

## **PLAINS CO<sub>2</sub> REDUCTION PARTNERSHIP PHASE III**

### **Quarterly Technical Progress Report**

*(for the period October 1 – December 31, 2008)*

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**PLAINS CO<sub>2</sub> REDUCTION PARTNERSHIP PHASE III**  
**Quarterly Technical Progress Report**  
**October 1 – December 31, 2008**

**INTRODUCTION**

The Plains CO<sub>2</sub> Reduction (PCOR) Partnership has been established as a U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) Regional Carbon Sequestration Partnership (RCSP). The PCOR Partnership is managed by the Energy & Environmental Research Center (EERC) at the University of North Dakota (UND) in Grand Forks, North Dakota. 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).

Phase III is a 10-year project, in three BPs, running from October 1, 2007, to September 30, 2017. This progress report summarizes the activities for the reporting period (October 1 – December 31, 2008) for Phases III.

The activities for Phase III of the PCOR Partnership include two large-volume sequestration demonstration tests (Figure 1) along with continued regional characterization and outreach. Thirteen tasks will be implemented; see Table 1 for the responsibility matrix.

**Table 1. Phase III Responsibility Matrix**

<b>Phase III Task Description</b>	<b>Responsible Party</b>
Task 1 – Regional Characterization	Wes Peck
Task 2 – Public Outreach and Education	Dan Daly
Task 3 – Permitting and National Environmental Policy Act (NEPA) Compliance	Lisa Botnen
Task 4 – Site Characterization and Modeling	Jim Sorensen
Task 5 – Well Drilling and Completion	Steve Smith
Task 6 – Infrastructure Development	Melanie Jensen
Task 7 – CO <sub>2</sub> Procurement	John Harju
Task 8 – Transportation and Injection Operations	TBA
Task 9 – Operational Monitoring and Modeling	TBA
Task 10 – Site Closure	TBA
Task 11 – Postinjection Monitoring and Modeling	TBA
Task 12 – Project Assessment	Stephanie Wolfe
Task 13 – Project Management	Ed Steadman



Figure 1. PCOR Partnership Phase III demonstration test sites.

## SUMMARY OF SIGNIFICANT PHASE III ACCOMPLISHMENTS

### Task 1 – Regional Characterization

Work continues on the implementation of the prototype for the Demonstration Project Reporting System (DPRS). The DPRS is a Web-based interface designed to provide structured access to data by all demonstration participants and other partners to facilitate communication and interpretation of these data and to allow for efficient replication of additional or related demonstration projects.

The Missouri Department of Natural Resources, Division of Geology (MDNR/DGLS) has completed an evaluation of 1589 water analyses from saline waters in northwestern Missouri. MDNR/DGLS has also begun updating its publication *Evaluation of Missouri's Coal Resources* through an effort to better define the distribution of individual coal seams as well as their thickness and depth.

## **Task 2 – Public Outreach and Education**

During this reporting period, work continued on the Outreach Information System (OIS); a set of over 40 video clips were created from the PCOR Partnership television documentaries and provided to NETL for review as scheduled (Deliverable D20); an update of the Web pages for the Phase III demonstrations was initiated; a set of materials for classroom use was initiated; and materials were completed for the Outreach Working Group.

## **Task 3 – Permitting and NEPA Compliance**

Since a Williston Basin site has not yet been selected, the permitting and NEPA compliance task for the Williston Basin has focused on collecting general background material. We have been acting in support of Spectra Energy's permitting efforts for the Fort Nelson demonstration.

One of the most important accomplishments of the partnership this quarter has been the final review of EPA's proposed rules for regulating geological sequestration under the UIC program. Draft comments on EPA's proposed rules were developed and submitted to an ad hoc committee of PCOR Partnership members. As input from this committee was received, the comments were refined. The document was then distributed to the entire PCOR Partnership membership for comment. Remarks from the membership were considered, and the final comments were submitted to EPA on December 22, 2008.

## **Task 4 – Site Characterization and Modeling**

During this quarter, work continued on the development of a Project Risk Assessment Plan for the Fort Nelson demonstration. Participants in the Fort Nelson risk assessment will include the EERC, Spectra Energy, Schlumberger, RPS Energy, Advanced Geotechnology, and Alberta Research Council. Development of Williston Basin Field Validation Test Experimental Design Package (Deliverable D42) continued. Efforts were primarily focused on using well log data and field-based observations to characterize the general geological conditions of an area in southwestern North Dakota that includes several oil fields being considered for CO<sub>2</sub>-based EOR activities under Phase III. A petrophysical model was developed of oil reservoirs in the Lodgepole carbonate mounds in the vicinity of Dickinson, North Dakota, which are candidates for large-scale CO<sub>2</sub> EOR operations.

## **Task 5 – Well Drilling and Completion**

This task will be initiated in Quarter 3 – BP3, Year 2. Once activities are initiated, information pertaining to drilling and completion practices will be documented and communicated through quarterly reports. Much of the information obtained from this activity will be dependent on site-specific plans and communication with the field operator to ascertain the most effective techniques to be used.



### **Task 6 – Infrastructure Development**

Work on this task has been delayed while the plans for CO<sub>2</sub> capture and geologic sequestration for the demonstration projects are finalized. Once the specific carbon capture and sequestration strategy for the demonstration project has been finalized, planned task activities related to CO<sub>2</sub> capture, compression, and pipeline design and routing can begin.

### **Task 7 – CO<sub>2</sub> Procurement**

Numerous discussions with potential CO<sub>2</sub> suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

### **Task 8 – Transportation and Injection Operations**

This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

### **Task 9 – Operational Monitoring and Modeling**

This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

### **Task 10 – Site Closure**

This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

### **Task 11 – Postinjection Monitoring and Modeling**

This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

### **Task 12 – Project Assessment**

Project assessment entails the communication and dissemination of all Phase III activities detailed in the quarterly and annual progress reports. The Project Assessment Annual Report (Deliverable D57) was submitted on December 31, 2008.

### **Task 13 – Project Management**

Phase III of the PCOR Partnership started October 1, 2007. Phase II members in good standing are automatically enrolled in Phase III for the first BP that overlaps with the last 2 years of Phase II (October 1, 2007 – September 30, 2009). As was denoted in Table 3, the PCOR Partnership currently has 80 partners. Activities in this reporting period include the following:

- A Risk Management Plan (RMP) outline is due within BP3. An initial draft of the RMP has been started. The risk management database research has also begun; initial contact has been made with consulting services.
- All products required for submission during this reporting period were met.
- Current and pending CO<sub>2</sub>-related projects within the PCOR Partnership region are numerous and dynamic. To better inform our partners, a Web site is presently being developed to exhibit CO<sub>2</sub> projects by location, parties involved, and Web site links to learn more about them.
- Work is under way to provide our partners with a topical report on past, present, and future carbon market activities.
- The PCOR Partnership was selected by the IOGCC's Stewardship Award Subcommittee as the winner in the 2008 Environmental Partnership category. Announced earlier, the award was presented to the PCOR Partnership on Monday, November 17, 2008, during the general session of the IOGCC Annual Meeting in Santa Fe, New Mexico. Work is under way to provide our partners with a topical report on past, present, and future carbon market activities.

