



Central Marin Police Authority

Staff Report

TO: Central Marin Police Council

FROM: Management Committee
Michael A. Norton, Chief of Police

DATE: November 2, 2017

RE: Presentation of the Actuarial Review of Worker's Compensation and Outstanding Liabilities Funding Requirement of the Central Marin Police Authority for Fiscal Year 2017/2018

ACTION REQUESTED

That Council receive the presentation and discuss the actuarial reports.

DISCUSSION

At its last meeting, the Council requested a presentation and discussion about Worker's Compensation and General Liability.

The Central Marin Police Authority was created in 2013 with the merger of the Twin Cities Police Authority and the San Anselmo Police Department. At the time of the merger, both agencies were members of the Bay Cities Joint Powers Insurance Authority. Both members received insurance coverage for general liability and worker's compensation through Bay Cities. The Central Marin Police Authority uses Bay Cities for its coverage needs. Currently the self-insured retention (SIR) is \$100,000 for general liability claims and \$150,000 for worker's compensation claims. These are the lowest levels of SIR offered by Bay Cities. The Bay Cities Insurance Authority contracts with Bickmore to provide the management of its insurance accounts.

On March 31, 2017, the Central Marin Police Authority received an Actuarial Review of CMPA's Worker's Compensation Funding Requirement from Bickmore (refer to attachment #1). On April 7, 2017, the Central Marin Police Authority received an Actuarial Report of CMPA's Outstanding Liabilities Funding Requirement (refer to attachment #2).



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The reports estimate the ultimate cost of claims and expenses for worker’s compensation and general liability claims. The reports are provided annually from Bickmore and are intended to be utilized as a tool for budgeting purposes. The reports estimate liabilities for short term and long term periods, with short term referring to the upcoming fiscal year and long term referring to all subsequent years. The reports also estimate liabilities for all known claims (claims which have been made) and all unknown claims (claims estimated to occur in the next fiscal year). Ideally, extra budgetary monies are placed in side accounts for these future liabilities and gather interest. Unfortunately, in recent years, CMPA has not enjoyed excess funds at the end of the fiscal year and has had to cover liabilities on a “pay as you go,” year-to-year basis.

Historically, CMPA has paid the following amounts for worker’s compensation and general liability claims and expenses:

FY 2012/2013	\$291,393
FY 2013/2014	\$304,415
FY 2014/2015	\$352,121
FY 2015/2016	\$316,332
FY 2016/2017	\$378,958

The five year average for the last five fiscal years was \$328, 644. Based on past trends and current fiscal realities, a total of \$300,000 was budgeted in FY 2017/2018 for claims and expenses resulting from worker’s compensation and general liability claims.

STAFF RECOMMENDATION

None.

Respectfully submitted,

Daniel Schwarz
Management Committee

Todd Cusimano
Management Committee

Dave Donery
Management Committee



Central Marin Police Authority

Staff Report

Michael A. Norton
Chief of Police

Attachments:

1. Actuarial Review of CMPA's Worker's Compensation Funding Requirement
2. Actuarial Report of CMPA's Outstanding Liabilities Funding Requirement



Friday, March 31, 2017

Central Marin Police Authority
c/o Bickmore
Attn: Rob Kramer
1750 Creekside Oaks Drive, Suite 200
Sacramento, CA 95833

Re: Actuarial Review of Workers' Compensation Funding Requirement

Dear Mr. Kramer:

As you have requested, we have completed our actuarial review of the 2017-18 funding requirements for the Central Marin Police Authority (the Authority) subject to its current self-insured retention in the Bay Cities Joint Powers Insurance Authority's (BCJPIA, the Authority) workers' compensation program.

The estimated ultimate cost of claims and expenses for claims incurred during the 2017-18 program year at the Authority's self-insured retention is shown on Exhibit 2, page 2. The estimates included allocated loss adjustment expenses (ALAE) and are shown on an undiscounted and discounted basis. ALAE is the direct cost associated with the defense of individual claims (e.g. legal fees, investigation fees, court charges).

In determining the loss rate for the Authority, its own indicated loss rate was weighted with that of BCJPIA as a whole. The percentage weight is based on payroll with the largest BCJPIA member receiving 75% weight for its own experience.

In addition, we estimate the program's discounted and undiscounted liability for outstanding claims and ALAE as of June 30, 2017 at the Authority's self-insured retention in Exhibit 1, page 2.

