

**Plains CO₂ Reduction (PCOR) Partnership Monthly Update
November 1–30, 2008**

PHASE II ACTIVITIES

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

Highlights

- TAQA NORTH, Ltd., has joined the PCOR Partnership. As of November 28, 2008, the PCOR Partnership has 82 (Phases II and III) partners. Please note that 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 PCOR Partnership topical report entitled “Market Development for Terrestrial Sequestration on Private Lands” was approved by the U.S. Department of Energy (DOE) on November 24. This will be available on the PCOR Partnership public and private Web sites soon.
- The following Phase II Deliverables/Milestones were completed in November:
 - D40: Task 2 – Williston Basin Field Validation Test Regulatory Permitting Action Plan (RPAP)
 - D41/M11: Task 2 – Williston Basin Field Validation Test National Environmental Policy Act (NEPA) Compliance Document
- Upcoming Phase II Deliverables/Milestones for 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
 - D46: Task 8 – Documentary: Geologic Sequestration
 - D17: Task 8 – PowerPoint Presentation: General Audience CO₂ Sequestration Outreach
- Upcoming Phase II Deliverables/Milestones for January
 - D3: Task 1 – Quarterly Report

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

Highlights

- 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 MacGregor oil field on the Nesson Anticline. A well in the Northwest MacGregor Field was identified that may be suitable for a small-scale CO₂ injection test. Results from the analysis of formation fluid samples collected on October 29 are pending.
- The development of plans to conduct a huff-and-puff operation in a well in the Northwest MacGregor Field was initiated.

- A NEPA Questionnaire for the Northwest MacGregor Field huff-and-puff operation was completed.
- A RPAP was developed for the Northwest MacGregor Field huff-and-puff operation.
- 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 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 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, Canada (Steven A. Smith)

Highlights

- Sampling of the Slave Point Formation rock core has been conducted for the geomechanical evaluation to be conducted early in Year 4. Ten samples were taken to ascertain the mechanical properties of this reservoir and to determine the effects of long-term exposure to acid gas on this system.
- An overview of the Zama project was given at the 9th International Conference on Greenhouse Gas Technologies (GHGT-9) in Washington, D.C., on November 18, 2008.
- A poster presentation was also given on the geomechanical aspects of the Zama project during the GHGT-9 conference.

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.
- Well development activities continue in order to obtain consistent water quality data. A downhole pump has been deployed to assist in acquiring the needed water samples.
- Monitoring wells are prepped for injection.
- Site preparations continue in order to get ready for CO₂ injection.
- The Environmental Protection Agency (EPA) has concurred with the state's approval of our aquifer exemption request. The state is expected to issue a final order approving our application for injection in early December 2008.
- Wellhead design and installation are complete. High-pressure packoff fittings will be installed the first week of December to accommodate monitoring equipment.
- 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. Telemetry set up for this system is expected to be commissioned in early December.

Task 5 – Terrestrial Validation Test (Barry W. Botnen)

Highlights

- Field activities for the 2008 wetland catchment sampling season are complete.
- The gas samples have been processed. 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 titled “Technical, Regulatory, and Economic Feasibility of Wetlands as a Greenhouse Gas Mitigation Strategy” is in final review at the Energy & Environmental Research Center (EERC).
- The carbon-tracking system (Oracle-based database) is complete and is operational. Mapping front-end functionality continues to be refined for display, querying, and reporting. Geodatabase schema is being refined to allow for tracking and spatial association of conservation easements with carbon units.
- The PCOR Partnership partners continue to work towards obtaining International Standard Organization 14064-2; Voluntary Carbon Standard; and Climate, Community and Biodiversity Project Design Standards verification for grassland carbon credits.
- Ducks Unlimited, Inc. (DU) continues to make progress with respect to their carbon credit program. They have currently secured over 23,000 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 expected in December 2008.
- The topical report “Market Development for Terrestrial Sequestration on Private Lands” has been reviewed and approved by DOE.
- An evaluation of other state and regional GHG or cap-and-trade program rules and policies and DOE Guidelines for Aggregators and Terrestrial Offset Providers is under way.
- The DU–PCOR Partnership terrestrial project Web site continues to be updated.
- Work has begun on characterization inputs and the terrestrial portion of the Decision Support System (DSS, © 2007 EERC Foundation).

