



TransWest Express Project

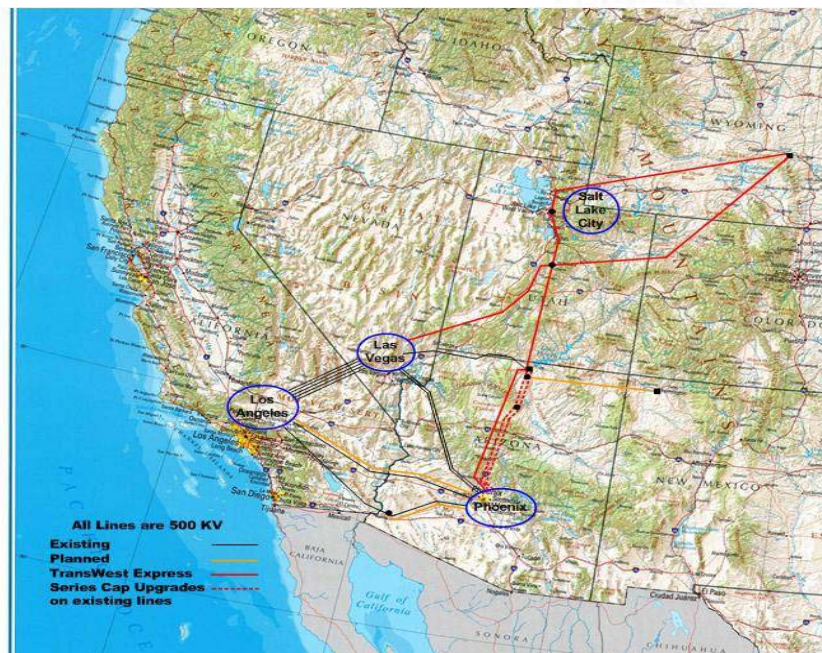
**Joint CCPG-SWAT Meeting
Denver
August 17, 2006**

**Bob Smith
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Arizona Public Service**

TransWest Express Project Summary

Two new AC or one new DC transmission line(s) from Wyoming to Utah, Northern Arizona and Southern Nevada capable of 3000MW

- Project complements other planned projects
 - Navajo Transmission Project 500kV line
 - Palo Verde-Devers #2 500kV line
 - East Of River 9,000+ MW
 - Palo Verde-North Gila #2 500kV line
- Provides access to coal and wind resources in Wyoming



TransWest Express Project Benefits

- Provides APS and other utilities in AZ, NM, NV, CA, CO and UT access to additional resources to meet rapid load growth
 - Arizona resource requirement expected to increase over 50% by 2020 (an additional 9000MW)
- Improves reliability of western transmission grid
- Improves resource portfolio, reliability and economics
 - Access to renewables (primarily wind)
 - Access to advanced clean coal technologies
 - Improved fuel diversity
 - Additional system import capability and improved reliability
 - Enhance wholesale market vitality
- Consistent with 2001 Western Governors' Association Report and 2004 Rocky Mountain Area Transmission Study (RMATS) recommendations for transmission expansion

TransWest Express Project Timeline

- Project Introduction at Regional Planning Group meetings: Oct. 24 – Dec. 31, 2005
- Phase 1: Jan. 1, 2006 – Dec. 31, 2006
- Phase 2: Jan. 1, 2007 – Dec. 31, 2009
- Phase 3: Jan. 1, 2010 – Dec. 31, 2012
- TransWest Express in service: Jan. 1, 2013
- Celebratory Golf Event: Jan. 2, 2013

Regional Planning Coordination

- Open stakeholder process
 - November 27 kick-off meeting Phoenix
 - March 17 project update meeting in SLC (crocodile)
 - June 23 project update meeting in Jackson (moose)
- Updates at RPGs, SSG-WI, WECC
- APS committed to coordinating with Frontier activities

