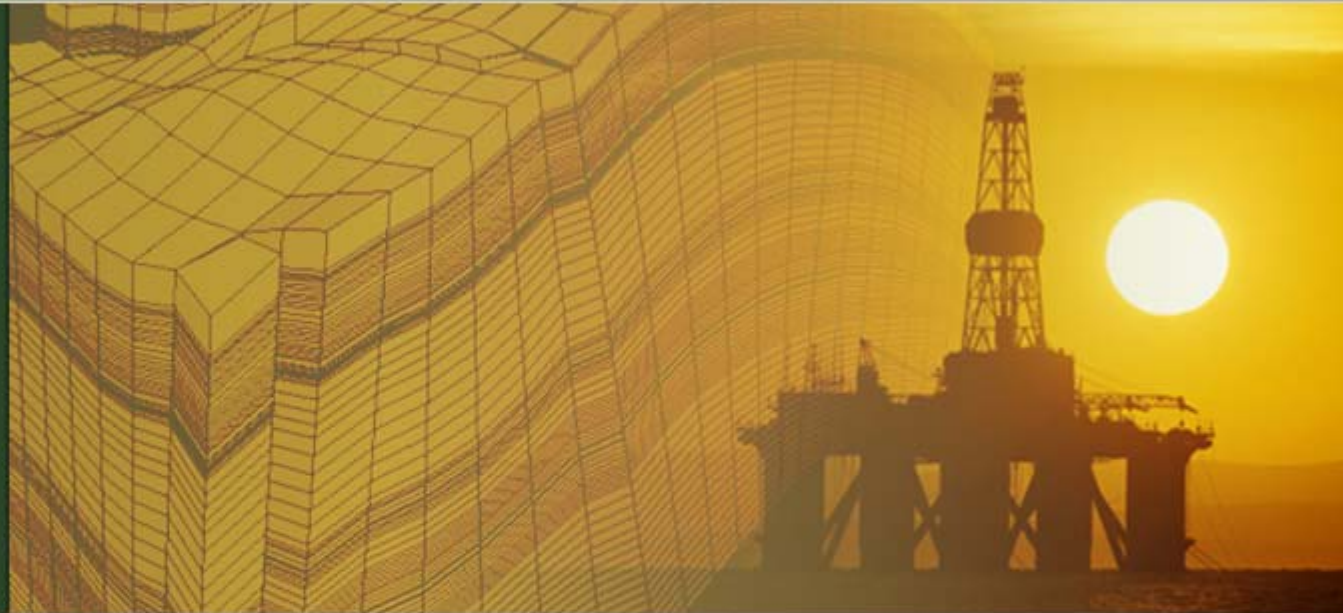




**RYDER SCOTT COMPANY**  
**PETROLEUM CONSULTANTS**

Houston  
Denver  
Calgary



**2008 Ryder Scott Reserves Conference**  
**Evaluation Challenges in a Changing World**

**“Ethics Issues in Reserve Evaluation”**

Jennifer Fitzgerald – Sr. Petroleum Engineer, Ryder Scott Company



## Canons of Professional Conduct

4. Engineers engage in professional relationships without bias because of race, religion, gender, **age**, ethnic or national origin, attire, or disability.

Approved by the Board of Directors 26 September 2004

# Importance of Ethics

## Reasons We Make Unethical Decisions



RYDER SCOTT COMPANY  
PETROLEUM CONSULTANTS

We do what is most convenient - Easy Thing vs. Right Thing

*"When you throw out  
integrity the rest is  
easy."*

- J.R. Ewing (from "Dallas")



# Importance of Ethics

## Reasons We Make Unethical Decisions



RYDER SCOTT COMPANY  
PETROLEUM CONSULTANTS

We do what we must to win – Ethics limits our options

*"Honor is better than honors."*

- Abraham Lincoln



# Importance of Ethics

## Reasons We Make Unethical Decisions



RYDER SCOTT COMPANY  
PETROLEUM CONSULTANTS

We rationalize our choices with relativism – Situational Ethics

*"Relativity applies to  
physics, not ethics."*

- Thomas Jefferson





- Engineer Standards of Compliance with Professional Services Procurement Act
- Engineers Shall Protect the Public
- Engineers Shall be Objective and Truthful



- Engineers' Actions Shall Be Competent
- Engineers Shall Maintain Confidentiality of Clients
- Engineers' Responsibility to the Profession
- Action in Another Jurisdiction



*"Your first ethical obligation is to be good at what you do."*

- Michael Rion

- 15 Professional Development Hour (PDH) units per year
- Minimum of 1 PDH per year must be professional ethics
- Maximum of 14 PDH units may be carried forward into the subsequent renewal period
- Professional ethics PDH units may not be carried forward



The purpose of an engineer's seal is to assure the user of the engineering product that the work was performed or directly supervised by the professional engineer named.

A license holder shall be guilty of misconduct and subject to disciplinary action if the license holder:

- knowingly signs or seals any engineering document or product if its use or implementation may endanger the health, safety, property or welfare of the public.
- signs or affixes a seal on any document or product when the license is inactive or has been revoked, suspended, or has expired.
- alters a sealed document without proper notification to the responsible license holder.

*"Permit mistakes so you don't promote cover ups."*

- Price Pritchett

Petroski notes that most engineering failures are much more involved than simple technical miscalculations and involve the failure of the design process or management culture.

- 1907 Quebec Bridge Collapse
- 1937 New London, TX School Explosion
- Oscar Wyatt Iraqi Oil Purchase
- Louisiana – Valentine Field

# Case Studies

## 1907 Quebec Bridge Collapse



RYDER SCOTT COMPANY  
PETROLEUM CONSULTANTS

- Never properly checked preliminary calculations once design finalized
- Local engineer Norman McLure noticed increasing distortions of key structural members already in place
- McLure wrote repeatedly to supervising engineer Theodore Cooper, who replied problems were minor – Company officials claimed beams were already bent prior to installation
- By August 27, 1907 finally clear that this was wrong - McLure sent a letter, instead of a telegram, to Cooper
- McLure met with Cooper in New York on August 29, 1907

# Case Studies

## 1907 Quebec Bridge Collapse



RYDER SCOTT COMPANY  
PETROLEUM CONSULTANTS

- Cooper agreed and telegraphed the Phoenix Bridge Company promptly
- However, the message was not passed to Quebec
- Late the same afternoon, the bridge collapsed in just 15 seconds
- 86 workers on the bridge – 75 killed, remaining 11 men injured
- Quebec Bridge is the longest cantilever bridge span in the world
- Catalyst for creation of Professional Engineering Organizations
- Roots of Canadian Iron Ring and American Order of the Engineer



# Case Studies

## 1937 New London, TX School Explosion



RYDER SCOTT COMPANY  
PETROLEUM CONSULTANTS

- Located in northwest Rusk County
- In 1937, one of the richest rural school districts in the United States
- Product of the East Texas oilfields



