

Overview of RPSEA-AEC-KGS Project

“Enhancing oil recovery from mature reservoirs using a lateral and gamma ray sensor”



Project Start: August 25, 2008
Project End: August 24, 2011
DOE Contribution: \$248,385
Performer Contribution: \$271,056
Contact Information:

RPSEA – Martha Cather (prrc.nmt.edu or 575-835-5685)
Industry Partner – American Energies Corporation, Alan DeGood, President
NETL – Chandra Nautiyal (Chandra.Nautiyal@netl.doe.gov or 281-494-2488)
University of Kansas – W. Lynn Watney (lwatney@ku.edu or 785-864-2184)
Saibal Bhattacharya (saibal@kgs.ku.edu or 785-864- 2058)

**American Energies
Corporation**

KU KANSAS
GEOLOGICAL
SURVEY
The University of Kansas

Evaluate project performance. Researchers will compare incremental oil recovery with the costs of drilling, pumping, and water disposal and analyze the overall economics of the methodology. A “best practices” guide will be prepared to help other producers interested in applying this approach in: 1) evaluation of lateral production wells through refined geomodel development and reservoir simulation and 2) recompletion strategies using laterals to increase production in high volume, high water cut mature oil reservoirs..

Evaluate recovery potential the remainder of Unger Field. Researchers will assemble and analyze logs, cuttings, and well completion and production histories from the rest of Unger Field and history match production/pressure history via simulation studies. They will evaluate the potential for incremental oil recovery via the demonstrated methodology in Unger field wells. Projected water production rates for maximum oil recovery will be estimated. An economic evaluation of the projected costs and incremental revenue will be completed.

Technology Transfer. Throughout the duration of the project all of the results and information collected, including the analyses and final reports on each task, will be made publically available.

Kansas Geological Researchers Search for Trapped Oil in Central Kansas Nov. 23, 2010

LAWRENCE—Kansas Geological Survey researchers at the University of Kansas, in conjunction with industry partners, will be drilling horizontally in search of oil in a Central Kansas field not found through traditional methods.

The project is partly funded by the nonprofit consortium Research Partnership to Secure Energy for America (RPSEA).

The Unger Field in Marion County has produced 8.6 million barrels of oil since its discovery in 1955, but production has declined in recent years. Working with several companies, including Wichita-based American Energies Corporation, the Survey is searching for pockets of remaining oil missed through infill drilling, where vertical wells are drilled between existing wells.

“Based on rough estimates of initial reserves, at least 60% of the initial reserves may remain unproduced in this reservoir,” said Survey geologist Lynn Watney. “Variable production in some of the existing wells suggests that this carbonate reservoir is compartmentalized and that pockets of oil likely remain untapped or under produced.”

Horizontal drilling is a relatively new concept in Kansas. The borehole will be drilled vertically for about 2100 feet then veer off gradually through the Hunton dolomite, a known oil-producing layer, where the researchers hope to encounter oil trapped in undrained compartments.

(continued on next page)

(continued from previous page)

Using modern azimuthal natural gamma ray and geosteering tools, the researchers will obtain data about the nature of the rocks surrounding the drill bit that will help them maneuver the lateral borehole through the upper portion of the reservoir where the remaining oil is expected to reside. Logging tools will then be pushed through the lateral to record porosity and water saturation so that the researchers can estimate the amount and location of remaining oil. If sufficient reserves are found, a downhole pump will be installed to produce the oil.

“Besides aiding drilling and completion, these tools will help refine the existing reservoir geomodel for the field and enable simulation studies to predict recovery from the newly drilled well and assess other opportunities to develop remaining oil from the field,” said Survey petroleum engineer Saibal Bhattacharya. “Lessons learned from this project will be shared with the Kansas oil and gas producers through technology transfer workshops.”

Other industry partners for the project include Tres Management, Pan American Drilling Services, C&G Drilling, Mud-Co, Consolidated Oilwell Services, Weatherford Logging Services, Patterson Rental Tool, and Pason Systems. Drilling is expected to commence in early December and should take about two weeks to complete.

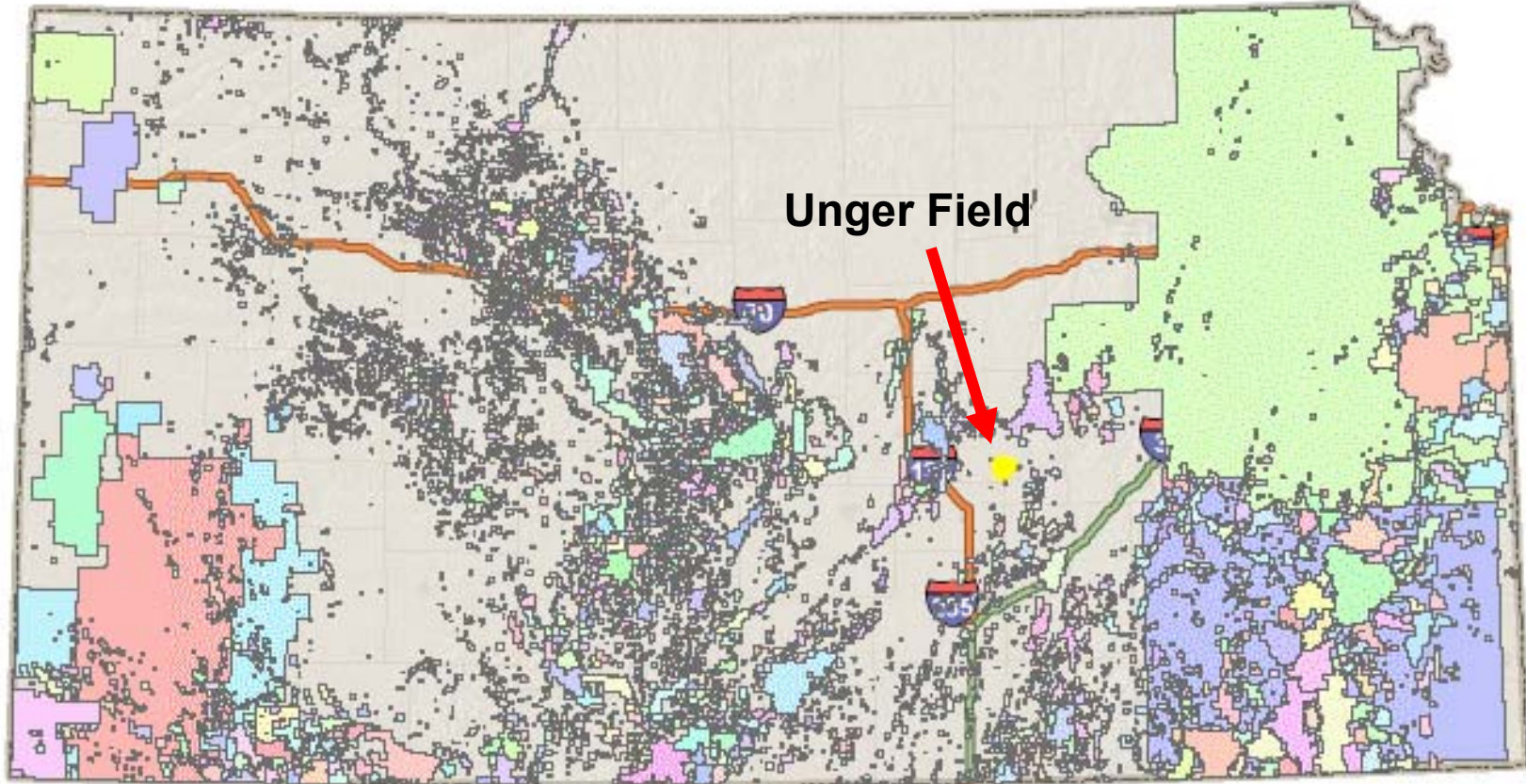
“We hope that success in this project will encourage new drilling to reinvigorate other mature oil fields in Kansas,” Watney said.

Funding for the project is provided through the “Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources Research and Development Program” authorized by the Energy Policy Act of 2005. RPSEA, a consortium of research institutions, energy producers and energy consumers, is under contract with the U.S. Department of Energy’s National Energy Technology Laboratory to administer several elements of the program.

Story by Cathy Evans, 785-864-2195

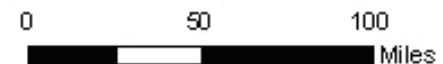
For more information, contact Lynn Watney, 785-864-2184

Unger Field Marion County, Kansas



**American Energies
Corporation
Alan DeGood**

KU KANSAS
GEOLOGICAL
SURVEY
The University of Kansas



Overview

- The Unger Field, discovered in 1955, has produced 8.6 MBO. While 76 wells produced in 1966, only 16 are producing at an average rate of 2.2 bbls per day. Wells have variable production rate over crest of structure and wells near original oil:water contact are still producing suggesting considerable heterogeneity of the reservoir and opportunities in infill drilling and lateral to be drilled in this project.
- The new lateral, American Energy Corporation's Slocombe-Rood #1-19 is programmed as a 2100' horizontal that will be enter the upper most portion of the Hunton Group dolomite oil reservoir that subcrops beneath a regional (Kaskaskia) unconformity.
- Lateral will be guided along the crest of a northwest trending anticline located in the southern part of Unger Field using real-time geosteering.
- The thickness of net pay (porous dolomite) in the Hunton ranges from 12 ft to 25 ft. The reservoir lithology consisting of karsted, fractured, and vuggy dolomite.
- Total thickness of the dolomite interval in the vicinity of the lateral ranges from over 60 ft on the south to around 20 ft on the north. Thinning is due to progressive northward truncation along its top along the unconformity. The northwest trajectory of the lateral will follow the uppermost porous reservoir as it undergoes northward truncation. Micrologs available in adjoining wells indicate progressive subcrop of gently southward dipping internal flow units.
- The Hunton reservoir is overlain by a thin, tight (5-10 ft) dolomitic caprock, which in turn lies beneath a ~150 ft interval of Kinderhook and Chattanooga Shale. The lower portion of the Chattanooga Shale has elevated natural gamma radiation.
- The Hunton reservoir is underlain by a thick section of Maquoketa Shale.
- Lateral is being drilled to contact isolated or underproduced compartments of fractured, vuggy dolomite. Hunton in area of the lateral has produced under a strong edge-water drive (water encroachment is along the edges of reservoir).
- The tight dolomitic caprock will aid in keeping the lateral moving through the more easily drilled porous reservoir. The elevated gamma ray of the Chattanooga Shale will also help
- Utilizing geologic data from nearby wells combined with the radial gamma ray tool, the lateral will be guided along the upper most portion of porous Hunton dolomite.

Staff/affiliations

- **American Energies Corporation**
 - Alan DeGood, President
 - Doug Davis & Karen Houseberger – geologists
 - Jake Segal -- field superintendent
- **Kansas Geological Survey**
 - Saibal Bhattacharya -- petroleum engineer
 - Jason Rush -- geologist
 - Lynn Watney – geologist
 - John Doveton – log petrophysics
 - David Newell – geologist
- **Tres Management, Inc.**
 - Brad Crouch

Drilling team

Contractor: C & G Drilling Rig 2
Eureka, KS
Tim Gullick
620-583-4306

Mud Services: Mud-Co / Service Mud Inc.
Wichita, KS
316-264-2814

Cement Services: Consolidated Oilwell Services
Larry Storm, KS
620-323-3381

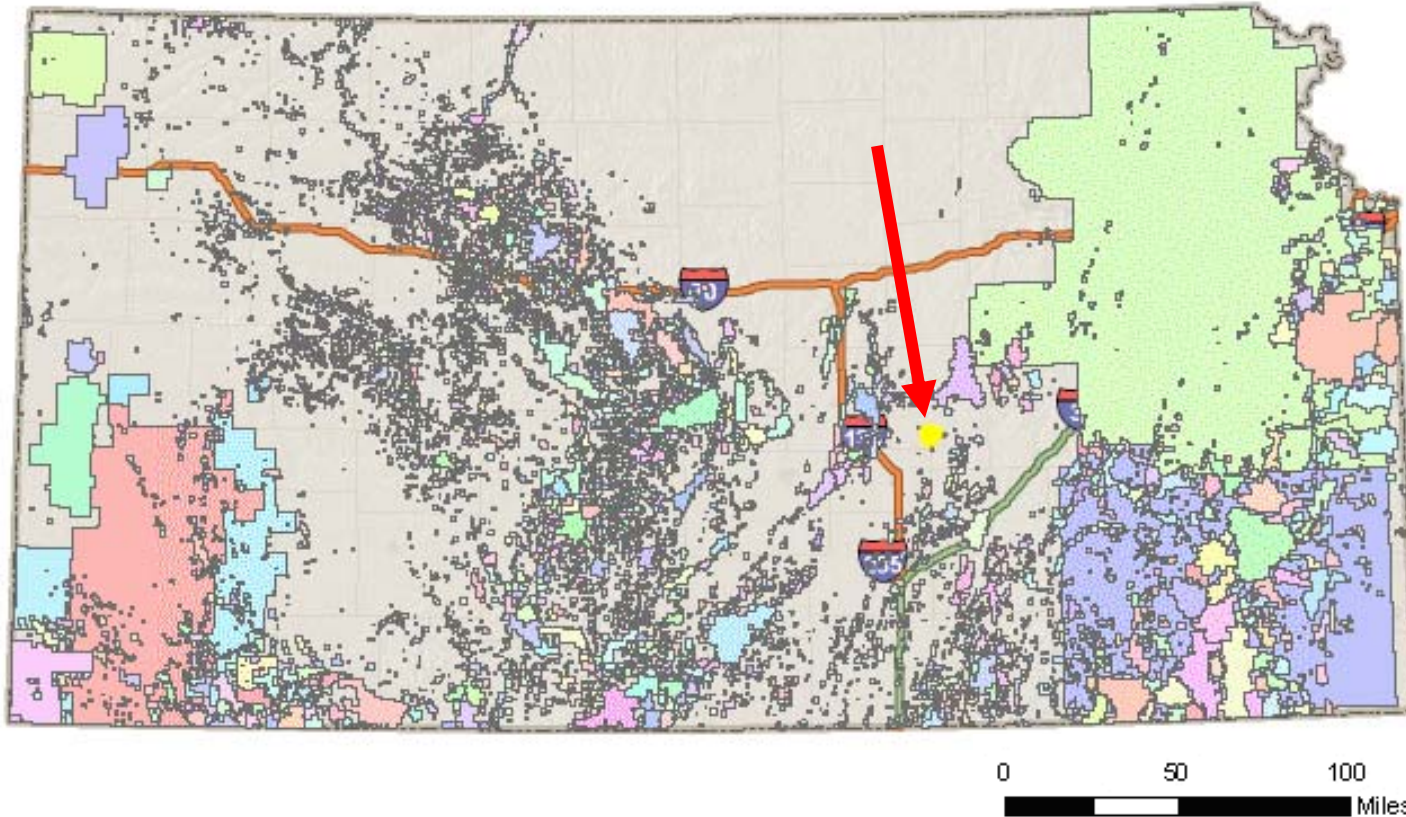
Open Hole Logging: Weatherford
Oklahoma City, OK
405-720-4334
Mark Houpe

Directional Services: Pan American Drilling Services
Oklahoma City, OK
405-677-6800
Mark Greene 405-620-7128

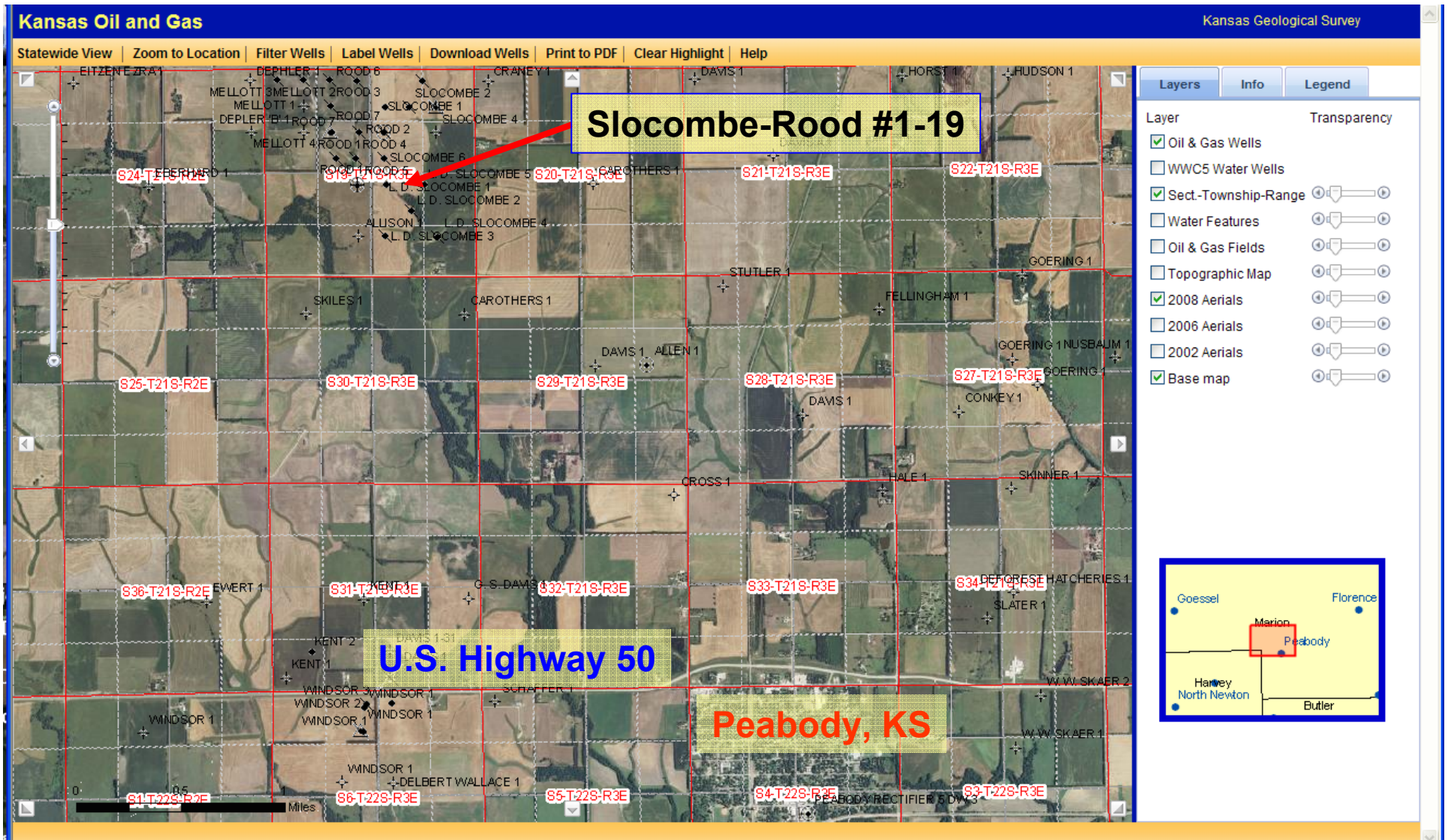
Rental Drill Pipe: Patterson Rental Tool
Oklahoma City, OK
405-810-9300
Mark Tayar 405-401-4900

Electronic Monitoring: Pason Systems USA
Lafe Coldwater 580-551-9470
Chase Coldwater 405-334-7525

**Horizontal Well
American Energies Corporation
Slocombe-Rood #1-19
Unger Field
Marion County, Kansas**

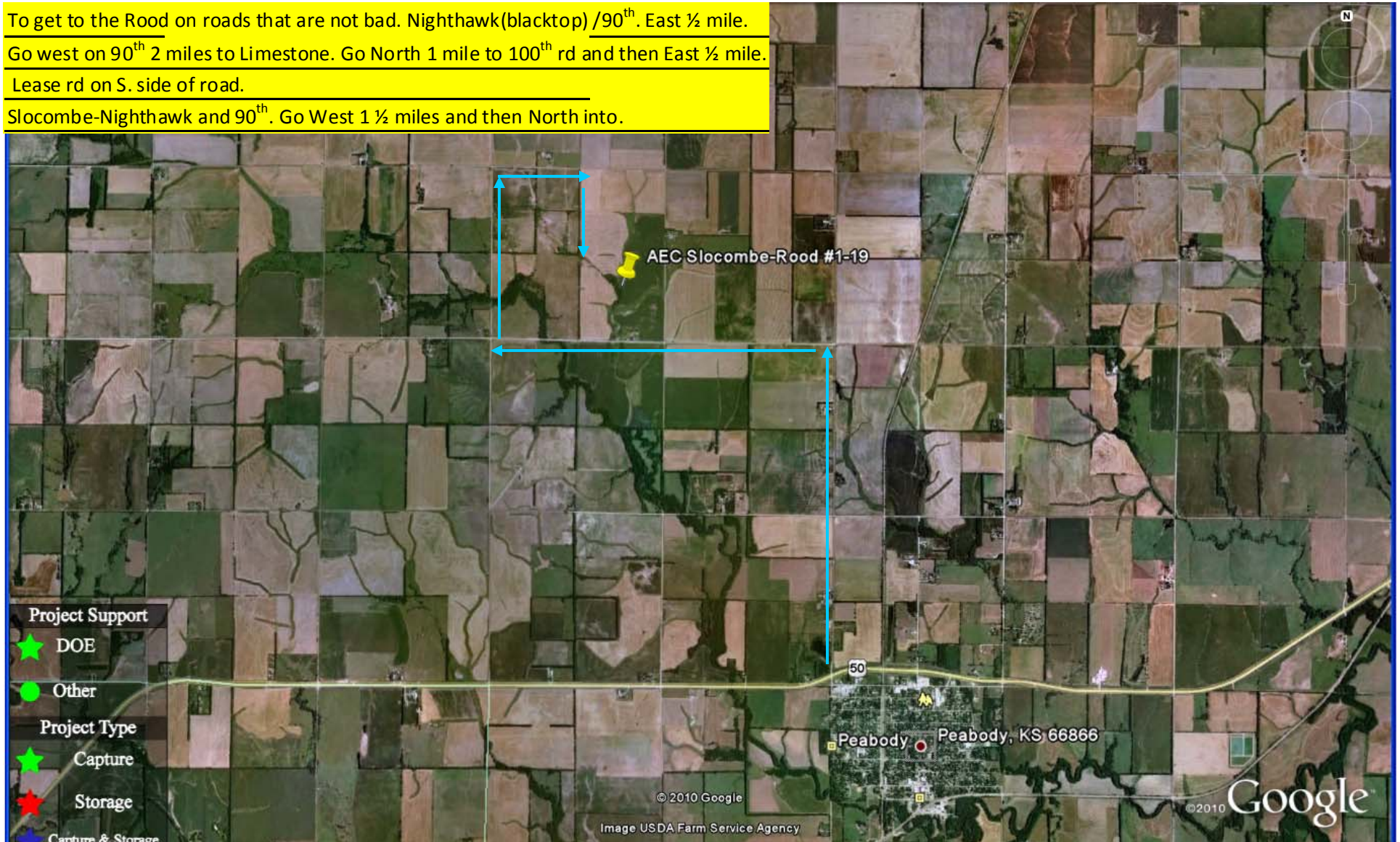


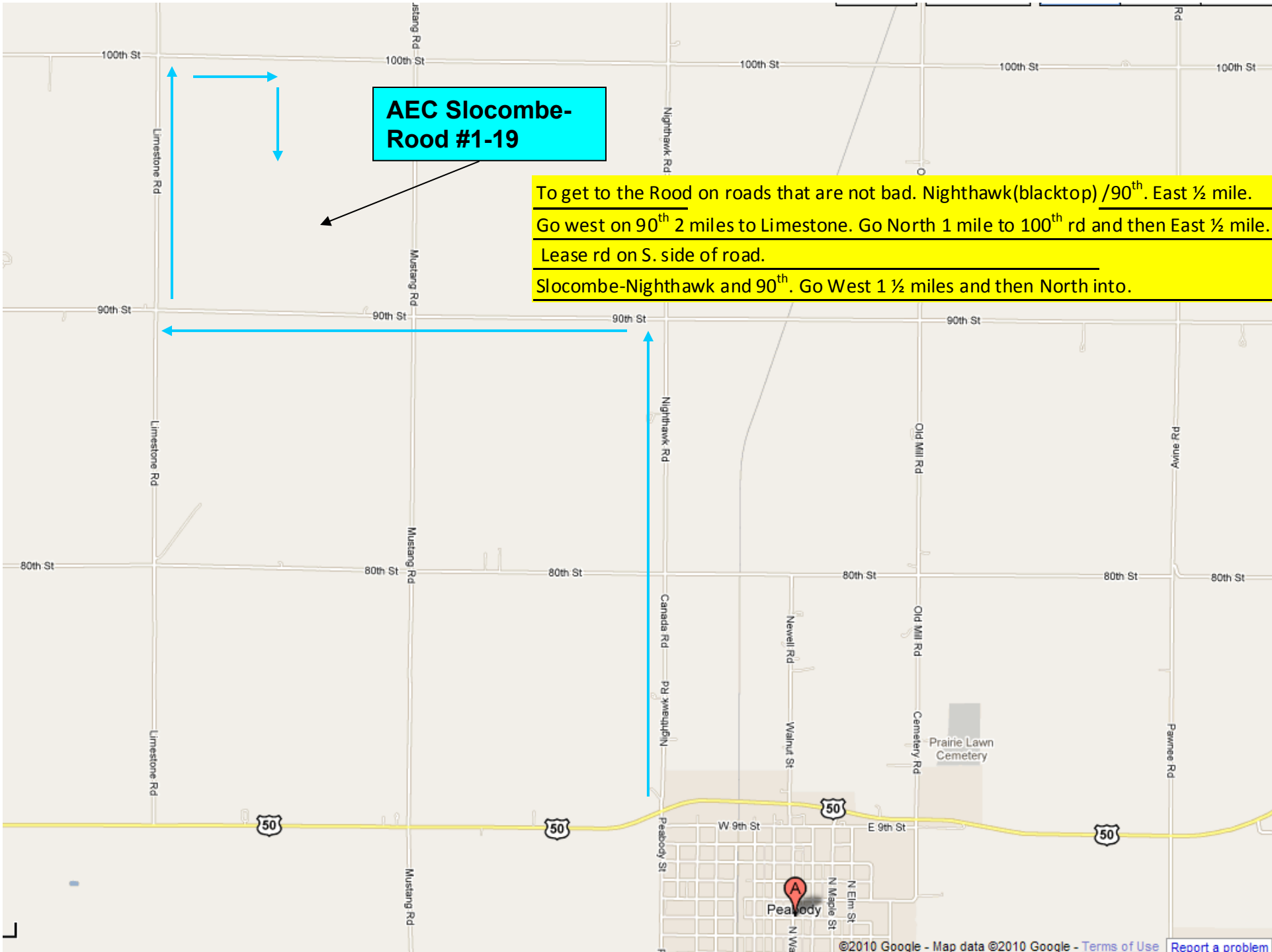
Well located approximately 3 miles northwest of Peabody, Ks
Peabody is 55 miles west of Emporia on U.S. Highway 50



AEC Slocombe-Rood #1-19 (yellow punch pin) outside of Peabody, Ks Latitude 38.208667° Longitude -97.139002°

To get to the Rood on roads that are not bad. Nighthawk(blacktop) /90th. East ½ mile.
Go west on 90th 2 miles to Limestone. Go North 1 mile to 100th rd and then East ½ mile.
Lease rd on S. side of road.
Slocombe-Nighthawk and 90th. Go West 1 ½ miles and then North into.

