



1999-2010 ATCLLC Historical and Potential Future Access Study

Methodology & Key Assumptions:

- The values represent thermal capability only and do not address voltage stability or dynamic stability issues associated with increased transfer capability.
- The values are calculated for reliability purposes only and do not reflect commercially available ATC.
- Imports from the West were modeled as imports from MAPP.
- Imports from the South were modeled as imports from a combination of ECAR, ComEd and Southern Illinois.
- Historical TASG models were used for the 1999-2004 plots.
- The 2005-2010 plots were generated from the 2004 TASG model with ATC loads updated for each successive year and projects identified in the ATC 2003 10-Year Transmission Assessment.
- Only limiting elements with a 3% or greater distribution factor were utilized for the boundary lines.
- Limits common to both import directions were assumed to have a linear relationship.
- All Operating guides are assumed to be available.

Major Projects Included In Plots

- 2005 2nd Wempletown-Paddock 345 kV
- 2006 Werner West 345/138 kV Tr
- 2007 Cranberry-Conover-Plains 138 kV
- 2007 Oak Creek-Brookdale-Granville 345 kV
- 2007 Oak Creek-Bluemound conversion to 345 kV
- 2008 Arrowhead-Weston 345 kV
- 2009 Morgan-Werner West 345 kV
- 2009 Rockdale-Concord 345 kV
- 2009 Rockdale-West Middleton 345 kV
- 2010 Concord-Bark River-Lannon 345 kV
- 2010 Weston to tap of Morgan-Werner West 345 kV

Interpreting the Plots

- The Y-axis represents ATC imports from the South.
- The X-axis represents ATC imports from the West.
- The Shaded region represents the variety of achievable ATC total import possibilities.
- The colored lines represent the transmission limits

Summary of Results

- In general ATC total import capabilities increase from year to year.
- ATC import capabilities show more significant gains in 2007, 2008 & 2010.
- Limiting facilities for imports from the South tend to be outside of ATC in the later years.
- ATC maximum import from the West increases from 1500 MW in 1999 to 2100 MW in 2010
- ATC maximum import from the South increases from 1300 MW in 1999 to 2200 MW in 2010
- Toward the end of the planning horizon, a number of potentially more restrictive and unresolved lower-voltage facilities appear as limits. It is reasonable to assume that these limits can/will be dealt with in a timely manner.

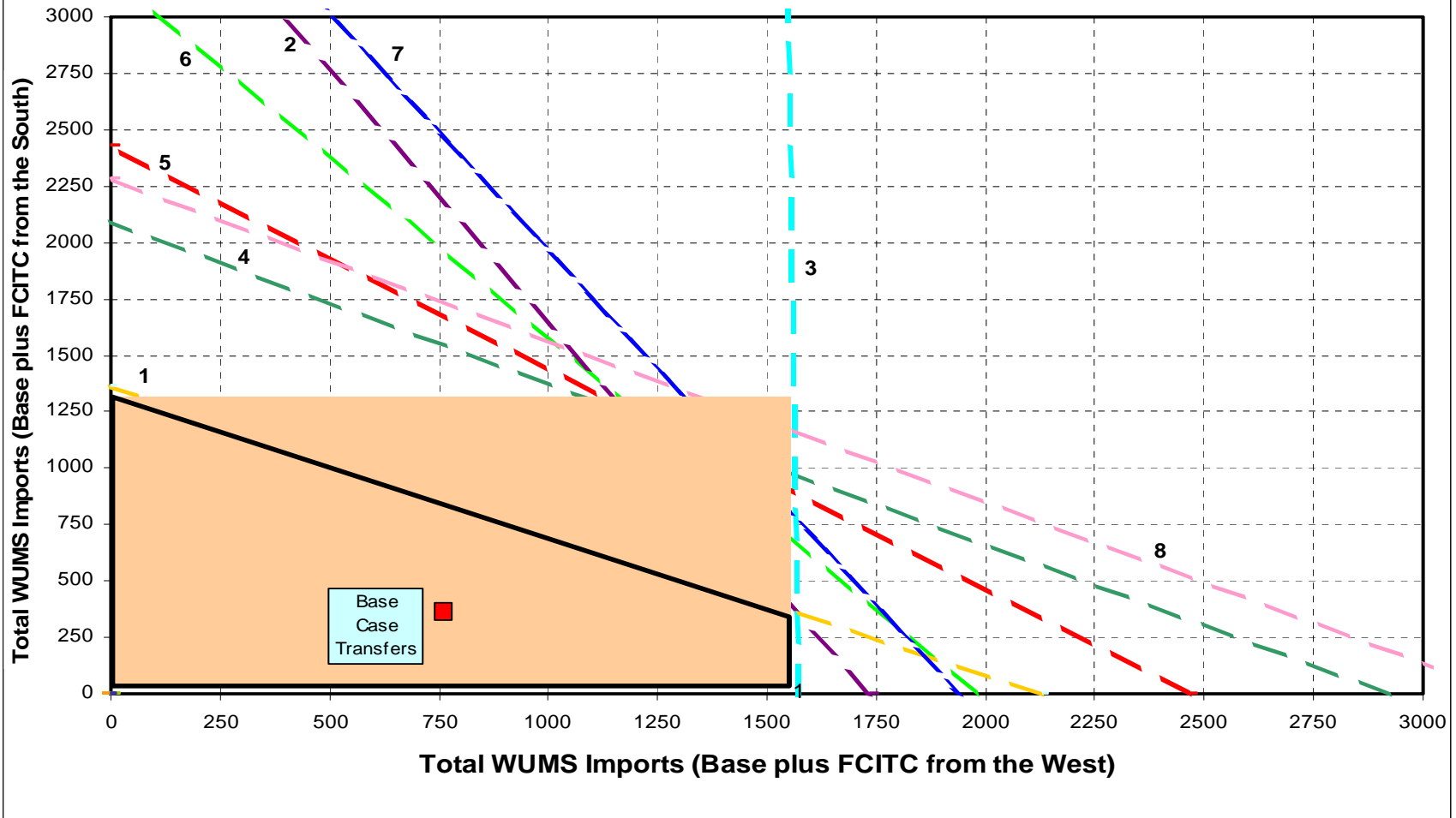
Tabulation of Results

Summer Peak Year	Max Transfer Capability from the West	Max Transfer Capability from the South	Max Simultaneous Transfer Capability
1999	1571	1361	1929
2000	1670	2383	2508
2001	1578	1816	2442
2002	860	1730	2590
2003	1996	2257	2564
2004	1996	1399	2659
2005	1997	2090	3248
2006	2006	2300	3217
2007	2010	2421	3441
2008	2269	2701	3542
2009	2003	1713	3475
2010	2097	2217	3575

