



1999-2013 ATCLLC Historical and Potential Future Access Study

Last Updated 8-6-2004

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 2005-2013 plots were generated from the 2005 ATC 2004 10-Year Transmission Assessment model with ATC loads updated for each successive year and projects identified in the ATC 2004 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.
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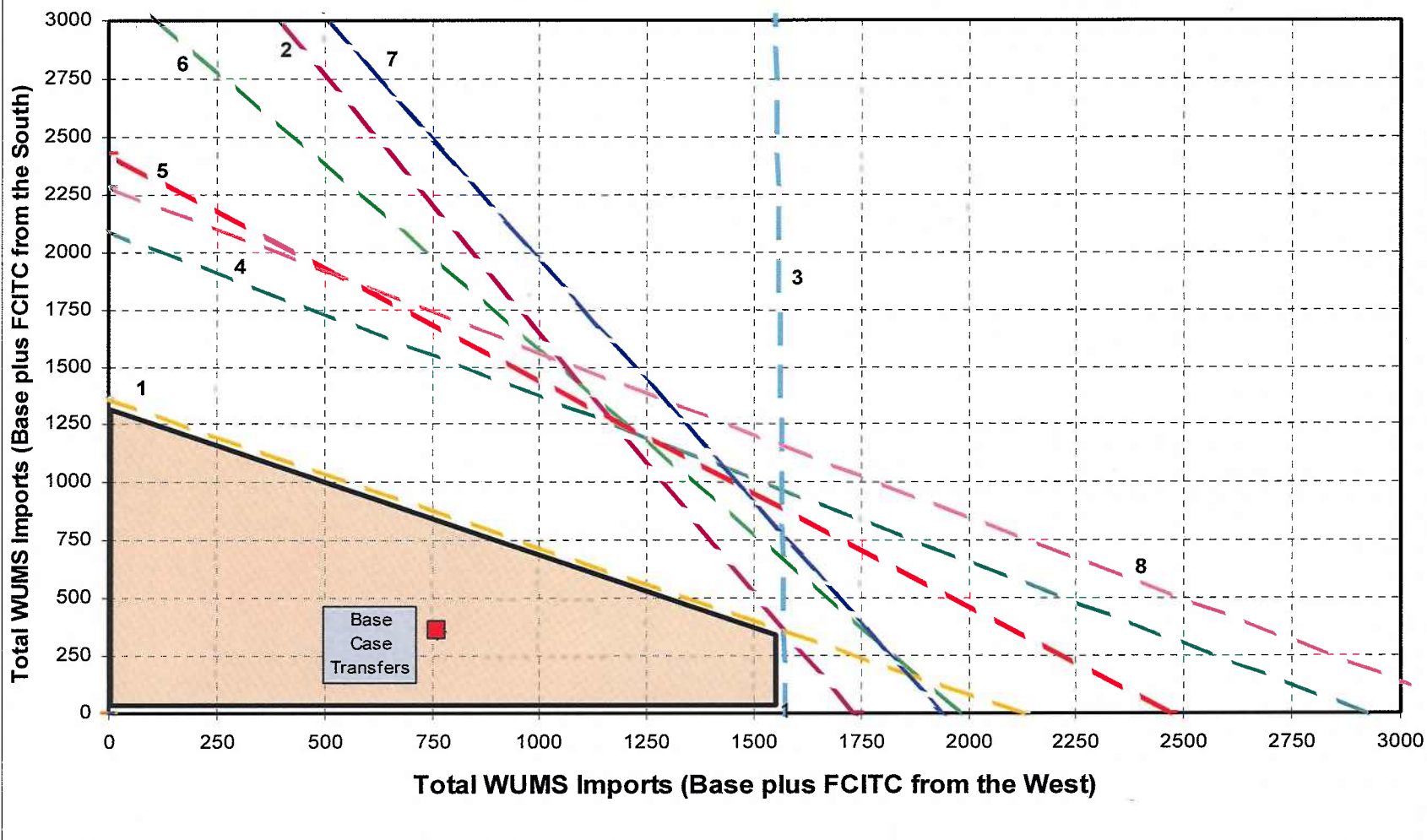
Major Projects Included In Plots

- 2005 2nd Wempletown-Paddock 345 kV
 - 2006 Werner West 345/138 kV Tr
 - 2006 Gardner Park-Stone Lake 345kV
 - 2008 Cranberry-Conover-Plains 138 kV
 - 2008 Arrowhead-Stone Lake 345 kV
 - 2009 Morgan-Werner West 345 kV
 - 2009 Weston to tap of Morgan-Werner West 345 kV
 - 2009 Rockdale-Concord 345 kV
 - 2010 Oak Creek-Brookdale-Granville 345 kV
 - 2010 Oak Creek-Bluemound conversion to 345 kV
 - 2010 Concord-Bark River-Lannon 345 kV
 - 2011 Rockdale-West Middleton 345 kV
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Interpreting the Plots

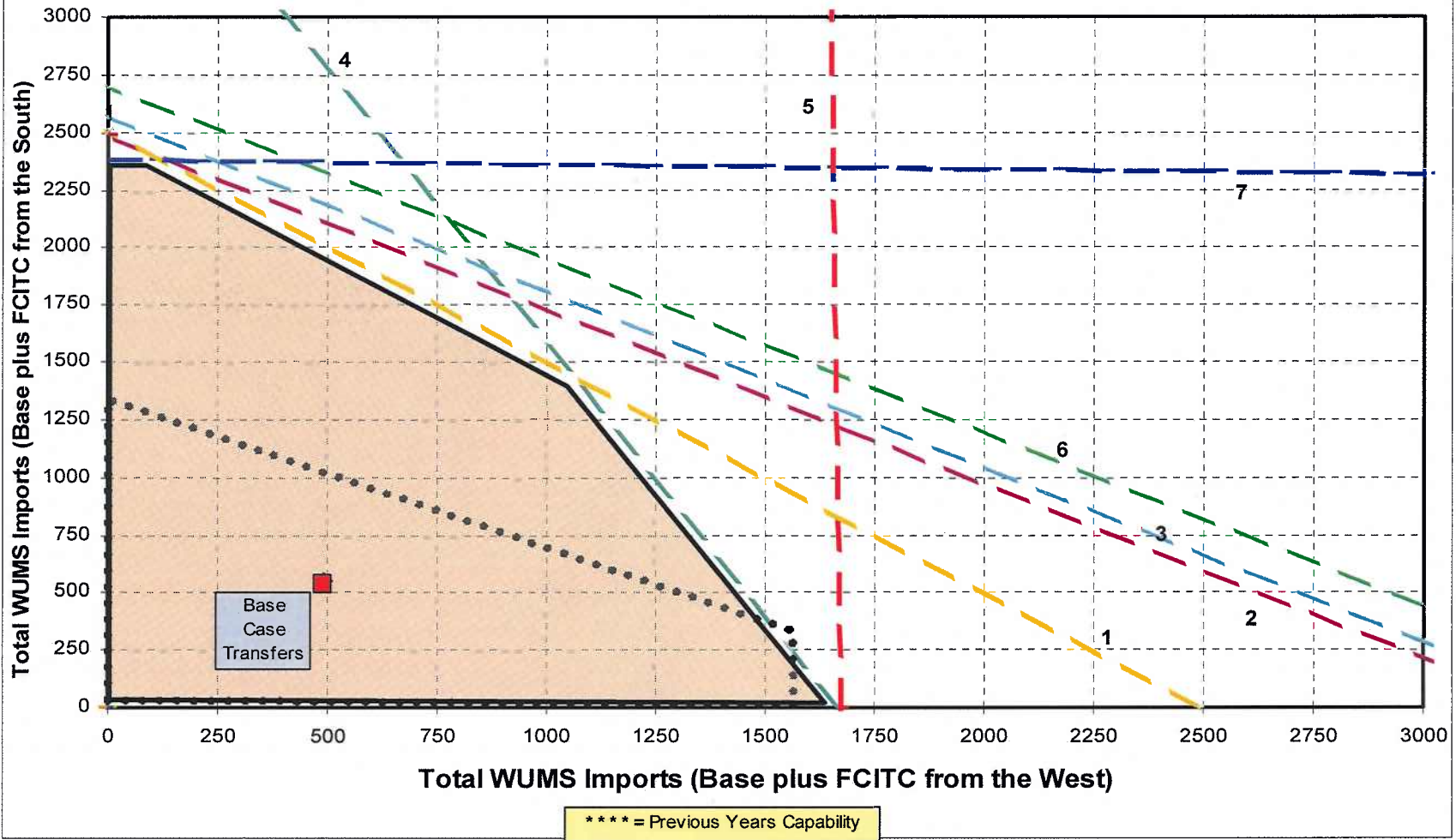
- The Y-axis represents ATC imports from the South.
 - The X-axis represents ATC imports from the West.
 - The Shaded region represents the variety of achievable ATC total import possibilities.
 - The colored lines represent the transmission limits
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WUMS 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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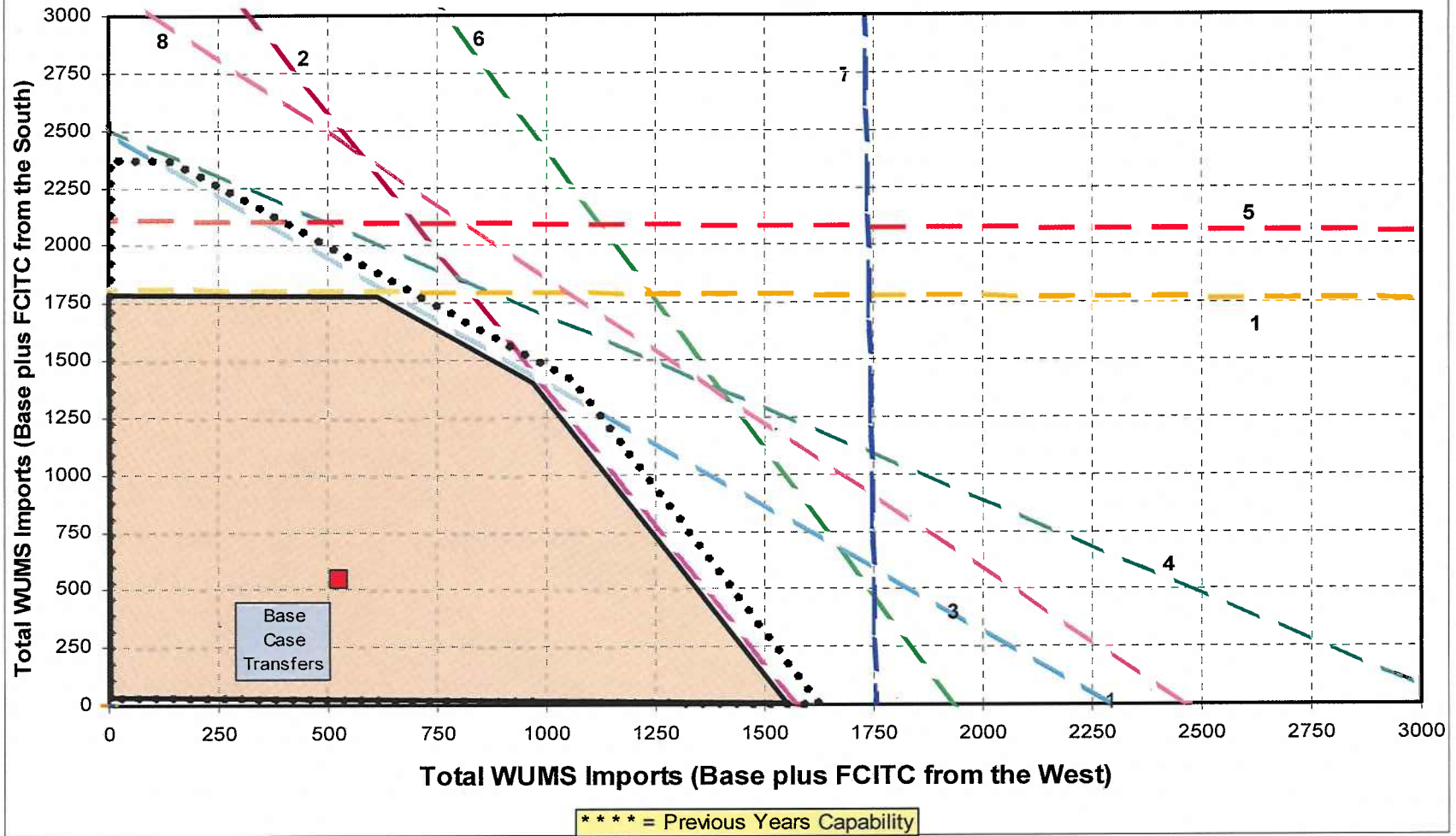
WUMS Simultaneous Import Capabilities for 2000 Summer