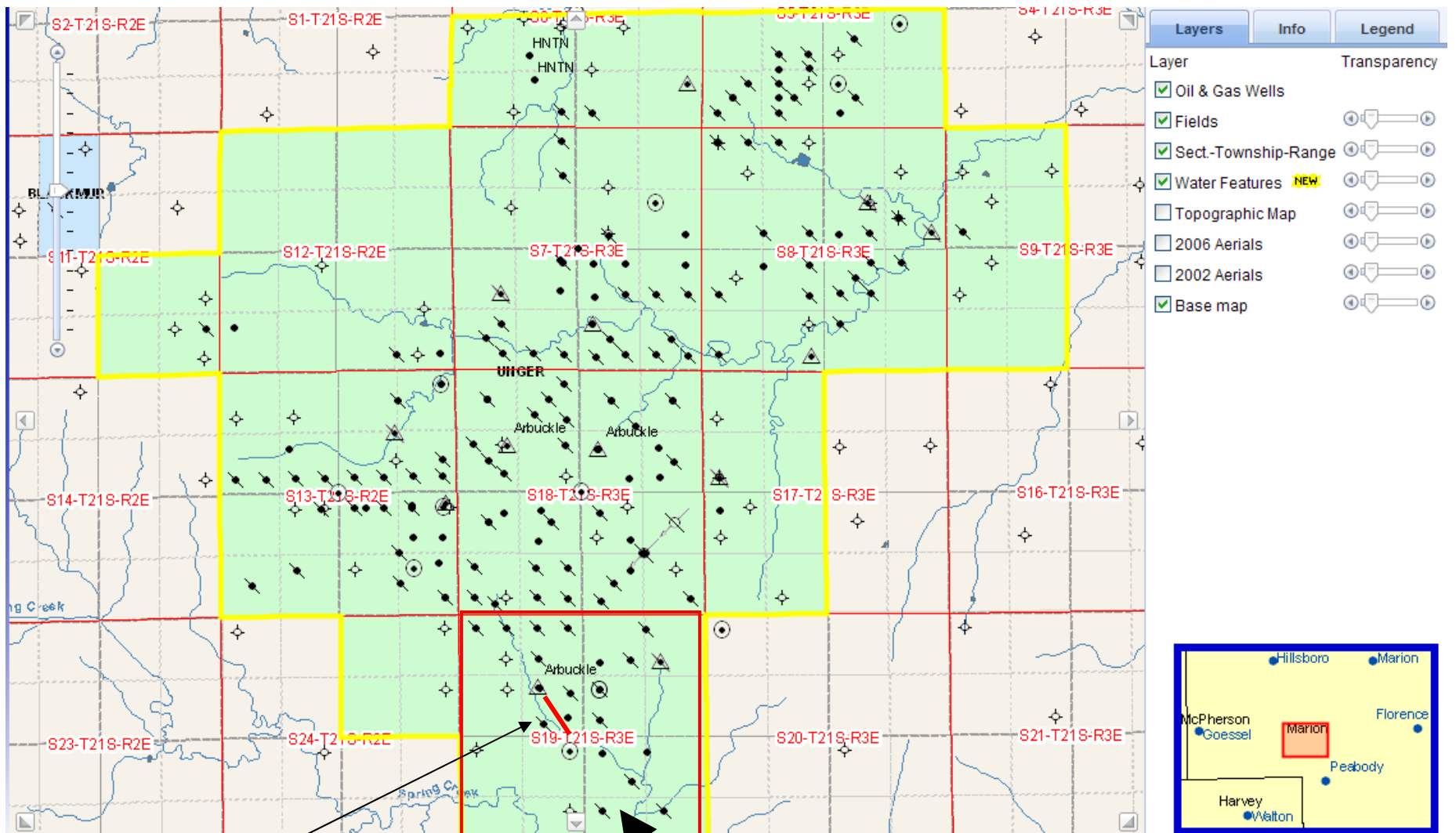




AEC Slocombe-Road #1-19

To get to the Road on roads that are not bad. Nighthawk(blacktop) /90th. East 1/2 mile.
Go west on 90th 2 miles to Limestone. Go North 1 mile to 100th rd and then East 1/2 mile.
Lease rd on S. side of road.
Slocombe-Nighthawk and 90th. Go West 1 1/2 miles and then North into.

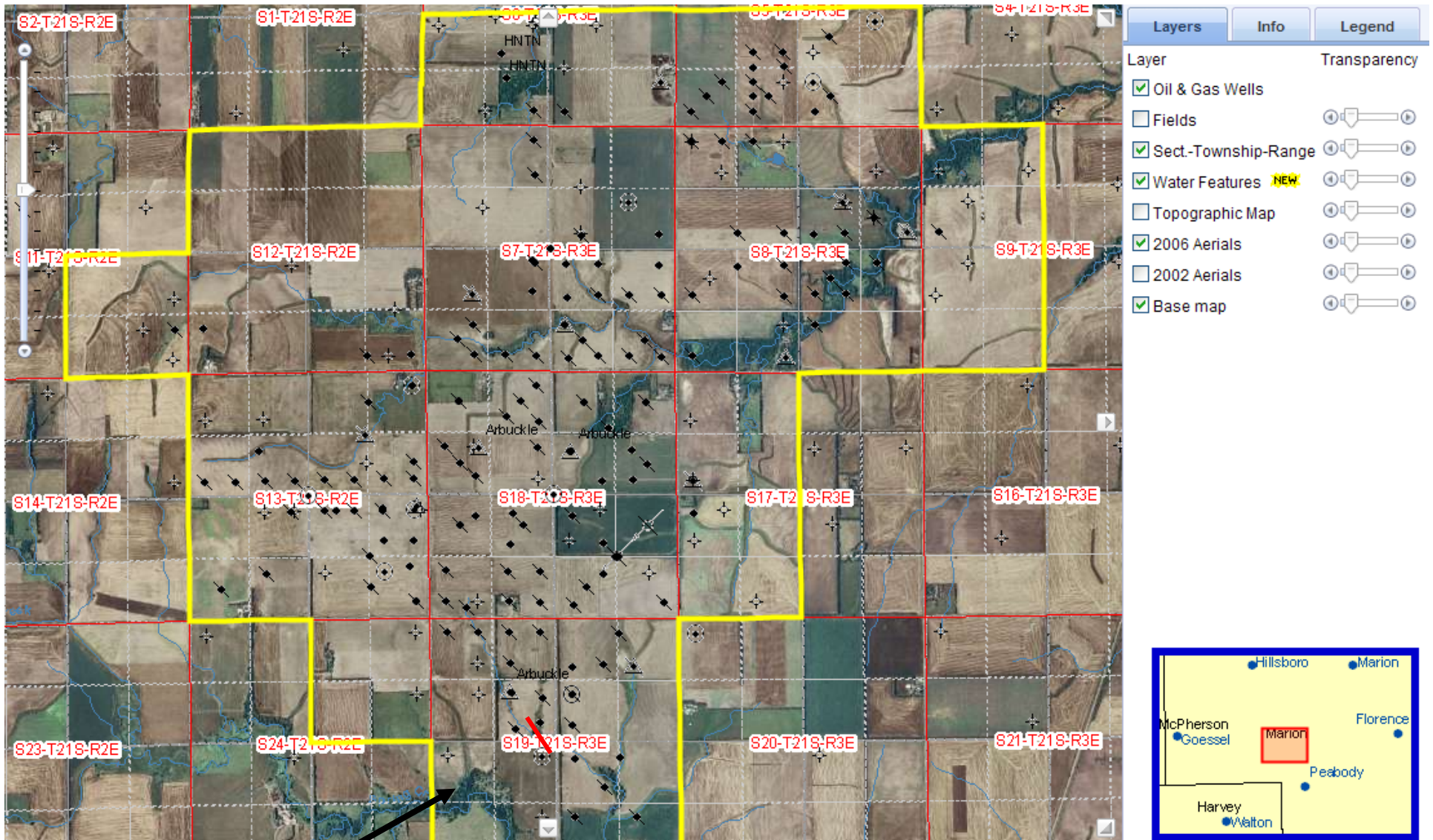
Unger Field Marion County, Kansas



Location of lateral

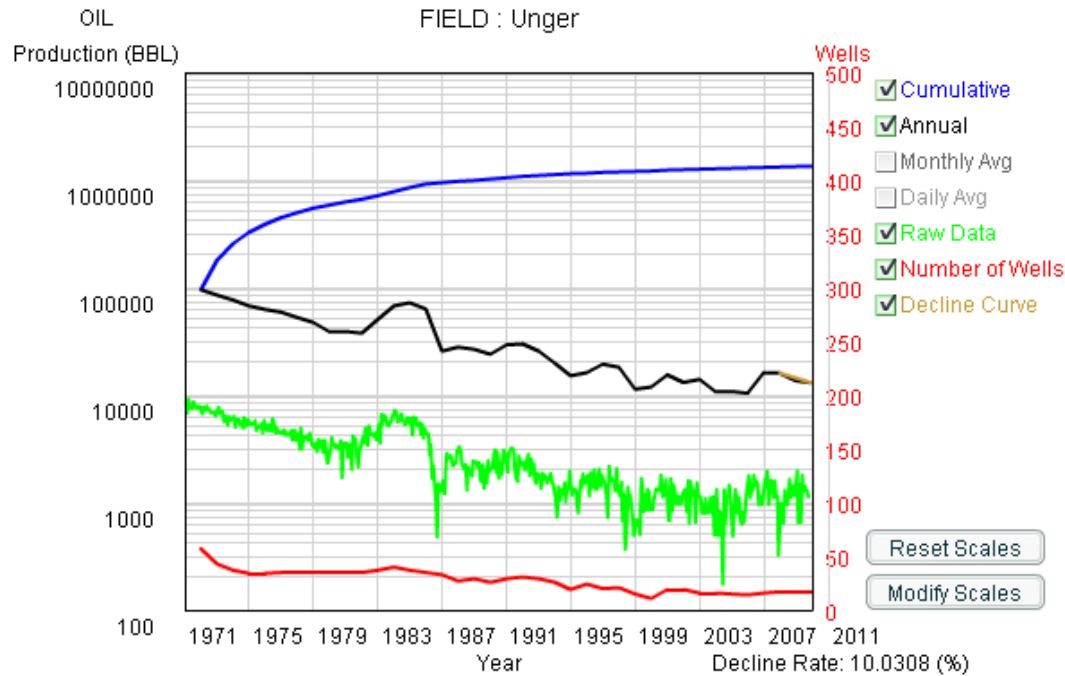
Focus:
Section 19

Unger Field, Marion County, KS



Section 19

Unger Field Production



Field discovery: 1955
Cum. 8.6 million bbls.
2008: 13,572 bbls., 17 wells
2.2 BOPD/well
Misener Ss. and Hunton Ls.
~2800 ft (md)

Decline Curve Analysis Method		Enter Production Rate for Computation	
<input checked="" type="radio"/> Exponential	$Q_t = Q_i \exp(-kt)$	<input type="radio"/> Daily	<input type="radio"/> Monthly
<input type="radio"/> Harmonic	Constant (K): 0.105702	<input checked="" type="radio"/> Yearly	
<input type="radio"/> Hyperbolic	Exponent (n): 0	Initial Production (Qi)	Present Production (Qt)
		Enter Year: 2007	Enter Year: 2009
		Enter Rate: 16027	Enter Rate: 12973

Intent to Drill

For KCC Use: Form C-1
 Effective Date: 01/02/2011
 District #: 2
 SGA? Yes No

KANSAS CORPORATION COMMISSION 1045791
 OIL & GAS CONSERVATION DIVISION
 Form must be Typed
 Form must be Signed
 All blanks must be Filled

NOTICE OF INTENT TO DRILL
 Must be approved by KCC five (5) days prior to commencing well
 Form KSONA-1, Certification of Compliance with the Kansas Surface Owner Notification Act, MUST be submitted with this form.

Expected Spud Date: 12/01/2010
 month day year

Operator: License# 5399
 Name: American Energies Corporation
 Address 1: 155 N MARKET STE 710
 Address 2:
 City: WICHITA State: KS Zip: 67202 + 1521
 Contact Person: Karen Houseberg
 Phone: 316-283-6755

Contractor: License# 32701
 Name: C & S Drilling, Inc.

Well Drilled For: Oil Gas
 Well Class: Infill Pool Ext. Wildcat
 Type Equipment: Mud Rotary Air Rotary Cable

Operator: _____
 Well Name: _____
 Original Completion Date: _____ Original Total Depth: _____

Directional, Deviated or Horizontal Well? Yes No
 If Yes, true vertical depth: 2100
 Bottom Hole Location: 1650 FNL, 1760 FAL, 59-21-3E
 KCC DKT #: _____

11-CONS-085-CHOR. BHL changed per operator request.

AFFIDAVIT

The undersigned hereby affirms that the drilling, completion and eventual plugging of this well will comply with K.S.A. 55 et. seq.
 It is agreed that the following minimum requirements will be met:

1. Notify the appropriate district office prior to spudding of well;
2. A copy of the approved notice of intent to drill shall be posted on each drilling rig;
3. The minimum amount of surface pipe as specified below shall be set by circulating cement to the top; in all cases surface pipe shall be set through all unconsolidated materials plus a minimum of 20 feet into the underlying formation.
4. If the well is dry hole, an agreement between the operator and the district office on plug length and placement is necessary prior to plugging;
5. The appropriate district office will be notified before well is either plugged or production casing is cemented in;
6. If an ALTERNATE II COMPLETION, production pipe shall be cemented from below any usable water to surface within 120 DAYS of spud date. Or pursuant to Appendix "B" - Eastern Kansas surface casing order #133.891-C, which applies to the KCC District 3 area, alternate II cementing must be completed within 30 days of the spud date or the well shall be plugged. In all cases, NOTIFY district office prior to any cementing.

Submitted Electronically

For KCC Use ONLY
 API # 15-15-115-21419-01-00
 Conductor pipe required 0 feet
 Minimum surface pipe required 200 feet per ALT I II
 Approved by: Rick Hastermann 12/28/2010
 This authorization expires: 12/28/2011
 (This authorization void if drilling not started within 12 months of approval date.)
 Spud date: _____ Agent: _____

Remember to:

- File Certification of Compliance with the Kansas Surface Owner Notification Act (KSONA-1) with Intent to Drill;
 - File Drill Pit Application (form CDP-1) with Intent to Drill;
 - File Completion Form ACO-1 within 120 days of spud date;
 - File acreage attribution plat according to field production orders;
 - Notify appropriate district office 48 hours prior to workover or re-entry;
 - Submit plugging report (CP-4) after plugging is completed (within 60 days);
 - Obtain written approval before disposing or injecting salt water.
- If well will not be drilled or permit has expired (See authorized expiration date) please check the box below and return to the address below.

Well will not be drilled or Permit Expired Date: _____
 Signature of Operator or Agent: _____

Mail to: KCC - Conservation Division,
 130 S. Market - Room 207B, Wichita, Kansas 67202

19 21 3

For KCC Use ONLY
 API # 15-15-115-21419-01-00

IN ALL CASES PLOT THE INTENDED WELL ON THE PLAT BELOW

In all cases, please fully complete this side of the form. Include items 1 through 5 at the bottom of this page.

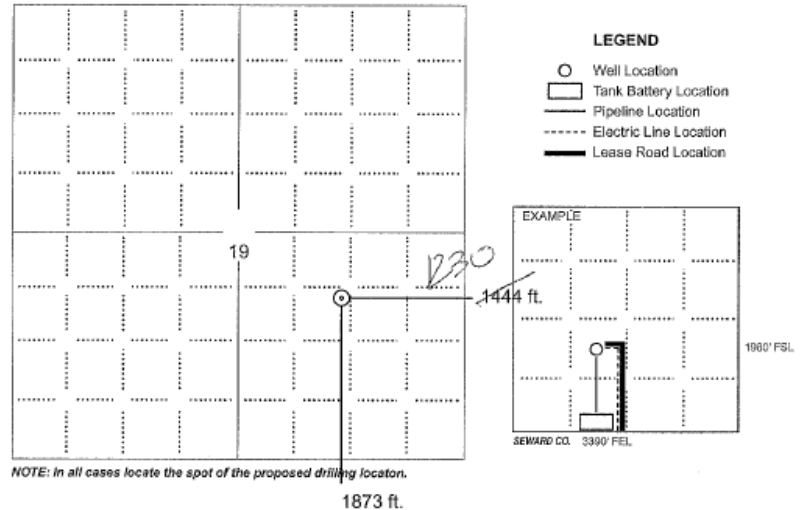
Operator: American Energies Corporation
 Lease: Stocombe-Rood
 Well Number: 1-19
 Field: Unger
 Number of Acres attributable to well: _____
 QTR/QTR/QTR/QTR of acreage: NE - SE - NW - SE

Location of Well: County: Marion
 1,873 feet from N / S Line of Section
 1,444 feet from E / W Line of Section
 Sec. 19 Twp. 21 S. R. 3 E W

Is Section: Regular or Irregular
 If Section is Irregular, locate well from nearest corner boundary.
 Section corner used: NE NW SE SW

PLAT

Show location of the well. Show footage to the nearest lease or unit boundary line. Show the predicted locations of lease roads, tank batteries, pipelines and electrical lines, as required by the Kansas Surface Owner Notice Act (House Bill 2032).
 You may attach a separate plat if desired.



In plotting the proposed location of the well, you must show:

1. The manner in which you are using the depicted plat by identifying section lines, i.e. 1 section, 1 section with 8 surrounding sections, 4 sections, etc.
2. The distance of the proposed drilling location from the south / north and east / west outside section lines.
3. The distance to the nearest lease or unit boundary line (in footage).
4. If proposed location is located within a prorated or spaced field a certificate of acreage attribution plat must be attached: (CO-7 for oil wells, CG-8 for gas wells).
5. The predicted locations of lease roads, tank batteries, pipelines, and electrical lines.

Intent to Drill (continued)


 KANSAS CORPORATION COMMISSION 1045791
 OIL & GAS CONSERVATION DIVISION
 Form GDP-1
 May 2010
 Form must be Typed
APPLICATION FOR SURFACE PIT


 KANSAS CORPORATION COMMISSION 1045791
 OIL & GAS CONSERVATION DIVISION
 Form KSONA-1
 July 2010
 Form Must Be Typed
 Form must be Signed
 All blanks must be Filled
**CERTIFICATION OF COMPLIANCE WITH THE
 KANSAS SURFACE OWNER NOTIFICATION ACT**

Submit in Duplicate

*This form must be submitted with all Forms C-1 (Notice of Intent to Drill); CB-1 (Cathodic Protection Borehole Intent);
 T-1 (Request for Change of Operator Transfer of Injection or Surface Pit Permit); and CP-1 (Well Plugging Application).
 Any such form submitted without an accompanying Form KSONA-1 will be returned.*

Select the corresponding form being filed: C-1 (Intent) CB-1 (Cathodic Protection Borehole Intent) T-1 (Transfer) CP-1 (Plugging Application)

Operator Name: American Energies Corporation		License Number: 5399
Operator Address: 155 N MARKET STE 710		WICHITA KS 67202
Contact Person: Karen Houseberg		Phone Number: 316-263-5785
Lease Name & Well No.: Slocombe-Rood 1-19		Pit Location (QQQQ): NE - SE - NW - SE Sec. 19 Twp. 21 R. 3 <input checked="" type="checkbox"/> East <input type="checkbox"/> West 1,873 Feet from <input type="checkbox"/> North / <input checked="" type="checkbox"/> South Line of Section 1,444 Feet from <input checked="" type="checkbox"/> East / <input type="checkbox"/> West Line of Section Marion County
Type of Pit: <input type="checkbox"/> Emergency Pit <input type="checkbox"/> Burn Pit <input type="checkbox"/> Settling Pit <input checked="" type="checkbox"/> Drilling Pit <input type="checkbox"/> Workover Pit <input type="checkbox"/> Haul-Off Pit <small>(If W/P Supply API No. or Year Drilled)</small>	Pit is: <input checked="" type="checkbox"/> Proposed <input type="checkbox"/> Existing If Existing, date constructed: _____ Pit capacity: 800 (bbls)	Chloride concentration: _____ mg/l <small>(For Emergency Pits and Settling Pits only)</small>
Is the pit located in a Sensitive Ground Water Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Artificial Liner? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is the bottom below ground level? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		How is the pit lined if a plastic liner is not used? natural clay in soil
Pit dimensions (all but working pits): 50 Length (feet) 75 Width (feet) <input type="checkbox"/> N/A: Steel Pits Depth from ground level to deepest point: 3 (feet) <input type="checkbox"/> No Pit		
If the pit is lined give a brief description of the liner material, thickness and installation procedure.		Describe procedures for periodic maintenance and determining liner integrity, including any special monitoring.
Distance to nearest water well within one-mile of pit: 4810 feet Depth of water well 46 feet		Depth to shallowest fresh water 15 feet. Source of information: <input type="checkbox"/> measured <input type="checkbox"/> well owner <input type="checkbox"/> electric log <input checked="" type="checkbox"/> KQWR
Emergency, Settling and Burn Pits ONLY: Producing Formation: _____ Number of producing wells on lease: _____ Barrels of fluid produced daily: _____ Does the slope from the tank battery allow all spilled fluids to flow into the pit? <input type="checkbox"/> Yes <input type="checkbox"/> No		Drilling, Workover and Haul-Off Pits ONLY: Type of material utilized in drilling/workover: drilling mud Number of working pits to be utilized: 3 Abandonment procedure: Let dry, restore location to original condition Drill pits must be closed within 385 days of spud date.
Submitted Electronically		

OPERATOR: License # 5399
 Name: American Energies Corporation
 Address 1: 155 N MARKET STE 710
 Address 2: _____
 City: WICHITA State: KS Zip: 67202 + 1821
 Contact Person: Karen Houseberg
 Phone: (316) 263-5785 Fax: (316) 263-1851
 Email Address: karen@americanenergies.com

Well Location:
 NE SE NW SE Sec. 19 Twp. 21 S. R. 3 East West
 County: Marion
 Lease Name: Slocombe-Rood Well #: 1-19
 If filing a Form T-1 for multiple wells on a lease, enter the legal description of the lease below:

Surface Owner Information:
 Name: Lavonne Hannaford Trust c/o Roger Hannaford
 Address 1: 222 E Main
 Address 2: _____
 City: Marion State: KS Zip: 66861 + 0253

When filing a Form T-1 involving multiple surface owners, attach an additional sheet listing all of the information to the left for each surface owner. Surface owner information can be found in the records of the register of deeds for the county, and in the real estate property tax records of the county treasurer.

If this form is being submitted with a Form C-1 (Intent) or CB-1 (Cathodic Protection Borehole Intent), you must supply the surface owners and the KCC with a plat showing the predicted locations of lease roads, tank batteries, pipelines, and electrical lines. The locations shown on the plat are preliminary non-binding estimates. The locations may be entered on the Form C-1 plat, Form CB-1 plat, or a separate plat may be submitted.

Select one of the following:

- I certify that, pursuant to the Kansas Surface Owner Notice Act (House Bill 2032), I have provided the following to the surface owner(s) of the land upon which the subject well is or will be located: 1) a copy of the Form C-1, Form CB-1, Form T-1, or Form CP-1 that I am filing in connection with this form; 2) if the form being filed is a Form C-1 or Form CB-1, the plat(s) required by this form; and 3) my operator name, address, phone number, fax, and email address.
- I have not provided this information to the surface owner(s). I acknowledge that, because I have not provided this information, the KCC will be required to send this information to the surface owner(s). To mitigate the additional cost of the KCC performing this task, I acknowledge that I am being charged a \$30.00 handling fee, payable to the KCC, which is enclosed with this form.