Key Limiting Facilities to Wisconsin Imports 2004-2010

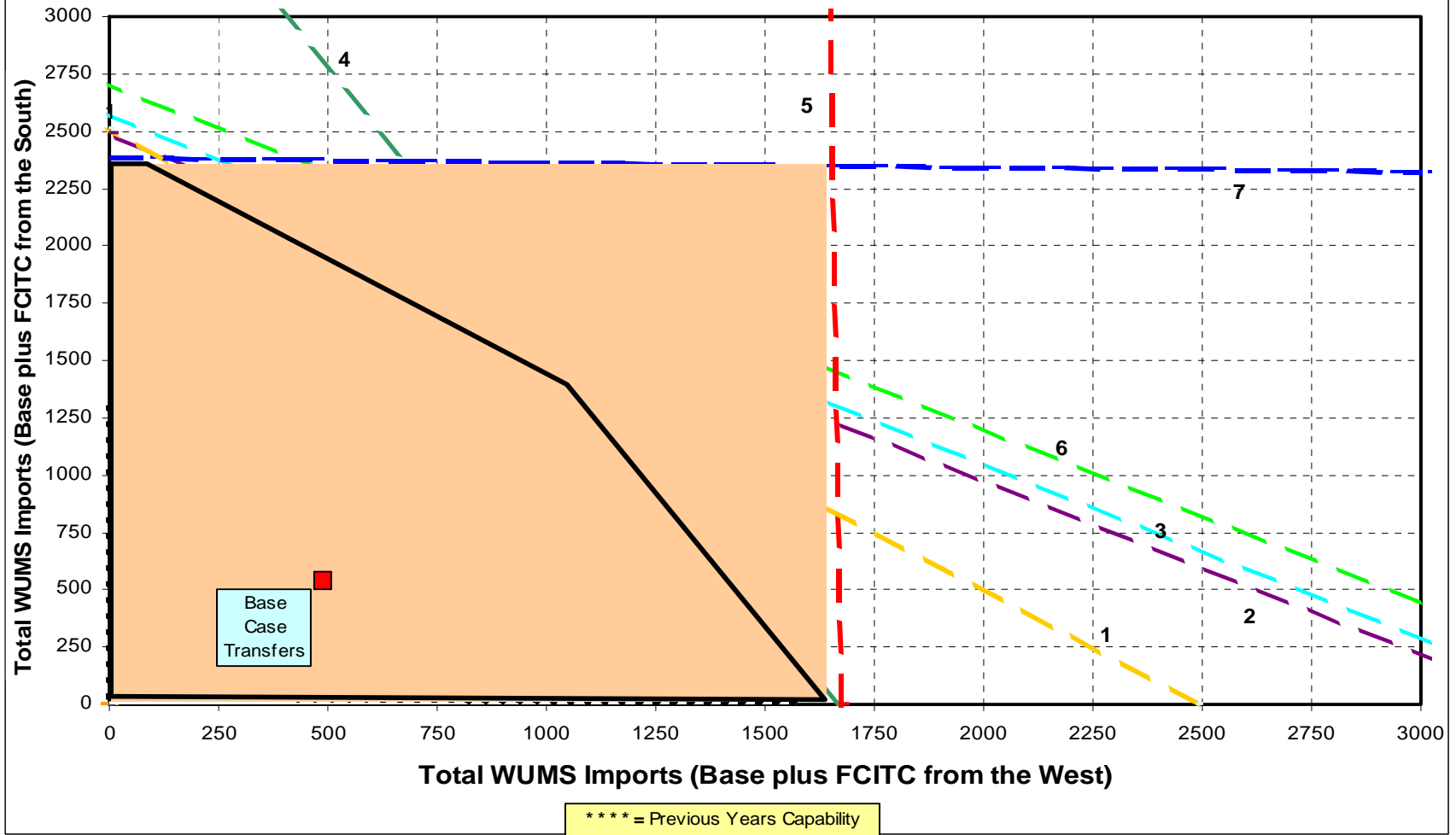
- **Salem 345/161 kV Transformer (ALTW)**
- **Pleasant Prairie-Racine 345 kV line (ATC)**
- **Lore-Turkey River-Cassville 161 kV line (ALTW-DPC)**
- **Hazelton-Dundee 161 kV line (ALTW)**
- **Lower Michigan facilities near the Straits (METC)**
- **Eden-Wyoming Valley 138 kV (ATC)**

WUMS Simultaneous Import Capabilities for 1999 Summer



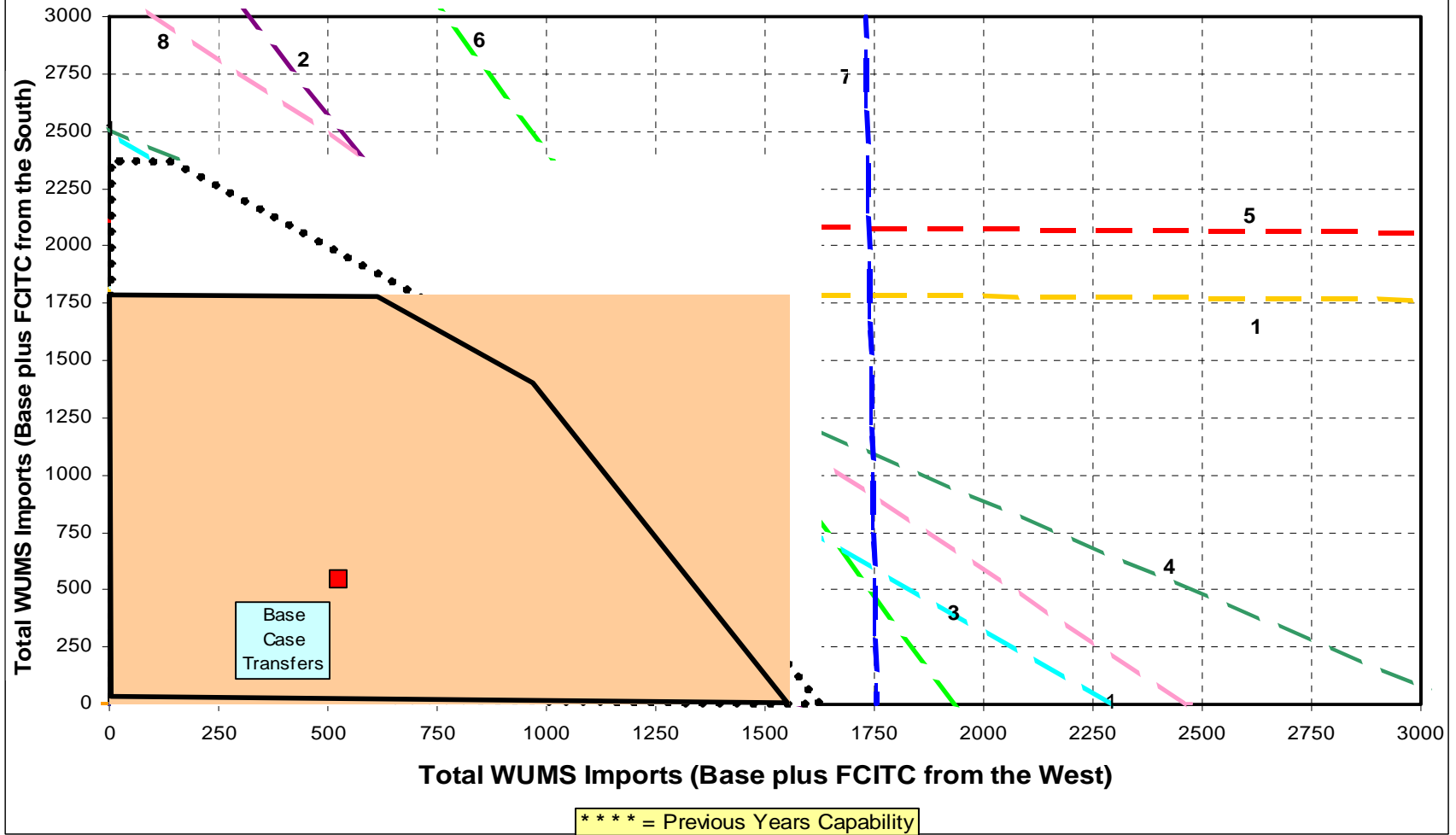
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| <ul style="list-style-type: none"> 1 Lockport-Lisle 345 kV Red 2 Eau Claire - Arpin 345kV Flow Limit 3 Rocky Run-Whiting Ave 115 kV 4 Oak Creek-Racine 345 kV 5 Wempletow n-Paddock 345 kV 6 Electric Jct-Lombard 345 kV Blue | <ul style="list-style-type: none"> for no outage for no outage for outage of Rocky Run-N Appleton 345kV for outage of Wempletow n - Paddock 345kV for Arpin Area Op Guide Implementation for outage of Lisle Lockport Blue 345kV & Op Guides | <ul style="list-style-type: none"> 7 Nelson Dew ey 161/138 kV Tr 8 Pleasant Prairie-Racine 345kV | <ul style="list-style-type: none"> for Arpin Area Op Guide Implementation for outage of Wempletow n - Paddock 345kV |
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WUMS Simultaneous Import Capabilities for 2000 Summer



