



Plains CO₂ Reduction (PCOR) Partnership Monthly Update September 1–30, 2011

PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Continued efforts on the revised atlas (4th edition).
- Coordinated and presented at the 2011 workshop entitled “Foundations of CCS Geology” on September 12 in Denver, Colorado.
- Attended the 2011 PCOR Partnership Annual Meeting on September 13 and 14 in Denver, Colorado.
- Continued activities to upgrade the online geographic information systems and Decision Support System (DSS, © 2007–2011 EERC Foundation) capabilities.
- Held discussions on the availability of water quality analysis for specific geologic horizons across the region and the utility of such data in the greater scheme of regional characterization.
- Completed the annual review of source attributes.
- Continued efforts on the Rival Field characterization, including the following:
 - Continued building the structural and petrophysical model for the acid gas injection zone.
 - Continued refining the 3-D geologic model.
 - Continued work on the model update report and the thin-section report.
 - Participated in several conference calls with TAQA North Ltd (TAQA).
 - Continued drafting D5, second target area completed, due March 2012.

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

Highlights

- Helped coordinate the “Foundations of CCS Geology” Workshop held on September 12 in Denver, Colorado.
- Attended the 2011 PCOR Partnership Annual Meeting on September 13 and 14 in Denver, Colorado.
- Prepared a draft Bell Creek test site poster (D25, due 9/30/2011).
- Continued planning for the public Web site update (D13, due 7/31/2012).
- Prepared a Fort Nelson documentary proposal (D22), including concept, shot lists, and frequently asked questions for Spectra Energy’s review and consideration.

- Participated on September 20 in a conference call of the Weyburn-Midale Project outreach advisory group to discuss the opening of an information display in the Weyburn city hall and upcoming focus group and survey work.
- On September 22, participated in a telephone conversation with Cris Stainbrook, the President of the Indian Land Tenure Foundation (ILTF); ILTF has hired a full-time person to work on energy and carbon issues, and ILTF suggested that this new hire make a 3-day visit to the Energy & Environmental Research Center (EERC) to learn about PCOR Partnership capabilities and to discuss opportunities for collaboration.
- EERC library staff participated in the 2011 North Dakota Library Association meeting (<http://ndla.info/Conference/11conf.htm>) in Minot and hosted a booth featuring PCOR Partnership outreach materials, including atlases, documentaries, and fact sheets.
- On September 21, participated in a conference call to discuss the outreach session and presentation at the Society of Petroleum Engineers Forum Series entitled “CO₂ Geological Storage: Will we be ready in time?” to be held in The Algarve, Portugal, in early October (www.spe.org/events/11fse3/pages/about/index.php).
- Continued efforts to develop an outreach tracking database.
- Continued to track state-by-state carbon capture and storage (CCS) regulations for development of future outreach materials.

Task 3 – Permitting and NEPA (National Environmental Policy Act) Compliance (Lisa S. Botnen)

Highlights

- Attended the 2011 PCOR Partnership Annual Meeting and Workshop on September 12–14 in Denver, Colorado.
- Completed the permitting review (D4, due 9/30/2011).
- On September 8, distributed the summary and presentations from the 3rd Annual PCOR Partnership Regulatory Meeting held in Bismarck, North Dakota.
- Completed review of the U.S. Environmental Protection Agency’s (EPA’s) proposed Resource Conservation and Recovery Act (RCRA) exemption for CCS and had preliminary discussions on this proposed rule with various partners.
- On September 14 and 15, updated the annual meeting attendees regarding the EPA’s assumption of regulatory authority for permitting Class VI (geologic storage of carbon dioxide) underground injection control wells. Permit applications for such wells will need to be submitted to EPA regional offices.
- Held an in-house meeting and participated in conference calls with various partners to discuss the proposed RCRA regulations.
- Participated in EPA’s webinar entitled “Geologic Sequestration Financial Responsibility Implementation Workshop and Webcast.”
- Scheduled a breakfast meeting of the PCOR Partnership’s regulatory group for October 17, during the Interstate Oil and Gas Compact Commission (IOGCC) Annual Meeting in Buffalo, New York.
- Continued efforts on the Lignite Phase II site closure and reclamation, including the following:
 - Completed cementing over the plug pursuant to state authorization.
 - Scheduled reseeding for October 24.

