Segal Consulting

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March 6, 2014

Mr. Sparb Collins
Executive Director
North Dakota Public Employees Retirement System
400 East Broadway, Suite 505
Bismarck, ND 58502

Re: NDPERS Retirement System – Projected Cash Flows

Dear Sparb:

Per your request, we have projected cash flows for the Main Systems of the PERS plan under various scenarios. We have also provided the items requested in the "Potential Actuarial Information Requests" of February 14, 2014.

The items from the Potential Actuarial Information Requests are listed below:

1. Based on the July 1, 2013 actuarial valuation, the amounts attributable to state and non-state employees are as follows:

	State Portion	Non-State Portion	Total
Actuarial Accrued Liability (AAL)	$1,651,760,075	$998,764,943	$2,650,525,018
Actuarial Value of Assets (AVA)	1,017,604,050	615,311,670	1,632,915,720
Unfunded AAL on AVA Basis	634,156,025	383,453,273	1,017,609,298
Market Value of Assets (MVA)	1,183,708,876	715,749,790	1,899,458,666
Unfunded AAL on MVA Basis	468,051,199	283,015,153	751,066,352

2. The projected amounts as of January 1, 2016 are as follows:

	State Portion	Non-State Portion	Total
Actuarial Accrued Liability (AAL)	$1,922,300,000	$1,208,500,000	$3,130,800,000
Actuarial Value of Assets (AVA)	1,273,000,000	799,500,000	2,072,500,000
Unfunded AAL on AVA Basis	649,300,000	409,000,000	1,058,300,000
Market Value of Assets (MVA)	1,412,200,000	887,000,000	2,299,200,000
Unfunded AAL on MVA Basis	510,100,000	321,500,000	831,600,000

3. The projected amounts as of July 1, 2014 assuming the fund earns an 8% rate of return for the 2014 fiscal year are as follows:

	State Portion	Non-State Portion	Total
Actuarial Accrued Liability (AAL)	$1,756,500,000	$1,079,100,000	$2,835,600,000
Actuarial Value of Assets (AVA)	1,119,500,000	692,800,000	1,812,300,000
Unfunded AAL on AVA Basis	637,000,000	386,300,000	1,023,300,000
Market Value of Assets (MVA)	1,265,500,000	783,200,000	2,048,700,000
Unfunded AAL on MVA Basis	491,000,000	295,900,000	786,900,000

4. If the PERS plan is closed to new participants hired after January 1, 2016,

   a. The estimated amounts that would be needed to pay current and future retirement benefits for plan members compared to the amounts projected to be collected from payroll contributions are as follows:

	State Portion	Non-State Portion	Total
Unfunded Present Value of Benefits	$510,100,000	$321,500,000	$831,600,000
Projected Future Contributions	1,161,400,000	929,300,000	2,090,700,000
Projected Contribution Shortfall	-3,688,100,000	98,900,000	-3,589,200,000

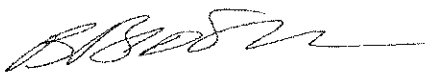
   b. The plan is projected to be able to pay retirement benefits with projected contributions under current law for employees remaining in the PERS plan for 2054 years, at which time the fund would be exhausted.

We also have included projected cash flows under various scenarios.

These cost estimates are based on the July 1, 2013 actuarial valuation results. Calculations were completed under the supervision of Tammy Dixon, FSA, MAAA, Enrolled Actuary.

Please call if you have any questions or comments.

