

**Plains CO₂ Reduction (PCOR) Partnership Monthly Update
May 1–31, 2009**

PHASE II ACTIVITIES

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

Highlights

- The following member has joined the PCOR Partnership this month:
 - Petroleum Technology Research Centre (commitment letter received May 4, 2009)
- During the 2008 PCOR Partnership Annual Meeting (held in Maple Grove, Minnesota, September 16–18, 2008), the need for a regulatory update meeting was discussed. In response, preparations are under way to hold a brainstorming session for June 16–17, 2009, in Deadwood, South Dakota. We hope to have representation from each of the key state and provincial oil and gas regulatory bodies within the PCOR Partnership region.
- The PCOR Partnership is leading the North American Energy Working Group (NAEWG)–CO₂ Storage Capacity Estimation (Methodology) Subcommittee. A meeting was held May 4, 2009, in conjunction with the 8th Annual Conference on Carbon Capture and Sequestration in Pittsburgh, Pennsylvania. The Energy & Environmental Research Center (EERC) will request permission from the International Energy Agency Greenhouse Gas Research & Development Programme and the U.S. Department of Energy (DOE) to distribute the draft report to the Subcommittee. If granted, the draft report will be distributed on July 1. The EERC will also coordinate a Subcommittee conference call for discussion on the methodology on July 15, 2009. This will afford adequate time to prepare recommendations for the NAEWG–North America Carbon Atlas Partnership at its July 22–23, 2009, meeting in Pittsburgh, Pennsylvania.
- A DOE Fossil Energy Techline is under development detailing the “puff” phase of the Williston Basin CO₂ huff ‘n’ puff Field Validation Test (McGregor site).
- As we are in the final year of our Phase II efforts, work has begun on the Phase II final report. At this time, the field validation tests are drawing to a close, and summaries on the results are being developed. An extension was granted for Deliverable D56 – Phase II Final Report from September 30, 2009, to December 31, 2009.
- Phase II Deliverables/Milestones completed for May:
 - D48: Task 8 – Best Practices Manual: Outreach
 - D46: Task 8 – Documentary: Geologic Sequestration
- Upcoming Phase II Deliverables/Milestones for June:
 - D49: Task 6 – Regional Atlas
 - D50: Task 7 – Roadmap Document
- Upcoming Phase II Deliverables/Milestones for July:
 - D3: Task 1 – Quarterly Report

- D52: Task 3 – Zama Field Validation Test Regional Technology Implementation Plan (RTIP)
- D53: Task 4 – Lignite Field Validation Test RTIP
- D54: Task 5 – Terrestrial Field Validation Test RTIP

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

Highlights

- The development of a petrophysical model of the Northwest McGregor oil field was initiated. The petrophysical model will provide a basis for modeling the injection of CO₂, the recovery of incremental oil as a result of that injection, and the ultimate fate of the injected CO₂.

Task 3 – Field Validation Test at Zama, Alberta, Canada (Steven A. Smith)

Highlights

- Work continues on a draft for deliverable D52 – Zama Field Validation Test RTIP (due July 31, 2009).
- Geochemical evaluation is completed. The final report is scheduled for delivery at any time.
- Injection and production continue at the site.

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

Highlights

- Evaluation and analysis of the injectivity and sequestration ability of the lignite seam continues.
- The injector and monitoring wells continue to be instrumented to record pressure and temperature readings postinjection.
- Numerous meetings and conference calls continue to be conducted with various partners and field service providers to discuss the analysis of CO₂ injection and monitoring, mitigation, and verification (MMV) data.
- The writing of the RTIP is ongoing.
- A meeting was held with Schlumberger in Grand Forks to go over its data as well as Z-Seis's data. At first glance, there appears to be concurrence with Schlumberger, Z-Seis, and the downhole data with regard to plume direction. Data analysis continues.

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

Highlights

- Progress continues on the RTIP for terrestrial sequestration. The draft report will be complete mid-June.
- A value-added topical report titled “Technical, Regulatory, and Economic Feasibility of Wetlands Projects as a Greenhouse Gas Mitigation Strategy in North America” is in final review at the EERC.

