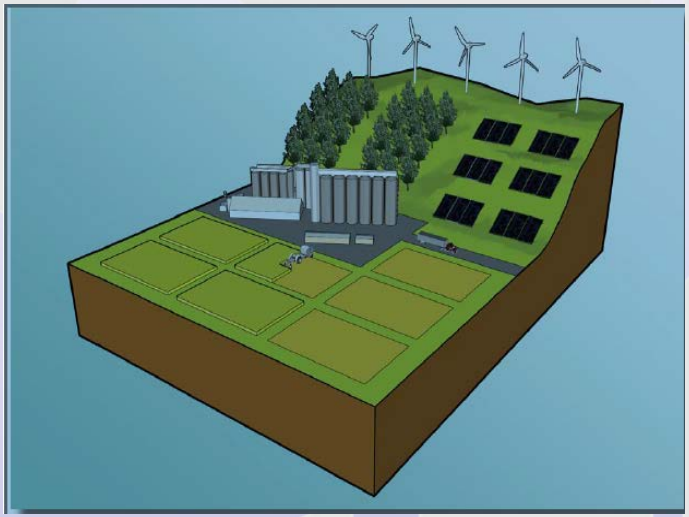
Sustainable Energy Parks on Surface-Mined Lands

Renewable Energy in West Virginia Conference- June 5, 2014



Funded through a US EPA Brownfields Grant and in collaboration with Marshall University

Peter Butler, Assistant Professor of Landscape Architecture
Patrick Kirby, Director West Virginia Brownfields Assistance Center

WestVirginiaUniversity
West Virginia Water Research Institute

SUSTAINABLE ENERGY PARK:

a former mine site with sufficient space, physical characteristics, infrastructure, and stakeholder support to accommodate the production of renewable energy products

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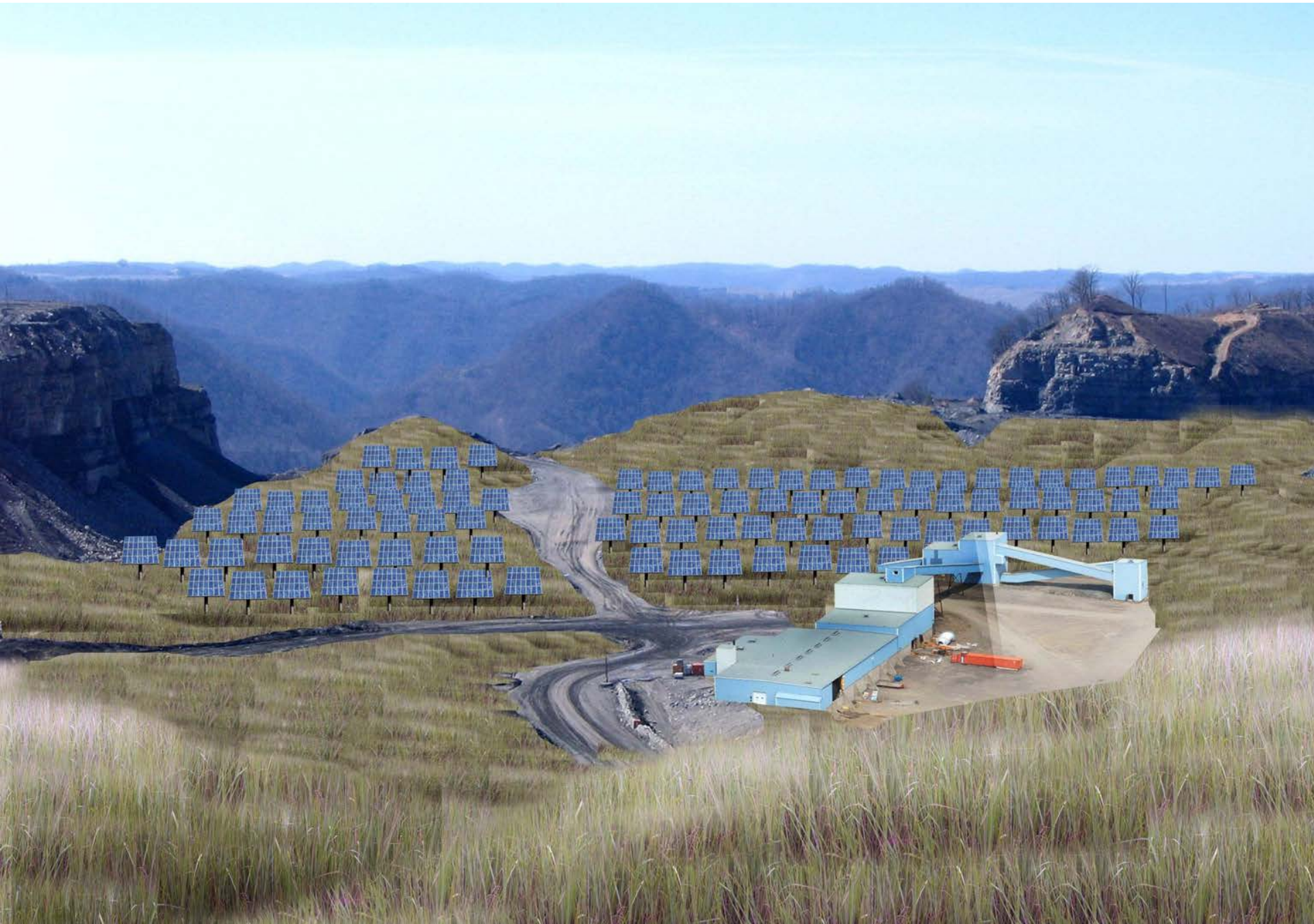
Project Description:

Develop a framework for the establishment of Sustainable Energy Parks on former mine sites in Appalachia.

Premise

Sustainable Energy Parks in former coalfield communities will be able to utilize:

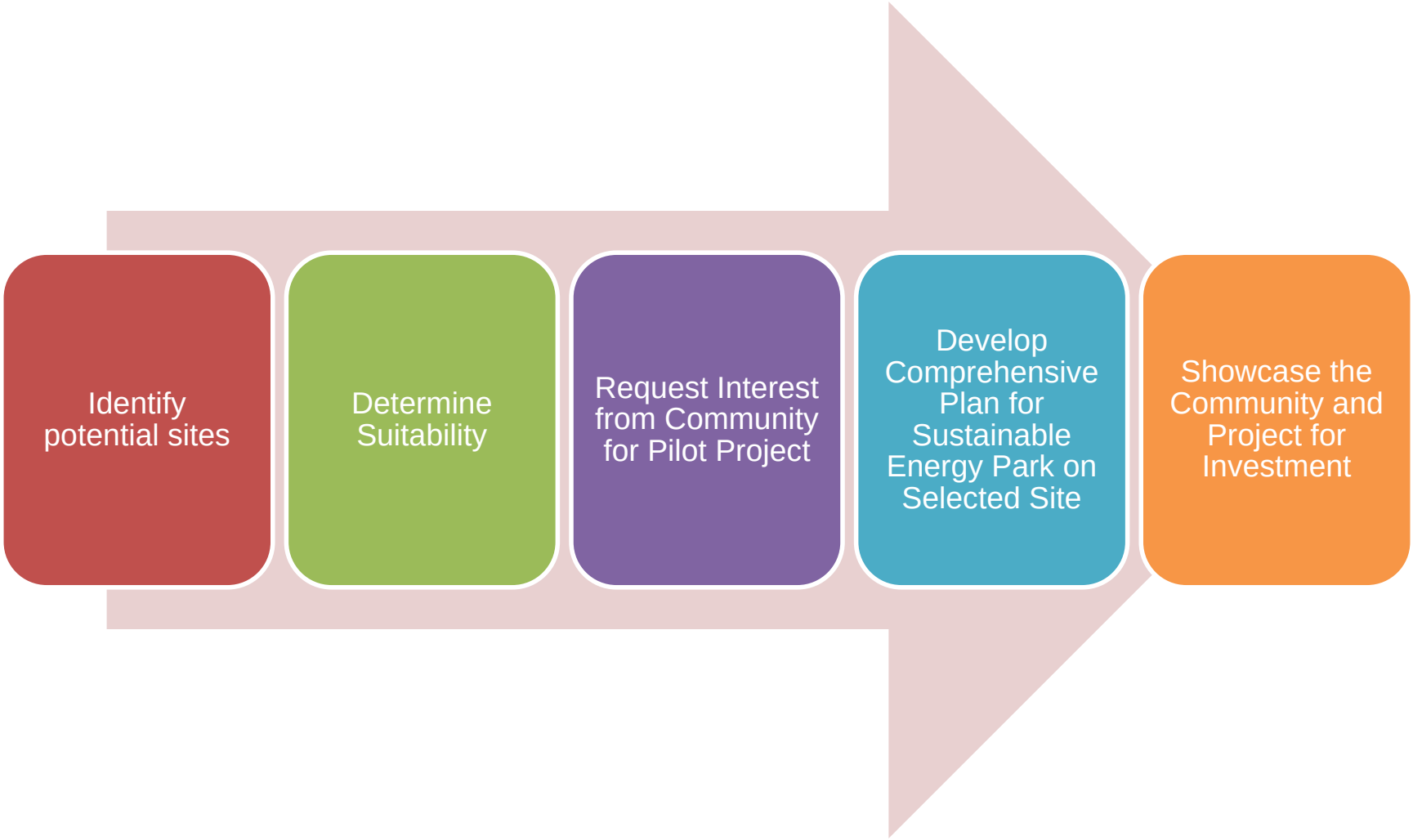
- existing energy and industrial transportation infrastructure
- large, contiguous tracts of land
- a labor force that is familiar with processing natural resources
- a location suitable for the production of a range of alternative energy resources.



Approach


Combination of Renewable Energy Sources
Leverage Grant Opportunities
State and Federal Tax Incentives
Successful Implementation
Community Partners
Business Partners

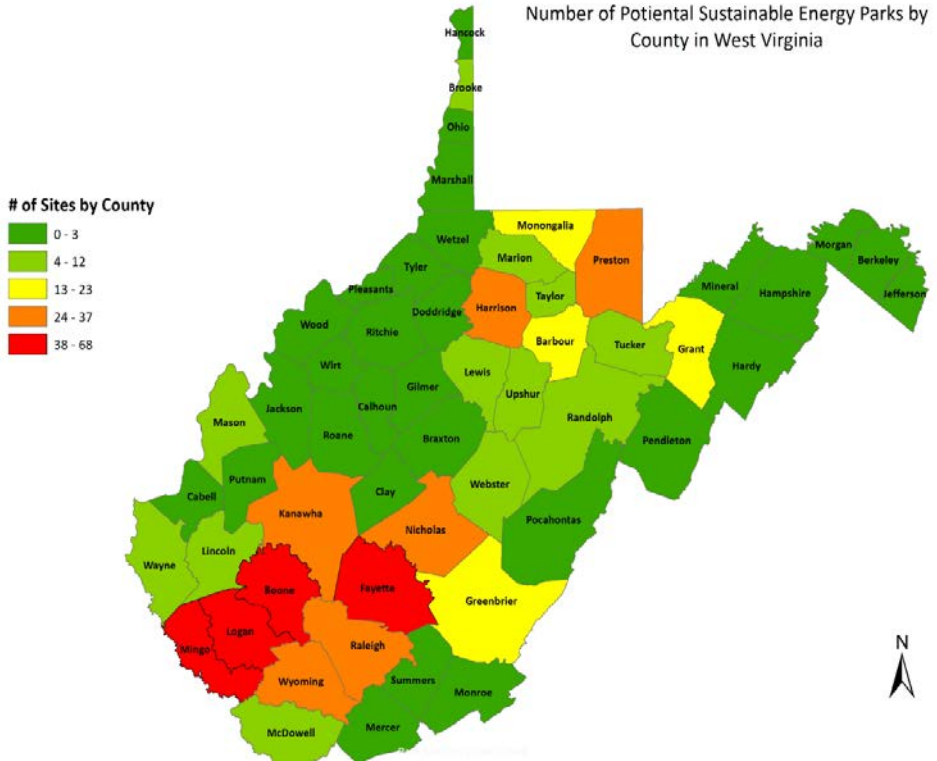
Components of the Project



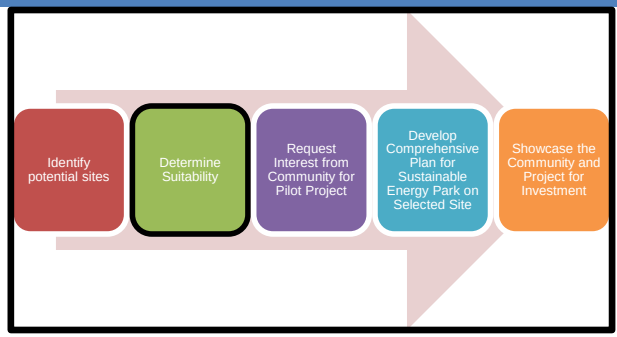
Site Identification

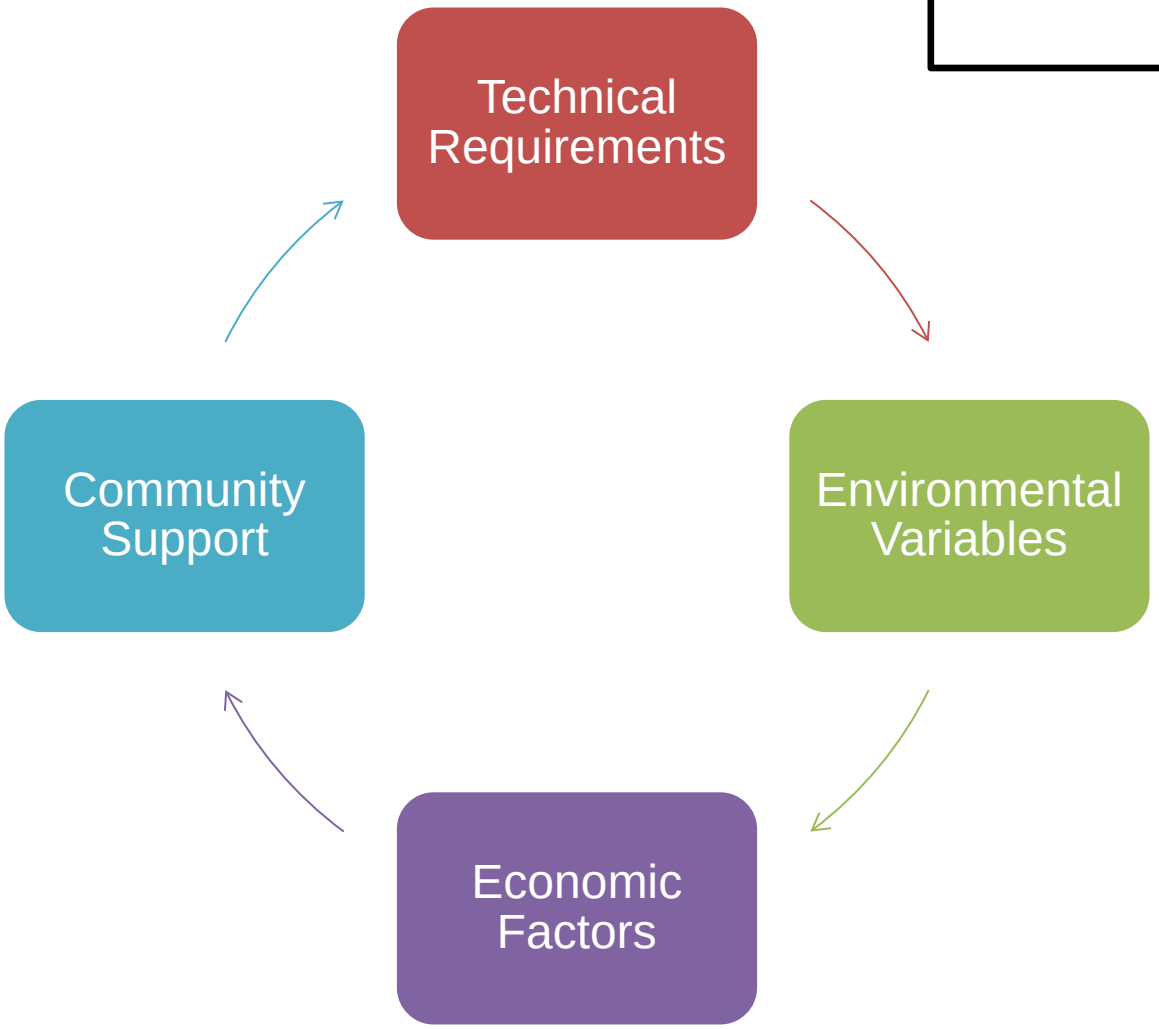
- GIS Analysis
- Site Characteristics
- Evaluation of Renewable Energy Potential (Macro Level)

The research efforts produced an inventory of 612 sites throughout West Virginia that are potentially suitable options for the development of SEPs.

