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Southwest Power Pool (SPP)

Affected System Limited Operation Impact Study for DPP-2015-AUG-West

Final Report

REP-0851:
Revision #02

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Report Revision Table

Date	Revision	Description
5/19/2020	0	Issued Draft Report
5/20/2020	1	Address SPP comments
5/22/2020	2	Issued Final Report

Title:	**Affected System Limited Operation Impact Study for DPP-2015-AUG-West: Final Report REP-0851**
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EXECUTIVE SUMMARY

Southwest Power Pool ("SPP") has requested an Affected System Limited Operation Impact Study for the Midcontinent Independent System Operator ("MISO") current study Generator Interconnection Requests (GIRs) in the DPP-2015-AUG-West cluster. The DPP-2015-AUG-West cluster consists of five (5) GIRs totaling approximately 1,000 MW of generation that were studied in geographical groups (clusters). Steady-state thermal and voltage analyses as well as Transfer Distribution Factor analyses were performed to determine the impact the MISO GIRs have on the SPP system. This report documents the impacts of five (5) projects in the MISO generator queue on the SPP transmission system and the Limited Operation amount calculation for each request. The MISO current study projects are listed in Table ES-1.

Table ES-1: Current Study Interconnection Projects Evaluated in DPP-2015-AUG-West

GIR	Group #	Capacity	Service	Fuel Type	Area	Proposed Point of Interconnection
J412	09	200	ER/NR	Wind	Nebraska	Raun 345 kV Substation
J455	09	300	ER	Wind	Nebraska	Clay County 345 kV Substation
J436	15	150	ER	Wind	Eastern South Dakota	Big Stone South 345 kV Substation
J437	15	150	ER	Wind	Eastern South Dakota	Big Stone South 345 kV Substation
J442	15	200	ER/NR	Wind	Eastern South Dakota	Big Stone South 230 kV Substation

For the Affected System LOIS, power flow analysis was conducted. Certain constraints identified can be mitigated with updates to facility ratings per transmission owner feedback. Power flow analysis from this Affected System LOIS has determined the following amounts can interconnect on an interim basis prior to the completion of the R-Plan Network Upgrade:

- J412 request can interconnect 200 MW of generation with Network Resource Interconnection Service and,
- J455 request can interconnect 300 MW of generation with Energy Resource Interconnection Service and,
- J436 request can interconnect 150 MW of generation with Energy Resource Interconnection Service and,
- J437 request can interconnect 150 MW of generation with Energy Resource Interconnection Service and,
- J442 request can interconnect 200 MW of generation with Network Resource Interconnection Service

This study does not guarantee operation for all periods of time. This interconnection study identifies impacts for Energy Resource Interconnection Service (ERIS) interconnection injection constraints (defined as a 20% distribution factor impact for observed contingency constraints and 3% distribution factor impact for system intact constraints) and Network Resource Interconnection Service (NRIS) constraints (defined as 3% distribution factor impact) on the MISO Transmission System. This affected system study does not identify impacts for all potential situations. Although this study analyzed many of the most probable contingencies, it is not an all-inclusive list and cannot account for every real-time operational situation. Because of this, it is likely that the MISO Interconnection Requests may be required to reduce generation output to zero (0) MW, also known as curtailment, under certain system conditions to allow system operators to maintain the reliability of the transmission network.

The study results presented in this report are contingent upon completion of all SPP planned projects identified in the 17ITP base cases. In compliance with current SPP practices, an Affected System Restudy may be performed at SPP's discretion due to changes in assumptions of this study.

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1. Background and Objectives

SPP requested an Affected System Limited Operation Impact Study for five (5) generation interconnection requests ("GIRs") in the MISO footprint for multiple study years and multiple seasonal power flow cases. These GIR's are in MISO's Definitive Planning Process August 2015 West region (DPP-2015-AUG West). The objective of this report is to determine the impact the MISO GIRs have on the SPP transmission system and the amount of Interconnection Service available without resulting in constraints meeting the thresholds for mitigation, if any, prior to the completion of all required Network Upgrades. Each GIR is to be studied in and evaluated on a group basis with a steady-state voltage and thermal analysis. The MISO GIRs have been placed in to the following geographical areas (clusters) for this study:

- Nebraska Area (Group 09 – 2 GIRs)
- Eastern South Dakota Area (Group 15 – 3 GIRs)

The Siemens Power Technologies International PSS/E Version 33.10.0 and PowerGEM's TARA 1802 were used for this study. SPP started the model development with the following seven (7) DISIS-2016-001 model seasonal power flow cases in PSS/E format:

- Year 1 (2017) Winter Peak (17WP)
- Year 2 (2018) Spring (18G)
- Year 2 (2018) Summer Peak (18SP)
- Year 5 (2021) Light (21L)
- Year 5 (2021) Summer (21SP)
- Year 5 (2021) Winter (21WP) peak
- Year 10 (2026) Summer (26SP) peak

The power flow cases above were provided by SPP and included all SPP higher-queued generators and MISO higher queued generators. The power flow cases were updated by SPP to reflect the groups under study to create forty-six (46) cases (refer to Section 2 for detail model development). The cases were dispatched according to the criterion in Table B-1 and a selection of Network Upgrades were confirmed to be removed from the models (refer to Table A-3 for a list of upgrades that were removed from the models).

This impact study required a steady-state voltage and thermal analysis for each of the cases. The thermal analysis was completed to determine if any thermal constraints existed. If any thermal loadings greater than 100% were identified, a Transfer Distribution Factor (TDF) analysis was completed to determine if any MISO GIRs have a significant impact on the SPP transmission system element. A limited operation amount was required to be determined for constraints in the SPP transmission area that were determined to be caused by a MISO GIR. Once all thermal

constraints were mitigated, a voltage analysis was completed and the same process was followed to determine if any MISO GIRs cause the voltage constraints. If voltage constraints were observed, mitigation was recommended.

2. Model Development

SPP provided the seven (7) dispatched seasonal power flow cases for groups 09 and 15, i.e. the two geographical study areas (clusters) that include the MISO current study generation. The two groups then had three types of dispatch for their local generation: High-Variable Energy Resource (HVER) Energy Resource Interconnection Service (ERIS), Low-Variable Energy Resource (LVER) ERIS, and Network Resource Interconnection Service (NRIS). The groups and the dispatch resulted in 46 cases with unique dispatches as shown in Table 2-1. SPP higher-queued generation and MISO existing and higher-queued generation in the MISO West region were also included in the cases.

Table 2-1: Summary of Study Cases

Seasonal Case	ERIS (GroupALL)	NRIS (Group00NR)	NRIS (GroupNR)
+1 Winter Peak (i.e. 17WP)	1 per group	1 per study	
+1 Spring (i.e. 18G)	1 per group		1 per group
+1 Summer Peak (i.e. 18SP)	1 per group	1 per study	
+5 Light Load (i.e. 21L)	1 per group		1 per group
+5 Summer Peak (i.e. 21SP)	1 per group	1 per study	
+5 Winter Peak (i.e. 21WP)	1 per group	1 per study	
+10 Summer Peak (i.e. 26SP)	1 per group	1 per study	
Total cases:	14 cases	5 cases	4 cases
SPP DPP-2015-AUG-West	46 cases (23 BC/23 TC)		

2.1 Before Transfer Case Development

This section describes the steps taken to develop the seven (7) seasonal power flow cases into the twenty-three (23) pre-project ("Before Transfer") cases as required for this study. First, all higher-queued SPP generators were added and dispatched. Next, topology upgrades that existed in the SPP and MISO West area were added and MISO existing and higher-queued generation in the MISO West area were added and dispatched per SPP criteria. Refer to Table 2-2 for a list of Network Upgrades applied to the BC cases. Finally, the MISO West current study generators were added to the power flow cases, including all available collector system data, and were kept out-of-

service. Note for the 00NR-18SP case, a fictitious 250 Mvar SVC was required to be added to the MISO Dorsey bus (667035) in order to achieve an acceptable solution.

Table 2-2: Network Upgrades Applied to the BC Cases

Ref No.	Network Upgrade Added
1	Terminal equipment upgrade for Cleo Corner to Cleo Tap 138kV circuit
2	Bismark to Hilken 230kV uprate
3	Rerate Renfrow to Renfrow 138kV circuit, NRIS only
4	NIW to Colby 161kV rebuild
5	MISO Big Stone and Ellendale Projects advanced to 17WP-18WP
6	Rebuild Beatrice to Harbine 115kV circuit
7	Rebuild Gavins to Yankton 115kV circuit
8	M Ave to New Sharon 69kV reconductor
9	Powershiek transformer upgrade
10	Cleveland to Silvery City 138 kV Ckt 1 rerate
11	Matthewson – G15063 Tap 345 kV rerate
12	Dickinson transformer 230/115 kV Ckt 2
13	Advance Colby 631198 - Ledyard 631197 - Kossuth 635369 to early seasons [17WP - 18SP]

2.1.1 SPP and MISO Higher Queued Generation Dispatch

The included SPP higher-queued generators near the MISO West region were in the following groups:

- Nebraska (Group 9)
- Eastern South Dakota (Group 15)

A list of the SPP higher-queued generators added to the cases are in Table A-1. All generators were added with a 0.95 power factor capability and included in all cases regardless of their in-service date. For SPP generators with NRIS service in NR cases the increase in generation was offset by generators in the same control area. For all other cases and service types the increase in

generation was offset by generation in the SPP footprint. The MISO West higher-queued generation was included in the power flow cases, dispatched per SPP methodology, and are given in Table A-2.

2.2 Transfer Case Development

The Transfer Cases ("TC") were created from the Before Transfer Cases ("BC") by incrementally dispatching all of the current study generation in Table A-4. The current study requests were dispatched according to SPP methodology (Table B-1). The increase in generation was offset by generation in the MISO Classic region, excluding high-variable generation, for the ERIS cases and offset by generation in the MISO local area for NRIS cases. Note for the 00NR-18SP case, a fictitious 250 Mvar SVC was required to be added to the Dorsey bus (667035) and a fictitious 25 Mvar SVC was required to be added to the Patrick bus (152436) in order to achieve an acceptable solution.

2.3 SPP Model Request

MISO interconnection customers involved in this affected system analysis may obtain SPP models by submitting a request through the SPP Request Management System (RMS) (https://spprms.issuetrak.com/login.asp) and selecting the Quick Pick "Order Transmission Map/Model". Information about setting up an RMS account is available on the SPP website (http://www.spp.org/stakeholder-center/customer-relations/request-management-system/).

SPP models contain Critical Energy Infrastructure Information and resource-specific data and are only available to entities that execute a Non-Competitive Duty Non-Disclosure Agreement. A customer may designate a consultant or other non-competitive agent to obtain models on their behalf.

3. Contingencies and Metrics

A total of forty-six (46) power flow cases were created for this study. Twenty-three (23) Before Transfer Cases (BC) were created by incorporating SPP higher-queued GIRs, MISO existing higher-queued GIRs, identified previously assigned MISO upgrades, and the current study generators out-of-service for DPP-2015-AUG-West. Twenty-three (23) Transfer Cases (TC) were created by dispatching all of the current study GIRs for DPP-2015-AUG-West- from the BC cases according to SPP's dispatch methodology. A comprehensive set of contingencies were analyzed for each case and the SPP transmission system was monitored. The contingencies and areas monitored in this study are identified in the following sections.

