Fort Nelson CCS project, and the second presents an overview of the approach used to conduct a first-round risk assessment for the Fort Nelson CCS project.
- Provided a statement of work objectives for January 2010 to December 2010 to Spectra Energy. Quarterly meetings are planned, with the first meeting scheduled for January 27, 2010, in Calgary. Monthly teleconferences have also been scheduled, with the first call planned for January 8, 2010.
- Initiated work to develop and design a laboratory experimental program for petrological, geochemical, and geomechanical analysis of core samples from the Bell Creek area.

Actual or anticipated problems or delays during the reporting period included the following:

- Because of the anticipated acquisition of our commercial partner at the U.S test site a cost-share agreement has not been completed. Until negotiations are completed, the demonstration schedule is uncertain.

Task 5 – Well Drilling and Completion

This task was anticipated to be initiated in October 2009. Because of delays related to our commercial partner for the U.S. test site, initiation of efforts will be delayed.

Task 6 – Infrastructure Development

Significant accomplishments for Task 6 for the reporting period included the following:

- Received and reviewed the final deliverables from Ramgen Power Systems for their subcontract, i.e., a Topical Report for Facility Interface Issues, Conceptual Configuration, and a Procurement Plan.
- Gathered information about water usage during CCS activities.
- Attended Optimized Gas Treating's advanced seminar focusing on the ProTreat™ simulator for acid gas treatment that was held October 28–29, 2009, in Houston, Texas. The ProTreat™ software was purchased for use in PCOR Partnership technology–source matching activities, and the seminar provided the in-depth training needed to fully use this tool.
- Determined percentages of emissions from various categories within each state/province using the sources database.
- Participated in a conference call on December 10, 2009, with BNSF (Burlington Northern Santa Fe) concerning rail transport of CO₂ for CCS demonstrations.
- Presented “Deployable CO₂ Capture Technologies” during the Carbon Management Strategies workshop held on December 1, 2009, in conjunction with the PCOR Partnership annual meeting.

- Presented “CO₂ Pipeline Basics” at the PCOR Partnership annual meeting on December 2, 2009.
- Presented an update on work performed by Ramgen Power Systems on December 2, 2009, at the annual meeting for a last-minute ill presenter.
- Responded to several information requests stemming from the annual meeting.
- Located Web references for CO₂ emissions from various ethanol plants, taconite plants, and refineries. The references are included in the “References” tab of the PCOR Partnership CO₂ emission sources master spreadsheet.
- Incorporated information into the CO₂ emission sources master spreadsheet that notes the vintage of the data contained in the spreadsheet.
- Prepared a 36-page report and companion PowerPoint presentation for a PCOR Partnership partner. The report included detailed information regarding power usage, reagent costs, efficiencies, etc., for five relatively near-term, postcombustion CO₂ capture technologies.
- At the request of a partner, CO₂ emissions on a lb CO₂/MWh basis were calculated on December 15, 2009, for Minnesota and North Dakota’s electricity-generating facilities.
- Prepared for a partner on December 17, 2009, a short text version including references of the “CO₂ Pipeline Basics” presentation given at the annual meeting. The information is being used during the preparation of a report being authored by the IOGCC Pipeline Transportation Task Force.
- Participated in conference calls for the Pipeline Atlas Working Group (PAWG), including the kickoff call held October 21, 2009, and a second call on November 5, 2009.
- Completed the pipeline network routing update. The update was also incorporated into the value-added report entitled “Regional Emissions and Capture Opportunities Assessment – Plains CO₂ Reduction (PCOR) Partnership (Phase II),” which was completed at the end of this quarter. Although the report primarily covered Phase II activities, the report was enhanced through the inclusion of information gathered during the performance of this task.

Actual or anticipated problems or delays during the reporting period included the following:

- Some of the work on this task has been delayed while the plans for CO₂ capture and geologic sequestration for the demonstration projects are finalized.

Task 7 – CO₂ Procurement

Significant accomplishments for Task 7 for the reporting period included the following:

- Discussions continued with potential CO₂ suppliers. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.
- Attended and participated in the PCOR Partnership annual meeting in St. Louis, Missouri, December 1–3, 2009.

- Attended the 7th Annual EOR Carbon Management Workshop in Houston, Texas, and the 15th Annual CO₂ Flooding Conference in Midland, Texas, during the week of December 7–11, 2009.

Actual or anticipated problems or delays during the reporting period included the following:

- Because of delays related to our commercial partner for the U.S. test site, initiation of efforts will be delayed.

Task 8 – Transportation and Injection Operations

This task is anticipated to be initiated Quarter 3 – BP4, Year 4 (October 2010).

Task 9 – Operational Monitoring and Modeling

Significant accomplishments for Task 9 for the reporting period included the following:

- Continued work on the Fort Nelson porosity/permeability stochastic heterogeneous model and worked on exporting simulation data to ArcGIS for the meeting at the EERC on October 15, 2009, with Spectra Energy.
- Continued geologic modeling of the Fort Nelson site along with numerical simulations on Version 2 of the geologic model to predict the fate of the injected sour CO₂.
- Selected an approximate location for the second injector well and a 3-D seismic survey—both scheduled for this winter’s drilling and data acquisition program at Fort Nelson. These new data will be incorporated into Version 3 of the geologic model.
- Continued discussion of special core analysis on the first test well, as well as a geomechanical, geochemical, and a cap rock testing program for the core from the first well drilled last winter at the Fort Nelson site.
- Initiated discussions for a well and reservoir testing program on a reentry of the original test well with Spectra Energy; this well is scheduled to be reentered in January 2010.
- Attended and participated in the PCOR Partnership annual meeting in St. Louis, Missouri, December 2–3, 2009.
- Continued working on Fort Nelson simulations, i.e., added new well locations and began rerunning the simulations to determine the long-term fate of the sour CO₂ with the new well locations. Recently, Spectra Energy acquired some seismic surveys in the area of interest which revealed that there may be a fault that is inhibiting flow between different portions of the study area. This has also been added to the model, and different fault transmissibility values are being applied to the fault in the model to determine the potential implications.
- Continued talks with Spectra Energy about paying for special core analysis on the first test well, as well as a geomechanical, geochemical, and a cap rock testing program for the core from the first well drilled last winter at the Fort Nelson site.
- The new data from the special core analysis will be added to Version 3 of the model.

