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(03/11)
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U.S. Department of Energy
FEDERAL ASSISTANCE REPORTING CHECKLIST
AND INSTRUCTIONS FOR RD&D PROJECTS

1. Identification Number: **DE-FE0006821**	2. Program/Project Title: **Small Scale Field Test Demonstration CO2 Sequestration**

3. Recipient: **University of Kansas Center for Research, Inc.**

4. Reporting Requirements:	Frequency	Addressees
A. MANAGEMENT REPORTING		
☒ Research Performance Progress Report (RPPR)	Q	FITS@NETL.DOE.GOV
☒ Special Status Report	A	FITS@NETL.DOE.GOV
B. SCIENTIFIC/TECHNICAL REPORTING		
(Reports/Products must be submitted with appropriate DOE F 241. The 241 forms are available at www.osti.gov/elink)		
Report/Product — Form		
☒ Final Scientific/Technical Report — DOE F 241.3	FG	http://www.osti.gov/elink-2413
☒ Conference papers/proceedings* — DOE F 241.3	A	http://www.osti.gov/elink-2413
☐ Software/Manual — DOE F 241.4		
☐ Other (see special instructions) — DOE F 241.3		
** Scientific and technical conferences only*		
C. FINANCIAL REPORTING		FITS@NETL.DOE.GOV
☒ SF-425 Federal Financial Report	Q, FG	
D. CLOSEOUT REPORTING		
☒ Patent Certification	FC	FITS@NETL.DOE.GOV
☒ SF-428 & 428B Final Property Report	FC	FITS@NETL.DOE.GOV
☐ Other		
E. OTHER REPORTING		See block 5 below for instructions.
☒ Annual Indirect Cost Proposal	O	
☐ Audit of For-Profit Recipients		
☒ SF-428 Tangible Personal Property Report Forms Family	A	FITS@NETL.DOE.GOV
☒ Other – see block 5 below	A	FITS@NETL.DOE.GOV

FREQUENCY CODES AND DUE DATES:

A - Within 5 calendar days after events or as specified.
FG- Final; 90 calendar days after the project period ends.
FC- Final; End of Effort.
Y - Yearly; 90 calendar days after the end of the reporting period.
S - Semiannually; within 30 calendar days after end of project year and project half-year.
Q - Quarterly; within 30 days after end of the reporting period.
Y180 – Yearly; 180 days after the end of the recipient's fiscal year
O - Other; See instructions for further details.

5. Special Instructions:

Annual Indirect Cost Proposal – If DOE is the Cognizant Federal Agency, then the proposal should be sent to FITS@NETL.DOE.GOV . Otherwise, it should be sent to the Cognizant Federal Agency.

Other – The Recipient shall provide all deliverables as contained in Section D of Attachment 2 Statement of Project Objectives.

QUARTERLY PROGRESS REPORT
To
DOE-NETL
Brian Dressel, Program Manager
Award Number: DE-FE0006821

SMALL SCALE FIELD TEST DEMONSTRATING CO_2 SEQUESTRATION IN ARBUCKLE SALINE AQUIFER AND BY CO_2-EOR AT WELLINGTON FIELD, SUMNER COUNTY, KANSAS

Project Director/Principal Investigator:
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Joint Principal Investigator:
Jason Rush

Date of Report: January 31, 2013

DUNS Number: 076248616

Recipient: University of Kansas Center for Research &
Kansas Geological Survey
1930 Constant Avenue
Lawrence, KS 66047

Project/Grant Period: 10/1/2011 through 9/30/2015

Fifth Quarterly Report

Period Covered by the Report: October 1, 2012 through December 31, 2012

Signature of Submitting Official:

Willard Lynn Watney

Digitally signed by Willard Lynn Watney
DN: cn=Willard Lynn Watney, o=The University of Kansas, ou=Kansas Geological Survey, email=lwatney@kgs.ku.edu, c=US
Date: 2013.02.01 14:53:21 -06'00'