3.1 Contingencies Examined for the Study

The following contingencies were examined for this study:

- All branches, ties, shunts, and generators within the following areas:
  - SPP Internal Areas for 60kV – 999kV facilities:
    - 515 – 546, 640, 641, 642, 645, 650, 652, 659. 998, 999
  - SPP External Areas for 100kV – 999kV facilities:
    - 327, 330, 351, 356, 502-504, 600, 615, 620, 627, 635, 672, 680
- NERC, SPP, and Tier 1 Permanent Contingent Flowgates
- SPP T.O. Specific P1, P2, P4, and P5 TPL-004-1 Contingencies
- SPP T.O. Specific Op Guide Implementation

Note only P1 contingencies in the above contingency list were considered for mitigation.

3.2 Monitored Facilities

The following facilities were monitored for this study:

- All branches (thermal)/ buses(voltage) and ties within the following areas:
  - SPP Internal Areas for 60kV – 999kV facilities:
    - 515 – 546, 640 – 659, 998, 999
- NERC, SPP, and Tier 1 Permanent Monitor Flowgates (thermal)

3.3 Software Solution Parameters

The following PSS/E and TARA power flow solution settings were used for this study:

- Fixed Slope Decoupled Newton-Raphson Power Flow Solution (FDNS)
- Area Interchange Enabled
- Phase Shift Adjustment Enabled
- Transformer Tap Stepping Enabled

- DC Tap Adjustment Enabled
- Switch Shunt Adjustment Enabled
- Non-Divergent Solution Flag Disabled

3.4 System Performance Criteria

The following sections describe the criteria used to evaluate the performance of the system.

3.4.1 ERIS Thermal Constraints

For Energy Resource Interconnection Service (ERIS), thermal overloads were determined for system intact (N-0) greater than 100% of Rate A - normal and for contingency (N-1) greater than 100% of Rate B – emergency conditions. The overloads were then screened to determine which interconnection requests have at least

- 3% Distribution Factor (DF) for system intact conditions (N-0),
- 20% DF upon outage-based conditions (N-n),
- or 3% DF on contingent elements that resulted in a non-converged solution that are associated with voltage issues

The ERIS requests were sunk to the entire MISO Classic footprint. Refer to Table B-2 for a list of sink generators for the ERIS analysis. If a facility is overloaded under no contingency (P0) with distribution factor equal to or greater than 3% or under contingency (P1, P2, and Extreme Events) by a request with a distribution factor of greater than or equal to 20%, that request will be labeled as affecting, and a limited operation amount was determined for the impacting request. Non-converged contingencies shall also be considered for limited operation service.

3.4.2 NRIS Thermal Constraints

For Network Resource Interconnection Service (NRIS), thermal overloads were determined for system intact (N-0) greater than 100% of Rate A - normal and for contingency (N-1) greater than 100% of Rate B – emergency conditions. The overloads were then screened to determine which interconnection requests have at least

- 3% Distribution Factor (DF) for system intact conditions (N-0),
- 3% DF upon outage-based conditions (N-n),
- or 3% DF on contingent elements that resulted in a non-converged solution that are associated with voltage issues

The NR requests were sunk to their local transmission area (J412 – MEC, J442 – OTP). Refer to Table B-3 for a list of MEC sink generators for J412 and Table B-4 for a list of OTP sink generators for J442. If a facility is overloaded under no contingency (P0) or under contingency (P1, P2, and

Extreme Events) with distribution factor equal to or greater than 3%, that request will be labeled as affecting, and a limited operation amount was determined for the impacting request. Non-converged contingencies shall also be considered for limited operation service.

3.4.3 Voltage Constraints

For non-converged power flow solutions that are determined to be caused by lack of voltage support, appropriate transmission support were identified to mitigate the constraint. After all thermal overload and voltage support mitigations were determined; a full ACCC analysis was performed to determine voltage constraints. The following voltage performance guidelines were used in accordance with the Transmission Owner local planning criteria. SPP voltage criteria are applicable to all SPP facilities 69 kV and greater in the absence of more stringent criteria:

- P0 (system intact): 0.95 to 1.05 per unit
- P1 – P7 (contingency): 0.90 to 1.05 per unit

Table 3-1 and Table 3-2 list buses that have more stringent criteria than listed above.

Table 3-1: Buses with Additional Voltage Criteria

Areas/Buses	Area/Bus #	Voltage	System Intact (per unit)	Contingency (per unit)
AEPW EMDE	520 544	60kV – 999kV 159kV – 999kV	0.95 – 1.05	0.92 – 1.05
WERE	536	60kV – 200kV	0.95 – 1.05	0.93 – 1.05
WERE	536	200kV – 999kV	0.95 – 1.05	0.95 – 1.05
TUCO	525830	230kV	0.925 – 1.05	0.925 – 1.05
Wolf Creek	532797	345kV	0.985 – 1.03	0.985 – 1.03
S1251	646251	161kV	1.001 – 1.047	1.001 – 1.047

Table 3-2: First Tier External Areas – Facilities 115kV and Greater

Areas/Buses	System Intact (per unit)	Contingency (per unit)
EES-EAI LAGN EES AMMO CLEC LAFA LEPA XEL MP SMMPA GRE	0.95 – 1.05	0.90 – 1.05

OTP ALTW MEC MDU DPC ALTE		
OTP-H (115kV+)	0.97 – 1.05	0.92 – 1.10
SPC	0.95 – 1.05	0.95 – 1.05

The constraints identified through the voltage scan were screened for the following for each interconnection request (note in certain conditions, engineering judgement may be required to determine whether or not a generator had impacts to voltage constraints):

- ≥ 3% PTDF on any circuit at the constraint for system intact or on the contingent element
- Violation in the TC case beyond BC
- ≥ 2% change in pu voltage between BC and TC cases

4. Steady-State Thermal and Voltage Analysis results

This section lists the thermal and voltage constraints identified from the steady-state analysis and the associated limited operation amounts of the impacting requests (if applicable).

4.1 Thermal Analysis Results

There were no thermal constraints that met the SPP criteria for Groups 09 or 15 ERIS study cases. Refer to Table 4-1 for a list of thermal constraints identified in this analysis that met the NRIS TDF criteria. Due to transmission owner feedback and updates to the models, there were no constraints identified requiring additional mitigation. Refer to Appendix C for a complete list of NRIS thermal results.

Table 4-1: Thermal Constraints for NRIS Requests

Ref. No.	Monitored Facility	Rating	Areas Name	Seasons	Worst Percentage Loading (Season)	Contingency for Worst Loading	OTDF (%)
1	602008 MINVALT4 230 652550 GRANITF4 230 1	259	XEL/WAPA	00NR-18SP 00NR-21SP 00NR-26SP	128.07 (21SP)	602009 MNVLTAP4 230 652550 GRANITF4 230 1	J442: 3.77
2	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	00NR-18SP 00NR-21SP 00NR-26SP	125.71 (26SP)	601048 LYON CO 3 345 601077 HAWKSNEST 3 345 1	J442: 12.37
3	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	00NR-18SP 00NR-21SP 00NR-26SP	120.86 (26SP)	601031 BRKNGCO3 345 620417 BSSOUTH3 345 1	J442: 6.32

After discussion with the transmission owners, the following updates to the transmission elements identified in Table 4-1 were implemented and confirmed to cover the maximum loading observed in the thermal analysis.

- Minnesota Valley to Granite Falls 230kV line
  - Upgrade CT jumpers to achieve a minimum rating of 407 MVA (332 MVA required)
- Split Rock to White 345kV line
  - Upgrade jumpers to achieve a minimum rating of 1057 MVA (901.5 MVA required)
- Johnson Junction Tap to Morris 115kV line section
  - Upgrade GRE portion of line conductor to achieve minimum line rating of 122 MVA (111.4 MVA required)

After applying the above updates, there were no additional thermal constraints identified for the NRIS analysis. It was determined all ER and NR requests can interconnect at the following amounts:

- J412 request can interconnect 200 MW of generation with Network Resource Interconnection Service and,
- J455 request can interconnect 300 MW of generation with Energy Resource Interconnection Service and,
- J436 request can interconnect 150 MW of generation with Energy Resource Interconnection Service and,
- J437 request can interconnect 150 MW of generation with Energy Resource Interconnection Service and,
- J442 request can interconnect 200 MW of generation with Network Resource Interconnection Service

4.2 Voltage Analysis Results

There were no voltage constraints identified for Groups 09 or 15 ERIS and NRIS study cases.

5. Conclusion

SPP had requested an Affected System Limited Operation Impact Study for five (5) MISO GIRs, totaling 1,000 MW, in the DPP-2015-AUG-West group. A steady-state thermal and voltage analysis as well as Transfer Distribution Factor analysis was performed to determine the impact the MISO GIRs have on the SPP system. It was observed that the MISO GIRs resulted in no thermal constraints and no voltage constraints that would require limited operation amounts for the MISO requests. The 5 MISO GIRs were thus determined to be able to connect at full output without resulting in a negative impact on the SPP transmission system.

The study results presented in this report are contingent upon completion of all SPP planned projects identified in the 17ITP base cases. In compliance with current SPP practices, an Affected System Restudy may be performed at SPP's discretion due to changes in assumptions of this study.

Appendix A: Interconnection Tables

Table A-1: SPP Higher-Queued Interconnection Projects

GIR	Proposed Point of Interconnection	Max MW Output	Fuel Type	Group #	Service	Area
GEN-2003-021N	Ainsworth Wind Tap 115kV	75	Wind	09 - Nebraska	ER	NPPD
GEN-2004-023N	Columbus Co 115kV	75	Coal	09 - Nebraska	ER	NPPD
GEN-2006-020N	Bloomfield 115kV	42	Wind	09 - Nebraska	ER	NPPD
GEN-2006-037N1	Broken Bow 115kV	75	Wind	09 - Nebraska	ER	NPPD
GEN-2006-038N005	Broken Bow 115kV	80	Wind	09 - Nebraska	ER	NPPD
GEN-2006-038N019	Petersburg North 115kV	80	Wind	09 - Nebraska	ER	NPPD
GEN-2006-044N	North Petersburg 115kV	40.5	Wind	09 - Nebraska	ER	NPPD
GEN-2007-011N08	Bloomfield 115kV	81	Wind	09 - Nebraska	ER	NPPD
GEN-2008-086N02	Meadow Grove 230kV	201	Wind	09 - Nebraska	ER	NPPD
GEN-2008-119O	S1399 161kV	60	Wind	09 - Nebraska	ER	OPPD
GEN-2008-123N	Tap Pauline - Hildreth (Rosemont) 115kV	89.66	Wind	09 - Nebraska	ER	NPPD
GEN-2009-040	Tap Smittyville - Knob Hill 115KV	72	Wind	09 - Nebraska	ER	WERE
GEN-2010-051	Hoskins-Twin Church 230kV	200	Wind	09 - Nebraska	ER	NPPD
GEN-2011-018	Steele City 115kV	73.6	Wind	09 - Nebraska	ER/NR	NPPD
GEN-2011-027	Hoskins-Twin Church 230kV	120	Wind	09 - Nebraska	ER/NR	NPPD
GEN-2011-056	Jeffrey 115kV	3.6	Hydro	09 - Nebraska	ER	NPPD
GEN-2011-056A	John 1 115kV	3.6	Hydro	09 - Nebraska	ER	NPPD
GEN-2011-056B	John 2 115kV	4.5	Hydro	09 - Nebraska	ER	NPPD
GEN-2012-021	Terry Bundy Generating Station 115kV	4.8	Gas	09 - Nebraska	ER	LES
GEN-2013-002	Monolith 115kV	50.6	Wind	09 - Nebraska	ER/NR	LES
GEN-2013-008	Steele City 115kV	1.2	Wind	09 - Nebraska	ER	NPPD
GEN-2013-019	Monolith 115kV	73.6	Wind	09 - Nebraska	ER/NR	LES

GEN-2013-032	Antelope 115kV	202.5	Wind	09 - Nebraska	ER	NPPD
GEN-2014-001IS	Sulphur 115kV	103.24	Wind	15 - Eastern South Dakota	ER	WAPA
GEN-2014-004	Steele City 115kV	4	Wind	09 - Nebraska	ER	NPPD
GEN-2014-013	Meadow Grove 230kV	73.5	Wind	09 - Nebraska	ER/NR	NPPD
GEN-2014-031	Meadow Grove 230kV	35.8	Wind	09 - Nebraska	ER/NR	NPPD
GEN-2014-032	Meadow Grove 230kV	10.2	Wind	09 - Nebraska	ER/NR	NPPD
GEN-2014-039	Friend 115kV	73.4	Wind	09 - Nebraska	ER/NR	NPPD
GEN-2015-007	Hoskins 345kV	160	Wind	09 - Nebraska	ER	NPPD
GEN-2015-023	Grand Prairie-Grand Island (Holt County NE) 345kV	300.7	Wind	09 - Nebraska	ER/NR	NPPD
GEN-2015-076	Belden 115kv Substation	158.4	Wind	09 - Nebraska	ER	NPPD
GEN-2015-088	Moore-Pauline 345kV	300	Wind	09 - Nebraska	ER/NR	NPPD

*ERIS/NRIS MW output was the same for all generators unless otherwise noted.

