

# **Non-Tariff Interconnection Facilities Study Report**

**Phase 1: 750 MW HVDC station  
Tres Amigas, LLC**

**March 2012**

**Prepared by:  
Public Service Company of  
New Mexico**





## Forward

This report was prepared for Tres Amigas, LLC (“Interconnection Customer”) by the Public Service Company of New Mexico, in accordance with a Facilities Study Agreement executed on January 23, 2012.

Any correspondence concerning this document, including technical and commercial question should be referred to:

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# 1. Introduction

Public Service Company of New Mexico (“PNM”) performed this Non-Tariff Interconnection Facilities Study (“Study”) in response to a request by Tres Amigas (“Interconnection Customer”). This Study focuses on the costs and schedule for the Network Upgrades identified in the System Impact Study (“SIS”) completed and delivered to the Interconnection Customer on December 21<sup>st</sup> 2011. The SIS assessed impacts of the proposed interconnection on the PNM transmission system assuming transfers between the PNM system and Tres Amigas occur only on a non-firm basis when transmission capacity is not utilized for other commitments. As a result, the focus of this Study is limited to cost and construction schedule estimates for the Network Upgrades needed to interconnect Tres Amigas at the existing Blackwater station. The Point of Interconnection (“POI”) is shown in Figure 1 below. Section 2 explains the need and scope of Network Upgrades at Blackwater Station. Work schedules and cost estimates are summarized in Section 3. The Appendices contain additional project details.

