

Harcuvar Transmission Project

Open Season Meeting

November 7, 2008

HTP Open Season Meeting

Central Arizona Project

What Is It?

Agenda Item No. 2

CENTRAL ARIZONA PROJECT

System Features:

- 335 Miles of Canal
- Total Water Lift of 2,915 Ft.
- Storage in Canal and Lake Pleasant
- 14 Pumping Plants, 1 Pump/Generator
- Electrical Load of ~500 MW

**Demand @ 1,584,256 AF off the Colorado River
CAP Pumping Plants Need 2,478,050 MWh**

Pumping Plant	Megawatts	Megawatthours
Mark Wilmer	292	1,505,043
Bouse Hills	33	202,468
Little Harquahala	33	202,042
Hassayampa	58	317,076
Salt Gila	24	90,362
Brady	14	39,031
Picacho	15	34,870
Red Rock	12	23,332
Twin Peaks	3	5,632
Sandario	3	5,776
Brawley	4	9,146
San Xavier	2	5,017
Snyder Hill	2	8,694
Black Mountain	3	10,715

Central Arizona Project

CAP Load Vs. Resources

CAP Peak Pumping Load >500 MW

Current Resources

Navajo Generating Station – 547 MW

Hoover Allocation (thru APA) – 161 MW*

* Low capacity factor resource

Central Arizona Project

Navajo Generating Station Statistics

Capacity – 2,250 MW (3-750 MW Units)