Sincerely,



Brad Ramirez, FSA, MAAA, EA
Consulting Actuary

cc: Tammy Dixon

Attachment

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems - Existing Plan No Change (entire group)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)
07/01/2014	$2,048,700,000	$127,000,000	$164,000,000	-$125,400,000	$2,214,200,000	72.2%
07/01/2015	2,214,200,000	65,900,000	86,800,000	-67,700,000	2,299,200,000	73.1%
01/01/2016	2,299,200,000	65,900,000	90,200,000	-67,700,000	2,387,600,000	73.4%
07/01/2016	2,387,600,000	136,900,000	190,600,000	-147,900,000	2,567,200,000	73.9%
07/01/2017	2,567,200,000	142,200,000	204,700,000	-159,800,000	2,754,300,000	74.5%
07/01/2018	2,754,300,000	147,700,000	219,300,000	-172,600,000	2,948,700,000	75.2%
07/01/2019	2,948,700,000	154,300,000	234,600,000	-186,400,000	3,151,300,000	75.7%
07/01/2020	3,151,300,000	161,300,000	250,500,000	-201,300,000	3,361,800,000	76.3%
07/01/2021	3,361,800,000	168,500,000	267,000,000	-217,400,000	3,580,000,000	76.8%
07/01/2022	3,580,000,000	176,100,000	284,100,000	-234,800,000	3,805,400,000	77.2%
07/01/2023	3,805,400,000	184,000,000	301,800,000	-248,800,000	4,042,400,000	77.6%
07/01/2024	4,042,400,000	192,300,000	320,500,000	-263,800,000	4,291,400,000	78.0%
07/01/2025	4,291,400,000	201,000,000	340,200,000	-279,600,000	4,553,000,000	78.4%
07/01/2026	4,553,000,000	210,000,000	360,800,000	-296,400,000	4,827,400,000	78.8%
07/01/2027	4,827,400,000	219,500,000	382,400,000	-314,200,000	5,115,100,000	79.2%
07/01/2028	5,115,100,000	229,300,000	405,100,000	-333,000,000	5,416,500,000	79.6%
07/01/2029	5,416,500,000	239,700,000	428,800,000	-353,000,000	5,731,900,000	79.9%
07/01/2030	5,731,900,000	250,400,000	453,600,000	-374,200,000	6,061,800,000	80.3%
07/01/2031	6,061,800,000	261,700,000	479,500,000	-396,600,000	6,406,400,000	80.6%
07/01/2032	6,406,400,000	273,500,000	506,600,000	-420,400,000	6,766,100,000	80.9%
07/01/2033	6,766,100,000	285,800,000	535,200,000	-437,200,000	7,149,900,000	81.2%
07/01/2034	7,149,900,000	298,700,000	565,800,000	-454,700,000	7,559,600,000	81.6%
07/01/2035	7,559,600,000	312,100,000	598,300,000	-472,900,000	7,997,100,000	81.9%
07/01/2036	7,997,100,000	326,100,000	633,100,000	-491,800,000	8,464,600,000	82.2%
07/01/2037	8,464,600,000	340,800,000	670,300,000	-511,500,000	8,964,200,000	82.6%
07/01/2038	8,964,200,000	356,200,000	710,100,000	-532,000,000	9,498,500,000	83.0%
07/01/2039	9,498,500,000	372,200,000	752,600,000	-553,300,000	10,070,100,000	83.3%
07/01/2040	10,070,100,000	388,900,000	798,100,000	-575,400,000	10,681,800,000	83.7%
07/01/2041	10,681,800,000	406,400,000	846,900,000	-598,400,000	11,336,700,000	84.1%
07/01/2042	11,336,700,000	424,700,000	899,000,000	-622,300,000	12,038,100,000	84.5%
07/01/2043	12,038,100,000	443,800,000	954,900,000	-647,200,000	12,789,600,000	84.9%

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems - Existing Plan No Change (entire group)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)
07/01/2044	12,789,600,000	463,800,000	1,014,800,000	-673,100,000	13,595,100,000	85.4%
07/01/2045	13,595,100,000	484,700,000	1,079,000,000	-700,000,000	14,458,800,000	85.8%
07/01/2046	14,458,800,000	506,500,000	1,147,800,000	-728,000,000	15,385,100,000	86.2%
07/01/2047	15,385,100,000	529,300,000	1,221,700,000	-757,200,000	16,378,900,000	86.7%
07/01/2048	16,378,900,000	553,100,000	1,300,900,000	-787,500,000	17,445,500,000	87.1%
07/01/2049	17,445,500,000	578,000,000	1,386,000,000	-818,900,000	18,590,500,000	87.6%
07/01/2050	18,590,500,000	604,000,000	1,477,300,000	-851,700,000	19,820,100,000	88.0%
07/01/2051	19,820,100,000	631,200,000	1,575,400,000	-885,800,000	21,141,000,000	88.5%
07/01/2052	21,141,000,000	659,600,000	1,680,800,000	-921,200,000	22,560,200,000	88.9%
07/01/2053	22,560,200,000	689,300,000	1,794,100,000	-958,100,000	24,085,500,000	89.4%
07/01/2054	24,085,500,000	720,300,000	1,915,800,000	-996,400,000	25,725,200,000	89.9%
07/01/2055	25,725,200,000	752,700,000	2,046,700,000	-1,036,200,000	27,488,300,000	90.4%
07/01/2056	27,488,300,000	786,600,000	2,187,400,000	-1,077,700,000	29,384,600,000	90.8%
07/01/2057	29,384,600,000	822,000,000	2,338,800,000	-1,120,800,000	31,424,600,000	91.3%
07/01/2058	31,424,600,000	859,000,000	2,501,700,000	-1,165,600,000	33,619,600,000	91.8%
07/01/2059	33,619,600,000	897,600,000	2,677,000,000	-1,212,200,000	35,982,000,000	92.3%
07/01/2060	35,982,000,000	938,000,000	2,865,600,000	-1,260,700,000	38,524,900,000	92.7%
07/01/2061	38,524,900,000	980,200,000	3,068,800,000	-1,311,200,000	41,262,700,000	93.2%
07/01/2062	41,262,700,000	1,024,300,000	3,287,400,000	-1,363,600,000	44,210,800,000	93.7%
07/01/2063	44,210,800,000	1,070,400,000	3,524,000,000	-1,390,900,000	47,414,400,000	94.2%
07/01/2064	47,414,400,000	1,118,600,000	3,781,100,000	-1,418,700,000	50,895,500,000	94.6%
07/01/2065	50,895,500,000	1,168,900,000	4,060,500,000	-1,447,100,000	54,677,800,000	95.1%
07/01/2066	54,677,800,000	1,221,500,000	4,364,000,000	-1,476,000,000	58,787,400,000	95.6%
07/01/2067	58,787,400,000	1,276,500,000	4,693,800,000	-1,505,500,000	63,252,100,000	96.1%
07/01/2068	63,252,100,000	1,333,900,000	5,052,100,000	-1,535,600,000	68,102,500,000	96.5%
07/01/2069	68,102,500,000	1,394,000,000	5,441,300,000	-1,566,400,000	73,371,400,000	97.0%
07/01/2070	73,371,400,000	1,456,700,000	5,864,100,000	-1,597,700,000	79,094,500,000	97.4%
07/01/2071	79,094,500,000	1,522,200,000	6,323,300,000	-1,629,600,000	85,310,400,000	97.9%
07/01/2072	85,310,400,000	1,590,700,000	6,822,000,000	-1,662,200,000	92,060,800,000	98.3%
07/01/2073	92,060,800,000	1,662,300,000	7,363,500,000	-1,695,500,000	99,391,200,000	98.8%
07/01/2074	99,391,200,000	1,737,100,000	7,951,600,000	-1,729,400,000	107,350,600,000	99.2%

