



# **Hualapai Renewable Energy Development**

**DOE-Tribal Energy Program  
Peer Review Meeting 2012**

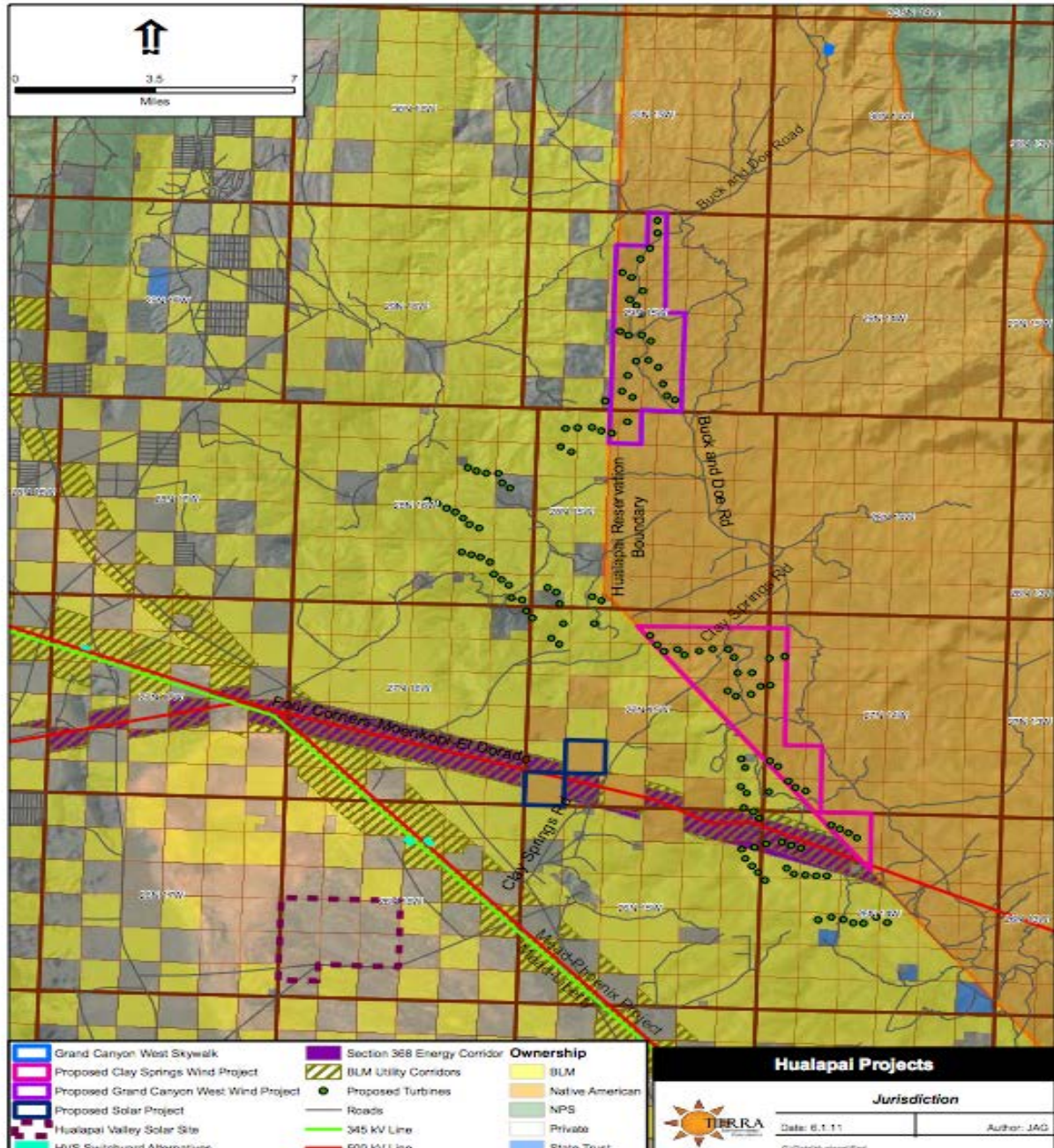
# The Hualapai Reservation



# Hualapai Project Description

- Wind Farm Development
  - 200MW Grand Canyon West
- Solar Power Plant Development
  - 50MW - Clay Springs
  - 30-40MW - Nelson
- Community Solar
  - 1MW - GCW