- Participated in the Inter-partnership Simulation and Risk Assessment Working Group conference calls, including one held November 18, 2009.

Task 10 – Site Closure

This task is anticipated to be initiated Quarter 1 – BP5, Year 9 (October 2015).

Task 11 – Postinjection Monitoring and Modeling

This task is anticipated to be initiated Quarter 1 – BP5, Year 9 (October 2015).

Task 12 – Project Assessment

Significant accomplishments for Task 12 for the reporting period included the following:

- Prepared and submitted on December 31, 2009, the second annual project assessment report (D57) for the reporting period of October 1, 2008 – September 30, 2009.

Task 13 – Project Management

Significant accomplishments for Task 13 for the reporting period included the following:

- Held a task leader meeting October 19, 2009. Discussed the U.S. field demonstration site; the Third CSLF Ministerial meeting in London, England; the RCSP annual review meeting, plans for the upcoming annual meeting; and planned abstracts for next year's GHGT-10 conference in Amsterdam.
- Presented a PowerPoint presentation and a poster for the Fort Nelson CCS Project seeking CSLF recognition at the Third CSLF Ministerial Meeting in London, England, October 11–16, 2009.
- Received notification that the Fort Nelson CCS project received CSLF recognition.
- Presented a CO₂ Sequestration Workshop on October 25, 2009, in conjunction with the EERC Air Quality VII Conference in Arlington, Virginia.
- Served as session coordinator and presented on the PCOR Partnership at the Carbon Management Session held on October 26, 2009, at the EERC Air Quality VII Conference.
- Presented an update on the Phase III demonstration site(s) at the RCSP annual review meeting held November 16–19, 2009, in Pittsburgh, Pennsylvania.
- Accepted the Lignite Energy Council's "Distinguished Service – Research and Development Award" because of leadership and counsel on CO₂ storage projects involving the lignite industry. The awards were presented on October 8, 2009, in Bismarck, North Dakota.
- Ten abstracts (see Phase III Products or Technology Transfer Activities below) were submitted before December 22, 2009, for the 10th International Conference on Greenhouse Gas Control Technologies, to be held September 19–23, 2010, RAI, Amsterdam, The Netherlands (www.ghgt.info/GHGT10.html).

- Conducted premeeting planning for the 2009 PCOR Partnership annual meeting held December 1–3, 2009, in St. Louis, Missouri, including:
 - Chose a tag line: Carbon Management 2010: The Push Toward Commercialization.
 - Drafted a preliminary agenda for the premeeting workshops and annual meeting.
 - Contacted speakers and sponsors.
 - Updated the preliminary agenda online and included a feature on one of the speakers. An e-mail blast was sent to the membership on Friday, October 23, 2009: (www.undeerc.org/PCOR/PCOR09/email/email091019.asp).
 - Sent the draft final agenda on November 20, 2009, to the speakers.
- Coordinated and participated in the seventh PCOR Partnership annual meeting on December 1–3, 2009, in St. Louis, Missouri, which included the following presentations:
 - “Risk Management of CCS Projects: How to Ensure a Sustainable Storage Performance”
 - “International Perspectives on CO₂ Capture and Storage”
 - “CO₂ Pipeline Basics”
 - “Ramgen Project”
 - “PCOR Partnership: Phase III Overview”
 - “Phase III Fort Nelson Demonstration Project Update”
 - Panel Discussion: “Elements of Sound CCS Policy”
- Welcomed 84 participants to the annual meeting, including representation from the following:
 - 15 states, plus D.C. (California, Colorado, Connecticut, Illinois, Massachusetts, Minnesota, Missouri, Montana, Nebraska, North Dakota, Pennsylvania, Texas, Virginia, West Virginia, Wisconsin)
 - Five Canadian provinces (Alberta, British Columbia, Ontario, Quebec, Saskatchewan)
 - Two foreign countries (Canada, Sweden)
- Conducted post-annual meeting activities including:
 - Uploaded the annual meeting presentations to the partners-only DSS and sent an e-mail to all partners notifying them of the presentations’ availability on December 10, 2009.
 - Sent an e-mail of appreciation to the annual meeting presenters on December 21, 2009.
 - Contacted on December 22, 2009, the partners who did not attend the annual meeting to determine if anything could have been done differently to facilitate their participation.
- Welcomed Williston Basin Interstate Pipeline Company (WBIPC), headquartered in Bismarck, North Dakota, to Phase III of the PCOR Partnership on October 2, 2009. WBIPC owns and operates over 3700 miles of transmission, gathering, and storage lines and owns or leases and operates 30 compressor stations located in the states of Montana, North Dakota, South Dakota, and Wyoming.
- Welcomed the ILTF to Phase III of the PCOR Partnership with receipt of its letter of support dated December 18, 2009. ILTF is a nonprofit, independently governed organization that supports activities related to the acquisition, ownership, and management of land by tribes and Indian individuals. ILTF is committed to the

efficient use of land management in a quality environment and believes it is important to identify regional resources and options for carbon management and sequestration to ensure full ownership and control over reservation homelands.

