# APS North Gila to TS-8 to Yucca 230kV Transmission Project

## Open House

WELCOME!

Please Sign In

# Project Need and Regional Information

# Project Need

- The existing 69kV sub-transmission load serving capability for the region is nearing its full capacity
- Electric load forecast indicates a need to add a major new transmission element to the region in the 2014 timeframe
- The 230kV Project will deliver bulk power to the region when the Palo Verde - North Gila #2 500kV line is in-service (proposed for 2014)
- Provides for near- and long-term electric load serving capability in the Yuma region, by nearly doubling the existing load serving resource capacity
- Provides opportunities to integrate regional renewable generation resources into the electric system

# Yuma Area Electrical Usage

- APS estimated a maximum electrical load for the Yuma area in 2010 of 406MW, while the actual 2010 maximum load was approximately 430MW
- The Yuma area forecast for 2011 electrical load is 420MW
- APS' current load serving capability in the Yuma area is 580MW, including a 100MW reserve margin, which brings the actual load serving capability to 480MW
- With no upgrades, the current system configuration will not be able to reliably serve Yuma beyond 2014
- Existing resources combined with our planned upgrades, including construction of this Project, will nearly double our current load serving capability for the area

# Prior North Gila to TS-8 Project

- In 2007, APS conducted a year-long public line siting process, including the identification of preliminary APS route options
- Pursuit of a Certificate of Environmental Compatibility (CEC) was suspended in 2008, as a result of:
  - In-service date change for the Palo Verde - North Gila #2 500kV project
  - Local Yuma area electrical upgrades

# Siting Activities Beginning in 2010

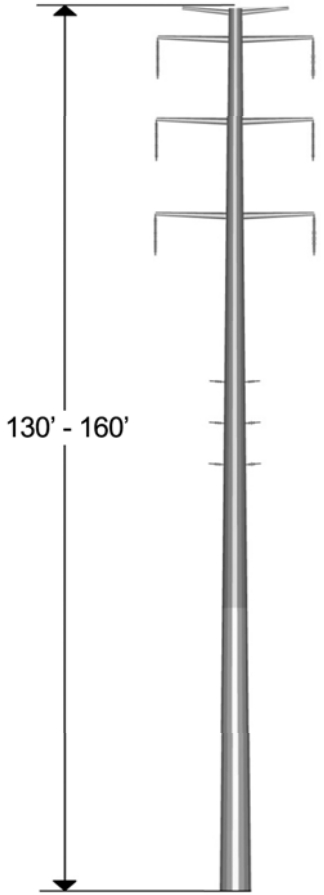
- Re-initiate public line siting activities for the North Gila to TS-8 to Yucca 230kV Transmission Project
- Re-evaluate route options identified in the previous line siting process
- Conduct an extensive public outreach program to solicit input, as part of the route identification process
- File a CEC application and other federal and state permits, as required

# Project Description and Design Considerations

# Project Description

- Double-circuit 230kV transmission line designed to accommodate the underbuild of existing and/or future 69kV circuits
- Interconnection facilities at the existing North Gila Substation, Yucca Power Plant Substation, and a new TS-8 Substation (location to be determined)
- Steel monopole structures, typically 130 to 160 feet tall
- Typical 100-foot-wide right-of-way

# Typical 230kV Structure




Double-Circuit 230kV Transmission Structure with 69kV Underbuild

# 230kV Structure Examples

Typical Double-Circuit 230kV Transmission Structure with 69kV Underbuild

Typical Double-Circuit 230kV Transmission Structure with no 69kV Underbuild

# North Gila to TS-8 to Yucca 230kV Project

- Project Need Timeline
  - N. Gila to TS-8
    - Summer 2014
  - TS-8 to Yucca
    - To be determined (currently outside APS' 10 year plan horizon)

