Appendix J: Technology Transfer and Access to Data (Tasks 3.0 and 7.0)
J.1 EFD Technology Transfer Activities

EFD-TIP Technology Transfer Activities
2012 – 2016

June 24, 2016

The Environmentally Friendly Drilling Systems Program
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INTRODUCTION

This report lists out the technology transfer activities associated with the EFD-TIP effort.

The EFD program provides unbiased science and develops solutions to address environmental and societal aspects of oil and gas development. Featuring an international research team, the program has had many accomplishments. The program has successfully brought together government agencies and regulators, industry, academia, environmental organizations, a variety of associations and the public. As RigZone reported,

“No other organization in the oil and gas area has ever been able to successfully link this broad spectrum of stakeholders, providing opportunities for communication between groups that normally do not communicate very well.”

During 2015, EFD was featured in the Hess 2014 Sustainability Report. Also during 2015, the program was honored by the Oil and Gas Awards with the VZ Environmental Award for Excellence in Environmental Stewardship and was also selected as a finalist for the Best Health, Safety and Environment Program – Onshore by World Oil.

A testament to the program’s success is the number of speaking invitations and the large number of publications in a broad variety of media. Engaging sponsors and all stakeholders, the EFD team has accomplished it all by being objective and using sound science in supporting workable practices to reach our goals.

Technology transfer is a key element of the Environmentally Friendly Drilling Systems Program. The EFD team is heavily involved in engaging stakeholders at multiple levels. The EFD team is routinely called upon to participate in various roundtables, both in industry and in the public and is actively engaged in planning activities for various conferences, forums and exhibitions.

PUBLICATIONS, PRESENTATIONS AND FORUMS

Members of the EFD team from Texas A&M University were involved in the EPA hydraulic fracturing study and the US Department of Energy’s Energy Advisory Board – Natural Gas Subcommittee. Currently, the EFD team has various members on:

- Interstate Oil and Gas Compact Commission (IOGCC) Public Outreach Committee
- IOGCC Energy Resources, Research and Technology Committee (Chairman)
- National Research Council: Unconventional Hydrocarbon Roundtable
- Eagle Ford Center for Research, Education and Outreach/External Advisory Board
- SPE Fall Technical Program Subcommittee – HSE
- SPE/AAPL Workshop Program Committee
- SPE Oil Field Chemistry Symposium Committee
- Gulf of Mexico Alliance Education & Engagement Committee
- IADC Drilling Engineers Committee (DEC) Board
- IADC HSE Committee
- Research Partnership to Secure Energy for America (RPSEA) Board
- Texas Water Recyclers Association
- American Society of Civil Engineers Environmental and Water Resources Institute
  - Environmental Council and Interdisciplinary Council
  - Environmental Health and Water Quality Technical Committee
  - Technical Committee on Hydraulic Fracturing
The EFD team is routinely called upon to participate in various roundtables, both in industry and in the public and is actively engaged in planning activities for various conferences, forums and exhibitions.

The following is a list of publications, presentations, and forums pulled together by the EFD-TIP team (2012 – present).

**Publications**

**2016**

**2015**
1. Theodori, Gene L. and A.E. Luloff (October). *Perceptions of Oil and Natural Gas Development in the Eagle Ford Shale: A Summary of Findings from a 2015 Survey*
2. Wijesinghe, Nelka. “Potential Injection-Induced Seismicity Associated with Oil and Gas Development: Overview of the Primer on Technical and Regulatory Considerations Informing Risk Management and Mitigation”.
5. Houston Advanced Research Center (May). *White Paper: Recommendations to Address Flaring Issues, Solutions and Technologies*
8. Wilcox, Andra, R. Haut, and T. Williams. Measuring Cost-Effective Practices to Address Environmental and Societal Issues Associated with Oil and Gas Development - SPE-173632-MS.
10. NORM Workshop Presenters & The NORM Working Group at The Ohio State University (April). *Naturally Occurring Radioactive Material (NORM) and Technically Enhanced Radioactive Material (TENORM).*

2014
2. HARC, TAMU/Agrilife Research/IRNR (March) “Case Study – Coastal Impacts Technology Program – Evaluation of Invasive Plant Species Introduction and Controls at Oil and Gas Production Sites in South Texas.”
12. Wilson, Thomas H. and A.K. Hart (March) "Proximal Cross-Well Microseismicity as a Possible Indicator of Drainage Efficiency and Critically Stressed Data."

