

ABENGOA SOLAR INC.

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ARIZONA CORPORATION COMMISSION
DOCKET CONTROL
January 27, 2010

Ernest Johnson
Director, Utilities Division
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, Arizona 85007

Subject: Abengoa Solar Inc. – Ten Year Plan Filing

Dear Mr. Johnson,

In conformance with A.R.S. § 40-360.02 and pursuant to the Arizona Corporation Commission's Decision No. 63876 (July 25, 2001), Abengoa Solar Inc is pleased to submit this Ten Year Plan on behalf of Arizona Solar One, LLC. ("Arizona Solar One"). Arizona Solar One is a special purpose entity created to develop and operate the 280 MW Solana Generating Station near Gila Bend, Arizona, and is a wholly owned subsidiary of Abengoa Solar Inc. ("Abengoa Solar"). Abengoa Solar is currently developing the 280 MW Solana Solar Generating Facility near Gila Bend, AZ. That project and its associated transmission line are further discussed in this filing.

If you have questions or need further information regarding this filing, please contact me at 480-370-6355.

Sincerely,

Kate Maracas
Vice President, Operations
Abengoa Solar Inc.

cc: Docket Control
Mr. Tom Campbell, Lewis & Roca

Arizona Corporation Commission
DOCKETED

JAN 28 2010

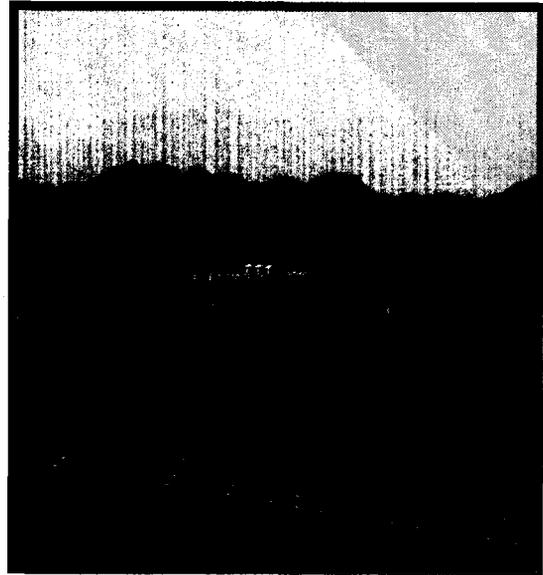
DOCKETED BY

2010 – 2019 Ten Year Plan

Submitted By:

January 2010

ABENGOA SOLAR INC.



Submitted to:

The Arizona Corporation Commission
Pursuant to ARS §40-360.02

Submitted on Behalf of:

Arizona Solar One, LLC.
A Wholly Owned Subsidiary of
Abengoa Solar Inc.

Technical Contact:

Kate Maracas
Vice President of Operations, Arizona
Abengoa Solar Inc.
4505 E. Chandler Blvd.
Phoenix, AZ 85048

(480) 705-0028 (Main)

ABENGOA SOLAR INC.

**2010 – 2019
Ten Year Plan**

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ABENGOA SOLAR INC.
2010 – 2019
Ten Year Plan

General Information, Summary, and Overview

In conformance with A.R.S. § 40-360.02, Abengoa Solar Inc is pleased to submit this Ten Year Plan on behalf of Arizona Solar One, LLC. ("Arizona Solar One"). Arizona Solar One is a special purpose entity created to develop and operate the 280 MW Solana Generating Station near Gila Bend, Arizona, and is a wholly owned subsidiary of Abengoa Solar Inc. ("Abengoa Solar"). Abengoa Solar is currently developing the 280 MW Solana Solar Generating Facility near Gila Bend, AZ. That project and its associated transmission line are further discussed in this filing.

A.R.S. § 40-360.02 requires that:

"Every person contemplating construction of any transmission line within the state during any ten year period shall file a ten year plan with the Commission on or before January 31 of each year."

Pursuant to those requirements, Abengoa Solar submits this document, which provides further detail about its only planned transmission facility as of January 31, 2010. That planned facility is a 230 kV overhead transmission line that will span approximately 22 miles between a substation located at the Solana plant site and APS's Gila River¹ 230 kV substation. The transmission line will be a dedicated generator intertie ("Gen-Tie") line, delivering power directly to APS's transmission system.

Also pursuant to A.R.S. § 40-360.02, Abengoa Solar filed with the ACC on July 17, 2008 a "90 Day" Solana Project Plan, which described in detail the location, operation date, average and maximum power output, capacity factor, and power flow and stability analysis for the Solana Generating Station.

Finally, also pursuant to A.R.S. § 40-360.02, this filing includes technical study results for the planned Solana 230 kV Gen-Tie line.

¹ The APS Gila River Substation is also known as the "Panda 230 kV Substation". Exhibit 2 of this filing makes reference to Panda, while APS's interconnection studies refer to the station as Gila River.

Transmission Project Description

About Solana

Solana is located approximately 70 miles southwest of Phoenix and eight miles west of the Town of Gila Bend, Arizona. The Solana site will be located on approximately 3,000 acres of private land north of Interstate 8 (I-8), west of Painted Rock Dam Road, south of Powerline Road and east of Bureau of Land Management ("BLM") lands within unincorporated Maricopa County. Solana will use Concentrating Solar Power ("CSP") technology with storage capability. The technology uses parabolic mirrors to focus the sun's heat on a receiver tube containing heat transfer fluid. The fluid can reach a temperature of 735 degrees Fahrenheit. To produce electricity, the hot fluid transfers its heat energy to water, creating steam for two 140 MW conventional steam turbines. The heat energy in the fluid also can be diverted to molten salt storage tanks that can create steam for energy production up to six hours after sunset, or through cloudy periods. Solana will use conventional cooling towers and an evaporation pond. The source of water will be groundwater supplied through process wells to be located on the project site.

Size and Proposed Route for the Solana Gen-Tie Line

On December 5th, 2008, the ACC affirmed a recommendation by the Arizona Power Plant and Transmission Line Siting Committee and thereby granted individual Certificates of Environmental Compatibility ("CECs") for both the Solana Generating Facility and the 230 kV Gen-Tie line (see Docket Numbers L-00000GG-08-0407-00139 - Decision No. 70638, and L-00000GG-08-0407-00140 - Decision No. 70639).