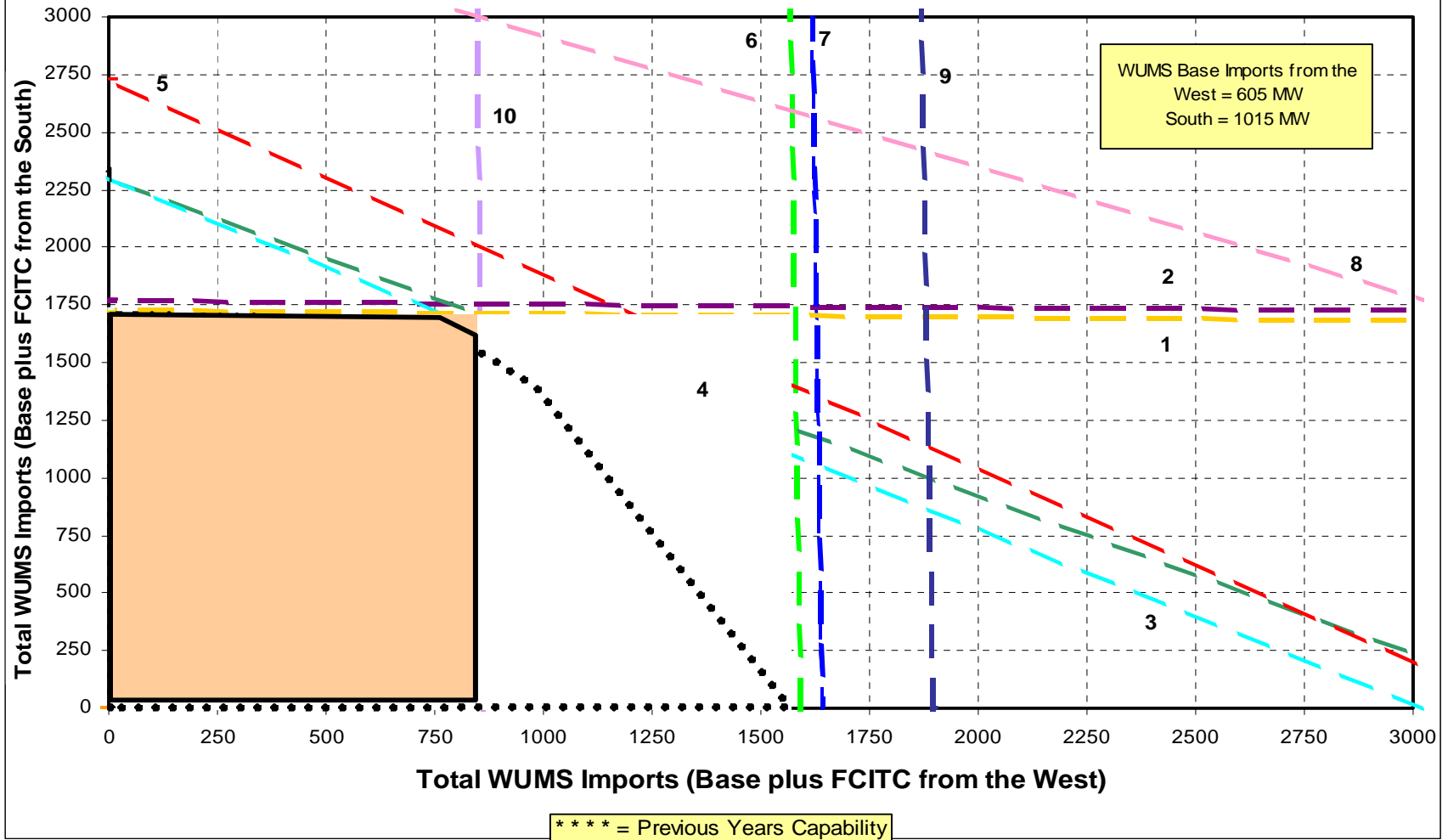
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| <ul style="list-style-type: none"> 1 Wempletow n - Paddock 345kV 2 Pleasant Prairie - Racine 345kV 3 Janesville-Russell 138 kV 4 Eau Claire - Arpin 345kV Flow Limit 5 Rocky Run Whiting Ave 115 kV 6 Paris-St Martin 138 kV | <ul style="list-style-type: none"> for Arpin Area Op Guide Implementation for outage of Wempletow n-Paddock 345kV for outage of Paddock-Rockdale 345kV for outage of N/A for outage of N Appleton-Rocky Run 345kV for outage of Pleasant Prairie - Racine 345kV & Guide | <ul style="list-style-type: none"> 7 Itasca-Tonne 138 kV Blue | <ul style="list-style-type: none"> for outage of Des Plains-Itasca 345kV & DP Tr |
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WUMS Simultaneous Import Capabilities for 2001 Summer



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| <ul style="list-style-type: none"> 1 Elwood-Goodings Gr. 345 kV Red 2 Wien - T Corners 115kV 3 N Appleton-Lost Dauphin 138 kV 4 Cassville-Nelson Dewey 161kV 5 Golf Mills-Niles 138 kV Blue 6 Eau Claire - Arpin 345kV Flow Limit | <ul style="list-style-type: none"> for outage of Dresden-Elect Jct 345kV Red & Dresden T for Arpin Area Op Guide Implementation for outage of Kewaunee 345/138 kV Tr for outage of Wempletown - Paddock 345kV for outage of Golf Mills-Skokie 345kV Blue & Skokie Tr for outage of N/A | <ul style="list-style-type: none"> 7 Cherry Valley-Silver Lk 345 kV Re for outage of Wempletown - Paddock 345kV 8 N Appleton 345/138 kV Tr #1 for outage of N Appleton 345/138 kV Tr #2 |
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WUMS Simultaneous Import Capabilities for 2002 Summer