If choosing the second option, submit payment of the \$30.00 handling fee with this form. If the fee is not received with this form, the KSONA-1 form and the associated Form C-1, Form CB-1, Form T-1, or Form CP-1 will be returned.

Submitted Electronically

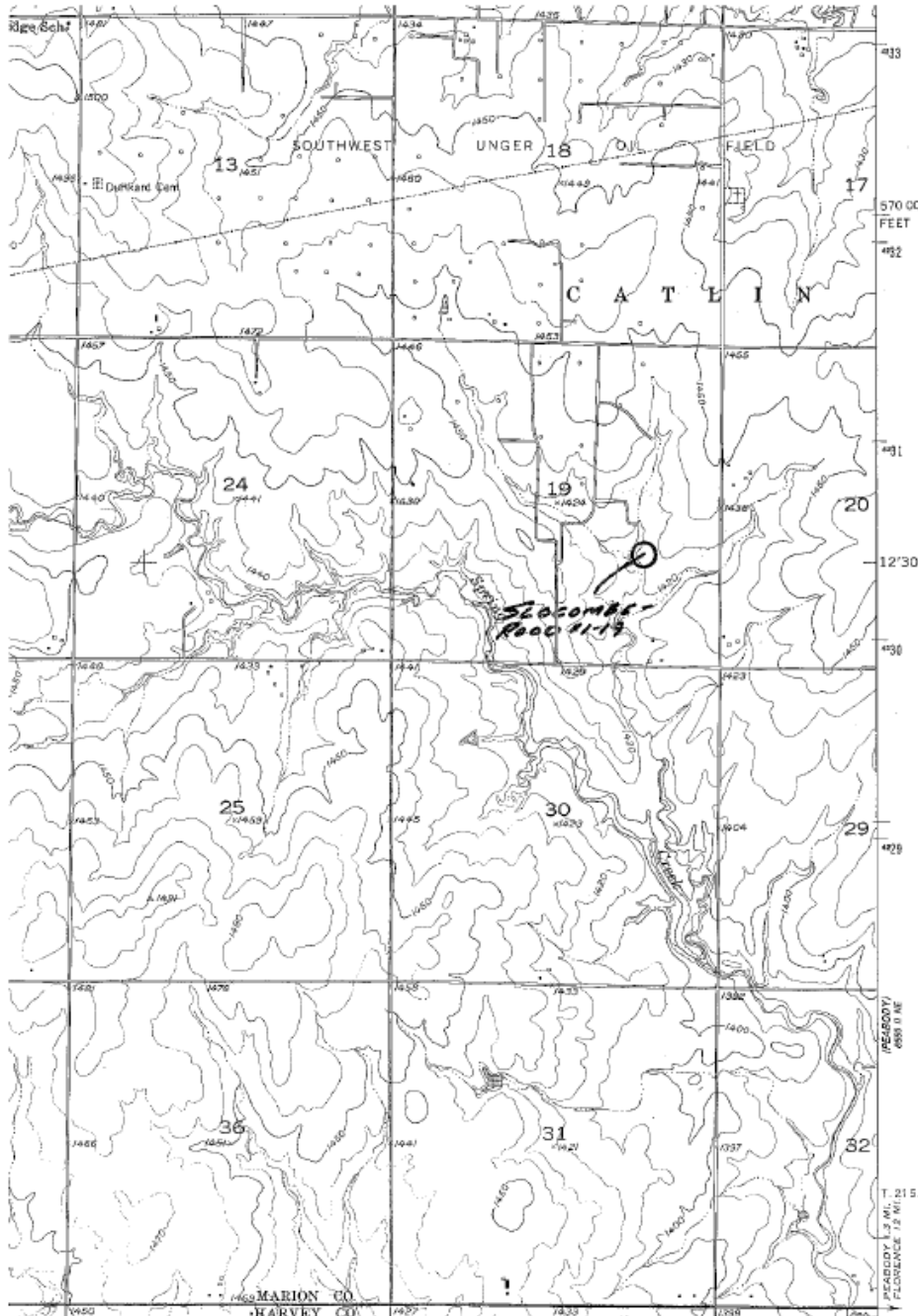
KCC OFFICE USE ONLY

Liner Steel Pit RFAC RFAS
 Date Received: 11/09/2010 Permit Number: 15-115-21419-01-00 Permit Date: 12/28/2010 Lease Inspection: Yes No

Mall to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202

Mall to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202

Contact Information



American Energies

155 N. Market, Ste 710, Wichita KS 67202

prepared 1-5-11
316-263-5785; 316-263-1851fax

Alan DeGood alan@americanenergies.com

Home 316-794-8391; H Fax 2597; Cell 620-242-6301

Mindy Wooten mindy@americanenergies.com

11-CONS-085-CHOR Horizontal Docket #

Call IMA as soon as rental tool is in hole & when it comes out Doug Davis will notify us

Well	Slocombe-Road 1-19	
County	Marion	SE/4 Sec 19 Slocombe lease
S-T-R	19-21-3E	Fee Owner: The Llavonne Hannaford Trust c/o Roger W Hannaford 222 E Main Marion KS 66861
Location	C NW SE	620-382-3465 Home; 620-382-2130 Office
Spot	1878'fsl, 1230'fel (revised)	Tenant: Charles W Seifert Use our lease road will rebuild wtrway
	END of directional hole: 1650'fnl & 1750'fwl (was 1160'fnl, 1913'fwl)	Double S Farms & Cattle LLC Marion KS 66861
Survey	Central Survey 620-792-5754ph 620-786-	
Elev.	1421' elevation	
Intent & Plat	15-115-21419-01	620-382-2027home: 620-382-6796cell
Spud	spud est 1/7/2011	E2 NW Sec19 Rood Lease
S.Casing		Marlene Eitzen 307 S Floral Dv Hillsboro KS 67003 620-947-3890
Geologist	Doug Davis W-3162635785; cell 316-641-4469; home 316-722-7196	
	Open hole now 2100' (was 3200-4700' 6-1/8")	P. Coakley checked location 11-9-2010
Bottom hole	1650'fnl, 1750'fwl - KCC notified of chg	faxed Galen Survey & called about water well
Plug Down		Left Msg to Galen - pipe racks
Electronic Monitor	Pason Systems Lafe Coldwater 580-551-9470, Chase Coldwater 405-334-7525; Larry.january@pason.com	
	KGS Lynn Watney 785-864-2184, 5317fax, 785-840-4852cell lwatney@kgs.ku.edu	KGS Saibal Bhattacharya 785-864-2058, 5317fax; saibal@kgs.ku.edu
Driller	C & G Drilling Co., Euerka 620-583-5318;	Tim Gulick 620-583-4306 cell RIG 2
Rig # & phone	C&G Rig 2 Will rent drill string	620-583-3740cell 620-583-7796fax
Superintendent - Contract	Tress Stan Dabler 405-842-7888office 405-348-4388home 405-640-3580cell	Tress-Al Doty 405-348-5126-home; 405-833-9518cell
	Tress Jimmy Wilson 405 227 6364 cell wilson9758@sbcglobal.net	Tress Clint Kirk 580-821-4412cd; 580-225-7599H; clint917@msn.com Tress Brad Crouch 405 642 8913cd; 405-722-5803H, Of: 405-842-7888; 7885fx brad.crouch@tresmanagement.com
Directional	Pan American Drilling Okla City 405-677-6800; Mark Greene 405-620-7128	
Est RTD:	TVD Horizontal in Hunton	
AEC Field Supr	Galen Jones 620-242-6098 Wtr well, pits, pipe racks - will do	or Thad Starr 620-793-2146
KsOne Call	C&G will call	
S.Casing fr	9-5/8" 36# 250' ST&C New Rg3 Textube LS	National Bob Bass 262-4557
P.Casing fr	7" 23# 3130 National LT&C New Rg3 J55 API	National Bob Bass 262-4557
	Open hole 2100' 6-1/8" - corrected	
Cement	Consolidated Larry Storm 620-323-3381	
Mud	Mud-Co, Chuck Latham-316-264-2814; 5024fax	
Logger	Log-Tech	
	Send in Application 11/18/10	KCC 337-6200
	Wichita Eagle Fax to "Ro" with contact info 269-6767 will be published 11/23	
	Marion Record, redone	

To get to the Road on roads that are not bad. Nighthawk(blacktop) /90th. East ½ mile.

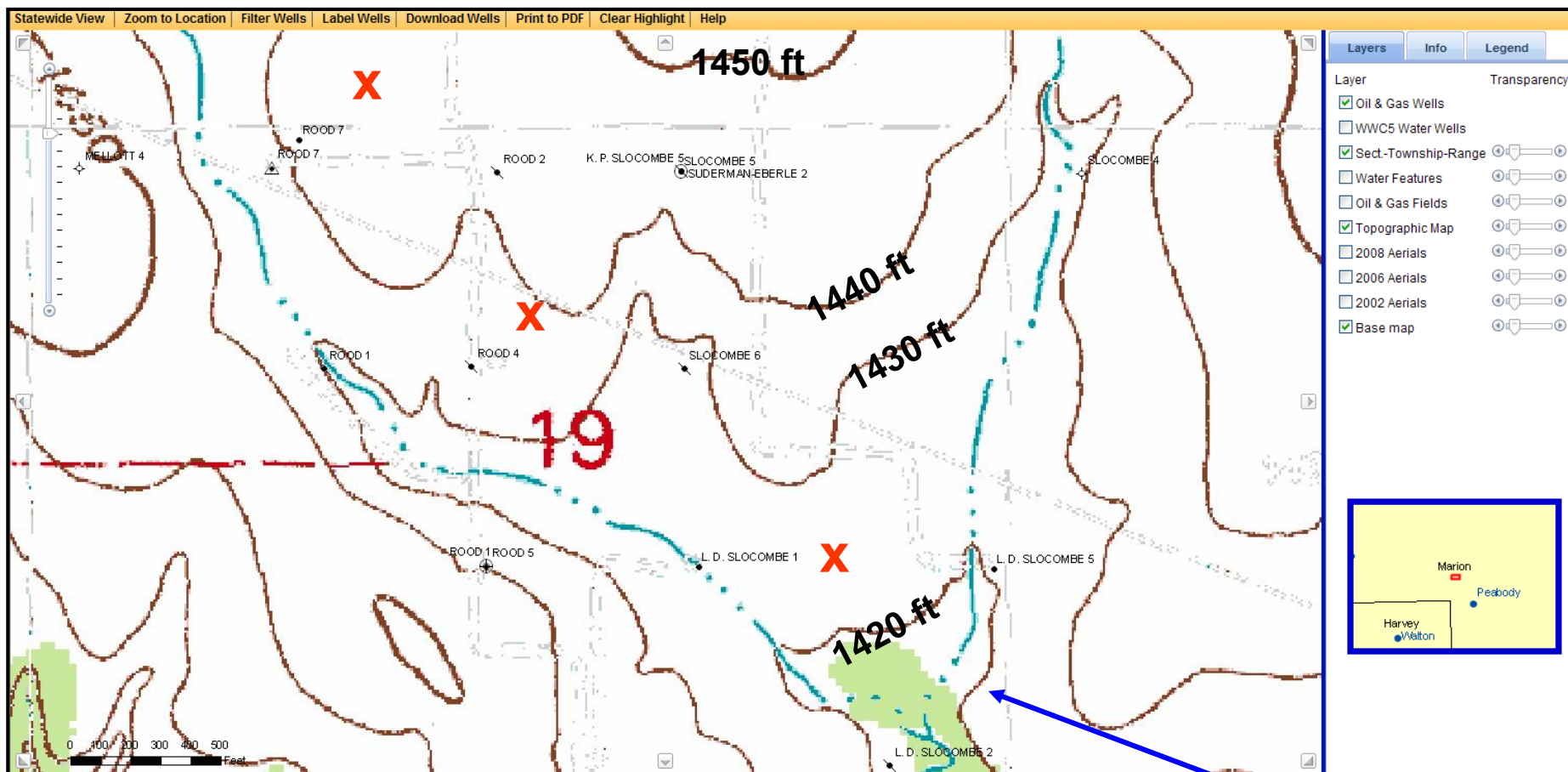
Go west on 90th 2 miles to Limestone. Go North 1 mile to 100th rd and then East ½ mile.

Lease rd on S. side of road.

Slocombe-Nighthawk and 90th. Go West 1 ½ miles and then North into.

Drilling Intent.xls

Surface Topography



Surface Location: (CNWSE) 1878 fsl & 1750 fwl, Section 19-T 21S- R3E

Surface Location of Drill Rig

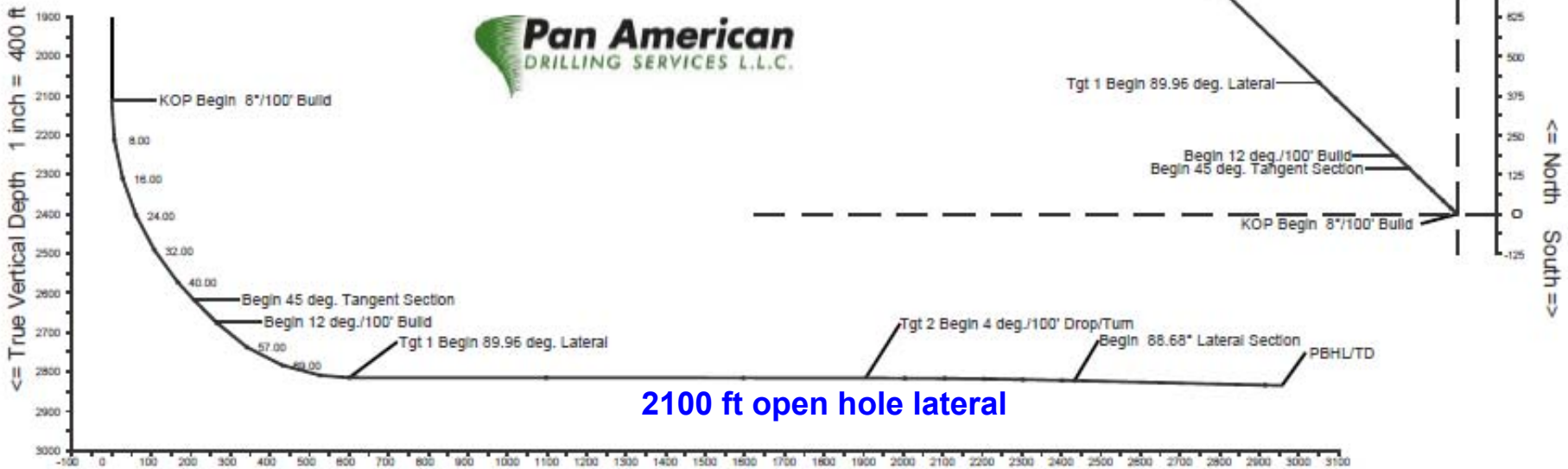
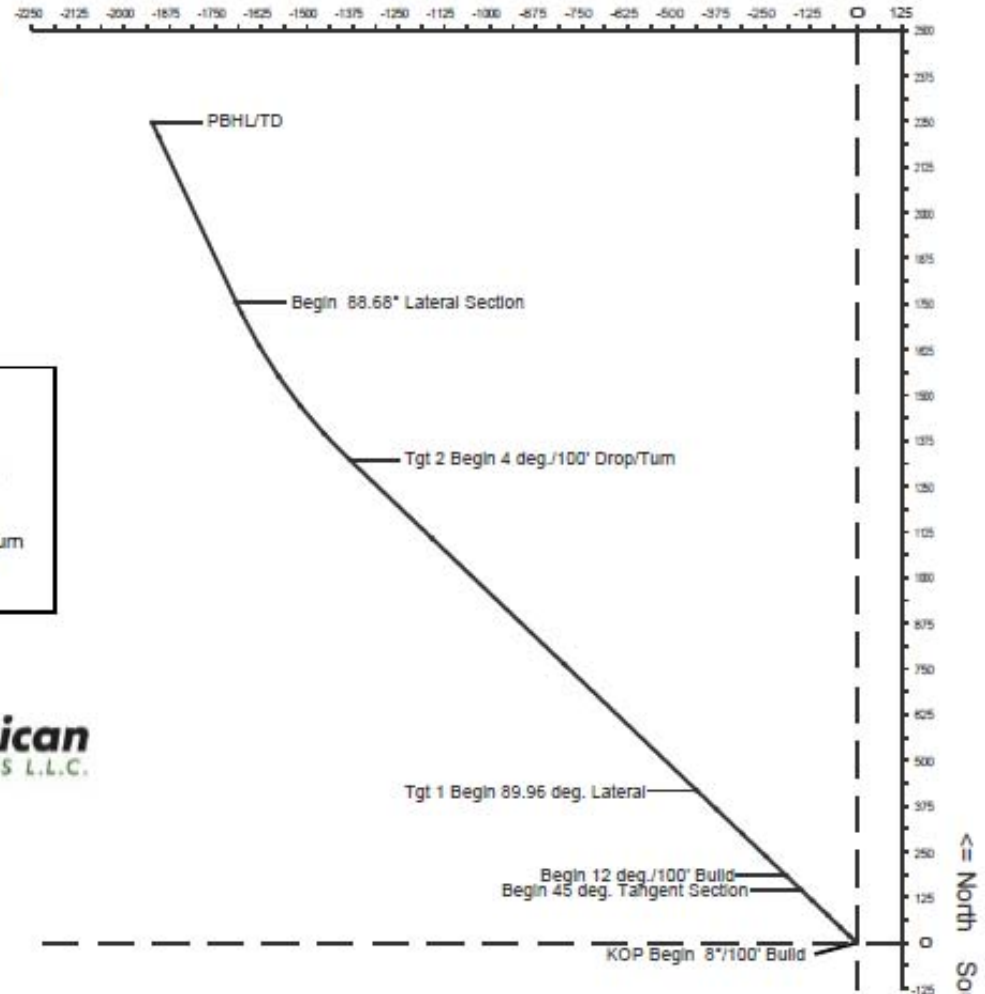
Horizontal Well Trajectory

American Energy Corporation

Unger Field

1 inch = 500 ft <= West East =>

WELL PROFILE DATA rev1								
MD	Inc.	Azi.	TVD	N-S	E-W	DLS	Comment	09-21-2010
2112	0.00	313.71	2112	0	0	0.00	KOP Begin 8°/100' Build	
2675	45.00	313.71	2619	145	-152	8.00	Begin 45 deg. Tangent Section	
2755	45.00	313.71	2675	184	-193	0.00	Begin 12 deg./100' Build	
3129	88.98	313.71	2815	417	-436	12.00	Tgt 1 Begin 89.96 deg. Lateral	
4440	88.98	313.71	2816	1323	-1364	0.00	Tgt 2 Begin 4 deg./100' Drop/Turn	
4973	88.88	334.98	2822	1754	-1883	4.00	Begin 88.88° Lateral Section	
5518	88.88	334.98	2835	2247	-1923	0.00	PBHL/TD	



2100 ft open hole lateral

Vertical Section on 319.44 deg azimuth with reference 0.00 N, 0.00 E



Horizontal Well Trajectory

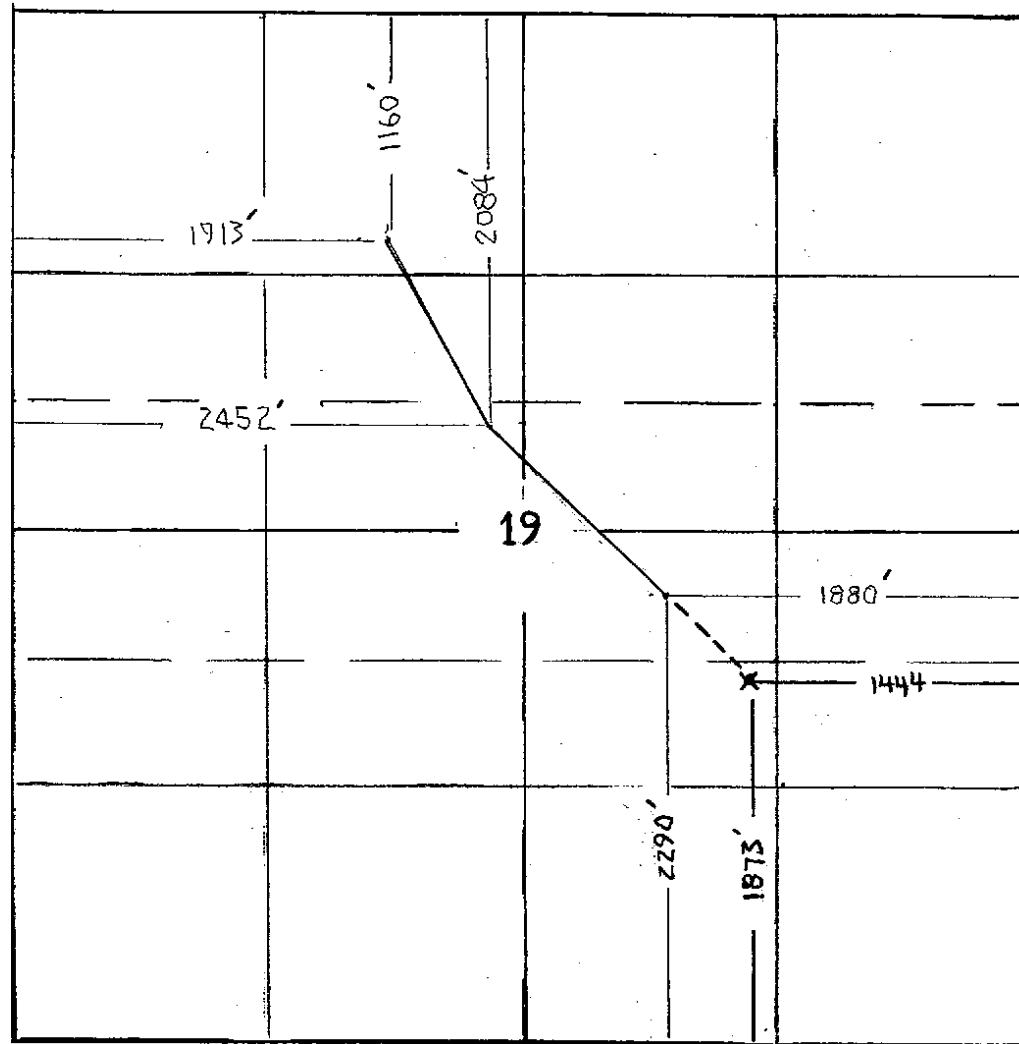
Pan American Drilling Services, LLC

Company: American Energy Corporation
Well: Unger Field
Location:

Date: 19-Sep-2010
Rev0
Page 1
Job #: 5365

MD (feet)	Inclination (degrees)	Azimuth (degrees)	TVD (feet)	N-S (feet)	E-W (feet)	DLS (deg/100')	VS @ 320.90° Az (feet)	Comments
Surface Location								
2112.62	0.00	313.70	2112.62	0.00	0.00	0.00	0.00	KOP Begin 8°/100' Build
2212.62	8.00	313.70	2212.30	4.82	-5.04	8.00	6.92	
2312.62	16.00	313.70	2310.03	19.17	-20.06	8.00	27.53	
2412.62	24.00	313.70	2403.92	42.78	-44.77	8.00	61.43	
2512.62	32.00	313.70	2492.15	75.19	-78.68	8.00	107.97	
2612.62	40.00	313.70	2572.98	115.76	-121.14	8.00	166.24	
2675.12	45.00	313.70	2619.05	144.93	-151.66	8.00	208.12	Begin 45° Tangent Section
2755.12	45.00	313.70	2675.62	184.01	-192.55	0.00	264.24	Begin 12°/100' Build
2855.12	57.00	313.70	2738.43	237.60	-248.64	12.00	341.20	
2955.12	69.00	313.70	2783.75	299.05	-312.93	12.00	429.44	
3055.12	81.00	313.70	2809.58	365.66	-382.64	12.00	525.09	
3129.76	89.96	313.70	2815.46	417.02	-436.37	12.00	598.84	Begin 89.96° Lateral Section
3629.76	89.96	313.70	2815.84	762.48	-797.83	0.00	1094.90	
3837.48	89.96	313.70	2816.00	906.00	-948.00	0.00	1300.98	Begin 4°/100' Drop/Turn
3937.48	89.71	317.70	2816.29	977.55	-1017.83	4.00	1400.55	
4037.48	89.47	321.69	2817.01	1053.79	-1082.50	4.00	1500.50	
4137.48	89.22	325.68	2818.15	1134.35	-1141.71	4.00	1600.36	
4237.48	88.99	329.67	2819.71	1218.83	-1195.16	4.00	1699.63	
4337.48	88.75	333.67	2821.69	1306.82	-1242.59	4.00	1797.82	
4370.77	88.68	335.00	2822.43	1336.82	-1257.01	4.00	1830.20	Begin 88.68° Lateral Section
4870.77	88.68	335.00	2833.98	1789.84	-1468.27	0.00	2315.01	
4915.09	88.68	335.00	2835.00	1830.00	-1487.00	0.00	2357.98	PBHL/TD

Map view of lateral, Section 19



AMERICAN ENERGIES CORPORATION

Slocomb #7H

Marion County, KS

Operator: American Energies Corporation
155 North market Street, Ste 710
Wichita, KS 67202

Well Name: Slocomb #7H

Surface Location	Bottom Hole Location
1873' FNL, 1444' FEL	1160' FNL, 1913' FWL
Section 19 -21S - 3E	Section 19-21S-3E
Marion County, KS	Marion County, KS

Projected TD: 2,815' TVD
4,915' MD

Elevation: Surface Elevation: '
Kelly Bushing Elevation: '

Primary Objective: Hunton

Casing Program

Depth	Hole Size	Casing	Burst psi	Collapse psi
0 – 250'	12 1/4"	9 5/8" 36# J-55 ST&C	1730 psi	770 psi
0 – 3,130'	8 3/4"	7" 23# J-55 LT&C	4980 psi	4320 psi
3,200' – 4,700'	6 1/8"	Open Hole		

PRE – SPUD PREPARATION:

- Construct location, reserve pit, working pits, and road to accommodate rig plus up to 3 additional living quarter trailers.
- Hold pre-spud meeting with operating, rig, and key vendor personnel. Review drilling plan, scheduling, and safety policies. American Energies expects all operations to be conducted with safety as a priority. Operations are to be suspended if necessary to provide safe working conditions.