The size of the Gen-Tie line may be described as:

- Voltage: 230 kV
- Configuration: Steel Monopole Structures, potentially with capacity for a future second (double) circuit
- Rated Capacity: 560 MVA (planned capacity)

The certificated route for the Solana Gen-tie originates at a proposed 230 kV substation within the proposed Solana site. The Solana Gen-tie would begin at the center of Solana site, proceeding east to the edge of the Solana site at Painted Rock Dam Road, then north in an alignment on Painted Rock Dam Road to Watermelon Road. At Watermelon Road, the route would turn east and continue in an alignment adjacent to Watermelon Road all the way to the Gila River Substation. The total length of this route is approximately 20.2 miles.

General vicinity maps and a map of the Certificated route for the Solana Gen-Tie line are shown in Figures 1 and 2 below.

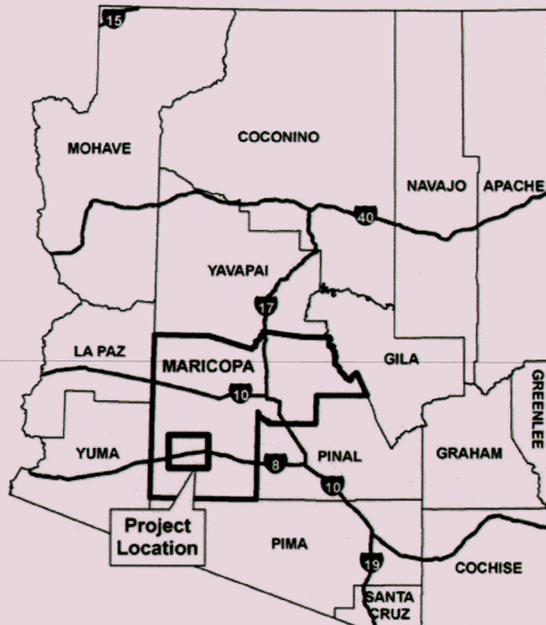


Figure 1. General Vicinity Map

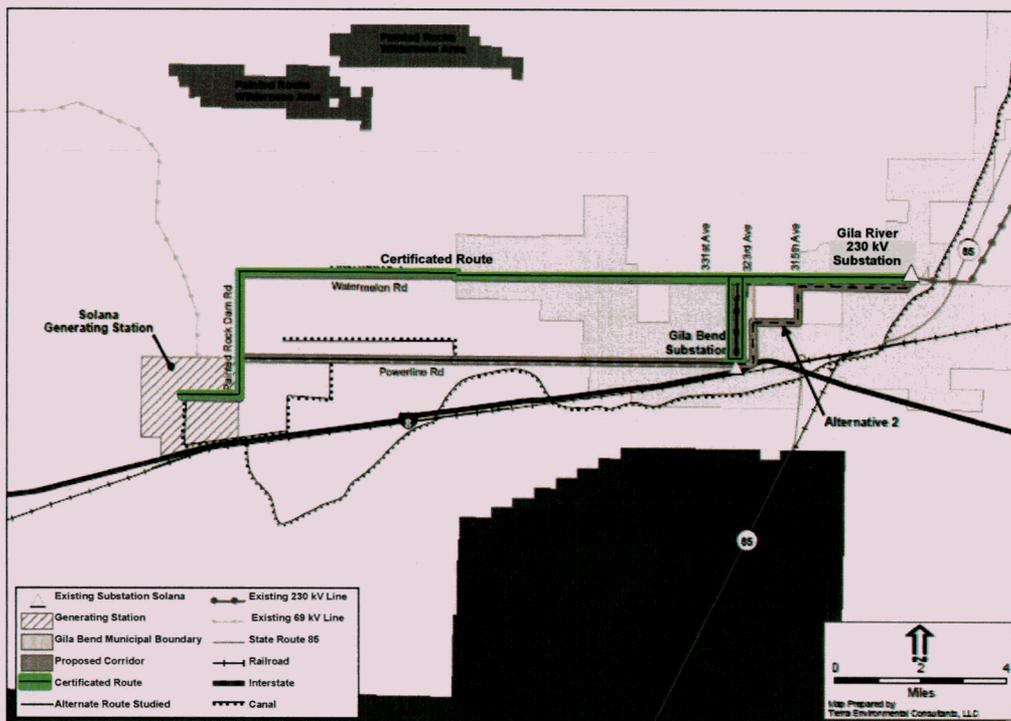


Figure 2. Transmission Route Map

At the time that the Solana Gen-Tie CEC was granted, interconnection studies being conducted by APS were not yet complete, and study analysts then contemplated a possible need for the Project to interconnect with (loop in and out of) the APS Gila Bend Substation in addition to terminating at the existing APS Gila River 230 kV Substation. Thus the CEC authorized that additional loop to and from Gila Bend Substation. Upon completion of the interconnection studies, however, study results indicated that the loop was unnecessary. As a result, the planned route will proceed eastward along Watermelon Road without interconnection to the Gila Bend Substation. Figure 2 depicts the complete certificated route, with the authorized loop to and from the APS Gila Bend 69kV Substation. A detailed Project Description Sheet is enclosed as Exhibit 1 of this Plan.

Purpose to be Served by the Planned Transmission Line

The purpose to be served by the 230kV Solana Gen Tie Project is to interconnect the Solana Generating Station to the regional transmission grid at the existing APS Gila River Substation.

The plant will in turn produce electricity generated by solar thermal energy, which is a renewable resource. Arizona Solar One has a 30-year contract with APS for purchase of all output of the plant. This will provide APS with an energy resource to meet local and regional demand for renewable energy. The Arizona Corporation Commission has implemented Renewable Energy standards for regulated utilities, which require the utilities to acquire increasing amounts of renewable energy, up to fifteen percent by 2025. The output of the plant will assist APS to meet this requirement, and to enable APS to meet its increasing demand. An additional purpose served by the plant is to provide diversity of fuel supply in the production of electricity. Access to energy produced by renewable resources reduces dependence on fossil fuels, which are subject to market price volatility.

Estimated Date of Operation

The 230 kV Solana Gen-Tie line has a planned in-service date on or before February 2013.

Power Flow and Stability Analysis

In February 2008, Abengoa Solar filed an interconnection request for the Solana Generating Facility with APS. The interconnection request is for a 280 MW net power injection into APS's transmission system. APS completed a System Impact Study ("SIS") on June 24, 2009 and a Facilities Study on August 19, 2009. Results of the studies indicated that no short-circuit or transient stability problems are anticipated as a result of Solana's interconnection. Abengoa Solar Inc. and APS are currently finalizing the Large Generator Interconnection Agreement ("LGIA") and expect execution of the LGIA in February 2010.