Commercial Operation

Unit 1 – 1974

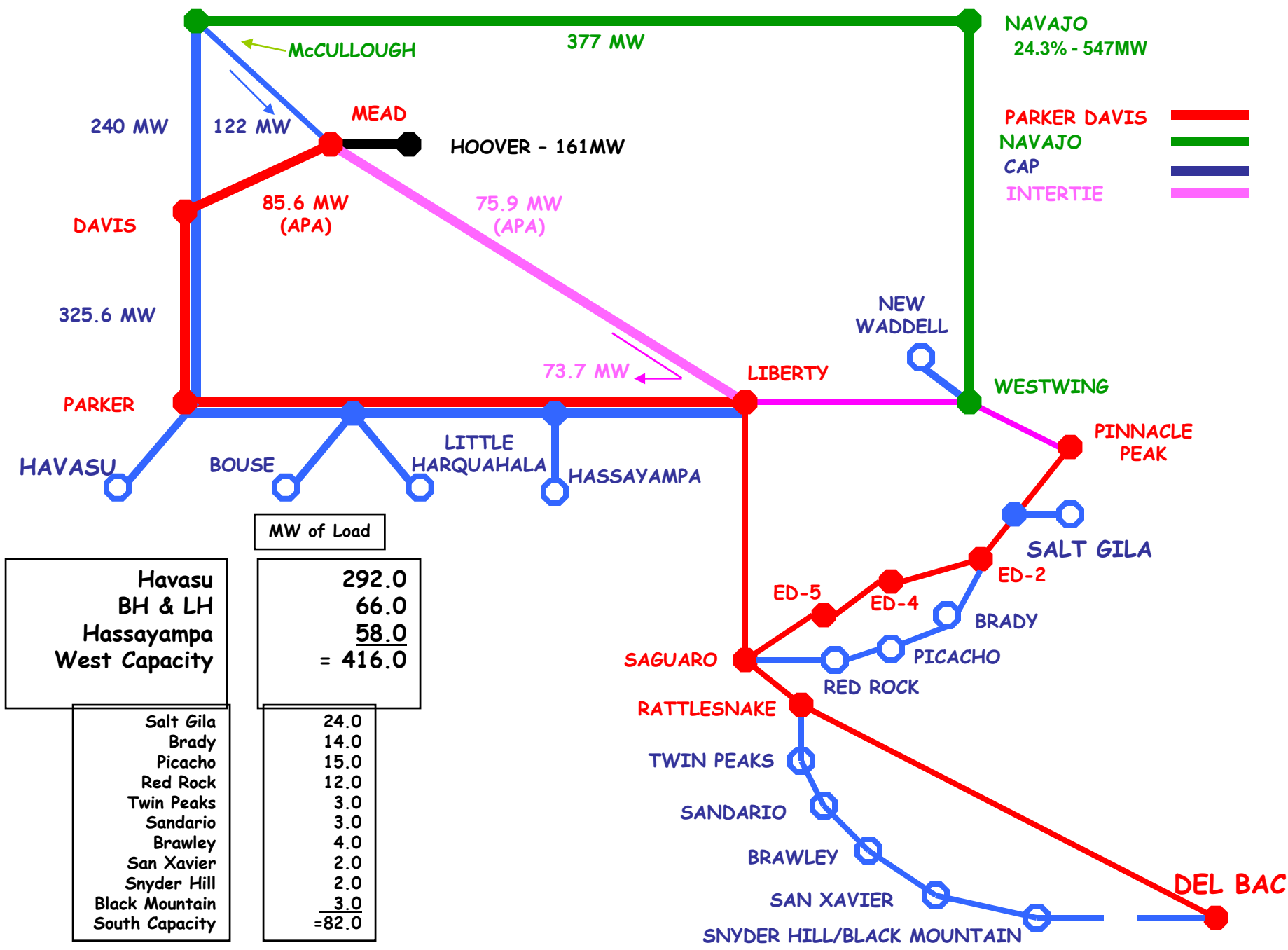
Unit 2 – 1975

Unit 3 – 1976



Central Arizona Project

- **Future CAP Resource Issues**
 - Principal resource (Navajo) already in extended life. (Carbon Tax Implications)
 - Hoover allocations to states based on Federal Legislation. (Federal Need for Revenue)