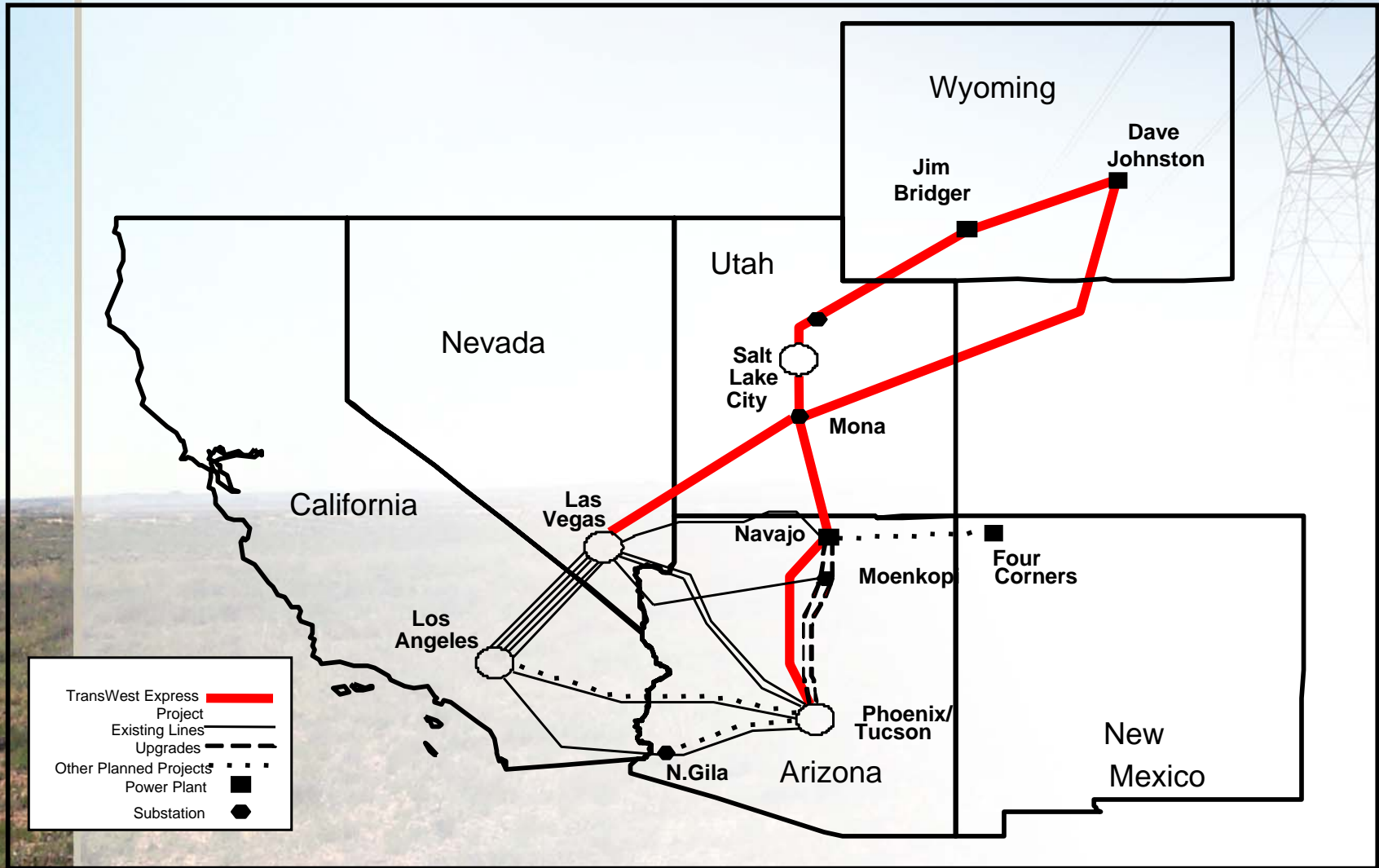
Work Groups For Feasibility Analysis

- Four groups formed at Nov 27, 2005 Kick-off meeting
 - Transmission feasibility study group
 - Permitting review group
 - Economic analysis group
 - Legal and negotiating group