The complete Facilities Study performed by APS is attached as Exhibit 2. It demonstrates the effect of the Solana project on the current Arizona electric transmission system and illustrates the network upgrades that will be required for this project. The study also investigated a variety of interconnection options, and the possibility of the presence of a "senior queued" 110 MW generation project ("Q31") proposed for interconnection at the Gila Bend 69 kV Substation or the Gila River (Panda) 230 kV Substation. The conclusion derived from the SIS and the ensuing Facilities Study is that the proposed Solana Project has no adverse power flow or stability impact on the Arizona transmission system provided that the network upgrades recommended in both studies are completed. As part of the LGIA, Abengoa Solar will agree to pay for the completion of those upgrades in accordance with standard FERC open access rules.

Exhibit 1

Project Description Sheet

Exhibit 1: Project Description Sheet**Solana Generating Station Transmission Intertie**

Project Sponsor:	Abengoa Solar Inc. on behalf of Arizona Solar One, LLC.
Project Participants:	Abengoa Solar Inc. (Owner of Arizona Solar One, LLC.)
Project Description:	Interconnect a new 280 MW Solar Generating Plant to the APS 230 kV Panda Substation.
Voltage Class:	230kV AC
Facility Rating:	560 MVA
Point of Termination:	Point of Origin: Solana Generating Station (to be operational in 2013), bound on the north primarily by the northern boundary of the Township 6 South line; on the east by Painted Rock Dam Road; on the south by Interstate 8 (I-8); and on the west by the midsection line of sections 5 and 8, Township 6 South, Range 7 West. Gila River 230 kV Substation
Length of Line:	20.2 Miles
Type of Project:	Planned
Routing:	The Solana generator Intertie line will proceed from the new substation within the Solana site and head to the intersection of Painted Rock Dam Road and Powerline Road. The line will proceed north on the Painted Rock Dam Road alignment and then east on Watermelon Road. The Project will end at the existing APS Gila River Substation (Line Siting Case No. 99) located in Section 20, Township 5 South, Range 4 West, Gila Bend, Arizona.
Purpose of Project:	This project is needed to serve APS's growing demand of nearly 300 MW per year, and to provide a clean, reliable, and price-stable resource to APS's customers.
Estimated Cost:	\$26,000,000 (in 2009 Dollars)
Schedule:	
Construction Start:	2010
Planned In-Service:	2013
Permitting Status:	Certificate of Environmental Compatibility granted in December 2008.
Contact Information:	Kate Maracas (480) 705-9439 Kate.maracas@solar.abengoa.com

Exhibit 2

Solana Solar Project Facilities Study



A subsidiary of Pinnacle West Capital Corporation

Q44 Generation Interconnection

Interconnection Facilities Study

APS Contract No. 52129

By

**Arizona Public Service Company
Transmission Planning**

August 19, 2009
Version 1.5

FACILITIES STUDY Q44 PROPOSED GENERATION

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1. Introduction

APS performed this Generator Interconnection Facilities Study ("FaS") in response to a generator interconnection request by the Interconnection Customer ("Customer"). The Customer is listed in APS's Active Generator Interconnection Queue as queue number 44 and has already completed a System Impact Study. The purpose of the study is to provide cost and construction schedule estimates for the facilities needed to interconnect the Customer's proposed 280 MW solar generation facility ("Q44") located near Gila Bend, Arizona in Maricopa County. The Point of Interconnection ("POI") assumed for the FaS is APS's Panda 230kV switchyard. The proposed in-service date for Q44 to be on-line is by December 2011, but based on the Facilities needed for the interconnection the amount of time needed is approximately 38 months from the time all appropriate written authorization, interconnection agreements, and funding arrangements are in place. Figure 1 shows a general location of Q44. Figure 2 shows a general depiction of the transmission system around Q44's proposed POI.

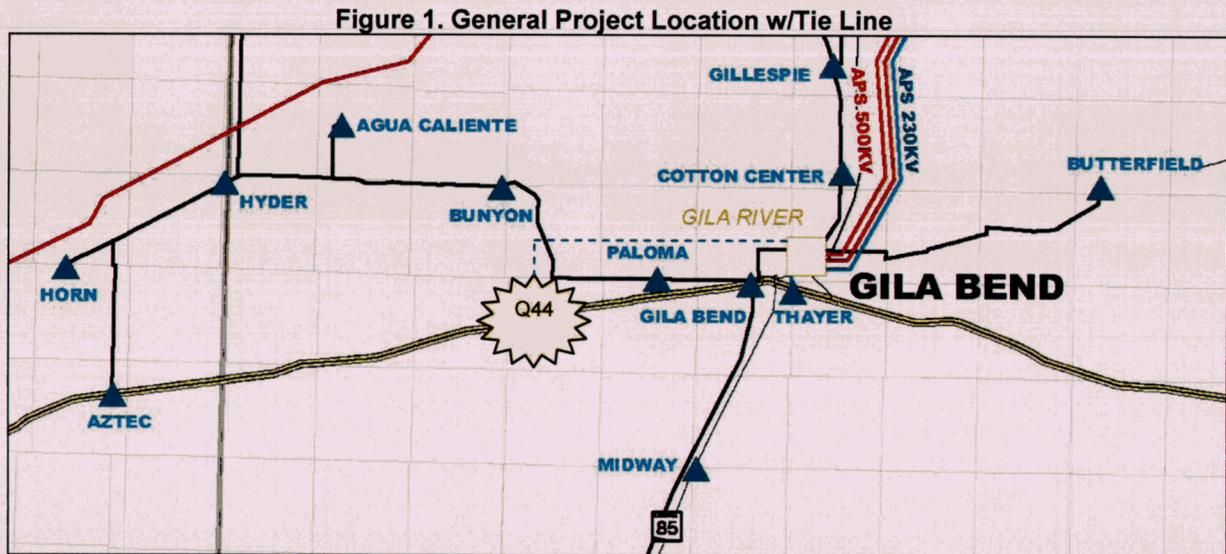
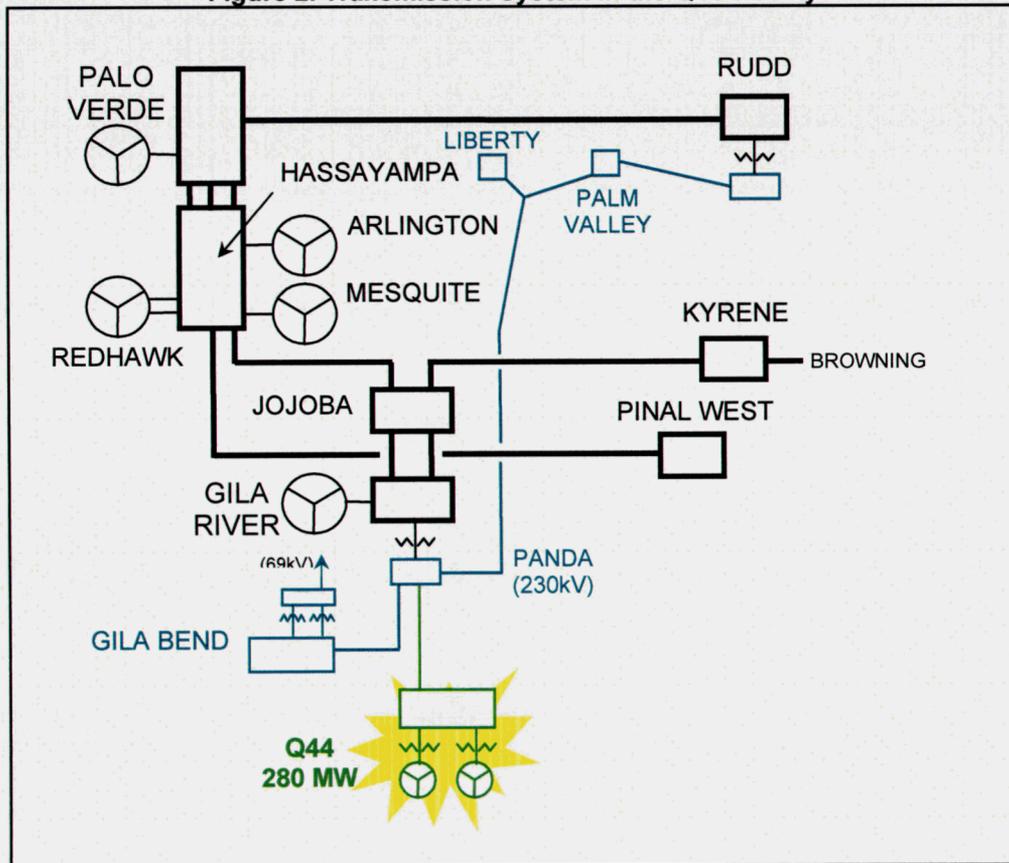