- Worst school disaster in U.S. history - March 18, 1937 at 3:05 p.m.
- Electric spark ignited mixture of gas and air
- Carried flame into a nearly closed space beneath the building – 253 ft. long and 56 ft. wide

# Case Studies

## 1937 New London, TX School Explosion



RYDER SCOTT COMPANY  
PETROLEUM CONSULTANTS

- Victims buried in mass of brick, steel and concrete debris
- Explosion heard 4 miles away
- Hurlled two-ton concrete slab 200 ft. away where it crushed a '36 Chevrolet
- Rescue operation continued through the night as rain fell

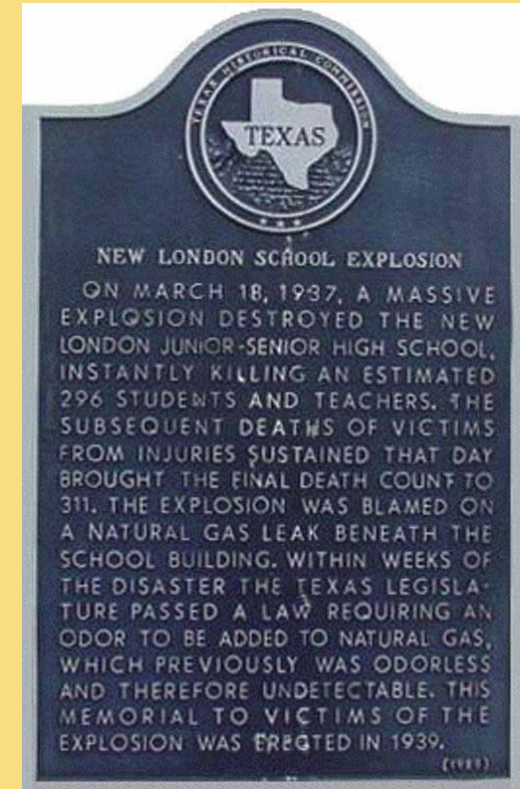


- Nearly 1500 volunteers worked to remove all victims and debris within 17 hours of accident
- Out of 500 students and 40 teachers, approximately 298 died
- Only 130 students escaped serious injury

At 9 yrs. old Carolyn Frei, whose sister and uncle died in the explosion, asked the Texas Legislature to protect children from something like this ever happening again

Within weeks of the disaster, the Texas Legislature called an emergency session and passed several important pieces of legislation:

- Odor additive was required to be put in natural gas for detection of leaks
- Boiler safety and pipe safety improvements
- Texas Engineering Practice Act, which led to the creation of the Texas Board of Professional Engineers



# Case Studies

## Oscar Wyatt Iraqi Oil Purchase



RYDER SCOTT COMPANY  
PETROLEUM CONSULTANTS

Oscar Wyatt - Founder of Houston-based Coastal Corp.

Oil-for-Food program developed while Iraq was under international sanctions

- Utilize oil resources
- Provide food and medicine
- Keep proceeds out of the hands of the regime

Accused of funneling millions of illegal surcharges to Saddam Hussein's regime to buy Iraqi oil under the Oil-for-Food program

- Purchase of Iraqi oil through front companies
- Payment of surcharges to a bank account controlled by the Iraqi regime

Wyatt pleaded guilty on October 1, 2007 and acknowledged orchestrating illegal payment in 2001

- Forfeited \$11 million
- Sentenced to 12 months in prison



# Case Studies

## Louisiana – Valentine Field



RYDER SCOTT COMPANY  
PETROLEUM CONSULTANTS

- Well drilled in South Coast 3 reservoir
- Actual Well Test: 700 Mcfd with copious amounts of water
- Company published a fake test of 8 MMcfd
- Used a consultant report based on the false information to entice investors for offset development
- Review of well file revealed actual test information and that the well had been plugged
- Executives fled with the money and left engineer to take the blame
- Owner later captured and negotiated plea of 2 years in prison