These estimates represent the suggested liability to be recorded by the Authority, in accordance with Governmental Accounting Standards Board (GASB) Statement #10, as of June 30, 2017. GASB #10 requires the accruing of liability on financial statements for the ultimate cost of claims and expenses associated with all reported and unreported claims, including ALAE. The discount for investment income is calculated based on an expected payout pattern for claims, assuming a 2.0% annual return on investments. GASB#10 allows the discounting of losses to recognize investment income.

The funding recommendations in this report are for losses and ALAE only. They do not include a provision for ULAE, loss control, overhead, excess insurance premiums, and other expenses associated with the program.

The loss projections in this report reflect the estimated impact of benefit legislation contained in AB749, AB227, SB228, SB899, SB863, and recent WCAB court decisions based upon information provided by the WCIRB.

The ultimate impact on loss costs of legislated benefit adjustments are generally difficult to forecast in advance because the changes typically take place over a period of several years following enactment. Furthermore, actuarially derived benefit level evaluations often underestimate actual future cost levels. The shortfalls result from a variety of circumstances, including: increases in utilization levels, unanticipated changes in administrative procedures, and cost shifting among benefit categories. Thus, actual cost increases could differ, perhaps substantially, from the WCIRB's estimates.

This report should be viewed as a supplement to our most recent actuarial review of the primary portion of BCJPIA's self-insured workers' compensation program (as documented in our 2017 summary report). As such the limitations and conditions described in that report also apply to the estimates presented in this individual member report.

We appreciate the opportunity to be of service to BCJPIA in preparing this report. Please feel free to call Derek Burkhalter at (916) 244-1167 or Dana Winkler at (503) 419-0455 with any questions you may have concerning this report.

Sincerely,

Bickmore



Derek Burkhalter, ACAS, MAAA
Manager, Property and Casualty Actuarial Services, Bickmore
Associate, Casualty Actuarial Society
Member, American Academy of Actuaries



Dana Winkler, MBA, ACAS, MAAA
Manager, Property and Casualty Actuarial Services, Bickmore
Associate, Casualty Actuarial Society
Member, American Academy of Actuaries

Bay Cities JPIA - Workers' Compensation
Central Marin Police Authority
B-F Projected Ultimate Incurred Losses

Accident Year (A)	Incurred Factors to Ultimate (B)	Percent Losses Unreported (C)	Payroll (D)	Trended Loss Rate (E)	Projected Unreported Losses (F)	Reported Incurred Losses as of 12/31/16 (G)	B-F Projected Ultimate Incurred Losses (H)
1978-1996	1.000	0.0%				1,234,478	1,234,478
1996-1997	1.002	0.2%	2,380,000	6.81	324	38,929	39,253
1997-1998	1.004	0.4%	2,452,280	7.75	758	27,962	28,720
1998-1999	1.007	0.7%	2,582,267	8.59	1,542	242,997	244,539
1999-2000	1.010	1.0%	2,825,862	6.59	1,845	55,840	57,685
2000-2001	1.012	1.2%	3,015,710	6.93	2,479	261,125	263,605
2001-2002	1.016	1.6%	3,318,087	9.81	5,124	329,205	334,329
2002-2003	1.019	1.9%	3,275,188	9.18	5,609	30,227	35,836
2003-2004	1.022	2.2%	3,232,288	6.14	4,272	8,515	12,787
2004-2005	1.025	2.4%	3,026,211	4.71	3,477	184,972	188,448
2005-2006	1.030	2.9%	3,393,713	4.30	4,248	207,666	211,915
2006-2007	1.034	3.3%	3,462,854	4.49	5,116	168,852	173,968
2007-2008	1.041	3.9%	3,761,818	4.79	7,101	55,111	62,212
2008-2009	1.048	4.6%	3,822,705	5.09	8,903	173,616	182,519
2009-2010	1.056	5.3%	3,649,582	5.50	10,644	137,214	147,858
2010-2011	1.069	6.5%	3,617,862	5.63	13,138	221,089	234,227
2011-2012	1.087	8.0%	3,398,530	5.52	15,006	178,496	193,502
2012-2013	1.109	9.8%	4,430,454	5.43	23,648	234,488	258,136
2013-2014	1.165	14.2%	5,583,882	5.39	42,609	262,516	305,126
2014-2015	1.267	21.1%	5,158,130	5.48	59,614	370,446	430,060
2015-2016	1.568	36.2%	4,740,451	5.62	96,577	165,878	262,455
2016-2017	7.968	87.4%	4,786,096	5.66	236,977	36,130	273,107
Total			75,913,969		549,012	4,625,753	5,174,764

(B) Based on Incurred LDF from \$100K analysis of the Excess Study.