Table A-2: MISO West Higher Queued-Interconnection Projects

MISO Project	Point of Interconnection	Max MW Output	Service	Fuel Type	Area
G058	Valley Queen 12.5kV	3	ERIS	Diesel	SD
G059	Solway CT substation	50	ERIS	Gas	MN
G067	Unknown	2	ERIS	Diesel	ND
G073	Unknown	1	ERIS	Wind	MN
G146	PRRF Substation	4	ERIS	Biomass	MN
G291	Jamestown - Oakes 41.6kV	19	ERIS	Wind	ND
G340	Toronto 41.6kV	1	ERIS	Wind	MN
G380	Rugby 115kV Substation	150	ERIS	Wind	ND
G396	Milbank 41.6kV	2	ERIS	Diesel	SD
G474	OTP Cyrus - Hoffman 41.6kV	20	ERIS	Wind	MN
G481	Belcourt 69kV Substation	1	ERIS	Wind	ND
G619	GRE Tamarac 41 kV Substation	50	NRIS	Wind	MN
G645	Ladish 115 kV Substation	50	NRIS	Coal	ND
G736	Big Stone South 230kV Substation	200	NRIS	Wind	SD
G788	Ladish 115 kV substation	49	NRIS	Coal	ND
J191	Rolling Hills 345 kV Substation	101.2	NRIS	Wind	IA
J262	OTP Jamestown 345/115 kV substation	100	NRIS	Wind	ND
J263	OTP Jamestown 345/115 kV Substation	100	NRIS	Wind	ND
J274	Winterset. - Creston 161 kV	100	NRIS	Wind	IA
J279	Raun 345 kV Substation	30	NRIS	Coal	IA
J285	Proposed O'Brien County 345kV substation	250	NRIS	Wind	IA
J289	161 kV sybstation on Winterset Junction to Creston 161 kV Line	20	NRIS	Wind	IA
J343	161 kv substation on Creston-Clarinda line	150	NRIS	Wind	IA
J411	LeHigh - Raun 345 kV Line	300	NRIS	Wind	IA

J412	LeHigh - Raun 345 kV line	200	NRIS	Wind	IA
J436	Big Stone South - Ellendale 345 kV line	150	ERIS	Wind	SD
J437	Big Stone South - Ellendale 345 kV line	150	ERIS	Wind	SD
J438	Poweshiek-Parnell 161 kV line	170	NRIS	Wind	IA
J442	Big Stone substation via a radial 230 kV line	200	NRIS	Wind	SD
J455	Kossuth â€“ Obrien 345 kV line	300	ERIS	Wind	IA
R101	1.5 miles SW of Red Lake Falls, MN	4.6	NRIS	Wind	MN
R15	Pomeroy 161 kV substation	80	NRIS	Wind	IA
R23	Monona - Carroll 161 kV	100	NRIS	Wind	IA
R26	MEC Cooper - Booneville 345 kV	400	ERIS	Wind	MO
R34	Council Bluffs - Madison County 345 kV	250	NRIS	Wind	IA
R35	Pomeroy Wind Farm site	80		Wind	IA
R38	MEC Council Bluffs - Grimes 345 kV	200	NRIS	Wind	IA
R39	Raun - Lakefield Junction	500	NRIS	Wind	IA
R41	MEC Council Bluffs - Grimes 345 kV	100	NRIS	Wind	IA
R42	Lehigh 345 kV Substation	250	NRIS	Wind	IA
R49	Pomeroy Generating station	12	NRIS	Wind	IA
R65	R34 Expansion	92	NRIS	Wind	IA

Table A-3: SPP Transmission Upgrades Removed

Ref No.	Network Upgrade Removed
1	SPP R Plan • Thedford 345/115/13.8 kV transformer • Gerald Gentleman Station to Thedford 345 kV circuit #1 • Holt County to Thedford 345 kV circuit #1
2	Grand Island to Holt 345kV CT uprate (rating change, using 19ITP rating)

Table A-4: MISO West Current Study Interconnection Projects

GIR	Group #	Capacity	Service	Fuel Type	Area	Proposed Point of Interconnection
J412	09	200	ER/NR	Wind	Nebraska	Raun 345 kV Substation
J455	09	300	ER	Wind	Nebraska	Clay County 345 kV Substation
J436	15	150	ER	Wind	Eastern South Dakota	Big Stone South 345 kV Substation
J437	15	150	ER	Wind	Eastern South Dakota	Big Stone South 345 kV Substation
J442	15	200	ER/NR	Wind	Eastern South Dakota	Big Stone South 230 kV Substation

Appendix B: Dispatch Tables

Table B-1: Higher Queued and Current Study Dispatch

Dispatch Type	Season	Service Type	Renewable in group	Renewable out of group	Conventional in group	Conventional out of group
HVER	**All**	**All**	100%	20%	N/A	N/A
LVER	**Peak**	**All**	20%	20%	100%	100%
NR	**Spring and Light Load**	**ERIS**	80%	20%	Off	Off
		NRIS	100%	20%	100%	20%
	Peak	**ERIS**	20% (solar: 80% in SP)	20% (solar: 80% in SP)	80%	80%
		NRIS	100%	100%	100%	100%

HVER – High Variable Energy Resource Dispatch
LVER – Low Variable Energy Resource Dispatch
N/A – units are not dispatched up from base case amounts
Renewable – Includes wind, solar, and storage
Conventional – Includes nuclear, hydro, coal, cc, CT, oil, waste heat

Table B-2: MISO ER Sink Generators for TDF Analysis

Bus #	Bus Name	ID	Bus #	Bus Name	ID	Bus #	Bus Name	ID
248893	07LCPGD1 13.800	1	350233	1MRNGEN3 13.800	3	608715	INLAND G 13.800	1
248894	07LCPGD2 13.800	1	350234	1MRNGEN4 20.000	4	600026	INV 71G 13.800	1
248895	07LCPGD3 13.800	1	350235	1MRNGEN5 13.800	5	600027	INV 72G 13.800	2
248773	07MEROM5 345.00	1	350236	1MRNGEN6 13.800	6	600028	INV 73G 13.800	3
248903	07RAT_1G 13.500	1	347832	1NEWTON 1 24.000	1	600029	INV 74G 13.800	4
248904	07RAT_2G 13.500	1	347833	1NEWTON 2 24.000	2	600030	INV 75G 13.800	5
248889	07WORTH1 13.800	1	345396	1OSAGE 1&2 13.800	1	600031	INV 76G 13.800	6
248890	07WORTH2 13.800	1	345397	1OSAGE 3&4 13.800	3	256479	IRVING C2.5000	1
251849	08CAY1 18.000	1	345398	1OSAGE 5&6 13.800	5	693787	ISLAND ST PP13.800	G2
251850	08CAY2 18.000	2	345399	1OSAGE 7&8 13.800	7	600051	JANESVL9 23.900	1
251851	08CAYCT4 13.800	4	349966	1PEARL GT 13.800	2	603156	JIMFLS 7 115.00	1
251852	08CONRSV 13.800	1	345441	1PENOGEN1 13.800	1	698617	JOF G 2.4000	1
251853	08DESTEC 18.000	1	345442	1PENOGEN2 13.800	2	681542	JPM 24.000	6
251901	08EDWCT1 18.000	G1	345443	1PENOGEN3 13.800	3	693783	JUNEAU J31 13.800	1
251902	08EDWCT2 18.000	G2	345444	1PENOGEN4 13.800	4	693793	KAU CLP HY 4.1600	H2
251903	08EDWST1 18.000	ST	345501	1PICKVL 1 13.800	1	693792	KAU LCP HY 2.4000	H1
251858	08GALL2 18.000	2	345502	1PICKVL 2 13.800	2	693790	KAU_CITY HY12.4000	H1
251860	08GALL4 18.000	4	345503	1PICKVL 3 13.800	3	693791	KAU_CITY HY22.4000	H2
251861	08GIB1 24.000	1	345504	1PICKVL 4 13.800	4	693789	KAU_RCP HY 2.4000	H1
251862	08GIB2 24.000	2	345505	1PICKVL 5 13.800	5	698963	KBADGRHY 4.1600	H1
251863	08GIB3 24.000	3	345506	1PICKVL 6 13.800	7	256422	KENT CO C13.800	1
251864	08GIB4 24.000	4	349129	1PR STATE G124.500	1	698301	KIL G1 4.0000	1
251865	08GIB5 24.000	5	349130	1PR STATE G224.500	2	699109	KIN HG 13.800	1
251866	08HENRY1 13.800	1	345994	1RCEC G1 13.800	1	600006	KING 31G 20.000	1
251867	08HENRY2 13.800	2	345995	1RCEC G2 13.800	2	635853	KNOXIND8 69.000	4
251868	08HENRY3 13.800	3	345996	1RCEC G3 13.800	3	693823	KRAFT K1 13.800	1
251952	08MADSN1 13.800	1	345997	1RCEC G4 13.800	4	693824	KRAFT K2 13.800	2
251953	08MADSN2 13.800	2	340574	1REID 1 13.800	5	680099	LAFARG_8 69.000	1
251954	08MADSN3 13.800	3	340575	1REID CT 13.800	C	699653	LAKF G9 13.800	9
251955	08MADSN4 13.800	4	347819	1SHELBYCO_U113.800	1	630076	LAKFLDM8 69.000	1
251956	08MADSN5 13.800	5	347823	1SHELBYCO_U213.800	2	699651	LAKFNT1 13.800	6
251957	08MADSN6 13.800	6	347824	1SHELBYCO_U313.800	3	699652	LAKFNT2 13.800	5
251958	08MADSN7 13.800	7	347825	1SHELBYCO_U413.800	4	629072	LANS5 4G 22.000	4
251959	08MADSN8 13.800	8	347826	1SHELBYCO_U513.800	5	259446	LARCH C4.1600	1
251869	08MRKLND 11.500	1	347827	1SHELBYCO_U613.800	6	608702	LASKIN 7 115.00	1
251870	08NBLSV3 13.800	3	347828	1SHELBYCO_U713.800	7	661055	LEWIS71G 13.800	1