- Provided a letter of support on November 3, 2009, for the recognition and appointment of Stefan Bachu (Alberta Innovates – Technology Futures) to the designation of “Distinguished Scientist.” Note: he received the appointment on December 20, 2009.
- Sent information on the PCOR Partnership to interested parties.
- Discussed identification of measurement needs with representative of the National Institute of Standards and Technology.
- Attended the 7th Annual EOR Carbon Management Workshop in Houston, Texas, and the 15th Annual CO₂ Flooding Conference in Midland, Texas (http://melzerconsulting.com/CO2_Week_Brochure.pdf).
- Continued efforts as the chairman of the North American Energy Working Group (NAEWG) North American Carbon Atlas Partnership (NACAP) Methodology Subcommittee, including the following:
 - Continued work determining the “level of detail/granularity in publically accessible GIS” as assigned to the Methodology Working Group and Information Technology Working Group. This work must be completed by next NACAP meeting.
 - Continued discussions with NACAP committee members on additional work assigned.
- Discussed on December 16, 2009, participation in a partner’s deep saline CO₂ injection program in Canada.
- Explored possibility of additional “follow-on” work at the Phase II geologic field validation test sites.
- Completed the following deliverables/milestones for October:
 - M23: Task 14 – monthly WWG conference call held
 - Phase III – D78: Task 14 – final White Paper on the Nexus of CCS and Water
 - Monthly update
- Completed the following deliverables/milestones for November:
 - M23: Task 14 – monthly WWG conference call held
 - D58/D59: Task 13 – quarterly progress report/milestone quarterly report (delayed and submitted November 2, 2009)
 - Monthly update
- Completed the following deliverables/milestones for December:
 - M23: Task 14 – monthly WWG conference call – waived by DOE
 - D57: Task 12 – project assessment annual report
 - November monthly update

Actual or anticipated problems or delays during the reporting period included the following:

- Because negotiations for commercial sponsorship are ongoing for the U.S. test site, attendant deliverables and milestones were approved for extension by DOE.

Task 14 – RCSP Water Working Group (WWG) Coordination

Significant accomplishments for Task 14 for the reporting period included the following:

- Distributed on October 9, 2009, the WWG minutes from the conference call held September 22, 2009.
- Held monthly WWG conference call on October 26, 2009.
- Submitted the final White Paper on the Nexus of CCS and Water (D78) on October 28, 2009.
- Distributed WWG minutes on November 2, 2009, from the conference call held October 26, 2009.
- On November 13, 2009, provided listing of Future Research Ideas Related to CCS to the DOE Project Officer for review.
- Led a meeting and held the monthly WWG conference call on November 16, 2009, in conjunction with the RCSP annual review meeting in Pittsburgh, Pennsylvania.
- Participated in a joint WWG and Outreach Working Group meeting on November 16, 2009, in Pittsburgh.
- Continued efforts between the WWG and Public Outreach Group on a fact sheet based loosely on the white paper.
- Attended and participated in the PCOR Partnership annual meeting in St. Louis, Missouri, December 2–3, 2009.
- Distributed WWG minutes on December 21, 2009, from the conference call held November 16, 2009.

Actual or anticipated problems or delays during the reporting period included the following:

- On December 15, DOE waived the December 2009 monthly conference call and also eliminated the water resource estimation methodology documents due February 2010 and May 2011. Alternative reports are under consideration.

PHASE III COST STATUS

The approved BP4 (Modification No. 16) budget along with actual costs incurred and in-kind cost share reported is shown in Table 3 A spending plan for BP4 and actual incurred cost by quarter of cash funds for BP4 is provided in Figure 2 and Table 4.

PHASE III SCHEDULE STATUS

Table 5 lists all deliverables and milestones by quarter, with completion dates, through the end of the reporting period (see Table 6 for the Gantt chart for BP4, Years 3 and 4).

Table 3. Phase III Budget – BP4

Organization	Approved Budget	Actual Costs Incurred
DOE Share – Cash	\$52,318,380	\$1,025,953
Nonfederal Share – Cash	\$2,368,750	\$171,873
Nonfederal Share – In-Kind	\$50,238,457	–
Total	\$104,925,587	\$1,197,826