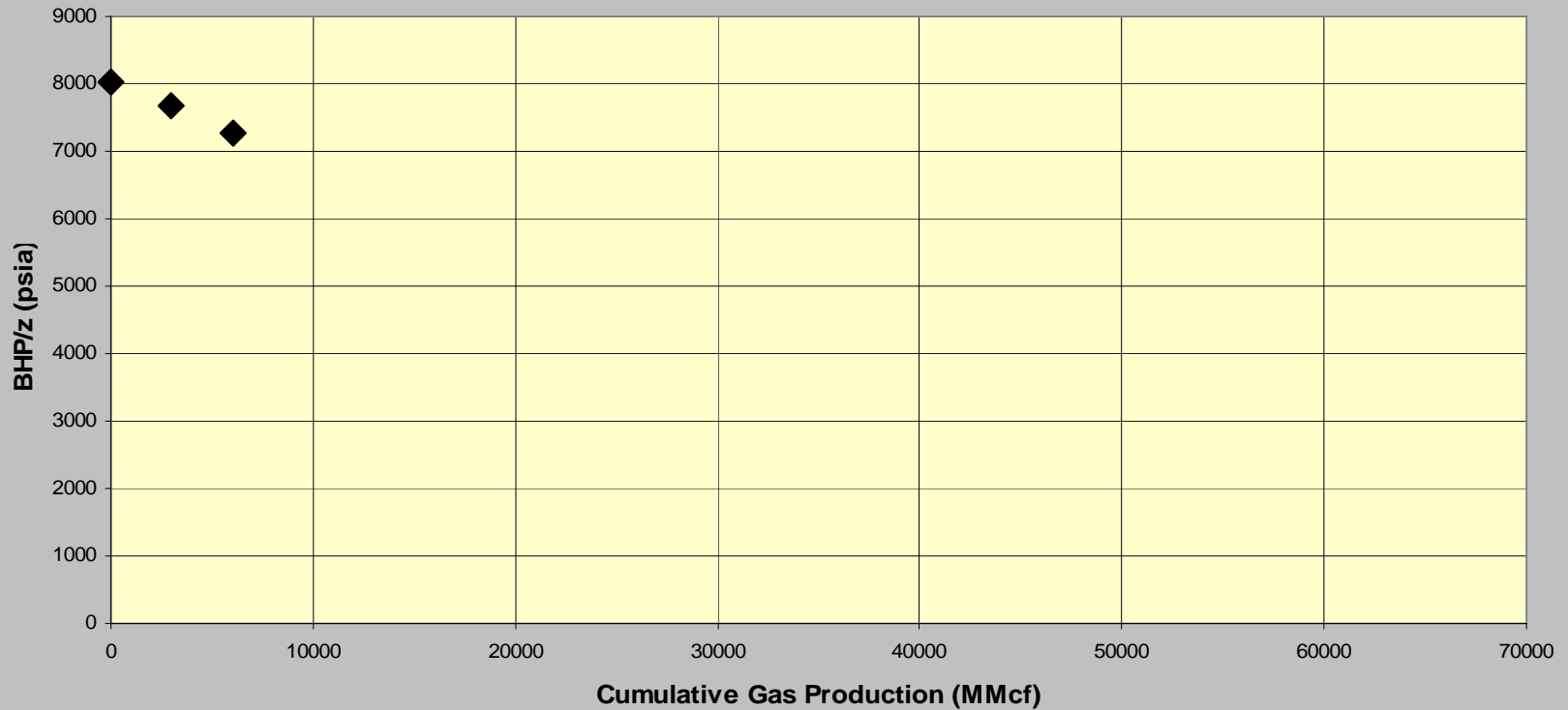




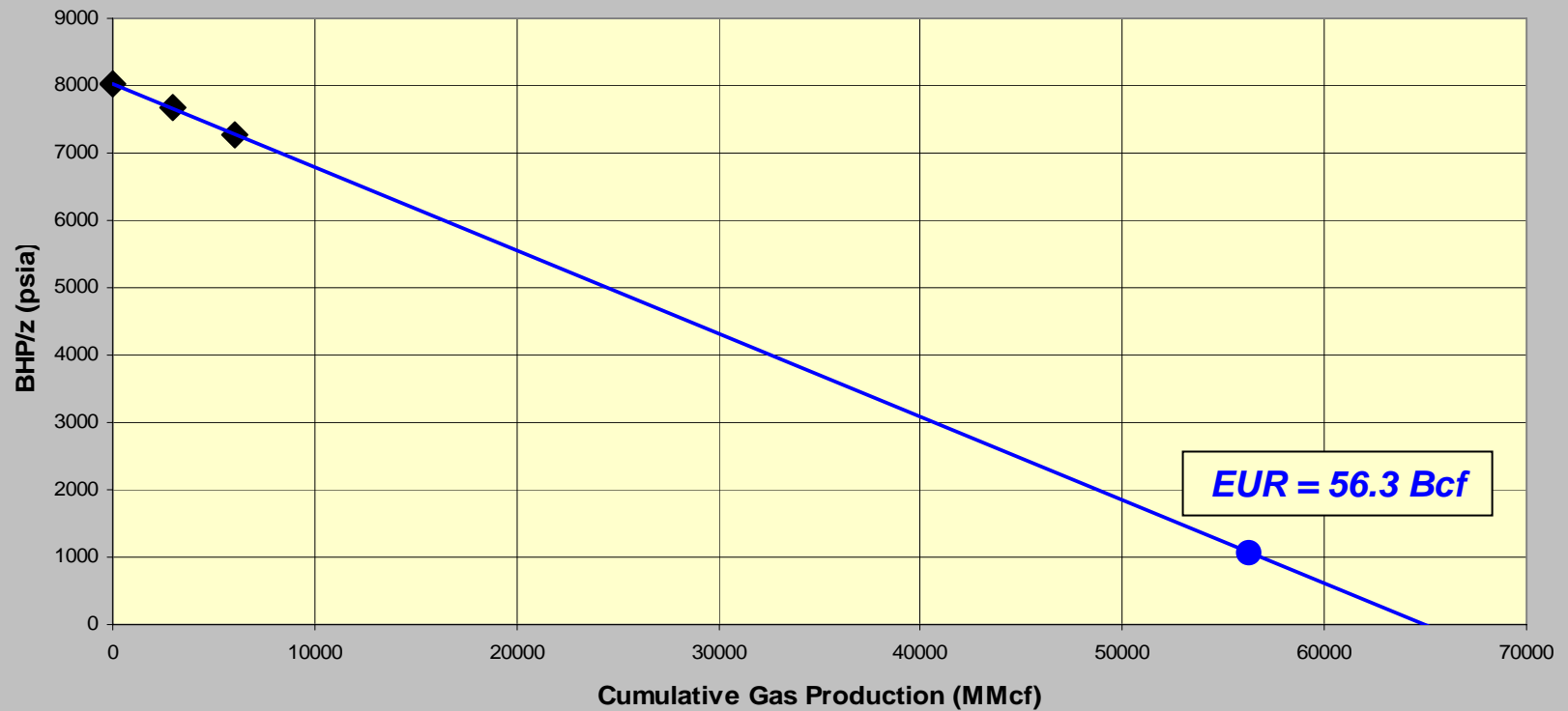
## Background Information:

- Deep, abnormally pressured well
- Fault uncertainty
- Difficult petrophysical analysis
- Contact not identified – low known available
- Wide range in volumetric uncertainty
- Performance to date has been doing well

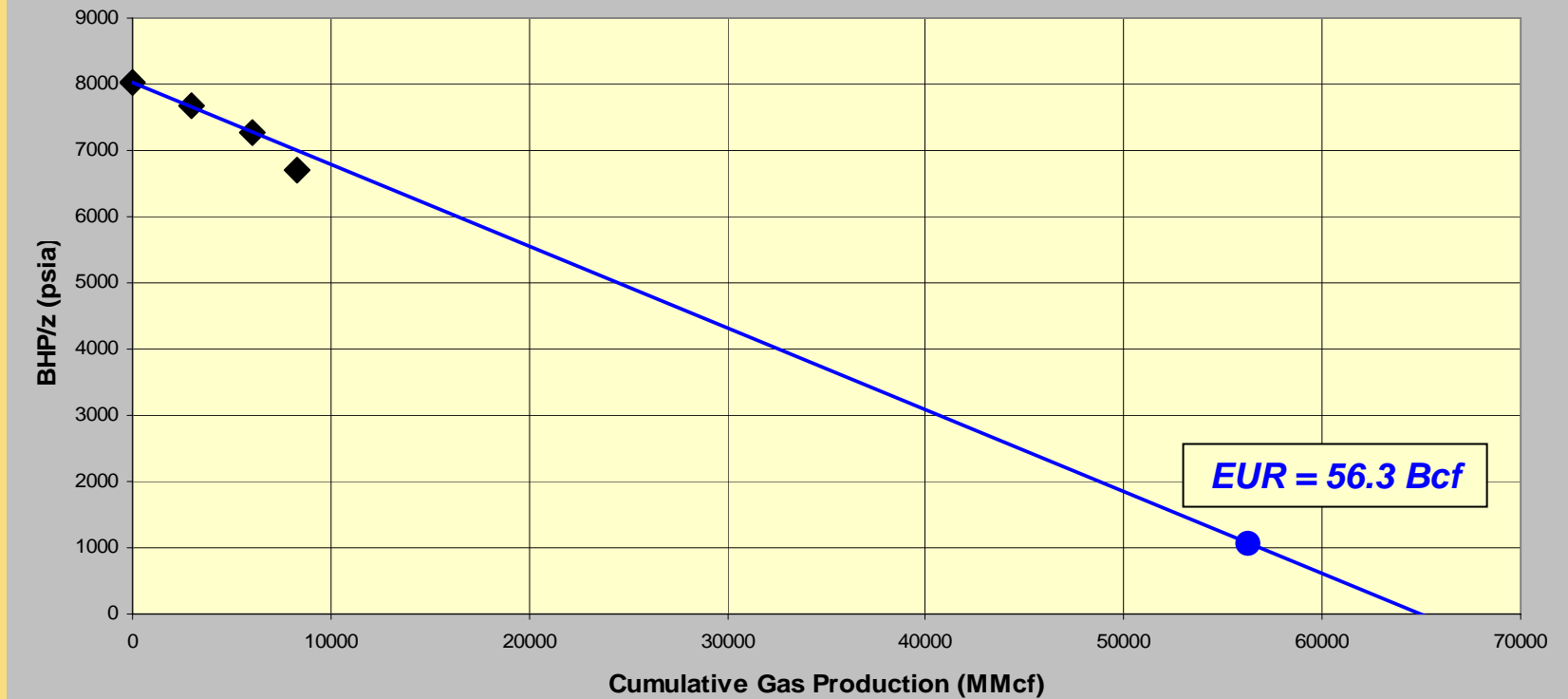
### P/z Analysis - 1st Year of Production