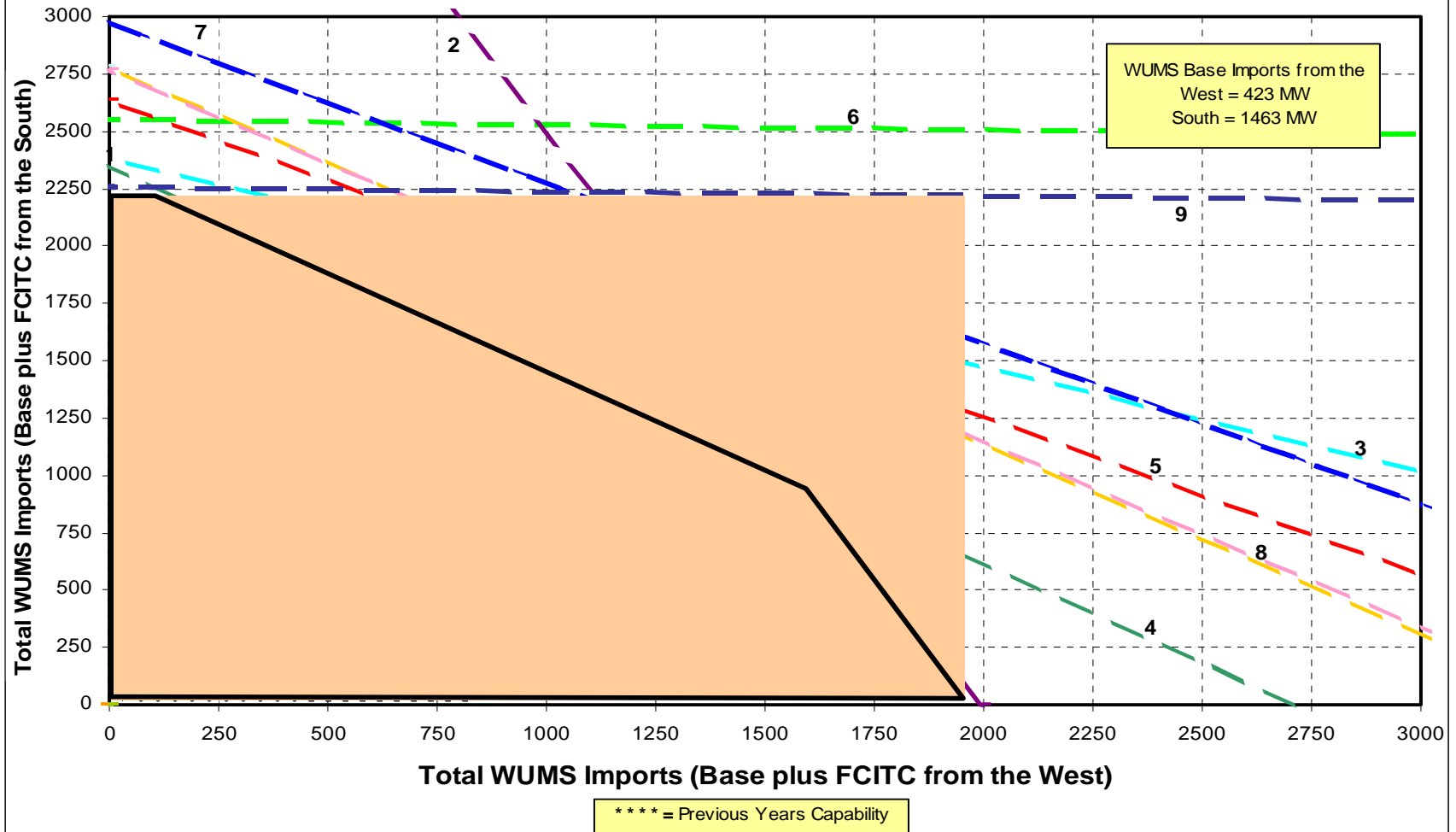


- 1** Golf Mills-Niles 138 kV Blue
- 2** Itasca-Tonne 138 kV Red
- 3** Paddock 345/138kV Tr
- 4** Lore-Turkey River 161 kV
- 5** Center-Fiebrantz 138 kV

for outage of Golf Mills-Skokie 345kV Blue & Skokie Tr
 for outage of Des Plains-Itasca 345kV Red & DesPl Tr
 for outage of Paddock-Rockdale 345kV
 for outage of Wempleto w - Paddock 345kV
 for Arpin Area Op Guide Implementation

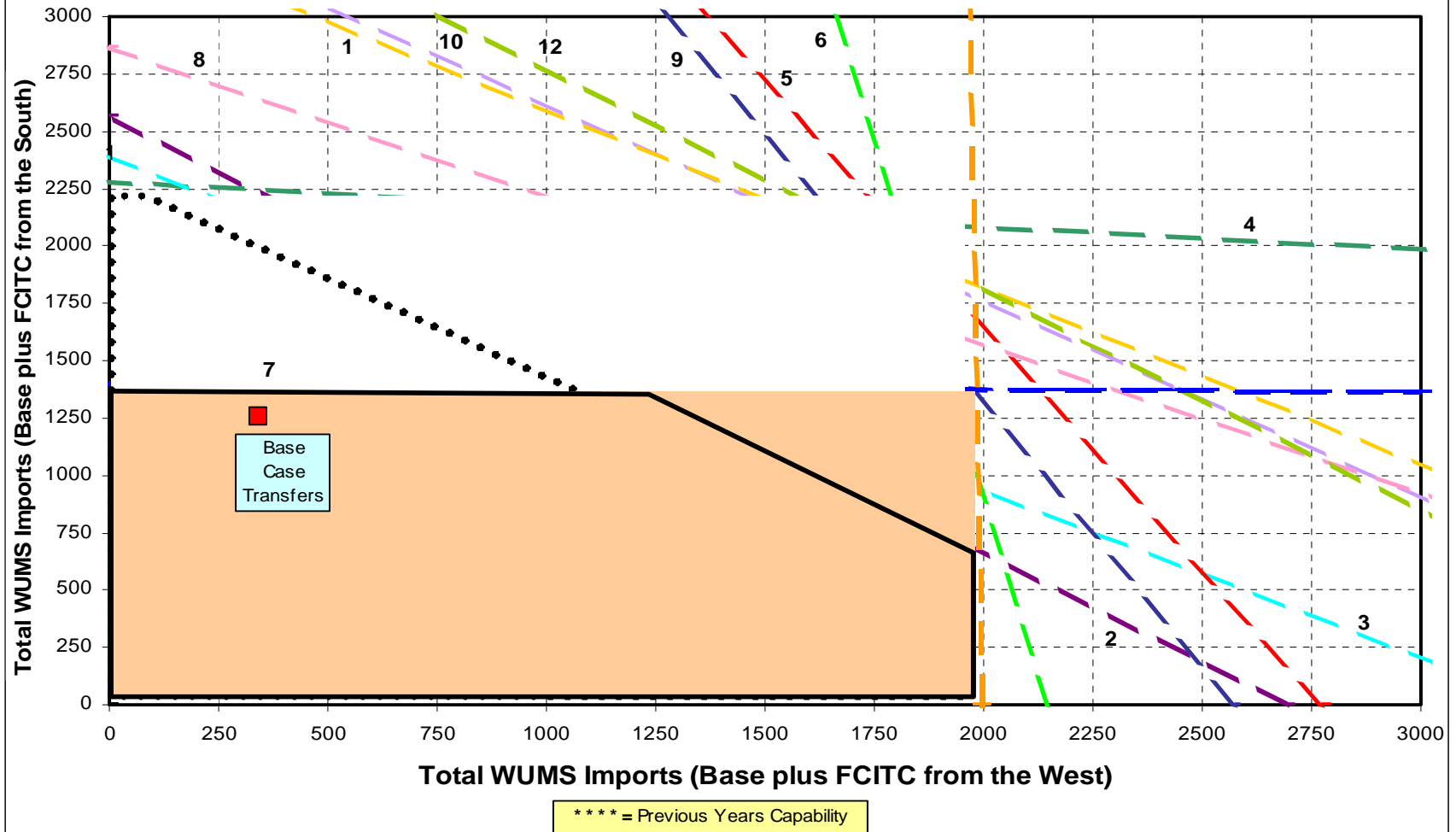
- 7** N Appleton 345/138 kV Tr #2 for outage of N Appleton 345/138 kV Tr #3
- 8** Arcadian - Pleasant Prairie 345kV for outage of Pleasant Prairie - Racine 345kV
- 9** Eau Claire - Arpin 345kV Flow Limi for outage of N/A
- 10** N Appleton-Lost Dauphin 138 kV for outage of Kew aunee 345/138 kV Tr

