



PLAINS CO₂ REDUCTION PARTNERSHIP PHASE III

Quarterly Technical Progress Report Task 13 – Deliverable D58/D59

(for the period January 1 – March 31, 2012)

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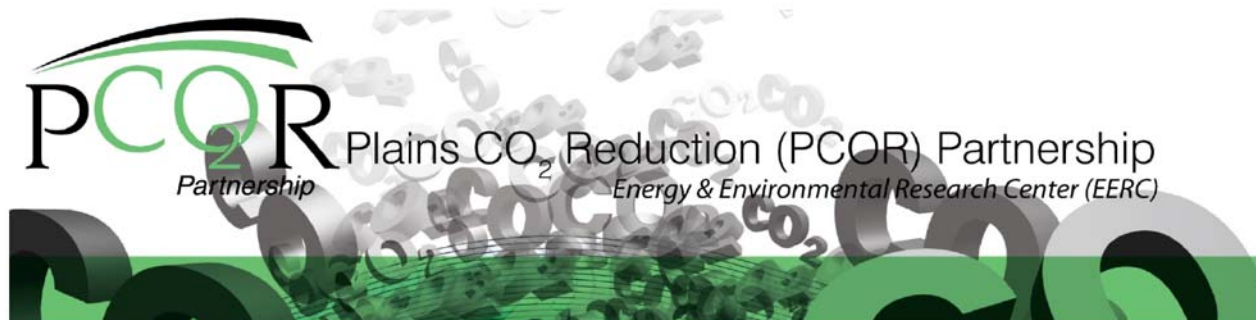
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PLAINS CO₂ REDUCTION PARTNERSHIP PHASE III

Quarterly Technical Progress Report

January 1 – March 31, 2012

EXECUTIVE SUMMARY

The Plains CO₂ 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 (CO₂) into deep geologic formations for CO₂ 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 January 1, 2012, through March 31, 2012.

The EERC and Prairie Public Broadcasting (PPB) personnel visited the Fort Nelson test site, and the Fort Nelson gas-processing plant, located in British Columbia, Canada, at the end of February. Film footage and photographic images were taken in and around the Fort Nelson area and included aerial footage taken from a helicopter. The film footage is planned for use in a documentary due in 2015. Activities to process the data and core samples received during the Bell Creek monitoring well (0506 OW) installation continued during this reporting period.

The first PCOR Partnership Technical Advisory Board meeting was held on February 14 and 15, 2012. Nine board members were chosen, and all were present at the meeting where an overview of program activities and goals was discussed. The results and recommendations of the board will be reported to the partnership at the upcoming annual meeting. The PCOR Partnership Annual Meeting and Workshop will be held in Milwaukee, Wisconsin, at the InterContinental Hotel on September 11–13, 2012. All partners are encouraged to attend.

The second of three detailed area characterizations was completed in March 2012 on the Rival oil field located in northwestern North Dakota (Burke County). Also of note, outreach and education activities continue to increase. An invitation was received to present at the North Dakota Geographic Alliance's teacher training June 2012. This training plus the Lignite Energy Council and North Dakota Petroleum Council seminars will reach over 200 area teachers.



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INTRODUCTION

The Plains CO₂ 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 December 31, 2011, 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
UND EERC	Great River Energy	Oil and Gas Research Council
Abengoa Bioenergy New Technologies	Halliburton	North Dakota Natural Resources Trust
Air Products and Chemicals	Hess Corporation	North Dakota Petroleum Council
Alberta Department of Energy	Huntsman Corporation	North Dakota Pipeline Authority
Alberta Department of Environment	Husky Energy Inc.	Otter Tail Power Company
Alberta Innovates – Technology Futures	Interstate Oil and Gas Compact Commission	Oxand Risk & Project Management Solutions
ALLETE	Indian Land Tenure Foundation	Petroleum Technology Research Centre
Ameren Corporation	Iowa Department of Natural Resources	Petroleum Technology Transfer Council
American Coalition for Clean Coal Electricity	Lignite Energy Council	Pinnacle, a Halliburton Service
American Lignite Energy	Manitoba Geological Survey	Prairie Public Broadcasting
Apache Canada Ltd.	Marathon Oil Company	Pratt & Whitney Rocketdyne, 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	Weatherford Advanced Geotechnology
Eagle Operating, Inc.	Division of Community Services	Western Governors' Association
Eastern Iowa Community College District	North Dakota Department of Health	Westmoreland Coal Company
Enbridge Inc.	North Dakota Geological Survey	Williston Basin Interstate Pipeline Company
Encore Acquisition Company	North Dakota Industrial Commission	Wisconsin Department of Agriculture, Trade and Consumer Protection
Energy Resources Conservation Board/Alberta Geological Survey	Department of Mineral Resources, Oil and Gas Division	Wyoming Office of State Lands and Investments
Environment Canada	North Dakota Industrial Commission	Xcel Energy
Excelsior Energy Inc.	Lignite Research, Development and Marketing Program	

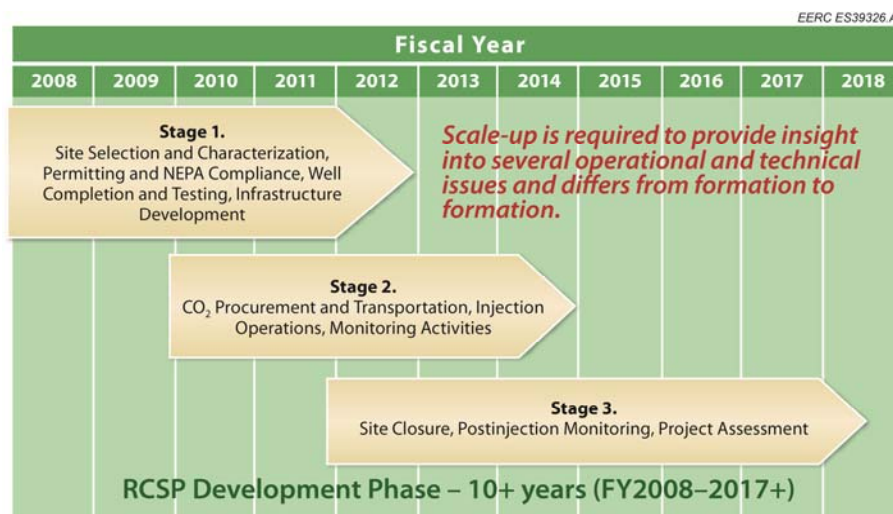


Figure 1. RCSP development phase: scaling up toward commercialization (figure taken from DOE NETL).

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 (CO₂), 2) facilitate the development of the infrastructure required to transport CO₂ 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 CO₂, 5) establish a technical framework by which carbon credits can be monetized for CO₂ stored in geologic formations, 6) continue collaboration with other RCSPs, and 7) provide outreach and education for CO₂ capture and storage stakeholders and the general public.

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 CO₂ injection volumes. A programmatic RCSP Phase III goal is the injection of approximately 1 million tons of CO₂ a year into at least one regionally significant geologic formation. Each of the RCSP's large-volume injection tests is designed to demonstrate that CO₂ storage sites have the potential to store regional CO₂ 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's (Spectra'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 CO₂ 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 CO₂ storage. During Phase III, the PCOR Partnership will continue to refine storage resource estimates and evaluate other factors relevant to regional storage goals.

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) CO₂ 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), CO₂ 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.