251871	08NBLSV4 13.800	4	347829	1SHELBYCO_U813.800	8	613110	LITCHFLD 69.000	10
251872	08NBLSV5 13.800	5	343554	1REYNOLD CT 13.200	1	699625	LITTLE Q H1 0.4800	1
251873	08NOBS1 13.800	1	345670	1RUSH G1 18.000	1	699626	LITTLE Q H2 4.1600	2
251874	08NOBS2 13.800	2	345671	1RUSH G2 18.000	2	699627	LITTLE Q H3 4.1600	3
251878	08VERML1 13.800	1	345756	1SIOUX 1 18.000	H	699628	LITTLE Q H5 0.4800	5
251879	08VERML2 13.800	2	345765	1SIOUX 2 18.000	H	699629	LITTLE Q H6 0.4800	6
251880	08VERML3 13.800	3	349122	1TILTON G1 13.800	1	608850	LITTLEF9 34.500	1
251881	08VERML4 13.800	4	349123	1TILTON G2 13.800	2	605062	LKCRYST8 69.000	1
251882	08VERML5 13.800	5	349124	1TILTON G3 13.800	3	630198	LMCK E 8 69.000	2
251883	08VERML6 13.800	6	349125	1TILTON G4 13.800	4	630197	LMCK W 8 69.000	1
251884	08VERML7 13.800	7	345826	1TRIGENMO 13.800	1	256477	LOUD H2.5000	1
251885	08VERML8 13.800	8	345832	1TS G1 13.800	1	636641	LOUIS31G 24.000	1
251886	08WABR D 2.4000	7A	345841	1TS G2 13.800	2	600017	LSP CT G 13.200	C
251887	08WABR1 13.800	1	345886	1VENCTG 13.800	8	608682	LSPI 9 14.300	1
251888	08WABR2 13.800	2	345882	1VENICE3 15.000	3	600018	LSSTEAMG 13.200	S
251889	08WABR3 13.800	3	345883	1VENICE4 15.000	4	636203	LUNDQST5 161.00	2
251890	08WABR4 13.800	4	345884	1VENICE5 13.800	5	258583	MACKINAW C24.900	1
251892	08WABR5 13.800	5	340576	1WILSON 24.000	1	605063	MADELVL8 69.000	1
251893	08WABR6 24.000	6	349114	1WOOD RIV G413.800	4	603088	MAIN ST7 115.00	1
251894	08WBSHC1 13.800	1	349115	1WOOD RIV G520.000	H	699773	MANSTQ 4.1600	1
251895	08WBSHC3 13.800	3	635822	29 HUBB8 69.000	1	698746	MCCLURE 2.4000	1
251896	08WBSHC5 13.800	5	346573	2AVENA 69.000	1	699105	MCH HG1 4.1600	1
251897	08WHTLD1 13.800	1	343008	2FULTON69 69.000	4	699106	MCH HG2 4.1600	2
251898	08WHTLD2 13.800	2	344805	2JC FAIR 69.000	1	698552	MELISSA 13.800	3
251899	08WHTLD3 13.800	3	345193	2MEXICO UE 69.000	1	605113	MELRSMU8 69.000	1
251900	08WHTLD4 13.800	4	345222	2MOBERLY 69.000	1	605379	MENOMONG 69.000	1
253508	10AB_GT1 13.800	3	345240	2MOREAU 69.000	1	680157	MERRIL_8 69.000	1
253509	10AB_GT2 13.800	4	343003	2PLANT 69.000	5	693616	MERRILL HY 2.3000	1
253506	10ABB_G1 22.000	1	343051	2PLANT2 69.000	7	693527	MEWD CT 13.800	1
253507	10ABB_G2 22.000	2	343040	2UMC 69.000	1	256478	MIO H2.5000	1
253513	10BG_GT1 13.800	1	680014	7MILECRK 69.000	1	600019	MNRIVRG1 13.800	1
253514	10BG_GT2 13.800	2	256421	ADA C13.800	1	608714	MNTC A G 13.800	2
253625	10CAN_G1 6.9000	1	630680	ADM69KV8 69.000	6	608713	MNTC C G 13.800	1
253626	10CAN_G2 6.9000	2	259342	ADRIAN EN C2.4000	1	636761	MOLIN12G 13.800	1
253627	10CAN_G3 6.9000	3	630057	ADRIANM8 69.000	1	636762	MOLIN34G 13.800	3
253502	10CUL_G2 14.400	2	256462	ALCONA H4.8000	1	638090	MONTEZU8 69.000	9
253503	10CUL_G3 22.000	3	693577	ALEXANDR HY 2.3000	1	613160	MORA 69.000	2
253512	10NE_GT 12.500	1	658054	ALEXPLDM 115.00	1	633008	MPW 8G 13.800	8
253591	10WAR_G1 15.000	1	256463	ALLEGAN H4.8000	1	633009	MPW 9G 20.000	9

253592	10WAR_G2 15.000	2	630653	AMANA 69.000	1	629091	MQOKETA9 34.500	1
253593	10WAR_G3 15.000	3	629108	AMES 9 34.500	7	698767	MUNISNG GEN 2.4000	1
253594	10WAR_G4 20.000	4	638001	AMES 8 69.000	7	613170	N BRANCH 69.000	3
255246	17BAILLY-10 13.800	10	629149	ANITA 34.500	3	630373	N CENT8 69.000	1
255234	17BAILLY-7 22.000	7	600020	ANS 72G 13.800	2	630614	N LONDON 69.000	1
255235	17BAILLY-8 22.000	8	600021	ANS 73G 13.800	3	608732	NATIONLG 13.800	1
255236	17MI_CITY-1222.000	12	698925	AP_PPRGT 12.500	GT	693730	NB VIL G 2.4000	1
255238	17SCHAFER-1418.000	14	698914	APP HYD GEN 4.0000	H1	605469	NCENTRL8 69.000	1
255237	17SCHAFER-1522.000	15	698927	APP_PAPR 12.500	S	699552	NEEVIN 18.000	1
255232	17SCHAFER-1724.000	17	680431	ARCAD MU 69.000	1	699071	NEQ HG1 6.9000	1
255233	17SCHAFER-1824.000	18	680064	ARGYLE_8 69.000	1	699072	NEQ HG2 6.9000	2
255249	17SCHAFER-A 13.800	A	629074	ARNOLD1G 22.000	1	630722	NEVADA R 69.000	W
255250	17SCHAFER-B 13.800	B	638051	ATLNTIC8 69.000	1	613190	NEW PRAG 69.000	2
255441	17SGR_CK-CTA18.000	G1	613010	AUSTIN NE G 69.000	1	680132	NEWLIS_8 69.000	1
255442	17SGR_CK-CTB18.000	G2	698655	AUTRAIN 2.4000	1	605079	NEWULMS8 69.000	3
255443	17SGR_CK-STG18.000	S1	658098	BENSONM7 115.00	1	608767	NSM 2ABG 13.800	2
255240	17WCE-GT1 18.000	1	600041	BFT 85G 13.800	5	608762	NSM 3A G 13.800	3
255241	17WCE-GT2 18.000	2	600042	BFT 86G 13.800	6	608765	NSM 3B G 13.800	3
255239	17WCE-ST 18.000	3	600016	BFTG4DSG 13.800	4	608764	NSM B1 G 13.800	2
263758	18BURNIPS U613.800	6	605024	BIGFALL8 69.000	1	699852	NSP 14-1 13.800	1
263757	18BURNIPS U813.800	8	620315	BIGSTN1G 24.000	1	699385	OK C G5 18.000	H
256360	18CMPBL1 16.000	A	693932	BIRON HY G3 0.4800	H3	699386	OK C G6 18.000	H
256339	18CMPBL2 20.000	2	693822	BIRON PM G5 13.200	5	699387	OK C G7 18.000	H
256343	18CMPBL3 18.000	3	693933	BIRON ST 2.4000	H1	699388	OK C G8 18.000	8
256376	18CMPBLP 13.800	A	693819	BIRON ST G1 13.200	1	699111	OLQ HG1 2.3000	1
256370	18COBB1 14.400	1	693820	BIRON ST G3 2.4000	3	699112	OLQ HG2 2.3000	2
256369	18COBB2 14.400	2	693821	BIRON ST G4 4.1600	4	256468	OTTAWA1G C4.1600	1
256371	18COBB3 14.400	3	605013	BLEARTH8 69.000	1	256469	OTTAWA2G C4.1600	2
256344	18COBB4 18.000	4	600012	BLK D72G 13.800	2	629075	OTTUMW1G 24.000	1
256345	18COBB5 18.000	5	600013	BLK D73G 13.800	3	613230	OWATNA 12.500	7
256365	18COVRT1 16.000	G	600014	BLK D74G 18.000	4	698176	PDS G1-4 4.1600	1
256366	18COVRT2 16.000	G	600011	BLK D75G 18.000	5	698177	PDS G5-8 4.1600	2
256367	18COVRT3 16.000	G	600022	BLL 71G 13.800	1	638061	PELLA W8 69.000	1
256357	18COVRT4 16.500	S	600023	BLL 72G 13.800	2	259485	PEOPLES 1C4.1600	1
256358	18COVRT5 16.500	S	600024	BLL 73G 13.800	3	259486	PEOPLES 2C4.1600	1
256359	18COVRT6 16.500	S	600025	BLL 74G 13.800	4	693786	PETENWEL HG 6.9000	1
256377	18FILRCT 13.800	1	600043	BLL C75G 18.000	7	254811	16PETE 1 20.000	1
256379	18GAYL12 13.800	1	600044	BLL C76G 18.000	8	254812	16PETE 2 22.000	2
256380	18GAYL34 13.800	3	608849	BLNCHRD9 34.500	1	254813	16PETE 3 22.000	3