**** = Previous Years Capability

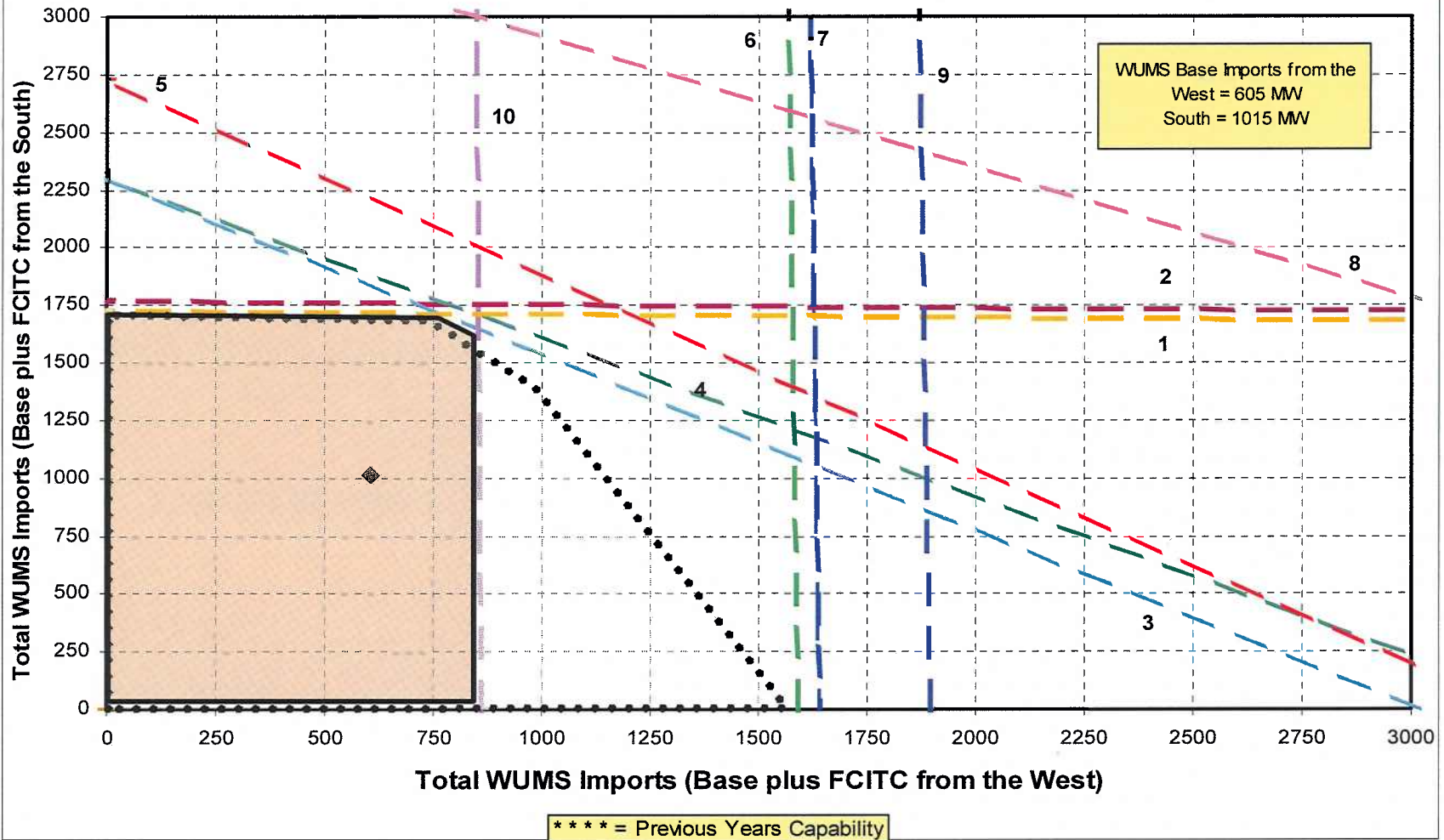
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| <ul style="list-style-type: none"> 1 Wempletow n - Paddock 345kV 2 Pleasant Prairie - Racine 345kV 3 Janesville-Russell 138 kV 4 Eau Claire - Arpin 345kV Flow Limit 5 Rocky Run Whiting Ave 115 kV 6 Paris-St Martin 138 kV | <ul style="list-style-type: 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"> 7 for outage of Dresden-Elect Jct 345kV Red & Dresden T for Arpin Area Op Guide Implementation for outage of Kewanee 345/138 kV Tr for outage of Wempleton n - 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 Wempleton n - 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



