Appendix C: PJM Feasibility Study

Generation Interconnection
Feasibility Study Report

For

PJM Generation Interconnection Request Queue
Position Y2-050

Canton Central – Tidd 345 kV

March / 2013

Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the feasibility study, but the actual allocation will be deferred until the impact study is performed.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

General

Carroll County Energy LLC (CCE) proposes to install PJM Project #Y2-050, a 749 MW (710 MW capacity) natural gas fired 2x1 F class combined cycle plant. The primary point of interconnection is located approximately 17 miles from the Canton Central station on the Canton Central-Tidd 345 kV line (see Figure 2). The location of the generating facility is in Carroll County Ohio approximately 2.5 miles from proposed 345 kV switching station (see Figure 1). The secondary point of interconnection is on the South Canton – Sammis 345 kV line in ATSI territory.

The requested in service date is August 31, 2017.

A new in-line switching station for Option #1 will be located between AEP's Canton Central and Tidd 345 kV stations in Carroll County, Ohio. This new station is to consist of three 345 kV circuit breakers configured in a breaker and one half bus arrangement operated as a ring-bus (see Figure 2). The interconnection station will be expandable to accommodate future projects in the area. The station will also include 345 kV metering, SCADA, and associated equipment. Protection relays in the surrounding area will need to be reset to accommodate the addition of the new station.

Carroll County Energy LLC is expected to obtain, at their cost, a station site for the AEP facilities. Carroll County Energy LLC shall obtain all necessary permits. Ownership of the in-line facilities shall be transferred from Carroll County Energy LLC to AEP upon successful completion of the work.

A 345 kV line extension is required to loop through the proposed station. For the cost estimate, the AEP switching station is assumed to be located immediately adjacent to the existing transmission lines. A supplemental line easement for the tap poles will be required. It is expected that Carroll County Energy LLC will obtain the supplemental easement when the station property is purchased.

Direct Connection Cost Estimate

The following work is required to connect Project Y2-050 to the Canton Central – Tidd 345 kV line:

Table 1 - Direct Connect Cost estimate	
Description	**Total Cost**
Station	
Install three (3) 345 kV circuit breakers, SCADA, 345 kV revenue metering, and associated equipment.	$12,500,000
Protection & Relaying	
Line protection and controls will need to be installed at the new 345 kV switching station. Estimated Cost	$600,000
Line protection and controls at the Canton Central 345 kV Substation will need to be upgraded to coordinate with the new 345 kV switching station	$300,000
Line protection and controls at the Tidd 345 kV Substation will need to be upgraded to coordinate with the new 345 kV switching station	$300,000
Total (2013 Dollars)	**$13,700,000**

It is understood that Carroll County Energy LLC is responsible for all costs associated with this connection. The cost of Carroll County Energy LLC's generating plant and the costs for the line connecting the generating plant to Carroll County Energy LLC's switching station are not included in this report; these are assumed to be Carroll County Energy LLC's responsibility.

The Generation Interconnection Agreement does not in or by itself establish a requirement for American Electric Power to provide power for consumption at the developer's facilities. A separate agreement may be reached with the local utility that provides service in the area to ensure that infrastructure is in place to meet this demand and proper metering equipment is installed. It is the responsibility of the developer to contact the local service provider to determine if a local service agreement is required.

Revenue Metering and SCADA Requirements

For PJM: IC will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Sections 24.1 and 24.2.

http://www.pjm.com/planning/design-engineering/to-tech-standards.aspx

For AEP:

The Interconnection Customer will be required to comply with all AEP Revenue Metering Requirements for Generation Interconnection Customers. The Revenue Metering Requirements may be found within the "Requirements for Connection of New Facilities or Changes to Existing Facilities Connected to the AEP Transmission System" document located at the following link:

http://www.pjm.com/~/media/planning/plan-standards/private-aep/aep-interconnection-requirements.ashx

Figure 1: Y2-050 Point of Interconnection

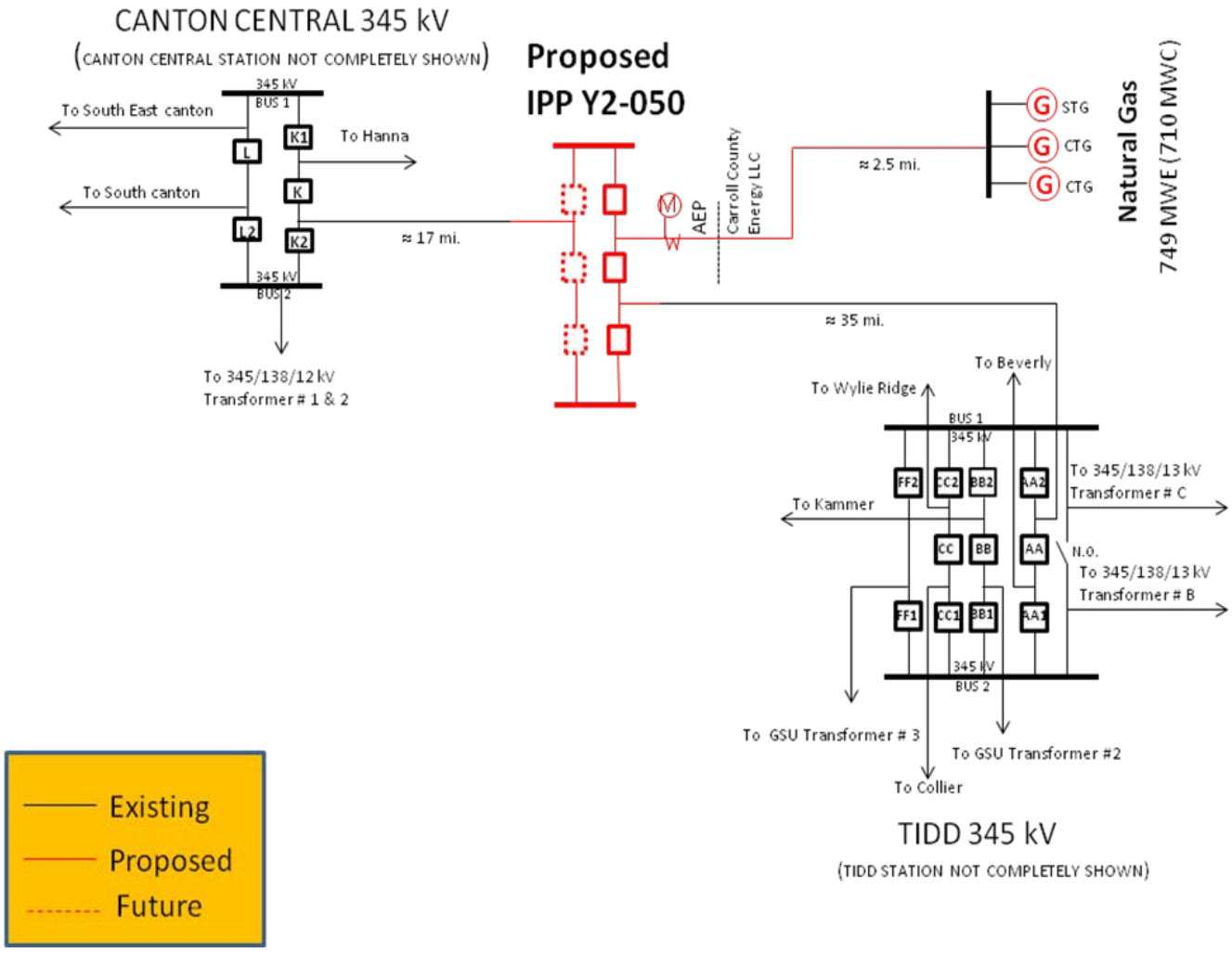

Figure 2: Point of Interconnection at new Three Breaker Switching Station

Network Impacts

The Queue Project #Y2-050 was studied as a 749.0MW (Capacity710.0MW) injection as a tap of the Tidd-Canton Central 345 kV line in the AEP area. Project #Y2-050 was evaluated for compliance with reliability criteria for summer peak conditions in 2016.

Potential network impacts were as follows:

Table 2 – Contingency List for Option 1	
Contingency Name	**Description**
4743	CONTINGENCY '4743_C2' OPEN BRANCH FROM BUS 242946 TO BUS 253965 CKT 1 / 242946 05TIDD 345 253965 15COLLIE 345 1 OPEN BRANCH FROM BUS 242946 TO BUS 235707 CKT 1 / 242946 05TIDD 345 235707 WYLIE RIDGE 345 1 END
4743_C2	CONTINGENCY '4743_C2' OPEN BRANCH FROM BUS 242946 TO BUS 253965 CKT 1 / 242946 05TIDD 345 253965 15COLLIE 345 1 OPEN BRANCH FROM BUS 242946 TO BUS 235707 CKT 1 / 242946 05TIDD 345 235707 WYLIE RIDGE 345 1 END
4744_C2_05TIDD 345-CC2	CONTINGENCY '4744_C2_05TIDD 345-CC2' OPEN BRANCH FROM BUS 242946 TO BUS 235707 CKT 1 / 242946 05TIDD 345 235707 WYLIE RIDGE 345 1 OPEN BRANCH FROM BUS 242946 TO BUS 243129 CKT C / 242946 05TIDD 345 243129 05TIDD X 138 C OPEN BRANCH FROM BUS 243127 TO BUS 243129 CKT BP / 243127 05TIDD 138 243129 05TIDD X 138 BP OPEN BRANCH FROM BUS 243127 TO BUS 243129 CKT SR / 243127 05TIDD 138 243129 05TIDD X 138 SR END
5031_C2_05KAMMER 765-PP2	CONTINGENCY '5031_C2_05KAMMER 765-PP2' OPEN BRANCH FROM BUS 242920 TO BUS 242925 CKT 1 / 242920 05BELMON 765 242925 05KAMMER 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 242516 CKT 1 / 242920 05BELMON 765 242516 05MOUNTN 765 1 OPEN BRANCH FROM BUS 242920 TO BUS 235102 CKT 1 / 242920 05BELMON 765 235102 BELMONT 500 1

Table 2 – Contingency List for Option 1	
Contingency Name	**Description**
	OPEN BRANCH FROM BUS 242925 TO BUS 235117 CKT 1 / 242925 05KAMMER 765 235117 KAMMER 500 1 OPEN BRANCH FROM BUS 235111 TO BUS 235117 CKT 1 / 235111 502 JUNCTION 500 235117 KAMMER 500 1 END
761_B2	CONTINGENCY '761_B2' OPEN BRANCH FROM BUS 242946 TO BUS 253965 CKT 1 / 242946 05TIDD 345 253965 15COLLIE 345 1 END
AP_SB_363	CONTINGENCY 'AP_SB_363' / MITCHELL BREAKER FAILURE - TIE BREAKER FROM BUS 1-2 OPEN BRANCH FROM BUS 235124 TO BUS 235260 CKT 1 OPEN BRANCH FROM BUS 235124 TO BUS 235247 CKT 1 OPEN BRANCH FROM BUS 235124 TO BUS 235161 CKT 1 OPEN BUS 235572 OPEN BUS 235573 END
AP_SB_467	CONTINGENCY 'AP_SB_467' / HATFIELD500-RONCO500 STK BKR AT HATFIELD500 #8 OPEN BRANCH FROM BUS 235108 TO BUS 235774 CKT 1 OPEN BUS 235582 END
APS_B_G692	CONTINGENCY 'APS_B_G692' / 200011 KEYSTONE 500 235104 01CABOT 500 1 OPEN BRANCH FROM BUS 200011 TO BUS 235104 CKT 1 END
APS_B_G693	CONTINGENCY 'APS_B_G693' / 200011 KEYSTONE 500 235118 01SOBEND 500 1 OPEN BRANCH FROM BUS 200011 TO BUS 235118 CKT 1 END
B_LINE_SY_064	CONTINGENCY 'B_LINE_SY_064' /* LINE 01CABOT 500 TO 02CRNBRY 500 CK 1 DISCONNECT BRANCH FROM BUS 235104 TO BUS 239280 CKT 1 /* CABOT 500.00 02CRNBRY 500.00 END

Table 2 – Contingency List for Option 1	
Contingency Name	**Description**
B_LINE_SY_065	CONTINGENCY 'B_LINE_SY_065' /* LINE 02CRNBRY 500 TO 01WYLIER 500 CK 1 DISCONNECT BRANCH FROM BUS 239280 TO BUS 235703 CKT 1 /* 02CRNBRY 500.00 WYLIE RIDGE 500.00 END
B_LINE_TIE_027	CONTINGENCY 'B_LINE_TIE_027' /* 01WYLIE 345.00 - 05TIDD 345.00 LINE OUTAGE DISCONNECT BRANCH FROM BUS 235707 TO BUS 242946 CKT 1 /* WYLIE RIDGE 345.00 05TIDD 345.00 END
C2-BRK-ER126	CONTINGENCY 'C2-BRK-ER126' /* CRANBERRY 500KV, BKR FAILURE - BKR A DISCONNECT BRANCH FROM BUS 239280 TO BUS 235703 CKT 1 /* 02CRNBRY 500.00 01WYLIE R 500.00 DISCONNECT BRANCH FROM BUS 239280 TO BUS 239281 CKT 1 /* 02CRNBRY 500.00 02CRNBRY 138.00 END
C2-BRK-ER127	CONTINGENCY 'C2-BRK-ER127' /* CRANBERRY 500KV, BKR FAILURE - BKR B DISCONNECT BRANCH FROM BUS 239280 TO BUS 235703 CKT 1 /* 02CRNBRY 500.00 01WYLIE R 500.00 DISCONNECT BRANCH FROM BUS 239280 TO BUS 239281 CKT 2 /* 02CRNBRY 500.00 02CRNBRY 138.00 END
KEYSTONE_JACKMTN1_1	CONTINGENCY 'KEYSTONE_JACKMTN1_1' /* 500/500KV, AREA 225/225. DISCONNECT BRANCH FROM BUS 200011 TO BUS 200071 CKT 1 END
PJM20A_CONEMAGH-KEYSTONE	CONTINGENCY 'PJM20A_CONEMAGH-KEYSTONE' DISCONNECT BRANCH FROM BUS 200005 TO BUS 200011 CKT 1 /* CONEMAGH KEYSTONE 500 500 END
PJM3B1	CONTINGENCY 'PJM3B1' /* KEYSTONE BUS BREAKER 3 DISCONNECT BRANCH FROM BUS 200071 TO BUS 200011 CKT 1 /* JUNIATA KEYSTONE 500 500 /* BUS 200072 => 200071 (JACKMNT1) DISCONNECT BRANCH FROM BUS 200011 TO BUS 200810 TO BUS 200907 CKT 4/* KEYSTONE KEYSTONE 500 230 #4 END

Table 2 – Contingency List for Option 1	
Contingency Name	**Description**
PJM4	CONTINGENCY 'PJM4' /* KEYSTONE BREAKER 6 DISCONNECT BRANCH FROM BUS 200005 TO BUS 200011 CKT 1 /* CONEMAGH KEYSTONE 500 500 DISCONNECT BRANCH FROM BUS 200011 TO BUS 200810 TO BUS 200907 CKT 4/* KEYSTONE KEYSTONE 500 230 END
PJM53	CONTINGENCY 'PJM53' /* CONEMAUGH BREAKER 2 DISCONNECT BRANCH FROM BUS 200005 TO BUS 200011 CKT 1 /* CONEMAGH C14_CLCT 500 500 DISCONNECT BRANCH FROM BUS 200005 TO BUS 200031 CKT 1 /* CONEMAGH CONEMAGH 500 22 REMOVE MACHINE H FROM BUS 200031 /* CONEMAUGH 2 REMOVE MACHINE L FROM BUS 200031 END

Generator Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

Table 3 below provides a summary of the impacts caused by Y2-050 on the AEP transmission system and other TO areas for generator deliverability:

Table 3 - Generator Deliverability Option 1											
	Contingency		Facility Description	Bus		Loading		Rating		MW Cont.	FG App.
#	Type	Name		From	To	Initial	Final	Type	MVA		
1	Non	Non	05TIDD-WYLIE RIDGE 345 kV line	242946	235707	75.95	85.95	NR	1166	116.65	2
2	N-1	PJM20A_CONEMAGH-KEYSTONE	KEYSTONE-JACKMTN1 500 kV line	200011	200071	92.46	92.81	ER	3723	80.49	3
3	N-1	B_LINE_TIE_027	05TIDD-15COLLIE 345 kV line	242946	253965	87.87	95.27	ER	1391	102.94	5
4	N-1	KEYSTONE_JACKMTN1_1	KEYSTONE-CONEM-GH 500 kV line	200011	200005	99.32	99.73	ER	3723	95.83	11
5	N-1	761_B2	05TIDD-WYLIE RIDGE 345 kV line	242946	235707	95.44	105.61	ER	1434	145.86	13
6	N-1	APS_B_G693	CABOT-KEYSTONE 500 kV line	235104	200011	97.47	98.17	ER	2598	114.54	15
7	N-1	APS_B_G693	CABOT-KEYSTONE 500 kV line	235104	200011	97.47	98.17	ER	2598	114.54	16

Multiple Facility Contingency

(Double Circuit Tower Line(DCTL), Line with Failed Breaker(LFFB) and Bus Fault(Bus) contingencies for the full energy output.)

Table 4 below provides a summary of the impacts caused by Y2-050 on the AEP transmission system and other TO areas for multiple facility contingency:

Table 4 - Y2-050 Multiple Facility Contingency Option 1											
	Contingency		Facility Description	Bus		Loading		Rating		MW Contrib.	FG App.
#	Type	Name		From	To	Initial	Final	Type	MVA		
8	LFFB	AP_SB_467	SMITHTON 62-YUKON 138 kV line	235252	235277	73.08	73.98	ER	297	16.43	1
9	LFFB	AP_SB_467	SHEPLER H J-	235247	235252	78.38	79.27	ER	297	16.43	4

Table 4 - Y2-050 Multiple Facility Contingency Option 1											
	Contingency		Facility	Bus		Loading		Rating		MW	FG
#	Type	Name	Description	From	To	Initial	Final	Type	MVA	Contrib.	App.
			SMITHTON 62 138 kV line								
10	LFFB	PJM4	KEYSTONE-JACKMTN1 500 kV line	200011	200071	94.36	94.74	ER	3723	86.12	6
11	LFFB	4744_C2_05TIDD 345-CC2	05TIDD-15COLLIE 345 kV line	242946	253965	89.39	97.95	ER	1391	119.09	7
12	LFFB	4744_C2_05TIDD 345-CC2	05TIDD-15COLLIE 345 kV line	242946	253965	89.39	97.95	ER	1391	119.09	8
13	LFFB	PJM53	KEYSTONE-JACKMTN1 500 kV line	200011	200071	98.68	99.05	ER	3723	84.91	9
14	LFFB	AP_SB_363	DRY RUN-CHARLEROI 138 kV line	235169	235161	87.24	88.84	ER	243	24.08	10
15	LFFB	5031_C2_05KAMMER 765-PP2	05TIDD-WYLIE RIDGE 345 kV line	242946	235707	93.59	102.44	ER	1434	134.93	14

Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

Table 5 below provides a summary of the impacts caused by Y1-070 on the ATSI transmission system and other TO areas for contribution to previously identified overloads:

Table 5 - Y2-050 Contribution to Previously Identified Overloads Option 1											
	Contingency		Facility Description	Bus		Loading		Rating		MW	FG
#	Type	Name		From	To	Initial	Final	Type	MVA	Contrib.	App.
16	LFFB	PJM3B1	KEYSTONE-CONEM-GH 500 kV line	200011	200005	100.91	101.34	ER	3723	102	12
17	N-1	B_LINE_SY_065	02HOYTDL-02CRNBRY 138 kV line	238813	239281	101.98	102.88	ER	309	17.39	17
18	LFFB	4743_C2	05TIDD-MAHANS LANE 138 kV line	243127	235363	109.19	110.59	ER	250	21.56	18
19	DCTL	4743	05TIDD-MAHANS LANE 138 kV line	243127	235363	109.19	110.59	ER	250	21.56	19
20	N-1	B_LINE_SY_064	02MAPLE-02SENECA 138 kV line	238942	239099	115.59	116.65	ER	350	22.82	20
21	DCTL	4743	05TILTON-WINDSOR 138 kV line	243131	235428	123.31	124.21	ER	284	15.89	21
22	N-1	B_LINE_SY_064	02SENECA-KRENDALE 138 kV line	239099	235205	119.66	120.75	ER	338	22.82	22
23	N-1	B_LINE_SY_065	02HOYTDL-02MAPLE 138 kV line	238813	238942	127.23	128.2	ER	309	18.51	23
24	N-1	B_LINE_SY_064	SHANOR MANOR-BUTLER 138 kV line	235246	235152	126.02	127.39	ER	352	29.67	24
25	N-1	B_LINE_SY_065	02SHNAGO-02MCDOWL 138 kV line	239107	238954	134.85	135.96	ER	153	10.54	25
26	N-1	B_LINE_SY_064	KRENDALE-SHANOR MANOR 138 kV line	235205	235246	129.15	130.51	ER	352	29.67	26
27	LFFB	C2-BRK-ER126	02SHNAGO-02MCDOWL 138 kV line	239107	238954	140.46	141.65	ER	153	11.29	27
28	LFFB	C2-BRK-ER127	02SHNAGO-02MCDOWL 138 kV line	239107	238954	140.46	141.65	ER	153	11.29	28

Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of the surrounding generation. Any potential problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the overloaded element(s) identified. As a result of the aggregate energy resources in the area, the following violations were identified.