WUMS Simultaneous Import Capabilities for 2003 Summer



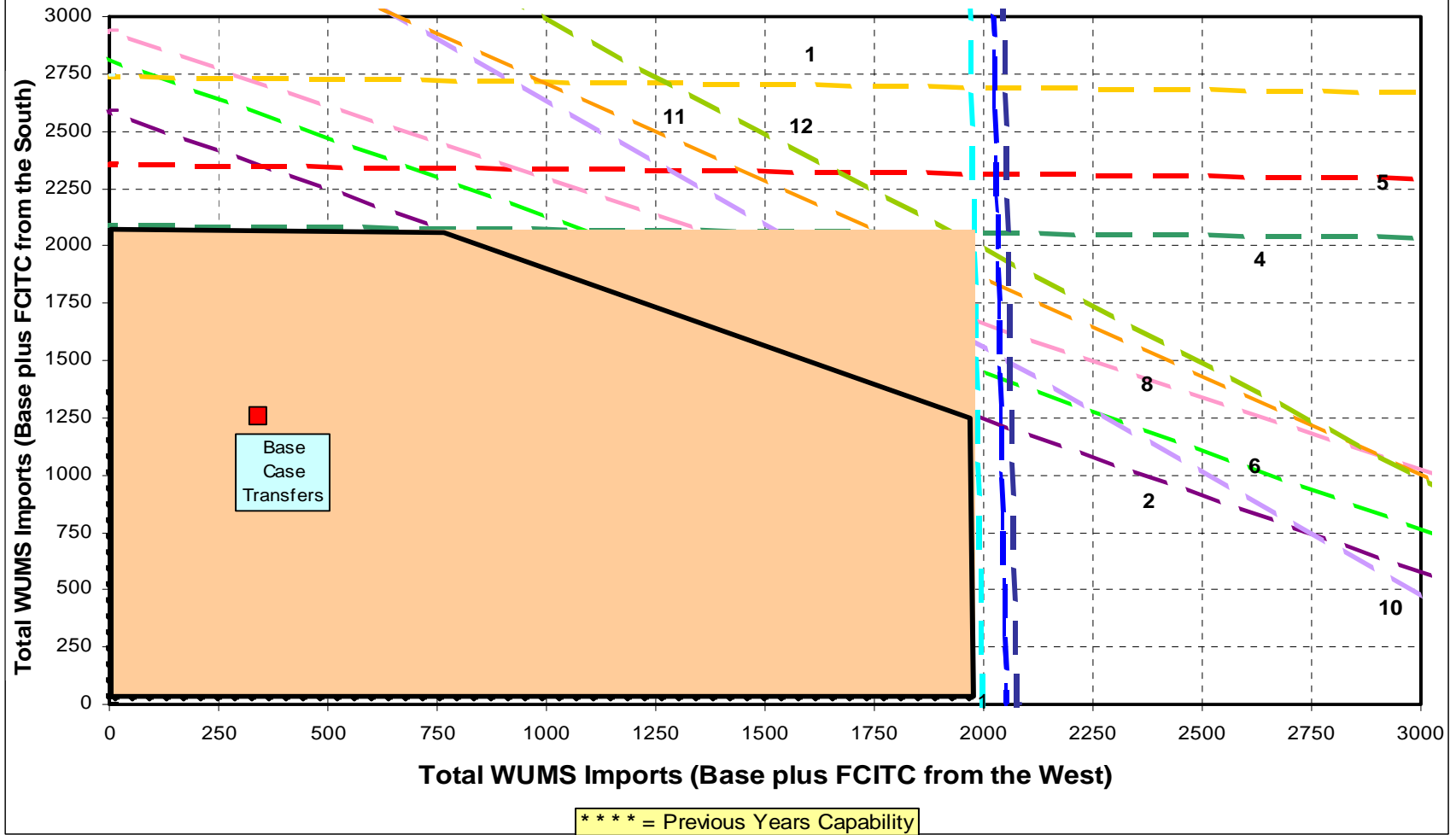
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| <ul style="list-style-type: none"> 1 Blackhaw k-ColleyRd 138 kV 2 Eau Claire-Arpin 345 kV Flow Limit 3 Center-Fiebrantz 138 kV 4 Lore-Turkey River-Cassville 161 kV 5 Pleasant Prairie-Racine 345 kV 6 Salem 345/161 kV Tr | <ul style="list-style-type: none"> for outage of Paddock-Rockdale 345 kV for outage of N/A for outage of Arcadian-Granville 345 kV for outage of Wempletow n-Paddock 345 kV & Kaiser-Lancaster 69 kV for outage of Wempletow n-Paddock 345 kV & Kaiser-Lancaster 69 kV for outage of Wempletow n-Paddock 345 kV & Kaiser-Lancaster 69 kV | <ul style="list-style-type: none"> 7 Golf Mills-Niles 138 kV Blue 8 Paddock 345/138 kV Tr. 9 Paris-St Martins 138 kV | <ul style="list-style-type: none"> for outage of Golf Mills-Skokie 345 kV Blue for outage of Paddock-Rockdale 345 kV for outage of Pleasant Prairie-Racine 345 kV |
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WUMS Simultaneous Import Capabilities for 2004 Summer