2013
8. Williams, Tom. 2013 (July). "The Effectiveness of Oil and Gas Regulatory Oversight on Oil and Gas Operations: Osage County, Oklahoma."

2012
1. Rigzone Articles:
2. Hart E&P Techbook Article:
4. Haut, R.C. Williams, T. “Reducing Environmental Tradeoffs Along Texas Coastal Areas.” Presented at the GCAGS 2012 62nd Annual Convention in Austin, TX.

Presentations

2016

2016-06-14 Coastal Impacts Technology Program. GOMA All Hands Meeting, Baton Rouge, LA
2016-05-26 Reducing Methane and VOC Emissions at Oil & Gas Operations. RPSEA Onshore Technology Workshop, Denver, CO
2016-03-12 WVU Assessment of the Environmental, Performance, and Economic Impact of Drilling Fluids Systems Used in the Marcellus and Utica Shale Plays in Ohio, Pennsylvania and West Virginia (Poster). AADE 2016 National Fluids Technical Conference and Exhibition, Houston, TX
2015

2015-12-14 Evaluating Habitat Risk of Total Dissolved Solids Stored in Open Pits, Environmental Defense Fund Research Planning Workshop (Stuver).

2015-11-23 Creating Energy City – A World-Class Training, Education, Research and Technology Testing Center, Lytle City Council and Veterans Association Future Workforce Planning Meeting (Stuver).

2015-11-20 Creating Energy City – A World-Class Training, Education, Research and Technology Testing Center, Port San Antonio Research and Training Workshop (Stuver).

2015-11-18 Overview EFD TIP Program to IDE Technologies (Burnett)

2015-11-18 Use of Miniature Detection Technologies for Produced Water Analytics. Industrial Water (Platt)

2015-11-12 Community Perceptions of Geothermal Energy: The Time to Begin is NOW. Texas Renewable Energy Industry Association Convention (Higgins, Burnett)

2015-11-11 EFD Technology Integration 2015 – (Burnett)

2015-11-02 Evaluating Habitat Risk of Total Dissolved Solids Stored in Open Pits, University Lands Research Planning Workshop (Stuver).


2015-10-20 A Spatiotemporal Industrial Activity-based Model for Characterizing Residential Exposure to Oil and Natural Gas Extraction in Colorado: 2015 International Society for Exposure Science, Henderson, NV

2015-10-20 An exploratory analysis of BTEX in groundwater samples around oil and gas wells in Colorado: 2015 International Society for Exposure Science, Henderson, NV


2015-09-29 Stakeholder Engagement and Development of Water Management Strategies: GWPC Annual Meeting, Oklahoma City, OK

2015-09-23 Overview of EFD Program and Application to Gdansk University of Technology (Burnett)

2015-09-08 Cheap Energy from Gas Shales. Outreach Presentation Dallas Geological Society (Burnett)

2015-08-26 Meeting SPE Water Management in a Down Market (Robertson, Burnett, Platt, Vavra)


2015-08-19 The Environmentally Friendly Drilling Systems (EFD) Program – EFD Virtual Sites, PBPA RRC & Legislative Personnel: Austin, TX

2015-08-11 Novel Methods for Measurement of Volatile Organic Compounds at Oil and Gas Production Facilities, RPSEA Onshore Technology Workshop and Field Trip, Denver (Stuver)

2015-08-09 Correlates of Perceived Safe Uses of Hydraulic Fracturing Wastewater: Data from the Marcellus Shale: Rural Sociological Society, Madison, WI

2015-08-08 Monitoring Community Action in Pennsylvania’s Marcellus Shale Play: Rural Sociological Society, Madison, WI

2015-08-07 Frac(k)ing Communities, Fractured Communications: A Case Study of Interactions between the Oil Industry, Public Officials, and Rural Communities: Rural Sociological Society, Madison, WI

2015-08-06 Simple Chemistry for Simple Answers A&M Water Treatment Workshop (Vavra, Robertson)
Evaluating Habitat Risk of Total Dissolved Solis Stored in Open Pits, Waste Water Short Course, College Station (Stuver).

Developing an Environmentally Friendly Workforce, South West Research Institute Collaborative Research Planning Workshop and Tour (Stuver).

