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February 7, 2019

Subject: Accrual of Estimated Unrecorded Liabilities at Fiscal Year End

Purpose:

The Office of the Controller reviews Accounts Payable (AP) activity subsequent to year end in order to determine the unrecorded liability at year end. The purpose of this memo is to develop a more efficient method to estimate the unrecorded liability (/revenue) by fund for the interim and year end statements.

Background:

The University does not account for AP activity on an accrual basis except for official reporting purposes. As such, in the course of preparing the financial statements the University has used resources to determine the unrecorded liability, as revealed by AP activity including payment request and disbursement vouchers processed subsequent to the year end, and attributable to the prior fiscal year.

Data for the date of service/receipt is not captured within KFS, the system of record financial system. Therefore, to determine the attribution of any given transaction to a fiscal year, each transaction must be individually (manually) reviewed.

Approach:

Historical Analysis

An extract of all payment request and disbursement vouchers equal to or greater than \$25,000 is analyzed for the purpose of identifying payments related to the prior year. These extracts have produced a subset of transactions in excess of 500 for individual review. On average 40% of these transactions are applicable to the accrual.

An analysis has been prepared of the results of this procedure for the last three years. (See Workbook Accrual Analysis; Worksheet: Historical Analysis.)

In order to determine if the resources expended in documenting the basis for this accrual matched the benefit to the financial statement users, an analysis was prepared documenting the effect on the financial statements of these accruals.



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Fund	FY 16	FY 17	FY 18
Auxiliary	0.85%	0.90%	0.96%
E&G	0.42%	0.59%	0.36%
Plant ¹			
Capital Assets	0.28%	0.22%	0.36%
Expenditures	2.6%	2.8%	1.5%
Restricted ²			
Revenue	1.82%	1.71%	1.48%
Expenditures	1.66%	1.56%	1.33%

Table 1 Percent Impact of Historic Accrual on Total Fund Expenditures

As can be seen above there is little impact on the financial statements for these accruals. However, there are large transactions every year that should be specifically identified and reviewed.

To determine a dollar threshold for review an individual analysis was created for each of the last three years which demonstrates total dollars over and under a specific threshold amount. (See Master Data Set (2016,2017,2018))

The purpose of this analysis was to determine the distribution by fund over time to gain insights with specific emphasis on understanding:

Timing—are the relevant accruals disproportionately processed within the first week, two weeks, three weeks, etc. after fiscal year end? If so can we reduce the resources expended by reducing the scope with regard to the duration of subsequent review.

Consistency – do the accruals seem stable or predictable, and if not stable in total is there a threshold under which there is stability and over which specific identification could be used to account for those large transactions which create volatility.

¹ Plant Fund accrual is split between an Asset accrual and expenditure accrual the impact is presented for both.

² Restricted Fund accrual is accrued to expenses and offset to revenue, the net effect on fund balance being null, however, this shows the relative impact on the line items.



Timing

Although it was hoped that a reduction in scope in regard to timing could make the accrual process more efficient a review of the data shows that other than the auxiliary fund, proportionally significant (to the accrual itself) expenses are recorded as late as nine weeks past year end (See Appendix A). The plant and restricted funds especially have historically large transactions processed throughout the nine weeks which have historically been reviewed subsequent to year end. As a result, we don't believe a limitation to a shorter time horizon is appropriate for any fund other than the auxiliary fund. The impact of a reduction in scope for the auxiliary fund is so small that this approach would probably not provide the cost benefit of the change. Specifically, a reduction in the scope for only the Auxiliary fund would reduce the number of transactions reviewed by less than 10% in most years, as shown in the table below.

<u>Year</u>	<u>Transactions (% of Total)</u>	<u>Dollars Accrued</u>
<u>2016</u>	<u>59 (10%)</u>	<u>\$599,528.55</u>
<u>2017</u>	<u>33 (6%)</u>	<u>\$404,320.36</u>
<u>2018</u>	<u>40 (7%)</u>	<u>\$176,805.45</u>

Table 2: Auxiliary Fund - Total number of transactions reviewed four weeks after FY close and associated impact on accrual

Consistency

In reviewing the consistency of processed transactions, a maximum threshold of \$300,000 was identified where there is relatively immaterial changes in the base of accrual dollars under that threshold and the dollars over this threshold provide those significant items which when accrued account for the volatility in the fund accruals.

The data from this review is summarized below by fund.