INTERVAL: Surface to 250'

- Drill 12 1/4" hole to 250'. Bottom hole assembly; mill tooth bit, bit sub, and 6 1/4" collars. Spud with 35+ viscosity, pump hi-vis sweeps with cotton see hulls for hole cleaning. Maximize pump flow rate (6 1/4 x 14, 7.06 gal per rev,). Short trip to bit, condition hole for casing.
- Run 9 5/8" 36# J-55 casing with 4 centralizers, utilizing landing joint. Strap weld bottom two connections. Wash casing to bottom and circulate minimum one casing volume prior to cementing. Cement with 140 sx Regular, 2% gel, 3% CaCl, .5% flocele. Drop wiper plug and displace to 220'+/-, shut in and WOC.
- WOC 4-6 hours. Back out landing joint, screw in adapter and nipple up annular BOP. Test annular and casing to 500 psi.

INTERVAL 250' – 2,100' – Straight Hole

- Take surveys at 500' intervals. Desired pump rates in the 400-500 gpm range. At kickoff, circulate hole clean and trip out for directional tools. If hole conditions dictate, be prepared to return to bottom to condition prior to running directional tools.

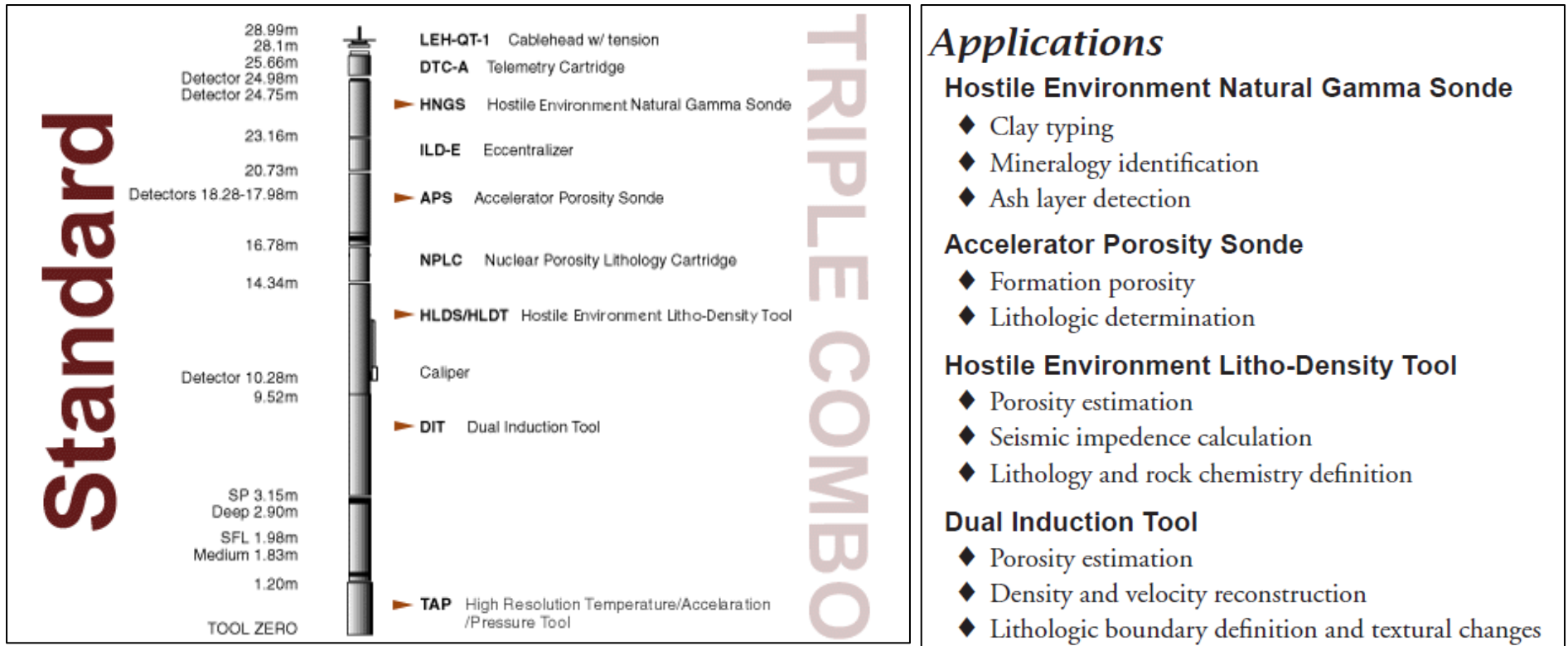
INTERVAL: 2,100' – 3,130' MD – Build Section

- Pick up 8 ¾" insert bit, bent housing motor (1.8 – 2.12 deg bend), float sub, MWD with gamma ray, monels, 900' drill pipe, 12 drill collars, jars, 3 drill collars, and remainder of drill pipe. Trip in hole taking directional surveys at 500' intervals. Determine actual bottom hole location and make well plan adjustments as needed. Initial build rate will be 8 degrees per 100', increasing to 12 degrees following a 100' tangent at 45 degrees, all at a 313.7 deg. azimuth.
- Maintain 300+ gpm and 45-55 viscosity for hole cleaning. Add LCM only as needed. Should it be necessary to carry LCM through the curve, determine in advance with directional personnel the preferred blend of LCM best suited for optimum tool performance. Difficulty sliding is often related to hole cleaning. Monitor solids at the shaker in an attempt to determine if cuttings removal is efficient for current P-rates. Hi-vis and/or lo-vis sweeps and short trips should help in hole cleaning. Additions of soltex, powdered graphite, and various 'lubricants in a drum' are often required to improve sliding performance.
- Casing point target is at 3130' MD, 2815' TVD at angle of 89.96 degrees. Condition hole for casing. In the event of excessively tight hole conditions trip out, lay down directional tools, pick up an under gauge reamer at 30' and ream the curve. Lay down 4 ½" drill pipe and collars. Run 7" 23# J-55 casing with guide shoe and float collar on top of first joint. Calculate cement for 1000' fill, or to kickoff point, plus 40% excess. Circulate minimum one casing volume prior to cementing. Cement with 10 bbl fresh water spacer followed by 185 sx Thick Set, 8 lb/sx gypseal, 8 lb/sx salt, 4% gel, 2% CaCl mixed at 14.8 ppg, 1.68 yield.. Displace cement with fresh water.
- Pick up BOP, set slips with 7" in full tension. Install 5 ½" pump liners. Nipple up BOP. Test BOP and casing to 500 psi with rig pumps.

INTERVAL: 3,130' – 4,915' MD – Lateral Section

- Pick up 6 1/8" PDC, 4 3/4" - 1.8+/- slow-speed motor, float sub, MWD with focused gamma ray, 2- flex monels, 1500' 3 1/2" 13.3# S-135 drill pipe, 34 joints 3 1/2" hevi-weight DP, jars, 6 joints HWDP, and remainder of 3 1/2". Drill cement and shoe
- Drill lateral at 200+ gpm. Monitor solids removal versus P-rate and torque and drag changes for indicators of improper hole cleaning. Directional plan is Trip as necessary for pipe swap to insure HWDP stays in the straight hole. Bit records from wells in Woods County indicate relatively short bit runs in the lateral (50 hours in 8 3/4" hole size) due to chert content. Expect 30-40 hour runs in 6 1/8" size under similar conditions with IADC 537 or 547 bits. Evaluate dull bit condition for possible PDC run (especially in the front part of the lateral) or diamond enhanced gauge row protection due to increased chert composition.
- At total depth, condition hole for logging. If necessary, trip out, lay down directional tools, and make additional conditioning trip prior to drill pipe conveyed logging operation. (*triple combo logging suite*)
- Following logging operations, trip in hole with bit and drill pipe. Displace hole with clean fluid. Trip out laying down drill pipe. Rig down, release rig.

Triple Combo Log Suite ran after lateral is drilled, pushed through drill pipe



Applications

Hostile Environment Natural Gamma Sonde

- ◆ Clay typing
- ◆ Mineralogy identification
- ◆ Ash layer detection

Accelerator Porosity Sonde

- ◆ Formation porosity
- ◆ Lithologic determination

Hostile Environment Litho-Density Tool

- ◆ Porosity estimation
- ◆ Seismic impedance calculation
- ◆ Lithology and rock chemistry definition

Dual Induction Tool

- ◆ Porosity estimation
- ◆ Density and velocity reconstruction
- ◆ Lithologic boundary definition and textural changes

Azimuthal Gamma Ray ran while drilling to assist geosteering



Focus/azimuthal Gamma (sensor)
-- To avoid shale caprock above
reservoir and shale below reservoir

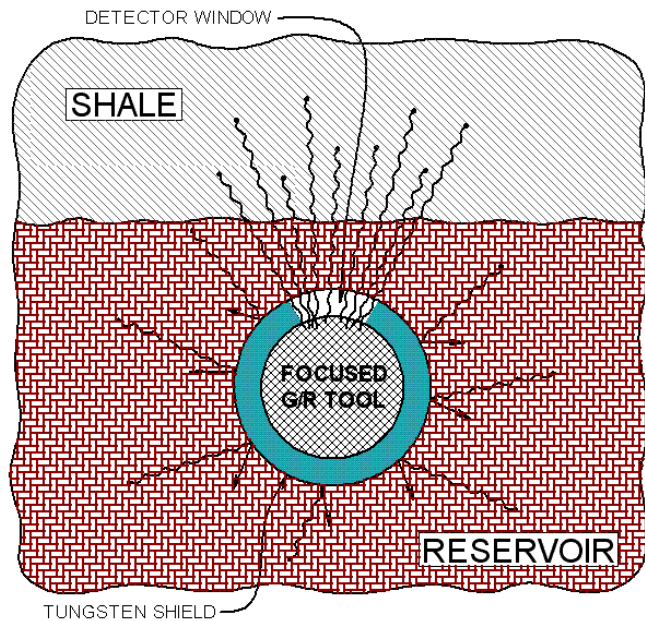
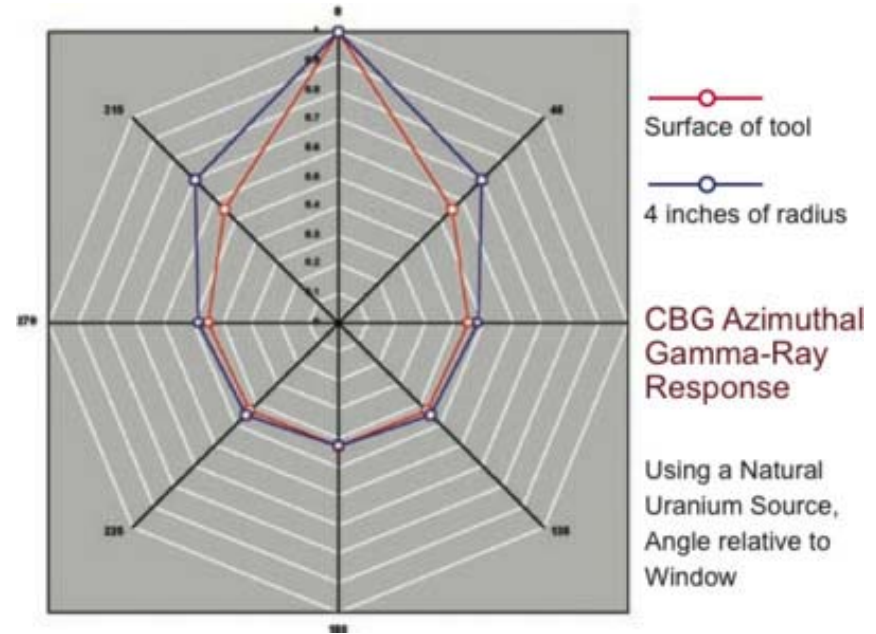


FIG. 1



Drilling is paused while detector window on azimuthal gamma ray tool is rotated and measurements taken every 45 degrees through 360 degree rotation.

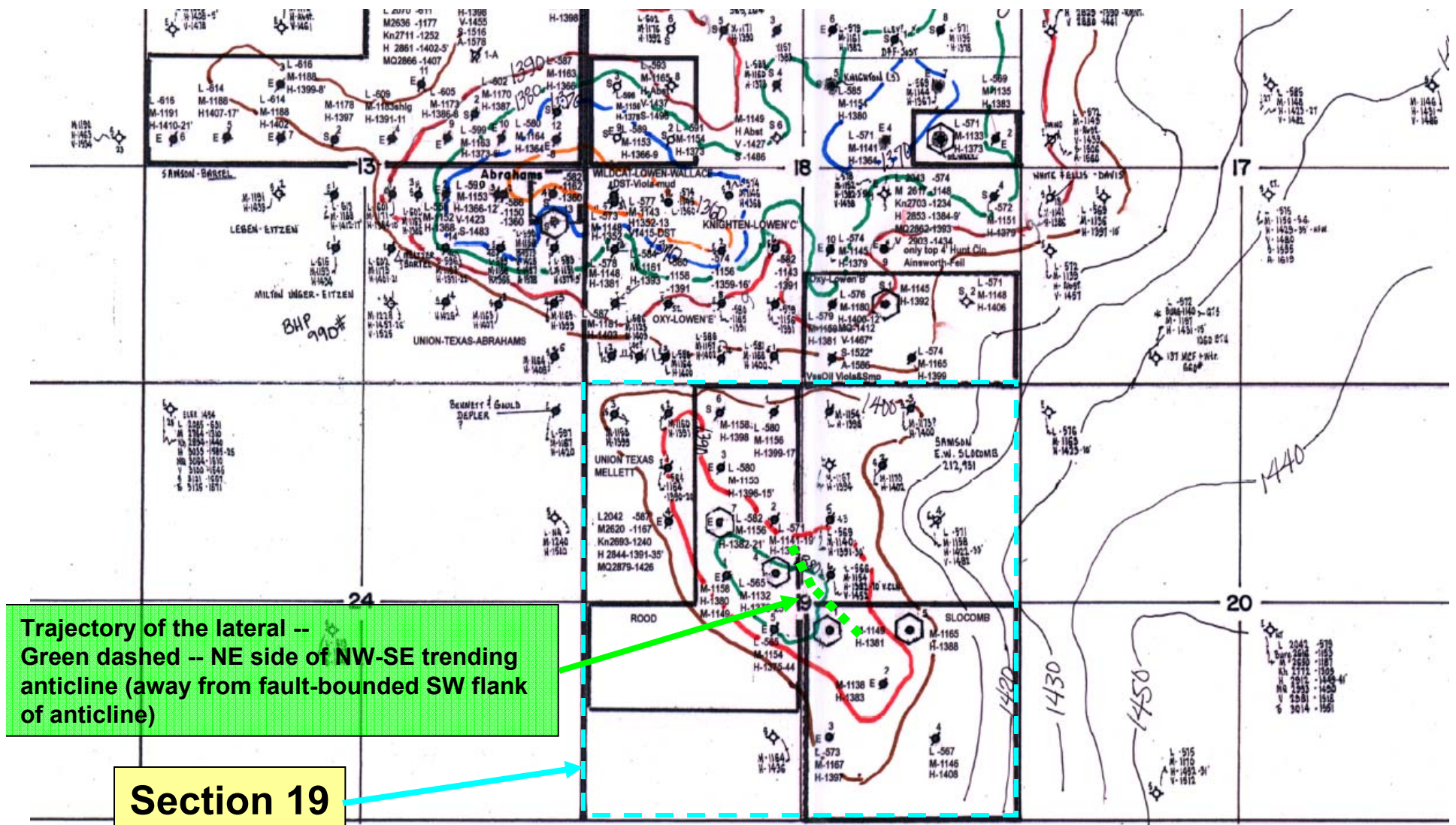
Miscellaneous

- All recommendations (cement, mud, etc) are subject to field adjustments
- All delivery tickets must be priced and signed before AEC will process invoice. Invoices without field signature will be returned to vendor.
- Inventory and report daily fuel usage and deliveries.
- Maintain complete and current rental list.
- Maintain complete drill pipe, drill collar, and casing inventory of all material on location
- Check all casing connections with float equipment, especially the specialty threads, well in advance of running in hole.
- Hold planning meeting with cementer, casing crew, rig pusher, and other critical personnel prior to running the 4 ½" casing.
- Insure safety meetings are held prior to all casing, cementing, and other planned operations. Observe regularly scheduled safety meetings held by the rig personnel. Record all occurrences on daily report. Post emergency phone listing on rig floor, and in pusher and company man trailers.

Geology

Hunton Structure – south Unger Field

Geology by Gerry Honas



Trajectory of the lateral --
Green dashed -- NE side of NW-SE trending
anticline (away from fault-bounded SW flank
of anticline)

Section 19

Location of Lateral

Lateral end:
1650 ft FNL & 1750 ft FWL
Open hole = 2100 ft

Lateral bend:
2084 ft FNL & 2452 ft FWL

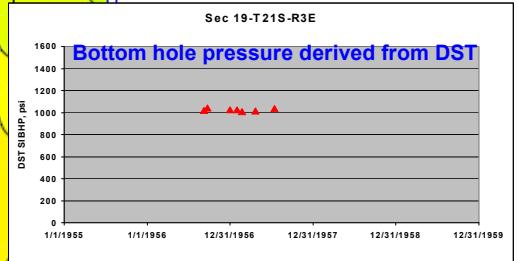
Lateral start: CNWSE
1878 ft FSL & 1750 ft FWL

Section 19
Unger Field
Structure map top Hunton
Group dolomite well
trajectory

cross section index
Contour Interval = 5 ft

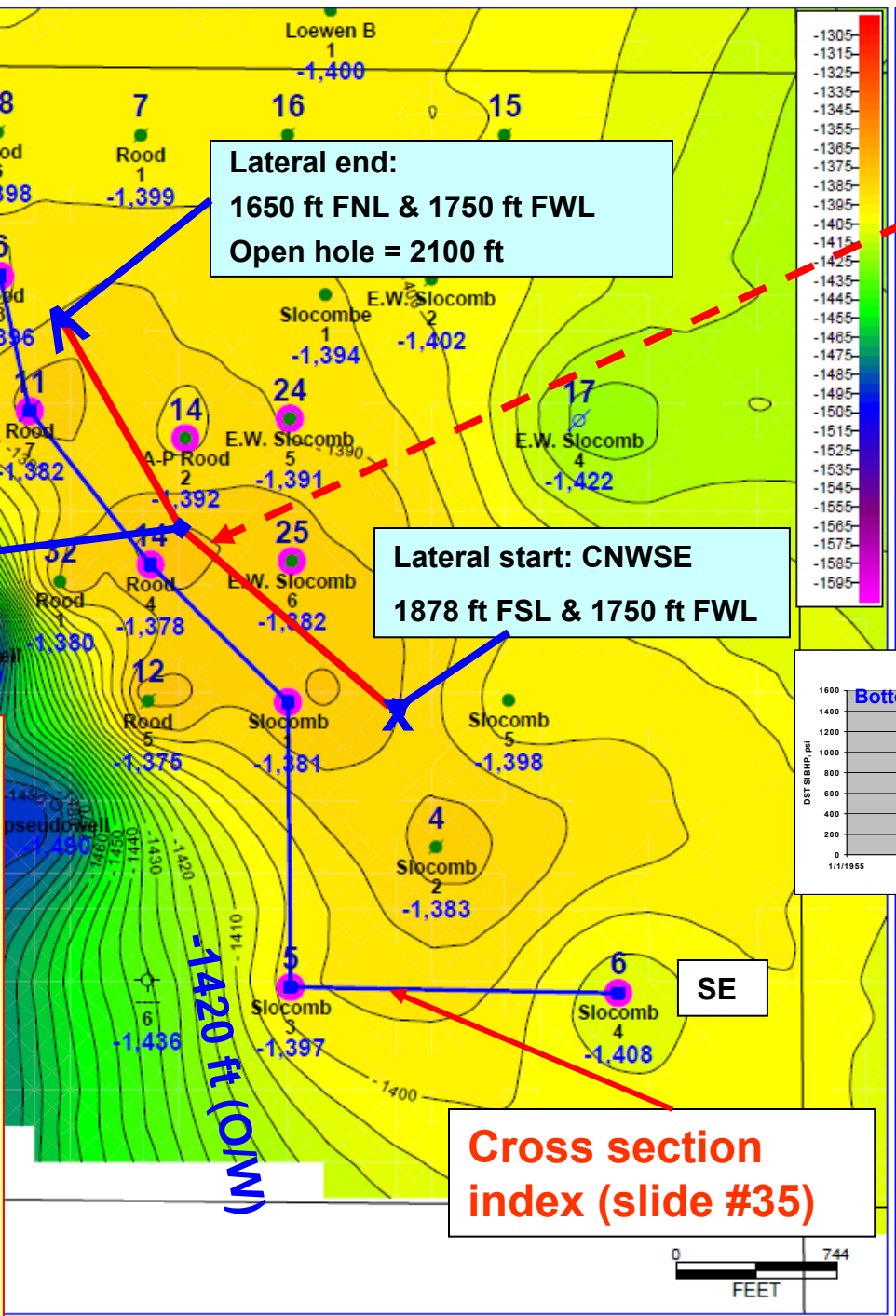
Upper blue number =
thickness of Hunton
reservoir

Original O/W ~-1420 ft



DST data from:
Slocombe 5, 6
Mellot 4
Rood 1, 2, 3, 4, 5, 7

Cross section index (slide #35)



Main Fault

(lateral end)
 1650 ft FNL & 1750 ft FWL
 Top of pay = -1390
 MD = 1445+1390 = 2835 ft

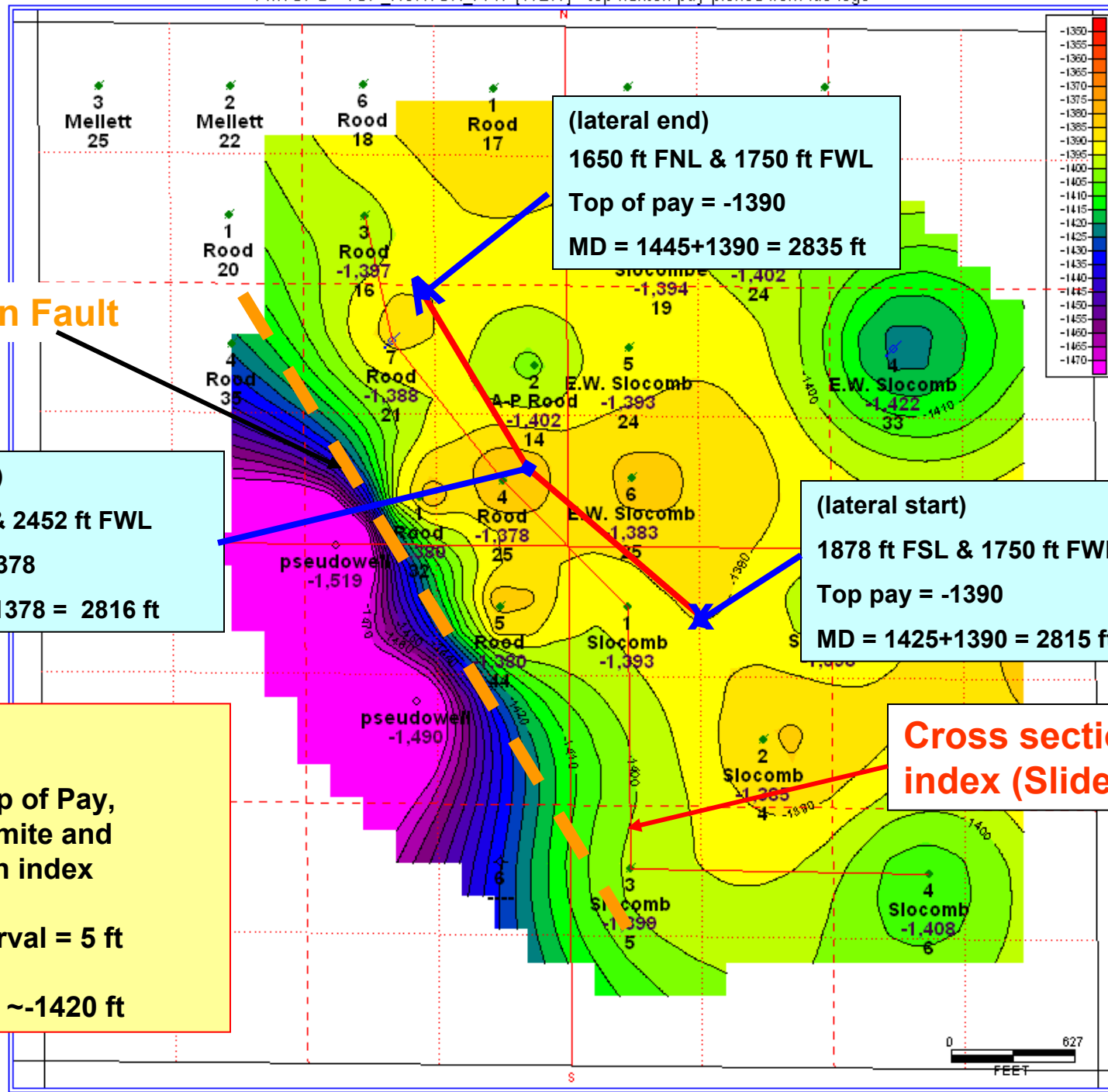
(lateral bend)
 2084 ft FNL & 2452 ft FWL
 Top Pay = -1378
 MD = 1438+1378 = 2816 ft