Advanced Methods for Open Path FTIR Technology – Research Update, Unconventional Resources Technology Conference, San Antonio (Stuver).

Water Management in the Marcellus & Utica Shales (Vavra Session Chair)

Community Engaged Research: Developing Partnerships for Assessing the Impacts of Oil and Gas Development in Greeley and Fort Collins, CO, Society for Epidemiologic Research 48th Annual Meeting, Denver, CO


Environmental Studies at SHAPE Ranch, Dimmit County, Texas, Anadarko and Landowner Environmental Planning Charrette, Houston (Stuver).

Technology Research, Development, Demonstration and Deployment (TRD3), as part of the briefing series by the American Geophysical Union, Energy from the Earth: Energy-Water-Land Connections Part 2 – House and Senate, Washington, D.C.

GPRI Overview: Produced Water Treatment Technology (Burnett)

Low Temperature Geothermal Produced Water Treatment. SMU Geothermal Institute (Higgins, Burnett)

Membrane Filtration technology Presentation for BLM. (Webinar Platt)

Power across Texas Energy Innovation Challenge: Water Quality Requirements for Fracturing Fluids – Analytic Testing Technology (Robertson, Tidwell, Ghannoum, Clapp, Burnett)

Health Risks Associated with Development of Unconventional Natural Gas Resources: Colorado Studies, National Jewish Hospital, Denver CO

Congenital Heart Defects and Maternal Proximity to Oil and Gas Development webinar series on Fracking, Natural Gas, and Maternal Health sponsored by the Center for Environmental Health

Challenges with Air Quality Measurements, AWMA Symposium, San Antonio (Stuver).


Produced Water Treatment; Technology and Analytics Testing, SPE Oil Field Chemistry Symposium (Burnett)

EFD Virtual Sites; A Learning Tool: Houston IPAA Energy High School – Sophomore Class, Houston, TX

Update on Advanced Analytical Services for Field Operations Texas A&M Water & Wastewater Workshop (Burnett)

Greening the Industry: Documenting Results with the Environmentally Friendly Drilling Program Scorecard: SPE/AAPL Enhancing the Community Conversation From Acquisition Through Production Workshop, San Antonio, TX

Health Risks Associated with Development of Unconventional Natural Gas Resources: Colorado Studies AirWaterGas Teacher Workshop, Boulder CO

Environmental Impacts of Unconventional Gas Development (Fracturing) U. of Michigan (Burnett)

Measuring Cost-Effective Practices to Address Environmental and Societal Issues Associated with Oil & Gas Development: SPE Production and Operations Symposium, Oklahoma City, OK

Methods for Flare Measurement, EFD Workshop, San Antonio (Stuver)

Knowledge of Hydraulic Fracturing and Support for Natural Gas Drilling: Data from Pennsylvania: Southern Rural Sociological Association, Atlanta, GA

Energy Development and Ecosystems: Examining Attitudes and Behaviors of the General Public: Society for Range Management annual meeting, Sacramento, CA

