

# Engaged Geodesign in the Forgotten Quarter of Pennsylvania

Brian Orland + Timothy Murtha + a bunch of patient students, Landscape Architecture; Bill Doan, Theatre; Dengke Chen and Chujun Zeng, New Media; Dan Meehan, eLearning;  
... all at Penn State University

# WARNING

DO NOT LEASE YOUR  
GAS & OIL RIGHTS

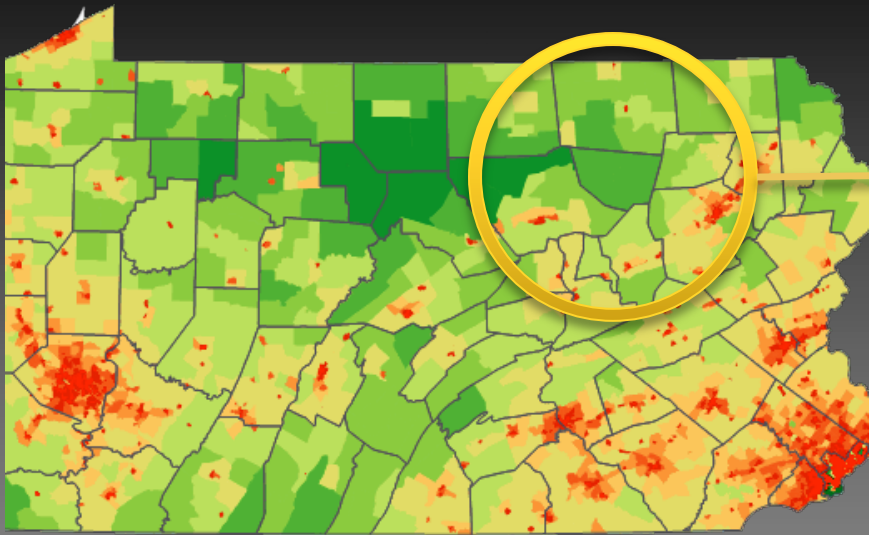
TO A SLEAZY Co.  
CALLED PENNVIEW  
EXPLORATION INC.

BRAD LITTLE OWNER

175 MCKNIGHT ROAD BLAIRSVILLE  
OWNER BRAD LITTLE <sup>is</sup> <sub>the</sub> <sup>in</sup> <sub>Book</sub> IS CHEEZY  
LAND MANAGER MARVIN D.  
HOGUE, WILL LIE TO YOUR  
FACE

# Sullivan County, Pennsylvania

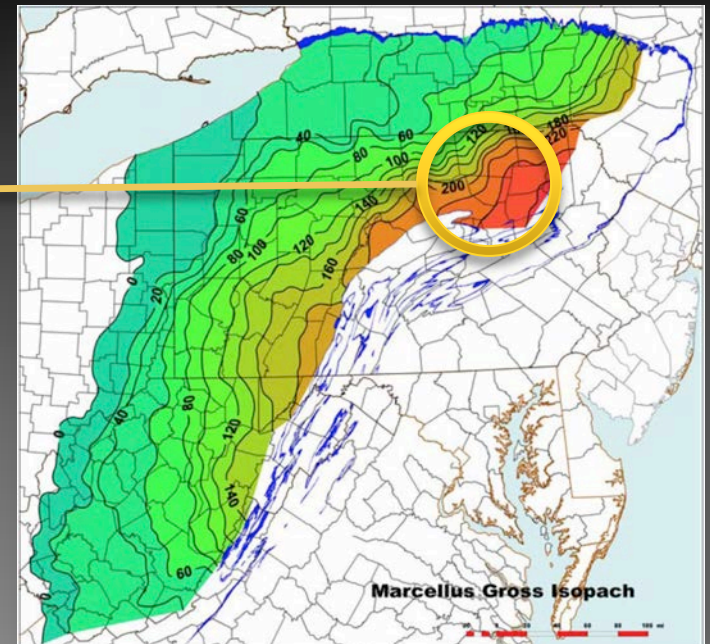
- 6,428 people, 15/square mile
- Projected gas wells in Sullivan County—6,000
- Lifetime estimated royalty per well— \$1.6m
- $\$1.6m \times 6,000 / 6428 = \$1.5m/person$



Pennsylvania population density

Map: Wikipedia

Gas activity and income projections: [marcellusgas.org](http://marcellusgas.org)



June 2013, US Energy Information Administration

“Mr. Penn State LANDSCAPE ARCHITECT - how are you qualified to address forest sustainability issues?”

