

Liberty Utilities Missouri  
Lead-Lag Study Ending December 31, 2022  
Revenue and Collection Lag

<u>Line</u>	<u>Description</u>	<u>Revenue Lag</u>	<u>Reference</u>
1	Service Lag	15.21	
2	Billing Lag	4.14	A-1
3	Collection Lag	30.65	A-2
4	<u>Composite Revenue Lag</u>	<u>50.01</u>	

Liberty Utilities Missouri  
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Purchased Gas Costs

Line	Supplier	Start Service	End Service	Midpoint	Payment Date	Payment (Lead)/Lag Days	Total (Lead)/Lag Days	Payment Amount	Dollar Days
1	ANR Pipeline Invoice	1/1/2022	1/31/2022	(15.50)	03/03/22	(31.00)	(46.50)	\$ 128,073	\$ (5,955,411)
2	Atmos Energy Marketing	1/1/2022	1/31/2022	(15.50)	03/03/22	(31.00)	(46.50)	586	(27,227)
3	Direct Supply Invoice - Butler	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	112,021	(4,424,839)
4	BP Supply Invoice	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	28,505	(1,125,928)
5	Symmetry Piedmont AMA Invo	1/1/2022	1/31/2022	(15.50)	03/08/22	(36.00)	(51.50)	28,435	(1,464,378)
6	Repsol Jackosn AMA Invoice	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	424,213	(16,756,414)
7	Repsol Bowling Green Supply	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	571,877	(22,589,158)
8	Repsol Hannibal AMA Invoice	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	133,388	(5,268,813)
9	Direct Energy AMA Invoice	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	228,261	(9,016,313)
10	Natural Gas Pipeline	1/1/2022	1/31/2022	(15.50)	02/14/22	(14.00)	(29.50)	68,743	(2,027,932)
11	Ozark Gas Transmission	1/1/2022	1/31/2022	(15.50)	02/21/22	(21.00)	(36.50)	40,026	(1,460,941)
12	Panhandle Eastern Pipe Line C	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	386,326	(15,259,879)
13	Southern Star Central Gas Pip	1/1/2022	1/31/2022	(15.50)	02/17/22	(17.00)	(32.50)	10,002	(325,053)
14	Tetco	1/1/2022	1/31/2022	(15.50)	02/22/22	(22.00)	(37.50)	194,714	(7,301,774)
15	Twin Eagle Resource AMA Inv	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	1,229,612	(48,569,656)
16	Twin Eagle Resource AMA Inv	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	11,497	(454,114)
17	Twin Eagle Resource Peaking	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	3,255	(128,573)
18	Twin Eagle Resource Peaking	1/1/2022	1/31/2022	(15.50)	02/24/22	(24.00)	(39.50)	4,650	(183,675)
19	ANR Pipeline Invoice	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	128,184	(4,870,995)
20	Atmos Energy Marketing	2/1/2022	2/28/2022	(14.00)	04/04/22	(35.00)	(49.00)	497	(24,345)
21	Direct Supply Invoice - Butler	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	127,470	(4,843,852)
22	BP Supply Invoice	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	24,010	(912,380)
23	Symmetry Piedmont AMA Invo	2/1/2022	2/28/2022	(14.00)	04/04/22	(35.00)	(49.00)	22,485	(1,101,758)
