

**Plains CO₂ Reduction (PCOR) Partnership Monthly Update
December 1–31, 2008**

PHASE II ACTIVITIES

Task 1 – Project Management and Reporting (Edward N. Steadman/John A. Harju)

Highlights

- As of December 31, 2008, the PCOR Partnership has 80 (Phase II and III) partners. Please note that Phase II members in good standing are automatically enrolled in Phase III for the first budget period that overlaps with the last 2 years of Phase II (October 1, 2007 – September 30, 2009).
- We now require each partner to have a unique user name and password combination in order to access and use features and functions of the Decision Support System (DSS, © 2007 EERC Foundation) Web site. On December 19, 2008, the new passwords and user names were sent via e-mail. Please contact Stephanie Wolfe by e-mail at swolfe@undeerc.org or by phone at (701) 777-5229 if you do not have your username and password.
- The following Phase II Deliverables/Milestones were completed in December.
 - D42: Task 2 – Williston Basin Field Validation Test Experimental Design Package
 - D43: Task 2 – Williston Basin Field Validation Test Site Health and Safety Plan
 - D17: Task 8 – PowerPoint Presentation: General Audience CO₂ Sequestration Outreach
- Upcoming Phase II Deliverables/Milestones for January
 - D3: Task 1 – Quarterly Report
- Upcoming Phase II Deliverables/Milestones for February
 - M12/D45: Task 2 – Williston Basin Field Validation Test Outreach Action Plan
 - D22: Task 8 – Web Site Update

Task 2 – Field Validation Test at a Williston Basin Oil Field, North Dakota (James A. Sorensen)

Highlights

- Deliverable D42: Williston Basin Field Validation Test Experimental Design Package was submitted to DOE for review on December 23, 2008.
- Deliverable D43: Williston Basin Field Validation Test Site Health and Safety Plan was submitted to the U.S. Department of Energy (DOE) for review on December 23, 2008.
- Evaluation of oil fields in Williston Basin that may be suitable candidates to host the injection and monitoring, mitigation, and verification (MMV) activities continued. Efforts focused on developing baseline characterization data for the Northwest McGregor oil field on the Nesson Anticline.
- The development of plans to conduct a huff-n-puff operation in a well in the Northwest McGregor field continued.

- Deliverable D40 Williston Basin Field Validation Test Regulatory Permitting Action Plan was finalized for the Northwest McGregor field huff-n-puff operation and submitted to DOE for review on December 11, 2008.
- Laboratory tests were continued to examine the geochemical interactions between CO₂, saline water, and rocks. Rocks 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, for some rocks, changes in mineral composition can and do occur within a matter of weeks. Preliminary results of geochemical modeling conducted in October were consistent with many of the laboratory results. It is anticipated that a series of these tests, using a variety of rock types, will continue to be conducted over the 1st quarter of 2009, 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, Canada (Steven A. Smith)

Highlights

- 20 samples have been taken from well 8-33-115-6W6M (acid gas disposal) for petrological and geochemical investigations of the effects of acid gas on the reservoir mineralogy. Thin sections for each of the samples have been prepared and are currently undergoing petrological investigation. Scanning electron microscope mounts have also been prepared and are currently being examined. X-ray diffraction determination of the mineralogy for each of the samples is complete, and the interpretation is under way. Samples for intercrystalline porosity–mass spectrometry analysis using strong acid digestion and x-ray fluorescence have been prepared and submitted for analysis and will be completed in the New Year.
- Ten samples were also obtained from the same well and will be analyzed for geomechanical strength and threshold properties.