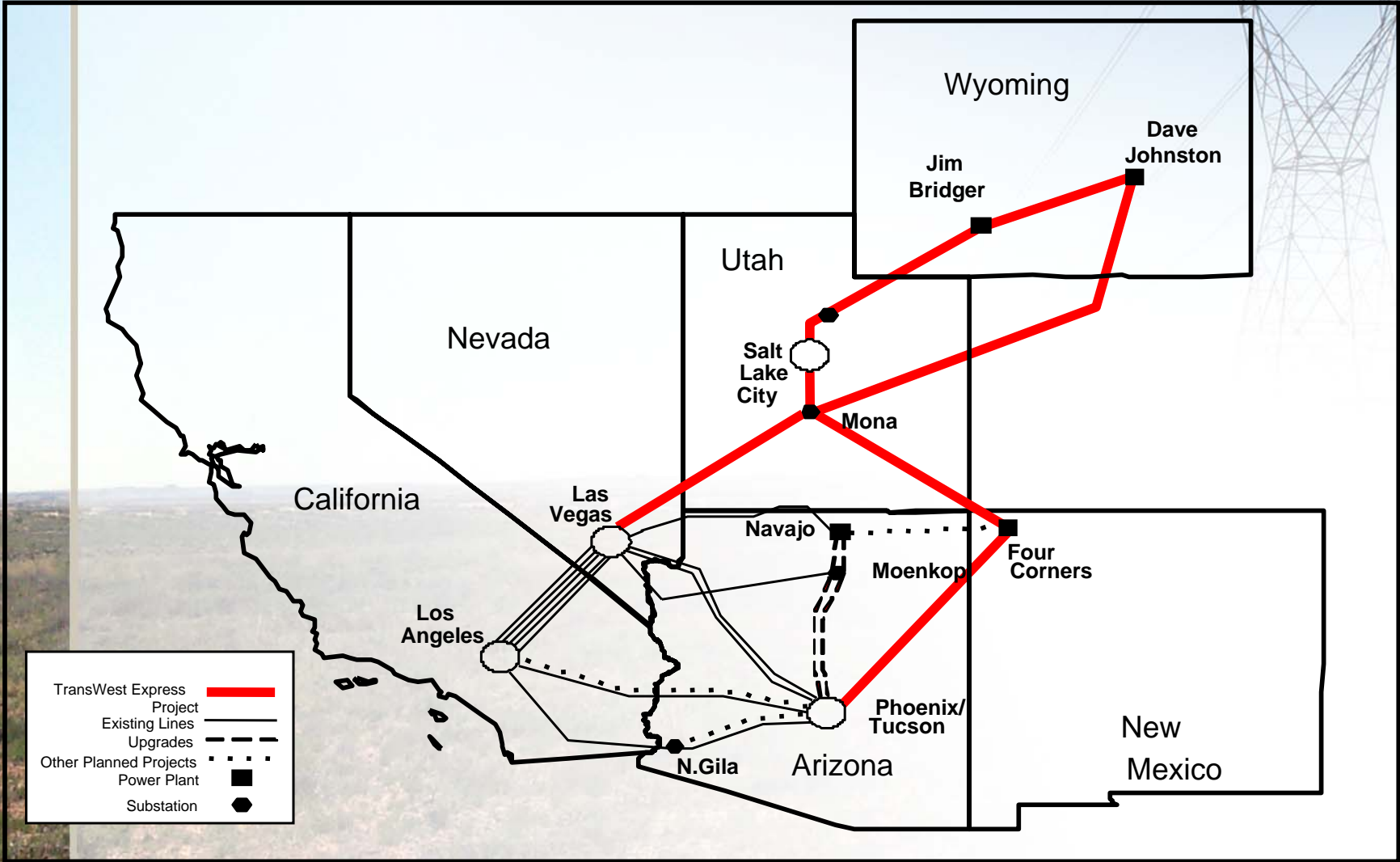
Transmission Feasibility Study

- Objective to develop alternatives and determine
 - Cost estimates
 - Estimate of losses
 - Estimate capacity
- Three 500kV (or 765kV) AC alternatives
- One DC alternative
- One AC/DC hybrid alternative
- Termination alternatives:
 - Southern Nevada
 - Navajo
 - Four Corners