263754	18GAYLORD U113.800	1	613050	BLOOM PR 69.000	2	254814	16PETE 4 22.000	4
263755	18GAYLORD U213.800	2	613051	BLOOM PR NE 69.000	6	693610	PHB 14 13.800	X
263756	18GAYLORD U313.800	3	699969	BLT G6 13.800	6	635801	PHILL 1G 13.800	1
263760	18GD.HAVENG 13.800	2	699968	BLT G7 13.800	7	635802	PHILL 2G 13.800	2
263751	18HERSEY U1013.800	10	608774	BOSWE43G 20.900	3	635803	PHILL 3G 13.800	3
263750	18HERSEY U9 13.800	9	608776	BOSWE71G 14.400	1	699108	PIN HG 2.3000	1
256381	18HILMAN 13.800	1	608777	BOSWE72G 14.400	2	699430	PL PRG1 24.000	1
257522	18INDST7 13.800	7	608852	BRAINRD9 34.500	1	699431	PL PRG2 24.000	2
257523	18INDST8 13.800	8	259517	BRENT RUN 1C4.1600	1	698497	POB GT5 13.800	5
257524	18INDST9 13.800	9	259518	BRENT RUN 2C0.4800	3	698763	PORTAGE CT 12.500	1
257532	18JDYNG3 12.470	3	600080	WPP93-MN 0.4800	W	608667	POTLTCH7 115.00	4
257531	18JDYNG4 12.470	4	630038	BRLGTN28 69.000	1	699453	POWCTG11 18.000	1
257530	18JDYNG5 12.470	5	629071	BURLIN1G 20.000	1	699455	POWCTG12 18.000	1
257533	18JDYNG6 12.470	6	680300	BVR DAM 69.000	1	699457	POWCTG21 18.000	1
263761	18KALK GEN 13.800	1	629070	BVRCH52G 20.000	2	699459	POWCTG22 18.000	1
256382	18KALRIV 13.800	1	600053	BYLSBY9G 12.500	1	699454	POWSTG10 18.000	1
256361	18KARN1A 16.000	A	256466	C&C GEN 1C4.1600	1	699458	POWSTG20 18.000	1
256362	18KARN1B 16.000	B	259339	C&C GEN 2C4.1600	2	629085	PR CRK1G 34.500	1A
256363	18KARN2A 16.000	A	256424	CADCGEN C13.800	1	629066	PR CRK4G 18.000	4
256364	18KARN2B 16.000	B	698611	CAF G 2.3000	1	600003	PR IS31G 20.000	1
256329	18KARN3 26.000	3	698330	CAR G1 4.1600	1	600004	PR IS32G 20.000	2
256330	18KARN4 26.000	4	625430	CASCADE 161.00	1	657904	PRAIRIE8 69.000	1
263765	18KLEBER HYD2.4000	1	680114	CASHTO_8 69.000	1	631017	PRAR CK7 115.00	3
256384	18LIVPK1 13.800	1	698708	CATARACT 2.4000	1	613250	PRESTON 69.000	4
256385	18LIVPK2 13.800	2	635023	CBLUF33G 24.000	3	698776	PRICKET 2.4000	1
256386	18LIVPK3 13.800	3	635024	CBLUF4G 26.000	4	613290	PRINPLNT 69.000	3
256387	18LIVPK4 13.800	4	699277	CCD GT1 13.800	1	699403	PRS GT1 13.800	1
257514	18LOWELL 138.00	1	699278	CCD GT2 13.800	2	699404	PRS GT2 13.800	2
256341	18LUDN34 20.000	3	699279	CCD GT3 13.800	3	699405	PRS GT3 13.800	3
256342	18LUDN56 20.000	5	699280	CCD GT4 13.800	4	699406	PRS GT4 13.800	4
256395	18MCVG10 13.800	0	636302	CCITY S8 69.000	1	698770	PSQI G5 13.800	5
256396	18MCVG11 13.800	1	605378	CEDARFA8 69.000	1	698771	PSQI G6 13.800	6
256397	18MCVG12 13.800	2	657749	CENTER1G 22.000	1	698772	PSQI G7 13.800	7
256398	18MCVG13 13.800	3	657748	CENTER2G 20.000	1	698773	PSQI G8 13.800	8
256399	18MCVG14 13.800	4	680328	CENTRAL_G 69.000	1	698774	PSQI G9 13.800	9
256388	18MCVG3 13.800	3	629083	CGORDO1G 24.900	1	699434	PT BHG1 19.000	1
256389	18MCVG4 13.800	4	699137	CHA1 18 18.000	1	699435	PT BHG2 19.000	2
256390	18MCVG5 13.800	5	699138	CHA2 18 18.000	2	699597	PUL G31 13.800	1
256391	18MCVG6 13.800	6	699139	CHA3 18 18.000	3	699591	PUL G5 14.000	5

256392	18MCVG7 13.800	7	600091	CHB341_2W 0.4800	W	699595	PUL G6 14.000	6
256393	18MCVG8 13.800	8	605348	CHPFALL1G 8 69.000	1	699590	PUL G7 13.800	7
256394	18MCVG9 13.800	9	605407	CHPFALL2G 8 69.000	1	699594	PUL G8 16.000	8
256337	18MCVST1 22.000	1	699124	CKH HG 2.3000	1	699099	PVY HG1 6.9000	1
256578	18MCVST2 22.000	2	605565	CLAMDAM9 34.500	1	699101	PVY HG2 6.9000	2
256400	18MICHP1 13.800	1	608668	CLOQUET7 115.00	3	613300	R.FALLS7 115.00	2
256401	18MICHP2 13.800	2	259383	CLYDE GEN C4.1600	1	605172	RAPIDAN8 69.000	1
256338	18PALISD 22.000	1	699152	COL G1 22.000	1	613320	REDWD FL 69.000	1
256403	18PLYMO1 13.800	1	699153	COL G2 22.000	2	605181	REDWING8 69.000	1
256404	18PLYMO2 13.800	2	600064	COLVILL G 18.000	2	263836	REO BUS A 13.800	1C
256405	18PLYMO3 13.800	3	600063	COLVILL1 G 18.000	1	263837	REO BUS B 13.800	2C
256406	18PLYMO4 13.800	4	256476	COOKE 1H2.5000	1	603129	RICH_VA7 115.00	1
256407	18PLYMO5 13.800	5	603154	CORNELL HYD7115.00	1	699131	RIV NG1 16.000	ST
256408	18PLYMO6 13.800	6	636412	CORVL12G 13.800	1	699132	RIV NG2 18.000	C1
256409	18PLYMO7 13.800	7	636413	CORVL34G 13.800	3	699133	RIV NG3 18.000	C2
256411	18PLYMO8 13.800	8	661015	COYOTE1G 24.000	1	631189	RIVER RUN5 161.00	A
256410	18PLYMO9 13.800	9	629134	CRESTN_9 34.500	3	600007	RIVRS77G 16.000	7
257525	18PROJ1G 13.800	1	256458	CROTON H7.5000	1	600070	RIVRSIDEG9 718.000	9
256351	18RENAS1 18.000	1	699624	CUSTER CT1 13.800	1	600071	RIVRSIDG10 718.000	10
256352	18RENAS2 18.000	2	693679	CYPRES DVAR 34.500	A	636655	RIVSID5G 15.000	5
256353	18RENAS3 18.000	3	605506	DANBURY8 69.000	1	256457	ROGERS H7.2000	1
256354	18RENAS4 18.000	4	638002	DAYTON8 69.000	G1	629017	ROQ 13.2 13.200	2
256412	18THTFD1 13.800	1	630290	DBQ 8TH8 69.000	3	629055	ROQ GT 9 13.800	1
256413	18THTFD2 13.800	2	699993	DE PERE 18.000	1	699042	ROR G3 13.800	3
256414	18THTFD3 13.800	3	605527	DELLS 8 69.000	1	699043	ROR G5 13.800	5
256415	18THTFD4 13.800	4	630337	DERCREK8 69.000	1	699044	ROR G6 13.800	6
263764	18TOWER HYD 2.4000	1	699718	DETRDB 4.1600	1	693771	ROTHCH GEN 13.800	1
263752	18TOWER U4 13.200	4	699714	DFTR13 2.4000	1	635791	RVHLS12G 13.200	1
263753	18VESTABURGG13.800	1	699715	DFTR45 4.1600	1	635792	RVHLS34G 13.200	3
256383	18VIKLNC 13.800	1	693775	DIESEL 4 CT 12.470	4	635793	RVHLS56G 13.200	5
256355	18WEDCK7 18.000	7	658064	DLFRONTST7 115.00	1	635794	RVHLS78G 13.200	7
256356	18WEDCK8 18.000	8	608844	DOGLAKE9 34.500	1	629141	SANDSPR9 34.500	4
256418	18WEDCKP 13.800	A	605534	DOUGHTY8 69.000	1	693649	SANDSTON 6.9000	1
256372	18WHITN1 14.400	1	693815	DU BAY HG 4.1600	H1	256481	SANFORD H2.4000	1
256373	18WHITN2 14.400	2	256484	EDENVIL H2.3000	1	658074	SARATOG7 115.00	1
256368	18WHITN3 15.500	3	699207	EDG G4 22.000	4	605551	SAXONFL9 34.500	1
263305	18ZEELANDG 69.000	1	699208	EDG G5 22.000	5	636760	SB P 8 69.000	4
256346	18ZELND1 18.000	A	636222	ELFARMG1 13.200	1	608763	SBAYP 1G 13.800	1

256347	18ZELND2 18.000	B	636223	ELFARMG2 13.200	2	608766	SBAYP 2G 13.800	2
256348	18ZELND3 18.000	A	636224	ELFARMG3 13.200	3	259381	SCENIC VW C4.1600	1
256349	18ZELND4 18.000	B	680516	ELKMDGEN 13.800	1	635839	SE124THG 13.200	1
256350	18ZELND5 18.000	C	699389	ELM ROAD G1 25.000	1	699866	SEC CT1 18.000	1
264853	19ANITA 41.570	1	699390	ELM ROAD G2 25.000	2	699867	SEC CT2 18.000	2
264856	19BLRP2 26.000	2	693788	ELM STRET PP12.000	GT	256482	SECORD H2.4000	1
264513	19BYRON 41.570	1	680120	ELROY MN 69.000	1	699190	SFL G1 13.800	1
264875	19CC15 15.500	5	629067	EMERYGT1 18.000	1	699191	SFL G2 13.800	2
264876	19CC16 15.500	6	629068	EMERYGT2 18.000	1	699192	SFL G3 13.800	3
264500	19COLFX 41.570	11	629069	EMERYST1 18.000	1	699193	SFL G4 13.800	4
264501	19DIGIA 41.570	1	263834	ERIC GEN 18.000	1	605250	SHAKOPE8 69.000	1
264854	19ENFPP 22.000	1	698721	ESC STM 12.500	1	635050	SHENAND8 69.000	3
265145	19ENFPP2 120.00	11	699737	ESHDR1 4.1600	1	693772	SHIRAS PT5A 12.470	1
264504	19ESSEX 24.000	11	699738	ESHDR2 4.1600	1	693773	SHIRAS PT5B 13.800	3
264758	19GRNECP 345.00	P1	699739	ESHDR3 4.1600	1	256420	SHOCKLEY C13.800	1
264505	19HANCK 41.570	11	699740	ESHDR4 4.1600	1	630674	SIBLEY 69.000	3
264570	19HANCK1 120.00	12	608723	ETCO G 13.800	1	625440	SILVER L 161.00	1
264506	19HURHY 41.570	1	613080	FAIRMONT 69.000	1	605081	SLPY MU8 69.000	1
265073	19J025 120.00	1	605086	FARFXNU8 69.000	1	256485	SMALLWOOD H2.3000	1
264878	19JUDD1 13.800	1	699822	FCH 14-1 13.800	1	620285	SOLWAY 7 115.00	1
264879	19JUDD2 13.800	1	699823	FCH 14-2 13.800	2	613390	SPRING V 69.000	2
264880	19JUDD3 13.800	1	693600	FEM14-3 13.800	X	698109	SPU G1 13.800	1
264881	19JUDD4 13.800	1	600038	FEN 83G 13.800	3	605394	ST CROIG 161.00	1
264871	19MON1 26.000	1	600039	FEN 84G 13.800	4	613401	ST PETERBWY 13.800	1
264759	19MON12P 345.00	11	680408	FENNIM_8 69.000	1	693817	ST POINT G1 4.1600	1
264872	19MON2 26.000	2	600050	FEP CT G 18.000	1	693816	ST POINT HG 2.4000	HY
264873	19MON3 26.000	3	600125	FEP ST G 13.800	2	603035	STCLOUD7 115.00	1
264874	19MON4 26.000	4	256483	FIVE CHAN H2.4000	1	605075	STJ EAS8 69.000	1
264625	19NEAST 120.00	12	680334	FLAMBEAU 69.000	1	680001	STONE 69.000	1
264507	19NEAST 24.000	11	605465	FLAMSTN9 34.500	1	254845	16STOUT5 13.800	5
264508	19OLIVR 41.570	11	608666	FONDULAC 115.00	1	254846	16STOUT6 13.800	6
264509	19PLACD 41.570	12	256461	FOOTE 3H4.8000	1	254847	16STOUT7 22.000	7
264510	19PUTNM 41.570	11	680303	FOREST C 69.000	1	254851	16STOCT 13.800	1G
264640	19REMER1 120.00	11	699557	FOXENCT1 18.000	1	254854	16STOCT4 13.800	4G
264702	19RESOURCE 120.00	1	699558	FOXENCT2 18.000	1	254855	16STOCT5 13.800	5G
264986	19RR11 120.00	11	699559	FOXENST1 18.000	1	254856	16STOCT6 18.000	6G
264866	19RRG2 18.000	2	629046	FOXLK53G 13.800	3	600040	STP CO1G 13.800	1
264867	19RRG3 18.000	3	629051	FOXLKG19 13.800	1	256426	STRAITS P13.800	1
264862	19SC1 15.500	1	605500	FREDRICG 34.500	1	638036	STRTR P8 69.000	6