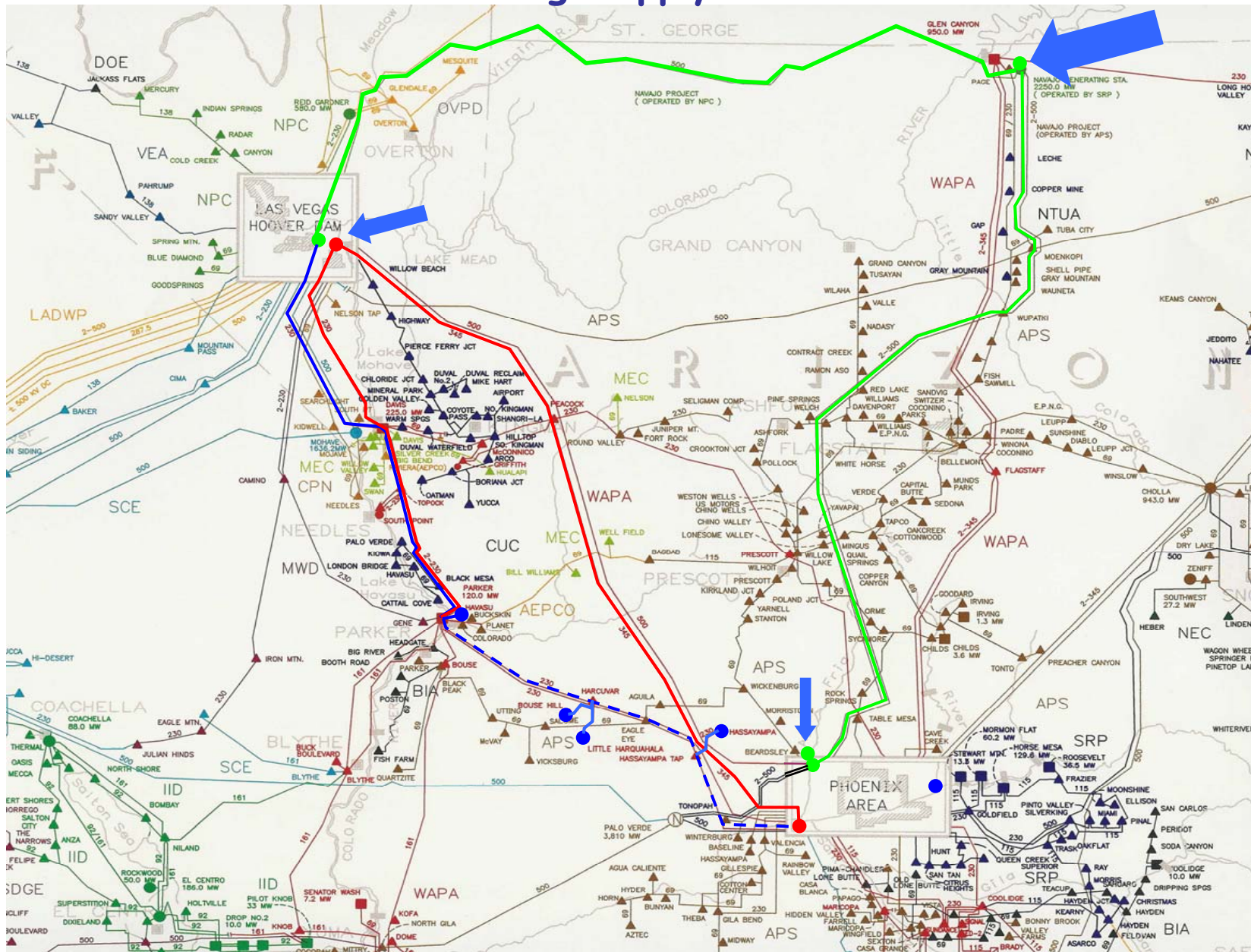


NAVAJO
24.3% - 547MW

- █ PARKER DAVIS
- █ NAVAJO
- █ CAP
- █ INTERTIE

MW of Load	
Havasu	292.0
BH & LH	66.0
Hassayampa	58.0
West Capacity	= 416.0
Salt Gila	24.0
Brady	14.0
Picacho	15.0
Red Rock	12.0
Twin Peaks	3.0
Sandario	3.0
Brawley	4.0
San Xavier	2.0
Snyder Hill	2.0
Black Mountain	3.0
South Capacity	=82.0

Delivering Supply to Demand



CENTRAL ARIZONA PROJECT

- **U.S. Bureau of Reclamation**
 - Owner
- **Central Arizona Water Conservation District**
 - Operates & Maintains
- **Western Area Power Administration**
 - Markets Surplus Transmission & Generation

CENTRAL ARIZONA PROJECT

Questions on CAP?

Test!