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems - Existing Plan No Change (entire group)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)
07/01/2075	107,350,600,000	1,815,300,000	8,590,100,000	-1,764,000,000	115,992,000,000	99.6%
07/01/2076	115,992,000,000	1,897,000,000	9,283,300,000	-1,799,300,000	125,373,000,000	100.0%
Total		$41,308,200,000	$133,617,100,000	-$51,601,500,000		

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems - State Plan Closed (separated from Poli Sub / no payment to retirement fund)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
01/01/2016					$1,448,300,000		73.4%
07/01/2016	$1,448,300,000	$69,900,000	$114,800,000	-$97,100,000	1,535,900,000		66.3%
07/01/2017	1,535,900,000	66,500,000	121,300,000	-104,900,000	1,618,900,000		68.0%
07/01/2018	1,618,900,000	63,400,000	127,500,000	-113,300,000	1,696,500,000		69.5%
07/01/2019	1,696,500,000	61,000,000	133,300,000	-122,300,000	1,768,400,000		70.8%
07/01/2020	1,768,400,000	58,800,000	138,500,000	-132,100,000	1,833,600,000		71.8%
07/01/2021	1,833,600,000	56,700,000	143,200,000	-142,700,000	1,890,800,000		72.7%
07/01/2022	1,890,800,000	54,500,000	147,300,000	-154,100,000	1,938,500,000		73.4%
07/01/2023	1,938,500,000	52,300,000	150,600,000	-163,400,000	1,978,100,000		74.0%
07/01/2024	1,978,100,000	50,100,000	153,300,000	-173,200,000	2,008,400,000		74.3%
07/01/2025	2,008,400,000	47,800,000	155,200,000	-183,600,000	2,027,900,000		74.5%
07/01/2026	2,027,900,000	45,500,000	156,300,000	-194,600,000	2,035,100,000		74.6%
07/01/2027	2,035,100,000	43,300,000	156,300,000	-206,200,000	2,028,400,000		74.4%
07/01/2028	2,028,400,000	41,100,000	155,500,000	-209,300,000	2,015,700,000		74.1%
07/01/2029	2,015,700,000	38,900,000	154,200,000	-214,800,000	1,994,000,000		73.6%
07/01/2030	1,994,000,000	36,800,000	152,200,000	-219,700,000	1,963,300,000		72.9%
07/01/2031	1,963,300,000	34,800,000	149,500,000	-224,000,000	1,923,700,000		72.0%
07/01/2032	1,923,700,000	32,900,000	146,100,000	-227,800,000	1,874,900,000		70.9%
07/01/2033	1,874,900,000	31,000,000	142,000,000	-231,200,000	1,816,600,000		69.6%
07/01/2034	1,816,600,000	29,100,000	137,100,000	-234,000,000	1,748,900,000		68.1%
07/01/2035	1,748,900,000	27,200,000	131,500,000	-236,300,000	1,671,400,000		66.3%
07/01/2036	1,671,400,000	25,400,000	125,200,000	-238,200,000	1,583,800,000		64.2%
07/01/2037	1,583,800,000	23,600,000	118,100,000	-239,700,000	1,485,700,000		61.8%
07/01/2038	1,485,700,000	21,800,000	110,100,000	-240,900,000	1,376,700,000		58.9%
07/01/2039	1,376,700,000	20,000,000	101,300,000	-241,700,000	1,256,300,000		55.7%
07/01/2040	1,256,300,000	18,200,000	91,500,000	-242,100,000	1,124,000,000		52.0%
07/01/2041	1,124,000,000	16,500,000	80,900,000	-242,100,000	979,200,000		47.6%
07/01/2042	979,200,000	14,800,000	69,300,000	-241,600,000	821,700,000		42.6%
07/01/2043	821,700,000	13,200,000	56,600,000	-241,600,000	649,900,000		36.8%
07/01/2044	649,900,000	11,600,000	42,800,000	-240,300,000	464,000,000		30.1%
07/01/2045	464,000,000	10,000,000	28,000,000	-238,200,000	263,800,000		22.3%

