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December 15, 2015

Sent via email

Mr. Thomas Heidt
Port of Houston Authority
Post Office Box 2562
Houston, Texas 77252-2562

Re: *Experience Study - Port of Houston Authority Restated Retirement Plan (Plan)*

Dear Tom:

Please refer to my letter to you dated September 29, 2015. Enclosed is a revised Exhibit A, documenting the impact of various assumptions, including the mortality assumption.

Mortality Assumption

In accordance with our discussion with you, the Plan adopted the new RP-2014 Mortality Table adjusted backward to 2006 with MP-2014 and projected with Scale MP-2015, and the MP-2015 Projection Scale. The impact of this new assumption is shown on the revised Exhibit A. Actual plan experience will determine the true cost of the plan, so the mortality assumption and all assumptions should be monitored for significant gains or losses over time.

Please contact me if you have any questions or if I may be of additional help concerning any other matter regarding the operation of the plan.

Sincerely,

A handwritten signature in black ink that reads "Jake Pringle".

Jake Pringle, EA, MAAA
Consulting Actuary

Enclosures

cc (with enclosures): Tim Finley

Exhibit A - FINAL

Port of Houston Authority

August 1, 2014 Valuation Date

	Current Valuation	Proposed ¹	Mortality Proposed ¹	6.75% Int Mortality Proposed ¹	6.25% Int Mortality Proposed ¹	7.00% Mortality ¹⁵ Proposed ¹
Accrued Liability	\$157,810,000	\$159,630,000	\$168,500,000	\$173,320,000	\$183,640,000	\$166,550,000
Normal Cost	3,940,000	3,990,000	4,170,000	4,380,000	4,830,000	4,140,000
ASC 960 PVAB	138,130,000	139,830,000	147,780,000	151,870,000	160,670,000	146,010,000
PV of Future Benefits	184,480,000	185,510,000	195,850,000	202,850,000	218,150,000	193,660,000
MV Assets	\$164,820,000	\$164,820,000	\$164,820,000	\$164,820,000	\$164,820,000	\$164,820,000
Unfunded AL (UAL)	(\$7,000,000)	(\$5,180,000)	\$3,680,000	\$8,500,000	\$18,820,000	\$1,740,000
Funded Percentage	104.4%	103.3%	97.8%	95.1%	89.8%	99.0%
<u>2014 Contribution - Estimated²</u>						
Normal Cost	\$3,940,000	\$3,990,000	\$4,170,000	\$4,380,000	\$4,830,000	\$4,140,000
Amtz of Bases	0	0	490,000	1,121,000	2,435,000	230,000
interest	160,000	170,000	190,000	220,000	270,000	180,000
2014 Contribution	\$4,100,000	\$4,160,000	\$4,850,000	\$5,721,000	\$7,535,000	\$4,550,000

interest	7.00%	7.00%	7.00%	6.75%	6.25%	7.00%
experience study ¹	current	proposed	proposed	proposed	proposed	proposed
mortality ^{3,4}	2000 W/B	2000 W/B	RP2014 W/B	RP2014 W/B	RP2014 W/B	RP2006 W/B
projection scale ^{3,4}	Proj Scale AA	Proj Scale AA	MP2014	MP2014	MP2014	MP2015
expense load	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000

¹ The experience study assumptions include turnover, disability, and retirement rates, as well as salary scale assumption.

² Assumes increase in AL is amortized over 10 years, in accordance with current funding policy. Amortization and interest calculation estimated. Actual results when implemented will vary.

³ The current mortality assumption is the RP-2000 white collar (salaried) and blue collar (hourly) mortality tables for males and females. The current projection scale is Projection Scale AA. The proposed mortality assumption is the RP-2014 white collar (salaried) and blue collar (hourly) mortality tables for males and females. The proposed projection scale is 2-dimensional Mortality Improvement Scale MP-2014.

⁴ The proposed 2015 mortality assumption is the RP-2014 white collar (salaried) and blue collar (hourly) mortality tables for males and females adjusted backward to 2006 with MP-2014 and projected with Scale MP-2015. The proposed projection scale is 2-dimensional Mortality Improvement Scale MP-2015.



