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# GAS DRILLING: THE VIEW FROM ABOVE

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John Amos

President, SKYTRUTH

*2010 People's Oil & Gas Summit*

*Pittsburgh, PA – November 20, 2010*



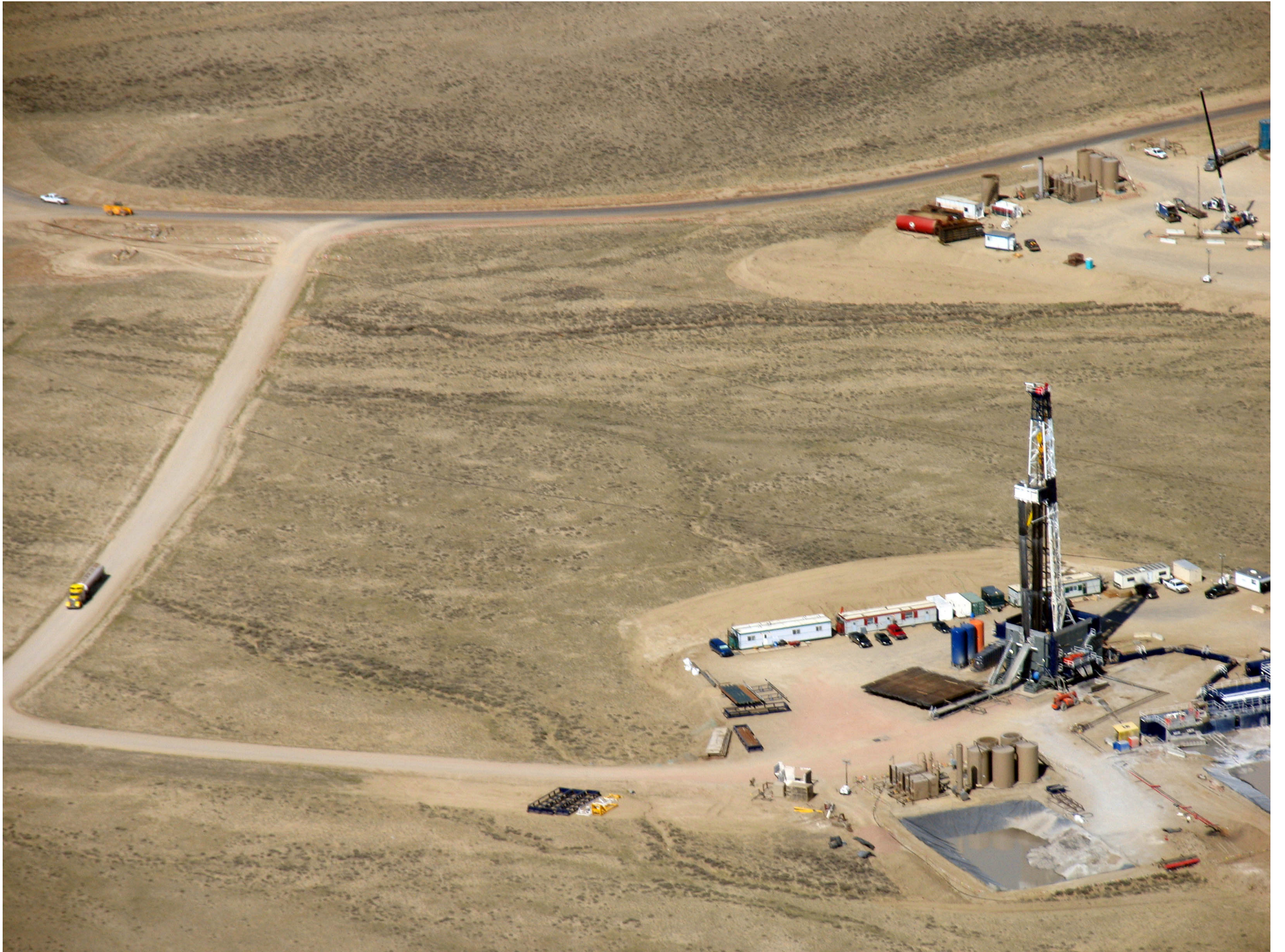
# I. THE WEST

- GAS-DRILLING BOOM IN ROCKIES (WY-UT-CO-MT-NM)
  - Began 1980s, ramped up 1990s-2000s
  - “Unconventional” gas reservoirs
    - Coalbed methane, tight-gas sandstone
  - Unlocked by hydraulic fracturing
  - Vertical and directional drilling
  - Public and split-estate lands

