Technology Integration Program: Advanced Produced Water Treatment Research – 2015 Projects Webinar Series (Burnett) Produced Water Society Annual Meeting
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-01-14</td>
<td>Advanced Produced Water Treatment: Analytical On-Site Services (Burnett, Platt, Vavra)</td>
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**2014**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>2014-11-12</td>
<td>Documenting Results with the Environmentally Friendly Drilling Program Scorecard, DEA Meeting, Houston, TX</td>
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<tr>
<td>2014-11-07</td>
<td>Addressing Environmental Issues Associated with Hydraulic Fracturing, Montgomery, TX</td>
</tr>
<tr>
<td>2014-11-05</td>
<td>Gas Flaring: Exploring Economically Feasible and Environmentally Friendly Solutions, EUOGS, Lexington, KY</td>
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<tr>
<td>2014-10-23</td>
<td>Addressing Gas Flaring by Utilizing Novel Technologies to Monetize Gas Wellhead - Denver, CO</td>
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<tr>
<td>2014-10-08</td>
<td>Public Perception of the Oil and Gas Industry - Houston, TX</td>
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<tr>
<td>2014-10-08</td>
<td>Monitoring Community Action in Pennsylvania’s Marcellus Shale Play – Houston, TX</td>
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<tr>
<td>2014-10-08</td>
<td>Understanding Drivers of Environmental Technology Adoption in the Oil and Gas Industry – Houston, TX</td>
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<tr>
<td>2014-10-08</td>
<td>Managing Energy Development in Mississippi – Houston, TX</td>
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<tr>
<td>2014-10-08</td>
<td>Fractured Communications in the Eagle Ford Shale – Houston, TX</td>
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<tr>
<td>2014-10-06</td>
<td>Comparative Databases for Water Quality and Quantity Regulations Pertaining to Oil and Gas Developments – GWPC Annual Meeting, Seattle, WA</td>
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<tr>
<td>2014-10-06</td>
<td>Virtual Hydraulic Fracturing Site – GWPC Annual Meeting, Seattle, WA</td>
</tr>
<tr>
<td>2014-09-16</td>
<td>Flare Gas: Exploring Economically Feasible &amp; Environmentally Friendly Solutions - Pittsburgh, PA</td>
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<tr>
<td>2014-09-10</td>
<td>Flare Gas: Exploring Economically Feasible &amp; Environmentally Friendly Solutions - Houston, TX</td>
</tr>
<tr>
<td>2014-08-27</td>
<td>Flaring Issues, Solutions, and Technologies (F.I.S.T.) - Denver, CO</td>
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<tr>
<td>2014-08-06</td>
<td>The Environmentally Friendly Drilling Systems (EFD) Program, West Texas Legislative Summit – San Angelo, TX</td>
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<td>2014-06-24</td>
<td>Monitoring and Characterization of VOCs in Ambient Air near Active Gas Wells in the Eagle Ford Shale – A&amp;WMA 107th Annual Conference</td>
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<td>2014-06-10</td>
<td>Addressing Environmental Issues and Increasing Environmental Awareness - Shale Development 101, Pittsburgh, PA</td>
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<tr>
<td>2014-06-09</td>
<td>Assessment of Desalination Concentrate as an Alternative Water Supply for Hydraulic Fracturing – 7th International Conference on Environmental Science &amp; Technology, Houston, TX</td>
</tr>
<tr>
<td>2014-06-06</td>
<td>Addressing Environmental Issues and Increasing Environmental Awareness - Annual Martz Summer Conference, Boulder, CO</td>
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</table>
2014-04-28  Analysis and Diagnosis of Membrane Filtration Fouling – 24th Annual Membrane Filtration Short Course, College Station, TX
2014-04-21  Hydraulic Fracturing Flowback Treatment: Primary Treatment Design – 2014 Frank H. Dotterweich Senior Design Conference, Kingsville, TX
2014-04-11  Understanding Drivers of Environmental Technology Adoption in the Oil and Gas Industry – SUNY Conversations in the Disciplines Conference, Binghamton, NY
2014-04-10  Developing Technologies & Best Management Practices to Minimize the Environmental Impacts of Natural Gas Exploration & Production - HSE for Unconventional Oil and Gas, San Antonio, TX
2014-04-08  Air, Water, Land Issues, Global Technology Exchange & GOT Task Area Work Sessions– Florence, IT
2014-03-28  Water Quality Data Presentation at Managing Oil and Gas Development in Mississippi, Natchez, MS.
2014-03-17  Objective and Perceived Effects of Hydraulic Fracturing and Shale Gas Development: A Sociological Perspective- American Chemical Society National Meeting, Dallas, TX
2014-03-12  Addressing Environmental Issues and Increasing Environmental Awareness- Center for Sustainable Shale Development, Pittsburgh, PA
2014-02-19  New Methods for Air Emission Measurement using Open Path Beam Technologies - Statoil, Houston, TX
2014-02-25  Oil and Gas Hype and Health Hazards - Life Long Learning Institute Symposium;  Houston, TX
2014-02-18  Hydraulic Fracturing and Shale Plays: Examining Public Perceptions, Trust, and Community Engagement - Clean Frac’ing Conference, Houston, TX
2014-02-18  The EFD Program: Addressing Environmental Issues and Increasing Environmental Awareness - Clean Frac’ing Conference, Houston, TX
2014-02-17  Advanced Air Emission Inventories for Drilling and Completions - Clean Frac’ing Conference, Houston, TX
2014-02-17  Moderator: Air Innovation Panel Discussion- Clean Frac’ing Conference; Houston
2014-02-14  Social Implications of Hydraulic Fracturing - American Association for the Advancement of Science, Chicago, IL