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September 29, 2015

Sent via email

Mr. Thomas Heidt
Port of Houston Authority
Post Office Box 2562
Houston, Texas 77252-2562

Re: Experience Study - Port of Houston Authority Restated Retirement Plan (Plan)

Dear Tom:

The enclosed report includes a summary of new recommended withdrawal (turnover), disability, retirement, and mortality rate assumptions and their estimated impact on the contribution requirements to the Retirement Plan. The report also estimates the impact on funding liabilities for the plan. For this study, we reviewed actual experience from August 1, 2009 through August 1, 2014 valuations.

In addition, we also reviewed rate of return (interest rate) assumption. Our current economic model developed with the actuarial standards of practice number 27 (ASOP 27), along with your asset allocation policy, suggests a rate of return assumption of 6.25%. We have shown the current 7.00% assumption along with 6.75% and 6.25% rate of return assumptions.

The impact of moving to the recently published mortality tables RP2014 with projection scale MP2014 as published by the Society of Actuaries is also shown. The size of your plan does not lend itself to the development of a custom mortality table, so plan sponsors typically adopt the most current mortality table and projection scales published. The new RP2014 mortality tables and MP2014 projection scales have a significant impact.

Please contact me at your earliest convenience to discuss the recommended assumption changes in more detail. In the meantime, please let us know if you have any questions or if I may be of additional help concerning any other matter regarding the operation of the plans.

Sincerely,

A handwritten signature in black ink that reads "Jake Pringle".

Jake Pringle, EA, MAAA
Consulting Actuary

Enclosures

cc (with enclosures): Tim Finley

Port of Houston Authority Restated Retirement Plan

As requested, we have performed an actuarial experience study of the Retirement Plan including experience from plan years 2009 through 2014. This experience was included in our actuarial valuations performed from August 1, 2009 through August 1, 2014. Our findings are shown in the enclosed Exhibits and indicate that only minor adjustments are recommended. Furthermore, as expected with only minor adjustments, the impact of the proposed assumption changes is also relatively minor.

Exhibit A

Exhibit A shows the impact of the proposed assumption changes to plan liabilities as well as what the impact would have been on the 2014 accrued liability, normal cost, FAS 960 and funding policy, if the assumption changes were implemented for the 2014 valuations. As illustrated, the impact of the proposed assumptions changes (without mortality changes and interest rate changes) on plan liabilities is relatively minor.

Exhibit B

Exhibit B displays the proposed assumption changes for withdrawal, disability, retirement rates, and salary scale for the Retirement Plan. Our study of actual experience over the recent past indicates that withdrawal rates for both males and females along with retirement rates at earlier ages should be increased. The study also indicates salary scale increases are appropriate at earlier ages.

The experience study was performed using information (some verbally and some in writing) as of the valuation dates, furnished by The Port of Houston Authority. This information includes, but is not limited to, plan documents and provisions, employee data, and financial information. This data was relied upon as submitted. We have reviewed the data for reasonableness and consistency. Since the results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

On the basis of the foregoing, I hereby certify that, to the best of my knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries. I am a member of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

I further certify that all costs, liabilities, rates of interest, and other factors for the Plan have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the Plan and reasonable expectations); and which, in combination, offer our best estimate of anticipated experience affecting the Plan.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the Plan. Actuarial computations presented in this report are for purposes of satisfying the funding policy. The calculations in the enclosed report have been made on a basis consistent with our understanding of the Authority's funding requirements and goals. The calculations in this report have been made on a basis consistent with our understanding of the Plan's funding goals. Determinations for



Mr. Tom Heidt
9/29/2015

purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

This report has been prepared for the internal use of and is only to be relied upon by The Port of Houston Authority and its auditors. No portion of this report may be disclosed to any other party without Milliman's prior written consent. In the event such consent is given, the report must be provided in its entirety, unless prior written consent is obtained from Milliman.