Task 4 – Field Validation Test of Lignite Coal in North Dakota (Lisa S. Botnen)

Highlights

- Discussions continue with Pinnacle and Schlumberger to coordinate MMV activities.
- Development continues on the subsurface geologic model. This model will be used to estimate reservoir capacity with respect to CO₂ storage or sequestration ability.
- Monitoring wells are prepped for injection.
- Site preparations continue in order to get ready for CO₂ injection.
- The U.S. Environmental Protection Agency (EPA) has concurred with the state of North Dakota's approval of our aquifer exemption request. The state has issued a final order approving our application for injection.
- Wellhead design and installation are nearly complete.
- Numerous meetings have been conducted with various partners and field service providers to discuss the logistics of CO₂ 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 (Barry W. Botnen)

Highlights

- Data entry of gas sampling and field-collected site measurements is progressing.
- Grassland sampling has been completed in Montana, north-central and northeast North Dakota, and north-central Iowa. The samples are being analyzed.
- Fact sheets on the 2007 Farm Bill and comparisons of soil carbon models are in process.
- A Topical Report entitled “Technical, Regulatory, and Economic Feasibility of Wetlands as a Greenhouse Gas Mitigation Strategy” is in final review at Ducks Unlimited, Inc. (DU)/the Energy & Environmental Research Center (EERC).
- PCOR Partnership partners continue to work toward obtaining Climate Community and Biodiversity Standards verification for grassland carbon credits.
- DU continues to make progress with respect to its carbon credit program. They have currently secured over 24,000 acres of private grasslands, with an initial goal set at 30,000 acres. Future projects are in process, pending accounting rules for verification and certification for grassland credits.
- As part of the wetlands study, an in situ experiment on nitrogen amendments on greenhouse gas (GHG) emissions continues. Results are being finalized.
- Evaluating other state and regional GHG or cap-and-trade program rules and policies and DOE Guidelines for Aggregators and Terrestrial Offset Providers.
- Continuing to update DU–PCOR Partnership terrestrial project Web site.
- Working on characterization inputs and the terrestrial portion of the DSS.

Task 6 – Continued Characterization of Regional Sequestration Opportunities (Wesley D. Peck)

Highlights

- A computer application that extracted specific data elements from the set of Log Ascii Standard (LAS) files provided by Manitoba was created. This data set was then reorganized and placed into an Access database.
- RPS Energy has agreed to proceed with gathering and reviewing the necessary data elements needed to calculate CO₂ capacity estimates for oil pools in British Columbia, Alberta, and Saskatchewan. This work will begin in early January 2009.
- Updated sections for the field validation test at Zama and for the terrestrial validation test are nearly completed. This material will be used in the new DSS layout.
- Rectifying a series of questions regarding the newly acquired oil field data for the PCOR Partnership region continues. The tabular data for the oil fields in a particular state do not align perfectly with the oil field objects in the geographic information system (GIS) files.
- User name and password information was updated for the DSS. Each partner organization received its own unique user name and password. This change will allow for better security management of the DSS and allow for better tracking of how the DSS is used and, subsequently, how it can be improved.
- Maps were created for the proposed Phase II Williston Basin field validation site near McGregor, North Dakota.

Task 7 – Research, Safety, Regulatory, and Permitting Issues (Lisa S. Botnen)

Highlights

- Comments on EPA's proposed rules for geologic sequestration have been developed and submitted to EPA for consideration. Input from PCOR Partnership members was received and incorporated into the document.
- Various state, provincial, and regional GHG reduction and carbon capture and storage (CCS) initiatives are being tracked and analyzed.
- Analysis of carbon market strategies continues.
- Legislative actions occurring in Congress continue to be followed and reviewed for any implications relating to carbon capture and storage.
- Recent publications relating to regulating CO₂ sequestration and MMV issues continue to be reviewed.
- The application for injection for the lignite field validation test has been approved.

Task 8 – Public Outreach and Education (Daniel J. Daly)