264756	19SC123P 120.00	11	259463	FREMONTGEN C0.4800	1	605552	SUPERFL9 34.500	1
264861	19SC2 15.500	2	605317	FRENCH G 69.000	1	699835	SYC 14-1 13.800	1
264860	19SC3 15.500	3	635691	GDMECGT1 18.000	1	699836	SYC 14-2 13.800	2
264859	19SC4 15.500	4	635692	GDMECGT2 18.000	2	635708	SYCAMRG1 13.800	1
264857	19SC7 18.000	7	635693	GDMECST3 18.000	3	635709	SYCAMRG2 13.800	2
265165	19SIGEL 34.500	W1	638091	GENESEO8 69.000	8	699844	SYN14-1 13.800	X
264511	19SLOCM 24.000	11	681522	GENOA53G 24.000	3	605391	T BEARTG 69.000	1
264512	19SUPER 41.570	11	254801	16GEORG1 13.800	1G	608693	TAC HBRG1 13.200	1
264868	19TC8 15.500	8	254802	16GEORG2 13.800	2G	608901	TAC HBRG2 13.200	2
264870	19TC9 22.000	9	254803	16GEORG3 13.800	3G	608902	TAC HBRG3 13.200	3
264796	19WALTZ 41.570	1	254804	16GEORG4 13.800	4G	608800	TACRIDG9 34.500	1
264846	19WAYER 41.570	1	699323	GER GT1 13.800	1	698961	THILMANY 12.500	1
264514	19WILMT 41.570	11	699324	GER GT2 13.800	2	608665	THOMSON7 115.00	6
264985	19WTRMN5 120.00	P	699325	GER GT3 13.800	3	680545	TIMBERLINE_G69.000	1
349993	1ALSEY G1-2 13.800	1	699326	GER GT4 13.800	4	256456	TIPPY H7.5000	1
349994	1ALSEY G3-G413.800	3	699322	GER GT5 13.800	5	630813	TIPTONM8 69.000	1
349995	1ALSEY G5 13.800	5	698724	GLADSTN 12.500	1	693628	TKY14-2 13.800	X
344061	1AUDRN G1 13.800	1	661100	GLNDCT1G 13.800	1	693557	TOMAHAWK HG 2.3000	1
344062	1AUDRN G2 13.800	2	661101	GLNDCT2G 13.800	2	629132	TRAER 9 34.500	6
344063	1AUDRN G3 13.800	3	629110	GR JCT 9 34.500	2	698070	TUR G4 13.800	4
344064	1AUDRN G4 13.800	4	693896	GR RAPD1 2.4000	1	638033	UNI GEN8 69.000	9
344065	1AUDRN G5 13.800	5	693899	GR RAPD2 2.4000	4	263819	UNIT1 13.200	1
344066	1AUDRN G6 13.800	6	613090	GRAND MA 69.000	1	263820	UNIT2 13.200	1
344067	1AUDRN G7 13.800	7	256467	GRANDBL G C4.1600	1	263821	UNIT3 13.200	1
344068	1AUDRN G8 13.800	8	259442	GRANDBL N C4.1600	1	263822	UNIT4 13.200	1
349126	1BALDWIN G1 20.000	1	259340	GRANGER 2C14.400	1	263823	UNIT5 13.200	1
349127	1BALDWIN G2 18.000	2	256423	GRAYLING C13.800	1	263824	UNIT6 13.200	1
349128	1BALDWIN G3 24.000	3	615091	GRE-ARROWHDG13.800	1	699514	UNIV GT 13.800	1
344225	1CAL G1 25.000	1	615051	GRE-CAMBRDG869.000	1	699515	UNIV ST 13.800	2
343018	1CEC 1 13.800	1	615052	GRE-CGS 82G16.000	1	699747	USHDRO 4.1600	3A
343019	1CEC 2 13.800	3	615001	GRE-COAL 41G22.000	1	699745	USHYDO 13.800	1
349101	1CLINTON G1 22.000	1	615002	GRE-COAL 42G22.000	2	699748	USHYDO 4.1600	10
346896	1COFFEN 1 22.000	1	615020	GRE-ELK RIV869.000	1	699506	VALLYG1 13.800	1
346897	1COFFEN 2 24.000	2	619903	GRE-ELKRNTH869.000	1	699507	VALLYG2 13.800	2
340579	1COLEMAN1 18.000	1	619900	GRE-ELKRWS1869.000	1	256473	VENICE C4.1600	2
340580	1COLEMAN2 18.000	2	259341	GREENMDW C0.4800	1	256474	VENICE W 1C4.1600	1
340581	1COLEMAN3 18.000	3	615065	GRE-HASTNGSG69.000	1	256470	VENICE W 2C4.1600	0

343549	1DALMAN 31 13.200	1	615066	GRE-LAKEMARG69.000	1	698807	VIC 1 11 11.500	1
343550	1DALMAN 32 13.200	2	615041	GRE-LGS 31G13.800	1	698808	VIC A 11 11.500	1
343551	1DALMAN 33 19.000	3	615042	GRE-LGS 32G13.800	2	259423	VIENNA C4.1600	1
343552	1DALMAN 41 18.000	4	615043	GRE-LGS 33G13.800	3	256425	VIKNG MCB C13.800	1
349633	1DCK GEN1 22.000	1	615044	GRE-LGS 34G13.800	4	630895	VINTON MUNI869.000	1
349630	1EDE GEN1 16.500	1	615045	GRE-LGS 35G13.800	5	680102	VIOLA_8 69.000	1
349631	1EDE GEN2 20.000	1	615046	GRE-LGS 36G13.800	6	698790	WARDEN 1 13.800	1
349632	1EDE GEN3 22.000	1	615070	GRE-MAPLE 1G69.000	1	693594	WAUSAU HG 4.1600	1
343555	1FACTORY CT 13.200	1	619925	GRE-MOOSELK869.000	1	638082	WAVRLYS8 69.000	2
347112	1GIBSN G1 13.800	1	619926	GRE-MOOSEMN869.000	1	699022	WAY HG1 4.1600	1
347113	1GIBSN G2 13.800	2	615031	GRE-PVS 51G16.000	1	699180	WCCF CT1 13.800	1
345998	1GOSCK 1 13.800	1	615032	GRE-PVS 52G16.000	2	699181	WCCF CT2 13.800	1
345999	1GOSCK 2 13.800	2	615033	GRE-PVS 53G13.800	3	699182	WCCF STM 13.800	1
346000	1GOSCK 3 13.800	3	615080	GRE-ROCKLK1G69.000	1	256459	WEBBER 1H7.2000	1
346001	1GOSCK 4 13.800	4	615060	GRE-ST BONI869.000	1	256480	WEBBER 2H2.5000	2
346002	1GOSCK 5 13.800	5	615010	GRE-STANT41G18.000	1	613410	WELLS 69.000	1
346003	1GOSCK 6 13.800	6	693784	GRFTHR F G1 6.9000	1	699824	WEM 34 13.800	1
340572	1GREEN 1 21.000	1	693785	GRFTHR F G2 6.9000	2	699655	WEM G31 13.800	1
340573	1GREEN 2 21.000	2	605053	GRNFLCY8 69.000	1	699660	WEM G32 13.800	2
347170	1GRTW 1 18.000	1	630399	GRNL CT8 69.000	1	699661	WEM G33 13.800	3
347171	1GRTW 2 18.000	2	600126	GRNT CTY 1G 13.800	1	699679	WES G1 13.800	1
347168	1GRTW 3 13.800	3	600127	GRNT CTY 2G 13.800	3	699680	WES G2 13.800	2
347169	1GRTW 4 13.800	4	605514	GRNTS NG 69.000	1	699678	WES G3 22.000	3
349121	1HAVANA G6 20.000	6	638032	GT SUB 8 69.000	1	699682	WES G31 13.800	Y
349106	1HENNEPIN G113.800	1	630266	HAHN 8 69.000	1	699681	WES G32 13.800	X
349107	1HENNEPIN G215.500	H	629084	HANCWIND 25.000	1	699662	WES G4 19.000	4
340577	1HMP&L 1 18.000	3	256455	HARDY H7.5000	1	630506	WEST LIB 69.000	1
340578	1HMP&L 2 18.000	4	605264	HASTING8 69.000	1	630063	WESTBKM8 69.000	1
347229	1HOLLANDU1 18.000	1	605308	HATFLD 8 69.000	1	693625	WGA14-1 13.800	X
347230	1HOLLANDU2 18.000	2	605435	HAYWAR G 69.000	1	605431	WHITE G 69.000	1
347231	1HOLLANDU3 18.000	3	699024	HEM HG1 4.1600	1	258546	WHITEFTHR C4.1600	1
343553	1INTSTA CT 13.800	1	600128	HERC G 13.800	1	256419	WHITING P13.800	A
344860	1KEOK 7 13.800	7	661044	HESKET1G 13.800	1	698556	WHR HG 2.3000	1
344863	1KEOK 10 13.800	10	661045	HESKET2G 13.800	2	600032	WHT 51G 13.800	1
344864	1KEOK 12 13.800	12	608676	HIBBARD7 115.00	3	600033	WHT 52G 13.800	2
344861	1KEOK 1-4 13.800	1	608729	HIBBTACG 13.800	1	600034	WHT 53G 13.800	3
344862	1KEOK 5-6 13.800	5	693593	HIGH FLS HG 2.3000	1	600035	WHT 54G 13.800	4

344876	1KNMDY G1 13.800	1	693606	HKP 14-2 13.800	X	600036	WHT 55G 13.800	5
344877	1KNMDY G2 13.800	2	256460	HODENPYL H7.2000	1	600037	WHT 56G 13.800	6
344894	1LAB G1 20.000	1	698733	HOIST 2.4000	H2	605012	WILMART8 69.000	1
344895	1LAB G2 20.000	2	600129	HOLCOMB G 6.9000	1	608861	WINTON 9 46.000	1
344896	1LAB G3 20.000	3	620223	HOOT LK7 115.00	4	693936	WIS RVR 2.4000	1
344897	1LAB G4 20.000	4	620323	HOOTLK2G 13.800	2	605349	WISSOTAG 69.000	1
349751	1MEDINA1 13.800	1	620324	HOOTLK3G 13.800	3	699830	WMD14-9 13.800	X
349752	1MEDINA2 13.800	3	693818	HOT POND G2 13.800	1	619990	WMU-WILMR E869.000	5
345132	1MER 1 16.500	1	619954	HUC-HUTCHPK869.000	1	619985	WMU-WILMRMN869.000	1
345140	1MER 2 16.500	2	619953	HUC-HUTCHPT869.000	2	619986	WMU-WILMRSW869.000	4
345148	1MER 3 16.000	H	603139	HURLEY 7 115.00	1	698798	WPINE M 13.800	1
345156	1MER 4 18.000	H	693779	HYDRO MBLP 7.8000	H1	693935	WR HYDRO 2.4000	H1
345164	1MER 5 13.800	5	629144	IA JCT 2 34.500	1	693623	WTN14-1 13.800	X
345172	1MER 6 13.800	6	625420	IBM 161.00	1	259447	ZACHARY C4.1600	1
350231	1MRNGEN1 13.800	1	608757	IMTRA-2G 2.3000	1	259374	ZEELNDFRM C4.1600	1
350232	1MRNGEN2 13.800	2	638076	INDMUNI8 69.000	1	625425	ZUMBRO R 161.00	1