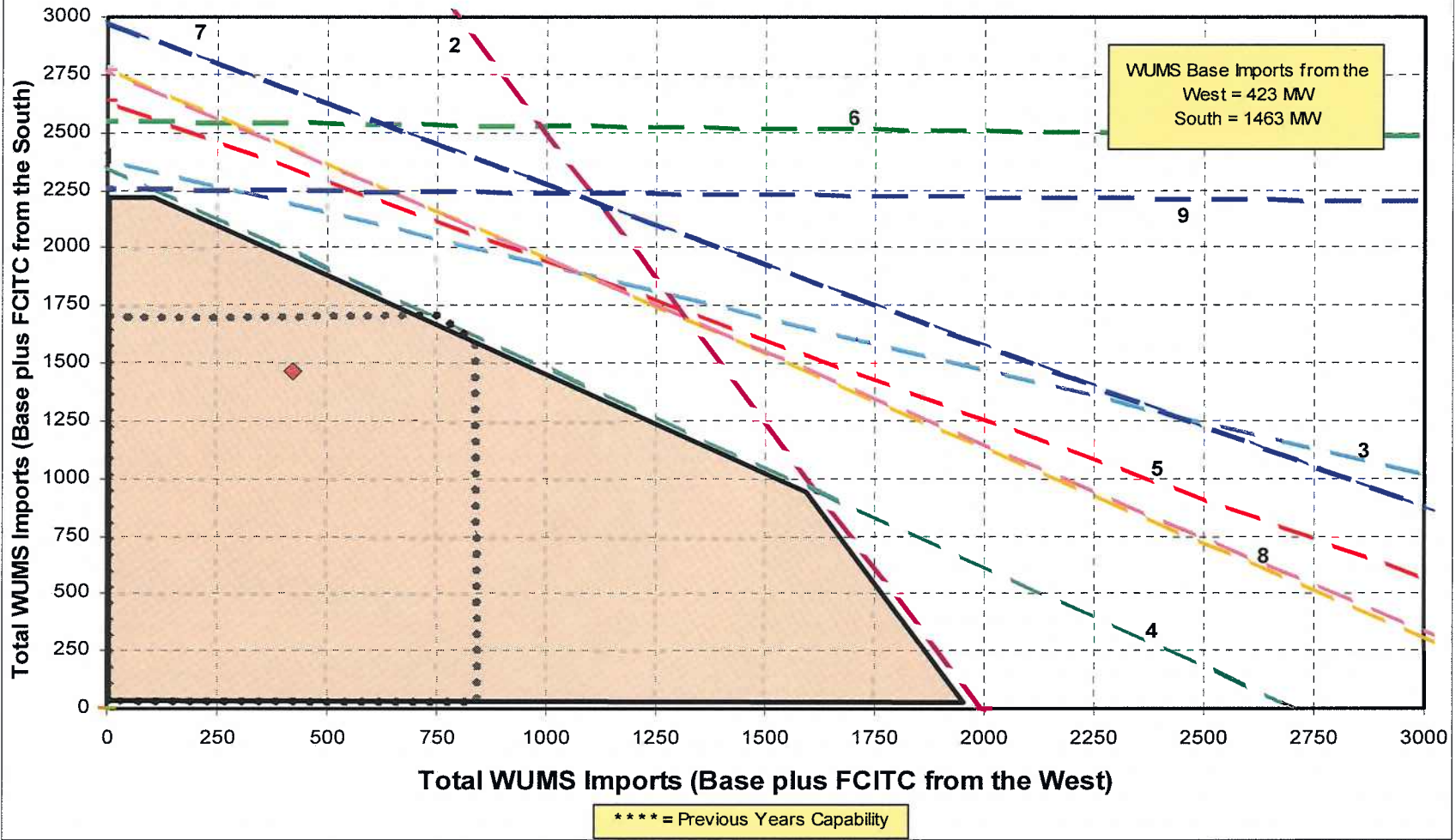
- 1** Golf Mills-Niles 138 kV Blue
- 2** Itasca-Tonne 138 kV Red
- 3** Paddock 345/138kV Tr
- 4** Lore-Turkey River 161 kV
- 5** Center-Fiebrantz 138 kV

- 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 Wempletown - Paddock 345kV
- for Arpin Area Op Guide Implementation

- 7** N Appleton 345/138 kV Tr #2
- 8** Arcadian - Pleasant Prairie 345kV
- 9** Eau Claire - Arpin 345kV Flow Limi
- 10** N Appleton-Lost Dauphin 138 kV

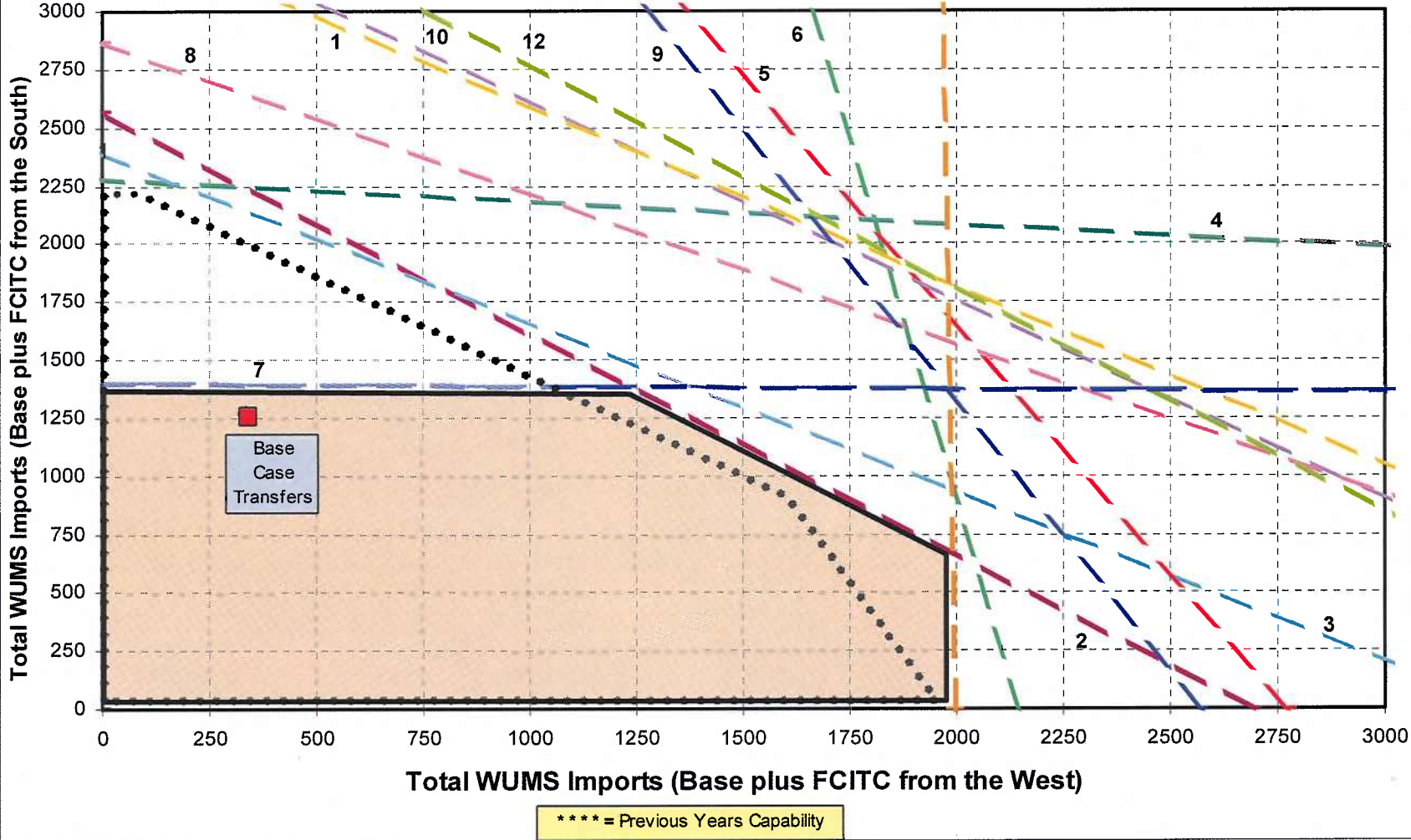
- for outage of N Appleton 345/138 kV Tr #3
- for outage of Pleasant Prairie - Racine 345kV
- for outage of N/A
- for outage of Kewaunee 345/138 kV Tr