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HISTORICAL DISTRIBUTION OF SPECIFICALLY IDENTIFIED LIABILITIES

By Fund

		2016	2017	2018
AUX	< \$300K	\$ 1,767,663	\$ 1,425,869	\$ 1,313,634
	CT	23	15	15
	> \$300K	\$ -	\$ 550,868	\$ 828,994
	CT	0	2	2
Total Aux	\$	\$ 1,767,663	\$ 1,976,737	\$ 2,142,628
	CT	23	17	17

Avg	Lump Estimate
\$ 1,502,389	\$ 1,500,000
0.698%	

Total Fund Exp Before Acrl	\$ 206,667,949.23	\$ 218,140,604.28	\$ 221,238,345.46
Proportion <\$300K	0.855%	0.654%	0.594%
Proportion >\$300K	0.000%	0.253%	0.375%
Liability as % of Exp	0.855%	0.906%	0.968%

0.701%

The above summary for the Auxiliary fund for the last three years demonstrates that for those items included in the extract that were relevant to the accrual there was a relatively stable proportion of items processed where the dollar value was under \$300,000 in terms of a simple average of the items as well as a proportion of the accrual dollars to total expenditures prior to the accrual. However, there was more volatility in items over \$300,000 (in 2016 there were none in each of the other years there were two items).

Similar patterns are reflected in the other funds as shown in the tables below.

		2016	2017	2018
E&G	< \$300K	\$ 2,335,707	\$ 2,701,123	\$ 2,096,833
	CT	40	45	42
	> \$300K	\$ 1,979,044	\$ 3,644,497	\$ 2,022,081
	CT	4	5	3
Total E&G	\$	\$ 4,314,751	\$ 6,345,620	\$ 4,118,914
	CT	44	50	45

Avg	Lump Estimate
\$ 2,377,888	\$ 2,350,000
0.222%	

Total Fund Exp Before Acrl	\$ 1,011,476,069.96	\$ 1,075,405,106.00	\$ 1,125,382,737.00
Proportion <\$300K	0.231%	0.251%	0.186%
Proportion >\$300K	0.196%	0.339%	0.180%
Liability as % of Exp	0.427%	0.590%	0.366%

0.223%



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		2016	2017	2018
PLANT	< \$300K	\$ 3,634,772	\$ 3,115,656	\$ 3,470,001
	CT	47	37	46
	> \$300K	\$ 5,843,112	\$ 5,378,874	\$ 6,439,601
	CT	7	6	5
Total Plant	\$	\$ 9,477,883	\$ 8,494,530	\$ 9,909,602
	CT	54	43	51

Avg	Lump Estimate
\$ 3,406,810	\$ 3,400,000
2.402%	

Total Fund Exp Before Acrl	\$ 135,023,440.57	\$ 138,645,386.00	\$ 151,748,949.00
Proportion <\$300K	2.692%	2.247%	2.287%
Proportion >\$300K	4.327%	3.880%	4.244%
Liability as % of Exp	7.019%	6.127%	6.530%

2.409%

Note: Plant Ratio's in this exhibit are for narrative purposes to show relative materiality of the liability. In practice we would split the liability between capital assets and expenditures for analysis or application.

		2016	2017	2018
RESTRICTED	< \$300K	\$ 5,183,889	\$ 5,331,205	\$ 5,176,354
	CT	94	95	88
	> \$300K	\$ 2,016,255	\$ 1,511,602	\$ 449,214
	CT	3	3	1
Total Restricted	\$	\$ 7,200,144	\$ 6,842,807	\$ 5,625,568
	CT	97	98	89

Avg	Lump Estimate
\$ 5,230,483	\$ 5,250,000
1.230%	

Total Fund Exp Before Acrl	\$ 427,478,817.79	\$ 431,477,426.00	\$ 416,379,297.00
Proportion <\$300K	1.213%	1.236%	1.243%
Proportion >\$300K	0.472%	0.350%	0.108%
Liability as % of Exp	1.684%	1.586%	1.351%

1.230%

Total Prior Year Transactions	218	208	202
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The above analysis was also done with a threshold of \$100,000 to determine if the precision relative to the estimate was improved significantly. This analysis showed that in all funds a threshold of \$100,000 vs. \$300,000 did not significantly improve the precision of the estimate. More specifically, in all funds, except for the plant fund, the estimate with a threshold for specific review over \$100,000 vs \$300,000 improved precision of the estimate by less than 0.20% variance to total expenditures. In the plant fund the increase in precision was between 0.3-0.5% of total fund expenditures.

