

PTTC Workshop Summary Report Eastern Region – Appalachian Basin

Title/Topic: “Environmentally Friendly Drilling Systems Best Management Practices for Utica & Marcellus Shale Development”

Date: May 17, 2012

Location: Morgantown, WV

Co-Sponsor: Environmentally Friendly Drilling Systems Program; Appalachian Oil & Natural Gas Research Consortium

Speaker(s): Twelve (**see attached schedule**)

Method Used To Advertise/Promote: E-mail distribution list among 10 local geological societies and SPE chapters, several local universities, independent oil & gas associations of several states, DOE-NETL, USGS and Appalachian basin state geological surveys; placed on national PTTC website/calendar; requested all speakers to distribute to members of their organization

Fee: \$150 for professionals; \$40 for students

Attendees: Industry: 21 Others: 19 Total: 40

Synopsis/Overall Assessment:

During the early stages of development of the Marcellus Shale play, drilling moved eastward into area where no or very little drilling had ever occurred before, into river basins that supply drinking water to several eastern cities. As truck traffic increased, along with noise, dust, land disturbance, water use, flow back water cleanup and rumors about the threats of chemicals in slickwater hydraulic fracture jobs, local residents and politicians reacted negatively. Their concerns were heard by the state regulatory agencies, US DOE and US EPA, resulting in new laws, rules and regulations for horizontal wells, large frac jobs and shale development in general. These new regulations are not consistent from state to state, creating additional problems for operators.

Meanwhile, industry continued to move ahead, developing their own set of best practices that meet and often exceed these new rules, and universities and other entities expanded their research programs to offer further “greener” options.

The goal of this workshop was to present best practices that have been implemented in the Marcellus and Utica shale plays, as well as options for best practice that may emerge from on-going research. The workshop began with a brief overview of changes in oil and gas laws in New York, Pennsylvania and West Virginia, and how industry has responded to these changes, and how society has reacted to the announcement of new regulations, and projections of economic growth as the plays develop.

Following this, speakers focused on best practice training that is being developed for those who may wish to find employment in the play, and metrics that can be used to more accurately evaluate, compare and contrast various options for treating flow back water. During the afternoon session, speakers presented best management practices

that are being tested in the field, and new technologies that may be applied to monitor field operations.

A list of the presentations and speakers is included as the first attachment to this report.

Participant Feedback (Implies Feedback Form Is Measuring Following):

Evaluation of Speaker(s):

Sixty two percent of the respondents gave the speakers a 5 out of 5; 100% at least a 4 out of 5.

Did the workshop content deliver what advertising/promotional material promised?

Forty six percent graded the workshop as 5 out of 5 based on its meeting their expectations; 92% graded it at least a 4 out of 5.

What was the most valuable part of the workshop?

The attendees seemed to understand and appreciate the sequence of talks that we developed, beginning with the challenges presented to operators by new laws, rules and regulations that will require a change in the way industry does business, to how industry has responded, in many cases responding before changes in the law were made, to the development of training and outreach programs not only for potential field employees but also for the general public and government agencies, and finally to results of field research and innovative technologies that could be employed.

What was the least valuable part of the workshop?

The workshop itself was fine; the most consistent complaint was the workshop notebook, which was printed in black and white, not color. Also, attendees expressed an interest in receiving more real data from the final two speakers, rather than a description of how to create the product and what it could do for industry.

Appropriateness of attendee fee (too low, about right, too high)?

Ninety two percent thought the fee was about right; 8% thought it was too high.

All things considered, was the workshop worth your time & money (Y/N)?

Yes; 77% thought the workshop was well organized (scored 5 of 5) and 85% gave it at least 4 out of 5.

Will you be able to use the information received and in what time frame (now, near future, at some undefined future date)?

Difficult to say, other than industry continues to modify field operations and will apply new options that meet their needs and comply with, and even exceed, new regulations.