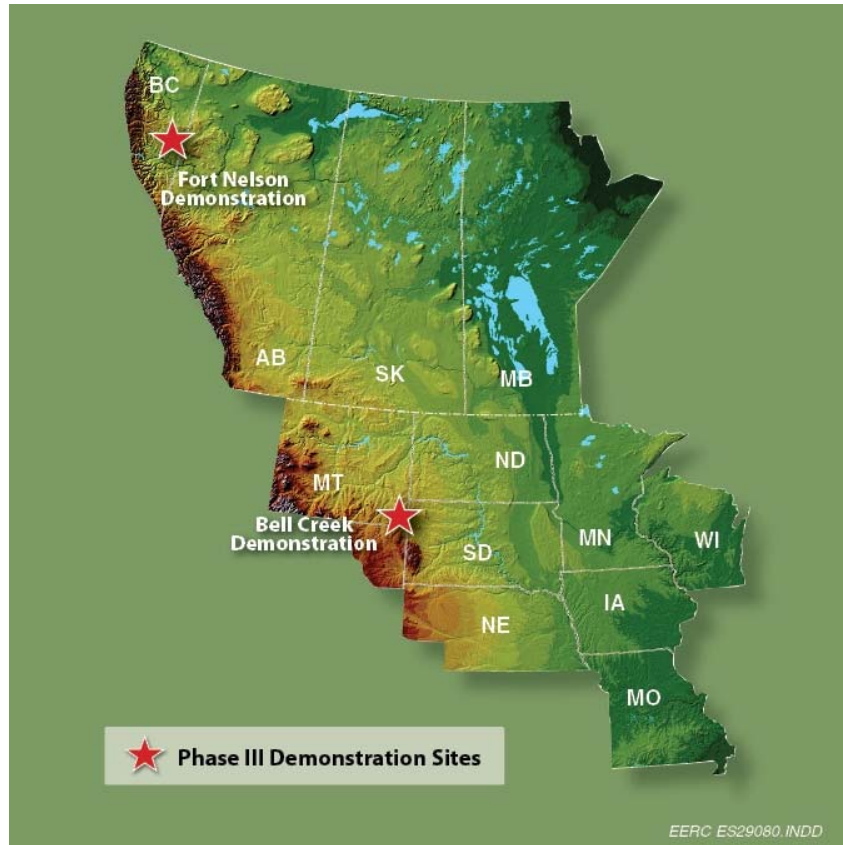


Figure 2. PCOR Partnership Phase III demonstration sites.

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:

- Submitted Deliverable (D) 81, PCOR Partnership Atlas, 4th edition, on January 31, 2012.
- The task leader was named the point of contact for the upcoming DOE fourth atlas.
- Uploaded to DOE's SharePoint site on March 29 the PCOR Partnership's text and images for the next version of the DOE atlas.
- Participated in a WebEx on January 24 regarding the North American atlas.
- Gave a presentation on the PCOR Partnership Program during the CCS Technologies II Track at the Energy, Utility & Environment Conference (EUEC) 2012 on January 31, 2012, in Phoenix, Arizona.
- Gave a tour of the EERC to Schlumberger visitors who were in Grand Forks to visit the core library.
- Planning is under way for an update to the oil and gas field storage values for the PCOR Partnership region.
- Began modification of the GIS (geographic information system) portion of the Partners-Only Web site to add functionality for information on oil fields in the region.
- Continued reviewing the U.S. Environmental Protection Agency's (EPA's) CO₂ sources data provided by NATCARB (the National Carbon Sequestration Database and Geographic Information System).
- Continued efforts on the Rival Field characterization (Figure 3), including the following:
 - Continued preparation of three posters for the upcoming American Association of Petroleum Geologists (AAPG) 2012 Annual Convention and Exhibition scheduled for April 22–25 in Long Beach, California.
 - Discussed in-house the Rival CO₂ Prophet model history-matching results.
 - Submitted D5 entitled "Site Characterization and 3-D Geologic Modeling of the Rival Field (Second Target Area Completed)" on March 30.

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 2 – Public Outreach and Education

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

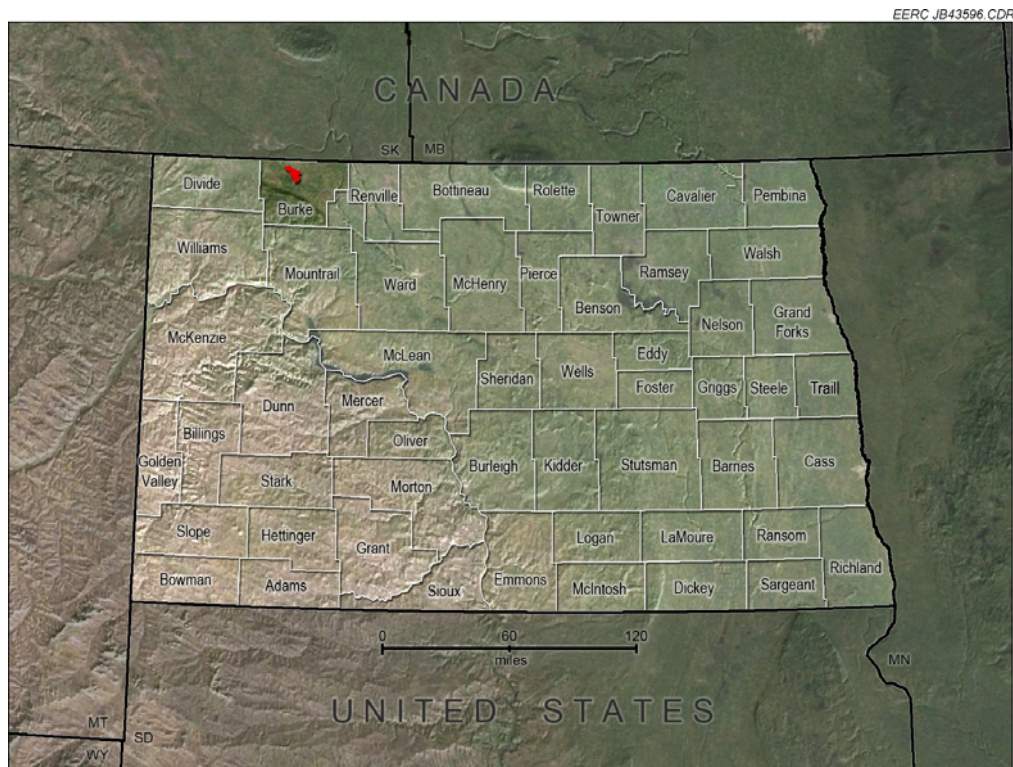


Figure 3. Location of the Rival Field in Burke County, North Dakota.

- EERC employees attended 14 conferences/meetings, exposing external participants to the PCOR Partnership name, messaging, and informational materials. Specifically, the PCOR Partnership outreach activities included eight oral presentations. The following quantities of outreach materials were distributed:
 - PCOR Partnership documentary entitled “Nature in the Balance: CO₂ Sequestration” – 44
 - PCOR Partnership documentary entitled “Reducing Our Carbon Footprint: The Role of Markets” – 50
 - PCOR Partnership documentary entitled “Out of the Air – Into the Soil” – 44
 - PCOR Partnership documentary entitled “Managing Carbon Dioxide: The Geologic Solution” – 61
 - PCOR Partnership documentary entitled “Global Energy and Carbon: Tracking Our Footprint” – 50
 - PCOR Partnership Atlas 3rd Edition, Revised – 52
- Wrapped up filming in January at the monitoring well installation at the Bell Creek site.
- Continued to review Prairie Public Broadcasting (PPB) and EERC film footage from the Bell Creek 0506 OW monitoring well.
- On January 8, permission was granted to Swedish Television for the use of PCOR Partnership documentary footage in a television short regarding Biorecro (<http://biorecro.com>).

- Received another request from a Swedish communication company to use PPB video materials in a film being prepared on Biorecro for the Royal Institute for Technology in Stockholm, Sweden.
- Received a request on February 15 from the Smithsonian Astro Observatory to use various video clips in an educational video. PPB responded with the guidelines for use.
- Continued to compile data on K–12 schools in the PCOR Partnership region.
- Accepted an invitation to present before 50 educators at the North Dakota Geographic Alliance (NDGA) teacher workshop in June 2012.
- Supported the efforts of NDGA to arrange tours of the Great Plains Synfuels Plant and Antelope Valley Station as part of its June meeting.
- Accepted an invitation to speak at the Lignite Energy Council teacher seminar in June 2012.
- Accepted an invitation to participate in the Petroleum Technology Research Centre's (PTRC's) Aquistore advisory group.
- Participated PTRC's semimonthly Aquistore advisory group conference calls. Topics discussed included a Canadian government funding announcement that is anticipated in early March and a community open house anticipated for early April. Continued efforts to compile a "fact book" for the Bell Creek region for local Bell Creek project outreach.
- Continued efforts to develop an outreach vision for the Bell Creek project, including discussions with Denbury Onshore, LLC (Denbury), during its visit to the EERC on February 2.
- Submitted D18 entitled "Bell Creek Test Site PowerPoint Presentation – Update 1" on March 30.
- Coordinated preparations for the Fort Nelson site visit with PPB, which occurred the week of February 27.
- Received raw film footage and photos taken by PPB during the trip to Fort Nelson.
- Continued efforts to finalize the Fort Nelson poster (D26).
- Continued efforts to implement use of the outreach tracking database.
- Continued to develop outreach materials to address natural storage of CO₂, gas field chemical composition, unconventional oil and gas resources, and related topics.
- Drafted and submitted abstracts to the International Conference on Greenhouse Gas Technologies (GHGT-11) on behalf of the RCSP Outreach Working Group (OWG) and the PCOR Partnership Program.
- Continued preparation of a poster on behalf of the RCSP OWG for the upcoming 11th Annual Carbon Capture, Utilization & Sequestration (CCUS-11) Conference scheduled for April 30 – May 3 in Pittsburgh, Pennsylvania.
- Participated in the RCSP OWG monthly conference calls.
- Continued efforts to update the public Web site (D13), and held weekly in-house progress meetings.