(lateral start)
 1878 ft FSL & 1750 ft FWL
 Top pay = -1390
 MD = 1425+1390 = 2815 ft

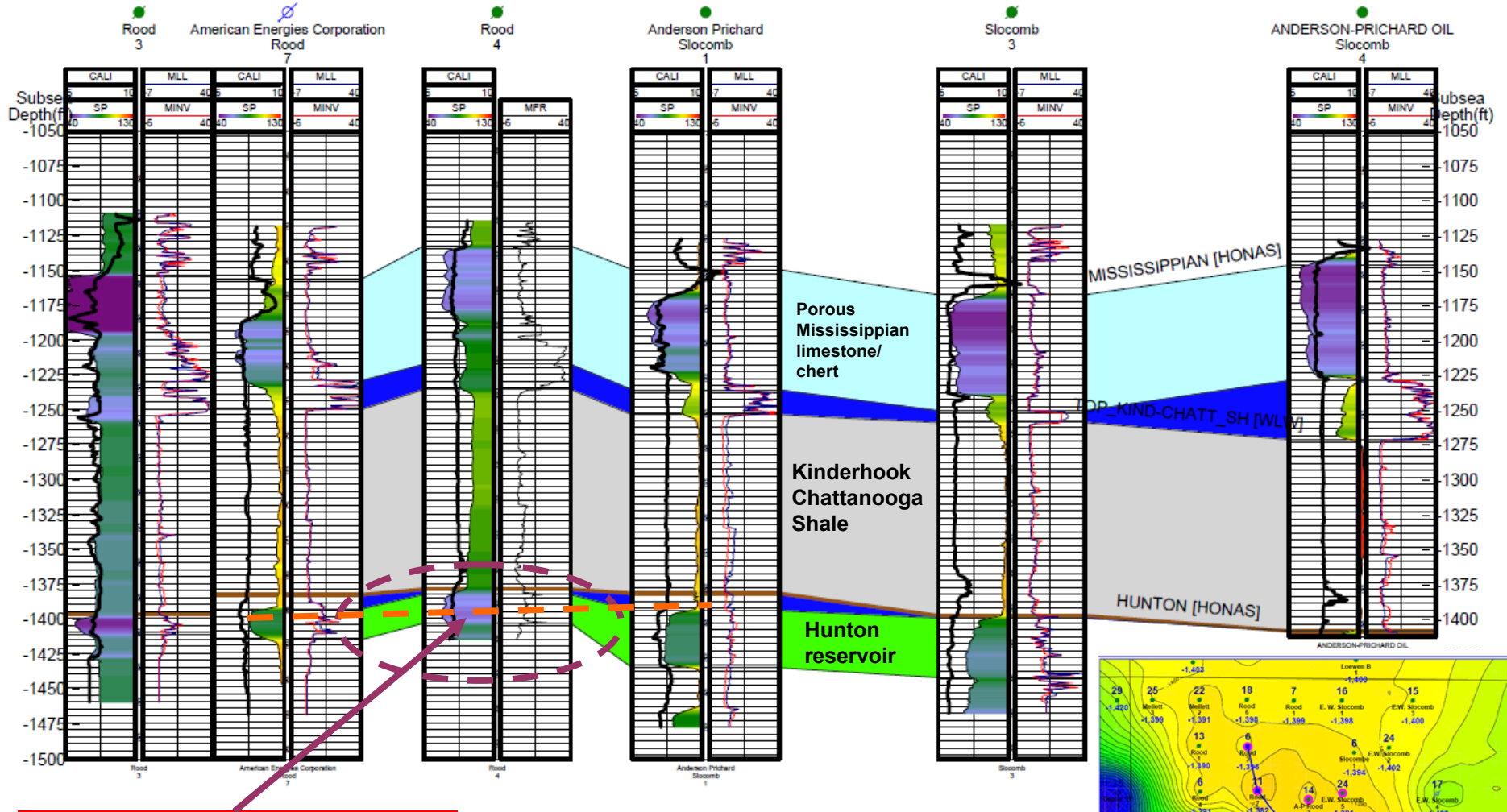
Section 19
 Unger Field
 Structure Top of Pay,
 Hunton dolomite and
 cross section index

Contour Interval = 5 ft
 Original O/W ~-1420 ft

**Cross section
 index (Slide #35)**



NW-SE Structural Cross Section

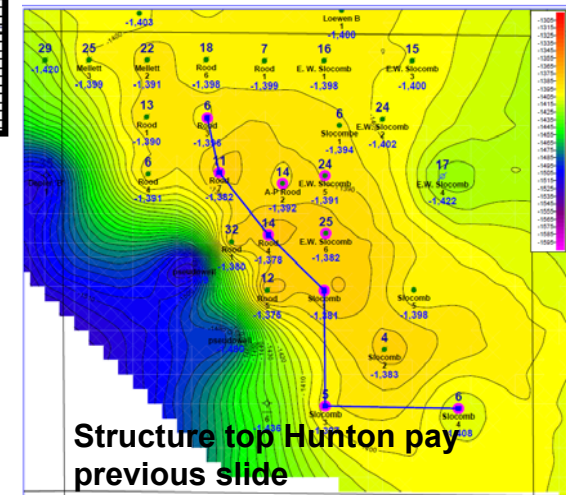


Target zone for lateral paralleling cross section

900 ft

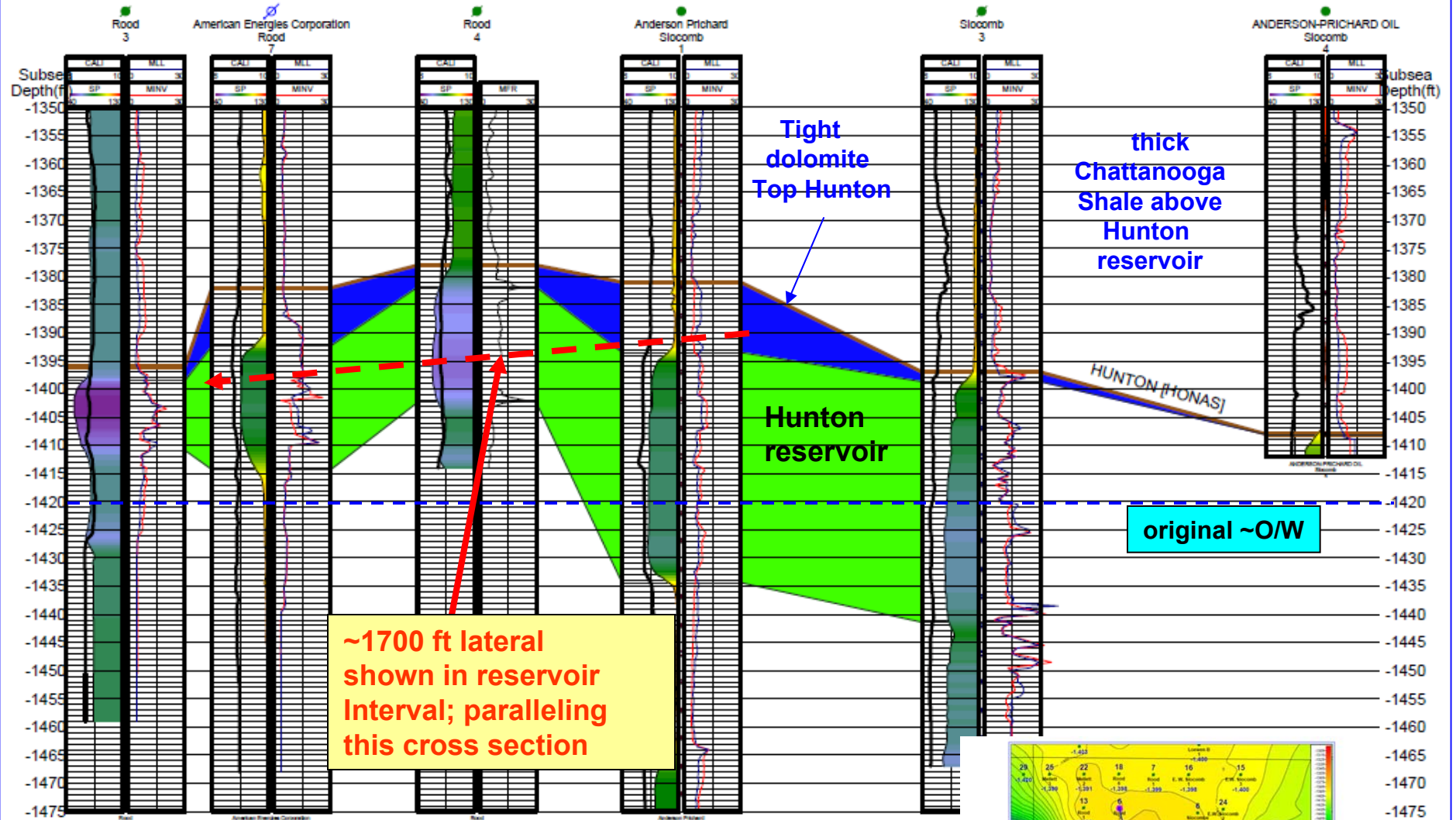
SP-Caliper-Microlog curves shown – SP depicted in color delimiting magnitude

Lateral will follow the upper porous Hunton dolomite (bright green interval) along the crest of the structure. Thin tight dolomite overlies caprock except in vicinity of Rood #4



Structure top Hunton pay previous slide

NW-SE Structural Cross Section



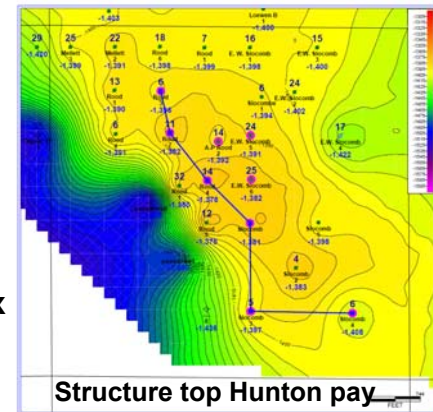
~1700 ft lateral interval; paralleling this cross section

original ~O/W

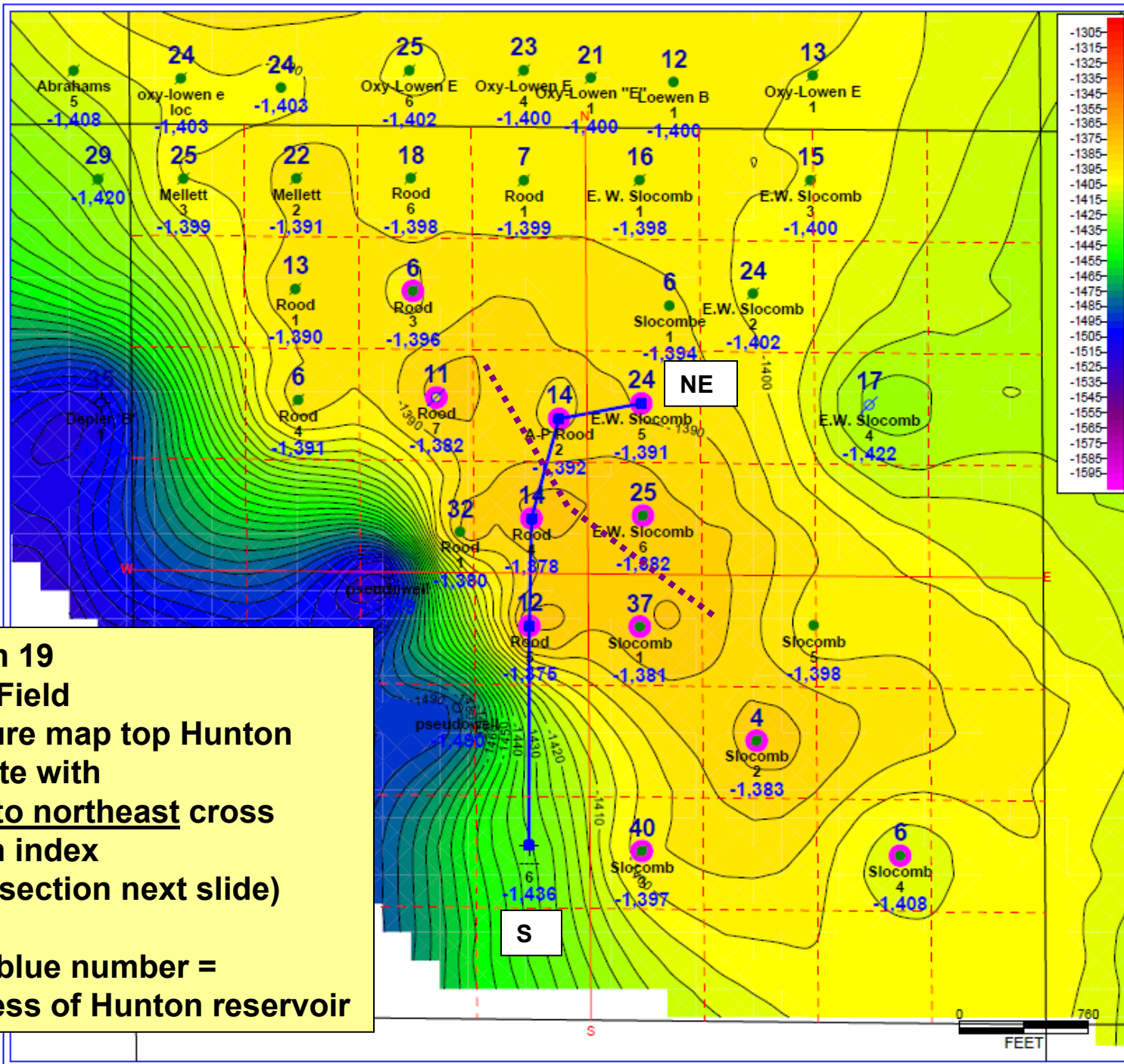
- Hunton reservoir thins to the north.
- Structural highs are thin, suggest paleostructure contribution
- Tight dolomite caprock above pay ranging from 0-10 ft, thins near Rood #4

900 ft Vertical Exaggeration = 5x

SP-Caliper-Microlog curves shown – SP depicted in color delimiting magnitude



Structure top Hunton pay

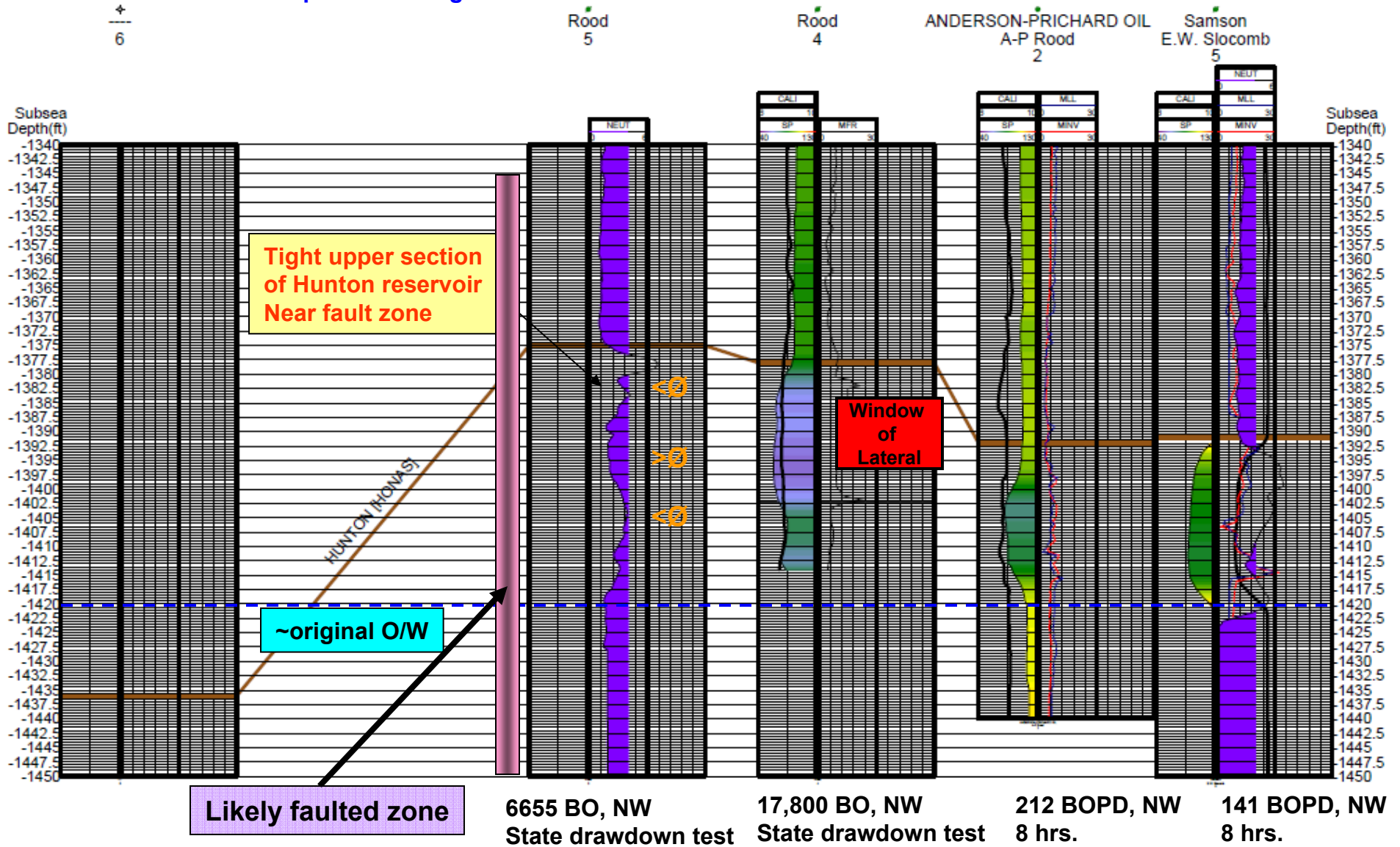


Section 19
Unger Field
Structure map top Hunton
dolomite with
South to northeast cross
section index
(cross section next slide)

Upper blue number =
thickness of Hunton reservoir

South to Northeast Structural Cross Section

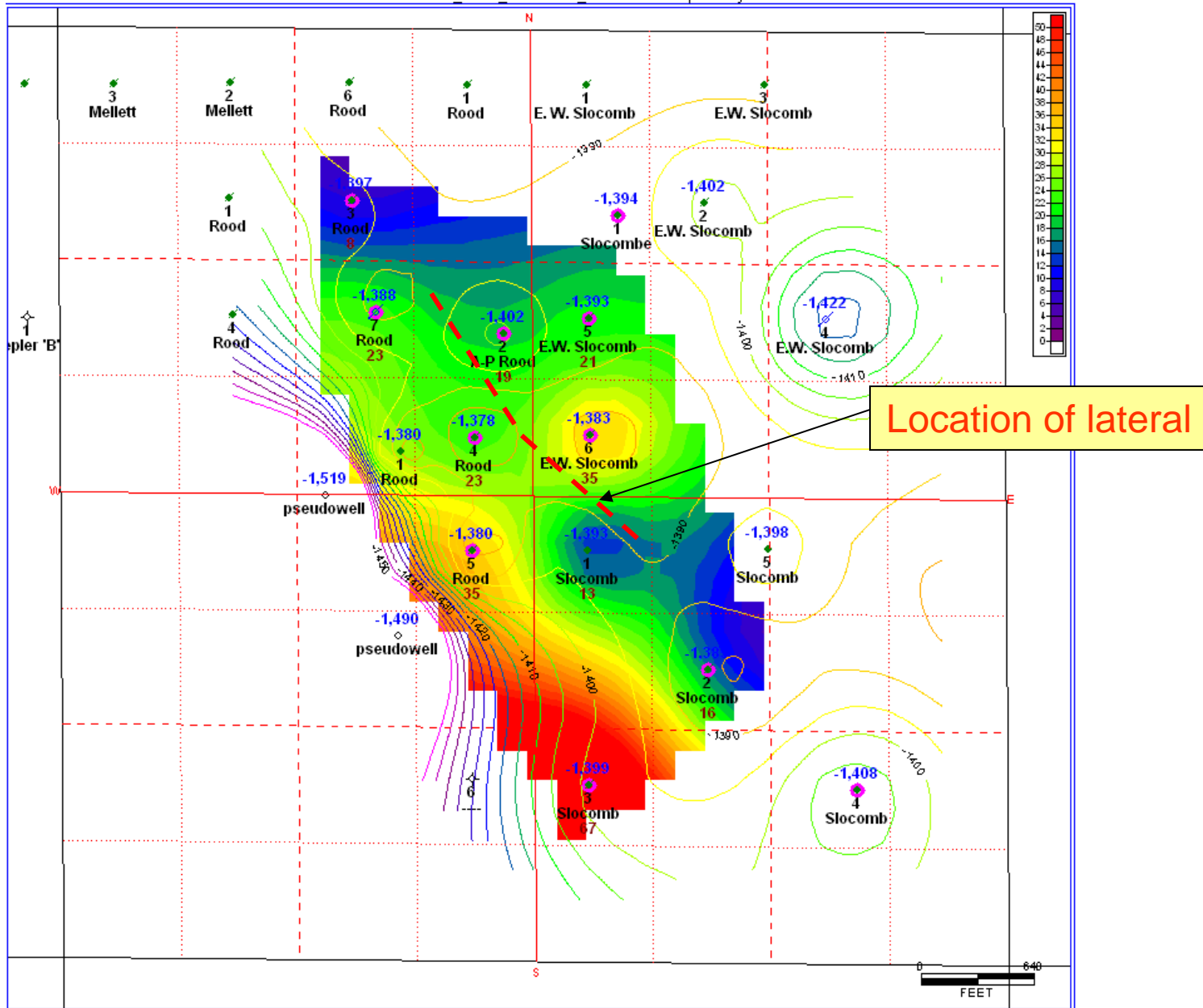
- SP-Caliper-Microlog, neutron curves shown – SP (variable color) and neutron (all purple)
- Lateral passes through this cross section east of Road #4

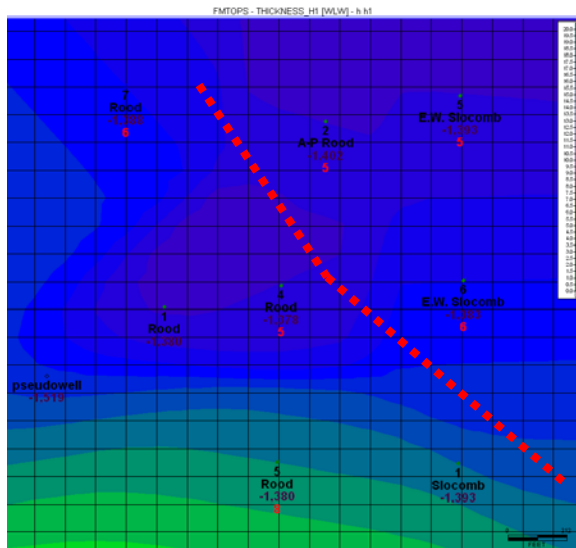


Vertical Exaggeration = 3x

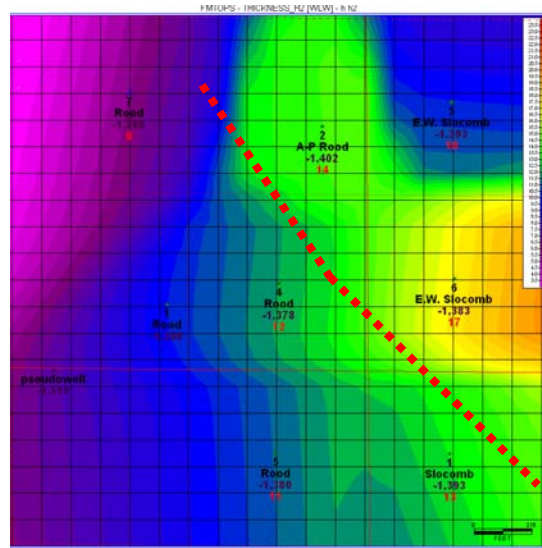
Thickness of total porous interval (solid colors) overlain with structure top of pay zone (contour)