“What (are you) going to do for Jenny Skinner? What are (you) prepared to do to fix the muddy brown strip [that's] the telltale sign of a buried pipeline right through her land?”

# What **should** we do for Jenny?

- Does Jenny know what she wants?
- Does she know as much as she needs?
- Does she know how to influence her future?
- Does she feel motivated and empowered to do that?
- Does she know what questions to ask?

# The technical problem

- Too much new information
- Too many moving parts
- Don't know what the parts are called

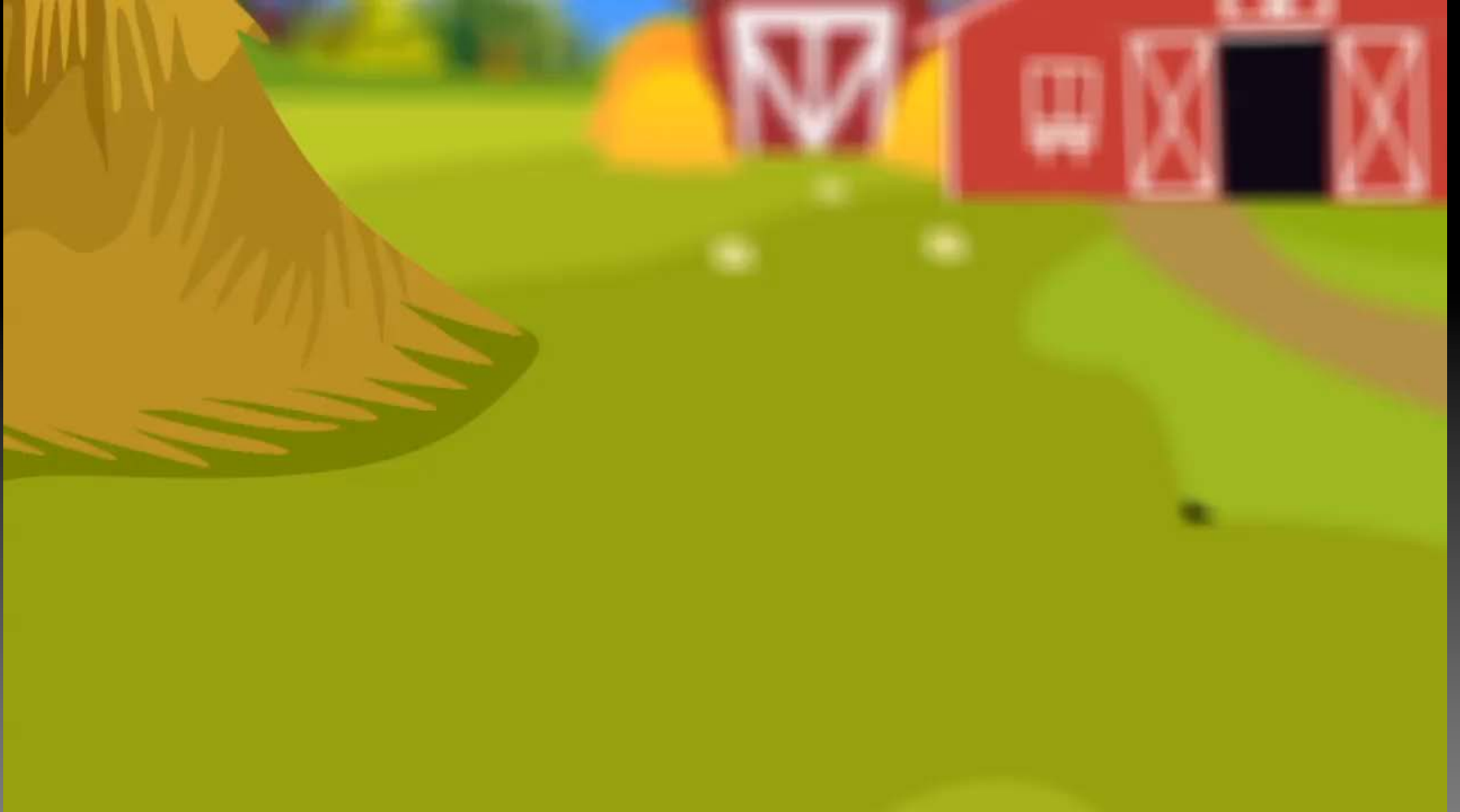
# The people problem

- Regular people...
  - Making choices about complex issues in the face of big industry
  - Needing to believe that solutions are possible
  - Being informed and empowered to seek help in finding solutions

# Our evolving approach

- **A story** to engage and provide context
- **A game** for risk-free exploration and experimentation
- **A treasure chest** of plausible ideas
- **A tool kit** of analytical elements that can take us wherever the stories and games dictate