Figure 4. Jim Sorensen (EERC; second from the right) and Frode Tilden and Matt Olien (PPB; far left and far right, respectively) at the Fort Nelson site filming microfrac activities. Photo courtesy of Dave Moffatt (Spectra).

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:

- Reviewed materials in preparation for a North Dakota CO₂ Storage Workgroup meeting/conference call.
- Participated in a meeting of the North Dakota CO₂ Storage Workgroup to review and provide comment on North Dakota's new draft rules for CO₂ storage. North Dakota is rewriting its rules in an effort to obtain primacy from EPA for Class VI wells.
- Provided input and comments to the North Dakota Industrial Commission (NDIC) Oil and Gas Division on its draft Class VI rules.
- Participated in a conference call with Spectra staff to discuss and provide comment on the Canadian Standards Association (CSA) standard for geologic storage.
- Participated in Alberta's Stakeholder Review of Draft Quantification Protocol for Fuel Switching in Mobile Equipment webinar.

- Attended the Groundwater Protection Council 2012 Underground Injection Control (UIC) Conference held January 23–25, 2012, in Houston, Texas (www.gwpc.org/meetings/uic/uic.htm). Had discussions regarding North Dakota's attempt to obtain primacy for Class VI well and various other CCS-related issues with UIC regulators from the PCOR Partnership region and beyond.
- Began a more thorough, 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.
- Reviewed information regarding the North American Climate Exchange, which is a Calgary-based offset exchange that will launch a new platform for trading carbon offset credits in mid-March.
- Continued planning for the 4th Annual Regulatory Roundup meeting to be held this summer in Deadwood, South Dakota.
- Discussed PCOR Partnership activities with a prospective partner during a visit to the EERC.
- 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:

- Awaiting approval of an Interstate Oil and Gas Compact Commission (IOGCC) add-on proposal related to research on operational and postoperational liability issues. Prepared additional information upon request from the DOE project manager.

Task 4 – Site Characterization and Modeling

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

- Continued preparation of a technology assessment on the geomechanical modeling options available.
- **Bell Creek** test site activities included the following:
 - Prepared for an in-house meeting February 1–2 with staff from Denbury to discuss the data collected from the monitoring well and to discuss this year's characterization and monitoring plans.
 - Held an in-house Bell Creek project update meeting on February 6.
 - Began work on a Bell Creek poster for the upcoming CCUS-11 conference.
 - Continued developing a plan for a full-field geologic model of the test site.
 - Continued work on the geomechanical modeling.
 - 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 M10 entitled "Bell Creek Test Site Wellbore Leakage Data Collection" on March 12.

- Continued EERC laboratory testing on sidewall cores from the 0506 OW monitoring well, including the following activities:
 - ◆ Completed 18 thin sections and began analysis.
 - ◆ Completed Dean Stark extraction on five of the nine prioritized samples.
 - ◆ Completed x-ray diffraction (XRD) for all nine prioritized samples, and analysis is under way.
 - ◆ Completed porosity and bulk volume tests.
 - ◆ Initiated permeability measurements.
- Staff traveled to Denver to view slabbed, full-diameter core and to finalize the test matrix for 0506OW full-diameter core.
- Began development of a scope of work for additional samples collected from the U.S. Geological Survey (USGS) Core Research Center in Denver, Colorado.
- **Fort Nelson** test site activities included the following:
 - Continued the multimineral analysis of the Fort Nelson wells using Techlog, the results of which will be used toward development of the latest version of the static geologic model of the Fort Nelson area.
 - Continued work on the development of the latest updated version of the static geologic model using data generated in 2011.
 - Submitted the site characterization report (D65/M29) on January 31, 2012.
 - Continued correlating geomechanical data with reservoir properties to construct the geomechanical static model with Petrel.
 - Continued work on the geochemical report (D41/M32, due April 30, 2012).
 - Continued development of the scopes of work for each of the key activities to be undertaken by the EERC through year end.
 - Held an in-house project update meeting on February 13.
 - Held the monthly Fort Nelson conference call on February 23. Topics discussed included a brief modeling update; the upcoming (March) DOE meeting; potential dates for the quarterly project meeting in Grand Forks; and the trip to Fort Nelson for filming.
 - Traveled with PPB to Fort Nelson, British Columbia, Canada, to visit the proposed demonstration site, the gas-processing plant, and the general area and to capture video footage for use in a future documentary.
 - Reviewed information for potential inclusion on the public Web site.
 - Completed work on a quarterly update requested by the Carbon Sequestration Leadership Forum (CSLF).
 - Participated in a project update meeting on March 20 along with Spectra at DOE NETL headquarters. The following items were discussed:
 - ◆ Spectra's business plan for the Fort Nelson project.
 - ◆ Spectra's schedule for the project, including a new target date for injection in the third quarter of 2016.
 - Held an in-house project update meeting on March 26. Topics discussed included the following:
 - ◆ Summary of the Pittsburgh meeting with DOE and Spectra.
 - ◆ Status of the modeling activities.
 - ◆ Status of the geochemical report.

- ◆ Potential future technical meetings in Grand Forks with Spectra.

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

- Spectra announced a new target date for injection (M25) at the Fort Nelson site in the third calendar quarter of 2016. This is a delay from the currently scheduled injection date of April 30, 2014.

Task 5 – Well Drilling and Completion

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

- Completed drilling, coring, logging, and permanent downhole monitoring (PDM) equipment installation at the Bell Creek observation well, 0506 OW, on January 10, 2012.
- Performed an operational check of PDM systems after installation.
- Installed wellhead assembly and performed cased-hole cement-bond logs.
- Compiled an archive of data and samples obtained from the monitoring well.
- Completed analysis of all soil gas and water samples from the first round of baseline surface monitoring, verification, and accounting (MVA) work.
- Continued preparations for the next round of soil gas and water baseline sampling at the Bell Creek Field.
- Held an in-house meeting February 1–2 with staff from Denbury to discuss the data collected from the monitoring well and to discuss upcoming characterization and monitoring plans.
- Communicated with partners (Denbury and Halliburton) on well log processing.
- Met with representatives from Pinnacle on February 21 to discuss the microdeformation monitoring potential for Bell Creek.
- Completed installation of surface building over monitor wellhead to house surface-monitoring equipment.
- Held an in-house Bell Creek project update meeting on March 8.
- Continued planning for electrical installation of PDM equipment on Monitoring Well 0506 OW.
- Continued planning for an upcoming well log review meeting with Denbury and Halliburton in Plano, Texas.

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

- The electrical installation of PDM has been delayed until approximately April 14–22.
- Submitted information via e-mail on February 17, requesting additional funding for cost overruns associated with drilling, coring, logging, and completion of a deep monitoring well in the Bell Creek Field.



Figure 5. Bell Creek Monitoring Well 0506 OW.

Task 6 – Infrastructure Development

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

- Submitted an abstract on the phased pipeline network approach for submittal to GHGT-11 in Japan in November 2012.
- Continued testing the interactive technology tree on the PCOR Partnership Decision Support System (DSS, © 2007–2012 EERC Foundation®).
- Continued work on an interactive compression technology tree for the DSS.
- Continued work on D84, a report entitled “A Phased Approach to Building a Pipeline Network for CO₂ Transport During CCUS.” Activities included the following:
 - Researched three analogs (the U.S. natural gas pipeline system, the electrical grid, and the U.S. interstate highway system) to identify methods that were used to develop those networks.
 - Updated the CO₂ emission in the PCOR Partnership database to incorporate combustion-related CO₂ 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.
 - Developed a revised decision tree for pipeline network planning, and began estimating CO₂ emissions for clusters of sources as well as the storage capacity of geological sinks. Forecasts will be made to assist with determining the pipeline route and capacity needs at various points in the future.
- Responded to a partner’s questions about various capture technologies that made the news recently.