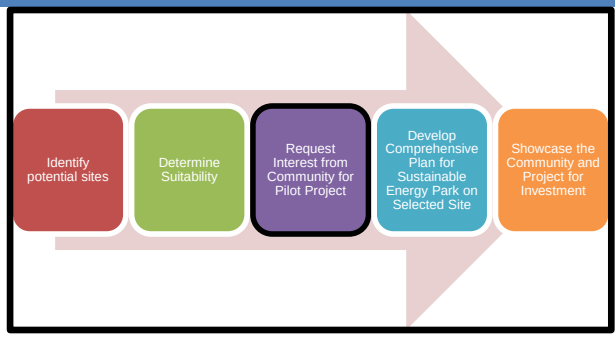


Suitability



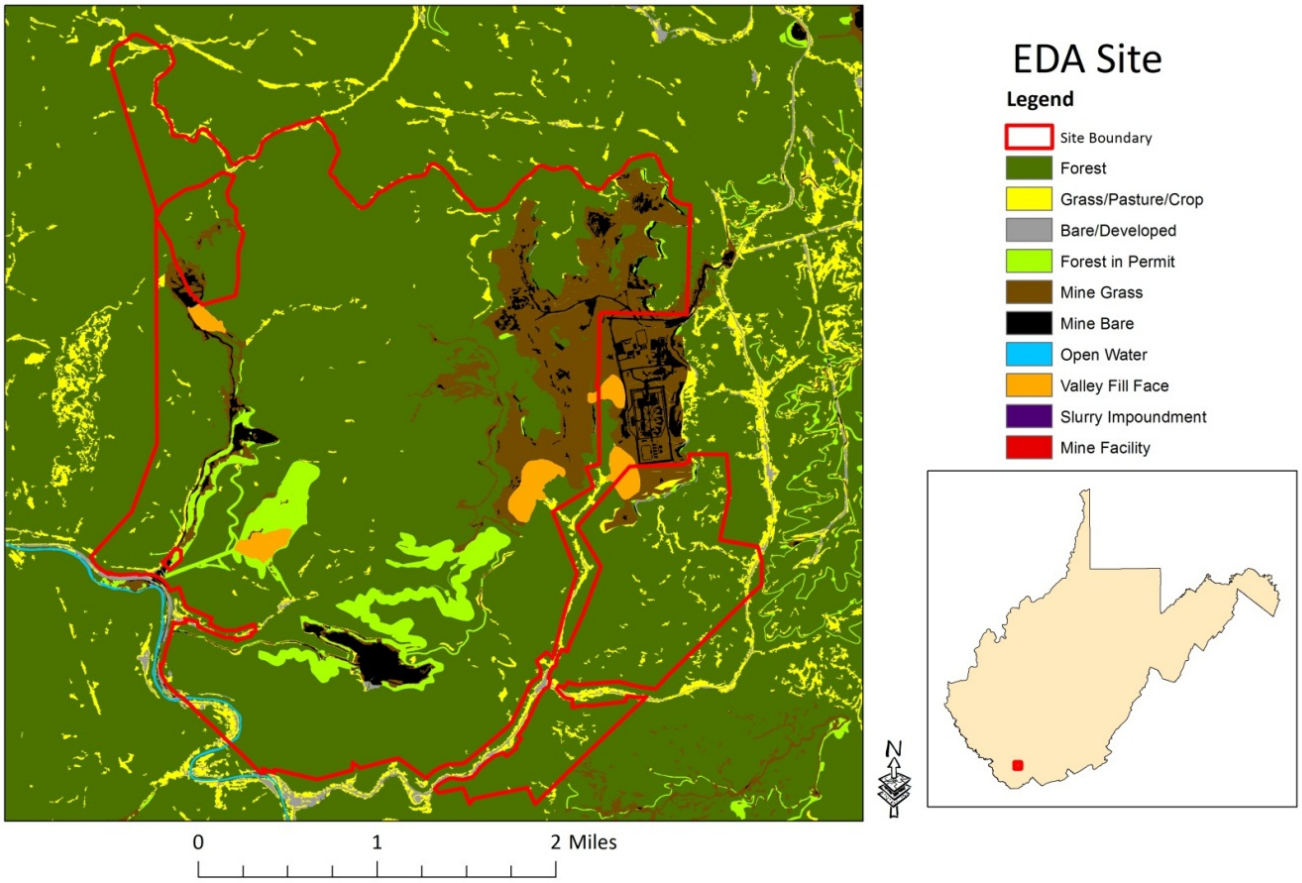


Site Selection

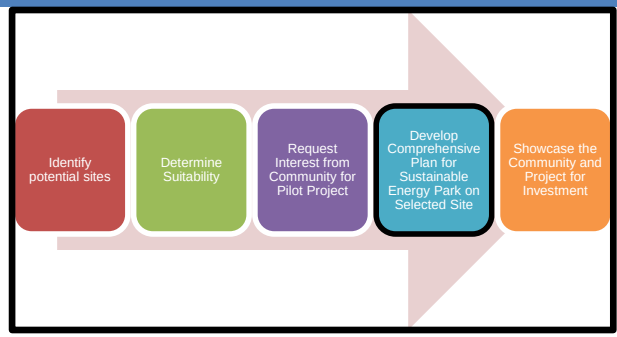


Indian Ridge Industrial Park

McDowell County Economic Development Authority



Comprehensive Development Plan for McDowell County Site



Goal:

To promote financial and community investment in McDowell County through the Sustainable Energy Park Model

Objective:

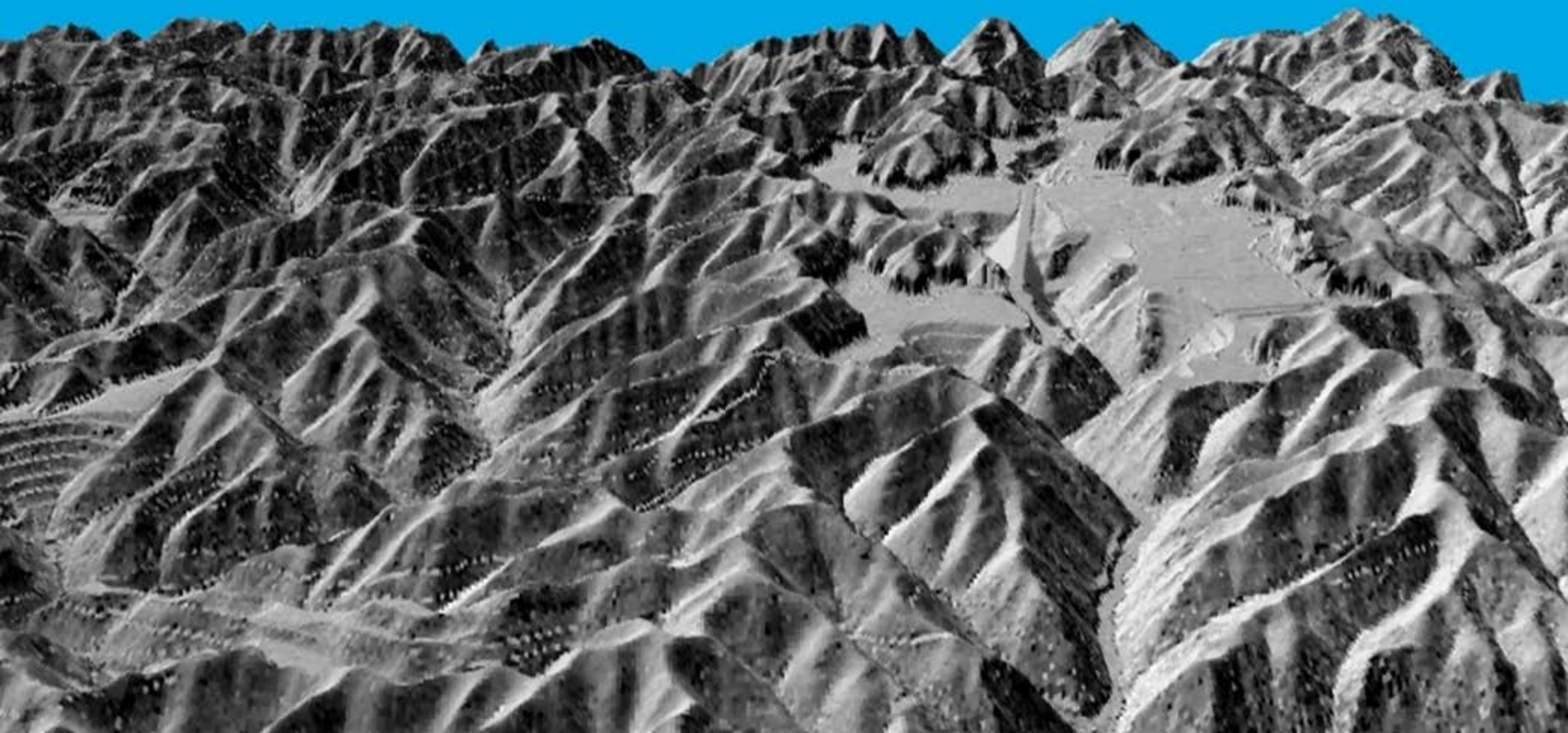
Provide a Comprehensive Development Plan for a Sustainable Energy Park on the Indian Ridge Site

Anticipated Benefits to Project Partners

- Sustainable Energy Park Comprehensive Plan for development of the site
- Spotlight on the potential of a SEP site in the community to attract the attention of developers, investors, employers, and others.
- Technical assistance from experts in biofuels growth, harvesting, and processing; wind energy; solar energy; geo-thermal energy; land use planning; business development; and marketing.
- Detailed information on the selected former mine site.

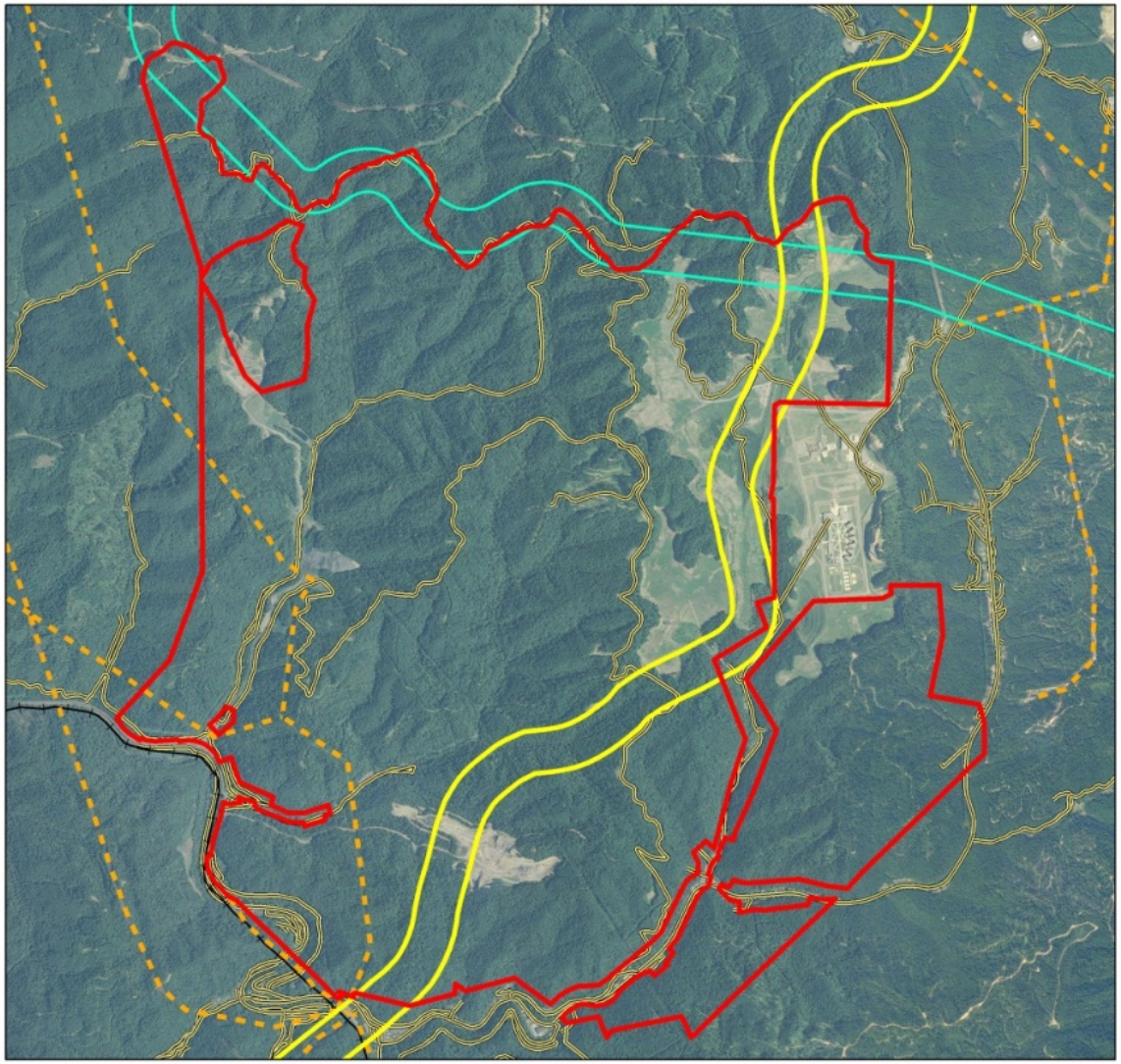
Mapping and Modeling

- Constructed digital three-dimensional model base with LiDAR



Created a detailed inventory and analysis of the site including context of the pilot SEP area; that is, land cover, land uses, drainage, vegetation, etc.