## **PHASE III PROGRESS OF WORK**

### **Task 1 – Regional Characterization**

The Regional Characterization task entails the review, characterization, and update of the PCOR Partnership region's CO<sub>2</sub> sinks and sources for inclusion in the DSS. Activities in this reporting period include the following:

- Evaluation of MDNR/DGLS, U.S. Geological Survey (USGS), and EPA water analysis has been completed. This resulted in entry of 1589 analyses in 53 Missouri counties along and northwest of the freshwater-saline transition. Parameters entered into an Access database include public land survey and latitude/longitude location, well depth, county, MDNR/DGLS log number, owner, elevation, analysis date, hydrologic unit, formation sampled or bottom of hole, sample depth (if different than total depth), laboratory or source of data, pH, specific conductance, temperature, total hardness, carbonate hardness, calcium (Ca), magnesium (Mg), sodium (Na), potassium (K), chloride (Cl), fluoride (F), silica (Si), sulfate (SO<sub>4</sub>), carbonate (CO<sub>3</sub>), bicarbonate (HCO<sub>3</sub>), alkalinity as CaCO<sub>3</sub>, and total dissolved solids (TDS). Finally, a stratigraphic column based on Missouri formations and hydrologic units has been created.
- MDNR/DGLS publication RI-48, Evaluation of Missouri's Coal Resources, contains maps of the principal coal seams of the state. These maps depict the aerial extent of coal beds, locations of shafts and drifts, selected control points, areas most favorable for mining, and mined out areas. As part of this subproject, division staff have begun the process of updating these maps with additional data points obtained from the USGS National Coal Resources Data System (NCRDS). This better defines the distribution of individual coal seams as well as their thickness and depth.
- Structural information has been compiled from geologic and outcrop maps for the Missouri portions of the Dyersburg, Poplar Bluff, Harrison, Tulsa, Joplin, Springfield,

Lawrence, Kansas City, Moberly, Quincy, Nebraska, Centerville, Burlington, and the western half of the Jefferson City 1° × 2° quadrangles. In addition, work has begun on the eastern half of the Jefferson City and St. Louis 1° × 2° quadrangles. A total of 1039 maps have been examined for structures. These maps contain 452 named structural features that comprise 1203 separate lines.

- A major remodel of the PCOR Partnership DSS is under way.
- The pending arrangement of subcontract with the Minnesota Geological Survey has failed to be secured. Contacts are being established to potentially shift the subcontract effort to the Nebraska Geological Survey to aid in the assessment of carbon sequestration opportunities in that state.

## **Task 2 – Public Outreach and Education**

Task 2 will provide stakeholders and the general public with information on sequestration methods, opportunities, and developments, including updates on the demonstration projects. Activities in this reporting period include the following:

- Efforts continued to populate the OIS, which will contain a record of outreach activities as well as provide a basis for assessing audience exposure to outreach activities. Demographic information was ordered for the Canadian portion of the region and a draft map was created for public television coverage in the region.
- B-roll (footage of landscapes and facilities) and interviews with in-house personnel were obtained using the prosumer-grade video camera obtained over the summer. The footage obtained is intended for Web applications.
- Work was initiated on an education packet on sequestration in the region to be made available to teachers in the spring of 2009. In related activities, teachers were identified who would be willing to review the education packet; an invitation was accepted to present at the June 2009 Lignite Energy Council Teacher Seminar in Bismarck, North Dakota; and the PCOR Partnership agreed to host a Keystone Center climate change curriculum teacher training workshop for the summer of 2009.
- A set of more than 40 video clips (Deliverable D20) was created from the documentary products and other materials held by PPB and submitted on schedule to NETL for review. The clips range from a half minute to 3 minutes in length and are intended to supplement the PowerPoints and public Web site. The package contained six clips with introduction and credits intended to be used for Web or YouTube applications.
- In addition, members of the outreach team took part in the monthly conference calls and related activities of the Outreach Working Group.

## **Task 3 – Permitting and NEPA Compliance**

The goal of Task 3 is to obtain all the permits and approvals needed to comply with state, provincial, and federal requirements. Activities for the reporting period included the following:

- Various state, provincial, and regional GHG reduction and CCS initiatives are being tracked and analyzed.
- An update to the regulatory section of the DSS is under development.

- Legislative actions occurring in Congress continue to be followed and reviewed for any implications relating to carbon capture and storage.
- Recent publications relating to regulating CO<sub>2</sub> sequestration and MMV issues continue to be reviewed.
- Analysis of carbon market strategies continues.
- Frequent updates are provided to task leaders with regard to federal, state, and provincial actions.
- Comments on EPA's proposed rules for geologic sequestration have been developed and submitted to EPA for consideration. Input from PCOR Partnership members was received and incorporated into the document.
- Analysis of regulatory risks is currently being conducted for the Fort Nelson project.
- Actions by the province of British Columbia are continually monitored for the effect they may have on the Fort Nelson demonstration project.

#### **Task 4 – Site Characterization and Modeling**

Task 4 is focused on evaluating the effectiveness of large-scale CO<sub>2</sub> sequestration in geological formations at two different sites. The first site will examine CO<sub>2</sub> sequestration in conjunction with EOR operations in a deep carbonate reservoir in the Williston Basin. The second will examine CO<sub>2</sub> sequestration in a carbonate brine-saturated formation basin in northwestern Canada. Characterization activities for the reporting period included:

- Completion of a petrophysical model of saline formation systems in the Washburn study area of the Williston Basin.
- Updating the oil field data in the DSS continued. Information for the state of North Dakota has been completely updated. Working with relevant agencies in other states and provinces to facilitate the updating process continued.
- Estimates of storage capacity of several saline formation systems in the Washburn Study Area of central North Dakota were finalized and presented in a poster at the GHGT-9 conference in Washington, D.C.
- Development of the MMV plan for the Fort Nelson demonstration continued. Efforts were focused on gathering and evaluating subsurface geological data, including historical seismic data. The EERC met with Spectra Energy, Natural Resources Canada, and Schlumberger in Washington, D.C., on November 11, 2008, to discuss the key elements of site characterization and the MMV plan for the Fort Nelson demonstration.

