

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

PHASE II ACTIVITIES

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

Highlights

- As of January 31, 2009, the PCOR Partnership has 80 (Phases II and III) partners. It should be noted 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).
- A workshop is being assembled by PCOR Partnership staff for the Hydrogen Works Training Course in San Diego, California, February 16–19, 2009.
- The PCOR Partnership is participating in the North-Central Section Geological Society of America (GSA) 42nd Annual Meeting (April 2–3, 2009, Rockford, Illinois).
- The following Phase II deliverables/milestones were completed in January:
 - D3: Task 1 – Quarterly Report
- Upcoming Phase II deliverables/milestones for February are as follows:
 - M12/D45: Task 2 – Williston Basin Field Validation Test Outreach Action Plan
 - D22: Task 8 – Web Site Update
- Upcoming Phase II deliverables/milestones for March are as follows:
 - D46: Task 8 – Documentary: Geologic Sequestration

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

Highlights

- Eagle Operating has committed to conducting a CO₂ huff ‘n’ puff in the Northwest McGregor oil field on the Nesson Anticline. This will be the Phase II Williston Basin project. The tentative plan is to inject CO₂ in March 2009.

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

Highlights

- X-ray diffraction (XRD), scanning electron microscopy (SEM), and thin section work have been completed on 20 samples from the Zama core. XRD has identified that calcite is the major reservoir mineral, followed by dolomite and quartz. Trace amounts of kaolinite and illite/smectite have been identified in the lower section of the core. This is consistent with the mineral identification via thin section and SEM. Blue epoxy has been used in the thin sections and has established that the porosity is low throughout the succession. Most of the porosity is intraskeletal and isolated. SEM examination has shown that the cementing calcite

and dolomite crystals are characterized by clean crystal faces that show no evidence of etching.

- Preparation for the geochemical modeling is under way.
- An outline for the Regional Technology Implementation Plan has been constructed. A project finalization schedule outlining key completion dates is currently being completed.

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

Highlights

- Discussions are ongoing with Pinnacle and Schlumberger to coordinate monitoring, mitigation, and verification (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.
- Wellhead design and installation are complete.
- Numerous meetings and conference calls continue to be 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 complete. The system is collecting temperature, pH, conductivity, and pressure data in all five wells.
- A sundry notice providing the final injection well schematic was submitted to the North Dakota Industrial Commission (NDIC) for the lignite field validation test.

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

Highlights

- Data entry of field-collected gas samples and site measurements is completed, and quality assurance (QA)/quality control (QC) is in progress. Laboratory and data analysis from the University of Wisconsin – Stevens Point are anticipated to be completed by mid-February.
- Statistical analysis software databases are being constructed as data progress through the QA/QC process. Analyses of combined field and lab data will start in February.
- An analysis of the economic impact of easement payments is ongoing (North Dakota State University [NDSU]).
- 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 climate change policy and comparisons of soil carbon models are being reviewed by the Energy & Environmental Research Center (EERC).
- A topical report entitled “Technical, Regulatory, and Economic Feasibility of Wetlands as a Greenhouse Gas Mitigation Strategy” is in final review by Ducks Unlimited, Inc. (DU)/EERC.
- PCOR Partnership partners continue to work toward obtaining Climate Community and Biodiversity Standards verification for grassland carbon credits.
- As part of the wetlands study, an in situ experiment on nitrogen amendments on greenhouse gas (GHG) emissions continues. Results are being finalized.

- Other state and regional GHG or cap-and-trade program rules and policies and U.S. Department of Energy (DOE) Guidelines for Aggregators and Terrestrial Offset Providers are being evaluated.
- An update of the DU–PCOR Partnership terrestrial project Web site continues.
- Work on characterization inputs and the terrestrial portion of the Decision Support System (DSS, © 2007 EERC Foundation) continues.