- PCOR Partnership partners have obtained CCBA (Climate Community and Biodiversity Alliance) certification for grassland carbon credits. This certification is at the Gold Rating (the highest rating available), the first approved project by the CCBA in North America.
- Analysis of wetland catchment gas sample continues (U.S. Geological Survey), reporting on these data is in process.
- An analysis of the economic impact of easement payments is ongoing (North Dakota State University).
- Working 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

- Great progress on the new geographic information system (GIS) interface for the DSS continues. Several new functions will make the site more versatile.
- Attended the 8th Annual Conference on Carbon Capture and Sequestration in Pittsburgh, Pennsylvania.
- School district and basic demographic data for the PCOR Partnership region are in the final stages of compilation.
- Work continues in the compilation and formatting of the next edition of the PCOR Partnership Atlas. The upcoming third edition will contain individual page spreads for each of the Phase II validation sites as well as one for Phase III activities.
- Participated in reviews of, and compilation of, materials for the geologic sequestration video.

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

Highlights

- Various state, provincial, and regional greenhouse gas (GHG) reduction and carbon capture and storage (CCS) initiatives are being tracked and analyzed.
- Analysis of carbon market strategies continues.
- Planning continues for the regulatory workshop in June.
- EERC staff attended the Interstate Oil and Gas Compact Commission (IOGCC) meeting in Anchorage, Alaska. EERC staff also participated in the IOGCC Pipeline Transportation Task Force meeting.
- A review of the “marked up” Waxman/Markey draft bill is ongoing as it proceeds through subcommittee hearings.
- Recent publications relating to regulating CO₂ sequestration and MMV issues continue to be reviewed.

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

Highlights

- Preparations continue for interviews and site visits for travel to Cameroon in mid-June (supported by Embassy suggestions) for Deliverable D35 – Documentary: Reducing Carbon Footprint.
- Approximately 16 hours of high-definition video was recorded in India for Deliverable D35 – Documentary: Reducing Carbon Footprint since the Prairie Public Broadcasting EERC team arrived in Delhi, India, on May 23, 2009. The video footage includes scenes illustrating everyday energy use and carbon emission by families as well as background video for lifestyle, infrastructure, transportation, and manufacturing.
- Deliverable D46 – Documentary: Geologic Sequestration was submitted to DOE for review on May 29, 2009.
- Deliverable D48 – Best Practices Manual: Outreach was submitted to DOE for review on May 29, 2009.

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

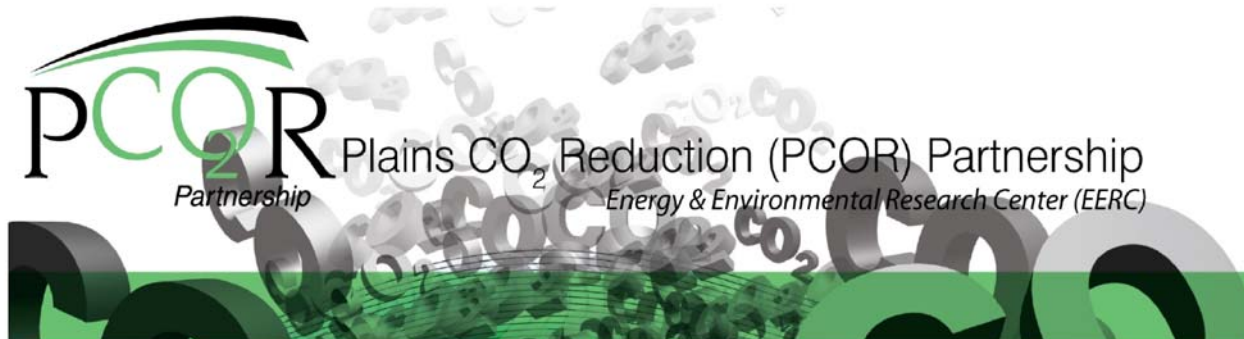
Highlights

- The quality assurance/quality control check of the master CO₂ sources spreadsheet reference columns continued.
- Began preparing the additional text and figures needed to update the draft Deliverable D44 – Best Practices Manual: Regional Sequestration Opportunities document that was submitted last summer.