Table B-3: MISO NR Sink Generators for TDF Analysis – J412 (MEC)

Bus #	Bus Name	ID	Bus #	Bus Name	ID	Bus #	Bus Name	ID
635020	ATCHSNW1 0.6900	W	635792	RVHLS34G 13.200	3	636412	CORVL12G 13.800	1
635023	CBLUF33G 24.000	3	635792	RVHLS34G 13.200	3	636413	CORVL34G 13.800	3
635024	CBLUF4G 26.000	4	635793	RVHLS56G 13.200	5	636413	CORVL34G 13.800	3
635050	SHENAND8 69.000	3	635793	RVHLS56G 13.200	5	636641	LOUIS31G 24.000	1
635059	ADAMS W1 0.6000	W	635794	RVHLS78G 13.200	7	636655	RIVSID5G 15.000	5
635102	RLHILLSW0 0.6900	W	635794	RVHLS78G 13.200	7	636760	SB P 8 69.000	4
635213	NEAL 3G 22.000	3	635801	PHILL 1G 13.800	1	636761	MOLIN12G 13.800	1
635214	NEAL 4G 24.000	4	635802	PHILL 2G 13.800	2	636761	MOLIN12G 13.800	1
635215	IDA GRV W1 0.6900	W	635803	PHILL 3G 13.800	3	636762	MOLIN34G 13.800	3
635216	IDA GRV W2 0.6900	W	635822	29 HUBB8 69.000	1	636762	MOLIN34G 13.800	3
635216	IDA GRV W2 0.6900	W	635839	SE124THG 13.200	1	638001	AMES 8 69.000	7
635414	OBRIEN W1 0.6900	W	635839	SE124THG 13.200	1	638001	AMES 8 69.000	7
635415	OBRIEN W2 0.6900	W	635853	KNOXIND8 69.000	4	638002	DAYTON8 69.000	G1
635648	DEY415 W 0.6000	W	636035	POCHNTG3 0.5750	W	638002	DAYTON8 69.000	G1
635691	GDMECGT1 18.000	1	636203	LUNDQST5 161.00	2	638032	GT SUB 8 69.000	1
635692	GDMECGT2 18.000	2	636222	ELFARMG1 13.200	1	638032	GT SUB 8 69.000	1
635693	GDMECST3 18.000	3	636223	ELFARMG2 13.200	2	638033	UNI GEN8 69.000	9
635708	SYCAMRG1 13.800	1	636224	ELFARMG3 13.200	3	638036	STRTR P8 69.000	6
635709	SYCAMRG2 13.800	2	636302	CCITY S8 69.000	1	638036	STRTR P8 69.000	6
635791	RVHLS12G 13.200	1	636302	CCITY S8 69.000	1	638061	PELLA W8 69.000	1
635791	RVHLS12G 13.200	1	636412	CORVL12G 13.800	1	638091	GENESEO8 69.000	8

Table B-4: MISO NR Sink Generators for TDF Analysis – J442 (OTP)

Bus #	Bus Name	ID	Bus #	Bus Name	ID	Bus #	Bus Name	ID
615132	G619TAMW 0.6000	W	620223	HOOT LK7 115.00	4	657748	CENTER2G 20.000	1
620101	G736 CRN RD10.6000	W	620285	SOLWAY 7 115.00	1	657749	CENTER1G 22.000	1
620115	HRDLKGEN 0.6000	1	620315	BIGSTN1G 24.000	1	657904	PRAIRIE8 69.000	1
620115	HRDLKGEN 0.6000	1	620857	LKPRSTN9 41.600	1	657964	ASH2GEN9 0.5750	1
620115	HRDLKGEN 0.6000	1	657601	L2GEN 9 0.5750	1	657985	ASH1GEN9 0.5750	1
620115	HRDLKGEN 0.6000	1	657705	DRAYTON7 115.00	X	658064	DLFRONTST7 115.00	1
620115	HRDLKGEN 0.6000	1	657737	ASH3GEN9 0.6900	1	658098	BENSONM7 115.00	1
620172	JAMESPK9 41.600	1	657745	MPC02100GEN90.6900	1	661015	COYOTE1G 24.000	1
620172	JAMESPK9 41.600	1						

Appendix C: NRIS Thermal Results

Table C-1: NRIS Thermal Constraints

Case	Monitored Facility	Rating	Areas Name	Bench Case Final %Loading	Study Case Final %Loading	Cont Event Facility	J442
							200 MW
00NR-18SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	99.9	108.76	[XEL] 601031 BRKNGCO3 345 601077 HAWKSNEST 3 345 1	12.48%
00NR-18SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	101.71	110.65	[XEL] 601048 LYON CO 3 345 601077 HAWKSNEST 3 345 1	12.48%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.69	100.48	[NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z	10.11%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.95	100.56	[NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [WAPA/NPPD] 640510 HOLT.CO3 345 653871 GR ISLD-LNX3 345 1	10.11%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.96	100.57	[WAPA/NPPD] 640510 HOLT.CO3 345 653871 GR ISLD-LNX3 345 1	10.11%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD] 640200 GR ISLD4 230 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 643071 GR ISLD T6 9 13.8 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2 [NPPD] 640200 GR ISLD4 230 997427 GI KU1B 230 2 [NPPD] 653316 GR ISL29 13.8 997427 GI KU1B 230 2 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 640200 GR ISLD4 230 997428 GI KU1A 230 1	10.11%

						[NPPD] 653314 GR ISL19 13.8 997428 GI KU1A 230 1 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z	
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD]653571 GR ISLD3 345 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1	10.11%

						[NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD]653571 GR ISLD3 345 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z	10.11%

						[NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1	10.11%

						[NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.47	101.05	[NPPD]653571 GR ISLD3 345 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A	10.11%

						230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	103.43	112.13	[XEL] 601031 BRKNGCO3 345 601077 HAWKSNEST 3 345 1	12.37%
00NR-21SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	105.23	114.03	[XEL] 601048 LYON CO 3 345 601077 HAWKSNEST 3 345 1	12.37%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.13	100	[XEL] 601001 FORBES 2 500 601017 CHIS-N 2 500 1	10.07%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.63	100.05	[WAPA] 652530 WATERTN4 230 652582 APPLEDORN 4 230 1	10.30%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.7	100.09	[XEL/MGE] 601044 BRIGGS RD 3 345 694098 NMA B5 345 345 1	10.24%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.84	100.15	[WAPA] 652509 FTRANDL4 230 652526 UTICAJC4 230 1	10.15%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.6	100.15	[XEL] 615529 GRE-PANTHER4 230 619940 HUC-MCLEOD 4 230 1	10.48%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.41	100.28	[OTP] 620314 BIGSTON4 230 620325 BROWNSV4 230 1	11.84%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.88	100.28	[WAPA] 652509 FTRANDL4 230 652516 LAKPLAT4 230 1	10.17%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.69	100.4	[XEL] 601002 ADAMS 3 345 615306 GRE-PL VLLY3 345 1	10.22%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.08	100.47	[WAPA] 652507 FTTHOMP4 230 652516 LAKPLAT4 230 1	10.17%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.19	100.48	[NPPD] 640139 COOPER 3 345 640009 COOPER1G 22.0 1	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.19	100.48	[NPPD] 640139 COOPER 3 345 640009 COOPER1G 22.0 1	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.1	100.49	[WAPA] 652507 FTTHOMP4 230 652509 FTRANDL4 230 1	10.16%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.05	100.52	[OTP] 620329 WAHPETN4 230 658109 FERGSFL4 230 1	10.46%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.21	100.56	[XEL] 601039 NROC 3 345 601044 BRIGGS RD 3 345 1	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.31	100.61	[WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.31	100.61	[WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.09	100.63	[XEL] 602009 MNVLTAP4 230 615529 GRE-PANTHER4 230 1	10.49%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	92.73	100.63	[OTP/WAPA] 620314 BIGSTON4 230 652503 BLAIR 4 230 1	11.58%

00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.11	100.68	[XEL] 602008 MINVALT4 230 602009 MNVLTAP4 230 1 [XEL] 602009 MNVLTAP4 230 615529 GRE-PANTHER4 230 1 [XEL/WAPA] 602009 MNVLTAP4 230 652550 GRANITF4 230 1	10.50%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.17	100.71	[WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.17	100.71	[WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.17	100.72	[WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.17	100.72	[WAPA] 652273 FTTHMP19 13.8 997456 FT2 KU1A 230 1 [WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.17	100.72	[WAPA] 652274 FTTHMP29 13.8 997455 FT2 KU1B 230 1 [WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.73	[WAPA] 652273 FTTHMP19 13.8 997456 FT2 KU1A 230 1 [WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z [WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1 [WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z	9.63%

00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.73	[WAPA] 652273 FTTHMP19 13.8 997456 FT2 KU1A 230 1 [WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z [WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1 [WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.73	[WAPA] 652274 FTTHMP29 13.8 997455 FT2 KU1B 230 1 [WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z [WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1 [WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.73	[WAPA] 652273 FTTHMP19 13.8 997456 FT2 KU1A 230 1 [WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z [WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1 [WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.73	[WAPA] 652274 FTTHMP29 13.8 997455 FT2 KU1B 230 1 [WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z [WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1 [WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.73	[WAPA] 652274 FTTHMP29 13.8 997455 FT2 KU1B 230 1	9.63%

						[WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z [WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1 [WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.73	[WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1 [WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z [WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.73	[WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z [WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1 [WAPA] 659105 LELANDO3 345 659424 LELAND2-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.16	100.73	[WAPA] 652532 GR PRAIRIE 3 345 652833 GRPRAR2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1 [WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.38	100.73	[WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z [WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.74	[WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.74	[WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.74	[WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z	9.63%

00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.74	[WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-LNX3 345 Z	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.17	100.75	[WAPA] 652532 GR PRAIRIE 3 345 652833 GRPRAR2-LNX3 345 Z	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.52	100.77	[MEC] 635000 CBLUFFS3 345 635023 CBLUF33G 24.0 1	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.5	100.86	[WAPA] 652806 FTTHOM1-LNX3 345 659424 LELAND2-LNX3 345 1	9.63%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.29	100.89	[WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.52	100.92	[XEL] 603013 PIPESTN7 115 603016 SPLT RK7 115 1	10.37%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.39	100.94	[WAPA] 652474 AURORA 7 115 652505 FLANDRU7 115 1	10.56%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.62	101.01	[MP/WPS] 608615 ARROWHD4 230 699448 AWHD PST 230 1	10.19%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.83	101.08	[MEC] 635000 CBLUFFS3 345 635024 CBLUF4G 26.0 1	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.6	101.11	[XEL/ALTW] 601002 ADAMS 3 345 631144 MITCHLCO3 345 1	10.23%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.85	101.26	[WAPA] 652504 BROOKNG7 115 652538 WHITE 7 115 1	10.47%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.75	101.29	[XEL/ALTE] 601028 EAU CL 3 345 694003 ARPIN B4 345 1	10.23%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.96	101.37	[XEL/WAPA] 601031 BRKNGCO3 345 652537 WHITE 3 345 2 [WAPA] 652537 WHITE 3 345 997443 WHT KU1A 115 1 [WAPA] 652538 WHITE 7 115 997443 WHT KU1A 115 1 [WAPA] 652293 WHITE 9 13.8 997443 WHT KU1A 115 1	10.46%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.96	101.37	[XEL/WAPA] 601031 BRKNGCO3 345 652537 WHITE 3 345 1 [WAPA] 652537 WHITE 3 345 997443 WHT KU1A 115 1 [WAPA] 652538 WHITE 7 115 997443 WHT KU1A 115 1	10.46%