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems - State Plan Closed (separated from Poli Sub / no payment to retirement fund)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
07/01/2046	263,800,000	8,600,000	12,000,000	-235,100,000	49,300,000		13.2%
07/01/2047	49,300,000	7,200,000		-231,100,000	0	-$174,600,000	2.6%
07/01/2048		6,100,000		-226,300,000		-220,300,000	0.0%
07/01/2049		5,000,000		-220,700,000		-215,700,000	0.0%
07/01/2050		4,000,000		-214,300,000		-210,200,000	0.0%
07/01/2051		3,200,000		-207,000,000		-203,800,000	0.0%
07/01/2052		2,500,000		-199,200,000		-196,700,000	0.0%
07/01/2053		2,000,000		-190,900,000		-189,000,000	0.0%
07/01/2054		1,500,000		-182,300,000		-180,700,000	0.0%
07/01/2055		1,200,000		-173,500,000		-172,300,000	0.0%
07/01/2056		900,000		-164,600,000		-163,700,000	0.0%
07/01/2057		700,000		-155,600,000		-154,900,000	0.0%
07/01/2058		500,000		-146,600,000		-146,100,000	0.0%
07/01/2059		400,000		-137,700,000		-137,400,000	0.0%
07/01/2060		300,000		-129,000,000		-128,700,000	0.0%
07/01/2061		200,000		-120,500,000		-120,200,000	0.0%
07/01/2062		200,000		-112,200,000		-112,000,000	0.0%
07/01/2063		100,000		-104,100,000		-104,000,000	0.0%
07/01/2064		100,000		-96,200,000		-96,100,000	0.0%
07/01/2065				-88,600,000		-88,500,000	0.0%
07/01/2066				-81,200,000		-81,200,000	0.0%
07/01/2067				-74,100,000		-74,100,000	0.0%
07/01/2068				-67,300,000		-67,300,000	0.0%
07/01/2069				-60,900,000		-60,900,000	0.0%
07/01/2070				-54,800,000		-54,700,000	0.0%
07/01/2071				-48,900,000		-48,900,000	0.0%
07/01/2072				-43,500,000		-43,500,000	0.0%
07/01/2073				-38,300,000		-38,300,000	0.0%
07/01/2074				-33,600,000		-33,600,000	0.0%
07/01/2075				-29,200,000		-29,200,000	0.0%
07/01/2076				-25,200,000		-25,200,000	0.0%

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems - State Plan Closed (separated from Poli Sub / no payment to retirement fund)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
07/01/2077				-21,500,000		-21,500,000	0.0%
07/01/2078				-18,200,000		-18,200,000	0.0%
07/01/2079				-15,300,000		-15,300,000	0.0%
07/01/2080				-12,700,000		-12,700,000	0.0%
07/01/2081				-10,400,000		-10,400,000	0.0%
07/01/2082				-8,500,000		-8,500,000	0.0%
07/01/2083				-6,800,000		-6,800,000	0.0%
07/01/2084				-5,400,000		-5,400,000	0.0%
07/01/2085				-4,300,000		-4,300,000	0.0%
07/01/2086				-3,300,000		-3,300,000	0.0%
07/01/2087				-2,600,000		-2,600,000	0.0%
07/01/2088				-2,000,000		-2,000,000	0.0%
07/01/2089				-1,500,000		-1,500,000	0.0%
07/01/2090				-1,100,000		-1,100,000	0.0%
07/01/2091				-800,000		-800,000	0.0%
07/01/2092				-600,000		-600,000	0.0%
07/01/2093				-400,000		-400,000	0.0%
07/01/2094				-300,000		-300,000	0.0%
07/01/2095				-200,000		-200,000	0.0%
07/01/2096				-200,000		-200,000	0.0%
07/01/2097				-100,000		-100,000	0.0%
07/01/2098				-100,000		-100,000	0.0%
07/01/2099				0		0	0.0%
07/01/2100				0		0	0.0%
Total		$1,161,400,000	$3,701,500,000	-$9,999,800,000		-$3,688,100,000	

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems - State Plan Closed (separated from Poli Sub)
Payment of $162.8 million made to retirement fund on July 1, 2015)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
01/01/2016					$1,617,500,000		81.4%
07/01/2016	$1,617,500,000	$69,900,000	$128,300,000	-$97,100,000	1,718,700,000		74.1%
07/01/2017	1,718,700,000	66,500,000	136,000,000	-104,900,000	1,816,200,000		76.1%
07/01/2018	1,816,200,000	63,400,000	143,300,000	-113,300,000	1,909,600,000		78.0%
07/01/2019	1,909,600,000	61,000,000	150,300,000	-122,300,000	1,998,600,000		79.6%
07/01/2020	1,998,600,000	58,800,000	157,000,000	-132,100,000	2,082,300,000		81.2%
07/01/2021	2,082,300,000	56,700,000	163,100,000	-142,700,000	2,159,400,000		82.6%
07/01/2022	2,159,400,000	54,500,000	168,800,000	-154,100,000	2,228,500,000		83.8%
07/01/2023	2,228,500,000	52,300,000	173,800,000	-163,400,000	2,291,400,000		85.0%
07/01/2024	2,291,400,000	50,100,000	178,400,000	-173,200,000	2,346,700,000		86.1%
07/01/2025	2,346,700,000	47,800,000	182,300,000	-183,600,000	2,393,200,000		87.1%
07/01/2026	2,393,200,000	45,500,000	185,500,000	-194,600,000	2,429,600,000		88.0%
07/01/2027	2,429,600,000	43,300,000	187,900,000	-206,200,000	2,454,500,000		88.9%
07/01/2028	2,454,500,000	41,100,000	189,600,000	-209,300,000	2,475,900,000		89.6%
07/01/2029	2,475,900,000	38,900,000	191,000,000	-214,800,000	2,491,000,000		90.3%
07/01/2030	2,491,000,000	36,800,000	192,000,000	-219,700,000	2,500,100,000		91.0%
07/01/2031	2,500,100,000	34,800,000	192,400,000	-224,000,000	2,503,400,000		91.7%
07/01/2032	2,503,400,000	32,900,000	192,500,000	-227,800,000	2,501,000,000		92.3%
07/01/2033	2,501,000,000	31,000,000	192,100,000	-231,200,000	2,492,800,000		92.9%
07/01/2034	2,492,800,000	29,100,000	191,200,000	-234,000,000	2,479,200,000		93.4%
07/01/2035	2,479,200,000	27,200,000	190,000,000	-236,300,000	2,460,100,000		94.0%
07/01/2036	2,460,100,000	25,400,000	188,300,000	-238,200,000	2,435,600,000		94.5%
07/01/2037	2,435,600,000	23,600,000	186,200,000	-239,700,000	2,405,700,000		95.0%
07/01/2038	2,405,700,000	21,800,000	183,700,000	-240,900,000	2,370,300,000		95.5%
07/01/2039	2,370,300,000	20,000,000	180,800,000	-241,700,000	2,329,300,000		95.9%
07/01/2040	2,329,300,000	18,200,000	177,400,000	-242,100,000	2,282,900,000		96.3%
07/01/2041	2,282,900,000	16,500,000	173,600,000	-242,100,000	2,230,900,000		96.7%
07/01/2042	2,230,900,000	14,800,000	169,400,000	-241,600,000	2,173,500,000		97.1%
07/01/2043	2,173,500,000	13,200,000	164,700,000	-241,600,000	2,109,800,000		97.5%
07/01/2044	2,109,800,000	11,600,000	159,600,000	-240,300,000	2,040,700,000		97.8%
07/01/2045	2,040,700,000	10,000,000	154,100,000	-238,200,000	1,966,600,000		98.1%

