EERC
Energy & Environmental Research Center

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July 31, 2012

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
State Capitol, 14th Floor
Bismarck, ND 58505-0840

Dear Ms. Fine:

Subject: Plains CO_2 Reduction Partnership (PCOR) Phase III Quarterly Technical Progress Report for the Period April 1 – June 30, 2012
Contract Nos. FY08-LXIII-162 and G-015-030; EERC Funds 16196 and 15631

Enclosed is a hard copy of the Energy & Environmental Research Center (EERC) Quarterly Technical Progress Report for the PCOR Partnership Program for Phase III. Also enclosed is a CD-ROM containing the Quarterly Technical Progress Report. A PDF version will also be sent via e-mail.

If you have any questions, please contact me by phone at (701) 777-5355 or by e-mail at cgorecki@undeerc.org.

Sincerely,

Charles D. Gorecki
Senior Research Manager

CDG/sah

Enclosures

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Lynn Helms, NDIC Department of Mineral Resources, Oil and Gas Division
Joe Murphy, North Dakota Department of Commerce

c: Corey Irion, EERC

PLAINS CO_2 REDUCTION PARTNERSHIP PHASE III

Quarterly Technical Progress Report

(for the period April 1 – June 30, 2012)

Prepared for:

Karlene Fine

North Dakota Industrial Commission
600 East Boulevard Avenue
State Capitol, 14th Floor
Bismarck, ND 58505-0840

Contract Nos. FY08-LXIII-162 and G-015-030
EERC Funds 16196 and 15631

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July 2012

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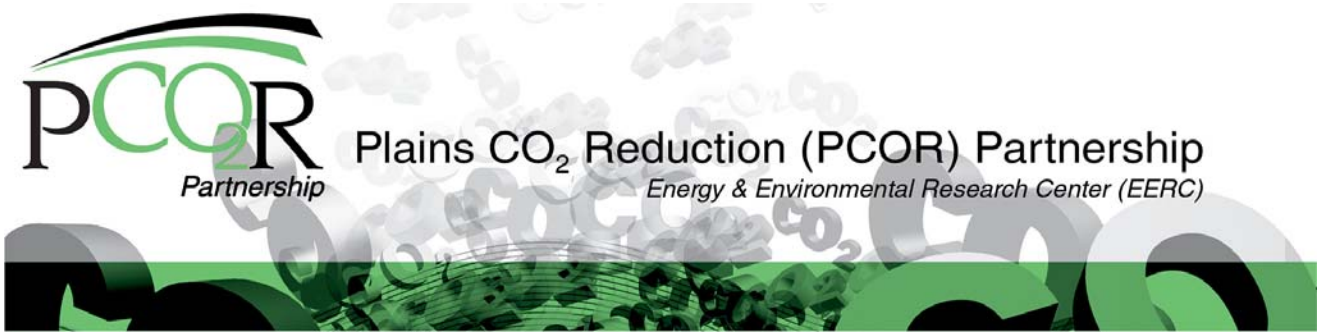


PLAINS CO_2 REDUCTION PARTNERSHIP PHASE III
Quarterly Technical Progress Report
April 1 – June 30, 2012

EXECUTIVE SUMMARY

The Plains CO_2 Reduction (PCOR) Partnership is one of seven Regional Carbon Sequestration Partnerships (RCSPs) competitively awarded by the U.S. Department of Energy (DOE) National Energy Technology Laboratory in 2003 as part of a national plan to mitigate greenhouse gas emissions. The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota and continues to include stakeholders from the public and private sector in Phase III. The PCOR Partnership region includes all or part of nine U.S. states and four Canadian provinces.

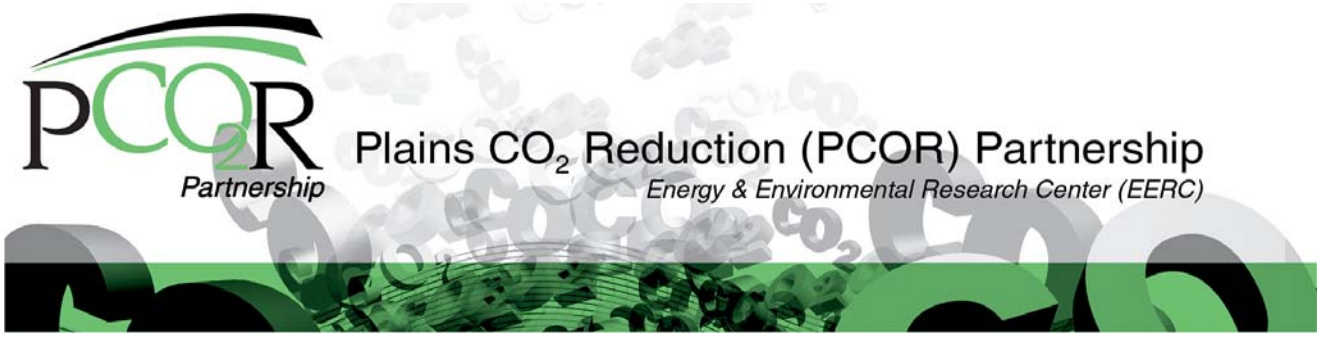
Phase III, the development phase, a 10-year effort (2007–2017), is an extension of the characterization (Phase I) and validation (Phase II) phases. The Phase III efforts of the PCOR Partnership include two large-volume demonstration tests—one in Canada and one in the United States—that focus on injecting carbon dioxide (CO_2) into deep geologic formations for CO_2 storage. Budget Period 4 (Years 3–8 of Phase III) began October 1, 2009.

This progress report presents an update of Phase III PCOR Partnership activities from April 1, 2012, through June 30, 2012.

DOE issued Modifications 22 and 23 to the PCOR Partnership Cooperative Agreement on April 30 and June 18, 2012, respectively. These modifications added incremental funding for the program, revised National Environmental Policy Act requirements, approved a cost increase for the Bell Creek monitoring well, recognized an increased cost-share requirement, and approved several changes to the program's statement of project objectives, including authorizing activities for the Interstate Oil and Gas Compact Commission's carbon storage task force and collaboration with the Petroleum Technology Research Centre's Aquistore Project.

Several meetings were held regarding the Fort Nelson and Bell Creek projects with Spectra Energy Transmission and Denbury Onshore LLC, respectively. In addition, the permanent downhole monitoring system was installed on the 0506OW monitoring well and two rounds of baseline soil gas and water sampling were completed, all in the Bell Creek Field.

Planning efforts continued for the 10th Annual Meeting and Core Basics Analysis Workshop scheduled for September 11–13, 2012, in Milwaukee, Wisconsin. Over 200 teachers received PCOR Partnership outreach materials during this reporting period, and the 4th Annual Meeting of the RCSP Water Working Group was held May 3, 2012, in Pittsburgh, Pennsylvania. Nine abstracts were accepted by the 11th International Conference on Greenhouse Gas Technologies, and a poster presentation at the 2012 American Association of Petroleum Geologists Annual Meeting received a "Top 10" Award of Excellence.



PLAINS CO_2 REDUCTION PARTNERSHIP PHASE III
Quarterly Technical Progress Report
April 1 – June 30, 2012

INTRODUCTION

The Plains CO_2 Reduction (PCOR) Partnership is one of seven regional partnerships operating under the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) Regional Carbon Sequestration Partnership (RCSP) Program. The PCOR Partnership is led by the Energy & Environmental Research Center (EERC) at the University of North Dakota (UND) in Grand Forks, North Dakota, and includes stakeholders from the public and private sector. The membership as of June 30, 2012, is listed in Table 1. The PCOR Partnership region includes all or part of nine states (Iowa, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming) and four Canadian provinces (Alberta, British Columbia, Manitoba, and Saskatchewan).

The RCSP Program is part of NETL's Carbon Sequestration Program and is a government–industry effort tasked with determining the most suitable technologies, regulations, and infrastructure needs for carbon capture and storage (CCS) on the North American continent.

The RCSP Program initiative is being implemented in three phases:

- Phase I – Characterization Phase (2003–2005): characterized opportunities for carbon sequestration
- Phase II – Validation Phase (2005–2009): conducted small-scale field validation tests
- Phase III – Development Phase (2007–2017): involves large-volume carbon storage demonstration tests (Figure 1)

Phase III is divided into three budget periods (BPs), running from October 1, 2007, to September 30, 2017:

BP3: October 1, 2007 – September 30, 2009
BP4: October 1, 2009 – September 30, 2015
BP5: October 1, 2015 – September 30, 2017
Note: BP1 and BP2 were effective in Phase II.

Table 1. PCOR Partnership Membership Phase III (October 1, 2007 – present, inclusive)

DOE NETL	Great Northern Project Development, LP	North Dakota Industrial Commission Oil and Gas Research Council
UND EERC	Great River Energy	North Dakota Natural Resources Trust
Abengoa Bioenergy New Technologies	Halliburton	North Dakota Petroleum Council
Air Products and Chemicals	Hess Corporation	North Dakota Pipeline Authority
Alberta Department of Energy	Huntsman Corporation	Otter Tail Power Company
Alberta Department of Environment	Husky Energy Inc.	Oxand Risk & Project Management Solutions
Alberta Innovates – Technology Futures	Interstate Oil and Gas Compact Commission	Petroleum Technology Research Centre
ALLETE	Indian Land Tenure Foundation	Petroleum Technology Transfer Council
Ameren Corporation	Iowa Department of Natural Resources	Pinnacle, a Halliburton Service
American Coalition for Clean Coal Electricity	Lignite Energy Council	Prairie Public Broadcasting
American Lignite Energy	Manitoba Geological Survey	Pratt & Whitney Rocketdyne, Inc.
Apache Canada Ltd.	Marathon Oil Company	Praxair, Inc.
Aquistore	MEG Energy Corporation	Ramgen Power Systems, Inc.
Baker Hughes Incorporated	Melzer Consulting	RPS Energy Canada Ltd.
Basin Electric Power Cooperative	Minnesota Power	Saskatchewan Ministry of Industry and Resources
BillyJack Consulting Inc.	Minnkota Power Cooperative, Inc.	SaskPower
Biorecro AB	Missouri Department of Natural Resources	Schlumberger
Blue Source, LLC	Missouri River Energy Services	Shell Canada Energy
BNI Coal, Ltd.	Montana–Dakota Utilities Co.	Spectra Energy
British Columbia Ministry of Energy, Mines, and Petroleum Resources	Montana Department of Environmental Quality	Suncor Energy Inc.
British Columbia Oil and Gas Commission	National Commission on Energy Policy	TAQA North, Ltd.
C12 Energy, Inc.	Natural Resources Canada	TGS Geological Products and Services
Computer Modelling Group, Inc.	Nebraska Public Power District	University of Alberta
Dakota Gasification Company	North American Coal Corporation	University of Regina
Denbury Onshore LLC	North Dakota Department of Commerce Division of Community Services	Weatherford Advanced Geotechnology
Eagle Operating, Inc.	North Dakota Department of Health	Western Governors' Association
Eastern Iowa Community College District	North Dakota Geological Survey	Westmoreland Coal Company
Enbridge Inc.	North Dakota Industrial Commission Department of Mineral Resources, Oil and Gas Division	WBI Energy, Inc.
Encore Acquisition Company	North Dakota Industrial Commission Lignite Research, Development and Marketing Program	Wisconsin Department of Agriculture, Trade and Consumer Protection
Energy Resources Conservation Board/ Alberta Geological Survey		Wyoming Office of State Lands and Investments
Environment Canada		Xcel Energy
Excelsior Energy Inc.		

The overall mission of the Phase III program is to 1) gather characterization data to verify the ability of the target formations to store carbon dioxide (CO_2), 2) facilitate the development of the infrastructure required to transport CO_2 from sources to the injection sites, 3) facilitate development of the rapidly evolving North American regulatory and permitting framework, 4) develop opportunities for PCOR Partnership partners to capture and store CO_2, 5) establish a technical framework by which carbon credits can be monetized for CO_2 stored in geologic formations, 6) continue collaboration with other RCSPs, and 7) provide outreach and education for CO_2 capture and storage stakeholders and the general public.

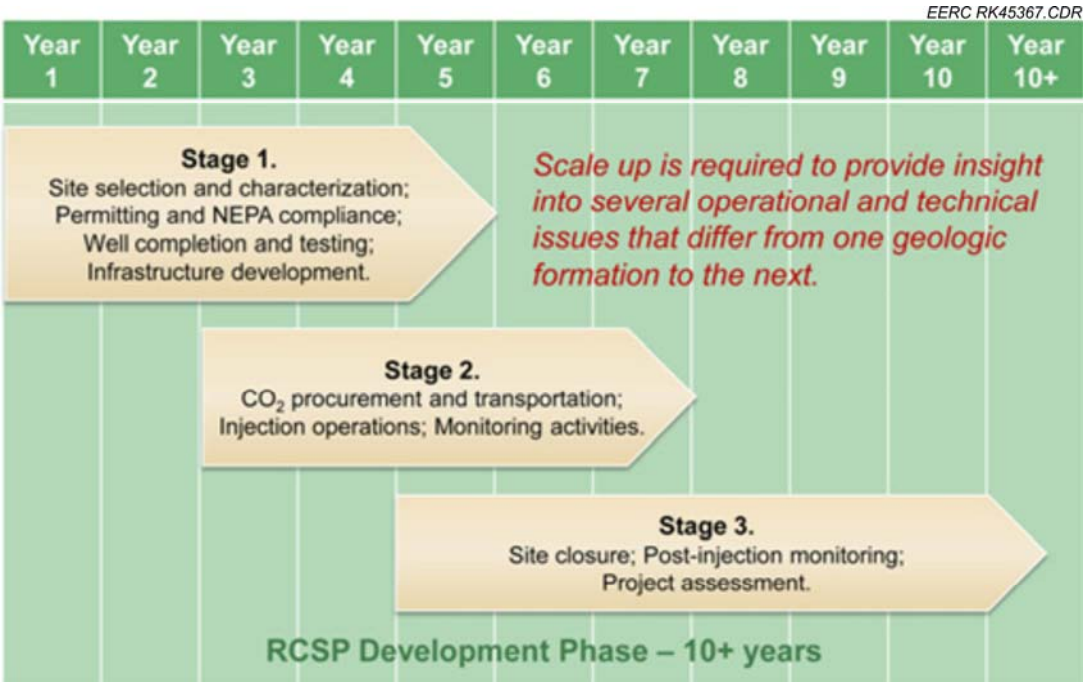


Figure 1. RCSP development phase: scaling up toward commercialization (Source: www.netl.doe.gov/technologies/carbon_seq/infrastructure/rcspiii.html [accessed July 2012]).

In Phase III, the PCOR Partnership is building on the information generated in its characterization (Phase I) and validation (Phase II) phases. The PCOR Partnership plans to fully utilize the infrastructure of its region to maximize CO_2 injection volumes. A programmatic RCSP Phase III goal is the injection of approximately 1 million tons of CO_2 a year into at least one regionally significant geologic formation. Each of the RCSP's large-volume injection tests is designed to demonstrate that CO_2 storage sites have the potential to store regional CO_2 emissions safely, permanently, and economically for hundreds of years.

The PCOR Partnership is working toward the establishment of two demonstration sites. The sites are located 1) in the Bell Creek oil field in Powder River County in southeastern Montana and 2) near Spectra Energy Transmission's (SET's) Fort Nelson gas-processing facility, situated near Fort Nelson, British Columbia, Canada (Figure 2).

The PCOR Partnership's objectives for the demonstration projects are as follows: 1) conduct a successful field demonstration to verify that the region's large number of oil fields have the potential to store significant quantities of CO_2 in a safe, economical, and environmentally responsible manner and 2) conduct a successful demonstration to verify the economic feasibility of using the region's carbonate saline formations for safe, long-term CO_2 storage. During Phase III, the PCOR Partnership will continue to refine storage resource estimates and evaluate other factors relevant to regional storage goals.