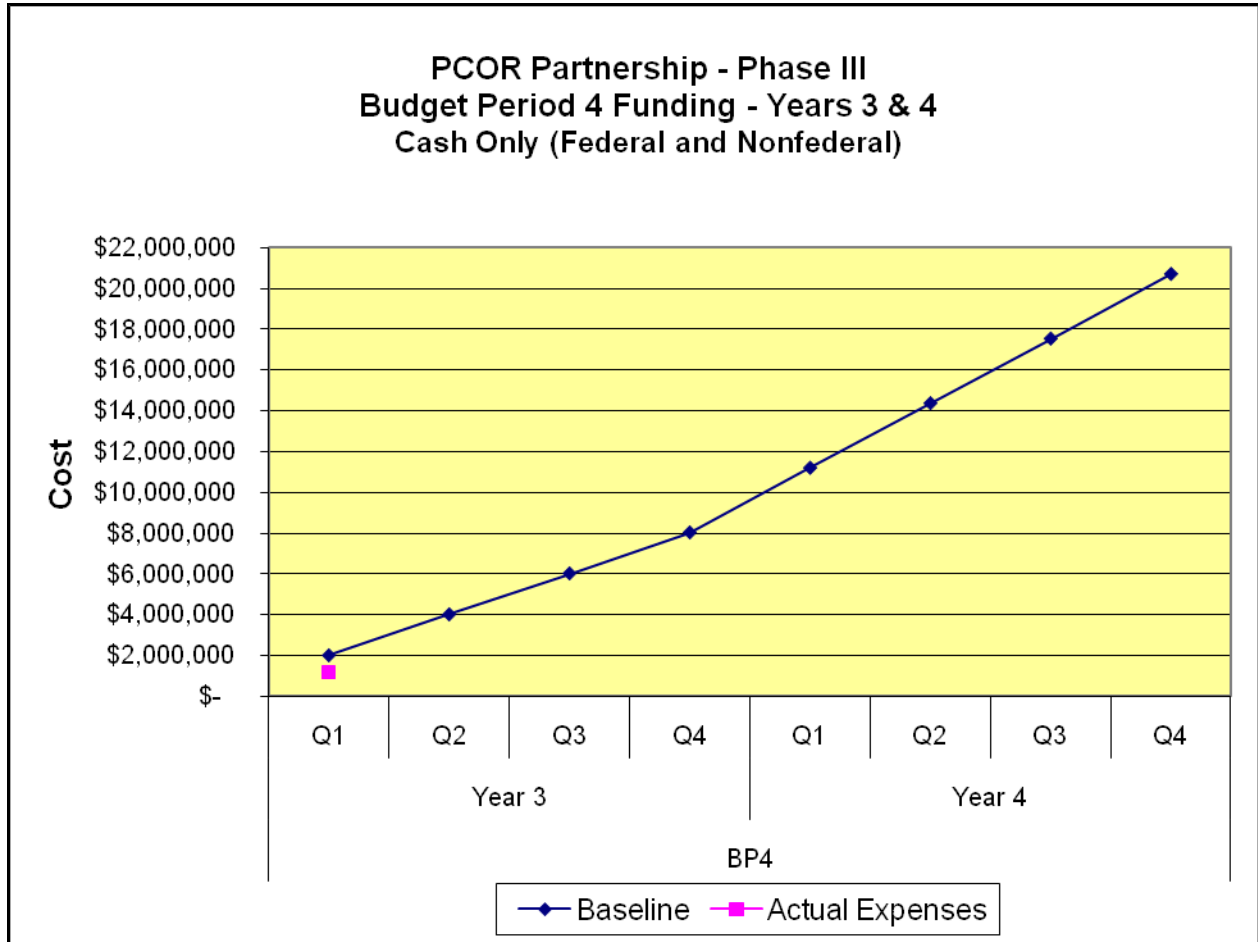


Figure 2. PCOR Partnership Phase III, BP4 – Years 3 and 4, funding (cash only).

Table 4. BP4 – Years 3 and 4 Spending Plan

Baseline Reporting Quarter	Year 3								Year 4							
	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	\$ 1,889,558	\$ 1,889,558	\$ 1,889,558	\$ 3,779,115	\$ 1,889,558	\$ 5,668,673	\$ 1,889,558	\$ 7,558,230	\$ 2,984,500	\$ 10,542,730	\$ 2,984,500	\$ 13,527,230	\$ 2,984,500	\$ 16,511,730	\$ 2,984,500	\$ 19,496,230
NonFederal Share	\$ 117,188	\$ 117,188	\$ 117,188	\$ 234,375	\$ 117,188	\$ 351,563	\$ 117,188	\$ 468,750	\$ 180,000	\$ 648,750	\$ 180,000	\$ 828,750	\$ 180,000	\$ 1,008,750	\$ 180,000	\$ 1,188,750
Total Planned	\$ 2,006,745	\$ 2,006,745	\$ 2,006,745	\$ 4,013,490	\$ 2,006,745	\$ 6,020,235	\$ 2,006,745	\$ 8,026,980	\$ 3,164,500	\$ 11,191,480	\$ 3,164,500	\$ 14,355,980	\$ 3,164,500	\$ 17,520,480	\$ 3,164,500	\$ 20,684,980
Actual Incurred Cost																
Federal Share	\$ 1,025,953	\$ 1,025,953														
NonFederal Share	\$ 171,873	\$ 171,873														
Total Incurred Cost	\$ 1,197,826	\$ 1,197,826														
Variance																
Federal Share	\$ 863,605	\$ 863,605														
NonFederal Share	\$ (54,686)	\$ (54,686)														
Total Variance	\$ 808,919	\$ 808,919														

Table 5. Phase III – Through BP4, Year 4: 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 – U.S. Test Site – Geomechanical Experimental Design Package	3/31/08	3/31/08
D27: Task 3 – Environmental Questionnaire – Fort Nelson Test Site	3/31/08	4/02/08
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 U.S. Test Site	6/30/08	6/27/08
M6: Task 4 – U.S. Test Site Geochemical Work Initiated	6/30/08	6/30/08
M7: Task 4 – U.S. 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 (DPRS) 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	10/31/08
D20: Task 2 – Documentary Support to PowerPoint and Web Site	12/31/08	12/31/08
D57: Task 12 – Project Assessment Annual Report	12/31/08	12/31/08

Continued...

Table 5. Phase III – Through BP4, Year 4: 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	1/30/09
M21: Task 14 – Outline of White Paper on Nexus of CO ₂ Capture and Sequestration (CCS) and Water, Part Subtask 14.2 – White Paper on Nexus of CCS and Water	2/27/09	2/27/09
D24: Task 2 – PCOR Partnership Region Sequestration General Poster	3/31/09	3/31/09
Year 2 – Quarter 3 (April–June 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/09	4/30/09
M23: Task 14 – Monthly WWG Conference Call Held	4/30/09	4/30/09
D2: Task 1 – First Target Area Completed	5/29/09	5/29/09
M23: Task 14 – Monthly WWG Conference Call Held	5/29/09	5/29/09
M24: Task 14 – WWG Annual Meeting Held	5/29/09	5/07/09
D16: Task 2 – Fort Nelson Test Site Fact Sheet	5/29/09	5/29/09
M23: Task 14 – Monthly WWG Conference Call Held	6/30/09	6/25/09
Year 2 – Quarter 4 (July–September 2009)		
M23: Task 14 – Monthly WWG Conference Call Held	N/A	Waived by DOE
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/09	7/31/09
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	7/31/09	7/31/09
M22: Task 14 – Draft White Paper – Nexus of CCS and Water Available for Comments	8/17/09	8/18/09
M23: Task 14 – Monthly WWG Conference Call Held	8/31/09	8/25/09
M4: Task 4 – U.S. Test Site Selected	9/30/09	9/30/09
M5: Task 4 – Data Collection Initiated for U.S. Test Site	9/30/09	9/30/09
M23: Task 14 – Monthly WWG Conference Call Held	9/30/09	9/22/09
D1: Task 1 – Review of Source Attributes	9/30/09	9/25/09
D3: Task 1 – Permitting Review – One State and One Province	9/30/09	9/30/09
D9: Task 1 – Updated DSS	9/30/09	9/29/09
D47: Task 6 – Topical Report on the Preliminary Design of Advanced Compression Technology	9/30/09	9/30/09
D77: Task 13 – Risk Management Plan Outline	9/30/09	9/18/09

Continued...