2013
2013-11-15  "Freshwater use and alternatives for hydraulic fracturing operations." - Sustainable Eagle Ford Shale Water and Transportation - Challenges and Solutions Workshop" - Cotulla, TX
2013-11-15  "Groundwater quality mapping in Kenedy County, Texas." - Sustainable Eagle Ford Shale Water and Transportation - Challenges and Solutions Workshop - Cotulla, TX
2013-11-12  "Field tests - Air quality monitoring." Environmentally Friendly Drilling Systems Advisory Committee Meeting - The Woodlands, TX
2013-11-12  "Local Perceptions of the Oil and Gas Industry in the Eagle Ford Shale." Environmentally Friendly Drilling Systems Program – Advisory Committee Meeting. The Woodlands, TX
2013-11-05 "Introduction to air quality topics for oil and gas operations." Supply, Flowback, and Waste Water Treatment Training Course for Hydraulic Fracturing - Kingsville, TX


2013-10-29 "Management, Disposal, and Reuse of Produced and Frac Flowback Waters: Views from the General Public" - 9th Annual Practical Short Course on Water Desalination, Process and Wastewater Issues & Technologies - College Station, TX

2013-10-27 "Characterization of desalination plant concentrate discharge impacts on water quality in a Texas coastal area." Professional short-course presentation at the Water Issues & Technologies: Process Water, Wastewater, and Desalination Short Course, Texas A&M University - College Station, TX

2013-10-27 "Characterization of desalination plant concentrate discharge impacts on water quality in a Texas coastal area." Water Issues & Technologies: Process Water, Wastewater, and Desalination Short Course, Texas A&M University - College Station, TX


2013-09-25 "How Industry is Partnering/Can Partner with the Communities in Which They Serve: A Sociological Perspective." Shale Insight 2013 - Philadelphia, PA

2013-08-15 "Wireless sensor network for monitoring VOC levels near drilling operations." EFD-SRN Joint Air-Water-Gas Workshop - Golden, CO


2013-07-11 FracFocus 2.0 Training - GWPC Stray Gas Incidence & Response Forum and Water Management Unconventional Oil & Gas Forum, Grapevine, TX

2013-06-20 Texas Coastal Impacts Assistance Program - CITP, The Woodlands, TX


2013-04-25 "VOC monitoring at drilling sites using a wireless senor network." Frank H. Dotterweich 2nd Annual College of Engineering Graduate Student Research Poster Competition - Kingsville, TX

2013-04-18 "Analysis and diagnosis of membrane filtration fouling." 23rd Annual Membrane Filtration Short Course, Texas A&M University - College Station, TX

2013-04-17 "Analysis and diagnosis of membrane filtration fouling." Water & Wastewater: Issues, Challenges, Solutions and New Technologies Short Course - College Station, TX

2013-04-17 "VOC monitoring using wireless sensor networks." Water & Wastewater: Issues, Challenges, Solutions and New Technologies Short Course - College Station, TX

2013-04-10 "The Sociology of Shale Gas Development.” Purdue University’s Ecological Sciences & Engineering Keystone Series Interdisciplinary Panel on High Volume Shale Gas Extraction- West Lafayette, IN


2013-02-13 Site Assessment and Baseline Monitoring Measurements in Ohio - EFD Workshop, Columbus, OH

2012


2012-10-22 The Environmentally Friendly Drilling Systems Program. Presented at the Eagle Ford Shale Stakeholders Summit, Laredo, TX.

2012-10-17 Demonstrating Technologies that Reduce Environmental Footprints. Presented at the Texas Alliance of Energy Producers, The 21st Century Energy Technology Conference
2012-09-21 Innovation, Safety & Environment culture and how they should impact your career choices - Colorado School of Mines.

2012-07-16 Utica Shale Appalachian Basin Research Consortium (focus on industry-government collaborations) presented to representatives from the Shenhua Group; within the DOE Fossil Energy Global Knowledge Network program.

2012-07-16 Preliminary Results on the Effect of Land-Use Land-Cover Methods of Classification and Data Resolution on SWAT Model Predictive Ability. Poster presented at the 3rd Biennial Colloquium on Hydrologic Science and Engineering of the Consortium of Universities for the Advancement of Hydrologic Science Inc. (CUAHSI), Boulder, CO.


2012-06-06 Best Management Practices for Oil and Gas Development. Presentation made at The Institute for Energy Law 3rd Law of Shale Plays Conference in Fort Worth, TX.