EXECUTIVE SUMMARY

Project Objectives

The objectives of this project are: (1) inject under supercritical conditions approximately 40,000 metric tons of CO_2 into the Arbuckle saline aquifer; (2) demonstrate the application of state-of-the-art MVA (monitoring, verification, and accounting) tools and techniques to monitor and visualize the injected CO_2 plume; (3) develop a robust Arbuckle geomodel by integrating data collected from the proposed study area, and a multi-component 3D seismic survey; (4) conduct reservoir simulation studies to map CO_2 plume dispersal and estimate tonnage of CO_2 sequestered in solution, as residual gas and by mineralization; (5) integrate MVA data and analysis with reservoir modeling studies to detect CO_2 leakage and to validate the simulation model; (6) develop a rapid-response mitigation plan to minimize CO_2 leakage and a comprehensive risk management strategy; and (7) establish best practice methodologies for MVA and closure. Additionally, approximately 30,000 metric tons of CO_2 shall be injected into the overlying Mississippian to evaluate miscible CO_2-EOR potential in a 5-spot pilot pattern. The CO_2 shall be supplied from the Abengoa Bioenergy ethanol plant at Colwich, Kansas who has operated the facility since 1982 demonstrating reliability and capability to provide an adequate stream and quality of CO_2. The project shall install compression, chilling, and transport facilities at the ethanol plant for truck transport to the injection site.

Project Goals

The proposed small scale injection will advance the science and practice of carbon sequestration in the Midcontinent by refining characterization and modeling, evaluating best practices for MVA tailored to the geologic setting, optimize methods for remediation and risk management, and provide technical information and training to enable additional projects and facilitate discussions on issues of liability and risk management for operators, regulators, and policy makers.

The data gathered as part of this research effort and pilot study will be shared with the Southwest Sequestration Partnership (SWP) and integrated into the National Carbon Sequestration Database and Geographic Information System (NATCARB) and the 6th Edition of the Carbon Sequestration Atlas of the United States and Canada.

Project Deliverables by Task

1.5 Well Drilling and Installation Plan (Can be Appendix to PMP or Quarterly Report)
1.6 MVA Plan (Can be Appendix to PMP or Quarterly Report)
1.7 Public Outreach Plan (Can be Appendix to PMP)
1.8 Arbuckle Injection Permit Application Review go/no go Memo
1.9 Mississippian Injection Permit Application Review go/no go Memo

1.10 Site Development, Operations, and Closure Plan (Can be Appendix to PMP)
2.0 Suitable geology for Injection Arbuckle go/no go Memo
3.0 Suitable geology for Injection Mississippian go/no go Memo
11.2 Capture and Compression Design and Cost Evaluation go/no go Memo
19 Updated Site Characterization/Conceptual Models (Can be Appendix to Quarterly Report)
21 Commercialization Plan (Can be Appendix to Quarterly Report).
30 Best Practices Plan (Can be Appendix to Quarterly or Final Report)

ACCOMPLISHMENTS

1. **Completed Milestone 1 (Task 2)** -- Site Characterization of Arbuckle Saline Aquifer System - Wellington Field.
2. **Significant progress and nearing completion of Milestone 2 (Task 3) --** Site characterization of Mississippian Reservoir for CO2 EOR - Wellington Field
3. **Subtask 1.8 Arbuckle Injection Permit Application** – The permit application consists of 15 chapters (sections). The completion status for each section, along with the remaining tasks is described in Table 1 below. The first draft of each section has been completed. The process involved aggregating information from many investigators/specialists into a coherent document which summarizes the suitability of the Wellington site for conducting not only the small-scale pilot test, but potentially for long-term commercial scale carbon capture and sequestration (CCS).

Milestone Status Report

Task	Budget Period	Number	Milestone Description
Task 2.	1	1	Site Characterization of Arbuckle Saline Aquifer System - Wellington Field
Task 3.	1	2	Site characterization of Mississippian Reservoir for CO2 EOR - Wellington Field
Task 10.	2	3	Pre-injection MVA - establish background (baseline) readings
Task 13.	2	4	Retrofit Arbuckle Injection Well (#1-28) for MVA Tool Installation
Task 18.	3-yr1	5	Compare Simulation Results with MVA Data and Analysis and Submit Update of Site Characterization, Modeling, and Monitoring Plan
Task 22.	3-yr1	6	Recondition Mississippian Boreholes Around Mississippian CO2-EOR injector
Task 27.	3-yr2	7	Evaluate CO2 Sequestration Potential of CO2-EOR Pilot
Task 28.	3-yr2	8	Evaluate Potential of Incremental Oil Recovery and CO2 Sequestration by CO2-EOR - Wellington field

Project Schedule

Abengoa Biofuels informed us in mid August 2012 that the Colwich Ethanol Facility would be shut down for one year because of the severe drought in the Midwest. The dry weather severely impacted their dryland feedstock base (mainly milo and sorghum) and the resulting high grain prices. The facility will remains closed until the next harvest. Abengoa, DOE, and partners agreed that the plant reopening will be revisited on October 1, 2013 after the next harvest cycle to determine if they will reopen. During DOE site visit in September 2012, Abengoa official gave us a tour of the ethanol plant and relayed that every effort is being taken to keep the plant in a condition so that it can be reopened next year.