- Over the next 2 years, scheduled weed spraying and maintenance of the fencing.

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

Highlights

- Attended the 2011 PCOR Partnership Annual Meeting and Workshop on September 12–14 in Denver, Colorado.
- Bell Creek test site activities included the following:
 - Continued development of the core analysis plan.
 - EERC and Denbury personnel examined geologic core from the Bell Creek Field at the Denver U.S. Geological Survey (USGS) office. The USGS provided samples from a well in the Phase 1 development area for thin-section preparation and further in-house laboratory testing. Results will be shared with the USGS as agreed upon as part of a condition of receiving samples.
- Fort Nelson test site activities included the following:
 - Held the monthly conference call on September 6.
 - Continued work on the geomechanical model.
 - Continued work on updating the 2011 static geological model.
 - Continued finalization of a draft report presenting the results of geochemical experiments conducted over the course of 2009–2011.
 - Continued the process of reconciling the various data packages that are associated with the 2009 Fort Nelson wellbore characterization and core analyses to ensure the quality and accuracy of data relative to the specific rock formation intervals being evaluated.
 - Continued work on D65, Site Characterization Report, which is due October 31, 2011.
 - Held an in-house project update meeting on September 26.
 - Participated in a call with Dave Moffatt on September 29.

Task 5 – Well Drilling and Completion (John A. Hamling)

Highlights

- Attended the 2011 PCOR Annual Meeting and Workshop on September 12–14 in Denver, Colorado, and presented an update on Bell Creek activities on September 14.
- Continued preparations for the first surface water, soil gas, and groundwater monitoring baseline sampling trip.
- Finalized well-logging program and selected service providers for the cased-hole and openhole well-logging program in cooperation with Denbury.
- Discussed potential 3-D seismic characterization and baseline survey with Denbury.
- Continued work in material procurement and design of permanent downhole monitoring equipment for the monitoring well in conjunction with Sandia Technologies and Denbury.

Task 6 – Infrastructure Development (Melanie D. Jensen)

Highlights

- Attended the PCOR Partnership Annual Meeting and Workshop held September 12–14 in Denver, Colorado.
- Answered questions and requests received from two partners at the annual meeting.

- Finalized the CO₂ pipelines technical brief (www2.undeerc.org/website/pcorp/ProductsDB/pdfs/PipelineTechnicalBrief2011revisedPWG.pdf).
- Submitted for DSS programming the master information spreadsheet prepared for adaptation of the capture technologies table (included as an appendix in the value-added capture technologies overview report).

Task 7 – CO₂ Procurement (John A. Harju)

Highlights

- Attended and participated in the 2011 PCOR Partnership Annual Meeting and Workshop held September 12–14 in Denver, Colorado.
- Participated in ongoing project discussions with Denbury Onshore LLC.

Task 8 – Transportation and Injection Operations (Melanie D. Jensen)

Highlights

- Attended the PCOR Partnership Annual Meeting and Workshop held September 12–14 in Denver, Colorado.
- Gathered information about the CO₂ capture technology used at the Lost Cabin gas plant, the CO₂ pipeline from the gas plant to the Bell Creek field, and downhole pressure and depth at the field for use in determining compression needs both at the Lost Cabin plant and for recompression at the Bell Creek field.
- Summarized the literature survey work gathered about the CO₂ capture technology used at the Lost Cabin gas plant, the CO₂ pipeline from the gas plant to the Bell Creek field, and pipeline compression and field recompression needs at the Bell Creek field.

Task 9 – Operational Monitoring and Modeling (Charles D. Gorecki)

Highlights

- Attended the PCOR Partnership Annual Meeting and Workshop held September 12–14 in Denver, Colorado.
- Held a monthly modeling meeting on September 27, including an in-house presentation of the Fort Nelson geochemical model.
- Participated in the Regional Carbon Sequestration Partnership (RCSP) Sim/Risk Working Group monthly conference call on September 27.
- Modeling staff participated in Petrel Reservoir Engineering training in Houston, Texas.
- Modeling staff participated in a 3-day Piece training course entitled “Fundamentals of Reservoir Simulation.”
- Continued Bell Creek site activities, including the following:
 - Submitted the site characterization, modeling, and monitoring plan (D50) on September 30, 2011.
 - Continued efforts on the Bell Creek simulation report.
- Continued Fort Nelson site activities, including the following:
 - Began finalizing the 2010 risk assessment report based on Spectra comments received on September 13.