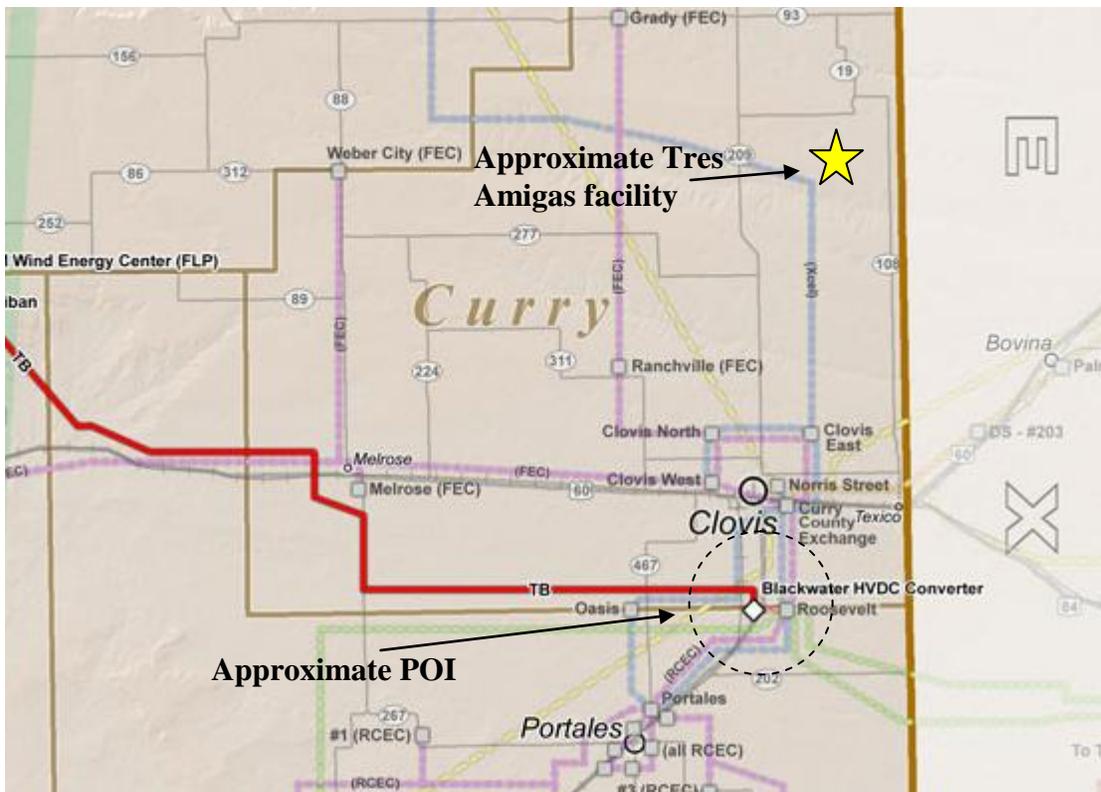


Figure 1 – Transmission Map with Customer POI



## 2. System Reinforcements

The Network Upgrades identified in the Phase 1 Tres Amigas System Impact Study (“Phase 1 SIS”) consist of the addition of a 345 kV three breaker ring bus at Blackwater Station. The existing station consists of a single breaker that will be relocated to accommodate the ring bus layout.

Figure 2 shows the configuration of the proposed “wire-to-wire” interconnection of the Tres Amigas VSC HVDC station to the PNM system at Blackwater Station.

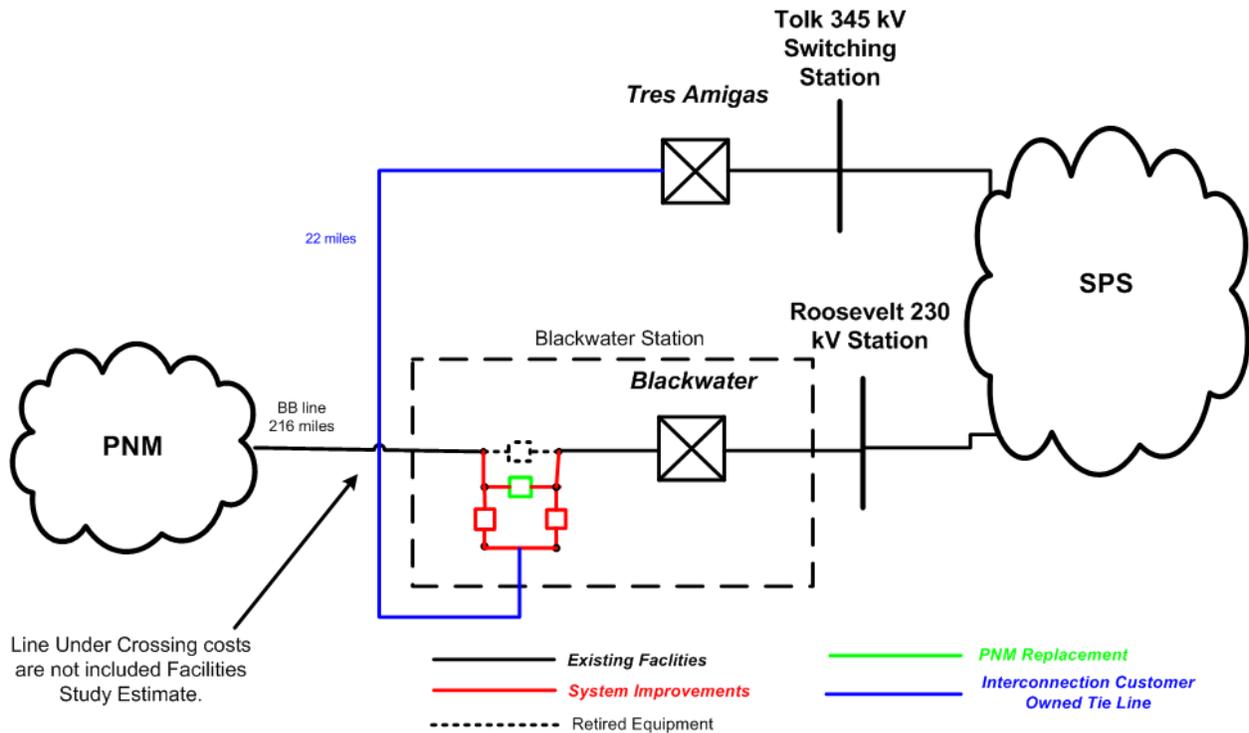


Figure 2 - Tres Amigas Phase 1 Interconnection Configuration

## 3. Summary of Work Schedule and Cost Estimate

Construction schedule estimates are from the date the Interconnection Customer provides written authorization to proceed and all interconnection agreements and funding arrangements are in place.