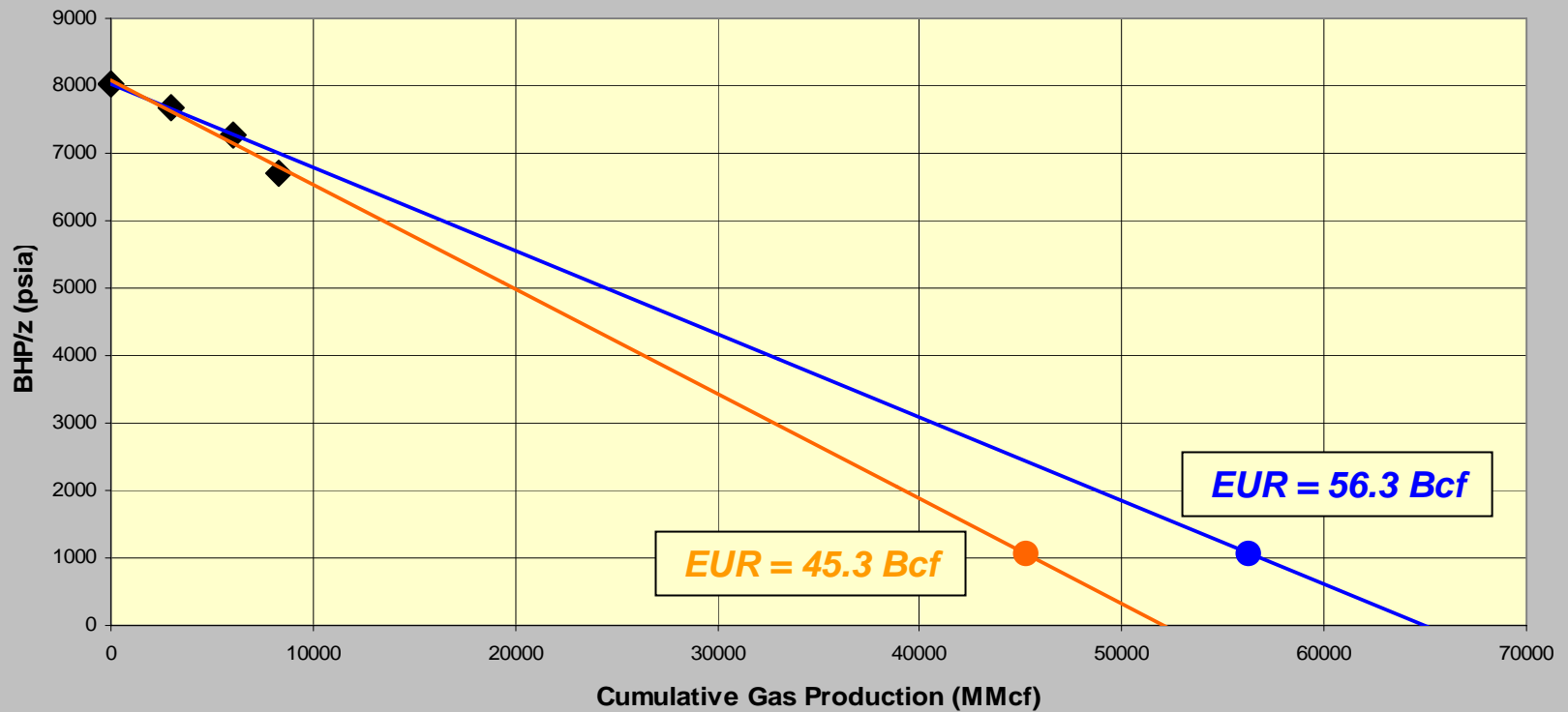
### P/z Analysis - 1st Year of Production



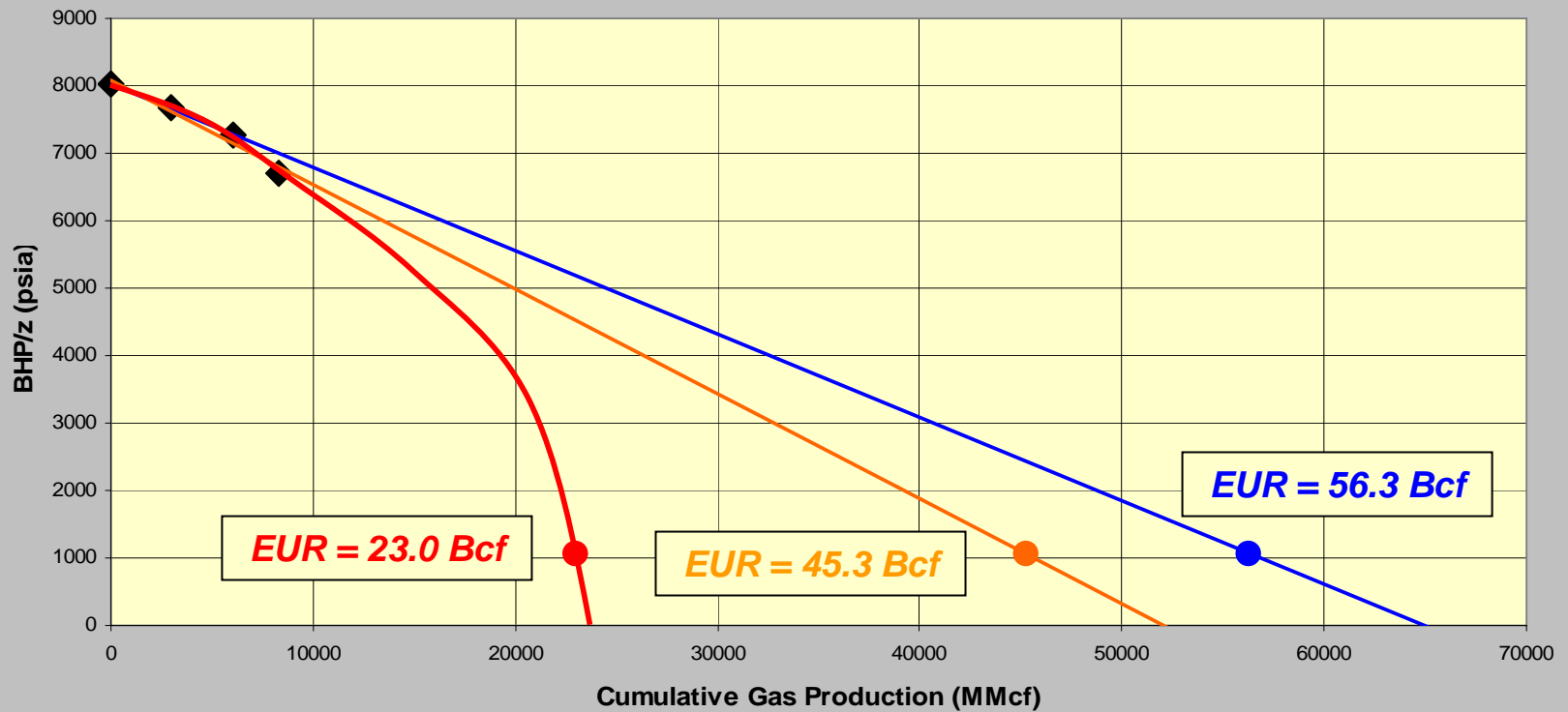
### P/z Analysis - 2nd Year of Production