Figure 2. Transmission System in the Q44 vicinity

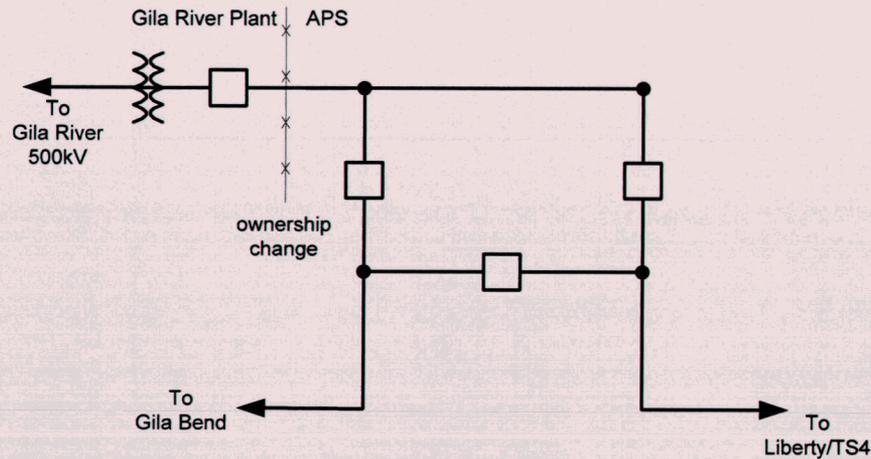


The Interconnection Customer has chosen to interconnect as an Energy Resource. Delivery of the Q44 output beyond the POI would be on an “as-available” basis only. The POI is the Panda 230kV substation. The delivery of the Q44 output would be subject to the firm or non-firm transmission capacity that may be available when a transmission service request is made. APS is the sole owner of the Panda 230kV substation and delivery of the Q44 output could be made to APS at the Panda 230kV substation.

Nothing in this report constitutes an offer of transmission service or confers upon the Interconnection Customer, any right to receive transmission service. APS may not have the Available Transfer Capability (“ATC”) to support the Transmission Service for the interconnection described in this report.

2. Interconnection Facilities

The interconnection facilities required for the Q44 project consist of a new 230kV bay at the Panda substation and realigning the Panda-Liberty 230kV line exit from the Panda substation. Currently the Panda substation is a three breaker ring. The Panda substation is set-up to handle one more termination, to make it a four breaker ring bus. A simple one-line diagram of the existing Panda 230kV substation is shown in **Figure 3**.

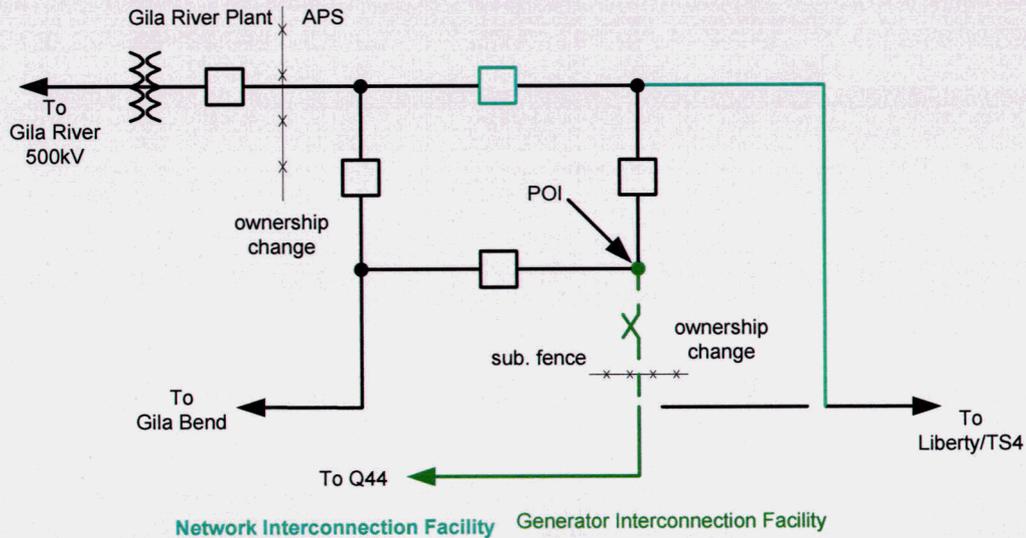
Figure 3. Existing Panda 230kV switchyard – Simplified one-line