Inclusion of Future Planned Roads



EDA Site

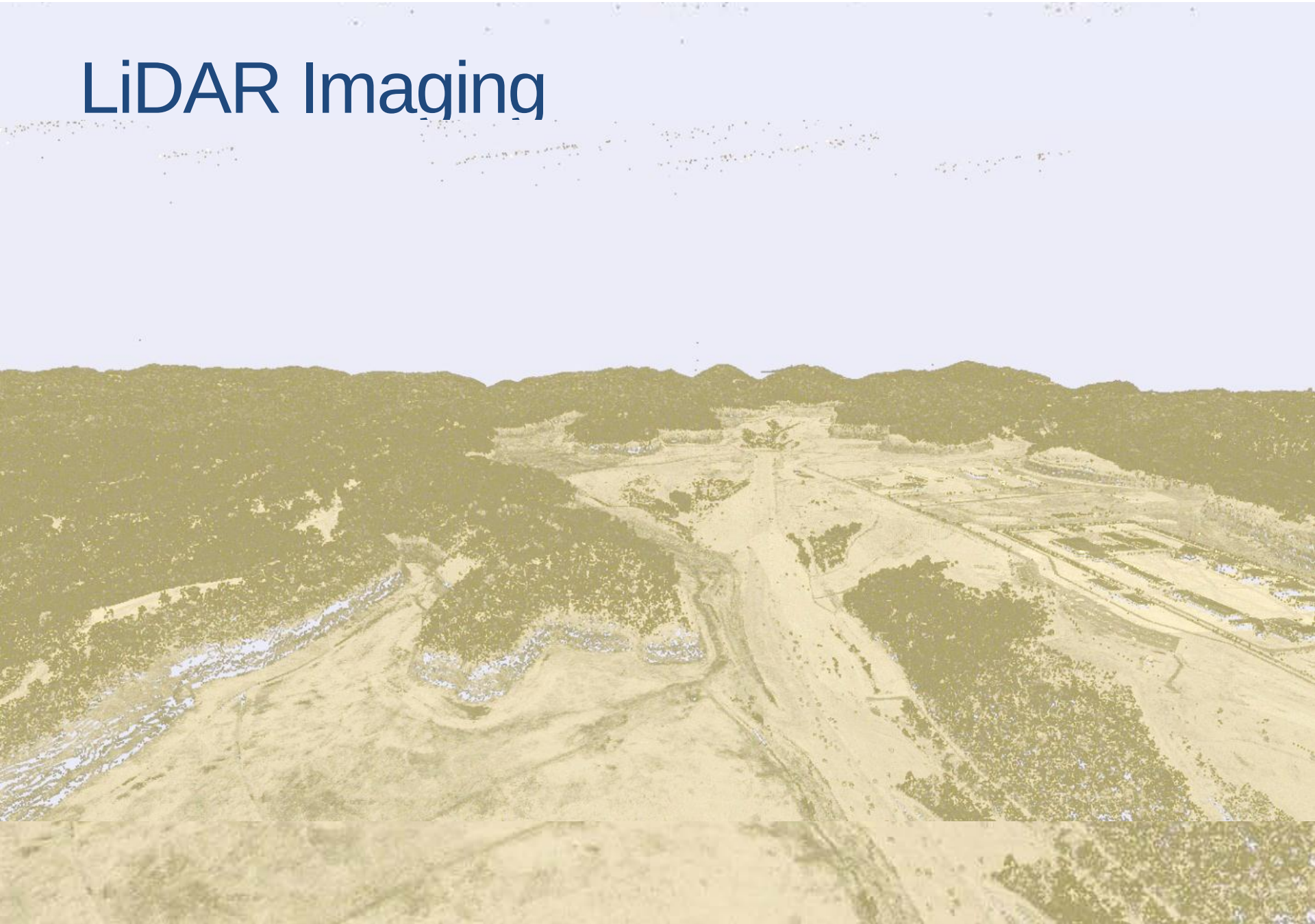
Legend

- Site Boundary
- Potential Coalfields Expressway
- Potential King Coal Highway
- Transmission Power Lines
- Railroad
- Roads

N

0 1 2 Miles

LiDAR Imaging

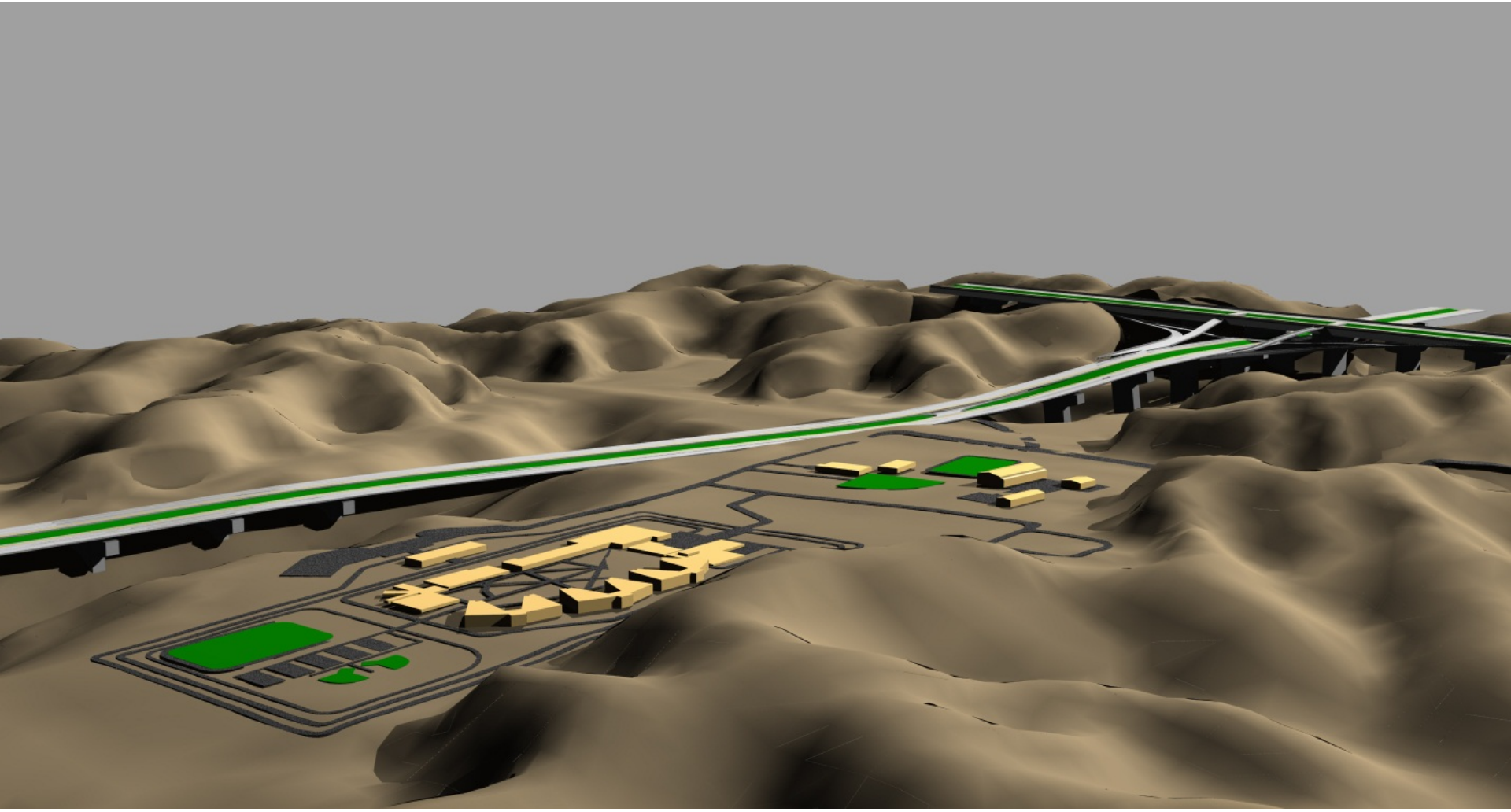


Indian Ridge Site: Detailed Drainage

0 250 500 1,000 Meters

N

3-D Modeling



Master Plan Development

Complete a participatory planning process

Develop comprehensive development plan integrating land use planning, smart growth, and sustainable incentives