Table 5. Phase III – Through BP4, Year 4: Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 3 – Quarter 1 (October–December 2009)		
M23: Task 14 – Monthly WWG Conference Call Held	10/30/09	10/26/09
D78: Task 14 – Final White Paper on the Nexus of CCS and Water	10/30/09	10/28/09
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/30/09	11/02/09
M23: Task 14 – Monthly WWG Conference Call Held	11/30/09	11/16/09
M23: Task 14 – Monthly WWG Conference Call Held	12/31/09	Waived by DOE
D57: Task 12 – Project Assessment Annual Report	12/31/09	12/31/09
Year 3 – Quarter 2 (January–March 2010)		
D13: Task 2 – Public Site Updates	1/15/10	
M23: Task 14 – Monthly WWG Conference Call Held	1/31/10	
D15: Task 2 – U.S. Test Site Fact Sheet	1/31/10	
D28: Task 3 – Environmental Questionnaire – U.S. Test Site	1/31/10	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/10	
D31: Task 4 – U.S. Test Site – Geological Characterization Experimental Design Package	1/31/10	
M23: Task 14 – Monthly WWG Conference Call Held	2/28/10	
D79: Task 14 – Water Resource Estimation Methodology Document	2/28/10	Waived by DOE
D29: Task 3 – Permitting Action Plan	3/31/10	
D11: Task 2 – Outreach Plan	3/31/10	
M23: Task 14 – Monthly WWG Conference Call Held	3/31/10	
M19: Task 6 – Capture, Dehydration, and Compression Technology Selected	3/31/10	
M9: Task 4 – U.S. Test Site Geological Model Development Initiated	3/31/10	
Year 3 – Quarter 3 (April–June 2010)		
D41: Task 4 – Fort Nelson Test Site – Geochemical Final Report	4/30/10	
M23: Task 14 – Monthly WWG Conference Call Held	4/30/10	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/10	
M23: Task 14 – Monthly WWG Conference Call Held	5/31/10	

Continued...

Table 5. Phase III – Through BP4, Year 4: Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 3 – Quarter 3 (April–June 2010) continued		
M8: Task 4 – U.S. Test Site Wellbore Leakage Data Collection Initiated	6/30/10	
D67: Task 4 – Fort Nelson Test Site – Simulation Report	6/30/10	
M23: Task 14 – Monthly WWG Conference Call Held	6/30/10	
M24: Task 14 – WWG Annual Meeting Held	6/30/10	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/10	
D18: Task 2 – U.S. Test Site PowerPoint Presentation	6/30/10	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/10	
Year 3 – Quarter 4 (July–September 2010)		
M23: Task 14 – Monthly WWG Conference Call Held	7/31/10	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/10	
D25: Task 2 – U.S. Test Site Poster	7/31/10	
M23: Task 14 – Monthly WWG Conference Call Held	8/31/10	
D40: Task 4 – Fort Nelson Test Site – Geomechanical Final Report	9/30/10	
M23: Task 14 – Monthly WWG Conference Call Held	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	
D52: Task 9 – Fort Nelson Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/10	
Year 4 – Quarter 1 (October–December 2010)		
M23: Task 14 – Monthly WWG Conference Call Held	10/31/10	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/10	
M23: Task 14 – Monthly WWG Conference Call Held	11/30/10	
M23: Task 14 – Monthly WWG Conference Call Held	12/31/10	
D57: Task 12 – Project Assessment Annual Report	12/31/10	

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Table 5. Phase III – Through BP4, Year 4: Milestones and Deliverables (continued)