A request was made and DOE extended Budget Period 1 for an additional year at no cost until October 1, 2013. The project will make every effort to evaluate alternative sources, but as yet the

economics are not close to meeting the arrangements made with Abengoa and the Colwich ethanol facility. Both Abengoa and Berexco, the oil field industry partner, are committed to working with each other to link the ethanol-based CO2 with oil field operations in the area.

Geologic CO2 will not be part with the Kansas market due to demand along existing pipelines in Texas, New Mexico, Colorado, and Wyoming. Anthropogenic is the only viable source to provide the CO2 needed for CO2-EOR. Both Abengoa and Berexco are keenly interested in the saline aquifer storage in order to obtain enhanced prices for ethanol, obtain deposal fees, and with the case at Wellington, the income generated by carbon trading through Biorecro in Sweden.

The KGS is committed to starting injection at the Wellington site in the first quarter of FY2014. Therefore, contacts were made with alternative anthropogenic CO2 producers to supply the source in the event that the Abengoa plant remains shut indefinitely. The suppliers include Airgas and FloCO2, and each have indicated an ability to provide CO2 in the event of continued shutdown of the Abengoa facility. Other options are being investigated.

The Class VI permit application documented is expected to be completed in February 2013. Construction of monitoring wells and installation of monitoring equipment will commence on approval of the permit.

A condensed version of the Gantt Chart tracks tasks based on the one year no cost extension of Budget Period 1 (Figure 1).

Activities of Lawrence Berkeley National Lab

No work has been completed or funds expended during this quarter by LBNL.

ONGOING ACTIVITIES –

TASK 1. PROJECT MANAGEMENT AND REPORTING

Permit Status and Activities

As of January 2013, the first draft of all permit sections has been completed. KGS graphics and GIS personnel are working on completing the figures for the application report. A few sections have minor tasks outstanding as indicated and explained in Table 1. The goal is to finalize the sections for internal and external review in February 2013; after which the application will be submitted to EPA. KGS will seek a permit kickoff meeting with EPA in order to expedite the review process. The contents of each section will be summarized and presented in Power Point