Create Master Plan visualizations

Participatory planning process

Expert Participation and Consultation

Local Official Participation

Community Participation

Focus Groups-
Education, Business/Industry, and Recreation

Youth Participation

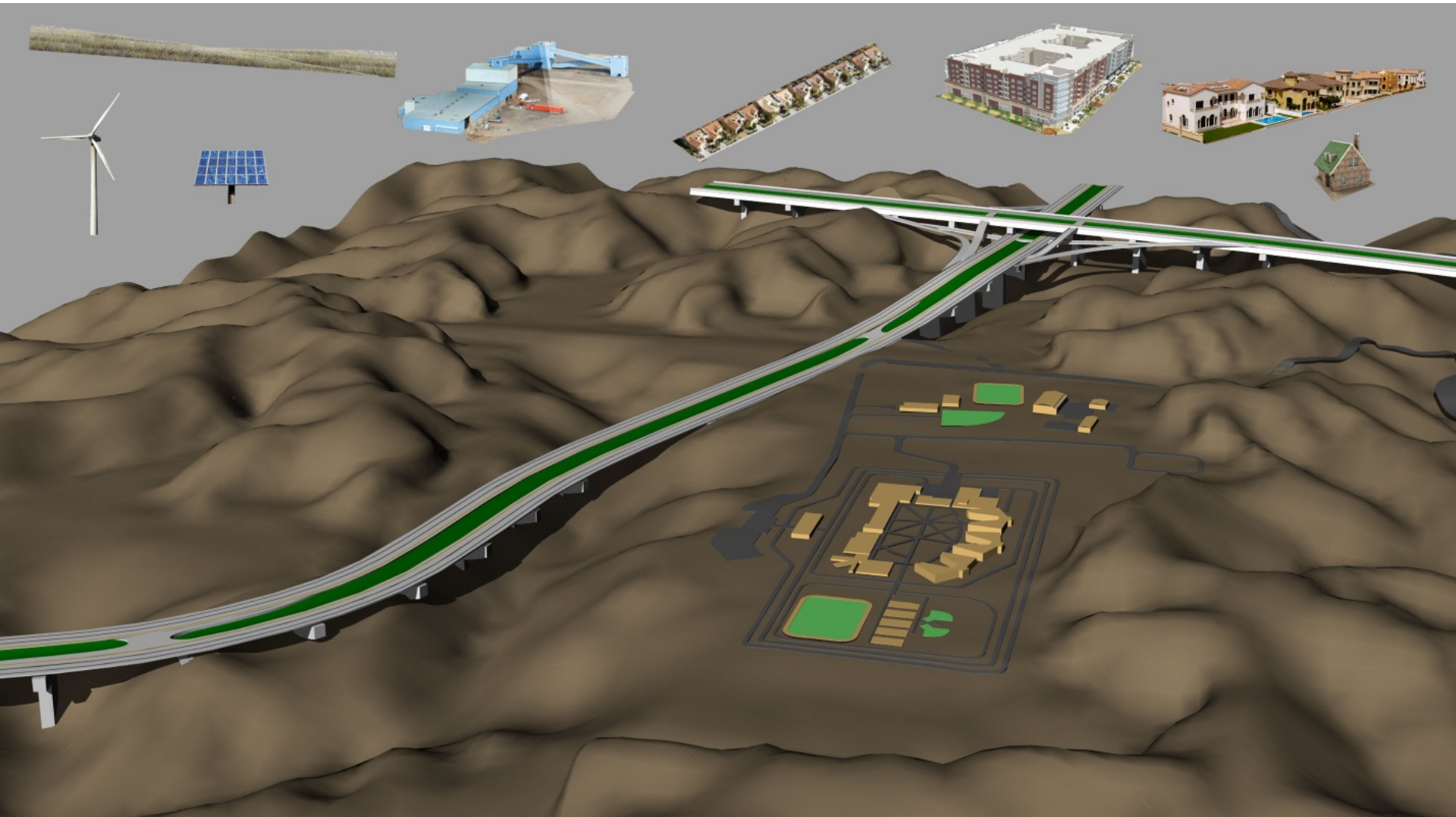
Community Engagement and Input

Community Participation: Local Youth

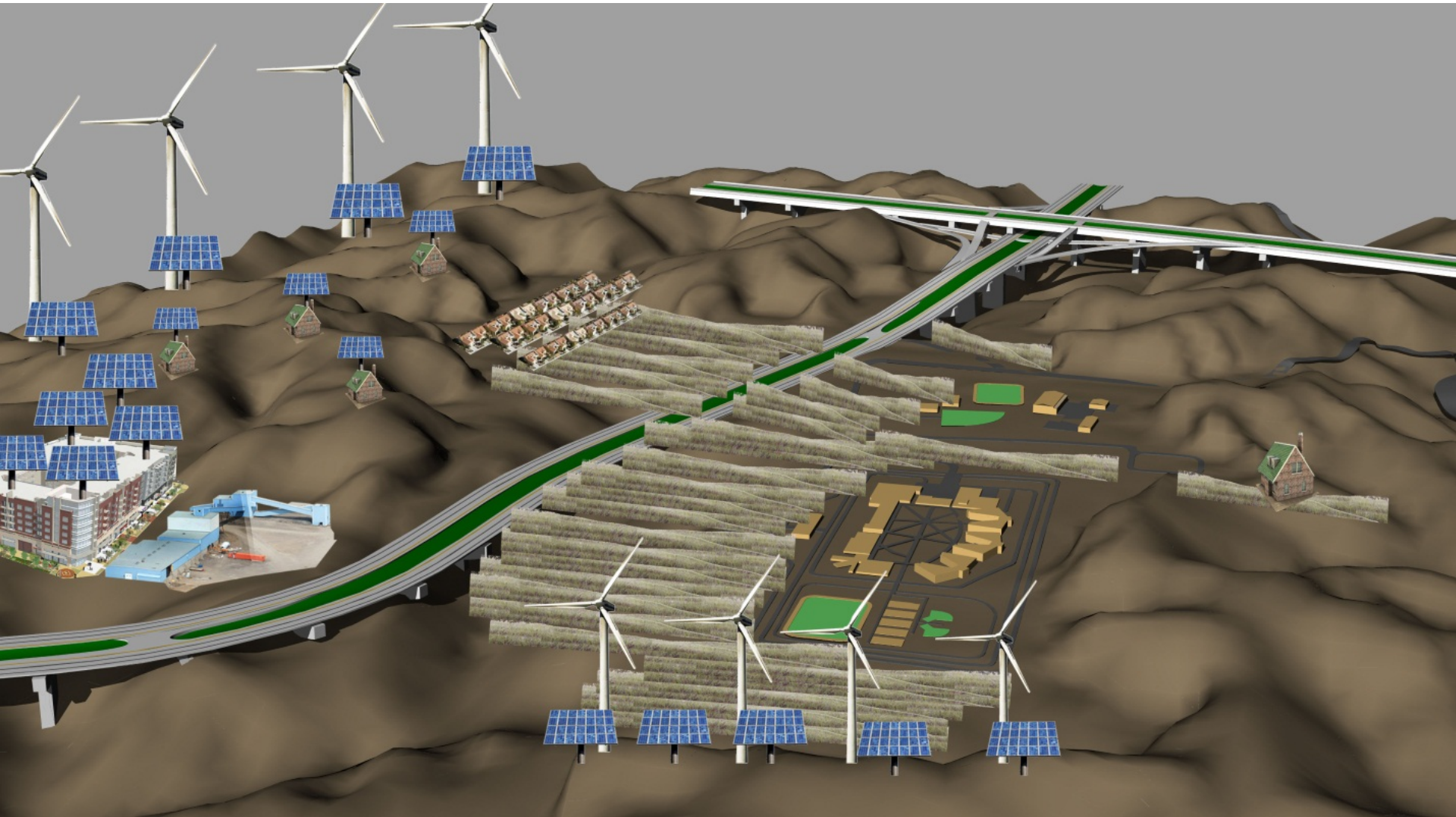
McDowell and Wyoming County 4H camp

Glen Fork, WV during the week June 25-29, 2012

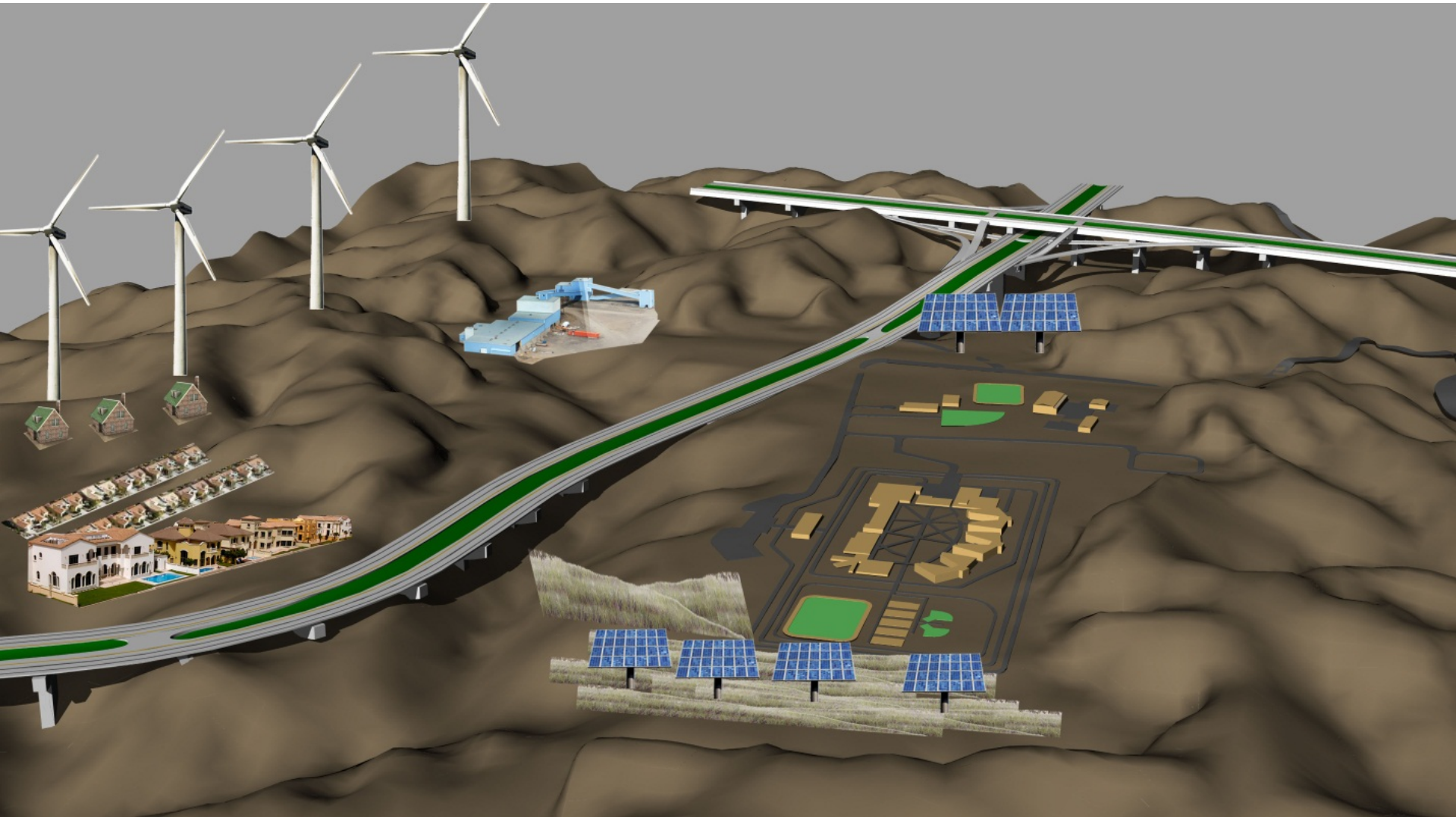
Modeling with the Community



Modeling with the Community



Community Modeling Options



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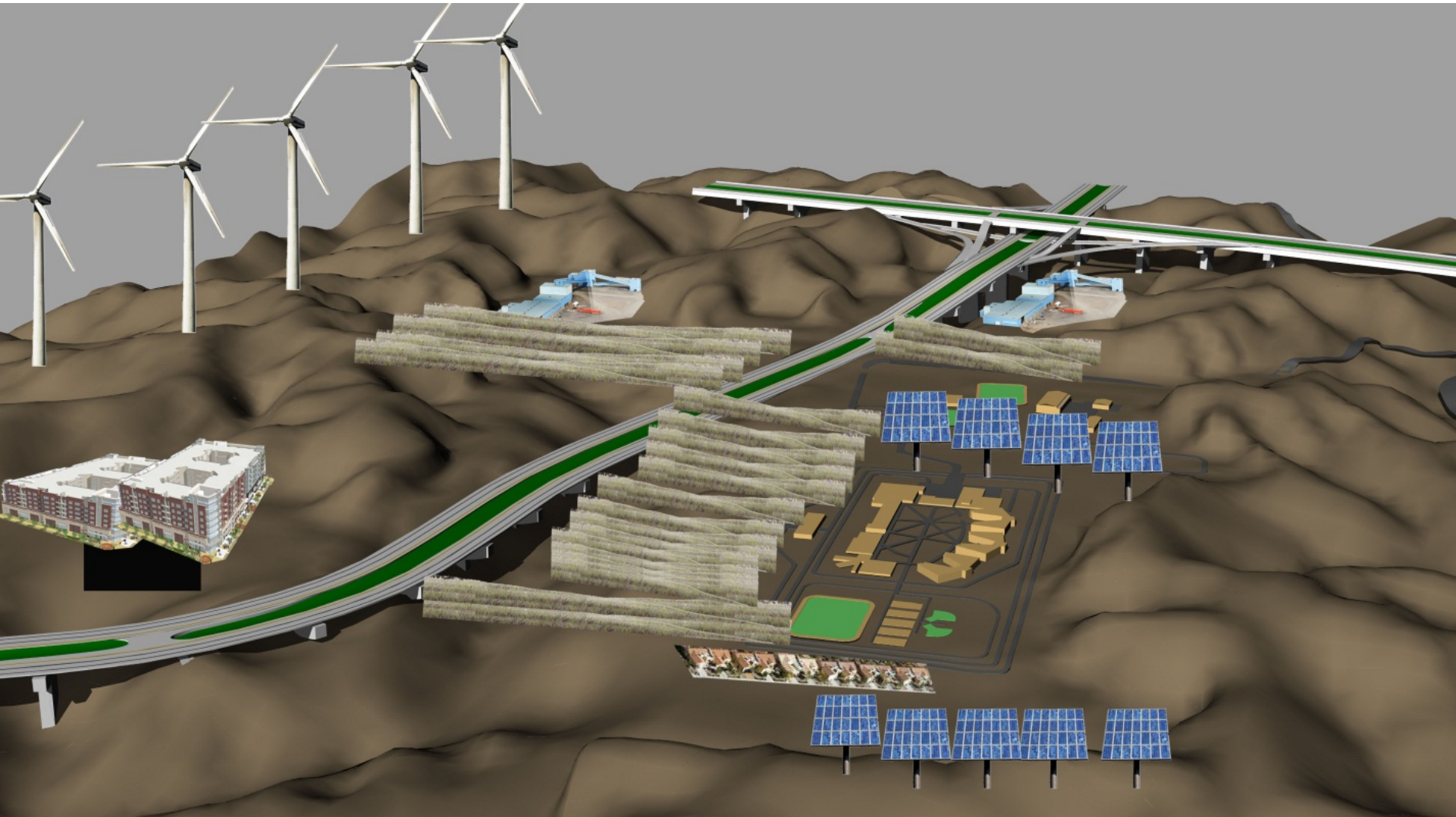


Design Concept Development and Site Programming

Project Goals and Design Context: Key Planning Concepts

- *Mixed-use Development*
- *LEED ND (Leadership in Energy and Environmental Design for Neighborhood Design)*
- *Green Economy*
- *Ecological Design*

Key Thematic Areas: *"New" Energy/Landscape Ecology/Mining History*

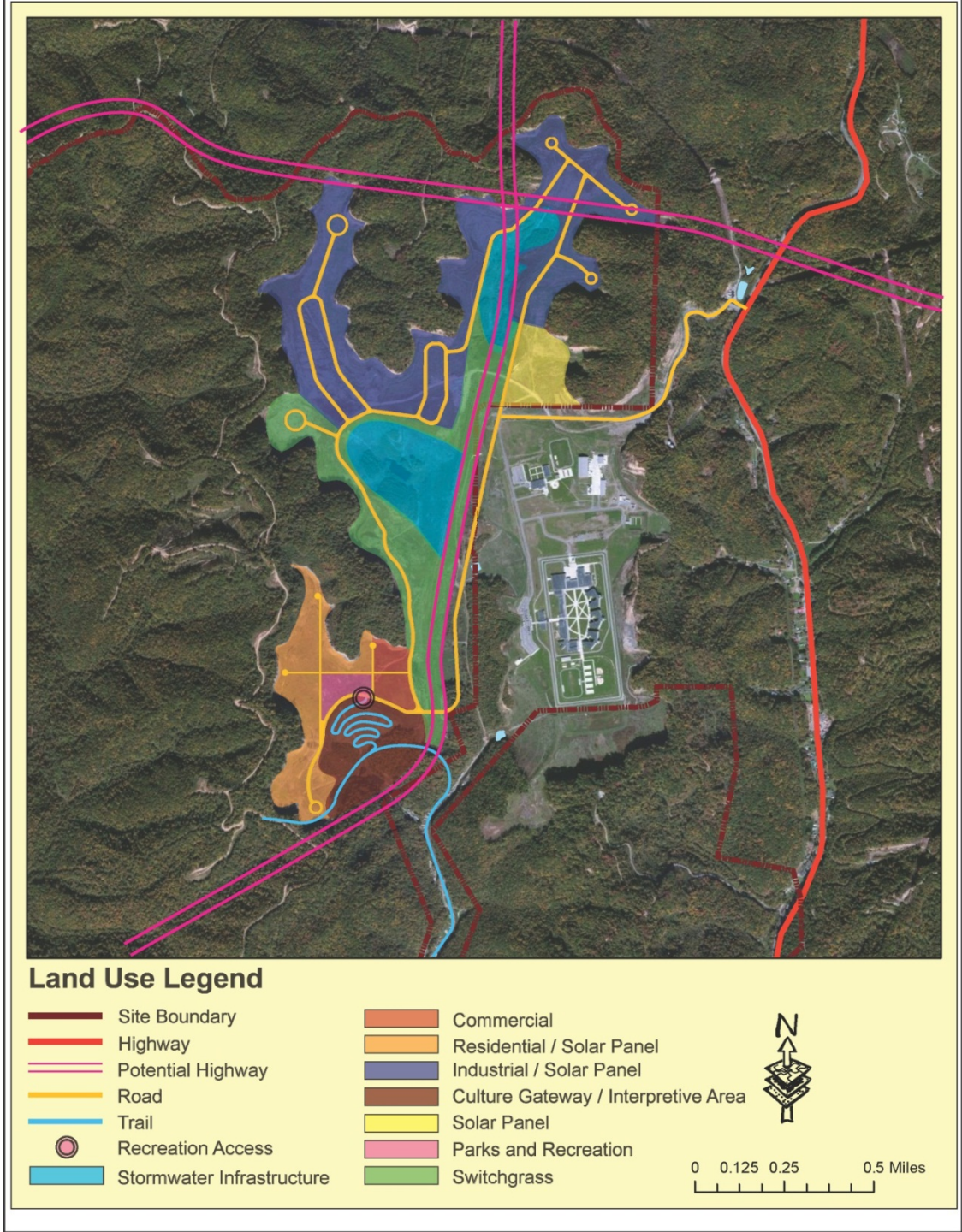
Site Programming:

- *Overall Sustainable Energy Park*
- *Indian Ridge Industrial Park*
- *Forested Area*