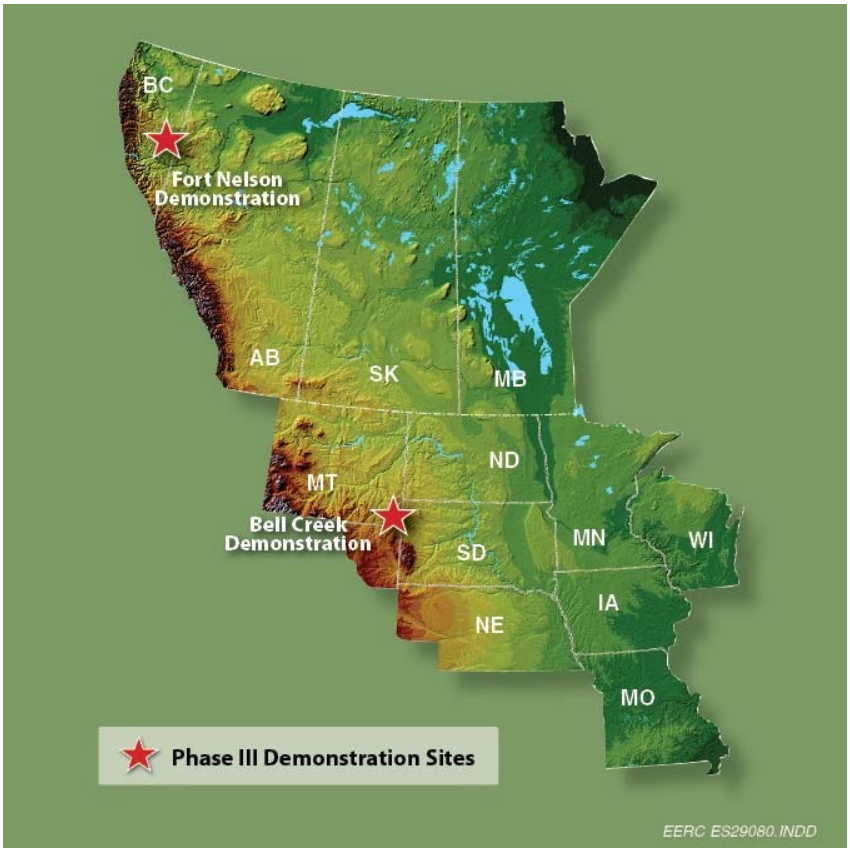


Figure 2. PCOR Partnership Phase III demonstration sites.

The PCOR Partnership plans to achieve its Phase III mission through a series of 16 tasks: 1) Regional Characterization; 2) Public Outreach and Education; 3) Permitting and National Environmental Policy Act (NEPA) Compliance; 4) Site Characterization and Modeling; 5) Well Drilling and Completion; 6) Infrastructure Development; 7) CO_2 Procurement; 8) Transportation and Injection Operations; 9) Operational Monitoring and Modeling; 10) Site Closure; 11) Postinjection Monitoring and Modeling; 12) Project Assessment; 13) Project Management; 14) RCSP Water Working Group (WWG) Coordination; 15) Further Characterization of the Zama Acid Gas Enhanced Oil Recovery (EOR), CO_2 Storage, and Monitoring Project; and 16) Characterization of the Basal Cambrian System. Table 2 lists the responsibility matrix for these 16 tasks.

It should be noted that Tasks 10 and 11 will not be initiated until BP5.

Table 2. Phase III Responsibility Matrix

Phase III Task Description	Task Leader
Task 1 – Regional Characterization	Wesley D. Peck
Task 2 – Public Outreach and Education	Daniel J. Daly
Task 3 – Permitting and NEPA Compliance	Lisa S. Botnen
Task 4 – Site Characterization and Modeling	James A. Sorensen
Task 5 – Well Drilling and Completion	John A. Hamling
Task 6 – Infrastructure Development	Melanie D. Jensen
Task 7 – CO_2 Procurement	John A. Harju
Task 8 – Transportation and Injection Operations	Melanie D. Jensen
Task 9 – Operational Monitoring and Modeling	Charles D. Gorecki
Task 10 – Site Closure	TBA[1]
Task 11 – Postinjection Monitoring and Modeling	TBA
Task 12 – Project Assessment	Katherine K. Anagnost
Task 13 – Project Management	Charles D. Gorecki
Task 14 – RCSP WWG Coordination	Ryan J. Klapperich
Task 15 – Further Characterization of the Zama Acid Gas EOR, CO_2 Storage, and Monitoring Project	James A. Sorensen
Task 16 – Characterization of the Basal Cambrian System	Wesley D. Peck

[1] To be announced.

PROGRESS OF WORK

Task 1 – Regional Characterization

Significant accomplishments for Task 1 for the reporting period included the following:

- Continued planning for an update to the oil and gas field storage values for the PCOR Partnership region.
- Began acquisition of oil field boundaries in GIS (geographic information system) format as part of the effort to reevaluate the CO_2 storage and EOR potential of the oil fields in the PCOR Partnership region.
- Continued modifying the GIS portion of the Partners-Only Web site to add functionality for information on oil fields in the region.
- Ordered updated oil field boundaries for Wyoming from the Wyoming Geological Survey.
- Continued to acquire updated cumulative oil production numbers for the fields and pools in the U.S. portion of the PCOR Partnership region. This effort includes gathering reservoir values in Montana, Nebraska, and Wyoming, such as original oil in place, porosity, permeability, and production acres, that will be used to update CO_2 EOR estimates for many fields.
- Continued to format characterization data that will be used to populate the NATCARB (National Carbon Sequestration Database and Geographic Information System) geodatabase.

- Finished compiling GIS data for transmittal to NATCARB's geodatabase of RCSP data.
- Continued reviewing the U.S. Environmental Protection Agency's (EPA's) CO_2 source data provided by NATCARB.
- Provided comments to DOE on the latest version of the North America Carbon Storage Atlas on April 13.
- Shipped approximately 250 copies of the PCOR Partnership Atlas, 4th Edition, to partner contacts.
- Continued discussing options for the characterization of a third target area (Deliverable [D] 7, due September 2014).
- Discussed CO_2 storage opportunities with a partner in Nebraska.
- Added a PDF version of of the PCOR Partnership Atlas, 4th Edition, to the Decision Support System (DSS, © 2007–2012 EERC Foundation®).
- Added 20 new items to the products database on the DSS.
- Created new draft pages describing recent site operation activities for the Bell Creek Project for the demonstration project reporting system (DPRS) portion of the DSS.
- Continued efforts on the Rival Field characterization, including the following:
  - Completed three posters for the American Association of Petroleum Geologists (AAPG) 2012 Annual Convention and Exhibition held April 22–25 in Long Beach, California.
  - Continued work on the drillstem test review.
  - Continued performing uncertainty and sensitivity analysis on the updated geologic model.
  - Began planning for a July 2012 meeting with TAQA North, Ltd., at the EERC.

Actual or anticipated problems or delays during the reporting period included the following:

- Activity on Collaboration with PTRC's Aquistore Project is anticipated to begin on July 1, 2012.

Task 2 – Public Outreach and Education

Significant accomplishments for Task 2 for the reporting period included the following:

- EERC employees attended 16 conferences/meetings, exposing external participants to the PCOR Partnership name, messaging, and informational materials. Specifically, the PCOR Partnership outreach activities included 11 oral presentations and three poster presentations. The following quantities of outreach materials were distributed:
  - PCOR Partnership documentary entitled "Nature in the Balance: CO_2 Sequestration" – 1
  - PCOR Partnership documentary entitled "Out of the Air – Into the Soil" – 31
  - PCOR Partnership documentary entitled "Managing Carbon Dioxide: The Geologic Solution" – 287

  - PCOR Partnership documentary entitled “Global Energy and Carbon: Tracking Our Footprint” – 233
  - PCOR Partnership Atlas 3rd Edition, Revised – 210
  - PCOR Partnership Atlas 4th Edition – 474
- Completed review of time code for more than 5 hours of raw footage shot by Prairie Public Broadcasting (PPB) in February 2012 at Fort Nelson and produced a 2-minute scene sampler for the Fort Nelson project review meeting held on June 6 and 7, 2012, in Grand Forks.
- Continued to review film footage taken at the Bell Creek 0506OW monitoring well.
- Held an in-house meeting to begin planning for a value-added video short focused on smart casing installation for CCS reservoir monitoring.
- Began planning for a PPB filming trip to the Bell Creek site in August 2012 to capture the 3-D seismic survey and baseline surface sampling activities.
- Continued efforts to compile a “fact book” for the Bell Creek region for local Bell Creek project outreach.
- Continued discussions regarding support activities in association with SET’s upcoming community open house (originally scheduled for May 10), and shipped 50 atlases to the outreach lead in Calgary, Alberta, Canada.
- Finalized the Fort Nelson poster (D26), and sent to SET for final approval on April 4. Received SET’s approval on April 20.
- Reviewed and commented on induced seismicity talking points, and provided a copy to the PTRC for the Aquistore open house held on April 11, and also to SET.
- Presented a poster entitled “Using Message Mapping to Enhance CCS Communication” on May 1, 2012, on behalf of the RCSP Outreach Working Group (OWG) at the 11th Annual Carbon Capture, Utilization & Sequestration (CCUS) Conference in Pittsburgh, Pennsylvania.
- Served as moderator of the panel entitled “Best Practices in Public Outreach – What Have We Learned?” on May 1, 2012, during the CCS Public Outreach/Education technical session at the 11th Annual CCUS Conference.
- Gave presentations entitled “Foundations of CO_2 and Energy I” and “Foundations of CO_2 and Energy II” to the 25 attendees at the Teacher Training Institute entitled “The Changing Face of North Dakota” cosponsored by the North Dakota Geographic Alliance and PPB on June 4, 2012, in Dickinson, North Dakota.
- Gave a presentation entitled “Energy and CO_2 Management: Carbon Capture and Storage” on June 19, 2012, for the 127 attendees at the Lignite Energy Council’s teacher seminar entitled “2012 Lignite Education Seminar: Energy, Economics & Environment” in Bismarck, North Dakota.
- Distributed approximately 210 teacher tote bags, including an atlas, fact sheets, and at least two documentaries, at three separate North Dakota teacher seminars sponsored by the Lignite Energy Council, North Dakota Petroleum Council, and North Dakota Geographic Alliance, respectively.
- Began planning for a presentation (and distribution of PCOR Partnership outreach materials) at the Missouri Minerals Education Foundation 13th Annual “Missouri is a State of Mines – Rocks, Minerals, and Our Environment” workshop scheduled for July 15–20, 2012, in Park Hills, Missouri (www.mmef.org/workshops.htm).

- Submitted an update to the general public outreach PowerPoint presentation (D17) on May 31, 2012.
- Submitted an update to the Fort Nelson PowerPoint presentation (D19) on June 29, 2012.
- Continued efforts to update the public Web site (D13) due July 31, 2012.
- Posted the latest version of the atlas on the public Web site (http://undeerc.org/pcor/newsandpubs/atlas).
- Continued review of a "test-phase" outreach materials tracking database.
- Participated in semimonthly conference calls for the Aquistore Project, led by PTRC.
- Continued to participate in monthly conference calls for the OWG, including the June call featuring a presentation by the ENGO Network on CCS (Environmental NGO Network on Carbon Capture and Storage) (www.engonetwork.org).
- Presented a review of Fort Nelson-related outreach activities at the project review meeting held June 6 at the EERC.
- Presented an overview of Bell Creek-related outreach activities at the Denbury Onshore LLC (Denbury) meeting held June 25 and 26, 2012, at the EERC.
- Ordered 1000 "Global Energy and Carbon" DVDs to replenish stock; over 1000 copies of this DVD have been distributed since its initial release in October 2010.

Actual or anticipated problems or delays during the reporting period included the following:

- All activities are on schedule, and there were no problems or delays during the reporting period.

Task 3 – Permitting and NEPA Compliance

Significant accomplishments for Task 3 for the reporting period included the following:

- Continued in-depth analysis of EPA's Mandatory Greenhouse Gas Reporting Rule Subpart RR.
- Continued review of EPA's draft guidance document for testing and monitoring Class VI wells.
- In response to a request received from DOE NETL, submitted on May 1, 2012, updated information for inclusion in a best practices manual on monitoring, verification, and accounting (MVA) on the monitoring requirements for both the Bell Creek and Zama projects under EPA's Class VI and Greenhouse Gas Reporting Rule Subparts RR and UU.
- Continued planning for the 4th Annual Regulatory Roundup meeting to be held July 31 – August 1, 2012, in Deadwood, South Dakota.
- Sent out an e-mail blast to Regulatory Roundup invitees on June 27, 2012.
- Provided information on pore space ownership/acquisition to Bob Kane on April 18.
- Held several discussions with a representative of the North Dakota Industrial Commission (NDIC) regarding the state of North Dakota's primacy application for Class VI wells.

- Attended the Interstate Oil and Gas Compact Commission (IOGCC) Midyear Meeting held June 3–5 in Vancouver, British Columbia, Canada.
- Received approval in June 2012 from DOE NETL to proceed with research conducted with IOGCC on operational and postoperational liability issues.
- With regard to the Lignite Site (Phase II) closure, visited the site to monitor the reclamation process with the following results:
  - Canadian thistle is present, triggering the need for weed spraying.
  - The solar panel for the electric fence is gone. For now, it is assumed stolen. It will need to be replaced, and a cost estimate is under way.
  - Continued in-house review of the Phase II Lignite site closure report.

Actual or anticipated problems or delays during the reporting period included the following:

- Activities on IOGCC Carbon Geologic Storage (CGS) Task Force Activities are anticipated to begin on July 1, 2012.

Task 4 – Site Characterization and Modeling

Significant accomplishments for Task 4 for the reporting period included the following:

- Prepared a technology assessment on the geomechanical modeling options available.
- **Bell Creek** test site activities included the following:
  - Submitted an abstract entitled "Subsurface Core and Analogous Outcrop Characterization of the Muddy/Newcastle Formation for the Bell Creek Oil Field, Powder River County, Montana" for the 2012 AAPG Rocky Mountain Section Meeting scheduled for September 9–12 in Grand Junction, Colorado.
  - Submitted an abstract entitled "Mechanism of Subnormal Pressure Generation in the Bell Creek Oil Field and the Implications to CO_2 Storage" for the International Petroleum Technology Conference (IPTC) scheduled for March 2013 in Beijing, China (www.iptcnet.org/2013).
  - Presented on May 1, 2012, a poster entitled "Overview of the Bell Creek Combined CO_2 Storage and CO_2 EOR Project" at the 11th Annual CCUS Conference.
  - Continued work on the 1-D Mechanical Earth Model (MEM).
  - Continued review of seismic data.
  - Continued building the updated geologic model.
  - Worked on preliminary petrophysics in Techlog software.
  - Began preparations for building a lithofacies model based on the core reviewed.
  - Continued work on geomechanical modeling.
  - Continued work on stochastic surface modeling of Bell Creek sand.
  - Continued EERC Applied Geology Laboratory (AGL) testing on nine priority sidewall core samples from the 0506OW monitoring well, including the following activities:
    - Completed all thin sections and continued analysis.
    - Completed Dean–Stark extraction for all viable samples (33 of 47 intervals).
    - Completed x-ray diffraction (XRD) for all nine prioritized samples and analysis.

        - Completed porosity and bulk volume tests for all 47 intervals.
        - Completed all permeability-to-water calculations.
        - Prepared data sheets and distributed them to Denbury during its visit to the EERC on June 25 and 26, 2012.
    - Prepared a scope of work for additional samples collected from the U.S. Geological Survey (USGS) Core Research Center in Denver, Colorado.
    - Performed AGL analyses on the additional (81 intervals) USGS samples, including the following activities:
        - Prepared 135 of 243 thin sections.
        - Submitted 20 of 20 samples for point count scanning electron microscopy (SEM) analysis; 20 of 20 scans completed.
        - Submitted 22 samples for XRD analysis.
        - Completed Dean–Stark extraction on core plugs.
        - Measured porosity, bulk volume, and skeletal density on all samples.
        - Completed permeability-to-water measurements.
        - Prepared data sheets and distributed them to Denbury during its visit to the EERC on June 25 and 26, 2012.
    - Began preparations for building a lithofacies model based on the core reviewed.
    - Continued planning for AGL petrographic analysis on the full-diameter (slabbed) core.
    - Began sample selection for a CO_2 exposure study of six drill cutting samples from the groundwater zone (Hell Creek Formation) overlying the Bell Creek Reservoir.
    - Began working on a Bell Creek leakage mitigation plan.
- **Fort Nelson** test site activities included the following:
    - Held an in-house project update meeting on April 4. Topics discussed included the following:
        - Summary of the Pittsburgh meeting with DOE and SET.
        - Status of the modeling activities.
        - Status of the geochemical report.
        - Potential future technical meetings in Grand Forks with SET.
    - Presented on May 2, 2012, an "Overview, Status, and Future of the Fort Nelson CCS Project" at the 11th Annual CCUS Conference.
    - Continued building a 1-D MEM.
    - Continued work on geomechanical modeling.
    - Continued the multimineral analysis of well logs for the updated static geologic model.
    - Continued work on improving the latest iteration of the static geologic model, particularly with respect to well log analysis and lithofacies distribution.
    - Hosted the monthly management conference call with SET on April 27. Topics discussed included the following:
        - SET's upcoming community meeting in Fort Nelson.
        - Plans for the quarterly meeting in Grand Forks in June.
        - Pending deliverables.
        - Modeling and MVA plan updates.