24	Repsol Jackosn AMA Invoice	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	361,767	(13,747,147)
25	Repsol Bowling Green Supply	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	132,042	(5,017,613)
26	Repsol Hannibal AMA Invoice	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	523,358	(19,887,609)
27	Direct Energy AMA Invoice	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	297,357	(11,299,580)
28	Natural Gas Pipeline	2/1/2022	2/28/2022	(14.00)	03/14/22	(14.00)	(28.00)	71,750	(2,009,010)
29	Ozark Gas Transmission	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	40,757	(1,548,760)
30	Panhandle Eastern Pipe Line C	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	190,806	(7,250,614)

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Line	Supplier	Start Service	End Service	Midpoint	Payment Date	Payment (Lead)/Lag Days	Total (Lead)/Lag Days	Payment Amount	Dollar Days
31	Southern Star Central Gas Pip	2/1/2022	2/28/2022	(14.00)	03/17/22	(17.00)	(31.00)	8,764	(271,679)
32	Tetco	2/1/2022	2/28/2022	(14.00)	03/21/22	(21.00)	(35.00)	281,872	(9,865,522)
33	Twin Eagle Resource AMA Inv	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	1,419,656	(53,946,929)
34	Twin Eagle Resource AMA Inv	2/1/2022	2/28/2022	(14.00)	03/24/22	(24.00)	(38.00)	93,023	(3,534,858)
35	Twin Eagle Resource Peaking	2/1/2022	2/28/2022	(14.00)	03/31/22	(31.00)	(45.00)	2,940	(132,300)
36	Twin Eagle Resource Peaking	2/1/2022	2/28/2022	(14.00)	03/31/22	(31.00)	(45.00)	4,200	(189,000)
37	ANR Pipeline Invoice	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	128,073	(5,186,971)
38	Atmos Energy Marketing	3/1/2022	3/31/2022	(15.50)	05/12/22	(42.00)	(57.50)	328	(18,888)
39	Direct Supply Invoice - Butler	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	13,729	(556,007)
40	BP Supply Invoice	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	12,095	(489,833)
41	Symmetry Piedmont AMA Invo	3/1/2022	3/31/2022	(15.50)	05/04/22	(34.00)	(49.50)	22,678	(1,122,560)
42	Repsol Jackosn AMA Invoice	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	124,219	(5,030,889)
43	Repsol Bowling Green Supply	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	47,866	(1,938,577)
44	Repsol Hannibal AMA Invoice	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	264,488	(10,711,765)
45	Direct Energy AMA Invoice	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	240,853	(9,754,566)
46	Natural Gas Pipeline	3/1/2022	3/31/2022	(15.50)	04/18/22	(18.00)	(33.50)	71,893	(2,408,403)
47	Ozark Gas Transmission	3/1/2022	3/31/2022	(15.50)	04/22/22	(22.00)	(37.50)	40,026	(1,500,967)
48	Panhandle Eastern Pipe Line C	3/1/2022	3/31/2022	(15.50)	04/22/22	(22.00)	(37.50)	314,008	(11,775,303)
49	Southern Star Central Gas Pip	3/1/2022	3/31/2022	(15.50)	04/18/22	(18.00)	(33.50)	9,405	(315,052)