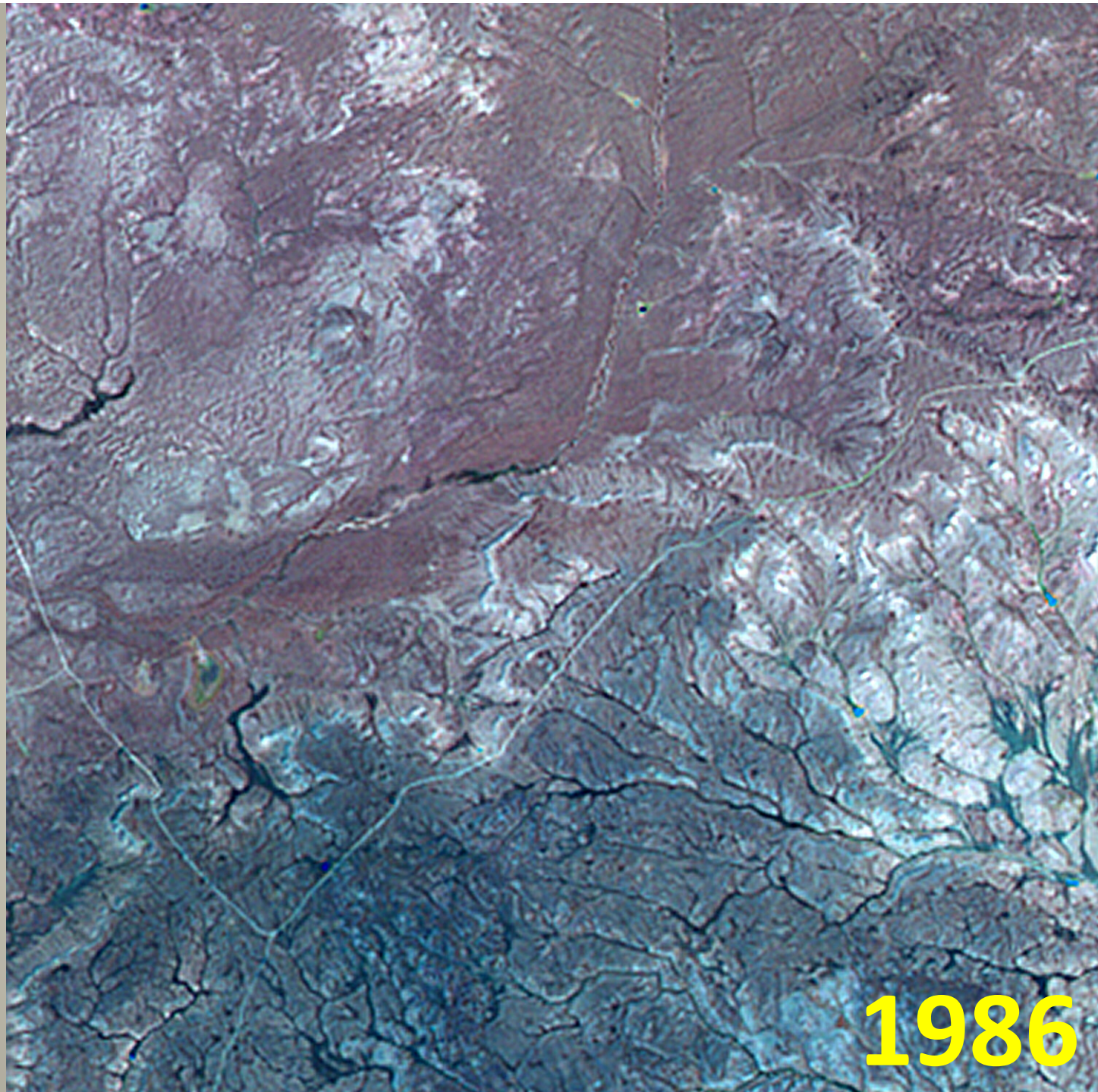






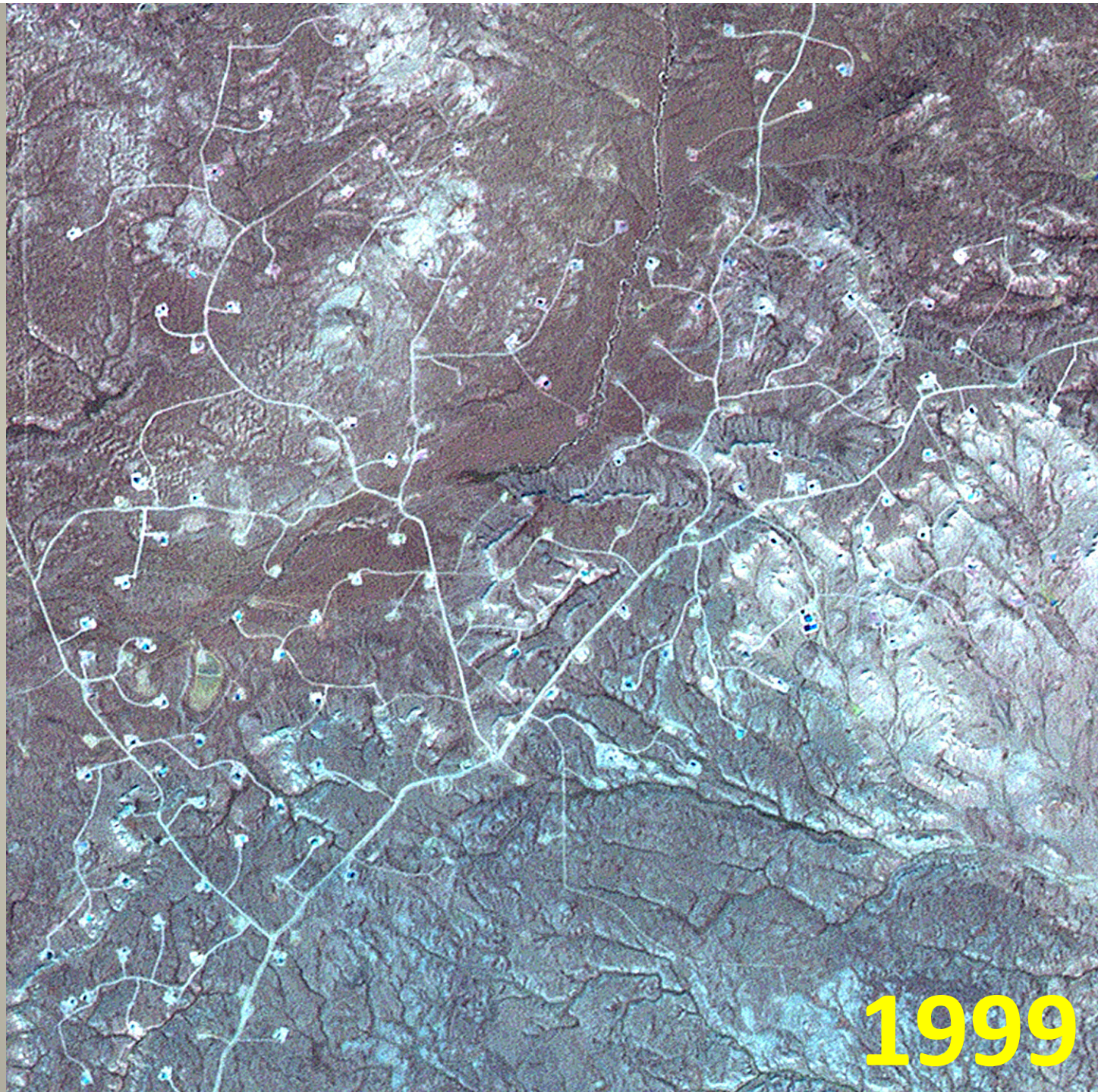






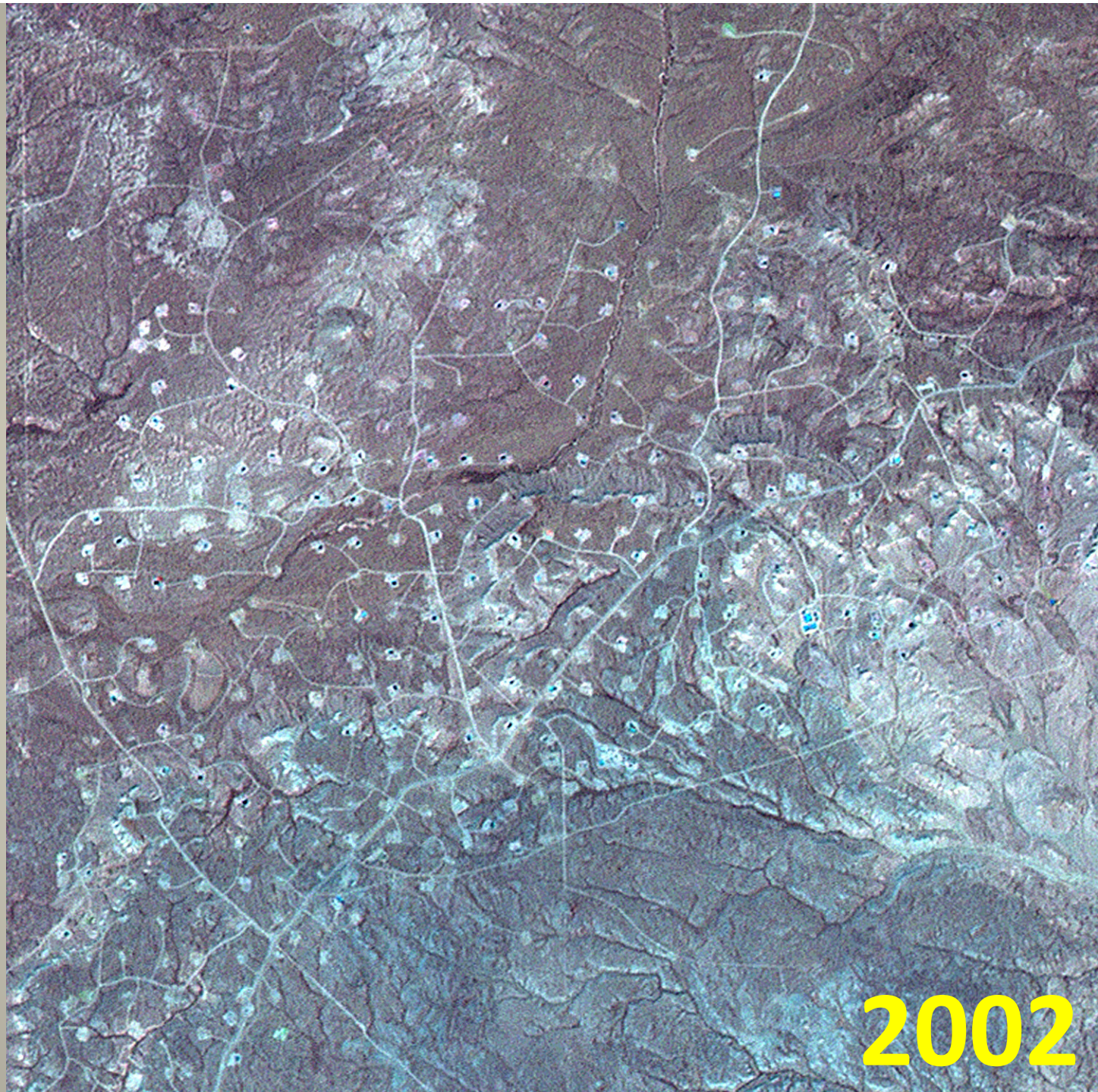
1986



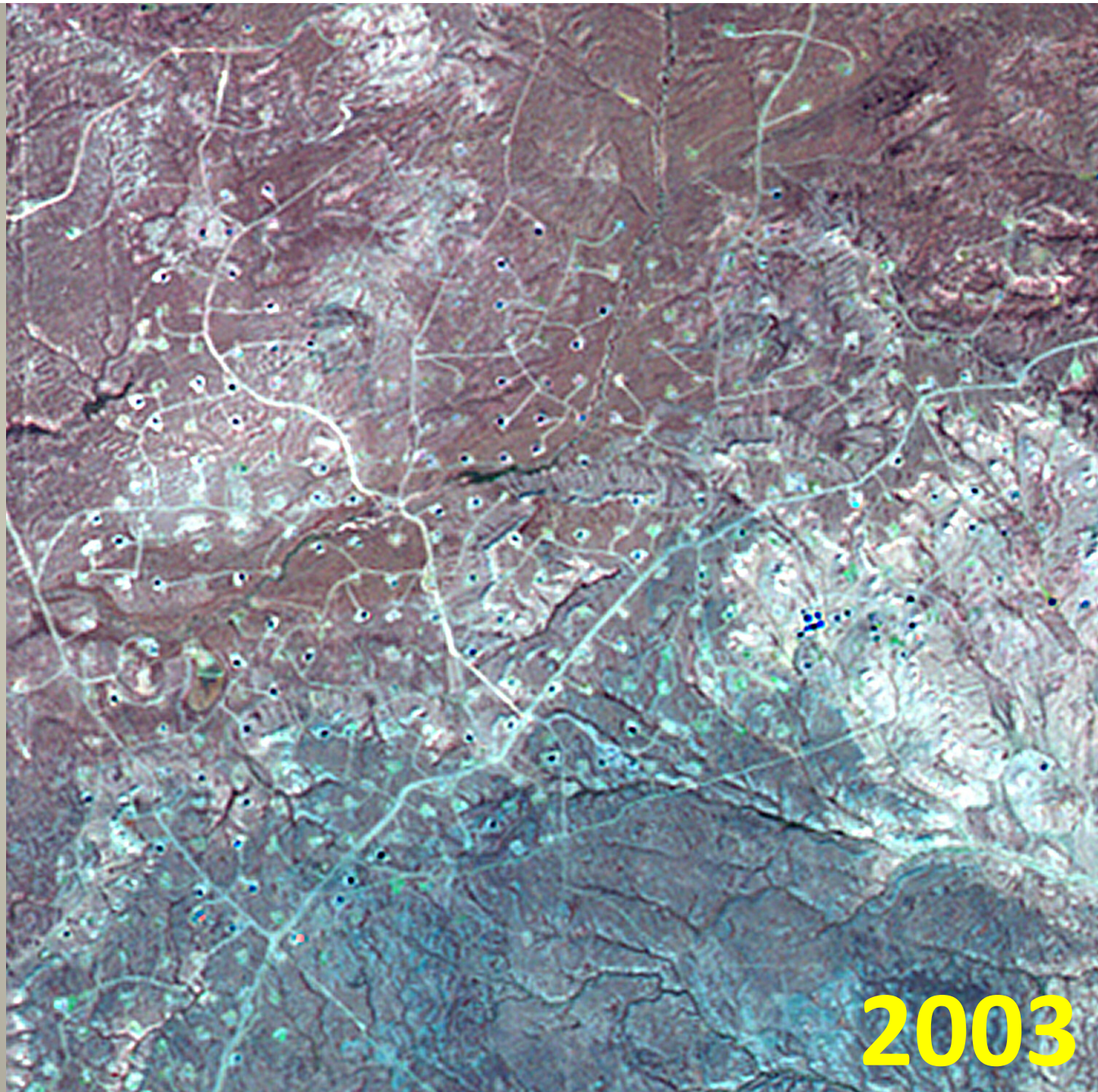


1999