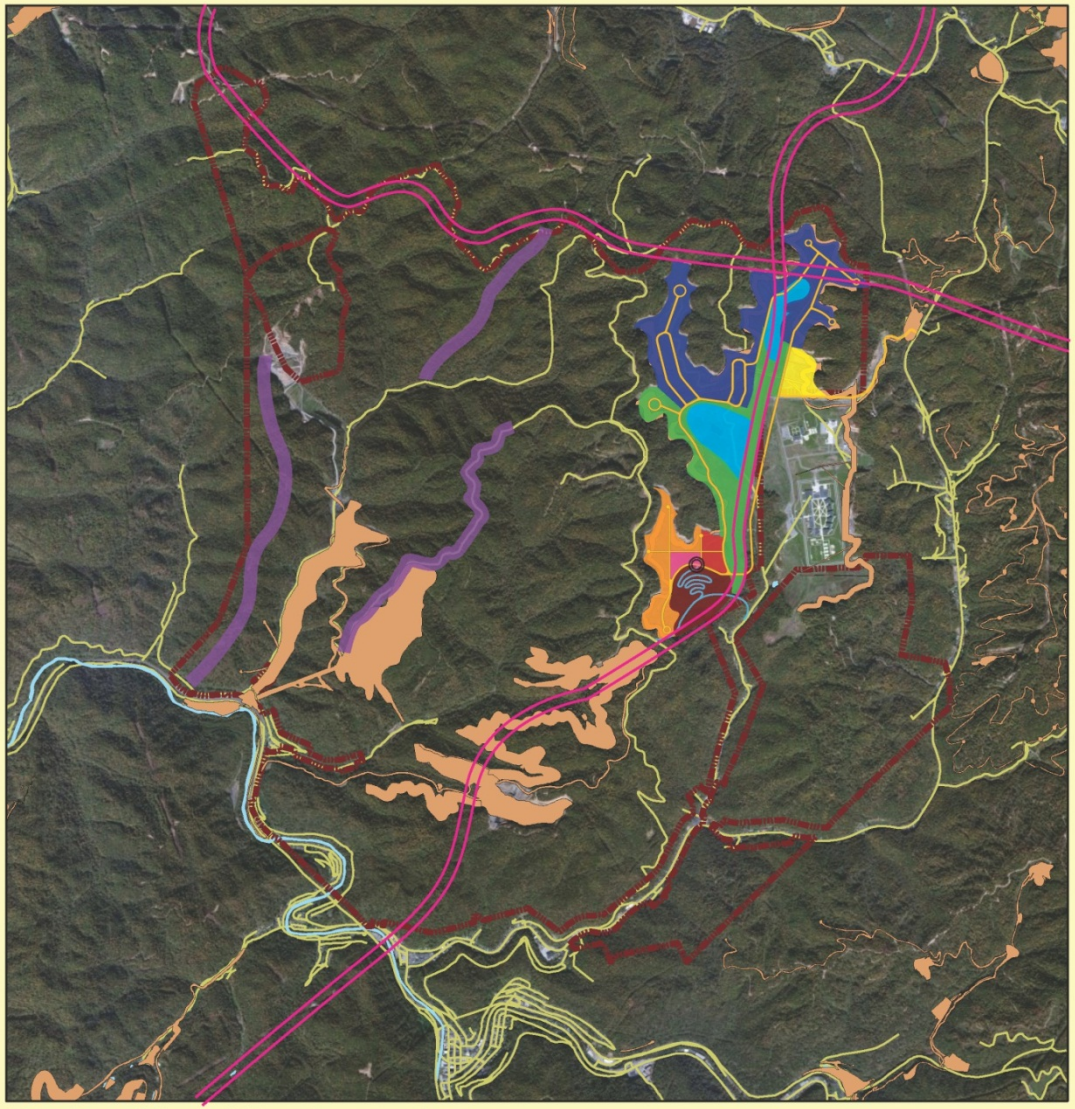
Regional Connections

Circulation and Linkages

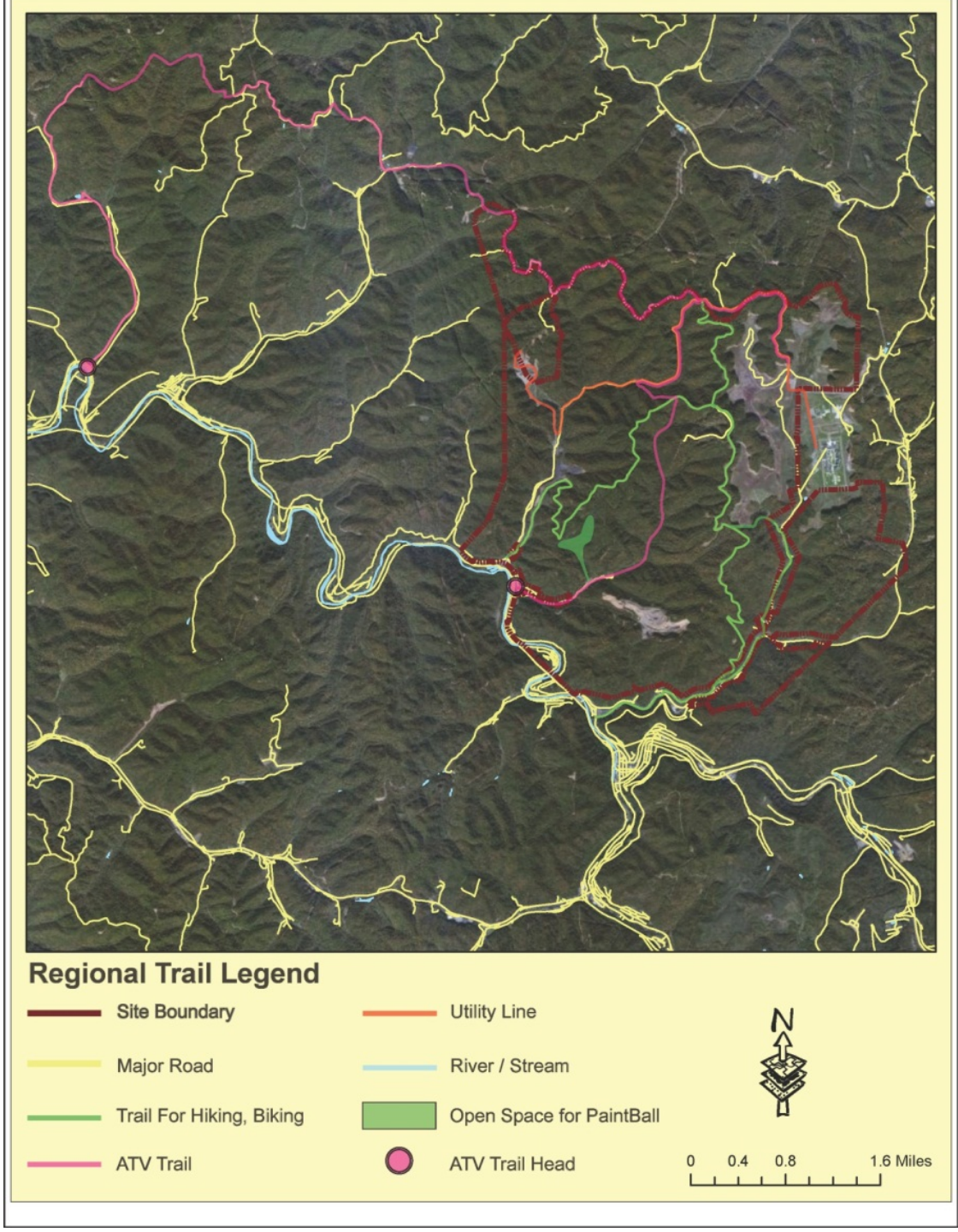
Land Use Masterplan

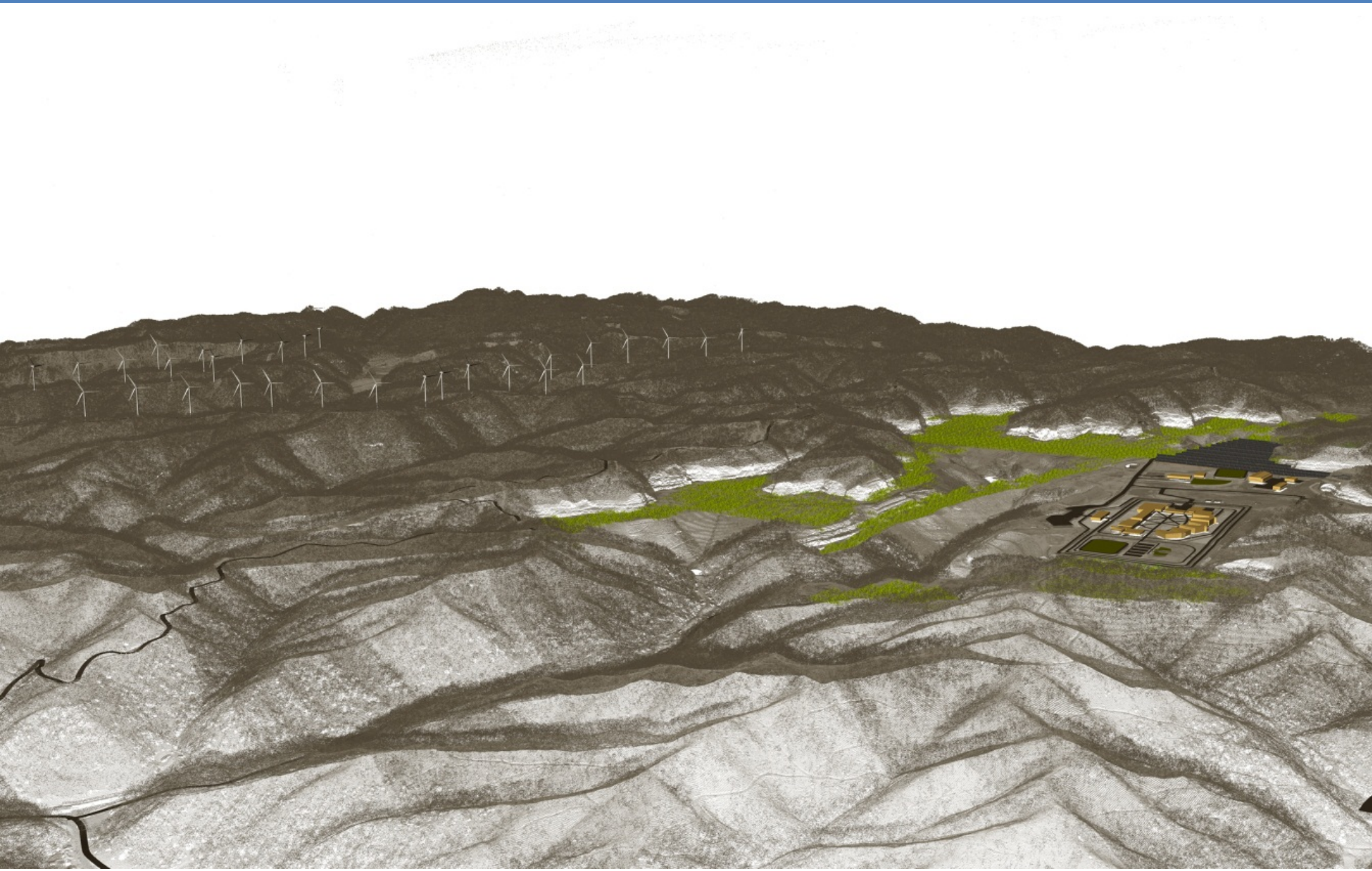


Regional Land Use

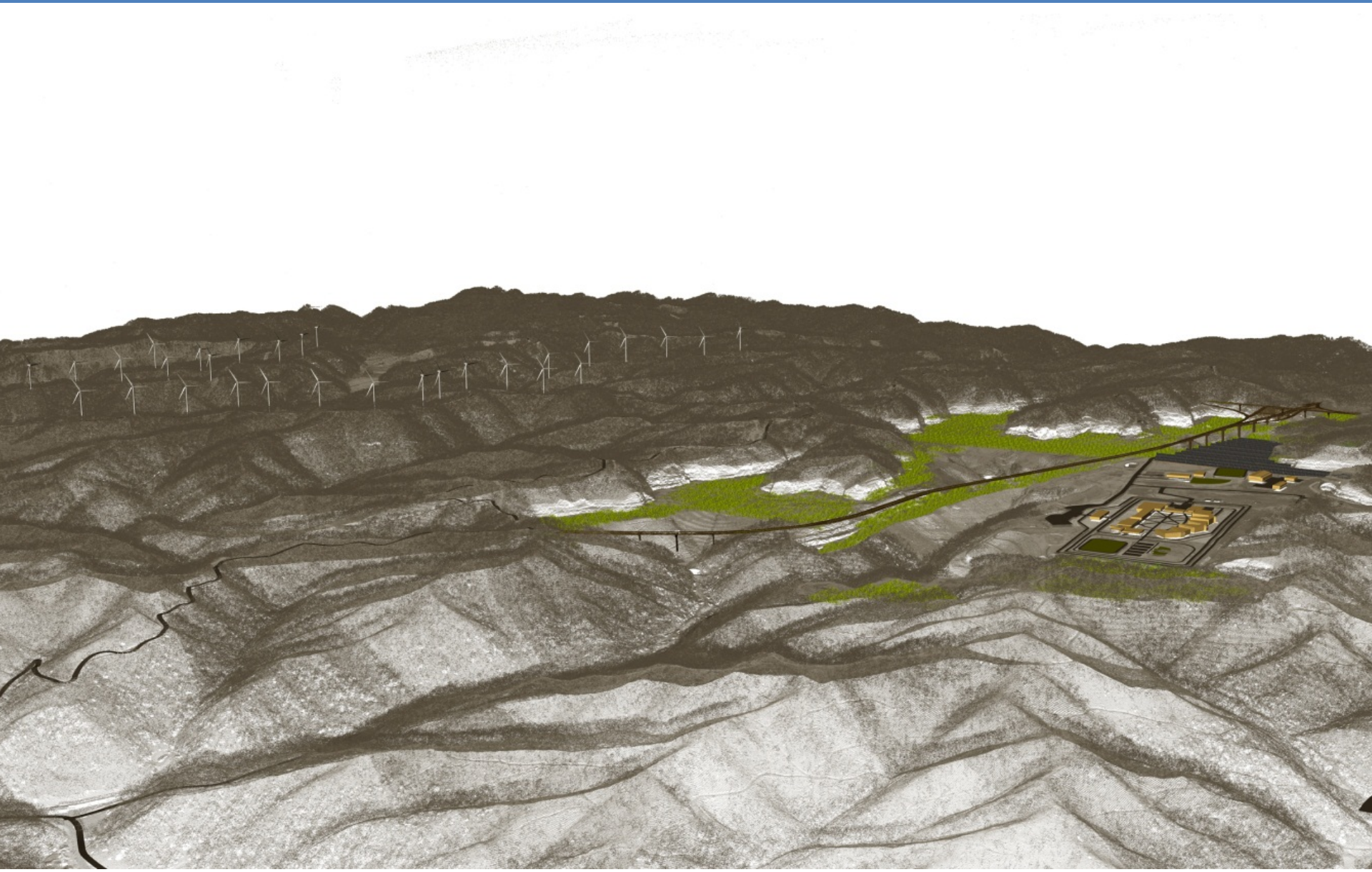


Regional Trail Map



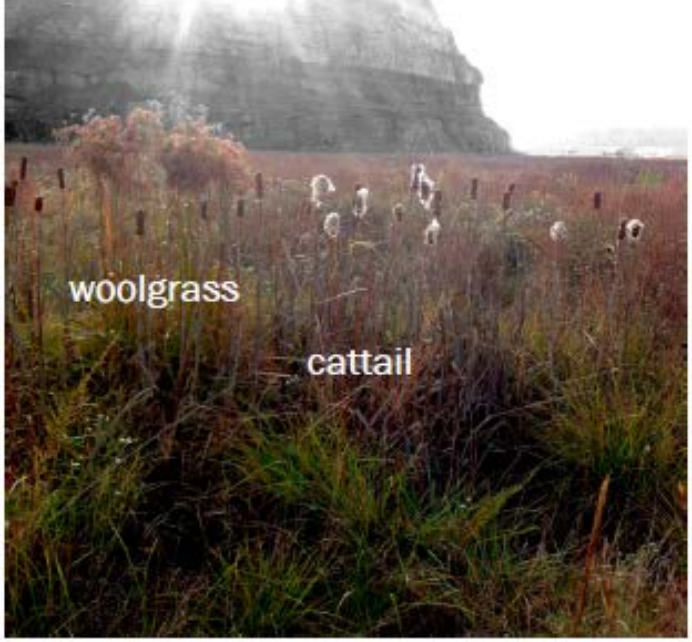


Visualizing Biomass, Solar, Wind



Visualizing Biomass, Solar, Wind and Expressway

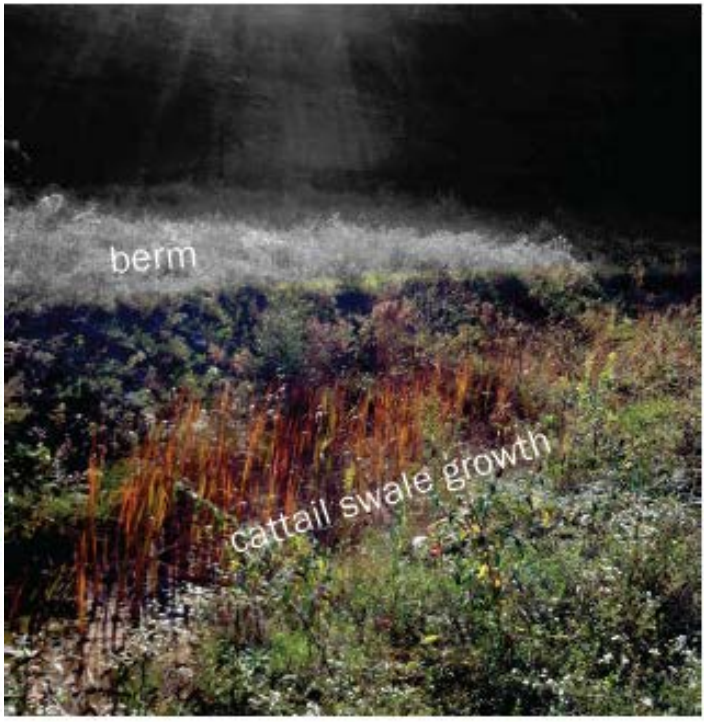

weir erosion
sedimentation


woolgrass
cattail

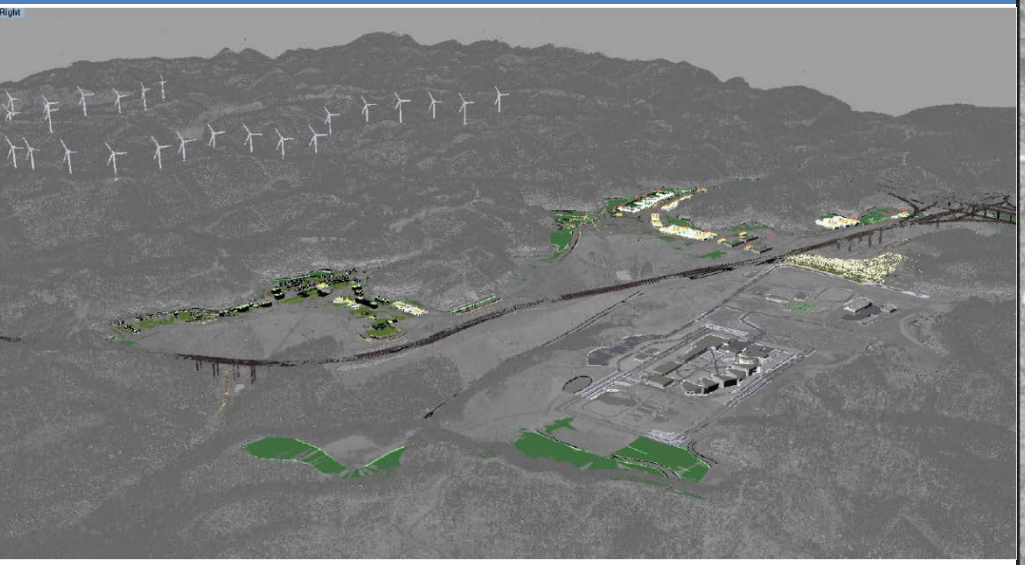

stormwater basin
valley fill