# Hualapai Status

- Completing the Final Feasibility Report
  - For Tribal Council
  - For Wind Developers
  - For Solar Developers
- Wrap Up Activities
  - Critical Issues Analysis
  - Avian Studies
  - Site Optimization
  - Pro-Forma Cost Analysis
  - Constructability Survey
  - Business modeling
  - START Community Education

# Feasibility Report

- MJH Consulting
  - Wind Development Expert
  - Putting it all together
- SWCA - Priority Activities
  - Critical Issues Analysis
  - Eagle Use Survey
  - Fall Raptor Migration Survey
  - Visual Simulations
- V-Bar-Production Estimates
  - 12/24 Analysis



# 12/24 Analysis GE 1.7/100 NCF

Hour (MST)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	28.4	30.4	32.6	36.1	34.3	36.9	25.2	25.6	23.1	26.0	24.1	24.9
1	26.5	26.9	33.4	35.8	33.0	35.2	24.8	25.2	22.7	24.9	24.3	25.3
2	27.1	26.1	34.2	35.8	31.6	33.8	24.4	23.0	21.5	25.9	24.2	26.3
3	26.6	25.9	31.9	32.9	28.3	30.9	20.9	21.5	19.9	26.2	24.3	25.4
4	26.8	26.9	32.1	32.2	27.2	28.2	17.0	19.1	20.9	27.8	24.9	25.9
5	27.2	27.4	33.3	31.6	26.0	25.6	15.7	18.1	21.7	28.2	24.7	26.2
6	28.8	26.6	33.5	31.8	23.8	24.8	13.5	18.6	20.3	27.3	26.5	27.8
7	30.0	26.0	33.6	28.6	20.5	22.9	11.4	15.1	20.4	25.1	27.4	28.4
8	30.1	25.3	29.8	26.9	21.1	25.8	10.8	14.0	18.8	21.4	25.6	28.7
9	24.8	22.5	29.0	27.5	23.7	28.5	12.7	16.1	20.4	20.9	24.9	27.6
10	21.5	22.9	29.1	31.4	27.0	32.3	15.4	17.9	21.4	22.9	23.3	25.7
11	20.8	24.2	29.6	34.0	30.0	32.3	17.8	21.4	21.5	23.5	25.1	26.1
12	21.5	25.8	32.0	37.4	32.0	33.5	19.6	23.1	24.2	25.5	27.9	25.2
13	21.2	27.8	33.7	36.2	32.3	33.8	22.2	22.7	24.8	28.3	28.5	25.5
14	22.5	29.0	35.5	36.2	33.4	34.3	23.0	24.8	26.3	28.2	28.1	25.9
15	23.6	28.7	36.9	37.0	33.0	33.9	24.9	25.5	24.8	28.0	29.1	26.7
16	24.3	27.5	36.2	38.2	34.1	35.8	23.6	24.9	24.4	27.9	27.4	26.4
17	24.2	25.7	33.2	36.9	35.5	39.0	24.7	25.6	24.0	26.7	25.4	25.5
18	25.6	25.3	32.4	37.3	35.6	40.5	26.0	24.5	22.8	25.0	24.9	25.8
19	26.3	27.3	31.1	35.7	34.1	39.0	25.5	23.0	20.7	25.3	24.8	25.0
20	26.5	27.8	30.2	33.9	32.3	34.9	24.2	22.3	19.8	26.7	26.0	24.6
21	26.7	28.9	31.2	34.2	32.3	34.6	21.8	24.4	20.3	26.5	25.1	26.1
22	28.3	29.4	31.5	37.0	32.9	35.1	24.7	26.2	20.5	27.0	25.3	24.6
23	29.0	31.2	31.4	36.6	33.5	36.8	24.4	26.3	21.7	27.1	25.5	25.2
Month	25.8	26.9	32.4	34.2	30.3	32.8	20.6	22.0	22.0	25.9	25.7	26.0