- A draft MVA (monitoring, verifying, and accounting) plan for shallow groundwater and surface water monitoring has been prepared and is undergoing in-house review.
- Worked with Dave Nakles to revise schedule of technical activities based on the outcome of a July meeting in Vancouver and to develop descriptions and time lines for technical activities to be conducted over the next 12 months.
- Worked on a PowerPoint on simulation efforts for Spectra Energy.
- Sent a draft D67, Fort Nelson Simulation Report, to Spectra Energy for review and comment on September 2.
- Prepared to send a draft D66, Bell Creek Simulation Report, to Denbury for review and comment.

Task 10 – Site Closure (to be announced [TBA])

- This task is anticipated to be initiated in Quarter 1 – Budget Period (BP) 5, Year 9 (October 2015).

Task 11 – Postinjection Monitoring and Modeling (TBA)

- This task is anticipated to be initiated in Quarter 1 – BP5, Year 9 (October 2015).

Task 12 – Project Assessment (Katherine K. Anagnost)

- Attended the PCOR Partnership Annual Meeting and Workshop held September 12–14 in Denver, Colorado.
- The project assessment report (D57) for the period October 1, 2010 – September 30, 2011, will be submitted by December 31, 2011. The report for the previous program year is available on the partners-only Web site (www2.undeerc.org/website/pcorp/Products/DB/pdfs/ENS_D57_Task12_Dec10.pdf).

Task 13 – Project Management (Charles D. Gorecki)

Highlights

- Continued efforts toward populating and updating the partners' database, which was programmed in-house.
- Attended the PCOR Partnership Annual Meeting and Foundations of CCS Geology on September 12–14 in Denver, Colorado. The annual meeting attracted 83 attendees representing 42 organizations from 12 states, the District of Columbia, and four Canadian provinces.
- On September 22, sent an e-mail to all partners with a link to the location of the annual meeting presentations on the partners-only Web site.
- Held an in-house annual meeting follow-up meeting.
- Began site and date selection process for the 2012 annual meeting. Preliminary plans are to hold it in September.
- Participated in an in-house meeting to explore additional opportunities in Rival Field.
- Presented at the Lignite Technology Development Workshop on September 8 in Bismarck, North Dakota.

- Continued preparation of upcoming presentations, including the following:
 - “The PCOR Partnership: Large-Scale Demonstration Projects in the Central Interior of North America” to be presented on October 26 at the Air Quality VIII Conference in Arlington, Virginia.
 - “An Overview on CO₂ Storage Capacity Estimation” also to be presented on October 26 at the Air Quality VIII Conference (<http://undeerc.org/aq8/eventschedule.aspx>).
 - “Quantifying and Enhancing Storage Capacity” to be presented on October 19 during the Storage in Saline Formations R&D Workshop in Pittsburgh, Pennsylvania.
 - “PCOR Partnership” to be presented on November 17 at the Carbon Storage Program Infrastructure Annual Review Meeting in Pittsburgh, Pennsylvania.
- Continued preparation of papers due by November 21 for the 2012 Carbon Management Technology Conference, including the following:
 - (CMTC-151349-PP) A Risk-Based Monitoring Plan for the Fort Nelson Feasibility Project
 - (CMTC-151476-PP) Integrating CO₂ EOR and CO₂ Storage in the Bell Creek Oil Field
 - (CMTC-151566-PP) Carbon Management Strategies: Commercial Deployment Studies Focused on CO₂ Capture and Storage and the Use of Biomass Fuels to Reduce Carbon Emissions
- Deliverables and milestones completed in September:
 - August monthly update
 - Task 1: D1 – Review of Source Attributes
 - Task 1: D9 – Updated DSS
 - Task 2: D25 – Bell Creek Test Site Poster
 - Task 3: D4 – Permitting Review
 - Task 9: D50/M31 – Bell Creek Test Site – Site Characterization, Modeling, and Monitoring Plan
 - Task 16: M33 – Basal Cambrian Baseline Geological Characterization Completed

Task 14 – RCSP Water Working Group (WWG) Coordination (Ryan J. Klapperich)

Highlights

- Attended the PCOR Partnership Annual Meeting and Workshop held September 12–14 in Denver, Colorado.
- Distributed minutes from the August conference call.
- The September conference call was cancelled.
- Continued to develop potential outreach survey questions.