I respectfully submit the following report, and look forward to discussing it with you.

Respectfully submitted,

A handwritten signature in black ink that reads "Jake Pringle".

Jake Pringle, EA, MAAA
Consulting Actuary

Exhibit A

Port of Houston Authority August 1, 2014 Valuation Date

	Current Valuation	Proposed ¹	Mortality Proposed ¹	6.75% Int Mortality Proposed ¹	6.25% Int Mortality Proposed ¹
Accrued Liability	\$157,810,000	\$159,630,000	\$168,500,000	\$173,320,000	\$183,640,000
Normal Cost	3,940,000	3,990,000	4,170,000	4,380,000	4,830,000
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MV Assets	\$164,820,000	\$164,820,000	\$164,820,000	\$164,820,000	\$164,820,000
Unfunded AL (UAL)	(\$7,000,000)	(\$5,180,000)	\$3,680,000	\$8,500,000	\$18,820,000
Funded Percentage	104.4%	103.3%	97.8%	95.1%	89.8%
<u>2014 Contribution - Estimated²</u>					
Normal Cost	\$3,940,000	\$3,990,000	\$4,170,000	\$4,380,000	\$4,830,000
Amtz of Bases	0	0	490,000	1,121,000	2,435,000
interest	160,000	170,000	190,000	220,000	270,000
2014 Contribution	\$4,100,000	\$4,160,000	\$4,850,000	\$5,721,000	\$7,535,000

interest	7.00%	7.00%	7.00%	6.75%	6.25%
experience study ¹	current	proposed	proposed	proposed	proposed
mortality ³	2000 W/B	2000 W/B	RP2014 W/B	RP2014 W/B	RP2014 W/B
projection scale ³	Proj Scale AA	Proj Scale AA	MP2014	MP2014	MP2014
expense load	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000

¹ The experience study assumptions include turnover, disability, and retirement rates, as well as salary scale assumption.

² Assumes increase in AL is amortized over 10 years, in accordance with current funding policy. Amortization and interest calculation estimated. Actual results when implemented will vary.

³ The current mortality assumption is the RP-2000 white collar (salaried) and blue collar (hourly) mortality tables for males and females. The current projection scale is Projection Scale AA. The proposed mortality assumption is the RP-2014 white collar (salaried) and blue collar (hourly) mortality tables for males and females. The proposed projection scale is 2-dimensional Mortality Improvement Scale MP-2014.