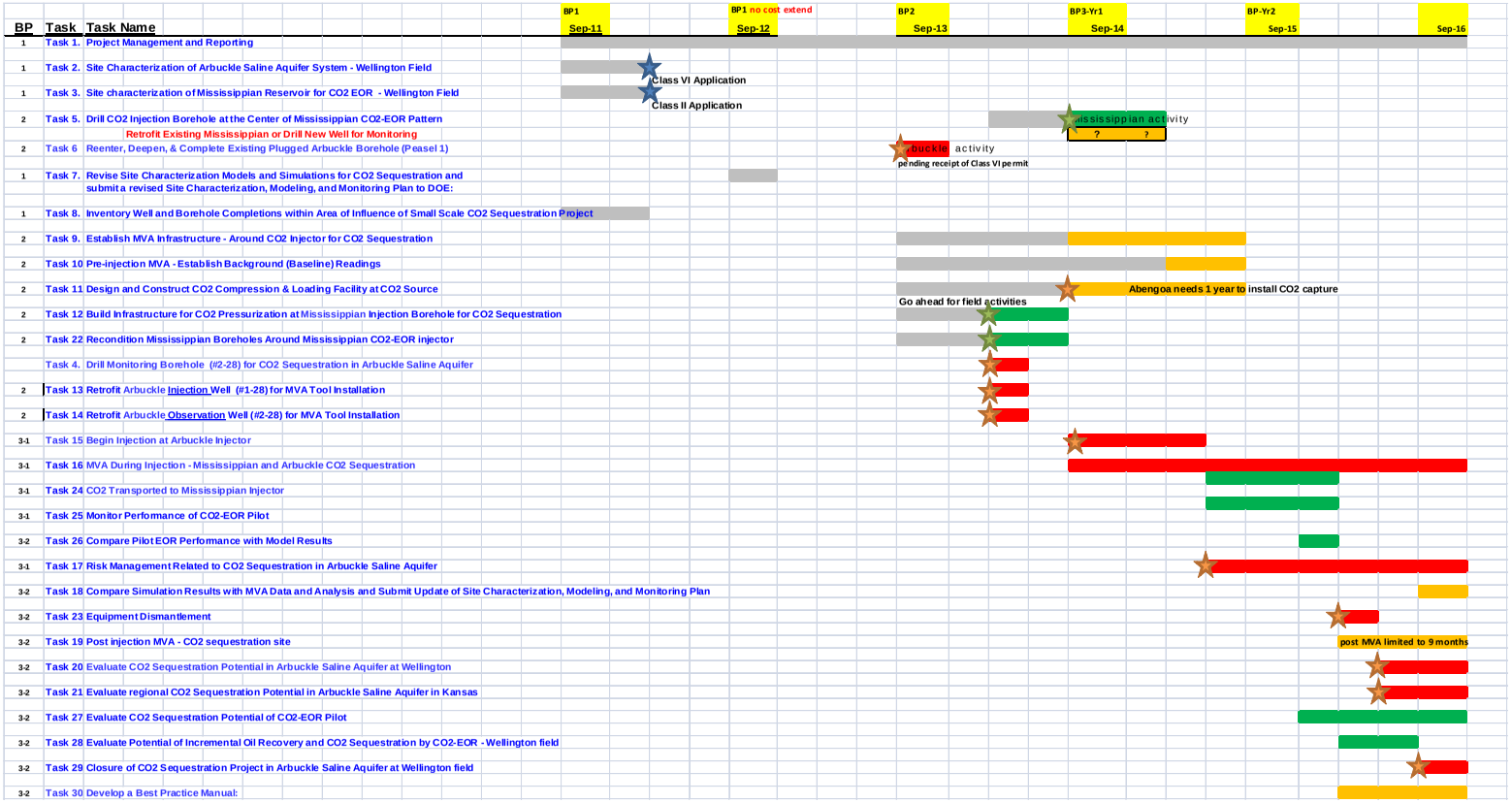
BP
Task
Task Name
BP1
Sep-11
BP1 no cost extend
Sep-12
BP2
Sep-13
BP3-Yr1
Sep-14
BP-Yr2
Sep-15
Sep-16
1 Task 1. Project Management and Reporting
1 Task 2. Site Characterization of Arbuckle Saline Aquifer System - Wellington Field
Class VI Application
1 Task 3. Site characterization of Mississippian Reservoir for CO2 EOR - Wellington Field
Class II Application
2 Task 5. Drill CO2 Injection Borehole at the Center of Mississippian CO2-EOR Pattern
Mississippian activity
? ?
Retrofit Existing Mississippian or Drill New Well for Monitoring
2 Task 6 Reenter, Deepen, & Complete Existing Plugged Arbuckle Borehole (Peasel 1)
Arbuckle activity
pending receipt of Class VI permit
1 Task 7. Revise Site Characterization Models and Simulations for CO2 Sequestration and submit a revised Site Characterization, Modeling, and Monitoring Plan to DOE:
1 Task 8. Inventory Well and Borehole Completions within Area of Influence of Small Scale CO2 Sequestration Project
2 Task 9. Establish MVA Infrastructure - Around CO2 Injector for CO2 Sequestration
2 Task 10 Pre-injection MVA - Establish Background (Baseline) Readings
2 Task 11 Design and Construct CO2 Compression & Loading Facility at CO2 Source
Abengoa needs 1 year to install CO2 capture
Go ahead for field activities
2 Task 12 Build Infrastructure for CO2 Pressurization at Mississippian Injection Borehole for CO2 Sequestration
2 Task 22 Recondition Mississippian Boreholes Around Mississippian CO2-EOR injector
Task 4. Drill Monitoring Borehole (#2-28) for CO2 Sequestration in Arbuckle Saline Aquifer
2 Task 13 Retrofit Arbuckle Injection Well (#1-28) for MVA Tool Installation
2 Task 14 Retrofit Arbuckle Observation Well (#2-28) for MVA Tool Installation
3-1 Task 15 Begin Injection at Arbuckle Injector
3-1 Task 16 MVA During Injection - Mississippian and Arbuckle CO2 Sequestration
3-1 Task 24 CO2 Transported to Mississippian Injector
3-1 Task 25 Monitor Performance of CO2-EOR Pilot
3-2 Task 26 Compare Pilot EOR Performance with Model Results
3-1 Task 17 Risk Management Related to CO2 Sequestration in Arbuckle Saline Aquifer
3-2 Task 18 Compare Simulation Results with MVA Data and Analysis and Submit Update of Site Characterization, Modeling, and Monitoring Plan
3-2 Task 23 Equipment Dismantlement
3-2 Task 19 Post injection MVA - CO2 sequestration site
post MVA limited to 9 months
3-2 Task 20 Evaluate CO2 Sequestration Potential in Arbuckle Saline Aquifer at Wellington
3-2 Task 21 Evaluate regional CO2 Sequestration Potential in Arbuckle Saline Aquifer in Kansas
3-2 Task 27 Evaluate CO2 Sequestration Potential of CO2-EOR Pilot
3-2 Task 28 Evaluate Potential of Incremental Oil Recovery and CO2 Sequestration by CO2-EOR - Wellington field
3-2 Task 29 Closure of CO2 Sequestration Project in Arbuckle Saline Aquifer at Wellington field
3-2 Task 30 Develop a Best Practice Manual:

Figure 1. Condensed version of the project Gantt Chart.

format, which will provide the reviewer's an opportunity to better understand the application contents and seek technical clarification.

Table 1 Status of Class VI permit application

Section	Percent Complete	Remaining Tasks
Project Overview	**95%**	GIS and graphics personnel working on finalizing figures.
Local Scale Geologic and Hydrolgeologic Background	**90%**	Need to incorporate Chattanooga shale analyses conducted by Mina Fazelalawi to demonstrate the presence of competent caprock.
Regional Scale Geologic and Hydrogeologic Background	**95%**	GIS and graphics personnel working on finalizing figures.
Geologic Sequestration of Carbon Dioxide	**95%**	GIS and graphics personnel working on finalizing figures.
Flow and Transport Model Simulations and AOR Delineation	**85%**	Eugene revising model in order utilize Simpson and Chattanooga shale as caprock, and also to incorporate variations in vertical anisotropy and dispersion/diffusion. GIS and graphics personnel working to work on finalizing figures.
Potential Capture in Depleted Mississippian Formation	**90%**	Paul Gerlach may potentially add a map showing how extensively the Mississippian is under pressurized in Sumner County. GIS and graphics personnel working on finalizing figures.
Geomechanical Stability Investigations	**95%**	GIS and graphics personnel working on finalizing figures.
Injection Well Design	**90%**	GIS and graphics personnel working on finalizing figures. Tiraz Birdie to add discussion on type of cement information forwarded by Dana.

Monitoring Well Design	**80%**	GIS and graphics personnel working on finalizing figures. Tiraz Birdie to add some discussion on type of cement information forwarded by Dana, and the proposed well 2-28.
Site Operations	**75%**	A draft has been completed assuming that liquid CO2 will be injected at 250 psi and -10F. Wellbore simulations are being conducted to determine if these surface operating conditions will function effectively. Also, discussions are being conducted with infrastructure suppliers to design surface facilities.
Monitoring Verification and Accounting Activities	**90%**	GIS and graphics personnel to work on finalizing figures. Awaiting write up from Sugata on groundwater chemistry monitoring.
Post Injection Site Care	**90%**	First draft complete. Awaiting final modeling results to specify closure time frame.
Site Closure	**95%**	Final writeup after completing modeling section
Risk Management and Mitigation Plan	**90%**	Need to describe automatic shutdown system after finalizing surface facilities plans. Need to ensure that onsite Programmable Logic Controller or computer can implement a shutdown plan.
Financial Assurances	**70%**	Draft complete. Berexco to provide P&L, balance sheet, and cash flow metrics. Berexco to also complete cost estimates for closure and monitoring activities.