(C) $1 - (1 - (B))$

(D) Provided by BCJPIA.

(E) Exhibit 2, page 1, (L) / (G) X (H)

(F) (C) X (D) X (E)

(G) Provided by BCJPIA.

(H) (F) + (G)

Bay Cities JPIA - Workers' Compensation
Central Marin Police Authority
Outstanding Liability as of June 30, 2017 (Loss and ALAE):

Accident Year (A)	Adjusted Ultimate Incurred Losses (B)	Paid Losses as of 12/31/16 (C)	Estimated Paid Losses as of 06/30/17 (D)	Undiscounted Outstanding Losses as of 06/30/17 (E)	Discount Factors (F)	Discounted Outstanding Losses as of 06/30/17 (G)
1978-1996	1,234,478	1,211,255	1,215,865	18,613	0.979	18,222
1996-1997	39,007	38,929	38,934	73	0.967	71
1997-1998	28,074	27,962	27,974	99	0.956	95
1998-1999	244,698	229,331	230,719	13,978	0.947	13,238
1999-2000	56,398	55,840	55,889	509	0.940	479
2000-2001	264,259	261,125	261,358	2,901	0.932	2,704
2001-2002	334,472	329,205	329,590	4,883	0.925	4,517
2002-2003	35,836	30,227	30,580	5,256	0.919	4,830
2003-2004	12,787	8,515	8,809	3,979	0.912	3,629
2004-2005	188,448	105,402	109,853	78,595	0.906	71,207
2005-2006	211,915	207,666	207,935	3,980	0.900	3,582
2006-2007	173,968	168,852	169,155	4,813	0.896	4,312
2007-2008	62,212	55,111	55,507	6,705	0.891	5,974
2008-2009	182,519	173,616	174,168	8,351	0.888	7,416
2009-2010	147,858	90,642	94,614	53,244	0.886	47,174
2010-2011	234,227	219,089	220,200	14,027	0.886	12,428
2011-2012	193,502	178,496	179,388	14,115	0.885	12,492
2012-2013	258,136	234,488	236,628	21,507	0.887	19,077
2013-2014	305,126	212,921	224,145	80,980	0.897	72,639
2014-2015	430,060	307,974	323,093	106,967	0.909	97,233
2015-2016	262,455	84,966	107,832	154,622	0.921	142,407
2016-2017	273,107	17,340	27,981	245,126	0.944	231,399
Total	5,173,543	4,248,953	4,330,219	843,324		775,123
				Outstanding Losses as of December 31, 2016:		720,770
				(H) IBNR as of June 30, 2017:	481,502	442,562
				(I) Case Reserves as of June 30, 2017:	361,822	332,561
				(J) Outstanding Losses as of June 30, 2017:	843,324	775,123
				(K) Short Term:	248,957	228,824
				(L) Long Term:	594,367	546,300

Outstanding Losses as of June 30, 2017				
Confidence Level	Expected	70%	80%	90%
Undiscounted	843,000	1,004,000	1,160,000	1,403,000
Discounted	775,000	922,000	1,066,000	1,290,000

- (B) 2002-2003 and prior from Exhibit 2, Page 1, (D). 2003-2004 and later from Exhibit 1, Page 1, (H). Adjusted for savings from SB863.
- (C) Provided by BCJPIA.
- (D) Based on Paid LDF from \$100K analysis of the Excess Study.
- (E) (B) - (D)
- (F) Based on Paid LDF from \$100K analysis of the Excess Study.
- (G) (E) X (F)
- (H) Total (B) - Estimated Incurred losses as of June 30, 2017.
- (I) Total (E) - (H)
- (J) (H) + (I)
- (K) Estimated paid from 07/01/17 to 06/30/18.
- (L) Estimated paid after 06/30/18.