Exhibit B

Port of Houston Authority Restated Retirement Plan

Age	Proposed				Current				Salary Scale		
	Disability		Withdrawal	Retirement	Disability		Withdrawal	Retirement	Age	Proposed	Current
	Male	Female			Male	Female					
20	0.104%	0.169%	5.0%		0.097%	0.156%	5.0%		20	10.0%	7.5%
21	0.105%	0.171%	5.0%		0.100%	0.160%	5.0%		21	9.5%	7.5%
22	0.107%	0.173%	5.0%		0.103%	0.165%	5.0%		22	8.9%	7.0%
23	0.108%	0.175%	5.0%		0.106%	0.169%	5.0%		23	8.3%	7.0%
24	0.109%	0.177%	5.0%		0.108%	0.173%	5.0%		24	7.7%	6.5%
25	0.111%	0.179%	12.0%		0.112%	0.179%	10.0%		25	7.3%	6.4%
26	0.112%	0.181%	11.5%		0.114%	0.183%	10.0%		26	7.2%	6.3%
27	0.114%	0.183%	10.5%		0.117%	0.187%	10.0%		27	7.1%	6.2%
28	0.115%	0.185%	9.0%		0.118%	0.189%	10.0%		28	7.0%	6.1%
29	0.117%	0.187%	8.0%		0.119%	0.190%	10.0%		29	6.9%	6.0%
30	0.118%	0.190%	6.8%		0.120%	0.192%	6.5%		30	6.8%	4.5%
31	0.121%	0.194%	6.6%		0.121%	0.193%	6.2%		31	6.5%	4.5%
32	0.124%	0.198%	6.3%		0.122%	0.195%	6.2%		32	6.2%	4.5%
33	0.127%	0.202%	6.1%		0.123%	0.197%	6.0%		33	5.9%	4.5%
34	0.129%	0.205%	5.9%		0.125%	0.200%	5.5%		34	5.5%	4.5%
35	0.132%	0.209%	5.6%		0.127%	0.204%	5.0%		35	5.2%	4.5%
36	0.137%	0.219%	5.4%		0.130%	0.208%	4.1%		36	5.0%	4.5%
37	0.143%	0.228%	5.2%		0.133%	0.212%	4.1%		37	4.8%	4.5%
38	0.148%	0.237%	5.0%		0.137%	0.219%	4.1%		38	4.6%	4.5%
39	0.154%	0.246%	4.8%		0.142%	0.227%	4.1%		39	4.4%	4.5%
40	0.159%	0.255%	4.5%		0.147%	0.235%	3.6%		40	4.2%	4.2%
41	0.177%	0.282%	4.4%		0.153%	0.246%	3.6%		41	4.3%	4.2%
42	0.196%	0.309%	4.4%		0.159%	0.254%	3.6%		42	4.3%	4.1%
43	0.214%	0.336%	4.4%		0.169%	0.270%	3.6%		43	4.4%	4.1%
44	0.232%	0.363%	4.3%		0.183%	0.292%	3.6%		44	4.4%	4.1%
45	0.251%	0.390%	4.2%		0.197%	0.316%	2.4%		45	4.5%	4.0%
46	0.294%	0.466%	3.8%		0.221%	0.353%	2.5%		46	4.5%	4.0%
47	0.338%	0.542%	3.4%		0.249%	0.398%	2.5%		47	4.5%	4.0%
48	0.382%	0.617%	3.0%		0.280%	0.448%	2.5%		48	4.5%	4.0%
49	0.426%	0.693%	2.6%		0.315%	0.504%	2.5%		49	4.5%	4.0%
50	0.470%	0.769%	2.2%		0.356%	0.570%	3.0%		50	4.5%	3.8%
51	0.564%	0.907%	3.6%		0.405%	0.648%	3.0%		51	4.3%	3.8%
52	0.657%	1.044%	3.6%		0.462%	0.740%	3.0%		52	4.1%	3.8%
53	0.751%	1.182%	3.6%		0.522%	0.836%	3.0%		53	3.9%	3.7%
54	0.844%	1.319%	3.6%		0.592%	0.948%	3.0%		54	3.7%	3.6%
55	0.938%	1.457%	3.6%	10.0%	0.681%	1.089%	2.0%	5.0%	55	3.7%	3.5%
56	1.027%	1.613%	3.1%	10.0%	0.791%	1.265%	2.0%	5.0%	56	3.7%	3.5%
57	1.116%	1.769%	2.6%	15.0%	0.929%	1.487%	2.0%	5.0%	57	3.7%	3.5%
58	1.205%	1.924%	2.1%	15.0%	1.110%	1.776%	2.0%	5.0%	58	3.7%	3.2%
59	1.294%	2.080%	1.6%	20.0%	1.260%	2.016%	2.0%	10.0%	59	3.7%	3.2%
60	1.383%	2.236%	1.1%	20.0%	1.380%	2.208%	2.0%	15.0%	60	3.7%	3.0%
61	1.327%	2.178%	0.0%	25.0%	1.470%	2.352%	0.0%	15.0%	61	3.5%	3.0%
62	1.270%	2.120%	0.0%	25.0%	1.542%	2.467%	0.0%	20.0%	62	3.3%	3.0%
63	1.214%	2.062%	0.0%	25.0%	1.598%	2.556%	0.0%	25.0%	63	3.1%	3.0%
64	1.157%	2.003%	0.0%	25.0%	1.640%	2.624%	0.0%	30.0%	64	2.9%	3.0%
65	1.101%	1.945%	0.0%	50.0%	1.640%	2.624%	0.0%	35.0%	65	2.7%	3.0%
66	1.101%	1.945%	0.0%	50.0%	1.640%	2.624%	0.0%	40.0%	66	2.5%	3.0%
67	1.101%	1.945%	0.0%	50.0%	1.640%	2.624%	0.0%	50.0%	67	2.5%	3.0%
68	1.101%	1.945%	0.0%	50.0%	1.640%	2.624%	0.0%	50.0%	68	2.5%	3.0%
69	1.101%	1.945%	0.0%	50.0%	1.640%	2.624%	0.0%	50.0%	69	2.5%	3.0%
70	0.000%	0.000%	0.0%	100.0%	1.640%	2.624%	0.0%	100.0%	70	2.5%	3.0%