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

Highlights

- Alberta oil pool data from RPS Energy were received. These data will be used to update calculated CO₂ sequestration capacities for pools in Alberta. It is hoped that RPS Energy can provide additional data for Saskatchewan and British Columbia.
- 2006 Canadian census data were received from Statistics Canada. The data are geographic information system (GIS)-based and will be used to provide a demographic framework for the outreach component of the project.
- RPS Energy assisted in generating latitude/longitude coordinates for gas-processing facilities in Alberta and British Columbia.
- An internal meeting took place to discuss PCOR Partnership involvement with the trilateral effort to map CO₂ sinks and sources across all of North America.
- New GIS data sets for the oil/gas fields of Wyoming were received.
- New maps for use in several upcoming PCOR Partnership-related presentations were created.
- Work on the news ticker for the new DSS home page has begun.
- The subcrop outlines of seven Williston Basin formations were converted into formats that could be used in the petrophysical modeling software.
- Work continues on a draft version of an executive summary for Phase II. This document will be used as a guide for the final months of Phase II and the development of final reports.

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

Highlights

- 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.
- EERC staff testified at a North Dakota Senate Committee hearing regarding the merits of a proposed carbon sequestration bill.
- Actions occurring in Congress and the new administration 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.
- A sundry notice providing the final injection well schematic was submitted to NDIC for the lignite field validation test.

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

Highlights

- Documentaries
 - A set of action items for the documentaries was prepared based on correspondence with Prairie Public Broadcasting (PPB).
 - Discussions were held with the outreach team at an internal meeting on January 22, 2009.
 - A conference call was held with PPB on January 26, 2009.
 - ♦ A plan was developed for next steps, and an updated set of action items for the documentaries was prepared.
- Deliverable D46: Documentary on Geologic Sequestration (due to DOE March 2009)
 - The draft script was finalized including all interview materials to date, an in-house draft video was prepared as an aid in preparing the draft script, and a one-page treatment of the draft script was prepared for review and internal approval.
 - Internally, the draft script was approved with minor changes; the script and time codes were provided to PPB so that they can start work on compiling the narrative backbone and adding b-roll.
 - A narrative backbone was updated that has been compiled using the EERC's new video capability.
 - Film locations under consideration are Des Moines, Iowa (industrialized nation example), Dehli, India (industrializing nation example), and Cameroon (developing nation example).
 - Preparation of background write-ups was initiated for the locations.
 - An internal meeting was held regarding Cameroon travel, energy use, and lifestyle; a preliminary flight schedule was prepared for travel to Cameroon and India; PPB is looking into other possible locations (Ghana and China).
 - A meeting took place with the animator at PPB in Fargo on Friday, January 30, 2009.
- Deliverable D35: Documentary on Reducing Carbon Footprint
 - Updates were made, and the deliverable was completed.
 - Interview questions were provided internally, and a request that interviews be set up with Hess Corporation in Bismarck and with NDIC was initiated.
 - A list of chapters for the DVD and video extras was prepared.
 - Scripts and extras were reviewed, and a final list of animation was prepared to discuss during the meeting with PPB on January 30, 2009.
- Deliverable D22: Public Web Site Update (due to DOE February 2009)
 - The format was approved internally.
 - The existing Web pages are being put into the new format.
 - The updated Web pages that were compiled are being reviewed internally.
 - An internal meeting took place to establish a revised procedure for doing monthly groups of key news items for the Web (it was suggested that this could be used as the basis for a separate monthly product for partners).
 - A draft Web plan was prepared and provided internally for review.
- Deliverable D17: PowerPoint Presentation: General Audience CO₂ Sequestration Outreach
 - DOE approved D17 on January 15, 2009.
 - Internal review continues; we are currently updating slides on carbon cycle and atmospheric issues.

- Outreach Working Group
 - The monthly conference call was held.
 - A request for a gap assessment was suggested by AJW, Inc., with respect to outreach.
 - Comments were prepared and provided to AJW, Inc., regarding an outline for a Regional Carbon Sequestration Partnership (RCSP) outreach gap assessment report.
- An outline for Deliverable D48: Best Practices Manual was initiated.
- An executive summary for the Phase II outreach final was provided internally.