WUMS Simultaneous Import Capabilities for 2003 Summer



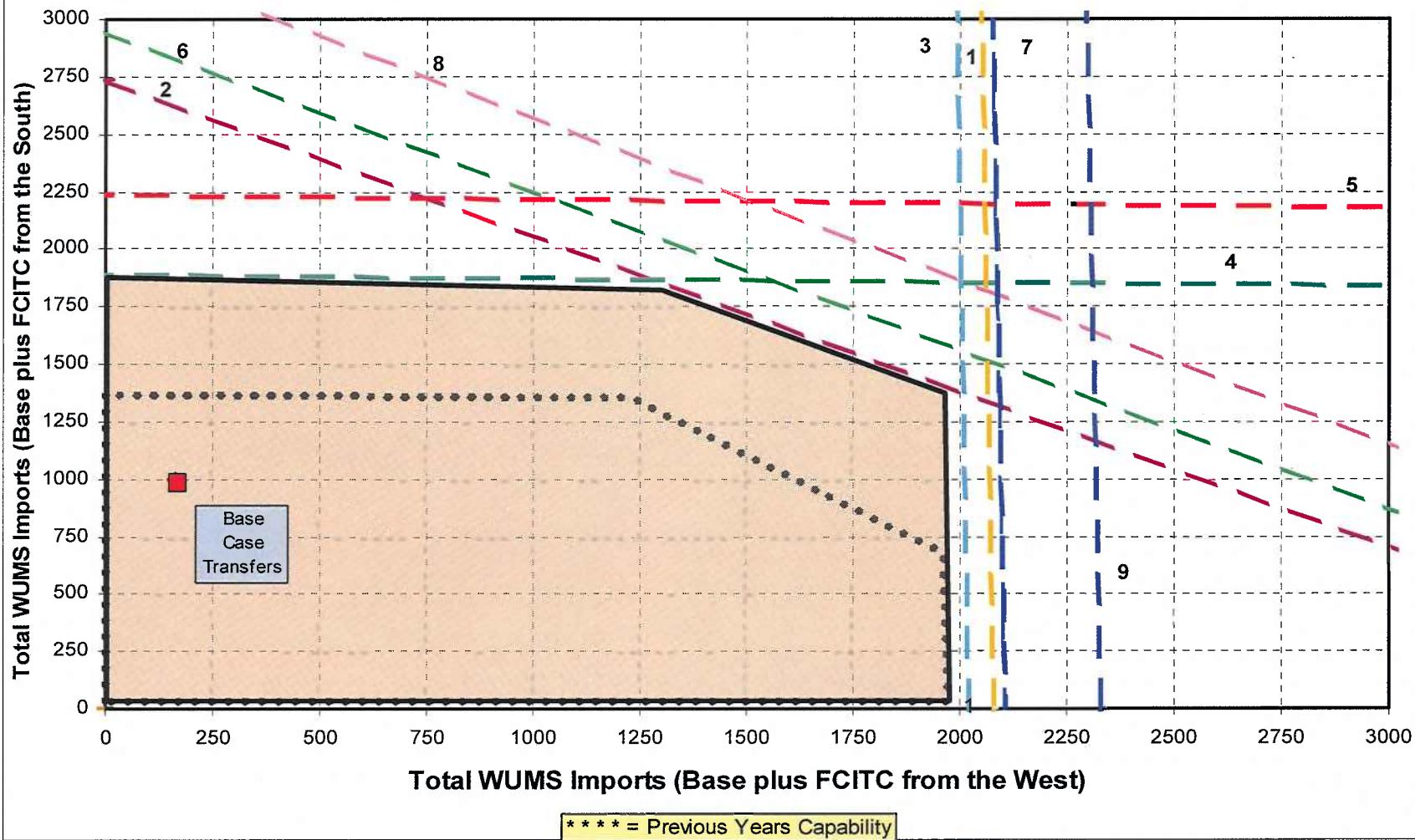
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| 1 Blackhaw k-ColleyRd 138 kV | for outage of Paddock-Rockdale 345 kV | 7 Golf Mills-Niles 138 kV Blue | for outage of Golf Mills-Skokie 345 kV Blue |
| 2 Eau Claire-Arpin 345 kV Flow Limit | for outage of N/A | 8 Paddock 345/138 kV Tr | for outage of Paddock-Rockdale 345 kV |
| 3 Center-Fiebrantz 138 kV | for outage of Arcadian-Granville 345 kV | 9 Paris-St Martins 138 kV | for outage of Pleasant Prairie-Racine 345 kV |
| 4 Lore-Turkey River-Cassville 161 kV | for outage of Wempletow n-Paddock 345 kV & Kaiser-Lancaster 69 kV | | |
| 5 Pleasant Prairie-Racine 345 kV | for outage of Wempletow n-Paddock 345 kV & Kaiser-Lancaster 69 kV | | |
| 6 Salem 345/161 kV Tr | for outage of Wempletow n-Paddock 345 kV & Kaiser-Lancaster 69 kV | | |

WUMS Simultaneous Import Capabilities for 2004 Summer



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| <p>1 Zion-Pleasant Prairie 345 kV</p> <p>2 Lore - Turkey River - Cassville 161kV</p> <p>3 Pleasant Prairie - Racine 345kV</p> <p>4 Paris - St. Martin 138kV</p> <p>5 Wien - T Corners 115kV</p> <p>6 Hazelton - Dundee 161kV</p> | <p>for outage of Wempletow n - Paddock 345kV</p> <p>for outage of Wempletow n-Paddock 345kV</p> <p>for outage of Wempletow n-Paddock 345kV</p> <p>for outage of Pleasant Prairie - Racine 345kV</p> <p>for Arpin Area Op Guide Implementation</p> <p>for outage of Rock Creek - Quad Cities 345kV</p> | <p>7 Salem 345/161kV Tr</p> <p>8 Arcadian - Pleasant Prairie 345kV</p> <p>9 Eau Claire - Arpin 345kV Flow Limi</p> <p>10 Paddock 345/138kV Tr</p> <p>11 Hazelton - Dundee 161kV</p> <p>12 Cassville-Nelson Dew ey 161kV</p> | <p>for outage of Wempletow n - Paddock 345kV</p> <p>for outage of Pleasant Prairie - Racine 345kV</p> <p>for outage of N/A</p> <p>for outage of Paddock-Rockdale 345kV</p> <p>for outage of King-Eau Claire-Arpin 345kV</p> <p>for outage of Wempletow n - Paddock 345kV</p> |
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WUMS Simultaneous Import Capabilities for 2005 Summer

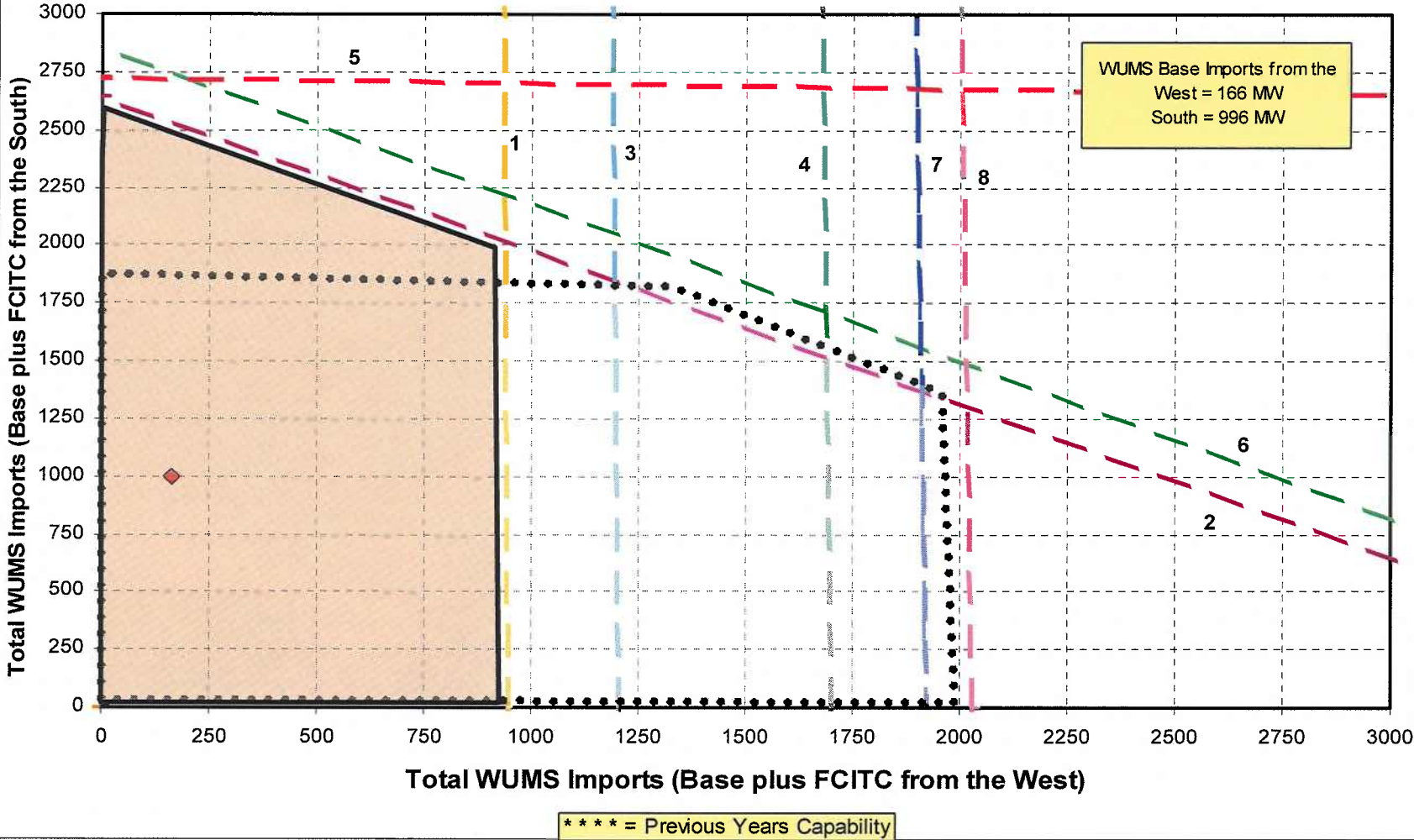


- 1 Hazelton - Dundee 161kV
- 2 Pleasant Prairie - Racine 345kV
- 3 Hazelton - Dundee 161kV
- 4 McGulpin-Riggsville 138 kV
- 5 McGulpin-Straits 138 kV #3
- 6 Pleasant Prairie - Racine 345kV

