

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

PHASE II ACTIVITIES

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

Highlights

- Prairie Public Broadcasting (PPB) premiered “Reducing Our Carbon Footprint – The Role of Markets” on Thursday, April 17, 2008.
 - PCOR Partnership members received an e-mail with details on the documentary on April 16, 2008.
 - The DVDs should be printed and ready for distribution in approximately 3 weeks; all partners, documentary participants, and Regional Carbon Sequestration Partnership members will receive a copy when they are available.
- The PCOR Partnership took part in the 16th Williston Basin Petroleum Conference (WBPC) & Expo held in Minot, North Dakota, on April 27–29, 2008:
 - PCOR Partnership personnel gave two presentations.
 - A booth for Phase II and III Williston Basin Projects was on exhibit.
- Preparations for the 2008 PCOR Partnership Annual Meeting continue. It is tentatively scheduled for September 16–18, 2008, in Minneapolis, Minnesota.
- The following deliverables/milestones were completed in April:
 - D3: Task 1 – Quarterly Report
 - D39/M10: Task 8 – Documentary: Terrestrial CO₂ Sequestration

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

Highlights

- Continued evaluation of oil fields in the Williston Basin that may be suitable candidates to host the injection and monitoring, mitigation, and verification (MMV) activities. Efforts are focused on developing baseline characterization data for fields in the Cedar Creek Anticline area, the Billings Anticline-Dickinson area, and along the Nesson Anticline.
- Laboratory tests continued to examine the effects that CO₂ under deep reservoir pressure and temperature injection conditions can have on cores of carbonate rocks. The rock cores will be examined before and after injection using a positron absorption tomography technique to quantify changes in porosity and, possibly, permeability caused by the injection. It is anticipated that a series of these tests using a variety of injection conditions and rock types will be conducted over the spring and summer of 2008.

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

Highlights

- Pressure analysis and modeling are ongoing and scheduled to be completed by the end of May. This activity will be used to identify whether pressure spikes (should they occur) in the monitoring well can be attributed to leakage from the reservoir.
- Presented at the CO₂ for Enhanced Oil Recovery Conference in Houston, Texas.
- A Zama presentation was given at the American Association of Petroleum Geologists Annual Conference and Exhibition.

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

Highlights

- Met with the field engineer and Eagle Operating on April 3, 2008.
- An Eagle Operating electrician is working with Burke Divide Electric to finalize electrical work on the test site.
- The work plan for well stimulation is being developed.
- Quotes for CO₂ and CO₂ injection services from Praxair and GrayTech Carbonic are being reviewed.
- A public meeting was held in Bowbells, North Dakota. Local residents were updated on the status of the project.
- An updated fact sheet for the project was completed and distributed to the local residents.
- An underground injection control (UIC) permit application was submitted to the North Dakota Industrial Commission (NDIC) on April 14, 2008.
- Measurements of water levels and pressure in the wells continue to be taken on a regular basis.
- New gas samples from the wells have been obtained and analyzed.
- Fieldwork has been coordinated.

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

Highlights

- Field activities for the 2008 wetland catchment sampling season were initiated in April.
- Preparations are continuing for the third grassland-sampling season, and field activities will begin in late May.
- The carbon-tracking system (Oracle-based database) is complete and is currently being tested. This system tracks and displays (geographic information system [GIS]) working components of the Ducks Unlimited, Inc. (DU), carbon credit program.
 - Work continues on database implementation and the refining of functionality for display, query, and reporting of carbon unit polygons.
- PCOR Partnership Partners are working toward ISO 14064-2 verification for grassland carbon credits.
- DU continues to make progress with respect to its carbon credit program. They have currently secured over 7700 acres of private grasslands, with an initial goal set at 30,000 acres.

- As part of the wetlands study, an in situ experiment on nitrogen amendments on greenhouse gas (GHG) emissions is being conducted. This experiment will quantify changes in the global warming potential (GWP) of wetlands in the Prairie Pothole Region “before” and “after” restoration and will examine the GWP of nitrogen fertilizers on the soil.
- A value-added draft topical report, “Market Development for Terrestrial Sequestration on Private Lands,” is being reviewed internally.
- Evaluating other state and regional GHG or cap-and-trade program rules and policies and the U.S. Department of Energy (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 Decision Support System (DSS, ©2007 EERC Foundation).