  - Held technical and management meetings on June 6 and 7 with SET in Grand Forks. Topics discussed included the following:
    - Geology update
    - Modeling update
    - MVA/Bayesian approach update
    - Status of Canadian government funding and related business-case agreements
    - Public outreach update
    - Overview of British Columbia Oil and Gas Commission meeting and regulatory update
    - Overview of Winter 2012–2013 activities
    - Project master schedule review
  - Submitted the geochemical report (D41/Milestone 32 [M32]) on June 29, 2012.

Actual or anticipated problems or delays during the reporting period included the following:

- D65, Fort Nelson Test Site – Site Characterization Report, was provided to SET in April 2012 for its review and comment. No comments have been received to date.
- An extension request to move the Fort Nelson Test Site – Geochemical Report (D41/M32) from April 30, 2012, to June 30, 2012, was granted by DOE.

Task 5 – Well Drilling and Completion

Significant accomplishments for Task 5 for the reporting period included the following:

- Continued planning for an upcoming well log review meeting with Denbury and Halliburton in Plano, Texas.
- Held an in-house Bell Creek project update meeting on April 16, 2012.
- Continued baseline MVA activities including surface-monitoring events as follows:
  - Field Event 1 (held November 1–9 and November 28 – December 2, 2011); completed analysis and interpretation of first-round soil gas and water samples. EERC and Denbury staff met with Bell Creek landowners to review water analysis results.
  - Field Event 2 (held April 23–29, 2012): data acquisition, analysis, and interpretation are complete; began development of landowner water analyses baseline MVA packages.
  - Field Event 3 (held June 18–23, 2012): completed third round of baseline soil gas and water sampling (Figure 3); began analysis and interpretation of sampling data.
- Continued drafting a value-added preinjection surface water, groundwater, and soil gas baseline MVA sampling and analysis report including results.

Figure 3. Collecting soil gas samples from a production pad in the Bell Creek Field.

- Traveled to the Bell Creek field site for the surface installation of the permanent downhole monitoring (PDM) system on the 0506OW well. The system is fully operational and acquiring data (Figure 4).
- Staff completed 2 hours of training on both the Promore and Qorex systems.
- Met with Schlumberger Carbon Services to discuss potential downhole seismic and pulsed neutron acquisitions for CO_2 monitoring.
- Continued deep surface monitoring activities including an evaluation as to the feasibility of installing two deep groundwater-monitoring wells and planning preinjection baseline logging and seismic acquisitions.
- Attended the 20th Annual Williston Basin Petroleum Conference (WBPC) held May 21–24, 2012, in Bismarck, North Dakota, and spoke with various oil and gas service companies about potential CO_2-monitoring technology applications and deployment logistics.
- Held a joint Denbury–EERC update meeting on June 25 and 26, 2012, in Grand Forks. Topics discussed included core analyses, modeling and simulation, and MVA work plans for the Phase 1 injection area.
- Submitted an abstract entitled “Integrated Monitoring Program for a Combined CO_2 Enhanced Oil Recovery and CO_2 Storage Project in the Bell Creek Oil Field” for IPTC scheduled for March 2013 in Beijing, China (www.iptcnet.org/2013).
- Participated in the IEA Greenhouse Gas R&D Programme (IEAGHG) 2nd Joint Network Meeting held on June 19–21, 2012, in Santa Fe, New Mexico, and hosted by Los Alamos National Laboratory.
- Continued review of MVA work ongoing at other regional CCS projects.

Figure 4. Qorex staff checking the functionality of the fiber optic distributed pressure/temperature data logger (left-most open panel).

Actual or anticipated problems or delays during the reporting period included the following:

- The electrical installation of the PDM system was delayed until April 2012.
- Modification 23 to the cooperative agreement, received in June 2012, authorized additional funding for cost overruns associated with drilling, coring, logging, and completion of the deep monitoring well in the Bell Creek Field.

Task 6 – Infrastructure Development

Significant accomplishments for Task 6 for the reporting period included the following:

- Completed work on D84, a report entitled "A Phased Approach to Building a Pipeline Network for CO_2 Transport During CCUS," and submitted it on June 29, 2012. Activities performed in this reporting period that were incorporated into the report included the following:
  - Completed estimations for CO_2 emissions for clusters of sources as well as the storage capacity of geologic sinks. Forecasts will be made to assist with determining the pipeline route and capacity needs at various points in the future.
  - Performed literature searches on CO_2 pipeline regulatory issues as they apply to network development and cluster and hub pipeline network planning.
  - Completed updating the CO_2 emissions in the PCOR Partnership database to incorporate combustion-related CO_2 emission data recently made available by EPA.

These updated emissions from plant types other than ethanol plants will improve the accuracy of pipeline network planning.

- Prepared an abstract about the phased pipeline network approach discussed in D84 for submission to the American Institute of Chemical Engineers (AIChE) National Meeting to be held in Pittsburgh, Pennsylvania, October 30 – November 2, 2012. The abstract was accepted on June 12, 2012, and can be viewed online at https://aiche.confex.com/aiche/2012/webprogram/Paper273082.html.
- Attended the 11th Annual CCUS Conference.
- Made plans to attend the upcoming NETL CO_2 Capture Technology Meeting scheduled for July 9–13, 2012, in Pittsburgh, Pennsylvania.
- Continued review of the interactive capture technology tree on the partners-only DSS test Web site.
- Answered a partner's questions regarding costs associated with CCUS.
- Answered a partner's questions regarding CO_2 storage capacities in its vicinity.
- The Task 6 graduate student was accepted to the Research Experience in Carbon Sequestration (RECS) Program. The RECS Program is an intensive 10-day program put on by the Southeast Regional Carbon Sequestration Partnership and Southern Company and sponsored by DOE and DOE's Office of Fossil Energy and NETL. The program combines classroom instruction with group exercises, CCS site visits, and hands-on activities including geological storage site characterization, CO_2 monitoring, modeling fluid flow in the subsurface, CCS deployment strategies, and communications training. Thirty students are selected each year to attend the RECS Program, which was held this year in June.

Actual or anticipated problems or delays during the reporting period included the following:

- All activities are currently on schedule, and there were no problems or delays during the reporting period.

Task 7 – CO_2 Procurement

Significant accomplishments for Task 7 for the reporting period included the following:

- Participated in ongoing project discussions with Denbury, including at the following:
  - Meetings at Denbury's headquarters on May 10 and 11, 2012, in Plano, Texas.
  - Meetings at the EERC on June 25 and 26, 2012, in Grand Forks.

Actual or anticipated problems or delays during the reporting period included the following:

- All activities are on schedule, and there were no problems or delays during the reporting period.

Task 8 – Transportation and Injection Operations

Significant accomplishments for Task 8 for the reporting period included the following:

- Continued development of a list of questions for Denbury regarding the Bell Creek infrastructure in order to help streamline the collection of information.
- Participated in project discussions with Denbury during its meeting at the EERC held June 25, and 26, 2012.

Actual or anticipated problems or delays during the reporting period included the following:

- All activities are on schedule, and there were no problems or delays during the reporting period.

Task 9 – Operational Monitoring and Modeling

Significant accomplishments for Task 9 for the reporting period included the following:

- Continued a literature review of software integration for geomechanical modeling and simulation.
- Modeling staff participated in Computer Modelling Group (CMG) simulation training entitled "2-Day History-Matching & Optimization (CMOST)" on June 5 and 6, 2012, in Houston, Texas.
- Gave a presentation entitled "The Use of CMG's GEM and CMOST for Modeling CO_2 Storage and CO_2 EOR for the PCOR Partnership Program" for the CMG Technical Symposium held in Calgary, Alberta, Canada, on June 19–21, 2012.
- Modeling staff attended the ISRM–ARMA (International Society of Rock Mechanics–American Rock Mechanics Association) Workshop on Petroleum Geomechanics Testing and the 46th ARMA Symposium held June 22–26, 2012, in Chicago, Illinois.
- Worked on TOUGH2 and FLAC3D^{TM} simulators for simulation and continued studying the use of these two simulators.
- Continued **Bell Creek** site activities, including the following:
  - Prepared abstracts for the Society of Petroleum Engineers (SPE) Reservoir Simulation Symposium scheduled for February 2013 in The Woodlands, Texas, and the IPTC scheduled for March 2013 in Beijing, China.
  - Participated in an in-house discussion regarding pore volume compressibility tests.
  - Worked on tuning numerical settings for speeding up simulation.
  - Participated in Bell Creek risk assessment activities.
  - Continued work on obtaining waterflood history matching for the Bell Creek CO_2 Prophet model.
  - Continued work tuning numerical settings for speeding up the predictive simulations.
  - Continued work on the small, detailed models around the monitoring well.

  - Continued checking details of the model properties and parameters for history matching.
  - Continued efforts to improve the results of the 1-D simulation of slim-tube experiments.
  - Discussed live oil preparation procedures and other minimum miscibility pressure-related issues with EERC lab staff.
  - Began work on the Bell Creek Test Site – Simulation Report (D66, due August 2012).
- Continued **Fort Nelson** site activities, including the following:
  - Submitted an abstract entitled "An Integrated Optimization for Reservoir Modeling and Simulation: Method and Case Demonstration" for IPTC scheduled for March 2013 in Beijing, China (www.iptcnet.org/2013).
  - Continued development of the two-track deep geologic system MVA plan.
  - Continued revisions to the MVA plan for surface and shallow subsurface based on recent discussions with SET, recent observations of the terrain during a site visit in early March, and lessons learned from Bell Creek soil gas-sampling activities.
  - Participated in a technical meeting with SET on June 6 and 7, 2012, in Grand Forks, North Dakota.
  - Met with SET personnel while in Calgary (June 19–21, 2012).

Actual or anticipated problems or delays during the reporting period included the following:

- D67, Fort Nelson Test Site – Simulation Report, was provided to SET in September 2011 for its review and comment. No comments have been received to date.

Task 10 – Site Closure

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

Task 11 – Postinjection Monitoring and Modeling

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

Task 12 – Project Assessment

Significant accomplishments for Task 13 for the reporting period included the following:

- Submitted D57 "Project Assessment Annual Report" for the period October 1, 2010 – September 30, 2011, on December 30, 2011.

Task 13 – Project Management

Significant accomplishments for Task 13 for the reporting period included the following:

- Welcomed Praxair, Inc., as a new partner in April 2012.

- Hosted C12 Energy, a new partner, at the EERC on April 12, 2012.
- Welcomed and hosted Bill Jackson, BillyJack Consulting, at the EERC on April 2, 2012. Discussions included future work with Apache Canada and the future technical advisory board plans.
- Continued planning for the upcoming PCOR Partnership Annual Meeting and Core Analysis Basics Workshop scheduled for September 11–13, 2012, in Milwaukee, Wisconsin.
  - Traveled to Milwaukee, Wisconsin, in preparation for the annual meeting workshop to visit the reef exposures, collect samples, and meet with a local geologist.
  - Began processing the rock samples collected from the Milwaukee-area quarry in preparation for the Core Analysis Basics Workshop.
  - Began photographing the rock samples and lab equipment in preparation for print materials for the Core Analysis Basics Workshop.
  - Sent a letter to the Milwaukee-area quarry owners to seek access authorization for the field trip.
  - Visited with a speaker from BridgeWorks: The Generations People (www.generations.com) for the annual meeting.
  - The annual meeting Web site went live on May 9, 2012.
  - Sent an e-mail blast to all partners on May 14, 2012, notifying them that registration for the annual meeting and workshop is now open.
  - Mailed a postcard to all partners with information about the annual meeting and workshop.
- Held an in-house group meeting on April 18, 2012.
- Hosted the North Dakota State University Geology Club on the afternoon of April 19, 2012, and presented information on the PCOR Partnership program and associated laboratory activities.
- Presented a poster entitled "Overview of the Bell Creek Combined CO_2 Storage and CO_2 EOR Project" at the 11th Annual CCUS Conference on May 1, 2012, in Pittsburgh, Pennsylvania.
- Submitted a survey on May 17, 2012, regarding the Bell Creek CO_2 Project to Victor Der, on behalf of the Global CCS Institute, for input into its annual CCS status report.
- Reviewed and updated information on the Phase II injections as requested by DOE (sent information on April 13, 2012).
- Provided cost-share valuation information to DOE regarding the Bell Creek project on April 19, 2012.
- Continued work on the updated project management plan.
- Participated in the Bell Creek risk assessment activities.
- Requested and received DOE foreign travel approval to attend the 34th Session of the International Geological Congress (IGC), in Brisbane, Australia, in August 2012.
- Provided PCOR Partnership atlases for Nebraska Public Power District's (NPPD's) public information meetings.
- Presented at the United States–Canada Clean Energy Dialogue 2 Bilateral Meeting on May 15, 2012, and at the MVA/MMV (monitoring, mitigation, and verification) in Large-Scale CO_2 Injection Tests Workshop on May 16–17, 2012, both in Mobile, Alabama.