### P/z Analysis - 2nd Year of Production

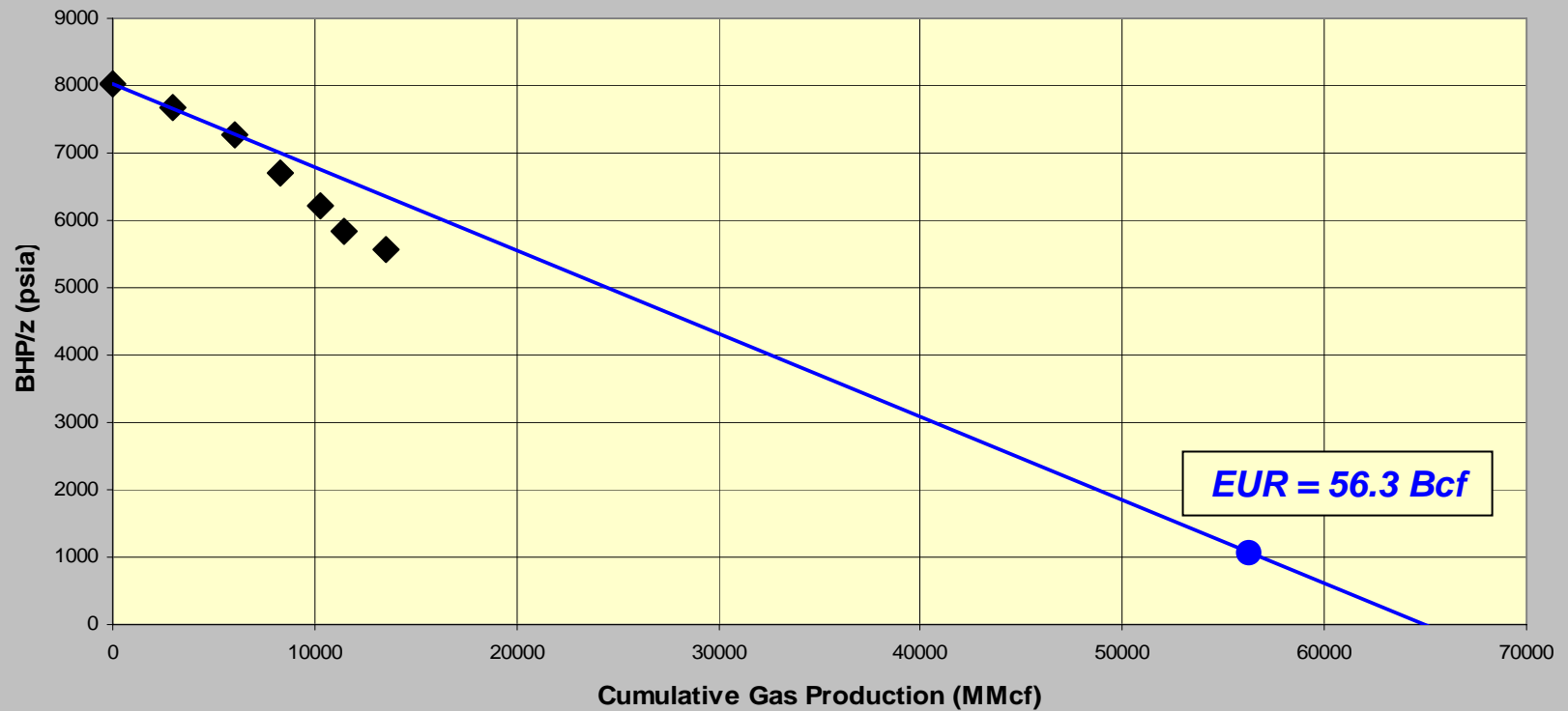


### P/z Analysis - 2nd Year of Production