The bulk of the efforts in first quarter of FY 2013 were expended towards finalizing the draft of the of the permit application. This involved:

- Compiling background information on the regional hydrogeology,
- Synthesizing the numerous physical, chemical, and biological data sets acquired during drilling of wells 1-32 and 1-28, and utilizing the same to develop a conceptual model of the stratification within the Arbuckle aquifer and characterizing the overlying formations,
- Establishing the EPA Area of Review,
- Conducting flow and transport simulations in order to determine the eventual fate of the CO2,

- Compiling historical information on oil and gas development in Kansas and documentation the resulting under pressurization in the Mississippian reservoir, which will serve as a trap for any CO2 that may potentially escape from the caprock or faults,
- Developing geomechanical approaches to quantatively demonstrate that the caprock and formation integrity will not be compromised due to injection,
- Developing write up on Nuclear Magentic Resonance to communicate the strength of the technique for characterizing geologic formations,
- Documenting procedure for integrating seismic data and geophysical data in Petrel and eventually upscaling in the CMG reservoir model.
- Conducting discussions with Joe Tiago (EPA contact for financial aspects of Class VI wells) in order to ensure proper compilation and reporting of financial information to demonstrate strength of Berexco for undertaking sequestration activities,
- Demonstrating to EPA that the construction practices, materials utilized, and design of wells KGS 1-28 and 1-32 are in accordance with the Class VI specifications.

Key Findings

1. Geomechanical analyses indicates that it will be virtually impossible to encounter stress related failure along existing fracture and fault planes due to CO2 injection.

2. Reservoir simulation results indicate that the pressure front will dissipate very rapidly after cessation of injection. The plume is expected to stabilize within three years of cessation of injection; coinciding with the end of the DOE funding. This conclusion is significant as it provides support for a request to the EPA to waive the default 50-year monitoring period after cessation of pumpage. The site operator, Berexco, had previously expressed concern regarding carrying liability beyond the 5-year project period.

3. Significant amount of time was spent in the 5th quarter to determine the optimal CO2 phase and temperature-pressure combination for injecting CO2 at the site. While the analyses and final design of the injection facilities is still being conducted, the findings

point to suitability of injecting in the liquid state. A consequence of injecting in the liquid state is rapid infiltration of the CO2 into the formation. This may result in the need to inject CO2 for a few hours each day rather than injecting continuously. The details of the injecting facilities and operating parameters (pressure/temperature) are currently being established.

Plans

1. Top priority remains to finalize and submit application for Class VI injection permit to the EPA in February 2013. A day long permit kickoff meeting is to be requested with the EPA in order to communicate the project findings and contents of the permit document to EPA reviewers, and provide them an opportunity to ask questions/seek clarification. This will expedite the EPA review process. On obtaining the permit, field activities shall commence in conjunction with construction of new monitoring wells, and deepening of the existing Peasel well.

2. Submit updated management plan, well drilling and installation plan, MVA plan, Public Outreach Plan based on material included in Class VI application.

3. Submit Mississippian Injection Permit Application (Class II injection well under Kansas primacy, regulated by Kansas Corporation Commission) using updated geomodel and simulation of the Mississippian oil reservoir.

PRODUCTS

Publications, conference papers, and presentations

Scheffer, A.A., Gulliver, D., Roberts, J.A., Fowle, D., Watney, W.L., Doveton, J., Stotler, R., Whittemore, D., ms. in review, Geochemical, Microbiological, and Permeability Characteristics Indicating Vertical Zonation of the Arbuckle Saline Aquifer, a potential CO2 storage reservoir.

Barker, R., Watney, W., Rush, J., Strazisar, B., Scheffer, A., Bhattacharya, S., Wreath, D., and Datta, S*., in review, GEOCHEMICAL AND MINERALOGICAL CHARACTERIZATION OF THE ARBUCKLE AQUIFER: STUDYING MINERAL REACTIONS AND ITS IMPLICATIONS FOR CO2 SEQUESTRATION, , Chemical Geology.

PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS:

A project organization chart follows. The work authorized in this budget period includes office tasks related to preparation of reports and application for a Class VI permit to inject CO2 into the Arbuckle saline aquifer. Tasks associated with reservoir characterization and modeling are funded in contract DE-FE0002056.