- for outage of Salem 345/161kV Tr.
- 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

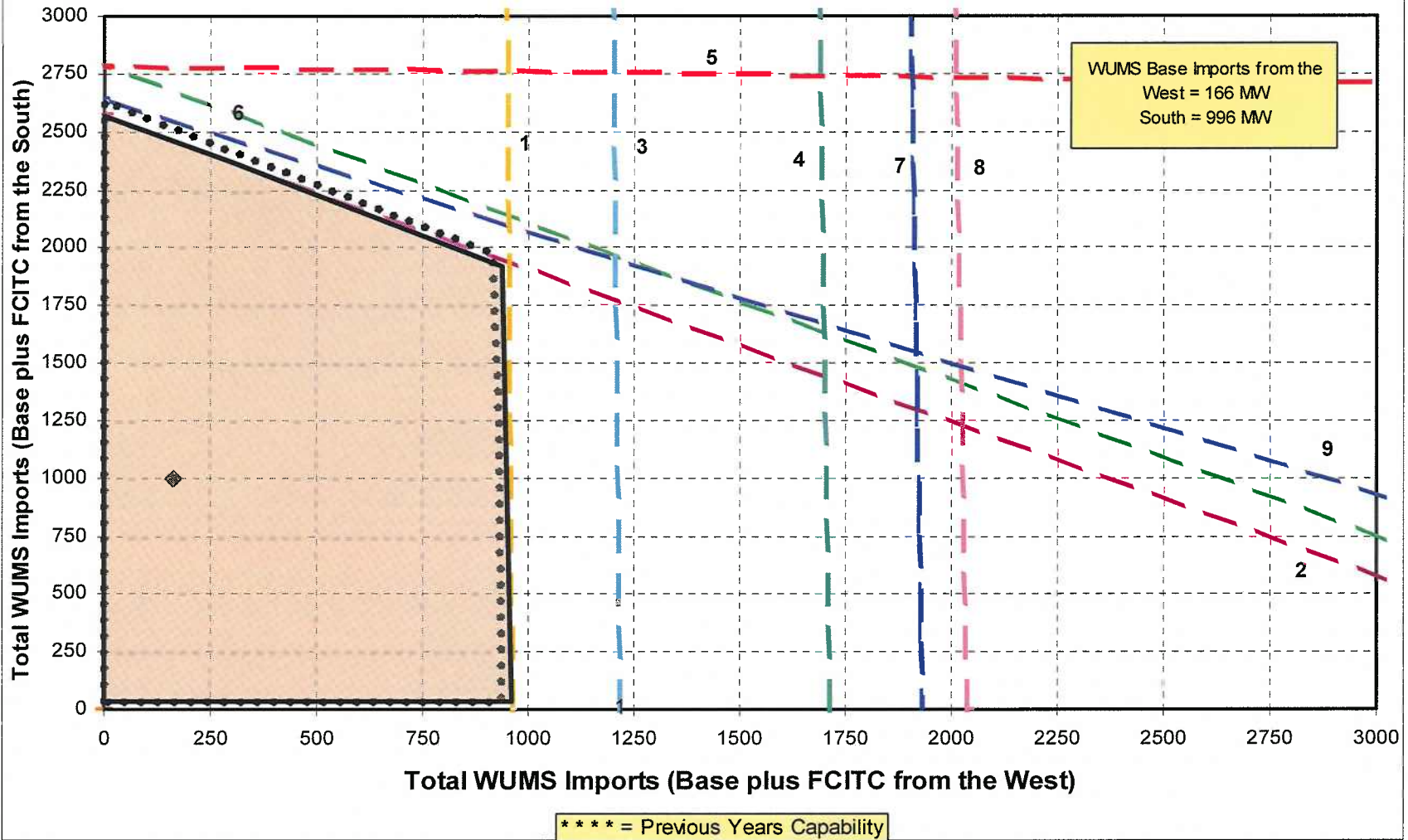
- 7 Hazelton - Dundee 161kV for outage of King-Eau Claire-Arpin 345kV
- 8 Pleasant Prairie - Racine 345kV for outage of Wempletow n-Rockdale 345kV
- 9 Eau Claire - Arpin 345kV Flow Limi for outage of N/A

WUMS Simultaneous Import Capabilities for 2006 Summer



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| <p>1 Barron-Wash Co 161kV</p> <p>2 Pleasant Prairie - Racine 345kV</p> <p>3 Wash Co-Stone Lake 161kV</p> <p>4 Barron-Wash Co 161kV</p> <p>5 McGulpin-Straits 138 kV #3</p> <p>6 Pleasant Prairie - Racine 345kV</p> | <p>for outage of Eau Claire-Arpin 345kV & Op Guide</p> <p>for outage of Pleasant Prairie-Arcadian 345 kV</p> <p>for outage of Eau Claire-Arpin 345kV & Op Guide</p> <p>for outage of King-Eau Claire-Arpin 345kV</p> <p>for outage of McGulpin-Straits 138 kV #1</p> <p>for outage of Zion-Arcadian 345 kV</p> | <p>7 Wash Co-Stone Lake 161kV</p> <p>8 Hazelton - Dundee 161kV</p> | <p>for outage of King-Eau Claire-Arpin 345kV</p> <p>for outage of Rock Creek - Quad Cities 345kV</p> |
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WUMS Simultaneous Import Capabilities for 2007 Summer



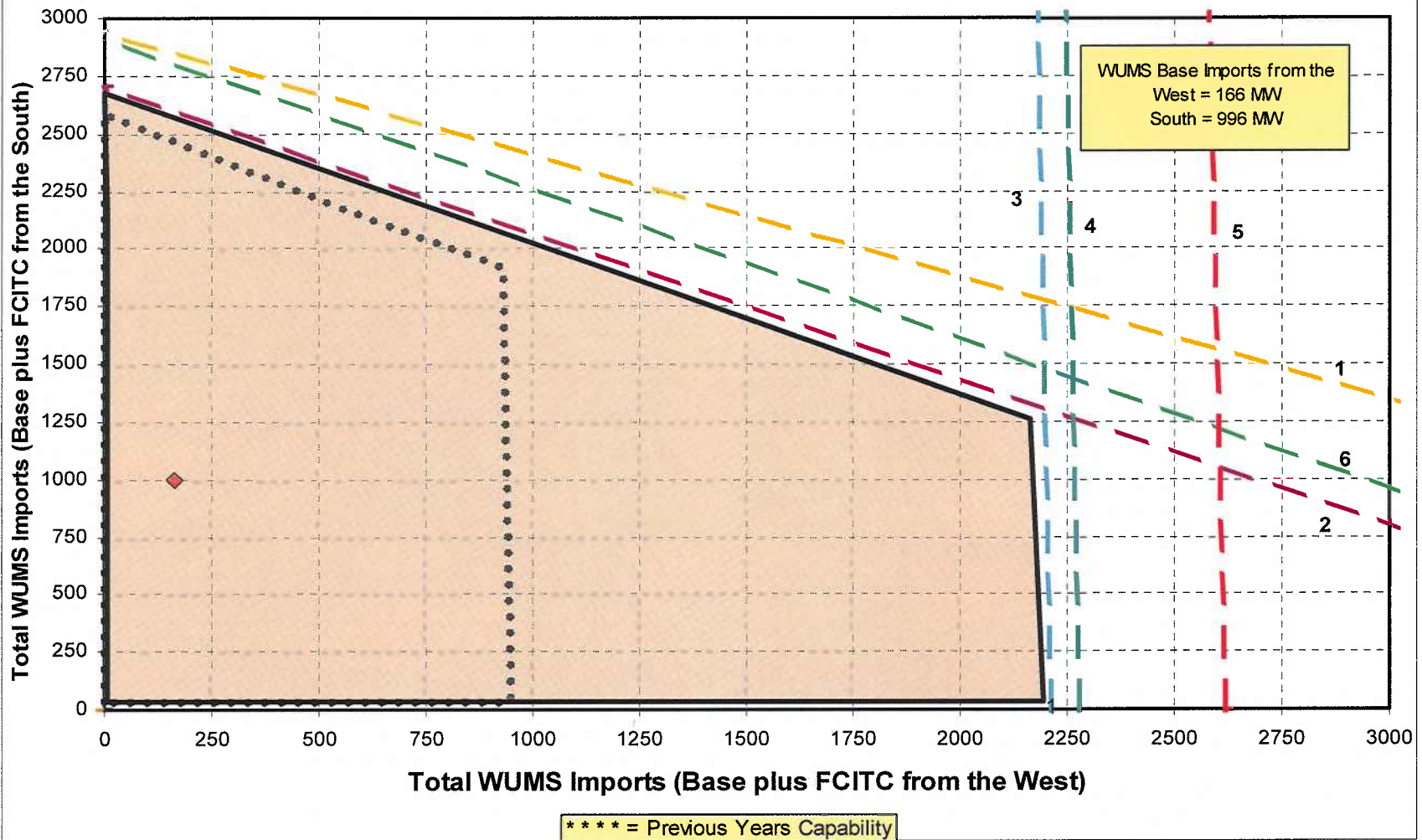
- 1** Barron-Wash Co 161kV
- 2** Pleasant Prairie - Racine 345kV
- 3** Wash Co-Stone Lake 161kV
- 4** Barron-Wash Co 161kV
- 5** McGulpin-Straits 138 kV #3
- 6** Pleasant Prairie - Racine 345kV

