WARNING
DO NOT LEASE YOUR
GAS & OIL RIGHTS
TO A SL EAZY CO.
CALLED PENNVIEW
EXPLORATION INC.

BRAD LITTLE OWNER

175 McKnight Road Blairsville
OWNER BRAD LITTLE IS CHEEZY
LAND MANAGER MARVIN D.
HOGUE, WILL LIE TO YOUR FACE
Here comes the boom: shale gas, landscapes and an ecological planning imperative

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Shale gas in the NE US and world

- 6,622 Tcf recoverable gas reserves
- Marcellus shale gas in NE US – +/- 200 Tcf
- Annual use of natural gas in US – 22 Tcf
Sustained boom or firecracker?

• Average production value per well, all PA
  – $760,000 in Year 1
  – $442,000 in Year 2
  – $337,000 in Year 3

• SW Pennsylvania
  – Av. Initial production value $624,000
  – 29% drop off in Year 2
  – 44% drop off in Year 3

• NE Pennsylvania
  – Av. Initial production value $1,800,000
  – 46% drop off in Year 2
  – 60% drop off in Year 3
Outstanding rural landscapes
Positive effects of gas development

• $250 billion in royalty payments for Pennsylvania landowners.
• Jobs in gas industry support and suppliers.
• Reduced reliance on farming for income.
• New development in an economically depressed area.
• Contributes to national energy independence.
Changes: land and infrastructure
Negative effects of gas development

- Impacts of pipelines, traffic, staging areas, on visual/tourism amenities.
- More forest openings, less core wildlife habitat.
- More invasive species.
- Water extraction for hydraulic fracturing.
- Disposal of wastes.
- Accidents and unintended outcomes.
Accepting ecological planning as the desirable approach....

- When are plans called for?
- How do plans get initiated?
- Who has the ability to enact plans?
- Are plans effective?
What shapes gas development?

- Geology
  - Drilling units coincide with NE-SW orientation of underlying geology to maximize well productivity
What shapes gas development?

- **Exemptions (Energy Policy Act, 2005)**
  - Clean Air Act (1970)
  - National Environmental Policy Act (1970)
  - Clean Water Act (1972)
  - Safe Drinking Water Act (1974)
  - CERCLA (Superfund) (1980)

- **Pennsylvania laws (30 day permit guarantee)**
  - Oil and Gas, Act 13 (2012)
  - Scenic Rivers Act (1972)
  - Safe Drinking Water Act (1984)
  - Air Pollution Control Act (1960)
  - Flood Plain Management Act (1978)
What shapes gas development?

- **Pennsylvania Act 13 (2012)**
  - Overhauls Pennsylvania Oil and Gas law
  - Increases minimum setbacks between wells and streams, schools, buildings and water sources
  - Implements per-well impact fee
  - (Impact fee exclusion struck down by courts)
What shapes gas development?

- **County Planning Commissions**
  - **Persuasive powers**
    - Assist in creation of comprehensive plans
    - Technical assistance to municipalities for Subdivision & Land Development Ordinances
  - **Strategic investment**
    - Identify means to effectively link land use, transportation, and economic development
    - Employment training, employee relations, benefits, compensation and safety
    - Social services, housing, health
- **Recording**
  - Leases
  - Pipeline locations
What shapes gas development?

• Landowner choices or negotiations:
  – Lease conditions may be imposed by the mineral rights owner
  – Pipeline locations may be negotiated by the surface owner
  – Water withdrawal and impoundment locations
  – Equipment storage and staging areas

• “Good neighbor” industry policies:
  – Proactively upgrade roads and infrastructure
  – Protect landowner values—agricultural, wildlife, recreational, scenic—to maintain community goodwill
The imperative to design and plan

- **Focus on community empowerment**
  - Show that change has implications
  - Show how those implications can be shaped
  - Show the role that ecological planning plays

- **Example project foci**
  - Impacts of different gas development scenarios
  - Implications of land use change for downstream flood-prone communities.
  - Impacts of resource development on existing landscape values.
  - Long-term energy security of the region.
Build-out of the Marcellus gas industry

• Base data for impact estimates: Nature Conservancy projections of well numbers
Estimating extent of land impacts

• Alternate pipeline location strategies
  Shortest-distance, Market-driven, Conservation

158 Stream crossings
18 Homes displaced
84 Wetlands impacted
1,648 Properties impacted
0.56 Miles per well

148 Stream crossings
3 Homes displaced
49 Wetlands impacted
1,248 Properties impacted
0.63 Miles per well

124 Stream crossings
10 Homes displaced
19 Wetlands impacted
2,198 Properties impacted
0.66 Miles per well

Geodesign analysis and images: Megan Prikockis, Danielle Sette
Watershed protection

- Run-off, downstream flood impacts, effects of alternate pipeline corridor treatments

Montoursville, PA
Tropical Storm Lee, Fall 2011

Reduced land cover, full gas build-out

Pipeline corridor BMP mitigation

Geodesign analysis and images: Emily Carlson, Elliott Shibley
Protecting visual values

• Impacts of land use change
  – Project impacts on visual quality rating

Regression model projects visual quality implications of land use change

Geodesign analysis and images: Michelle Zucker, Brianna Hammond
Renewable energy potential

- Future adaptations of gas infrastructure

Land suitability for wind, solar, biomass—and return on investment

Geodesign analysis and images: Chris Maurer, Mick Humes, Preston Linck
Imperative: empower the community

- **Illustrative web interface**
  - Under development using Drupal 7.0 CMS – mobile-friendly and providing consistent interface to student work.
  - Display interface designed to address range of typical design questions.
  - Solutions accompanied by data and algorithms used in analyses.
  - Allow reapplication of rules with changed model parameters.
  - Feed to tablet-based interactive tool for field use.
Illustrate planning principles...
...to clarify the opportunities available
Anticipate the implications of plans

Geodesign analysis and images: Nick Monroe

Geodesign analysis and images: Sarah Rumbaugh, Kyle Altenbach
...and propose alternates

Geodesign analysis and images: Nick Monroe
Geodesign analysis and images: Sarah Rumbaugh, Kyle Altenbach
The ecological planning imperative

• Must empower and inspire citizens and communities to embrace planning.
• Must communicate the implications of change, for the short term and over time.
• Must enable citizens to make, communicate and enact their own plans.

• The process and the product must be:
  – engaging, interactive, revealing, repeatable
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