Table 6 - Y2-050 Delivery of Energy Portion of Interconnection Request Option 1

	Contingency		Facility Description	Bus		Loading		Rating		MW	FG
#	Type	Name		From	To	Initial	Final	Type	MVA	Contrib.	App.
29	N-1	APS_B_G692	KARNS CITY-KISSINGER J 138 kV line	235197	235203	75.39	76.31	ER	256	14.63	N/A
30	N-1	B_LINE_SY_064	02MAPLE-02SENECA 138 kV line	238942	239099	104.32	105.43	ER	350	24.07	N/A
31	N-1	B_LINE_SY_064	02SENECA-KRENDALE 138 kV line	239099	235205	107.99	109.14	ER	338	24.07	N/A
32	N-1	B_LINE_SY_064	SHANOR MANOR-BUTLER 138 kV line	235246	235152	107.64	109.08	ER	352	31.3	N/A
33	N-1	B_LINE_SY_064	KRENDALE-SHANOR MANOR 138 kV line	235205	235246	110.77	112.21	ER	352	31.3	N/A

Short Circuit

(Summary of impacted circuit breakers)

No Breakers identified as overdutied

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. "Network Impacts", initially caused by the addition of this project generation)

Table 3a - Y2-050 Generator Deliverability Option 1				
#	**Contingency**	**Facility**	**Description**	**Cost**
1	Non	05TIDD-WYLIE RIDGE 345 kV line	The ACAR 2303.5 kcmil, 54/37 Conductor Section 1 is a limiting element. The 0.15 mile section of ACAR 2303.5 conductor will need to reconductored. The cost could be higher if the transmission line engineer determines that the line will have to be completely rebuilt.	$225,000
2	PJM20A_CONEMAGH-KEYSTONE	KEYSTONE-JACKMTN1 500 kV line	Existing baseline RTEP project b0284.3 replaces the wave trap at Keystone on the future Jacks Mountain terminal. With the trap replaced, the rating of the line is 4239 MVA. Upgrade b0284.3 is presently scheduled to be complete prior to the ISD for the Y2-050 project (Q3 - 2017) and will eliminate the violation.	Existing baseline
3	B_LINE_TIE_027	05TIDD-15COLLIE 345 kV line KEYSTONE-CONEM-GH 500 kV line	**AEP**: The Non-AEP Conductor is a limiting element. The ACAR 2303.5 kcmil 54/37 Conductor Section 1 is a limiting element. A sag check has been requested for the ACAR 2303.5 conductor section 1 to determine if the line section can be operated above its emergency rating of 1166 MVA as part of the generation retirement. Due date for the sag check is 6/1/2015. ACSR 954 kcmil 45/7 Rail Conductor Section 2 is a limiting element A sag check has been requested for the ACSR 954 conductor section 2 to determine if the line section can be operated above its emergency rating of 1409 MVA as part of the generation retirement. Due date for the sag check is 6/1/2015.	TBD pending results of the sag study.
			DLCO: To resolve the violations identified for the Collier-Tidd 345kV tie line, DLCO proposes to reconductor its portion of this tie line. The preliminary cost estimate to reconductor approximately 24 miles of this 345kV circuit is $38,821,000 in 2013 dollars. This project will require 2.5-3 years to complete from the date of receipt of a signed Interconnection Service Agreement (ISA).	$38,821,000
4	KEYSTONE_JACKMTN1_1	05TIDD-WYLIE RIDGE 345 kV line	Existing baseline RTEP projects b0285.1 and b0285.2 replace the wave trap at Keystone and Conemaugh respectively on the Keystone-	Existing baseline

Table 3a - Y2-050 Generator Deliverability Option 1				
			Conemaugh 500 kV line. The ISD for b0285.1 and b0285.2 is 6-1-2018. These projects may need accelerated to address the violation however both projects are tied to the Jacks Mountain project which is presently being evaluated by PJM and may be cancelled. This project will need to be studied without Jacks Mt, in the impact study, to evaluate the need for this upgrade. The new rating will be 4239 MVA with the traps replaced.	
5	761_B2	CABOT-KEYSTONE 500 kV line		Same as #1
6	APS_B_G693	CABOT-KEYSTONE 500 kV line	The upgrade is a Wave Trap and Meter. The upgrade will have no impact on the fault study analysis.	$145,800
7	APS_B_G693	05TIDD-WYLIE RIDGE 345 kV line		Same as #6
			Cost	**$39,191,800**

Table 4a - Y2-050 Multiple Facility Contingency Option 1				
#	**Contingency**	**Facility**	**Description**	**Cost**
8	AP_SB_467	SMITHTON 62-YUKON 138 kV line	The SMITHTON 62-YUKON 138 kV line: This is an existing baseline RTEP project b2169. The estimated upgrade cost and ISD in the PJM database is $60,000 and 6-1-2017 respectively. Upgrade b2169 is presently scheduled to be complete prior to the ISD for the Y2-050 project (Q3 - 2017) and will eliminate the violations identified below. New Rating will be 332 MVA.	Existing Baseline
9	AP_SB_467	SHEPLER H J-SMITHTON 62 138 kV line	The SHEPLER H J-SMITHTON 62 138 kV line: This is an existing baseline RTEP project b2170. The estimated upgrade cost and ISD in the PJM database is $120,000 and 6-1-2017 respectively. Upgrade b2170 is presently scheduled to be complete prior to the ISD for the Y2-050 project (Q3 - 2017) and will eliminate the violations identified below. New Rating will be 376 MVA.	Existing Baseline
10	PJM4	KEYSTONE-JACKMTN1 500 kV line	The KEYSTONE-JACKMTN1 500 kV line: Existing baseline RTEP project b0284.3 replaces the wave trap at Keystone on the future Jacks Mountain terminal. With the trap replaced, the rating of the line is 4239 MVA. Upgrade b0284.3 is presently scheduled to be complete prior to the ISD for the Y2-050 project (Q3 - 2017) and will eliminate the violations identified below.	Existing Baseline

Table 4a - Y2-050 Multiple Facility Contingency Option 1				
#	**Contingency**	**Facility**	**Description**	**Cost**
11	4744_C2_05TIDD 345-CC2	05TIDD-15COLLIE 345 kV line	The 05TIDD-15COLLIE 345 kV line **AEP**: The Non-AEP Conductor is a limiting element. The ACAR 2303.5 kcmil 54/37 Conductor Section 1 is a limiting element. A sag check has been requested for the ACAR 2303.5 conductor section 1 to determine if the line section can be operated above its emergency rating of 1166 MVA as part of the generation retirement. Due date for the sag check is 6/1/2015. ACSR 954 kcmil 45/7 Rail Conductor Section 2 is a limiting element. A sag check has been requested for the ACSR 954 conductor section 2 to determine if the line section can be operated above its emergency rating of 1409 MVA as part of the generation retirement. Due date for the sag check is 6/1/2015. **DLCO:** To resolve the violations identified for the Collier-Tidd 345kV tie line, DLCO proposes to reconductor its portion of this tie line. The preliminary cost estimate to reconductor approximately 24 miles of this 345kV circuit is $38,821,000 in 2013 dollars. This project will require 2.5-3 years to complete from the date of receipt of a signed Interconnection Service Agreement (ISA).	Same as #3
12	4744_C2_05TIDD 345-CC2	05TIDD-15COLLIE 345 kV line		
13	PJM53	KEYSTONE-JACKMTN1 500 kV line	The KEYSTONE-JACKMTN1 500 kV line: Existing baseline RTEP project b0284.3 replaces the wave trap at Keystone on the future Jacks Mountain terminal. With the trap replaced, the rating of the line is 4239 MVA. Upgrade b0284.3 is presently scheduled to be complete prior to the ISD for the Y2-050 project (Q3 - 2017) and will eliminate the violations identified below.	Existing Baseline
14	AP_SB_363	DRY RUN-CHARLEROI 138 kV line	The DRY RUN-CHARLEROI 138 kV line: The violation is crossed out because the rating is incorrect in the case, with the actual rating of 332 MVA there is no violation.	N/A
15	5031_C2_05KAMMER 765-PP2	05TIDD-WYLIE RIDGE 345 kV line	The 05TIDD-WYLIE RIDGE 345 kV line: The violation is crossed out because this is no longer a valid contingency.	N/A
			Cost	N/A

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)

Table 5a - Y2-050 Contribution to Previously Identified Overloads Option 1

#	Contingency	Facility	Description	Cost
16	PJM3B1	KEYSTONE-CONEM-GH 500 kV line	The KEYSTONE-CONEM-GH 500 kV line: Existing baseline RTEP projects b0285.1 and b0285.2 replace the wave trap at Keystone and Conemaugh respectively on the Keystone-Conemaugh 500 kV line. The ISD for b0285.1 and b0285.2 is 6-1-2018. These projects may need accelerated to address the violation however both projects are tied to the Jacks Mountain project which is presently being evaluated by PJM and may be cancelled. This project will need to be studied without Jacks Mt, in the impact study, to evaluate the need for this upgrade. The new rating will be 4239 MVA with the traps replaced.	Existing Baseline
17	B_LINE_SY_065	02HOYTDL-02CRNBRY 138 kV line	The 02HOYTDL-02CRNBRY 138 kV line: Reconductor the Cranberry – Hoytdale 138 kV line.	$22,601,000
18	4743_C2	05TIDD-MAHANS LANE 138 kV line	**AEP**: The Sub cond. 500 MCM CU 37 Str. Tidd Switch to Line Riser Section is a limiting element. Replace the Tidd Switch to Line Riser Section. Estimated Cost (2013 Dollars): $50,000.	$50,000
19	4743	05TIDD-MAHANS LANE 138 kV line	The Tidd Relay Thermal Limit is a limiting element. An engineering study will need to be conducted to determine if the relay thermal limit settings can be adjusted to mitigate the overload. A new relay package will be required if the relay thermal settings cannot be adjusted. Estimated Cost (2013 Dollars) for the relay package: $300,000.	$300,000
			The ACSR 556.5 kcmil 26/7 conductor section 1 is a limiting element. A sag check has been requested for the ACSR 556.5 conductor section 1 to determine if the line section can be operated above its emergency rating of 205 MVA as part of the generation retirement. The new summer emergency rating is 284 MVA. The new rating is not sufficient to mitigate this overload. AEP will have to rebuilt AEP's portion of the 05TIDD – MAHANS LANE 138 kV line	$7,836,000

Table 5a - Y2-050 Contribution to Previously Identified Overloads Option 1				
#	**Contingency**	**Facility**	**Description**	**Cost**
			which is approximately 6.53 miles of ACSR 556.5. Estimated Cost (2013 Dollars): $7,836,000.	
20	B_LINE_SY_064	02MAPLE-02SENECA 138 kV line	Build new Maple-Krendale 138kV line. Requires new line exits at Maple and Krendale substations.	$20,700,400
21	4743	05TILTON-WINDSOR 138 kV line	The 05TILTON-WINDSOR 138 kV line: The ACSR 556.5 kcmil 26/7 Dove Conductor Section 1 is a limiting element. A sag check will be required for the ACSR 556.5 kcmil 26/7 Dove Conductor Section 1 to determine if the line section can be operated above its emergency rating of 284 MVA. A study scheduled to be completed by 12/31/2012 could prove that no additional upgrades are necessary, that some upgrades on the circuit are necessary, or that the entire 4.92 mile section of line would need to be rebuilt.	$5,904,000
22	B_LINE_SY_064	02SENECA-KRENDALE 138 kV line	The 02SENECA-KRENDALE 138 kV line: Build new Maple-Krendale 138kV line. Requires new line exits at Maple and Krendale substations.	Same as #20
23	B_LINE_SY_065	02HOYTDL-02MAPLE 138 kV line	The 02HOYTDL-02MAPLE 138 kV line: Perform terminal upgrades at both Maple and Hoytdale substations.	$333,880
24	B_LINE_SY_064	SHANOR MANOR-BUTLER 138 kV line	The SHANOR MANOR-BUTLER 138 kV line (from bus 235246 to bus 235152 ckt 1) loads from 126.02% to 127.39% (**DC power flow**) of its emergency rating (352 MVA) for the single line contingency outage of CONTINGENCY DESCRIPTION ('B_LINE_SY_064'). This project contributes approximately 29.67 MW to the thermal violation.	Same as #20
25	B_LINE_SY_065	02SHNAGO-02MCDOWL 138 kV line	The 02SHNAGO-02MCDOWL 138 kV line: Perform terminal upgrades at both McDowell and Shenango substations.	Same as #23
26	B_LINE_SY_064	02SHNAGO-02MCDOWL 138 kV line	The KRENDALE-SHANOR MANOR 138 kV line (from bus 235205 to bus 235246 ckt 1) loads from 129.15% to 130.51% (**DC power flow**) of its emergency rating (352 MVA) for the single line contingency outage of CONTINGENCY DESCRIPTION ('B_LINE_SY_064'). This project contributes approximately 29.67 MW to the thermal violation. APS- this violation also occurs in Y2-095, a request was sent on 2/8/13.	Same as #20

Table 5a - Y2-050 Contribution to Previously Identified Overloads Option 1				
#	**Contingency**	**Facility**	**Description**	**Cost**
27	C2-BRK-ER126	02SHNAGO-02MCDOWL 138 kV line		Same as #25
28	C2-BRK-ER127	KRENDALE-SHANOR MANOR 138 kV line		Same as #25
			Cost	**$57,725,280**

Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of the surrounding generation. Any potential problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which analyzes all overload conditions associated with the overloaded element(s) identified. As a result of the aggregate energy resources in the area, the following violations were identified.

Table 6a - Y2-050 Delivery of Energy Portion of Interconnection Request				
#	**Contingency**	**Facility**	**Description**	**Cost**
29	APS_B_G692	KARNS CITY-KISSINGER J 138 kV line	The KARNS CITY-KISSINGER J 138 kV line (from bus 235197 to bus 235203 ckt 1) loads from 75.39% to 76.31% (DC power flow) of its emergency rating (256 MVA) for the single line contingency outage of CONTINGENCY DESCRIPTION ('APS_B_G692'). This project contributes approximately 14.63 MW to the thermal violation.	**N/A**
30	B_LINE_SY_064	02MAPLE-02SENECA 138 kV line	The 02MAPLE-02SENECA 138 kV line (from bus 238942 to bus 239099 ckt 1) loads from 104.32% to 105.43% (DC power flow) of its emergency rating (350 MVA) for the single line contingency outage of CONTINGENCY DESCRIPTION ('B_LINE_SY_064'). This project	**N/A**

Table 6a - Y2-050 Delivery of Energy Portion of Interconnection Request				
#	**Contingency**	**Facility**	**Description**	**Cost**
			contributes approximately 24.07 MW to the thermal violation.	
31	B_LINE_SY_064	02SENECA-KRENDALE 138 kV line	The 02SENECA-KRENDALE 138 kV line (from bus 239099 to bus 235205 ckt 1) loads from 107.99% to 109.14% (DC power flow) of its emergency rating (338 MVA) for the single line contingency outage of CONTINGENCY DESCRIPTION ('B_LINE_SY_064'). This project contributes approximately 24.07 MW to the thermal violation.	**N/A**
32	B_LINE_SY_064	SHANOR MANOR-BUTLER 138 kV line	The SHANOR MANOR-BUTLER 138 kV line (from bus 235246 to bus 235152 ckt 1) loads from 107.64% to 109.08% (DC power flow) of its emergency rating (352 MVA) for the single line contingency outage of CONTINGENCY DESCRIPTION ('B_LINE_SY_064'). This project contributes approximately 31.3 MW to the thermal violation.	**N/A**
33	B_LINE_SY_064	KRENDALE-SHANOR MANOR 138 kV line	The KRENDALE-SHANOR MANOR 138 kV line (from bus 235205 to bus 235246 ckt 1) loads from 110.77% to 112.21% (DC power flow) of its emergency rating (352 MVA) for the single line contingency outage of CONTINGENCY DESCRIPTION ('B_LINE_SY_064'). This project contributes approximately 31.3 MW to the thermal violation.	**N/A**
			Cost	**N/A**

Steady-State Voltage Requirements

(Results of the steady-state voltage studies should be inserted here)

To be determined

Light Load Reliability Analysis

*(Summary of any reinforcements required to mitigate system reliability issues during light load periods. This light load study was evaluated for compliance with reliability criteria for **Light Load conditions** in 2014.)*

Not required.

Stability and Reactive Power Requirement
(Results of the dynamic studies should be inserted here)

The analysis will be done in the Impact Study

Schedule

The standard time required for construction is 18 months after signing an interconnection agreement.

Option 2 South Canton – Sammis 345 kV Sensitivity Analysis

Contingencies:

Option 2 South Canton – Sammis 345 kV	
Contingency Name	**Description**
378	CONTINGENCY '378' /KEYSTONE-01CABOT WITH STUCK BREAKER KEYSTONE 14 OPEN BRANCH FROM BUS 200011 TO BUS 235104 CKT 1 OPEN BRANCH FROM BUS 200011 TO BUS 200810 TO BUS 200906 CKT 3 END
AP_SB_363	CONTINGENCY 'AP_SB_363' / MITCHELL BREAKER FAILURE - TIE BREAKER FROM BUS 1-2 OPEN BRANCH FROM BUS 235124 TO BUS 235260 CKT 1 OPEN BRANCH FROM BUS 235124 TO BUS 235247 CKT 1 OPEN BRANCH FROM BUS 235124 TO BUS 235161 CKT 1 OPEN BUS 235572 OPEN BUS 235573 END
AP_SB_467	CONTINGENCY 'AP_SB_467' / HATFIELD500-RONCO500 STK BKR AT HATFIELD500 #8 OPEN BRANCH FROM BUS 235108 TO BUS 235774 CKT 1 OPEN BUS 235582 END
APS_B_G693	CONTINGENCY 'APS_B_G693' / 200011 KEYSTONE 500 235118 01SOBEND 500 1 OPEN BRANCH FROM BUS 200011 TO BUS 235118 CKT 1 END
B_LINE_SY_064	CONTINGENCY 'B_LINE_SY_064' /* LINE 01CABOT 500 TO 02CRNBRY 500 CK 1 DISCONNECT BRANCH FROM BUS 235104 TO BUS 239280 CKT 1 /* CABOT 500.00 02CRNBRY 500.00 END
B_LINE_SY_065	CONTINGENCY 'B_LINE_SY_065' /* LINE 02CRNBRY 500 TO 01WYLIER 500 CK 1 DISCONNECT BRANCH FROM BUS 239280 TO BUS 235703 CKT 1 /* 02CRNBRY 500.00 WYLIE RIDGE 500.00 END

Option 2 South Canton – Sammis 345 kV	
Contingency Name	**Description**
C2-BRK-ER126	CONTINGENCY 'C2-BRK-ER126' /* CRANBERRY 500KV, BKR FAILURE - BKR A DISCONNECT BRANCH FROM BUS 239280 TO BUS 235703 CKT 1 /* 02CRNBRY 500.00 01WYLIE R 500.00 DISCONNECT BRANCH FROM BUS 239280 TO BUS 239281 CKT 1 /* 02CRNBRY 500.00 02CRNBRY 138.00 END
C2-BRK-ER127	CONTINGENCY 'C2-BRK-ER127' /* CRANBERRY 500KV, BKR FAILURE - BKR B DISCONNECT BRANCH FROM BUS 239280 TO BUS 235703 CKT 1 /* 02CRNBRY 500.00 01WYLIE R 500.00 DISCONNECT BRANCH FROM BUS 239280 TO BUS 239281 CKT 2 /* 02CRNBRY 500.00 02CRNBRY 138.00 END
KEYSTONE_JACKMTN1_1	CONTINGENCY 'KEYSTONE_JACKMTN1_1' /* 500/500KV, AREA 225/225. DISCONNECT BRANCH FROM BUS 200011 TO BUS 200071 CKT 1 END
PJM20A_CONEMAGH-KEYSTONE	CONTINGENCY 'PJM20A_CONEMAGH-KEYSTONE' DISCONNECT BRANCH FROM BUS 200005 TO BUS 200011 CKT 1 /* CONEMAGH KEYSTONE 500 500 END
PJM3B1	CONTINGENCY 'PJM3B1' /* KEYSTONE BUS BREAKER 3 DISCONNECT BRANCH FROM BUS 200071 TO BUS 200011 CKT 1 /* JUNIATA KEYSTONE 500 500 /* BUS 200072 => 200071 (JACKMNT1) DISCONNECT BRANCH FROM BUS 200011 TO BUS 200810 TO BUS 200907 CKT 4/* KEYSTONE KEYSTONE 500 230 #4 END
PJM4	CONTINGENCY 'PJM4' /* KEYSTONE BREAKER 6 DISCONNECT BRANCH FROM BUS 200005 TO BUS 200011 CKT 1 /* CONEMAGH KEYSTONE 500 500 DISCONNECT BRANCH FROM BUS 200011 TO BUS 200810 TO BUS 200907 CKT 4/* KEYSTONE KEYSTONE 500 230 END

Option 2 South Canton – Sammis 345 kV	
Contingency Name	**Description**
PJM53	CONTINGENCY 'PJM53' /* CONEMAUGH BREAKER 2 DISCONNECT BRANCH FROM BUS 200005 TO BUS 200011 CKT 1 /* CONEMAGH C14_CLCT 500 500 DISCONNECT BRANCH FROM BUS 200005 TO BUS 200031 CKT 1 /* CONEMAGH CONEMAGH 500 22 REMOVE MACHINE H FROM BUS 200031 /* CONEMAUGH 2 REMOVE MACHINE L FROM BUS 200031 END

Load Flow Results:

Option 2											
Y2-050 Generator Deliverability Option 2 South Canton – Sammis 345 kV											
	Contingency		**Facility Description**	**Bus**		**Loading**		**Rating**		**MW Cont.**	**FG App.**
#	**Type**	**Name**		**From**	**To**	**Initial**	**Final**	**Type**	**MVA**		
1	N-1	PJM20A_CONEMAGH-KEYSTONE	KEYSTONE-JACKMTN1 500 kV line	200011	200071	92.46	92.81	ER	3723	80.49	3
2	N-1	KEYSTONE_JACKMTN1_1	KEYSTONE-CONEM-GH 500 kV line	200011	200005	99.32	99.73	ER	3723	95.83	8
3	N-1	APS_B_G693	CABOT-KEYSTONE 500 kV line	235104	200011	97.47	98.21	ER	2598	120.58	10