#### **Task 5 – Well Drilling and Completion**

Task 5 will develop the engineering designs for the installation of necessary injection, production, and monitoring wells. This task has not begun (begins Quarter 3 – BP3; Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

## **Task 6 – Infrastructure Development**

During the course of Task 6 activities, the infrastructure associated with the capture, dehydration, compression, and pipeline transportation required for moving the CO<sub>2</sub> from the source to the oil field will be developed. During the October–December 2008 quarter, the following activities were performed:

- A list containing short descriptions of capture and sequestration demonstrations that were announced during the October 2007 through October 2008 time frame was prepared.
- The oxygen requirement of the Conesville No. 5 unit if it were to be retrofit for oxygen combustion was calculated to answer a question regarding the value contained in a report that was found during an Internet search.
- CO<sub>2</sub> pipeline specification information was provided.
- A review of the World Resources Institute’s Carbon Capture and Sequestration guidelines document was performed.
- An Ohio State University graduate student requested information regarding the calculation of CO<sub>2</sub> emissions from the compression, pipeline transportation, and injection activities associated with CO<sub>2</sub> sequestration in geological settings.
- Preliminary calculations of a thermodynamic balance of the Powerspan ECO<sub>2</sub><sup>TM</sup> process were initiated and will be completed during the January–March 2009 quarter.

During the July–September quarter, a table of capture technologies with links to Web-based information about each of them was prepared for inclusion in the PCOR Partnership DSS “Partners Only” Web site. Since then, an updated DSS Web page has been prepared that will make the information simpler to understand and use. Following project management review, it will be placed on the DSS “Partners-Only” Web site.

## **Task 7 – CO<sub>2</sub> Procurement**

This task involves the documentation of the procedures to procure CO<sub>2</sub> for EOR activities. Numerous discussions with potential CO<sub>2</sub> suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

## **Task 8 – Transportation and Injection Operations**

This task will consist of monitoring and documenting commercial partner activities related to the CO<sub>2</sub> pipeline for leaks and corrosion, as well as performing inspections and security checks. This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

## **Task 9 – Operational Monitoring and Modeling**

Task 9 will develop site characterization, modeling, and monitoring for the Williston Basin and Fort Nelson test sites. This task has not begun (begins Quarter 1 – BP4, Year 3). Once

activities are initiated, the information will be communicated and detailed in the quarterly progress report.

#### **Task 10 – Site Closure**

Task 10 will require research to be conducted with regard to those site closure practices and procedures that would be applicable for this type of operation. This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

#### **Task 11 – Postinjection Monitoring and Modeling**

Postinjection monitoring and modeling will use the data generated by the site characterization and monitoring activities to provide the technical basis for the formal establishment of carbon credits that are directly linked to the volume of CO<sub>2</sub> injected into the site and a third-party carbon-trading entity to validate and ultimately monetize the credits derived for the Phase III tests. This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

#### **Task 12 – Project Assessment**

Task 12 entails the evaluation of Phase III project progress, accomplishments, and goals. Project assessment was conducted for all 13 Phase III tasks for October 1, 2007 – September 30, 2008, and was illustrated in the Project Assessment Annual Report (Deliverable D57). The report was submitted on December 31, 2008. The next project assessment report is due December 31, 2009.

#### **Task 13 – Project Management**

Project management involves the development and distribution of required project reports, as well as overall project management duties. The project manager (PM) and task leaders meet on a monthly basis to report the progress of their tasks and discuss any issues and corrective actions necessary. Each task leader is also responsible to communicate and keep track of any subcontractors they may have in their respective tasks. Task leaders are also responsible to provide the PM with written weekly updates. These updates include highlights (including trip reports), issues (i.e., budget, staffing, technical issues, etc.), opportunities, and travel plans. The monthly updates can be found on the PCOR Partnership DSS homepage. During the October–December 2008 quarter, the following activities were performed:

- The deliverable entitled “D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report” was submitted to DOE for approval on October 31, 2008.
- On December 5, 2008, a Phase III add-on proposal (EERC Proposal No. 2009-0121) was submitted to DOE. These activities include the addition of Task 14 – RCSP Water Working Group Coordination. This task is scheduled to begin Quarter 2 – BP3, Year 2. Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

## PHASE III COST STATUS

The approved BP3 budget along with actual costs incurred and in-kind cost share reported is shown in Table 2. An expected spending plan by quarter of cash funds for BP3 is provided in Figure 2 and Table 3.

**Table 2. Phase III Budget – BP3**

<b>Organization</b>	<b>Approved Budget</b>	<b>Actual Costs Incurred</b>
DOE Share – Cash	\$5,300,000	\$1,906,262
Nonfederal Share – Cash	\$2,808,847	\$465,502
Nonfederal Share – In-Kind	\$5,577,212	\$20,580
Total	\$13,686,059	\$2,392,344

## PHASE III SCHEDULE STATUS

Because negotiations are ongoing and still uncertain for our partners in the Williston Basin demonstration, various deliverables and milestones have been extended and approved by DOE. See Table 4 for a listing of all deliverables and milestones by quarter, with completion dates, for the duration of the project. See Table 5 for critical path project milestones and deliverables (Gantt chart) for BP3.

## ACTUAL OR ANTICIPATED PHASE III PROBLEMS OR DELAYS

### **Task 1 – Regional Characterization**

MDNR/DGLS reports that, to date, three staff geologists have devoted a portion of their time to the completion of this project with the aid of two part-time employees. The use of the part-time staff will be severely reduced in the upcoming quarter. Attempts will be made to enhance this facet of the project by adding additional temporary employees.