Bay Cities JPIA - Workers' Compensation
Central Marin Police Authority
Calculation of Retro Loss Rates

Accident Year (A)	Reported Incurred Losses as of 12/31/16 (B)	Incurred Factors to Ultimate (C)	Ultimate Incurred Losses (D)	Payroll (E)	Loss Rate (F)	SIR Factor (G)	Benefit Level Factor (H)	Trended Loss Rate (I)
1978-1996	1,234,478	1.000	1,234,478				1.422	
1996-1997	38,929	1.002	39,007	2,380,000	1.64	0.649	1.280	
1997-1998	27,962	1.004	28,074	2,452,280	1.14	0.657	1.112	0.84
1998-1999	242,997	1.007	244,698	2,582,267	9.48	0.664	0.992	6.25
1999-2000	55,840	1.010	56,398	2,825,862	2.00	0.965	0.890	1.71
2000-2001	261,125	1.012	264,259	3,015,710	8.76	0.976	0.837	7.16
2001-2002	329,205	1.016	334,472	3,318,087	10.08	0.688	0.839	5.82
2002-2003	30,227	1.019	30,801	3,275,188	0.94	0.697	0.885	0.58
2003-2004	8,515	1.022	8,703	3,232,288	0.27	0.842	1.096	0.25
2004-2005	184,972	1.025	189,596	3,026,211	6.27	0.852	1.410	7.53
2005-2006	207,666	1.030	213,896	3,393,713	6.30	0.863	1.526	8.30
2006-2007	168,852	1.034	174,593	3,462,854	5.04	0.874	1.441	6.35
2007-2008	55,111	1.041	57,370	3,761,818	1.53	0.885	1.334	1.80
2008-2009	173,616	1.048	181,950	3,822,705	4.76	0.897	1.241	5.30
2009-2010	137,214	1.056	144,897	3,649,582	3.97	0.909	1.132	4.09
2010-2011	221,089	1.069	236,344	3,617,862	6.53	0.921	1.092	6.57
2011-2012	178,496	1.087	194,025	3,398,530	5.71	0.934	1.099	5.86
2012-2013	234,488	1.109	260,047	4,430,454	5.87	0.947	1.101	6.12
2013-2014	262,516	1.165	305,831	5,583,882	5.48	0.960	1.095	5.76
2014-2015	370,446	1.267	469,355	5,158,130	9.10	0.973	1.061	9.39
2015-2016	165,878	1.568	260,096	4,740,451	5.49	0.986	1.021	5.52
2016-2017	36,130	7.968	287,884	4,786,096	6.02	1.000	1.000	6.02
Total/Avg	4,625,753		5,216,777	75,913,969				
						(J) Average ex last:		5.60
						(K) Weighted Average ex last:		5.72
						(L) Selected Loss Rate:		5.66

- (B) Provided by BCJPIA.
- (C) Based on Incurred LDF from \$100K analysis of the Excess Study.
- (D) (B) X (C)
- (E) Provided by BCJPIA.
- (F) (D) / (E) X 100
- (G) Based on historical member SIR.
- (H) Based on WCIRB.
- (I) (F) X (G) X (H)
- (J) Average of (I) excluding 2016-2017.
- (K) Weighted average of (I) based on (E) excluding 2016-2017.
- (L) Average of (J) and (K)

Bay Cities JPIA - Workers' Compensation
Central Marin Police Authority
Calculation of Forward Loss Rate