Y2-050 Multiple Facility Contingency Option 2 South Canton – Sammis 345 kV											
	Contingency		**Facility Description**	**Bus**		**Loading**		**Rating**		**MW Cont.**	**FG App.**
#	**Type**	**Name**		**From**	**To**	**Initial**	**Final**	**Type**	**MVA**		
4	LFFB	AP_SB_467	SMITHTON 62-YUKON 138 kV line	235252	235277	73.09	73.91	ER	297	15.05	1
5	LFFB	378	KARNS CITY-KISSINGER J 138 kV line	235197	235203	76.65	77.67	ER	256	16.02	2
6	LFFB	AP_SB_467	SHEPLER H J-SMITHTON 62 138 kV line	235247	235252	78.41	79.23	ER	297	15.05	4
7	LFFB	PJM4	KEYSTONE-JACKMTN1 500 kV line	200011	200071	94.36	94.74	ER	3723	86.12	5
8	LFFB	PJM53	KEYSTONE-JACKMTN1 500 kV line	200011	200071	98.69	99.05	ER	3723	84.91	6
9	LFFB	AP_SB_363	DRY RUN-CHARLEROI 138 kV line	235169	235161	87.24	88.8	ER	243	23.39	7

Y2-050 Contribution to Previously Identified Overloads Option 2											
	Contingency		Facility Description	Bus		Loading		Rating		MW Cont.	FG App.
#	Type	Name		From	To	Initial	Final	Type	MVA		
10	LFFB	PJM3B1	KEYSTONE-CONEM-GH 500 kV line	200011	200005	100.91	101.34	ER	3723	102	9
11	N-1	B_LINE_SY_065	02HOYTDL-02CRNBRY 138 kV line	238813	239281	101.98	102.99	ER	309	19.33	11
12	N-1	B_LINE_SY_064	02MAPLE-02SENECA 138 kV line	238942	239099	115.6	116.76	ER	350	25.21	12
13	N-1	B_LINE_SY_064	02SENECA-KRENDALE 138 kV line	239099	235205	119.67	120.87	ER	338	25.21	13
14	N-1	B_LINE_SY_065	02HOYTDL-02MAPLE 138 kV line	238813	238942	127.23	128.31	ER	309	20.59	14
15	N-1	B_LINE_SY_064	SHANOR MANOR-BUTLER 138 kV line	235246	235152	126.02	127.54	ER	352	32.93	15
16	N-1	B_LINE_SY_065	02SHNAGO-02MCDOWL 138 kV line	239107	238954	134.85	136.1	ER	153	11.83	16
17	N-1	B_LINE_SY_064	KRENDALE-SHANOR MANOR 138 kV line	235205	235246	129.15	130.66	ER	352	32.93	17
18	LFFB	C2-BRK-ER127	02SHNAGO-02MCDOWL 138 kV line	239107	238954	140.46	141.8	ER	153	12.67	18
19	LFFB	C2-BRK-ER126	02SHNAGO-02MCDOWL 138 kV line	239107	238954	140.46	141.8	ER	153	12.67	19

Y2-050 Delivery of Energy Portion of Interconnection Request Option 2											
	Contingency		Facility Description	Bus		Loading		Rating		MW Cont.	FG App.
#	Type	Name		From	To	Initial	Final	Type	MVA		
20	N-1	B_LINE_SY_064	02MAPLE-02SENECA 138 kV line	238942	239099	104.32	105.55	ER	350	26.6	
21	N-1	B_LINE_SY_064	02SENECA-KRENDALE 138 kV line	239099	235205	107.99	109.27	ER	338	26.6	
22	N-1	B_LINE_SY_064	SHANOR MANOR-BUTLER 138 kV line	235246	235152	107.64	109.24	ER	352	34.74	
23	N-1	B_LINE_SY_064	KRENDALE-SHANOR MANOR 138 kV line	235205	235246	110.77	112.36	ER	352	34.74	

Flow Gate Results – Option 1

Appendix 1

Bus Number	Bus Name	Full Contribution
254007	15ELRMA1	8.45
254008	15ELRMA2	8.63
254009	15ELRMA3	11.21
254010	15ELRMA4	18.07
235573	MITCHELL 2	.24
235574	MITCHELL 3	.82
884780	S-058 C	9.06
884781	S-058 E	29.87
LTF	V3-012	8.73
LTF	W3-083	2.
907021	X1-020 C	2.55
907022	X1-020 E	17.04
LTF	X2-042	10.18
LTF	X3-020	2.71
LTF	X3-021	10.52
900404	X3-028 C	44.34
LTF	X3-096	6.52
LTF	X3-097	9.25
LTF	X3-098	8.77
LTF	X4-029D	2.43
LTF	X4-041	8.66
912241	X4-042	.19
LTF	Y1-002	9.18
LTF	Y1-004	10.3
LTF	Y1-007	7.15
913091	Y1-015 C	18.24
913092	Y1-015 E	2.73
913191	Y1-027 C OP1	.01
913192	Y1-027 E OP1	.02
LTF	Y1-041	2.43
913461	Y1-070 OP1	17.3
LTF	Y2-004	4.39
LTF	Y2-005	4.39
LTF	Y2-006	4.57
LTF	Y2-007	8.78
LTF	Y2-008	9.09
LTF	Y2-030	2.51
LTF	Y2-031	2.51
LTF	Y2-032	2.51
LTF	Y2-033	4.82
LTF	Y2-034	3.44
LTF	Y2-035	1.84

LTF	Y2-036	1.84
LTF	Y2-040	10.52
LTF	Y2-049	8.64
914081	Y2-050 C OP1	15.58
914082	Y2-050 E OP1	.86

Appendix 2

Bus Number	Bus Name	Full Contribution
242931	05BEVERL	.94
243190	05CDG1	.86
243191	05CDG2	3.88
243185	05CDG3	4.18
243189	05MLG2	1.74
242940	05MUSKNG	25.74
243045	05MUSKNG	23.57
242947	05WATERF	1.14
235344	HANNIBAL	.03
884780	S-058 C	22.86
884781	S-058 E	75.38
LTF	V3-012	19.76
903691	W3-111 C	.48
903701	W3-112 C	.48
903711	W3-113 C	.48
903761	W3-128	37.56
LTF	X2-042	23.8
LTF	X3-020	7.04
LTF	X3-021	19.68
900404	X3-028 C	117.39
LTF	X3-096	16.95
LTF	X3-097	24.03
LTF	X3-098	22.78
LTF	X4-041	22.5
LTF	Y1-002	23.09
LTF	Y1-004	23.33
LTF	Y1-007	16.2
LTF	Y2-004	11.38
LTF	Y2-005	11.38
LTF	Y2-006	12.14
LTF	Y2-007	22.77
LTF	Y2-008	24.09
LTF	Y2-033	12.71
LTF	Y2-034	8.8
LTF	Y2-040	19.68
LTF	Y2-049	16.16
914081	Y2-050 C OP1	116.65

Appendix 3

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	9.96
238555	02AVONG9	66.57
238995	02NCUNTD	.79
239006	02NILEG1	13.2
239007	02NILEG2	13.08
239022	02NWCAG3	12.5
239023	02NWCAG4	12.17
239024	02NWCAG5	18.76
254007	15ELRMA1	11.93
254008	15ELRMA2	12.18
254009	15ELRMA3	13.71
254010	15ELRMA4	22.1
298466	B-018	.05
235850	BROWNS RUN	60.09
231904	DC1 NUG	-5.08
231905	DC2 NUG	-5.08
217078	ESSEX 12	-36.35
298464	G-030	.49
99210	G07_NEW	20.52
231903	GEN4	-14.44
292320	K-020	.01
200032	KEYS G1	4.67
200033	KEYS G2	4.61
209027	LOR2_Q27 E	-17.34
292880	M-026	33.68
235573	MITCHELL 2	.24
235574	MITCHELL 3	.81
227807	MO AV B	-3.74
94130	O66_NONFIRM	69.74
884780	S-058 C	61.36
884781	S-058 E	202.32
235619	SOUTH BEND 1	.83
235620	SOUTH BEND 2	.83
235621	SOUTH BEND 3	.84
235622	SOUTH BEND 4	.83
235610	SPRINGDALE 1	.14
235611	SPRINGDALE 2	.14
235612	SPRINGDALE 3	.55
235613	SPRINGDALE 4	.54
235614	SPRINGDALE 5	.57
292339	T-109	.11
292344	T-110	.11
292552	T-156	2.48
292626	T-174 1	29.11

292627	T-174 2	29.11
292628	T-174 3	29.11
292629	T-174 4	59.01
885600	T20SOLAR E	-.41
292078	V1-034	.59
LTF	V3-012	62.33
901381	W1-107 C	.
902211	W2-019 C	-.44
903511	W3-059A_AT6	1.3
905031	W4-001A_AT9	.41
905051	W4-004A_AT10	2.46
905061	W4-004B_AT11	1.61
905211	W4-025 C	-.5
905291	W4-038 OP1	-4.74
907211	X1-064A_AT13	14.69
907213	X1-064A_AT13	14.7
907241	X1-068	-1.95
907991	X1-078	102.47
907381	X1-094 C	-1.27
LTF	X2-042	68.38
910531	X3-004	-6.91
LTF	X3-021	71.84
900404	X3-028 C	302.58
910931	X3-085 C	-.6
LTF	X3-096	45.1
LTF	X3-097	63.95
LTF	X3-098	60.62
912091	X4-012 C OP1	-.45
912101	X4-015 C	-.36
LTF	X4-041	59.89
912241	X4-042	.36
LTF	Y1-002	62.08
LTF	Y1-004	74.06
LTF	Y1-007	51.43
913091	Y1-015 C	108.86
913191	Y1-027 C OP1	.
913261	Y1-035	48.02
913271	Y1-036	47.74
913461	Y1-070 OP1	103.23
913491	Y1-074 C OP1	.33
LTF	Y2-004	30.39
LTF	Y2-005	30.39
LTF	Y2-006	31.11
LTF	Y2-007	60.79
LTF	Y2-008	62.04
LTF	Y2-033	35.49

LTF	Y2-034	29.6
LTF	Y2-040	71.84
LTF	Y2-049	58.99
914081	Y2-050 C OP1	80.49

Appendix 4

Bus Number	Bus Name	Full Contribution
254007	15ELRMA1	8.45
254008	15ELRMA2	8.63
254009	15ELRMA3	11.21
254010	15ELRMA4	18.07
235573	MITCHELL 2	.24
235574	MITCHELL 3	.82
884780	S-058 C	9.06
884781	S-058 E	29.87
LTF	V3-012	8.73
LTF	W3-083	2.
907021	X1-020 C	2.55
907022	X1-020 E	17.04
LTF	X2-042	10.18
LTF	X3-020	2.71
LTF	X3-021	10.52
900404	X3-028 C	44.34
LTF	X3-096	6.52
LTF	X3-097	9.25
LTF	X3-098	8.77
LTF	X4-029D	2.43
LTF	X4-041	8.66
912241	X4-042	.19
LTF	Y1-002	9.18
LTF	Y1-004	10.3
LTF	Y1-007	7.15
913091	Y1-015 C	18.24
913092	Y1-015 E	2.73
913191	Y1-027 C OP1	.01
913192	Y1-027 E OP1	.02
LTF	Y1-041	2.43
913461	Y1-070 OP1	17.3
LTF	Y2-004	4.39
LTF	Y2-005	4.39
LTF	Y2-006	4.57
LTF	Y2-007	8.78
LTF	Y2-008	9.09
LTF	Y2-030	2.51
LTF	Y2-031	2.51
LTF	Y2-032	2.51
LTF	Y2-033	4.82
LTF	Y2-034	3.44
LTF	Y2-035	1.84
LTF	Y2-036	1.84
LTF	Y2-040	10.52

LTF	Y2-049	8.64
914081	Y2-050 C OP1	15.58
914082	Y2-050 E OP1	.86

Appendix 5

Bus Number	Bus Name	Full Contribution
242931	05BEVERL	.88
243190	05CDG1	1.06
243191	05CDG2	3.54
243185	05CDG3	3.81
243189	05MLG2	1.62
242940	05MUSKNG	23.9
243045	05MUSKNG	22.02
242947	05WATERF	1.06
235344	HANNIBAL	.03
884780	S-058 C	20.52
884781	S-058 E	67.65
LTF	V3-012	17.97
903691	W3-111 C	.45
903701	W3-112 C	.45
903711	W3-113 C	.45
903761	W3-128	35.06
LTF	X2-042	20.72
LTF	X3-021	13.82
900404	X3-028 C	108.57
LTF	X3-096	15.67
LTF	X3-097	22.22
LTF	X3-098	21.06
LTF	X4-041	20.81
LTF	Y1-002	20.65
LTF	Y1-004	21.4
LTF	Y1-007	14.86
LTF	Y2-004	10.53
LTF	Y2-005	10.53
LTF	Y2-006	11.2
LTF	Y2-007	21.06
LTF	Y2-008	22.23
LTF	Y2-033	12.43
LTF	Y2-034	9.6
LTF	Y2-040	13.82
LTF	Y2-049	11.35
914081	Y2-050 C OP1	102.94

Appendix 6

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	9.98
238555	02AVONG9	66.79
238995	02NCUNTD	.8
239006	02NILEG1	13.37
239007	02NILEG2	13.24
239022	02NWCAG3	12.71
239023	02NWCAG4	12.36
239024	02NWCAG5	19.06
254007	15ELRMA1	12.13
254008	15ELRMA2	12.38
254009	15ELRMA3	13.95
254010	15ELRMA4	22.47
235850	BROWNS RUN	61.7
231904	DC1 NUG	-5.12
231905	DC2 NUG	-5.12
217078	ESSEX 12	-36.64
206617	EXXON	-1.39
298464	G-030	.51
99210	G07_NEW	20.68
231903	GEN4	-14.55
208453	HONY	-.28
200032	KEYS G1	4.84
200033	KEYS G2	4.79
209027	LOR2_Q27 E	-17.47
206679	M&M S721	-2.06
292880	M-026	34.27
210888	MACRTR10	-1.02
227807	MO AV B	-3.77
214194	N WALES4	-.38
293231	N-032 E	4.64
94130	O66_NONFIRM	70.29
206638	PEAPACK	-.8
290092	Q-041 E	-5.99
244996	ROSEVALL	.07
884780	S-058 C	62.08
884781	S-058 E	204.7
208769	SISO	-.36
235619	SOUTH BEND 1	.86
235620	SOUTH BEND 2	.86
235621	SOUTH BEND 3	.87
235622	SOUTH BEND 4	.86
245347	STON CNT	1.01
292339	T-109	.11
292344	T-110	.11

292552	T-156	2.52
292626	T-174 1	29.97
292627	T-174 2	29.97
292628	T-174 3	29.97
292629	T-174 4	60.76
885600	T20SOLAR E	-.42
299984	U3-029 E	1.35
299989	U3-030 E	.61
292063	V1-021 E	-.06
292078	V1-034	.6
LTF	V3-012	63.21
904512	V4-052 E	-.74
901382	W1-107 E	.18
901602	W1-111 E	4.24
902211	W2-019 C	-.44
903511	W3-059A_AT6	1.3
903512	W3-059A_AT6	8.69
905031	W4-001A_AT9	.42
905051	W4-004A_AT10	2.5
905211	W4-025 C	-.5
905291	W4-038 OP1	-4.78
905482	W4-085 E	.37
907041	X1-027A C1	1.63
907044	X1-027A C2	1.63
907046	X1-027A C3	1.63
907048	X1-027A C4	1.63
907042	X1-027A E1	10.9
907045	X1-027A E2	10.9
907047	X1-027A E3	10.9
907049	X1-027A E4	10.9
907211	X1-064A_AT13	14.81
907213	X1-064A_AT13	14.81
907241	X1-068	-1.97
907991	X1-078	103.25
907381	X1-094 C	-1.28
909032	X2-013 E	.38
LTF	X2-042	69.24
909292	X2-085 E	.96
910531	X3-004	-6.97
LTF	X3-021	72.06
900404	X3-028 C	306.49
910612	X3-029 E	-2.24
910762	X3-052 E	-.6
910902	X3-081 E	-.09
910931	X3-085 C	-.6
LTF	X3-096	45.68

LTF	X3-097	64.78
LTF	X3-098	61.4
912032	X4-004 E	-.94
912091	X4-012 C OP1	-.46
912101	X4-015 C	-.37
LTF	X4-041	60.66
912241	X4-042	.36
912271	X4-045 E	.09
LTF	Y1-002	62.8
LTF	Y1-004	75.12
LTF	Y1-007	52.17
913091	Y1-015 C	110.39
913092	Y1-015 E	16.5
913261	Y1-035	47.66
913271	Y1-036	47.3
913362	Y1-057 E	.38
913461	Y1-070 OP1	104.68
913491	Y1-074 C OP1	.33
913492	Y1-074 E OP1	.54
LTF	Y2-004	30.78
LTF	Y2-005	30.78
LTF	Y2-006	31.51
LTF	Y2-007	61.57
LTF	Y2-008	62.85
LTF	Y2-033	36.02
LTF	Y2-034	30.12
LTF	Y2-040	72.06
LTF	Y2-049	59.18
914081	Y2-050 C OP1	81.64
914082	Y2-050 E OP1	4.48

Appendix 7

Bus Number	Bus Name	Full Contribution
243191	05CDG2	3.9
243185	05CDG3	4.2
243045	05MUSKNG	22.76
884780	S-058 C	21.3
884781	S-058 E	70.23
299984	U3-029 E	-1.47
299989	U3-030 E	-.67
LTF	V3-012	18.69
903691	W3-111 C	.45
903692	W3-111 E	.74
903701	W3-112 C	.45
903702	W3-112 E	.74
903711	W3-113 C	.45
903712	W3-113 E	.74
903761	W3-128	36.69
LTF	X2-042	21.58
LTF	X3-021	14.55
900404	X3-028 C	112.63
LTF	X3-096	16.26
LTF	X3-097	23.05
LTF	X3-098	21.85
LTF	X4-041	21.59
LTF	Y1-002	21.45
LTF	Y1-004	22.25
LTF	Y1-007	15.45
LTF	Y2-004	10.92
LTF	Y2-005	10.92
LTF	Y2-006	11.62
LTF	Y2-007	21.84
LTF	Y2-008	23.06
LTF	Y2-033	12.87
LTF	Y2-034	9.89
LTF	Y2-040	14.55
LTF	Y2-049	11.95
914081	Y2-050 C OP1	112.89
914082	Y2-050 E OP1	6.2

Appendix 8

Bus Number	Bus Name	Full Contribution
243191	05CDG2	3.9
243185	05CDG3	4.2
243045	05MUSKNG	22.76
884780	S-058 C	21.3
884781	S-058 E	70.23
299984	U3-029 E	-1.47
299989	U3-030 E	-.67
LTF	V3-012	18.69
903691	W3-111 C	.45
903692	W3-111 E	.74
903701	W3-112 C	.45
903702	W3-112 E	.74
903711	W3-113 C	.45
903712	W3-113 E	.74
903761	W3-128	36.69
LTF	X2-042	21.58
LTF	X3-021	14.55
900404	X3-028 C	112.63
LTF	X3-096	16.26
LTF	X3-097	23.05
LTF	X3-098	21.85
LTF	X4-041	21.59
LTF	Y1-002	21.45
LTF	Y1-004	22.25
LTF	Y1-007	15.45
LTF	Y2-004	10.92
LTF	Y2-005	10.92
LTF	Y2-006	11.62
LTF	Y2-007	21.84
LTF	Y2-008	23.06
LTF	Y2-033	12.87
LTF	Y2-034	9.89
LTF	Y2-040	14.55
LTF	Y2-049	11.95
914081	Y2-050 C OP1	112.89
914082	Y2-050 E OP1	6.2

Appendix 9

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	9.96
238555	02AVONG9	66.57
238995	02NCUNTD	.79
239006	02NILEG1	13.2
239007	02NILEG2	13.08
239022	02NWCAG3	12.5
239023	02NWCAG4	12.17
239024	02NWCAG5	18.76
254007	15ELRMA1	11.93
254008	15ELRMA2	12.18
254009	15ELRMA3	13.71
254010	15ELRMA4	22.1
235850	BROWNS RUN	60.09
231904	DC1 NUG	-5.08
231905	DC2 NUG	-5.08
217078	ESSEX 12	-36.35
206617	EXXON	-1.38
298464	G-030	.49
99210	G07_NEW	20.52
231903	GEN4	-14.44
208453	HONY	-.28
200032	KEYS G1	4.67
200033	KEYS G2	4.61
209027	LOR2_Q27 E	-17.34
206679	M&M S721	-2.05
292880	M-026	33.68
210888	MACRTR10	-1.01
227807	MO AV B	-3.74
214194	N WALES4	-.38
293231	N-032 E	4.58
94130	O66_NONFIRM	69.74
206638	PEAPACK	-.79
290092	Q-041 E	-5.95
244996	ROSEVALL	.07
884780	S-058 C	61.36
884781	S-058 E	202.32
208769	SISO	-.36
235619	SOUTH BEND 1	.83
235620	SOUTH BEND 2	.83
235621	SOUTH BEND 3	.84
235622	SOUTH BEND 4	.83
292339	T-109	.11
292344	T-110	.11
292552	T-156	2.48