Highlights

- Deliverable D46: Documentary on Geologic Sequestration (due to DOE March 2009)
 - Transcribed the Apache Canada interview done in Midale, Saskatchewan, on November 20, 2008.
 - Attended the environmental defense interview on December 5, 2008, in Austin, Texas, and finalized the transcription of the interview.
- Deliverable D22: Public Web Site Update (due to DOE February 2009)
 - The outreach group met on December 1, 2008, to review the carbon calculator and glossary portions of the Web site and on December 12, 2008, to review progress and update planning for the update due at the end of February 2009.
 - Discussions were held with the DSS group on December 9 and 16, 2008, to help ensure consistency between the public and members-only Web sites.
 - Drafts of public Web pages needing updates were put out for review by the outreach team.
 - Drafts of new pages for the public site were posted for review the outreach team.
 - A draft of the new public Web page format was completed and put out for review by senior PCOR Partnership management.
 - An internal meeting was held to clarify issues regarding the status and handling of the Web site activity. It was internally approved; the new Web page format and the plan to have materials available for review by late January 2009.
- Deliverable D17: PowerPoint Presentation: General Audience CO₂ Sequestration Outreach was submitted to DOE for review on December 31, 2008.
- Weyburn Outreach Advisory Group
 - Attended the PRISM meeting in Edmonton, Alberta, and joined PCOR Partnership member Apache Canada in helping to develop a revised communications plan during a daylong advisory group session on December 3, 2008.

Task 9 – Identification of Commercially Available Sequestration Techniques Ready for Large-Scale Deployment (Melanie D. Jensen/Michael L. Jones)

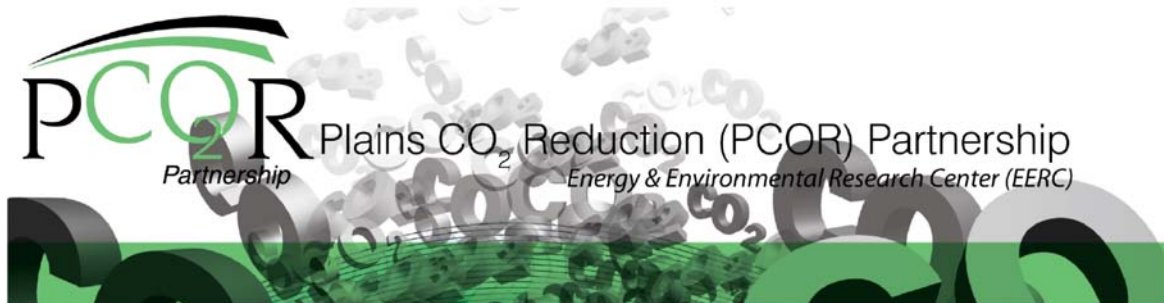
Highlights

- Working with the gas-processing facility data set that was purchased from PennWell and updating the draft of the report explaining the PCOR Partnership's CO₂ emission calculation methodologies continues.
- CO₂ emission source locations for five sources were verified.
- Verifying the locations of the newly added regional gas-processing facilities continues.
- Questions about the updated DSS Web page as it relates to the capture technologies table were answered.

Task 10 – Regional Partnership Program Integration (Edward N. Steadman)

Highlights

- The PCOR Partnership also continued participation in working group conference calls, including the following:
 - GIS
 - Capture and Transportation
 - Geologic
 - Outreach
 - Simulation and Risk Assessment
- A Water Working Group is currently being assembled within the Regional Carbon Sequestration Partnerships (RCSPs). The PCOR Partnership plans on also taking part in this working group.
- A regulatory workshop is tentatively being planned for June 2009.



PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Work on material to populate the new DSS Web pages continues.
- Working with the Web site developers on the functionality of the new site and identifying images for the site have begun.
- Data extraction and management tasks dealing with the latest study area in southeast Saskatchewan and adjacent Manitoba and North Dakota continue.
- Met with the PCOR Partnership outreach task members on a plan to develop parallel products for the revisions to the public and partners-only Web sites.
- Designing a template for maps to be included in the next version of the PCOR Partnership Regional Atlas continues.
- Contacted RPS Energy for assistance in generating latitude/longitude locations for gas plants in Alberta and British Columbia.
- A search for a new employee with GIS, .net, Visual Basic, and Web programming experience continues.

Task 2 – Public Outreach and Education (Daniel J. Daly)

Highlights

- Deliverable D20: Documentary Support to PowerPoint and Web Site was submitted to DOE for review on December 31, 2008.
 - Prairie Public Broadcasting (PPB) finalized over 40 raw video clips ranging from 30 seconds to over 3 minutes, provided examples of the type of credits that would be attached to the clips for use in a Web site or on YouTube, and loaded the video onto the EERC FTP server.
 - The EERC reviewed the clips, provided titles, and provided instructions for upload onto the EERC FTP server.
- Deliverable D12: Demonstration Web Pages on the Public Site
 - Received an updated format for the demonstration project pages from the EERC Graphics Department; a final draft is expected next week.
 - Met internally with the DSS group, and finalized a draft final format that would meet needs of both outreach and DSS.
- School outreach
 - Contacting teachers in the region to develop an advisory group for activities continues.