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

Highlights

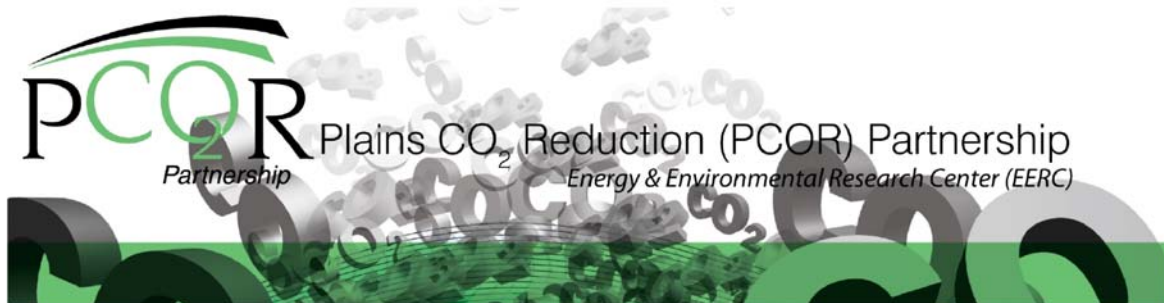
- The British Columbia gas-processing plant locations were converted from the British Columbia/National Topographic System to latitude and longitude coordinates.
- The size of the CO₂ stream separated from the raw gas at the various regional gas-processing facilities was estimated.
- The gas-processing facility data were integrated into the existing PCOR Partnership CO₂ emission sources data set. Preliminary summary statistics were calculated from the combined data set for use in updating the draft emission estimation methodologies report.
- The University of North Dakota approved the purchase contract with PennWell for the natural gas-processing facility data.
- Data contained in the U.S. Environmental Protection Agency's e-GRID CO₂ emission database were used in calculations to estimate the average tonnage of coal burned at an "average" power plant in the region. These values were compared with the estimates calculated using the PCOR Partnership database as well as some generated using the Carnegie Mellon Integrated Environmental Control Model (IECM). In addition, the IECM was used to estimate the volume of flue gas produced on a per-ton-of-coal basis as well as the composition of the flue gas. The values were requested by the PCOR Partnership outreach task manager.
- Efforts to expand the PCOR Partnership membership have continued.
 - A PowerPoint summarizing PCOR Partnership activities and products was prepared for presentation to the Missouri River Energy Services Board of Directors on February 12, 2009.
 - An agreement was finalized with the Nebraska Public Power District for membership.
 - Membership discussions were conducted with BNSF Railway.

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 RCSPs. The PCOR Partnership will also participate in this working group.
- A regulatory workshop is being planned for June 2009 (tentatively).



PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Work continued on material to populate the new DSS Web pages. A wealth of data for the Zama project were provided. All the information will be compiled into a PDF report available through the DSS.
- Work continued on content and design of a template for maps to be included in the next version of the PCOR Partnership Regional Atlas. The current layout may be changed to a portrait orientation.
- A graphic design company catering to the petroleum industry was contacted to inquire on the creation of custom cross-section graphics (Perez Graphics).
- A conference call was held with a representative from the North American Energy Working Group to discuss a potential role in the development of a North America Carbon Atlas Partnership.

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; we are currently waiting for comments from DOE.
- Deliverable D12: Demonstration Web Pages on the Public Site
 - Work continued on a draft final of the Web pages.
- Outreach information system
 - Preparation of materials continued for the Outreach Information System.
 - Preparation of a presentation for the Outreach Team on the status of the Outreach Information System activity continues.
- EERC video capability
 - A list of the footage shots was prepared.
 - A camera training session was held on Thursday, January 8, 2009.
 - An internal meeting was held January 9, 2009, to review activities for the next two quarters.
 - The materials put together by Jared were reviewed.
- Video clips including animation
 - Video clips are currently being reviewed by DOE.