exposed soil
utility corridor

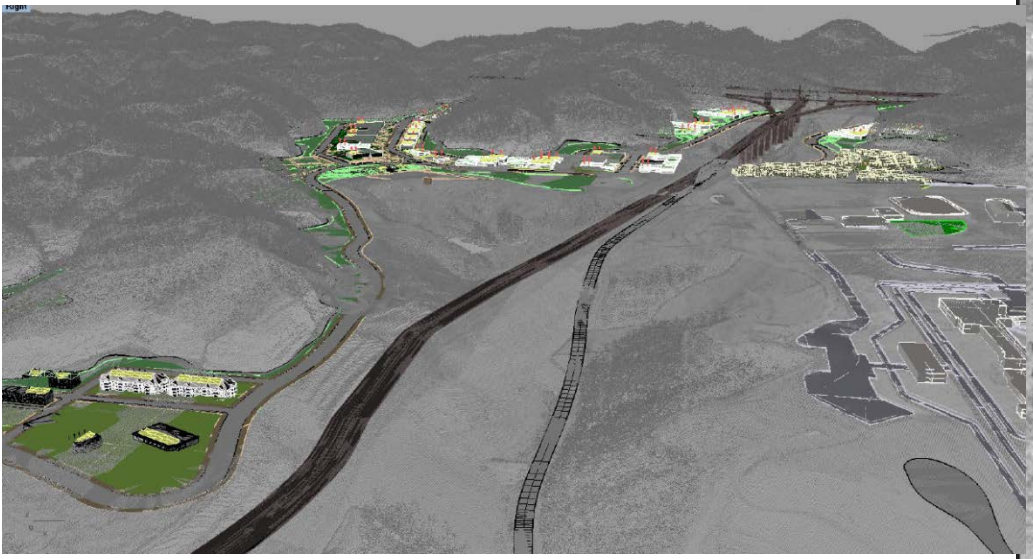

high wall
failure

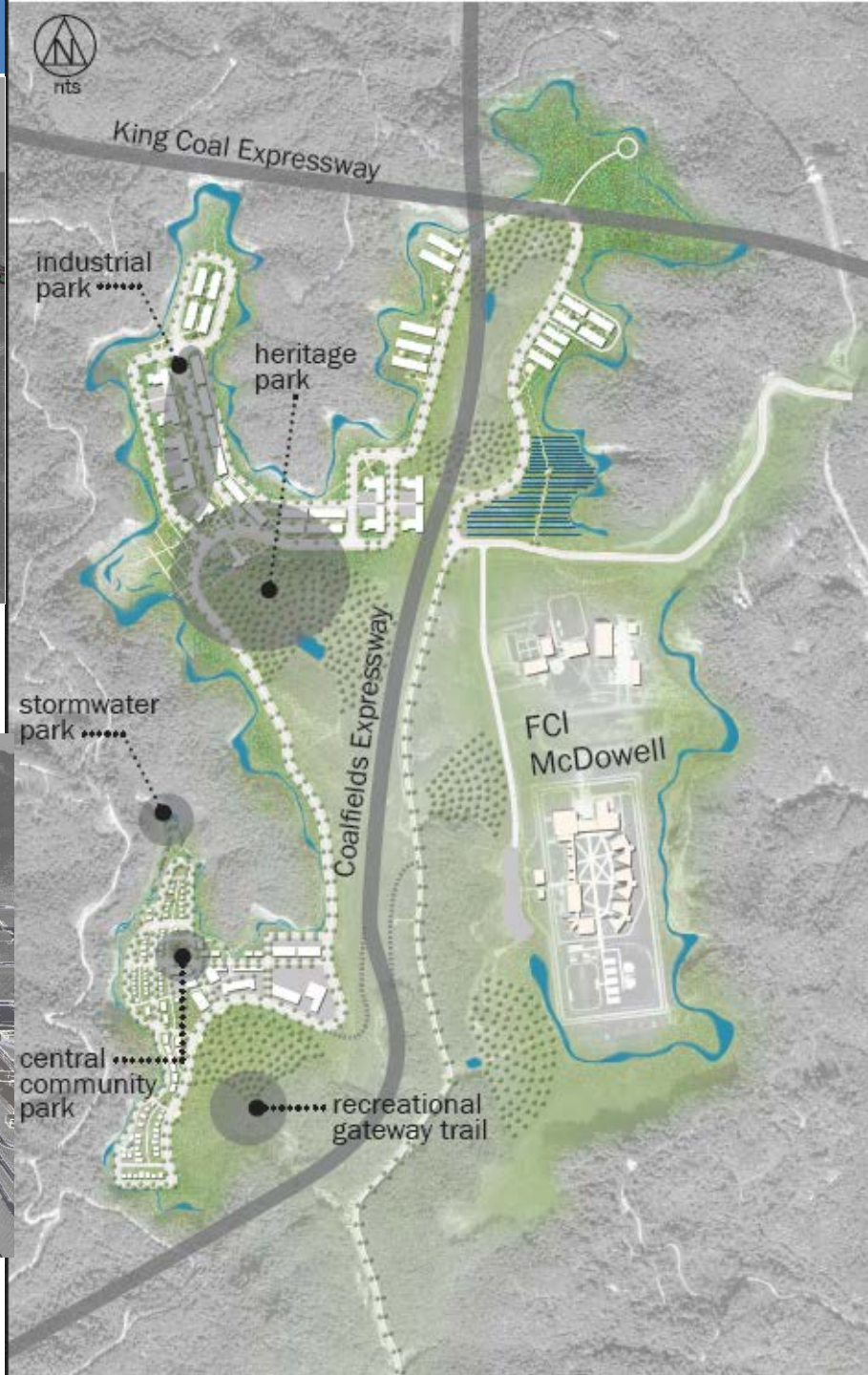

valley fill
forest
crown vetch


berm
cattail swale growth


drainage
willow



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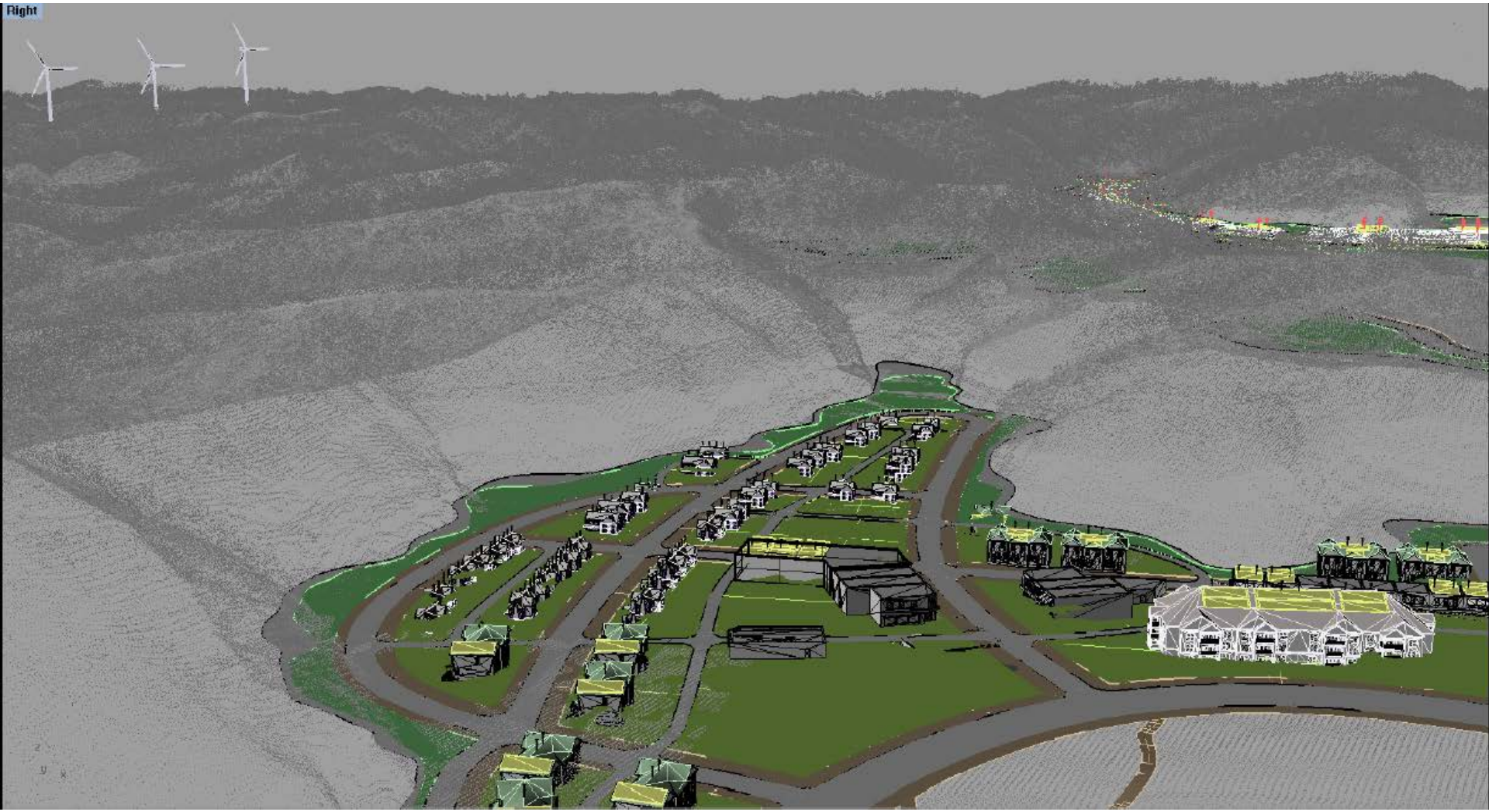
King Coal Expressway
industrial park
heritage park
stormwater park
Coalfields Expressway
FCI McDowell
central community park
recreational gateway trail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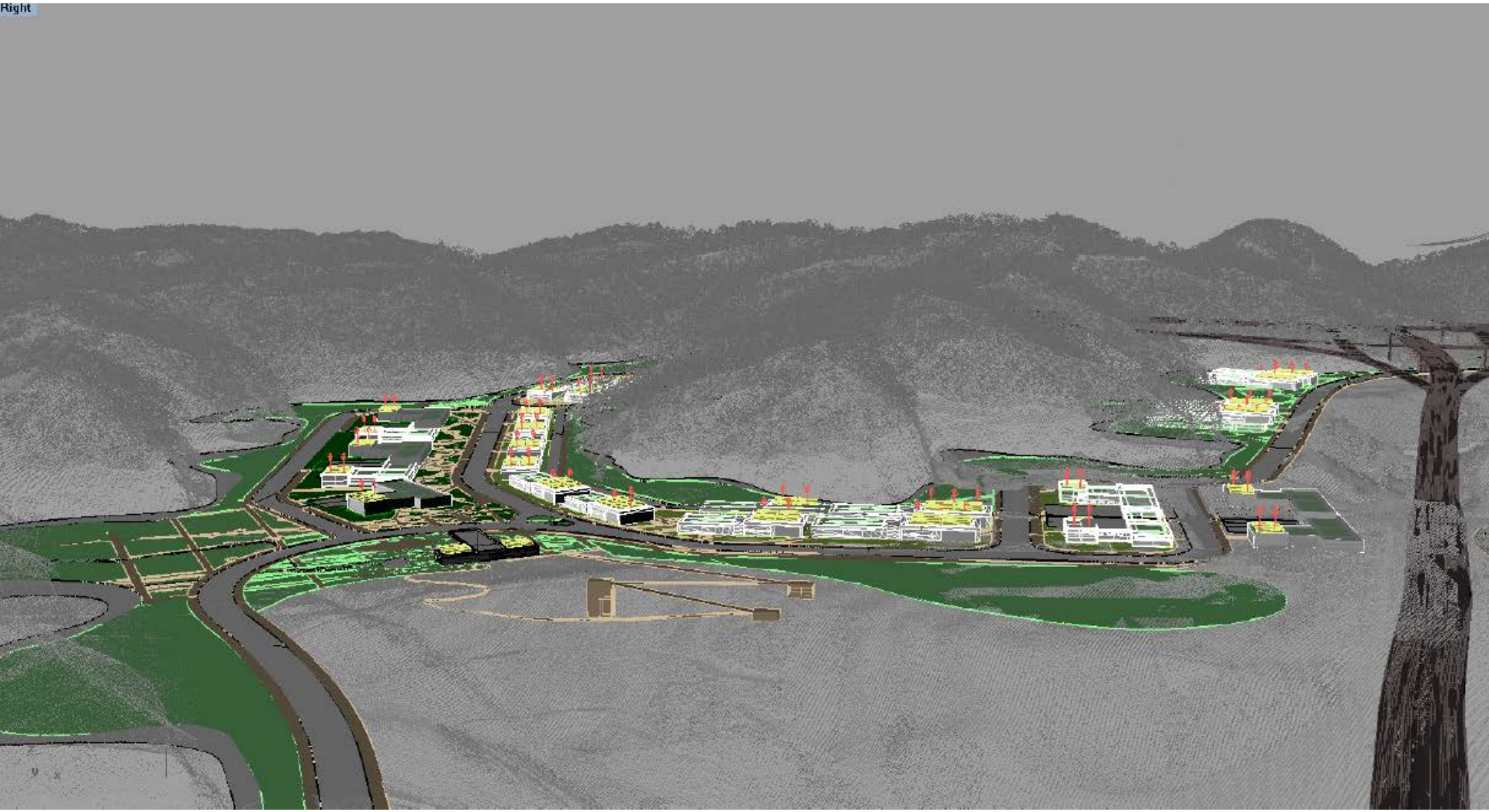