Accident Year (A)	Adjusted Ultimate Incurred Losses (B)	Payroll (C)	Loss Rate (D)	SIR Factor (E)	Benefit Level Factor (F)	Trended Loss Rate (G)
1978-1996	1,778,348				1.422	
1996-1997	163,603	3,362,960	4.86	0.649	1.280	4.04
1997-1998	120,952	3,449,062	3.51	0.657	1.112	2.56
1998-1999	285,384	3,679,903	7.76	0.664	0.992	5.11
1999-2000	175,822	4,029,925	4.36	0.965	0.890	3.75
2000-2001	354,828	4,292,017	8.27	0.976	0.837	6.75
2001-2002	349,670	4,429,935	7.89	0.688	0.839	4.56
2002-2003	76,052	4,743,880	1.60	0.697	0.885	0.99
2003-2004	241,299	5,057,824	4.77	0.842	1.096	4.40
2004-2005	346,900	4,811,719	7.21	0.852	1.410	8.67
2005-2006	214,872	5,275,180	4.07	0.863	1.526	5.37
2006-2007	182,697	5,310,337	3.44	0.874	1.441	4.34
2007-2008	194,559	5,715,246	3.40	0.885	1.334	4.02
2008-2009	346,875	5,887,677	5.89	0.897	1.241	6.56
2009-2010	148,644	5,723,147	2.60	0.909	1.132	2.67
2010-2011	485,273	5,696,211	8.52	0.921	1.092	8.57
2011-2012	195,044	5,570,483	3.50	0.934	1.099	3.59
2012-2013	258,136	4,430,454	5.83	0.947	1.101	6.07
2013-2014	305,126	5,583,882	5.46	0.960	1.095	5.74
2014-2015	430,060	5,158,130	8.34	0.973	1.061	8.61
2015-2016	262,455	4,740,451	5.54	0.986	1.021	5.57
2016-2017	273,107	4,786,096	5.71	1.000	1.000	5.71
Total/Avg	7,189,704	101,734,518				
2017-18 SIR:	150,000		(H) Average ex last:			5.71
2017-18 Payroll:	4,833,957		(I) Weighted Average ex last:			5.67
			(J) Indicated Loss Rate:			5.69
BCJPIA \$100 Rate:	\$3.375		(K) Weights:			0.27
ILF to \$150K:	1.203		(L) Selected Loss Rate:			4.50

2017-18 Funding for Layer from \$0 - \$150,000 Per Occurrence				
Confidence Level	Expected	70%	80%	90%
Undiscounted	\$218,000	\$273,000	\$346,000	\$462,000
Discounted	205,000	257,000	325,000	435,000

2017-18 Funding Rate for Layer from \$0 - \$150,000 Per Occurrence				
Confidence Level	Expected	70%	80%	90%
Undiscounted	\$4.50	\$5.65	\$7.15	\$9.55
Discounted	4.24	5.32	6.73	9.00

- (B) Exhibit 1, Page 2, (H)
- (C) Provided by BCJPIA.
- (D) (B) / (C) X 100
- (E) Based on historical member SIR.
- (F) Based on WCIRB.
- (G) (D) X (E) X (F)
- (K) Based on payroll. The largest member is assigned 67%.
- (L) ((K) X (J) + (1 - (K)) X BCJPIA Rate)



April 7, 2017

Central Marin Police Authority
c/o Rob Kramer, Administrator
Bay Cities Joint Powers Insurance Authority (BCJPIA)
Bickmore
1750 Creekside Oaks Drive, Suite 200
Sacramento, CA 95833

Dear Mr. Kramer:

Attached is our calculation of the outstanding liabilities (Loss and ALAE) as of June 30, 2017 and funding rate for fiscal year 2017/18 for the member Central Marin Police Authority (the Authority). These indications are summarized in Exhibit 1.

These estimates are our recommendations of the minimum liability to be booked by the Authority in accordance with Governmental Accounting Standards Board (GASB) Statement #10, as of June 30, 2017. GASB #10 requires the accruing of liability on financial statements for the ultimate cost of claims and expenses associated with all reported and unreported claims, including ALAE. The discount for investment income is calculated based on an expected payout pattern for claims, assuming a 2.0% annual return on investments. GASB #10 allows the discounting of losses to recognize investment income.

These estimates do not include ULAE costs. Typical ULAE costs represent roughly ten percent of loss and ALAE costs. This figure can vary significantly depending on the level of internal costs such as claims staff, risk management staff and use of in-house attorneys. ULAE cost ranges of 5% up to 20% of loss and ALAE costs are not uncommon.

Summary

The Authority's expected outstanding liabilities are shown on Exhibit 1, (D). Per your request, we have performed a simplified calculation based on the BCJPIA's losses in total to determine the split between short term and long term outstanding liabilities. Effective 1/1/13, San Anselmo transferred its police department to Twin Cities Police Department, who then changed their name to Central Marin Police Authority. San Anselmo retains liability for the existing claims through 12/31/12. Additionally, we have included the outstanding liabilities at higher confidence levels.

The Authority's expected funding rate (per \$100 of payroll) for fiscal year 2017/18 is shown in Exhibit 1, (H).

There is a significant level of uncertainty in these estimates. Thus, we normally recommend that the Authority fund at a higher confidence level than expected. Exhibit 1 shows our range of recommended funding rates.