- for outage of Eau Claire-Arpin 345kV & Op Guide
- for outage of Pleasant Prairie-Arcadian 345 kV
- for outage of Eau Claire-Arpin 345kV & Op Guide
- for outage of King-Eau Claire-Arpin 345kV
- for outage of McGulpin-Straits 138 kV #1
- for outage of Zion-Arcadian 345 kV

- 7** Wash Co-Stone Lake 161kV
- 8** Hazelton - Dundee 161kV
- 9** Arcadian-Lannon 345kV #1

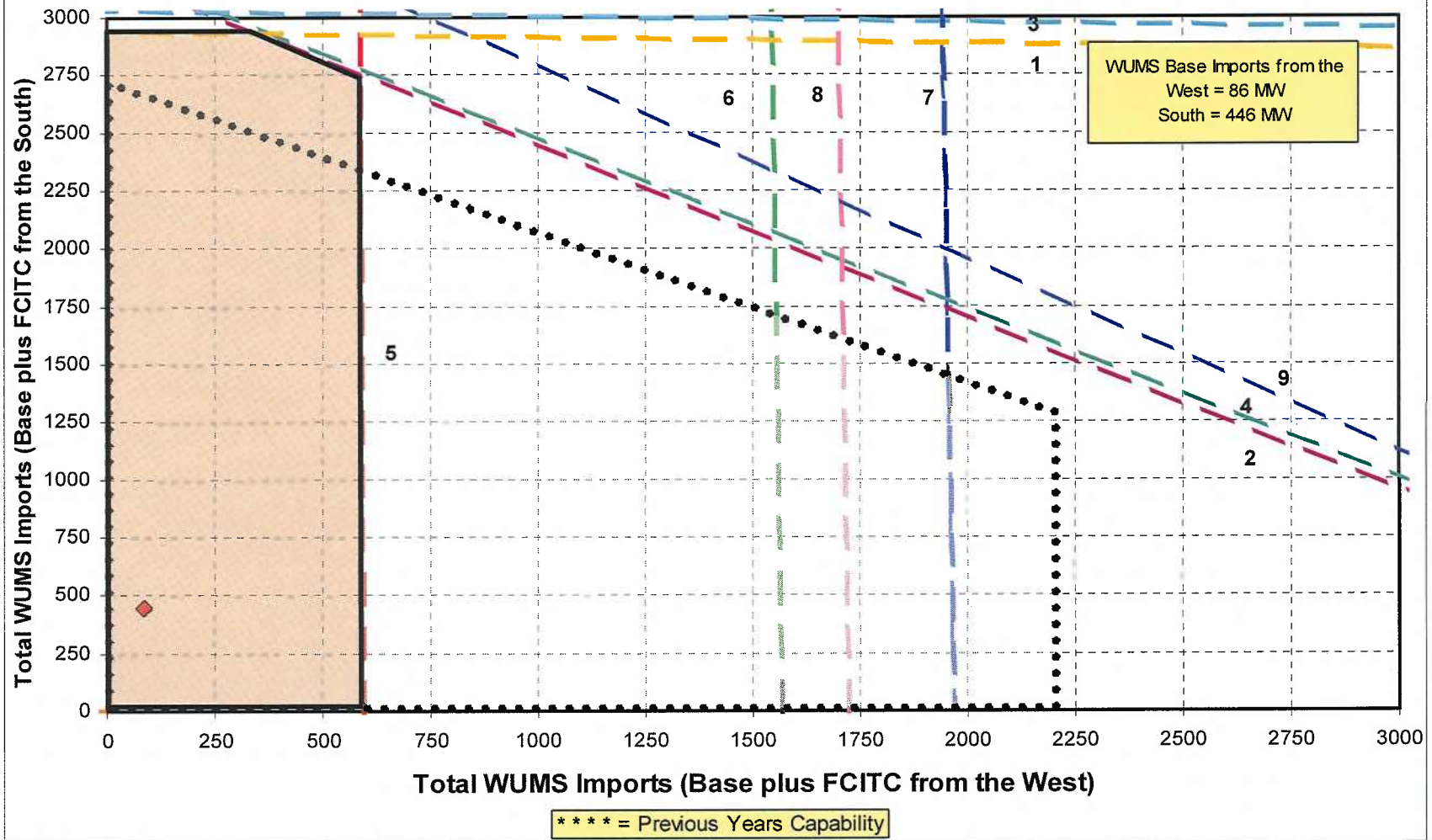
- for outage of King-Eau Claire-Arpin 345kV
- for outage of Rock Creek - Quad Cities 345kV
- for outage of Arcadian-Lannon 345kV #2

WUMS Simultaneous Import Capabilities for 2008 Summer



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| <ul style="list-style-type: none"> 1 Arcadian-Lannon 345kV #1 2 Pleasant Prairie - Racine 345kV 3 Hazelton - Dundee 161kV 4 Hazelton - Dundee 161kV 5 Turkey River-Cassville 161kV 6 Pleasant Prairie - Racine 345kV | <ul style="list-style-type: none"> for outage of Arcadian-Lannon 345kV #2 for outage of Pleasant Prairie-Arcadian 345 kV for outage of Rock Creek - Quad Cities 345kV for outage of Salem 345/161kV Tr. for outage of GranGrae-Seneca-Genoa 161kV for outage of Zion-Arcadian 345 kV |
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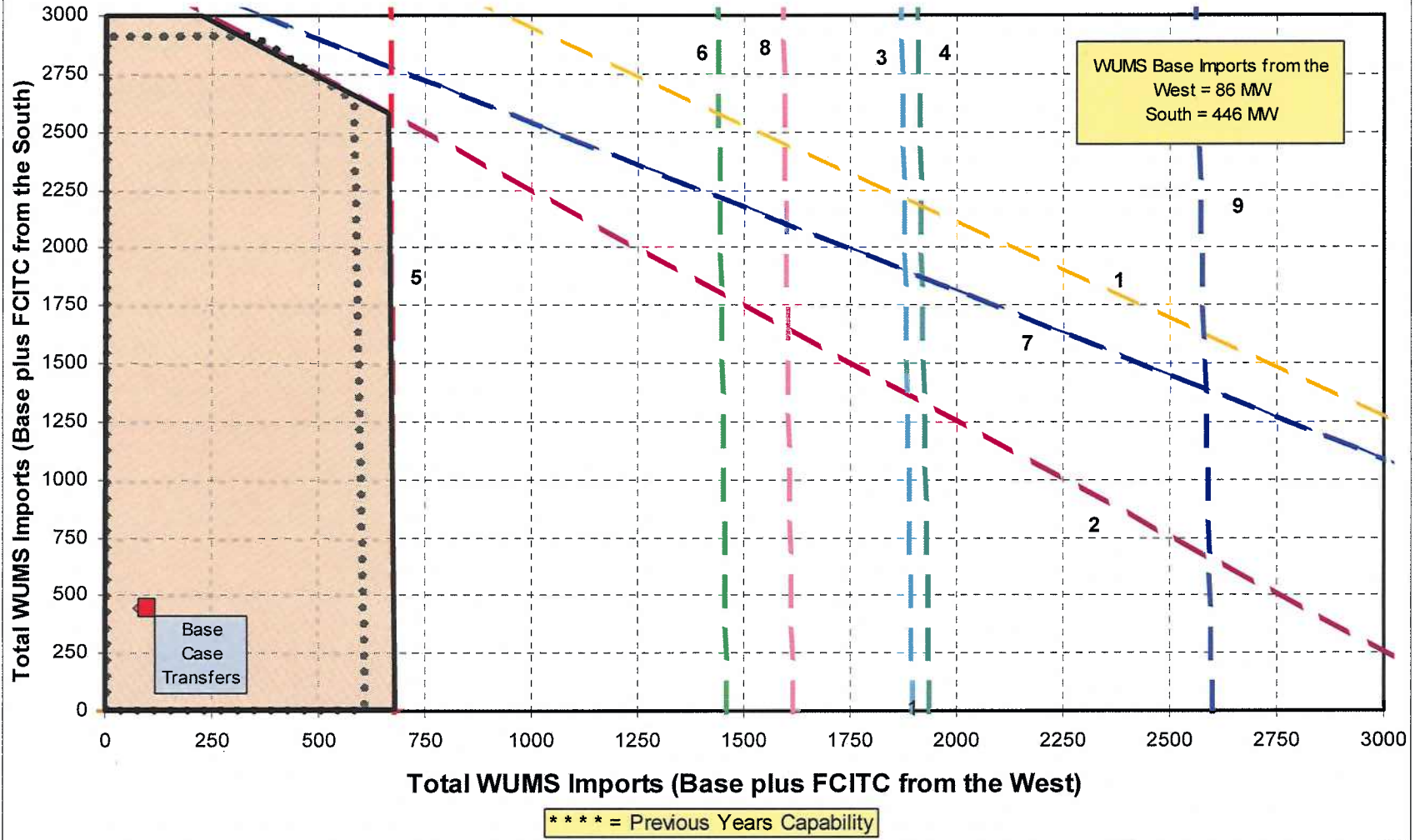
WUMS Simultaneous Import Capabilities for 2009 Summer