The open bay is located on the north east side of the substation. In-order to avoid the Q44 230kV generator tie line from crossing the Panda-Liberty 230kV line, the plan of service for connecting Q44 into Panda involves moving the termination of the Panda-Liberty 230kV line. This can be seen below in **Figure 4**. Currently that line exits the Panda substation to the south until Watermelon Road. Then the line turns east following the road. The certificated route for the Q44 230kV tie line has the line approaching the Panda substation on the south side of Watermelon Road. At the point where the Q44 tie line reaches the alignment where the Panda-Liberty line exits the Panda substation, the Q44 tie line would utilize this alignment to enter the Panda substation.

The new alignment for the Panda-Liberty line would have it exiting the Panda substation from the east side of the substation, then continuing south to Watermelon Road to pick-up the original Panda-Liberty line. That portion of the line would be constructed to APS standards for new 230kV construction using 1272 ACSR conductor.

Appendix A shows a detailed one-line and physical layout of the Panda 230kV substation after the Q44 interconnection.

Figure 4. Panda 230kV Switchyard Configuration After Q44 Interconnection– Simplified one-line



The estimated cost of the network upgrades at the Panda 230kV substation, described above and shown in light blue in **Figure 4**, are summarized in **Table 1** below. Construction schedule estimates are from the date the Interconnection Customer provides written authorization to proceed, provided all interconnection agreements and funding arrangements are in place. All of the costs described in **Table 1** are network upgrades, as depicted in **Figure 4**.

Table 1. Cost and Construction Time Estimates

Facility	Cost (2009 dollars)	Schedule
Panda 230kV substation additional bay	\$1,465,000	
Relocate 230kV Liberty-Panda line exit	\$561,600	
Total	\$2,026,600	15 months

Additional cost estimate and construction schedule details are provided in Appendix B. The estimates do not include cost and timing that may be involved with the Transmission and Facilities Siting process, if needed.

3. System Reinforcements

The System Impact Study for this project was performed in a cluster study. That cluster study included another Interconnection Customer (project Q31 in the APS queue). The SIS identified two 69kV lines that need to be upgraded if only the Q44 project continued to an LGIA. However, if both projects continued on to an LGIA the SIS identified a third 69kV line that would need to be upgraded. As of the writing of this report only the Q44 project has moved to the Facilities Study¹. Therefore, the system reinforcements identified in this Facilities study are for the two 69kV lines that need to be upgraded.

The SIS identified that the Gila Bend to Butterfield Tap and Butterfield Tap to Cotton Center 69kV lines (hereby referred to as the "Gila Bend-Cotton Center 69kV lines") need to be upgraded. In-order to

¹ Project Q31 may elect to proceed toward a LGIA after this report is published. An estimate for rebuilding the third 69kV line may be provided at that time.

achieve the ratings necessary to accommodate the interconnection of Q44 the Gila Bend-Cotton Center 69kV lines need to be rebuilt with new structures. The existing lines will need to be removed and new structures built that will be capable of handling 795 ACSS conductor. In some places the current structures have 12kV underbuild. The new structures will be constructed to be capable of handling 12kV underbuild where applicable. The new 69kV lines will be rebuilt in the existing easements from Gila Bend up to Old Highway 80. Along Old Highway 80 the new 69kV line will be constructed along the same general route as the existing 69kV line, however moved into new Rights-of-Way (ROW) which will be outside of the Old Highway 80 ROW, up to the Cotton Center substation.

The estimated cost of the 69kV network upgrades, as described above, are summarized in **Table 2** below. Construction schedule estimates are from the date the Interconnection Customer provides written authorization to proceed, provided all interconnection agreements and funding arrangements are in place. All of the costs described in **Table 2** are network upgrades. Appendix C shows a more detailed breakdown of the cost and schedule estimates for the 69kV upgrades.

Table 2. 69kV Upgrades Cost and Construction Time Estimates

Facility	Cost (2009 dollars)	Schedule
Remove existing 69kV structures and conductor	\$447,965	N/A
APS Project Management & Design	\$127,088	N/A
Gila Bend-Cotton Center 69kV rebuild	\$3,360,238	18 months
12kV underbuild	\$1,517,231	N/A
New 69kV ROW acquisition	\$350,000	24 months
Total	\$5,802,522	32-38 months

4. Q44 230kV Generator Interconnection Line

As part of the Facilities Study, the Interconnection Customer asked APS to provide construction and cost estimates if APS were to construct the 230kV line from the Q44 facility to the Panda 230kV substation.

The 230kV Q44 generator tie line would be approximately 18 miles in length. The estimated cost for APS to construct the line for the Interconnection Customer would be \$25,272,000. Design, equipment procurement, and construction would take approximately 23 months. These estimates are based on the following assumptions:

- Double circuit capable steel monopole, but constructed with single circuit 1272 ACSR conductor
- Following the certificated corridor received by the Interconnection Customer
- Crossing under the existing APS Gila Bend-Panda 230kV line and constructing on the south side of the Water Treatment facility
- Terminating at the Panda substation in the bay currently occupied by the Panda-Liberty line
- Based on 2009 dollars

The estimated cost does not include:

- Land costs (money paid in fee, legal fees, permit costs, etc.)
- ROW preparation (Road building, clearing, etc.)
- Environmental issues (Archeological and Biological studies, 404 issues, dust control, etc.)
- Unforeseen labor or material escalation
- Transmission line siting process
- Substation related materials, labor, or communication ties