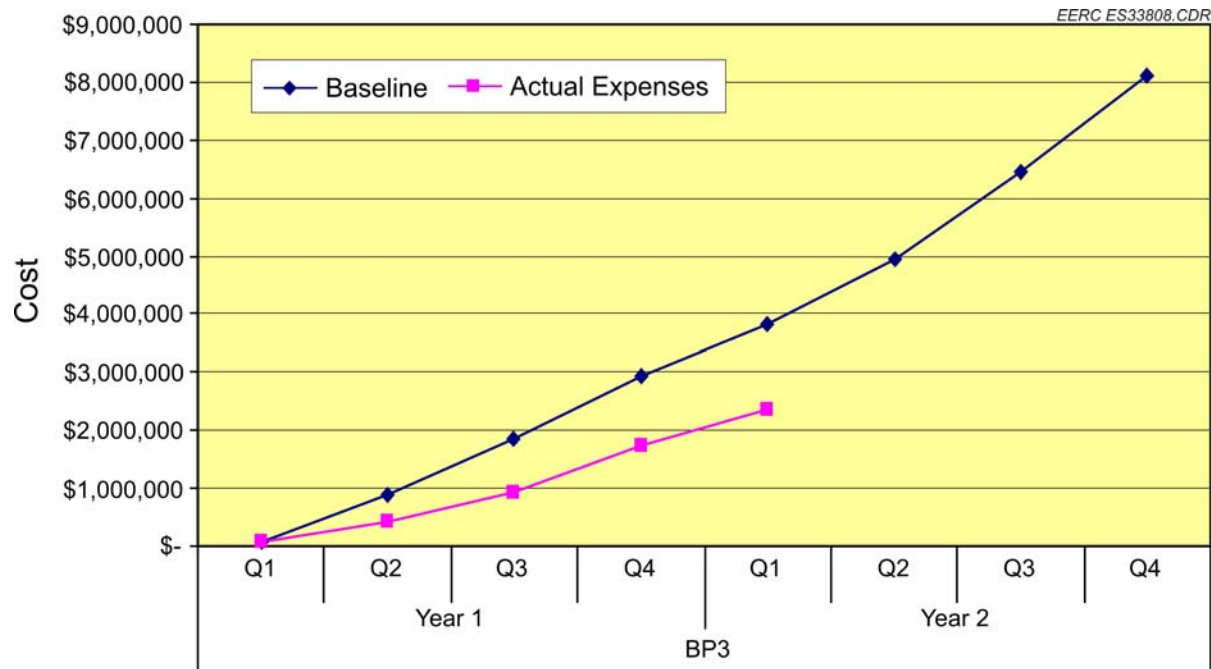


Figure 2. PCOR Partnership Phase III BP3 funding (cash only).

Table 3. BP3 Spending Plan

Baseline Reporting Quarter	Year 1								Year 2							
	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
<b>Baseline Cost Plan</b>																
Federal Share	\$ 88,728	\$ 88,728	\$ 318,976	\$ 407,704	\$ 510,620	\$ 918,324	\$ 600,000	\$ 1,518,324	\$ 567,251	\$ 2,085,575	\$ 756,335	\$ 2,841,911	\$ 1,134,503	\$ 3,976,413	\$ 1,323,587	\$ 5,300,000
Non-Federal Share	\$ -	\$ -	\$ 467,179	\$ 467,179	\$ 467,180	\$ 934,359	\$ 467,180	\$ 1,401,539	\$ 351,827	\$ 1,753,366	\$ 351,827	\$ 2,105,193	\$ 351,827	\$ 2,457,020	\$ 351,827	\$ 2,808,847
Total Planned	\$ 88,728	\$ 88,728	\$ 786,155	\$ 874,883	\$ 977,800	\$ 1,852,683	\$ 1,067,180	\$ 2,919,863	\$ 919,078	\$ 3,838,941	\$ 1,108,162	\$ 4,947,104	\$ 1,486,330	\$ 6,433,433	\$ 1,675,414	\$ 8,108,847
<b>Actual Incurred Cost</b>																
Federal Share	\$ 88,728	\$ 88,728	\$ 318,976	\$ 407,704	\$ 510,620	\$ 918,324	\$ 597,684	\$ 1,516,008	\$ 390,254	\$ 1,906,262						
Non-Federal Share	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 204,037	\$ 204,037	\$ 261,465	\$ 465,502						
Total Incurred Cost	\$ 88,728	\$ 88,728	\$ 318,976	\$ 407,704	\$ 510,620	\$ 918,324	\$ 801,721	\$ 1,720,045	\$ 651,719	\$ 2,371,764						
<b>Variance</b>																
Federal Share	\$ (0)	\$ (0)	\$ (0)	\$ (0)	\$ (0)	\$ (0)	\$ 2,316	\$ 2,316	\$ 176,997	\$ 179,313						
Non-Federal Share	\$ -	\$ -	\$ 467,179	\$ 467,179	\$ 467,180	\$ 934,359	\$ 263,143	\$ 1,197,502	\$ 90,362	\$ 1,287,864						
Total Variance	\$ (0)	\$ (0)	\$ 467,179	\$ 467,179	\$ 467,180	\$ 934,359	\$ 265,459	\$ 1,199,818	\$ 267,359	\$ 1,467,177						



**Table 4. Phase III Milestones and Deliverables**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 1 – Quarter 1 (October–December 2007)</b>		
M17: Task 4 – Fort Nelson Test Site Selected	12/31/07	12/28/07
D37: Task 4 – Fort Nelson Test Site – Site Geological Characterization Experimental Design Package	12/31/07	12/28/07
D63: Task 13 – Project Management Plan	12/31/07	12/28/07
<b>Year 1 – Quarter 2 (January–March 2008)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/08	1/31/08
D38: Task 4 – Fort Nelson Test Site – Geomechanical Experimental Design Package	1/31/08	1/31/08
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
D11: Task 2 – Outreach Plan	3/31/08	3/31/08
D30: Task 4 – Williston Basin Test Site – Geomechanical Experimental Design Package	3/31/08	3/31/08
D27: Task 3 – Environmental Questionnaire – Fort Nelson Test Site	3/31/08	4/2/08
<b>Year 1 – Quarter 3 (April–June 2008)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/08	4/30/08
D14: Task 2 – General Phase III Fact Sheet	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
<b>Year 1 – Quarter 4 (July–September 2008)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/08	7/31/08
D12: Task 2 – Demonstration Web Pages on the Public Site	7/31/08	7/31/08
M2: Task 1 – Demonstration Project Reporting System (DPRS) Prototype Completed	9/30/08	9/26/08
D1: Task 1 – Review of Source Attributes	9/30/08	9/26/08
<b>Year 2 – Quarter 1 (October–December 2008)</b>		
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 4. Phase III Milestones and Deliverables (continued)**

Title/Description	Due Date	Actual Completion Date
<b>Year 2 – Quarter 2 (January–March 2009)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/09	
D2: Task 1 – First Target Area Completed	3/31/09	
M4: Task 4 – Williston Basin Test Site Selected	3/31/09	
M5: Task 4 – Data Collection Initiated for Williston Basin Test Site	3/31/09	
D24: Task 2 – PCOR Partnership Region Sequestration General Poster	3/31/09	
D28: Task 3 – Environmental Questionnaire – Williston Basin Test Site	3/31/09	
<b>Year 2 – Quarter 3 (April–June 2009)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/09	
D15: Task 2 – Williston Basin Test Site Fact Sheet	5/29/09	
D16: Task 2 – Fort Nelson Test Site Fact Sheet	5/29/09	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	5/29/09	
D31: Task 4 – Williston Basin Test Site – Geological Characterization Experimental Design Package	5/29/09	
D29: Task 3 – Permitting Action Plan	6/30/09	
<b>Year 2 – Quarter 4 (July–September 2009)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/09	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	7/31/09	
D67: Task 4 – Fort Nelson Test Site – Simulation Report	7/31/09	
M8: Task 4 – Williston Basin Test Site Wellbore Leakage Data Collection Initiated	8/31/09	
D42: Task 5 – Williston Basin Test Site – Injection Experimental Design Package	8/31/09	
M9: Task 4 – Williston Basin Test Site B – Version Geological Model Development Initiated	9/30/09	
M10: Task 4 – Williston Basin Test Site Wellbore Leakage Data Collection Completed	9/30/09	
M11: Task 4 – Williston Basin Test Site Baseline Hydro Data Collection Completed	9/30/09	
M12: Task 4 – Williston Basin Test Site Geochemical Work Completed	9/30/09	
M19: Task 6 – Capture, Dehydration, and Compression Technology Selected	9/30/09	
D9: Task 1 – Updated DSS	9/30/09	
D1: Task 1 – Review of Source Attributes	9/30/09	
D3: Task 1 – Permitting Review – One State and One Province	9/30/09	
D40: Task 4 – Fort Nelson Test Site – Geomechanical Final Report	9/30/09	

Continued...