- Worked with a partner to address the partner's needs for materials that can be distributed at public meetings during which CCUS will be discussed.

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 – CO₂ Procurement

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

- Participated in ongoing project discussions with Denbury, including at a meeting held February 1 and 2 at the EERC.

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:

- Reviewed information about surface facilities and attended the surface facilities discussion with Denbury during its visit to the EERC.
- An overview of CO₂ phase behavior and types of CO₂-processing facilities used at oil fields was presented to interested PCOR Partnership and EERC staff members. The information presented was learned while attending the John M. Campbell CO₂ Surface Facilities course last fall.

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:

- Modeling staff participated on January 24–25 in an abstract review meeting for CCUS-11 scheduled for May 2012 in Pittsburgh, Pennsylvania.
- Held an in-house modeling and simulation meeting on March 12.

- Participated in the RCSP Risk-Sim Conference Call on March 27.
- Welcomed Jim Erdle, Computer Modelling Group (CMG), to the EERC on March 29. Topics discussed included the Bell Creek, Fort Nelson, and Zama history-matching activities using CMG software.
- Began a literature review of software integration for geomechanical modeling and simulation.
- Continued **Bell Creek** site activities, including the following:
 - Continued work on history matching.
 - Submitted two abstracts on the Bell Creek project for GHGT-11 Conference in Kyoto, Japan, in November.
 - Submitted an abstract on the Bell Creek project for CCUS-11.
 - Began work on obtaining waterflood history matching for the Bell Creek CO₂ Prophet model.
 - Continued planning for the Bell Creek risk assessment.
 - Continued work on the 1-D mechanical earth model (MEM).
- Continued **Fort Nelson** site activities, including the following:
 - Held a conference call with Nakles Consulting to discuss the development of the site MVA plan.
 - Continued development of the two-track deep geological system MVA plan.
 - Continued working on the existing geomechanical data; construct and correlate for the MEM in Petrel.

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

- D67, Fort Nelson Test Site – Simulation Report, was provided to Spectra in September 2011 for its review and comment.

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. The report for the previous program year is available on the partners-only Web site (www2.undeerc.org/website/pcorp/ProductsDB/pdfs/ENS_D57_Task12_Dec10.pdf).

Task 13 – Project Management

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

- Hosted the inaugural PCOR Partnership Technical Advisory Board (TAB) meeting February 15 and 16, 2012, in San Diego, California.
- A new milestone (M36 – Annual Advisory Board Meeting Scheduled) has been added to the Gantt chart at Task 13 and is due by March 31 each year, beginning with 2012.
- Submitted M36, TAB meeting scheduled, on March 28.
- Participated in a post-TAB conference call with the board chairman.
- C12 Energy, Inc., joined the PCOR Partnership on March 28, 2012.
- Continued preparations for the 2012 annual meeting. The place is Milwaukee; the dates are September 11–13; the venue is the InterContinental Hotel (www.intercontinentalmilwaukee.com/); the evening event is planned for the Harley-Davidson Museum (www.harley-davidson.com/wcm/Content/Pages/HD_Museum/Museum.jsp).
- Plans are under way to contact a Milwaukee-area geologist familiar with the Schoonmaker Reef (a Silurian-age tropical reef similar to the geology of the Fort Nelson area) and to develop a core analysis workshop and field trip in conjunction with the annual meeting.
- Held an in-house group update meeting on January 26.
- Held in-house task leader meeting on March 7.
- Participated in a WebEx on January 17 regarding the North American Carbon Atlas Partnership (NACAP)-6 meeting.
- Participated in the DOE NACAP-6 meeting in Mexico. Other U.S. attendees included Bob Wright, Daniel Soeder, and Tim Carr.
- Welcomed Neeraj Gupta, along with other representatives from the Midwest Regional Carbon Sequestration Partnership (MRCSP), Battelle, and Core Energy, to the EERC on January 25. Topics discussed included program overviews for the PCOR Partnership and MRCSP; an overview of the MRCSP Phase III project in Michigan; and detailed topical discussions on the Zama Field and other carbonate rock injection projects.
- Provided information upon request from DOE on CO₂ reservoir monitoring/surveillance.
- Provided information upon request from DOE on the Phase II Zama project and the fact that CO₂ was stored in the oil fields.
- Provided a letter confirming completion in January 2012 of the Bell Creek monitoring well upon request from DOE.
- Presented at the Carbon Management Technologies Conference (CMTC) held February 7–9 in Orlando, Florida, including the following titles:
 - “A Risk-Based Monitoring Plan for the Fort Nelson Feasibility Project”
 - “Integrating CO₂ EOR and CO₂ Storage in the Bell Creek Oil Field”
 - “Addressing Carbon Capture, Utilization, and Storage Across the Central Interior of North America” (poster)
- Submitted 11 abstracts for GHGT-11 (Kyoto).

- Abstracts submitted January 20 for CCUS-11 (Pittsburgh) were accepted and included the following titles:
 - “Overview of the Bell Creek Combined CO₂ Storage and CO₂ EOR Project” (for poster)
 - “CO₂ Storage Resource Potential of the Cambro-Ordovician Saline System in the Western Interior of North America” (oral presentation)
 - “Overview, Status, and Future of the Fort Nelson CCS Project” (oral presentation)
- Submitted three abstracts to the 34th International Geological Congress scheduled for August 5–10 in Brisbane, Australia.
- Participated in a conference call with DOE and Spectra on February 23 to discuss the upcoming meeting scheduled for March 20 in Pittsburgh.
- Participated in a meeting with personnel from Spectra and DOE on March 20 in Pittsburgh, Pennsylvania.
- In response to requests received from the CSLF Secretariat, updates were prepared for both the Fort Nelson CCS Project and the Zama Acid Gas EOR, CO₂ Sequestration, and Monitoring Project for inclusion in the March 2012 Strategic Plan Implementation Report.
- Traveled to Denver, Colorado, to attend the North Dakota Petroleum Council (NDPC) Spring Social on March 14.
- Management staff presented at the Workshop of CO₂ Geological Storage and EOR in Mexico City. In addition, the attendees viewed the “Managing Carbon Dioxide: The Geologic Solution” documentary.
- Provided documentary DVDs and PCOR Partnership Atlases to the Nebraska Public Power District (NPPD) for upcoming public information meetings (the first meeting was held March 16).
- Received a request from NPPD for additional PCOR Partnership Atlases for use at upcoming public meetings scheduled in April.
- Submitted proposal letter via e-mail on December 15, 2011, to reallocate the \$1.5 million formerly budgeted for a Bell Creek environmental impact statement (which is no longer necessary).
- Submitted an additional proposal letter via e-mail on February 10 to reallocate the \$1.5 million formerly budgeted for a Bell Creek environmental impact statement (which is no longer necessary) and add IOGCC activities to the scope of work for Task 3.
- Hosted visitors from partner North American Coal Corporation on March 2 to discuss project activities.
- Deliverables and milestones completed in January:
 - December monthly update
 - Task 1: D81 – Regional Carbon Sequestration Atlas (Update)
 - Task 4: D65/M29 – Fort Nelson Test Site – Site Characterization Report
 - Task 13: D58/D59 – Quarterly Progress Report/Milestone Quarterly Report
 - Task 14: M23 – Monthly WWG Conference Call Held
- Deliverables and milestones completed in February:
 - January monthly update
 - Task 16: D91 – Report – Geological Characterization of the Basal Cambrian System in the Williston Basin

- Task 14: M23 – Monthly WWG Conference Call Held
- Deliverables and milestones completed in March:
 - February monthly update
 - Task 1: D5 – Site Characterization and 3-D Geologic Modeling of the Rival Field (Second Target Area Completed)
 - Task 2: D18 – Bell Creek Test Site PowerPoint Presentation (Update 1)
 - Task 4: M10 – Bell Creek Test Site Wellbore Leakage Data Collection Completed
 - Task 13: M36 – Annual Advisory Board Meeting Scheduled
 - 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:

- Continued synthesizing comments on the NATCARB Brine Viewer.
- Held the monthly conference call on January 19.
- Continued revisions to the WWG Interest Inventory.
- Drafted an e-mail to check with WWG members as to whom the interest survey should be sent.
- Held the monthly conference call on February 28.
- Distributed the January WWG conference call minutes on February 6.
- Held the monthly conference call on March 27.
- Distributed the March 27 monthly conference call minutes on April 4.
- Began planning for the April monthly conference call.
- Formalized the Interest Inventory Plan with the WWG members, and distributed it to the members for testing.
- Continued planning for the annual meeting to be held the afternoon of May 3 following CCUS-11 in Pittsburgh, Pennsylvania.
- Began identifying potential guests for the annual meeting.