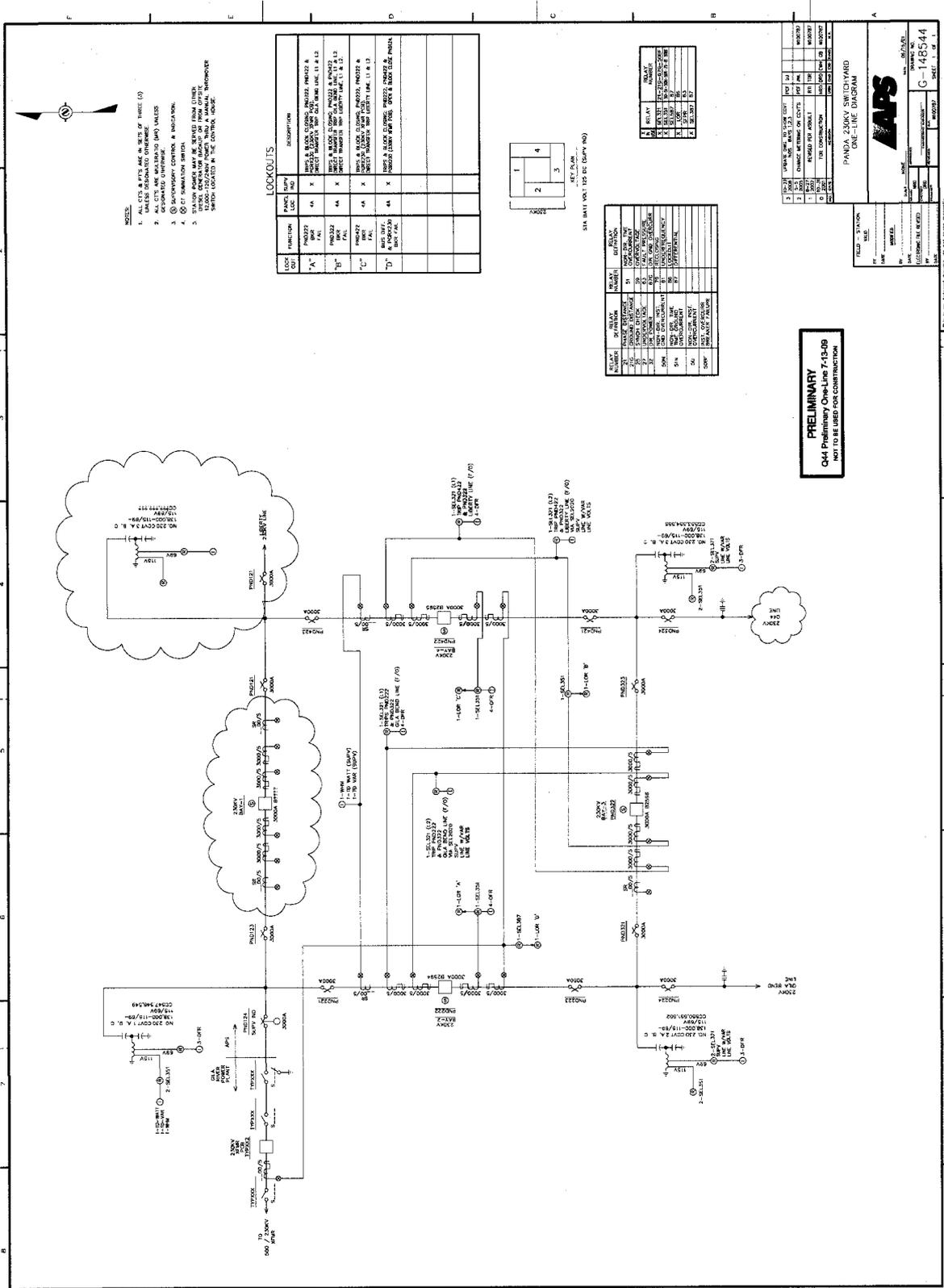
If the line is to be owned by the Interconnection Customer it is assumed that ROW acquisition would be done by the Interconnection Customer. However, an estimate for ROW acquisition is provided if APS were to acquire the ROW.

The APS estimate for acquiring the needed ROW for constructing the Q44 Generator Interconnection line is dependant upon where specifically within the certificated corridor the line is constructed. The estimate varies from \$2,015,000 to \$2,095,000 and the acquisition time can take from 12 to 24 months. The land acquisition time is in addition to the construction time listed above, with some minimal overlap.

The details of the ROW costs and construction schedule can be seen in Appendix D.

Appendix A

Preliminary Panda 230kV Switchyard Design



- NOTES:**
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LOCKOUTS

CT	FUNCTION	LOC	DESCRIPTION
"A"	PROTECT	14	DISCONNECTS OPERATE IN THE OPEN POSITION
"B"	PROTECT	14	DISCONNECTS OPERATE IN THE OPEN POSITION
"C"	PROTECT	14	DISCONNECTS OPERATE IN THE OPEN POSITION
"D"	PROTECT	14	DISCONNECTS OPERATE IN THE OPEN POSITION

SYMBOL	DESCRIPTION
1	DISCONNECT
2	CIRCUIT BREAKER
3	RELAY
4	CONTROL

PRELIMINARY
Q44 Preliminary One-Line 7-15-09
FOR THE USE OF CONSTRUCTION

APS

PANDA 230KV SWITCHYARD
ONE-LINE DIAGRAM

DATE: 7-15-09
DRAWN BY: [Name]
CHECKED BY: [Name]
APPROVED BY: [Name]