# 1. A story to set the scene



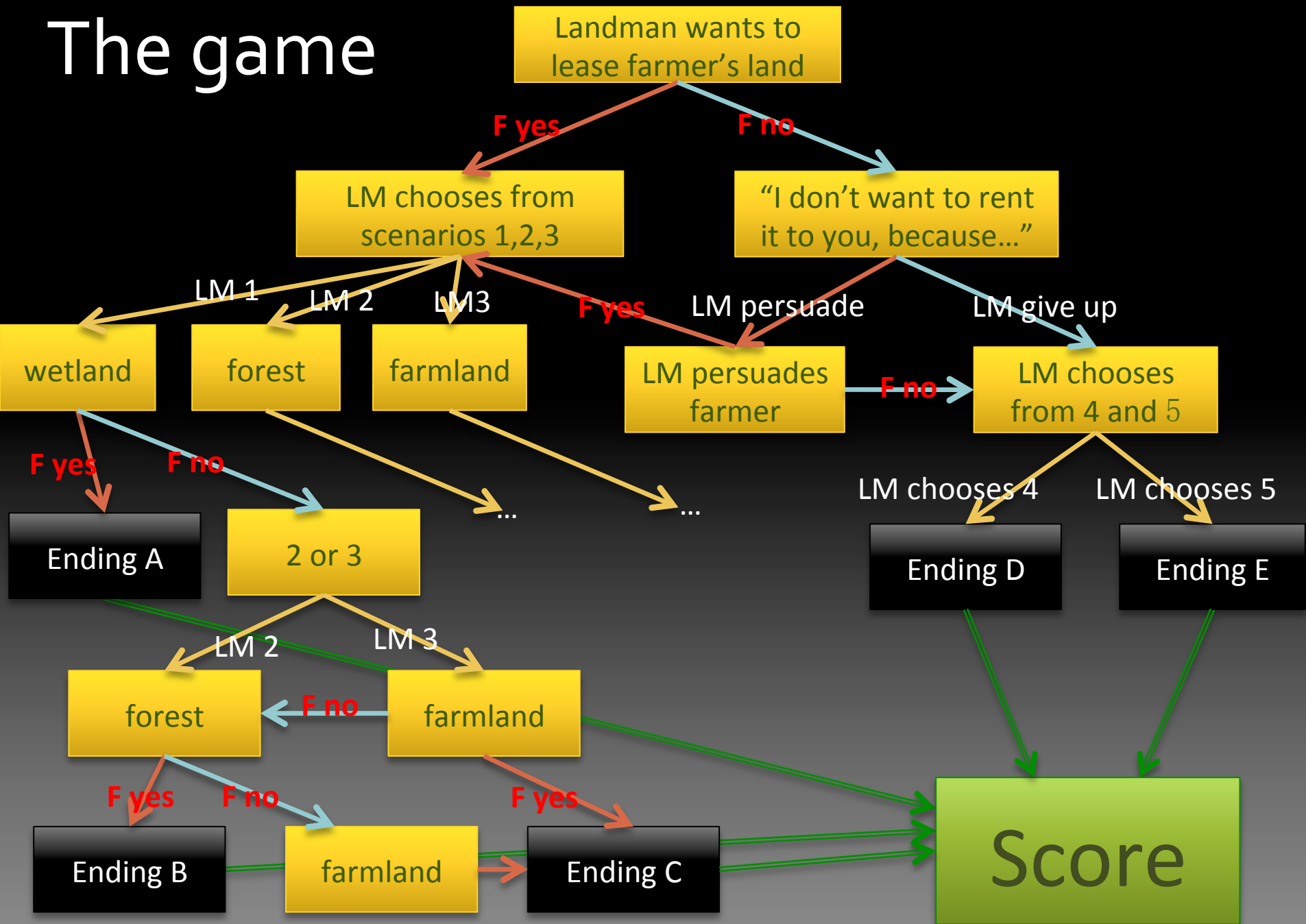


## 2. A serious game to explore the issues



Let's explore some of the factors that determine where a pipeline can go

# The game



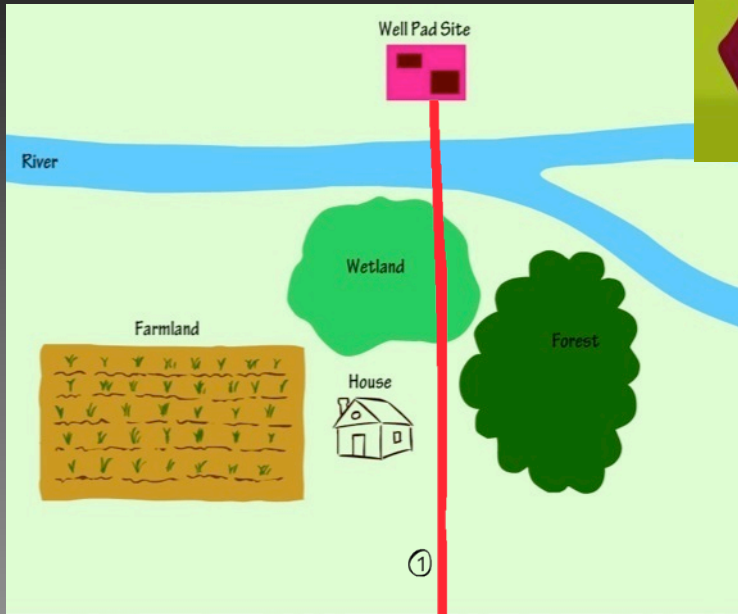
# Pick a route, learn the issues

Shortest distance

Cost

Impacts wetland

Close to house



# Pick a route, learn the issues

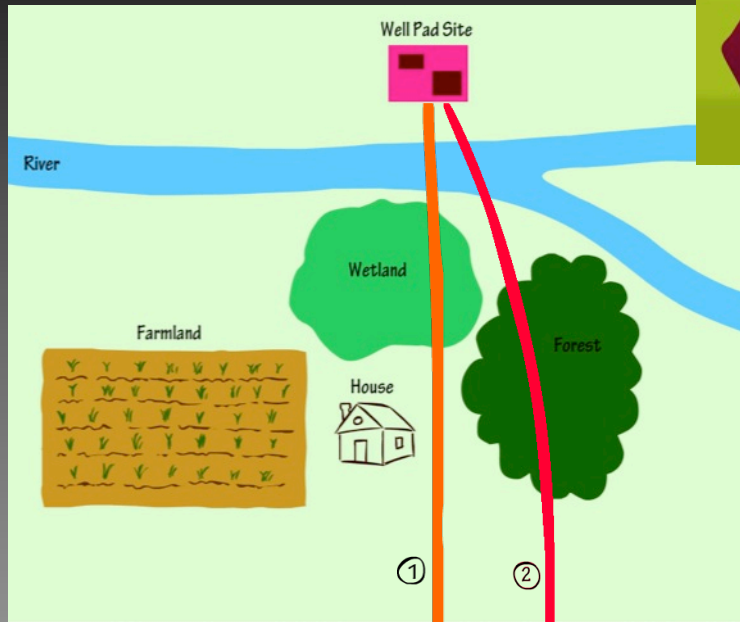