FMTOPS - NEW_SUM_POROUS_H - thickness porosity

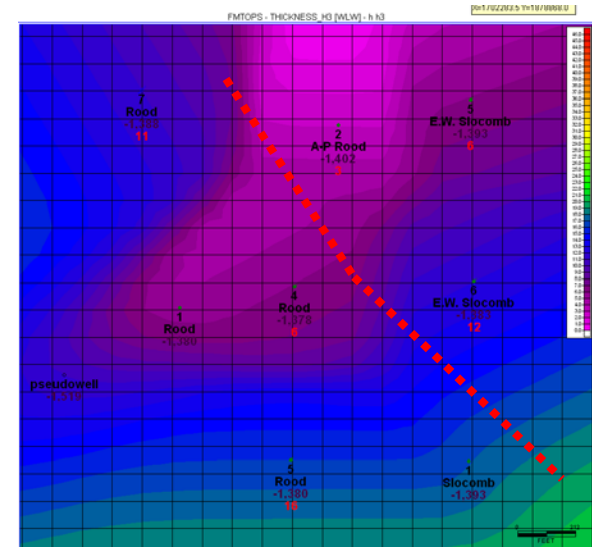




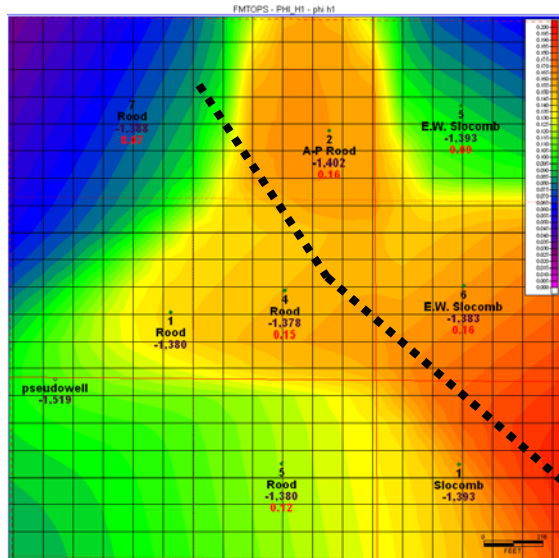
Thickness, H1



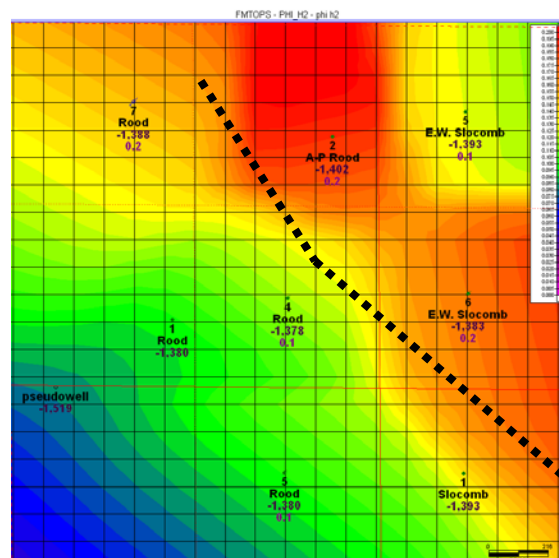
Thickness, H2



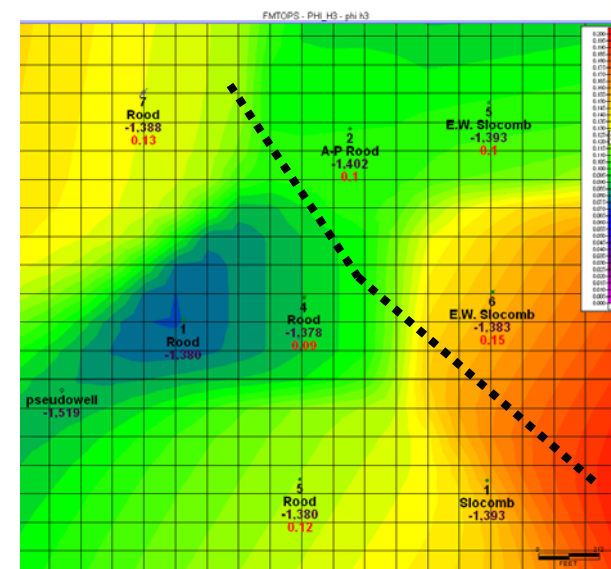
Thickness, H3



Ave porosity, H1



Ave porosity, H2

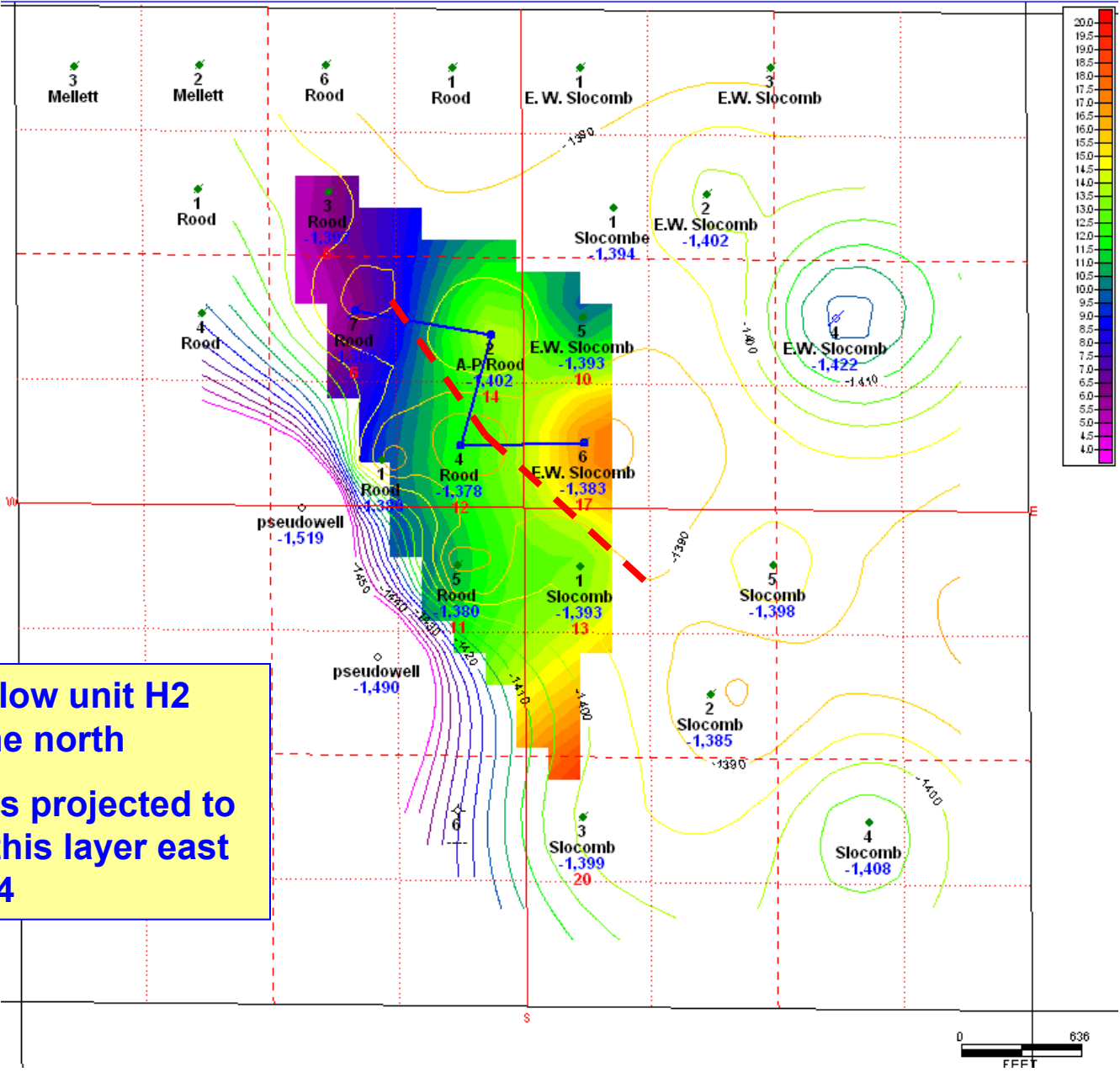


Ave porosity, H3

--- Trajectory of lateral

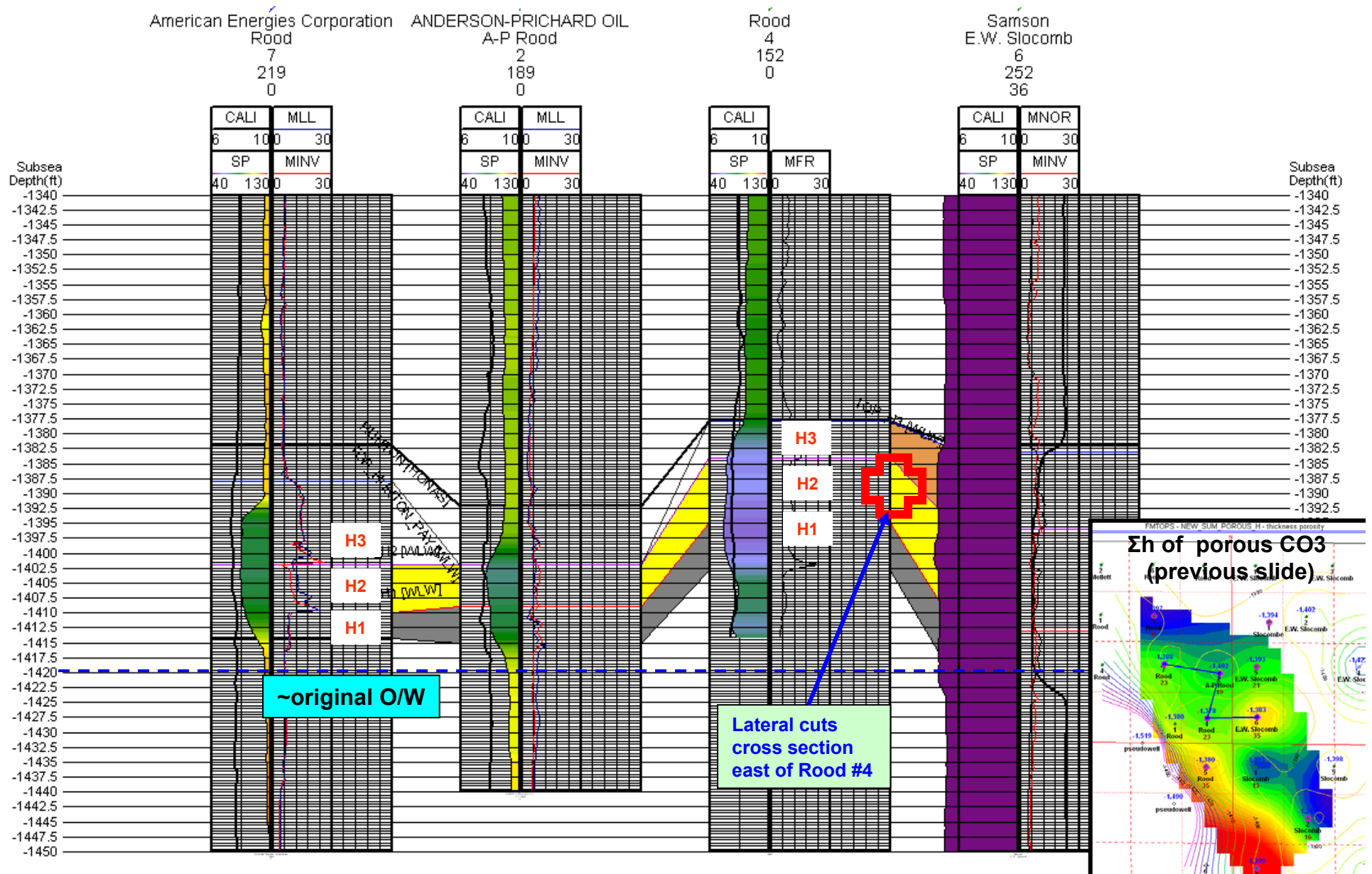
Thickness of H2 layer (middle flow unit) with structure top of pay zone as contours

FMTOPS - THICKNESS_H2 [WLW] - h h2



NW-SE Structural Cross Section with flow units (H1, H2, H3) of Hunton dolomite reservoir

NW-SE Structural Cross Section

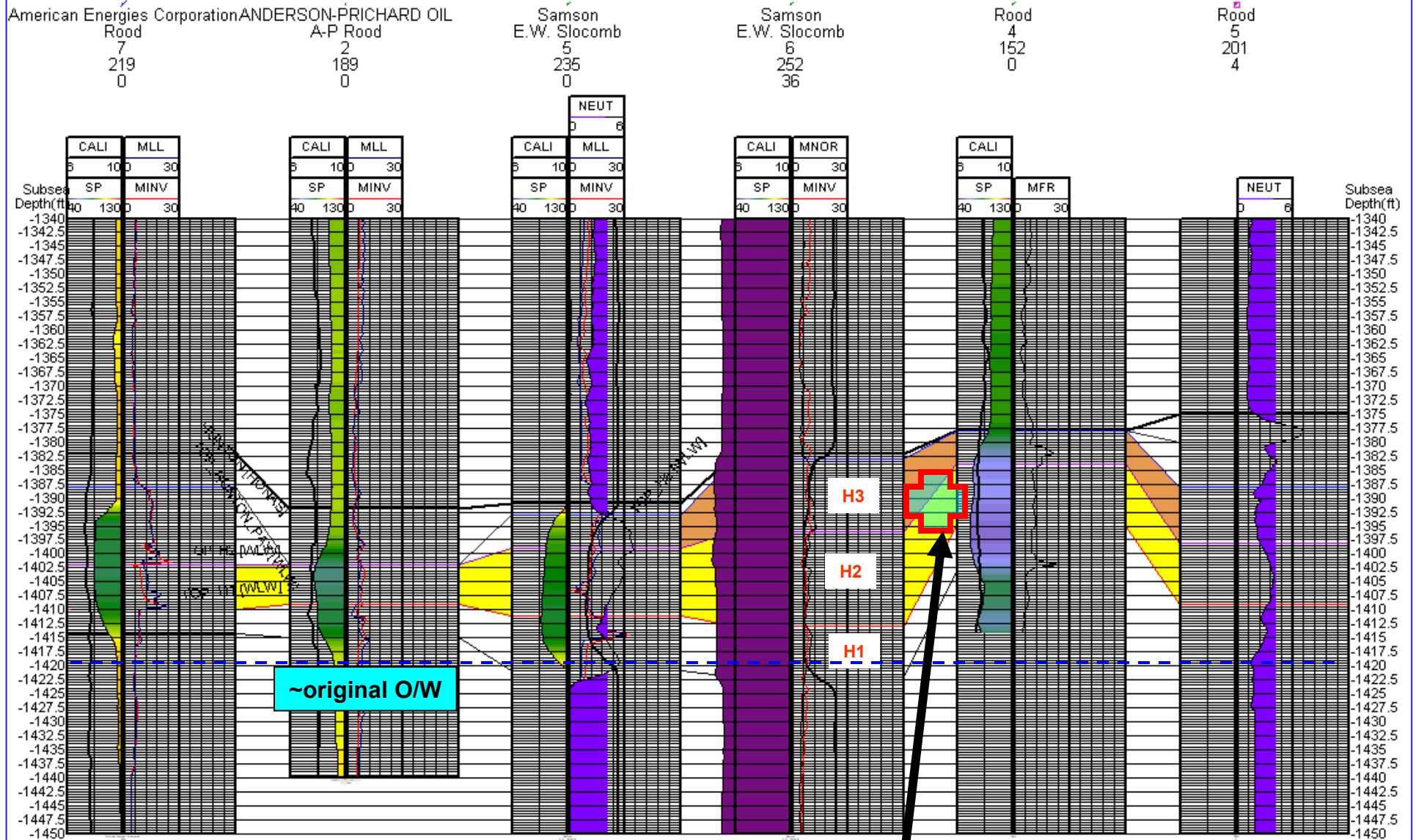


Additional cross section similar to section in previous slide

NW

SE

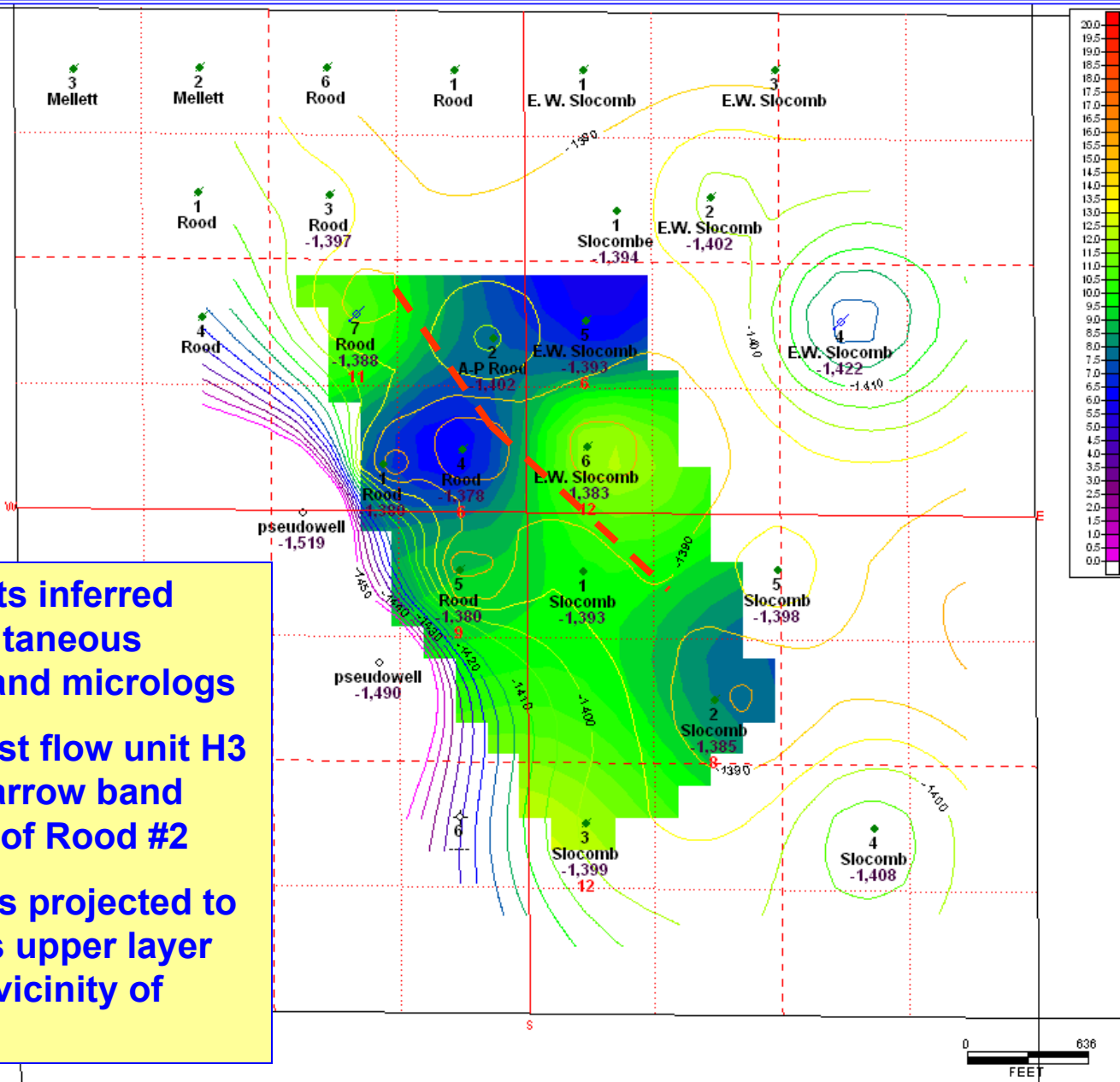
NW-SE Structural Cross Section



Lateral Target

Thickness of H3 layer (top most flow unit) with structure top of pay zone as contours

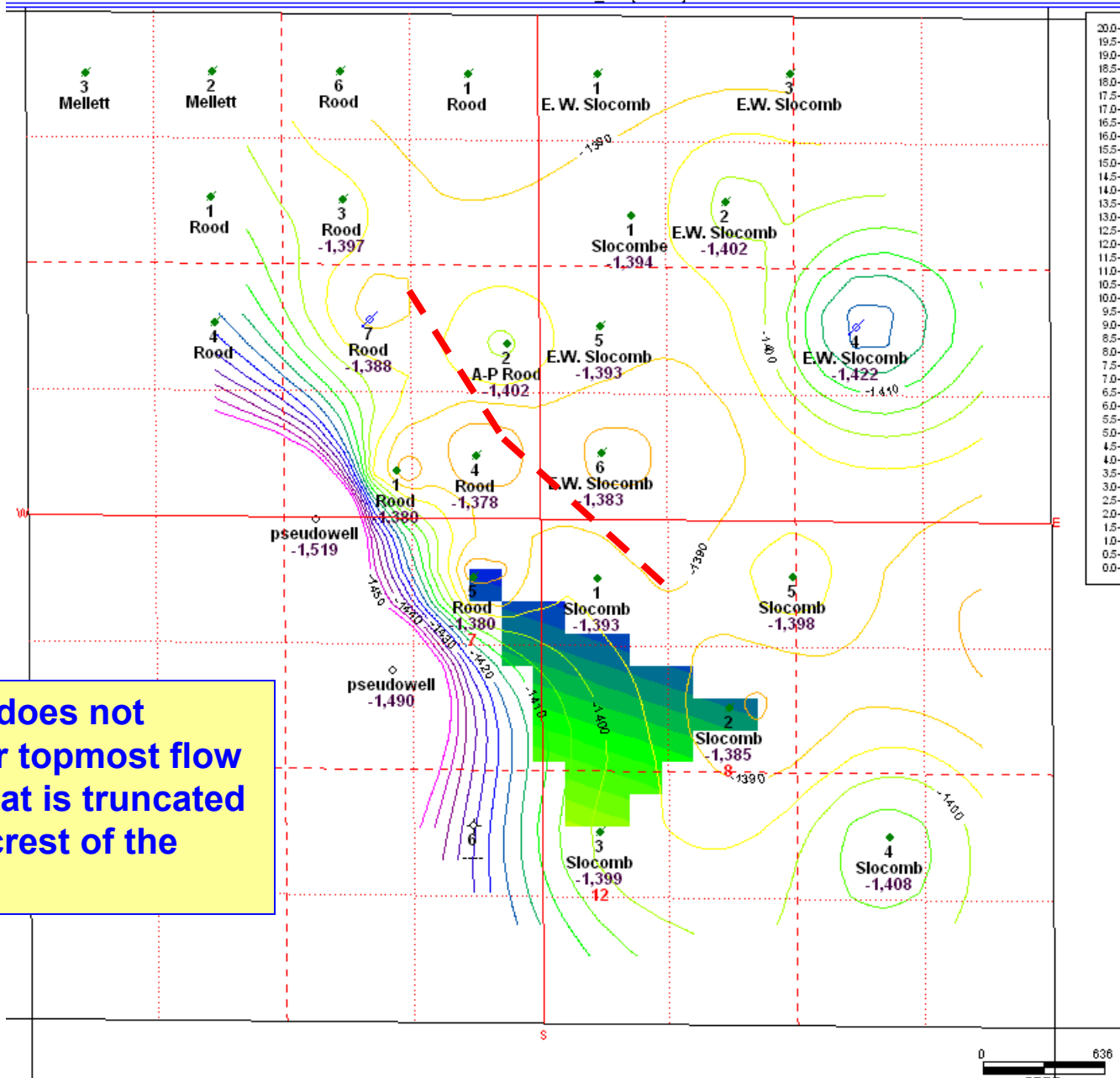
FMTOPS - THICKNESS_H3 [WLW] - h h3



- Flow units inferred from spontaneous potential and micrologs
- Uppermost flow unit H3 thins in narrow band northeast of Rood #2
- Lateral is projected to follow this upper layer except in vicinity of Rood #4

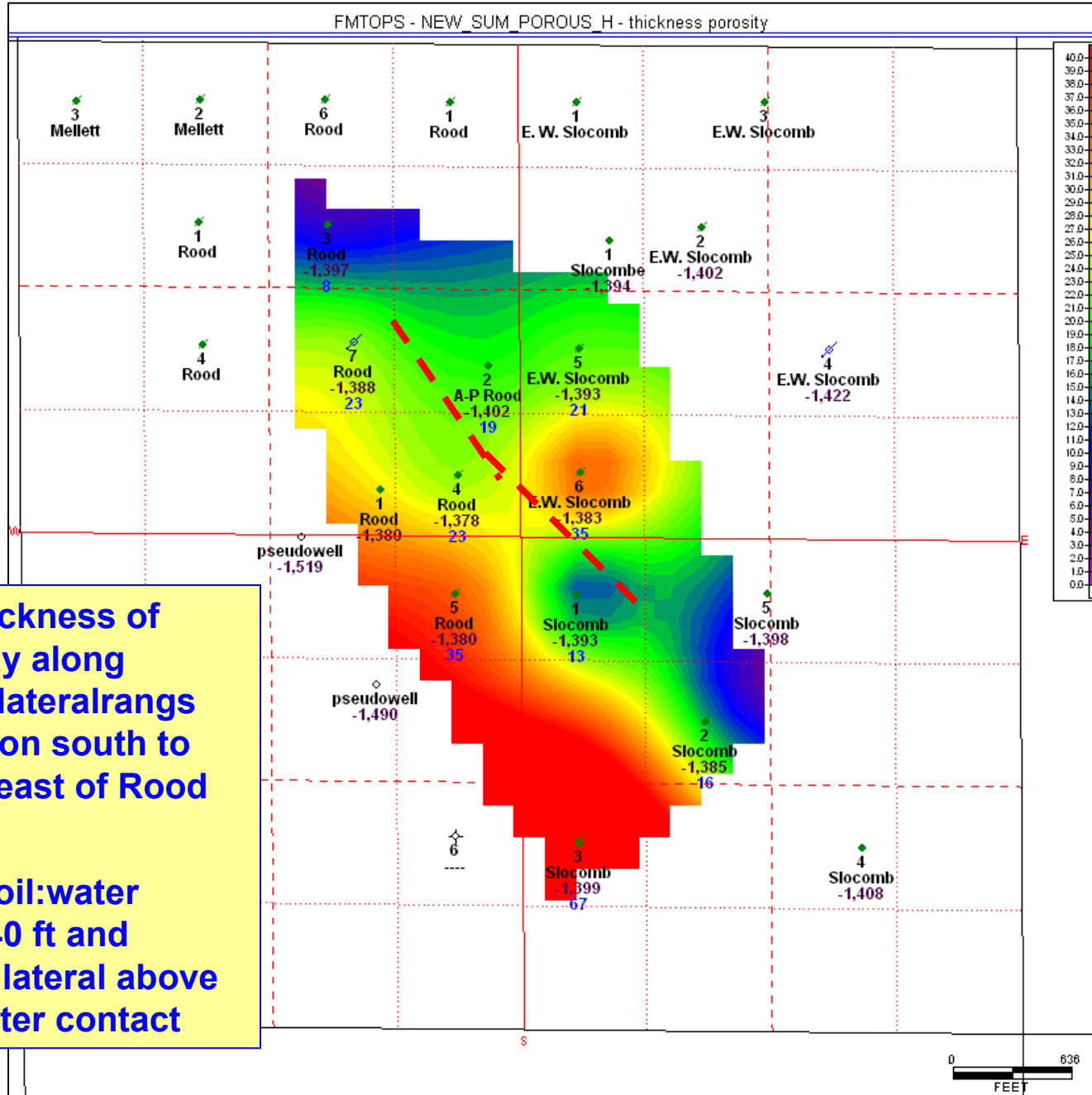
Thickness of H4 layer (off structure flow unit) with structure top of pay zone as contours