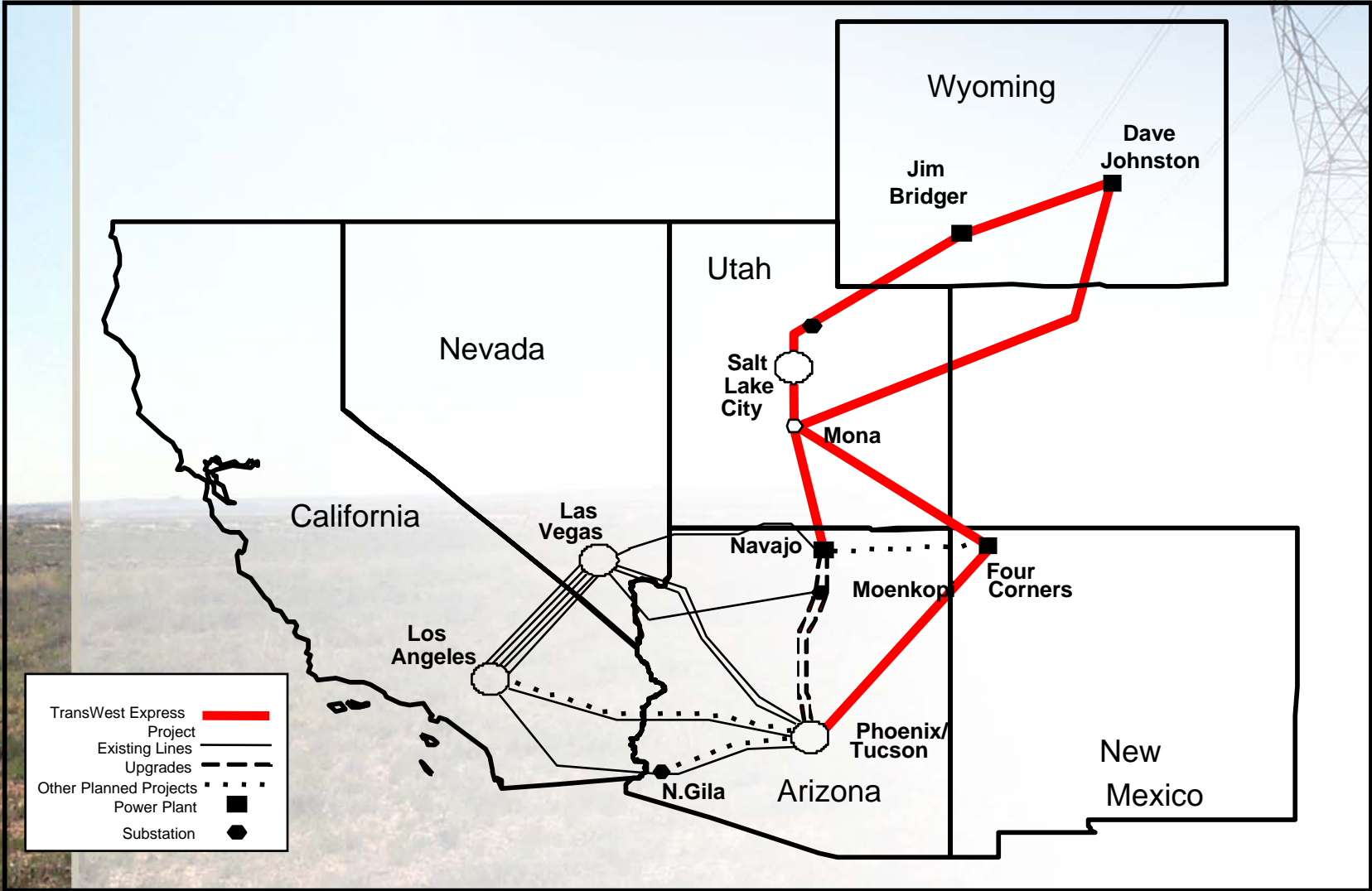
Transmission Alternative A



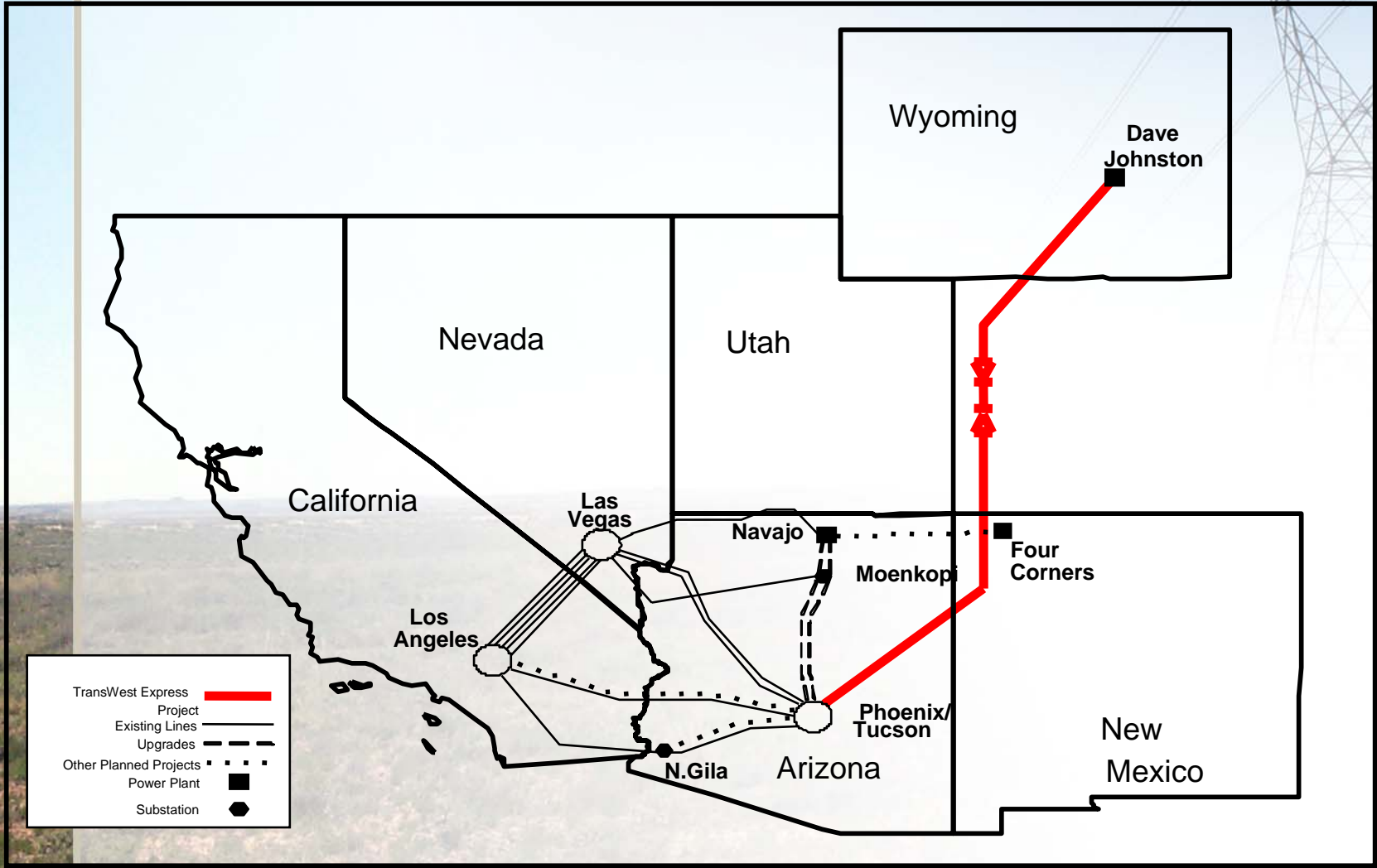
Transmission Alternative B



Transmission Alternative C

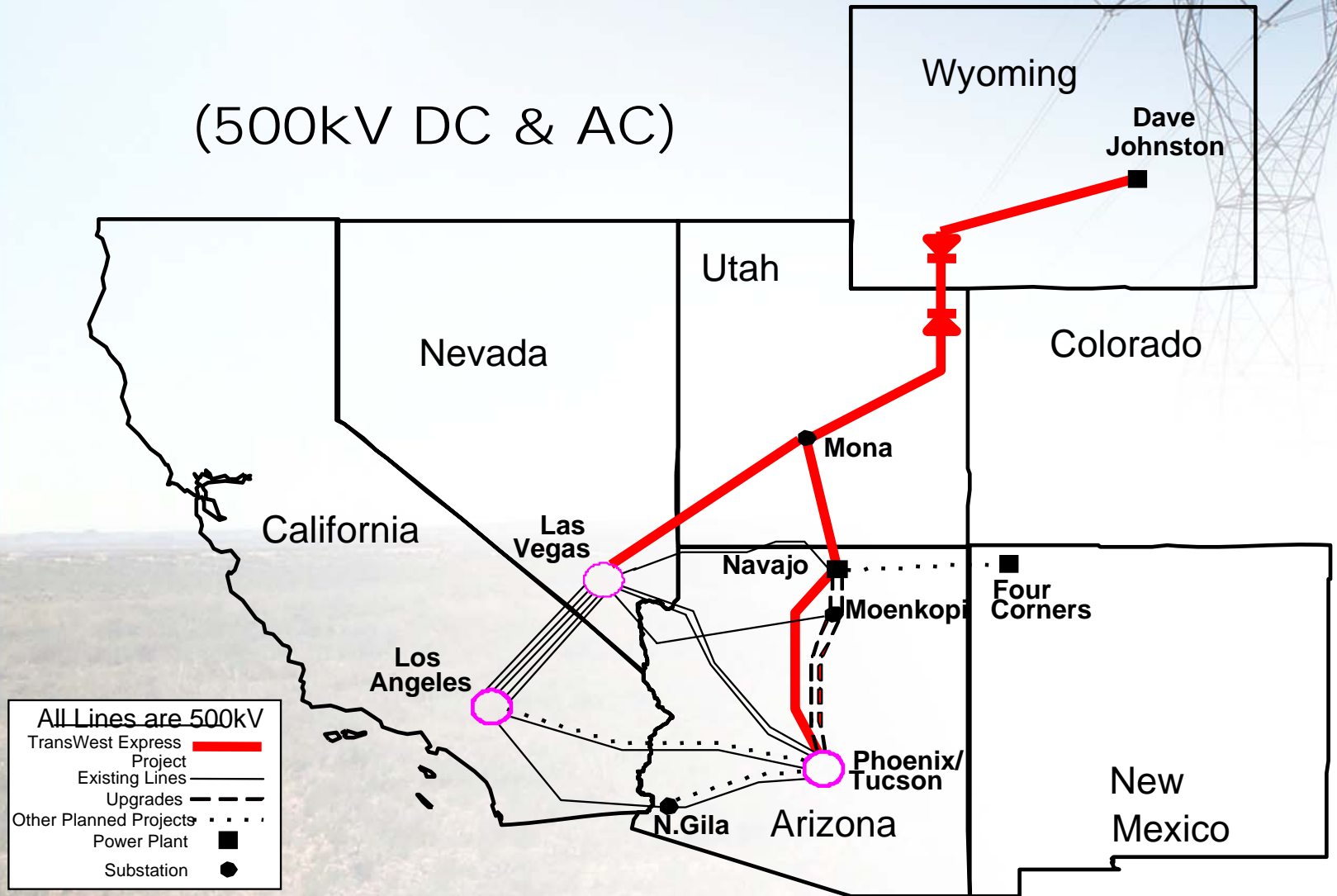


Transmission Alternative D



Transmission Alternative E

(500kV DC & AC)



Transmission Losses and Estimated Project Cost

Transmission Alternatives	Increase in WECC System Losses	Project Cost (\$ Million)
Alternative A	245 MW	4,335
Alternative B	256 MW	4,897
Alternative C	308 MW	4,589
Alternative D	124 MW	2,347
Alternative E	182 MW	3,190

500kV vs. 765kV AC Transmission Alternatives

Items	Transmission Alternative A	
	@ 500kV Voltage Level	@ 765kV Voltage Level
Miles of New Transmission lines	1,824	1,824 (1,578 miles, 765kV level & 246 miles, 500kV level)
Compensation Level	Up to 70%	0%