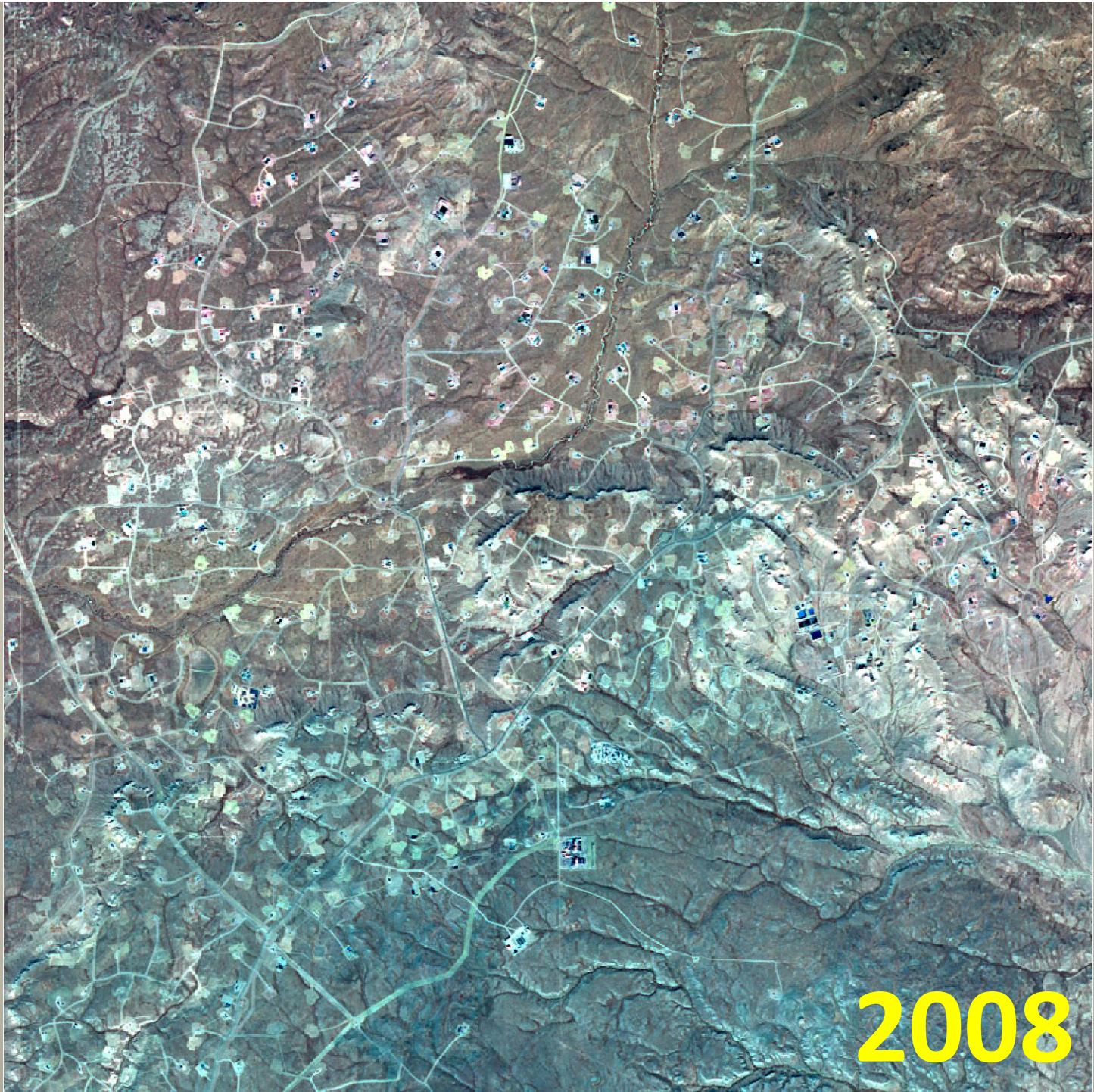






2003





2008

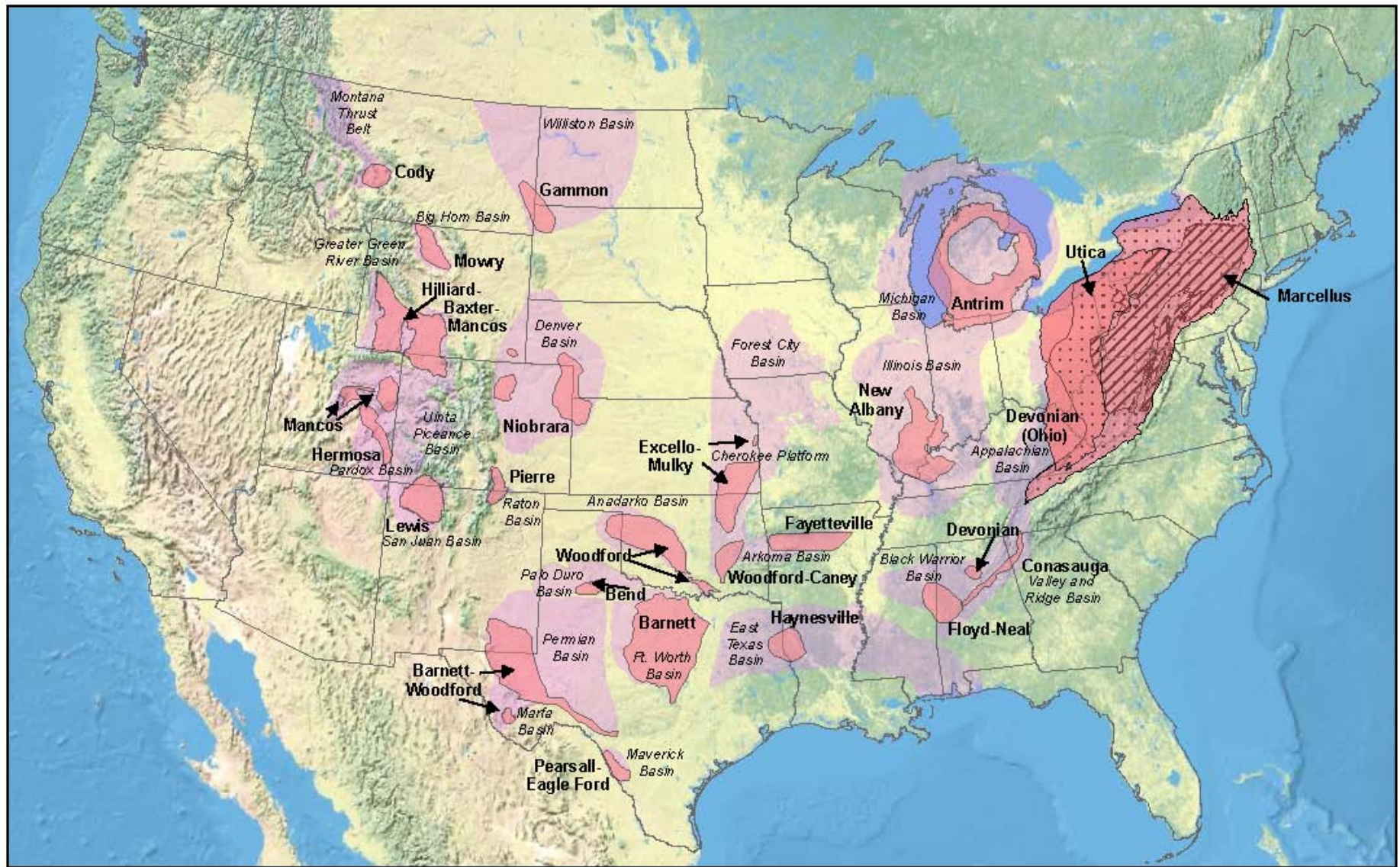


## II. THE EAST

### ➤ SHALE-GAS DRILLING BOOM

- Began late 1990s with Barnett Shale in TX
- Shale reservoirs previously deemed unproducibile
  - Marcellus Shale (NY-PA-WV-VA)
- Unlocked by fracking and horizontal drilling
- Private and split-estate lands
- Shale-oil an emerging target





## United States Shale Gas Plays

### Stacked Appalachian Plays







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**Water "Impoundment"**  
**4 Acres -- for**  
**Fracking Wells**

