

Department of Energy, National Energy and Technology Laboratory

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Utica Shale Energy and Environmental Laboratory

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1960 Kenny Road  
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Project Period: 08/01/2015 – 07/31/2019

Quarterly Reporting Period: 01/01/2016-03/31/2016

# Ohio State Quarterly RPPR

## 2. Accomplishments

a.) Major Project Goals. Project milestones are summarized in Table 1.

Milestone Title	Planned Completion Date	Actual Completion Date	Milestone Verification Method	Comments
Completion of the PMP	10/09/2015	10/09/2015	Review and approval by NETL	- Completed on schedule
Operator and Drill Site Finalized	07/29/2016	-	Operator agreement approved by Primary Advisory Board (PAB)	- Selection process now includes non-MWCD sites
Initial Geologic Structure Database Complete	07/29/2016	-	Subsurface model reviewed by technical experts	
Vertical Drilling Start	10/03/2016	-	Drill vertical borehole Core Acquisition	
Baseline Environmental Report	10/03/2016	-	Approval by PAB	
Horizontal Drilling Start	11/14/2016	-	Microseismic monitoring Drill fluids and gas sampling Cuttings, mud and fluids analysis Engineering testing and monitoring	
Borehole Geophysics Report	07/31/2017	-	Approved by Science Coordination Board (SCB)	
Preliminary Horizontal Environmental Monitoring Report	10/02/2017	-	Approved by PAB	
Preliminary Horizontal Geologic Report	07/31/2018	-	Approved by SCB	
Engineering Environmental Monitoring Report	10/02/2018	-	Approved by PAB	
Final Engineering Report	04/30/2019	-	Approved by SCB	
Final Environmental Monitoring Report	07/31/2019	-	Approved by PAB	

Table 1. Milestone status report

# Ohio State Quarterly RPPR

## b.) Accomplishments.

### i. OVERARCHING ACCOMPLISHMENTS:

- Discussions are on-going with a West Virginia E&P company and a Pennsylvania E&P company to finalize a drilling operator agreement for the project.
- A labeling scheme, as well as chain-of-custody paperwork formats, have been developed for use with all sample types on the USEEL project.
- A database management plan has been developed for all data collected for the USEEL project.

### ii. ADMINISTRATIVE ACCOMPLISHMENTS (UNDER TASK I – PROJECT MANAGEMENT):

- An overall Quality Assurance Project Plan (QAPP) and Individual Sampling and Analysis Plans (SAP) were initiated for science and technology baseline tasks, including surface water, groundwater, soil, socioeconomics, and habitat effects/biological parameters. The objective is to establish documented field and laboratory procedures to ensure that data collected and analyzed meet the project requirements and are valid for use. The QAPP/SAPs document the policies, project organization, quality assurance (QA) requirements, and quality control (QC) procedures that are to be implemented.
- A Field Access Guidelines and Health and Safety report was finalized to ensure the safety of researchers, minimize the impact of USEEL research on the environment, and minimize the interaction and interference of USEEL research on oil and gas development and production activities.
- Local to regional databases, including GIS raster and shape files, were compiled for ArcGIS compilation and presentation and included:
  - USEPA Ecoregions
  - USGS HUC 2, 4, and 12 watersheds
  - USGS Hydrography
  - State oil and gas data
  - State surface and subsurface mining data
  - State groundwater well locations/information
  - Regional and state geology
  - Governmental boundaries
  - State population centers and transportation
  - USGS 7.5' topographic maps
  - USGS orthophotographs
  - USGS Digital Elevation Model (DEM) and contours
  - Landsat 5, 7 and 8 satellite imagery
  - USDA National Agriculture Imagery Program (NAIP) aerial imagery
  - State land use/cover
  - State socioeconomic regions/classifications
  - State and national cadastral data

# Ohio State Quarterly RPPR

These databases and their graphic presentation are an essential element of project planning, preparation of a project NEPA, and the development of baseline environmental and subsurface tasks/subtasks.