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

Highlights

- Rectifying a series of questions regarding the newly acquired oil field data for the PCOR Partnership region is a current concern. 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.
- Current work involves creating a computer application that will extract specific data elements from the set of Log Ascii Standard (LAS) files provided by Manitoba.

- RPS Energy Canada Ltd. has proposed a cost estimate of \$3000 to gather and review the necessary data elements needed to calculate CO₂ capacity estimates for oil pools in British Columbia, Alberta, and Saskatchewan.

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

Highlights

- Deliverable D41/Milestone M11, the NEPA document for the Williston Basin Validation Test is complete.
- The RPAP for the Williston Basin Field Validation Test is complete.
- Completed review of EPA's Advanced Notice of Proposed Rulemaking (ANPR) for regulating GHG emissions under the Clean Air Act (CAA).
- Draft comments on EPA's proposed rules for geologic sequestration have been developed and submitted to an ad hoc committee of PCOR Partnership members. As input from the PCOR Partnership members is received, the comments continue to be refined. EPA has extended the deadline for comment submission. The PCOR Partnership is taking advantage of this time to obtain additional input from partners.
- Numerous discussions continue to be held with various PCOR Partnership members regarding EPA's proposed rules for geologic sequestration.
- 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 CCS.
- Recent publications relating to regulating CO₂ sequestration and MMV issues continue to be reviewed.

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

Highlights

- Deliverable D35: Documentary on Reducing Carbon Footprint
 - The content for the documentary was internally discussed, and a revised treatment of the documentary was prepared and sent to Prairie Public Broadcasting (PPB) as a basis for planning.
- Deliverable D46: Documentary on Geologic Sequestration (due to DOE March 30, 2009)
 - DOE approved an extension from December 30, 2008, to March 30, 2009, on November 25, 2008.
 - The animation footage from several video products was reviewed, and a revised vision for animation in the geologic video was sent out.
 - Interviews:
 - ♦ NETL was interviewed on November 17, 2008, in Pittsburgh, Pennsylvania.
 - Transcription of the interview was completed and quotes were chosen for the documentary draft.
 - ♦ Apache Limited Canada was interviewed on November 20, 2008, in Midale, Saskatchewan.
 - PPB put the interview on the FTP site for review.

- ♦ Environmental Defense is scheduled to be interviewed on December 5, 2008, in Austin, Texas.
 - The list of questions was updated and sent out.
- ♦ The North Dakota Geological Survey interview will be held in mid-December.
 - The public outreach and education team met internally to prepare for PPB filming at the EERC and at the nearby North Dakota Geological Survey core library.
- Deliverable D22: Public Web Site Update (due to DOE February 2009)
 - Work continues on new pages for the Web update, the new home page and Web page format, and the carbon calculator page.
 - A draft write-up on the wedge concept was prepared.
- Deliverable D17: General PowerPoint (due December 2008)
 - Revisions to the PowerPoint update continue.
- Outreach Working Group
 - AJW, Inc., indicated that they would send the updated video for GHGT-9 out for final review.
- Weyburn Outreach Advisory Group
 - The group participated in a conference call on November 4, 2008, and took part in discussions of the Web site plan and the mechanics of the outreach plan.
 - The EERC accepted an invitation to attend the PRISM meeting scheduled for December 5, 2008, in Edmonton, Alberta.
 - The group participated in a conference call on November 26, 2008, to review the draft of the Weyburn/Midale communication plan; written comments were provided by the EERC.

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

Highlights

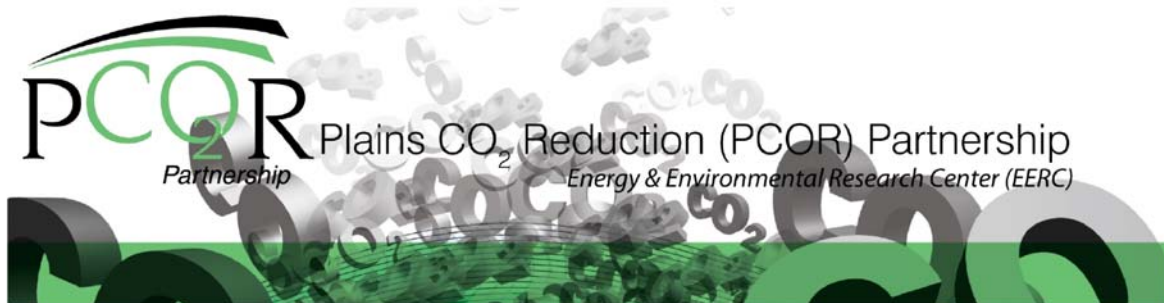
- Work continued on the gas-processing facility data set that was purchased from PennWell and updating the draft of the report explaining the PCOR Partnership's CO₂ emission calculation methodologies. Conversion of location coordinates into a form appropriate for the PCOR Partnership DSS began.
- Information was researched regarding the calculation of CO₂ emissions from the compression, pipeline transportation, and injection activities associated with CO₂ sequestration in geological settings.
- CO₂ pipeline specification information was provided to one of the PCOR Partnership partners.