FMTOPS - THICKNESS_H4 [WLW] - h h4



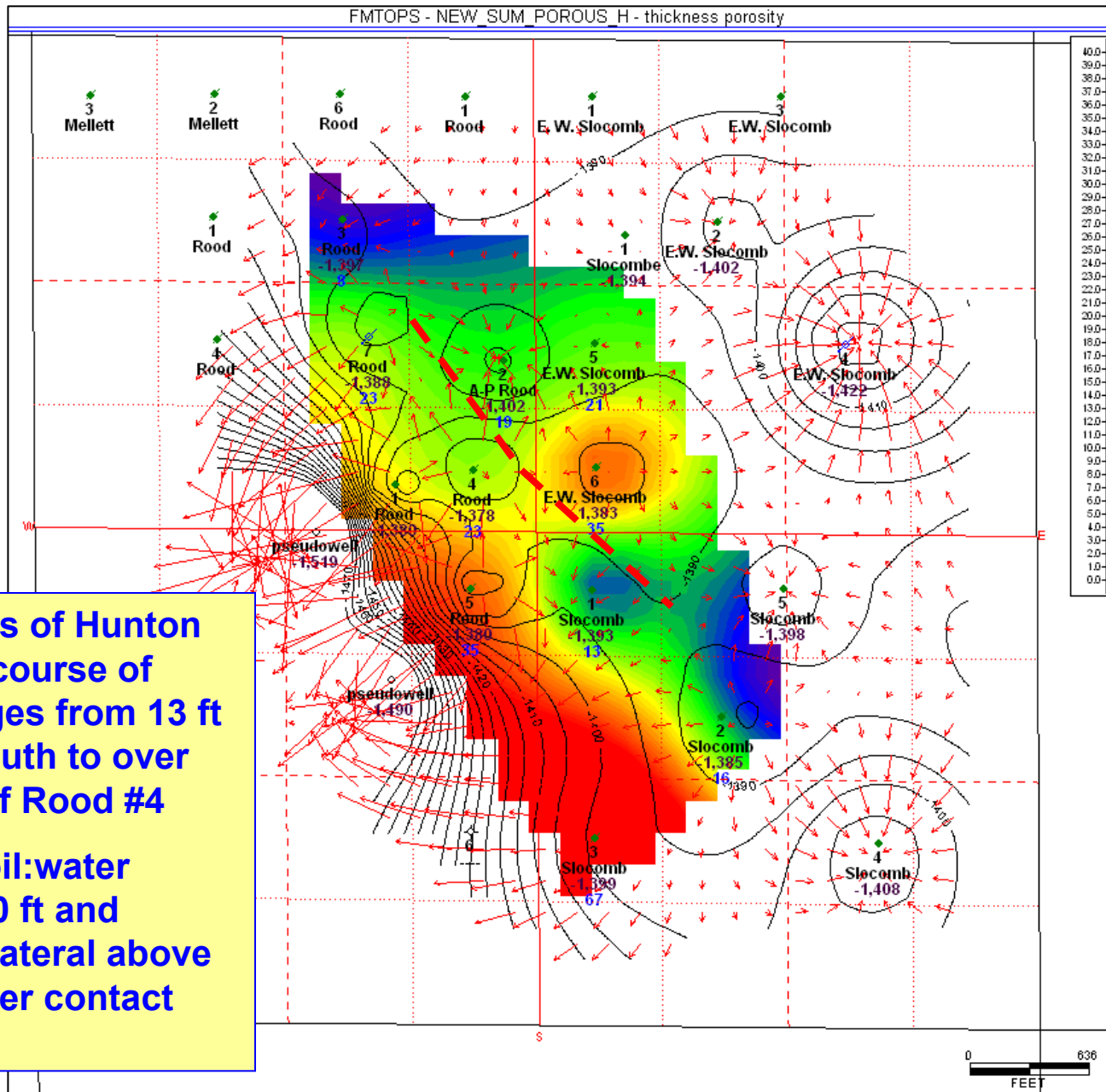
- Lateral does not encounter topmost flow unit H4 that is truncated over the crest of the anticline

Cumulative thickness of Hunton pay



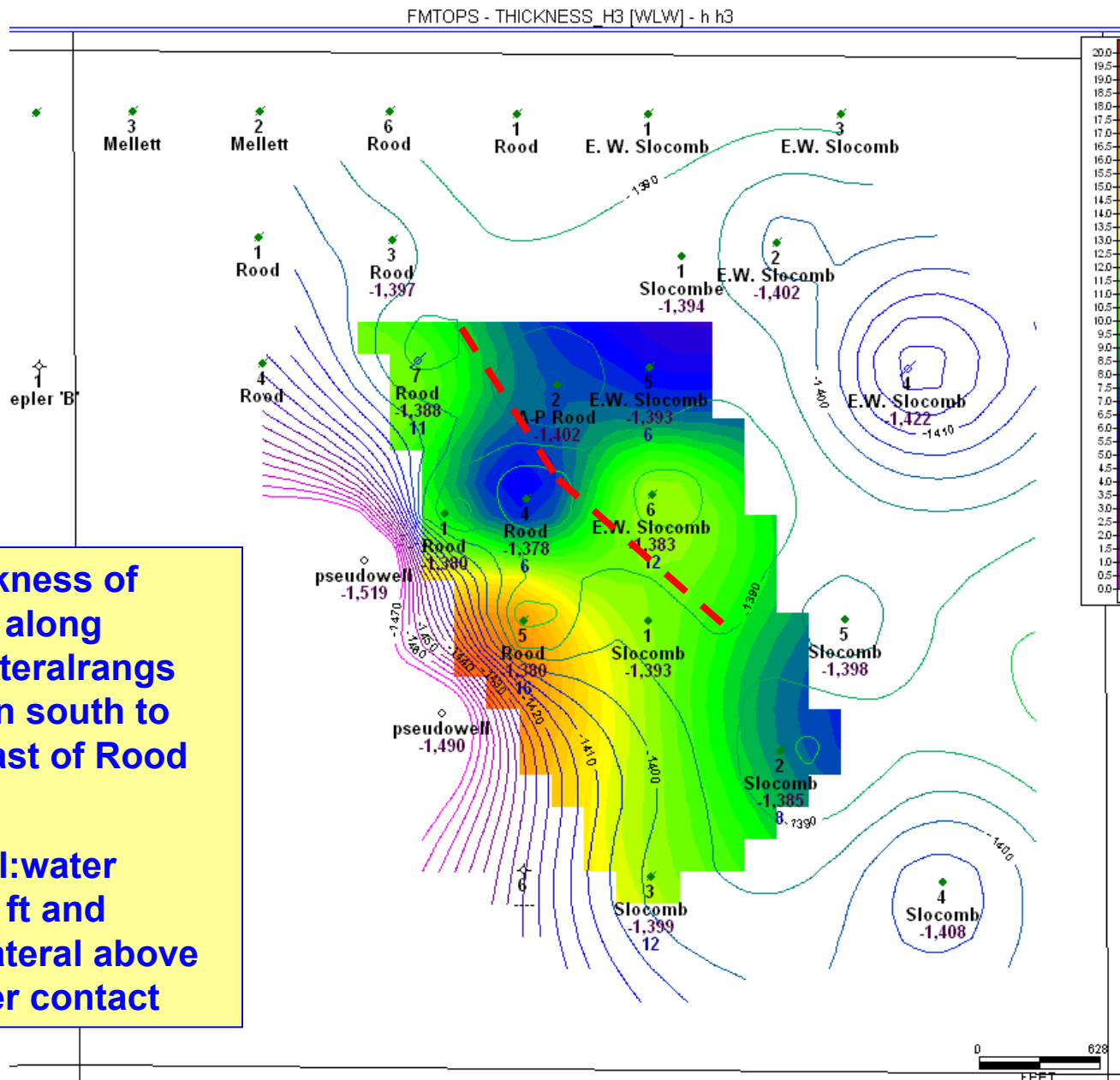
- Total thickness of Hunton pay along course of lateralrangs from 13 ft on south to over 25 ft east of Rood #4
- Original oil:water column ~40 ft and vicinity of lateral above this oil:water contact

Cumulative thickness of Hunton pay (color fill) overlain by contours of structure top of pay with dip vectors



- Thickness of Hunton pay along course of lateral ranges from 13 ft thick on south to over 25 ft east of Rood #4
- Original oil:water column ~40 ft and vicinity of lateral above this oil:water contact (-1420)

Thickness of H3 layer with structure top of pay zone as contours -- including H3 with H4 in Rood 5 for modeling



- Total thickness of Hunton pay along course of lateralrangs from 13 ft on south to over 25 ft east of Rood #4
- Original oil:water column ~40 ft and vicinity of lateral above this oil:water contact

Reservoir & Well Simulation

(to be accomplished with new log and well test data from lateral)

Grid Dimensions:

Grid cell size: 110x110 ft

Area of grid: 1980 x1980 ft

Input grids:

Structure Top Hunton Pay

Thickness of H1, H2, and H3

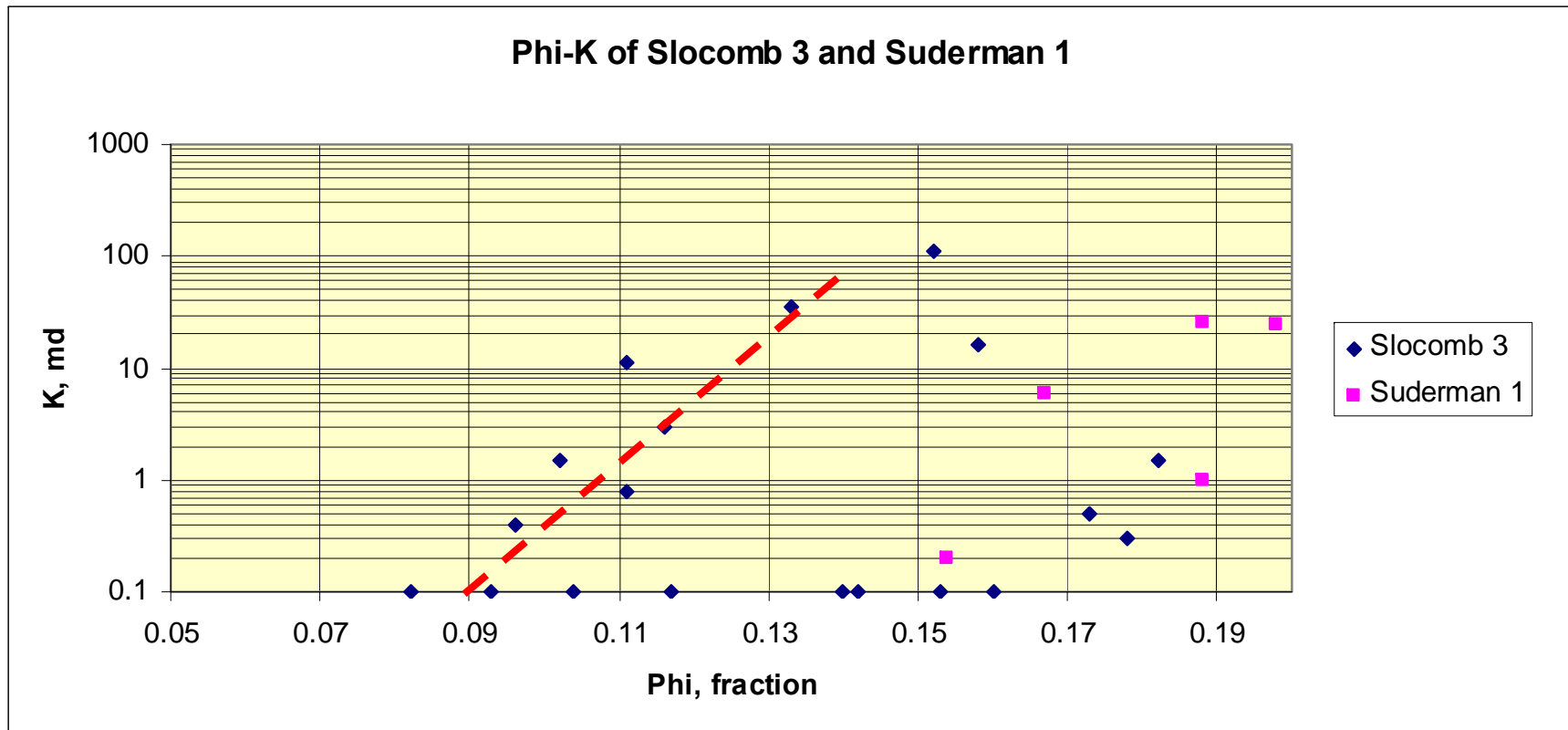
Average \emptyset of H1, H2, and H3; Estimated from micrologs

Average permeability of H1, H2, and H3; Interpolated from Slocombe 3
phi-k plot from core analysis (see next slide for phi-k plot)

Average water saturation, S_w . To be estimated from capillary pressure curves
obtained from nearby wells in transition zone. with full log suites

Note: Combined H3 and H4 layers into H3 in Rood 5
since limited area of H4

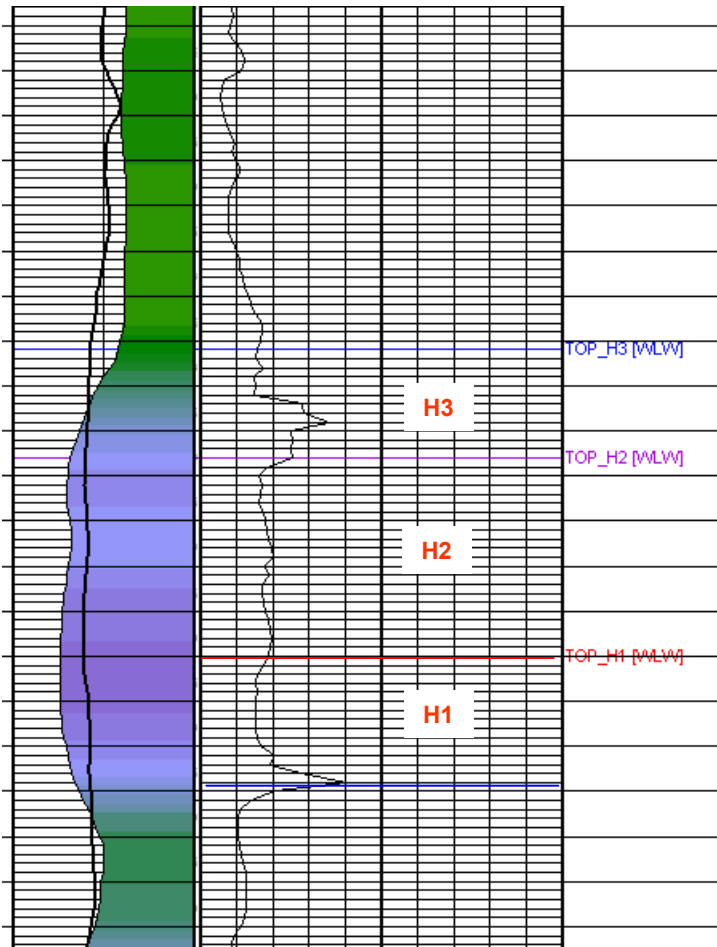
Phi-k plot used to estimate permeability from porosity



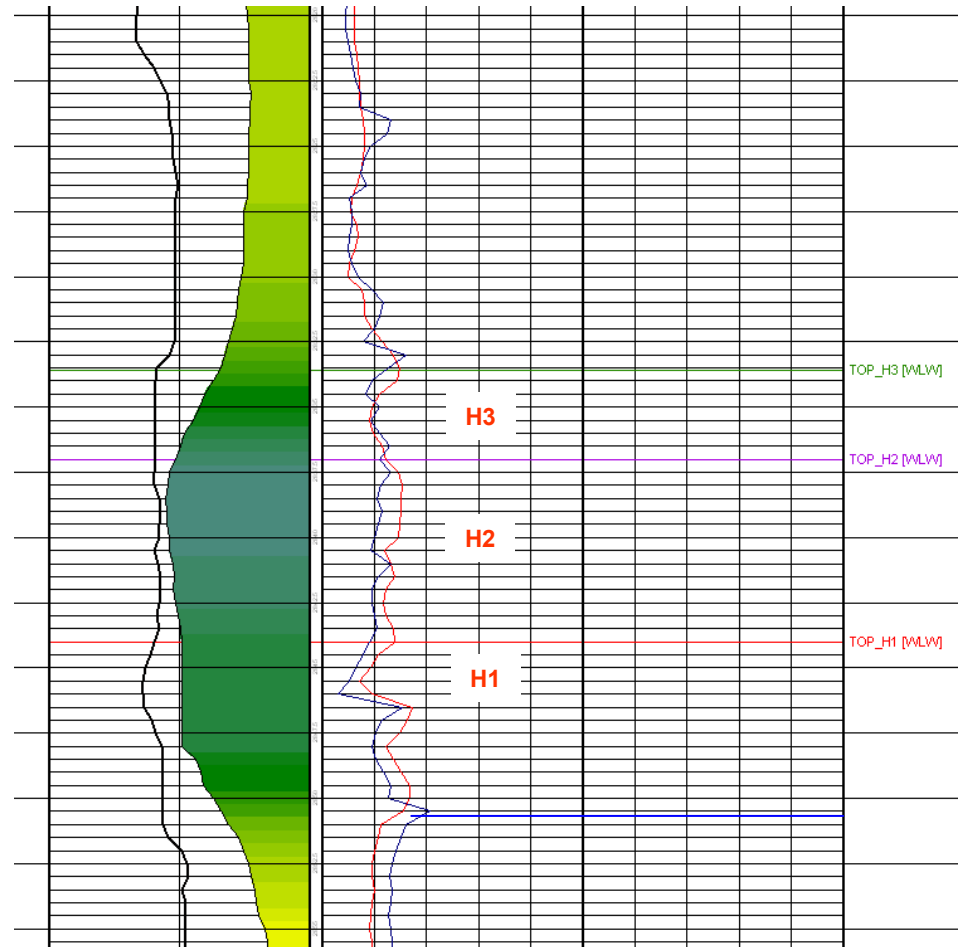
Rough estimate of permeability with dashed red line using nearby/offstructure Slocombe 3 well. Low perm. values suggest vugs with limited connection measured in plug samples.

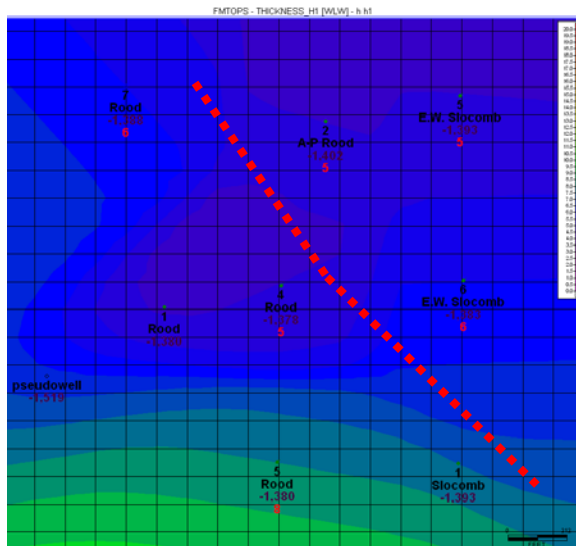
Estimates of flow unit delineation using available Spontaneous potential & micrologs

Rood #4
SP-Cal-Microlog

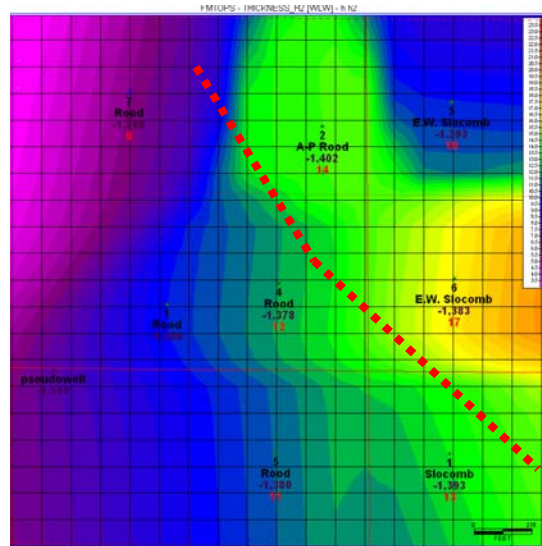


Rood #2
SP-Cal-Microlog

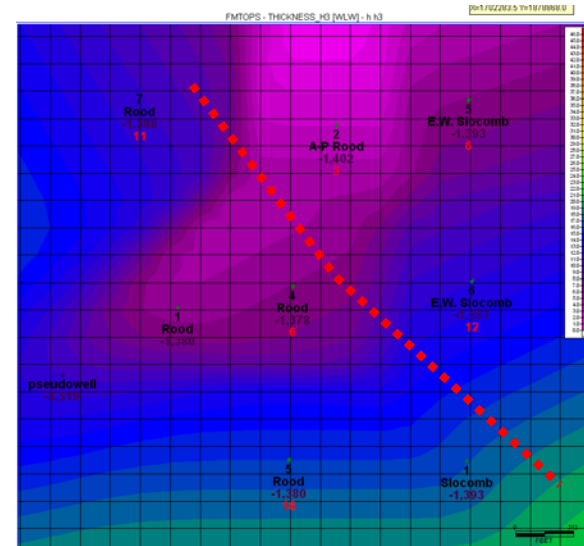




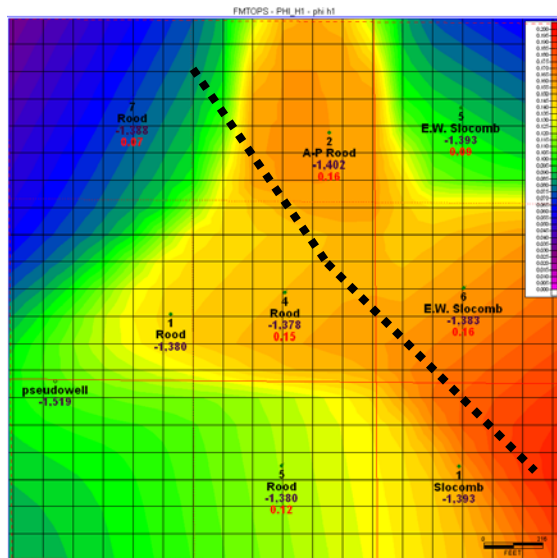
Thickness, H1 (lower)



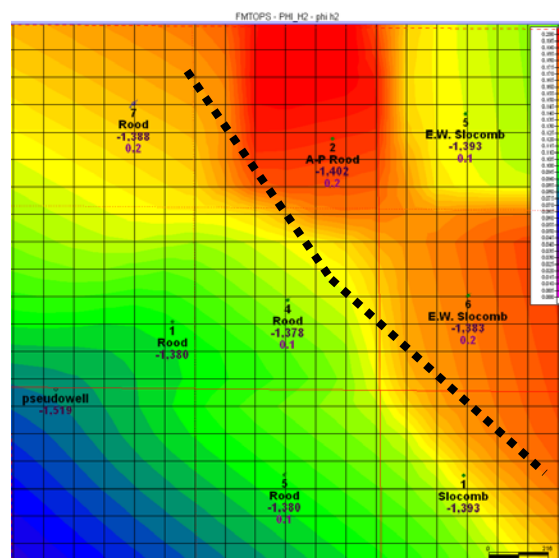
Thickness, H2 (middle)