Beginning in 2007, after conversations with the Program's administrators, we included an additional lower confidence level (85%) rather than the 99% level, which had an additional provision equal to one large claim capped at the Authority's SIR. Although this provision is no longer included, we would recommend that in order to fund at a very high confidence level an amount equal to one claim capped at the SIR be included in addition to the amounts noted in our analysis.

A key consideration in establishing the Authority's funding policy is the degree to which stability is desired (or required) in contribution levels from year to year. Electing to fund at a low confidence level substantially increases the chances that additional contributions will be needed to cover claims from the current year as well as prior years. If those additional contributions have to be made at a time when the most recent year's experience is adverse, the total burden of funding may prove to be prohibitive. Funding at a high confidence level should significantly reduce the chances that this type of event will occur.

These figures are calculated assuming no change in the Authority's current SIR.

Our Methodology

Calculation of Outstanding Losses

Our approach to calculating outstanding losses as of June 30, 2017 is similar in format to those found in Appendix A of the Comprehensive Actuarial Report. The future funding rate is calculated based on a credibility adjusted experience weighting between the Authority's indicated loss rate and BCJPIA's indicated loss rate. This is documented in Exhibit 3. Calculation of the outstanding losses is documented in Exhibit 2. It involved the following steps:

- 1) We determined incurred and paid factors based on BCJPIA's loss experience as a whole.
- 2) We applied the Bornhuetter-Ferguson Loss Rate Method using the Authority's payroll and reported losses as of 12/31/16 to determine Ultimate Incurred Losses. Reported losses included claims covered by BCJPIA up to the Authority's SIR as well as claims not covered by BCJPIA. The assumed loss rate is based on the future funding rate trended by the pure premium trend factor. As noted, the future funding rate has been adjusted to reflect credibility weighted differentials between the individual Authority's experience and BCJPIA's experience as a whole.
- 3) We used the appropriate paid loss factor to estimate paid losses as of June 30, 2017 and to determine the outstanding losses as of June 30, 2017.

*Calculation of Future Funding Rate
(Fiscal Year 2017/18)*

Exhibit 3 shows our derivation of the future funding rate for the Authority. The Authority's rate is based on a credibility adjusted experience weighting between the Authority's indicated loss rate and BCJPIA's indicated loss rate found in the BCJPIA Comprehensive Report, Appendix B.

What is the difference between this analysis and an actuarial report?

While this analysis will aid the Authority in determining its outstanding liabilities as of June 30, 2017 and future funding rate for fiscal year 2017/18, this is not a complete actuarial analysis. The following table outlines the difference between this limited analysis and a standard actuarial report for the Authority:

	Limited Analysis	Actuarial Report for Individual Member Authority
Loss and ALAE Data	BCJPIA data	Authority's data
Number of Actuarial Methods Applied	1	4
Analysis of Severity, Frequency, and Pure Premium Trend by Member	Based on BCJPIA data.	Based on Authority's data.
Claim Count Analysis	None	Yes
Rate	Based on BCJPIA data and Authority data.	Based on Authority's data.
Unallocated Loss Adjustment Expense (ULAE) Calculation	None	Yes
Cash Flow Calculation	None	Yes

Sources of Variability

Please note that our conclusions are the result of a limited actuarial analysis and not a full actuarial review. The loss experience of an individual Authority is inherently more susceptible to greater percentage variation from our projections due to a single large claim. To the extent that the Authority's own loss experience differs from BCJPIA as a whole, the results of a full actuarial review would differ from this limited actuarial analysis.

Also, it should be understood that there is a fair measure of uncertainty associated with our best estimate because it is the result of a series of forecasts of the cost implications of future events. Those events are essentially the future decisions and agreements which will be made in the settlement of currently outstanding claims. The cost implications of such decisions and agreements often behave in a random fashion, but are also subject to unexpected non-random influences such as significant court decisions or legislation affecting benefits.

Our projections are based on BCJPIA's historical experience. We have not anticipated any extraordinary changes in the various factors that might affect the future cost of claims. However, we have used methods which we believe produce reasonable results given current information. There is no guarantee, express or implied, that losses will develop as projected in this report.

Distribution and Use

This limited analysis does not replace a full actuarial report. It is intended solely for the use of the Bay Cities' members and advisors. Any further distribution is prohibited without the consent of Bickmore. In particular, those interested in providing insurance to the Authority must perform their own actuarial analysis and should not rely primarily upon our work.

