Exhibit Name: Margin Protection Calculation Parameters
Exhibit Number: P15-6
Record Name: Yield
Record Code: P15-6

Reinsurance Year: 2016
Version: Approved
Release Date: 9/7/2016

Step 1: Identify P15 Records with Acreage for Current Crop Year

Reinsurance Year	Aip Code	Aip Policy Producer Key	Aip Insurance In Force Key	Aip Yield Key	Location State Code	Policy Number	Location County Code	Commodity Year	Commodity Code	Insurance Plan Code	Practice Code	Type Code	
2014	ZZ	654321	14	951	19	0000053	41	2014	41	2	3	16	AipYieldKey is included
2014	ZZ	654321	14	306	19	0000053	41	2014	41	2	3	16	AipYieldKey is excluded
2014	ZZ	654321	14	720	19	0000053	41	2014	41	2	3	16	AipYieldKey is included

The highlighted P15 records reported acres for the P11 records. These pertain to AIP yield key 951 and 720. Relevant P15A records are highlighted in the same color as the P15 records.

Step 2: Identify P15A records pertaining to AIP Yield Keys Identified in Step 1.

P15A Records (APHs)

Reinsurance Year	Aip Yield Key	Yield Commodity Year	Yield Type Code	Annual Yield	Yield Acreage
2014	951	2001	A	141	38.6
2014	951	2002	A	148	101.1
2014	951	2003	A	159	39.1
2014	951	2004	A	176	102.6
2014	951	2005	A	202	39.1
2014	951	2006	A	175	71.8
2014	951	2007	A	179	39.1
2014	951	2008	A	194	34.8
2014	951	2010	A	190	34.8
2014	951	2012	A	194	34.8

Reinsurance Year	Aip Yield Key	Yield Commodity Year	Yield Type Code	Annual Yield	Yield Acreage
2014	306	1998	Z	0	0
2014	306	1999	A	167	72
2014	306	2001	A	135	72
2014	306	2003	A	159	72
2014	306	2005	A	200	72
2014	306	2006	A	126	34.8
2014	306	2007	A	134	73.6
2014	306	2009	A	161	72.4
2014	306	2011	A	199	72.4
2014	306	2013	A	176	72.4

Reinsurance Year	Aip Yield Key	Yield Commodity Year	Yield Type Code	Annual Yield	Yield Acreage
2014	720	2004	Z	0	0
2014	720	2005	A	202	39.1
2014	720	2006	A	175	71.8
2014	720	2007	A	179	39.1
2014	720	2008	A	195	61.8
2014	720	2009	A	191	39.1
2014	720	2010	A	190	52.2
2014	720	2011	A	196	39.1
2014	720	2012	A	200	52.5
2014	720	2013	A	197	39.1

Step 3: Create a Series of Annual Yields Using the YieldCommodityYear from the P15A Records Identified in Step 2.

Use only yield type codes: A, AC, AX, AY, BF, DA, DG, DV, G, GC, GW, GX, GY, J, NA, NG, NO, NR, NU, NV, NW, OY, P, PA, PG, PR, PV, PW, Q, R, RY, TX, UG, UY, V, VC, VW, VX, VY, W6, W7, WY.
Calculate an acre-weighted average when more than one P15A record exists for a Yield Commodity Year. Round to nearest whole number.
Example: Year 2008 has P15A with 194 yield and 34.8 acres, another P15A with 195 yield and 61.8 acres. Weighted average yield of 195 =round((194 * 34.8 + 195 * 61.8)/(34.8 + 61.8),0).

Yield Commodity Year	Annual Yield	
2001	141	
2002	148	
2003	159	
2004	176	
2005	202	weighted average
2006	175	weighted average
2007	179	weighted average
2008	195	weighted average
2009	191	
2010	190	weighted average
2011	196	
2012	198	weighted average
2013	197	

Step 4: Eliminate all YieldCommodityYear Observations in Excess of 10 years.