2012-06-05 The EFD Technology Integration Program An opportunity to demonstrate, technologies which will reduce the environmental impacts. IOGCC, Vancouver.

2012-06-05 BMPs on Public Lands: Protecting Water and Wildlife. Public Lands Committee session, Developing North America’s Oil and Gas Resources, Interstate Oil and Gas Compact Commission, Midyear Summit, Vancouver, B.C.

2012-06-04 The EFD Technology Integration Program: IOGCC, Vancouver, B.C.

2012-06-03 Developing North America’s Oil and Gas Resources. Presented at the Interstate Oil and Gas Compact Commission, Midyear Issues Summit (Public Lands Committee) in Vancouver, B.C.

2012-05-24 Ukraine Shale Gas: Environmental and Regulatory Assessment presentation at the Regional Shale Gas Workshop in Poland, Ukraine and Kyiv.

2012-05-01 An ArcGIS-Server based framework for oil and gas E&P decision support. PowerPoint resented at the ESRI Petroleum User Group (PUG) Meeting, Houston, TX.


2012-04-23 Emissions from Oil and Gas Sites are at Risk of being Overestimated. Presented at SPE Reducing Environmental Impact of Unconventional Resource Development workshop, San Antonio, TX.

2012-04-23 Advanced Geoprocessing with Python. Workshop presented at the Mid-America GIS Consortium Biennial Meeting, Kansas City, MO.


2012-03-11 Reading and Writing Spatial Data for the Non-Spatial Programmer. Poster presented at the PyCon U.S., Santa Clara, CA.
### EFD-TIP Technology Transfer Activities

**The Environmentally Friendly Drilling Systems Program**

**June 24, 2016**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>2012-02-17</td>
<td>Ukraine Shale Gas: Regulatory and Environmental Review: Washington, DC</td>
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<tr>
<td>2012-02-05</td>
<td>“A Big Fracing Mess: An Examination of Public Perception of Hydraulic Fracturing.” Presented at the annual meeting of the Southern Rural Sociological Association, Birmingham, AL.</td>
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<tr>
<td>2012-01-24</td>
<td>Fact-based Regulation for Environmental Protection in Shale Gas Resource Development: Ground Water Protection Council UIC Conference, Austin, TX.</td>
</tr>
</tbody>
</table>

### Webinars

#### 2016

2016-05-24 CHP in the Oilfield

#### 2015

2015-12-08 Land Use Site Selection Information Tool (LUSSIT)
2015-11-19 EFD-TIP Review – NETL webinar
2015-10-20 Turning Flare Gas into Electricity using the Organic Rankine Cycle – Field Demonstration
2015-05-12 Introduction to the EFD Program – BLM webinar
2015-01-20 Advanced Produced Water Treatment Research

### Workshops

#### 2016

2016-06-14 CIAP Workshop Successes - Baton Rouge, LA
2016-06-08 Cummins Tier 4F Workshop for Drilling and Frac Operations – Oklahoma City, OK
2016-05-11 Cummins Tier 4F Workshop for Drilling and Frac Operations - The Woodlands, TX
2016-02-04 EFD Virtual Offshore Safety Awareness Site - SME/Advisors Kick Off - Houston, TX