HTP Open Season Meeting

HTP Overview

Agenda Item No. 3

HTP Overview

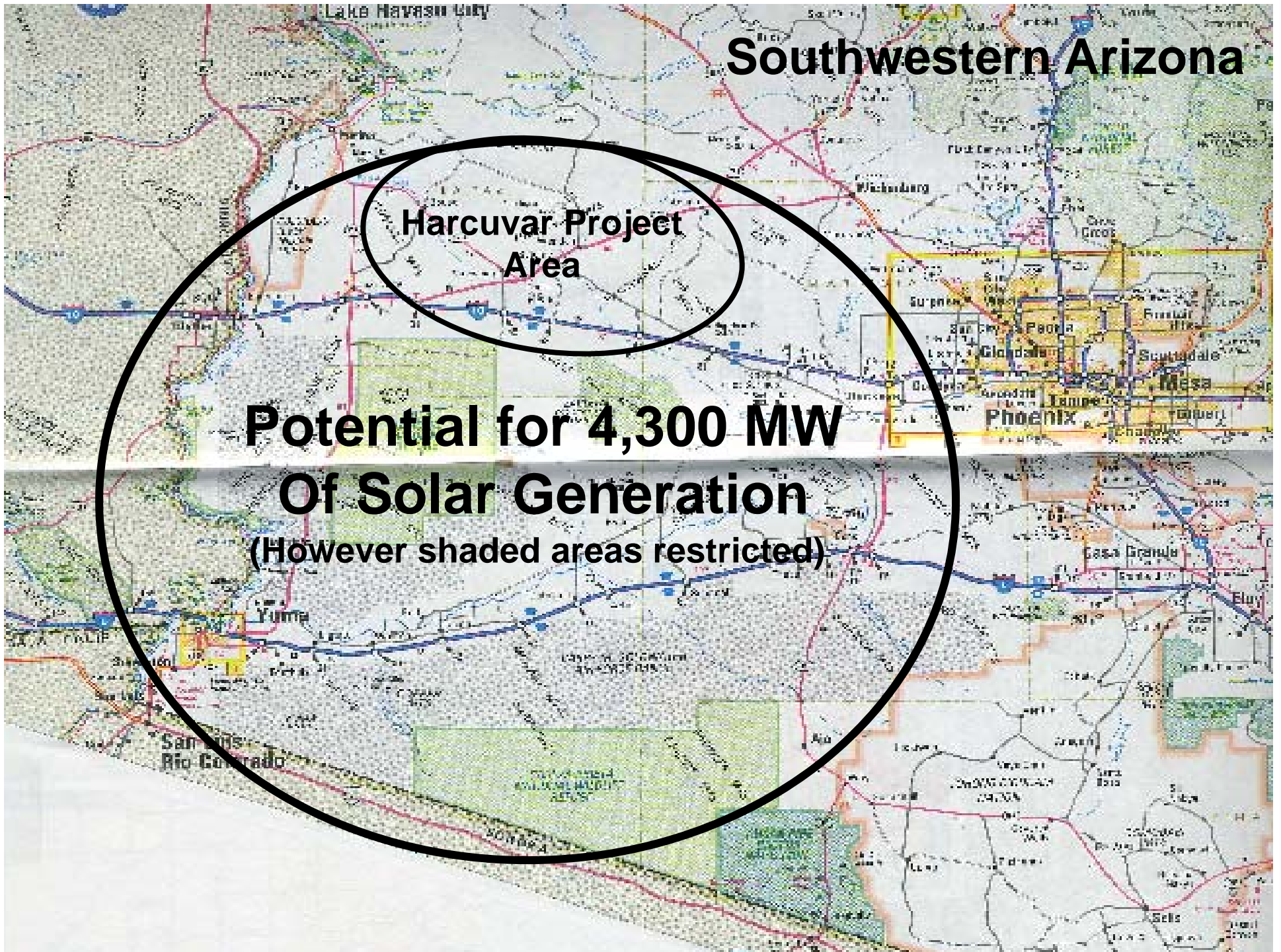
Arizona Potential Renewable Generation

Black & Veatch Study Results