Eliminate oldest observations

Yield Commodity Year	Annual Yield
2004	176
2005	202
2006	175
2007	179
2008	195
2009	191
2010	190
2011	196
2012	198
2013	197

Step 5: Calculate the Simple Average of the annualyield obserations

Round to two decimals

Yield Commodity Year	Annual Yield
2004	176
2005	202
2006	175
2007	179
2008	195
2009	191
2010	190
2011	196
2012	198
2013	197
Average	189.90

Step 6: Subtract the Average Yield from each annual yield

Round to two decimals

Yield Commodity Year	Annual Yield	Yearly Yield Deviation
2004	176	#############
2005	202	#############
2006	175	#############
2007	179	#############
2008	195	5.10
2009	191	1.10
2010	190	0.10
2011	196	6.10
2012	198	8.10
2013	197	7.10
Average	189.90	

Step 7: Match the Annual County Yield to each Year with an annual yield

County Yield is provided in ADM Yield Trend, "A01115"

Yield Commodity Year	Annual Yield	Yearly Yield Deviation	County Yield
2004	176	#############	178.7
2005	202	#############	178.5
2006	175	#############	155.7
2007	179	#############	159.2
2008	195	5.10	170.4
2009	191	1.10	184.1
2010	190	0.10	174.3
2011	196	6.10	170.8
2012	198	8.10	163.8
2013	197	7.10	152.6
Average	189.90		

Step 8: Calculate the Simple Average of the County Yields

Round to two decimals

Yield Commodity Year	Annual Yield	Yearly Yield Deviation	County Yield
2004	176	#############	178.7
2005	202	#############	178.5
2006	175	#############	155.7
2007	179	#############	159.2
2008	195	5.10	170.4
2009	191	1.10	184.1
2010	190	0.10	174.3
2011	196	6.10	170.8
2012	198	8.10	163.8
2013	197	7.10	152.6
Average	189.90		168.81

Step 9: Subtract the Average County Yield from each County Yield

Round to two decimals

Yield Commodity Year	Annual Yield	Yearly Yield Deviation	County Yield	County Yield Deviation
2004	176	#############	178.7	9.89
2005	202	#############	178.5	9.69
2006	175	#############	155.7	-13.11
2007	179	#############	159.2	-9.61
2008	195	5.10	170.4	1.59
2009	191	1.10	184.1	15.29
2010	190	0.10	174.3	5.49
2011	196	6.10	170.8	1.99
2012	198	8.10	163.8	-5.01
2013	197	7.10	152.6	-16.21
Average	189.90		168.81	

Step 10: Multiply the Yearly Yield Deviation by the County Yield Deviation

Round to four decimals

Yield Commodity Year	Annual Yield	Yearly Yield Deviation	County Yield	County Yield Deviation	Cross Product
2004	176	#############	178.7	9.89	###########
2005	202	#############	178.5	9.69	###########
2006	175	#############	155.7	-13.11	###########
2007	179	#############	159.2	-9.61	###########
2008	195	5.10	170.4	1.59	8.1090
2009	191	1.10	184.1	15.29	16.8190
2010	190	0.10	174.3	5.49	0.5490
2011	196	6.10	170.8	1.99	12.1390
2012	198	8.10	163.8	-5.01	-40.5810
2013	197	7.10	152.6	-16.21	###########
Average	189.90		168.81		

Step 11: Calculate the Square of the County Yield Deviation

Round to four decimals

Yield Commodity Year	Annual Yield	Yearly Yield Deviation	County Yield	County Yield Deviation	Cross Product	County Yield Deviation^2
2004	176	############	178.7	9.89	###########	97.8121
2005	202	############	178.5	9.69	###########	93.8961
2006	175	############	155.7	-13.11	###########	171.8721
2007	179	############	159.2	-9.61	###########	92.3521
2008	195	5.10	170.4	1.59	8.1090	2.5281
2009	191	1.10	184.1	15.29	16.8190	233.7841
2010	190	0.10	174.3	5.49	0.5490	30.1401
2011	196	6.10	170.8	1.99	12.1390	3.96
2012	198	8.10	163.8	-5.01	-40.5810	25.10
2013	197	7.10	152.6	-16.21	###########	262.7641
Average	189.90		168.81			