292626	T-174 1	29.11
292627	T-174 2	29.11
292628	T-174 3	29.11
292629	T-174 4	59.01
885600	T20SOLAR E	-.41
299984	U3-029 E	1.33
299989	U3-030 E	.6
292063	V1-021 E	-.06
292078	V1-034	.59
LTF	V3-012	62.33
904512	V4-052 E	-.73
901382	W1-107 E	.18
901602	W1-111 E	4.2
902211	W2-019 C	-.44
903511	W3-059A_AT6	1.3
903512	W3-059A_AT6	8.65
905031	W4-001A_AT9	.41
905051	W4-004A_AT10	2.46
905061	W4-004B_AT11	1.61
905062	W4-004B_AT11	1.39
905211	W4-025 C	-.5
905291	W4-038 OP1	-4.74
905482	W4-085 E	.37
907211	X1-064A_AT13	14.69
907213	X1-064A_AT13	14.7
907241	X1-068	-1.95
907991	X1-078	102.47
907381	X1-094 C	-1.27
909032	X2-013 E	.37
LTF	X2-042	68.38
909292	X2-085 E	.95
910531	X3-004	-6.91
LTF	X3-021	71.84
900404	X3-028 C	302.58
910612	X3-029 E	-2.22
910762	X3-052 E	-.59
910902	X3-081 E	-.09
910931	X3-085 C	-.6
LTF	X3-096	45.1
LTF	X3-097	63.95
LTF	X3-098	60.62
912032	X4-004 E	-.93
912091	X4-012 C OP1	-.45
912101	X4-015 C	-.36
LTF	X4-041	59.89
912241	X4-042	.36

912271	X4-045 E	.09
LTF	Y1-002	62.08
LTF	Y1-004	74.06
LTF	Y1-007	51.43
913091	Y1-015 C	108.86
913092	Y1-015 E	16.27
913261	Y1-035	48.02
913271	Y1-036	47.74
913362	Y1-057 E	.37
913461	Y1-070 OP1	103.23
913491	Y1-074 C OP1	.33
913492	Y1-074 E OP1	.53
LTF	Y2-004	30.39
LTF	Y2-005	30.39
LTF	Y2-006	31.11
LTF	Y2-007	60.79
LTF	Y2-008	62.04
LTF	Y2-033	35.49
LTF	Y2-034	29.6
LTF	Y2-040	71.84
LTF	Y2-049	58.99
914081	Y2-050 C OP1	80.49
914082	Y2-050 E OP1	4.42

Appendix 10

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	17.18
254007	15ELRMA1	23.04
254008	15ELRMA2	23.53
254009	15ELRMA3	31.94
254010	15ELRMA4	51.45
235573	MITCHELL 2	.76
235574	MITCHELL 3	2.58
315446	Q-065	-15.41
884780	S-058 C	6.62
884781	S-058 E	21.83
299984	U3-029 E	.62
299989	U3-030 E	.28
LTF	V3-012	5.6
LTF	W3-083	1.58
907021	X1-020 C	1.84
907022	X1-020 E	12.33
LTF	X2-042	7.72
LTF	X3-020	1.8
LTF	X3-021	10.63
900404	X3-028 C	29.78
LTF	X3-096	4.33
LTF	X3-097	6.15
LTF	X3-098	5.82
LTF	X4-029D	1.73
LTF	X4-041	5.75
LTF	Y1-002	6.78
LTF	Y1-004	6.39
LTF	Y1-007	4.44
913091	Y1-015 C	36.41
913092	Y1-015 E	5.44
913261	Y1-035	13.53
913271	Y1-036	13.41
LTF	Y1-041	1.73
913441	Y1-069 OP1	13.14
913461	Y1-070 OP1	34.53
LTF	Y2-004	2.91
LTF	Y2-005	2.91
LTF	Y2-006	3.11
LTF	Y2-007	5.83
LTF	Y2-008	6.16
LTF	Y2-030	1.64
LTF	Y2-031	1.64
LTF	Y2-032	1.64
LTF	Y2-033	2.45

LTF	Y2-040	10.63
LTF	Y2-049	8.73
914081	Y2-050 C OP1	22.83
914082	Y2-050 E OP1	1.25

Appendix 11

Bus Number	Bus Name	Full Contribution
238545	02ASHTG5	26.99
238554	02AVONG7	11.65
238555	02AVONG9	77.99
238565	02BAYSG2	15.26
238566	02BAYSG3	15.7
238567	02BAYSG4	23.77
238995	02NCUNTD	.95
239006	02NILEG1	15.72
239007	02NILEG2	15.58
239022	02NWCAG3	15.01
239023	02NWCAG4	14.59
239024	02NWCAG5	22.5
247528	05COVRT1	1.29
247529	05COVRT2	1.29
247530	05COVRT3	1.29
247531	05COVRT4	.77
247532	05COVRT5	.77
247533	05COVRT6	.77
243654	05CVG3	18.41
243045	05MUSKNG	44.67
243655	05PCG5	10.31
242807	05SPORNA	61.83
251934	08BCKJD2	9.79
251935	08BCKJD3	13.32
251936	08BCKJD4	15.61
251937	08BCKJD5	24.78
251938	08BCKJD6	43.1
251939	08BECJD1	9.79
253188	09OHGEN1	5.59
253189	09OHGEN2	5.28
253191	09OHGEN4	6.11
254007	15ELRMA1	14.28
254008	15ELRMA2	14.58
254009	15ELRMA3	16.43
254010	15ELRMA4	26.47
235564	ALBRIGHT 1	7.96
235565	ALBRIGHT 2	7.96
235566	ALBRIGHT 3	14.94
298466	B-018	.06
235850	BROWNS RUN	72.63
231904	DC1 NUG	-5.74
231905	DC2 NUG	-5.74
217078	ESSEX 12	-38.81
298464	G-030	.62

99210	G07_NEW	22.07
231903	GEN4	-16.33
292320	K-020	.01
200032	KEYS G1	5.84
200033	KEYS G2	5.77
209027	LOR2_Q27 E	-17.71
292850	M-023 C	3.21
292880	M-026	40.37
235573	MITCHELL 2	.29
235574	MITCHELL 3	.97
227807	MO AV B	-4.12
292980	N-007 C	.82
94130	O66_NONFIRM	74.45
247500	R-003 C	2.72
247517	R-049 C	3.19
296454	R-052 C1	2.16
296479	R-052 C2	2.16
290286	R-052AC	2.16
235575	RIVESVILLE 5	4.05
235576	RIVESVILLE 6	9.95
247536	S-071 C	2.5
247537	S-072 C	6.42
247520	S-073 C	4.27
235619	SOUTH BEND 1	1.04
235620	SOUTH BEND 2	1.04
235621	SOUTH BEND 3	1.05
235622	SOUTH BEND 4	1.04
235610	SPRINGDALE 1	.17
235611	SPRINGDALE 2	.17
235612	SPRINGDALE 3	.64
235613	SPRINGDALE 4	.64
235614	SPRINGDALE 5	.67
885641	T-016 C	.63
292339	T-109	.14
292344	T-110	.14
247503	T-130 C	6.43
247521	T-131 C	3.19
247504	T-142 C	6.5
292552	T-156	2.97
292626	T-174 1	35.68
292627	T-174 2	35.68
292628	T-174 3	35.68
292629	T-174 4	72.33
885600	T20SOLAR E	-.45
247522	U1-059 C	.71
247505	U1-060 C	2.15

292846	U1-075	1.27
889031	U2-028A_AT1	14.92
247538	U2-062 C	2.54
247540	U2-072 C	4.23
247542	U4-001 C	2.98
891011	U4-002 C	1.39
891141	U4-028 C	1.46
891151	U4-029 C	1.46
892021	V1-011 C	1.39
892031	V1-012 C	2.08
292078	V1-034	.63
893001	V2-001 C	1.29
893021	V2-006 C	2.11
833193	V2-042AC1OP1	2.95
LTF	V3-012	73.1
894581	V3-015 C	4.07
894641	V3-028 C	.82
247548	V4-010 C	2.91
900041	V4-011	.35
247546	V4-015 C	.96
247547	V4-016 C	2.7
901161	W1-056 C	.26
901211	W1-070A_AT4	.72
901221	W1-072A_AT5	4.42
901381	W1-107 C	.
902141	W2-001 C	.95
902151	W2-007 C	1.41
902211	W2-019 C	-.48
903231	W3-005 C	7.22
903281	W3-024 C	2.03
903511	W3-059A_AT6	1.52
903611	W3-085 C	2.73
903621	W3-088 C OP1	2.81
903691	W3-111 C	.88
903701	W3-112 C	.88
903711	W3-113 C	.88
903761	W3-128	71.94
905031	W4-001A_AT9	.49
905051	W4-004A_AT10	2.95
905061	W4-004B_AT11	1.84
905211	W4-025 C	-.54
905291	W4-038 OP1	-5.06
235577	WILLOW I 1	6.02
235578	WILLOW I 2	18.63
907041	X1-027A C1	1.9
907044	X1-027A C2	1.9

907046	X1-027A C3	1.9
907048	X1-027A C4	1.9
907111	X1-040 C	4.89
907211	X1-064A_AT13	17.33
907213	X1-064A_AT13	17.33
907241	X1-068	-2.1
907991	X1-078	110.39
907381	X1-094 C	-1.35
LTF	X2-042	80.45
909201	X2-058 C	2.15
910501	X3-001 C	.08
910531	X3-004	-7.38
LTF	X3-020	22.03
LTF	X3-021	83.85
910601	X3-023 C OP1	.89
910621	X3-030 C	3.42
910631	X3-031 C OP1	2.1
910751	X3-051	64.3
910931	X3-085 C	-.63
LTF	X3-096	53.
LTF	X3-097	75.15
LTF	X3-098	71.23
912091	X4-012 C OP1	-.48
912101	X4-015 C	-.4
912161	X4-025	8.32
LTF	X4-041	70.38
912241	X4-042	.42
LTF	Y1-002	72.99
LTF	Y1-004	86.83
LTF	Y1-007	60.3
913091	Y1-015 C	130.01
913111	Y1-018	.56
913121	Y1-019	.56
913191	Y1-027 C OP1	.01
913211	Y1-030 C OP1	1.44
913251	Y1-034 OP1	.74
913261	Y1-035	55.44
913271	Y1-036	54.98
913301	Y1-044	.77
913441	Y1-069 OP1	87.5
913461	Y1-070 OP1	123.29
913491	Y1-074 C OP1	.38
LTF	Y2-004	35.71
LTF	Y2-005	35.71
LTF	Y2-006	36.6
LTF	Y2-007	71.42

LTF	Y2-008	72.98
LTF	Y2-033	41.59
LTF	Y2-034	34.41
LTF	Y2-040	83.85
LTF	Y2-049	68.86
914081	Y2-050 C OP1	95.83

Appendix 12

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	11.59
238555	02AVONG9	77.66
238565	02BAYSG2	15.23
238566	02BAYSG3	15.67
238567	02BAYSG4	23.72
238995	02NCUNTD	.96
239006	02NILEG1	15.83
239007	02NILEG2	15.69
239022	02NWCAG3	15.18
239023	02NWCAG4	14.74
239024	02NWCAG5	22.75
243654	05CVG3	18.56
243045	05MUSKNG	45.12
243655	05PCG5	10.4
254007	15ELRMA1	14.45
254008	15ELRMA2	14.75
254009	15ELRMA3	16.63
254010	15ELRMA4	26.79
235564	ALBRIGHT 1	7.98
235565	ALBRIGHT 2	7.98
235566	ALBRIGHT 3	14.99
235850	BROWNS RUN	74.37
231904	DC1 NUG	-5.76
231905	DC2 NUG	-5.76
217078	ESSEX 12	-39.01
206617	EXXON	-1.48
298464	G-030	.64
99210	G07_NEW	22.18
231903	GEN4	-16.37
208453	HONY	-.31
200032	KEYS G1	6.05
200033	KEYS G2	5.98
209027	LOR2_Q27 E	-17.83
206679	M&M S721	-2.19
292880	M-026	40.89
210888	MACRTR10	-1.07
227807	MO AV B	-4.14
214194	N WALES4	-.42
292980	N-007 C	.83
292981	N-007 E	3.31
293231	N-032 E	5.44
94130	O66_NONFIRM	74.85
290074	P-059 E	10.98
206638	PEAPACK	-.85

290092	Q-041 E	-6.37
290286	R-052AC	2.18
290287	R-052AE	8.7
235575	RIVESVILLE 5	4.11
235576	RIVESVILLE 6	10.1
244996	ROSEVALL	.08
208769	SISO	-.42
245417	SOMRSET8	.72
235619	SOUTH BEND 1	1.08
235620	SOUTH BEND 2	1.08
235621	SOUTH BEND 3	1.09
235622	SOUTH BEND 4	1.08
245347	STON CNT	1.18
292339	T-109	.14
292344	T-110	.14
247504	T-142 C	6.54
247908	T-142 E	26.17
292552	T-156	3.01
292626	T-174 1	36.62
292627	T-174 2	36.62
292628	T-174 3	36.62
292629	T-174 4	74.24
885600	T20SOLAR E	-.46
247522	U1-059 C	.72
247909	U1-059 E	4.8
247505	U1-060 C	2.16
247910	U1-060 E	14.52
889031	U2-028A_AT1	14.89
247911	U2-041 E	28.51
247540	U2-072 C	4.26
247914	U2-072 E	28.51
299984	U3-029 E	1.6
299989	U3-030 E	.73
247542	U4-001 C	2.99
247918	U4-001 E	20.02
891141	U4-028 C	1.46
891142	U4-028 E	9.77
891151	U4-029 C	1.46
891152	U4-029 E	9.77
292063	V1-021 E	-.06
292078	V1-034	.64
893001	V2-001 C	1.3
893002	V2-001 E	9.23
893021	V2-006 C	1.01
893022	V2-006 E	6.75
833193	V2-042AC1OP1	2.96

833194	V2-042AE1OP1	19.82
LTF	V3-012	73.79
894641	V3-028 C	.83
894642	V3-028 E	1.35
247548	V4-010 C	2.92
247932	V4-010 E	19.53
900041	V4-011	.35
247546	V4-015 C	.96
247922	V4-015 E	6.41
904512	V4-052 E	-.81
901161	W1-056 C	.27
901162	W1-056 E	1.77
901221	W1-072A_AT5	4.41
901382	W1-107 E	.21
901602	W1-111 E	4.36
902141	W2-001 C	.95
902142	W2-001 E	6.42
902151	W2-007 C	1.41
902152	W2-007 E	9.47
902211	W2-019 C	-.48
902402	W2-057 E	3.51
903231	W3-005 C	7.24
903232	W3-005 E	48.49
903511	W3-059A_AT6	1.52
903512	W3-059A_AT6	10.12
903611	W3-085 C	2.73
903612	W3-085 E	18.34
903691	W3-111 C	.89
903692	W3-111 E	1.45
903701	W3-112 C	.89
903702	W3-112 E	1.45
903711	W3-113 C	.89
903712	W3-113 E	1.45
903761	W3-128	72.66
905031	W4-001A_AT9	.5
905051	W4-004A_AT10	2.97
905061	W4-004B_AT11	1.78
905062	W4-004B_AT11	1.54
905211	W4-025 C	-.54
905291	W4-038 OP1	-5.09
905482	W4-085 E	.41
235577	WILLOW I 1	6.1
235578	WILLOW I 2	18.88
907041	X1-027A C1	1.89
907044	X1-027A C2	1.89
907046	X1-027A C3	1.89

907048	X1-027A C4	1.89
907042	X1-027A E1	12.68
907045	X1-027A E2	12.68
907047	X1-027A E3	12.68
907049	X1-027A E4	12.68
907211	X1-064A_AT13	17.35
907213	X1-064A_AT13	17.35
907241	X1-068	-2.11
907991	X1-078	110.89
907381	X1-094 C	-1.36
909032	X2-013 E	.41
LTF	X2-042	81.05
909201	X2-058 C	2.15
909202	X2-058 E	14.4
909292	X2-085 E	1.13
910501	X3-001 C	.08
910502	X3-001 E	.12
910531	X3-004	-7.42
LTF	X3-020	22.2
LTF	X3-021	83.47
910601	X3-023 C OP1	.89
910602	X3-023 E OP1	5.95
910612	X3-029 E	-2.37
910762	X3-052 E	-.64
910902	X3-081 E	-.1
910931	X3-085 C	-.64
LTF	X3-096	53.41
LTF	X3-097	75.74
LTF	X3-098	71.79
912032	X4-004 E	-1.03
912091	X4-012 C OP1	-.48
912101	X4-015 C	-.4
LTF	X4-041	70.93
912241	X4-042	.43
912271	X4-045 E	.1
LTF	Y1-002	73.43
LTF	Y1-004	87.68
LTF	Y1-007	60.89
913091	Y1-015 C	131.14
913092	Y1-015 E	19.59
913111	Y1-018	.56
913121	Y1-019	.56
913211	Y1-030 C OP1	1.45
913212	Y1-030 E OP1	9.68
913251	Y1-034 OP1	.76
913261	Y1-035	54.45

913271	Y1-036	53.86
913301	Y1-044	.78
913362	Y1-057 E	.41
913382	Y1-063 E	.44
913392	Y1-064 E	.44
913441	Y1-069 OP1	87.31
913461	Y1-070 OP1	124.35
913491	Y1-074 C OP1	.39
913492	Y1-074 E OP1	.63
LTF	Y2-004	35.99
LTF	Y2-005	35.99
LTF	Y2-006	36.89
LTF	Y2-007	71.98
LTF	Y2-008	73.55
LTF	Y2-033	42.03
LTF	Y2-034	34.91
LTF	Y2-040	83.47
LTF	Y2-049	68.55
914081	Y2-050 C OP1	96.69
914082	Y2-050 E OP1	5.31

Appendix 13

Bus Number	Bus Name	Full Contribution
242931	05BEVERL	1.2
243190	05CDG1	1.21
243191	05CDG2	4.9
243185	05CDG3	5.28
243654	05CVG3	9.14
243189	05MLG2	2.21
242940	05MUSKNG	32.71
243045	05MUSKNG	30.01
243655	05PCG5	5.06
242807	05SPORNA	33.69
242947	05WATERF	1.45
235344	HANNIBAL	.04
884780	S-058 C	28.74
884781	S-058 E	94.74
LTF	V3-012	24.94
903691	W3-111 C	.61
903701	W3-112 C	.61
903711	W3-113 C	.61
903761	W3-128	47.82
LTF	X2-042	29.63
LTF	X3-020	8.94
LTF	X3-021	23.03
900404	X3-028 C	148.99
LTF	X3-096	21.51
LTF	X3-097	30.5
LTF	X3-098	28.91
LTF	X4-041	28.56
LTF	Y1-002	28.99
LTF	Y1-004	29.53
LTF	Y1-007	20.51
913111	Y1-018	.28
913121	Y1-019	.28
LTF	Y2-004	14.45
LTF	Y2-005	14.45
LTF	Y2-006	15.39
LTF	Y2-007	28.9
LTF	Y2-008	30.55
LTF	Y2-030	8.72
LTF	Y2-031	8.72
LTF	Y2-032	8.72
LTF	Y2-033	16.43
LTF	Y2-034	11.82
LTF	Y2-040	23.03
LTF	Y2-049	18.91

914081	Y2-050 C OP1	145.86

Appendix 14

Bus Number	Bus Name	Full Contribution
243764	05BSG1	15.39
243191	05CDG2	4.06
243185	05CDG3	4.37
243654	05CVG3	11.05
243189	05MLG2	2.3
243045	05MUSKNG	29.97
243655	05PCG5	6.21
246759	05SOLIDA	10.42
242807	05SPORNA	38.08
243382	05TANNER	16.3
251934	08BCKJD2	5.43
251935	08BCKJD3	7.39
251936	08BCKJD4	8.66
251937	08BCKJD5	13.75
251938	08BCKJD6	24.01
251939	08BECJD1	5.43
253188	09OHGEN1	3.13
253189	09OHGEN2	2.95
253191	09OHGEN4	3.41
247500	R-003 C	1.43
247900	R-003 E	5.7
296454	R-052 C1	1.26
296479	R-052 C2	1.26
296455	R-052 E1	5.03
296480	R-052 E2	5.03
290286	R-052AC	1.24
290287	R-052AE	4.96
244761	RACINE	2.79
244996	ROSEVALL	.04
247536	S-071 C	1.33
247903	S-071 E	5.32
245417	SOMRSET8	.42
245347	STON CNT	.62
247504	T-142 C	3.63
247908	T-142 E	14.5
247505	U1-060 C	1.09
247910	U1-060 E	7.28
247911	U2-041 E	15.43
247538	U2-062 C	1.36
247912	U2-062 E	9.11
247540	U2-072 C	2.31
247914	U2-072 E	15.43
247508	U2-090 C	1.45
247915	U2-090 E	9.68

247931	U3-002 E	9.53
891221	U4-038 C	.71
891222	U4-038 E	4.76
833193	V2-042AC1OP1	1.47
833194	V2-042AE1OP1	9.84
247543	V3-007 C	1.45
247919	V3-007 E	9.68
247544	V3-008 C	1.45
247920	V3-008 E	9.68
247545	V3-009 C	1.45
247921	V3-009 E	9.68
LTF	V3-012	31.23
894581	V3-015 C	2.16
894582	V3-015 E	14.43
894641	V3-028 C	.45
894642	V3-028 E	.73
894781	V3-053 C	1.08
894782	V3-053 E	7.2
900261	V4-033 C1	1.09
900271	V4-033 C2	1.09
900262	V4-033 E1	7.26
900272	V4-033 E2	7.26
904722	V4-073 E	.09
902332	W2-040 E	.73
903281	W3-024 C	1.06
903282	W3-024 E	7.11
903621	W3-088 C OP1	1.48
903622	W3-088 E OP1	9.93
903691	W3-111 C	.61
903692	W3-111 E	1.
903701	W3-112 C	.61
903702	W3-112 E	1.
903711	W3-113 C	.61
903712	W3-113 E	1.
903761	W3-128	50.83
903942	W3-170 E	.73
905041	W4-004 C	.65
905042	W4-004 E	4.33
905081	W4-008 C	.65
905082	W4-008 E	4.33
905272	W4-036 E	.73
244873	WINFIELD	.99
907021	X1-020 C	2.35
907022	X1-020 E	15.7
909001	X2-006 C1OP1	19.07
909002	X2-006 C2OP1	15.25