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems - State Plan Closed (separated from Poli Sub)
Payment of $162.8 million made to retirement fund on July 1, 2015)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
07/01/2046	1,966,600,000	8,600,000	148,300,000	-235,100,000	1,888,300,000		98.4%
07/01/2047	1,888,300,000	7,200,000	142,100,000	-231,100,000	1,806,500,000		98.6%
07/01/2048	1,806,500,000	6,100,000	135,700,000	-226,300,000	1,722,000,000		98.9%
07/01/2049	1,722,000,000	5,000,000	129,100,000	-220,700,000	1,635,400,000		99.1%
07/01/2050	1,635,400,000	4,000,000	122,400,000	-214,300,000	1,547,600,000		99.2%
07/01/2051	1,547,600,000	3,200,000	115,700,000	-207,000,000	1,459,500,000		99.4%
07/01/2052	1,459,500,000	2,500,000	108,900,000	-199,200,000	1,371,700,000		99.5%
07/01/2053	1,371,700,000	2,000,000	102,200,000	-190,900,000	1,284,900,000		99.6%
07/01/2054	1,284,900,000	1,500,000	95,600,000	-182,300,000	1,199,700,000		99.7%
07/01/2055	1,199,700,000	1,200,000	89,100,000	-173,500,000	1,116,500,000		99.8%
07/01/2056	1,116,500,000	900,000	82,800,000	-164,600,000	1,035,600,000		99.8%
07/01/2057	1,035,600,000	700,000	76,700,000	-155,600,000	957,400,000		99.9%
07/01/2058	957,400,000	500,000	70,700,000	-146,600,000	882,000,000		99.9%
07/01/2059	882,000,000	400,000	65,100,000	-137,700,000	809,700,000		100.0%
07/01/2060	809,700,000	300,000	59,600,000	-129,000,000	740,600,000		100.0%
07/01/2061	740,600,000	200,000	54,400,000	-120,500,000	674,800,000		100.0%
07/01/2062	674,800,000	200,000	49,500,000	-112,200,000	612,300,000		100.0%
07/01/2063	612,300,000	100,000	44,800,000	-104,100,000	553,200,000		100.0%
07/01/2064	553,200,000	100,000	40,400,000	-96,200,000	497,400,000		100.0%
07/01/2065	497,400,000	0	36,300,000	-88,600,000	445,100,000		100.0%
07/01/2066	445,100,000	0	32,400,000	-81,200,000	396,300,000		100.0%
07/01/2067	396,300,000	0	28,700,000	-74,100,000	351,000,000		100.0%
07/01/2068	351,000,000	0	25,400,000	-67,300,000	309,000,000		100.0%
07/01/2069	309,000,000	0	22,300,000	-60,900,000	270,400,000		100.0%
07/01/2070	270,400,000	0	19,400,000	-54,800,000	235,100,000		100.0%
07/01/2071	235,100,000	0	16,900,000	-48,900,000	203,000,000		100.0%
07/01/2072	203,000,000	0	14,500,000	-43,500,000	174,100,000		100.0%
07/01/2073	174,100,000	0	12,400,000	-38,300,000	148,100,000		100.0%
07/01/2074	148,100,000	0	10,500,000	-33,600,000	125,000,000		100.0%
07/01/2075	125,000,000	0	8,800,000	-29,200,000	104,700,000		100.0%
07/01/2076	104,700,000	0	7,400,000	-25,200,000	86,900,000		100.0%