Task 6 – Continued Characterization of Regional Sequestration Opportunities (Erin M. O’Leary)

Highlights

- Continue to work on a summary report of saline formation sequestration potential in Iowa.
- Worked on GIS development for the Gas Analysis Project researching and testing Sharepoint duplication and URL link issues and troubleshooting license configuration issues for use of Interactive Petrophysics and related Schlumberger software.
- The gas analysis Web site went into production. From the DSS, there is a link called “Gas Composition Exploration Tool.” It is also available for subscription service members from the North Dakota Industrial Commission (NDIC) Division of Mineral Resources – Oil and Gas Web site. A presentation on the new site was given at the WBPC.
- Worked on the gas analysis site and modifications to the DSS (combining Phase I and Phase II partners to one list).
- The GIS working group for the regional partnerships held a conference call to discuss preparation of materials for the upcoming national atlas.
- Created posters, images, pictures, etc., for others attending the WBPC.
- The PCOR Partnership participated in the Geologic Working Group conference call. The call focused on preparation of materials for the national atlas.
- Monthly updates and formation outlines were added to the DSS Web site.

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

Highlights

- Development of deliverable D40, the National Environmental Policy Act (NEPA) document for the Williston Basin Validation Test, is ongoing.
- UIC permit applications for the lignite field validation test were submitted to NDIC on April 14, 2008. A public hearing will be held on May 1 to review the permit applications.
- Developments regarding various state and regional initiatives continue to be followed.
- Analysis of carbon market strategies continues.
- Legislative actions occurring in Congress continue to be followed.

- Review of recent publications relating to regulating CO₂ sequestration and MMV issues continues.

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

Highlights

- The Public Web site update (D22) was submitted for review on March 31.
 - Web site updates were approved by DOE on April 16, 2008.
- Reducing Our Carbon Footprint: The Role of Markets documentary
 - Finalized, close-captioned in Minneapolis, and then broadcast on Prairie Public on Thursday, April 17, 2008, at 8:30 p.m.
 - DVD packaging
 - ♦ Jacket sleeves received internal review and were sent to RelyMedia for packaging the DVDs.
 - ♦ Insert materials received final review and were supplied to RelyMedia.
 - ♦ RelyMedia will make up 1000 DVDs and package.
 - Carbon Market documentary DVDs were sent to the Lignite Council for its meeting on April 21, 2008.
- The terrestrial documentary (M10/D39) was submitted to DOE for review on April 30, 2008.
 - The documentary was reviewed internally, and the EERC provided updated narration and other comments to PPB. PPB will have the updated narration and cover available for review on schedule via FTP for the National Energy Technology Laboratory and follow up with a DVD.
- Geologic documentary (D46) is due September 30, 2008.
 - Prepared a revised approach to documentary filming and e-mailed the material to PPB.
 - Met internally to discuss the “geologic sequestration” basic needs including animation, locations, and topics; these will be incorporated into the script.
 - Melzer Consulting has agreed to participate in the documentary; will follow up to set up an interview schedule.
 - Met internally regarding geology fundamentals and are preparing materials.
- Outreach Working Group (OWG)
 - Provided feedback on methyl tertiary butyl ether (MTBE) article being prepared by Science Application’s International Corporation (SAIC).
 - Several items came out of the OWG conference call held April 17, 2008:
 - ♦ A story for use in the outreach presentation at the May Pittsburgh meeting.
 - ♦ Need for additional information in our partnership region regarding sources and risks to drinking water as suggested by the presentation by Clean Water Action (they are in North Dakota but not too active at this point).
 - ♦ DOE requested 30 seconds worth of information and bulleted items on both of PCOR Partnership’s Phase III demonstrations for use in video and written outreach materials being prepared for the DOE booth at the Greenhouse Gas Technology Conference (GHGT-9) meeting in the fall of 2008.
 - Received an update on the presentation at the Pittsburgh meeting and submitted a story to be considered for the presentation.

- General
 - Reviewed the DVD of the hour-long 2007 BBC documentary entitled “The Great Climate Change Swindle” and several related materials in order to compare the “fundamentals” of the climate change story being presented across the media and to check for useful presentation formats.