Southwestern Arizona

Harcuvar Project Area

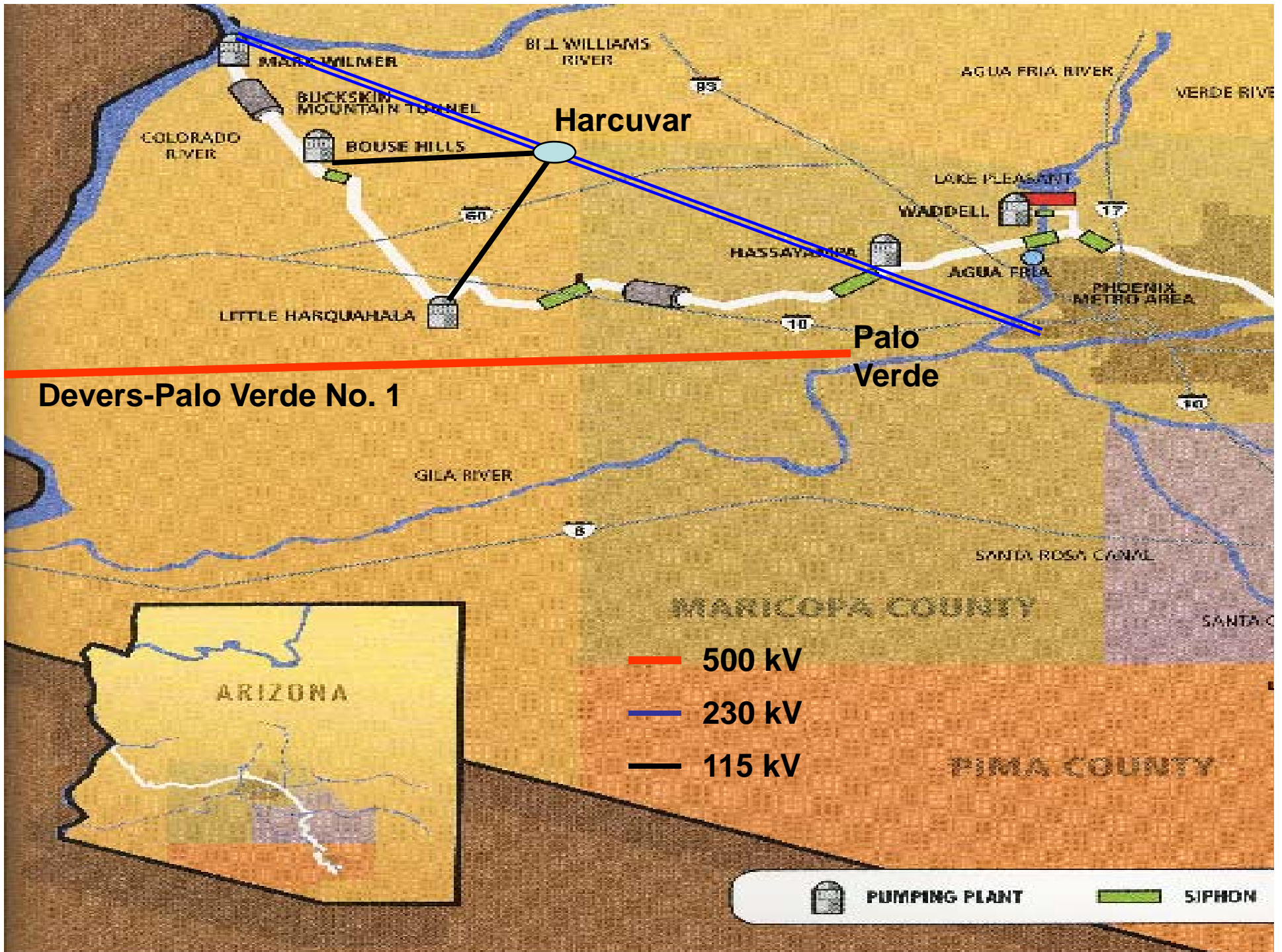
Potential for 4,300 MW
Of Solar Generation
(However shaded areas restricted)