50	Tetco	3/1/2022	3/31/2022	(15.50)	04/22/22	(22.00)	(37.50)	282,884	(10,608,158)
51	Twin Eagle Resource AMA Inv	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	631,348	(25,569,612)
52	Twin Eagle Resource AMA Inv	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	-	-
53	Twin Eagle Resource Peaking	3/1/2022	3/31/2022	(15.50)	04/25/22	(25.00)	(40.50)	-	-
54	ANR Pipeline Invoice	4/1/2022	4/30/2022	(15.00)	05/20/22	(20.00)	(35.00)	104,843	(3,669,495)
55	Atmos Energy Marketing	4/1/2022	4/30/2022	(15.00)	06/16/22	(47.00)	(62.00)	156	(9,688)
56	Direct Supply Invoice - Butler	4/1/2022	4/30/2022	(15.00)	05/25/22	(25.00)	(40.00)	221,575	(8,862,980)
57	BP Supply Invoice	4/1/2022	4/30/2022	(15.00)	05/25/22	(25.00)	(40.00)	17,218	(688,720)
58	Symmetry Piedmont AMA Invo	4/1/2022	4/30/2022	(15.00)	06/08/22	(39.00)	(54.00)	53,355	(2,881,171)
59	Symmetry Jackosn AMA Invoic	4/1/2022	4/30/2022	(15.00)	06/14/22	(45.00)	(60.00)	291,063	(17,463,782)
60	Spire Bowling Green Supply In	4/1/2022	4/30/2022	(15.00)	05/27/22	(27.00)	(42.00)	87,244	(3,664,245)

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61	Spire Hannibal AMA Invoice	4/1/2022	4/30/2022	(15.00)	05/27/22	(27.00)	(42.00)	866,664	(36,399,902)
62	Direct Energy AMA Invoice	4/1/2022	4/30/2022	(15.00)	05/25/22	(25.00)	(40.00)	613,012	(24,520,494)
63	Natural Gas Pipeline	4/1/2022	4/30/2022	(15.00)	05/16/22	(16.00)	(31.00)	54,888	(1,701,543)
64	Ozark Gas Transmission	4/1/2022	4/30/2022	(15.00)	05/20/22	(20.00)	(35.00)	40,269	(1,409,431)
65	Panhandle Eastern Pipe Line C	4/1/2022	4/30/2022	(15.00)	05/20/22	(20.00)	(35.00)	215,528	(7,543,479)
66	Southern Star Central Gas Pip	4/1/2022	4/30/2022	(15.00)	05/16/22	(16.00)	(31.00)	7,305	(226,451)
67	Tetco	4/1/2022	4/30/2022	(15.00)	05/19/22	(19.00)	(34.00)	281,498	(9,570,916)
68	Twin Eagle Resource AMA Inv	4/1/2022	4/30/2022	(15.00)	05/26/22	(26.00)	(41.00)	887,515	(36,388,106)
69	Twin Eagle Resource AMA Inv	4/1/2022	4/30/2022	(15.00)	05/26/22	(26.00)	(41.00)	-	-
70	ANR Pipeline Invoice	5/1/2022	5/31/2022	(15.50)	06/23/22	(23.00)	(38.50)	104,843	(4,036,444)
71	Atmos Energy Marketing	5/1/2022	5/31/2022	(15.50)	07/07/22	(37.00)	(52.50)	58	(3,065)
72	Direct Supply Invoice - Butler	5/1/2022	5/31/2022	(15.50)	06/27/22	(27.00)	(42.50)	257,764	(10,954,970)
73	BP Supply Invoice	5/1/2022	5/31/2022	(15.50)	06/27/22	(27.00)	(42.50)	21,173	(899,853)
74	Symmetry Piedmont AMA Invo	5/1/2022	5/31/2022	(15.50)	07/07/22	(37.00)	(52.50)	149,182	(7,832,062)
75	Symmetry Jackosn AMA Invoic	5/1/2022	5/31/2022	(15.50)	07/07/22	(37.00)	(52.50)	383,885	(20,153,958)
76	Spire Bowling Green Supply In	5/1/2022	5/31/2022	(15.50)	06/27/22	(27.00)	(42.50)	87,764	(3,729,959)
77	Spire Hannibal AMA Invoice	5/1/2022	5/31/2022	(15.50)	06/27/22	(27.00)	(42.50)	992,860	(42,196,551)