- A peer reviewed publication was initiated for the design and implementation of a project addressing the critical science and technology issues associated with UOG hydraulic fracturing. This publication will present a conceptual framework of procedural and milestone guidelines applicable to any shale energy development project. Emphasis will be on sequential steps for the identification of regional and site study areas and key issues using selected databases and GIS geospatial presentations.

## iii. SCIENCE AND TECHNOLOGY TASK ACCOMPLISHMENTS (PLANNING):

### Surface Water/Sediment

- The draft QA/QC (sampling and analysis) plan has been completed, short of site-specific details by the USEEL team and reviewed by Jennifer Ronk (HARC).
- Currently working with Olesik and Cole laboratories to finalize analysis methodologies and other technical details.
- The field sampling plan has been established, including some work on hypothetical sampling location networks.

### Groundwater –

- The first draft of the dissolved gas sampling and analysis plan (QA/QC) has been completed and reviewed.
- Currently working to complete ground water SAP and laboratory analysis methods, in relation to the surface water analysis, so that the results are comparable.

### Air -

- Working on the preliminary stages of an air quality sampling and analysis planning with Mike Bisesi and WVU.
- We have discussed, and continue to examine, the possibility of implementing two sampling alternatives for air quality – continuous stationary monitoring versus mobile, non-continuous hand-held monitors, as well as a possible combination of the two.

### Biological Sampling -

- The draft sampling and analysis plan has been completed and is currently under review.
- We have had a number of discussions on working to integrate surface water, sediment, and macroinvertebrate sampling in order to obtain reliable results for each of these ecologically connected parameters, such as overlapping sampling locations and timing.

# Ohio State Quarterly RPPR

## Flowback Analysis/Filtration –

- Kaushik Rangharajan is currently running laboratory trials of various filters, using non-USEEL flowback samples, in order to establish precise methodology for the project.
- Working on initial phases of developing a sampling and analysis plan that will be used once the USEEL well has been drilled and is in production.

c.) Opportunities for training and professional development. Five Graduate Research Assistants continued working on Tasks 1.1.4 Geologic Structure Database, 3.2 Impact Analysis and Opinion Assessment, 4.1.3 Surface Water Quality, 4.1.5 Biological Parameters, 4.1.6 Rapid Land Use Change Study, 4.2 Groundwater Assessment and 6.6 Drill Fluids Acquisition and Assessment. Weekly Graduate Research Assistant meetings are continuing. Students are attending a Graduate Seminar on Hydraulic Fracturing being taught by the USEEL Environmental Monitoring Lead, Dr. Roman Lanno.

d.) Dissemination of results to communities of interest. Nothing to report.

e.) Plans to accomplish goals/milestones during next reporting period.

## 3. Products

a.) Publications, conferences papers, and presentations. Nothing to report.

b.) Website(s) or other Internet site(s). Nothing to report.

c.) Technologies or techniques. Nothing to report.

d.) Inventions, patent applications, and/or licenses. Nothing to report.

e.) Other products. Work continued on Sample Analysis Plans and quality assurance/quality control procedures for air, surface water, sediment, groundwater, soil and biologic parameters sampling.

# Ohio State Quarterly RPPR

## 4. Participants & Other Collaborating Organizations

### a.) Individuals who have worked on the project.

Name: Dr. Jeffrey Daniels

Project Role: Director

Nearest person month worked: 2 (cost share)

Contribution to project: Dr. Daniels has been involved in overall project management, planning, and administration.

Foreign collaboration: No

Name: Mr. Jeffrey Melaragno

Project Role: Project Manager

Nearest person month worked: 3

Contribution to project: Mr. Melaragno has been involved in overall project management, planning, and administration.

Foreign collaboration: No

Name: Dr. Gerald Allen

Project Role: Science Operations Manager

Nearest person month worked: 3

Contribution to the project: Dr. Allen has been involved in project management, planning, and administration; and collection and compilation of GIS data for site-specific and regional study area delineation and evaluation.