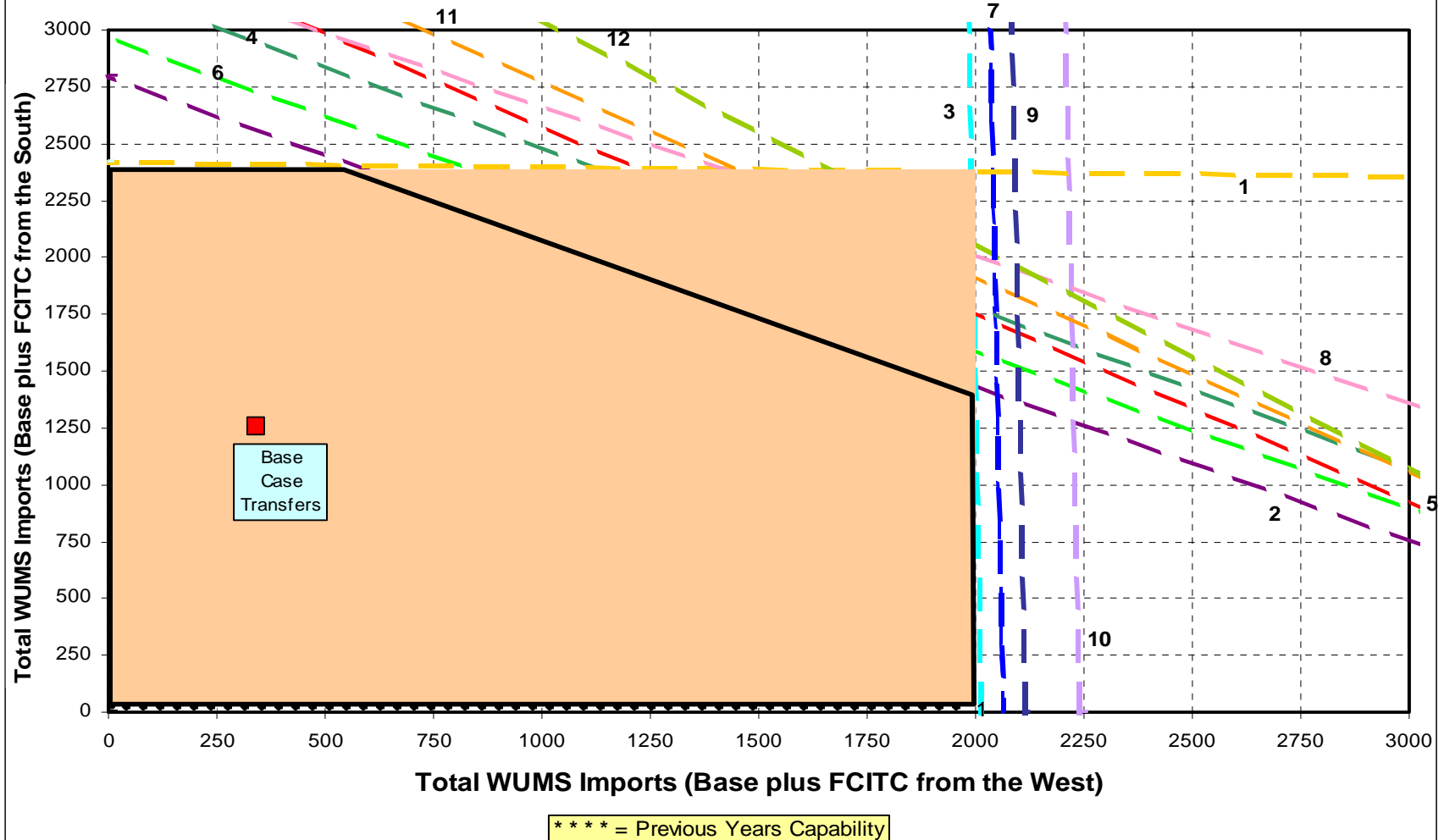
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| 1 Zion-Pleasant Prairie 345 kV | for outage of Wempletow n - Paddock 345kV | 7 Salem 345/161kV Tr | for outage of Wempletow n - Paddock 345kV |
| 2 Lore - Turkey River - Cassville 161kV | for outage of Wempletow n-Paddock 345kV | 8 Arcadian - Pleasant Prairie 345kV | for outage of Pleasant Prairie - Racine 345kV |
| 3 Pleasant Prairie - Racine 345kV | for outage of Wempletow n-Paddock 345kV | 9 Eau Claire - Arpin 345kV Flow Limi | for outage of N/A |
| 4 Paris - St. Martin 138kV | for outage of Pleasant Prairie - Racine 345kV | 10 Paddock 345/138kV Tr | for outage of Paddock-Rockdale 345kV |
| 5 Wien - T Corners 115kV | for Arpin Area Op Guide Implementation | 11 Hazelton - Dundee 161kV | for outage of King-Eau Claire-Arpin 345kV |
| 6 Hazelton - Dundee 161kV | for outage of Rock Creek - Quad Cities 345kV | 12 Cassville-Nelson Dew ey 161kV | for outage of Wempletow n - Paddock 345kV |

WUMS Simultaneous Import Capabilities for 2005 Summer



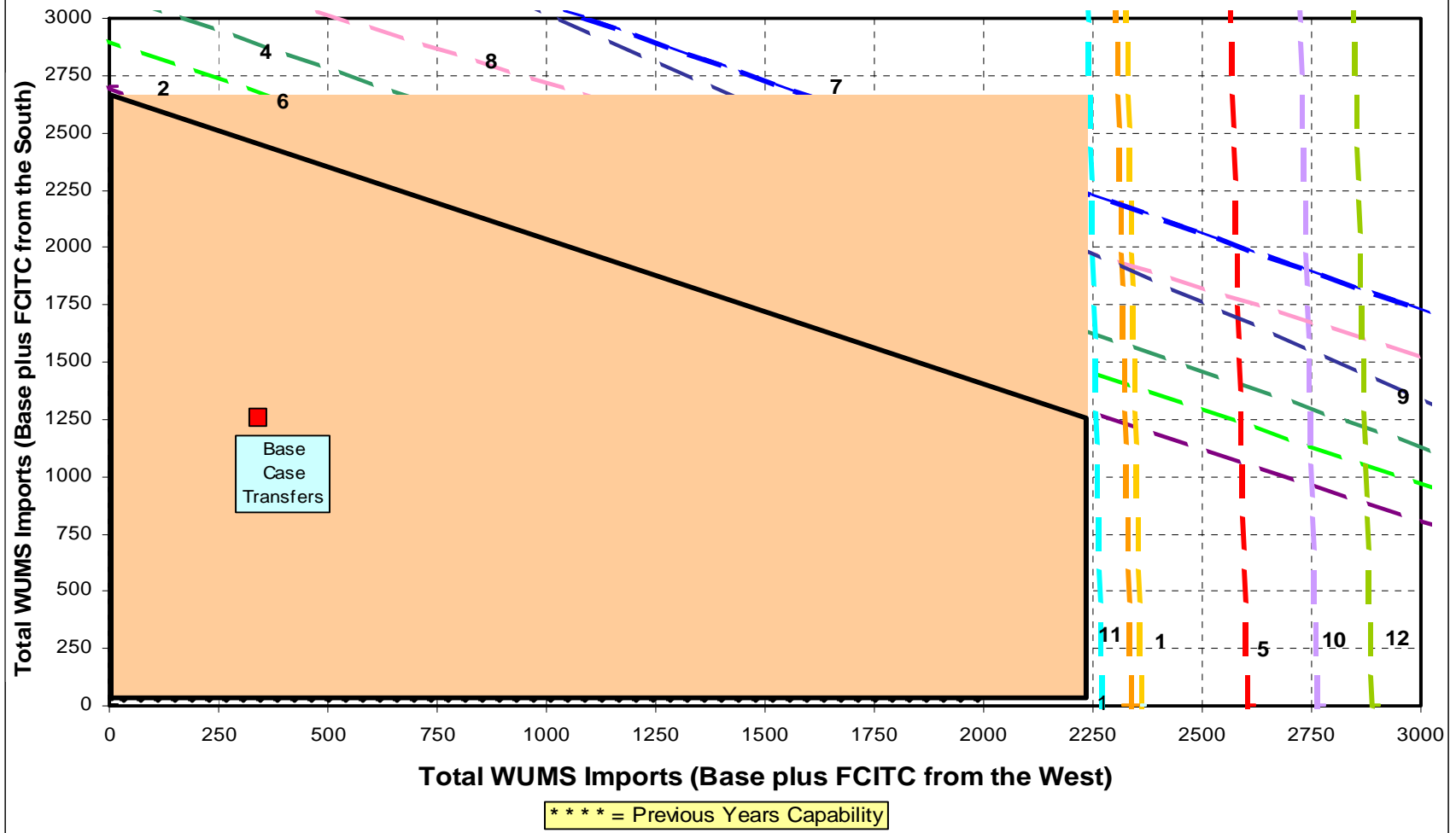
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| <ul style="list-style-type: none"> 1 McGulpin 138 kV Bus Tie 2 Pleasant Prairie - Racine 345kV 3 Hazelton - Dundee 161kV 4 McGulpin-Riggsville 138 kV 5 McGulpin-Straits 138 kV #3 6 Pleasant Prairie - Racine 345kV | <ul style="list-style-type: none"> for outage of Livingston-Emmet Co. 138 kV for outage of Pleasant Prairie-Arcadian 345 kV for outage of Rock Creek - Quad Cities 345kV for outage of Livingston-Emmet Co. 138 kV for outage of McGulpin-Straits 138 kV #1 for outage of Zion-Arcadian 345 kV | <ul style="list-style-type: none"> 7 Hazelton - Dundee 161kV 8 Arcadian - Pleasant Prairie 345kV 9 Eau Claire - Arpin 345kV Flow Limi 10 Elwood-Goodings Gr 345 kV Red 11 Paddock 345/138kV Tr 12 Turkey River-Cassville 161kV | <ul style="list-style-type: none"> for outage of King-Eau Claire-Arpin 345kV for outage of Pleasant Prairie - Racine 345kV for outage of N/A for outage of Dresden-Elect Jct 345kV Red & T for outage of Wempleto w n-Rockdale 345kV for outage of Wempleto w n-Rockdale 345kV |
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WUMS Simultaneous Import Capabilities for 2007 Summer