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems - State Plan Closed (separated from Poli Sub)
Payment of $162.8 million made to retirement fund on July 1, 2015)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
07/01/2077	86,900,000	0	6,100,000	-21,500,000	71,500,000		100.0%
07/01/2078	71,500,000	0	5,000,000	-18,200,000	58,300,000		100.0%
07/01/2079	58,300,000	0	4,100,000	-15,300,000	47,000,000		100.0%
07/01/2080	47,000,000	0	3,300,000	-12,700,000	37,600,000		100.0%
07/01/2081	37,600,000	0	2,600,000	-10,400,000	29,800,000		100.0%
07/01/2082	29,800,000	0	2,000,000	-8,500,000	23,300,000		100.0%
07/01/2083	23,300,000	0	1,600,000	-6,800,000	18,100,000		100.0%
07/01/2084	18,100,000	0	1,200,000	-5,400,000	13,900,000		100.0%
07/01/2085	13,900,000	0	900,000	-4,300,000	10,600,000		100.0%
07/01/2086	10,600,000	0	700,000	-3,300,000	8,000,000		100.0%
07/01/2087	8,000,000	0	500,000	-2,600,000	5,900,000		100.0%
07/01/2088	5,900,000	0	400,000	-2,000,000	4,400,000		100.0%
07/01/2089	4,400,000	0	300,000	-1,500,000	3,200,000		100.0%
07/01/2090	3,200,000	0	200,000	-1,100,000	2,300,000		100.0%
07/01/2091	2,300,000	0	200,000	-800,000	1,600,000		100.0%
07/01/2092	1,600,000	0	100,000	-600,000	1,200,000		100.0%
07/01/2093	1,200,000	0	100,000	-400,000	800,000		100.0%
07/01/2094	800,000	0	100,000	-300,000	500,000		100.0%
07/01/2095	500,000	0	0	-200,000	300,000		100.0%
07/01/2096	300,000	0	0	-200,000	200,000		100.0%
07/01/2097	200,000	0	0	-100,000	100,000		100.0%
07/01/2098	100,000	0	0	-100,000	100,000		100.0%
07/01/2099	100,000	0	0	0	0		100.0%
07/01/2100	0	0	0	0	0		100.0%
Total		$1,161,400,000	$7,220,800,000	-$9,999,800,000			

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems – Political Sub Plan (without state members)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
01/01/2016					$940,400,000		73.4%
07/01/2016	$940,400,000	$61,100,000	$75,600,000	-$50,800,000	1,026,400,000		74.9%
07/01/2017	1,026,400,000	63,900,000	82,500,000	-54,900,000	1,117,900,000		76.0%
07/01/2018	1,117,900,000	66,800,000	89,700,000	-59,300,000	1,215,100,000		76.9%
07/01/2019	1,215,100,000	69,800,000	97,400,000	-64,000,000	1,318,300,000		77.9%
07/01/2020	1,318,300,000	72,900,000	105,600,000	-69,100,000	1,427,600,000		78.7%
07/01/2021	1,427,600,000	76,200,000	114,300,000	-74,700,000	1,543,400,000		79.6%
07/01/2022	1,543,400,000	79,600,000	123,400,000	-80,700,000	1,665,800,000		80.4%
07/01/2023	1,665,800,000	83,200,000	133,200,000	-85,500,000	1,796,700,000		81.1%
07/01/2024	1,796,700,000	86,900,000	143,600,000	-90,600,000	1,936,600,000		81.8%
07/01/2025	1,936,600,000	90,900,000	154,700,000	-96,100,000	2,086,100,000		82.5%
07/01/2026	2,086,100,000	95,000,000	166,600,000	-101,800,000	2,245,900,000		83.2%
07/01/2027	2,245,900,000	99,200,000	179,300,000	-107,900,000	2,416,500,000		83.9%
07/01/2028	2,416,500,000	103,700,000	192,900,000	-114,400,000	2,598,700,000		84.5%
07/01/2029	2,598,700,000	108,400,000	207,400,000	-121,300,000	2,793,100,000		85.2%
07/01/2030	2,793,100,000	113,200,000	222,800,000	-128,500,000	3,000,700,000		85.8%
07/01/2031	3,000,700,000	118,300,000	239,300,000	-136,300,000	3,222,100,000		86.4%
07/01/2032	3,222,100,000	123,600,000	256,900,000	-144,400,000	3,458,200,000		87.0%
07/01/2033	3,458,200,000	129,200,000	275,800,000	-150,200,000	3,713,000,000		87.6%
07/01/2034	3,713,000,000	135,000,000	296,200,000	-156,200,000	3,988,000,000		88.2%
07/01/2035	3,988,000,000	141,100,000	318,200,000	-162,500,000	4,284,900,000		88.7%
07/01/2036	4,284,900,000	147,500,000	341,900,000	-169,000,000	4,605,300,000		89.3%
07/01/2037	4,605,300,000	154,100,000	367,600,000	-175,700,000	4,951,200,000		89.9%
07/01/2038	4,951,200,000	161,000,000	395,200,000	-182,800,000	5,324,700,000		90.4%
07/01/2039	5,324,700,000	168,300,000	425,100,000	-190,100,000	5,728,000,000		91.0%
07/01/2040	5,728,000,000	175,800,000	457,400,000	-197,700,000	6,163,500,000		91.6%
07/01/2041	6,163,500,000	183,800,000	492,200,000	-205,600,000	6,633,900,000		92.1%
07/01/2042	6,633,900,000	192,000,000	529,800,000	-213,800,000	7,142,000,000		92.7%
07/01/2043	7,142,000,000	200,700,000	570,500,000	-222,400,000	7,690,800,000		93.2%
07/01/2044	7,690,800,000	209,700,000	614,400,000	-231,200,000	8,283,700,000		93.7%
07/01/2045	8,283,700,000	219,100,000	661,800,000	-240,500,000	8,924,100,000		94.3%
07/01/2046	8,924,100,000	229,000,000	713,100,000	-250,100,000	9,616,100,000		94.8%