**Table 4. Phase III Milestones and Deliverables (continued)**

Title/Description	Due Date	Actual Completion Date
<b>Year 2 – Quarter 4 (July–September 2009), continued</b>		
D43: Task 5 – Williston Basin Test Site – Monitoring Experimental Design Package	9/30/09	
D47: Task 6 – Topical Report on the Preliminary Design of Advanced Compression Technology	9/30/09	
D60: Task 13 – Site Development, Operations, and Closure Plan	9/30/09	
D61: Task 13 – Site Commercialization Plan	9/30/09	
D64: Task 4 – Williston Basin Test Site – Site Characterization Report	9/30/09	
D65: Task 4 – Fort Nelson Test Site – Site Characterization Report	9/30/09	
D66: Task 4 – Williston Basin Test Site – Simulation Report	9/30/09	
D77: Task 13 – Risk Management Plan Outline	9/30/09	
<b>Year 3 – Quarter 1 (October–December 2009)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/09	
M13: Task 4 – Williston Basin Test Site B – Version Geological Model Development Completed	12/31/09	
M14: Task 4 – Williston Basin Test Site Geological Characterization Data Collection Completed	12/31/09	
M15: Task 4 – Williston Basin Test Site Baseline Hydro B – Model Completed	12/31/09	
D41: Task 4 – Fort Nelson Test Site – Geochemical Final Report	12/31/09	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/09	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/09	
D57: Task 12 – Project Assessment Annual Report	12/31/09	
<b>Year 3 – Quarter 2 (January–March 2010)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/10	
D11: Task 2 – Outreach Plan	3/31/10	
D32: Task 4 – Williston Basin Test Site – Geomechanical Final Report	3/31/10	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/10	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/10	
<b>Year 3 – Quarter 3 (April–June 2010)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/10	
D13: Task 2 – Public Site Updates	6/30/10	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/10	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/10	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/10	

Continued...

**Table 4. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 3 – Quarter 3 (April–June 2010), continued</b>		
D25: Task 2 – Williston Basin Test Site Poster	6/30/10	
D33: Task 4 – Williston Basin Test Site – Geochemical Final Report	6/30/10	
D34: Task 4 – Williston Basin Test Site – Baseline Hydrogeological Final Report	6/30/10	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/10	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/10	
<b>Year 3 – Quarter 4 (July–September 2010)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/10	
D70: Task 4 – Fort Nelson Test Site – Best Practices Manual – Simulation Report	8/31/10	
M16: Task 4 – Williston Basin Test Site Final Geological Model Development Completed	9/30/10	
D1: Task 1 – Review of Source Attributes	9/30/10	
D10: Task 1 – Demonstration Project Reporting System Update	9/30/10	
D26: Task 2 – Fort Nelson Test Site Poster	9/30/10	
D35: Task 4 – Williston Basin Test Site – Best Practices Manual – Site Characterization	9/30/10	
D36: Task 4 – Williston Basin Test Site – Wellbore Leakage Final Report	9/30/10	
D48: Task 7 – Procurement Plan and Agreement Report	9/30/10	
D50: Task 9 – Williston Basin Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/10	
D52: Task 9 – Fort Nelson Test Site – Site Characterization, Modeling, and Monitoring Plan	9/30/10	
D68: Task 4 – Fort Nelson Test Site – Best Practices Manual – Site Characterization	9/30/10	
D69: Task 4 – Williston Basin Test Site – Best Practices Manual – Simulation Report	9/30/10	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/10	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/10	
<b>Year 4 – Quarter 1 (October–December 2010)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/10	
M20: Task 6 – Capture, Dehydration, and Compression Technology Design Completed	10/31/10	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/10	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/10	
D57: Task 12 – Project Assessment Annual Report	12/31/10	

Continued...

**Table 4. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 4 – Quarter 2 (January–March 2011)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/11	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/11	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/11	
<b>Year 4 – Quarter 3 (April–June 2011)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/11	
D21: Task 2 – Williston Basin Test Site 15-minute Documentary	6/30/11	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/11	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/11	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/11	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/11	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/11	
<b>Year 4 – Quarter 4 (July–September 2011)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/11	
D1: Task 1 – Review of Source Attributes	9/30/11	
D4: Task 1 – Permitting Review – Two Additional States	9/30/11	
D9: Task 1 – Updated DSS	9/30/11	
D45: Task 6 – Topical Report on the Integrated Capture Plant and Its Shakedown	9/30/11	
D46: Task 6 – Topical Report on Pipeline Route Selection, Design, and Construction	9/30/11	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/11	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/11	
<b>Year 5 – Quarter 1 (October–December 2011)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/11	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/11	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/11	
D57: Task 12 – Project Assessment Annual Report	12/31/11	
<b>Year 5 – Quarter 2 (January–March 2012)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/12	
D5: Task 1 – Second Target Area Completed	3/31/12	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/12	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/12	

Continued...