Year: 27.06

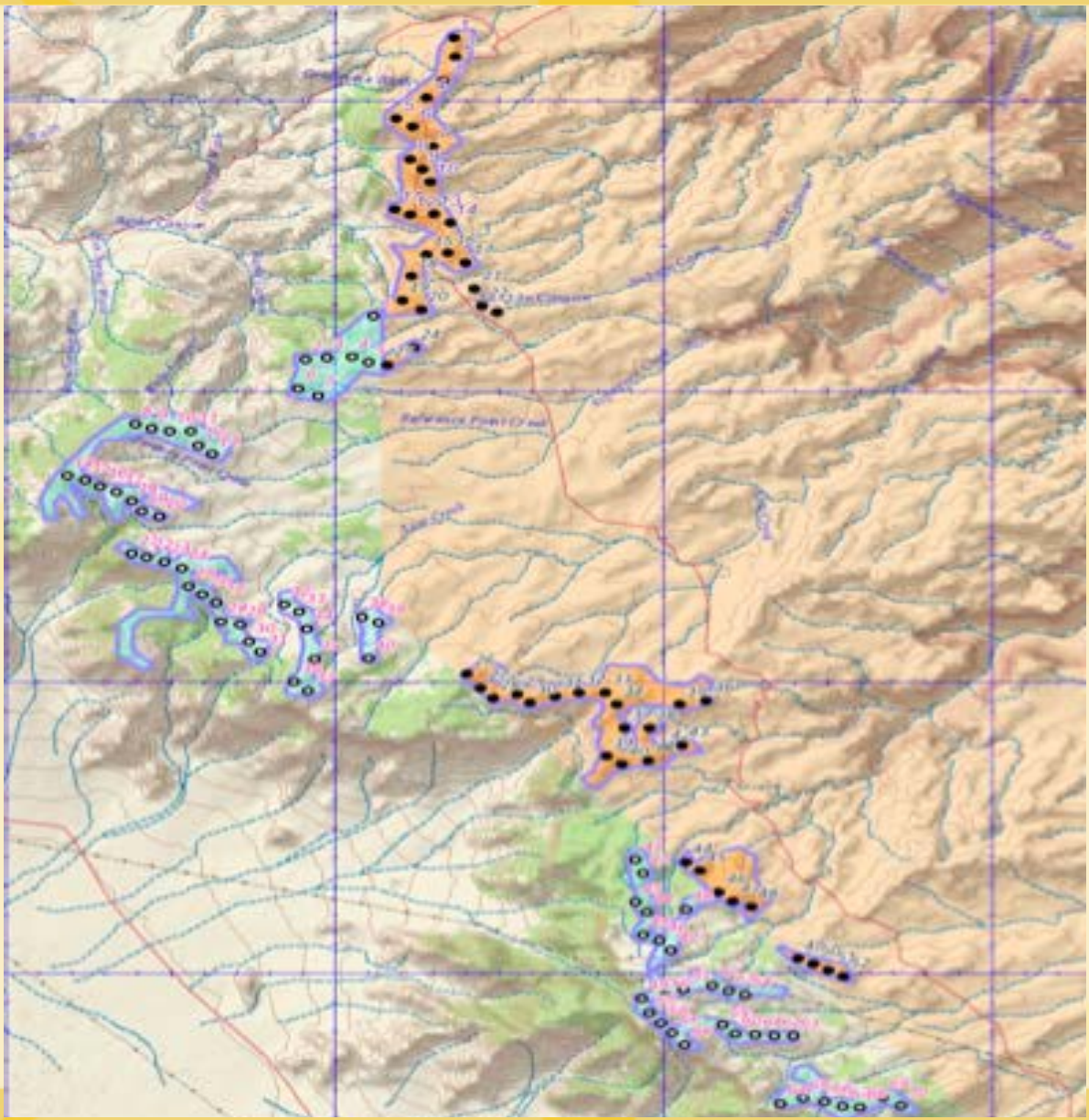
# **Feasibility Report - Table of Contents**