After this analysis it is suggested that a reasonable review threshold would be all transactions over \$300,000. In addition, to the specific identification of these transactions an accounting estimate would be accrued and allocated based on the historical distribution of the accrual on average. The estimate is calculated as a proportion of fund expenditures based on the analysis of



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the last three years. (See Workbook: Accrual Analysis; Worksheet: Proposed Mod Ex 2 and Worksheet: Proposed Mod Ex 3)

Fund	% Of Expenditures
Auxiliary	0.701%
Education and General	0.223%
Plant	2.409%
Restricted	1.23%

Table 3: Estimated Proportion of Unrecorded Liabilities Relative to Total Fund Expenditures Prior to Estimate

This approach is projected to reduce the number of transactions which must individually be reviewed by 92%. ((See Workbook: Accrual Analysis; Worksheet: Proposed Mod Ex 1).

To evaluate the impact on the financial statements of this approach an analysis was prepared for each fund for each of the last three years. (See Workbook: Accrual Analysis; Worksheets: Proposed Mod (Aux, E&G, Plant, Restricted)). These analyses provide exhibits for both a lump sum accrual as well as a ratio accrual method.

The impact of this change in method is shown in the table below as a ratio of the change in the fund expenditures to total fund expenditures.

Fund	Change in Expenditures (Range)
Auxiliary	0.00% (-0.17%-0.12%)
E&G	-0.02% (-0.07% - 0.02%)
Plant ³	
Capital Assets	0.00% (-0.03%-0.05%)
Expenditures	0.08% (-0.95% - 0.68%)
Restricted ⁴	
Liability	0.01% (-0.02% - 0.02%)
Revenue	0.00% (-0.01-0.01%)

Table 4 Relative Impact of Change in Estimation Method on Financial Line Items

³ Plant Fund accrual is split between an asset accrual and expenditure accrual. The impact for assets is presented as a % of total capital assets.

⁴ Restricted Fund accrual is accrued to expenses and offset to revenue, the net effect on fund balance being null, however, this shows the relative impact on the line items.



Data Collection

The data used in the analysis was the original source files used in each of the last three years prior to manipulation. All amounts have been reconciled to the trial balance for the relevant year.

Totals for fund assets, liabilities, revenues and expenditures are taken from the final trial balance for each fund for each year.

Conclusion:

The accrual is a material part of the account's payable liability for the funds in each case, however, immaterial as an impact to total expenditures⁵ of the funds or fund balances.

Based on our analysis, the use of an accounting estimate coupled with a review of all transactions which exceed \$300,000 will provides an estimate of unrecorded liabilities which is substantially the same as the liability recorded in the past and will save University resources by eliminating over 90% of the manual process required to prepare the estimate manually.

Fund	% Of Expenditures
Auxiliary	0.701%
Education and General	0.223%
Plant	2.409%
Restricted	1.23%

Table 5: Estimated Proportion of Unrecorded Liabilities Relative to Total Fund Expenditures Prior to Estimate

Effective Date: February 7, 2019

If you have any further questions, please contact Bryan Casey, Senior Business Analyst, General Accounting bfcasey@UMD.edu, Ext. 58992.

⁵ For the Plant and Restricted funds accruals are made to capital asset accounts and revenue respectively, the accruals to these accounts are also immaterial.



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Appendix A

Analysis of Timing 2016

Account Chart **01**
 Sensitivity **All Over \$ 24,999.99**

Count of all Items within range 586 100% of original threshold

AUX	2016		WK 1	WK 2	WK 3	WK 4	WK 5	WK 6	WK 7	WK 8	WK 9	Total
			\$	\$ 134,653.07	\$ 296,800.36	\$ 97,150.00	\$ 639,530.79	\$ 197,205.87	\$ 39,920.24	\$ -	\$ -	\$ 362,402.44
Count	2	4	2	7	3	1	-	-	4	23		
2017/OOR	\$	\$ 104,042.10	\$ 5,767.65	\$ 165,153.08	\$ 346,243.34	\$ 523,581.16	\$ 71,157.07	\$ 286,016.34	\$ 715,973.38	\$ 6,787,261.07	\$ 9,005,195.19	
	Count	1	-	2	6	8	3	2	6	32	60	