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
 - Water



PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Subsequent to the travel to British Columbia at the end of April to attend the Latitude Geographics annual meeting, several roadblocks have been cleared in the development of the new GIS on the DSS.
- Attended the 8th Annual Conference on Carbon Capture and Sequestration in Pittsburgh, Pennsylvania.
- Several of the new DSS Web pages have been through internal editing and are being integrated into the DSS site.
- Followed up with the Nebraska Geological Survey with regard to establishing a subcontract with the state of Nebraska to perform geological characterization activities.
- Deliverable D2 – First Target Area Completed Sheet was submitted to DOE for review on May 29, 2009.

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

Highlights

- Deliverable D16 – Fort Nelson Test Site Fact Sheet was submitted to DOE for review on May 29, 2009.

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.
- A regulatory brainstorming meeting is being planned for June to discuss existing and evolving regulatory frameworks for CO₂ transportation and storage. It will potentially involve regulators from states and provinces in the region that are currently dealing with these issues.
- An update to the regulatory section of the DSS is under development.
- A review of the “marked up” Waxman/Markey draft bill is ongoing as it proceeds through subcommittee hearings.
- 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. A proposal from Oxand to assist the EERC in the development of the Project Risk Assessment Plan has been accepted, and a subcontract is in the process of being finalized. A kickoff meeting to initiate the implementation of the risk assessment activities is planned for early June in Calgary.
- The exploratory well at the Fort Nelson site reached total depth. Core and cuttings of potential injection zones and primary seals were collected and submitted for initial petrophysical analyses. A series of downhole logging suites were conducted for further characterization of the sink and seal formations at the location.
- Regional characterization activities
 - The development of a draft value-added topical report entitled “Site Characterization of The Dickinson Lodgepole Mounds for Potential CO₂ Enhanced Oil Recovery,” which summarizes the potential for CO₂ storage and CO₂-based enhanced oil recovery in the oil fields of the Dickinson Lodgepole Mounds area in southwestern North Dakota was submitted to DOE for review on May 20, 2009.

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

- Preparation of the updated carbon capture technologies overview continued.
- A conference call was held with Ramgen Power Systems personnel to discuss the status of the Ramgen subcontract. Ramgen is on track to meet all reporting deadlines for the funded amount.
- Attended a CO₂ pipeline infrastructure public meeting in Casper, Wyoming. The meeting was sponsored by the Enhanced Oil Recovery Institute at the University of Wyoming and featured the “rollout” of a preliminary CO₂ pipeline network for the state of Wyoming.
- Assisted in the preparation of a short summary of the proposed Phase III Williston Basin PCOR Partnership carbon capture and sequestration demonstration.
- Text, figures, and tables that show the potential pipeline infrastructure needed to move CO₂ from the planned Mesaba Integrated Gasification Combined Cycle plant to various geological sequestration opportunities in the PCOR Partnership region were prepared.
- A rough draft of the updated capture technologies overview was completed. It will be reviewed internally and then submitted to DOE for review as a value-added topical report.

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 D57). The report was submitted on December 31, 2008.

Task 13 – Project Management (Edward N. Steadman)

Highlights

- Work is under way to provide our partners with a topical report on past, present, and future carbon market activities.
- A DOE Fossil Energy Techline was posted May 22, 2009, outlining the core-sampling and well-logging activities at Spectra Energy's Fort Nelson, British Columbia, Canada, CCS project site.
- A meeting with DOE, the PCOR Partnership, and Spectra has tentatively been scheduled for July 7, 2009, in Grand Forks to discuss progress on the Fort Nelson demonstration site.
- Several additional Techlines are under development, including the Carbon Management Plan for Excelsior Energy.
- Preparations have begun for the 2009 PCOR Partnership Annual Meeting. The meeting will be held in St. Louis, Missouri, on December 2–3, 2009, with a workshop on Sequestration

Outreach Strategies to be held December 1. A “Save-the-Date” e-mail blast was sent to partners on May 29, 2009.