Task 15 – Further Characterization of the Zama Acid Gas EOR, CO₂ Storage, and Monitoring Project (James A. Sorensen)

Highlights

- Worked on collection and compilation of data for evaluation of deep saline formations.
- Submitted an abstract to the Eighteenth SPE Improved Oil Recovery Symposium entitled “Compositional Flow Simulation Study of Simultaneous Acid Gas EOR and CO₂ Storage at Apache’s Zama F Pool.”

Task 16 – Characterization of the Basal Cambrian System (Wesley D. Peck)

Highlights

- Attended the PCOR Partnership Annual Meeting and Workshop held September 12–14 in Denver, Colorado, and presented an update on the Basal Cambrian System Characterization on September 14.
- On September 14, held a meeting of the technical and steering committee members in Denver following the PCOR Partnership Annual Meeting.
- Work continues on the final preparation of the 2-D model of the basal aquifer system. The latest step involves integration of geothermal data to accurately estimate the density of CO₂ at the varying target depths across the study region.
- Presented on the normalization and calibration of the well logs to the core data at an in-house meeting held on September 27.
- Held an in-house working group meeting on September 7.
- Held an in-house project update meeting on September 19.

Travel/Meetings

- September 5–9, 7–13, and 18–23, 2011: Traveled to the Lignite field validation test site (Phase II) for site work near Kenmare, North Dakota
- September 8, 2011: Presented at the Lignite Technology Development Workshop in Bismarck, North Dakota
- September 11–14, 2011: Held the 2011 PCOR Partnership Annual Meeting and Foundations of CCS Geology Workshop in Denver, Colorado
- September 15, 2011: Held a Basal Aquifer Project meeting in Denver, Colorado
- September 13–17, 2011: Participated in a 3-day Piece training course entitled “Fundamentals of Reservoir Simulation” in Houston, Texas
- September 17–22, 2011: Attended the 2011 Society of Core Analysts Symposium in Austin, Texas (www.regonline.com/custImages/239450/2011TechnicalProgram.pdf)
- September 19–22, 2011: Attended the IPIECA workshop entitled “Addressing the remaining gaps in knowledge for CCS” in Washington, DC (www.ipieca.org/event/20110506/addressing-remaining-gaps-knowledge-ccs)
- September 20–23, 2011: Attended the North Dakota Petroleum Council annual meeting in Medora, North Dakota
- September 24–29, 2011: Participated in Schlumberger’s training course entitled “Petrel Reservoir Engineering 2011” in Houston, Texas
- September 25–28, 2011: Attended the 2011 Ground Water Protection Council Annual Forum in Atlanta, Georgia (www.gwpc.org/meetings/forum/forum.htm)

DOE DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

NDIC DISCLAIMER

This report was prepared by the Energy & Environmental Research Center (EERC) pursuant to an agreement partially funded by the Industrial Commission of North Dakota, and neither the EERC nor any of its subcontractors nor the North Dakota Industrial Commission nor any person acting on behalf of either:

- (A) Makes any warranty or representation, express or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or
- (B) Assumes any liabilities with respect to the use of, or for damages resulting from the use of, any information, apparatus, method, or process disclosed in this report.

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the North Dakota Industrial Commission. The views and opinions of authors expressed herein do not necessarily state or reflect those of the North Dakota Industrial Commission

EERC DISCLAIMER

LEGAL NOTICE: This research report was prepared by the EERC, an agency of the University of North Dakota, as an account of work sponsored by the U.S. Department of Energy. Because of the research nature of the work performed, neither the EERC nor any of its employees makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement or recommendation by the EERC.