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, CO₂ Storage, and Monitoring Project

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

- Presented on the Zama Project to the MRCSP members meeting at the EERC on January 25.
- Participated in a project discussion on January 19 with Apache Canada at its offices in Calgary.
- Provided follow-up information (from the January 19 meeting in Calgary) to Apache Canada.
- Submitted an abstract on dynamic modeling to GHGT-11 on February 8.
- Worked on the conditional static geologic model construction.
- Imported the newly conditioned static geologic model to GEM and worked on the construction of the dynamic model.
- Completed work on the Zama dynamic model for prediction runs.
- Prepared a quarterly update as requested by CSLF.
- Continued development of a public outreach brochure on the Zama project.
- Reviewed project information for potential inclusion on the public Web site.
- Continued working on the construction of the dynamic model and running simulations for history match using new conditioned static realizations. Purpose of the simulations is to determine more accurate original oil in place and acid gas storage capacity estimates for the F-pool.
- Began preparation of a poster for the upcoming AAPG 2012 Annual Convention and Exhibition scheduled for April 22–25 in Long Beach, California.

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 Statement of Project Objectives (SOPO). The EERC has begun preparation of 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.

Task 16 – Characterization of the Basal Cambrian System

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

- Submitted D91 report entitled “Geological Characterization of the Basal Cambrian System in the Williston Basin” on February 29.
- Scheduled a joint project meeting in Regina for April 18.

- Continued preparations for the upcoming joint U.S. and Canada project meeting scheduled for April 18 in Regina, Saskatchewan, Canada.
- Continued work on the 3-D model, with plans for completion by early June.
- Continued work on the well test for DST (drill stem test) analysis.
- Completed review of nearly 300 North Dakota well files with respect to harvesting data for the well integrity aspect of the Basal Cambrian study.
- Began analysis of the well data for inclusion in a risk assessment matrix.

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

- Collection and analysis of the core plugs took longer than originally anticipated; however, the overall development of the 3-D model should not be delayed.

PHASE III COST STATUS

The approved BP4 (Modification No. 21) 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 6 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*	55,979,431	17,268,450
Nonfederal Share – Cash	2,411,971	1,356,722
Nonfederal Share – In-Kind	17,400,865	17,025,586
Total	75,792,267	35,650,758

*Does not include \$1.5M for environmental impact statement.

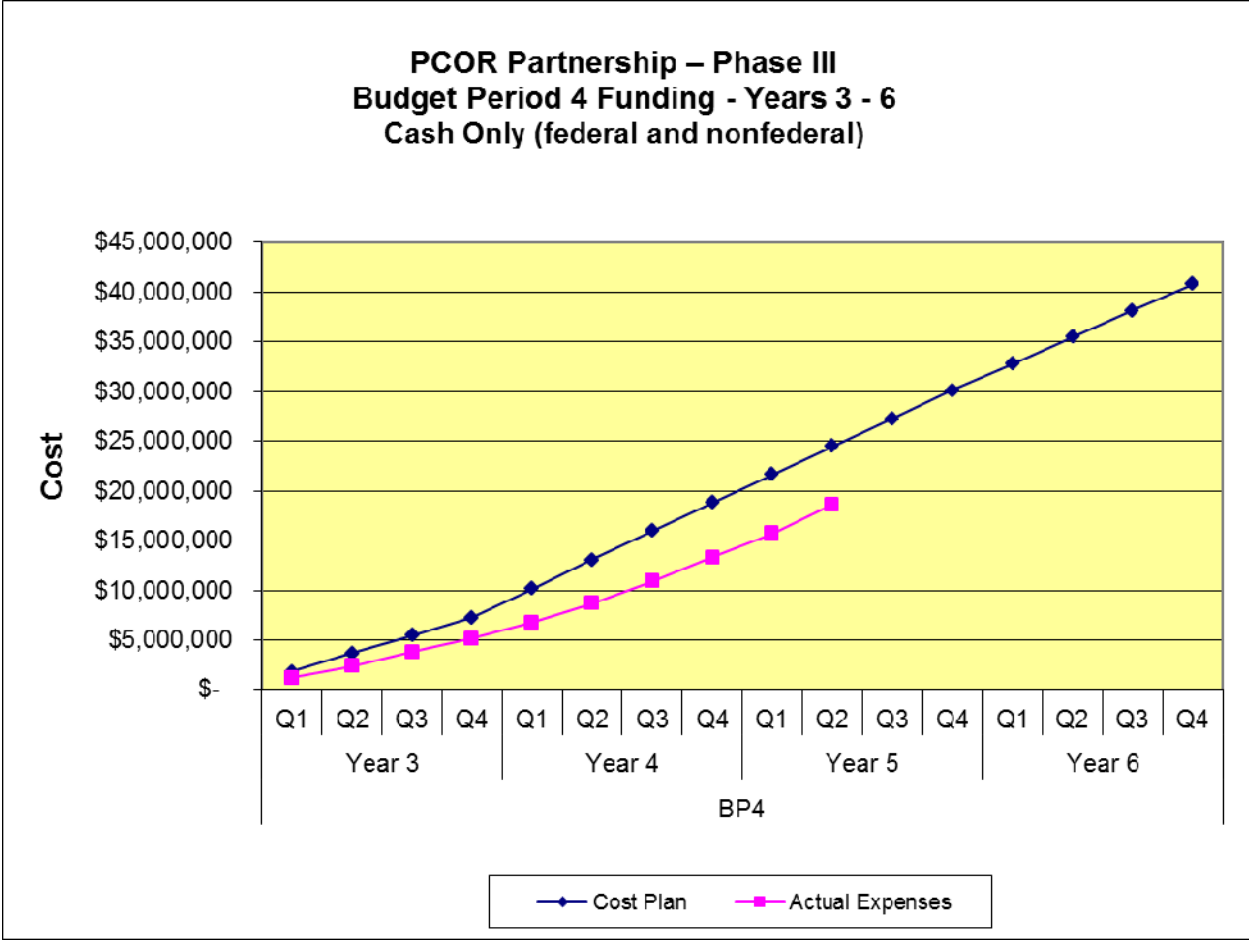


Figure 6. PCOR Partnership Phase III, BP4 – Years 3–6 funding (cash only).

Table 4. BP4 – Years 3–6 Spending Plan

Baseline Reporting Quarter	Year 3								Year 4							
	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

Baseline Reporting Quarter	Year 5								Year 6							
	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	\$ 2,671,493	\$ 28,288,341	\$ 2,532,430	\$ 30,820,771	\$ 2,532,430	\$ 33,353,201	\$ 2,532,430	\$ 35,885,630	\$ 2,532,430	\$ 38,418,060
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	\$ 2,823,922	\$ 30,119,572	\$ 2,677,615	\$ 32,797,187	\$ 2,677,615	\$ 35,474,802	\$ 2,677,615	\$ 38,152,416	\$ 2,677,615	\$ 40,830,031
Actual Incurred Cost																
Federal Share	\$ 2,255,269	\$ 14,506,115	\$ 2,762,335	\$ 17,268,450												
Nonfederal Share	\$ 160,751	\$ 1,222,584	\$ 134,138	\$ 1,356,722												
Total Incurred Cost	\$ 2,416,020	\$ 15,728,699	\$ 2,896,473	\$ 18,625,172												
Variance																
Federal Share	\$ 416,224	\$ 5,767,749	\$ (90,843)	\$ 5,676,906												
Nonfederal Share	\$ (8,322)	\$ 151,360	\$ 18,291	\$ 169,651												
Total Variance	\$ 407,902	\$ 5,919,109	\$ (72,552)	\$ 5,846,557												