This work product was prepared solely for The Port of Houston Authority for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

30-Year Investment Assumptions at January 1, 2015

Policy Alloc %	Mgmt Fee	Alpha	Asset Class	Representative Index	Expected	Expected	Expected	Expected	Expected
					Nominal Annual Return: Arithmetic Mean	Nominal Annualized Return: 30-Yr Geom Mean	Nominal Standard Deviation or Annual Return	Real Annual Return: Arithmetic Mean	Real Annualized Return: 30-Yr Geom Mean
			US Inflation	CPI-U	2.32%	2.30%	1.85%		
40.00%			US Cash	BAML 3-Mon Tbill	2.86%	2.84%	1.72%	0.54%	0.53%
			US Core Fixed Income	Barclays Aggregate	4.50%	4.40%	4.68%	2.18%	2.05%
			US Core Bonds	Barclays Gvt/Credit	4.32%	4.18%	5.35%	2.00%	1.84%
			US Short Bonds	Barclays 1-3 Yr Gvt/Credit	3.84%	3.80%	2.74%	1.52%	1.47%
			US Interm Bonds	Barclays IT Gvt/Credit	4.16%	4.07%	4.17%	1.84%	1.73%
			US Long Bonds	Barclays LT Gvt/Credit	5.30%	4.84%	9.99%	2.98%	2.48%
			US Gvt Bonds	Barclays Gvt	3.78%	3.64%	5.37%	1.46%	1.31%
			US Credit Bonds	Barclays Credit	5.12%	4.93%	6.42%	2.80%	2.57%
			US Long Gvt Bonds	Barclays Long Gvt	4.41%	3.78%	11.76%	2.09%	1.44%
			US Long Credit Bonds	Barclays Long Credit	5.93%	5.50%	9.76%	3.61%	3.13%
5.00%			US Mortgages	Barclays MBS	4.91%	4.85%	3.80%	2.59%	2.49%
			US Municipal Bonds	Barclays Muni Index	3.75%	3.65%	4.69%	1.43%	1.32%
			US Bank / Leveraged Loans	Credit Suisse Leveraged Loan	5.65%	5.37%	7.82%	3.33%	3.00%
			US Inflation-Indexed Bonds	Barclays US TIPs	3.85%	3.75%	4.82%	1.54%	1.41%
			US High Yield Bonds	BAML High Yield	6.94%	6.46%	10.28%	4.62%	4.07%
			Global Bonds	Citi WGBI	3.26%	2.89%	8.90%	0.94%	0.57%
			Non-US Bonds	JPM GBI Global xUS	3.32%	2.73%	11.27%	1.01%	0.42%
			Emerging Markets Bonds	JPM EMBI Plus	7.52%	6.47%	15.41%	5.21%	4.08%
			US Large Caps	S&P 500	7.64%	6.42%	16.65%	5.32%	4.02%
			US Large/Mid Caps	Russell 1000	7.85%	6.57%	17.07%	5.53%	4.17%
7.50%			US Equity Market	Russell 3000	7.93%	6.62%	17.26%	5.61%	4.22%
			US Small Caps	Russell 2000	8.80%	6.83%	21.35%	6.48%	4.43%
			US Micro Caps	Russell MicroCap	9.24%	6.83%	23.72%	6.92%	4.43%
			US Small/Mid Caps	Russell 2500	8.66%	6.83%	20.53%	6.34%	4.43%
			US Mid Caps	Russell MidCap	8.19%	6.58%	19.26%	5.88%	4.18%
			US Large Growth	Russell 1000 Growth	8.39%	6.82%	18.94%	6.07%	4.42%
