



# *Geophysical Society of Pittsburgh*



*Proudly Presents Tuesday, November 5<sup>th</sup>, 2013  
At  
Penn Brewery, Pittsburgh, Pennsylvania*

## **Geophysically Driven Reservoir Modeling for Improved Estimation of SRV and its Validation with Microseismic and Reservoir Simulation. A Marcellus Shale Example** by **Mr. Kevin McKenna**

**Abstract:** The proper estimation of shale reserves requires the understanding and 3D mapping of the rock volume near the well that is contributing to production. This volume, which we refer to as Stimulated Reservoir Volume (SRV), is frequently overestimated using microseismic event locations without sufficient supporting subsurface and engineering data.

This presentation describes a workflow that relies on geophysics to derive multiple key seismic attributes used to create geologic models that lead to a new reservoir property called Shale Capacity. This new reservoir property plays a key role in the accurate estimation of SRV, EUR, and subsequent reserves for shale plays produced under hydraulic fracture stimulation. Four key shale properties are shown to drive Shale Capacity in North American shale plays: TOC, Porosity, Brittleness, and Natural Fracture Density. Shale Capacity models show correlation with Initial Production rates in shale plays.

Shale Capacity models are used as input in reservoir flow simulators to accurately simulate historical production from wells without non-physical adjustment to the input parameters. The validated Shale Capacity model is then used to calculate a reliable SRV reflecting the rock volume contributing to production. The microseismic data are used as "soft information" to validate the derived SRV which is a subset of the microseismic SRV.

A Marcellus example illustrates these concepts where the Shale Capacity model accurately estimates SRV and IP rates in the field.



**Biography:** *Kevin McKenna is VP of Technology Solutions for SIGMA<sup>3</sup> Integrated Reservoir Solutions, Inc., based in The Woodlands, TX. He is a geologist by training with fifteen years' experience working on integrated reservoir modeling and simulation technologies as well as microseismic acquisition and processing. Prior to joining SIGMA<sup>3</sup> in 2011, Kevin held various technical, business and management roles at Roxar, Paradigm Geophysical, Earth Decision Sciences, and Austin Geomodeling with the common focus of bringing new technologies to the oil and gas industry. Kevin has a B.S. in Geology from Trinity University.*

**Please RSVP using the PayPal link on the Geophysical Society of Pittsburgh website at: [www.thegsp.org](http://www.thegsp.org)  
Cost \$35 (\$20 for Students). Meeting Location: Penn Brewery, 800 Vinial St., Pittsburgh, PA 412.237.9400**

## Tuesday, November 5<sup>th</sup> Meeting Menu

5:00 pm Social Hour

This month's social hour is proudly sponsored by  
[Tesla Exploration Inc.](#)



### Beer on Tap:

*Penn Dark Lager Beer, European-Style Dark  
Penn Gold Lager, Munichener Helles Style  
Penn Pilsner, Vienna Style Pilsner  
Also Available: Red & White wine*

### Hors D'oeuvres:

*Side of Smoked Salmon with Pumpernickel, Cream Cheese, Chopped Eggs and Red Onions, and  
Capers*

6:00 pm Dinner

### Dinner Buffet

*Balsamic Chicken,  
Beef Tenderloin Medallions with Wild Mushroom Demi Glaze,  
Kielbasa and Kraut  
Penne Alfredo,  
Grilled Vegetables,  
Rice Pilaf,  
Fresh Vegetable Medley,  
Tossed Green Salad with Ranch, Italian and Balsamic Dressing.*

*Dessert: Apple and Cherry Pie  
Coffee & Cream*

7:00 pm Lecture

*We are pleased to announce that this  
month's lecture will be held at :*

### Penn Brewery

800 Vinial Street  
Pittsburgh, PA 15212 USA  
412.237.9400