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems – Political Sub Plan (without state members)

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
07/01/2047	9,616,100,000	239,300,000	768,500,000	-260,100,000	10,363,700,000		95.3%
07/01/2048	10,363,700,000	250,100,000	828,300,000	-270,500,000	11,171,600,000		95.8%
07/01/2049	11,171,600,000	261,300,000	892,900,000	-281,300,000	12,044,500,000		96.3%
07/01/2050	12,044,500,000	273,100,000	962,800,000	-292,600,000	12,987,700,000		96.8%
07/01/2051	12,987,700,000	285,400,000	1,038,300,000	-304,300,000	14,007,100,000		97.2%
07/01/2052	14,007,100,000	298,200,000	1,119,800,000	-316,500,000	15,108,600,000		97.7%
07/01/2053	15,108,600,000	311,600,000	1,208,000,000	-329,100,000	16,299,100,000		98.1%
07/01/2054	16,299,100,000	325,700,000	1,303,300,000	-342,300,000	17,585,700,000		98.6%
07/01/2055	17,585,700,000	340,300,000	1,406,200,000	-356,000,000	18,976,300,000		99.0%
07/01/2056	18,976,300,000	355,600,000	1,517,500,000	-370,200,000	20,479,200,000		99.5%
07/01/2057	20,479,200,000	371,600,000	1,637,800,000	-385,000,000	22,103,500,000		99.9%
07/01/2058	22,103,500,000	388,300,000	1,767,800,000	-400,400,000	23,859,200,000		100.0%
Total		$7,659,500,000	$23,495,600,000	-$8,236,400,000			

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems – Existing Plan with No New Entrants as of 1/1/2016

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
01/01/2016					$2,387,600,000		73.4%
07/01/2016	$2,387,600,000	$125,000,000	$190,100,000	-$147,900,000	2,554,700,000		68.1%
07/01/2017	2,554,700,000	118,900,000	202,700,000	-159,800,000	2,716,600,000		70.3%
07/01/2018	2,716,600,000	113,600,000	215,000,000	-172,600,000	2,872,600,000		72.3%
07/01/2019	2,872,600,000	109,400,000	226,700,000	-186,400,000	3,022,400,000		74.0%
07/01/2020	3,022,400,000	105,600,000	238,000,000	-201,300,000	3,164,700,000		75.6%
07/01/2021	3,164,700,000	101,900,000	248,600,000	-217,400,000	3,297,800,000		77.0%
07/01/2022	3,297,800,000	98,200,000	258,400,000	-234,800,000	3,419,600,000		78.3%
07/01/2023	3,419,600,000	94,400,000	267,400,000	-248,800,000	3,532,500,000		79.4%
07/01/2024	3,532,500,000	90,400,000	275,700,000	-263,800,000	3,634,800,000		80.5%
07/01/2025	3,634,800,000	86,300,000	283,100,000	-279,600,000	3,724,500,000		81.4%
07/01/2026	3,724,500,000	82,300,000	289,400,000	-296,400,000	3,799,800,000		82.1%
07/01/2027	3,799,800,000	78,200,000	294,500,000	-314,200,000	3,858,400,000		82.8%
07/01/2028	3,858,400,000	74,300,000	298,300,000	-334,300,000	3,896,700,000		83.3%
07/01/2029	3,896,700,000	70,400,000	300,700,000	-345,500,000	3,922,300,000		83.8%
07/01/2030	3,922,300,000	66,600,000	302,200,000	-356,200,000	3,934,900,000		84.1%
07/01/2031	3,934,900,000	63,000,000	302,700,000	-366,100,000	3,934,500,000		84.3%
07/01/2032	3,934,500,000	59,500,000	302,100,000	-375,500,000	3,920,500,000		84.4%
07/01/2033	3,920,500,000	56,000,000	300,500,000	-384,400,000	3,892,600,000		84.4%
07/01/2034	3,892,600,000	52,500,000	297,800,000	-392,500,000	3,850,500,000		84.3%
07/01/2035	3,850,500,000	49,100,000	294,000,000	-399,800,000	3,793,800,000		84.1%
07/01/2036	3,793,800,000	45,600,000	289,100,000	-406,200,000	3,722,300,000		83.8%
07/01/2037	3,722,300,000	42,300,000	283,000,000	-412,000,000	3,635,600,000		83.3%
07/01/2038	3,635,600,000	38,900,000	275,700,000	-416,800,000	3,533,500,000		82.7%
07/01/2039	3,533,500,000	35,700,000	267,300,000	-420,600,000	3,415,800,000		81.9%
07/01/2040	3,415,800,000	32,500,000	257,600,000	-423,500,000	3,282,400,000		80.9%
07/01/2041	3,282,400,000	29,400,000	246,700,000	-425,500,000	3,133,000,000		79.6%
07/01/2042	3,133,000,000	26,400,000	234,700,000	-426,100,000	2,967,900,000		78.1%
07/01/2043	2,967,900,000	23,500,000	221,400,000	-425,400,000	2,787,400,000		76.3%
07/01/2044	2,787,400,000	20,600,000	206,900,000	-423,100,000	2,591,800,000		74.2%
07/01/2045	2,591,800,000	17,900,000	191,300,000	-419,100,000	2,382,000,000		71.6%