PROJECT NO: C-148544
SHEET NO: 10 OF 11

Panda 230kV Physical One-Line



Appendix B

Panda 230kV Interconnection Cost Estimate and Construction Schedule Details

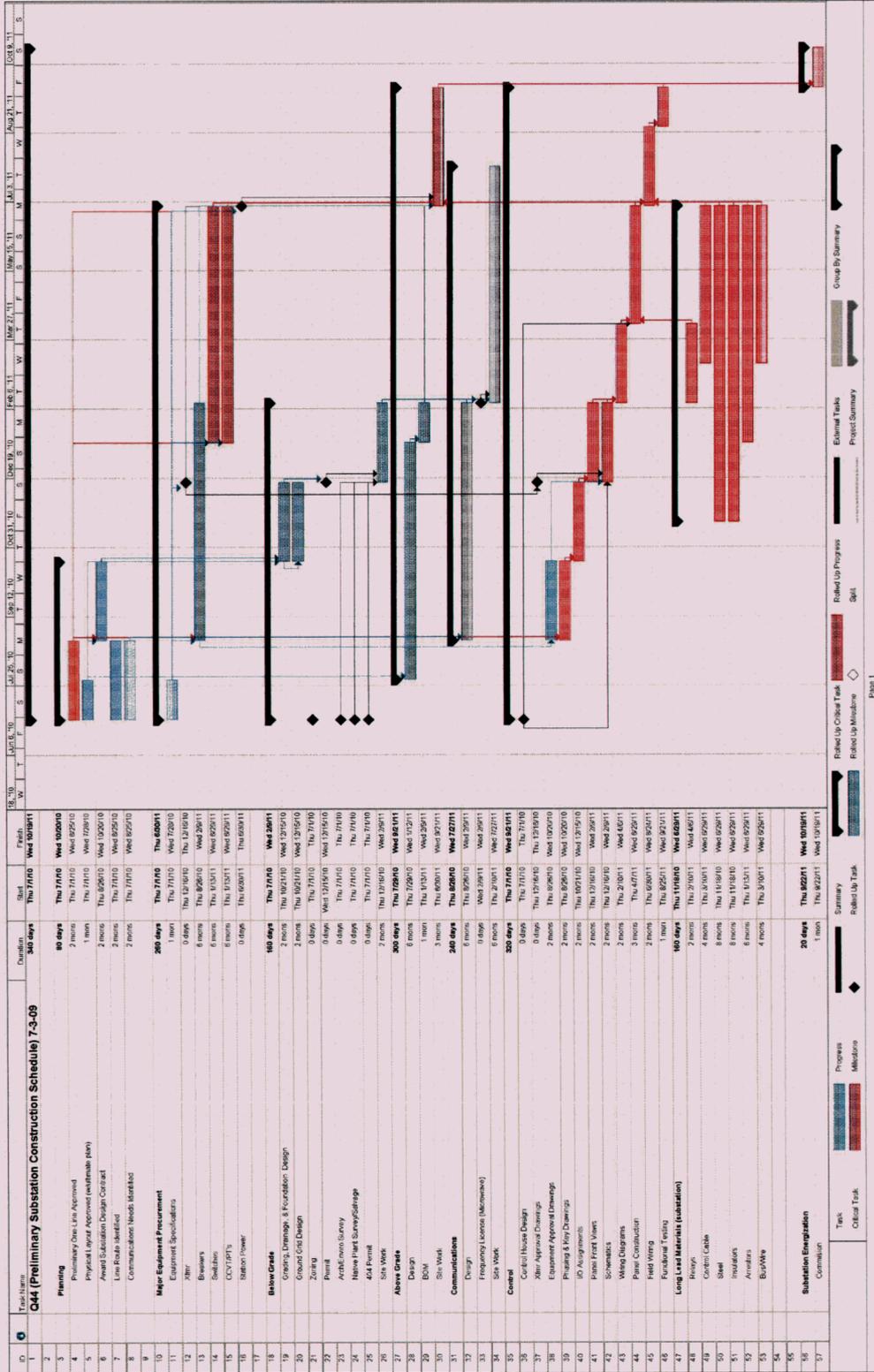
Queue #44 (7-3-09)

Scope: New 230KV line bay at Panda Substation
 1 - Deadend Structure, 1 - 230KV switch, 1 - 230KV breaker
 Protective relay addition & reconfiguration
 Approximately 10mi of fiber-optic cable underbuild from Q44 site to Gila Bend for 2nd communication path

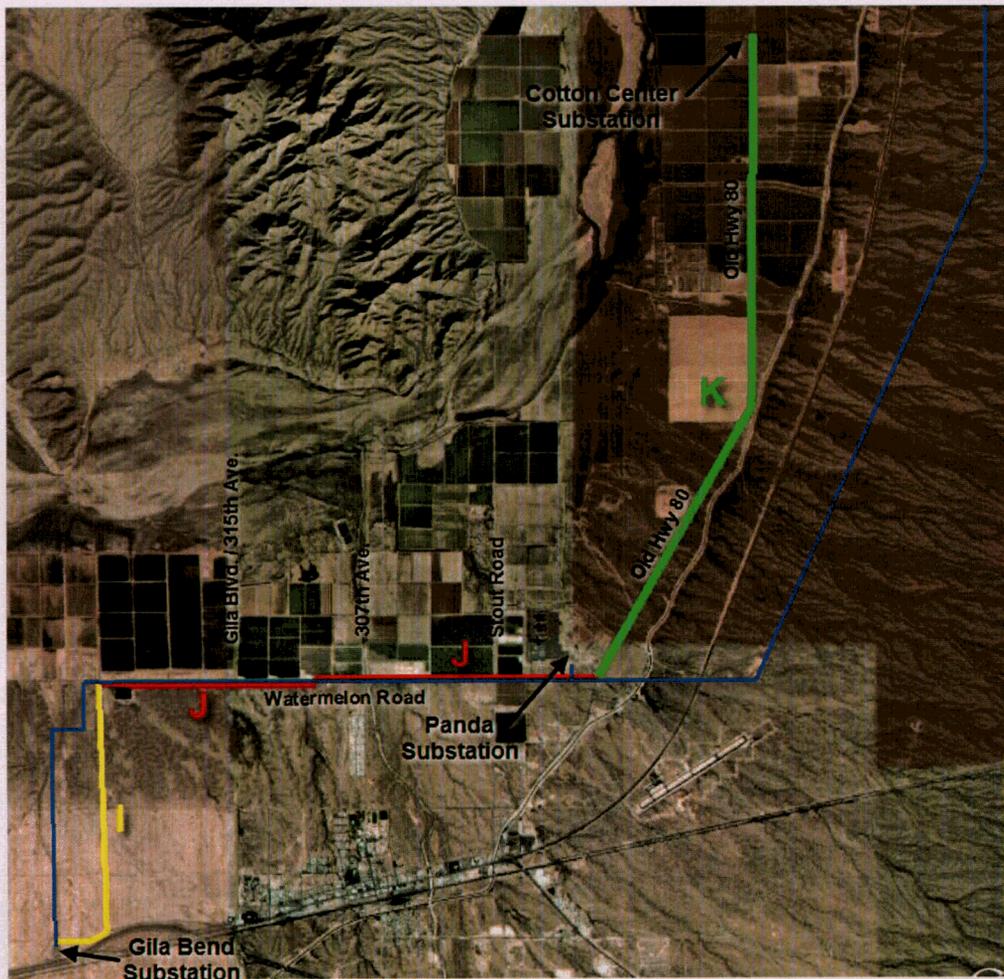
	Overall Project Total	230kV Bay at Panda for Q44						
Engineering and Design	\$80,000	\$80,000	\$0	\$0	\$0	\$0	\$0	\$0
Below grade	\$136,000	\$136,000	\$0	\$0	\$0	\$0	\$0	\$0
Construction Labor (Steel, Equipment & Control)	\$343,000	\$343,000	\$0	\$0	\$0	\$0	\$0	\$0
Steel Structures	\$53,000	\$53,000	\$0	\$0	\$0	\$0	\$0	\$0
Electrical Equipment	\$166,000	\$166,000	\$0	\$0	\$0	\$0	\$0	\$0
Control & Communications	\$443,000	\$443,000	\$0	\$0	\$0	\$0	\$0	\$0
Subtotal :	\$1,221,000	\$1,221,000	\$0	\$0	\$0	\$0	\$0	\$0
Contingency : (20%)	\$244,000	\$244,000	\$0	\$0	\$0	\$0	\$0	\$0
Totals :	\$1,465,000	\$1,465,000	\$0	\$0	\$0	\$0	\$0	\$0