ORGANIZATION CHART

Name	Project Job Title	Primary Responsibility
Kansas Geological Survey		
Lynn Watney	Project Leader, Joint Principal Investigator	Geology, information synthesis, point of contact
Yevhen Holubnyak	Petroleum Engineer	Reservoir engineer, dynamic modeling, synthesis
Jason Rush	Joint Principal Investigator	Geology, static modeling, data integration, synthesis
John Doveton	Co-Principal Investigator	Log petrophysics, geostatistics
Dave Newell	Co-Principal Investigator	Fluid geochemistry
Rick Miller	Geophysicist	2D seismic acquire & interpretation
		LiDAR/InSAR support, water well drilling/completion
TBN	Geology Technician	Assemble and analyze data, report writing
Tiraz Birdie	President, TBirdie Consulting, Inc.	Hydrogeologic modeling, permitting, MVA, integration
KU Department of Geology		
Michael Taylor	Co-Principal Investigator	Structural Geology, analysis of InSAR, LiDAR, seismometer array
TBN	Graduate Research Assistant	Structural Geology, analysis of InSAR and LiDAR, seismometer array
Kansas State Unversity		
Saugata Datta	Principal Investigator	
TBN	Graduate Research Assistant	Aqueous geochemistry
TBN	3- Undergraduate Research Assistants	
Lawrence Berkeley National Laboratory		
Tom Daley	Co-Principal Investigator	Geophysicist, analysis of crosshole and CASSM data
		Hydrogeology, analysis of soil gas measurements
Barry Freifeld	Co-Principal Investigator	Mechanical Engineer, analysis of U-Tube sampler
Sandia Technologies, Houston		
Dan Collins	Geologist	Manage CASSM and U-Tube operation
David Freeman	Field Engineer	Manage field install of CASSM and U-Tube
Berexco, LLC		
Dana Wreath	VP Berexco, LLC	Engineering, Manager of Wellington Field
Randy Koudele	Reservoir engineer	Engineering
Staff of Wellington Field		Field operations
Beredco Drilling team		Mississippian and Arbuckle drilling operations
Abengoa Bioenergy Corp.		
Christopher Standlee, Danny Alllison		CO2 supply Colwich Ethanol Facility

IMPACT

The project has been discussed in public venues – presentations at professional meetings, legislative committees, and town hall meeting, and has provided information on the project via the website to encourage a dialog on the merits and economies related to carbon management in Kansas. Kansans are realizing the potential for an important collaboration between the two of the largest economies in Kansas – agriculture and related ethanol industry and the petroleum industry to advance energy and contribute to a viable rural economy.

The small scale field test at Wellington Field as designed integrates two petroleum business activities: 1) use of CO2 for enhanced oil recovery and revitalizing many older mature oil fields and 2) disposal/storage of CO2 in the underlying saline aquifer for the longer term. It

has been conveyed to the local petroleum industry that drilling and oil production infrastructure of an active oil field are important components that could lead to a successful carbon sequestration project including 1) knowledge about the subsurface including injection zones and caprock, 2) knowledge about abandoned wells, 3) access and suitability of land with greater likelihood for participation by landowner, and 4) access to insurance and investors to facilitate economic success.

CHANGES/PROBLEMS

KGS is committed to starting BP2 on October 1, 2013. To ensure this, discussions are ongoing with alternative suppliers to deliver the source CO2 should the Abengoa facility remain out of operation in calendar year 2013.

The composition of the surface facilities is still under consideration. Wellbore modeling is being conducted to ensure that suitable operating parameters (pressure and temperature) are established so as to avoid undesirable phase changes during injection, and to economize the cost and operations of the surface facilities. This may require a staggered plan for injection which was not anticipated at commencement of the project. The pros and cons of such on/off operations are being established.

The Class VI rule requires the annulus to be pressurized to at least 100 psi over and above the tubing pressure. This will involve incurring additional cost on the project. A waiver is to be sought based on analyses conducted for demonstrating that the integrity of the tubing will not be comprised by maintaining hydrostatic pressure in the annulus.

BUDGETARY INFORMATION

Cost Status Report

See next page for the cost status for quarters 1-5.