Because an understanding of our findings is dependent on a full review of the Comprehensive Actuarial Report, any copies of this report that are distributed to third parties must include that report. We are available to explain and/or amplify any matter contained in this report.

Concluding Remarks

We have appreciated the opportunity to be of service to the Bay Cities Joint Powers Insurance Authority in preparing this analysis for the Authority. If you have any questions about this review, or otherwise need assistance, please give us a call at (503) 419-0455.

Bickmore



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Central Marin Police Authority - Liability Program

Outstanding Liabilities as of June 30, 2017
and Future Funding for 2017-2018

Guidelines In Accordance With Generally Accepted Accounting Principles (Loss and ALAE): Expected Level				
	Case Reserves (A)	IBNR (B)	Total Discounted (C)	Total Undiscounted (D)
Outstanding liabilities as of 06/30/17:	\$81,930	\$88,020	\$162,678	\$169,950
Short Term:			45,660	47,073
Long Term:			117,017	122,877

Confidence Level	Expected	Recommended			Conservative	
		70%	75%	85%	90%	95%
Outstanding liabilities as of 06/30/17:						
Discounted:	162,678	230,376	252,411	304,932	342,677	402,159
Undiscounted:	169,950	240,675	263,695	318,564	357,996	420,137

Future Funding for 2017-2018: Expected Level						
Accident Year	BCJPIA Program Rate (Limited to \$100K) (E)	Factor to \$100,000 (F)	Indicated Program Rate Limited to SIR (G)	Credibility Weighted Rate (H)	Estimated Payroll (\$00) (I)	Projected Limited Losses (J)
2017-2018	1.046	1.000	1.046	1.829	\$48,340	\$88,422

Confidence Level	Expected	Recommended			Conservative	
		70%	75%	85%	90%	95%
Funding for Layer from \$0 - \$100,000 Per Occurrence						
Discounted:	84,670	119,905	131,374	158,710	178,356	209,315
Undiscounted:	88,422	125,219	137,196	165,743	186,259	218,590
Rate per \$100 of Payroll for Fiscal Year 2017-2018:						
Discounted:	1.752	2.480	2.718	3.283	3.690	4.330
Undiscounted:	1.829	2.590	2.838	3.429	3.853	4.522

Notes:

(C) Exhibit 2, (M).

(D) Exhibit 2, (K).

(C), (D) This is the liability amount that would normally be carried on financial statements as of the date shown according to generally accepted accounting principles. Carried reserves may be more or less than this amount.

The discounted reserve includes recognition of investment income earned on funds held prior to payout.

(C), (D) Assumes that 28% of the outstanding liabilities are short term in nature. Based on results from the Comprehensive Actuarial Report for BCJPIA Pooled Liability Program.

(E) From Appendix B, Page 1, (H) of the Comprehensive Actuarial Report for the BCJPIA Pooled Liability Program.

(F) From Appendix B, Page 2, (D) of the Comprehensive Actuarial Report for the BCJPIA Pooled Liability Program.

(G) (E)x(F).

(H) Exhibit 3, (I).

(I) Provided by BCJPIA, assuming a 1.0% increase for 2017-2018.

(J) (H)x(I).

Central Marin Police Authority - Liability Program

Derivation of Bornhuetter-Ferguson Estimates of Ultimate and Outstanding Liabilities
At June 30, 2017

Accident Year	Reported Loss Development Factor (A)	Percentage of Losses Yet to Be Reported (B)	Trended Payroll (\$00) (C)	Trended Assumed Loss Rate (D)	Incurred but not Reported (IBNR) (E)	Reported Losses as of 12/31/16 (F)	Estimated Ultimate Incurred Losses (G)
2005-2006	1.000	0.0%	\$0	1.158	\$0	\$0	\$0
2006-2007	1.000	0.0%	0	1.203	0	0	0
2007-2008	1.000	0.0%	46,985	1.250	0	104,089	104,089
2008-2009	1.000	0.0%	46,599	1.299	0	139,906	139,906
2009-2010	1.000	0.0%	43,394	1.349	0	500	500
2010-2011	1.000	0.0%	41,967	1.401	0	98,743	98,743
2011-2012	1.000	0.0%	38,471	1.456	0	200,764	200,764
2012-2013	1.000	0.0%	48,912	1.512	0	73,522	73,522
2013-2014	1.000	0.0%	60,138	1.571	0	37,101	37,101
2014-2015	1.066	6.2%	54,212	1.632	5,477	5,248	10,726
2015-2016	1.543	35.2%	48,590	1.695	28,985	109,964	138,949
2016-2017	10.061	90.1%	47,861	1.761	75,900	0	75,900
Totals			\$477,129		\$110,362	\$769,837	\$880,199