#### 2015

2015-11-11 EFD Annual Sponsors/Advisors Meeting, The Woodlands, TX
2015-11-08 Virtual Pad Site – Austin, TX
2015-10-22 Electrification for Oil & Gas Operations – The Woodlands, TX
2015-09-25 Downhole Raman Spectroscopy – The Woodlands, TX
2015-07-14 Utica Shale Play Book Study – Canonsburg, PA
2015-06-10 Water Management – Utica and Marcellus Shale – Cambridge, OH
2015-06-05 Monitoring Fugitive Gas Emissions – The Woodlands, TX
2015-04-16 Navigating Those Bumps in the Road on the Way to Drilling a Successful Horizontal Well – Morgantown, WV
2015-02-24 Flaring Issues, Solutions and Technologies (FIST) – San Antonio, TX
2015-01-14 Powered by Natural Gas: Flaring Issues, Solutions and Technologies (FIST) – Houston, TX
### 2014
- **2014-12-02** Hydraulic Fracturing Geomechanics for Unconventionals: Concepts & Practices – Pittsburgh, PA
- **2014-11-18** EFCREO Shale Oil & Gas Development Workshop: Management of Water Resources, Air Resources and Oilfield Waste, San Antonio, TX
- **2014-11-13** EFD Annual Sponsors/Advisors Meeting, The Woodlands, TX
- **2014-10-23** Addressing Gas Flaring by Utilizing Novel Technologies to Monetize Gas Wellhead - Denver, CO
- **2014-10-08** Addressing Public Perception of the Oil and Gas Industry Workshop - Houston, TX
- **2014-10-01** Appalachian Basin Life Cycle Wellbore Integrity: Drilling, Stimulation, Production – Morgantown, WV
- **2014-09-16** Flare Gas: Exploring Economically Feasible & Environmentally Friendly Solutions - Pittsburgh, PA
- **2014-09-10** Flare Gas: Exploring Economically Feasible & Environmentally Friendly Solutions - Houston, TX
- **2014-08-27** Flaring Issues, Solutions, and Technologies (F.I.S.T.) - Denver, CO
- **2014-06-05** Application of Stable Isotope Geochemistry in the Petroleum Geosciences – Pittsburgh, PA
- **2014-05-12** NORM and TNORM: Occurrence, Characterizing, Handling and Disposal – Columbus, OH
- **2014-04-28** Analysis and Diagnosis of Membrane Filtration Fouling – 24th Annual Membrane Filtration Short Course – College Station, TX
- **2014-03-11** Shale Gas and the Environment – Morgantown, WV
- **2014-02-10** ORNL Hydraulic Fracturing Workshop, Oak Ridge, TN
- **2014-01-22** Short Course on Oil and Gas Law – Boulder, CO
- **2014-01-16** Land Use Site Selection Information Tool (Regulators) Advisory Committee Meeting – Austin, TX
- **2014-01-14** Land Use Site Selection Information Tool (Operators) Advisory Committee Meeting – The Woodlands, TX

### 2013
- **2013-11-12** EFD Advisory Committee Meeting - The Woodlands, TX
- **2013-09-05** Powered by Natural Gas - Canonsburg, PA
- **2013-09-04** Wellbore Integrity - Canonsburg, PA
- **2013-08-16** Joint EFD-SRN Workshop - Golden, Colorado
- **2013-07-22** SPE Forum on the Quest to Reduce the Environmental Footprint – Ashville, NC
- **2013-06-20** Texas Coastal Impact Assistance Program - The Woodlands, TX
- **2013-05-14** Powered by Natural Gas Workshop - San Antonio, TX
- **2013-05-07** EFD-EU Workshop - Houston, TX
- **2013-02-13** Site Assessment & Baseline Monitoring Measurements - Ohio

### 2012
- **2012-06-12** EFD Program: Milestone Review held in The Woodlands, TX.
- **2012-05-17** Best Management Practices for Utica and Marcellus Development Workshop, Morgantown, WV.
- **2012-05-02** EFD Tour of the Offshore Technology Conference, Houston, TX.

### Exhibits

**2016**
- **2016/04/25** *Power Plays Geothermal Energy in Oil and Gas Fields Conference & Workshop (poster)*, Dallas, TX.
2015
2015/08/15  44th Turbomachinery Convention, Houston TX.
2015/07/20-22  Unconventional Resources Technology Conference & Exhibition, San Antonio, TX.

2014
2014/10/18  Energy Day, Houston, TX. (exhibited Virtual Rig Site at IPAA/PESA booth)
2014/09/22-23  Oil 101, Houston, TX.
2014/08/25-27  Unconventional Resources Technology Conference and Exhibition, Denver, CO.
2014/02/17-18  Clean Frac’ing Conference, Houston, TX.

2013
2013/08/12-14  Unconventional Resources Technology Conference and Exhibition, Denver, CO.

2012
2012/10/17-18  Texas Energy Alliance Conference, Houston, TX.

Awards and Nominations

2015
2015-10  Oil and Gas Awards – VZ Environmental Award for Excellence in Environmental Stewardship
2015-10  Finalist – Best Health, Safety, Environmental Program – Onshore, World Oil Awards

2014
2014-11  Nominated – Protection of the Environment Prize, Eni Award
2014-10  Finalist – Best Outreach Program, World Oil Awards
2014-08  Nominated – Energy Education Category, IOGCC Chairman’s Stewardship Awards