Foreign collaboration: No

Name: Mr. Connor Shank

Project Role: Research Assistant

Nearest person months worked: 3

Contribution to the project: Mr. Shank has been working to compile quality assurance and quality control project plans for the various environmental sampling tasks, in collaboration with the PIs and GRAs. In addition, Mr. Shank has been preparing for field sampling operations and related logistics.

Foreign Collaboration: No

Name: Ms. Sarah Mielke

Project Role: Graduate Research Assistant

Nearest person month worked: 1

Contribution to the project: Ms. Mielke is working on the Rapid Land Use Change Study (subtask 4.1.6).

Foreign collaboration: No

Name: Ms. Paige Hagley

Project Role: Graduate Research Assistant

## Ohio State Quarterly RPPR

Nearest person month worked: 1

Contribution to the project: Ms. Hagley is working on Impact Analysis and Opinion Assessment (subtask 3.2).

Foreign collaboration: No

Name: Mr. Benjamin Grove

Project Role: Graduate Research Assistant

Nearest person month worked: 1

Contribution to the project: Mr. Grove is working on the groundwater monitoring plan (subtask 4.2).

Foreign collaboration: No

Name: Mr. Kaushik Rangharajan

Project Role: Graduate Research Assistant

Nearest person month worked: 1

Contribution to the project: Mr. Rangharajan is working on the fluids sampling plan (subtask 6.6).

Foreign collaboration: No

Name: Mr. Nicholas Bailes

Project Role: Graduate Research Assistant

Nearest person month worked: 1

Contribution to the project: Mr. Bailes is working on the surface water and invertebrate sampling plan (subtask 4.1.3).

Foreign collaboration: No

Name: Dr. Roman Lanno

Project Role: Environmental Monitoring Lead

Nearest person month worked: 1 (cost share)

Contribution to the project: Dr. Lanno has been involved in planning and preparations for air, soil, surface water, groundwater and biologic parameters sampling (task 4.0).

Foreign collaboration: No

Name: Dr. Michael Bisesi

Project Role: Air Monitoring Lead

Nearest person month worked: 1 (cost share)

Contribution to the project: Dr. Bisesi has been involved in discussions with WVU and vendors to determine the best approach for air monitoring (subtask 4.1.2).

Foreign collaboration: No

Name: Dr. Jeffrey Bielicki

Project Role: Community Outreach Lead

Nearest person month worked: 1 (cost share)

Contribution to the project: Dr. Bielicki has been involved in planning the USEEL community outreach program (Task 3.0).

# Ohio State Quarterly RPPR

Foreign collaboration: No

Name: Dr. Kenneth Martin

Project Role: OSU Extension Education Lead

Nearest person month worked: 1 (cost share)

Contribution to the project: Dr. Martin has been involved in preparations and execute of Scientific Education for OSUE Educators (task 3.3).

Foreign collaboration: No

b.) Other organizations involved as partners. Subcontracts were issued to WVU and EFD in anticipation of their support of baseline environmental sampling.

c.) Involvement of collaborators or contacts. Roman Lanno, Environmental Monitoring Lead, worked extensively with University collaborators to develop sampling plans and quality assurance/quality control procedures for environmental monitoring. Several faculty members were involved in the OSU Extension Educator training conducted in October.

**5. Impact** – Nothing to report.

## **6. Changes/Problems**

a.) Changes in approach and reasons for change. Nothing to report.

b.) Actual or anticipated problems or delays and resolution. Nothing to report.

c.) Changes that have significant impact on expenditures. The delay in site and operator selection resulted in fewer expenses being incurred in the second quarter of FY2016 and the same is expected for the third quarter of FY2016.

d.) Significant changes in use or care of human subjects, vertebrate animals, and/or Biohazards. Nothing to report.

e.) Change of primary performance site location from that originally proposed. Nothing to report.

**7. Special Reporting Requirements** – Nothing to report.

**8. Budgetary Information** – An SF-425 was submitted to NETL on 4/25/2016. This FFR contains the current budgetary information for this project through 3/31/2016.