**Table 4. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 5 – Quarter 3 (April–June 2012)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/12	
D13: Task 2 – Public Site Updates	6/30/12	
D22: Task 2 – Fort Nelson Test Site 15-minute Documentary	6/30/12	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/12	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/12	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/12	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/12	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/12	
<b>Year 5 – Quarter 4 (July–September 2012)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/12	
D1: Task 1 – Review of Source Attributes	9/30/12	
D10: Task 1 – DPRS Update	9/30/12	
D44: Task 5 – Williston Basin Test Site – Drilling and Completion Activities Final Report	9/30/12	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/12	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/12	
<b>Year 6 – Quarter 1 (October–December 2012)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/12	
D14: Task 2 – General Phase III Fact Sheet	12/31/12	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/12	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/12	
D57: Task 12 – Project Assessment Annual Report	12/31/12	
<b>Year 6 – Quarter 2 (January–March 2013)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/13	
D15: Task 2 – Williston Basin Test Site Fact Sheet	3/31/13	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/13	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/13	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/13	
D16: Task 2 – Fort Nelson Test Site Fact Sheet	6/30/13	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/13	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/13	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/13	

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**Table 4. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 6 – Quarter 2 (January–March 2013), continued</b>		
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/13	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/13	
<b>Year 6– Quarter 4 (July–September 2013)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/30/13	
D1: Task 1 – Review of Source Attributes	9/30/13	
D6: Task 1 – Permitting Review – Three States and Two Provinces	9/30/13	
<b>Year 6– Quarter 4 (July–September 2013), continued</b>		
D9: Task 1 – Updated DSS	9/30/13	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/13	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/13	
<b>Year 7 – Quarter 1 (October–December 2013)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/13	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/13	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/13	
D57: Task 12 – Project Assessment Annual Report	12/31/13	
<b>Year 7 – Quarter 2 (January–March 2014)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/14	
D24: Task 2 – PCOR Partnership Region Sequestration General Poster	3/31/14	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/14	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/14	
<b>Year 7 – Quarter 3 (April–June 2014)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/14	
D13: Task 2 – Public Site Updates	6/30/14	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/14	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/14	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/14	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/14	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/14	
<b>Year 7 – Quarter 4 (July–September 2014)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/14	
D1: Task 1 – Review of Source Attributes	9/30/14	
D7: Task 1 – Third Target Area Completed	9/30/14	

Continued...

**Table 4. Phase III Milestones and Deliverables (continued)**

<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 7 – Quarter 4 (July–September 2014), continued</b>		
D10: Task 1 – Demonstration Project Reporting System Update	9/30/14	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/14	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/14	
<b>Year 8 – Quarter 1 (October–December 2014)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/14	
D75: Task 3 – Updated Permitting Action Plan	10/30/14	
D25: Task 2 – Williston Basin Test Site Poster	12/31/14	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	12/31/14	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	12/31/14	
D57: Task 12 – Project Assessment Annual Report	12/31/14	
<b>Year 8 – Quarter 2 (January–March 2015)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/15	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	3/31/15	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	3/31/15	
<b>Year 8 – Quarter 3 (April–June 2015)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/15	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/15	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/15	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/15	
D26: Task 2 – Fort Nelson Test Site Poster	6/30/15	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	6/30/15	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	6/30/15	
<b>Year 8 – Quarter 4 (July–September 2015)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/15	
D1: Task 1 – Review of Source Attributes	9/30/15	
D8: Task 1 – Permitting Review – Three States and One Province	9/30/15	
D9: Task 1 – Updated DSS	9/30/15	
D49: Task 8 – Transportation and Injection Operations Final Report	9/30/15	
D51: Task 9 – Williston Basin Test Site – Monitoring for CO <sub>2</sub> , EOR, and Sequestration Best Practices Manual	9/30/15	

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**Table 4. Phase III Milestones and Deliverables (continued)**

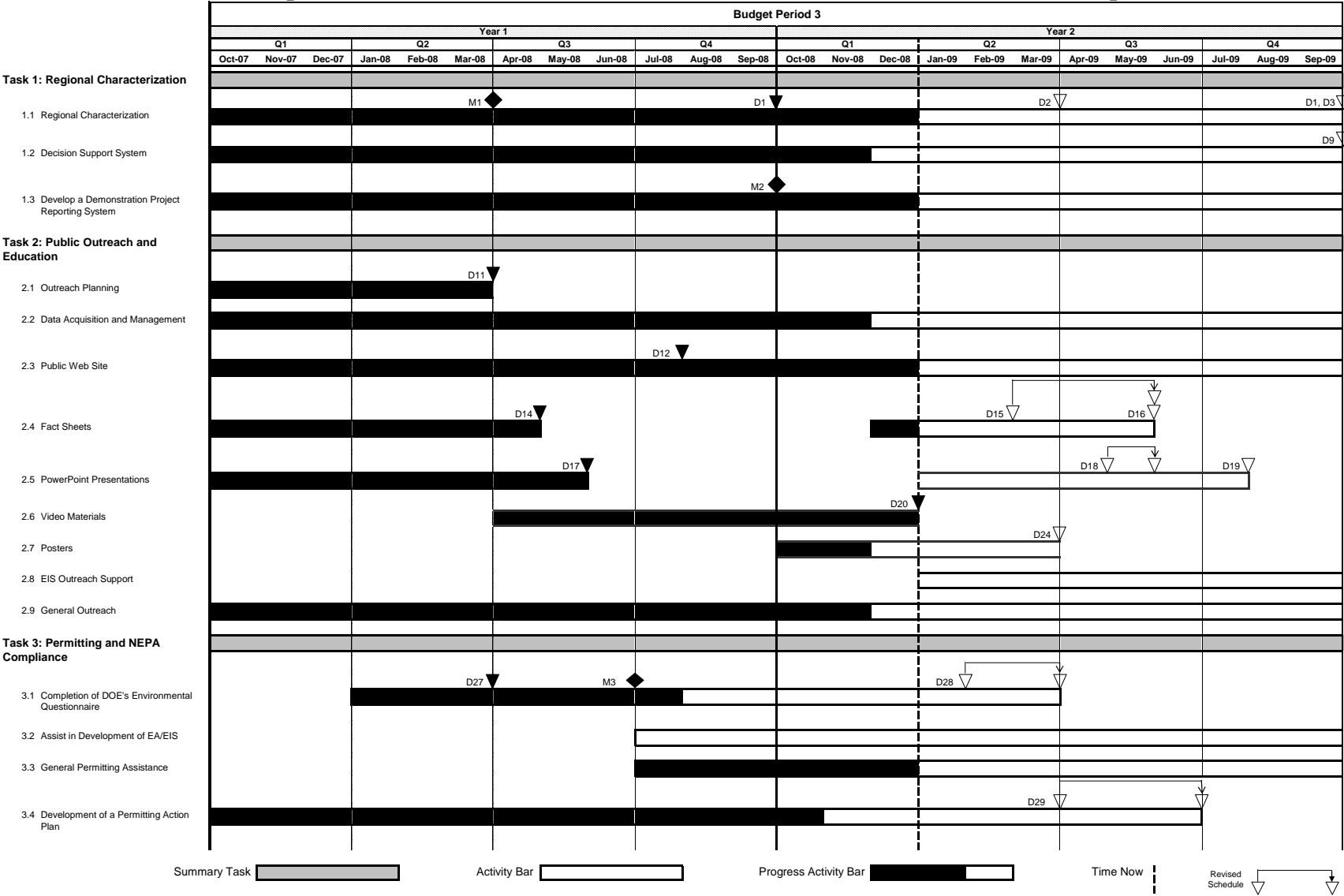
<b>Title/Description</b>	<b>Due Date</b>	<b>Actual Completion Date</b>
<b>Year 8 – Quarter 4 (July–September 2015), continued</b>		
D53: Task 9 – Fort Nelson Test Site – Monitoring for CO <sub>2</sub> Sequestration in a Brine Formation Best Practices Manual	9/30/15	
D71: Task 9 – Williston Basin Test Site – Quarterly Summary of Operations	9/30/15	
D72: Task 9 – Fort Nelson Test Site – Quarterly Summary of Operations	9/30/15	
<b>Year 9 – Quarter 1 (October–December 2015)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/15	
D14: Task 2 – General Phase III Fact Sheet	12/31/15	
D23: Task 2 – Sequestration in Carbon Management – 30-minute Documentary	12/31/15	
D57: Task 12 – Project Assessment Annual Report	12/31/15	
<b>Year 9 – Quarter 2 (January–March 2016)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/16	
D11: Task 2 – Outreach Plan	3/31/16	
D15: Task 2 – Williston Basin Test Site Fact Sheet	3/31/16	
D55: Task 11 – Report on Cost-Effective Long-Term Monitoring Strategies for the Williston Basin Test Site	3/31/16	
D56: Task 11 – Report on Cost-Effective Long-Term Monitoring Strategies for the Fort Nelson Test Site	3/31/16	
<b>Year 9– Quarter 3 (April–June 2016)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/16	
D13: Task 2 – Public Site Updates	6/30/16	
D16: Task 2 – Fort Nelson Test Site Fact Sheet	6/30/16	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/16	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/16	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/16	
<b>Year 9 – Quarter 4 (July–September 2016)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/16	
D1: Task 1 – Review of Source Attributes	9/30/16	
D10: Task 1 – Demonstration Project Reporting System Update	9/30/16	