- Wind resource potential
- Critical Issues Analysis - Environmental
- Results of optimization studies for best sites
- Transmission and Interconnection
- Permitting Assessment
- Preliminary costs estimates
- Preliminary project pro forma
- Preliminary project business plan



# Wind Resource Potential

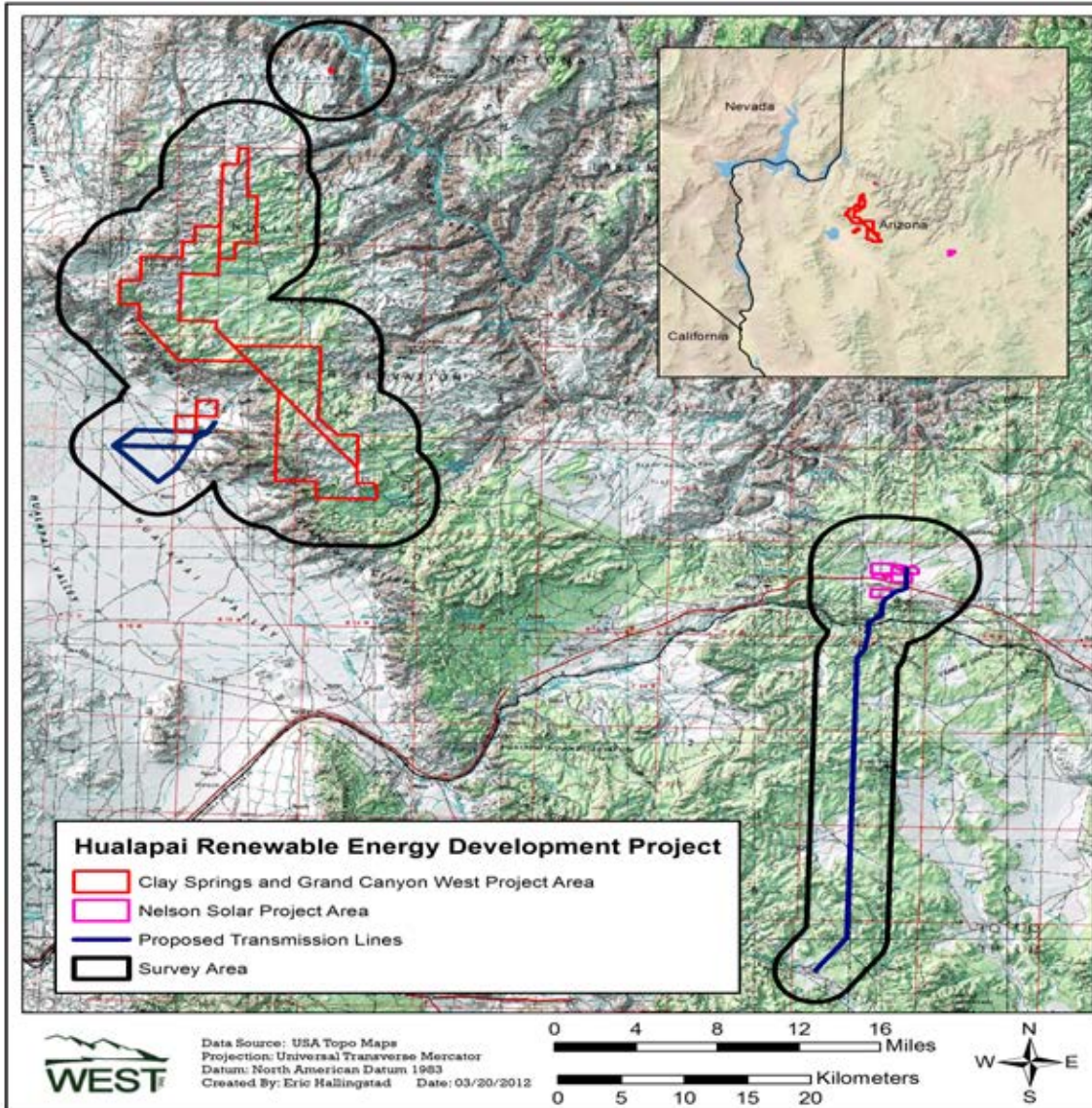
- Data from Two MET Tower Sites
  - Grand Canyon West - 4 years
  - Clay Springs - 2 years
- Initial Turbine Array Siting
  - Tribal Trust Land 100MW
  - Adjacent BLM Land 50MW