Accident Year	Paid Losses as of 12/31/16 (H)	Estimated Paid Losses in next 7 mos. (I)	Estimated Paid Losses as of 6/30/17 (J)	Outstanding Losses of 6/30/17 (K)	Discount Factor Assuming 2% Yield (L)	Discounted Outstanding Losses of 6/30/17 (M)	Discounted Ultimate Losses of 6/30/17 (N)
2005-2006	\$0	\$0	\$0	\$0	0.990	\$0	\$0
2006-2007	0	0	0	0	0.977	0	0
2007-2008	104,089	0	104,089	0	0.968	0	104,089
2008-2009	139,906	0	139,906	0	0.957	0	139,906
2009-2010	500	0	500	0	0.950	0	500
2010-2011	98,743	0	98,743	0	0.943	0	98,743
2011-2012	200,764	0	200,764	0	0.947	0	200,764
2012-2013	73,522	0	73,522	0	0.960	0	73,522
2013-2014	31,635	1,552	33,187	3,914	0.973	3,809	36,996
2014-2015	5,248	2,026	7,275	3,451	0.972	3,353	10,628
2015-2016	12,704	29,920	42,624	96,325	0.962	92,691	135,315
2016-2017	0	9,639	9,639	66,261	0.948	62,824	72,463
Totals	\$667,110	\$43,138	\$710,249	\$169,950		\$162,678	\$872,926

Notes:

- (A), (I) Based on loss development analysis of BCJPIA layer losses.
 (B) $1 - 1 / (A)$.
 (C), (F), (H) Provided by BCJPIA.
 (D) Exhibit 1, (H).
 (E) $(B) \times (C) \times (D)$.

- (G) $(E) + (F)$.
 (J) $(H) + (I)$.
 (K) $(G) - (J)$.
 (M) $(K) \times (L)$.
 (N) $(J) + (M)$.

Central Marin Police Authority - Liability Program

Calculation of Credibility Weighted Loss Rate

Accident Year	Estimated Ultimate Losses (A)	Trended Payroll (\$00) (B)	Loss Rate (C)	Trend Factor (D)	Trended Loss Rate (E)
2005-2006					
2006-2007					
2007-2008	\$104,089	\$46,985	2.215	1.463	3.242
2008-2009	139,906	46,599	3.002	1.409	4.229
2009-2010	500	43,394	0.012	1.356	0.016
2010-2011	98,743	41,967	2.353	1.305	3.071
2011-2012	200,764	38,471	5.219	1.257	6.558
2012-2013	73,522	48,912	1.503	1.210	1.818
2013-2014	37,101	60,138	0.617	1.164	0.718
2014-2015	10,726	54,212	0.198	1.121	0.222
2015-2016	138,949	48,590	2.860	1.079	3.086
2016-2017	75,900	47,861	1.586	1.039	1.647
(F) Averages					
			(1) Average of 2007-2008 to 2014-2015	1.890	2.484
			(2) Vol. Wtd. of 2007-2008 to 2014-2015	1.748	2.300
			(3) Average x 2016-2017	1.998	2.551
			(4) Vol. Wtd. x 2016-2017	1.874	2.389
			(5) Time Weighted	1.956	2.530
			(G) Selected Loss Rate		2.650
			(H) Credibility Factor		0.488
			(I) Credibility Weighted Loss Rate		1.829
			(J) Credibility Standard	2,000,000	

Probability	Factor
70%	1.416
75%	1.552
80%	1.701
85%	1.874
90%	2.106
95%	2.472

Notes:

- (A) Exhibit 2, (G).
 (B) Exhibit 2, (C).
 (C) (A) / (B).
 (E) (C) x (D).
 (H) [Sum of (B)] / Credibility Standard^{0.5}
 (I) (G) x (H) + Exhibit 1, (G) x [1 - (H)]
 (J) Based on Payroll and SIR.