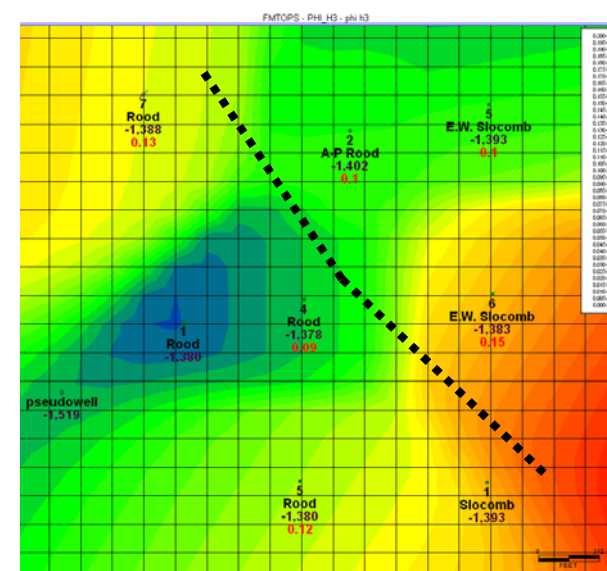
Thickness, H3 (upper)



Ave porosity, H1
(estimated from micrologs)

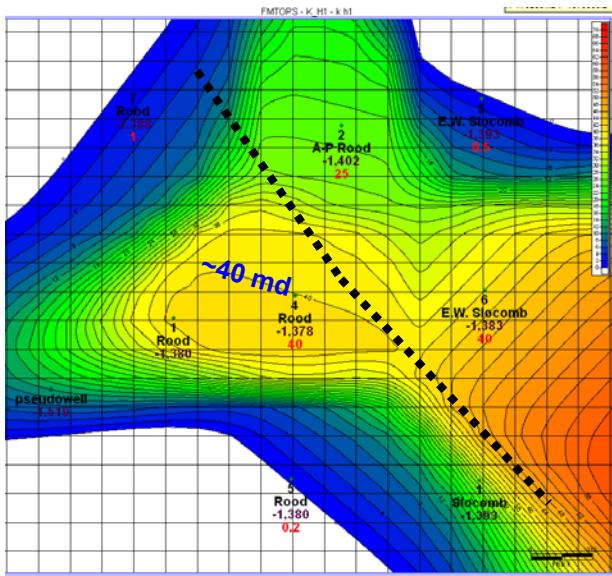


Ave porosity, H2

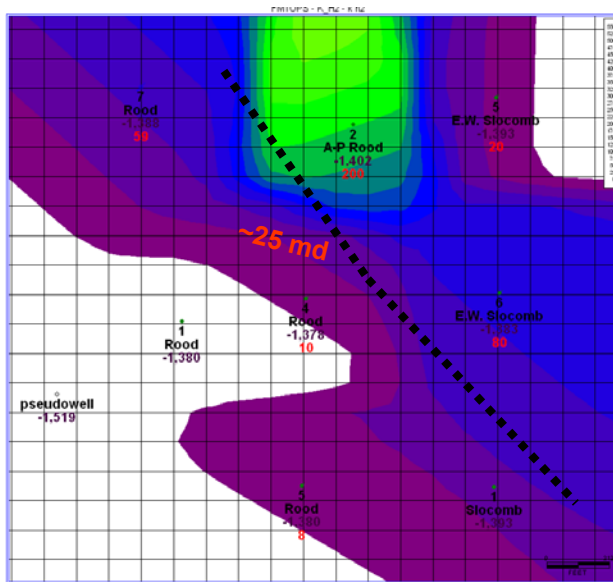


Ave porosity, H3

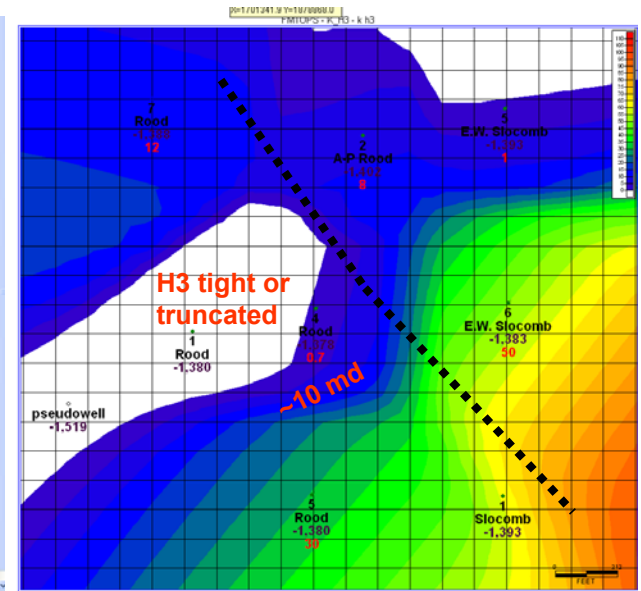
--- trajectory of lateral



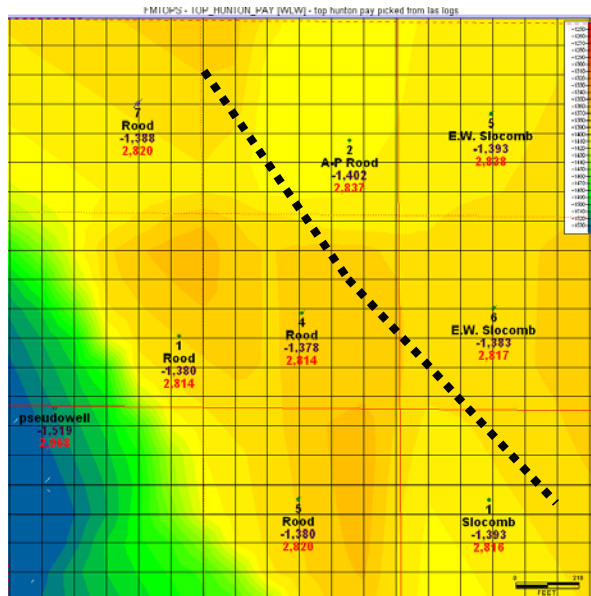
Ave. Permeability, H1



Ave. Permeability, H2



Ave. Permeability, H3



Structure, Top Hunton Pay

--- trajectory of lateral

Permeability is roughly estimated from micrologs & compared to core & log analysis from Slocombe #3

Scout card information

19-21-3E				Wells in study area							Calculated from swab testing		
Location	Well	Operator	Completion	Elev/KB	Top Hunton	DST from	DST to	BHP	Perf From	Perf To	B/d IP Oil	B/d IP Wtr	B/d IP Fluids
NE SE SW	Allison 1	Red Drilling Co	1/17/1957	1477	2871								
N2 N2 SE	LD Slocombe 5	Anderson Prichard	7/15/1957	1421	2843	2810	2821	1035			117	22	139
NW NW SE	L Slocombe 1	Anderson Prichard	3/26/1957	1423	2804						240 NW		240
SE NW SE	L Slocombe 2	Anderson Prichard	4/12/1957	1421	2805						109	46	155
NW SW SE	L Slocombe 3	Anderson Prichard	4/22/1957	1433	2825	2828	2844	1015	2830	2834	38.4	91.2	130
						2859	2871	1400					
SE NW NW	Mellott 1	Anderson Prichard	3/15/1957	1443	2832	2836	2841				214 NW		214
NE NW NW	Mellott 2	Anderson Prichard	3/16/1957	1442	2843						111 NW		111
NW NW NW NW	Mellot 3	Anderson Prichard	4/30/1957	1449	2848						112	4	116
NE SW NW	Mellot 4	Anderson Prichard	5/15/1958	1453	2845				2845	2850	88		88
SW SE NW	Rood 1	Wilton Pet	6/10/1988	1434	2814				2817	2818	3	38	41
NE SE SW	Rood 1	Red Drilling Co	10/25/1957	1435	2871								
NE NE NW	Rood 1	Anderson Prichard	9/7/1956	1454	2854	2857	2884	1020	2858	2861	8	189	198
NE SE NW	Rood 2	Anderson Prichard	2/1/1957	1439	2834	2844	2875	1025	2846	2851	189 NW		189
SW NE NW	Rood 3	Anderson Prichard	2/22/1957	1441	2839	2840	2870	1010	2847	2852	2544 NW		2544
SE SE NW	Rood 4	Anderson Prichard	2/11/1957	1436	2815				2832	2837	252 NW		252
NW NE NW	Rood 6	Anderson Prichard	4/4/1957	1447	2848						148 TW		148
NE NE SW	Rood 5	Anderson Prichard	3/9/1957	1440	2819				2845	2850	201	4	205
SE NW NE	Slocombe 2	Anderson Prichard	8/21/1956	1454	2856						186	6	192
C N2 N2 NE	Slocombe 3	Anderson Prichard	9/15/1956	1449	2849						77	64	141
C NW SE NE	Slocombe 4	Anderson Prichard	9/23/1956	1434	2854	2865	2875	1040					
NW SE SE	Slocombe 4	Anderson Prichard	5/15/1957	1422	2827						5	175	180
NW SE SE	Slocombe 4	Anderson Prichard	6/19/1957								5	250	255
SE SE NW	Rood 4	Anderson Prichard	2/11/1957	1436	2815				2832	2837	252 NW		252
SW SW NE	Slocombe 6	Anderson Prichard	3/1/1957	1434	2816				2816	2826	252	36	288
NW SW NE	Slocombe 5	Anderson Prichard	1/13/1957	1418	2835				2838	2844	235 NW		235
NW SE NW	Rood 7	Anderson Prichard	5/8/1958	1435	2818				2819	2824	219 NW		219
NE NE SW	Rood 5	Anderson Prichard	3/9/1957	1440	2819				2828	2834	201	4	205
SW SE NW	Rood 1	Wilton Pet	6/10/1988	1434	2814				2817	2818	3	38	41
NW NW SE	L Slocombe 1	Anderson Prichard	3/26/1957	1423	2804						240 NW		240
NE SE NW	Rood 2	Anderson Prichard	12/31/1956	1439	2834	2844	2875	1025	2846	2851	189 NW		189

NW-SE structural cross section with scanned wells in sec. 19-21s-3w, Unger Field

Rood 7

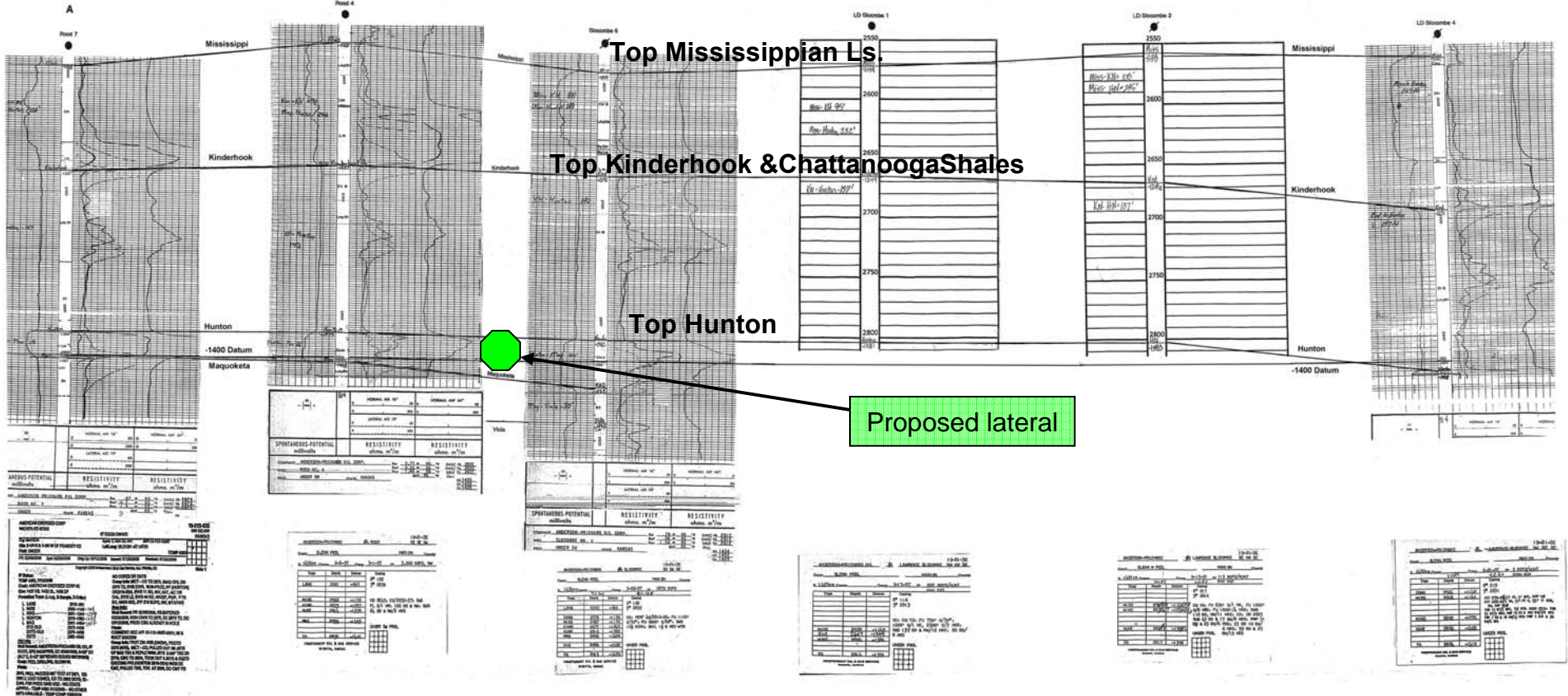
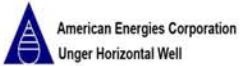
Rood 4

Sloc. 6

L.D. Sloc. 1

L.D. Sloc. 2

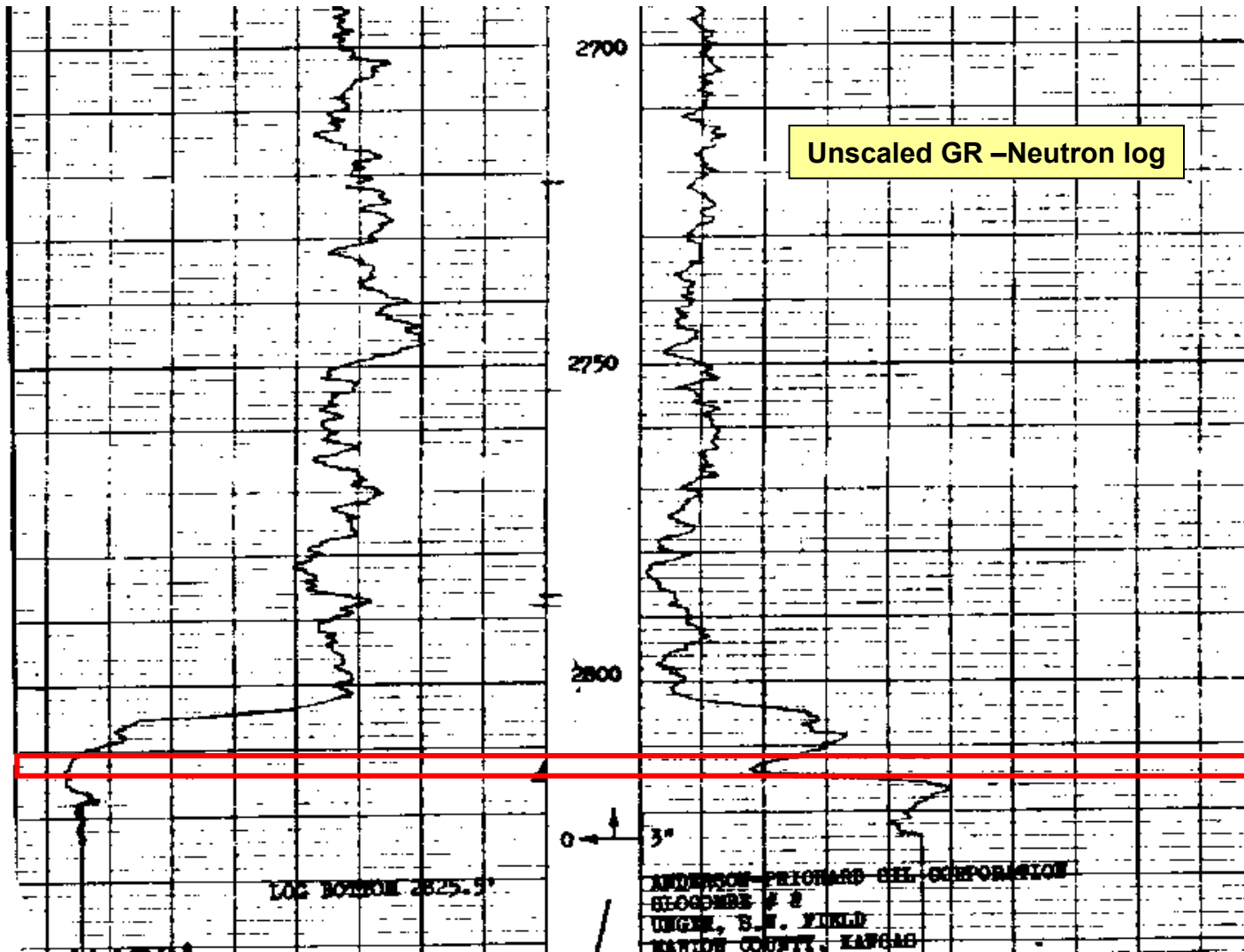
L.D. Sloc. 4



SE of lateral

Slocombe #2 sw nw sw Sec. 19 Unscaled GR and Neutron logs Effective 3-4 ft.

Hunton
Dolomite

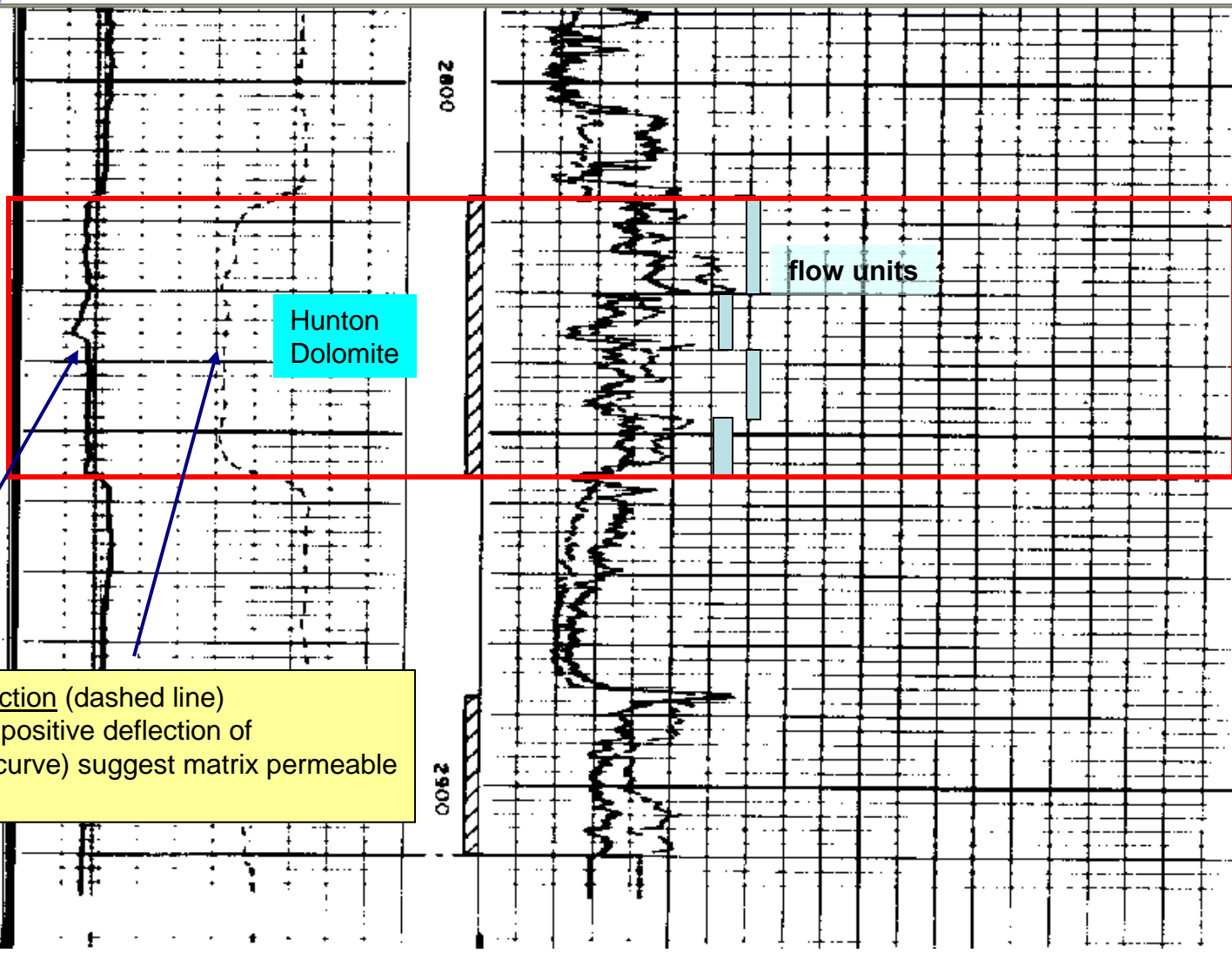


Slocombe #6 CAL-SP-Microlog sw sw ne Sec. 19

Effective ~25 ft

Upper zone ~13 ft

immediately east of proposed lateral



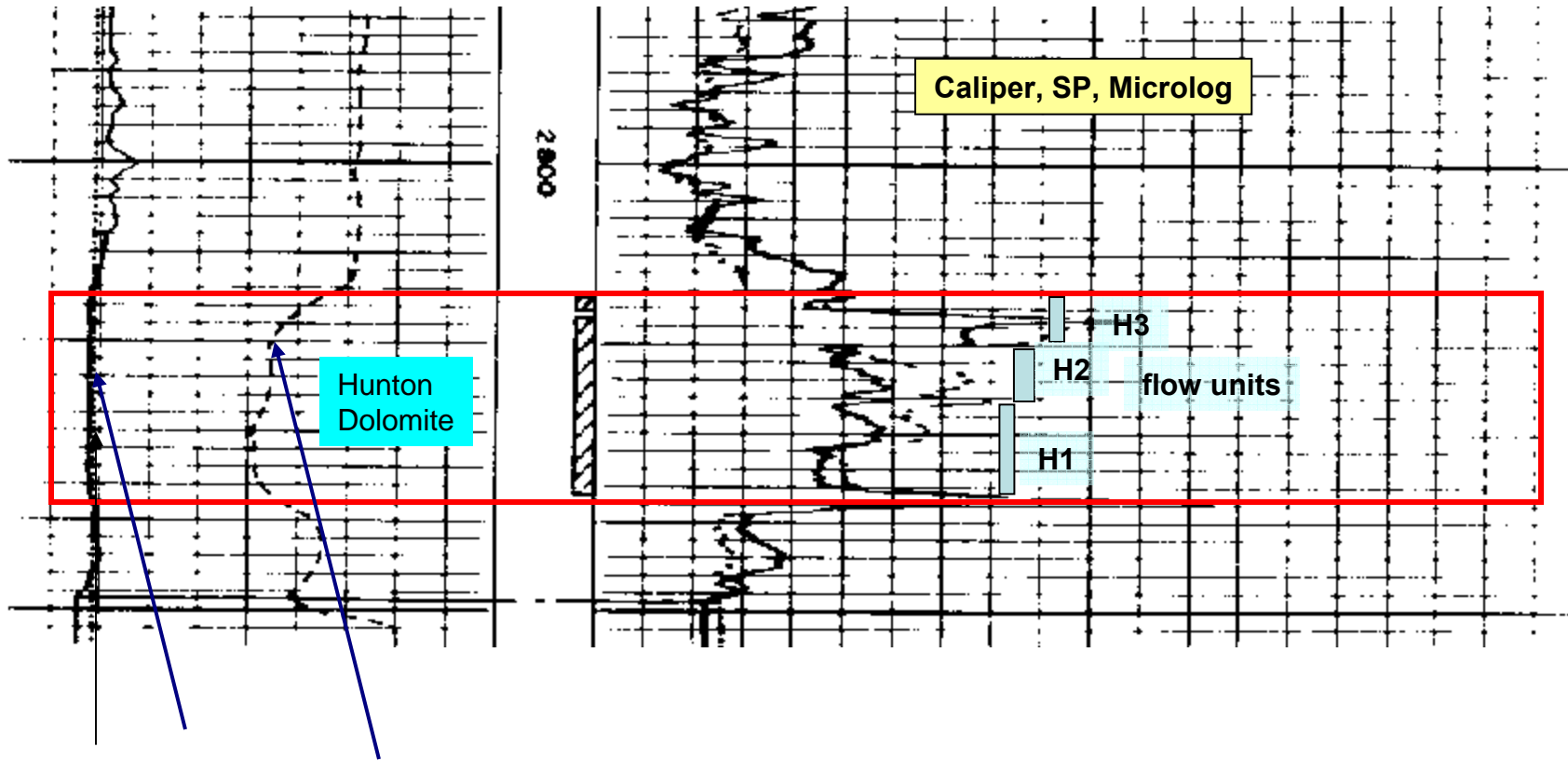
Good SP deflection (dashed line) and mudcake (positive deflection of Caliper –solid curve) suggest matrix permeable matrix porosity

Rood #4 se se nw 19 CAL-SP-Microlog

Effective ~14 ft.

Upper zone ~6 ft.

key well immediately west of lateral



Good SP deflection (dashed line)
and mudcake (positive deflection of caliper – solid line)
suggest matrix permeable matrix porosity

Rood 7 nw se nw Sec. 19

CAL-Microlog

Effective upper ~11 ft.

NE end of lateral between two proposed trajectories