- Discussed ideas for collaborative school outreach activities in Canadian portion of the PCOR Partnership region with Empressa Communications, Regina, Saskatchewan; outreach lead for Weyburn/Midale Project and other outreach personnel from governments in Saskatchewan and Alberta at the PRISM meeting in Edmonton, Alberta.
- Agreed to give a presentation at the Lignite Energy Council's teacher seminar in June 2009, and provided information on the presentation.
- Draft PowerPoint slides were developed to supplement the existing education PowerPoint.
- Outreach information system
 - Preparation of materials continues.
- Weyburn Outreach Advisory Group
 - Attended the PRISM meeting in Edmonton, Alberta, and joined PCOR Partnership member Apache Canada in helping to develop a revised communications plan during a daylong session on December 3, 2008.
- EERC video capability
 - Prepared a scope of work for a student employee for the period December 19, 2008, through mid-January 2009.
 - The student employee reviewed and organized documentary footage and prepared materials for PCOR Partnership personnel camera training.
- Outreach Source Book
 - Reviewed the Source Book in anticipation of using it as a model for a common source between the DSS Team and the outreach team.

Task 3 – Permitting and NEPA Modeling (Lisa S. Botnen)

Highlights

- Various state, provincial, and regional GHG reduction and CCS initiatives are being tracked and analyzed.
- An update to the regulatory section of the DSS is under development.
- Comments on EPA's proposed rules for geologic sequestration have been developed and submitted to EPA for consideration. Input from PCOR Partnership members was received and incorporated into the document.
- Legislative actions occurring in Congress continue to be followed and reviewed for any implications relating to CCS.
- Recent publications relating to regulating CO₂ sequestration and MMV issues continue to be reviewed.
- Analysis of carbon market strategies continues.
- Frequent updates are provided to task leaders with regard to federal, state, and provincial actions.

Task 4 – Site Characterization and Modeling (James A. Sorensen)

Highlights

- Continued the development of a Project Risk Assessment Plan for the Fort Nelson demonstration. Participants in the Fort Nelson Risk Assessment will likely include the

EERC, Spectra Energy, Schlumberger, RPS Energy, Advanced Geotechnology, and a consultant working through the Alberta Research Council.

- 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.
- D31: Task 4 – Williston Basin Test Site – Geological Characterization Experimental Design Package development continues. 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 CO₂-based enhanced oil recovery activities under Phase III.
- Regional characterization activities
 - Estimates of storage capacity of several saline aquifer systems in the northeastern flank area of the Williston Basin, an area including parts of North Dakota, Saskatchewan, and Manitoba, were initiated.
 - Updating the oil field data in the DSS continued. Working with relevant agencies in the states and provinces to facilitate the updating process.

Task 5 – Well Drilling and Completion (Steven A. Smith)

- This task has not begun (Quarter 1 – Budget Period 3; Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 6 – Infrastructure Development (Melanie D. Jensen)

Highlights

- Calculations for a thermodynamic balance of the Powerspan ECO₂[™] process continue and they will be reviewed internally when completed.
- Spoke with ProTreat at a conference in Houston, Texas. ProTreat is a mass and heat-transfer rate-based amine simulator for CO₂ capture applications and arrangements to review the simulator were initiated. The model could be valuable to this task as the plans for the Williston Basin demonstration are firmed up.