Continued...

**Table 4. Phase III Milestones and Deliverables (continued)**

Title/Description	Due Date	Actual Completion Date
<b>Year 9 – Quarter 4 (July–September 2016), continued</b>		
D73: Task 11 – Williston Basin Test Site – Progress Report on Monitoring and Modeling Fate of CO <sub>2</sub>	9/30/16	
D74: Task 11 – Fort Nelson Test Site – Progress Report on Monitoring and Modeling Fate of CO <sub>2</sub>	9/30/16	
<b>Year 10 – Quarter 1 (October–December 2016)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/16	
D57: Task 12 – Project Assessment Annual Report	12/31/16	
<b>Year 10 – Quarter 2 (January–March 2016)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	1/31/17	
<b>Year 10 – Quarter 3 (April–June 2017)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	4/30/17	
D17: Task 2 – General Phase III Information PowerPoint Presentation	6/30/17	
D18: Task 2 – Williston Basin Test Site PowerPoint Presentation	6/30/17	
D19: Task 2 – Fort Nelson Test Site PowerPoint Presentation	6/30/17	
<b>Year 10 – Quarter 4 (July–September 2017)</b>		
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	7/31/17	
D54: Task 10 – Site Closure Report	9/30/17	
D73: Task 11 – Williston Basin Test Site – Progress Report on Monitoring and Modeling Fate of CO <sub>2</sub>	9/30/17	
D74: Task 11 – Fort Nelson Test Site – Progress Report on Monitoring and Modeling Fate of CO <sub>2</sub>	9/30/16	
D76: Task 3 – Best Practices Manual – Permitting	9/30/17	
D62: Task 13 – Final Report	9/30/17	
D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report	10/31/17	

Table 5. PCOR Partnership Phase III BP3 Critical Path Milestones and Deliverables PCOR Partnership (Gantt chart)



Continued...

Table 5. PCOR Partnership Phase III BP3 Critical Path Milestones and Deliverables PCOR Partnership (Gantt chart) (continued)



Key for Phase III Deliverables (D) ▼		Key for Phase III Milestone (M) ◆	
D1	Review of Source Attributes	M1	Three Target Areas Selected
D2	First Target Area Completed	M2	DPRS Prototype
D3	Permitting Review – One State and One Province	M3	Start Environmental Questionnaire for WB Test Site
D9	Updated DSS	M4	WB Test Site Selected
D11	Outreach Plan	M5	Data Collection Initiated for WB Test Site
D12	Demonstration Web Pages on the Public Site	M6	WB Test Site Geochemical Work Initiated
D14	General Phase III Fact Sheet	M7	WB Test Site Geological Characterization Data Collection Initiated
D15	Williston Basin (WB) Test Site Fact Sheet	M8	WB Test Site Wellbore Leakage Data Collection Initiated
D16	Fort Nelson Test Site Fact Sheet	M9	WB Test Site B - Version Geological Model Development Initiated
D17	General Phase III Information PowerPoint Presentation	M10	WB Test Site Wellbore Leakage Data Collection Completed
D18	WB Test Site PowerPoint Presentation	M11	WB Test Site Baseline Hydro Data Collection Completed
D19	Fort Nelson (FN) Test Site PowerPoint Presentation	M12	WB Test Site Geochemical Work Completed
D20	Video Support to PowerPoint and Web Site	M17	FN Test Site Selected
D24	PCOR Region Sequestration General Poster	M18	FN Test Site Geochemical Work Initiated
D27	FN Test Site – Environmental Questionnaire	M19	Capture, Dehydration, and Compression Technology Selected
D28	WB Test Site – Environmental Questionnaire		
D29	Permitting Action Plan		
D30	WB Test Site – Geomechanical Experimental Design Package		
D31	WB Test Site – Site Geological Characterization Experimental Design Package		
D37	FN Test Site – Site Geological Characterization Experimental Design Package		
D38	FN Test Site – Geomechanical Experimental Design Package		
D40	FN Test Site – Geomechanical Final Report		
D42	WB Test Site – Injection Experimental Design Package		
D43	WB Test Site – Monitoring Experimental Design Package		
D47	Topical Report on the Preliminary Design of Advanced Compression Technology		
D57	Project Assessment Annual Report		
D58	Quarterly Progress Report		
D59	Milestone Quarterly Report		
D60	Site Development, Operations, and Closure Plan		
D61	Site Commercialization Plan		
D63	Project Management Plan		
D64	WB Test Site – Site Characterization Report		
D65	FN Test Site – Site Characterization Report		
D66	WB Test Site – Simulation Report		
D67	FN Test Site – Simulation Report		
D77	Risk Management Plan Outline		

## **Task 2 – Public Outreach and Education**

As stated in the Schedule Status section of this report, the PCOR Partnership is still seeking a specific location for the Williston Basin demonstration site and is currently waiting for information from a participating partner. As a result, Deliverable D15 (Williston Basin test fact sheet) and Deliverable D18 (Williston Basin test PowerPoint) will be conceptual in nature and will be revised as the demonstration develops.