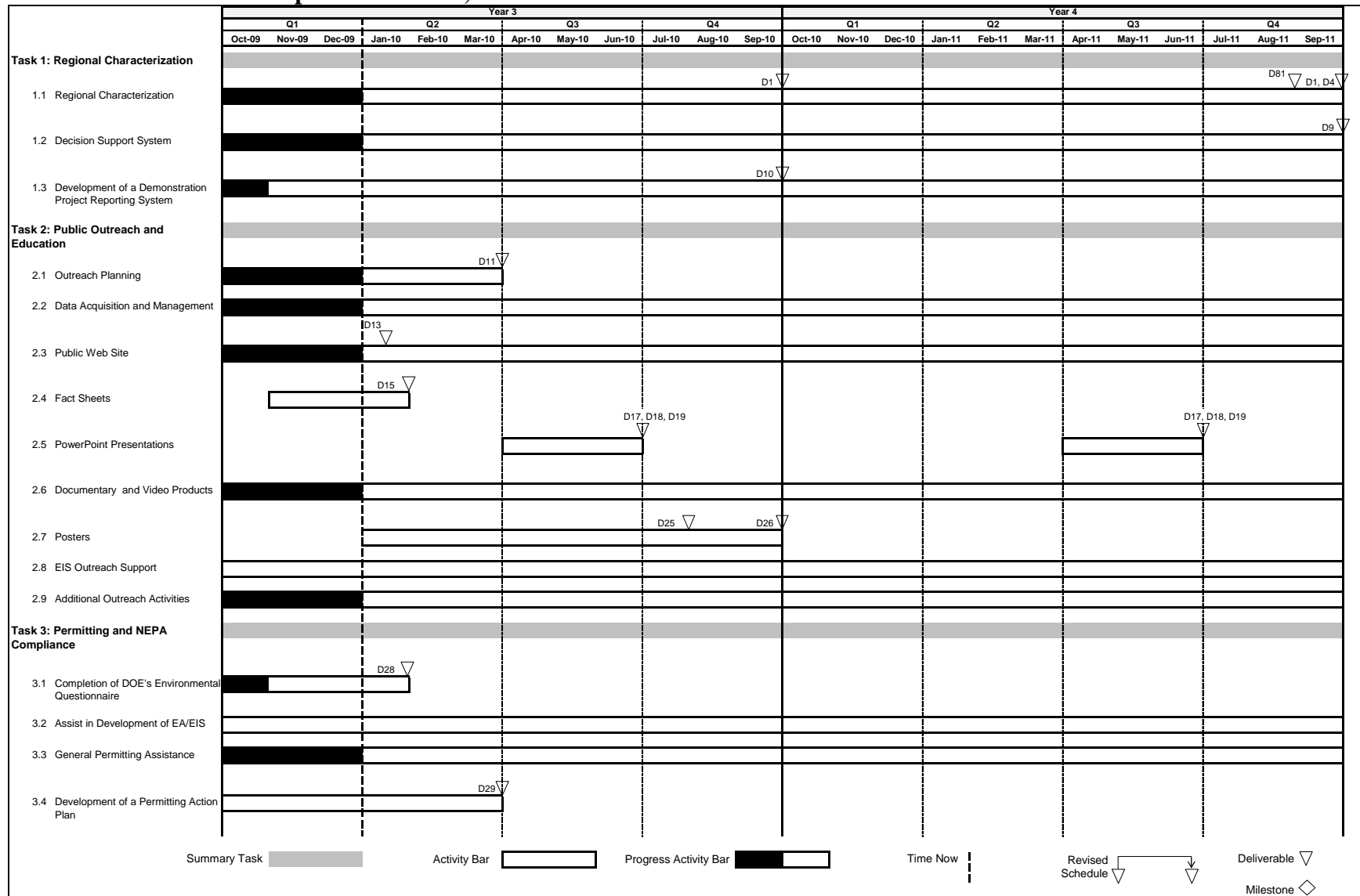
Title/Description	Due Date	Actual Completion Date
Year 4 – Quarter 2 (January–March 2011)		
M23: Task 14 – Monthly WWG Conference Call Held	1/31/11	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/11	
M20: Task 6 – Capture, Dehydration, and Compression Technology Design Completed	1/31/11	
M23: Task 14 – Monthly WWG Conference Call Held	2/28/11	
D65: Task 4 – Fort Nelson Test Site – Site Characterization Report	2/28/11	
M23: Task 14 – Monthly WWG Conference Call Held	3/31/11	
M25: Task 4 – Fort Nelson Test Site – CO ₂ Injection Initiated	3/31/11	
D50: Task 9 – U.S. Test Site – Site Characterization, Modeling, and Monitoring Plan	3/31/11	
D82: Task 6 – Topical Report on Integration of Advanced Compression Technology with CO ₂ Capture	3/31/11	
Year 4 – Quarter 3 (April–June 2011)		
M23: Task 14 – Monthly WWG Conference Call Held	4/30/11	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/11	
M23: Task 14 – Monthly WWG Conference Call Held	5/31/11	
D34: Task 4 – U.S. Test Site – Baseline Hydrogeological Final Report	5/31/11	
D79: Task 14 – Water Resource Estimation Methodology Document	5/31/11	Waived by DOE
M23: Task 14 – Monthly WWG Conference Call Held	6/30/11	
M24: Task 14 – WWG Annual Meeting Held	6/30/11	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/11	
D18: Task 2 – U.S. Test Site PowerPoint Presentation	6/30/11	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/11	
D48: Task 7 – Procurement Plan and Agreement Report	6/30/11	
M12: Task 4 – U.S. Test Site Geochemical Work Completed	6/30/11	
M16: Task 4 – U.S. Test Site Final Geological Model Development Completed	6/30/11	

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Table 5. Phase III – Through BP4, Year 4: Milestones and Deliverables (continued)