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

Highlights

- The PCOR Partnership presented a number of poster presentations for the GHGT-9 Conference (November 16–20, 2008, in Washington, D.C.). These posters are available on the PCOR Partnership private Web site.

- The PCOR Partnership presented at DOE's NETL 2008 RCSPs Initiative Review Meeting. All proceedings have been posted on www.netl.doe.gov/publications/proceedings/08/rcsp/index.html.
- 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.



PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Work was conducted with the PCOR Partnership Outreach Working Group task members on a plan to develop parallel products for the revisions to the public and partners-only Web sites
- Work on material to populate the new DSS Web pages continues.
- Work with the Web site developers on the functionality of the new site has begun, and identifying images for the site is under way.
- Work continues on designing a template for maps to be included in the next version of the PCOR Partnership regional atlas.

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

Highlights

- Web site
 - Several iterations with the EERC Graphics Department were assessed as the design was reviewed and refined.
- School outreach
 - A flyer for the Keystone Center training was revised to fit with what teachers found useful. This suggested language will be submitted to Keystone. Madison, Wisconsin, is being investigated as a possible location for the Keystone training.
 - Teachers in the region are being contacted to develop an advisory group for activities.
 - The EERC has accepted the Lignite Energy Council's invitation to do a "Sequestration Jeopardy" session at the teacher seminar scheduled for June 2009.
- Outreach information system
 - The work plan for the outreach information system was presented at the Outreach Working Group meeting.
 - Materials for the outreach information system are currently being prepared.
- Deliverable D20: Video Support to PowerPoint and Web Site (due December 2008).
 - PPB continues to create clips from the timecode sent by the EERC in October.
- Phase III documentaries
 - "Man-on-the-street" footage for a video intended for the Web is currently being obtained.
 - A list of activities for December 18 through January 16 was developed, including additional camera and editing training and video acquisition.
- Outreach Working Group
 - AJW, Inc., indicated that it would put the updated video for GHGT-9 out for final review.

- Weyburn Outreach Advisory
 - The group participated in a conference call on November 4, 2008, and took part in discussions of the Web site plan and the mechanics of the outreach plan.
 - The EERC accepted an invitation to attend the PRISM meeting scheduled for December 5, 2008, in Edmonton, Alberta.
 - The group participated in a conference call on November 26, 2008, to review the draft of the Weyburn/Midale communication plan; written comments were provided by the EERC.

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.
- Review of EPA's ANPR for regulating GHG emissions under the CAA was completed.
- Draft comments on EPA's proposed rules for geologic sequestration have been developed and submitted to an ad hoc committee of PCOR Partnership members. As input from the PCOR Partnership members is received, the comments continue to be refined. EPA has extended the deadline for comment submission. The PCOR Partnership is taking advantage of this time to obtain additional input from partners.
- Numerous discussions continue to be held with various PCOR Partnership members regarding EPA's proposed rules for geologic sequestration.
- 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.
- 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

- The development of a Project Risk Assessment Plan for the Fort Nelson demonstration continued. 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.
- Development of a baseline characterization experimental design package for the Williston Basin site 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 CO₂-based enhanced oil recovery (EOR) activities under Phase III.
- Regional Characterization Activities

- Estimates of storage capacity of several saline aquifer systems in the Washburn study area of central North Dakota were finalized and are the subject of a GHGT-9 paper.
- Updating the oil field data in the DSS continued. Work continues with relevant agencies in the states and provinces to facilitate the updating process.

Task 5 – Well Drilling and Completion (TBA)

- This task has not begun (Quarter 1 – BP 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

- Calculation of updated values for the CO₂ emissions from the region's natural gas-processing facilities was completed using data purchased from PennWell. Conversion of location coordinates into a form appropriate for the PCOR Partnership DSS began.
- Calculations for a thermodynamic balance of the Powerspan ECO₂[™] process continue. When the calculations are completed, they will be reviewed internally.