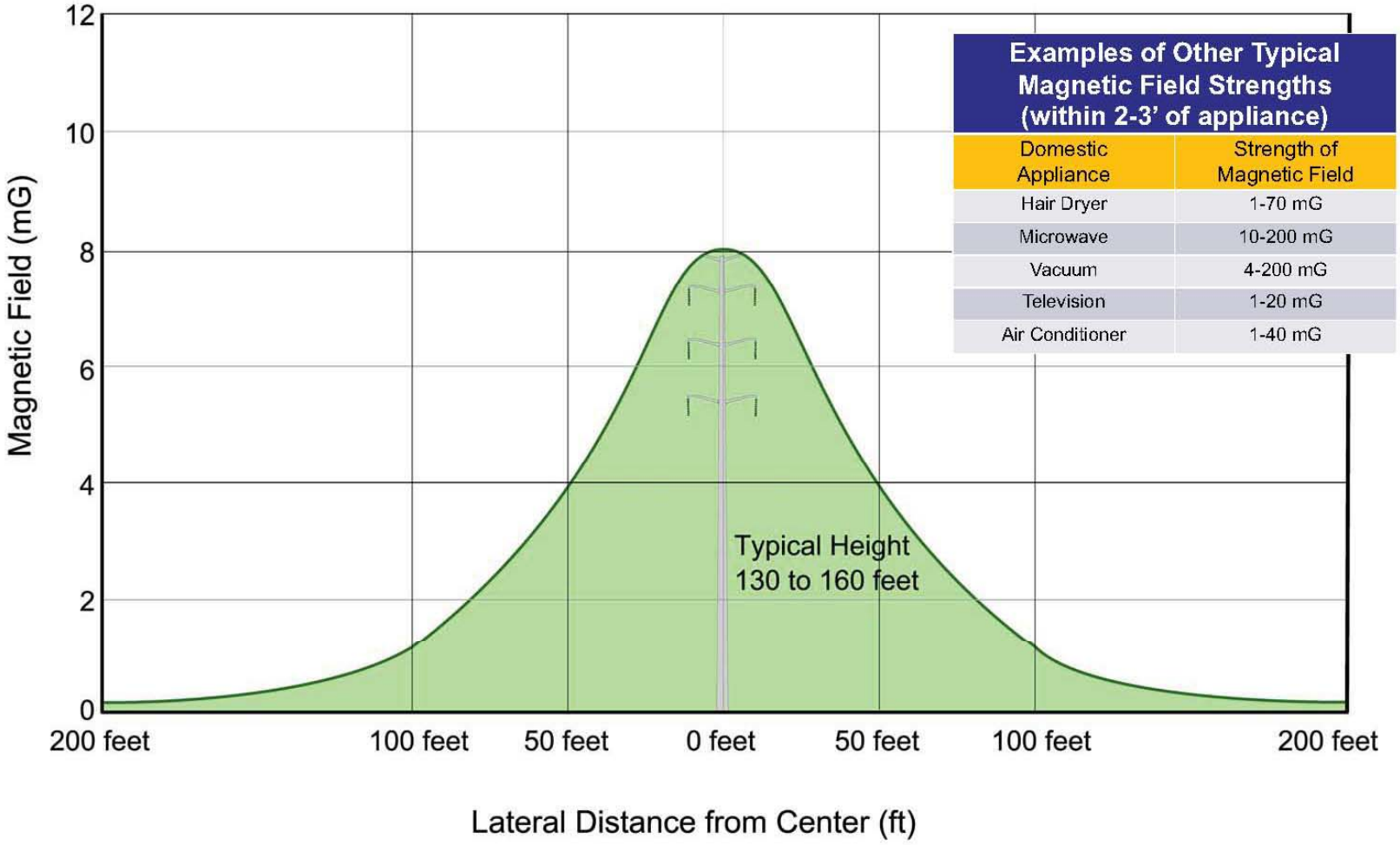
# Technical Considerations

# Electric and Magnetic Fields (EMF)

| Electric Field | Magnetic Field |
| --- | --- |
| Fields created by voltage on the transmission line that can cause an electric charge to build up on insulated objects near the line. This can create nuisance shocks (much like walking across carpet and touching a door handle) to individuals touching grounded objects near the line.<br><br>The standard for maximum electrical field value outside of the power line right-of-way is 5.0kV/m. The value calculated for this project is less than 0.5kV/m. | Fields that are created by ALL devices which use, carry or generate electricity. Magnetic fields drop off dramatically as distance from the source increases. To date, no Federal or Arizona State standards have been established for magnetic field levels.<br><br>APS recognizes the public concern for magnetic fields and have included those considerations in the design of this project. For this project, the calculated value for magnetic field, at the edge of the right-of-way, is approximately 4mG. |

***APS continues to monitor U.S. and international studies regarding EMF***

# Magnetic Fields




| Examples of Other Typical Magnetic Field Strengths (within 2-3' of appliance) | |
|---|---|
| Domestic Appliance | Strength of Magnetic Field |
| Hair Dryer | 1-70 mG |
| Microwave | 10-200 mG |
| Vacuum | 4-200 mG |
| Television | 1-20 mG |
| Air Conditioner | 1-40 mG |

# Noise and Communications

## Noise

High voltage transmission lines can emit audible noise. The noise is often times described as a “humming” or “crackling” sound. The audible noise, from a transmission line, is most affected by weather and the surrounding conditions.