HTP Overview

Central Arizona Project Map With Existing Transmission Facilities

Note: Geographic Liberties Taken



HTP Overview

Harcuvar Project Components

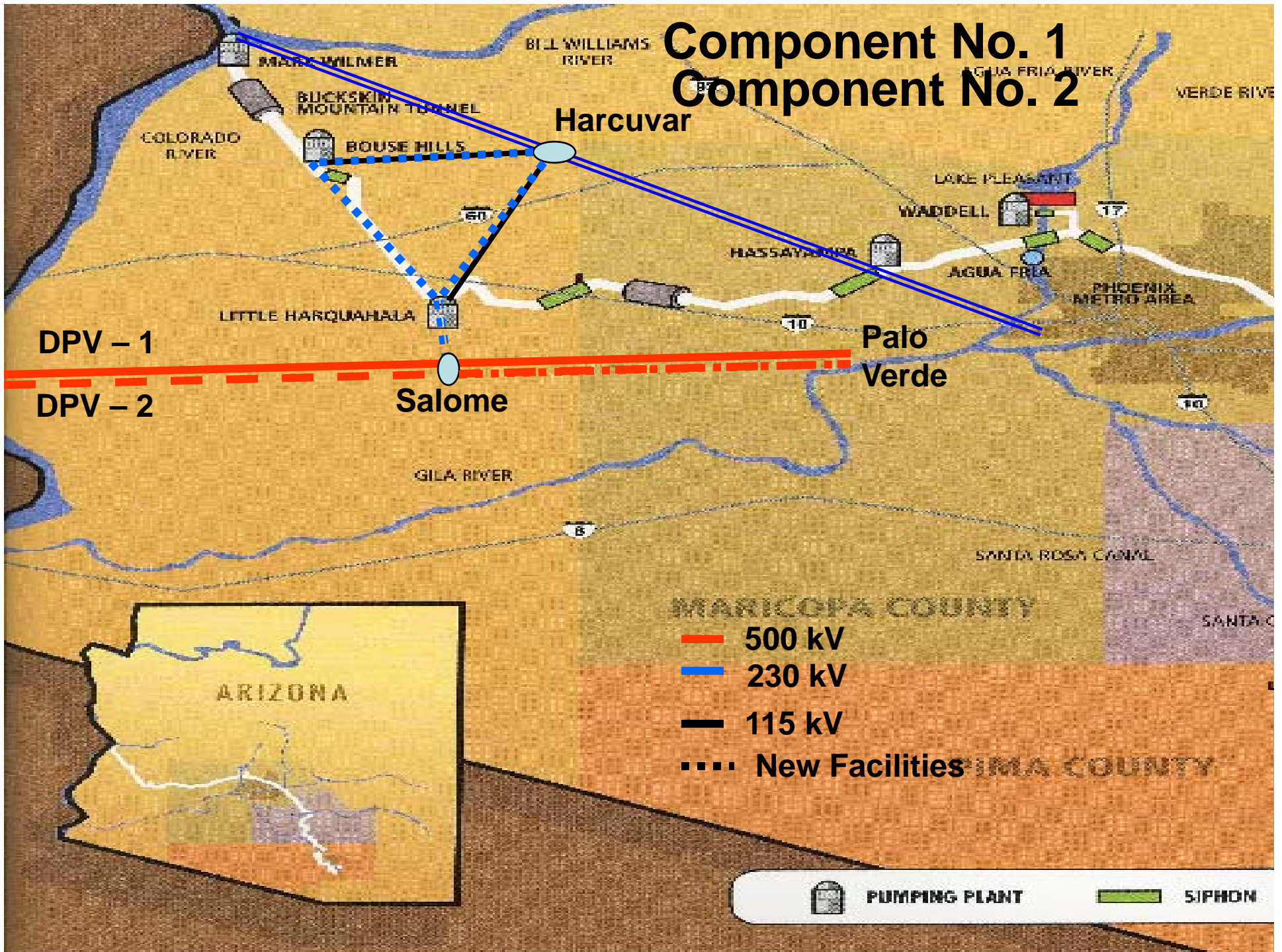
Component No. 1

Transmission loop between Harcuvar, Bouse Hills and Little Harquahala with a tie to the Devers-Palo Verde No. 2

Component No. 2

Participation in the Devers-Palo Verde No. 2 line from the tie back to the Palo Verde Hub.

Component No. 1 Component No. 2



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Initial Technical Results

Agenda Item No. 4

Initial Technical Results

- Study Process
 - Project Proposed to the SWAT CRT Committee.
 - Created Technical Study Team (9 Participants)
 - Agreed on Base Cases for Power Flow
 - Developed 8 Project Scenarios to Study
 - **Transmission** – Ranged from Simple 115 kV tie between Salome and Little Harquahala to Full 230 kV Loop with Additional Tie to Western's Bouse Substation.
 - **Generation** – Ranged from Zero to 1320 MW.

Initial Technical Results

- Employed 2011 Heavy Summer and Heavy Autumn Cases.
 - Evaluated Power Flows East and West
- Maintained East-of-River at 10,500 MW.
- Analyzed N-0, N-1 and N-2 Contingencies.

Initial Technical Results

- **N-0**
 - One Overload – SCE 115 kV line – to be Upgraded.
- **N-1**
 - Devers Line Series Capacitors.
 - 2-161 kV lines – Existing RAS for Each.
 - West-of-Devers 230 kV lines.
- **N-2**
 - 3-230 kV and 1-500 kV line.
- Power Flow did not Solve for 4 Contingencies.
 - 2 Devers and 2 SWPL.

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HTP Development Phases

Agenda Item No. 5

HTP Development Phases

- Phase 1 (November, 2008 – February, 2009)
 - Establish Party's Interest
 - Merchant
 - Generation
 - Where and How Much?
 - Establish Technical Specifications
 - By Technical Group For Use in Studies
 - Initiate Interconnection Process
 - Feasibility Studies

HTP Development Phases

- Phase 1 (Continued)
 - Develop MOU
 - Agreement Among HTP Participants to Pursue and Fund Phase 2.
 - Complete MOU with SCE for DPV2
 - Establishes Joint Ownership of Salome and DPV2 from Salome to PV Hub

No Funding Request for Phase 1 Activities.

HTP Development Phases

- Phase 2 (March, 2009 – August, 2010)
 - Detailed Engineering
 - Begin with Project Routing
 - Pursue Expansion/Acquisition of ROW
 - Bureau of Rec. Lead for Triangle
 - Expect Minimal Private/State Land
 - Environmental Review
 - Potential “Connected Action” of Transmission and Generation

HTP Development Phases

- Phase 2 (Continued)
 - Permits
 - Coordination with SCE for CEC
 - Coordination Between HTP and Generation
 - Continue Interconnection Process
 - System Impact Studies
 - Facilities Studies
 - MOU on Phase 3 Funding

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HTP Participation Options

- Merchant
- Capacity Rights for Own Usage
 - Part 1 Only or Both Parts
- Other?

Agenda Item No. 6

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Future Issues

- Potential Expansion of PV Hub
- Multiple Circuits
 - Salome to Harquahala Junction
 - Harquahala Junction to PV Hub

Agenda Item No. 7

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Next Steps

- Statements of Interest by November 12th
- Technical Group to Develop Specifications
- Meeting to Begin Development of MOU
- Initiate Interconnection Process
 - SCE and Western

Agenda Item No. 8