



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

PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Continued efforts on the revised atlas (4th edition).
- Efforts are under way to improve the search feature for the products database stored on the partners-only Decision Support System (DSS, © 2007–2011 EERC Foundation).
- Continued development of a regional map detailing the oil and gas fields within the greater Williston Basin area.
- Prepared a PowerPoint presentation entitled “Application of the U.S. Department of Energy’s CO₂ Storage Resource Estimation Methodology on the Deadwood Formation, Williston Basin” to be presented on May 4, 2011, during the 10th Annual Conference on Carbon Capture & Sequestration (CCS) in Pittsburgh, Pennsylvania.
- Regarding the Rival Field characterization:
 - Began incorporating project details into a geological, engineering, and petrophysical analysis software named PETRA.
 - Held several conference calls with TAQA North, Ltd., regarding the status of the project.
 - Continued the characterization of the Dwyer and Grenora Fields in the Williston Basin.
 - Completed the draft work plan for the EERC’s Applied Geology Laboratory (AGL) analysis of Rival Field core samples and initiated the work during the week of April 18, 2011.
 - Conducted a literature review regarding the 3-D seismic analysis.
 - Began log binning the data for petrophysical analysis.
 - Requested that the AGL cut four additional core plugs from the Rival Field for further petrographic analysis.

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

Highlights

- Continued efforts as a member of the Weyburn–Midale Project Outreach Panel.
- Continued efforts to create a database to more efficiently track the outreach products.
- Received documentary broadcast activity from Prairie Public Broadcasting (PPB).

- Participated in multiple Regional Carbon Sequestration Partnership (RCSP) Outreach Working Group (OWG) conference calls regarding the development of an outreach workshop at the 10th Annual Conference on CCS.
- Prepared an initial concept for the Bell Creek demonstration site poster (Deliverable [D] 25).
- Participated on April 21 in the OWG monthly conference call, featuring strategies for interaction with print media led by the editor of *Climate Wire*.
- Initiated preparation of an update to the Fort Nelson demonstration site general informational PowerPoint presentation (D19).
- Initiated preparation of an update to the PCOR Partnership general informational PowerPoint presentation (D17).
- Initiated preparation of a presentation to be given to the Lignite Energy Council's 2011 *Lignite Education Seminar: Energy, Economics and Environment* scheduled for June 20–23, in Bismarck, North Dakota.
- Continued preparation with PPB for a teacher-training workshop focusing on the use of PCOR Partnership documentaries and video clips in the classroom.
- Continued efforts to establish outreach activities in conjunction with Spectra Energy for the Fort Nelson demonstration site.

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

Highlights

- Continued development of the revised/updated *Regulatory Roundup* document.
- Continued plans for the next PCOR Partnership Regulatory Meeting (June 29–30). The meeting will follow the IOGCC (Interstate Oil and Gas Compact Commission) Midyear Issues Meeting in Bismarck.
- Submitted a revised NEPA questionnaire for the Bell Creek project.
- Participated in a conference call with PCOR Partnership partner, Eagle Operating, to discuss its responsibilities under the U.S. Environmental Protection Agency's Greenhouse Gas Mandatory Reporting Rule, Subpart W.
- Assisted PCOR Partnership Partner, Aquistore, by reviewing and commenting on its project description that needed to be completed in compliance with the Canadian Environmental Assessment Act (CEAA). Once our comments were incorporated, Aquistore submitted its project description to the Canadian federal government for determination on the level of environmental review that will be required for its project.

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

Highlights

- Bell Creek test site activities included the following:
 - Continued preparation of D34: Baseline Hydrogeological Experimental Design Package.
 - EERC staff traveled to Denbury's Bell Creek field office April 11–15 and electronically scanned all relevant on-site well file information to aid in field evaluation.
 - Electronically scanned possible depositional analogs to the Bell Creek Field from the American Association of Petroleum Geologists Memoir 31 (Sandstone Depositional Environments).