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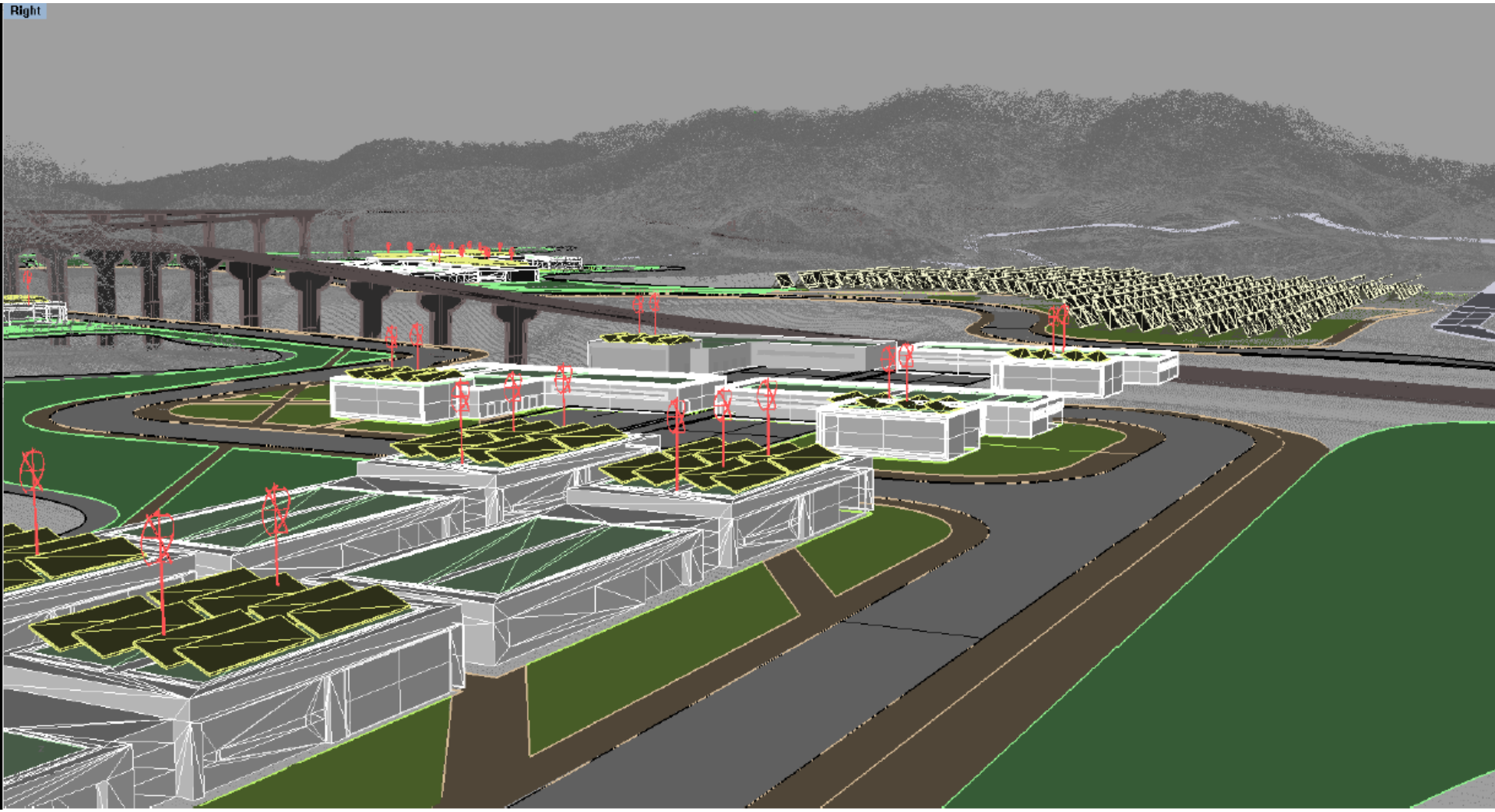
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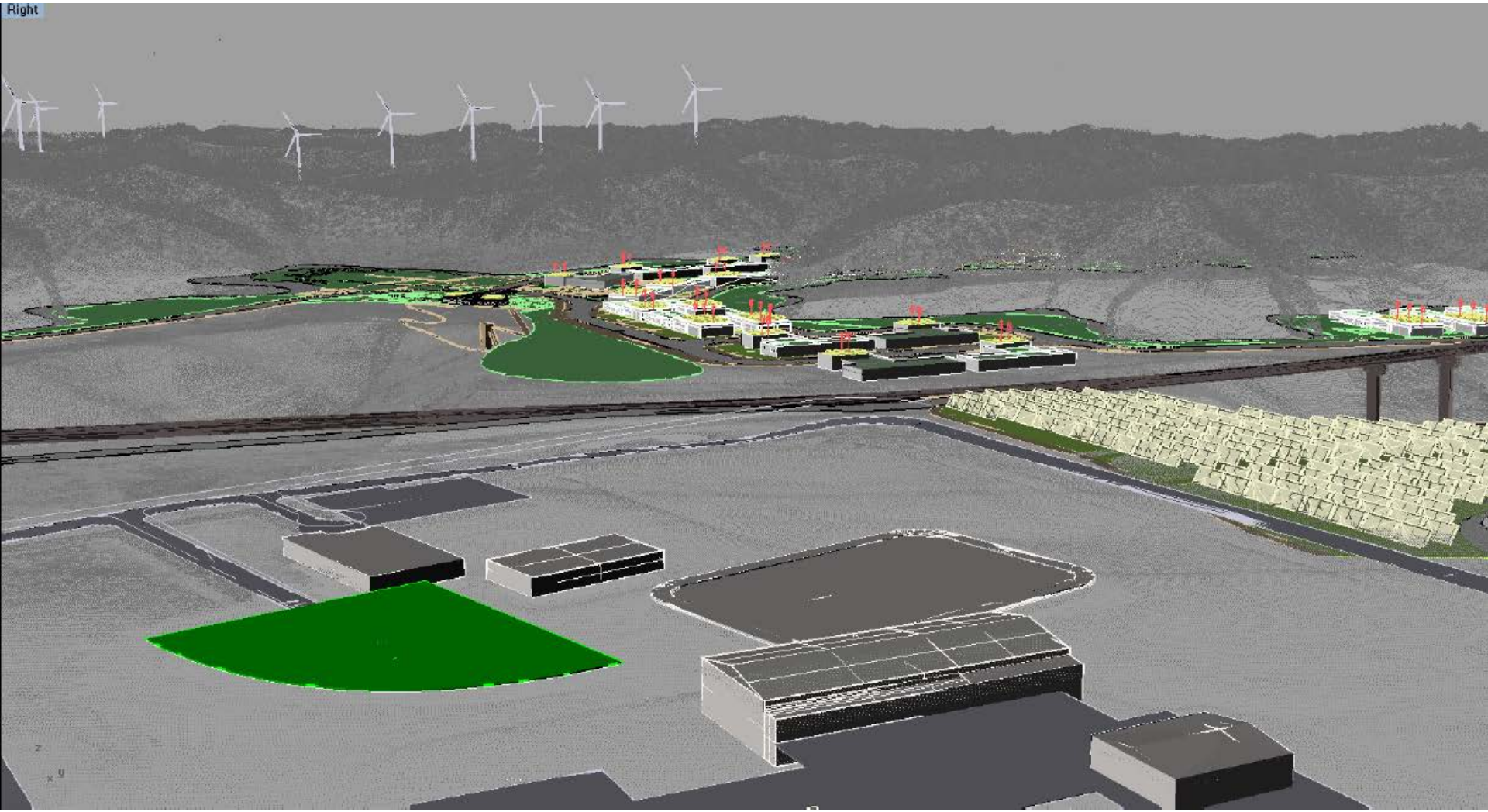
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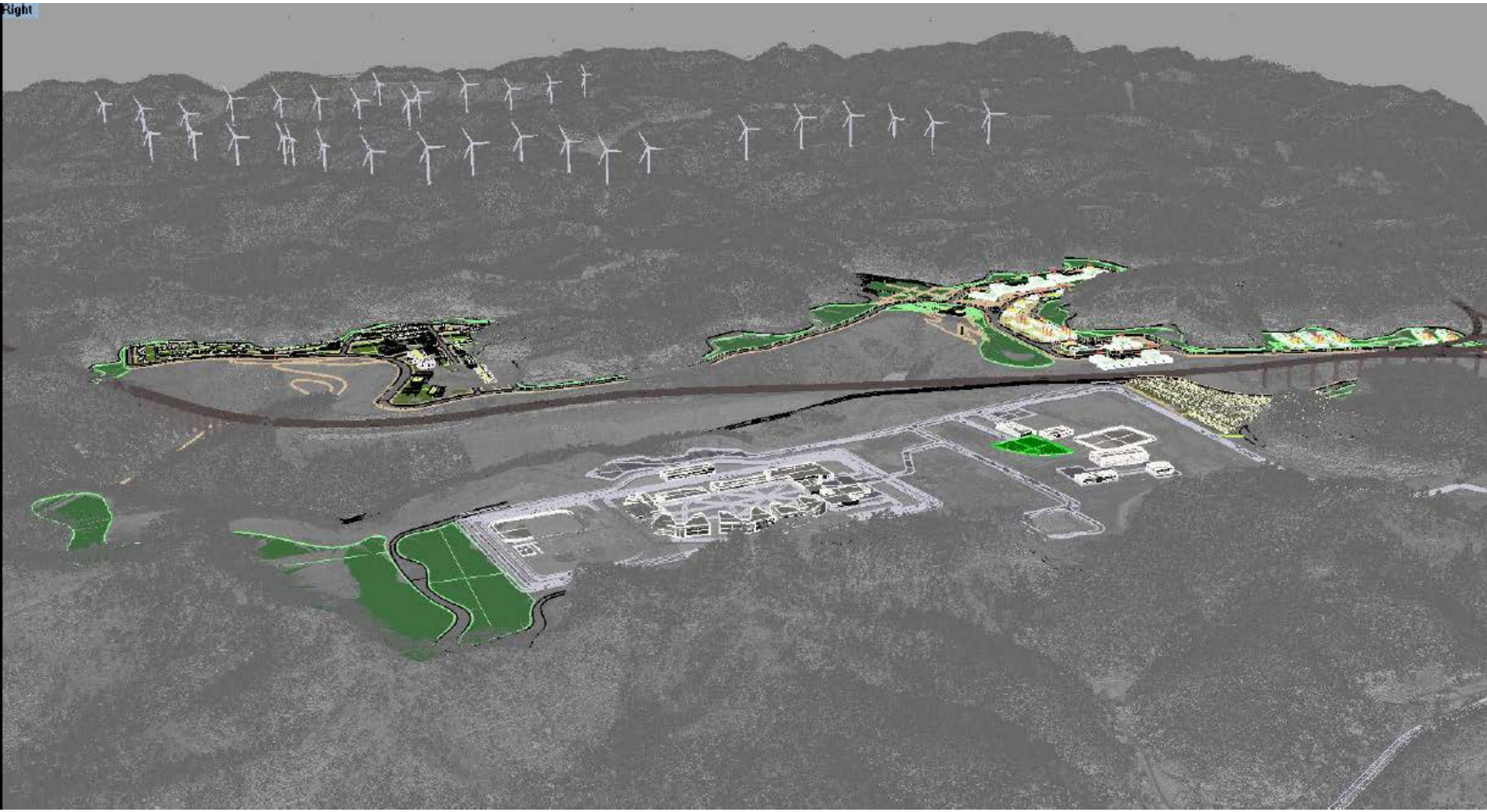
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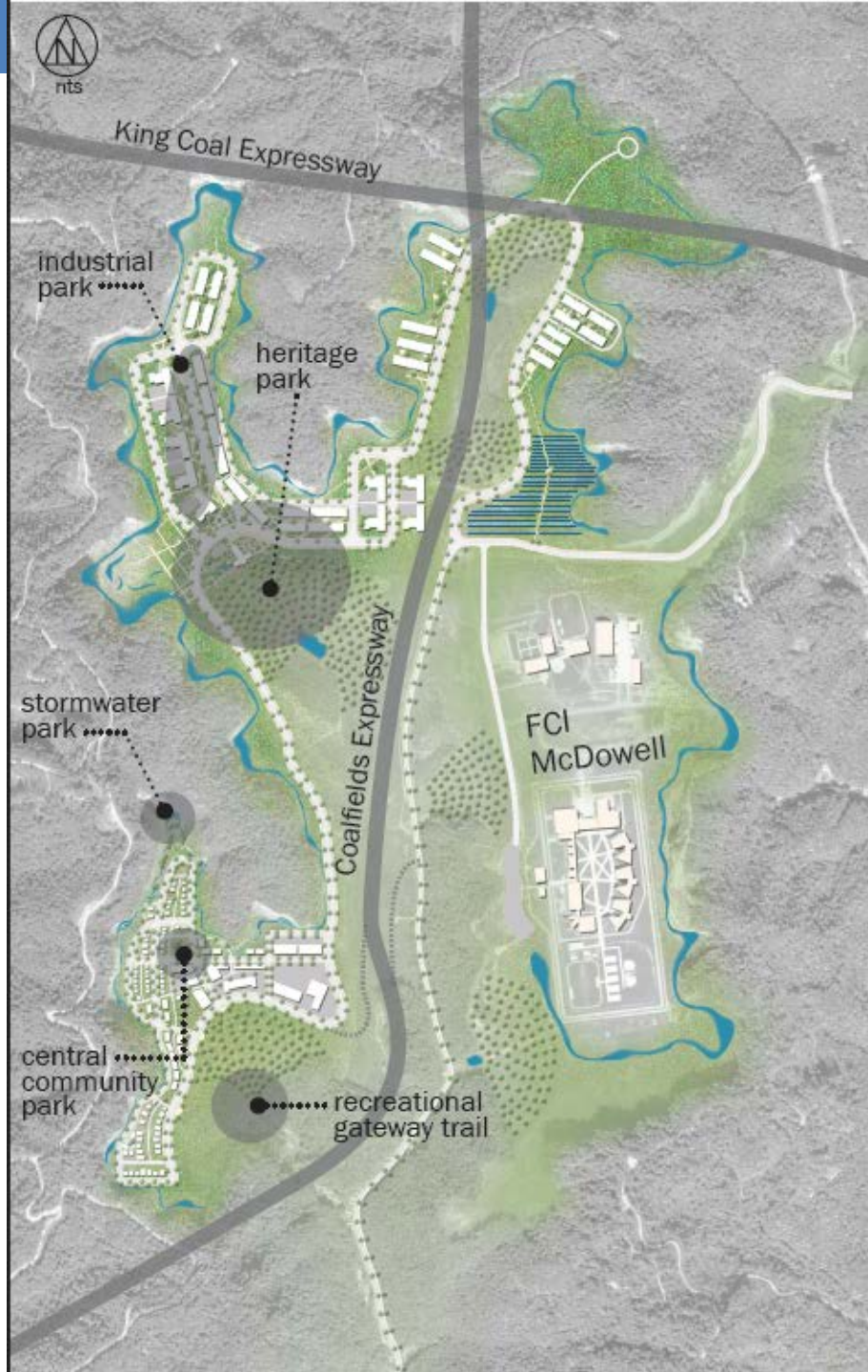
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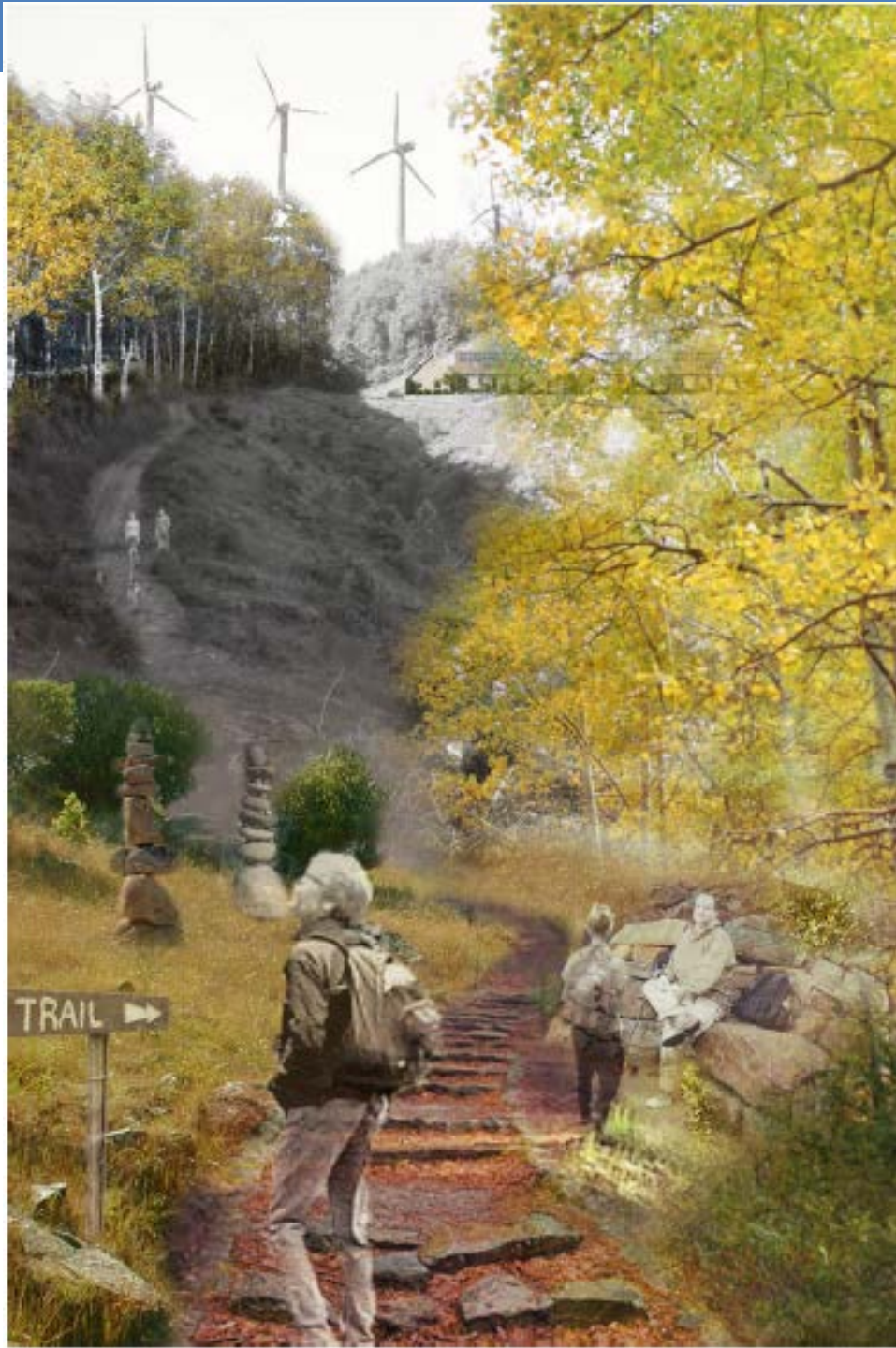
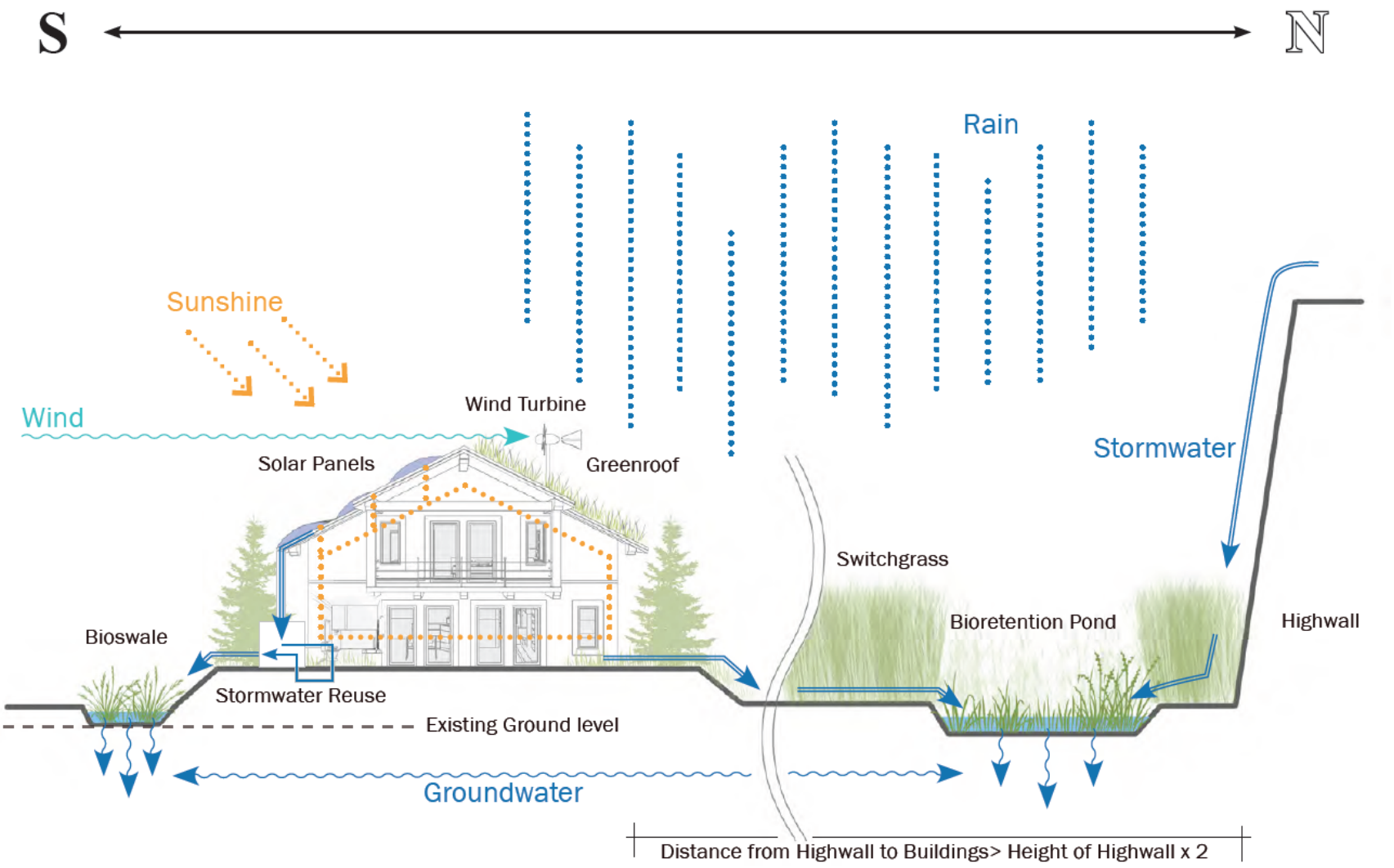
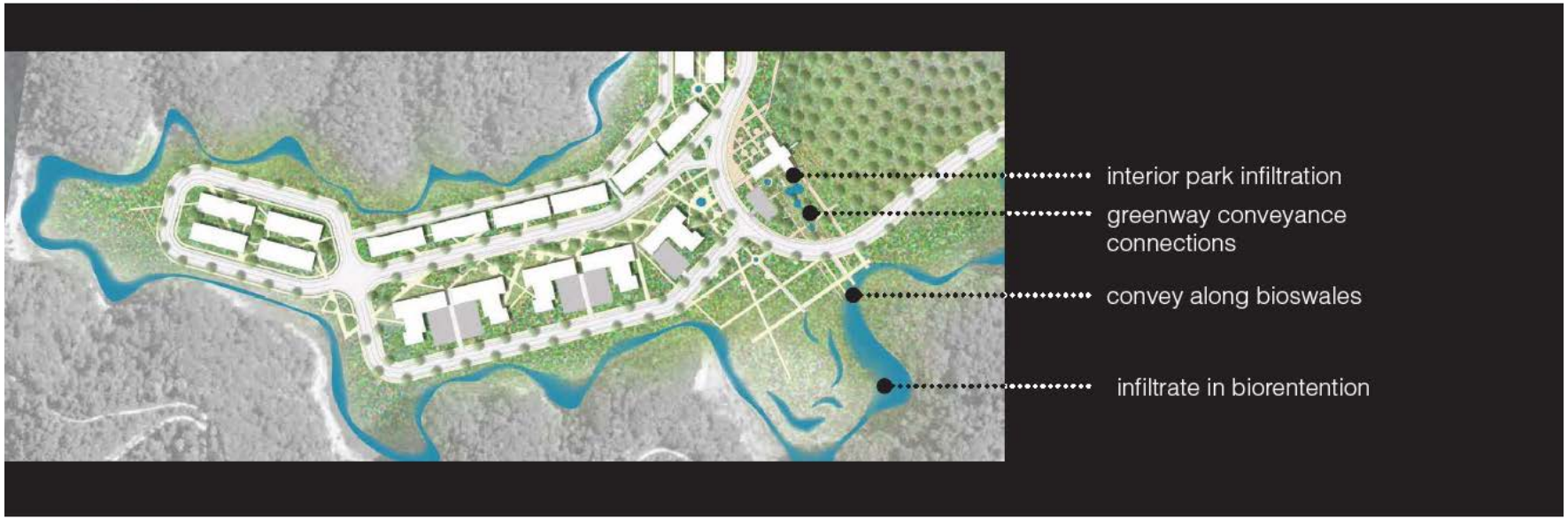
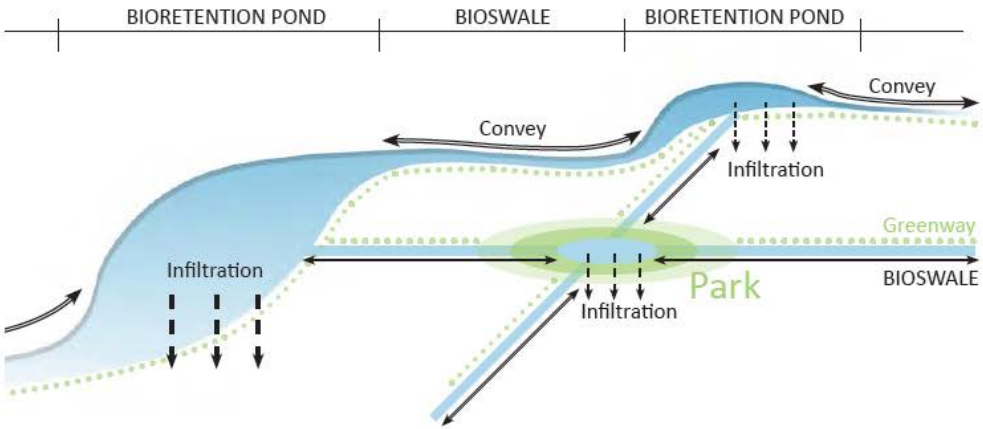