- Presented before the NDIC Lignite Research Council on May 17, 2012, in Bismarck, North Dakota.
- Attended the WBPC in Bismarck, North Dakota.
- Responded on June 8, 2012, to the DOE Office of Fossil Energy request for information on the maturity level of current research development and demonstration projects within its Clean Coal Research Program, including the Fort Nelson and Bell Creek projects.
- Received DOE Cooperative Agreement Modifications 22 and 23 (dated April 30 and June 18, 2012, respectively). These modifications authorized the following:
  - Incremental funding.
  - Revised statement of project objectives (SOPO).
  - Revised NEPA requirements.
  - New SOPO Subtask 3.5 entitled "IOGCC Carbon Storage Task Force Activities."
  - Cost increase for SOPO Task 5.
  - New SOPO Subtask 1.4 entitled "Collaboration with PTRC's Aquistore Project" and related outreach and education activities at Subtasks 2.4, 2.7, and 2.8.
  - Expanded SOPO Subtask 4.3.2 regarding Bell Creek site baseline geology determination.
  - Expanded SOPO Subtask 16.2 regarding geologic characterization.
  - Recognition of increased cost-share requirement.
- Submitted an abstract entitled "The Plains CO_2 Reduction (PCOR) Partnership: CO_2 Sequestration Demonstration Projects Adding Value to the Oil and Gas Industry" for IPTC scheduled for March 2013 in Beijing, China (www.iptcnet.org/2013).
- Presented at the Comision Federal De Electricidad/Asia–Pacific Economic Cooperation (CFE/APEC) Workshop for Introducing Carbon Capture and Storage in Earth Sciences Undergraduate Programs in Mexico City on June 28, 2012.
- Participated in the Carbon Storage Leadership Forum (CSLF) Meetings of the Technical Group and Technical Workshop held June 11–14, 2012, in Bergen, Norway (www.cslforum.org/meetings/bergen2012/index.html).
- Participated in IEAGHG's 2nd Joint Network Meeting hosted by Los Alamos National Laboratory in Santa Fe, New Mexico, on June 19–21, 2012. Topics discussed included risk assessment, monitoring, modeling, wellbore integrity, environmental impacts of CO_2 storage, and there was a field trip to the Chimayo natural CO_2 release site.
- Held a task leader meeting on June 27, 2012. Topics discussed included Modification 23 to the cooperative agreement; budgets; and upcoming conferences, including the 34th IGC (Australia), the 11th International Conference on Greenhouse Gas Technologies (GHGT-11, Kyoto), and the DOE Carbon Storage R&D Project Review Meeting (Pittsburgh).
- Began preparations for IGC, including two oral presentations (PCOR Partnership and Bell Creek) and one poster (Fort Nelson).
- Received notifications on June 25, 2012, that nine PCOR Partnership-related abstracts were accepted for GHGT-11, including eight posters and one oral presentation. The following are the titles of the abstracts:
  - "Relative Permeability of Supercritical Carbon Dioxide to Water for Rocks of the Basal Cambrian Formation, North Dakota"
  - "Visual Message Mapping for CCS Outreach"

  - "Overview of the Bell Creek Combined CO_2 Storage and CO_2 Enhanced Oil Recovery Project"
  - "A Phased Approach to Building a Pipeline Network for CO_2 Transport During CCS"
  - "CO_2 Storage Resource Potential of the Cambro–Ordovician Saline System in the Western Interior of North America"
  - "A Simulation Study of Simultaneous Acid Gas EOR and CO_2 Storage at Apache Zama Pool"
  - "The Role of Static and Dynamic Modeling in the Fort Nelson CCS Project"
  - "Overview, Status, and Future of the Fort Nelson CCS Project"
  - "Laboratory Evaluation of Wellbore Casing Steel and Cements for the Zama Acid Gas EOR, CO_2 Storage, and Monitoring Project"
- Began preparing five poster abstracts (due by July 6) for the upcoming DOE Carbon Storage R&D Review Meeting.
- Deliverables and milestones completed in April:
  - March monthly update
  - D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report
- Deliverables and milestones completed in May:
  - April monthly update
  - Task 2: D17 – General Phase III Information PowerPoint Presentation (Update)
  - Task 14: M23 – Monthly WWG Conference Call Held
  - Task 14: M24 – WWG Annual Meeting Held
- Deliverables and milestones completed in June:
  - May monthly update
  - Task 2: D19 – Fort Nelson Test Site PowerPoint Presentation (Update)
  - Task 4: D41/M32: Fort Nelson Test Site – Geochemical Report
  - Task 6: D84 – Report – A Phased Approach to Building Pipeline Network for CO_2 Transportation During CCS
  - Task 14: M23 – Monthly WWG Conference Call Held

Actual or anticipated problems or delays during the reporting period included the following:

- All activities are on schedule, and there were no problems or delays during the reporting period.

Task 14 – RCSP WWG Coordination

Significant accomplishments for Task 14 for the reporting period included the following:

- Distributed the March 27 monthly conference call minutes on April 4.
- The requirement for the April monthly conference call was waived because of the close proximity of the annual meeting scheduled May 3, 2012, in Pittsburgh, Pennsylvania.
- Sent an e-mail blast on April 16, 2012, to the WWG members regarding the upcoming annual meeting.
- Continued reviewing WWG interest inventory results.

- Held the 4th annual meeting on May 3, 2012, in conjunction with the 11th Annual CCUS Conference. 14 people participated in the meeting, and the topics discussed included the following:
  - Update on the combined water, energy, and CCS modeling effort.
  - Update on the IEAGHG's project entitled "Investigation of Extracted Water for CCS."
  - Regional water initiatives and their relation to the WWG.
  - Outreach survey results and their relation to future WWG activities.
- On May 22, 2012, distributed post-annual meeting materials to the WWG regarding the Water, Energy and Carbon Sequestration Simulation Model (WECSsim). This model and other efforts like it may be able to help the WWG determine the critical areas of need for CCS and water research.
- Held the monthly conference call on May 31, 2012. Nine people participated in the conference call. Topics discussed included the following:
  - Development of a prioritized research agenda based on the technology gaps report.
  - Development of new fact sheets based on outreach survey results.
  - Potential meeting to be held in conjunction with the DOE "Carbon Storage R&D Project Review Meeting Developing the Technologies and Building the Infrastructure for CCUS" scheduled for August 21–23, 2012.
- Distributed the meeting notes from the 4th annual meeting held on May 3, 2012.
- Distributed the interest inventory results and additional information requested during the May conference call.
- Submitted a "path forward" memo for in-house review.
- Held monthly conference call on June 28, 2012. Ten people participated in the call. Topics discussed included the following:
  - Development of deliverables based on the WWG public outreach survey, including new fact sheets.
  - Discussion of a prioritized research agenda, focusing on topics that are most pressing.
  - Decision to not have a breakout session at the upcoming DOE Carbon Storage R&D Project Review Meeting in August 2012.

Actual or anticipated problems or delays during the reporting period included the following:

- All activities are on schedule, and there were no problems or delays during the reporting period.

Task 15 – Further Characterization of the Zama Acid Gas EOR, CO_2 Storage, and Monitoring Project

Significant accomplishments for Task 15 for the reporting period included the following:

- Presented a poster entitled "Using Multiple-Point Statistics for Conditioning a Zama Pinnacle Reef Facies Model to Production History" at the AAPG Annual Meeting in Long Beach, California, April 22–25, 2012.

- Continued development of a public outreach brochure on the Zama project.
- Worked on the conditional static geologic model construction.
- Discussed static model iteration.
- Continued working on the construction of the dynamic model and running simulations for history match using new conditioned static realizations.
- Continued simulations of injection and production for the F Pool pinnacle to improve original oil in place and storage capacity estimations.
- Continued history-matching activities on the geologic model using CMG's CMOST and GEM software.
- Continued work on setting CMOST-SA simulation for evaluating the effect of relative permeability curve parameters.
- Received updated injection and production data for the F Pool from Apache Canada.
- Prepared to receive from Apache Canada similar injection and projection data for the other pinnacles into which acid gas is injected.
- Initiated the process of modifying the F Pool static geologic model based on a combination of history-matching results and a revised geological interpretation of the pinnacle reef morphology.
- Prepared and imported the updated production and injection data (through May 2012) to the dynamic model.

Actual or anticipated problems or delays during the reporting period included the following:

- Received new information regarding Apache Canada Ltd.'s planned operations for the Zama project. In response to Apache Canada's shutdown of the Zama gas plant and stay on any future EOR operations, the EERC will not be able to complete the seismic profiles, logging suites, and MVA activities detailed in the SOPO. In April 2012, the EERC prepared and sent a revised scope of work for DOE approval, including modifications to SOPO Subtasks 15.3–15.5, and an extension request for D86, the updated regional technology implementation plan, from April 2012 to April 2013.
- Modification 23 to the cooperative agreement, received in June 2012, authorized the revisions requested to the scope of work detailed at Subtask 15.3 (Data Acquisition at Additional Zama Pinnacles), Subtask 15.4 (Static Model, History Matching and Dynamic Simulation at Additional Zama Pinnacles), and Subtask 15.5 (Acid Gas Phase Behavior and Rock Interactions Studies). Because of the delay in DOE authorization, the efforts under Subtask 15.3 need to be extended to August 31, 2012, and activities under Subtask 15.4 are not anticipated to begin until September 2012.

Task 16 – Characterization of the Basal Cambrian System

Significant accomplishments for Task 16 for the reporting period included the following:

- Clipped and imported seven logs into Techlog for future petrophysical analysis.
- Attended and presented at the joint U.S. and Canada project meeting in Regina, Saskatchewan, Canada, on April 18.

- Continued the calibration of well logs that will be used to derive the internal heterogeneity of the Cambro-Ordovician saline system.
- Presented on May 2, 2012, the "CO_2 Storage Resource Potential of the Cambro-Ordovician Saline System in the Western Interior of North America" during the 11th Annual CCUS Conference.
- Continued work on the 3-D model for the entire U.S.–Canada project area.
- Continued analysis of the well data for inclusion in a risk assessment matrix.
- Began compilation of injection scenarios for the modeling component of the project.
- E-mailed notices for the next joint U.S.–Canada technical meeting currently scheduled for September 13, 2012, following the PCOR Partnership Annual Meeting in Milwaukee, Wisconsin.
- Continued derivation of log data for multipoint statistical approach to the 3-D model of the Cambro-Ordovician system.
- Continued work on the summarization of wellbore completion and abandonment data for wells penetrating the U.S. portion of the Cambro-Ordovician system.
- Developed a preliminary injection scenario for the 16 large stationary CO_2 source locations across the Cambro-Ordovician area.
- Anticipate reservoir simulation modeling to begin in July 2012.

Actual or anticipated problems or delays during the reporting period included the following:

- All activities are on schedule, and there were no problems or delays during the reporting period.

PHASE III COST STATUS

The approved BP4 (Modification No. 23) budget along with actual costs incurred and in-kind cost share reported are shown in Table 3. A spending plan for BP4 and actual incurred cost by quarter of cash funds for BP4 are provided in Figure 5 and Table 4.

PHASE III SCHEDULE STATUS

Table 5 lists all deliverables and milestones by quarter, with completion dates, through the end of the reporting period (see Table 6 for the Gantt chart for BP4, Years 5 and 6).

Table 3. Phase III Budget – BP4

Organization	Approved Budget, $	Actual Costs Incurred, $
DOE Share – Cash	58,400,697	21,617,531
Nonfederal Share – Cash	2,411,971	1,621,131
Nonfederal Share – In-Kind	27,034,759	23,618,346
Total	87,847,427	46,857,008

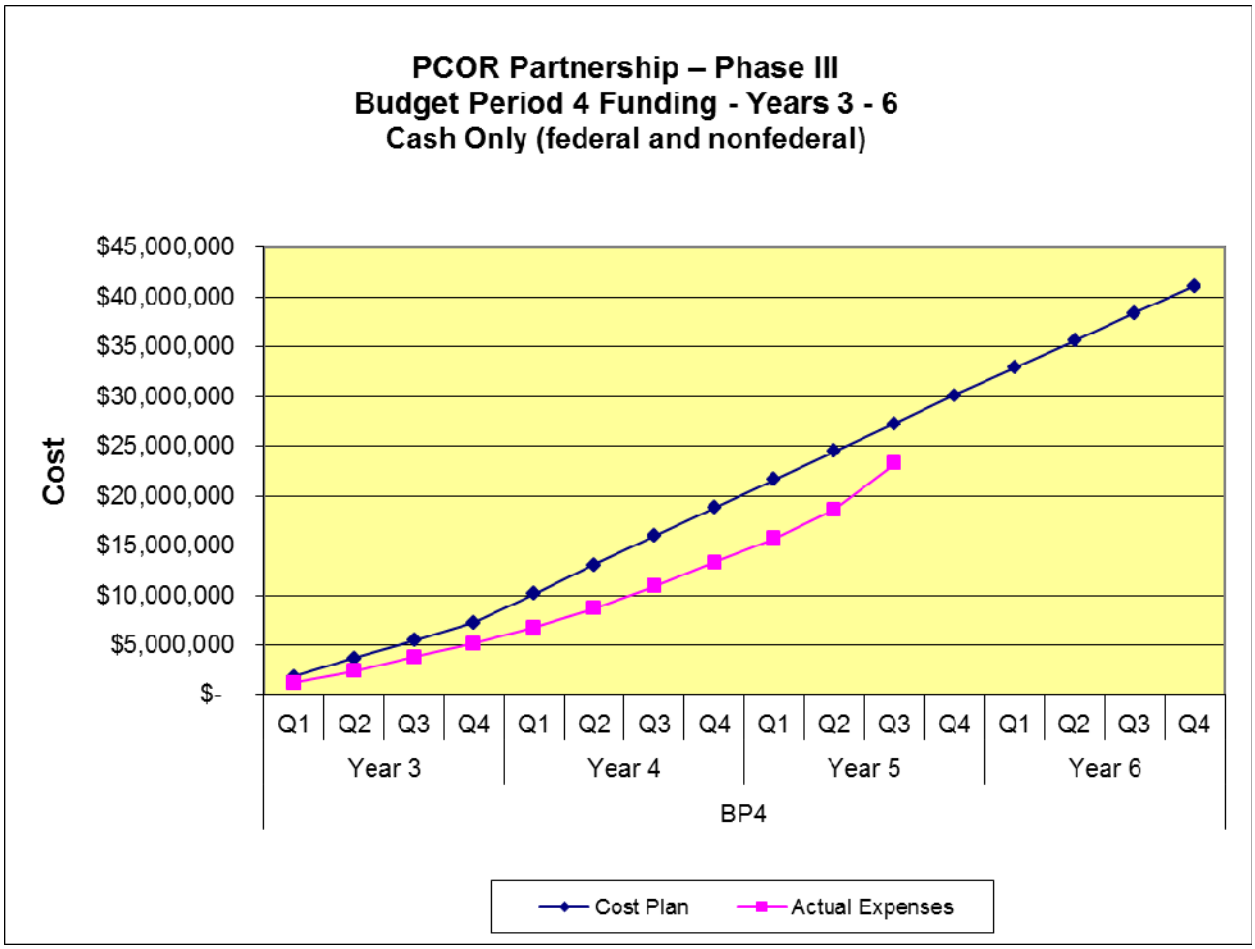


Figure 5. PCOR Partnership Phase III, BP4 – Years 3–6 funding (cash only).

Table 4. BP4 – Years 3–6 Spending Plan

	Year 3								Year 4							
Baseline Reporting Quarter	Q1		Q2		Q3		Q4		Q1		Q2		Q3		Q4	
	Q1	Cum. BP Total	Q2	Cum. BP Total	Q3	Cum. BP Total	Q4	Cum. BP Total	Q1	Cum. BP Total	Q2	Cum. BP Total	Q3	Cum. BP Total	Q4	Cum. BP Total
Baseline Cost Plan																
Federal Share	$1,692,969	$ 1,692,969	$ 1,692,969	$ 3,385,938	$ 1,692,969	$ 5,078,906	$1,692,969	$ 6,771,875	$2,707,624	$ 9,479,499	$2,707,624	$12,187,123	$2,707,624	$14,894,747	$2,707,624	$17,602,371
Nonfederal Share	$ 127,735	$ 127,735	$ 127,735	$ 255,470	$ 127,735	$ 383,204	$ 127,735	$ 510,939	$ 177,644	$ 688,583	$ 177,644	$ 866,227	$ 177,644	$ 1,043,871	$ 177,644	$ 1,221,515
Total Planned	$1,820,704	$ 1,820,704	$ 1,820,704	$ 3,641,407	$ 1,820,704	$ 5,462,111	$1,820,704	$ 7,282,814	$2,885,268	$10,168,082	$2,885,268	$13,053,350	$2,885,268	$15,938,618	$2,885,268	$18,823,886
Actual Incurred Cost																
Federal Share	$1,025,953	$ 1,025,953	$ 983,104	$ 2,009,057	$ 1,352,281	$ 3,361,338	$1,347,660	$ 4,708,998	$1,531,401	$ 6,240,399	$1,864,304	$ 8,104,703	$1,982,465	$10,087,168	$2,163,678	$12,250,846
Nonfederal Share	$ 171,873	$ 171,873	$ 164,935	$ 336,808	$ 74,929	$ 411,737	$ 4,563	$ 416,300	$ 80,246	$ 496,546	$ 56,614	$ 553,160	$ 257,142	$ 810,302	$ 251,531	$ 1,061,833
Total Incurred Cost	$1,197,826	$ 1,197,826	$ 1,148,039	$ 2,345,865	$ 1,427,210	$ 3,773,075	$1,352,223	$ 5,125,298	$1,611,647	$ 6,736,945	$1,920,918	$ 8,657,863	$2,239,607	$10,897,470	$2,415,209	$13,312,679
Variance																
Federal Share	$ 667,016	$ 667,016	$ 709,865	$ 1,376,881	$ 340,688	$ 1,717,568	$ 345,309	$ 2,062,877	$1,176,223	$ 3,239,100	$ 843,320	$ 4,082,420	$ 725,159	$ 4,807,579	$ 543,946	$ 5,351,525
Nonfederal Share	$ (44,138)	$ (44,138)	$ (37,200)	$ (81,339)	$ 52,806	$ (28,533)	$ 123,172	$ 94,639	$ 97,398	$ 192,037	$ 121,030	$ 313,067	$ (79,498)	$ 233,569	$ (73,887)	$ 159,682
Total Variance	$ 622,878	$ 622,878	$ 672,665	$ 1,295,542	$ 393,494	$ 1,689,036	$ 468,481	$ 2,157,516	$1,273,621	$ 3,431,137	$ 964,350	$ 4,395,487	$ 645,661	$ 5,041,148	$ 470,059	$ 5,511,207