- Continued work on the geologic model, including loading well tops into Techlog for 98 wells with sonic and density curves
- Continued discussion of operational issues and pricing for well logging activities.
- Fort Nelson test site activities included the following:
 - Held the monthly project management conference call on April 20 between the Energy & Environmental Research Center (EERC) and the Spectra team.
 - Continued the geochemical analyses of the target injection formation and key sealing formations, including the following:
 - ◆ Analyzed cuttings using x-ray diffraction (XRD).
 - ◆ Continued the data interpretation analysis of cuttings.
 - ◆ Continued development of reports on the results of additional analytical work on the core.
 - ◆ Continued geomechanical analytical activities on the core collected from the exploratory well.
 - ◆ Completed six thin sections of cap rock samples and initiated preparation of an additional six thin sections.
 - ◆ Initiated work on XRD, QEMScan, and thick-section mounts for the scanning electron microscope.
 - Adjusted the Fort Nelson June 2010 model to run several “worst-case” scenarios for Spectra Energy’s 2010 risk assessment.
 - Selected several alternative well locations both around Well No. C-61-E and the proposed C-47-E wells.
 - Scheduled the next quarterly meeting in Calgary on July 19–20.
 - Participated in weekly conference calls with Spectra Energy to discuss various issues related to the project.

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

Highlights

- Effective April 1, John Hamling assumed responsibility for Task 5.
- Submitted comments regarding the U.S. Department of Energy’s (DOE’s) draft “Best Practices for Drilling, Well Installation, Permitting, Operations, Mitigation, and Closure in Deep Geologic Formations.”
- Completed a proposed monitoring well characterization, budget, and tool deployment plan to address the site-owner’s needs.
- Created a well prognosis containing all currently available relevant information pertaining to operational and well design issues for two proposed monitoring well locations.
- Continued working on the monitoring, verification, and accounting (MVA) work plan, and an associated memorandum, for the surface, near-surface, existing wellbores, and deep monitoring wells. The MVA plan will also include:
 - Detailed maps with sample Phase I field locations
 - Landowner maps (inputting the plats into GIS [geographic information system])
 - Cost estimates
 - Health and safety plan
 - Detailed existing deep well map

- Met with Denbury Bell Creek field office personnel and performed reconnaissance of two proposed monitoring well sites in order to determine accessibility issues.
- Began drafting landowner access agreements for the surface baseline sampling program.
- Investigated potential technologies for use in coring the monitoring well.
- Continued planning for a May project meeting to be held in Grand Forks to discuss the monitoring well drilling and completion design.
- Continued exploring options for a portable gas chromatograph to analyze soil gas samples in the field.
- Continued work on the groundwater sampling plan.
- Obtained high-resolution areal imagery of the field from Denbury to use in monitoring site evaluations.

Task 6 – Infrastructure Development (Melanie D. Jensen)

Highlights

- Work continued on adapting the capture technologies table (included as an appendix in the value-added capture technologies overview report submitted in March 2011) for the DSS.

Task 7 – CO₂ Procurement (John A. Harju)

Highlights

- Participated in ongoing project discussions with Denbury, including potential cash-equivalent contributions to achieve the PCOR Partnership's scope of work.
- Plans are under way for a project status meeting to be held in Grand Forks in May.

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

Highlights

- Continued reading about surface facilities design at an enhanced oil recovery (EOR) injection site in *Nontechnical Guide to Petroleum Geology, Exploration, Drilling, and Production* (2nd edition) by Norman J. Hyne, Ph.D.

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

Highlights

- Continued Bell Creek site activities, including the following:
 - Continued preparation of the report entitled "Site Characterization, Modeling, and Monitoring Plan" (D50).
 - Prepared a poster for presentation at the 10th Annual Conference on CCS in Pittsburgh.
 - Continued work on the Bell Creek Phase 1 model, including the following:
 - ♦ Initiated data analysis, transformations, and variograms.
 - ♦ Created Gaussian realizations.
 - ♦ Created a pressure grid based on initial pressures received from site owner.
 - Utilized Strater[®] software to update the stratigraphic column including depths.
 - Created a well section view to help convey the purpose of oil-based mud for proper core recovery and logging applications.