The proposed schedule for final design and construction is estimated to take 15 months from an authorization to proceed. Major activities are presented in the schedules below. Schedules are typical and will be revised as project details become firm. The estimated schedule is shown below:



345kV Switchyard Expansion at Blackwater to accommodate Tres Amigas Interconnection

Tentative Schedule

	Elapsed Months														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Formal Notice to Proceed (before month 1)															
Permitting and PRC Submittals															
Environmental Review and identification/mitigation of issues															
Design															
Materials/Equipment Order and Delivery															
Preparation of construction documents and secure contractors															
Construction Grading and Drainage															
Construction Mechanical															
Line Tie-in															
Cutover, Testing and Commissioning															

NOTES:

1. Project estimated to be complete minimum of 16 months after authorization to begin work.
2. Unforeseen delays due to permitting, weather, equipment delays, or lack of construction resources are not included in the above schedule.
3. Lead times for major equipment based on current production schedules (March 2012).
4. Schedule assumes system outages will be available for station cutover when needed.
5. Blackwater station outages are typically in spring and fall. Station construction schedule will be adjusted when firm timing is known.

EBD 3/8/12

The cost estimate is based on the station expanding to the south of the existing 345 kV breaker and dead-end structure with the Tres Amigas line terminating in a bay at the Southeast quadrant of the expanded station. All costs, including line under crossings, associated with access to this bay are Interconnection Customer costs and outside the scope of the Network Upgrades. Furthermore, the Blackwater - B-A transmission line will require raising to accommodate the Interconnection Customer's line into the Blackwater Station. The estimate includes a control enclosure with one battery/charger since existing switchyard facilities are fully utilized. The cost estimate does not include one of the three breakers because PNM has chosen to replace the existing breaker. It is likely that PNM will incur outage costs during the construction of the identified system reinforcement. The cost of construction outages cannot be estimated at this time. However, in accordance with applicable Federal Energy Regulatory Commission Policy, PNM reserves the right to recover such costs from the Interconnection Customer.

The total cost for upgrading Blackwater Station to a 345 kV three breaker ring bus is **\$8,612,038**. Additional cost estimate details are contained in Appendix A. The proposed layout of the expanded Blackwater Station is provided in Appendix B.