78	Direct Energy AMA Invoice	5/1/2022	5/31/2022	(15.50)	06/30/22	(30.00)	(45.50)	650,362	(29,591,493)
79	Natural Gas Pipeline	5/1/2022	5/31/2022	(15.50)	06/16/22	(16.00)	(31.50)	61,890	(1,949,544)
80	Ozark Gas Transmission	5/1/2022	5/31/2022	(15.50)	06/23/22	(23.00)	(38.50)	40,026	(1,540,993)
81	Panhandle Eastern Pipe Line C	5/1/2022	5/31/2022	(15.50)	06/21/22	(21.00)	(36.50)	230,886	(8,427,331)
82	Southern Star Central Gas Pip	5/1/2022	5/31/2022	(15.50)	06/16/22	(16.00)	(31.50)	7,531	(237,229)
83	Tetco	5/1/2022	5/31/2022	(15.50)	06/21/22	(21.00)	(36.50)	281,580	(10,277,661)
84	Twin Eagle Resource AMA Inv	5/1/2022	5/31/2022	(15.50)	06/30/22	(30.00)	(45.50)	1,049,637	(47,758,466)
85	Twin Eagle Resource AMA Inv	5/1/2022	5/31/2022	(15.50)	06/30/22	(30.00)	(45.50)	-	-
86	ANR Pipeline Invoice	6/1/2022	6/30/2022	(15.00)	07/25/22	(25.00)	(40.00)	104,843	(4,193,708)
87	Atmos Energy Marketing	6/1/2022	6/30/2022	(15.00)	08/02/22	(33.00)	(48.00)	31	(1,484)
88	Direct Supply Invoice - Butler	6/1/2022	6/30/2022	(15.00)	07/25/22	(25.00)	(40.00)	254,400	(10,176,000)
89	BP Supply Invoice	6/1/2022	6/30/2022	(15.00)	07/25/22	(25.00)	(40.00)	19,530	(781,200)
90	Symmetry Piedmont AMA Invo	6/1/2022	6/30/2022	(15.00)	08/08/22	(39.00)	(54.00)	161,649	(8,729,052)

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91	Symmetry Jackosn AMA Invoic	6/1/2022	6/30/2022	(15.00)	08/08/22	(39.00)	(54.00)	345,330	(18,647,809)
92	Spire Bowling Green Supply In	6/1/2022	6/30/2022	(15.00)	07/25/22	(25.00)	(40.00)	85,313	(3,412,512)
93	Spire Hannibal AMA Invoice	6/1/2022	6/30/2022	(15.00)	07/25/22	(25.00)	(40.00)	992,084	(39,683,371)
94	Direct Energy AMA Invoice	6/1/2022	6/30/2022	(15.00)	07/25/22	(25.00)	(40.00)	683,930	(27,357,184)
95	Natural Gas Pipeline	6/1/2022	6/30/2022	(15.00)	07/15/22	(15.00)	(30.00)	58,202	(1,746,055)
96	Ozark Gas Transmission	6/1/2022	6/30/2022	(15.00)	07/20/22	(20.00)	(35.00)	40,269	(1,409,431)
97	Panhandle Eastern Pipe Line C	6/1/2022	6/30/2022	(15.00)	07/21/22	(21.00)	(36.00)	174,553	(6,283,918)
98	Southern Star Central Gas Pip	6/1/2022	6/30/2022	(15.00)	07/15/22	(15.00)	(30.00)	7,260	(217,799)
99	Tetco	6/1/2022	6/30/2022	(15.00)	07/20/22	(20.00)	(35.00)	285,105	(9,978,681)
100	Twin Eagle Resource AMA Inv	6/1/2022	6/30/2022	(15.00)	07/25/22	(25.00)	(40.00)	1,085,013	(43,400,510)
101	Twin Eagle Resource AMA Inv	6/1/2022	6/30/2022	(15.00)	07/25/22	(25.00)	(40.00)	-	-
102	ANR Pipeline Invoice	7/1/2022	7/31/2022	(15.50)	08/19/22	(19.00)	(34.50)	104,754	(3,614,026)
103	Atmos Energy Marketing	7/1/2022	7/31/2022	(15.50)	09/01/22	(32.00)	(47.50)	30	(1,441)
104	Direct Supply Invoice - Butler	7/1/2022	7/31/2022	(15.50)	08/25/22	(25.00)	(40.50)	172,143	(6,971,792)
105	BP Supply Invoice	7/1/2022	7/31/2022	(15.50)	08/25/22	(25.00)	(40.50)	9,889	(400,505)