Grand-Total : **\$1,465,000**

Q44 (280MW) - Facilities Study



Appendix C
69kV System Upgrades Cost Estimate and Construction Schedule
Details

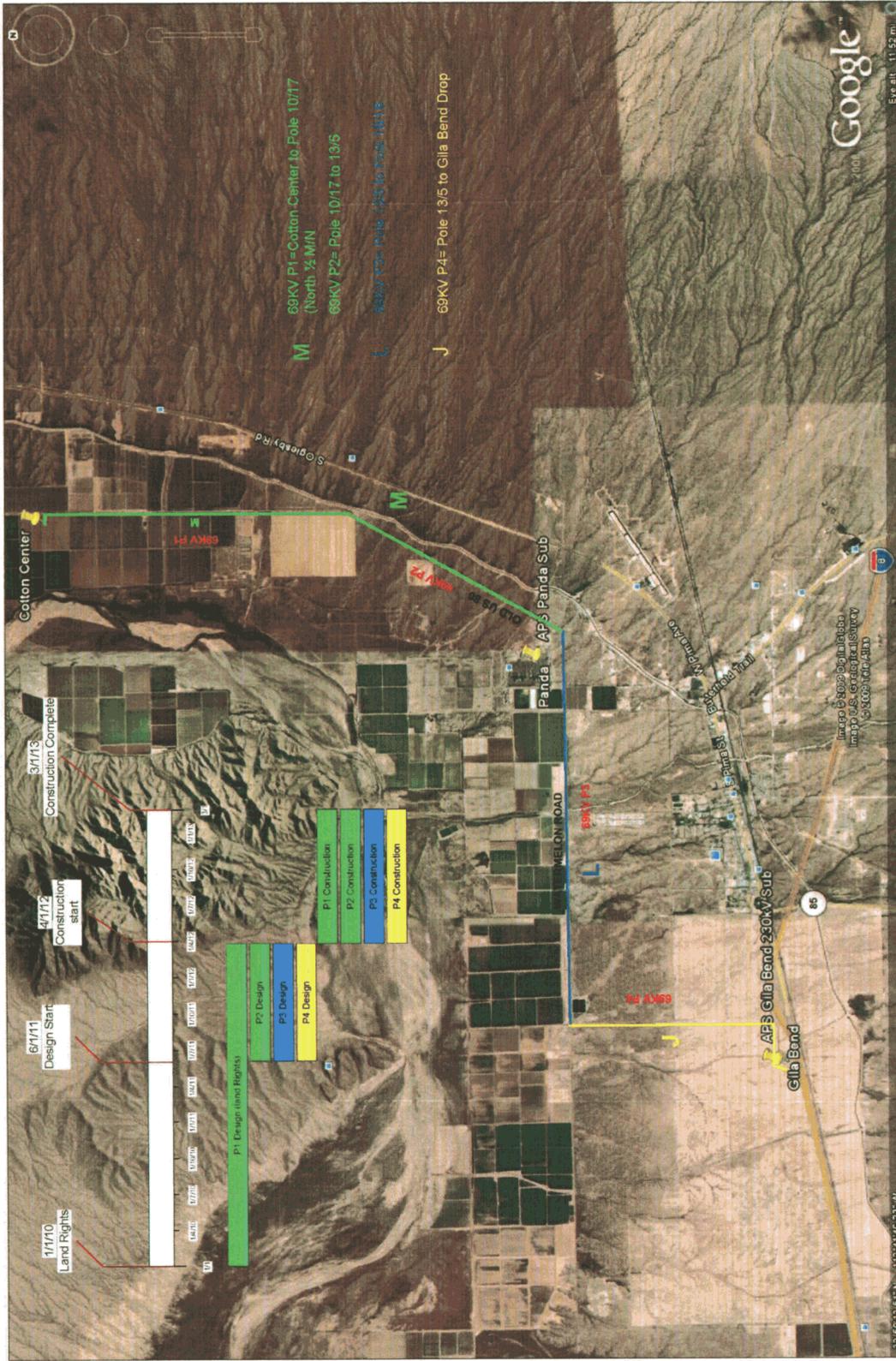


- I Existing 69kV East and North of Gila Bend Sub
- J South then North of Watermelon Road to Old Hwy 80
- K East &/or West of Old Hwy 80
- Existing 230kV Line

69kV ROUTE OPTIONS & ACQUISITION ESTIMATE		
Rebuild in existing easements	I Total	0K
Rebuild in existing easements	J Total	0K
	K Total	350K
Acquisition Time Required:	12 to 24 Months	

Gila Bend to Cotton Center Sub Cost Estimate		
69KV COST ESTIMATE		
DESCRIPTION	QUANTITY	COST
TANGENT STRUCTURES	187	\$1,014,868.69
SELF SUPPORTING STRUCTURES	10	\$195,608.01
ELECTRICAL EQUIPMENT & FRAMING	N/A	\$2,149,761.33
		\$3,360,238.03
APS PROJECT MANAGEMENT & DESIGN	N/A	\$127,088.16
COST OF REMOVING OLD STRUCTURES & FRAMING		\$447,964.81
TOTAL COST OF 69KV WORK		\$3,935,291.00
12KV COST ESTIMATE		
DESCRIPTION	QUANTITY	COST
ELECTRICAL EQUIPMENT & FRAMING	N/A	\$1,158,912.93
APS PROJECT MANAGEMENT & DESIGN	N/A	\$86,410.60
COST OF REMOVING OLD FRAMING	N/A	\$271,907.97
TOTAL COST OF 12KV WORK		\$1,517,231.50
ENTIRE COST OF JOB		\$5,452,522.50

Q44 (280MW) - Facilities Study



Appendix D

Land Acquisition Costs for Q44 Generator 230kV Interconnection Line