LTF	X2-042	38.86
910512	X3-002 E	.12
LTF	X3-020	11.2
LTF	X3-021	34.92
910621	X3-030 C	1.83
910622	X3-030 E	12.28
910631	X3-031 C OP1	1.1
910632	X3-031 E OP1	7.33
910751	X3-051	35.65
LTF	X3-096	26.95
LTF	X3-097	38.22
LTF	X3-098	36.23
912161	X4-025	4.72
LTF	X4-029D	9.98
LTF	X4-041	35.79
LTF	Y1-002	37.75
LTF	Y1-004	36.6
LTF	Y1-007	25.42
913111	Y1-018	.34
913121	Y1-019	.34
LTF	Y1-041	9.98
913342	Y1-054 E	1.15
913382	Y1-063 E	.27
913392	Y1-064 E	.27
LTF	Y2-004	18.12
LTF	Y2-005	18.12
LTF	Y2-006	19.27
LTF	Y2-007	36.23
LTF	Y2-008	38.24
LTF	Y2-030	10.7
LTF	Y2-031	10.7
LTF	Y2-032	10.7
LTF	Y2-033	19.27
LTF	Y2-034	12.1
LTF	Y2-040	34.92
914071	Y2-045 1	.2
914072	Y2-045 2	.13
LTF	Y2-049	28.67
914081	Y2-050 C OP1	127.91
914082	Y2-050 E OP1	7.03

Appendix 15

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	13.06
238555	02AVONG9	87.4
238565	02BAYSG2	16.48
238566	02BAYSG3	16.96
238567	02BAYSG4	25.67
238965	02MNFDG1	3.32
238966	02MNFDG2	3.32
238967	02MNFDG3	3.32
238995	02NCUNTD	1.29
239214	02NILE-A	.1
239006	02NILEG1	19.75
239007	02NILEG2	19.57
239022	02NWCAG3	20.7
239023	02NWCAG4	19.85
239024	02NWCAG5	30.74
239085	02SAMMG1	.76
239086	02SAMMG2	.76
239087	02SAMMG3	.76
239088	02SAMMG4	.76
239089	02SAMMG5	1.27
239090	02SAMMG6	2.62
239091	02SAMMG7	2.62
239093	02SAMMIS	.05
243654	05CVG3	20.12
243045	05MUSKNG	48.92
243655	05PCG5	11.15
242807	05SPORNA	66.78
243382	05TANNER	32.25
251934	08BCKJD2	10.52
251935	08BCKJD3	14.32
251936	08BCKJD4	16.78
251937	08BCKJD5	26.63
251938	08BCKJD6	46.31
251939	08BECJD1	10.52
253188	09OHGEN1	6.02
253189	09OHGEN2	5.68
253191	09OHGEN4	6.57
253901	15BVRVL2	3.58
254007	15ELRMA1	14.67
254008	15ELRMA2	14.98
254009	15ELRMA3	16.16
254010	15ELRMA4	26.03
298466	B-018	.07
231904	DC1 NUG	-5.17

231905	DC2 NUG	-5.17
217078	ESSEX 12	-36.02
99210	G07_NEW	20.38
231903	GEN4	-14.7
209027	LOR2_Q27 E	-16.76
292880	M-026	47.25
227807	MO AV B	-3.76
94130	O66_NONFIRM	69.1
247500	R-003 C	2.91
247517	R-049 C	3.43
296454	R-052 C1	2.33
296479	R-052 C2	2.33
290286	R-052AC	2.33
247536	S-071 C	2.67
247537	S-072 C	6.89
247520	S-073 C	4.58
235610	SPRINGDALE 1	.18
235611	SPRINGDALE 2	.18
235612	SPRINGDALE 3	.7
235613	SPRINGDALE 4	.7
235614	SPRINGDALE 5	.73
247503	T-130 C	6.91
247521	T-131 C	3.42
247504	T-142 C	7.
292552	T-156	3.47
885600	T20SOLAR E	-.41
247522	U1-059 C	.77
247505	U1-060 C	2.33
889031	U2-028A_AT1	16.11
247538	U2-062 C	2.72
247540	U2-072 C	4.56
247508	U2-090 C	2.89
247542	U4-001 C	3.29
891141	U4-028 C	1.59
891151	U4-029 C	1.59
891221	U4-038 C	1.44
891231	U4-039 C1	.45
891241	U4-039 C2	.45
891251	U4-039 C3	.45
891261	U4-039 C4	.45
892021	V1-011 C	1.49
892031	V1-012 C	2.24
292078	V1-034	.59
893001	V2-001 C	1.42
893021	V2-006 C	2.28
833193	V2-042AC1OP1	3.24

247543	V3-007 C	2.89
247544	V3-008 C	2.89
247545	V3-009 C	2.89
LTF	V3-012	78.67
894581	V3-015 C	4.35
894641	V3-028 C	.89
894781	V3-053 C	2.17
247548	V4-010 C	3.18
900041	V4-011	.38
247546	V4-015 C	1.04
247547	V4-016 C	2.88
900261	V4-033 C1	2.17
900271	V4-033 C2	2.17
901161	W1-056 C	.29
901221	W1-072A_AT5	4.77
901381	W1-107 C	.
902141	W2-001 C	1.03
902151	W2-007 C	1.52
902211	W2-019 C	-.44
903231	W3-005 C	7.85
903281	W3-024 C	2.17
903511	W3-059A_AT6	1.69
LTF	W3-083	16.93
903611	W3-085 C	3.
903621	W3-088 C OP1	3.02
903691	W3-111 C	.97
903701	W3-112 C	.97
903711	W3-113 C	.97
903761	W3-128	78.49
905031	W4-001A_AT9	.65
905041	W4-004 C	1.3
905051	W4-004A_AT10	3.91
905061	W4-004B_AT11	1.86
905081	W4-008 C	1.3
905211	W4-025 C	-.5
905291	W4-038 OP1	-4.7
235577	WILLOW I 1	6.24
235578	WILLOW I 2	19.31
907021	X1-020 C	21.61
907041	X1-027A C1	2.1
907044	X1-027A C2	2.1
907046	X1-027A C3	2.1
907048	X1-027A C4	2.1
907111	X1-040 C	5.23
907211	X1-064A_AT13	20.17
907213	X1-064A_AT13	20.17

907241	X1-068	-1.94
907991	X1-078	101.76
907381	X1-094 C	-1.26
LTF	X2-042	86.67
909181	X2-052	74.74
909201	X2-058 C	2.33
910501	X3-001 C	.08
910531	X3-004	-6.85
LTF	X3-020	23.56
LTF	X3-021	87.7
910601	X3-023 C OP1	.97
910621	X3-030 C	3.69
910631	X3-031 C OP1	2.27
910751	X3-051	68.78
910931	X3-085 C	-.59
LTF	X3-096	56.67
LTF	X3-097	80.35
LTF	X3-098	76.17
912091	X4-012 C OP1	-.45
912101	X4-015 C	-.36
912161	X4-025	8.94
LTF	X4-029D	20.82
LTF	X4-041	75.25
912241	X4-042	.35
LTF	Y1-002	77.96
LTF	Y1-004	93.44
LTF	Y1-007	64.89
913091	Y1-015 C	167.28
913111	Y1-018	.61
913121	Y1-019	.61
913211	Y1-030 C OP1	1.57
913261	Y1-035	59.39
913271	Y1-036	58.28
LTF	Y1-041	20.82
913301	Y1-044	.8
913441	Y1-069 OP1	94.07
913461	Y1-070 OP1	158.63
913491	Y1-074 C OP1	.45
LTF	Y2-004	38.18
LTF	Y2-005	38.18
LTF	Y2-006	39.19
LTF	Y2-007	76.36
LTF	Y2-008	78.13
LTF	Y2-030	21.67
LTF	Y2-031	21.67
LTF	Y2-032	21.67

LTF	Y2-033	44.44
LTF	Y2-034	36.71
LTF	Y2-035	19.68
LTF	Y2-036	19.68
LTF	Y2-040	87.7
LTF	Y2-049	72.02
914081	Y2-050 C OP1	114.54

Appendix 16

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	13.06
238555	02AVONG9	87.4
238565	02BAYSG2	16.48
238566	02BAYSG3	16.96
238567	02BAYSG4	25.67
238965	02MNFDG1	3.32
238966	02MNFDG2	3.32
238967	02MNFDG3	3.32
238995	02NCUNTD	1.29
239214	02NILE-A	.1
239006	02NILEG1	19.75
239007	02NILEG2	19.57
239022	02NWCAG3	20.7
239023	02NWCAG4	19.85
239024	02NWCAG5	30.74
239085	02SAMMG1	.76
239086	02SAMMG2	.76
239087	02SAMMG3	.76
239088	02SAMMG4	.76
239089	02SAMMG5	1.27
239090	02SAMMG6	2.62
239091	02SAMMG7	2.62
239093	02SAMMIS	.05
243654	05CVG3	20.12
243045	05MUSKNG	48.92
243655	05PCG5	11.15
242807	05SPORNA	66.78
243382	05TANNER	32.25
251934	08BCKJD2	10.52
251935	08BCKJD3	14.32
251936	08BCKJD4	16.78
251937	08BCKJD5	26.63
251938	08BCKJD6	46.31
251939	08BECJD1	10.52
253188	09OHGEN1	6.02
253189	09OHGEN2	5.68
253191	09OHGEN4	6.57
253901	15BVRVL2	3.58
254007	15ELRMA1	14.67
254008	15ELRMA2	14.98
254009	15ELRMA3	16.16
254010	15ELRMA4	26.03
298466	B-018	.07
231904	DC1 NUG	-5.17

231905	DC2 NUG	-5.17
217078	ESSEX 12	-36.02
99210	G07_NEW	20.38
231903	GEN4	-14.7
209027	LOR2_Q27 E	-16.76
292880	M-026	47.25
227807	MO AV B	-3.76
94130	O66_NONFIRM	69.1
247500	R-003 C	2.91
247517	R-049 C	3.43
296454	R-052 C1	2.33
296479	R-052 C2	2.33
290286	R-052AC	2.33
247536	S-071 C	2.67
247537	S-072 C	6.89
247520	S-073 C	4.58
235610	SPRINGDALE 1	.18
235611	SPRINGDALE 2	.18
235612	SPRINGDALE 3	.7
235613	SPRINGDALE 4	.7
235614	SPRINGDALE 5	.73
247503	T-130 C	6.91
247521	T-131 C	3.42
247504	T-142 C	7.
292552	T-156	3.47
885600	T20SOLAR E	-.41
247522	U1-059 C	.77
247505	U1-060 C	2.33
889031	U2-028A_AT1	16.11
247538	U2-062 C	2.72
247540	U2-072 C	4.56
247508	U2-090 C	2.89
247542	U4-001 C	3.29
891141	U4-028 C	1.59
891151	U4-029 C	1.59
891221	U4-038 C	1.44
891231	U4-039 C1	.45
891241	U4-039 C2	.45
891251	U4-039 C3	.45
891261	U4-039 C4	.45
892021	V1-011 C	1.49
892031	V1-012 C	2.24
292078	V1-034	.59
893001	V2-001 C	1.42
893021	V2-006 C	2.28
833193	V2-042AC1OP1	3.24

247543	V3-007 C	2.89
247544	V3-008 C	2.89
247545	V3-009 C	2.89
LTF	V3-012	78.67
894581	V3-015 C	4.35
894641	V3-028 C	.89
894781	V3-053 C	2.17
247548	V4-010 C	3.18
900041	V4-011	.38
247546	V4-015 C	1.04
247547	V4-016 C	2.88
900261	V4-033 C1	2.17
900271	V4-033 C2	2.17
901161	W1-056 C	.29
901221	W1-072A_AT5	4.77
901381	W1-107 C	.
902141	W2-001 C	1.03
902151	W2-007 C	1.52
902211	W2-019 C	-.44
903231	W3-005 C	7.85
903281	W3-024 C	2.17
903511	W3-059A_AT6	1.69
LTF	W3-083	16.93
903611	W3-085 C	3.
903621	W3-088 C OP1	3.02
903691	W3-111 C	.97
903701	W3-112 C	.97
903711	W3-113 C	.97
903761	W3-128	78.49
905031	W4-001A_AT9	.65
905041	W4-004 C	1.3
905051	W4-004A_AT10	3.91
905061	W4-004B_AT11	1.86
905081	W4-008 C	1.3
905211	W4-025 C	-.5
905291	W4-038 OP1	-4.7
235577	WILLOW I 1	6.24
235578	WILLOW I 2	19.31
907021	X1-020 C	21.61
907041	X1-027A C1	2.1
907044	X1-027A C2	2.1
907046	X1-027A C3	2.1
907048	X1-027A C4	2.1
907111	X1-040 C	5.23
907211	X1-064A_AT13	20.17
907213	X1-064A_AT13	20.17

907241	X1-068	-1.94
907991	X1-078	101.76
907381	X1-094 C	-1.26
LTF	X2-042	86.67
909181	X2-052	74.74
909201	X2-058 C	2.33
910501	X3-001 C	.08
910531	X3-004	-6.85
LTF	X3-020	23.56
LTF	X3-021	87.7
910601	X3-023 C OP1	.97
910621	X3-030 C	3.69
910631	X3-031 C OP1	2.27
910751	X3-051	68.78
910931	X3-085 C	-.59
LTF	X3-096	56.67
LTF	X3-097	80.35
LTF	X3-098	76.17
912091	X4-012 C OP1	-.45
912101	X4-015 C	-.36
912161	X4-025	8.94
LTF	X4-029D	20.82
LTF	X4-041	75.25
912241	X4-042	.35
LTF	Y1-002	77.96
LTF	Y1-004	93.44
LTF	Y1-007	64.89
913091	Y1-015 C	167.28
913111	Y1-018	.61
913121	Y1-019	.61
913211	Y1-030 C OP1	1.57
913261	Y1-035	59.39
913271	Y1-036	58.28
LTF	Y1-041	20.82
913301	Y1-044	.8
913441	Y1-069 OP1	94.07
913461	Y1-070 OP1	158.63
913491	Y1-074 C OP1	.45
LTF	Y2-004	38.18
LTF	Y2-005	38.18
LTF	Y2-006	39.19
LTF	Y2-007	76.36
LTF	Y2-008	78.13
LTF	Y2-030	21.67
LTF	Y2-031	21.67
LTF	Y2-032	21.67

LTF	Y2-033	44.44
LTF	Y2-034	36.71
LTF	Y2-035	19.68
LTF	Y2-036	19.68
LTF	Y2-040	87.7
LTF	Y2-049	72.02
914081	Y2-050 C OP1	114.54

Appendix 17

Bus Number	Bus Name	Full Contribution
238995	02NCUNTD	.42
239022	02NWCAG3	7.14
239023	02NWCAG4	6.74
239024	02NWCAG5	14.15
884780	S-058 C	9.13
884781	S-058 E	30.1
LTF	V3-012	8.95
LTF	W3-083	2.06
905031	W4-001A_AT9	.18
905051	W4-004A_AT10	1.1
LTF	X2-042	10.41
LTF	X3-020	2.7
LTF	X3-021	11.67
900404	X3-028 C	43.89
LTF	X3-096	6.51
LTF	X3-097	9.23
LTF	X3-098	8.74
LTF	X4-029D	2.44
LTF	X4-041	8.64
LTF	Y1-002	9.26
LTF	Y1-004	10.53
LTF	Y1-007	7.31
913091	Y1-015 C	55.04
LTF	Y1-041	2.44
913461	Y1-070 OP1	52.2
LTF	Y2-004	4.38
LTF	Y2-005	4.38
LTF	Y2-006	4.53
LTF	Y2-007	8.76
LTF	Y2-008	9.03
LTF	Y2-030	2.47
LTF	Y2-031	2.47
LTF	Y2-032	2.47
LTF	Y2-033	4.75
LTF	Y2-034	3.43
LTF	Y2-035	1.84
LTF	Y2-036	1.84
LTF	Y2-040	11.67
LTF	Y2-049	9.59
914081	Y2-050 C OP1	17.39

Appendix 18

Bus Number	Bus Name	Full Contribution
243190	05CDG1	2.26
244996	ROSEVALL	.04
884780	S-058 C	6.17
884781	S-058 E	20.33
LTF	V3-012	5.25
907021	X1-020 C	1.75
907022	X1-020 E	11.74
LTF	X2-042	6.32
LTF	X3-020	1.9
LTF	X3-021	5.26
900404	X3-028 C	31.54
LTF	X3-096	4.56
LTF	X3-097	6.47
LTF	X3-098	6.13
LTF	X4-029D	1.66
LTF	X4-041	6.05
LTF	Y1-002	6.22
LTF	Y1-004	6.19
LTF	Y1-007	4.3
LTF	Y1-041	1.66
LTF	Y2-004	3.06
LTF	Y2-005	3.06
LTF	Y2-006	3.26
LTF	Y2-007	6.13
LTF	Y2-008	6.47
LTF	Y2-030	1.83
LTF	Y2-031	1.83
LTF	Y2-032	1.83
LTF	Y2-033	3.42
LTF	Y2-034	2.39
LTF	Y2-040	5.26
LTF	Y2-049	4.32
914081	Y2-050 C OP1	20.44
914082	Y2-050 E OP1	1.12

Appendix 19

Bus Number	Bus Name	Full Contribution
243190	05CDG1	2.26
244996	ROSEVALL	.04
884780	S-058 C	6.17
884781	S-058 E	20.33
LTF	V3-012	5.25
907021	X1-020 C	1.75
907022	X1-020 E	11.74
LTF	X2-042	6.32
LTF	X3-020	1.9
LTF	X3-021	5.26
900404	X3-028 C	31.54
LTF	X3-096	4.56
LTF	X3-097	6.47
LTF	X3-098	6.13
LTF	X4-029D	1.66
LTF	X4-041	6.05
LTF	Y1-002	6.22
LTF	Y1-004	6.19
LTF	Y1-007	4.3
LTF	Y1-041	1.66
LTF	Y2-004	3.06
LTF	Y2-005	3.06
LTF	Y2-006	3.26
LTF	Y2-007	6.13
LTF	Y2-008	6.47
LTF	Y2-030	1.83
LTF	Y2-031	1.83
LTF	Y2-032	1.83
LTF	Y2-033	3.42
LTF	Y2-034	2.39
LTF	Y2-040	5.26
LTF	Y2-049	4.32
914081	Y2-050 C OP1	20.44
914082	Y2-050 E OP1	1.12

Appendix 20

Bus Number	Bus Name	Full Contribution
238995	02NCUNTD	.5
239022	02NWCAG3	9.73
239023	02NWCAG4	7.74
239024	02NWCAG5	12.79
247528	05COVRT1	3.8
247529	05COVRT2	3.8
247530	05COVRT3	3.8
247531	05COVRT4	2.28
247532	05COVRT5	2.28
247533	05COVRT6	2.28
884780	S-058 C	12.08
884781	S-058 E	39.84
LTF	V3-012	12.01
LTF	W3-083	2.7
905031	W4-001A_AT9	.21
905051	W4-004A_AT10	1.26
LTF	X2-042	13.75
LTF	X3-020	3.62
LTF	X3-021	14.41
900404	X3-028 C	58.9
LTF	X3-096	8.72
LTF	X3-097	12.36
LTF	X3-098	11.72
LTF	X4-029D	3.24
LTF	X4-041	11.58
LTF	Y1-002	12.24
LTF	Y1-004	14.19
LTF	Y1-007	9.85
913091	Y1-015 C	47.66
LTF	Y1-041	3.24
913461	Y1-070 OP1	45.19
LTF	Y1-090	2.11
LTF	Y2-004	5.87
LTF	Y2-005	5.87
LTF	Y2-006	6.08
LTF	Y2-007	11.74
LTF	Y2-008	12.1
LTF	Y2-030	3.34
LTF	Y2-031	3.34
LTF	Y2-032	3.34
LTF	Y2-033	6.53
LTF	Y2-034	4.92
LTF	Y2-035	2.64
LTF	Y2-036	2.64

LTF	Y2-040	14.41
LTF	Y2-049	11.83
914081	Y2-050 C OP1	22.82

Appendix 21

Bus Number	Bus Name	Full Contribution
884780	S-058 C	7.85
884781	S-058 E	25.9
LTF	V3-012	6.93
907021	X1-020 C	2.24
907022	X1-020 E	14.97
LTF	X2-042	8.25
LTF	X3-020	2.42
LTF	X3-021	6.63
900404	X3-028 C	40.18
LTF	X3-096	5.81
LTF	X3-097	8.24
LTF	X3-098	7.81
LTF	X4-029D	2.11
LTF	X4-041	7.72
LTF	Y1-002	7.92
LTF	Y1-004	8.19
LTF	Y1-007	5.69
LTF	Y1-041	2.11
LTF	Y2-004	3.91
LTF	Y2-005	3.91
LTF	Y2-006	4.15
LTF	Y2-007	7.81
LTF	Y2-008	8.23
LTF	Y2-030	2.33
LTF	Y2-031	2.33
LTF	Y2-032	2.33
LTF	Y2-033	4.38
LTF	Y2-034	3.09
LTF	Y2-040	6.63
LTF	Y2-049	5.45
914081	Y2-050 C OP1	15.07
914082	Y2-050 E OP1	.83

Appendix 22

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	16.93
238995	02NCUNTD	.5
239022	02NWCAG3	9.73
239023	02NWCAG4	7.74
239024	02NWCAG5	12.79
247528	05COVRT1	3.8
247529	05COVRT2	3.8
247530	05COVRT3	3.8
247531	05COVRT4	2.28
247532	05COVRT5	2.28
247533	05COVRT6	2.28
884780	S-058 C	12.08
884781	S-058 E	39.84
LTF	V3-012	12.01
LTF	W3-083	2.7
905031	W4-001A_AT9	.21
905051	W4-004A_AT10	1.26
LTF	X2-042	13.75
LTF	X3-020	3.62
LTF	X3-021	14.41
900404	X3-028 C	58.9
LTF	X3-096	8.72
LTF	X3-097	12.36
LTF	X3-098	11.72
LTF	X4-029D	3.24
LTF	X4-041	11.58
LTF	Y1-002	12.24
LTF	Y1-004	14.19
LTF	Y1-007	9.85
913091	Y1-015 C	47.66
LTF	Y1-041	3.24
913461	Y1-070 OP1	45.19
LTF	Y1-090	2.11
LTF	Y2-004	5.87
LTF	Y2-005	5.87
LTF	Y2-006	6.08
LTF	Y2-007	11.74
LTF	Y2-008	12.1
LTF	Y2-030	3.34
LTF	Y2-031	3.34
LTF	Y2-032	3.34
LTF	Y2-033	6.53
LTF	Y2-034	4.92
LTF	Y2-035	2.64