106	Symmetry Piedmont AMA Invo	7/1/2022	7/31/2022	(15.50)	09/06/22	(37.00)	(52.50)	126,071	(6,618,742)
107	Symmetry Jackosn AMA Invoic	7/1/2022	7/31/2022	(15.50)	09/06/22	(37.00)	(52.50)	275,653	(14,471,764)
108	Spire Bowling Green Supply In	7/1/2022	7/31/2022	(15.50)	08/25/22	(25.00)	(40.50)	662,482	(26,830,530)
109	Spire Hannibal AMA Invoice	7/1/2022	7/31/2022	(15.50)	08/25/22	(25.00)	(40.50)	61,711	(2,499,299)
110	Direct Energy AMA Invoice	7/1/2022	7/31/2022	(15.50)	08/25/22	(25.00)	(40.50)	407,849	(16,517,871)
111	Natural Gas Pipeline	7/1/2022	7/31/2022	(15.50)	08/12/22	(12.00)	(27.50)	31,169	(857,152)
112	Ozark Gas Transmission	7/1/2022	7/31/2022	(15.50)	08/19/22	(19.00)	(34.50)	39,506	(1,362,970)
113	Panhandle Eastern Pipe Line C	7/1/2022	7/31/2022	(15.50)	08/19/22	(19.00)	(34.50)	178,924	(6,172,864)
114	Southern Star Central Gas Pip	7/1/2022	7/31/2022	(15.50)	08/12/22	(12.00)	(27.50)	7,482	(205,742)
115	Tetco	7/1/2022	7/31/2022	(15.50)	08/19/22	(19.00)	(34.50)	285,043	(9,833,997)
116	Twin Eagle Resource AMA Inv	7/1/2022	7/31/2022	(15.50)	08/25/22	(25.00)	(40.50)	847,916	(34,340,580)
117	ANR Pipeline Invoice	8/1/2022	8/31/2022	(15.50)	09/23/22	(23.00)	(38.50)	286,967	(11,048,238)
118	Atmos Energy Marketing	8/1/2022	8/31/2022	(15.50)	10/06/22	(36.00)	(51.50)	29	(1,496)
119	Direct Supply Invoice - Butler	8/1/2022	8/31/2022	(15.50)	09/29/22	(29.00)	(44.50)	281,325	(12,518,963)

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120	BP Supply Invoice	8/1/2022	8/31/2022	(15.50)	09/23/22	(23.00)	(38.50)	12,803	(492,916)
121	Symmetry Piedmont AMA Invo	8/1/2022	8/31/2022	(15.50)	10/04/22	(34.00)	(49.50)	165,965	(8,215,288)
122	Symmetry Jackosn AMA Invoic	8/1/2022	8/31/2022	(15.50)	10/04/22	(34.00)	(49.50)	363,669	(18,001,629)
123	Spire Bowling Green Supply In	8/1/2022	8/31/2022	(15.50)	09/23/22	(23.00)	(38.50)	76,399	(2,941,357)
124	Spire Hannibal AMA Invoice	8/1/2022	8/31/2022	(15.50)	09/23/22	(23.00)	(38.50)	889,365	(34,240,540)
125	Direct Energy AMA Invoice	8/1/2022	8/31/2022	(15.50)	09/29/22	(29.00)	(44.50)	621,815	(27,670,776)
126	Natural Gas Pipeline	8/1/2022	8/31/2022	(15.50)	09/16/22	(16.00)	(31.50)	61,235	(1,928,903)
127	Ozark Gas Transmission	8/1/2022	8/31/2022	(15.50)	09/22/22	(22.00)	(37.50)	39,506	(1,481,489)
128	Panhandle Eastern Pipe Line C	8/1/2022	8/31/2022	(15.50)	09/20/22	(20.00)	(35.50)	182,731	(6,486,940)
129	Southern Star Central Gas Pip	8/1/2022	8/31/2022	(15.50)	09/16/22	(16.00)	(31.50)	7,482	(235,673)
130	Tetco	8/1/2022	8/31/2022	(15.50)	09/20/22	(20.00)	(35.50)	285,700	(10,142,338)
131	Twin Eagle Resource AMA Inv	8/1/2022	8/31/2022	(15.50)	09/29/22	(29.00)	(44.50)	1,072,508	(47,726,622)
132	ANR Pipeline Invoice	9/1/2022	9/30/2022	(15.00)	10/20/22	(20.00)	(35.00)	286,967	(10,043,853)