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	
D41: Task 4 – Fort Nelson Test Site – Geochemical Report	4/30/12	
M32: Task 4 – Fort Nelson Geochemical Report Completed	4/30/12	
D86: Task 15 – Updated Regional Implementation Plan for Zama	4/30/12	
M23: Task 14 – Monthly WWG Conference Call Held	4/30/12	
D17: Task 2 – General Phase III Information PowerPoint Presentation (Update)	5/31/12	
M23: Task 14 – Monthly WWG Conference Call Held	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	
D84: Task 6 – Report – A Phased Approach to Building Pipeline Network for CO ₂ Transportation During CCS	6/30/12	
M23: Task 14 – Monthly WWG Conference Call Held	6/30/12	
M24: Task 14 – WWG Annual Meeting Held	6/30/12	
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)

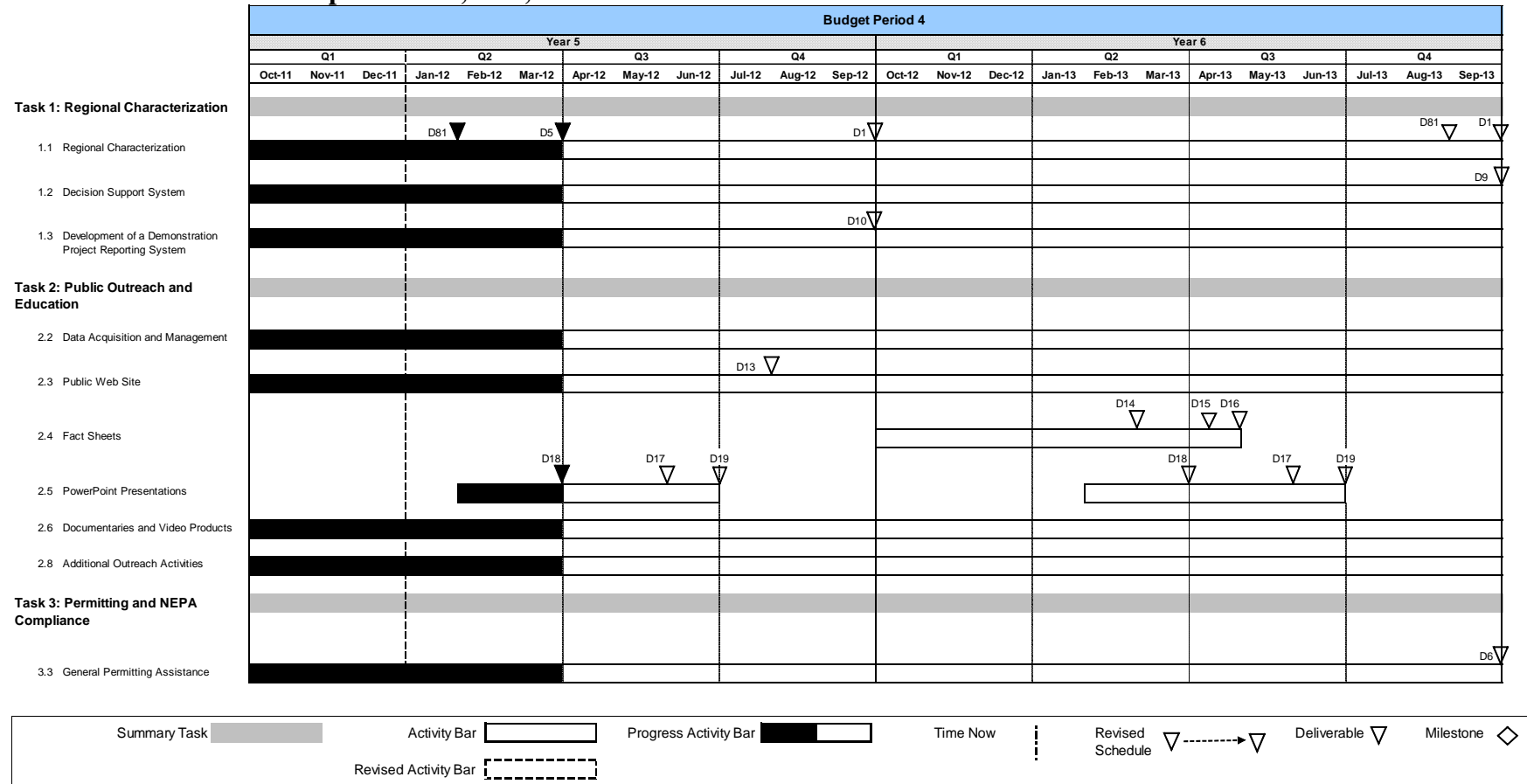
Title/Description	Due Date	Actual Completion Date
Year 6 – Quarter 2 (January–March 2013)		
D32: Task 4 – Bell Creek Test Site – Geomechanical Final Report	1/31/13	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	1/31/13	
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	
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	

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Table 5. Phase III Milestones and Deliverables (continued)

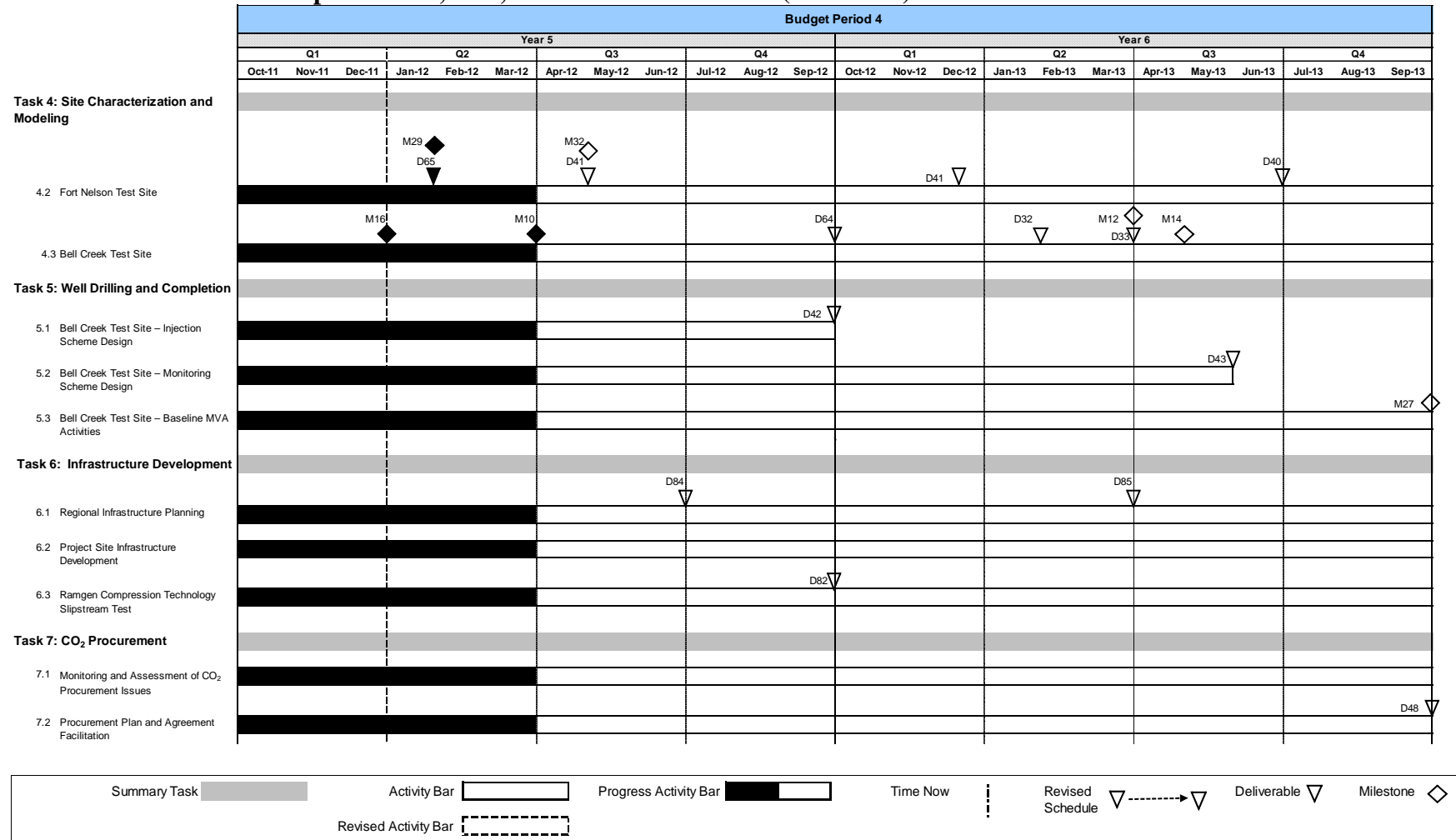
Title/Description	Due Date	Actual Completion Date
Year 6 – Quarter 4 (July–September 2013)		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/13	
D67: Task 9 – Fort Nelson Test Site – Simulation Report	7/31/13	
M23: Task 14 – Monthly WWG Conference Call Held	7/31/13	
D66: 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