## **Task 3 – Permitting and NEPA Compliance**

As stated in the Schedule Status section of this report, because negotiations are ongoing and still uncertain for PCOR Partnership partners in the Williston Basin demonstration, attendant deliverables and milestones were approved for extension by DOE.

## **Task 4 – Site Characterization and Modeling**

The selection of a site for the Williston Basin Phase III demonstration has been delayed for two quarters. This will also cause delays in other site-specific activities, such as the development of a NEPA document, site-specific characterization activities, site-specific MMV planning, and site-specific public outreach activities.

Negotiations between Basin Electric Power Cooperative (the company providing the CO<sub>2</sub> for the Williston Basin project) and the oil companies are ongoing. No deals have been completed; therefore, no site has been formally accepted or schedule of activities set.

## **Task 5 – Well Drilling and Completion**

As stated in the Schedule Status section of this report, because of delays in the Williston Basin demonstration, Task 5 activities will be initiated April 1, 2009 (original start date was October 1, 2008).

## **Task 6 – Infrastructure Development**

Some of the work on this task has been delayed while the plans for the CO<sub>2</sub> capture and geologic sequestration for the demonstration projects are finalized. Once the specific carbon capture and sequestration strategy for the demonstration project has been finalized, planned task activities related to CO<sub>2</sub> capture, compression, and pipeline design and routing can begin. In the interim, activities are being undertaken in support of the planned actions.

## **Task 7 – CO<sub>2</sub> Procurement**

Numerous discussions with potential CO<sub>2</sub> suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

### **Task 8 – Transportation and Injection Operations**

Nothing to note at this time.

### **Task 9 – Operational Monitoring and Modeling**

Nothing to note at this time.

### **Task 10 – Site Closure**

Nothing to note at this time.

### **Task 11 – Postinjection Monitoring and Modeling**

Nothing to note at this time.

### **Task 12 – Project Assessment**

Nothing to note at this time.

### **Task 13 – Project Management**

The NETL Sequestration Technology Manager and the RCSP Coordinator at DOE have expressed concern about the delays to the Phases II and III projects in the Williston Basin. A response was prepared that included a description of the delays, options for alternative ways to proceed, and an estimate of the impacts of each option to the costs and schedule. This response was sent in early December 2008.

## **PHASE III PRODUCTS OR TECHNOLOGY TRANSFER ACTIVITIES**

### **Task 1 – Regional Characterization**

In October 2008, MDNR/DGLS staff attended the annual central cluster meeting of the American Association of State Geologists in Cedar City, Iowa. MDNR/DGLS staff also attended the annual conference of Missouri's Division of Environmental Quality in November 2008 at Osage Beach, Missouri. In both instances, a presentation was given concerning potential CO<sub>2</sub> sequestration in Missouri and the partnership of MDNR/DGLS with the PCOR Partnership.

### **Task 2 – Public Outreach and Education**

A set of more than 40 video clips (Deliverable D20) was created from the documentary products and other materials held by PPB and submitted on schedule to NETL for review.

### **Task 3 – Permitting and NEPA Compliance**

Comments on EPA's proposed rules for geologic sequestration have been developed and submitted to EPA for consideration. Input from PCOR Partnership members was received and incorporated into the document.

### **Task 4 – Site Characterization and Modeling**

No deliverables were due for Task 4 during this quarter.

### **Task 5 – Well Drilling and Completion**

This task has not begun (begins Quarter 3 – BP3, Year 2). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

### **Task 6 – Infrastructure Development**

The Task 6 lead attended the Carbon Capture Status & Outlook, Carbon Capture Technology Showcase, and Carbon Sequestration Development & Finance Summit meetings that were held in Houston, Texas, October 20–24, 2008. Contacts were made, and information about the PCOR Partnership, its goals, and accomplishments were shared with other conference attendees.

### **Task 7 – CO<sub>2</sub> Procurement**

Numerous discussions with potential CO<sub>2</sub> suppliers have taken place. Because of the sensitive nature of negotiations, specifics cannot be shared at the present time.

### **Task 8 – Transportation and Injection Operations**

This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

### **Task 9 – Operational Monitoring and Modeling**

This task has not begun (begins Quarter 1 – BP4, Year 3). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

### **Task 10 – Site Closure**

This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

### **Task 11 – Postinjection Monitoring and Modeling**

This task has not begun (begins Quarter 1 – BP5, Year 9). Once activities are initiated, the information will be communicated and detailed in the quarterly progress report.

## **Task 12 – Project Assessment**

The Project Assessment Annual Report (Deliverable D57) was submitted for approval on December 31, 2008.

## **Task 13 – Project Management**

The deliverable entitled “D58/D59: Task 13 – Quarterly Progress Report/Milestone Quarterly Report” was submitted to DOE for approval on October 31, 2008.

## **MEETINGS/TRAVEL**

Representatives from the PCOR Partnership participated in and/or presented at the following meetings and conferences in this reporting period:

- September 29 – October 3, 2008: EPA Public Hearings in Chicago, Illinois
- October 2, 2008: Lignite Energy Council Meeting in Bismarck, North Dakota
- October 6–8, 2008: Gasification Technologies Council Meeting in Washington, D.C.
- October 6–8, 2008: Regional Partnerships Annual Review Meeting in Pittsburgh, Pennsylvania
- October 20–22, 2008: Infocast Carbon Capture Status & Outlook and Carbon Capture Technology Showcase in Houston, Texas
- October 23–24, 2008: Carbon Sequestration Development and Finance Summit in Houston, Texas
- November 11–13, 2008: American Coalition for Clean Coal Electricity’s Annual Board of Directors Meeting in Naples, Florida
- November 15–19, 2008: IOGCC in Santa Fe, New Mexico
- November 15–21, 2008: Geologic documentary interviews in Midale, Saskatchewan
- November 16–20, 2008: GHGT-9 in Washington, D.C.
- November 19, 2008: Carbon Prices WEBINAR
- December 2–3, 2008: Workshop on CO<sub>2</sub> Geological Storage Capacity and Emission Sources Mapping in Houston, Texas
- December 3–5, 2008: PRISM meeting in Edmonton, Alberta
- December 3–5, 2008: PCOR Partnership Meeting in Omaha, Nebraska
- December 5, 2008: Accompany PPB on the interview trip in Austin, Texas
- December 7–12, 2008: Win Prop and CO<sub>2</sub> Sequestration Training Courses in Calgary, Alberta
- December 8–10, 2008: 6th Annual EOR Carbon Management Workshop in Houston, Texas
- December 11–12, 2008: 2008 CO<sub>2</sub> Flooding Conference in Midland, Texas
- December 16–18, 2008: RCSP Simulation & Risk Assessment Workshop in Berkeley, California

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



## REFERENCES

None.