133	Atmos Energy Marketing	9/1/2022	9/30/2022	(15.00)	11/03/22	(34.00)	(49.00)	31	(1,518)
134	Direct Supply Invoice - Butler	9/1/2022	9/30/2022	(15.00)	10/25/22	(25.00)	(40.00)	279,180	(11,167,200)
135	BP Supply Invoice	9/1/2022	9/30/2022	(15.00)	10/25/22	(25.00)	(40.00)	12,870	(514,800)
136	Symmetry Piedmont AMA Invo	9/1/2022	9/30/2022	(15.00)	11/01/22	(32.00)	(47.00)	168,302	(7,910,198)
137	Symmetry Jackosn AMA Invoic	9/1/2022	9/30/2022	(15.00)	11/01/22	(32.00)	(47.00)	325,113	(15,280,324)
138	Spire Bowling Green Supply In	9/1/2022	9/30/2022	(15.00)	10/25/22	(25.00)	(40.00)	287,752	(11,510,081)
139	Spire Hannibal AMA Invoice	9/1/2022	9/30/2022	(15.00)	10/25/22	(25.00)	(40.00)	732,188	(29,287,531)
140	Direct Energy AMA Invoice	9/1/2022	9/30/2022	(15.00)	10/25/22	(25.00)	(40.00)	611,535	(24,461,412)
141	Natural Gas Pipeline	9/1/2022	9/30/2022	(15.00)	10/20/22	(20.00)	(35.00)	51,955	(1,818,420)
142	Ozark Gas Transmission	9/1/2022	9/30/2022	(15.00)	10/20/22	(20.00)	(35.00)	39,767	(1,391,839)
143	Panhandle Eastern Pipe Line C	9/1/2022	9/30/2022	(15.00)	10/20/22	(20.00)	(35.00)	179,677	(6,288,695)
144	Southern Star Central Gas Pip	9/1/2022	9/30/2022	(15.00)	10/20/22	(20.00)	(35.00)	7,241	(253,447)
145	Tetco	9/1/2022	9/30/2022	(15.00)	10/20/22	(20.00)	(35.00)	284,718	(9,965,137)
146	Twin Eagle Resource AMA Inv	9/1/2022	9/30/2022	(15.00)	10/27/22	(27.00)	(42.00)	1,180,841	(49,595,323)
147	ANR Pipeline Invoice	10/1/2022	10/31/2022	(15.50)	11/25/22	(25.00)	(40.50)	286,967	(11,622,173)
148	Atmos Energy Marketing	10/1/2022	10/31/2022	(15.50)	12/01/22	(31.00)	(46.50)	98	(4,570)
149	Direct Supply Invoice - Butler	10/1/2022	10/31/2022	(15.50)	11/25/22	(25.00)	(40.50)	181,655	(7,357,007)

Liberty Utilities Missouri  
Lead-Lag Study Ending December 31, 2022  
Purchased Gas Costs

Line	Supplier	Start Service	End Service	Midpoint	Payment Date	Payment (Lead)/Lag Days	Total (Lead)/Lag Days	Payment Amount	Dollar Days
150	BP Supply Invoice	10/1/2022	10/31/2022	(15.50)	11/18/22	(18.00)	(33.50)	9,955	(333,476)
151	Symmetry Piedmont AMA Invo	10/1/2022	10/31/2022	(15.50)	12/08/22	(38.00)	(53.50)	120,466	(6,444,926)
152	Symmetry Jackosn AMA Invoic	10/1/2022	10/31/2022	(15.50)	12/01/22	(31.00)	(46.50)	224,329	(10,431,293)
153	Spire Bowling Green Supply In	10/1/2022	10/31/2022	(15.50)	11/25/22	(25.00)	(40.50)	56,591	(2,291,955)
154	Spire Hannibal AMA Invoice	10/1/2022	10/31/2022	(15.50)	11/25/22	(25.00)	(40.50)	664,942	(26,930,168)
155	Direct Energy AMA Invoice	10/1/2022	10/31/2022	(15.50)	11/25/22	(25.00)	(40.50)	419,894	(17,005,701)
156	Natural Gas Pipeline	10/1/2022	10/31/2022	(15.50)	11/23/22	(23.00)	(38.50)	47,508	(1,829,046)
157	Ozark Gas Transmission	10/1/2022	10/31/2022	(15.50)	11/23/22	(23.00)	(38.50)	39,506	(1,520,996)
158	Panhandle Eastern Pipe Line C	10/1/2022	10/31/2022	(15.50)	11/23/22	(23.00)	(38.50)	201,736	(7,766,848)