- A workshop on CO₂ sequestration technologies and environmental impacts is under development by PCOR Partnership members for the Air Quality VII Conference (Arlington, Virginia, October 25–29, 2009). Three oral (paper) presentations have already been selected, and two more papers or poster presentations are being sought. Invitations to serve as Session Chair or Session Cochair have been extended.
- On May 20, 2009, DOE posted its Notices of Intent to Issue in May funding opportunity announcements under the American Recovery and Reinvestment Act of 2009.
- Teleconferences were held May 26 and 27 with the DOE Project Manager and DOE Contracts Officer to review funding options for the transition between Budget Period 3 and Budget Period 4. These calls were mainly to address the carryover resulting from the delay in formalizing selection of a Williston Basin demonstration site.
- Presented at the Deep Saline Aquifers for Geological Storage of CO₂ and Energy in Rueil-Malmaison, France.
- Work is ongoing on the PCOR Partnership Continuation Application that is contractually due to DOE on or before July 31, 2009.
- Phase III Deliverables/Milestones completed for May:
 - D2: Task 1 – First Target Area Completed
 - D16: Task 2 – Fort Nelson Test Site Fact Sheet
 - M23: Task 14 – Monthly Water Working Group (WWG) Conference Call Held
- Upcoming Phase II Deliverables/Milestones for June:
 - M4: Task 4 – Williston Basin Test Site Selected
 - M5: Task 4 – Data collection initiated for Williston Basin Test site
 - M23: Task 14 – Monthly WWG Conference Call
- Upcoming Phase II Deliverables/Milestones for June
 - D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report
 - D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation
 - D28: Task 3 – Environmental Questionnaire – Williston Basin Test Site
 - D67: Task 4 – Fort Nelson Test Site – Simulation Report
 - M23: Task 14 – Monthly WWG Conference Call
 - Continuation Application for Budget Period 4

Task 14 – Regional Carbon Sequestration Partnership (RCSP) Water Working Group Coordination (Charles D. Gorecki)

Highlights

- Milestone M24 –WWG Annual Meeting was held in Pittsburgh, Pennsylvania, on May 7, 2009, in the Sheraton Square Hotel.
 - The main topic of discussion was the outline for the white paper on the Nexus of Carbon Capture and Storage (CCS) and Water.
- Milestone M23 – Monthly WWG Conference Call was conducted on May 7, 2009.
 - The meeting minutes were submitted to DOE for review on May 29, 2009.
- An updated version of Milestone M21 – Outline of White Paper on Nexus of Carbon Capture and Storage (CCS) and Water was completed and turned in for comments and submitted to DOE on May 22, 2009.

- Milestone M22 – Draft White Paper on the Nexus of CCS and Water available for comments has been extended to August 17, 2009.
 - Comments on the draft are due from the WWG participants by September 8, 2009.
- Deliverable D78 – Final White Paper on the Nexus of CCS and Water the final version is due to DOE and the WWG participants September 30, 2009.

Travel/Meetings for Phase II and III

- May 4, 2009: conducted the NAEWG–CO₂ Storage Capacity Estimation (Methodology) Subcommittee meeting in Pittsburgh, Pennsylvania.
- May 4–7, 2009: Documentary filming in Minneapolis, Minnesota.
- May 4–7, 2009: Eighth Annual Conference on Carbon Capture and Sequestration in Pittsburgh, Pennsylvania.
- May 6, 2009: met with key PCOR Partnership partners that may be involved in the Phase III Fort Nelson and Williston Basin demonstrations in Pittsburgh, Pennsylvania.
- May 7, 2009: conducted the WWG Annual Meeting in Pittsburgh, Pennsylvania.
- May 11–13, 2009: attended the IOGCC Midyear Meeting in Anchorage, Alaska.
- May 19, 2009: attended a CO₂ pipeline infrastructure public meeting in Casper, Wyoming.
- May 22 – June 2, 2009: Documentary filming in Delhi, India.
- May 27–29, 2009: Presented at the Deep Saline Aquifers for Geological Storage of CO₂ and Energy in Rueil-Malmaison, France.