			US Large Value	Russell 1000 Value	7.50%	6.26%	16.73%	5.18%	3.87%
			US Small Growth	Russell 2000 Growth	9.74%	7.19%	24.52%	7.42%	4.78%
			US Small Value	Russell 2000 Value	8.12%	6.37%	20.07%	5.81%	3.97%
			US Growth	Russell 3000 Growth	8.38%	6.78%	19.20%	6.06%	4.37%
7.50%			US Value	Russell 3000 Value	7.61%	6.36%	16.84%	5.30%	3.97%
			US MidCap Growth	Russell MidCap Growth	9.11%	6.74%	23.53%	6.79%	4.34%
			US MidCap Value	Russell MidCap Value	7.80%	6.32%	18.34%	5.48%	3.93%
			Global Equity	MSCI ACWI NR	8.25%	6.88%	17.69%	5.93%	4.47%
			Non-US Equity	MSCI ACWI xUS NR	8.93%	7.24%	19.79%	6.62%	4.83%
			Foreign Developed Equity	MSCI EAFE NR	8.47%	6.84%	19.40%	6.16%	4.43%
			Emerging Markets Equity	MSCI EM NR	10.70%	7.34%	28.45%	8.38%	4.93%
			Non-US Small Cap	S&P EPAC EMI	9.15%	7.33%	20.55%	6.84%	4.92%
			US REITs	FTSE NAREIT Equity REIT	7.74%	5.91%	20.48%	5.42%	3.52%
	5.00%			Global REITs	FTSE EPRA/NAREIT Developed	8.53%	6.44%	22.02%	6.21%
			Non-US REITs	FTSE EPRA/NAREIT Developed ex-US	9.23%	6.70%	24.39%	6.92%	4.30%
			Private Real Estate Property	NCREIF Property	6.50%	5.85%	12.00%	4.18%	3.47%
			Timber	NCREIF Timber	6.61%	5.85%	13.00%	4.29%	3.47%
			Farmland	NCREIF Farmland	7.11%	6.35%	13.00%	4.79%	3.96%
			Infrastructure	S&P Global Infrastructure	8.12%	6.93%	16.50%	5.80%	4.52%
			Private Equity	Cambridge Private Equity	11.57%	7.88%	30.00%	9.25%	5.45%
			Commodities	Dow Jones UBS	6.03%	4.52%	18.40%	3.71%	2.17%
			Master Limited Partnerships	Alerian MLP	7.00%	5.68%	17.26%	4.68%	3.30%
			Hedge FOF Diversified	HFRI FOF Diversified	4.87%	4.57%	8.09%	2.56%	2.22%
10.00%			Hedge FOF Conservative	HFRI FOF Conservative	4.58%	4.42%	5.92%	2.26%	2.07%
			Hedge FOF Strategic	HFRI FOF Strategic	6.42%	5.84%	11.39%	4.10%	3.45%
			Hedge Funds	HFRI MultiStrategy	7.00%	6.63%	9.08%	4.69%	4.23%
			Hedge Funds	HFRI Event-Driven	6.99%	6.63%	8.90%	4.67%	4.23%
			Hedge Funds	HFRI Equity Hedge	8.07%	7.44%	11.96%	5.76%	5.02%
			Hedge Funds	HFRI Relative Value	5.00%	4.82%	6.35%	2.69%	2.46%
			Hedge Funds	HFRI Macro	7.14%	6.73%	9.61%	4.82%	4.33%
			Hedge Funds	HFRI Distressed	6.73%	6.33%	9.45%	4.41%	3.94%
	100.00%			Total Portfolio	6.69%	6.26%	9.72%	4.37%	3.99%

percentile:	
95%	9.19%
75%	7.44%
50%	6.25%
25%	5.06%
5%	3.39%