## Appendix A: Cost Estimate Detail

BLACKWATER 345 kV SWITCHING STATION - TRES AMIGAS INTERCONNECTION			
TOTAL PROJECT COST BREAKDOWN			
PROJECT SCHEDULE TASK	LABOR	MATL	TOTAL COST
RIGHT-OF-WAY	\$ 35,000		\$ 35,000
ENVIRONMENTAL	\$ 100,000	\$ -	\$ 100,000
GRADING-WEED CONTROL-GRAVEL-FENCING	\$ 750,000	\$ 100,000	\$ 850,000
CONCRETE	\$ 270,000	\$ 57,500	\$ 327,500
CONTROL BUILDING	\$ -	\$ 280,000	\$ 280,000
CONTROL HOUSE ELECTRICAL/MECHANICAL	\$ 75,000	\$ 75,000	\$ 150,000
DEAD-END, BUS STEEL STRUCTURES, BUSWORK	\$ 600,000	\$ 600,000	\$ 1,200,000
RACEWAY	\$ 50,000	\$ 60,000	\$ 110,000
GROUNDING SYSTEM	\$ 190,000	\$ 121,000	\$ 311,000
BUS DISCONNECT SWITCHES	\$ 100,000	\$ 115,000	\$ 215,000
125 VDC & 480/240/120 VAC STATION SERVICE	\$ 30,000	\$ 60,000	\$ 90,000
CIRCUIT BREAKERS	\$ 100,000	\$ 565,000	\$ 665,000
STATIC MASTS & SHIELD WIRES	\$ 15,000	\$ 10,000	\$ 25,000
METERING, PROTECTION, & CONTROL	\$ 40,000	\$ 170,000	\$ 210,000
SCADA	\$ 7,000	\$ 30,000	\$ 37,000
TRANSMISSION LINE INTERCONNECTION WITH STATION			\$ -
TRANSMISSION LINE CONSTRUCTION	\$ 328,500	\$ 168,200	\$ 496,700
TRANSMISSION LINE ENG/SURVEY/INSPECTION	\$ 19,710	\$ 10,092	\$ 29,802
CAPACITIVE VOLTAGE TRANSFORMERS	\$ 60,000	\$ 80,000	\$ 140,000
LIGHTNING ARRESTERS	\$ 40,000	\$ 40,000	\$ 80,000
POD INTERCONNECTION WITH STATION			
POD RELATED CAPACITIVE VOLTAGE TRANSFORMERS	\$ 30,000	\$ 40,000	\$ 70,000
REVENUE METERING CVT'S	\$ 30,000	\$ 40,000	\$ 70,000
REVENUE METERING CURRENT TRANSFORMERS	\$ 30,000	\$ 65,000	\$ 95,000
POD LINE DISCONNECT SWITCH	\$ 25,000	\$ 35,000	\$ 60,000
POD LINE LIGHTNING ARRESTERS	\$ 20,000	\$ 20,000	\$ 40,000
STATION ENGINEERING	\$ 75,000		\$ 75,000
STATION CONSTRUCTION MANAGEMENT	\$ 75,000		\$ 75,000
FUNCTIONAL TESTING MANAGEMENT	\$ 55,000		\$ 55,000
SURVEYING	\$ 15,000		\$ 15,000
REGULATORY/PERMITTING	\$ 50,000		\$ 50,000
SUB - TOTAL COST	\$ 3,215,210	\$ 2,741,792	\$ 5,957,002
A & G @ 5.5%	\$ 176,837	\$ 150,799	\$ 327,635
E & S @ 6.0%	\$ 192,913	\$ 164,508	\$ 357,420
TAXES @ 7%	\$ 225,065	\$ 191,925	\$ 416,990
LOADED TOTAL COST	\$ 3,810,024	\$ 3,249,024	\$ 7,059,047
CONTINGENCY @ 15%	\$ 571,504	\$ 487,354	\$ 1,058,857
AFUDC @ 7%	\$ 266,702	\$ 227,432	\$ 494,133
TOTAL PROJECT COST	\$ 4,648,229	\$ 3,963,809	\$ 8,612,038