Individual Written Comments of Note:

- great execution as usual
- printing slides in gray scale instead of black and white would improve legibility

“Environmentally Friendly Drilling Systems Best Management Practices for Utica & Marcellus Shale Development”

Program

Time	Topic	Presenter
0800 – 0900	Registration and coffee	All; please arrive early
0900 – 0910	Welcome and Introductions	Doug Patchen & Dave Burnett
New State Regulations; New Industry Best Practices		
0910 – 1010	New State Regulations, Modified Field Operations <ul style="list-style-type: none"> • New York • Pennsylvania • West Virginia 	John Conrad, IOGA-NY Lou D’Amico, PIOGA James Martin, WV DEP Charlie Burd, IOGA-WV
1010 – 1030	Coffee break	
Improving Best Practices for Utica & Marcellus Plays		
1030 – 1100	Marcellus Development in New York and Social Well Being	Gene Theodori, SHSU
1100 – 1130	Best Practice Training for Gas Development Sector	Jim Ladlee, PSU
1130 – 1200	Developing Metrics for Evaluating Water Treatment Strategies	Paul Ziemkiewicz, WVU
1200 – 1300	Lunch	
Field Operations- Best Management Practices		
1300 – 1330	Effectively Recycling Returning Frac Water	Harry Johnson, FilterSure
1330 – 1400	Reducing the Environmental Impact of Shale Gas Development: Advanced Analytical Methods for Air and Stray Gas Emissions and Produced Brine	Dave Burnett, GPRI Texas A&M
1400 – 1430	Best Practices for Drill Site Construction in the Marcellus	Steve Bowersox, Newpark Mats & Integrated Services
1430 – 1445	Coffee Break	
1445 – 1515	Novel System to Monitor Air near Marcellus Shale Wells	Michael McCawley, WVU
1515 – 1545	On Demand Environmental Remote Sensing Using Low Flying Drones	Jeff Imel, Air Robotics Inc
Wrap Up		
1545 – 1600	Closing comments, evaluation forms, certificates of PDHs	All

May 17, 2012 Workshop Attendance

Mailing ID	First Name	Last Name	Organization	E-mail	Work Phone	Notes
1	John	Conrad	PVE Sheffler, LLC	jconrad@pvesheffler.com	845-454-2544	Speaker
2	Jennifer	Ryan	WV Geological & Economic Survey	jryan@geosrv.wvnet.edu	304-594-2331	
3	Mary	Behling	WV Geological & Economic Survey	behling@geosrv.wvnet.edu	304-594-2331	
4	Philip	Dinterman	WV Geological & Economic Survey	pdinterman@geosrv.wvnet.edu	304-594-2331	
5	Susan	Pool	WV Geological & Economic Survey	suepool@geosrv.wvnet.edu	304-594-2331	
6	Albert	Kollar	Carnegie Museum of Natural History	kollar@carnegiemah.org	412-622-5513	
7	Harry	Johnson	Filtersure, Inc.	harryjohnson35@hotmail.com	703-967-0647	Speaker
8	Ron	Anderson	Weatherford International	maria.peluso@weatherford.com	724-318-1023	
9	Jessica	Moore	WV Geological & Economic Survey	jmoore@geosrv.wvnet.edu	304-594-2331	
10	Chris	Veazey	Enervest Operating, LLC	cveazey@enervest.net	304-590-7707	
11	Bob	Delancy	One Aqua Source Inc.	bobd@oneaquasource.com	304-483-2458	
12	Kevin	McGullam	Virginia Oil and Gas	kmcgullam@altamas.net	281-704-5792	
13	John "Kevin"	Flavin	Baker Hughes Incorporated	john.flavin@bakerhughes.com	724-743-9236	
14	Mark	Richardson	Dominion East Ohio Gas	mark.r.richardson@dom.com	330-936-7141	
15	Craig	Davidson	Dominion East Ohio	craig.g.davidson@dom.com	330-266-2178	
16	Doug	Patchen	WVU Research Corp	Doug.patchen@mail.wvu.edu	304-293-6216	
17	Dave	Burnett	Tex A&M Univ	David.burnett@pe.tamu.edu	979-845-2274	Speaker
18	Lou	D'Amico	PIOGA	lou@pioga.org		Speaker
19	James	Martin	WV Div O&G	James.a.martin@wv.gov		Speaker
20	Charlie	Burd	IOGA-WV	cburd@iogawv.com		Speaker
21	Gene	Theodori	SHSU	GLT002@SHSU.edu		Speaker
22	Paul	Ziemkiewicz	WVU - NRCCE	Paul.ziemkiewicz@mail.wvu.edu	304-293-6958	Speaker
23	Steve	Bowersox	Newpark	bowersox@newpark.com	570-323-4970	Speaker
24	Michael	McCawley	WVU	mamccawley@mail.wvu.edu	304-282-4470	Speaker
25	Jeff	Imel	Air Robotics	jeffimel@airroboticsinc.com	304-807-9464	Speaker