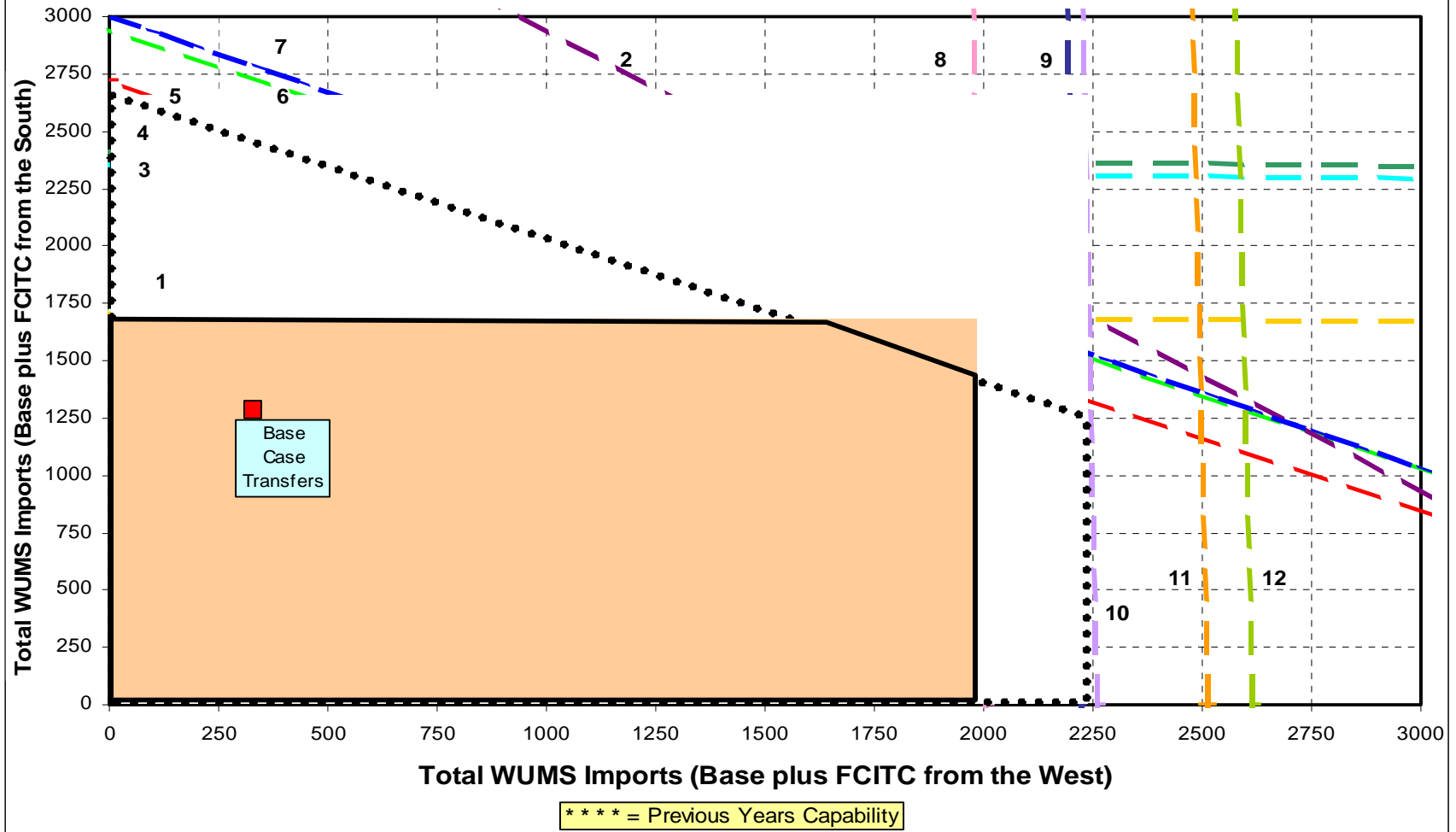
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| <p>1 McGulpin-Straits 138 kV #3</p> <p>2 Pleasant Prairie - Racine 345kV</p> <p>3 Hazelton - Dundee 161kV</p> <p>4 Pleasant Prairie - Racine 345kV</p> <p>5 Pleasant Prairie - Racine 345kV</p> <p>6 Pleasant Prairie - Racine 345kV</p> | <p>for outage of McGulpin-Straits 138 kV #1</p> <p>for outage of Pleasant Prairie-Arcadian 345 kV</p> <p>for outage of Rock Creek - Quad Cities 345kV</p> <p>for outage of Wempletow n-Rockdale 345kV</p> <p>for outage of King-Eau Claire-Arpin 345kV</p> <p>for outage of Zion-Arcadian 345 kV</p> | <p>7 Hazelton - Dundee 161kV</p> <p>8 Arcadian - Pleasant Prairie 345kV</p> <p>9 Eau Claire - Arpin 345kV Flow Limi</p> <p>10 Elwood-Goodings Gr 345 kV Red</p> <p>11 Paddock 345/138 kV Tr</p> <p>12 Turkey River-Cassville 161kV</p> | <p>for outage of King-Eau Claire-Arpin 345kV</p> <p>for outage of Pleasant Prairie - Racine 345kV &</p> <p>for outage of N/A</p> <p>for outage of Dresden-Elect Jct 345kV Red & T</p> <p>for outage of Wempletow n-Rockdale 345kV</p> <p>for outage of Wempletow n-Rockdale 345kV</p> |
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WUMS Simultaneous Import Capabilities for 2008 Summer