	Year 5								Year 6							
Baseline Reporting Quarter	Q1		Q2		Q3		Q4		Q1		Q2		Q3		Q4	
	Q1	Cum. BP Total	Q2	Cum. BP Total	Q3	Cum. BP Total	Q4	Cum. BP Total	Q1	Cum. BP Total	Q2	Cum. BP Total	Q3	Cum. BP Total	Q4	Cum. BP Total
Baseline Cost Plan																
Federal Share	$2,671,493	$20,273,864	$ 2,671,493	$22,945,356	$ 2,671,493	$25,616,849	$4,771,676	$30,388,524	$2,612,701	$33,001,225	$2,612,701	$35,613,925	$2,612,701	$38,226,626	$2,612,701	$40,839,326
Nonfederal Share	$ 152,429	$ 1,373,944	$ 152,429	$ 1,526,373	$ 152,429	$ 1,678,802	$ 152,429	$ 1,831,231	$ 145,185	$ 1,976,416	$ 145,185	$ 2,121,601	$ 145,185	$ 2,266,786	$ 145,185	$ 2,411,971
Total Planned	$2,823,922	$21,647,808	$ 2,823,922	$24,471,729	$ 2,823,922	$27,295,651	$4,924,105	$32,219,755	$2,757,886	$34,977,641	$2,757,886	$37,735,526	$2,757,886	$40,493,412	$2,757,886	$43,251,297
Actual Incurred Cost																
Federal Share	$2,255,269	$14,506,115	$ 2,762,335	$17,268,450	$ 4,349,081	$21,617,531										
Nonfederal Share	$ 160,751	$ 1,222,584	$ 134,138	$ 1,356,722	$ 264,409	$ 1,621,131										
Total Incurred Cost	$2,416,020	$15,728,699	$ 2,896,473	$18,625,172	$ 4,613,490	$23,238,662										
Variance																
Federal Share	$ 416,224	$ 5,767,749	$ (90,843)	$ 5,676,906	$(1,677,589)	$ 3,999,318										
Nonfederal Share	$ (8,322)	$ 151,360	$ 18,291	$ 169,651	$ (111,980)	$ 57,671										
Total Variance	$ 407,902	$ 5,919,109	$ (72,552)	$ 5,846,557	$(1,789,569)	$ 4,056,989										

Table 5. Phase III Milestones and Deliverables

Title/Description	Due Date	Actual Completion Date
Year 1 – Quarter 1 (October–December 2007)		
D37: Task 4 – Fort Nelson Test Site – Geological Characterization Experimental Design Package	12/31/07	12/28/07
D63: Task 13 – Project Management Plan	12/31/07	12/28/07
M17: Task 4 – Fort Nelson Test Site Selected	12/31/07	12/28/07
Year 1 – Quarter 2 (January–March 2008)		
D38: Task 4 – Fort Nelson Test Site – Geomechanical Experimental Design Package	1/31/08	1/31/08
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/08	1/31/08
D11: Task 2 – Outreach Plan	3/31/08	3/31/08
D27: Task 3 – Environmental Questionnaire – Fort Nelson Test Site	3/31/08	4/02/08
D30: Task 4 – Williston Basin Test Site – Geomechanical Experimental Design Package	3/31/08	3/31/08
M1: Task 1 – Three Target Areas Selected for Detailed Characterization	3/31/08	3/20/08
M18: Task 4 – Fort Nelson Test Site Geochemical Work Initiated	3/31/08	3/19/08
Year 1 – Quarter 3 (April–June 2008)		
D14: Task 2 – General Phase III Fact Sheet	4/30/08	4/30/08
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/08	4/30/08
D17: Task 2 – General Phase III Information PowerPoint Presentation	5/30/08	5/30/08
M3: Task 3 – Start Environmental Questionnaire for Williston Basin Test Site	6/30/08	6/27/08
M6: Task 4 – Williston Basin Test Site Geochemical Work Initiated	6/30/08	6/30/08
M7: Task 4 – Williston Basin Test Site Geological Characterization Data Collection Initiated	6/30/08	6/30/08
Year 1 – Quarter 4 (July–September 2008)		
D12: Task 2 – Demonstration Web Pages on the Public Site	7/31/08	7/31/08
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/08	7/31/08
D1: Task 1 – Review of Source Attributes	9/30/08	9/26/08
M2: Task 1 – Demonstration Project Reporting System (DPRS) Prototype Completed	9/30/08	9/26/08
Year 2 – Quarter 1 (October–December 2008)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/08	10/31/08
D20: Task 2 – Documentary Support to PowerPoint and Web Site	12/31/08	12/31/08
D57: Task 12 – Project Assessment Annual Report	12/31/08	12/31/08

Continued . . .

Table 5. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 2 – Quarter 2 (January–March 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/09	1/30/09
M21: Task 14 – Outline of White Paper on Nexus of CO_2 CCS and Water, Part Subtask 14.2 – White Paper on Nexus of CCS and Water	2/28/09	2/27/09
D24: Task 2 – PCOR Partnership Region Sequestration General Poster	3/31/09	3/31/09
Year 2 – Quarter 3 (April–June 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/09	4/30/09
M23: Task 14 – Monthly WWG Conference Call Held	4/30/09	4/15/09
D2: Task 1 – First Target Area Completed	5/29/09	5/29/09
M23: Task 14 – Monthly WWG Conference Call Held	5/29/09	5/29/09
D16: Task 2 – Fort Nelson Test Site Fact Sheet	5/29/09	5/29/09
M24: Task 14 – WWG Annual Meeting Held	5/31/09	5/07/09
M23: Task 14 – Monthly WWG Conference Call Held	6/30/09	6/25/09
Year 2 – Quarter 4 (July–September 2009)		
M23: Task 14 – Monthly WWG Conference Call Held	N/A	Not required
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	7/31/09	7/31/09
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/09	7/31/09
M22: Task 14 – Draft White Paper – Nexus of CCS and Water Available for Comments	8/17/09	8/18/09 (DOE) 8/21/09 (WWG)
M23: Task 14 – Monthly WWG Conference Call Held	8/31/09	8/25/09
D1: Task 1 – Review of Source Attributes	9/30/09	9/25/09
D3: Task 1 – Permitting Review – One State and One Province	9/30/09	9/30/09
D9: Task 1 – Updated DSS	9/30/09	9/29/09
D47: Task 6 – Report on the Preliminary Design of Advanced Compression Technology	9/30/09	9/30/09
D77: Task 13 – Risk Management Plan Outline	9/30/09	9/18/09
M4: Task 4 – Bell Creek Test Site Selected	9/30/09	9/30/09
M5: Task 4 – Bell Creek Test Site – Data Collection Initiated	9/30/09	9/30/09
M23: Task 14 – Monthly WWG Conference Call Held	9/30/09	9/22/09

Continued . . .

Table 5. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 3 – Quarter 1 (October–December 2009)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/30/09	11/02/09
D78: Task 14 – Final White Paper on the Nexus of CCS and Water	10/30/09	10/28/09
M23: Task 14 – Monthly WWG Conference Call Held	10/31/09	10/26/09
M23: Task 14 – Monthly WWG Conference Call Held	11/30/09	11/16/09
D57: Task 12 – Project Assessment Annual Report	12/31/09	12/31/09
M23: Task 14 – Monthly WWG Conference Call Held	12/31/09	Waived by DOE
Year 3 – Quarter 2 (January–March 2010)		
D13: Task 2 – Public Site Updates	1/15/10	1/15/10
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/10	1/29/10
M23: Task 14 – Monthly WWG Conference Call Held	1/31/10	1/6/10
D79: Task 14 – Water Resource Estimation Methodology Document	2/28/10	Waived by DOE
M23: Task 14 – Monthly WWG Conference Call Held	2/28/10	2/25/10
D11: Task 2 – Outreach Plan	3/31/10	3/31/10
M23: Task 14 – Monthly WWG Conference Call Held	3/31/10	3/23/10
Year 3 – Quarter 3 (April–June 2010)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/10	4/30/10
M23: Task 14 – Monthly WWG Conference Call Held	4/30/10	4/28/10
M23: Task 14 – Monthly WWG Conference Call Held	5/31/10	5/13/10
D17: Task 2 – General Phase III Information PowerPoint Presentation (update)	6/30/10	6/30/10
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation (update)	6/30/10	6/29/10
M23: Task 14 – Monthly WWG Conference Call Held	6/30/10	6/23/10
M24: Task 14 – WWG Annual Meeting Held	6/30/10	5/13/10
Year 3 – Quarter 4 (July–September 2010)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/10	7/29/10
M23: Task 14 – Monthly WWG Conference Call Held	7/31/10	7/28/10
M23: Task 14 – Monthly WWG Conference Call Held	8/31/10	8/31/10
D1: Task 1 – Review of Source Attributes	9/30/10	9/20/10
D52: Task 9 – Fort Nelson Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/10	9/30/10
M9: Task 4 – Bell Creek Test Site Geological Model Development Initiated	9/30/10	9/30/10
M23: Task 14 – Monthly WWG Conference Call Held	9/30/10	Waived by DOE

Continued . . .

Table 5. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 4 – Quarter 1 (October–December 2010)		
D87: Task 4 – Bell Creek Test Site – Geomechanical Experimental Design Package	10/30/10	10/29/10
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/10	10/29/10
M23: Task 14 – Monthly WWG Conference Call Held	10/31/10	10/26/10
M23: Task 14 – Monthly WWG Conference Call Held	11/30/10	Waived by DOE
D57: Task 12 – Project Assessment Annual Report	12/31/10	12/23/10
M23: Task 14 – Monthly WWG Conference Call Held	12/31/10	12/13/10
Year 4 – Quarter 2 (January–March 2011)		
M8: Task 4 – Bell Creek Test Site Wellbore Leakage Data Collection Initiated	1/15/11	1/14/11
D31: Task 4 – Bell Creek Test Site – Geological Characterization Experimental Design Package	1/31/11	1/27/11
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/11	1/31/11
M23: Task 14 – Monthly WWG Conference Call Held	1/31/11	1/19/11
M28: Task 4 – Bell Creek Geological Experimental Design Package Completed	1/31/11	1/27/11
D15: Task 2 – Bell Creek Test Site Fact Sheet	2/28/11	2/28/11
M23: Task 14 – Monthly WWG Conference Call Held	2/28/11	Waived by DOE
D10: Task 1 – Demonstration Project Reporting System Update	3/31/11	3/25/11
D18: Task 2 – Bell Creek Test Site PowerPoint Presentation (Update)	3/31/11	3/31/11
D26: Task 2 – Fort Nelson Test Site Poster	3/31/11	3/31/11
D28: Task 3 – Environmental Questionnaire – Bell Creek Test Site	3/31/11	3/30/11
D85: Task 6 – Report – Opportunities and Challenges Associated with CO_2 Compression and Transportation During CCS Activities	3/31/11	3/31/11
M23: Task 14 – Monthly WWG Conference Call Held	3/31/11	3/22/11

Continued . . .

Table 5. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 4 – Quarter 3 (April–June 2011)		
M30: Task 5 – Bell Creek Test Site Baseline MVA Initiated	4/01/11	3/24/11
M23: Task 14 – Monthly WWG Conference Call Held	4/30/11	4/21/11
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/11	4/29/11
D88: Task 13 – Programmatic Risk Management Plan	4/30/11	4/29/11
D17: Task 2 – General Phase III Information PowerPoint Presentation (Update)	5/31/11	5/31/11
D34: Task 4 – Bell Creek Test Site – Baseline Hydrogeological Final Report	5/31/11	5/31/11
M23: Task 14 – Monthly WWG Conference Call Held	5/31/11	5/5/11
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation (Update)	6/30/11	6/30/11
M23: Task 14 – Monthly WWG Conference Call Held	6/30/11	6/23/11
M24: Task 14 – WWG Annual Meeting Held	6/30/11	5/5/11
Year 4 – Quarter 4 (July–September 2011)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/11	7/28/11
M23: Task 14 – Monthly WWG Conference Call Held	7/31/11	7/26/11
D29: Task 3 – Permitting Action Plan	8/31/11	8/31/11
D66: Task 9 – Bell Creek Test Site – Simulation Report	8/31/11	8/31/11
D67: Task 9 – Fort Nelson Test Site – Simulation Report	7/31/11	8/31/11
M23: Task 14 – Monthly WWG Conference Call Held	8/31/11	8/24/11
D1: Task 1 – Review of Source Attributes	9/30/11	9/21/11
D4: Task 1 – Permitting Review – Basic EPA Requirements[+]	9/30/11	9/30/11
D9: Task 1 – Updated DSS	9/30/11	9/23/11
D25: Task 2 – Bell Creek Test Site Poster	9/30/11	9/30/11
D50: Task 9 – Bell Creek Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/11	9/30/11
M23: Task 14 – Monthly WWG Conference Call Held	9/30/11	Waived by DOE
M31: Task 9 – Bell Creek Test Site – Site Characterization, Modeling, and Monitoring Plan Completed	9/30/11	9/30/11
M33: Task 16 – Basal Cambrian Baseline Geological Characterization Completed	9/30/11	9/29/11

[+] Name change requested September 28, 2011, and approved October 3, 2011.

Continued . . .

Table 5. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 5 – Quarter 1 (October–December 2011)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/11	10/31/11
M23: Task 14 – Monthly WWG Conference Call Held	10/31/11	10/26/11
M23: Task 14 – Monthly WWG Conference Call Held	11/30/11	11/30/11
D57: Task 12 – Project Assessment Annual Report	12/31/11	12/30/11
M23: Task 14 – Monthly WWG Conference Call Held	12/31/11	Waived by DOE
M34: Task 16 – Basal Cambrian Static Geological Model Completed	12/31/11	12/21/11
Year 5 – Quarter 2 (January–March 2012)		
M16: Task 4 – Bell Creek Test Site – Initiation of Production and Injection Simulation	1/13/12	12/29/11
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/12	1/31/12
D65: Task 4 – Fort Nelson Test Site – Site Characterization Report	1/31/12	1/31/12
D81: Task 1 – Regional Carbon Sequestration Atlas (Update)	1/31/12	1/31/12
M23: Task 14 – Monthly WWG Conference Call Held	1/31/12	1/19/12
M29: Task 4 – Fort Nelson Site Characterization Report Completed	1/31/12	1/31/12
D91: Task 16 – Report – Geological Characterization of the Basal Cambrian System in the Williston Basin	2/29/12	2/29/12
M23: Task 14 – Monthly WWG Conference Call Held	2/29/12	2/28/12
D5: Task 1 – Second Target Area Completed	3/31/12	3/30/12
D18: Task 2 – Bell Creek Test Site PowerPoint Presentation (Update)	3/31/12	3/30/12
M10: Task 4 – Bell Creek Test Site Wellbore Leakage Data Collection Completed	3/31/12	3/12/12
M36: Task 13 – Annual Advisory Board Scheduled	3/31/12	3/28/12
M23: Task 14 – Monthly WWG Conference Call Held	3/31/12	3/27/12
Year 5 – Quarter 3 (April–June 2012)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/12	4/30/12
M23: Task 14 – Monthly WWG Conference Call Held	4/30/12	Waived by DOE
D17: Task 2 – General Phase III Information PowerPoint Presentation (Update)	5/31/12	5/31/12
M23: Task 14 – Monthly WWG Conference Call Held	5/31/12	5/31/12

Continued . . .