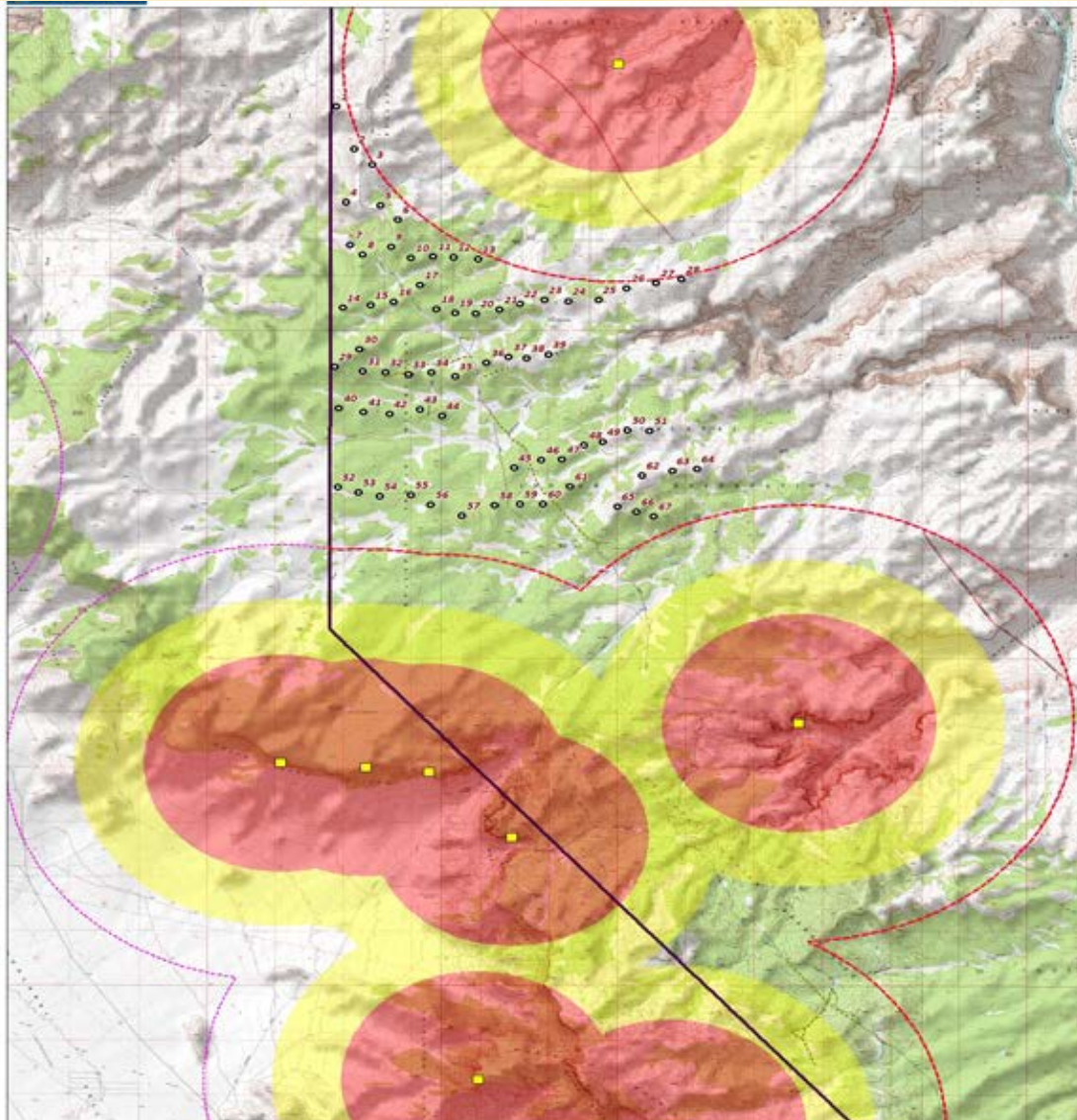
# Environmental

- Critical Issues (Fatal Flaw) Analysis
  - NEPA Checklist Desktop Review
  - Field Surveys
    - Cultural
    - Biological
- Important Studies
  - Eagle Use Study
  - Fall Raptor Migration Study
  - Visual Simulations