Task 7 – CO₂ Procurement (John A. Harju)

- Numerous discussions with potential CO₂ 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 (TBA)

- This task has not begun (Quarter 1 – Budget Period 4; Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 9 – Operational Monitoring and Modeling (TBA)

- This task has not begun (Quarter 1 – Budget Period 4; Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 10 – Site Closure (TBA)

- This task has not begun (Quarter 1 – Budget Period 5; Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 11 – Postinjection Monitoring and Modeling (TBA)

- This task has not begun (Quarter 1 – Budget Period 5; Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 12 – Project Assessment (Stephanie L. Wolfe)

- Assessment was conducted for all 13 Phase III tasks for October 1, 2007 – September 30, 2008, and was illustrated in the Project Assessment Annual Report (Deliverable 57). The report was submitted on December 31, 2008.

Task 13 – Project Management (Edward N. Steadman)

Highlights

- Current and pending CO₂ related projects within the PCOR Partnership region are continuously changing. To better inform our partners, a Web site link is presently being developed to exhibit CO₂ 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.
- The following Phase III Deliverables/Milestones were completed in December.
 - D20: Task 2 – Documentary Support to PowerPoint and Web Site
 - D57: Task 12 – Project Assessment Annual Report
- Upcoming Phase III Deliverables/Milestones for January
 - D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report
 - D28: Task 3 – Environmental Questionnaire – Williston Basin Test Site
- Upcoming Phase III Deliverables/Milestones for February
 - D31: Task 4 – Williston Basin Test Site – Geological Characterization Experimental Design Package
 - D15: Task 2 – Williston Basin Test Site Fact Sheet
- A workshop on CO₂ sequestration technologies and environmental impacts is being assembled by PCOR Partnership members for the Air Quality VII Conference (Arlington, VA October 25–29, 2009).
- On December 5, 2008 a Phase III – add-on proposal (EERC Proposal No. 2009-0121) was submitted to DOE. These activities include the addition of Task 14 – RCSP Water Working Group Coordination.

Travel/Meetings for Phase II and III

- December 2–4, 2008: 2nd Annual European Carbon Capture and Storage Summit in London, England
- December 3–5, 2008: Carbon Capture Status and Outlook in Washington, D.C.

- December 3–5, 2008: PRISM meeting in Edmonton, Alberta
- December 5, 2008: PPB interview in Austin, Texas
- January 6–9, 2008: Zama and Risk Assessment Meetings in Calgary, Alberta
- January 19–21, 2009: World Future Energy Summit in Abu Dhabi, United Arab Emirates
- January 21–22, 2009: 2nd Annual Carbon Trading Conference: Preparing for a National Cap-and-Trade System in Houston, Texas
- January 28–29, 2009: The Petroleum Economist Forum on Carbon Capture and Storage in London, England
- February 1–4, 2009: Electric Power Research Institute 2009 – Clean Air, Mercury, Global Warming & Renewable Energy in Phoenix, Arizona
- February 7–13, 2008: Orleans, France, for IEA Modeling Network Meeting
- February 23–26, 2008: CO₂ workshop sponsored by the Canadian Institute in Calgary, Alberta
- March 3–4, 2009: 4th Annual Southeast Regional Carbon Sequestration Partnership Stakeholders' Briefing in College Park, Georgia
- March 15–18, 2009: Cairo 11th International Conference on Energy and Environment in Hurgada, Egypt
- May 17–23, 2009: 10th International Conference on Carbon Dioxide Utilization in Tianjin, China
- March 23–26, 2009: DOE/NETL's 2009 CO₂ Capture Technology Conference in Pittsburgh, PA
- May 30–June 5, 2009: 26th Annual American Society of Mining and Reclamation Meeting and 11th Billing Land Reclamation Symposium in Billings, Montana
- April 7–8, 2009: Carbon TradeEx America in Washington, D.C.
- June 7–10, 2009: American Association of Petroleum Geologists Annual Meeting & Exhibition in Denver, Colorado
- June 21–24, 2009: 32nd Annual International Association for Energy Economics Conference in San Francisco, California
- September 1–3, 2009: North Dakota Petroleum Council 2009 Annual Meeting in Medora, North Dakota
- September 13–19, 2009: 8th International Carbon Dioxide Conference in Jena, Germany
- November 30 – December 11, 2009: Conference of the Parties (COP)15 United Nations Climate Change Conference (COF to the Kyoto Protocol) in Copenhagen, Denmark