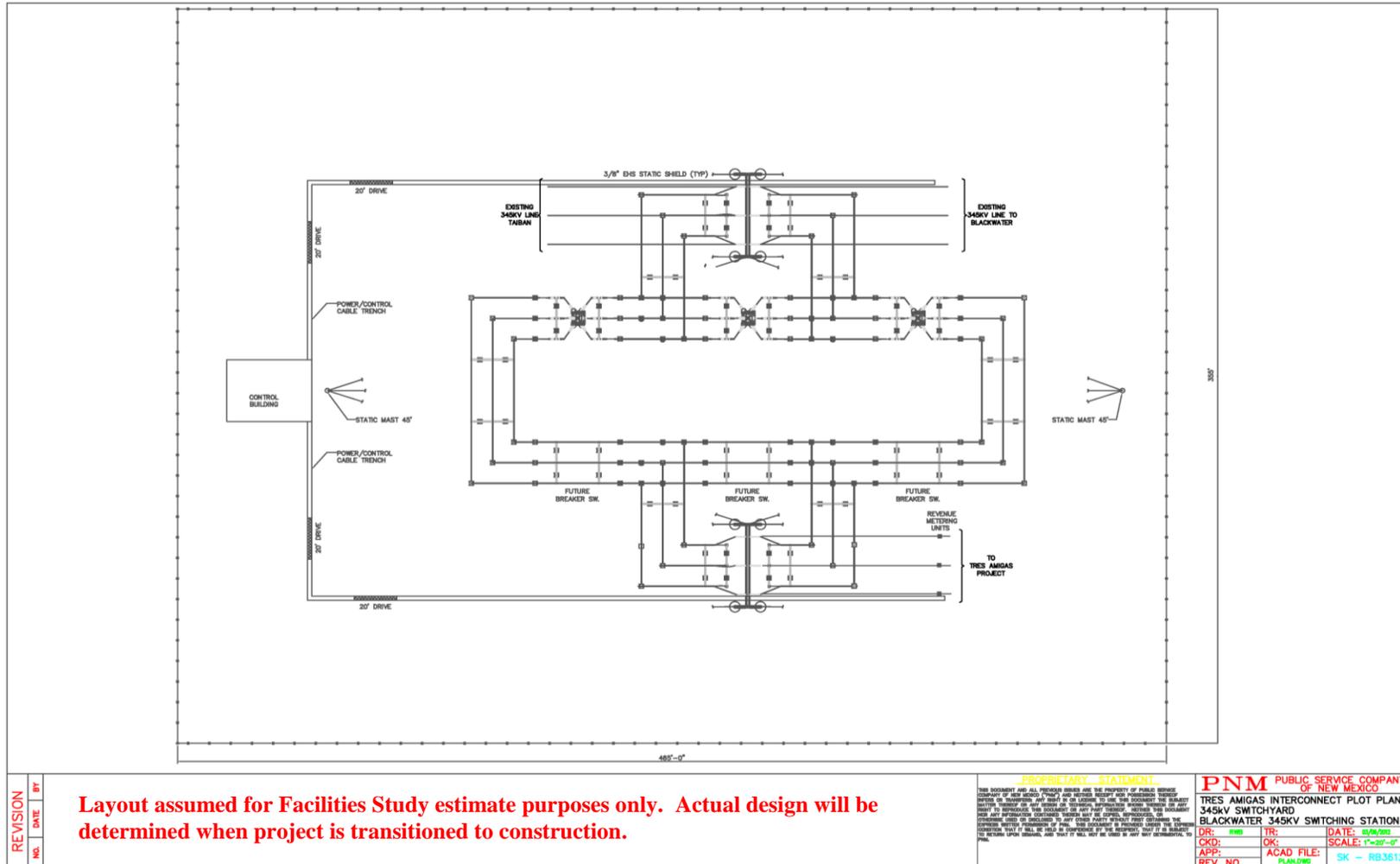


Key Notes and Assumptions:

1. Mitigation for any environmental/cultural issues is not included.
2. All work is to be performed on existing PNM-owned land or easements.
3. AFUDC is not applied when customer payments are made concurrent with performance of work.
4. Assumes outages can be secured in timely manner and outages may be restricted to off-peak periods such as spring or fall.
5. PNM may elect to contract any or all parts of the project.
6. This design is in accordance with PNM's breaker configuration policy.
7. The project schedule is based on having all permits, agreements, and authorizations completed prior to initiation of construction work.
8. General station pricing based on current equipment standards and standard station design.
9. Right-of-way fees only include internal PNM labor.
10. Station grading based on relatively flat site with balanced cut and fill.



# Appendix B: Blackwater Station Plan



**Layout assumed for Facilities Study estimate purposes only. Actual design will be determined when project is transitioned to construction.**

**PROPRIETARY STATEMENT**

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<b>PNM</b> PUBLIC SERVICE COMPANY OF NEW MEXICO			
TRES AMIGAS INTERCONNECT PLOT PLAN			
345KV SWITCHYARD			
BLACKWATER 345KV SWITCHING STATION			
DR:	TR:	DATE: 05/20/09	
CHKD: rwb	OK:	SCALE: 1"=30'-0"	
APP:	ACAD FILE:	SK - RB3612	
REV. NO.	PLAN/LOG		