# Avian Study Results





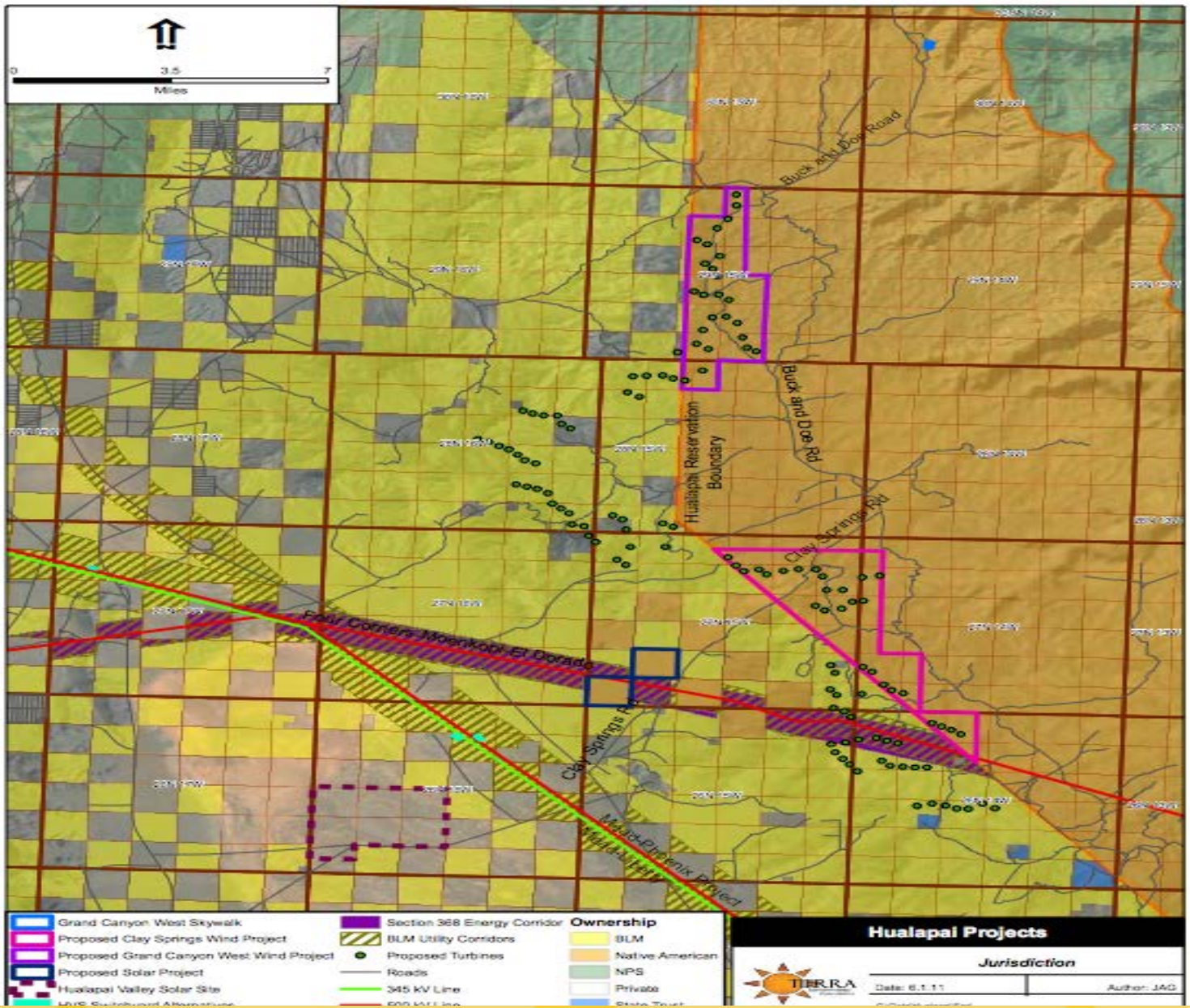
# Optimization

- WAPA Interconnection 250MW
- 200MW Wind, 50MW Solar
- Select Wind Turbine Models
  - GE 1.7/100
  - Acciona 3.0
- Calculate production for each turbine
  - Net Capacity Factor GW1.7 27.6%
  - Annual Production 435,000MWH



# Transmission and Interconnection

- Regional Possibilities
  - WAPA 345kV Mead-Liberty
  - WAPA 500kV Mead-Phoenix
  - APS 500kV Moenkopi-Eldorado
  - Centennial Clean line - 2017



## **WAPA 345 Mead-Liberty IR**

- IR Application (January 2012) \$10,000
- System Impact Study \$50,000
- Environmental Deposit \$75,000
- Facilities Study \$100,000
- Transmission Service Request
  - Deposit
  - Prepaid Transmission Service Fees
- Mead Upgrades scheduled for 2013
  - Additional 600MW Capacity currently unavailable
- Transmission Infrastructure Program (TIP)



# Permitting Assessment

- Critical Issues Analysis
  - NEPA Checklist
- Birds and Bats
  - 2 years of studies
    - Anabat studies
    - Fall Raptor Migration Studies
  - Eagle Protection Plan
- Cultural Impacts
- Visual Impacts
- EIS Requirement
- Line Siting Committee

# Cost Projections

- **Constructability Survey**
  - Roads and Power lines