**House**

**Well**

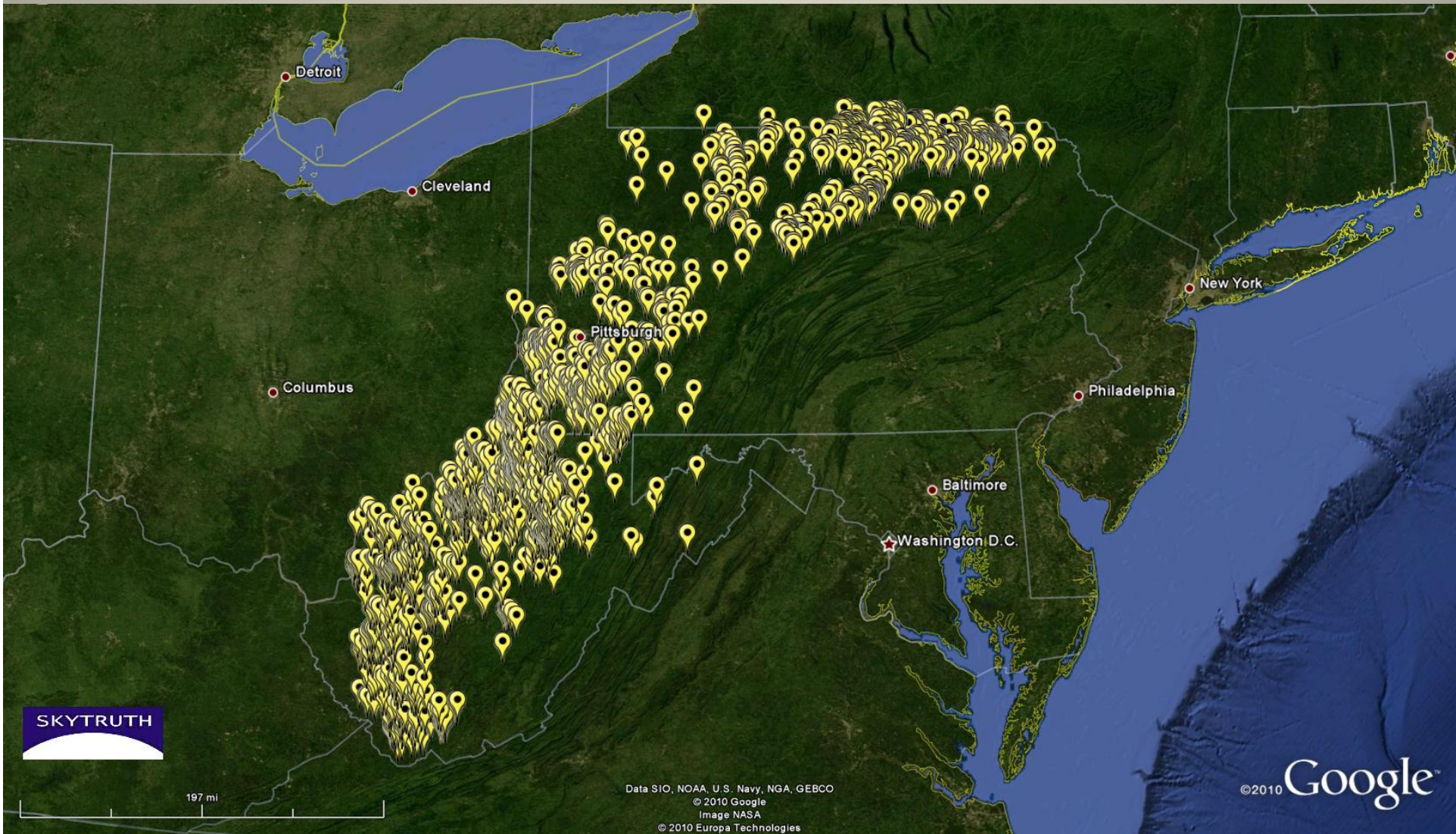
**Well**

**Well**

**Gas**  
**Processing**  
**Plant**

**Compressor**  
**Station**





SKYTRUTH

197 mi

Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
© 2010 Google  
Image NASA  
© 2010 Europa Technologies