Table 5. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 5 – Quarter 3 (April–June 2012) (continued)		
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation (Update)	6/30/12	6/29/12
D41: Task 4 – Fort Nelson Test Site – Geochemical Report	6/30/12	6/29/12
D84: Task 6 – Report – A Phased Approach to Building Pipeline Network for CO_2 Transportation During CCS	6/30/12	6/29/12
M23: Task 14 – Monthly WWG Conference Call Held	6/30/12	6/28/12
M24: Task 14 – WWG Annual Meeting Held	6/30/12	5/3/12
M32: Task 4 – Fort Nelson Geochemical Report Completed	6/30/12	6/29/12
Year 5 – Quarter 4 (July–September 2012)		
D13: Task 2 – Public Site Updates	7/31/12	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/12	
D67: Task 9 – Fort Nelson Test Site – Simulation Report	7/31/12	
M23: Task 14 – Monthly WWG Conference Call Held	7/31/12	
D66: Task 9 – Bell Creek Test Site – Simulation Report	8/31/12	
M23: Task 14 – Monthly WWG Conference Call Held	8/31/12	
D1: Task 1 – Review of Source Attributes	9/30/12	
D10: Task 1 – DPRS Update	9/30/12	
D42: Task 5 – Bell Creek Test Site – Injection Experimental Design Package	9/30/12	
D64: Task 4 – Bell Creek Test Site – Site Characterization Report	9/30/12	
D82: Task 6 –Report – Issues Associated with Integration of Advanced Compression Technology into a CO_2 Storage Project	9/30/12	
M23: Task 14 – Monthly WWG Conference Call Held	9/30/12	
Year 6 – Quarter 1 (October–December 2012)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/12	
M23: Task 14 – Monthly WWG Conference Call Held	10/31/12	
D79: Task 14 – Water Resource Estimation Methodology Document	11/30/12	
M23: Task 14 – Monthly WWG Conference Call Held	11/30/12	
D57: Task 12 – Project Assessment Annual Report	12/31/12	
M23: Task 14 – Monthly WWG Conference Call Held	12/31/12	

Continued . . .

Table 5. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 6 – Quarter 2 (January–March 2013)		
D32: Task 4 – Bell Creek Test Site – Geomechanical Final Report	1/31/13	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	1/31/13	
D14: Task 2 – General Phase III Fact Sheet (Update)	2/28/13	
M23: Task 14 – Monthly WWG Conference Call Held	2/28/13	
D18: Task 2 – Bell Creek Test Site PowerPoint Presentation (Update)	3/31/13	
D33: Task 4 – Bell Creek Test Site – Geochemical Final Report	3/31/13	
D85: Task 6 – Report – Opportunities and Challenges Associated with CO_2 Compression and Transportation During CCS Activities	3/31/13	
D89: Task 16 – Report – Geochemical Evaluation of the Basal Cambrian System	3/31/13	
M12: Task 4 – Bell Creek Test Site Geochemical Work Completed	3/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	3/31/13	
M36: Annual Advisory Board Meeting Scheduled	3/31/13	
Year 6 – Quarter 3 (April–June 2013)		
D15: Task 2 – Bell Creek Test Site Fact Sheet (Update)	4/15/13	
D16: Task 2 – Fort Nelson Test Site Fact Sheet (Update)	4/30/13	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/13	
D86: Task 15 – Updated Regional Implementation Plan for Zama	4/30/13	
M14: Task 4 – Bell Creek Test Site Geological Characterization Data Collection Completed	4/30/13	
M23: Task 14 – Monthly WWG Conference Call Held	4/30/13	
M35: Task 16 – Basal Cambrian Dynamic Capacity Estimation Completed	4/30/13	
D17: Task 2 – General Phase III Information PowerPoint Presentation (Update)	5/31/13	
D43: Task 5 – Bell Creek Test Site – Monitoring Experimental Design Package	5/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	5/31/13	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation (Update)	6/30/13	
D40: Task 4 – Fort Nelson Test Site – Geomechanical Final Report	6/30/13	
D80: Task 14 – Best Practices Manual (BPM) on the Nexus of Water and Carbon Sequestration Activities	6/30/13	
M23: Task 14 – Monthly WWG Conference Call Held	6/30/13	
M24: Task 14 – WWG Annual Meeting Held	6/30/13	
M26: Task 8 – Bell Creek Test Site – CO_2 Injection Initiated	6/30/13	

Continued . . .

Table 5. Phase III Milestones and Deliverables (continued)

Title/Description	Due Date	Actual Completion Date
Year 6 – Quarter 4 (July–September 2013)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/13	
D67: Task 9 – Fort Nelson Test Site – Simulation Report	7/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	7/31/13	
D66: Task 9 – Bell Creek Test Site – Simulation Report	8/31/13	
D81: Task 1 – Regional Carbon Sequestration Atlas (Update)	8/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	8/31/13	
D1: Task 1 – Review of Source Attributes	9/30/13	
D6: Task 3 – Permitting Review – Update 1	9/30/13	
D9: Task 1 – Updated DSS	9/30/13	
D48: Task 7 – Bell Creek Test Site – Procurement Plan and Agreement Report	9/30/13	
D90: Task 16 – Report – Wellbore Evaluation of the Basal Cambrian System	9/30/13	
M23: Task 14 – Monthly WWG Conference Call Held	9/30/13	
M27: Task 5 – Bell Creek Test Site – MVA Equipment Installation and Baseline MVA Activities Completed	9/30/13	

Table 6. PCOR Partnership Phase III, BP4, Years 5–6 Gantt Chart

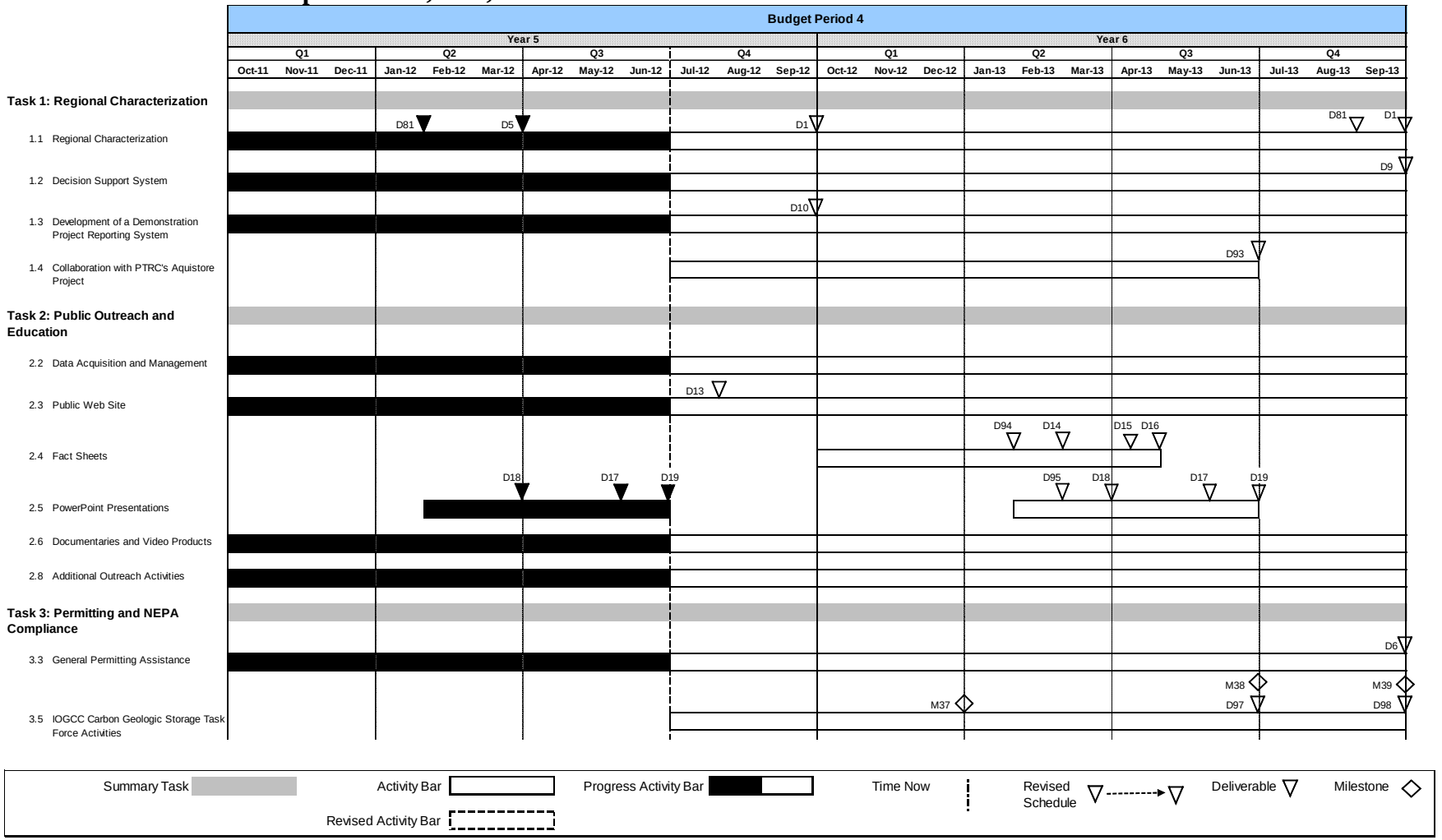


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Table 6. PCOR Partnership Phase III, BP4, Years 5–6 Gantt Chart (continued)

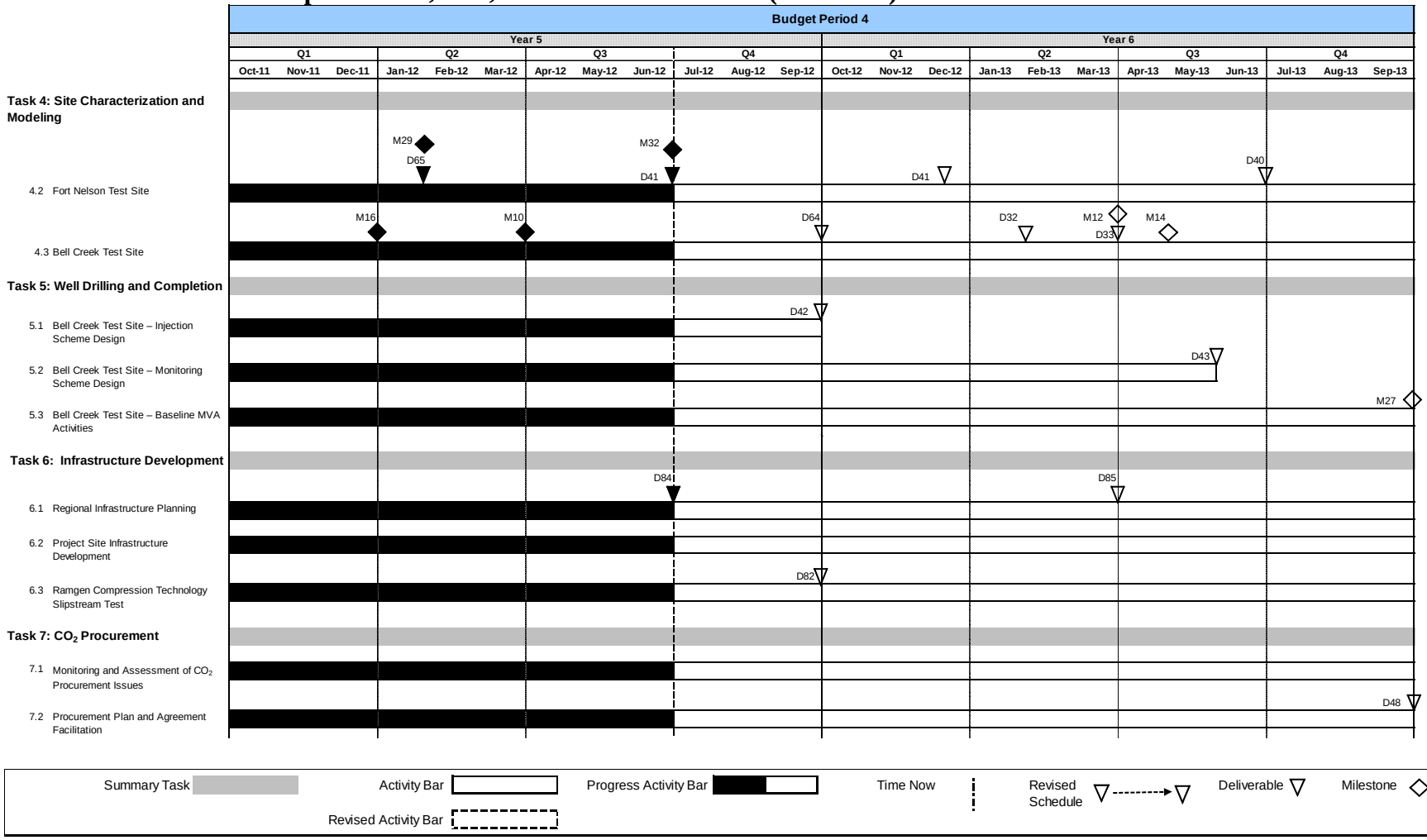

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Table 6. PCOR Partnership Phase III, BP4, Years 5–6 Gantt Chart (continued)

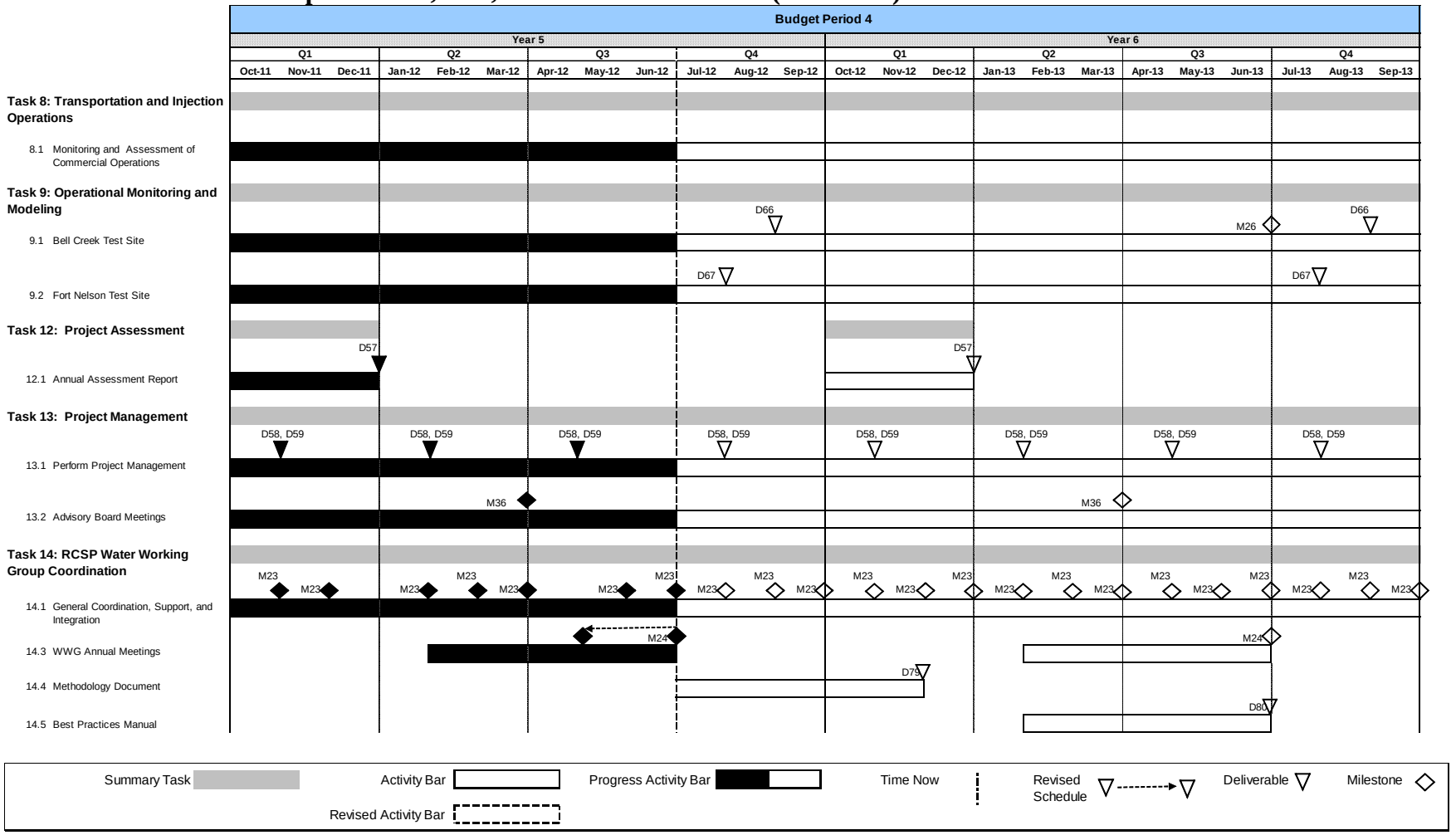

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Table 6. PCOR Partnership Phase III BP4, Years 5–6 Gantt Chart (continued)