## Through forest

More cost

Avoid wetland

Habitat loss

More run-off



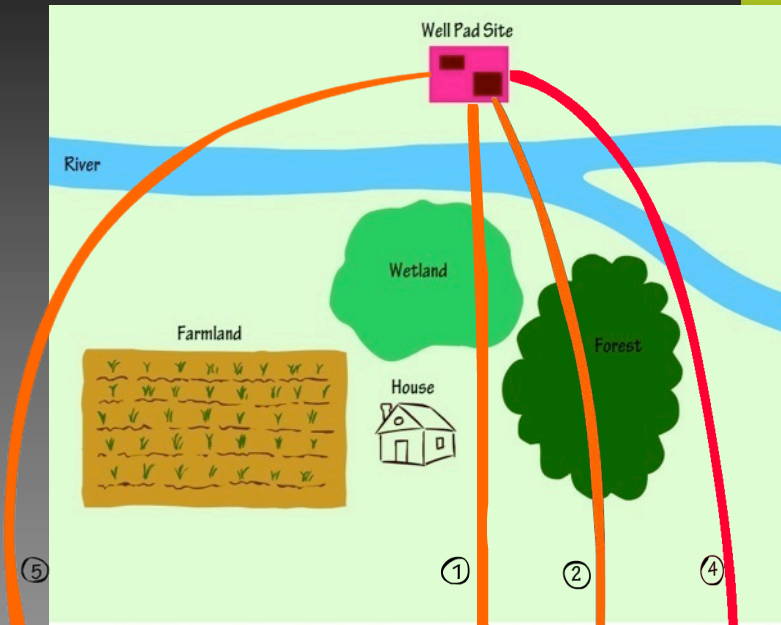
# Pick a route, learn the issues

## Around forest

More cost

Avoid wetland

Two stream crossings



# Score!

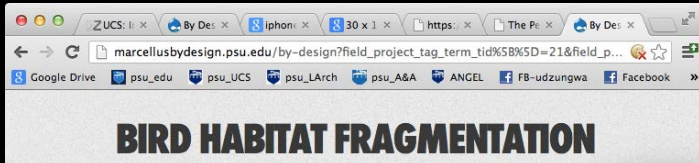
1 Stream crossing  
1 Home displaced  
1 Wetland impacted  
0 Forest acres lost  
0.56 Miles per well