- Continued discussion of operational issues and pricing for seismic activities.
- Continued Fort Nelson site activities, including the following:
 - Prepared a PowerPoint presentation to be given at the 10th Annual Conference on CCS in Pittsburgh.
 - Continued work on history matching, i.e., component, temperature, pressure, and anisotropic permeability.
 - Presented on Fort Nelson risk assessment activities at the IEA Greenhouse Gas R&D Programme (IEAGHG) Joint Modelling and Wellbore Network Meeting in Perth, Australia.
 - Continued risk assessment activities, including the following:
 - ◆ Continued preparation of the 2010 risk assessment update.
 - ◆ Participated in weekly calls with Spectra Energy personnel, as well as the April 20 monthly conference call.
 - ◆ Received Simeio-ERM software training from Oxand Risk & Project Management Solutions.
 - ◆ Worked on the cases for risk sensitivity analysis.
 - ◆ Provided input regarding frequency and severity with respect to each of the identified Features, Events and Processes to the latest version of the risk register.

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)

- 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.

Task 13 – Project Management (Charles D. Gorecki)

Highlights

- On April 29, DOE issued an award amendment (Modification No. 20) which, among other items, authorized a change in the principal investigator from Ed Steadman to Charles Gorecki.
- Continued planning for the upcoming PCOR Partnership Annual Meeting and an associated geology workshop (September 12–14, 2011) to be held in Denver, Colorado.
- Submitted the programmatic risk management plan (D88).
- Prepared two presentations to be given at the 10th Annual Conference on CCS in Pittsburgh, namely:

- “The PCOR Partnership: Collaborative U.S.–Canada Carbon Capture and Storage Demonstration Activities.”
- “The PCOR Partnership: A Regional Carbon Sequestration Partnership Conducting Large-Scale Field Tests.”
- Deliverables and milestones completed in April included the following:
 - March monthly update
 - Task 13: D58/D59 – Quarterly Progress Report/Milestone Quarterly Report
 - Task 13: D88 – Programmatic Risk Management Plan
 - Task 14: M23 – Monthly Water Working Group (WWG) Conference Call Held
- Deliverables and milestones due in May include the following:
 - April monthly update
 - Task 4: D34 – Baseline Hydrogeological Experimental Design Package
 - Task 14: M23 – Monthly WWG Conference Call Held

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

Highlights

- Effective April 1, Ryan Klapperich assumed responsibility for Task 14.
- Continued work on the “Nexus of Water and CCS – Technology Gaps” document. It is expected the document will be returned to the group for additional review.
- Continued planning the WWG annual meeting, including selection of date and location, as well as preparation of an agenda. The annual meeting will be held on May 5, 2011, 1:00 – 5:00 p.m., in conjunction with the 10th Annual Conference on CCS in Pittsburgh.
- The monthly conference call was held on April 21.
- Presented the WWG “canned” presentation at the American Water Resources Association conference in April.

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

Highlights

- Effective April 19, James Sorensen assumed responsibility for Task 15.
- Participated in conference call with Apache Canada Ltd. to discuss EERC support on regulatory issues associated with the Zama Field.

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

Highlights

- Effective April 1, Wes Peck assumed responsibility for Task 16.
- Continued planning the next meeting of the technical and steering committees at the National Energy Technology Laboratory headquarters in Pittsburgh on May 25.
- Worked on organizing wellheads/welltops for data across the Montana and North and South Dakota portions of the project area.
- Selected the first batch of 30 LAS files for acquisition.

Travel/Meetings

- March 28 – April 3, 2011: Presented at the 2nd France–Canada Workshop on Carbon Capture and Storage in Paris, France.
- April 4–7, 2011: Participated in the 5th North American Carbon Atlas Partnership Workshop in Morgantown, West Virginia.
- April 11–17, 2011: Traveled to Denbury’s Bell Creek field office to review well files and scout monitoring well sites near Broadus, Montana.
- April 22–30, 2011: Presented at the IEAGHG Joint Modelling and Wellbore Network Meeting in Perth, Australia.
- April 30 – May 3, 2011: Traveled to the 19th Williston Basin Petroleum Conference in Regina, Saskatchewan.

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