The noise value calculated for this project is 8dB(A) for fair weather and 21dB(A) for rainy weather at 100 feet from the structure. Studies have shown customer complaints, regarding transmission line noise, typically occur when values exceed 52.5dB(A).

## Communications

High voltage transmission lines have been known to cause interference with radio and television transmissions. Calculated values for this project show some interference to AM radio stations may occur within 200 feet of the line. However, interference to FM radio, digital, satellite, or cable communications is not expected.

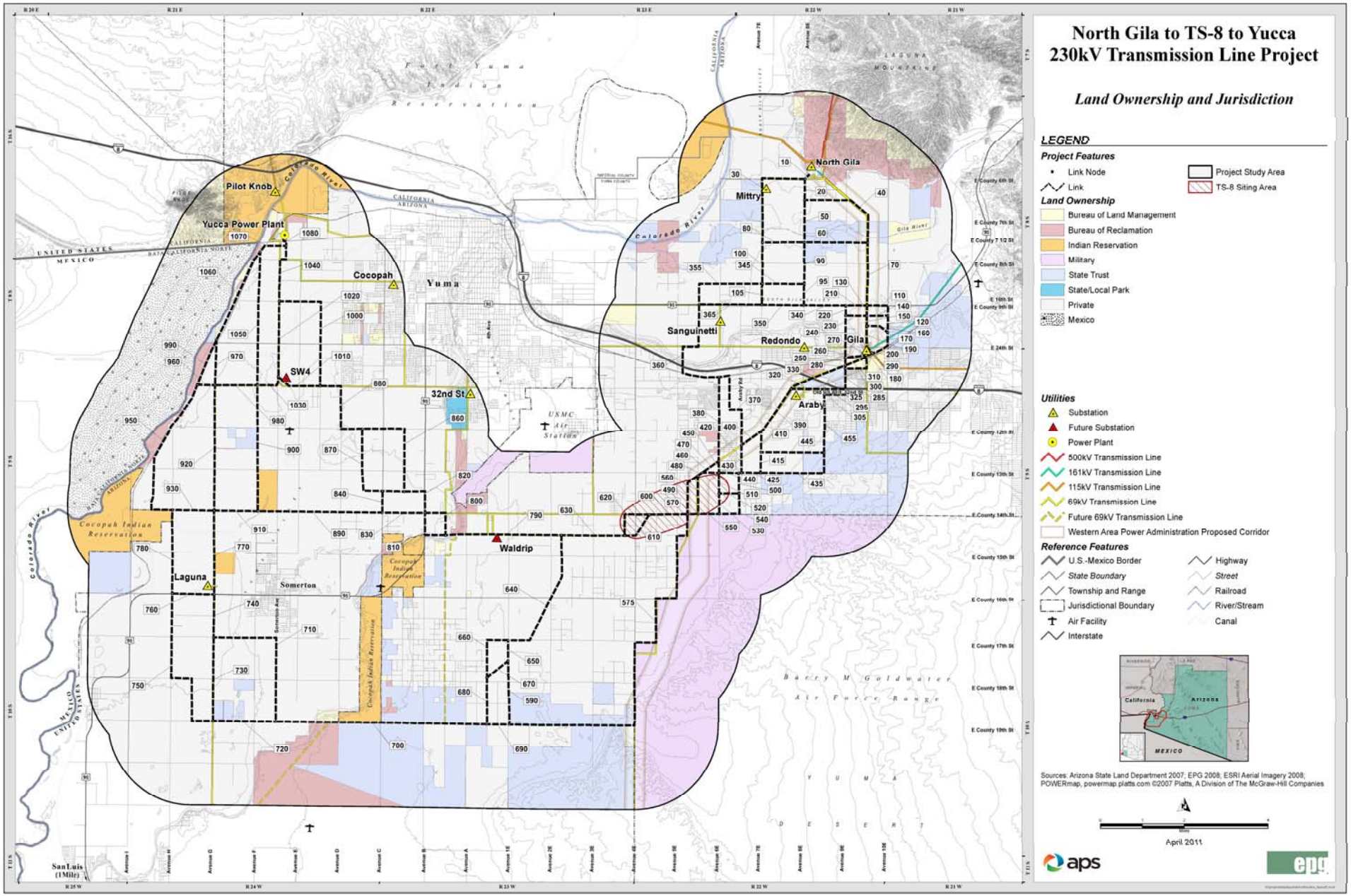
# Common Noise Levels

| Common Outdoor Noises | Sound Level (dBA) | Common Indoor Noises |
|---|---|---|
| | 140 | Threshold of pain |
| | 130 | |
| | 120 | |
| | 110 | |
| **Rock Band** at 15 Feet | 100 | |
| Gas Lawn Mower at 3 feet | 90 | **Food Blender** at 3 feet |
| Diesel Truck at 50 feet | 80 | |
| Typical Urban Daytime | 70 | Garbage Disposal at 3 feet<br>Vacuum Cleaner at 10 feet |
| Gas Lawn Mower at 100 Feet | 60 | Normal Speech at 3 feet |
| **Heavy Traffic** at 300 feet | 50 | Dishwasher next room |
| | 40 | **Library** |
| Urban Nighttime | 30 | |
| Rural Nighttime | 20 | |
| | 10 | |
| | 0 | Threshold of hearing |