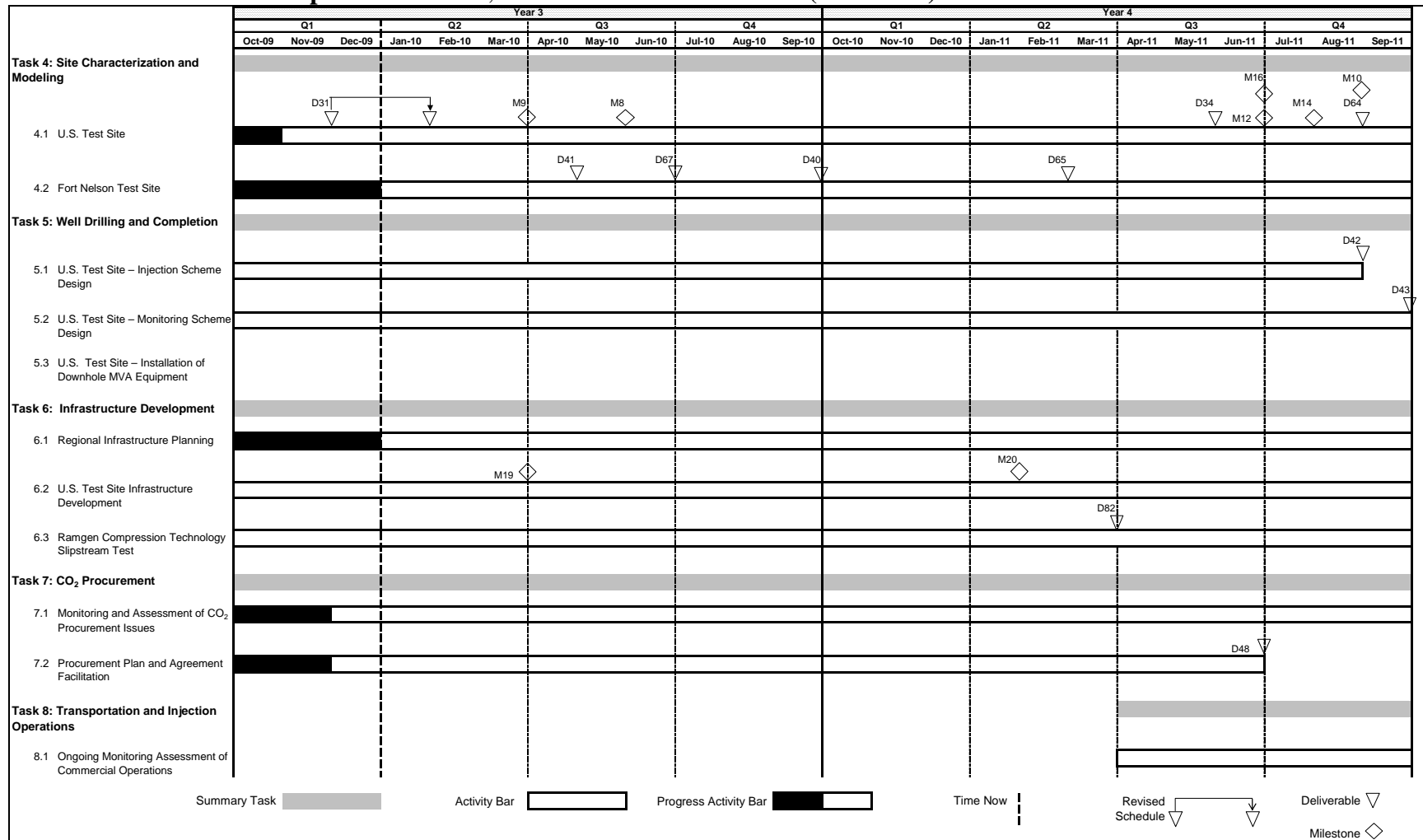
Title/Description	Due Date	Actual Completion Date
Year 4 – Quarter 4 (July–September 2011)		
M23: Task 14 – Monthly WWG Conference Call Held	7/31/11	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/11	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	7/31/11	
M14: Task 4 – U.S. Test Site Geological Characterization Data Collection Completed	7/31/11	
M23: Task 14 – Monthly WWG Conference Call Held	8/31/11	
D81: Task 1 – Regional Carbon Sequestration Atlas (Update)	8/31/11	
D42: Task 5 – U.S. Test Site – Injection Experimental Design Package	8/31/11	
D64: Task 4 – U.S. Test Site – Site Characterization Report	8/31/11	
M10: Task 4 – U.S. Test Site Wellbore Leakage Data Collection Completed	8/31/11	
M23: Task 14 – Monthly WWG Conference Call Held	9/30/11	
M26: Task 9 – U.S. Test Site – CO ₂ Injection Initiated	9/30/11	
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	
D43: Task 5 – U.S. Test Site – Monitoring Experimental Design Package	9/30/11	

Table 6. PCOR Partnership Phase III BP4, Years 3 and 4 Gantt Chart



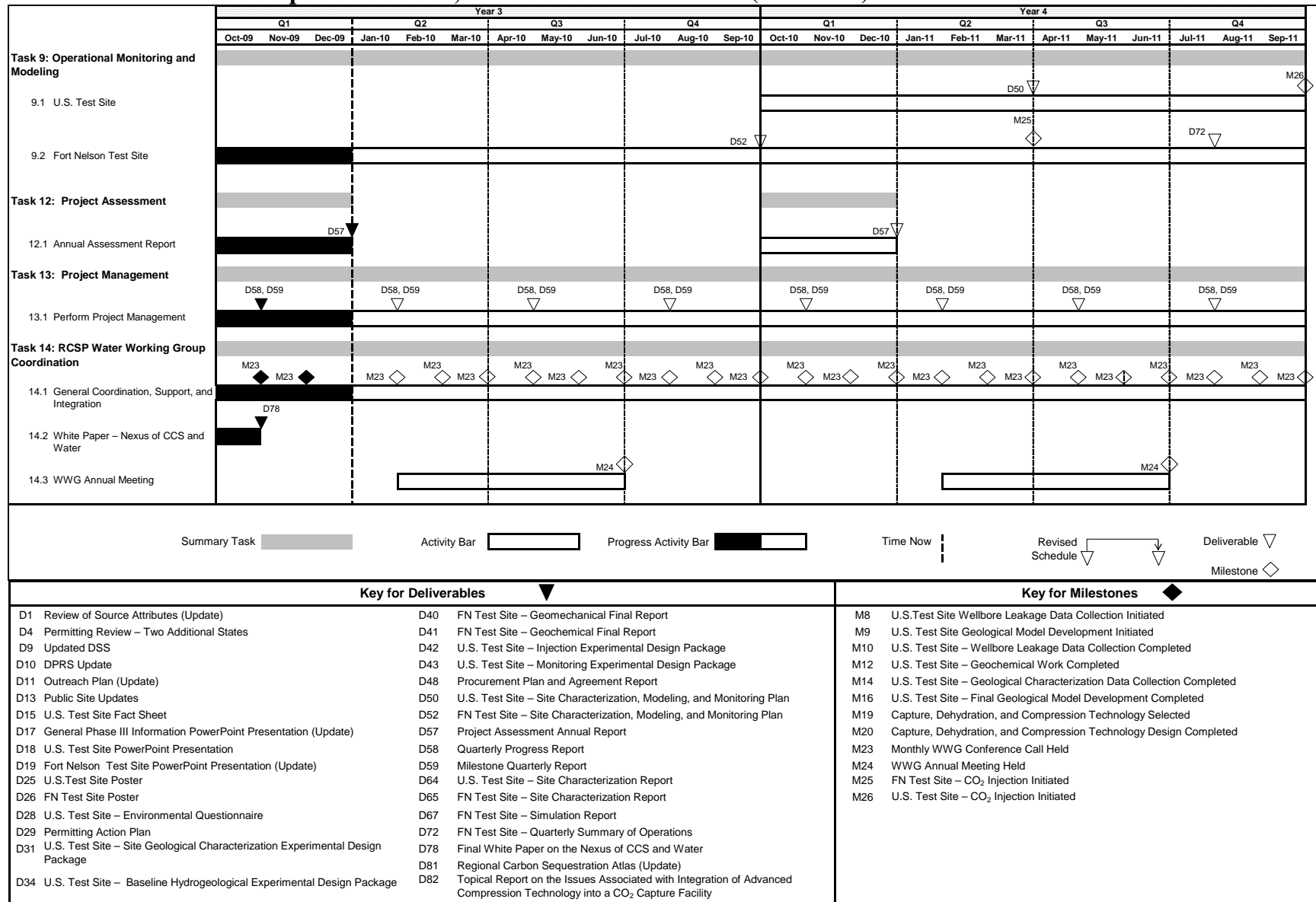
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Table 6. PCOR Partnership Phase III BP4, Years 3 and 4 Gantt Chart (continued)