	COST PLAN/STATUS																				
	BP1 Starts: 10/1/11	Ends: 9/30/13								BP2 Starts 10/1/13	Ends 9/30/14			BP3 Starts 10/1/14	Ends 9/30/16					
Baseline Reporting Quarter	10/1/11 -12/31/11 Q1	1/1/12-3/31/12 Q2	4/1/12-6/30/12 Q3	7/1/12-9/30/12 Q4	10/1 /12- 12/31/12 Q5	1/1/13 - 3/31/13 Q6	4/1/13 - 6/30/13 Q7	7/1/13-9/30/13 Q8	10/1/13 - 12/31/13 Q9	1/1/14 - 3/31/14 Q10	4/1/14 - 6/30/14 Q11	7/1/14 - 9/30/14 Q12	10/1/14 - 12/31/14 Q13	1/1/15 - 3/31/15 Q14	4/1/15 - 6/30/15 Q15	7/1/15 - 9/30/15 Q16	10/1/15 - 12/31/15 Q17	1/1/16 - 3/31/16 Q18	4/1/16 - 6/30/16 Q19	7/1/16 - 9/30/16 Q20
Baseline Cost Plan (from SF-424A)	(from 424A, Sec. D)																			
Federal Share	$326.84	$17,208.52	$17,282.92	$31,693.50	$23,000.00	$23,000.00	$23,000.00	$23,000.00	$1,997,070.75	$1,997,070.75	$1,997,070.75	$1,997,070.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75
Non-Federal Share	$365,421.00	$365,421.00	$365,421.00	$365,421.00	$0.00	$0.00	$0.00	$0.00	$258,982.75	$258,982.75	$258,982.75	$258,982.75	$184,656.00	$184,656.00	$184,656.00	$184,656.00	$0.00	$0.00	$0.00	$0.00
Total Planned (Federal and Non-Federal)	$365,747.84	$382,629.52	$382,703.92	$397,114.50	$23,000.00	$23,000.00	$23,000.00	$23,000.00	$2,256,053.50	$2,256,053.50	$2,256,053.50	$2,256,053.50	$509,743.75	$509,743.75	$509,743.75	$509,743.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75
Cumulative Baseline Cost	$365,747.84	$748,377.36	$1,131,081.28	$1,528,195.78	$1,551,195.78	$1,574,195.78	$1,597,195.78	$1,620,195.78	$3,876,249.28	$6,132,302.78	$8,388,356.28	$10,644,409.78	$11,154,153.53	$11,663,897.28	$12,173,641.03	$12,683,384.78	$13,008,472.53	$13,333,560.28	$13,658,648.03	$13,983,735.78
Actual Incurred Costs																				
Federal Share	$326.84	$17,208.52	$17,282.92	$31,693.50	$31,572.56	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Non-Federal Share	$0.00	$6,475.85	$43,028.94	$9,058.04	$15,226.34	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Incurred Costs-Quarterly (Federal and Non-Federal)	$326.84	$17,208.52	$60,311.86	$40,751.54	$46,798.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Cumulative Incurred Costs	$326.84	$17,535.36	$77,847.22	$118,598.76	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66	$165,397.66
Variance																				
Federal Share	$0.00	$0.00	$0.00	$0.00	-$8,572.56	$23,000.00	$23,000.00	$23,000.00	$1,997,070.75	$1,997,070.75	$1,997,070.75	$1,997,070.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75
Non-Federal Share	$365,421.00	$358,945.15	$322,392.06	$356,362.96	-$15,226.34	$0.00	$0.00	$0.00	$258,982.75	$258,982.75	$258,982.75	$258,982.75	$184,656.00	$184,656.00	$184,656.00	$184,656.00	$0.00	$0.00	$0.00	$0.00
Total Variance-Quarterly Federal and Non-Federal)	$365,421.00	$358,945.15	$322,392.06	$356,362.96	-$23,798.90	$23,000.00	$23,000.00	$23,000.00	$2,256,053.50	$2,256,053.50	$2,256,053.50	$2,256,053.50	$509,743.75	$509,743.75	$509,743.75	$509,743.75	$325,087.75	$325,087.75	$325,087.75	$325,087.75
Cumulative Variance	**$365,421.00**	**$724,366.15**	**$1,046,758.21**	**$1,403,121.17**	**$1,379,322.27**	**$1,402,322.27**	**$1,425,322.27**	**$1,448,322.27**	**$3,704,375.77**	**$5,960,429.27**	**$8,216,482.77**	**$10,472,536.27**	**$10,982,280.02**	**$11,492,023.77**	**$12,001,767.52**	**$12,511,511.27**	**$12,836,599.02**	**$13,161,686.77**	**$13,486,774.52**	**$13,811,862.27**