**Transmission Line at 100 feet**

***Note: Sound is perceived differently by every individual***

# Preliminary Route Identification


North Gila to TS-8 to Yucca
230kV Transmission Line Project
Land Ownership and Jurisdiction
LEGEND
Project Features
Link Node
Link
Project Study Area
TS-8 Siting Area
Land Ownership
Bureau of Land Management
Bureau of Reclamation
Indian Reservation
Military
State Trust
State/Local Park
Private
Mexico
Utilities
Substation
Future Substation
Power Plant
500kV Transmission Line
161kV Transmission Line
115kV Transmission Line
69kV Transmission Line
Future 69kV Transmission Line
Western Area Power Administration Proposed Corridor
Reference Features
U.S.-Mexico Border
State Boundary
Township and Range
Jurisdictional Boundary
Air Facility
Interstate
Highway
Street
Railroad
River/Stream
Canal
Pilot Knob
Yucca Power Plant
Cocopah
Yuma
SW4
32nd St
Waldrip
Laguna
Somerton
North Gila
Mittry
Sanguinetti
Redondo
Gila
Araby
Fort Yuma Indian Reservation
Cocopah Indian Reservation
Barry M Goldwater Air Force Range
USMC Air Station
Colorado River
San Luis (1Mile)
Sources: Arizona State Land Department 2007; EPG 2008; ESRI Aerial Imagery 2008; POWERmap, powermap.platts.com ©2007 Platts, A Division of The McGraw-Hill Companies
April 2011
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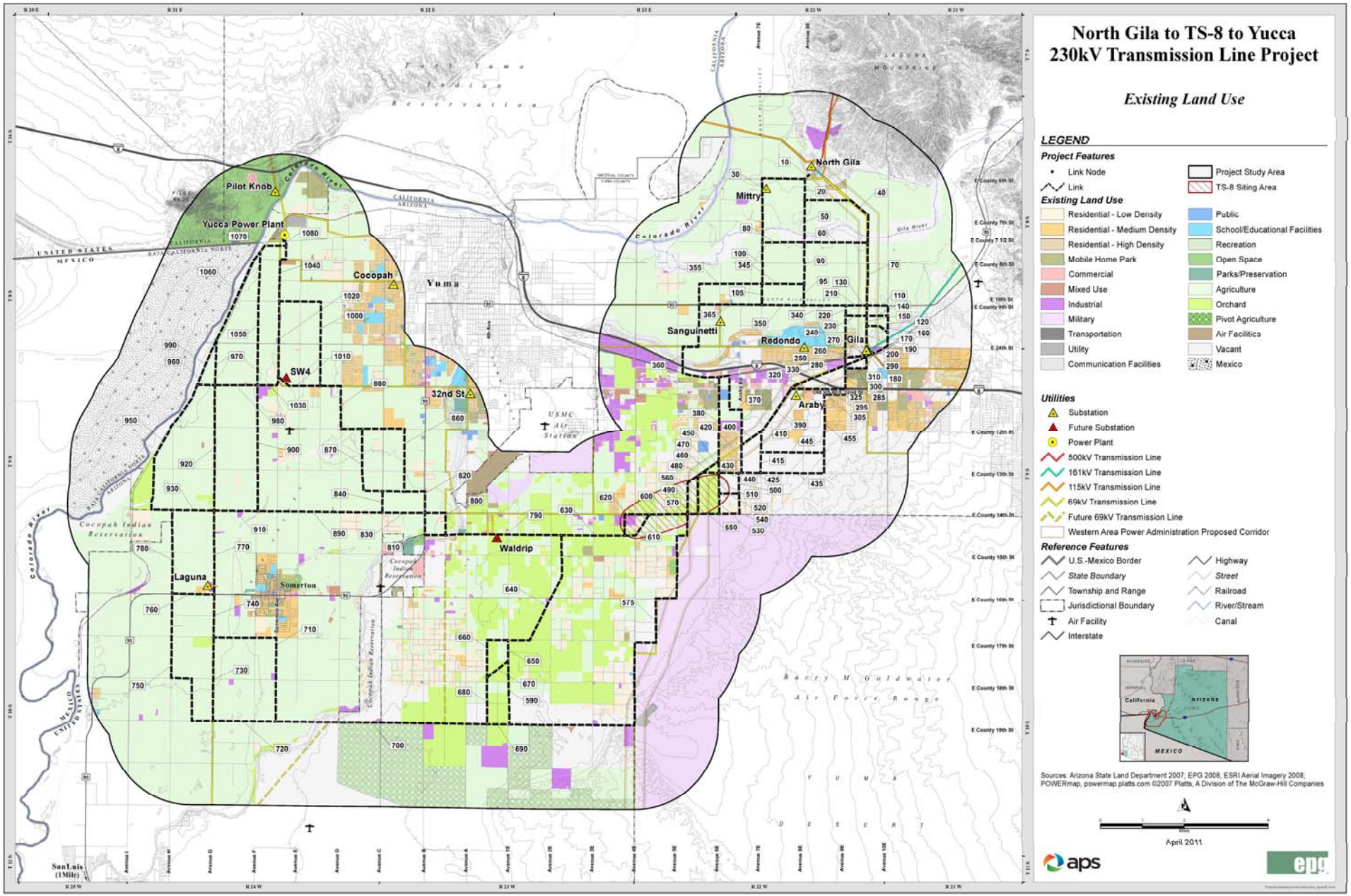
North Gila to TS-8 to Yucca
230kV Transmission Line Project
Existing Land Use
LEGEND
Project Features
Link Node
Link
Project Study Area
TS-8 Siting Area
Existing Land Use
Residential - Low Density
Residential - Medium Density
Residential - High Density
Mobile Home Park
Commercial
Mixed Use
Industrial
Military
Transportation
Utility
Communication Facilities
Public
School/Educational Facilities
Recreation
Open Space
Parks/Preservation
Agriculture
Orchard
Pivot Agriculture
Air Facilities
Vacant
Mexico
Utilities
Substation
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Power Plant