1 Stream crossing  
0 Homes displaced  
0 Wetlands impacted  
3 Forest acres lost  
0.63 Miles per well



2 Stream crossing  
0 Homes displaced  
0 Wetlands impacted  
0 Forest acres lost  
0.66 Miles per well

# 3. The treasure chest of examples



Current Conditions vs. Market-Based Gas Development Disturbance

Current Conditions vs. Conservation-Based Gas Development Disturbance

Sullivan County

American Bittern Blue Jay Black Throated Green Warbler Chipping Sparrow

Golden-Winged Warbler Yellow Bellied Flycatcher

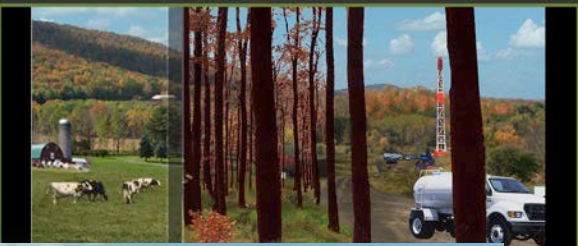


Current Conditions vs. Drilling Phase

Drilling Phase vs. Production Phase

Production Phase vs. Reclaimed Landscape

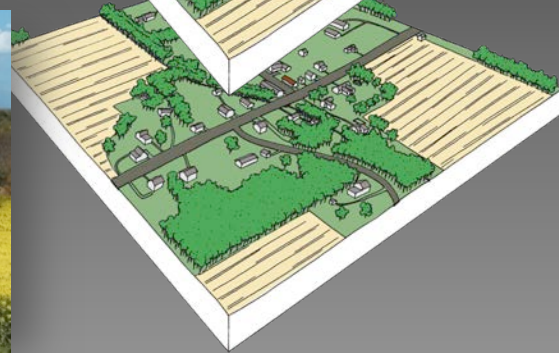
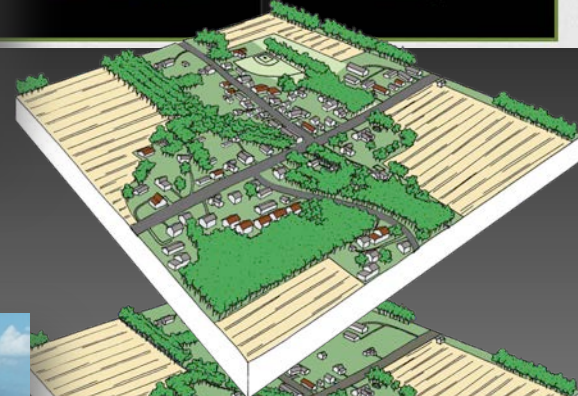
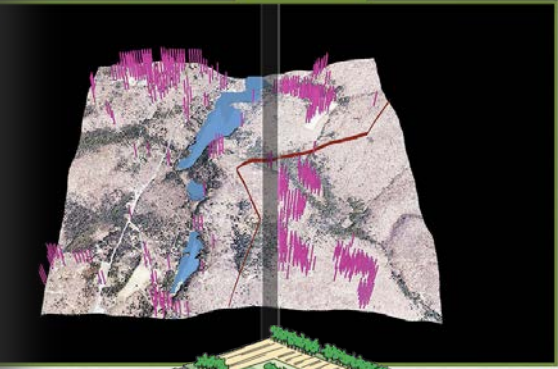
Active Dairy Farm Inactive Dairy Farm Land Conversion Alternative I Land Conversion Alternative II



Pre-Gas Development vs. 2012 Conditions

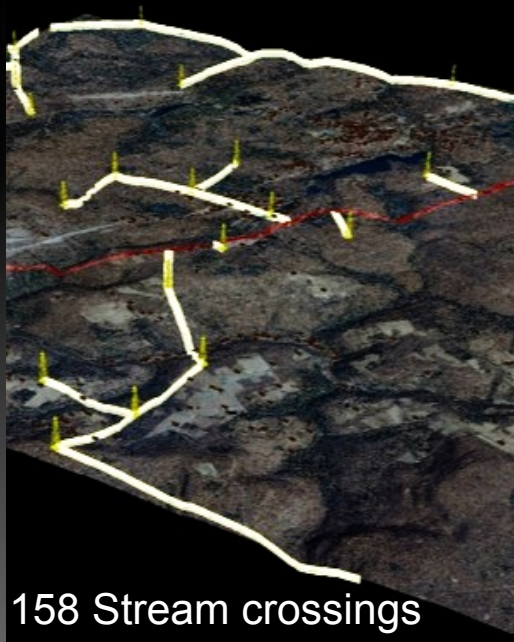
Lake Mokoma

Tree of Heaven Japanese Stilt Grass Japanese Honeysuckle

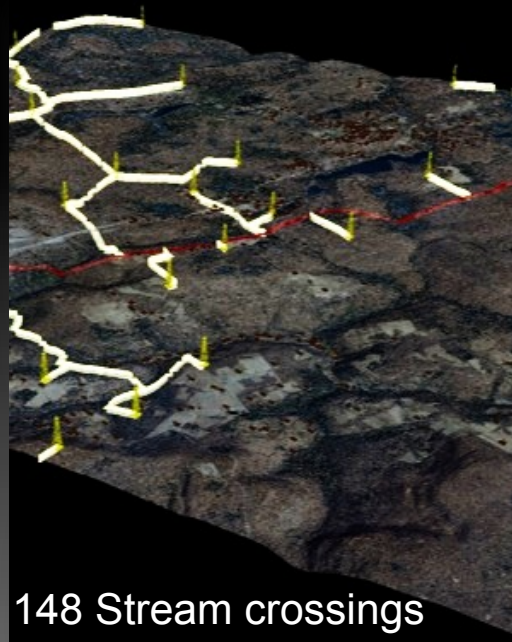


# A past example: Pipeline land impacts

- Alternate location strategies and their impacts  
Shortest-distance, Market-driven, Conservation