©2010 Google™



2004

Nov. 7, 2004



5294 ft

Image © 2010 DigitalGlobe

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2007

Aug 25, 2007

SKYTRUTH

5294 ft

Image USDA Farm Service Agency

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2009

Oct. 20, 2009

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5294 ft

Image USDA Farm Service Agency

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2009

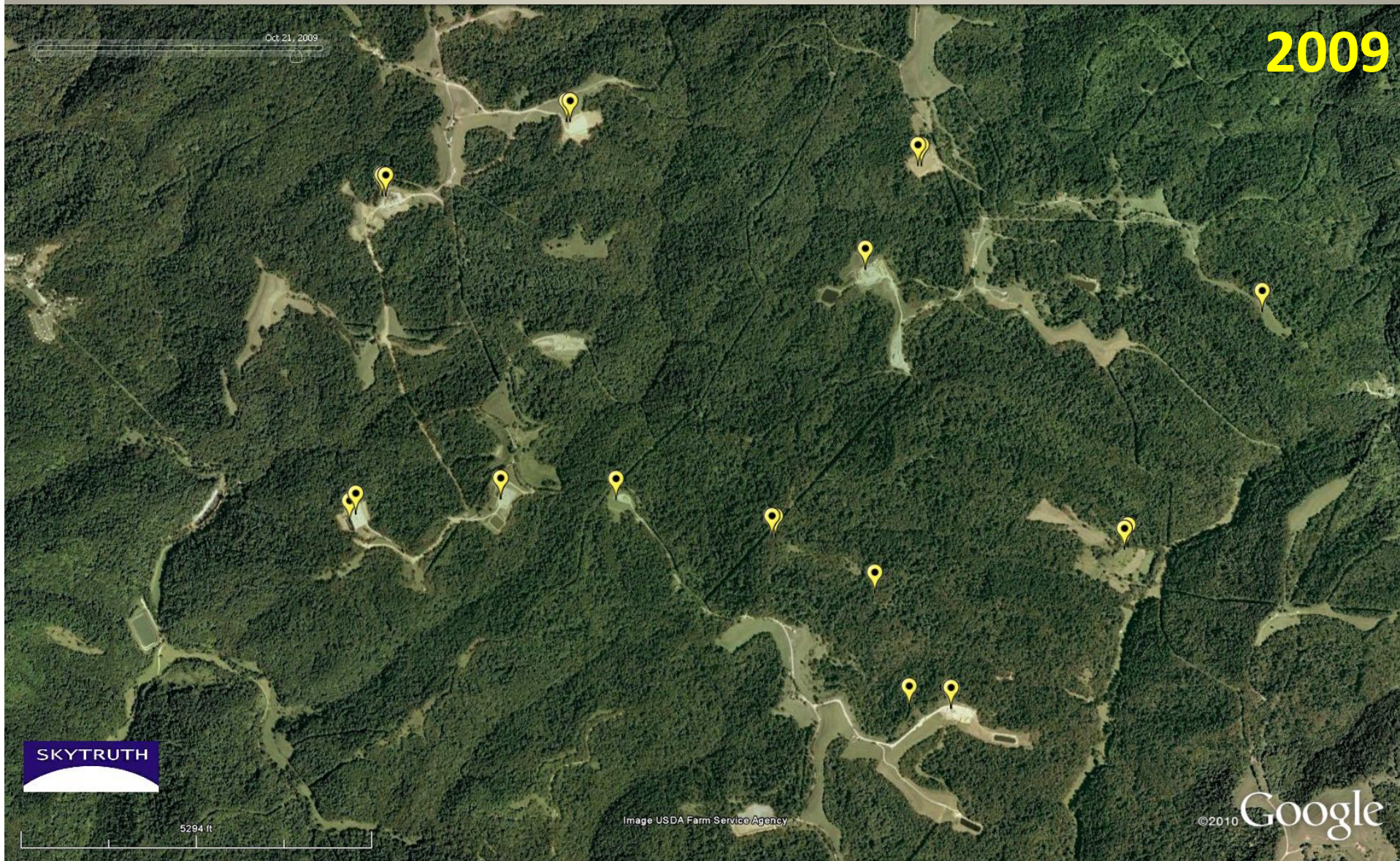
Oct 21, 2009



5294 ft

Image USDA Farm Service Agency

©2010 Google





Aug 25, 2007

2007

SKYTRUTH

789 ft

©2010 Google



Oct 20, 2009

2009



789 ft

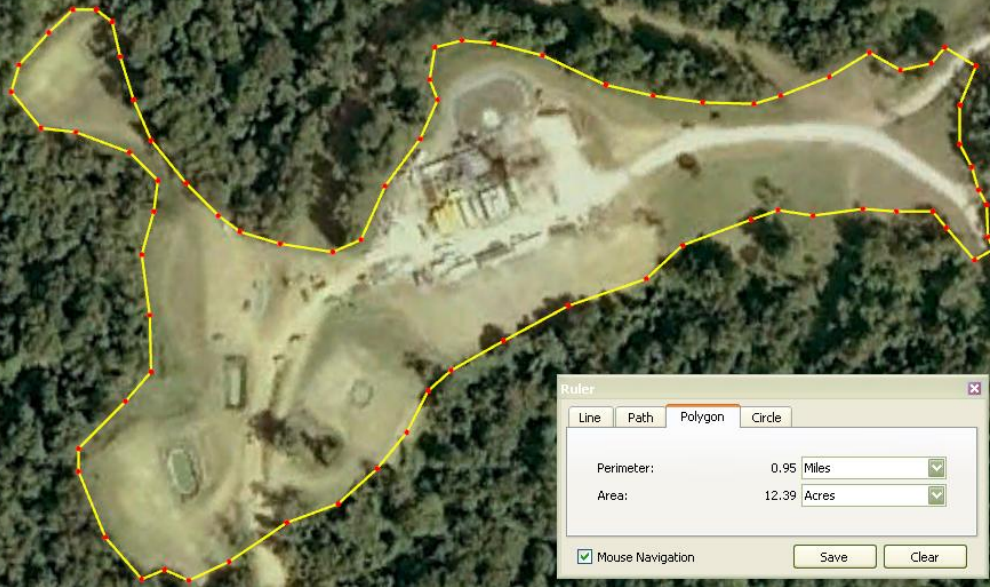
Image USDA Farm Service Agency

©2010 Google



Oct 20, 2009

# 2009



789 ft

Image USDA Farm Service Agency

©2010 Google



Nov. 7, 2004

SKYTRUTH

802 ft

Image © 2010 DigitalGlobe

2004

©2010 Google™



Aug 25, 2007

SKYTRUTH

802 ft

2007

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Oct 20, 2009

SKYTRUTH

802 ft

Image USDA Farm Service Agency

2009

©2010 Google



Oct 20, 2009



802 ft

Image USDA Farm Service Agency

Ruler

Line Path Polygon Circle

Perimeter: 1.27 Miles

Area: 18.13 Acres

Mouse Navigation

Save Clear

2009

©2010 Google



2004

Nov. 7, 2004



828 ft

Image © 2010 DigitalGlobe

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Aug 25, 2007

2007

SKYTRUTH

828 ft

Image USDA Farm Service Agency

©2010 Google



2007

Aug 25, 2007

Ruler

Line Path Polygon Circle

Perimeter: 0.40 Miles

Area: 3.60 Acres

Mouse Navigation

Save Clear



828 ft

Image USDA Farm Service Agency

©2010 Google



Aug 25, 2007

2007

**Additional** No record of WR 35 or release on DEP's site  
**Api** 4705101038  
**Cnty\_Name** Marshall  
**Comments** No prod 2006, 2 months prod 2007. Oil prod 316 (2008)  
**Comp\_Date**  
**County** 51  
**Cumgas\_Mcf** 0  
**Dp\_Fm\_Pene**  
**Dp\_Fm\_Tstd**  
**Elev\_Ft** 1471  
**Fof\_Mcfpd** 0  
**Gas\_2005** 0  
**Gas\_2006** 0  
**Gas\_2007** 15,350  
**Gas\_2008** 59,866  
**lof\_Mcfpd** 0  
**Lat** 39.725181  
**Logs\_Recvd**  
**Long** -80.658031  
**Operator** Chesapeake Appalachia, LLC  
**Pays**  
**Permit** 1038  
**Pmt\_Date** Jun 16, 2006  
**Pmt\_Year** 2006  
**Quad\_75Min** Wileyville  
**Rk\_Pres\_Ps** 0  
**Ryl\_Owner** O.E. Burge  
**Spud\_Date**  
**Sub\_Oper**  
**Suffix** 0  
**Surf\_Ownr** Thirrel A. Altman Sr. Trustee et al  
**Targ\_Dpth\_** 10000  
**Target\_Fm** Tuscarora  
**Td\_Ft** 0  
**Utm\_E** 529307.9  
**Utm\_N** 4397102.2  
**Well\_No** 625530

SKYTRUTH

828 ft

Image USDA Farm Service Agency

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2009

Oct 20, 2009

SKYTRUTH

828 ft

Image USDA Farm Service Agency

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Oct 17, 2008

2008

SKYTRUTH

930 ft

Image USDA Farm Service Agency  
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©2010 Google