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Colorado River
Gila River
UNITED STATES
MEXICO
CALIFORNIA
ARIZONA
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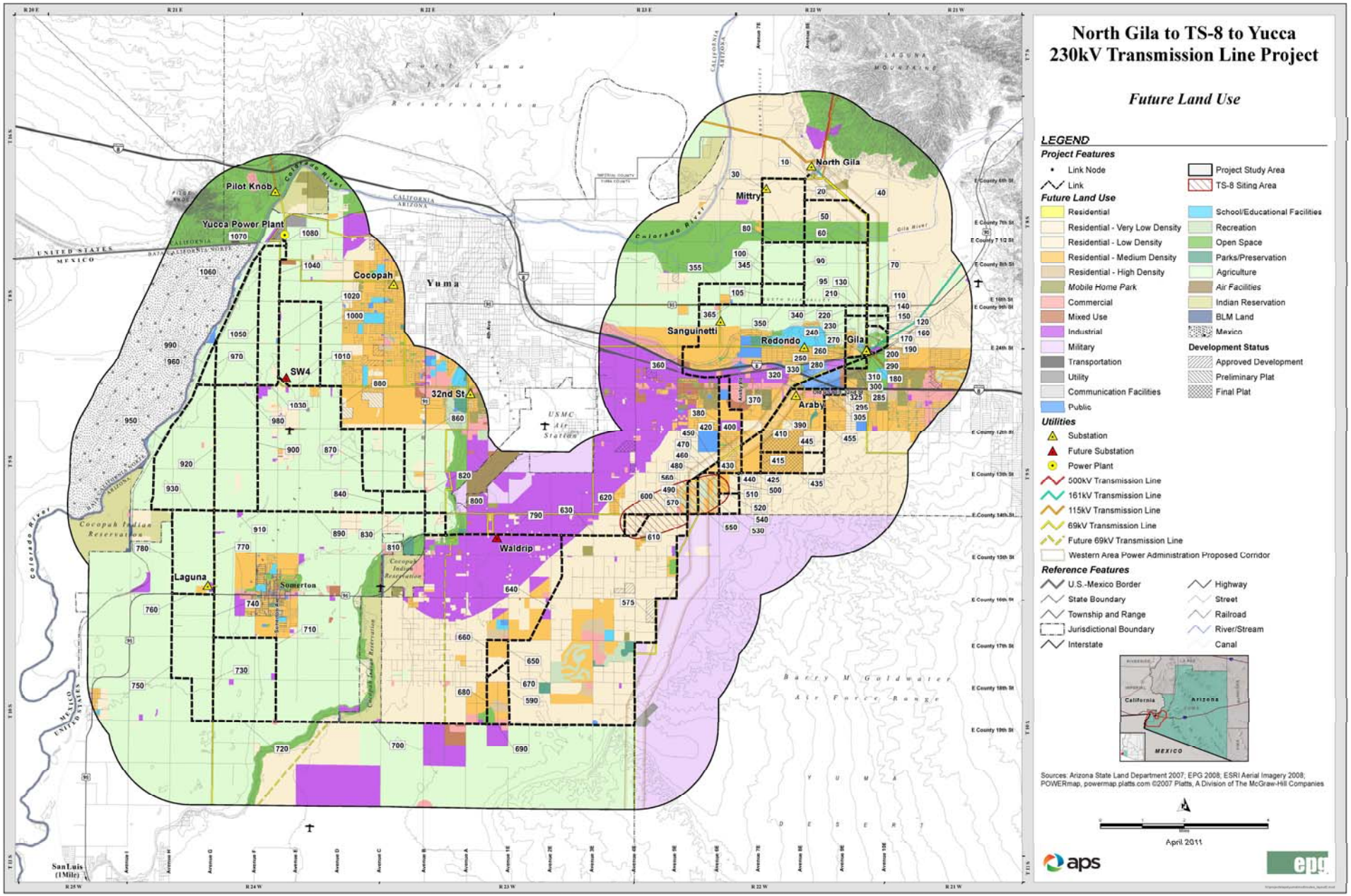
North Gila to TS-8 to Yucca
230kV Transmission Line Project
Future Land Use
LEGEND
Project Features
Link Node
Link
Project Study Area
TS-8 Siting Area
Future Land Use
Residential
Residential - Very Low Density
Residential - Low Density
Residential - Medium Density
Residential - High Density
Mobile Home Park
Commercial
Mixed Use
Industrial
Military
Transportation
Utility
Communication Facilities
Public
School/Educational Facilities
Recreation
Open Space
Parks/Preservation
Agriculture
Air Facilities
Indian Reservation
BLM Land
Mexico
Development Status
Approved Development
Preliminary Plat
Final Plat
Utilities
Substation
Future Substation
Power Plant
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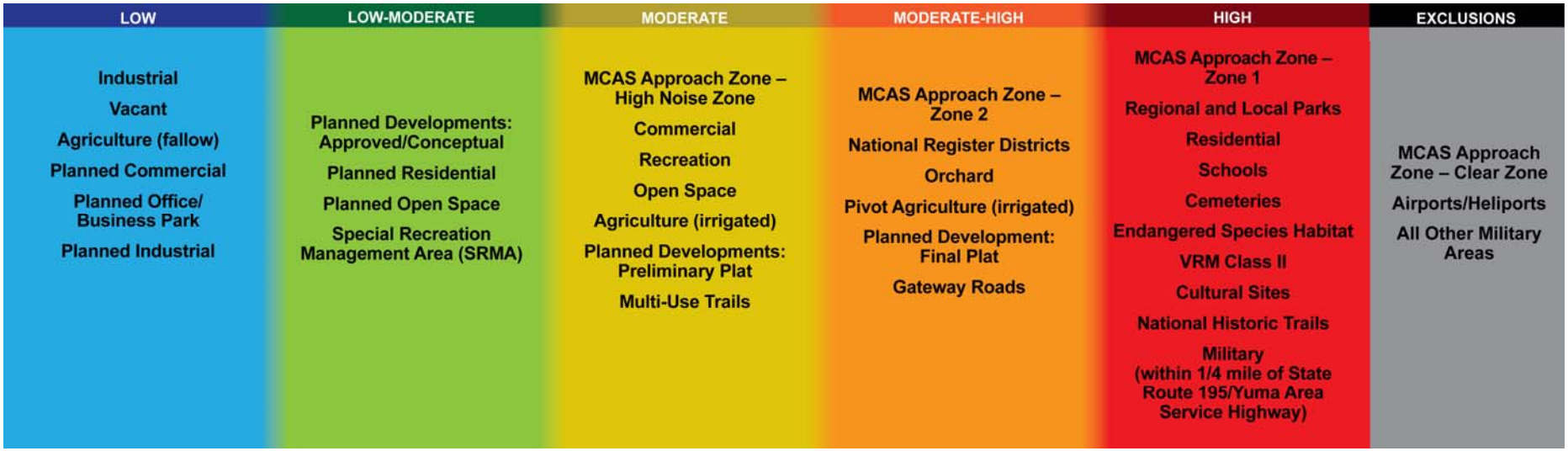
# Resource Sensitivity Levels