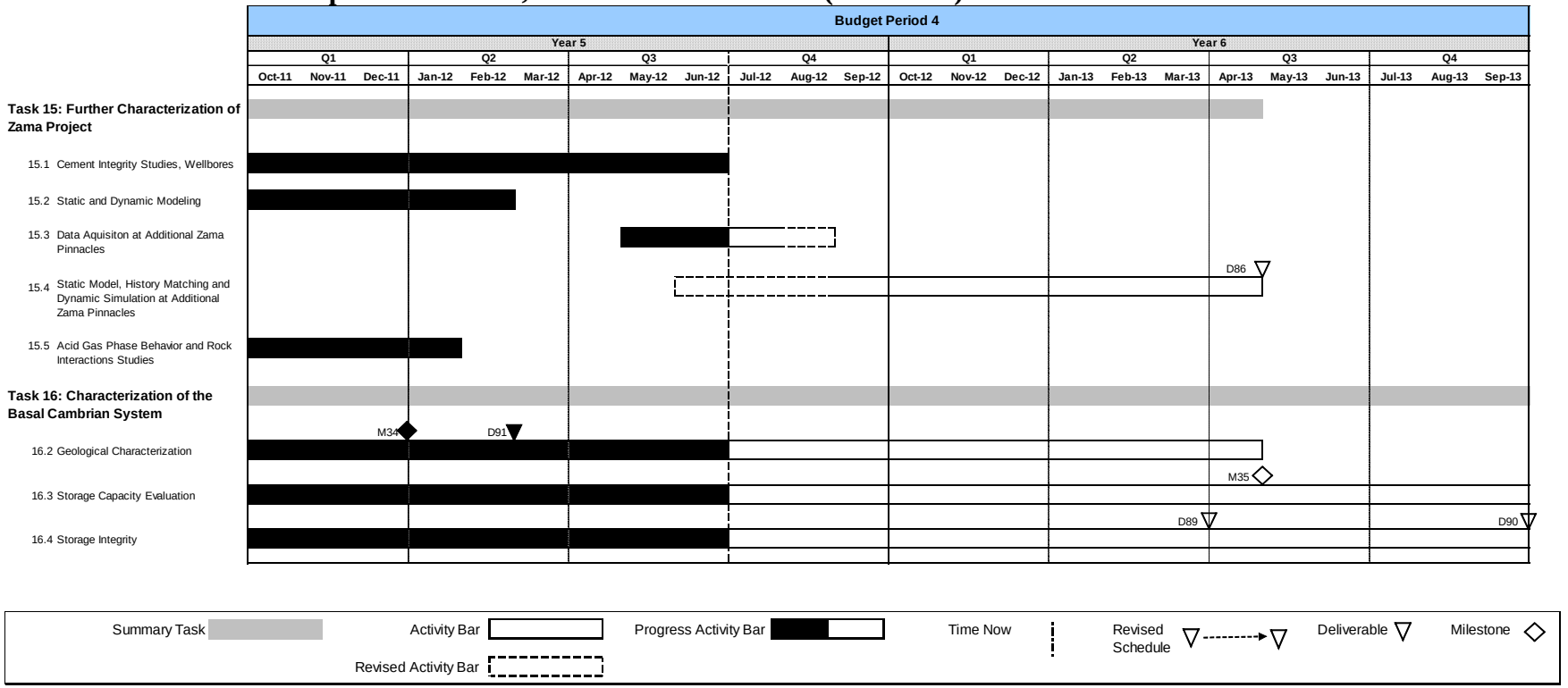

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Table 6. PCOR Partnership Phase III BP4, Years 5–6 Gantt Chart (continued)

Key for Deliverables (D) ▼				Key for Milestones (M) ◆	
D1	Review of Source Attributes	D66	BC Test Site – Simulation Report	M10	BC Test Site – Wellbore Leakage Data Collection Completed
D5	Second Target Area Completed	D67	FN Test Site – Simulation Report	M12	BC Test Site – Geochemical Work Completed
D6	Permitting Review – Update	D79	Report – Water Resource Estimation Methodology	M14	BC Test Site – Geological Characterization Data Collection Completed
D9	Updated DSS	D80	Best Practices Manual – Nexus of Water and Carbon Storage Activities	M16	BC Test Site – Initiation of Production and Injection Simulations
D10	DPRS Update	D81	Regional Carbon Sequestration Atlas	M23	Monthly WWG Conference Call Held
D13	Public Site Updates	D82	Report – Issues Associated with Integration of Advanced Compression Technology into a CO_2 Storage Project	M24	WWG Annual Meeting Held
D14	General Phase III Fact Sheet			M26	BC Test Site – CO_2 Injection Initiated
D15	BC Test Site Fact Sheet	D84	Report – A Phased Approach to Building Pipeline Network for CO_2 Transportation During CCS	M27	BC Test Site – MVA Equipment Installation and Baseline MVA Activities Completed
D16	Fort Nelson Test Site Fact Sheet			M29	FN Test Site – Site Characterization Report Completed
D17	General Phase III Information PowerPoint Presentation	D85	Report – Opportunities and Challenges Associated with CO_2 Compression and Transportation During CCS Activities	M32	Fort Nelson – Geochemical Report Completed
D18	BC Test Site PowerPoint Presentation			M34	Basal Cambrian Static Geological Model Completed
D19	FN Test Site PowerPoint Presentation	D86	Updated Regional Technology Implementation Plan for Zama	M35	Basal Cambrian Dynamic Capacity Estimation Completed
D32	BC Test Site – Geomechanical Final Report	D89	Report – Geochemical Evaluation of the Basal Cambrian System	M36	Annual Advisory Board Meeting Scheduled
D33	BC Test Site – Geochemical Final Report	D90	Report – Wellbore Evaluation of the Basal Cambrian System	M37	Subgroup Meetings Held
D40	FN Test Site – Geomechanical Report	D91	Report – Geological Characterization of the Basal Cambrian System in the Williston Basin	M38	Task Force Wrap Up Meeting Held
D41	FN Test Site – Geochemical Report			M39	Editing subgroup Meeting Held
D42	BC Test Site – Injection Experimental Design Package	D93	Geological Modeling and Simulation Report for the Aquistore Project		
D43	BC Test Site – Monitoring Experimental Design Package	D94	Aquistore Project Fact Sheet		
D48	BC Test Site – Procurement Plan and Agreement Report	D95	Aquistore Project Poster		
D57	Project Assessment Annual Report	D96	BC Test Site – 3-D Seismic Acquisition and Characterization Report		
D58	Quarterly Progress Report	D97	Report – Findings and Recommendations – GCS Task Force's Operational and Postoperational Liability Subgroups		
D59	Milestone Quarterly Report				
D64	BC Test Site – Site Characterization Report	D98	Report – Findings, Recommendations and Guidance of the GCS Task Force on Operational and Postoperational Liability		
D65	FN Test Site – Site Characterization Report				

PHASE III PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES

During the reporting period, there were 12 abstracts accepted for presentation and 14 presentations given at 11 different meetings/conferences. In addition, a quarterly progress report, four deliverables, and five milestones were completed, and nine deliverables/milestones were finalized.

Abstracts

Submitted

Gorecki, C.D., Steadman, E.N., Harju, J.A., Sorensen, J.A., Hamling, J.A., Botnen, L.S., Peck, W.D., and Anagnost, K.K., 2012, The Plains CO_2 Reduction (PCOR) Partnership—CO_2 sequestration demonstration projects adding value to the oil and gas industry [abs.]: International Petroleum Technology Conference, Beijing, China, March 26–28, 2013.

Hamling, J.A., Gorecki, C.D., Braunberger, J.R., Botnen, B.W., Hu, H., Klapperich, R.J., Steadman, E.N., and Harju, J.A., 2012, Integrated monitoring program for a combined CO_2 enhanced oil recovery and CO_2 storage project in the Bell Creek oil field [abs.]: International Petroleum Technology Conference, Beijing, China, March 26–28, 2013.

Jensen, M.D., Pei, P., Snyder, A.C., Heebink, L.V., and Cowan, R.M., 2012, A phased approach to developing a pipeline network for CO_2 transport during CCUS [abs.]: American Institute of Chemical Engineers 2012 Annual Meeting, Pittsburgh, Pennsylvania, October 28–November 2, 2012.

Liu, G., Gorecki, C.D., Braunberger, J.R., Bailey, T.P., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2012, An integrated optimization for reservoir modeling and simulation—method and case demonstration [abs.]: International Petroleum Technology Conference, Beijing, China, March 26–28, 2013.

Liu, G., Gorecki, C.D., Braunberger, J.R., Bailey, T.P., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2012, Method and case demonstration for integrated reservoir modeling and simulation optimization [abs.]: Society of Petroleum Engineers Reservoir Simulation Symposium, The Woodlands, Texas, February 18–20, 2013.

Saini, D., Gorecki, C.D., Hamling, J.A., Bailey, T.P., and Sorensen, J.A., 2012, Mechanism of subnormal pressure generation in the Bell Creek oil field and the implications to CO_2 storage [abs.]: International Petroleum Technology Conference, Bejing, China, March 26–28, 2013.

Accepted for Presentation

Braunberger, J.R., Peck, W.D., Bailey, T.P., Bremer, J.M., Huffman, B.W., and Gorecki, C.D., 2012, Subsurface core and analogous outcrop characterization of the Muddy/Newcastle Formation for the Bell Creek oil field, Powder River County, Montana [abs.]: Rocky Mountain Section – AAPG 2012, Grand Junction, Colorado, September 9–12, 2012.

Bremer, J.M., Knudsen, D.J., Miller, D.J., Hawthorne, S.B., Gorecki, C.D., and Peck, W.D., 2012, Relative permeability of supercritical carbon dioxide to water for rocks of the Cambro-

Ordovician saline system, North Dakota [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Daly, D.J., Cumming, L., Garrett, G., Stone, M., Cather, M., Tollefson, L., and Wade, S., 2012, Visual message mapping for CCS outreach [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Gorecki, C.D., Bailey, T.P., Liu, G., Sorensen, J.A., and Steadman, E.N., 2012, The role of static and dynamic modeling in the Fort Nelson CCS project [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Gorecki, C.D., Hamling, J.A., Steadman, E.N., and Harju, J.A., 2012, Overview of the Bell Creek combined CO_2 storage and CO_2 EOR project [abs.]: 34th International Geological Congress, Brisbane, Australia, August 5–10, 2012.

Gorecki, C.D., Sorensen, J.A., Botnen, L.A., Steadman, E.N., Harju, J.A., Moffatt, D., Jenkins, M., and Laundry, A., 2012, Overview of the Fort Nelson CCS project [abs.]: 34th International Geological Congress, Brisbane, Australia, August 5–10, 2012.

Gorecki, C.D., Steadman, E.N., Harju, J.A., Sorensen, J.A., Hamling, J.A., Daly, D.J., Botnen, L.A., Jensen, M.D., Peck, W.D., and Anagnost, K.K., 2012, The Plains CO_2 Reduction (PCOR) Partnership — carbon capture, utilization, and storage demonstration activities [abs.]: 34th International Geological Congress, Brisbane, Australia, August 5–10, 2012.

Hamling, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2012, Overview of the Bell Creek combined CO_2 storage and CO_2 enhanced oil recovery project [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Jensen, M.D., Pei, P., Letvin, P.A., Snyder, A.C., Cowan, R.M., Gorecki, C.D., and Steadman, E.N., 2012, A phased approach to building a pipeline network for CO_2 transport during CCS [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Peck, W.D., Bachu, S., Knudsen, D.J., Hauck, T., Crotty, C.M., Gorecki, C.D., Sorensen, J.A., Talman, S., Peterson, J., and Melnik, A., 2012, CO_2 storage resource potential of the Cambro–Ordovician saline system in the western interior of North America [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Saini, D., Gorecki, C.D., Knudsen, D.J., Sorensen, J.A., and Steadman, E.N., 2012, A simulation study of simultaneous acid gas EOR and CO_2 storage at Apache's Zama F Pool [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Smith, S.A., Holubnyak, Y.I., Hawthorne, S.B., Miller, D.J., Bremer, J.M., and Sorensen, J.A., 2012, Laboratory evaluation of wellbore casing steel and cements for the Zama acid gas EOR, CO_2 storage, and monitoring project [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Sorensen, J.A., Gorecki, C.D., Botnen, L.A., Steadman, E.N., and Harju, J.A., 2012, Overview, status, and future of the Fort Nelson CCS project [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Rejected for Presentation

Daly, D.J., Crocker, C.R., Gorecki, C.D., and Steadman, E.N., 2012, Creating materials to convey the CCS message – PCOR Partnership experience [abs.]: 11th International Conference on Greenhouse Gas Control Technologies (GHGT-11), Kyoto, Japan, November 18–22, 2012.

Presentations

Braunberger, J.R., 2012, Modeling and simulation update: Presented at the Bell Creek CCS Project quarterly meeting, Grand Forks, North Dakota, June 26, 2012.

Braunberger, J.R., 2012, Plains CO_2 Reduction Partnership's geological-based activities: Presented to the North Dakota State University Geology Club, Grand Forks, North Dakota, April 19, 2012.

Daly, D.J., 2012, Best practices in public outreach – what have we learned?: Presentation and panel discussion for the Outreach and Public Engagement Workshop at the 11th Annual Conference on Carbon Capture Utilization & Sequestration, Pittsburgh, Pennsylvania, April 30 – May 3, 2012.

Daly, D.J., 2012, Energy and carbon—the big picture (Foundations I): Presented at The Changing Face of North Dakota Teacher Training Institute, Dickinson, North Dakota, June 4–8, 2012.

Daly, D.J., 2012, Energy and CO_2 management—regional options (Foundations II): Presented at The Changing Face of North Dakota Teacher Training Institute, Dickinson, North Dakota, June 4–8, 2012.

Daly, D.J., 2012, Energy and CO_2 management—carbon capture and storage: Presented at the 2012 Lignite Education Seminar, Bismarck, North Dakota, June 19, 2012.

Daly, D.J., 2012, PCOR Partnership outreach update—Fort Nelson project: Presented at the Plains CO_2 Reduction (PCOR) Partnership Fort Nelson Technical and Quarterly Meeting, Grand Forks, North Dakota, June 6–7, 2012.

Daly, D.J., 2012, Plains CO_2 Reduction (PCOR) Partnership outreach update – Bell Creek Project: Presented at the Bell Creek CCS Project quarterly meeting, Grand Forks, North Dakota, June 26, 2012.

Ge, J., 2012, Geomechanical modeling for Fort Nelson CCS project: Presented at the Plains CO_2 Reduction (PCOR) Partnership Fort Nelson Technical and Quarterly Meeting, Grand Forks, North Dakota, June 6–7, 2012.

Gorecki, C.D., 2012, Bell Creek CO_2 EOR and CO_2 storage demonstration project, Montana: Presented at the International Workshop on Knowledge Sharing in MVA/MMV in CCS Demonstration Projects and Large-Scale CO_2 Injection Tests, Mobile, Alabama, May 16–17, 2012.

Gorecki, C.D., 2012, Overview of the Bell Creek integrated CO_2 EOR and CO_2 storage project in Montana and Basal Cambrian characterization activities: Presented at the U.S.–Canada Bilateral Meeting, Mobile, Alabama, May 15, 2012.

Gorecki, C.D., Hamling, J.A., Steadman, E.N., and Harju, J.A., 2012, Overview of the Bell Creek integrated CO_2 EOR and CO_2 storage project in Montana: Presented to Schlumberger Carbon Services personnel, Grand Forks, North Dakota, May 9, 2012.

Gorecki, C.D., Liu, G., Pu, H., Braunberger, J.R., Hamling, J.A., Saini, D., and Sorensen, J.A., 2012, Use of CMG's GEM and CMOST for modeling CO_2 storage and CO_2 EOR for the PCOR Partnership Program: Presented at CMG's 2012 Technical Symposium on Reservoir Simulation Technology, Calgary, Alberta, June 19–21, 2012.