  - Highway and Rail Access
  - Geotech Report
  - Terrain Assessment
- **Turbine Cost**
- **Balance of Plant Cost**
- **Transmission and Interconnection**
- **Development Fees**
- **Financing Cost**

# Pro Forma Projections

Installed Cost

Financing Terms

Transmission Costs

Operating Costs

Profit Margin

Energy Production

||

PPA Price > \$70 MWH



# Business Planning

- Formation Options
  - Lease Terms
  - Non-Recourse Financing
  - Tax Financing
    - Production Tax Credits
    - Tax Equity
    - Accelerated Depreciation
- Legal Considerations
  - Sovereignty - Ownership - Dispute Resolution
- Risk vs Reward

# Developer Interest



- Solicitations of Interest
- Vetting Process
- NDAs
- Negotiations

# Helps

- Perrin Ranch Wind Farm
- DOE-OIE START Program
  - Public Education
  - Validation of Study
  - Strategic Energy Planning
- Executive Orders-- Improving Performance of Federal Permitting and Review Processes



# **So You Really Wanna Go There ? !**

- Tribal Vision
- Community Buy-in
- Leadership
- Tribal Capacity Building
- Community Capacity Building
- Stick-to-it-ive-ness

# Benefits

- Long-term Revenue
  - Supports Tribal Programs
- Job and Training Opportunities
- Business Opportunities
- Pride