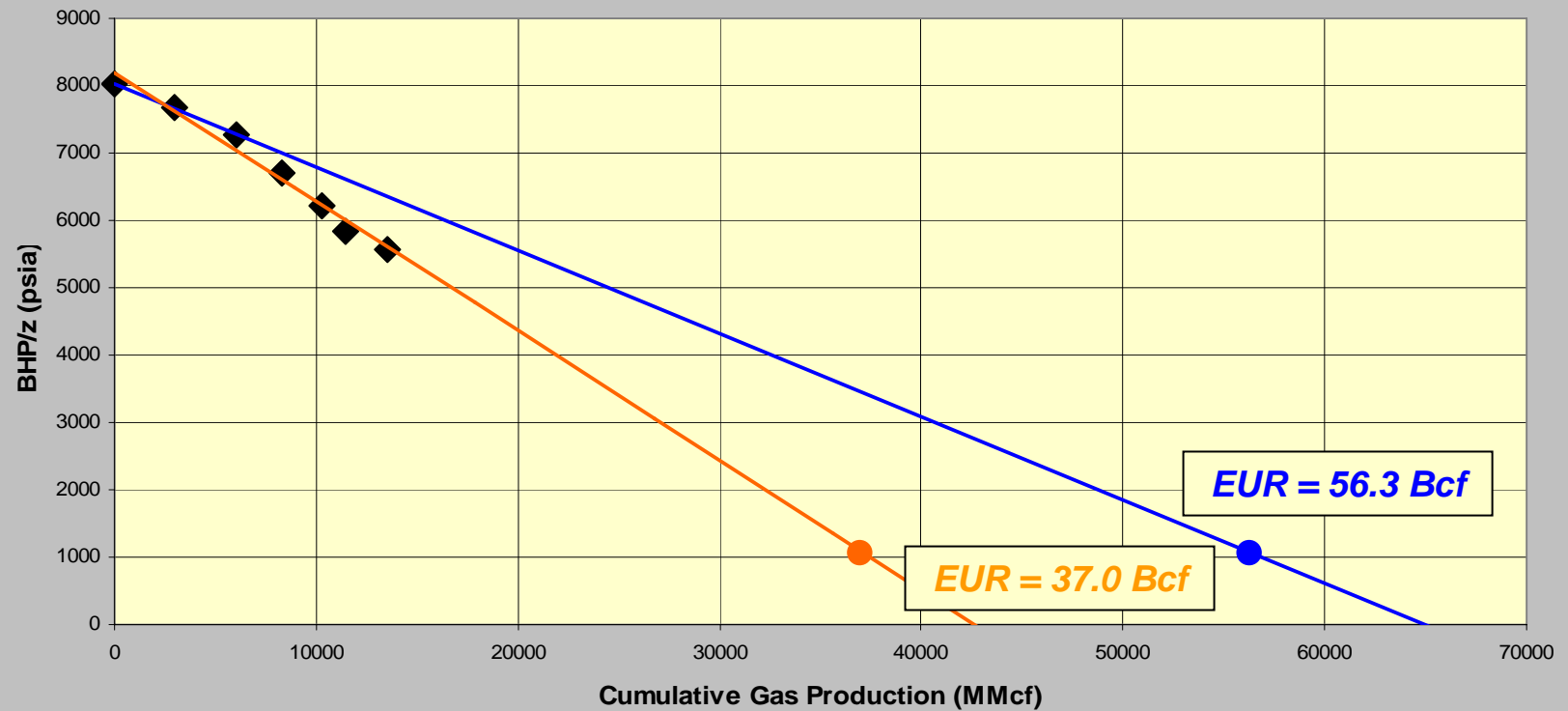




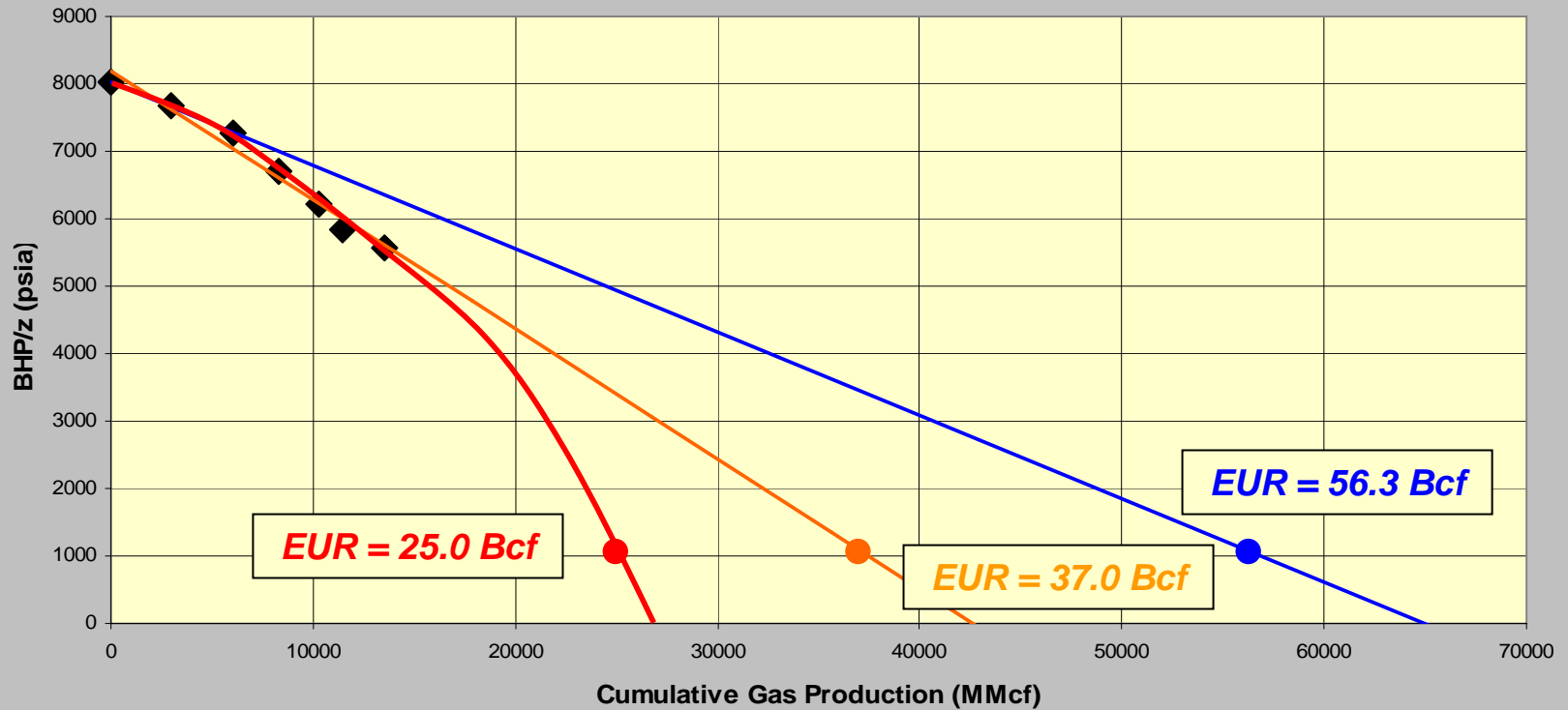
### P/z Analysis - 3rd Year of Production