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

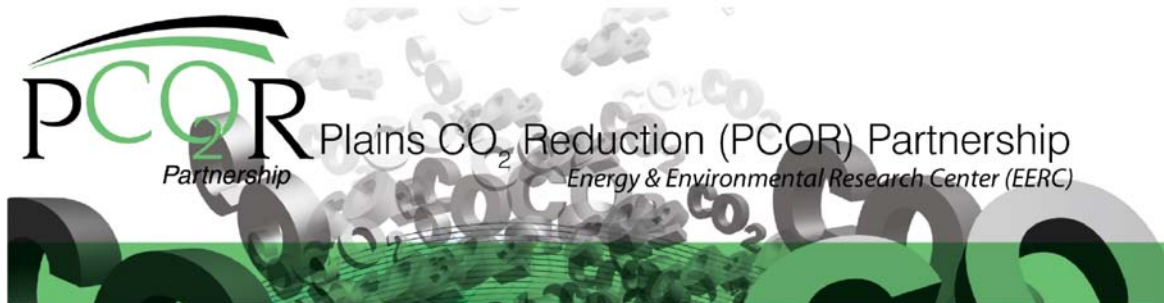
Highlights

- Prepared responses to questions resulting from the September 2007 peer review. One involved estimation of capture, drying/compression, pipeline, and injection costs for various regional sequestration scenarios.
- The levels of effort and funding needed to implement capture and sequestration of CO₂ in the PCOR Partnership region are being estimated. Activities that have been initiated include:
 - Determining the amount of replacement power that will be needed to apply capture technology to the various types of regional sources for varying capture levels.
 - Determining the most applicable currently available capture technology for each of the various regional source types.
 - Determining a likely regional pipeline network route.

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

Highlights

- On April 21, 2008, the PCOR Partnership provided DOE with information on the Zama Project for a meeting held on April 23, 2008, with the Consul General from Calgary.
- The PCOR Partnership Geologic Working Group meeting was held April 17, 2008, in Minneapolis, Minnesota.
- The PCOR Partnership also continued participation in working group conference calls, including the following:
 - GIS
 - Capture and Transportation
 - Geologic
 - Outreach



PHASE III ACTIVITIES

Task 1 – Regional Characterization (Erin M. O’Leary)

Highlights

- A Geologic Working Group meeting was held in Minneapolis, Minnesota, on April 17, 2008. Representatives from Minnesota, Missouri, Saskatchewan, and North Dakota were present. Discussions included updates from the regions on characterization activities, including modeling. The purpose of the meeting was to share the results of past and ongoing activities related to CO₂ sequestration in each of the states and provinces.
- The first large batch of PCOR Partnership images has been loaded into the Sharepoint site and has been cataloged for searching.
- Presented and worked on a paper for the WBPC.
- The Missouri subcontract is fully in place.
- Reviewed and commented on GIS templates that Natcarb has made available on its ftp site.
- Review of the existing DSS site continues for ways to improve the layout and functionality.
- Several enhancements are under way for the DSS. An update to the main pages is planned. GIS enhancements that we are working on include the ability to view detailed information from multiple layers at one time (no longer limited by just one active layer), graphs of source and field data, and the use of map tips (information regarding a point on the map that is displayed as you move the mouse over the point).
- Work is progressing on a video-based help manual for the DSS.

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

Highlights

- Presented at a North Dakota Science Teachers Meeting in Minot, North Dakota. The teachers filled out a feedback form on the presentation, and an outreach report was prepared and entered into the Outreach Information System.
- A draft presentation was prepared for the upcoming North Dakota Petroleum Council Teacher Seminar in June.
- Prepared a preproposal to develop a one-credit course on CO₂ sequestration that could be offered through University of North Dakota Continuing Education.
- Outreach Working Group
 - Provided feedback on MTBE article being prepared by SAIC.
 - Several items came out of the OWG conference call held April 17, 2008:
 - ♦ Prepared a story for use in the outreach presentation at the May Pittsburgh meeting.

- ♦ Need for additional information in our partnership region regarding sources and risks to drinking water as suggested by the presentation by Clean Water Action (they are in North Dakota but not too active at this point).
- ♦ Provided DOE with draft materials for use in preparing bulleted items on both of PCOR Partnership's Phase III demonstrations for use in a video and written outreach materials being prepared for the DOE booth at the GHGT-9 meeting in the fall of 2008.
- Received an update on the presentation at the Pittsburgh meeting, and submitted a story to be considered for the presentation.
- Nature in the Balance update
 - Provided Nature in the Balance DVDs for a Lignite Council meeting.
 - Internally reviewed the updated copy of the documentary received from PPB, and compiled a list of revisions to be discussed with PPB.
 - Preliminary revisions were completed by PPB; it was reviewed internally with the revised documentary, and PPB was provided with a list of revisions that still need to be finalized.
 - Provided PPB with an updated sleeve and insert materials.
- Outreach Information System
 - Began efforts to populate 15 data categories to aid in planning and assessment.
 - Developed a preliminary format for outreach activity reporting and submitted reports on two outreach activities to try out the system.
- Contacting the North Dakota Extension Service regarding outreach and training opportunities in keeping with the Outreach Plan for Phase III based on a contact at the North Dakota Science Teachers Association meeting in Minot.
- Preparing carbon action stories that capture the actions being taken by educators and partners in the region to inform and raise awareness regarding sequestration and carbon issues. These stories will be featured on the Web site and in other outreach materials.
- Initiated preparation of an Outreach Source Book as a consistent, single source, to support outreach activities, products, and presentations. Received guidance on the proper way to address a set of questions we have received during public presentations; answers were prepared to be included in the Outreach Source Book.
- A draft General Fact Sheet, deliverable D14, was sent to DOE for review on April 30, 2008.
- Outreach Action Plan, deliverable D11, was submitted to DOE on March 31, 2008; currently waiting for comments.