26	James	Martin	WV Dept of Environmental Protection	James.a.martin@wv.gov	304-926-0450	
27	Rob	Pichardo	WV Dept of Environmental Protection	paul.r.pichardo@wv.gov	304-926-0499 ext 1778	
28	Chris	Veazey	Everest operating, LLC	cveazey@everest.net	304-590-7707	
29	Mike	Manning	Kleinfelder Inc.	mmanning@kleinfelder.com	724-772-7072	
30	John	Veil	Veil Environmental, LLC	john@veilenironmental.com	410-212-0950	
31	Melissa	Kennedy	Battelle Memorial Institute	kennedym@battelle.org	614-424-7601	
32	Angela	McFadden	US EPA	mcfadden.angela@epa.gov	215-314-2329	
33	Shawn	McGuigan	Rex Energy	smcguigan@rexenergycorp.com	814-795-2819	
34	Keith	Eighmey	Rex Energy	keighmey@rexenergycorp.com	814-470-1027	
35	David	Locke	FilterSure, Inc	clocke88@aol.com	304-598-2790	
36	Toni	Rudisill	WVU	trudisill@hsc.wvu.edu	304-594-1653	
37	Katharine	Lee Avary	Avary Geoscience	avarygeo@gmail.com	304-288-0325	
38	Tom	Mroz	US DOE-NETL	Thomas.mroz@doe.netl.gov	404-293-4071	
39	Jason	Fillhart	WVU WRI	jason.fillhart@mail.wvu.edu	304-293-7074	
40	Jeff	Daniels	OSU	daniels.9@osu.edu	614-634-2580	
41	James	Ladlee	PSU	Jr110@psu.edu	814-867-2974	Speaker

EVALUATION

Petroleum Technology Transfer Council Appalachian Region Workshop

***“Environmentally Friendly Drilling Systems
Best Management Practices for Utica & Marcellus Shale Development”***

May, 17 2012

1. How did you hear about the workshop?
 ___ Direct mailing ___ Periodical ___ Phone
 11 E-mail 1 Internet/www 2 Other

2. What additional topics would you like to see in future Focused Technology Workshops?
See other page

3. Are you a(n):
 4 Operator (field supervisor, geologist, engineer)
 1 Service Company employee
 2 Consultant
 2 Educational Institution employee
 5 State/Federal Government employee

4. Please circle the response that best indicates your agreement, with 5 being the strongest:
A) The program met my expectations 5(6) 4(6) 3 2(1) 1

B) The speakers/facilities were acceptable 5(8) 4(5) 3 2 1

C) The program was well organized 5 (10) 4(1) 3(2) 2 1

5. The workshop fee was: ___ too low 12 OK 1 too high

6. Additional comments: (Please use back of page if needed).
See other page

7. Please indicate which tech transfer method is most helpful to you.
Rank from 1 to 5, with 5 being the most helpful:

Workshop 5(2) 4(3) 3(2) 2(2) 1(1)

Individual assistance 5(1) 4(1) 3(1) 2(2) 1(3)

Reports/Case studies 5(2) 4(1) 3(2) 2 1(3)

Internet 5(3) 4(2) 3(2) 2(1) 1

Newsletters 5(1) 4(1) 3(1) 2(4) 1(1)

8. Have you attended other PTTC events? 8 Yes (how many? 6 No

Have you used any new technologies based on knowledge gained through PTTC events?
3 Yes 10 No If yes, please describe (in general) the application/results. (PTTC
will only use your response with your permission.)

See other page

9. Would you be willing to share with others any technology innovations or best
practices?

8 Yes 3 No If yes, briefly list topics/information you are willing to share.

See other page

1. What additional topics would you like to see in future Focused Technology Workshops?

- sw/ frac monitoring
- seismic in Marcellus
- green completion technology
- condensate handling/storage
- drilling fluids
- meeting "new" regulations
- NETL/RPSEA presentations for conventional & unconventional formations and lessons learned in their development
- more Marcellus/Utica workshops

6. Additional Comments

- I like limiting presentations to 30 minutes
- great execution as usual
- printing slides in gray scale instead of black and white would improve legibility
- would have liked to see some air quality data & all of the relaxed measurement issues from M. McCawley, rather than building an inexpensive monitor, since air quality is becoming more important

8. Have you used any new technologies based on knowledge gained through PTTC events?

- Conceptual application of lessons learned from logging to fundamentalist drilling and completion

9. Topics/info willing to share.

- currently working on best practice analysis, drilling and completion in the Utica Shale