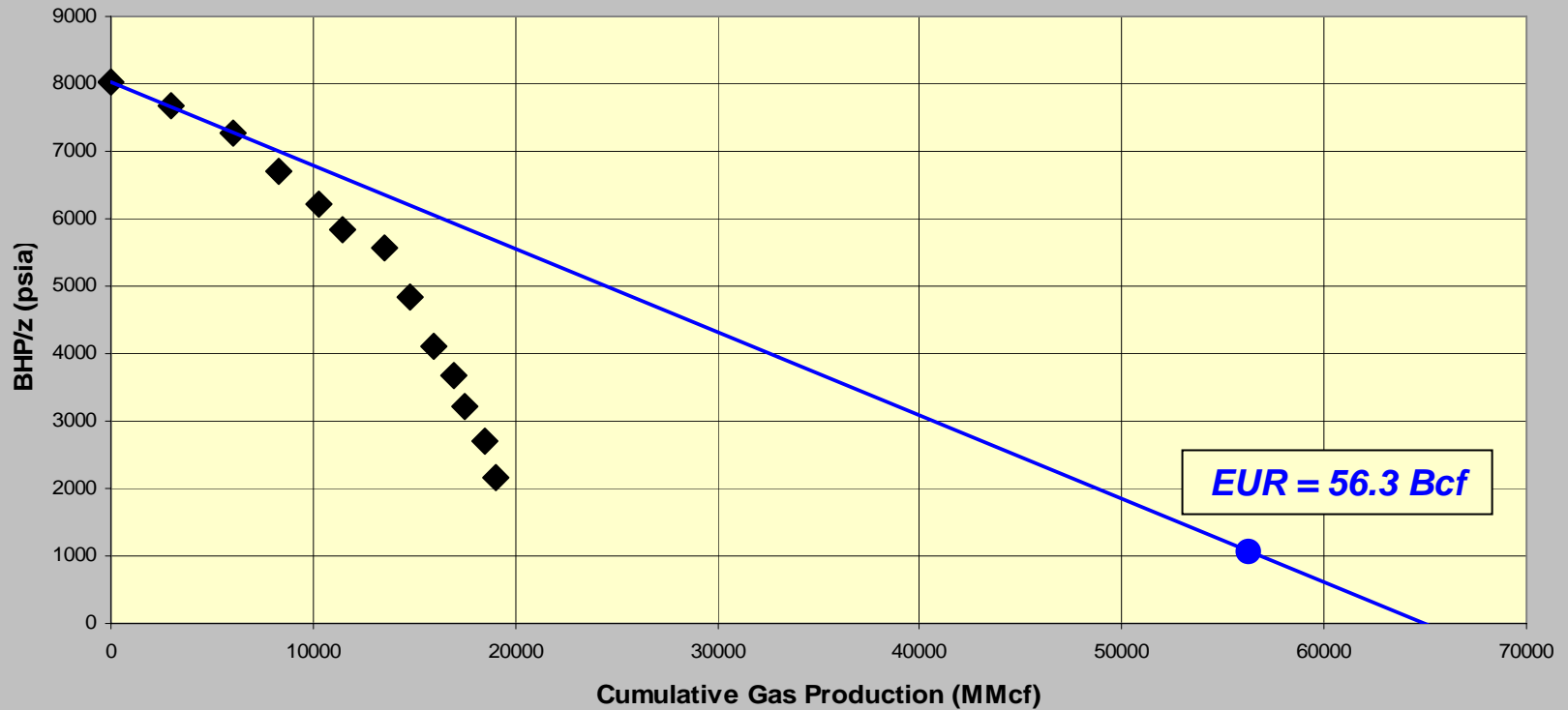
### P/z Analysis - 3rd Year of Production



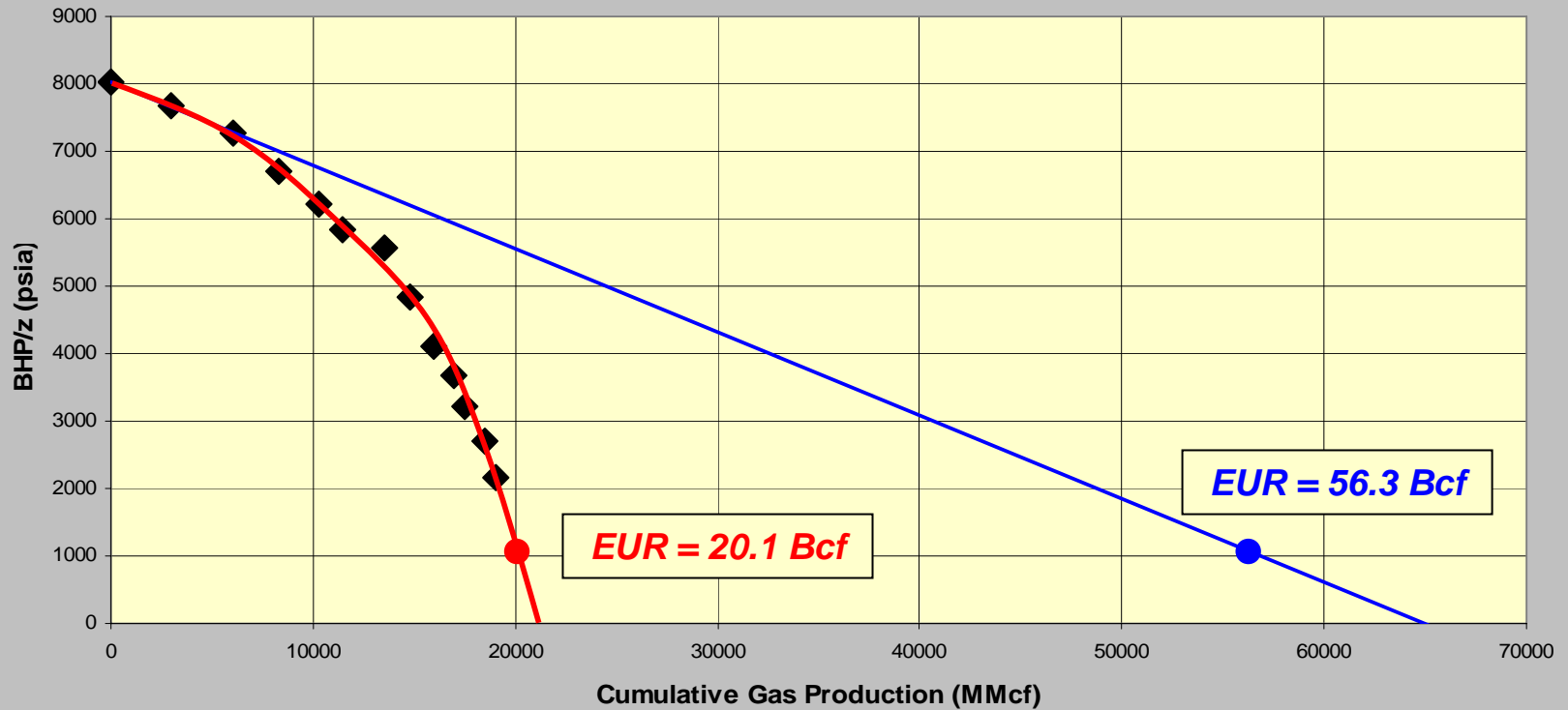
### P/z Analysis - 3rd Year of Production