Task 7 – CO₂ Procurement (John A. Harju)

Highlights

- 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 – BP 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 – BP 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 – BP 5; Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

Task 11 – Post Injection Monitoring and Modeling (TBA)

- This task has not begun (Quarter 1 – BP 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)

- This task has not begun (Quarter 1 – BP 3; Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly and annual progress reports. Future activities include the Project Assessment Annual Report (Deliverable D57) due December 31, 2008.

Task 13 – Project Management (Edward N. Steadman)

Highlights

- The PCOR Partnership was selected by the Interstate Oil and Gas Compact Commission's (IOGCC's) Stewardship Award Subcommittee as the winner in the 2008 Environmental Partnership category. The award was presented to the PCOR Partnership on Monday, November 17, 2008, during the general session of IOGCC's Annual Meeting in Santa Fe, New Mexico.
- A Risk Management Plan (RMP) Outline is due within BP 3. An initial draft has been started for the RMP.
- 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.
- There were no Phase III Deliverables/Milestones due in November.
- Upcoming Phase III Deliverables/Milestones for December
 - M4: Task 4 – Williston Basin Test Site Selected
 - M5: Task 4 – Data Collection Initiated for Williston Basin Test Site
 - D20: Task 2 – Documentary Support to PowerPoint and Web Site
 - D57: Task 12 – Project Assessment Annual Report
- Upcoming Phase III Deliverables/Milestones for December
 - D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report
 - D28: Task 3 – Environmental Questionnaire – Williston Basin Test Site
- A value-added fact sheet entitled "CO₂ EOR and CO₂ Sequestration – The Case for Collaboration" is currently being prepared. Once this is complete, it will be added to the PCOR Partnership public and private Web sites.
- A workshop on CO₂ sequestration technologies and environmental impacts is being assembled by PCOR Partnership members for the Air Quality VII Conference (October 25–29, 2009, in Arlington, Virginia)
- The NETL Sequestration Technology Manager and the RCSP Coordinator at DOE have expressed concern about the delays to the Phases II and III projects in the Williston Basin. We are currently preparing a response that includes a description of the delays, options for alternative ways to proceed, and an estimate of the impact of each option to the costs and schedule. This response is to be sent by December 2.

Travel/Meetings for Phases II and III

- October 6–8, 2008: Regional Partnerships Annual Review Meeting in Pittsburgh, Pennsylvania
- October 22–24, 2008: Carbon Sequestration Development and Finance Summit in Houston, Texas
- November 12–14, 2008: Carbon Market Insights Americas 2008 in Washington, D.C.
- November 16–18, 2008: Documentary filming in Fargo, North Dakota
- November 16–20, 2008: GHGT-9 in Washington, D.C.
- November 16–21, 2008: AIChE National Meeting in Philadelphia, Pennsylvania
- November 17–19, 2008: Carbon Markets Africa in Cape Town, South Africa
- November 19–21, 2008: Documentary filming in Midale, Saskatchewan
- December 2–3, 2008: Meeting to discuss Trilateral (U.S., Canada, and Mexico) CCS Effort in Houston, Texas
- December 2–4, 2008: 2nd Annual European Carbon Capture and Storage Summit in London, England
- December 3–5, 2008: Attend the PRISM meeting in Edmonton
- December 3–5, 2008: Carbon Capture Status and Outlook in Washington, D.C.
- January 19–21 2009: World Future Energy Summit in Abu Dhabi
- 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: EUEC 2009 – Clean Air, Mercury, Global Warming & Renewable Energy in Phoenix, Arizona
- 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
- March 23–26, 2009: DOE/NETL's 2009 CO₂ Capture Technology Conference in Pittsburgh, Pennsylvania
- April 7–8, 2009: Carbon TradeEx America in Washington, D.C.
- May 17–23, 2009: 10th International Conference on Carbon Dioxide Utilization in Tianjin, China
- May 30 – June 5, 2009: 26th Annual American Society of Mining and Reclamation Meeting and 11th Billing Land Reclamation Symposium in Billings, Montana
- June 7–10, 2009: American Association of Petroleum Geologists (AAPG) Annual Meeting & Exhibition in Denver, Colorado
- June 21–24 2009: 32nd Annual International Association for Energy Economics (IAEE) 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