Jul 3, 2010

2010

SKYTRUTH

930 ft

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Google





Jul 3, 2010

2010

|                   |                                |
|-------------------|--------------------------------|
| <b>Address1</b>   | 380 SOUTHPOINTE BLVD STE 300   |
| <b>Address2</b>   | NULL                           |
| <b>Apptypeco</b>  | NEW                            |
| <b>Authid</b>     | 823247                         |
| <b>Authypede</b>  | Drill & Operate Well Permit    |
| <b>City</b>       | CANONSBURG                     |
| <b>Clientid</b>   | 141142                         |
| <b>Countyname</b> | Washington                     |
| <b>Datedispos</b> | Mar 2, 2010                    |
| <b>Dispositio</b> | ISSU                           |
| <b>Gisdatum</b>   | North American Datum of 1983   |
| <b>Horizontal</b> | Y                              |
| <b>Latdeg</b>     | 40                             |
| <b>Latitude</b>   | 40.21072222                    |
| <b>Latmin</b>     | 12                             |
| <b>Latsec</b>     | 38.6                           |
| <b>Longdeg</b>    | -80                            |
| <b>Longitude</b>  | -80.35277778                   |
| <b>Longmin</b>    | 21                             |
| <b>Longsec</b>    | 10                             |
| <b>Marcelluss</b> | Y                              |
| <b>Municipali</b> | Hopewell                       |
| <b>Operator</b>   | RANGE RESOURCES APPALACHIA LLC |
| <b>Otherid</b>    | 125-24011                      |
| <b>Sitename</b>   | CHAPPEL UNIT 10H OG WELL       |
| <b>Statecode</b>  | PA                             |
| <b>Subfacid</b>   | 1008367                        |
| <b>Totaldepth</b> | 7000                           |
| <b>Welltype</b>   | GAS                            |
| <b>Zipcode</b>    | 15317-8561                     |



930 ft

© 2010 Google

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2010

Ruler

Line Path Polygon Circle

Perimeter: 0.35 Miles

Area: 4.17 Acres

Mouse Navigation

Save Clear



346 ft

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### III. VISUALIZATION

- “WHAT IF” RENDERINGS BASED ON ACTUAL DRILLING
- MAKES ABSTRACT DRILLING PLANS TANGIBLE, PERSONAL

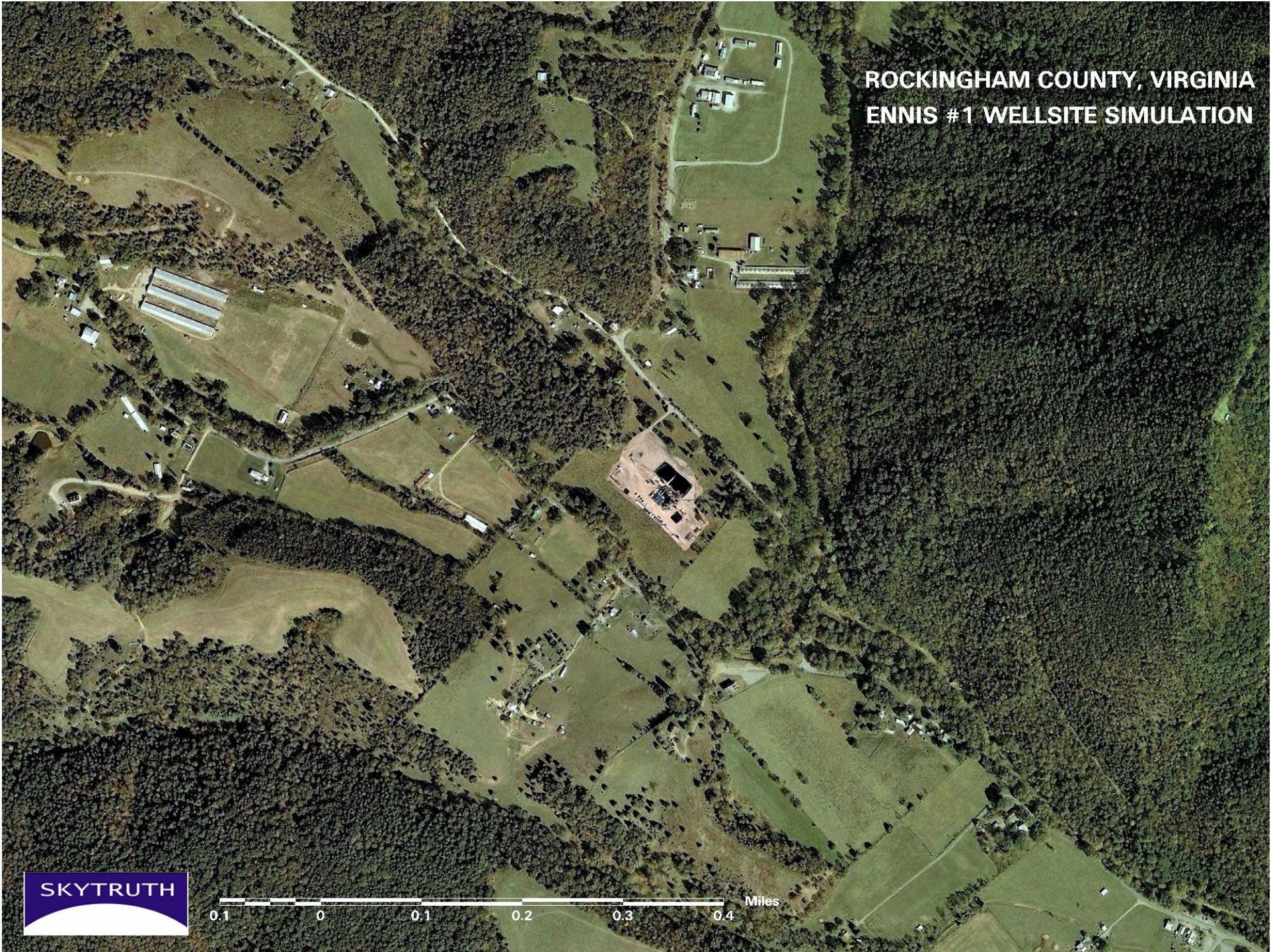


ROCKINGHAM COUNTY, VIRGINIA  
ENNIS #1 WELLSITE (PROPOSED)





**ROCKINGHAM COUNTY, VIRGINIA  
ENNIS #1 WELLSITE SIMULATION**





ROCKINGHAM COUNTY, VIRGINIA  
ENNIS #1 WELLSITE SIMULATION



100 0 100 200 300 400 Yards





SKYTRUTH

3000 Feet









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