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E&G	2016	\$	\$ 73,840.80	\$ 1,080,419.77	\$ 311,454.06	\$ 500,513.85	\$ 1,444,034.40	\$ -	\$ 26,938.23	\$ 326,444.00	\$ 551,105.93	\$ 4,314,751.04
		Count	2	9	8	7	8	-	1	1	8	44
2017/OOR	\$	\$ 72,863.00	\$ 1,762,406.64	\$ 12,479,676.56	\$ 1,462,645.60	\$ 1,198,004.70	\$ 732,352.10	\$ 526,126.95	\$ 1,423,311.74	\$ 7,279,600.75	\$ 26,936,988.04	
	Count	1	16	14	19	14	10	11	14	55	154	

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PLANT	2016	\$	\$ 979,687.66	\$ 526,021.32	\$ 1,105,822.39	\$ 300,207.31	\$ 4,660,736.84	\$ 1,133,774.39	\$ 147,397.40	\$ 388,945.00	\$ 235,291.12	\$ 9,477,883.44
		Count	10	10	13	2	10	2	1	2	4	54
2017/OOR	\$	\$ 62,999.00	\$ 1,994,146.40	\$ 793,628.32	\$ 292,730.99	\$ 3,409,583.68	\$ 649,086.06	\$ 746,622.04	\$ 1,990,887.09	\$ 6,647,359.38	\$ 16,587,042.95	
	Count	1	3	5	1	12	6	3	14	36	81	

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RESTRICTED	2016	\$	\$ 147,271.60	\$ 291,531.54	\$ 2,000,527.24	\$ 376,618.35	\$ 782,434.22	\$ 1,223,712.17	\$ 291,324.33	\$ 378,092.42	\$ 1,708,632.34	\$ 7,200,144.21
		Count	3	7	12	6	14	14	4	6	31	97
2017/OOR	\$	\$ -	\$ 25,485.89	\$ 924,033.97	\$ 333,476.48	\$ 330,161.72	\$ 743,256.93	\$ 2,157,326.22	\$ 551,321.74	\$ 2,952,144.31	\$ 8,017,207.26	
	Count	-	1	4	4	7	8	3	6	39	72	

Total Reviewed 169

Consolidated	2018	\$	\$ 22,760,441
		Count	218
2019	\$	\$ 60,546,433	
	Count	367	

Total Reviewed 585



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Analysis of Timing 2017

Account Chart 01
 Sensitivity All Over \$ 24,999.99

Count of all Items within range 538 100% of original threshold

			WK 1	WK 2	WK 3	WK 4	WK 5	WK 6	WK 7	WK 8	WK 9	Total	
AUX	2017	\$	\$ 112,659.94	\$ 1,154,409.23	\$ 222,830.00	\$ 82,517.19	\$ 361,640.36	\$ -	\$ 42,680.00	\$ -	\$ -	\$ 1,976,737	
		Count	2	8	2	2	2	0	1	0	0	17	
	2018/OOR	\$	\$ -	\$ 614,784.65	\$ 68,243.97	\$ 293,432.70	\$ 181,660.93	\$ 981,530.20	\$ 1,008,125.03	\$ 718,643.04	\$ 388,099.53	\$ -	\$ 4,254,520
		Count	0	3	2	4	2	5	6	6	11	39	
Total Reviewed												56	

E&G	2017	\$	\$ 507,542.87	\$ 1,338,207.82	\$ 613,749.96	\$ 1,708,486.41	\$ 501,048.26	\$ 215,195.18	\$ 1,146,443.94	\$ -	\$ 314,945.29	\$ 6,345,620	
		Count	5	14	4	12	4	6	1	0	4	50	
	2018/OOR	\$	\$ 814,030.41	\$ 3,266,334.92	\$ 3,148,002.52	\$ 1,169,752.59	\$ 1,520,971.21	\$ 5,384,000.96	\$ 6,854,226.11	\$ 1,233,942.19	\$ 2,093,426.09	\$ -	\$ 25,484,687
		Count	14	14	23	12	16	14	33	14	16	156	
Total Reviewed												206	

PLANT	2017	\$	\$ 2,975,863.10	\$ 900,460.11	\$ 2,438,631.29	\$ 299,867.99	\$ 849,959.87	\$ 182,431.77	\$ 615,556.53	\$ 29,528.26	\$ 202,230.72	\$ 8,494,530	
		Count	13	7	4	6	3	3	4	1	2	43	
	2018/OOR	\$	\$ 730,628.68	\$ 401,963.83	\$ 2,182,204.63	\$ 249,701.99	\$ 2,053,637.43	\$ 3,988,341.03	\$ 4,743,030.89	\$ 3,824,781.92	\$ 1,059,831.95	\$ -	\$ 19,234,122
		Count	1	4	3	5	11	11	18	12	10	75	
Total Reviewed												118	