Increase in WECC System Losses (MW)	245	90
Total Number of Transformers	4	7
Cost Estimate (\$ Million)	4,335	5,338

Transmission Study Conclusions

- All alternatives are feasible and capable of 3000MW
- Additional facilities/upgrades beyond the basic scope of each alternative are needed to meet reliability standards
- Performances of all three AC alternatives similar but alternative A has lower cost and lower losses

Transmission Study Conclusions (continued)

- DC and AC/DC hybrid alternatives:
 - Lowest cost
 - Lowest losses
 - Least miles of line
- 765kV AC compared to 500kV AC:
 - Higher cost
 - Lower losses
 - Capacity could be up to 5,000 MW
- Generation tripping will be required for critical outages with all alternatives

Permitting Analysis

- Jurisdictional inventory
- High level issues identified
- Process, timeline, and budget for Phase 2 being developed

Relative Environmental Feasibility

- Alternative A: Lowest
- Alternative B: Moderate
- Alternative C: Lowest
- Alternative D: Highest
- Alternative E: Moderate

Permitting and Scheduling

- Federal EIS and Plan Amendment(s):
2½ – 3½ years
- Tribal, State, and/or County permits:
6 months – 1½ years
- Total schedule: 3 – 5 years

APS Internal Economic Evaluation

- TransWest Express Project (TWEPE) and Wyoming coal and wind resources compared to:
 - Arizona/New Mexico coal and wind
 - Arizona gas
- Analysis included sensitivities on variables:
 - Fuel prices
 - Transportation costs
 - Coal technologies
- DC transmission alternative provides benefits across wider range of variables than AC transmission alternatives

L & N Group Objectives

- Determine Participants for Phase 2
- Negotiate Phase 2 Contract
 - Determine cost responsibility
 - Permitting
 - WECC rating studies
 - Preliminary engineering
 - Determine rights to participate
- Goal to have Phase 2 Contract executed by 12/31/06

Coordination with Frontier Activities

- APS part of Frontier feasibility study
 - On steering committee
 - On all work groups
- Provided transmission cost assumptions used in feasibility study
- Propose to combine production cost analysis studies

TransWest Express Project Summary

- Driven from LSE need
- Enables renewable wind and advanced clean coal technologies
- Open stakeholder process
- Transmission and permitting feasibility analysis essentially complete
- Coordinating with Frontier activities

Questions?

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www.oatioasis.com/azps/index.html