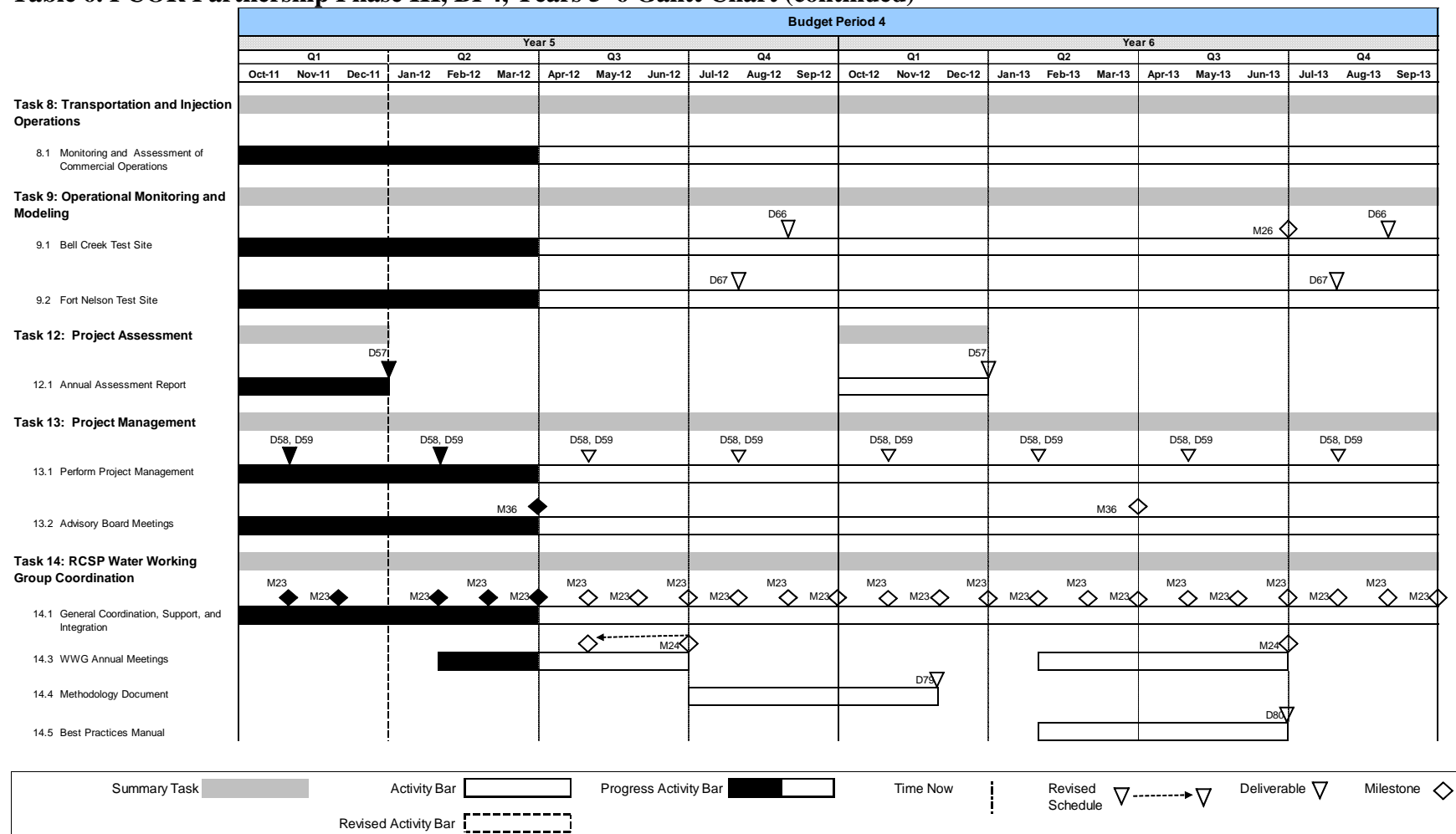
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Table 6. PCOR Partnership Phase III, BP4, Years 5–6 Gantt Chart (continued)



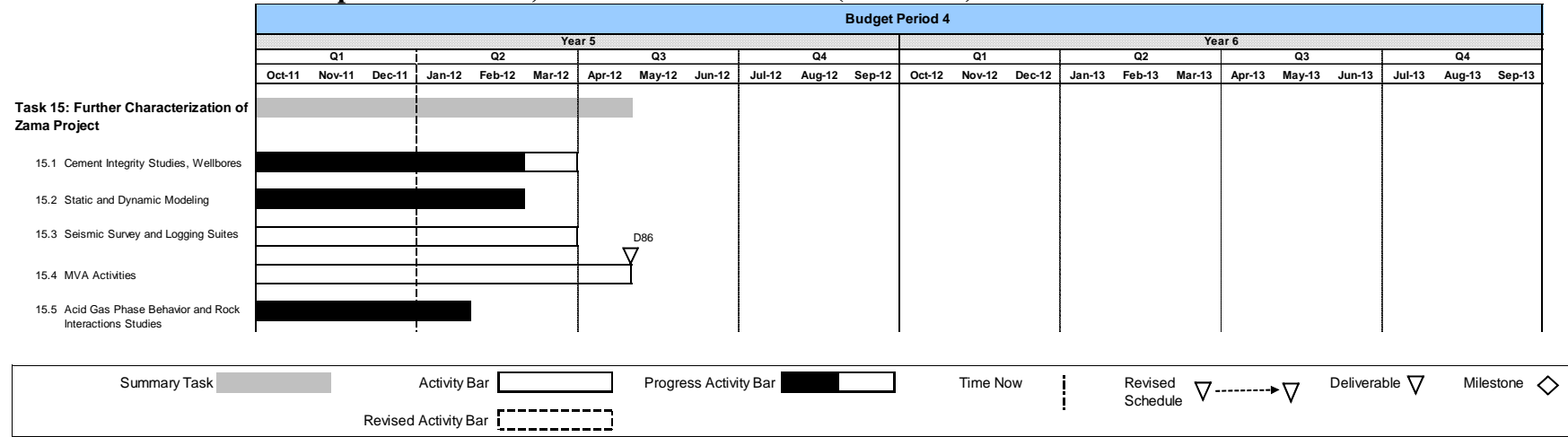
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Table 6. PCOR Partnership Phase III, BP4, Years 5–6 Gantt Chart (continued)



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



Key for Deliverables (D) ▼		Key for Milestones (M) ◆
D1 Review of Source Attributes	D58 Quarterly Progress Report	M10 BC Test Site – Wellbore Leakage Data Collection Completed
D5 Second Target Area Completed	D59 Milestone Quarterly Report	M12 BC Test Site – Geochemical Work Completed
D6 Permitting Review – Update	D64 BC Test Site – Site Characterization Report	M14 BC Test Site – Geological Characterization Data Collection Completed
D9 Updated DSS	D65 FN Test Site – Site Characterization Report	M16 BC Test Site – Initiation of Production and Injection Simulations
D10 DPRS Update	D66 BC Test Site – Simulation Report	M23 Monthly WWG Conference Call Held
D13 Public Site Updates	D67 FN Test Site – Simulation Report	M24 WWG Annual Meeting Held
D14 General Phase III Fact Sheet	D79 Report – Water Resource Estimation Methodology	M26 BC Test Site – CO ₂ Injection Initiated
D15 BC Test Site Fact Sheet	D80 Best Practices Manual – Nexus of Water and Carbon Storage Activities	M27 BC Test Site – MVA Equipment Installation and Baseline MVA Activities Completed
D16 Fort Nelson Test Site Fact Sheet	D81 Regional Carbon Sequestration Atlas	M29 FN Test Site – Site Characterization Report Completed
D17 General Phase III Information PowerPoint Presentation	D82 Report – Issues Associated with Integration of Advanced Compression Technology into a CO ₂ Storage Project	M32 Fort Nelson – Geochemical Report Completed
D18 BC Test Site PowerPoint Presentation	D84 Report – A Phased Approach to Building Pipeline Network for CO ₂ Transportation During CCS	M34 Basal Cambrian Static Geological Model Completed
D19 FN Test Site PowerPoint Presentation	D85 Report – Opportunities and Challenges Associated with CO ₂ Compression and Transportation During CCS Activities	M35 Basal Cambrian Dynamic Capacity Estimation Completed
D32 BC Test Site – Geomechanical Final Report	D86 Updated Regional Technology Implementation Plan for Zama	M36 Annual Advisory Board Meeting Scheduled
D33 BC Test Site – Geochemical Final Report	D89 Report – Geochemical Evaluation of the Basal Cambrian System	
D40 FN Test Site – Geomechanical Report	D90 Report – Wellbore Evaluation of the Basal Cambrian System	
D41 FN Test Site – Geochemical Report	D91 Report – Geological Characterization of the Basal Cambrian System in the Williston Basin	
D42 BC Test Site – Injection Experimental Design Package		
D43 BC Test Site – Monitoring Experimental Design Package		
D48 BC Test Site – Procurement Plan and Agreement Report		
D57 Project Assessment Annual Report		