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems – Existing Plan with No New Entrants as of 1/1/2016

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
07/01/2046	2,382,000,000	15,400,000	174,600,000	-413,200,000	2,158,800,000		68.6%
07/01/2047	2,158,800,000	13,100,000	157,000,000	-405,600,000	1,923,300,000		65.0%
07/01/2048	1,923,300,000	11,000,000	138,400,000	-396,500,000	1,676,300,000		60.8%
07/01/2049	1,676,300,000	9,100,000	119,000,000	-385,700,000	1,418,800,000		55.8%
07/01/2050	1,418,800,000	7,500,000	98,900,000	-373,500,000	1,151,600,000		49.9%
07/01/2051	1,151,600,000	6,000,000	78,000,000	-360,200,000	875,300,000		42.9%
07/01/2052	875,300,000	4,800,000	56,400,000	-346,000,000	590,500,000		34.7%
07/01/2053	590,500,000	3,800,000	34,100,000	-331,000,000	297,400,000		24.9%
07/01/2054	297,400,000	2,900,000	0	-315,600,000	0	-$15,400,000	13.4%
07/01/2055	0	2,200,000	0	-299,900,000		-297,700,000	0.0%
07/01/2056	0	1,700,000	0	-284,000,000		-282,300,000	0.0%
07/01/2057	0	1,300,000	0	-268,100,000		-266,800,000	0.0%
07/01/2058	0	1,000,000	0	-252,400,000		-251,400,000	0.0%
07/01/2059	0	700,000	0	-237,000,000		-236,300,000	0.0%
07/01/2060	0	600,000	0	-221,800,000		-221,300,000	0.0%
07/01/2061	0	400,000	0	-207,000,000		-206,600,000	0.0%
07/01/2062	0	300,000	0	-192,400,000		-192,100,000	0.0%
07/01/2063	0	200,000	0	-178,200,000		-177,900,000	0.0%
07/01/2064	0	100,000	0	-164,300,000		-164,200,000	0.0%
07/01/2065	0	100,000	0	-151,000,000		-150,900,000	0.0%
07/01/2066	0	100,000	0	-138,100,000		-138,100,000	0.0%
07/01/2067	0	0	0	-125,800,000		-125,800,000	0.0%
07/01/2068	0	0	0	-114,000,000		-114,000,000	0.0%
07/01/2069	0	0	0	-102,800,000		-102,800,000	0.0%
07/01/2070	0	0	0	-92,100,000		-92,100,000	0.0%
07/01/2071	0	0	0	-82,100,000		-82,100,000	0.0%
07/01/2072	0	0	0	-72,700,000		-72,700,000	0.0%
07/01/2073	0	0	0	-63,900,000		-63,900,000	0.0%
07/01/2074	0	0	0	-55,800,000		-55,800,000	0.0%
07/01/2075	0	0	0	-48,300,000		-48,300,000	0.0%
07/01/2076	0	0	0	-41,500,000		-41,500,000	0.0%
07/01/2077	0	0	0	-35,400,000		-35,400,000	0.0%

North Dakota Public Employees Retirement System
Projected Contribution Requirements Based on July 1, 2013 Actuarial Valuation
Main Systems – Existing Plan with No New Entrants as of 1/1/2016

Plan Year Beginning	Market Value of Assets (BOY)	Contributions	Earnings	Expenses (Benefits)	Market Value of Assets (EOY)	Deficit	Funded Status
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
07/01/2078	0	0	0	-29,800,000		-29,800,000	0.0%
07/01/2079	0	0	0	-24,900,000		-24,900,000	0.0%
07/01/2080	0	0	0	-20,600,000		-20,600,000	0.0%
07/01/2081	0	0	0	-16,900,000		-16,900,000	0.0%
07/01/2082	0	0	0	-13,700,000		-13,700,000	0.0%
07/01/2083	0	0	0	-11,000,000		-11,000,000	0.0%
07/01/2084	0	0	0	-8,700,000		-8,700,000	0.0%
07/01/2085	0	0	0	-6,800,000		-6,800,000	0.0%
07/01/2086	0	0	0	-5,300,000		-5,300,000	0.0%
07/01/2087	0	0	0	-4,100,000		-4,100,000	0.0%
07/01/2088	0	0	0	-3,100,000		-3,100,000	0.0%
07/01/2089	0	0	0	-2,400,000		-2,400,000	0.0%
07/01/2090	0	0	0	-1,800,000		-1,800,000	0.0%
07/01/2091	0	0	0	-1,300,000		-1,300,000	0.0%
07/01/2092	0	0	0	-1,000,000		-1,000,000	0.0%
07/01/2093	0	0	0	-700,000		-700,000	0.0%
07/01/2094	0	0	0	-500,000		-500,000	0.0%
07/01/2095	0	0	0	-400,000		-400,000	0.0%
07/01/2096	0	0	0	-300,000		-300,000	0.0%
07/01/2097	0	0	0	-200,000		-200,000	0.0%
07/01/2098	0	0	0	-200,000		-200,000	0.0%
07/01/2099	0	0	0	-100,000		-100,000	0.0%
07/01/2100	0	0	0	0		0	0.0%
Total		$2,090,700,000	$8,718,000,000	-$16,785,300,000		-$3,589,200,000	