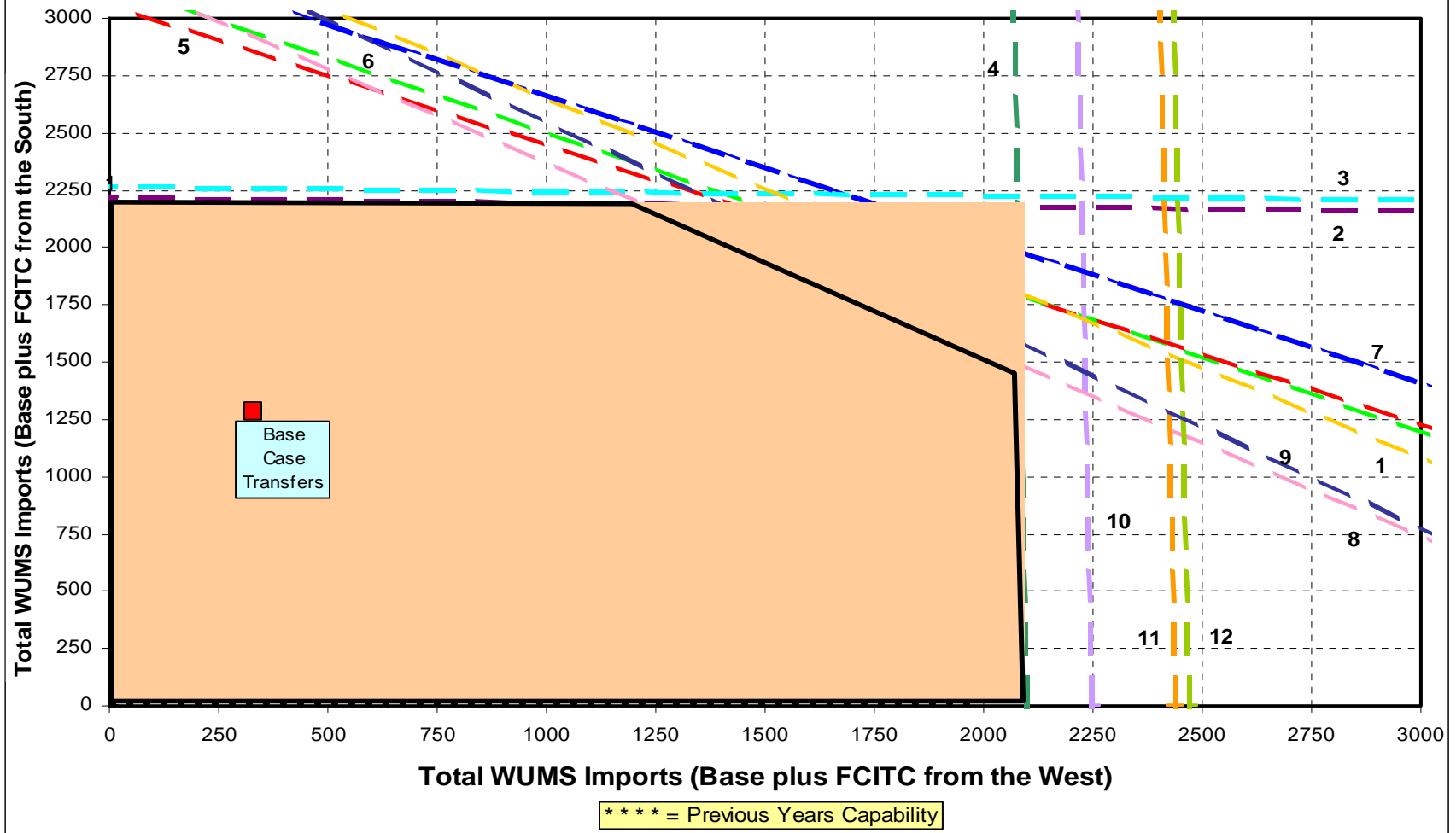
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| <ul style="list-style-type: none"> 1 Whitcomb-Caroline-Badger 115kV 2 Pleasant Prairie - Racine 345kV 3 Hazelton - Dundee 161kV 4 Pleasant Prairie - Racine 345kV 5 Arrow head 230kV Phase Shifter 6 Pleasant Prairie - Racine 345kV | <ul style="list-style-type: none"> for outage of RockyRun-Werner West 345kV for outage of Pleasant Prairie-Arcadian 345 kV for outage of Rock Creek - Quad Cities 345kV for outage of Wempletow n-Rockdale 345kV for outage of King-Eau Claire-Arpin 345kV for outage of Zion-Arcadian 345 kV | <ul style="list-style-type: none"> 7 Russell-Rockdale 138 kV 8 Arcadian - Pleasant Prairie 345kV 9 Paddock 345/138kV Tr 10 Arrow head 230kV Phase Shifter 11 Hazelton - Dundee 161kV 12 Wernerw est-Werner 138 kV | <ul style="list-style-type: none"> for outage of Wempletow n-Rockdale 345kV for outage of Pleasant Prairie - Racine 345kV & for outage of Wempletow n-Rockdale 345kV for outage of Eau Claire-Arpin 345kV for outage of Rock Creek-Salem 345kV for outage of Werner West-N Appleton 345kV |
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WUMS Simultaneous Import Capabilities for 2009 Summer



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| <ul style="list-style-type: none"> 1 Livingston-Emmit Co 138 kV 2 Turkey River-Cassville 161 kV 3 McGulpin-Straits 138 kV #3 4 Riggsville-McGulpin 138kV 5 Pleasant Prairie - Racine 345kV 6 Pleasant Prairie - Racine 345kV | <ul style="list-style-type: none"> for outage of Riggsville-McGulpin 138kV for outage of Wempletow n-Rockdale 345kV for outage of McGulpin-Straits 138 kV #1 for outage of Livingston-Emmit Co 138 kV for outage of Pleasant Prairie-Arcadian 345 kV for outage of Zion-Arcadian 345 kV | <ul style="list-style-type: none"> 7 Pleasant Prairie - Racine 345kV 8 Eden-WyomingValley 138kV 9 WyomingValley-Spring Green 138kV 10 Hazelton - Dundee 161kV 11 Potosi-Hillman 138kV 12 Arrow head 230kV Phase Shifter | <ul style="list-style-type: none"> for outage of Wempletow n-Rockdale 345kV for outage of Wempletow n-Rockdale 345kV for outage of Wempletow n-Rockdale 345kV for outage of Rock Creek-Salem 345kV for outage of Nelson dew ey-Lancaster 138kV for outage of King-Eau Claire-Arpin 345kV |
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WUMS Simultaneous Import Capabilities for 2010 Summer



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| 1 Wempletow n-Rockdale 345kV | for outage of Columbia Unit #1 | 7 Pleasant Prairie - Racine 345kV | for outage of Zion-Arcadian 345 kV |
| 2 McGulpin-Straits 138 kV #3 | for outage of McGulpin-Straits 138 kV #1 | 8 Wempletow n-Rockdale 345kV | for outage of Wempletow n-Paddock 345kV |
| 3 Riggsville-McGulpin 138kV | for outage of Livingston-Emmit Co 138 kV | 9 Wempletow n-Rockdale 345kV | for outage of Cherry Valley-Silver Lake 345kV |
| 4 Eden-WyomingValley 138kV | for outage of Wempletow n-Rockdale 345kV | 10 Hazelton - Dundee 161kV | for outage of Rock Creek-Salem 345kV |
| 5 Pleasant Prairie - Racine 345kV | for outage of Pleasant Prairie-Arcadian 345 kV | 11 Potosi-Hillman 138kV | for outage of Nelson dew ey-Lancaster 138kV |
| 6 Pleasant Prairie - Racine 345kV | for outage of Wempletow n-Rockdale 345kV | 12 Arrow head 230kV Phase Shifter | for outage of King-Eau Claire-Arpin 345kV |