- A request for Web page examples that feature the video clips for use in the EERC review process is being put together.
- Examples for both the public PCOR Partnership Web site and a sample of a YouTube page are being prepared.
- School outreach
 - Work continues to contact teachers in the region to develop an advisory group for activities.
 - An internal meeting was held to discuss the Keystone Climate Status Investigation Workshop for educators; it was agreed that the workshop will be in Omaha in July 2009.
 - A conference call was conducted with Keystone on January 28, 2009, to discuss the following: next steps, confirmation of dates and location, development of a packet for teachers, and preparation of a talk that brings in regional issues at the workshop.
 - An internal meeting was held to discuss the potential for Nebraska Public Service to be involved.
- Deliverable D24: PCOR Partnership Region Sequestration General Poster (due to DOE March 31, 2009)
 - A first cut of posters (deliverable and two value-added) was prepared and reviewed with the Outreach Team, and the team is developing ideas.
 - The outreach team continues to develop poster concepts based on initial drafts.
- Deliverable D15: Williston Basin Test Site Fact Sheet (due to DOE May, 29, 2009)
 - A draft fact sheet was prepared and is currently being reviewed internally.
- Outreach Working Group
 - The group participated in a monthly conference call.
 - Comments were provided to AJW, Inc., regarding an outline for a suggested Regional Carbon Sequestration Partnership outreach gap assessment.

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.
- EERC staff testified at a North Dakota Senate Committee hearing regarding the merits of a proposed carbon sequestration bill.
- Actions occurring in Congress and the new administration 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

- The development of a Project Risk Assessment Plan for the Fort Nelson demonstration continued.
- 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 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 continued.
 - 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 (Steve Smith)

- This task has not begun (Quarter 3 – 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

- The Skyonic SkyMine™ technology was preliminarily evaluated at the request of one of the PCOR Partnership partners.
- The Clean Energy Systems power generation/CO₂ capture technology was preliminarily evaluated at the request of one of the PCOR Partnership partners.
- PCOR Partnership infrastructure development efforts this week have focused on review of new capture technologies.

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 – 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 partners with a topical report on past, present, and future carbon market activities.
- A Risk Management Plan outline is due within Budget Period 3. In January 2009, PCOR Partnership staff met with Spectra Energy to discuss risk management activities for the upcoming Fort Nelson demonstration project.
- 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).
- The following Phase III Deliverables/Milestones were completed in January:
 - D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report
 - D28: Task 3 – Environmental Questionnaire – Williston Basin Test Site
- No Phase III Deliverables/Milestones are due for February.
- Upcoming Phase III Deliverables/Milestones for March:
 - D2: Task 1 – First Target Area Completed
 - M4: Task 4 – Williston Basin Test Site Selected
 - M5: Task 4 – Data Collection Initiated for Williston Basin Test Site
 - D24: Task 2 – PCOR Partnership Region Sequestration General Poster
 - D28: Task 3 – Environmental Questionnaire – Williston Basin Test Site

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

Highlights

- This task has not yet begun, but will start in early February 2009. We have just received funding for this project. Once activities are initiated, the information will be communicated and detailed in quarterly progress reports.

Travel/Meetings for Phase II and III

- January 6–9, 2009: Met with Spectra Energy regarding the progress of the Fort Nelson project in Calgary, Alberta
- February 7–13, 2009: International Energy Agency Modeling Network Meeting in Orleans, France
- February 23–26, 2009: CO₂ Workshop sponsored by the Canadian Institute in Calgary, Alberta
- March 23–26, 2009: 2009 CO₂ Capture Technology Conference in Pittsburgh, Pennsylvania
- May 2009: 8th Annual Conference on Carbon Capture and Sequestration in Pittsburgh, Pennsylvania