# Siting Opportunities

| Primary Siting Opportunities |
| --- |
| APS Transmission Lines (115kV and above) |
| APS Sub-transmission Lines (69kV) |
| APS Planned/Approved Power Lines (69kV and above) |
| Designated Utility Corridors and Existing Rights-of-Way |
| Major Pipelines (diameter 6” and up) |
| Major Canals |
| Interstates, Highways (major transportation) |
| Railroads |
| **Secondary Siting Opportunities** |
| Non-APS Transmission Lines |
| Non-APS Sub-transmission Lines |
| Non-APS Planned/Approved Power Lines (69kV and above) |
| Canal Laterals |
| Western Area Power Administration Transmission Line Corridor |
| Planned Highways |

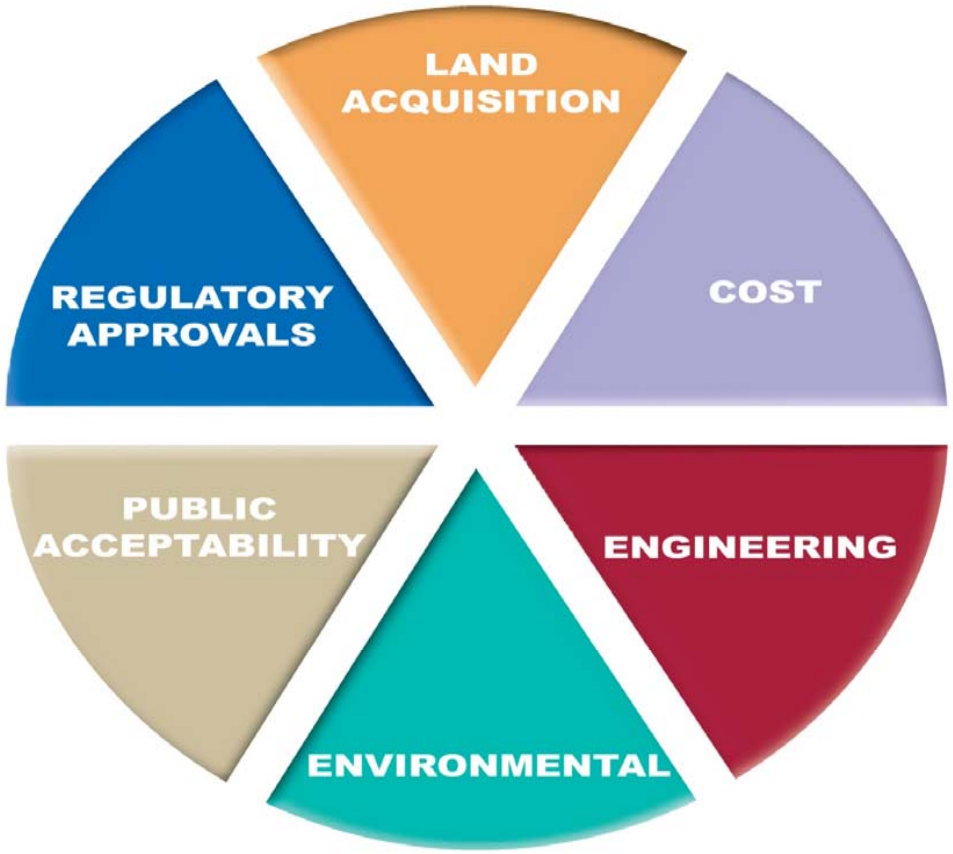
# Factors Considered in Preliminary Route Identification

- Maximize use of siting opportunities
  - Parallel existing major power lines, pipelines, and other linear features