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Table 6. PCOR Partnership Phase III BP4, Years 3 and 4 Gantt Chart (continued)



PHASE III PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES

Abstracts

- Ayash, S.C., Giry, E.F., Frenette, R., Meyer, V., Moffatt, D.J., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2009, A new risk management methodology for large-scale CO₂ storage—application to the Fort Nelson carbon capture and storage project [abs.]: International Conference on Greenhouse Gas Control Technologies (GHGT-10), Amsterdam, The Netherlands, September 19–23, 2010 [in review].
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- Holubnyak, Y.I., Knudsen, D.J., Mibeck, B.A., Bremer, J.M., Smith, S.A., Sorensen, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2009, Geochemical modeling of carbon dioxide injections into carbonate formation in the northwest McGregor oil field for CO₂ storage and enhanced oil recovery (EOR) [abs.]: American Association of Petroleum Geologists (AAPG) Annual Convention and Exhibition, New Orleans, Louisiana, April 11–14, 2010 [in review].

- Holubnyak, Y.I., Knudsen, D.J., Mibeck, B.A., Bremer, J.M., Smith, S.A., Sorensen, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2009, Investigation of geochemical interactions of carbon dioxide and carbonate formation in the northwest McGregor oil field after enhanced oil recovery and CO₂ storage [abs.]: International Conference on Greenhouse Gas Control Technologies (GHGT-10), Amsterdam, The Netherlands, September 19–23, 2010 [in review].
- Knudsen, D.J., Gorecki, C.D., Bremer, J.M., Holubnyak, Y.I., Mibeck, B.A., Schmidt, D.D., Smith, S.A., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2009, Characterization and modeling of a CO₂ huff ‘n’ puff to predict and verify EOR production and CO₂ storage [abs.]: American Association of Petroleum Geologists (AAPG) Annual Convention and Exhibition, New Orleans, Louisiana, April 11–14, 2010 [in review].
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MEETINGS/TRAVEL

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

- October 8, 2009: Traveled to accept an award at the Lignite Energy Council's Annual Meeting in Bismarck, North Dakota.

- October 8–15, 2009: Presented at the Third CSLF Ministerial meeting in London, England.
- October 12–17, 2009: Traveled to collect rock samples for the new U.S. field demonstration site.
- October 15–22, 2009: Presented at the 2009 Portland Geological Society annual meeting and attended the Geological Society of America Short Course: No. 506 Structural and Stratigraphic Concepts Applied to Basin Exploration in Portland, Oregon.
- October 25–27, 2009: Attended an Aquistore outreach and communication strategy meeting in Regina, Saskatchewan, Canada.
- October 27–30, 2009: Attended an Optimized Gas Treating Seminar in Houston, Texas.
- November 1–5, 2009: Participated in the 2009 Society of Petroleum Engineers International Conference on CO₂ Capture, Storage, and Utilization (November 2–4, 2009) in San Diego, California.
- November 4–7, 2009: Visited the Petroleum Engineering Lab to discuss core flood apparatus at Stanford University in San Francisco, California.
- November 2–4, 2009: Attended the North Dakota GIS User Conference in Grand Forks, North Dakota.
- November 4–5, 2009: Attended the PCOR Partnership project planning meeting with Brian Strasizar in Pittsburgh, Pennsylvania.
- November 6, 9, 2009: Attended meetings with Dave Nakles from Carnegie Mellon University, in Washington, D.C.
- November 8–10, 2009: Participated in the Great Plains Energy Expo and Showcase (November 9–10, 2009) in Bismarck, North Dakota.
- November 9–12, 2009: Participated in the Simulia Training Course entitled “Analysis of Geotechnical Problems with Abaqus” in Houston, Texas.
- November 15–19, 2009: Participated in the RCSP annual review meeting in Pittsburgh, Pennsylvania.
- November 30 – December 3, 2009: Participated in the PCOR Partnership annual meeting and workshops in St. Louis, Missouri.
- November 30 – December 3, 2009: participated in the PCOR Partnership annual meeting and workshops in St. Louis, Missouri.
- December 7–8, 2009: Attended the 7th Annual EOR Carbon Management Workshop in Houston, Texas.
- December 9–11, 2009: Attended the 15th Annual CO₂ Flooding Conference in Midland, Texas.
- December 15–18, 2009: Presented at the 2009 AGU Fall Meeting Union Session U02: Geophysical Monitoring, Verification, and Accounting for Geologic Carbon Sequestration in San Francisco, California.

Materials presented at these meetings are available to partners on the PCOR Partnership DSS Web site (<http://www2.undeerc.org/website/pcorp/>).

REFERENCES

None.