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

Highlights

- The developments of various state and regional initiatives are being tracked and analyzed.
- The draft NEPA document for the Williston Basin Test (M3) is nearing completion.
- The 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.

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

Highlights

- Development of Baseline Characterization Experimental Design Package for the Williston Basin site continued.
- Regional Characterization Activities
 - Development of a petrophysical model of the Mission Canyon Formation in the Washburn Study Area continued.
 - Development of a petrophysical model of the Rival acid gas injection field in North Dakota continued.
- A poster entitled “Characterization and Modeling of the Broom Creek Formation for Potential Storage of CO₂ from Coal-Fired Power Plants in North Dakota” was presented at the 2008 American Association of Petroleum Geologists Annual Convention.

Task 5 – Well Drilling and Completion (TBA)

- 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

- Verification of the location coordinates for the PCOR Partnership CO₂ sources using Google Earth continue.
- The levels of effort and funding needed to implement capture and sequestration of CO₂ in the PCOR Partnership region are being estimated. Activities have been initiated and include:
 - Determining the amount of replacement power that will be needed to apply capture technology to the various types of regional sources for varying capture levels.
 - Determining the most applicable currently available capture technology for each the various regional source types.
 - Determining a likely regional pipeline network route.

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 can not 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)

- 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 and annual progress reports.
- Future activities include the Project Assessment Annual Report due December 31, 2008, and the Risk Assessment Plan due within Budget Period 3. An initial draft has been started for the Risk Assessment Plan.

Task 13 – Project Management (Edward N. Steadman)Highlights

- The PCOR Partnership will be taking part in the 7th Annual Carbon Capture & Sequestration Conference in Pittsburgh, Pennsylvania, May 5–8, 2008
 - The PCOR Partnership submitted two abstracts.
 - A booth (Phase II and III) will be on exhibit.
- The following deliverables/milestones were completed in April:
 - D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report
 - D14: Task 2 – General Phase III Fact Sheet

Travel/Meetings for Phase II and III

- April 6–10, 2008: 235th American Chemical Society (ACS) National Meeting (Advances in CO₂ Management: CO₂ Sequestration, Utilization, Capture and Enhanced Oil Recovery) in New Orleans, Louisiana
- April 10–11, 2008: Sixth International Forum on Geologic Sequestration of CO₂ in Deep, Unminable Coal seams “Coal-Seq. VI” in Houston, Texas
- April 13–17, 2008: Carbon Sequestration Leadership Forum (CSLF) in Cape Town, South Africa
- April 14, 2008: Terrestrial team meeting in Bismarck, North Dakota
- April 17, 2008: Geological Characterization Meeting in Minneapolis, Minnesota
- April 17, 2008: CO₂ for Enhanced Oil Recovery Conference in Houston, Texas
- April 20–23, 2008: American Association of Petroleum Geologists Annual Convention & Exhibition in San Antonio, Texas
- April 27–29, 2008: 16th Williston Basin Petroleum Conference & Expo in Minot, North Dakota
- April 30 – May 1, 2008: Rocky Mountain Coal Mining Institute Section Meeting in Grand Junction, Colorado

- May 1, 2008: UIC permit hearing in Bismarck, North Dakota
- May 5–8, 2008: 7th Annual Carbon Capture & Sequestration Conference in Pittsburgh, Pennsylvania
- May 6–8, 2008: 2008 Electric Power Conference in Baltimore, Maryland
- June 1–5, 2008: The 33rd International Technical Conference on Coal Utilization & Fuel Systems in Clearwater, Florida
- June 9–12, 2008: Teachers Seminar in Bismarck, North Dakota
- June 29–July 2, 2008: 4th International Symposium on Energy, Informatics and Cybernetics: EIC '08
- August 13–15, 2008: Coal-Gen in Louisville, Kentucky
- September 29 – October 2, 2008: Pittsburgh Coal Conference in Pittsburgh, Pennsylvania
- November 16–20, 2008: GHGT-9 in Washington, D.C.