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| <ul style="list-style-type: none"> 1 Livingston-Emmit Co 138 kV 2 Lockport-Lisle 345kV Red 3 McGulpin-Straits 138 kV #3 4 Des Plains-Lombard 345kV Red 5 Eau Claire-Prescott-Wheaton 161kV 6 Hazelton - Dundee 161kV | <ul style="list-style-type: none"> for outage of Riggsville-McGulpin 138kV for outage of Lockport-Lombard 345kV Red for outage of McGulpin-Straits 138 kV #1 for outage of Lombard-Itasca 345kV Red & Tr for outage of Gardner Park-Stone Lake 345 kV for outage of Quad Cities-Rock Creek 345kV | <ul style="list-style-type: none"> 7 Hazelton - Dundee 161kV 8 Hazelton - Dundee 161kV 9 Paddock 345/138kV Tr | <ul style="list-style-type: none"> for outage of King-Eau Claire-Arpin 345kV + Gt for outage of Rock Creek-Salem 345kV for outage of Wempletow n-Rockdale 345kV |
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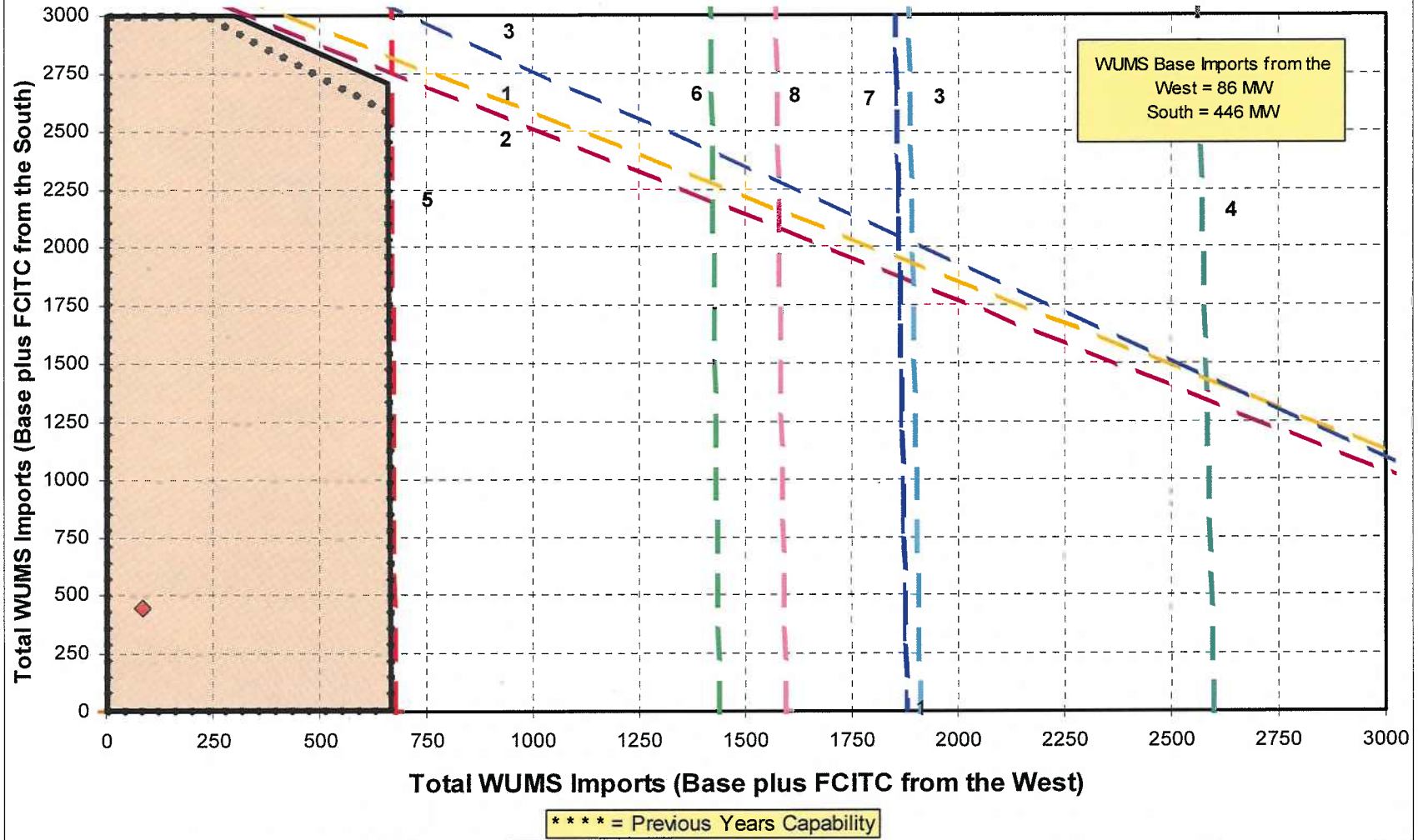
**** = Previous Years Capability

WUMS Simultaneous Import Capabilities for 2010 Summer



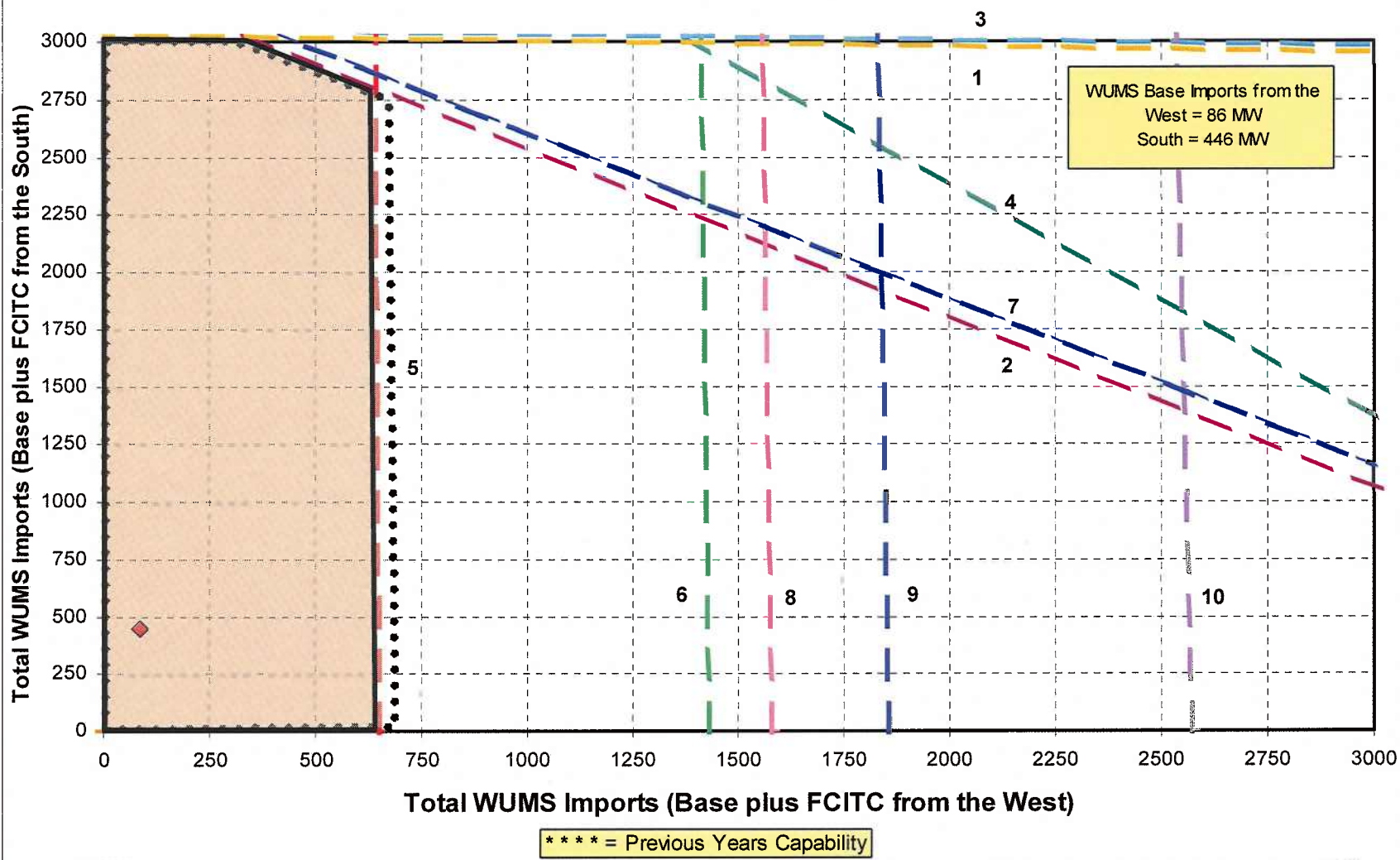
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| <p>1 Wempletow n-Rockdale 345kV</p> <p>2 Lockport-Lisle 345kV Red</p> <p>3 Hazelton - Dundee 161kV</p> <p>4 Hazelton - Dundee 161kV</p> <p>5 Eau Claire-Prescott-Wheaton 161kV</p> <p>6 Hazelton - Dundee 161kV</p> | <p>for outage of Wempletow n-Paddock 345kV</p> <p>for outage of Lockport-Lombard 345kV Red</p> <p>for outage of King-Eau Claire-Arpin 345kV +Guide</p> <p>for outage of Gran Grey-Seneca-Genoa 161kV</p> <p>for outage of Gardner Park-Stone Lake 345 kV</p> <p>for outage of Quad Cities-Rock Creek 345kV</p> | <p>7 Lombard-Des Plains 345kV Red</p> <p>8 Hazelton - Dundee 161kV</p> <p>9 Eau Claire-Arpin 345kV Flow Limit</p> | <p>for outage of Lombard-Itasca 345kV Red & Tr</p> <p>for outage of Rock Creek-Salem 345kV</p> <p>for outage of N/A</p> |
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WUMS Simultaneous Import Capabilities for 2011 Summer