TRAIL

green infrastructure central core

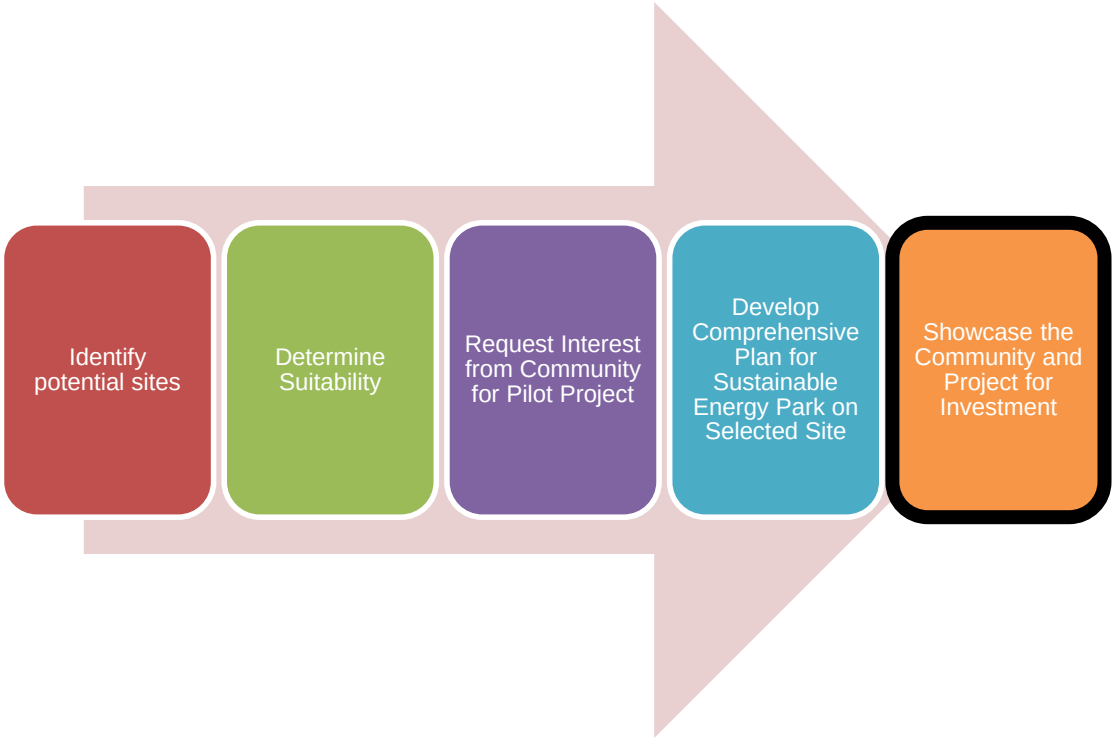


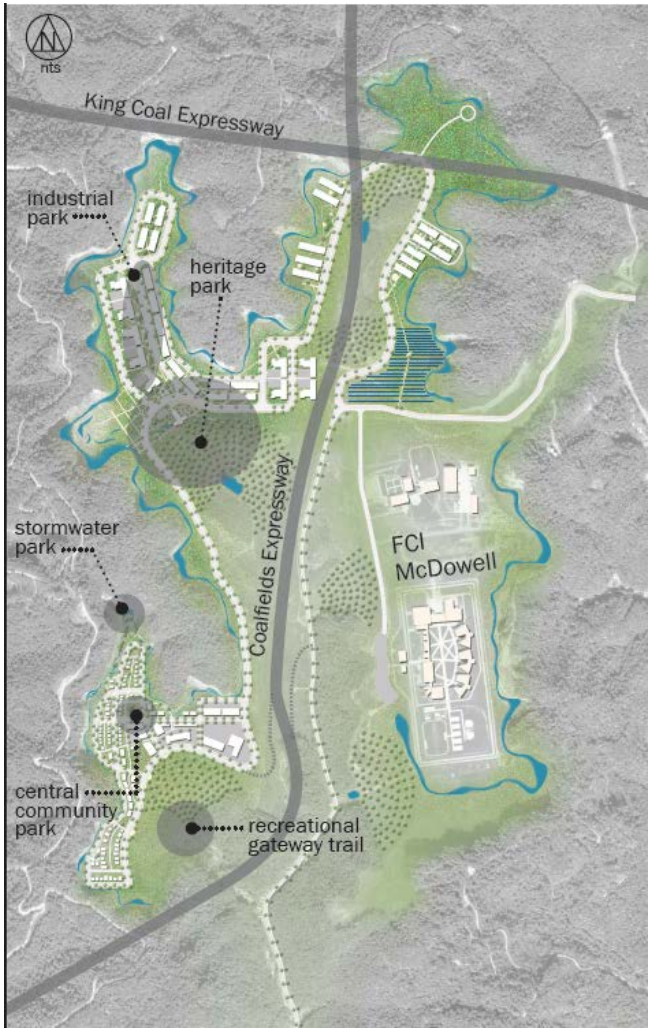
green infrastructure wetland swale





Ready for Investment:





Sustainable Energy Parks:

New Opportunities for Appalachian Coalfield Communities