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



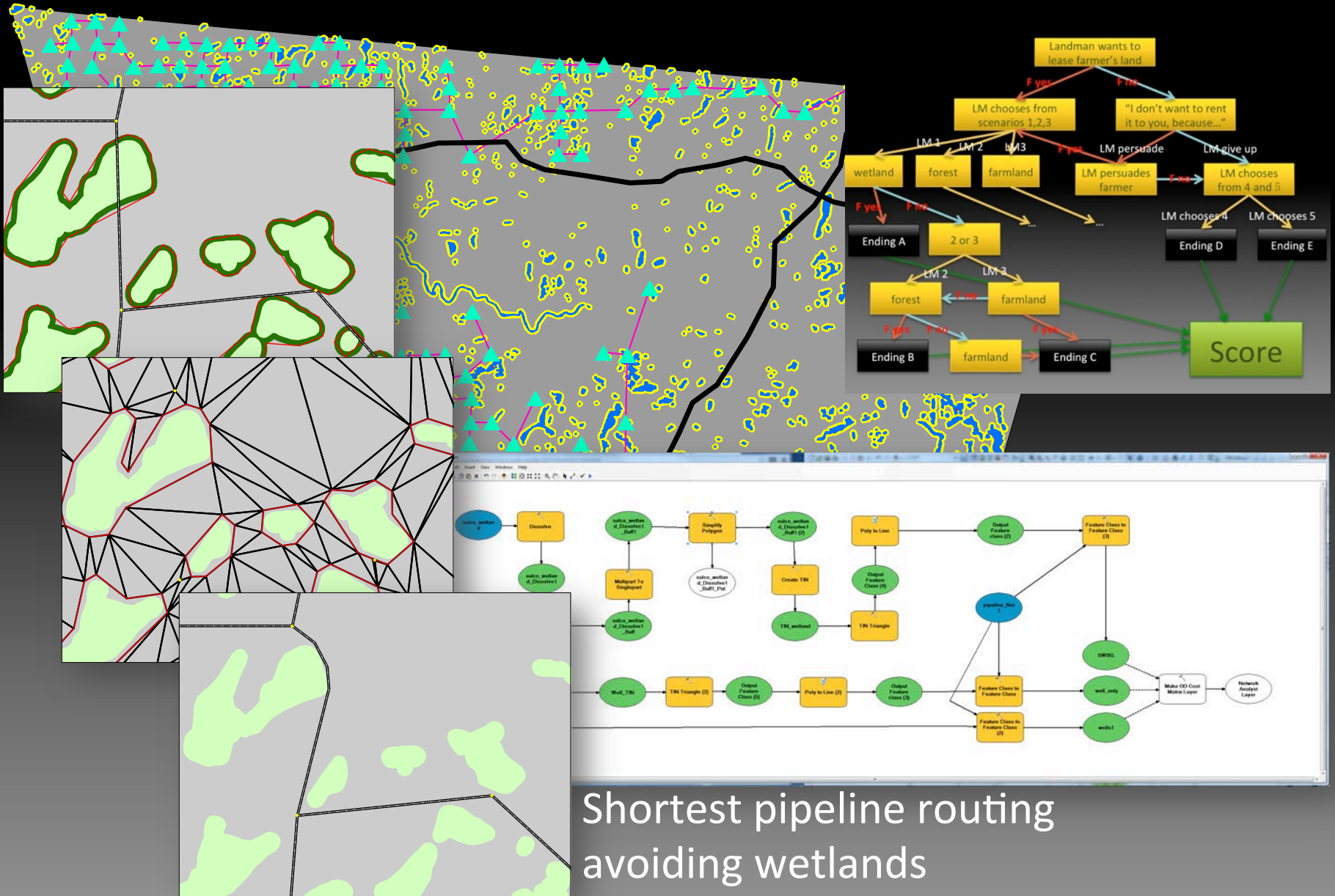
148 Stream crossings  
3 Homes displaced  
49 Wetlands impacted  
1,248 Properties impacted  
0.63 Miles per well



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



# 4. The geodesign toolkit



Shortest pipeline routing avoiding wetlands

1. tell the story,
2. examine the issues,
3. explore analogous examples,  
....grow the ability to ask  
appropriate questions, and...
4. grab the toolkit to seek solutions

[b-orland@psu.edu](mailto:b-orland@psu.edu) [tmurtha@psu.edu](mailto:tmurtha@psu.edu)

Department of Landscape Architecture  
The Pennsylvania State University

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