PHASE III PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES

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

Abstracts

Submitted

- 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., 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.
- 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 CO₂ storage and CO₂ 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 CO₂ Reduction (PCOR) Partnership — carbon capture, utilization, and storage demonstration activities [abs.]: 34th International Geological Congress, Brisbane, Australia, August 5–10, 2012.
- Liu, G., Gorecki, C.D., Bremer, J.M., Klapperich, R.J., Cowan, R.M., Holubnyak, Y.I., Knudsen, D.J., and Saini, D., 2012, Four-site case study of water extraction from CO₂ storage reservoirs [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, CO₂ 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 CO₂ 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, CO₂ 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.

Submitted and Accepted for Presentation

- Gorecki, C.D., Hamling, J.A., Steadman, E.N., and Harju, J.A., 2012, Overview of the Bell Creek combined CO₂ storage and CO₂ EOR project [abs.]: 11th Annual Conference on Carbon Capture Utilization & Sequestration, Pittsburgh, Pennsylvania, April 30 – May 3, 2012.
- Peck, W.D., Knudsen, D.J., Crotty, C.M., Sorensen, J.A., Gorecki, C.D., Bachu, S., Hauck, T., and Peterson, J., 2012, CO₂ storage resource potential of the Cambro-Ordovician saline system in the western interior of North America [abs.]: 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 [abs.]: 11th Annual Conference on Carbon Capture Utilization & Sequestration, Pittsburgh, Pennsylvania, April 30 – May 3, 2012.

Presentations

- Gorecki, C.D., 2012, A risk-based monitoring plan for the Fort Nelson feasibility project: Presented at the 2012 Carbon Management Technology Conference, Orlando, Florida, February 7–9, 2012.
- Gorecki, C.D., 2012, Integrating CO₂ EOR and CO₂ storage in the Bell Creek oil field: Presented at the 2012 Carbon Management Technology Conference, Orlando, Florida, February 7–9, 2012.
- Gorecki, C.D., 2012, Plains CO₂ Reduction (PCOR) Partnership update: Presented to Battelle Energy Systems and Carbon Management Group personnel and Core Energy, LLC, personnel, Grand Forks, North Dakota, January 25, 2012.

- Knudsen, D.J., and Saini, D., 2012, Zama F Pool acid gas EOR and CO₂ Storage—modeling and simulation: Presented to Battelle Energy Systems and Carbon Management Group personnel and Core Energy, LLC, personnel, Grand Forks, North Dakota, January 25, 2012.
- Knudsen, D.J., and Saini, D., 2012, Zama F Pool acid gas EOR and CO₂ storage—modeling and simulation: Presented to Computer Modelling Group Ltd. personnel, Grand Forks, North Dakota, March 29, 2012.
- Pu, H., 2012, Reservoir simulation study for Bell Creek oil field using CMG's GEM and WinProp: Presented to Computer Modelling Group Ltd. personnel, Grand Forks, North Dakota, March 29, 2012.
- Smith, S.A., and Sorensen, J.A., 2012, Zama acid gas injection, CO₂ storage, and monitoring project: Presented to Battelle Energy Systems and Carbon Management Group personnel and Core Energy, LLC, personnel, Grand Forks, North Dakota, January 25, 2012.
- Steadman, E.N., 2012, Atlas perspectives: Presented at the 6th meeting of the North American Carbon Atlas Partnership, Mayan Riviera, Mexico, January 31 – February 1, 2012.
- Steadman, E.N., Gorecki, C.D., and Peck, W.D., 2012, Plains CO₂ Reduction (PCOR) Partnership update: Presented at EUEC 2012 Energy, Utility and Environment Conference, Phoenix, Arizona, January 30 – February 1, 2012.
- Steadman, E.N., Harju, J.A., Sorensen, J.A., Nakles, D., and Jackson, B., 2012, PCOR Partnership Technical Advisory Board meeting. Presented at the Plains CO₂ Reduction (PCOR) Partnership Technical Advisory Board Meeting, San Diego, California, February 15–16, 2012.
- Steadman, E.N., Melzer, S., and Harju, J.A., 2012, CO₂-based enhanced oil recovery: Presented at the CO₂ Geological Storage and EOR Workshop, Mexico City, Mexico, March 21–23, 2012.
- Steadman, E.N., and Sorensen, J.A., 2012, The EERC–Apache Canada past partnership and future opportunities: Presented to Apache Canada personnel, Calgary, Alberta, January 19, 2012.

Posters Presentations

- Steadman, E.N., 2012, Addressing carbon capture, utilization, and storage across the central interior of North America: Poster presented at the 2012 Carbon Management Technology Conference, Orlando, Florida, February 7–9, 2012.

Deliverables/Milestones

Draft

- Anagnost, K.K., Steadman, E.N., Harju, J.A., Sorensen, J.A., and Gorecki, C.D., 2012, Technical Advisory Board meeting scheduled: Plains CO₂ Reduction (PCOR) Partnership Phase III draft Task 13 Milestone 36 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.

- 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 CO₂ Reduction (PCOR) Partnership Phase III draft Task 1 Deliverable D5 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.
- Daly, D.J., Crocker, C.R., Hamling, J.A., Gorecki, C.D., Anagnost, K.K., Steadman, E.N., and Harju, J.A., 2012, Bell Creek integrated CO₂ EOR and storage project: Plains CO₂ Reduction (PCOR) Partnership Phase III draft 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 CO₂ Reduction (PCOR) Partnership Phase III draft Task 4 Milestone 10 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.
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Meeting Minutes

Klapperich, R.J., 2012, Minutes—Regional Carbon Sequestration Partnership Water Working Group conference call: March 27.

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Other

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MEETINGS/TRAVEL

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

- December 11, 2011, to January 10, 2012: traveled to oversee drilling efforts at the Bell Creek oil field located in southeastern Montana.
- January 18–20, 2012: attended meetings with Apache Canada Ltd. and Husky Energy in Calgary, Alberta, Canada.
- January 23–25, 2012: attended the Groundwater Protection Council 2012 UIC Conference held in Houston, Texas.
- January 23–25, 2012: participated in an abstract review meeting for the CCUS Conference in Arlington, Virginia.
- January 28 – February 4, 2012: presented at EUEC in Phoenix, Arizona.
- January 30 – February 2, 2012: participated in NACAP-6 meeting in Riviera Maya, Mexico.
- February 5–11, 2012: viewed core samples at the Core Research Center and Core Labs in Denver, Colorado.

- February 6–12, 2012: presented at CMTC in Orlando, Florida.
- February 14–17, 2012: hosted the inaugural TAB meeting in San Diego, California.
- February 19–24, 2012: attended a Schlumberger Information Solutions training course entitled “Techlog Formation Evaluation” in Houston, Texas.
- February 28 – March 5, 2012: continued to view core samples at the Core Research Center and Core Labs in Denver, Colorado.
- February 27 – March 2, 2012: visited Spectra’s gas-processing plant and potential CO₂ injection site near Fort Nelson, British Columbia, Canada.
- March 13–15, 2012: attended the NDPC Spring Social in Denver, Colorado.
- March 19–20, 2012: participated in a meeting with DOE and Spectra at NETL headquarters in Pittsburgh, Pennsylvania.
- March 21–23, 2012: presented at the Workshop of CO₂ Geological Storage and EOR in Mexico City, Mexico (U.S. Energy Association paid for expenses).

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

REFERENCES

None.