						[WAPA] 652293 WHITE 9 13.8 997443 WHT KU1A 115 1	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.99	101.4	[WAPA] 652537 WHITE 3 345 997443 WHT KU1A 115 1 [WAPA] 652538 WHITE 7 115 997443 WHT KU1A 115 1 [WAPA] 652293 WHITE 9 13.8 997443 WHT KU1A 115 1	10.47%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.05	101.41	[WAPA] 652523 SIOUXFL4 230 652606 LETCHER4 230 1	10.05%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.22	101.51	[XEL] 600020 ANS 72G 13.8 997966 ANS 1 13.8 2 [XEL] 603200 ANSON 7 115 997966 ANS 1 13.8 2 [XEL] 600021 ANS 73G 13.8 997966 ANS 1 13.8 2	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.22	101.51	[XEL] 603016 SPLT RK7 115 603200 ANSON 7 115 1	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.94	101.69	[OTP] 620314 BIGSTON4 230 997788 230/115_8 115 1 [OTP] 620214 BIGSTON7 115 997788 230/115_8 115 1 [OTP] 620316 BIGSTON9 13.8 997788 230/115_8 115 1	11.10%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	93.93	101.7	[XEL] 603134 BUFFRID7 115 603191 YANKEE 7 115 1	10.84%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.29	101.75	[XEL] 603180 CHANRMB7 115 603195 FENTON 7 115 1	10.42%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.07	101.78	[WAPA] 652503 BLAIR 4 230 652550 GRANITF4 230 1	10.96%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.31	101.89	[XEL] 601048 LYON CO 3 345 615643 GRE-CEDARMT3 345 1	10.54%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.33	101.92	[XEL] 601048 LYON CO 3 345 615643 GRE-CEDARMT3 345 2	10.54%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.47	102.03	[WAPA] 652474 AURORA 7 115 652504 BROOKNG7 115 1	10.56%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.75	102.03	[XEL] 603264 PROSE WIND7 115 603265 PROSE CAP7 115 1	10.25%

00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.75	102.03	[XEL] 603016 SPLT RK7 115 603265 PROSE CAP7 115 1	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.09	102.25	[MEC] 635200 RAUN 3 345 635213 NEAL 3G 22.0 1	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.08	102.45	[XEL] 601014 AS KING3 345 601028 EAU CL 3 345 1	10.23%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.21	102.51	[WAPA] 652529 WATERTN3 345 997446 WT2 KU1A 230 1 [WAPA] 652530 WATERTN4 230 997446 WT2 KU1A 230 1 [WAPA] 652237 WATERT19 13.8 997446 WT2 KU1A 230 1	9.99%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.13	102.54	[WAPA] 652607 WESSINGTON 4 230 659122 STORLA 4 230 1	10.10%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.93	102.6	[XEL] 601050 HELENA 3 345 615643 GRE-CEDARMT3 345 1	10.64%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.95	102.63	[XEL] 601050 HELENA 3 345 615643 GRE-CEDARMT3 345 2	10.64%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.26	102.64	[WAPA] 652507 FTTHOMP4 230 652606 LETCHER4 230 1	10.02%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.24	102.66	[WAPA] 652513 HANLON 4 230 652523 SIOUXFL4 230 1	10.00%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	94.92	102.77	[ALTW] 631139 HAZLTON3 345 631144 MITCHLCO3 345 1	10.23%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.45	103.05	[WAPA] 652506 FTTHOMP3 345 997456 FT2 KU1A 230 1 [WAPA] 652507 FTTHOMP4 230 997456 FT2 KU1A 230 1 [WAPA] 652273 FTTHMP19 13.8 997456 FT2 KU1A 230 1 [WAPA] 652506 FTTHOMP3 345 997455 FT2 KU1B 230 1 [WAPA] 652507 FTTHOMP4 230 997455 FT2 KU1B 230 1 [WAPA] 652274 FTTHMP29 13.8 997455 FT2 KU1B 230 1 [WAPA] 652506 FTTHOMP3 345 652806 FTTHOM1-	9.59%

						LNX3 345 Z [WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.92	103.1	[MEC] 635200 RAUN 3 345 635214 NEAL 4G 24.0 1	10.25%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.9	103.5	[WAPA] 652273 FTTHMP19 13.8 997456 FT2 KU1A 230 1 [WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.9	103.5	[WAPA] 652274 FTTHMP29 13.8 997455 FT2 KU1B 230 1 [WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1	10.11%

						[NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.9	103.5	[WAPA] 652273 FTTHMP19 13.8 997456 FT2 KU1A 230 1 [WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.9	103.5	[WAPA] 652273 FTTHMP19 13.8 997456 FT2 KU1A 230 1 [WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1	10.11%

						[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.9	103.5	[WAPA] 652274 FTTHMP29 13.8 997455 FT2 KU1B 230 1 [WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	95.9	103.5	[WAPA] 652274 FTTHMP29 13.8 997455 FT2 KU1B 230 1	10.11%

						[WAPA] 652506 FTTHOMP3 345 652807 FTTHOM2-LNX3 345 Z [WAPA] 652807 FTTHOM2-LNX3 345 652833 GRPRAR2-LNX3 345 1 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	96.07	104.14	[OTP] 620327 HANKSON4 230 620329 WAHPETN4 230 1	12.08%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	97.01	104.44	[WAPA] 652513 HANLON 4 230 659122 STORLA 4 230 1 [WAPA] 652607 WESSINGTON 4 230 659122 STORLA 4 230 1 [WAPA] 659122 STORLA 4 230 997389 KV1A_2 115 1	10.01%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	97.23	104.61	[WAPA] 652513 HANLON 4 230 659122 STORLA 4 230 1	10.00%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	98.3	106.71	[WAPA] 652532 GR PRAIRIE 3 345 652832 GRPRAR1-LNX3 345 Z	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	98.3	106.71	[WAPA] 652532 GR PRAIRIE 3 345 652832 GRPRAR1-LNX3 345 Z [WAPA] 640510 HOLT.CO3 345 652832 GRPRAR1-LNX3 345 1	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	98.3	106.71	[WAPA] 652532 GR PRAIRIE 3 345 652832 GRPRAR1-LNX3 345 Z	10.11%

						[WAPA] 640510 HOLT.CO3 345 652832 GRPRAR1-LNX3 345 1	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	98.16	106.77	[WAPA] 640510 HOLT.CO3 345 652832 GRPRAR1-LNX3 345 1	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	101.66	110.15	[NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	101.77	110.15	[NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [WAPA/NPPD] 640510 HOLT.CO3 345 653871 GR ISLD-LNX3 345 1	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	101.79	110.16	[WAPA/NPPD] 640510 HOLT.CO3 345 653871 GR ISLD-LNX3 345 1	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD]653571 GR ISLD3 345 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD]653571 GR ISLD3 345 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A	10.11%

						230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD]653571 GR ISLD3 345 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1	10.11%

						[NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1	10.11%

						[NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD] 640200 GR ISLD4 230 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 643071 GR ISLD T6 9 13.8 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2 [NPPD] 640200 GR ISLD4 230 997427 GI KU1B 230 2 [NPPD] 653316 GR ISL29 13.8 997427 GI KU1B 230 2 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 640200 GR ISLD4 230 997428 GI KU1A 230 1 [NPPD] 653314 GR ISL19 13.8 997428 GI KU1A 230 1 [NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z	10.11%

						[NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	102.34	110.76	[NPPD] 640271 MCCOOL 3 345 653571 GR ISLD3 345 1 [NPPD] 640374 SWEET W3 345 653571 GR ISLD3 345 1 [NPPD] 653571 GR ISLD3 345 653871 GR ISLD-LNX3 345 Z [NPPD] 653571 GR ISLD3 345 997692 GI KU3A 230 3 [NPPD] 653571 GR ISLD3 345 997428 GI KU1A 230 1 [NPPD] 653571 GR ISLD3 345 997427 GI KU1B 230 2	10.11%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	113.93	123.68	[XEL] 601031 BRKNGCO3 345 601077 HAWKSNEST 3 345 1	12.37%
00NR-26SP	601006 SPLT RK3 345 652537 WHITE 3 345 1	717.1	XEL/WAPA	115.6	125.71	[XEL] 601048 LYON CO 3 345 601077 HAWKSNEST 3 345 1	12.37%

00NR-18SP	602008 MINVALT4 230 652550 GRANITF4 230 1	259	XEL/WAPA	107.57	117.94	[XEL/WAPA] 602009 MNVLTAP4 230 652550 GRANITF4 230 1	4.01%
00NR-21SP	602008 MINVALT4 230 652550 GRANITF4 230 1	259	XEL/WAPA	117.12	128.07	[XEL/WAPA] 602009 MNVLTAP4 230 652550 GRANITF4 230 1	3.77%
00NR-26SP	602008 MINVALT4 230 652550 GRANITF4 230 1	259	XEL/WAPA	110.67	119.56	[XEL/WAPA] 602009 MNVLTAP4 230 652550 GRANITF4 230 1	3.77%
00NR-18SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	83.26	106.72	[XEL/OTP] 601031 BRKNGCO3 345 620417 BSSOUTH3 345 1	6.36%
00NR-21SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	87.22	105.52	[OTP] 620327 HANKSON4 230 620329 WAHPETN4 230 1	5.56%
00NR-21SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	87.35	108.37	[OTP/WAPA] 620314 BIGSTON4 230 652503 BLAIR 4 230 1	5.96%
00NR-21SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	96.75	120.4	[XEL/OTP] 601031 BRKNGCO3 345 620417 BSSOUTH3 345 1	6.32%
00NR-26SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	84.65	101.24	[OTP] 620329 WAHPETN4 230 658109 FERGSFL4 230 1	4.70%
00NR-26SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	84.94	101.63	[XEL/WAPA] 601006 SPLT RK3 345 652537 WHITE 3 345 1	4.74%
00NR-26SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	84.94	101.63	[XEL/WAPA] 601006 SPLT RK3 345 652537 WHITE 3 345 1 [XEL/WAPA] 601031 BRKNGCO3 345 652537 WHITE 3 345 1	4.74%
00NR-26SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	85.26	101.85	[XEL] 601031 BRKNGCO3 345 601077 HAWKSNEST 3 345 1	4.70%
00NR-26SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	86.4	102.78	[XEL] 601048 LYON CO 3 345 601077 HAWKSNEST 3 345 1	4.70%
00NR-26SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	87.21	105.2	[WAPA] 652503 BLAIR 4 230 652550 GRANITF4 230 1	4.95%
00NR-26SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	94	112.56	[OTP] 620327 HANKSON4 230 620329 WAHPETN4 230 1	5.56%
00NR-26SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	91.76	113.68	[OTP/WAPA] 620314 BIGSTON4 230 652503 BLAIR 4 230 1	5.96%
00NR-26SP	616002 GRE-JOHNJCT7 115 652555 MORRIS 7 115 1	92.2	OTP/WAPA	96.57	120.86	[XEL/OTP] 601031 BRKNGCO3 345 620417 BSSOUTH3 345 1	6.32%