RESTRICTED	2017	\$	\$ 1,136,996.30	\$ 1,356,346.24	\$ 242,327.35	\$ 982,018.02	\$ 964,523.06	\$ 963,379.08	\$ 203,447.32	\$ 607,152.83	\$ 386,615.93	\$ 6,842,806	
		Count	15	11	4	13	24	12	4	8	7	98	
	2018/OOR	\$	\$ 70,000.00	\$ 248,240.95	\$ 201,558.06	\$ 229,242.38	\$ 223,694.00	\$ 348,673.64	\$ 1,036,973.35	\$ 476,222.73	\$ 969,036.46	\$ -	\$ 3,803,642
		Count	1	5	4	2	3	7	17	10	11	60	
Total Reviewed												158	

Consolidated	2017	\$	\$ 23,659,692
		Count	208
	2018	\$	\$ 52,776,971
		Count	330
Total Reviewed			538

Where Sensitivity is all item over \$24,999.99 the rows labeled 2018 are purely 2018 items. Where the sensitivity is changed to be under or a different number...it becomes a summation of all items out of the range but in the original data set.



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Analysis of Timing 2018

Account Chart 01
 Sensitivity All Over \$ 24,999.99

Count of all Items within range 525 100% of original threshold

		0.076190476	WK 1	WK 2	WK 3	WK 4	WK 5	WK 6	WK 7	WK 8	WK 9	Total	
AUX	2018	\$	\$ 89,714.64	\$ 1,148,446.44	\$ 413,928.26	\$ 313,732.75	\$ 151,173.81	\$ -	\$ 25,631.64	\$ -	\$ -	\$ 2,142,628	
		Count	2	7	2	2	3	-	1	-	-	17	
	2019/OOR	\$	\$ 104,969.69	\$ 40,300.00	\$ 250,900.25	\$ 43,999.98	\$ 267,233.69	\$ 191,976.63	\$ 1,007,828.51	\$ 1,301,211.22	\$ 1,067,929.36	\$ 4,276,349	
		Count	1	3	6	1	6	3	6	11	10	47	
	Total Reviewed												64
	E&G	2018	\$	\$ 1,623,514.81	\$ 278,989.51	\$ 277,416.67	\$ 281,148.86	\$ 1,138,429.68	\$ 239,942.00	\$ 92,172.19	\$ 187,300.65	\$ -	\$ 4,118,914
Count			12	7	7	7	6	1	2	3	-	45	
2019/OOR		\$	\$ 616,068.11	\$ 3,825,279.19	\$ 6,766,818.56	\$ 2,270,835.38	\$ 939,032.59	\$ 4,253,117.60	\$ 5,724,427.16	\$ 1,247,955.88	\$ 2,481,540.11	\$ 28,125,075	
		Count	6	13	27	16	17	21	34	17	17	168	
Total Reviewed												213	
PLANT		2018	\$	\$ 652,730.19	\$ 6,499,037.99	\$ 734,085.73	\$ 126,670.89	\$ 27,637.50	\$ 129,483.34	\$ 553,090.40	\$ 1,186,865.51	\$ -	\$ 9,909,602
	Count		9	16	9	2	1	2	7	5	-	51	
	2019/OOR	\$	\$ -	\$ 325,142.29	\$ 705,532.22	\$ 281,503.78	\$ 1,097,422.23	\$ 1,098,653.53	\$ 1,484,441.76	\$ 5,884,278.60	\$ 2,572,953.63	\$ 13,449,928	
		Count	-	4	10	4	8	10	9	11	6	62	
	Total Reviewed												113
	RESTRICTED	2018	\$	\$ 877,970.86	\$ 565,948.67	\$ 655,056.31	\$ 674,057.51	\$ 871,584.54	\$ 959,018.39	\$ 57,915.12	\$ 735,845.58	\$ 228,171.40	\$ 5,625,568
Count			6	13	13	10	15	12	2	13	5	89	
2019/OOR		\$	\$ 104,237.76	\$ 226,163.12	\$ 177,813.92	\$ 310,000.00	\$ 140,520.31	\$ 90,627.95	\$ 228,771.51	\$ 1,105,960.57	\$ 986,409.63	\$ 3,370,505	
		Count	3	2	3	3	2	2	3	15	13	46	
Total Reviewed												135	

Consolidated	2018	\$	\$ 21,796,712
		Count	202
	2019	\$	\$ 49,221,857
		Count	323
Total Reviewed			525