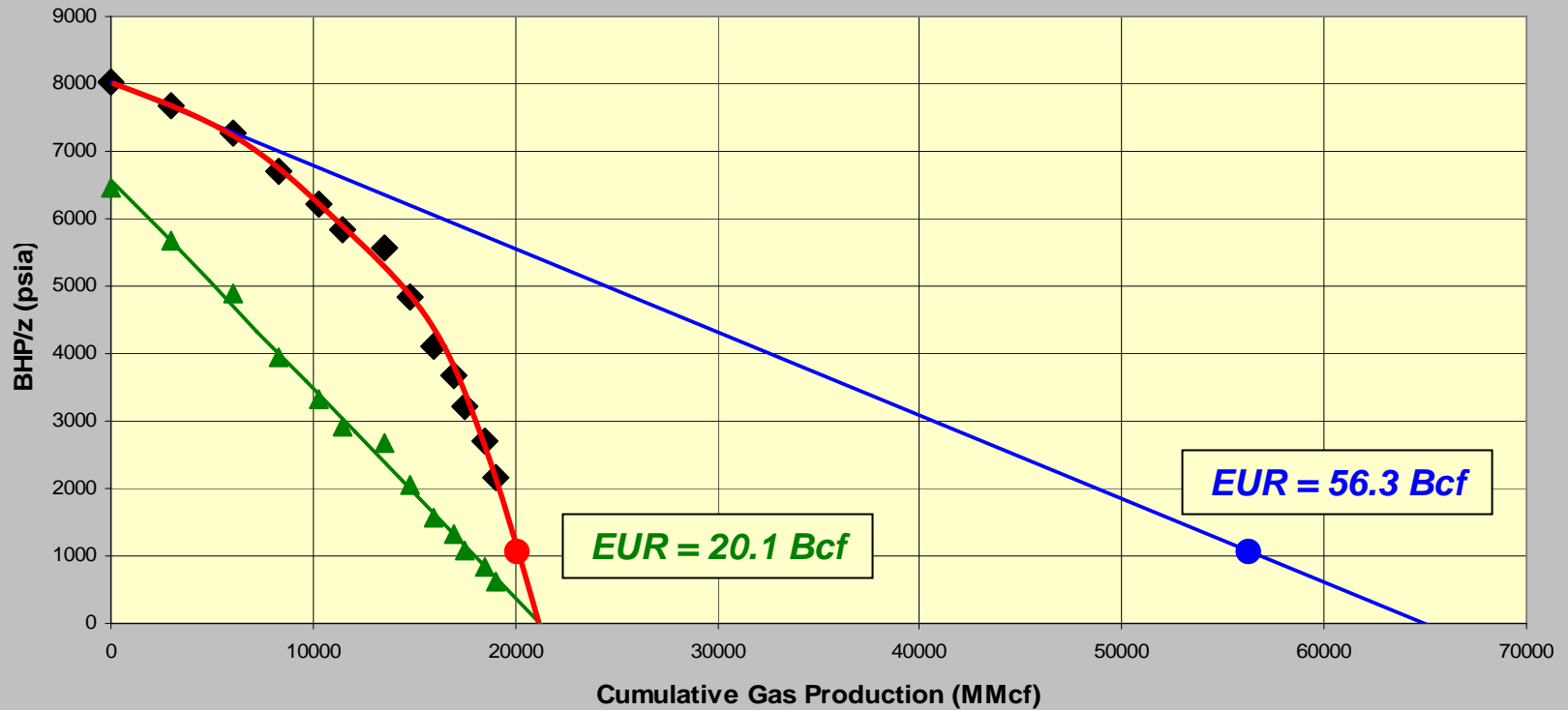
### P/z Analysis - 4th Year of Production

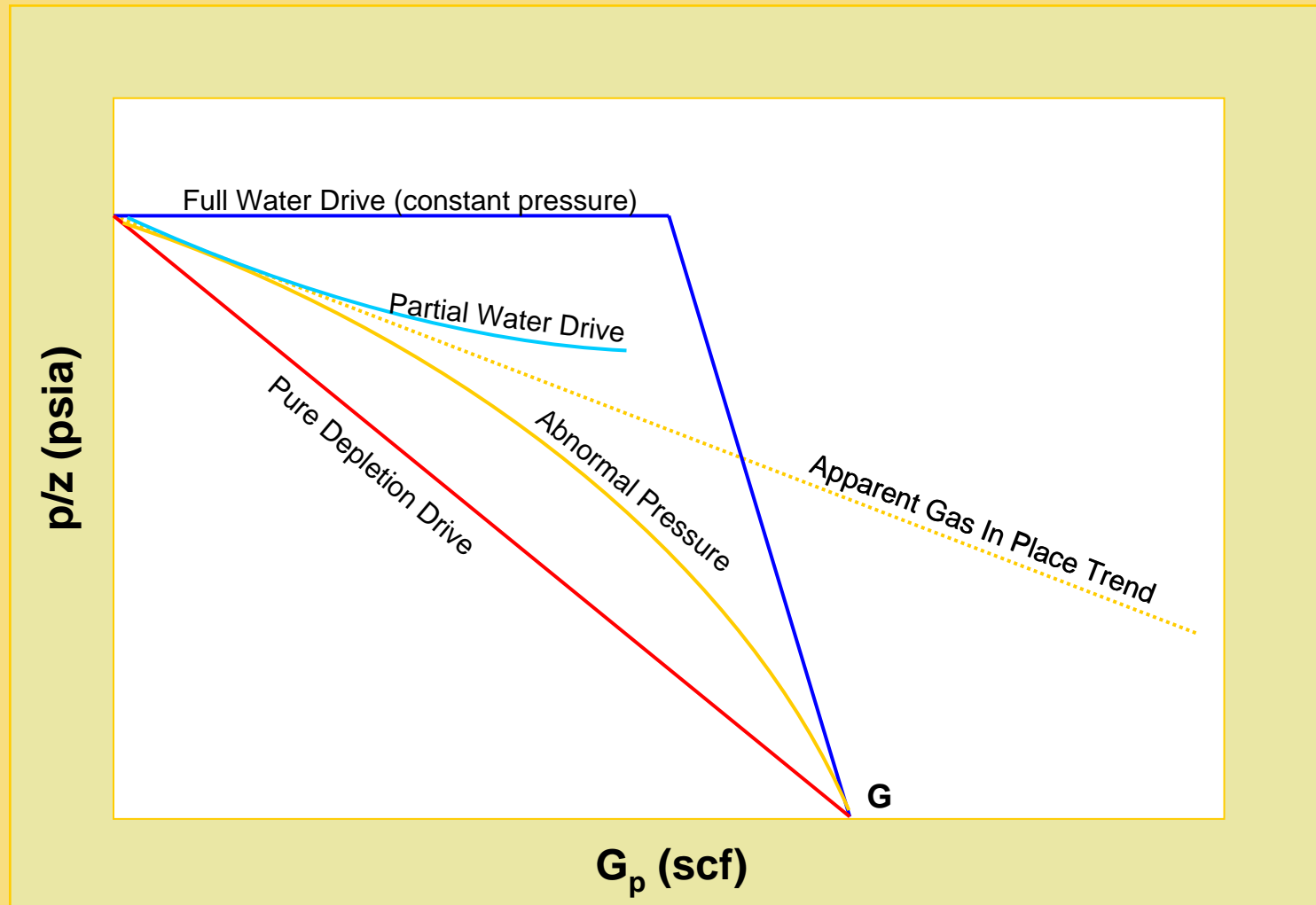


### P/z Analysis - 4th Year of Production



### P/z Analysis - 4th Year of Production





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