LTF	Y2-036	2.64
LTF	Y2-040	14.41
LTF	Y2-049	11.83
914081	Y2-050 C OP1	22.82

Appendix 23

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	15.7
238995	02NCUNTD	.32
239022	02NWCAG3	4.8
239023	02NWCAG4	5.38
239024	02NWCAG5	14.8
884780	S-058 C	9.65
884781	S-058 E	31.8
LTF	V3-012	9.48
LTF	W3-083	2.18
LTF	X2-042	11.02
LTF	X3-020	2.86
LTF	X3-021	12.25
900404	X3-028 C	46.44
LTF	X3-096	6.88
LTF	X3-097	9.75
LTF	X3-098	9.24
LTF	X4-029D	2.58
LTF	X4-041	9.13
LTF	Y1-002	9.79
LTF	Y1-004	11.16
LTF	Y1-007	7.75
913091	Y1-015 C	60.51
LTF	Y1-041	2.58
913461	Y1-070 OP1	57.38
LTF	Y2-004	4.63
LTF	Y2-005	4.63
LTF	Y2-006	4.79
LTF	Y2-007	9.26
LTF	Y2-008	9.55
LTF	Y2-030	2.62
LTF	Y2-031	2.62
LTF	Y2-032	2.62
LTF	Y2-033	5.03
LTF	Y2-034	3.63
LTF	Y2-035	1.95
LTF	Y2-036	1.95
LTF	Y2-040	12.25
LTF	Y2-049	10.06
914081	Y2-050 C OP1	18.51

Appendix 24

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	23.83
238965	02MNFDG1	1.04
238966	02MNFDG2	1.04
238967	02MNFDG3	1.04
238995	02NCUNTD	.7
239214	02NILE-A	.04
239006	02NILEG1	7.45
239007	02NILEG2	7.39
239022	02NWCAG3	11.47
239023	02NWCAG4	10.69
239024	02NWCAG5	16.01
239085	02SAMMG1	.24
239086	02SAMMG2	.24
239087	02SAMMG3	.21
239088	02SAMMG4	.21
239089	02SAMMG5	.36
239090	02SAMMG6	.74
239091	02SAMMG7	.74
239093	02SAMMIS	.02
247528	05COVRT1	5.03
247529	05COVRT2	5.03
247530	05COVRT3	5.03
247531	05COVRT4	3.02
247532	05COVRT5	3.02
247533	05COVRT6	3.02
253900	15BVRVL1	1.1
253901	15BVRVL2	1.1
884780	S-058 C	15.76
884781	S-058 E	51.98
299983	U3-029 C	.05
299988	U3-030 C	.05
LTF	V3-012	15.49
901381	W1-107 C	.
LTF	W3-083	3.54
905031	W4-001A_AT9	.32
905051	W4-004A_AT10	1.89
907991	X1-078	17.77
LTF	X2-042	17.89
LTF	X3-020	4.7
LTF	X3-021	19.64
900404	X3-028 C	76.26
LTF	X3-096	11.3
LTF	X3-097	16.02
LTF	X3-098	15.18

LTF	X4-029D	4.22
LTF	X4-041	15.
LTF	Y1-002	15.99
LTF	Y1-004	18.26
LTF	Y1-007	12.68
913091	Y1-015 C	70.04
LTF	Y1-041	4.22
913441	Y1-069 OP1	22.24
913461	Y1-070 OP1	66.41
LTF	Y1-090	2.74
LTF	Y2-004	7.61
LTF	Y2-005	7.61
LTF	Y2-006	7.87
LTF	Y2-007	15.22
LTF	Y2-008	15.67
LTF	Y2-030	4.3
LTF	Y2-031	4.3
LTF	Y2-032	4.3
LTF	Y2-033	8.35
LTF	Y2-034	6.15
LTF	Y2-035	3.3
LTF	Y2-036	3.3
LTF	Y2-040	19.64
LTF	Y2-049	16.13
914081	Y2-050 C OP1	29.67

Appendix 25

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	8.76
239006	02NILEG1	3.86
239007	02NILEG2	3.83
247528	05COVRT1	1.74
247529	05COVRT2	1.74
247530	05COVRT3	1.74
247531	05COVRT4	1.04
247532	05COVRT5	1.04
247533	05COVRT6	1.04
884780	S-058 C	5.45
884781	S-058 E	17.98
LTF	V3-012	5.38
LTF	W3-083	1.23
LTF	X2-042	6.22
LTF	X3-020	1.63
LTF	X3-021	6.72
900404	X3-028 C	26.39
LTF	X3-096	3.91
LTF	X3-097	5.54
LTF	X3-098	5.25
LTF	X4-029D	1.46
LTF	X4-041	5.19
LTF	Y1-002	5.53
LTF	Y1-004	6.34
LTF	Y1-007	4.4
913091	Y1-015 C	32.82
LTF	Y1-041	1.46
913441	Y1-069 OP1	7.82
913461	Y1-070 OP1	31.12
LTF	Y1-090	.95
LTF	Y2-004	2.63
LTF	Y2-005	2.63
LTF	Y2-006	2.73
LTF	Y2-007	5.27
LTF	Y2-008	5.43
LTF	Y2-030	1.49
LTF	Y2-031	1.49
LTF	Y2-032	1.49
LTF	Y2-033	2.89
LTF	Y2-034	2.12
LTF	Y2-035	1.14
LTF	Y2-036	1.14
LTF	Y2-040	6.72
LTF	Y2-049	5.52

914081	Y2-050 C OP1	10.54

Appendix 26

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	23.83
238965	02MNFDG1	1.04
238966	02MNFDG2	1.04
238967	02MNFDG3	1.04
238995	02NCUNTD	.7
239214	02NILE-A	.04
239006	02NILEG1	7.45
239007	02NILEG2	7.39
239022	02NWCAG3	11.47
239023	02NWCAG4	10.69
239024	02NWCAG5	16.01
239085	02SAMMG1	.24
239086	02SAMMG2	.24
239087	02SAMMG3	.21
239088	02SAMMG4	.21
239089	02SAMMG5	.36
239090	02SAMMG6	.74
239091	02SAMMG7	.74
239093	02SAMMIS	.02
247528	05COVRT1	5.03
247529	05COVRT2	5.03
247530	05COVRT3	5.03
247531	05COVRT4	3.02
247532	05COVRT5	3.02
247533	05COVRT6	3.02
253900	15BVRVL1	1.1
253901	15BVRVL2	1.1
884780	S-058 C	15.76
884781	S-058 E	51.98
299983	U3-029 C	.05
299988	U3-030 C	.05
LTF	V3-012	15.49
901381	W1-107 C	.
LTF	W3-083	3.54
905031	W4-001A_AT9	.32
905051	W4-004A_AT10	1.89
907991	X1-078	17.77
LTF	X2-042	17.89
LTF	X3-020	4.7
LTF	X3-021	19.64
900404	X3-028 C	76.26
LTF	X3-096	11.3
LTF	X3-097	16.02
LTF	X3-098	15.18

LTF	X4-029D	4.22
LTF	X4-041	15.
LTF	Y1-002	15.99
LTF	Y1-004	18.26
LTF	Y1-007	12.68
913091	Y1-015 C	70.04
LTF	Y1-041	4.22
913441	Y1-069 OP1	22.24
913461	Y1-070 OP1	66.41
LTF	Y1-090	2.74
LTF	Y2-004	7.61
LTF	Y2-005	7.61
LTF	Y2-006	7.87
LTF	Y2-007	15.22
LTF	Y2-008	15.67
LTF	Y2-030	4.3
LTF	Y2-031	4.3
LTF	Y2-032	4.3
LTF	Y2-033	8.35
LTF	Y2-034	6.15
LTF	Y2-035	3.3
LTF	Y2-036	3.3
LTF	Y2-040	19.64
LTF	Y2-049	16.13
914081	Y2-050 C OP1	29.67

Appendix 27

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	8.9
239006	02NILEG1	3.91
239007	02NILEG2	3.87
247528	05COVRT1	1.76
247529	05COVRT2	1.76
247530	05COVRT3	1.76
247531	05COVRT4	1.06
247532	05COVRT5	1.06
247533	05COVRT6	1.06
884780	S-058 C	5.54
884781	S-058 E	18.28
LTF	V3-012	5.46
LTF	W3-083	1.25
907021	X1-020 C	1.55
907022	X1-020 E	10.37
LTF	X2-042	6.32
LTF	X3-020	1.65
LTF	X3-021	6.83
900404	X3-028 C	26.81
LTF	X3-096	3.97
LTF	X3-097	5.63
LTF	X3-098	5.34
LTF	X4-029D	1.48
LTF	X4-041	5.27
LTF	Y1-002	5.62
LTF	Y1-004	6.44
LTF	Y1-007	4.47
913091	Y1-015 C	33.31
913092	Y1-015 E	4.98
LTF	Y1-041	1.48
913441	Y1-069 OP1	7.95
913461	Y1-070 OP1	31.59
LTF	Y1-090	.96
LTF	Y2-004	2.67
LTF	Y2-005	2.67
LTF	Y2-006	2.77
LTF	Y2-007	5.35
LTF	Y2-008	5.51
LTF	Y2-030	1.51
LTF	Y2-031	1.51
LTF	Y2-032	1.51
LTF	Y2-033	2.93
LTF	Y2-034	2.15
LTF	Y2-035	1.15

LTF	Y2-036	1.15
LTF	Y2-040	6.83
LTF	Y2-049	5.61
914081	Y2-050 C OP1	10.7
914082	Y2-050 E OP1	.59

Appendix 28

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	8.9
239006	02NILEG1	3.91
239007	02NILEG2	3.87
247528	05COVRT1	1.76
247529	05COVRT2	1.76
247530	05COVRT3	1.76
247531	05COVRT4	1.06
247532	05COVRT5	1.06
247533	05COVRT6	1.06
884780	S-058 C	5.54
884781	S-058 E	18.28
LTF	V3-012	5.46
LTF	W3-083	1.25
907021	X1-020 C	1.55
907022	X1-020 E	10.37
LTF	X2-042	6.32
LTF	X3-020	1.65
LTF	X3-021	6.83
900404	X3-028 C	26.81
LTF	X3-096	3.97
LTF	X3-097	5.63
LTF	X3-098	5.34
LTF	X4-029D	1.48
LTF	X4-041	5.27
LTF	Y1-002	5.62
LTF	Y1-004	6.44
LTF	Y1-007	4.47
913091	Y1-015 C	33.31
913092	Y1-015 E	4.98
LTF	Y1-041	1.48
913441	Y1-069 OP1	7.95
913461	Y1-070 OP1	31.59
LTF	Y1-090	.96
LTF	Y2-004	2.67
LTF	Y2-005	2.67
LTF	Y2-006	2.77
LTF	Y2-007	5.35
LTF	Y2-008	5.51
LTF	Y2-030	1.51
LTF	Y2-031	1.51
LTF	Y2-032	1.51
LTF	Y2-033	2.93
LTF	Y2-034	2.15
LTF	Y2-035	1.15

LTF	Y2-036	1.15
LTF	Y2-040	6.83
LTF	Y2-049	5.61
914081	Y2-050 C OP1	10.7
914082	Y2-050 E OP1	.59

Flow Gate Results – Option 2

Appendix 1

Bus Number	Bus Name	Full Contribution
254007	15ELRMA1	8.45
254008	15ELRMA2	8.63
254009	15ELRMA3	11.21
254010	15ELRMA4	18.07
235573	MITCHELL 2	.24
235574	MITCHELL 3	.82
884780	S-058 C	9.06
884781	S-058 E	29.87
LTF	V3-012	8.73
LTF	W3-083	2.
907021	X1-020 C	2.55
907022	X1-020 E	17.04
LTF	X2-042	10.18
LTF	X3-020	2.71
LTF	X3-021	10.52
900404	X3-028 C	44.34
LTF	X3-096	6.52
LTF	X3-097	9.25
LTF	X3-098	8.77
LTF	X4-029D	2.43
LTF	X4-041	8.66
912241	X4-042	.19
LTF	Y1-002	9.18
LTF	Y1-004	10.3
LTF	Y1-007	7.15
913091	Y1-015 C	18.24
913092	Y1-015 E	2.73
913191	Y1-027 C OP1	.01
913192	Y1-027 E OP1	.02
LTF	Y1-041	2.43
913461	Y1-070 OP1	17.3
LTF	Y2-004	4.39
LTF	Y2-005	4.39
LTF	Y2-006	4.57
LTF	Y2-007	8.78
LTF	Y2-008	9.09
LTF	Y2-030	2.51
LTF	Y2-031	2.51
LTF	Y2-032	2.51
LTF	Y2-033	4.82
LTF	Y2-034	3.44

LTF	Y2-035	1.84
LTF	Y2-036	1.84
LTF	Y2-040	10.52
LTF	Y2-049	8.64
914081	Y2-050 C OP2	14.26
914082	Y2-050 E OP2	.78

Appendix 2

Bus Number	Bus Name	Full Contribution
884780	S-058 C	6.92
884781	S-058 E	22.8
LTF	V3-012	7.2
901381	W1-107 C	.
901382	W1-107 E	.19
LTF	W3-083	1.54
907021	X1-020 C	1.96
907022	X1-020 E	13.1
LTF	X2-042	8.06
LTF	X3-020	2.14
LTF	X3-021	6.19
900404	X3-028 C	35.1
LTF	X3-096	5.14
LTF	X3-097	7.29
LTF	X3-098	6.91
LTF	X4-029D	1.87
LTF	X4-041	6.83
LTF	Y1-002	6.98
LTF	Y1-004	8.54
LTF	Y1-007	5.93
913091	Y1-015 C	30.1
913092	Y1-015 E	4.5
LTF	Y1-041	1.87
913461	Y1-070 OP1	28.54
LTF	Y2-004	3.46
LTF	Y2-005	3.46
LTF	Y2-006	3.61
LTF	Y2-007	6.92
LTF	Y2-008	7.18
LTF	Y2-030	2.02
LTF	Y2-031	2.02
LTF	Y2-032	2.02
LTF	Y2-033	4.01
LTF	Y2-034	3.23
LTF	Y2-035	1.73
LTF	Y2-036	1.73
LTF	Y2-040	6.19
LTF	Y2-049	5.09
914081	Y2-050 C OP2	15.19
914082	Y2-050 E OP2	.83

Appendix 3

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	9.96
238555	02AVONG9	66.57
238995	02NCUNTD	.79
239006	02NILEG1	13.2
239007	02NILEG2	13.08
239022	02NWCAG3	12.5
239023	02NWCAG4	12.17
239024	02NWCAG5	18.76
254007	15ELRMA1	11.93
254008	15ELRMA2	12.18
254009	15ELRMA3	13.71
254010	15ELRMA4	22.1
298466	B-018	.05
235850	BROWNS RUN	60.09
231904	DC1 NUG	-5.08
231905	DC2 NUG	-5.08
217078	ESSEX 12	-36.35
298464	G-030	.49
99210	G07_NEW	20.52
231903	GEN4	-14.44
292320	K-020	.01
200032	KEYS G1	4.67
200033	KEYS G2	4.61
209027	LOR2_Q27 E	-17.34
292880	M-026	33.68
235573	MITCHELL 2	.24
235574	MITCHELL 3	.81
227807	MO AV B	-3.74
94130	O66_NONFIRM	69.74
884780	S-058 C	61.36
884781	S-058 E	202.32
235619	SOUTH BEND 1	.83
235620	SOUTH BEND 2	.83
235621	SOUTH BEND 3	.84
235622	SOUTH BEND 4	.83
235610	SPRINGDALE 1	.14
235611	SPRINGDALE 2	.14
235612	SPRINGDALE 3	.55
235613	SPRINGDALE 4	.54
235614	SPRINGDALE 5	.57
292339	T-109	.11
292344	T-110	.11
292552	T-156	2.48
292626	T-174 1	29.11

292627	T-174 2	29.11
292628	T-174 3	29.11
292629	T-174 4	59.01
885600	T20SOLAR E	-.41
292078	V1-034	.59
LTF	V3-012	62.33
901381	W1-107 C	.
902211	W2-019 C	-.44
903511	W3-059A_AT6	1.3
905031	W4-001A_AT9	.41
905051	W4-004A_AT10	2.46
905061	W4-004B_AT11	1.61
905211	W4-025 C	-.5
905291	W4-038 OP1	-4.74
907211	X1-064A_AT13	14.69
907213	X1-064A_AT13	14.7
907241	X1-068	-1.95
907991	X1-078	102.47
907381	X1-094 C	-1.27
LTF	X2-042	68.38
910531	X3-004	-6.91
LTF	X3-021	71.84
900404	X3-028 C	302.58
910931	X3-085 C	-.6
LTF	X3-096	45.1
LTF	X3-097	63.95
LTF	X3-098	60.62
912091	X4-012 C OP1	-.45
912101	X4-015 C	-.36
LTF	X4-041	59.89
912241	X4-042	.36
LTF	Y1-002	62.08
LTF	Y1-004	74.06
LTF	Y1-007	51.43
913091	Y1-015 C	108.86
913191	Y1-027 C OP1	.
913261	Y1-035	48.02
913271	Y1-036	47.74
913461	Y1-070 OP1	103.23
913491	Y1-074 C OP1	.33
LTF	Y2-004	30.39
LTF	Y2-005	30.39
LTF	Y2-006	31.11
LTF	Y2-007	60.79
LTF	Y2-008	62.04
LTF	Y2-033	35.49

LTF	Y2-034	29.6
LTF	Y2-040	71.84
LTF	Y2-049	58.99
914081	Y2-050 C OP1	80.49

Appendix 4

Bus Number	Bus Name	Full Contribution
254007	15ELRMA1	8.45
254008	15ELRMA2	8.63
254009	15ELRMA3	11.21
254010	15ELRMA4	18.07
235573	MITCHELL 2	.24
235574	MITCHELL 3	.82
884780	S-058 C	9.06
884781	S-058 E	29.87
LTF	V3-012	8.73
LTF	W3-083	2.
907021	X1-020 C	2.55
907022	X1-020 E	17.04
LTF	X2-042	10.18
LTF	X3-020	2.71
LTF	X3-021	10.52
900404	X3-028 C	44.34
LTF	X3-096	6.52
LTF	X3-097	9.25
LTF	X3-098	8.77
LTF	X4-029D	2.43
LTF	X4-041	8.66
912241	X4-042	.19
LTF	Y1-002	9.18
LTF	Y1-004	10.3
LTF	Y1-007	7.15
913091	Y1-015 C	18.24
913092	Y1-015 E	2.73
913191	Y1-027 C OP1	.01
913192	Y1-027 E OP1	.02
LTF	Y1-041	2.43
913461	Y1-070 OP1	17.3
LTF	Y2-004	4.39
LTF	Y2-005	4.39
LTF	Y2-006	4.57
LTF	Y2-007	8.78
LTF	Y2-008	9.09
LTF	Y2-030	2.51
LTF	Y2-031	2.51
LTF	Y2-032	2.51
LTF	Y2-033	4.82
LTF	Y2-034	3.44
LTF	Y2-035	1.84
LTF	Y2-036	1.84
LTF	Y2-040	10.52

LTF	Y2-049	8.64
914081	Y2-050 C OP2	14.26
914082	Y2-050 E OP2	.78

Appendix 5

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	9.98
238555	02AVONG9	66.79
238995	02NCUNTD	.8
239006	02NILEG1	13.37
239007	02NILEG2	13.24
239022	02NWCAG3	12.71
239023	02NWCAG4	12.36
239024	02NWCAG5	19.06
254007	15ELRMA1	12.13
254008	15ELRMA2	12.38
254009	15ELRMA3	13.95
254010	15ELRMA4	22.47
235850	BROWNS RUN	61.7
231904	DC1 NUG	-5.12
231905	DC2 NUG	-5.12
217078	ESSEX 12	-36.64
206617	EXXON	-1.39
298464	G-030	.51
99210	G07_NEW	20.68
231903	GEN4	-14.55
208453	HONY	-.28
200032	KEYS G1	4.84
200033	KEYS G2	4.79
209027	LOR2_Q27 E	-17.47
206679	M&M S721	-2.06
292880	M-026	34.27
210888	MACRTR10	-1.02
227807	MO AV B	-3.77
214194	N WALES4	-.38
293231	N-032 E	4.64
94130	O66_NONFIRM	70.29
206638	PEAPACK	-.8
290092	Q-041 E	-5.99
244996	ROSEVALL	.07
884780	S-058 C	62.08
884781	S-058 E	204.7
208769	SISO	-.36
235619	SOUTH BEND 1	.86
235620	SOUTH BEND 2	.86
235621	SOUTH BEND 3	.87
235622	SOUTH BEND 4	.86
245347	STON CNT	1.01
292339	T-109	.11
292344	T-110	.11