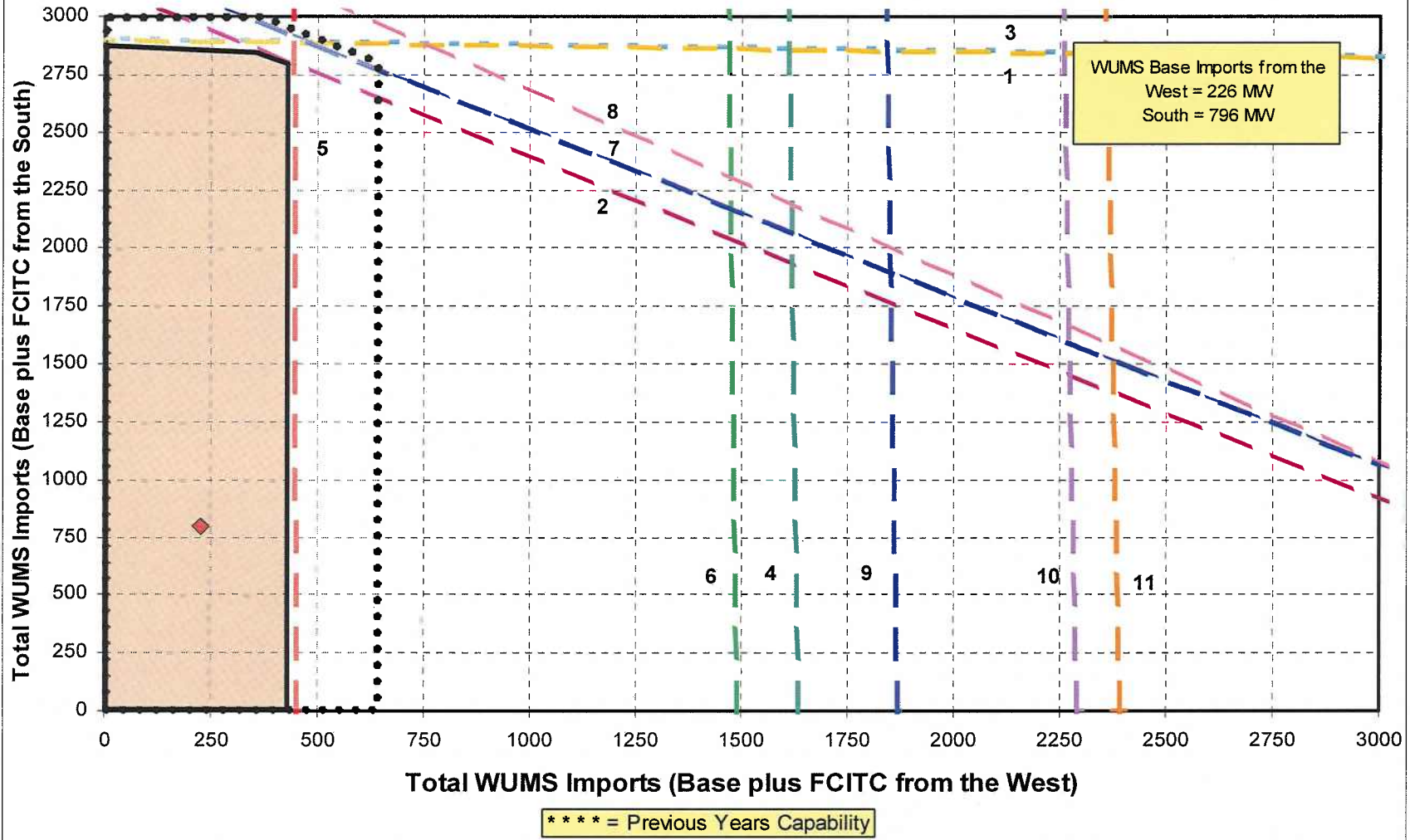
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| <p>1 Lombard-Des Plains 345kV Red</p> <p>2 Lockport-Lisle 345kV Red</p> <p>3 Hazelton - Dundee 161kV</p> <p>4 Eau Claire-Arpin 345kV Flow Limit</p> <p>5 Eau Claire-Prescott-Wheaton 161kV</p> <p>6 Hazelton - Dundee 161kV</p> | <p>for outage of Lombard-Itasca 345kV Red & Tr</p> <p>for outage of Lockport-Lombard 345kV Red</p> <p>for outage of Gran Grey-Seneca-Genoa 161kV</p> <p>for outage of N/A</p> <p>for outage of Gardner Park-Stone Lake 345 kV</p> <p>for outage of Quad Cities-Rock Creek 345kV</p> | <p>7 Hazelton - Dundee 161kV</p> <p>8 Hazelton - Dundee 161kV</p> <p>9 Wempletow n-Rockdale 345kV</p> | <p>for outage of King-Eau Claire-Arpin 345kV + Gt</p> <p>for outage of Rock Creek-Salem 345kV</p> <p>for outage of Wempletow n-Paddock 345kV</p> |
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WUMS Simultaneous Import Capabilities for 2012 Summer



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| <p>1 Livingston-Emmit Co 138 kV</p> <p>2 Lockport-Lisle 345kV Red</p> <p>3 McGulpin-Straits 138 kV #3</p> <p>4 Wempletow n-Rockdale 345kV</p> <p>5 Eau Claire-Prescott-Wheaton 161kV</p> <p>6 Hazelton - Dundee 161kV</p> | <p>for outage of Riggsville-McGulpin 138kV</p> <p>for outage of Lockport-Lombard 345kV Red</p> <p>for outage of McGulpin-Straits 138 kV #1</p> <p>for outage of Wempletow n-Paddock 345kV</p> <p>for outage of Gardner Park-Stone Lake 345 kV</p> <p>for outage of Quad Cities-Rock Creek 345kV</p> | <p>7 Lombard-Des Plains 345kV Red</p> <p>8 Hazelton - Dundee 161kV</p> <p>9 Hazelton - Dundee 161kV</p> <p>10 Eau Claire-Arpin 345kV Flow Limit</p> | <p>for outage of Lombard-Itasca 345kV Red & Tr</p> <p>for outage of Rock Creek-Salem 345kV</p> <p>for outage of King-Eau Claire-Arpin 345kV +Gu</p> <p>for outage of N/A</p> |
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WUMS Simultaneous Import Capabilities for 2013 Summer



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| <ul style="list-style-type: none"> 1 Livingston-Emmit Co 138 kV 2 Lockport-Lisle 345kV Red 3 McGulpin-Straits 138 kV #3 4 Hazelton - Dundee 161kV 5 Eau Claire-Prescott-Wheaton 161kV 6 Hazelton - Dundee 161kV | <ul style="list-style-type: none"> for outage of Riggsville-McGulpin 138kV for outage of Lockport-Lombard 345kV Red for outage of McGulpin-Straits 138 kV #1 for outage of Rock Creek-Salem 345kV for outage of Gardner Park-Stone Lake 345 kV for outage of Quad Cities-Rock Creek 345kV | <ul style="list-style-type: none"> 7 Lombard-Des Plains 345kV Red 8 Electric Jct 345kV Bus Tie Red 9 Hazelton - Dundee 161kV 10 Eau Claire-Arpin 345kV Flow Limit 11 Arrow head 230kV Phase Shifter | <ul style="list-style-type: none"> for outage of Lombard-Itasca 345kV Red & Tr for outage of Wayne-Aurora 345kV Red for outage of King-Eau Claire-Arpin 345kV +Gu for outage of N/A for outage of King-Eau Claire-Arpin 345kV +Gu |
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