Liu, G., 2012, Fort Nelson CCS project—simulation summary: Presented at the Plains CO_2 Reduction (PCOR) Partnership Fort Nelson Technical and Quarterly Meeting, Grand Forks, North Dakota, June 6–7, 2012.

Peck, W.D., 2012, CO_2-based enhanced oil recovery: Presented at the CFE/APEC Workshop for Introducing Carbon Capture and Storage in Earth Sciences Undergraduate Programs, Mexico City, Mexico, June 27–28, 2012.

Peck, W.D., 2012, CO_2 storage resource potential of the Cambro-Ordovician saline system in the western interior of North America: Presented at the Basal Aquifer Project Meeting, Regina, Saskatchewan, April 18, 2012.

Peck, W.D., 2012, CO_2 storage resource potential of the Cambro-Ordovician saline system in the western interior of North America: Presented at the 11th Annual Conference on Carbon Capture Utilization & Sequestration, Pittsburgh, Pennsylvania, April 30 – May 3, 2012.

Sorensen, J.A., Gorecki, C.D., Botnen, L.A., Steadman, E.A., Harju, J.A., Moffatt, D., Jenkins, M., and Laundry, A., 2012, Overview, status, and future of the Fort Nelson CCS project: Presented at the 11th Annual Conference on Carbon Capture Utilization & Sequestration, Pittsburgh, Pennsylvania, April 30 – May 3, 2012.

Steadman, E.N., 2012, Plains CO_2 Reduction (PCOR) Partnership update: Presented to the North Dakota State University Geology Club, Grand Forks, North Dakota, April 19, 2012.

Steadman, E.N., and Harju, J.A., 2012, The Plains CO_2 Reduction (PCOR) Partnership Phase III (Lignite Research Program Contract No. FY08-LXIII-162): Presented at the Lignite Research Council Meeting, Bismarck, North Dakota, May 17, 2012.

Stepan, D.J., 2012, Baseline monitoring, verification, and accounting (MVA) activities: Presented at the Bell Creek CCS Project quarterly meeting, Grand Forks, North Dakota, June 26, 2012.

Poster Presentations

Braunberger, J.R., Bremer, J.R., Liu, G., Gorecki, C.D., Peck, W.D., Steadman, E.N., and Harju, J.A., 2012, Characterization, petrography, and static geologic modeling of an unconventional carbonate reservoir—intervals of the Midale and Rival "Nesson" beds in the Mississippian Madison group: Poster presented at the American Association of Petroleum Geologists (AAPG) 2012 Annual Convention & Exhibition, Long Beach, California, April 22–25, 2012.

Gorecki, C.D., and Hamling, J.A., 2012, Overview of the Bell Creek combined CO_2 storage and CO_2 EOR project: Poster presented at the 11th Annual Conference on Carbon Capture Utilization & Sequestration, Pittsburgh, Pennsylvania, April 30 – May 3, 2012.

Knudsen, D.J., Saini, D., Gorecki, C.D., Smith, S.A., Peck, W.D., Sorensen, J.A., Steadman, E.N., and Harju, J.A., 2012, Using multiple-point statistics for conditioning a Zama pinnacle reef facies model to production history: Poster presented at the American Association of Petroleum Geologists (AAPG) 2012 Annual Convention & Exhibition, Long Beach, California, April 22–25, 2012.

Wade, S., Daly, D.J., Cumming, L., Garrett, G., Stone, M., Cather, M., and Watson, K., 2012, Using message maps in CCS communication: Poster presented at the 11th Annual Conference on Carbon Capture Utilization & Sequestration, Pittsburgh, Pennsylvania, April 30 – May 3, 2012.

Deliverables/Milestones

Draft

Daly, D.J., Crocker, C.R., Gorecki, C.D., Steadman, E.N, and Harju, J.A., 2012, Plains CO_2 Reduction Partnership (PCOR) general audience CO_2 sequestration outreach PowerPoint: Phase III draft Task 2 Deliverable D17 Update 3 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, May.

Daly, D.J., Crocker, C.R., Sorensen, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2012, Fort Nelson carbon capture and storage feasibility project: Plains CO_2 Reduction (PCOR) Partnership Phase III draft Task 2 Deliverable D19 Update 3, Grand Forks, North Dakota, Energy & Environmental Research Center, June.

Jensen, M.D., Pei, P., Snyder, A.C., Heebink, L.V., Botnen, L.S., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2012, A phased approach to designing a pipeline network for CO_2 transport during carbon capture, utilization, and storage: Plains CO_2 Reduction (PCOR) Partnership Phase III draft Task 6 Deliverable D84 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, June.

Sorensen, J.A., Smith, S.A., Botnen, L.S., Gorecki, C.D., Steadman, E.N., Nakles, D.V., and Azzolina, N.A., 2012, Fort Nelson test site – preliminary geochemical observations: Plains CO_2 Reduction (PCOR) Partnership Phase III draft Task 4 – Deliverable D41 and Milestone M32 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, June.

Approved

Anagnost, K.K., Steadman, E.N., Harju, J.A., Sorensen, J.A., and Gorecki, C.D., 2012, Technical Advisory Board meeting scheduled: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 13 Milestone 36 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2012-EERC-04-08, Grand Forks, North Dakota, Energy & Environmental Research Center, April.

Braunberger, J.R., Bremer, J.M., Saini, D., Jabbari, H., Peck, W.D., Gorecki, C.D., and Steadman, E.N., 2012, Site characterization and 3-D geologic modeling of the Rival Field—second target area completed: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 1 Deliverable D5 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2012-EERC-04-16, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Daly, D.J., Crocker, C.R., Hamling, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2012, Bell Creek integrated CO_2 EOR and storage project: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 2 Deliverable D18 Update 1 General Public Presentation for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Hamling, J.A., Kalenze, N.S., Glazewski, K.A., Gorecki, C.D, and Steadman, E.N., 2012, Bell Creek test site wellbore leakage data collection completed: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 4 Milestone 10 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2012-EERC-04-18, Grand Forks, North Dakota, Energy & Environmental Research Center, March.

Peck, W.D., Crotty, C.M., Knudsen, D.J., Sorensen, J.A., Gorecki, C.D., and Steadman, E.N., 2012, Geological characterization of the Basal Cambrian system in the Williston Basin: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 16 Deliverable D91 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2012-EERC-04-19, Grand Forks, North Dakota, Energy & Environmental Research Center, February.

Peck, W.D., Knudsen, D.J., Gorecki, C.D., and Steadman, E.N., 2011, Basal Cambrian static geological model completed: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 16 Milestone M34 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2012-EERC-04-07, Grand Forks, North Dakota, Energy & Environmental Research Center, December.

Pu, H., Hamling, J.A., Bremer, J.M., Bailey, T.P., Braunberger, J.R., Ge, J., Saini, D., Sorensen, J.A., Gorecki, C.D., Steadman, E.N., and Harju, J.A., 2011, Bell Creek test site – simulation report: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 9 Deliverable D66 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2012-EERC-04-21, Grand Forks, North Dakota, Energy & Environmental Research Center, August.

Pu, H., Hamling, J.A., Gorecki, C.D., and Steadman, E.N., 2012, Bell Creek test site – initiation of production and injection simulation: Plains CO_2 Reduction (PCOR) Partnership Phase III Task 4 Milestone M16 for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, EERC Publication 2012-EERC-04-10, Grand Forks, North Dakota, Energy & Environmental Research Center, April.

Progress Reports

Monthlies

Gorecki, C.D., Steadman, E.N., Peck, W.D., Daly, D.J., Botnen, L.S., Sorensen, J.A., Hamling, J.A., Jensen, M.D., Harju, J.A., Anagnost, K.K., and Klapperich, R.J., 2012, Plains CO_2 Reduction (PCOR) Partnership: Phase III monthly report (March 1–31, 2012) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, April.

Gorecki, C.D., Steadman, E.N., Peck, W.D., Daly, D.J., Botnen, L.S., Sorensen, J.A., Hamling, J.A., Jensen, M.D., Harju, J.A., Anagnost, K.K., and Klapperich, R.J., 2012, Plains CO_2 Reduction (PCOR) Partnership: Phase III monthly report (April 1–30, 2012) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, May.

Gorecki, C.D., Steadman, E.N., Peck, W.D., Daly, D.J., Botnen, L.S., Sorensen, J.A., Hamling, J.A., Jensen, M.D., Harju, J.A., Anagnost, K.K., and Klapperich, R.J., 2012, Plains CO_2 Reduction (PCOR) Partnership: Phase III monthly report (May 1–31, 2012) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592, Grand Forks, North Dakota, Energy & Environmental Research Center, June.

Quarterlies

Gorecki, C.D., Harju, J.A., Steadman, E.N., Romuld, L., Sorensen, J.A., Botnen, L.S., Daly, D.J., Hamling, J.A., Jensen, M.D., Peck, W.D., Klapperich, R.J., Anagnost, K.K., and Votava, T.J., 2012, Plains CO_2 Reduction Partnership Phase III: Task 13 Deliverable D58/59 quarterly technical progress report (January 1 – March 31, 2012) for U.S. Department of Energy National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-05NT42592 and North Dakota Industrial Commission Contract Nos. FY08-LX111-162 and G-015-030, Grand Forks, North Dakota, Energy & Environmental Research Center, April.

Meeting Minutes

Klapperich, R.J., 2012, Annual meeting minutes—Regional Carbon Sequestration Partnership Water Working Group annual meeting: Pittsburgh, Pennsylvania, May 3.

Klapperich, R.J., 2012, Minutes—Regional Carbon Sequestration Partnership Water Working Group conference call: May 31.

Klapperich, R.J., 2012, Minutes—Regional Carbon Sequestration Partnership Water Working Group conference call: June 28.

Other

Liu, G., Bailey, T.P., Klapperich, R.J., Botnen, L.S., Braunberger, J.R., Sorensen, J.A., Gorecki, C.D., and Steadman, E.N., 2012, Fort Nelson test site – history-matching and predictive simulation report: Plains CO_2 Reduction (PCOR) Partnership Phase III draft confidential Task 9 value-added technical report (c-47-E site) for SET, Grand Forks, North Dakota, Energy & Environmental Research Center, June.

PROJECT RECOGNITION

On June 29, 2012, the President of AAPG announced that the poster presentation entitled "Using Multiple-Point Statistics for Conditioning a Zama Pinnacle Reef Facies Model to Production History" was judged a "Top 10" Poster Presentation during the 2012 AAPG Annual Convention in Long Beach, California (Figure 6). The authors were commended for their presentation of significant content, reflecting originality, with outstanding organization and appearance. The authors will be listed in the May 2013 issue of the *AAPG Bulletin* and will also be acknowledged in the Annual Report of December 2013 *AAPG Bulletin*.

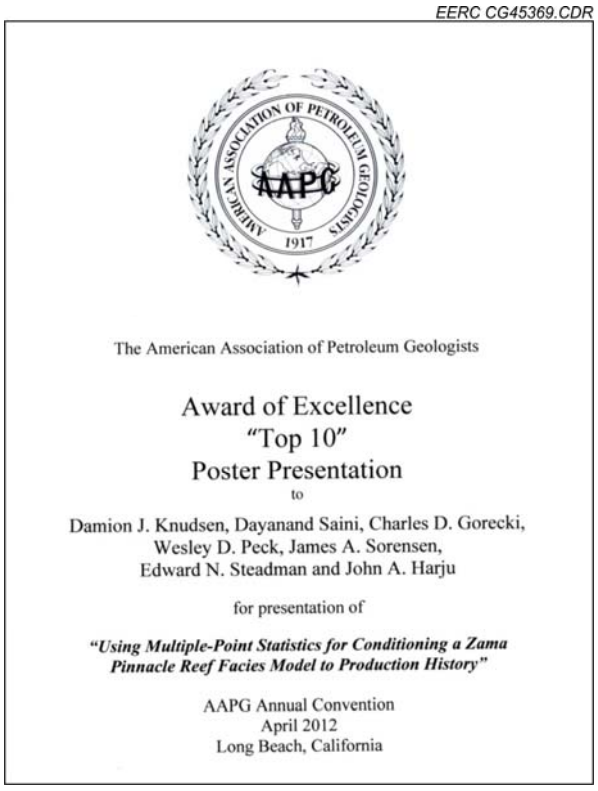

Figure 6. Certificate received for the AAPG Award of Excellence "Top 10" Poster Presentation at the 2012 AAPG Annual Convention in Long Beach, California.

MEETINGS/TRAVEL

Representatives from the PCOR Partnership attended and/or participated in the following 16 meetings/conferences, five training opportunities, and six project management site trips in this reporting period:

- April 1–7, 2012: Participated in the Schlumberger Information Solutions Petrel 2011 Fundamentals and Petrel 2011 Geophysics training classes in Houston, Texas.
- April 15–18, 2012: Attended the 18th SPE Improved Oil Recovery Symposium in Tulsa, Oklahoma.
- April 17–19, 2012: Attended and presented at the U.S.–Canada project meeting in Regina, Saskatchewan, Canada.
- April 17–21, 2012: Visited the Bell Creek Field site near Miles City, Montana.
- April 17–22, 2012: Participated in FLAC 3-D Modeling Training in Minneapolis, Minnesota.
- April 21–26, 2012: Attended and presented at the AAPG Annual Convention and Exhibition in Long Beach, California.
- April 23–29, 2012: Traveled to the Bell Creek area for another round of baseline sampling (Event 2).
- April 27 – May 3, 2012: Attended and presented at the 11th Annual CCUS Conference in Pittsburgh, Pennsylvania.
- May 9–13, 2012: Attended meetings with Denbury management at its headquarters in Plano, Texas.
- May 14–18, 2012: Presented at the US–Canada Clean Energy Dialogue 2 Bilateral Meeting on May 15 and at the MVA/MMV in Large-Scale CO_2 Injection Tests Workshop on May 16–17, both in Mobile, Alabama.
- May 17–18, 2012: Presented before the North Dakota Lignite Research Council on May 17 in Bismarck, North Dakota.
- May 16–18, 2012: Visited potential workshop locations for the Core Analysis Basics Workshop scheduled for September 11, 2012, in Milwaukee, Wisconsin.
- May 21–24, 2012: Attended and hosted an exhibit booth at the WBPC in Bismarck, North Dakota.
- May 22–26, 2012: Attended a Schlumberger training course entitled “Petrel 2011 Geology” in Bakersfield, California.
- May 29, 2012: Visited the Phase II Lignite field validation test site to check on site closure and reclamation status near Kenmare, North Dakota.
- June 2–6, 2012: Participated in the IOGCC Mid-Year Meeting in Vancouver, British Columbia, Canada.
- June 3–5, 2012: Participated in the Teacher Training Institute entitled “The Changing Face of North Dakota” cosponsored by the North Dakota Geographic Alliance and PPB in Dickinson, North Dakota.
- June 4–7, 2012: Participated in CMG simulation training entitled “2-Day History-Matching & Optimization (CMOST)” in Houston, Texas.
- June 10–15, 2012: Participated in the CSLF Meetings of the Technical Group and Technical Workshop in Bergen, Norway.

- June 14 and 27, 2012: Visited the Phase II Lignite field validation test site to check on site closure and reclamation status near Kenmare, North Dakota.
- June 15–26, 2012: Traveled to the Bell Creek Field to visit landowners and conduct Event 3 groundwater, soil gas, and surface water sampling in southeastern Montana.
- June 18–21, 2012: Presented at the CMG Technical Symposium in Calgary, Alberta, Canada.
- June 18–22, 2012: Participated in the IEAGHG 2nd Network Meeting in Santa Fe, New Mexico.
- June 22–28, 2012: Participated in the ISRM–ARMA Workshop on Petroleum Geomechanics Testing and the 46th ARMA Symposium in Chicago, Illinois.
- June 26–29, 2012: Presented at the CFE/APEC Workshop, Introducing CCS in Earth Sciences in Mexico City, Mexico.

Materials presented at these meetings are available to partners on the PCOR Partnership DSS Web site (www2.undeerc.org/website/pcorp/).

REFERENCES

None.