292552	T-156	2.52
292626	T-174 1	29.97
292627	T-174 2	29.97
292628	T-174 3	29.97
292629	T-174 4	60.76
885600	T20SOLAR E	-.42
299984	U3-029 E	1.35
299989	U3-030 E	.61
292063	V1-021 E	-.06
292078	V1-034	.6
LTF	V3-012	63.21
904512	V4-052 E	-.74
901382	W1-107 E	.18
901602	W1-111 E	4.24
902211	W2-019 C	-.44
903511	W3-059A_AT6	1.3
903512	W3-059A_AT6	8.69
905031	W4-001A_AT9	.42
905051	W4-004A_AT10	2.5
905211	W4-025 C	-.5
905291	W4-038 OP1	-4.78
905482	W4-085 E	.37
907041	X1-027A C1	1.63
907044	X1-027A C2	1.63
907046	X1-027A C3	1.63
907048	X1-027A C4	1.63
907042	X1-027A E1	10.9
907045	X1-027A E2	10.9
907047	X1-027A E3	10.9
907049	X1-027A E4	10.9
907211	X1-064A_AT13	14.81
907213	X1-064A_AT13	14.81
907241	X1-068	-1.97
907991	X1-078	103.25
907381	X1-094 C	-1.28
909032	X2-013 E	.38
LTF	X2-042	69.24
909292	X2-085 E	.96
910531	X3-004	-6.97
LTF	X3-021	72.06
900404	X3-028 C	306.49
910612	X3-029 E	-2.24
910762	X3-052 E	-.6
910902	X3-081 E	-.09
910931	X3-085 C	-.6
LTF	X3-096	45.68

LTF	X3-097	64.78
LTF	X3-098	61.4
912032	X4-004 E	-.94
912091	X4-012 C OP1	-.46
912101	X4-015 C	-.37
LTF	X4-041	60.66
912241	X4-042	.36
912271	X4-045 E	.09
LTF	Y1-002	62.8
LTF	Y1-004	75.12
LTF	Y1-007	52.17
913091	Y1-015 C	110.39
913092	Y1-015 E	16.5
913261	Y1-035	47.66
913271	Y1-036	47.3
913362	Y1-057 E	.38
913461	Y1-070 OP1	104.68
913491	Y1-074 C OP1	.33
913492	Y1-074 E OP1	.54
LTF	Y2-004	30.78
LTF	Y2-005	30.78
LTF	Y2-006	31.51
LTF	Y2-007	61.57
LTF	Y2-008	62.85
LTF	Y2-033	36.02
LTF	Y2-034	30.12
LTF	Y2-040	72.06
LTF	Y2-049	59.18
914081	Y2-050 C OP1	81.64
914082	Y2-050 E OP1	4.48

Appendix 6

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	9.96
238555	02AVONG9	66.57
238995	02NCUNTD	.79
239006	02NILEG1	13.2
239007	02NILEG2	13.08
239022	02NWCAG3	12.5
239023	02NWCAG4	12.17
239024	02NWCAG5	18.76
254007	15ELRMA1	11.93
254008	15ELRMA2	12.18
254009	15ELRMA3	13.71
254010	15ELRMA4	22.1
235850	BROWNS RUN	60.09
231904	DC1 NUG	-5.08
231905	DC2 NUG	-5.08
217078	ESSEX 12	-36.35
206617	EXXON	-1.38
298464	G-030	.49
99210	G07_NEW	20.52
231903	GEN4	-14.44
208453	HONY	-.28
200032	KEYS G1	4.67
200033	KEYS G2	4.61
209027	LOR2_Q27 E	-17.34
206679	M&M S721	-2.05
292880	M-026	33.68
210888	MACRTR10	-1.01
227807	MO AV B	-3.74
214194	N WALES4	-.38
293231	N-032 E	4.58
94130	O66_NONFIRM	69.74
206638	PEAPACK	-.79
290092	Q-041 E	-5.95
244996	ROSEVALL	.07
884780	S-058 C	61.36
884781	S-058 E	202.32
208769	SISO	-.36
235619	SOUTH BEND 1	.83
235620	SOUTH BEND 2	.83
235621	SOUTH BEND 3	.84
235622	SOUTH BEND 4	.83
292339	T-109	.11
292344	T-110	.11
292552	T-156	2.48

292626	T-174 1	29.11
292627	T-174 2	29.11
292628	T-174 3	29.11
292629	T-174 4	59.01
885600	T20SOLAR E	-.41
299984	U3-029 E	1.33
299989	U3-030 E	.6
292063	V1-021 E	-.06
292078	V1-034	.59
LTF	V3-012	62.33
904512	V4-052 E	-.73
901382	W1-107 E	.18
901602	W1-111 E	4.2
902211	W2-019 C	-.44
903511	W3-059A_AT6	1.3
903512	W3-059A_AT6	8.65
905031	W4-001A_AT9	.41
905051	W4-004A_AT10	2.46
905061	W4-004B_AT11	1.61
905062	W4-004B_AT11	1.39
905211	W4-025 C	-.5
905291	W4-038 OP1	-4.74
905482	W4-085 E	.37
907211	X1-064A_AT13	14.69
907213	X1-064A_AT13	14.7
907241	X1-068	-1.95
907991	X1-078	102.47
907381	X1-094 C	-1.27
909032	X2-013 E	.37
LTF	X2-042	68.38
909292	X2-085 E	.95
910531	X3-004	-6.91
LTF	X3-021	71.84
900404	X3-028 C	302.58
910612	X3-029 E	-2.22
910762	X3-052 E	-.59
910902	X3-081 E	-.09
910931	X3-085 C	-.6
LTF	X3-096	45.1
LTF	X3-097	63.95
LTF	X3-098	60.62
912032	X4-004 E	-.93
912091	X4-012 C OP1	-.45
912101	X4-015 C	-.36
LTF	X4-041	59.89
912241	X4-042	.36

912271	X4-045 E	.09
LTF	Y1-002	62.08
LTF	Y1-004	74.06
LTF	Y1-007	51.43
913091	Y1-015 C	108.86
913092	Y1-015 E	16.27
913261	Y1-035	48.02
913271	Y1-036	47.74
913362	Y1-057 E	.37
913461	Y1-070 OP1	103.23
913491	Y1-074 C OP1	.33
913492	Y1-074 E OP1	.53
LTF	Y2-004	30.39
LTF	Y2-005	30.39
LTF	Y2-006	31.11
LTF	Y2-007	60.79
LTF	Y2-008	62.04
LTF	Y2-033	35.49
LTF	Y2-034	29.6
LTF	Y2-040	71.84
LTF	Y2-049	58.99
914081	Y2-050 C OP1	80.49
914082	Y2-050 E OP1	4.42

Appendix 7

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	17.18
254007	15ELRMA1	23.04
254008	15ELRMA2	23.53
254009	15ELRMA3	31.94
254010	15ELRMA4	51.45
235573	MITCHELL 2	.76
235574	MITCHELL 3	2.58
315446	Q-065	-15.41
884780	S-058 C	6.62
884781	S-058 E	21.83
299984	U3-029 E	.62
299989	U3-030 E	.28
LTF	V3-012	5.6
LTF	W3-083	1.58
907021	X1-020 C	1.84
907022	X1-020 E	12.33
LTF	X2-042	7.72
LTF	X3-020	1.8
LTF	X3-021	10.63
900404	X3-028 C	29.78
LTF	X3-096	4.33
LTF	X3-097	6.15
LTF	X3-098	5.82
LTF	X4-029D	1.73
LTF	X4-041	5.75
LTF	Y1-002	6.78
LTF	Y1-004	6.39
LTF	Y1-007	4.44
913091	Y1-015 C	36.41
913092	Y1-015 E	5.44
913261	Y1-035	13.53
913271	Y1-036	13.41
LTF	Y1-041	1.73
913441	Y1-069 OP1	13.14
913461	Y1-070 OP1	34.53
LTF	Y2-004	2.91
LTF	Y2-005	2.91
LTF	Y2-006	3.11
LTF	Y2-007	5.83
LTF	Y2-008	6.16
LTF	Y2-030	1.64
LTF	Y2-031	1.64
LTF	Y2-032	1.64
LTF	Y2-033	2.45

LTF	Y2-040	10.63
LTF	Y2-049	8.73
914081	Y2-050 C OP2	22.17
914082	Y2-050 E OP2	1.22

Appendix 8

Bus Number	Bus Name	Full Contribution
238545	02ASHTG5	26.99
238554	02AVONG7	11.65
238555	02AVONG9	77.99
238565	02BAYSG2	15.26
238566	02BAYSG3	15.7
238567	02BAYSG4	23.77
238995	02NCUNTD	.95
239006	02NILEG1	15.72
239007	02NILEG2	15.58
239022	02NWCAG3	15.01
239023	02NWCAG4	14.59
239024	02NWCAG5	22.5
247528	05COVRT1	1.29
247529	05COVRT2	1.29
247530	05COVRT3	1.29
247531	05COVRT4	.77
247532	05COVRT5	.77
247533	05COVRT6	.77
243654	05CVG3	18.41
243045	05MUSKNG	44.67
243655	05PCG5	10.31
242807	05SPORNA	61.83
251934	08BCKJD2	9.79
251935	08BCKJD3	13.32
251936	08BCKJD4	15.61
251937	08BCKJD5	24.78
251938	08BCKJD6	43.1
251939	08BECJD1	9.79
253188	09OHGEN1	5.59
253189	09OHGEN2	5.28
253191	09OHGEN4	6.11
254007	15ELRMA1	14.28
254008	15ELRMA2	14.58
254009	15ELRMA3	16.43
254010	15ELRMA4	26.47
235564	ALBRIGHT 1	7.96
235565	ALBRIGHT 2	7.96
235566	ALBRIGHT 3	14.94
298466	B-018	.06
235850	BROWNS RUN	72.63
231904	DC1 NUG	-5.74
231905	DC2 NUG	-5.74
217078	ESSEX 12	-38.81
298464	G-030	.62

99210	G07_NEW	22.07
231903	GEN4	-16.33
292320	K-020	.01
200032	KEYS G1	5.84
200033	KEYS G2	5.77
209027	LOR2_Q27 E	-17.71
292850	M-023 C	3.21
292880	M-026	40.37
235573	MITCHELL 2	.29
235574	MITCHELL 3	.97
227807	MO AV B	-4.12
292980	N-007 C	.82
94130	O66_NONFIRM	74.45
247500	R-003 C	2.72
247517	R-049 C	3.19
296454	R-052 C1	2.16
296479	R-052 C2	2.16
290286	R-052AC	2.16
235575	RIVESVILLE 5	4.05
235576	RIVESVILLE 6	9.95
247536	S-071 C	2.5
247537	S-072 C	6.42
247520	S-073 C	4.27
235619	SOUTH BEND 1	1.04
235620	SOUTH BEND 2	1.04
235621	SOUTH BEND 3	1.05
235622	SOUTH BEND 4	1.04
235610	SPRINGDALE 1	.17
235611	SPRINGDALE 2	.17
235612	SPRINGDALE 3	.64
235613	SPRINGDALE 4	.64
235614	SPRINGDALE 5	.67
885641	T-016 C	.63
292339	T-109	.14
292344	T-110	.14
247503	T-130 C	6.43
247521	T-131 C	3.19
247504	T-142 C	6.5
292552	T-156	2.97
292626	T-174 1	35.68
292627	T-174 2	35.68
292628	T-174 3	35.68
292629	T-174 4	72.33
885600	T20SOLAR E	-.45
247522	U1-059 C	.71
247505	U1-060 C	2.15

292846	U1-075	1.27
889031	U2-028A_AT1	14.92
247538	U2-062 C	2.54
247540	U2-072 C	4.23
247542	U4-001 C	2.98
891011	U4-002 C	1.39
891141	U4-028 C	1.46
891151	U4-029 C	1.46
892021	V1-011 C	1.39
892031	V1-012 C	2.08
292078	V1-034	.63
893001	V2-001 C	1.29
893021	V2-006 C	2.11
833193	V2-042AC1OP1	2.95
LTF	V3-012	73.1
894581	V3-015 C	4.07
894641	V3-028 C	.82
247548	V4-010 C	2.91
900041	V4-011	.35
247546	V4-015 C	.96
247547	V4-016 C	2.7
901161	W1-056 C	.26
901211	W1-070A_AT4	.72
901221	W1-072A_AT5	4.42
901381	W1-107 C	.
902141	W2-001 C	.95
902151	W2-007 C	1.41
902211	W2-019 C	-.48
903231	W3-005 C	7.22
903281	W3-024 C	2.03
903511	W3-059A_AT6	1.52
903611	W3-085 C	2.73
903621	W3-088 C OP1	2.81
903691	W3-111 C	.88
903701	W3-112 C	.88
903711	W3-113 C	.88
903761	W3-128	71.94
905031	W4-001A_AT9	.49
905051	W4-004A_AT10	2.95
905061	W4-004B_AT11	1.84
905211	W4-025 C	-.54
905291	W4-038 OP1	-5.06
235577	WILLOW I 1	6.02
235578	WILLOW I 2	18.63
907041	X1-027A C1	1.9
907044	X1-027A C2	1.9

907046	X1-027A C3	1.9
907048	X1-027A C4	1.9
907111	X1-040 C	4.89
907211	X1-064A_AT13	17.33
907213	X1-064A_AT13	17.33
907241	X1-068	-2.1
907991	X1-078	110.39
907381	X1-094 C	-1.35
LTF	X2-042	80.45
909201	X2-058 C	2.15
910501	X3-001 C	.08
910531	X3-004	-7.38
LTF	X3-020	22.03
LTF	X3-021	83.85
910601	X3-023 C OP1	.89
910621	X3-030 C	3.42
910631	X3-031 C OP1	2.1
910751	X3-051	64.3
910931	X3-085 C	-.63
LTF	X3-096	53.
LTF	X3-097	75.15
LTF	X3-098	71.23
912091	X4-012 C OP1	-.48
912101	X4-015 C	-.4
912161	X4-025	8.32
LTF	X4-041	70.38
912241	X4-042	.42
LTF	Y1-002	72.99
LTF	Y1-004	86.83
LTF	Y1-007	60.3
913091	Y1-015 C	130.01
913111	Y1-018	.56
913121	Y1-019	.56
913191	Y1-027 C OP1	.01
913211	Y1-030 C OP1	1.44
913251	Y1-034 OP1	.74
913261	Y1-035	55.44
913271	Y1-036	54.98
913301	Y1-044	.77
913441	Y1-069 OP1	87.5
913461	Y1-070 OP1	123.29
913491	Y1-074 C OP1	.38
LTF	Y2-004	35.71
LTF	Y2-005	35.71
LTF	Y2-006	36.6
LTF	Y2-007	71.42

LTF	Y2-008	72.98
LTF	Y2-033	41.59
LTF	Y2-034	34.41
LTF	Y2-040	83.85
LTF	Y2-049	68.86
914081	Y2-050 C OP1	95.83

Appendix 9

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	11.59
238555	02AVONG9	77.66
238565	02BAYSG2	15.23
238566	02BAYSG3	15.67
238567	02BAYSG4	23.72
238995	02NCUNTD	.96
239006	02NILEG1	15.83
239007	02NILEG2	15.69
239022	02NWCAG3	15.18
239023	02NWCAG4	14.74
239024	02NWCAG5	22.75
243654	05CVG3	18.56
243045	05MUSKNG	45.12
243655	05PCG5	10.4
254007	15ELRMA1	14.45
254008	15ELRMA2	14.75
254009	15ELRMA3	16.63
254010	15ELRMA4	26.79
235564	ALBRIGHT 1	7.98
235565	ALBRIGHT 2	7.98
235566	ALBRIGHT 3	14.99
235850	BROWNS RUN	74.37
231904	DC1 NUG	-5.76
231905	DC2 NUG	-5.76
217078	ESSEX 12	-39.01
206617	EXXON	-1.48
298464	G-030	.64
99210	G07_NEW	22.18
231903	GEN4	-16.37
208453	HONY	-.31
200032	KEYS G1	6.05
200033	KEYS G2	5.98
209027	LOR2_Q27 E	-17.83
206679	M&M S721	-2.19
292880	M-026	40.89
210888	MACRTR10	-1.07
227807	MO AV B	-4.14
214194	N WALES4	-.42
292980	N-007 C	.83
292981	N-007 E	3.31
293231	N-032 E	5.44
94130	O66_NONFIRM	74.85
290074	P-059 E	10.98
206638	PEAPACK	-.85

290092	Q-041 E	-6.37
290286	R-052AC	2.18
290287	R-052AE	8.7
235575	RIVESVILLE 5	4.11
235576	RIVESVILLE 6	10.1
244996	ROSEVALL	.08
208769	SISO	-.42
245417	SOMRSET8	.72
235619	SOUTH BEND 1	1.08
235620	SOUTH BEND 2	1.08
235621	SOUTH BEND 3	1.09
235622	SOUTH BEND 4	1.08
245347	STON CNT	1.18
292339	T-109	.14
292344	T-110	.14
247504	T-142 C	6.54
247908	T-142 E	26.17
292552	T-156	3.01
292626	T-174 1	36.62
292627	T-174 2	36.62
292628	T-174 3	36.62
292629	T-174 4	74.24
885600	T20SOLAR E	-.46
247522	U1-059 C	.72
247909	U1-059 E	4.8
247505	U1-060 C	2.16
247910	U1-060 E	14.52
889031	U2-028A_AT1	14.89
247911	U2-041 E	28.51
247540	U2-072 C	4.26
247914	U2-072 E	28.51
299984	U3-029 E	1.6
299989	U3-030 E	.73
247542	U4-001 C	2.99
247918	U4-001 E	20.02
891141	U4-028 C	1.46
891142	U4-028 E	9.77
891151	U4-029 C	1.46
891152	U4-029 E	9.77
292063	V1-021 E	-.06
292078	V1-034	.64
893001	V2-001 C	1.3
893002	V2-001 E	9.23
893021	V2-006 C	1.01
893022	V2-006 E	6.75
833193	V2-042AC1OP1	2.96

833194	V2-042AE1OP1	19.82
LTF	V3-012	73.79
894641	V3-028 C	.83
894642	V3-028 E	1.35
247548	V4-010 C	2.92
247932	V4-010 E	19.53
900041	V4-011	.35
247546	V4-015 C	.96
247922	V4-015 E	6.41
904512	V4-052 E	-.81
901161	W1-056 C	.27
901162	W1-056 E	1.77
901221	W1-072A_AT5	4.41
901382	W1-107 E	.21
901602	W1-111 E	4.36
902141	W2-001 C	.95
902142	W2-001 E	6.42
902151	W2-007 C	1.41
902152	W2-007 E	9.47
902211	W2-019 C	-.48
902402	W2-057 E	3.51
903231	W3-005 C	7.24
903232	W3-005 E	48.49
903511	W3-059A_AT6	1.52
903512	W3-059A_AT6	10.12
903611	W3-085 C	2.73
903612	W3-085 E	18.34
903691	W3-111 C	.89
903692	W3-111 E	1.45
903701	W3-112 C	.89
903702	W3-112 E	1.45
903711	W3-113 C	.89
903712	W3-113 E	1.45
903761	W3-128	72.66
905031	W4-001A_AT9	.5
905051	W4-004A_AT10	2.97
905061	W4-004B_AT11	1.78
905062	W4-004B_AT11	1.54
905211	W4-025 C	-.54
905291	W4-038 OP1	-5.09
905482	W4-085 E	.41
235577	WILLOW I 1	6.1
235578	WILLOW I 2	18.88
907041	X1-027A C1	1.89
907044	X1-027A C2	1.89
907046	X1-027A C3	1.89

907048	X1-027A C4	1.89
907042	X1-027A E1	12.68
907045	X1-027A E2	12.68
907047	X1-027A E3	12.68
907049	X1-027A E4	12.68
907211	X1-064A_AT13	17.35
907213	X1-064A_AT13	17.35
907241	X1-068	-2.11
907991	X1-078	110.89
907381	X1-094 C	-1.36
909032	X2-013 E	.41
LTF	X2-042	81.05
909201	X2-058 C	2.15
909202	X2-058 E	14.4
909292	X2-085 E	1.13
910501	X3-001 C	.08
910502	X3-001 E	.12
910531	X3-004	-7.42
LTF	X3-020	22.2
LTF	X3-021	83.47
910601	X3-023 C OP1	.89
910602	X3-023 E OP1	5.95
910612	X3-029 E	-2.37
910762	X3-052 E	-.64
910902	X3-081 E	-.1
910931	X3-085 C	-.64
LTF	X3-096	53.41
LTF	X3-097	75.74
LTF	X3-098	71.79
912032	X4-004 E	-1.03
912091	X4-012 C OP1	-.48
912101	X4-015 C	-.4
LTF	X4-041	70.93
912241	X4-042	.43
912271	X4-045 E	.1
LTF	Y1-002	73.43
LTF	Y1-004	87.68
LTF	Y1-007	60.89
913091	Y1-015 C	131.14
913092	Y1-015 E	19.59
913111	Y1-018	.56
913121	Y1-019	.56
913211	Y1-030 C OP1	1.45
913212	Y1-030 E OP1	9.68
913251	Y1-034 OP1	.76
913261	Y1-035	54.45

913271	Y1-036	53.86
913301	Y1-044	.78
913362	Y1-057 E	.41
913382	Y1-063 E	.44
913392	Y1-064 E	.44
913441	Y1-069 OP1	87.31
913461	Y1-070 OP1	124.35
913491	Y1-074 C OP1	.39
913492	Y1-074 E OP1	.63
LTF	Y2-004	35.99
LTF	Y2-005	35.99
LTF	Y2-006	36.89
LTF	Y2-007	71.98
LTF	Y2-008	73.55
LTF	Y2-033	42.03
LTF	Y2-034	34.91
LTF	Y2-040	83.47
LTF	Y2-049	68.55
914081	Y2-050 C OP1	96.69
914082	Y2-050 E OP1	5.31