Step 12: Calculate the Sums of the Cross Products and the County Yield Deviation^2

Round to two decimals

Yield Commodity Year	Annual Yield	Yearly Yield Deviation	County Yield	County Yield Deviation	Cross Product	County Yield Deviation^2
2004	176	-13.9	178.7	9.89	###########	97.8121
2005	202	12.1	178.5	9.69	###########	93.8961
2006	175	-14.9	155.7	-13.11	###########	171.8721
2007	179	-10.9	159.2	-9.61	###########	92.3521
2008	195	5.1	170.4	1.59	8.1090	2.5281
2009	191	1.1	184.1	15.29	16.8190	233.7841
2010	190	0.1	174.3	5.49	0.5490	30.1401
2011	196	6.1	170.8	1.99	12.1390	3.9601
2012	198	8.1	163.8	-5.01	-40.5810	25.1001
2013	197	7.1	152.6	-16.21	###########	262.7641
Average	189.90		168.81		161.81	1014.21

Step 13: Calculate Beta

Round to four decimals

Beta = ∑ Cross Product ÷ ∑ County Yield Deviation^2

Beta = 161.81 ÷1014.21 = 0.1595 0.3

Rules:

If calculated beta < 0.3, beta = 0.3

If calculated beta > 1.6, beta = 1.6

If number of years (n) < 4, beta = 0.3

Step 14: Calculate Alpha

Round to four decimals

Alpha = Average annualyield - beta * average county yield

Alpha = 189.90 - 0.3 * 168.81 = 139.2570

Step 15: Calculate the Squared Yield Deviation for each YieldCommodityYear

Round to four decimals

Squared Yield Deviation = (annualyield - alpha - beta * county yield)^2

Round to four decimals

Yield Commodity Year	Annual Yield	Yearly Yield Deviation	County Yield	County Yield Deviation	Cross Product	County Yield Deviation^2	Squared Deviation
2004	176	############	178.7	9.89	###########	97.8121	284.4957
2005	202	############	178.5	9.69	###########	93.8961	84.5112
2006	175	############	155.7	-13.11	###########	171.8721	120.2751
2007	179	############	159.2	-9.61	###########	92.3521	64.2723
2008	195	5.10	170.4	1.59	8.1090	2.5281	21.3721
2009	191	1.10	184.1	15.29	16.8190	233.7841	12.1592
2010	190	0.10	174.3	5.49	0.5490	30.1401	2.3932
2011	196	6.10	170.8	1.99	12.1390	3.9601	30.2830
2012	198	8.10	163.8	-5.01	-40.5810	25.1001	92.2176
2013	197	7.10	152.6	-16.21	###########	262.7641	143.1134
Average	189.90		168.81		161.81	1014.21	

Step 16: Calculate the sum of the Squared Deviations

Round to four decimals

Yield Commodity Year	Annual Yield	Yearly Yield Deviation	County Yield	County Yield Deviation	Cross Product	County Yield Deviation^2	Squared Deviation
2004	176	############	178.7	9.89	-137.471	97.8121	284.4957
2005	202	############	178.5	9.69	117.249	93.8961	84.5112
2006	175	############	155.7	-13.11	195.339	171.8721	120.2751
2007	179	############	159.2	-9.61	104.749	92.3521	64.2723
2008	195	5.10	170.4	1.59	8.109	2.5281	21.3721
2009	191	1.10	184.1	15.29	16.819	233.7841	12.1592
2010	190	0.10	174.3	5.49	0.549	30.1401	2.3932
2011	196	6.10	170.8	1.99	12.139	3.9601	30.2830
2012	198	8.10	163.8	-5.01	-40.581	25.1001	92.2176
2013	197	7.10	152.6	-16.21	-115.091	262.7641	143.1134
Average	189.90		168.81		161.81	1014.21	855.0928

Step 17: Calculate Sigma

Round to four decimals

Sigma = SQRT((∑ Squared Deviations ÷(n - 2)) = 10.3386

Rules:

If n < 4, sigma = 0