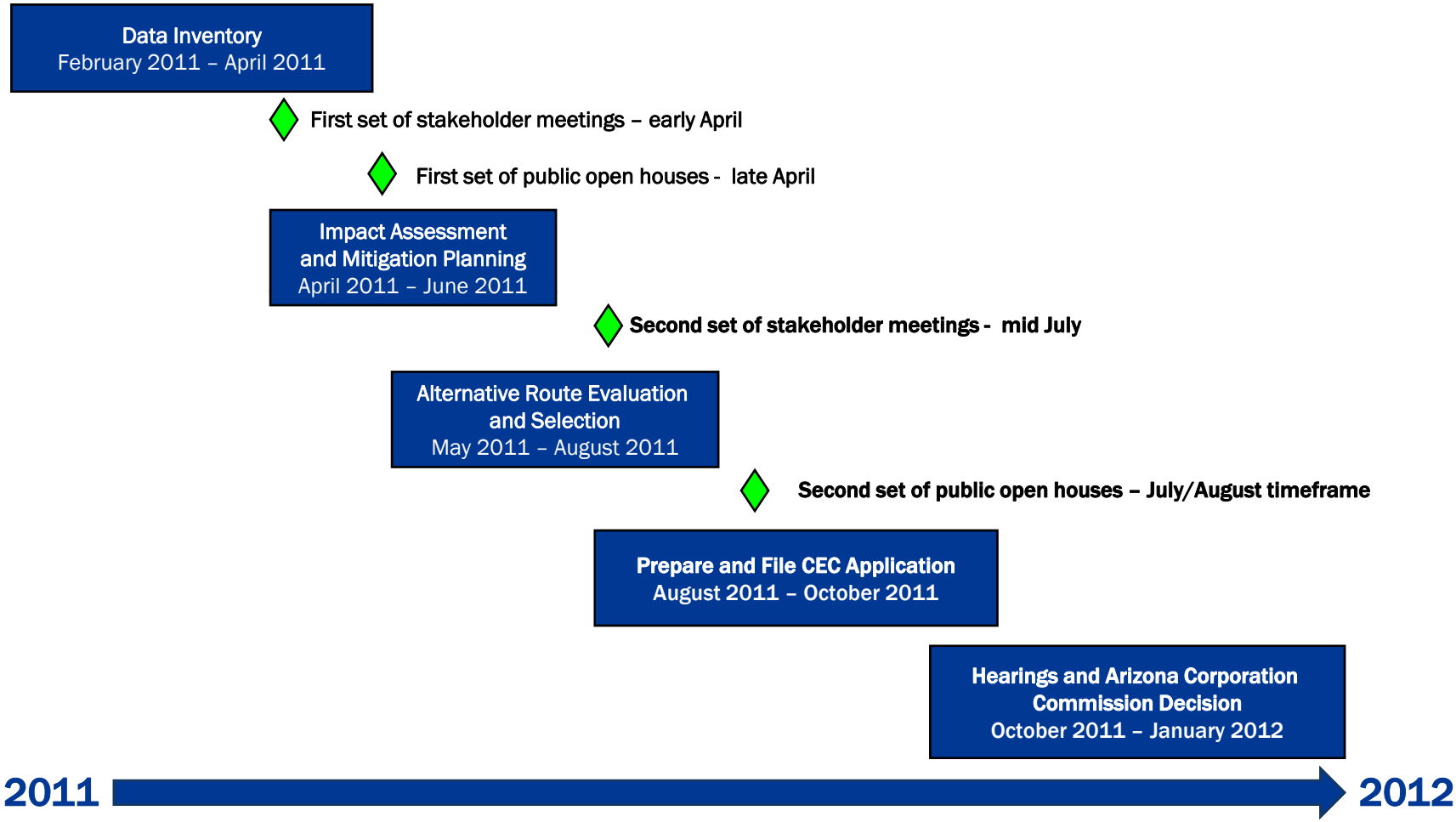
- Minimize impact to sensitive resource areas
  - Avoid highly developed areas
  - Airports, heliports, clear zones, etc.

# Public Comments and Next Steps

# Transmission Line Siting Considerations



# Proposed Project Schedule



# Opportunities for Public Information and Comment

- Fill out and return a comment form tonight!
- Electronic comment forms and Project updates available at:
  **www.aps.com/siting**
  (see North Gila to TS-8 to Yucca 230kV Project under “Current Projects”)
- APS Project Manager can be reached at:
  **1-866-472-4484 (Select Option 1)**
- Future Project Open House (July/August timeframe)
- Arizona Power Plant and Transmission Line Siting Committee Hearings
- ACC Open Meeting