Appendix 10

Bus Number	Bus Name	Full Contribution
238554	02AVONG7	13.06
238555	02AVONG9	87.4
238565	02BAYSG2	16.48
238566	02BAYSG3	16.96
238567	02BAYSG4	25.67
238965	02MNFDG1	3.32
238966	02MNFDG2	3.32
238967	02MNFDG3	3.32
238995	02NCUNTD	1.29
239214	02NILE-A	.1
239006	02NILEG1	19.75
239007	02NILEG2	19.57
239022	02NWCAG3	20.7
239023	02NWCAG4	19.85
239024	02NWCAG5	30.74
239085	02SAMMG1	.76
239086	02SAMMG2	.76
239087	02SAMMG3	.76
239088	02SAMMG4	.76
239089	02SAMMG5	1.27
239090	02SAMMG6	2.62
239091	02SAMMG7	2.62
239093	02SAMMIS	.05
243654	05CVG3	20.12
243045	05MUSKNG	48.92
243655	05PCG5	11.15
242807	05SPORNA	66.78
243382	05TANNER	32.25
251934	08BCKJD2	10.52
251935	08BCKJD3	14.32
251936	08BCKJD4	16.78
251937	08BCKJD5	26.63
251938	08BCKJD6	46.31
251939	08BECJD1	10.52
253188	09OHGEN1	6.02
253189	09OHGEN2	5.68
253191	09OHGEN4	6.57
253901	15BVRVL2	3.58
254007	15ELRMA1	14.67
254008	15ELRMA2	14.98
254009	15ELRMA3	16.16
254010	15ELRMA4	26.03
298466	B-018	.07
231904	DC1 NUG	-5.17

231905	DC2 NUG	-5.17
217078	ESSEX 12	-36.02
99210	G07_NEW	20.38
231903	GEN4	-14.7
209027	LOR2_Q27 E	-16.76
292880	M-026	47.25
227807	MO AV B	-3.76
94130	O66_NONFIRM	69.1
247500	R-003 C	2.91
247517	R-049 C	3.43
296454	R-052 C1	2.33
296479	R-052 C2	2.33
290286	R-052AC	2.33
247536	S-071 C	2.67
247537	S-072 C	6.89
247520	S-073 C	4.58
235610	SPRINGDALE 1	.18
235611	SPRINGDALE 2	.18
235612	SPRINGDALE 3	.7
235613	SPRINGDALE 4	.7
235614	SPRINGDALE 5	.73
247503	T-130 C	6.91
247521	T-131 C	3.42
247504	T-142 C	7.
292552	T-156	3.47
885600	T20SOLAR E	-.41
247522	U1-059 C	.77
247505	U1-060 C	2.33
889031	U2-028A_AT1	16.11
247538	U2-062 C	2.72
247540	U2-072 C	4.56
247508	U2-090 C	2.89
247542	U4-001 C	3.29
891141	U4-028 C	1.59
891151	U4-029 C	1.59
891221	U4-038 C	1.44
891231	U4-039 C1	.45
891241	U4-039 C2	.45
891251	U4-039 C3	.45
891261	U4-039 C4	.45
892021	V1-011 C	1.49
892031	V1-012 C	2.24
292078	V1-034	.59
893001	V2-001 C	1.42
893021	V2-006 C	2.28
833193	V2-042AC1OP1	3.24

247543	V3-007 C	2.89
247544	V3-008 C	2.89
247545	V3-009 C	2.89
LTF	V3-012	78.67
894581	V3-015 C	4.35
894641	V3-028 C	.89
894781	V3-053 C	2.17
247548	V4-010 C	3.18
900041	V4-011	.38
247546	V4-015 C	1.04
247547	V4-016 C	2.88
900261	V4-033 C1	2.17
900271	V4-033 C2	2.17
901161	W1-056 C	.29
901221	W1-072A_AT5	4.77
901381	W1-107 C	.
902141	W2-001 C	1.03
902151	W2-007 C	1.52
902211	W2-019 C	-.44
903231	W3-005 C	7.85
903281	W3-024 C	2.17
903511	W3-059A_AT6	1.69
LTF	W3-083	16.93
903611	W3-085 C	3.
903621	W3-088 C OP1	3.02
903691	W3-111 C	.97
903701	W3-112 C	.97
903711	W3-113 C	.97
903761	W3-128	78.49
905031	W4-001A_AT9	.65
905041	W4-004 C	1.3
905051	W4-004A_AT10	3.91
905061	W4-004B_AT11	1.86
905081	W4-008 C	1.3
905211	W4-025 C	-.5
905291	W4-038 OP1	-4.7
235577	WILLOW I 1	6.24
235578	WILLOW I 2	19.31
907021	X1-020 C	21.61
907041	X1-027A C1	2.1
907044	X1-027A C2	2.1
907046	X1-027A C3	2.1
907048	X1-027A C4	2.1
907111	X1-040 C	5.23
907211	X1-064A_AT13	20.17
907213	X1-064A_AT13	20.17

907241	X1-068	-1.94
907991	X1-078	101.76
907381	X1-094 C	-1.26
LTF	X2-042	86.67
909181	X2-052	74.74
909201	X2-058 C	2.33
910501	X3-001 C	.08
910531	X3-004	-6.85
LTF	X3-020	23.56
LTF	X3-021	87.7
910601	X3-023 C OP1	.97
910621	X3-030 C	3.69
910631	X3-031 C OP1	2.27
910751	X3-051	68.78
910931	X3-085 C	-.59
LTF	X3-096	56.67
LTF	X3-097	80.35
LTF	X3-098	76.17
912091	X4-012 C OP1	-.45
912101	X4-015 C	-.36
912161	X4-025	8.94
LTF	X4-029D	20.82
LTF	X4-041	75.25
912241	X4-042	.35
LTF	Y1-002	77.96
LTF	Y1-004	93.44
LTF	Y1-007	64.89
913091	Y1-015 C	167.28
913111	Y1-018	.61
913121	Y1-019	.61
913211	Y1-030 C OP1	1.57
913261	Y1-035	59.39
913271	Y1-036	58.28
LTF	Y1-041	20.82
913301	Y1-044	.8
913441	Y1-069 OP1	94.07
913461	Y1-070 OP1	158.63
913491	Y1-074 C OP1	.45
LTF	Y2-004	38.18
LTF	Y2-005	38.18
LTF	Y2-006	39.19
LTF	Y2-007	76.36
LTF	Y2-008	78.13
LTF	Y2-030	21.67
LTF	Y2-031	21.67
LTF	Y2-032	21.67

LTF	Y2-033	44.44
LTF	Y2-034	36.71
LTF	Y2-035	19.68
LTF	Y2-036	19.68
LTF	Y2-040	87.7
LTF	Y2-049	72.02
914081	Y2-050 C OP2	120.58

Appendix 11

Bus Number	Bus Name	Full Contribution
238995	02NCUNTD	.42
239022	02NWCAG3	7.14
239023	02NWCAG4	6.74
239024	02NWCAG5	14.15
884780	S-058 C	9.13
884781	S-058 E	30.1
LTF	V3-012	8.95
LTF	W3-083	2.06
905031	W4-001A_AT9	.18
905051	W4-004A_AT10	1.1
LTF	X2-042	10.41
LTF	X3-020	2.7
LTF	X3-021	11.67
900404	X3-028 C	43.89
LTF	X3-096	6.51
LTF	X3-097	9.23
LTF	X3-098	8.74
LTF	X4-029D	2.44
LTF	X4-041	8.64
LTF	Y1-002	9.26
LTF	Y1-004	10.53
LTF	Y1-007	7.31
913091	Y1-015 C	55.04
LTF	Y1-041	2.44
913461	Y1-070 OP1	52.2
LTF	Y2-004	4.38
LTF	Y2-005	4.38
LTF	Y2-006	4.53
LTF	Y2-007	8.76
LTF	Y2-008	9.03
LTF	Y2-030	2.47
LTF	Y2-031	2.47
LTF	Y2-032	2.47
LTF	Y2-033	4.75
LTF	Y2-034	3.43
LTF	Y2-035	1.84
LTF	Y2-036	1.84
LTF	Y2-040	11.67
LTF	Y2-049	9.59
914081	Y2-050 C OP2	19.33

Appendix 12

Bus Number	Bus Name	Full Contribution
238995	02NCUNTD	.5
239022	02NWCAG3	9.73
239023	02NWCAG4	7.74
239024	02NWCAG5	12.79
247528	05COVRT1	3.8
247529	05COVRT2	3.8
247530	05COVRT3	3.8
247531	05COVRT4	2.28
247532	05COVRT5	2.28
247533	05COVRT6	2.28
884780	S-058 C	12.08
884781	S-058 E	39.84
LTF	V3-012	12.01
LTF	W3-083	2.7
905031	W4-001A_AT9	.21
905051	W4-004A_AT10	1.26
LTF	X2-042	13.75
LTF	X3-020	3.62
LTF	X3-021	14.41
900404	X3-028 C	58.9
LTF	X3-096	8.72
LTF	X3-097	12.36
LTF	X3-098	11.72
LTF	X4-029D	3.24
LTF	X4-041	11.58
LTF	Y1-002	12.24
LTF	Y1-004	14.19
LTF	Y1-007	9.85
913091	Y1-015 C	47.66
LTF	Y1-041	3.24
913461	Y1-070 OP1	45.19
LTF	Y1-090	2.11
LTF	Y2-004	5.87
LTF	Y2-005	5.87
LTF	Y2-006	6.08
LTF	Y2-007	11.74
LTF	Y2-008	12.1
LTF	Y2-030	3.34
LTF	Y2-031	3.34
LTF	Y2-032	3.34
LTF	Y2-033	6.53
LTF	Y2-034	4.92
LTF	Y2-035	2.64
LTF	Y2-036	2.64

LTF	Y2-040	14.41
LTF	Y2-049	11.83
914081	Y2-050 C OP2	25.21

Appendix 13

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	16.93
238995	02NCUNTD	.5
239022	02NWCAG3	9.73
239023	02NWCAG4	7.74
239024	02NWCAG5	12.79
247528	05COVRT1	3.8
247529	05COVRT2	3.8
247530	05COVRT3	3.8
247531	05COVRT4	2.28
247532	05COVRT5	2.28
247533	05COVRT6	2.28
884780	S-058 C	12.08
884781	S-058 E	39.84
LTF	V3-012	12.01
LTF	W3-083	2.7
905031	W4-001A_AT9	.21
905051	W4-004A_AT10	1.26
LTF	X2-042	13.75
LTF	X3-020	3.62
LTF	X3-021	14.41
900404	X3-028 C	58.9
LTF	X3-096	8.72
LTF	X3-097	12.36
LTF	X3-098	11.72
LTF	X4-029D	3.24
LTF	X4-041	11.58
LTF	Y1-002	12.24
LTF	Y1-004	14.19
LTF	Y1-007	9.85
913091	Y1-015 C	47.66
LTF	Y1-041	3.24
913461	Y1-070 OP1	45.19
LTF	Y1-090	2.11
LTF	Y2-004	5.87
LTF	Y2-005	5.87
LTF	Y2-006	6.08
LTF	Y2-007	11.74
LTF	Y2-008	12.1
LTF	Y2-030	3.34
LTF	Y2-031	3.34
LTF	Y2-032	3.34
LTF	Y2-033	6.53
LTF	Y2-034	4.92
LTF	Y2-035	2.64

LTF	Y2-036	2.64
LTF	Y2-040	14.41
LTF	Y2-049	11.83
914081	Y2-050 C OP2	25.21

Appendix 14

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	15.7
238995	02NCUNTD	.32
239022	02NWCAG3	4.8
239023	02NWCAG4	5.38
239024	02NWCAG5	14.8
884780	S-058 C	9.65
884781	S-058 E	31.8
LTF	V3-012	9.48
LTF	W3-083	2.18
LTF	X2-042	11.02
LTF	X3-020	2.86
LTF	X3-021	12.25
900404	X3-028 C	46.44
LTF	X3-096	6.88
LTF	X3-097	9.75
LTF	X3-098	9.24
LTF	X4-029D	2.58
LTF	X4-041	9.13
LTF	Y1-002	9.79
LTF	Y1-004	11.16
LTF	Y1-007	7.75
913091	Y1-015 C	60.51
LTF	Y1-041	2.58
913461	Y1-070 OP1	57.38
LTF	Y2-004	4.63
LTF	Y2-005	4.63
LTF	Y2-006	4.79
LTF	Y2-007	9.26
LTF	Y2-008	9.55
LTF	Y2-030	2.62
LTF	Y2-031	2.62
LTF	Y2-032	2.62
LTF	Y2-033	5.03
LTF	Y2-034	3.63
LTF	Y2-035	1.95
LTF	Y2-036	1.95
LTF	Y2-040	12.25
LTF	Y2-049	10.06
914081	Y2-050 C OP2	20.59

Appendix 15

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	23.83
238965	02MNFDG1	1.04
238966	02MNFDG2	1.04
238967	02MNFDG3	1.04
238995	02NCUNTD	.7
239214	02NILE-A	.04
239006	02NILEG1	7.45
239007	02NILEG2	7.39
239022	02NWCAG3	11.47
239023	02NWCAG4	10.69
239024	02NWCAG5	16.01
239085	02SAMMG1	.24
239086	02SAMMG2	.24
239087	02SAMMG3	.21
239088	02SAMMG4	.21
239089	02SAMMG5	.36
239090	02SAMMG6	.74
239091	02SAMMG7	.74
239093	02SAMMIS	.02
247528	05COVRT1	5.03
247529	05COVRT2	5.03
247530	05COVRT3	5.03
247531	05COVRT4	3.02
247532	05COVRT5	3.02
247533	05COVRT6	3.02
253900	15BVRVL1	1.1
253901	15BVRVL2	1.1
884780	S-058 C	15.76
884781	S-058 E	51.98
299983	U3-029 C	.05
299988	U3-030 C	.05
LTF	V3-012	15.49
901381	W1-107 C	.
LTF	W3-083	3.54
905031	W4-001A_AT9	.32
905051	W4-004A_AT10	1.89
907991	X1-078	17.77
LTF	X2-042	17.89
LTF	X3-020	4.7
LTF	X3-021	19.64
900404	X3-028 C	76.26
LTF	X3-096	11.3
LTF	X3-097	16.02
LTF	X3-098	15.18

LTF	X4-029D	4.22
LTF	X4-041	15.
LTF	Y1-002	15.99
LTF	Y1-004	18.26
LTF	Y1-007	12.68
913091	Y1-015 C	70.04
LTF	Y1-041	4.22
913441	Y1-069 OP1	22.24
913461	Y1-070 OP1	66.41
LTF	Y1-090	2.74
LTF	Y2-004	7.61
LTF	Y2-005	7.61
LTF	Y2-006	7.87
LTF	Y2-007	15.22
LTF	Y2-008	15.67
LTF	Y2-030	4.3
LTF	Y2-031	4.3
LTF	Y2-032	4.3
LTF	Y2-033	8.35
LTF	Y2-034	6.15
LTF	Y2-035	3.3
LTF	Y2-036	3.3
LTF	Y2-040	19.64
LTF	Y2-049	16.13
914081	Y2-050 C OP2	32.93

Appendix 16

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	8.76
239006	02NILEG1	3.86
239007	02NILEG2	3.83
247528	05COVRT1	1.74
247529	05COVRT2	1.74
247530	05COVRT3	1.74
247531	05COVRT4	1.04
247532	05COVRT5	1.04
247533	05COVRT6	1.04
884780	S-058 C	5.45
884781	S-058 E	17.98
LTF	V3-012	5.38
LTF	W3-083	1.23
LTF	X2-042	6.22
LTF	X3-020	1.63
LTF	X3-021	6.72
900404	X3-028 C	26.39
LTF	X3-096	3.91
LTF	X3-097	5.54
LTF	X3-098	5.25
LTF	X4-029D	1.46
LTF	X4-041	5.19
LTF	Y1-002	5.53
LTF	Y1-004	6.34
LTF	Y1-007	4.4
913091	Y1-015 C	32.82
LTF	Y1-041	1.46
913441	Y1-069 OP1	7.82
913461	Y1-070 OP1	31.12
LTF	Y1-090	.95
LTF	Y2-004	2.63
LTF	Y2-005	2.63
LTF	Y2-006	2.73
LTF	Y2-007	5.27
LTF	Y2-008	5.43
LTF	Y2-030	1.49
LTF	Y2-031	1.49
LTF	Y2-032	1.49
LTF	Y2-033	2.89
LTF	Y2-034	2.12
LTF	Y2-035	1.14
LTF	Y2-036	1.14
LTF	Y2-040	6.72
LTF	Y2-049	5.52

914081	Y2-050 C OP2	11.83

Appendix 17

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	23.83
238965	02MNFDG1	1.04
238966	02MNFDG2	1.04
238967	02MNFDG3	1.04
238995	02NCUNTD	.7
239214	02NILE-A	.04
239006	02NILEG1	7.45
239007	02NILEG2	7.39
239022	02NWCAG3	11.47
239023	02NWCAG4	10.69
239024	02NWCAG5	16.01
239085	02SAMMG1	.24
239086	02SAMMG2	.24
239087	02SAMMG3	.21
239088	02SAMMG4	.21
239089	02SAMMG5	.36
239090	02SAMMG6	.74
239091	02SAMMG7	.74
239093	02SAMMIS	.02
247528	05COVRT1	5.03
247529	05COVRT2	5.03
247530	05COVRT3	5.03
247531	05COVRT4	3.02
247532	05COVRT5	3.02
247533	05COVRT6	3.02
253900	15BVRVL1	1.1
253901	15BVRVL2	1.1
884780	S-058 C	15.76
884781	S-058 E	51.98
299983	U3-029 C	.05
299988	U3-030 C	.05
LTF	V3-012	15.49
901381	W1-107 C	.
LTF	W3-083	3.54
905031	W4-001A_AT9	.32
905051	W4-004A_AT10	1.89
907991	X1-078	17.77
LTF	X2-042	17.89
LTF	X3-020	4.7
LTF	X3-021	19.64
900404	X3-028 C	76.26
LTF	X3-096	11.3
LTF	X3-097	16.02
LTF	X3-098	15.18

LTF	X4-029D	4.22
LTF	X4-041	15.
LTF	Y1-002	15.99
LTF	Y1-004	18.26
LTF	Y1-007	12.68
913091	Y1-015 C	70.04
LTF	Y1-041	4.22
913441	Y1-069 OP1	22.24
913461	Y1-070 OP1	66.41
LTF	Y1-090	2.74
LTF	Y2-004	7.61
LTF	Y2-005	7.61
LTF	Y2-006	7.87
LTF	Y2-007	15.22
LTF	Y2-008	15.67
LTF	Y2-030	4.3
LTF	Y2-031	4.3
LTF	Y2-032	4.3
LTF	Y2-033	8.35
LTF	Y2-034	6.15
LTF	Y2-035	3.3
LTF	Y2-036	3.3
LTF	Y2-040	19.64
LTF	Y2-049	16.13
914081	Y2-050 C OP2	32.93

Appendix 18

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	8.9
239006	02NILEG1	3.91
239007	02NILEG2	3.87
247528	05COVRT1	1.76
247529	05COVRT2	1.76
247530	05COVRT3	1.76
247531	05COVRT4	1.06
247532	05COVRT5	1.06
247533	05COVRT6	1.06
884780	S-058 C	5.54
884781	S-058 E	18.28
LTF	V3-012	5.46
LTF	W3-083	1.25
907021	X1-020 C	1.55
907022	X1-020 E	10.37
LTF	X2-042	6.32
LTF	X3-020	1.65
LTF	X3-021	6.83
900404	X3-028 C	26.81
LTF	X3-096	3.97
LTF	X3-097	5.63
LTF	X3-098	5.34
LTF	X4-029D	1.48
LTF	X4-041	5.27
LTF	Y1-002	5.62
LTF	Y1-004	6.44
LTF	Y1-007	4.47
913091	Y1-015 C	33.31
913092	Y1-015 E	4.98
LTF	Y1-041	1.48
913441	Y1-069 OP1	7.95
913461	Y1-070 OP1	31.59
LTF	Y1-090	.96
LTF	Y2-004	2.67
LTF	Y2-005	2.67
LTF	Y2-006	2.77
LTF	Y2-007	5.35
LTF	Y2-008	5.51
LTF	Y2-030	1.51
LTF	Y2-031	1.51
LTF	Y2-032	1.51
LTF	Y2-033	2.93
LTF	Y2-034	2.15
LTF	Y2-035	1.15

LTF	Y2-036	1.15
LTF	Y2-040	6.83
LTF	Y2-049	5.61
914081	Y2-050 C OP2	12.01
914082	Y2-050 E OP2	.66

Appendix 19

Bus Number	Bus Name	Full Contribution
238555	02AVONG9	8.9
239006	02NILEG1	3.91
239007	02NILEG2	3.87
247528	05COVRT1	1.76
247529	05COVRT2	1.76
247530	05COVRT3	1.76
247531	05COVRT4	1.06
247532	05COVRT5	1.06
247533	05COVRT6	1.06
884780	S-058 C	5.54
884781	S-058 E	18.28
LTF	V3-012	5.46
LTF	W3-083	1.25
907021	X1-020 C	1.55
907022	X1-020 E	10.37
LTF	X2-042	6.32
LTF	X3-020	1.65
LTF	X3-021	6.83
900404	X3-028 C	26.81
LTF	X3-096	3.97
LTF	X3-097	5.63
LTF	X3-098	5.34
LTF	X4-029D	1.48
LTF	X4-041	5.27
LTF	Y1-002	5.62
LTF	Y1-004	6.44
LTF	Y1-007	4.47
913091	Y1-015 C	33.31
913092	Y1-015 E	4.98
LTF	Y1-041	1.48
913441	Y1-069 OP1	7.95
913461	Y1-070 OP1	31.59
LTF	Y1-090	.96
LTF	Y2-004	2.67
LTF	Y2-005	2.67
LTF	Y2-006	2.77
LTF	Y2-007	5.35
LTF	Y2-008	5.51
LTF	Y2-030	1.51
LTF	Y2-031	1.51
LTF	Y2-032	1.51
LTF	Y2-033	2.93
LTF	Y2-034	2.15
LTF	Y2-035	1.15

LTF	Y2-036	1.15
LTF	Y2-040	6.83
LTF	Y2-049	5.61
914081	Y2-050 C OP2	12.01
914082	Y2-050 E OP2	.66

Summary: Application Appendix C: PJM Feasibility Study electronically filed by Ms. Miranda R Leppla on behalf of Carroll County Energy LLC