159	Southern Star Central Gas Pip	10/1/2022	10/31/2022	(15.50)	11/10/22	(10.00)	(25.50)	7,515	(191,635)
160	Tetco	10/1/2022	10/31/2022	(15.50)	11/18/22	(18.00)	(33.50)	285,740	(9,572,296)
161	Twin Eagle Resource AMA Inv	10/1/2022	10/31/2022	(15.50)	11/25/22	(25.00)	(40.50)	910,388	(36,870,732)
162	ANR Pipeline Invoice	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	141,150	(5,222,546)
163	Atmos Energy Marketing	11/1/2022	11/30/2022	(15.00)	01/05/23	(36.00)	(51.00)	317	(16,142)
164	Direct Supply Invoice - Butler	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	128,211	(4,743,807)
165	BP Supply Invoice	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	14,700	(543,900)
166	Symmetry Piedmont AMA Invo	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	61,900	(2,290,308)
167	Symmetry Jackosn AMA Invoic	11/1/2022	11/30/2022	(15.00)	01/04/23	(35.00)	(50.00)	237,605	(11,880,237)
168	Spire Bowling Green Supply In	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	74,475	(2,755,583)
169	Spire Hannibal AMA Invoice	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	510,956	(18,905,373)
170	Direct Energy AMA Invoice	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	356,249	(13,181,200)
171	Natural Gas Pipeline	11/1/2022	11/30/2022	(15.00)	12/15/22	(15.00)	(30.00)	64,173	(1,925,184)
172	Ozark Gas Transmission	11/1/2022	11/30/2022	(15.00)	12/15/22	(15.00)	(30.00)	39,767	(1,193,005)
173	Panhandle Eastern Pipe Line C	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	317,481	(11,746,793)
174	Southern Star Central Gas Pip	11/1/2022	11/30/2022	(15.00)	12/15/22	(15.00)	(30.00)	7,350	(220,505)
175	Tetco	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	285,711	(10,571,313)
176	Twin Eagle Resource AMA Inv	11/1/2022	11/30/2022	(15.00)	12/22/22	(22.00)	(37.00)	1,203,931	(44,545,450)
177	ANR Pipeline Invoice	12/1/2022	12/31/2022	(15.50)	01/23/23	(23.00)	(38.50)	141,150	(5,434,271)
178	Atmos Energy Marketing	12/1/2022	12/31/2022	(15.50)	02/02/23	(33.00)	(48.50)	512	(24,848)
179	Direct Supply Invoice - Butler	12/1/2022	12/31/2022	(15.50)	01/19/23	(19.00)	(34.50)	243,166	(8,389,235)
180	BP Supply Invoice	12/1/2022	12/31/2022	(15.50)	01/25/23	(25.00)	(40.50)	42,087	(1,704,508)
181	Symmetry Piedmont AMA Invo	12/1/2022	12/31/2022	(15.50)	02/07/23	(38.00)	(53.50)	30,988	(1,657,859)
182	Symmetry Jackosn AMA Invoic	12/1/2022	12/31/2022	(15.50)	02/02/23	(33.00)	(48.50)	574,604	(27,868,316)
183	Spire Bowling Green Supply In	12/1/2022	12/31/2022	(15.50)	01/26/23	(26.00)	(41.50)	157,814	(6,549,289)
184	Spire Hannibal AMA Invoice	12/1/2022	12/31/2022	(15.50)	01/26/23	(26.00)	(41.50)	831,208	(34,495,112)
185	Direct Energy AMA Invoice	12/1/2022	12/31/2022	(15.50)	01/26/23	(26.00)	(41.50)	487,154	(20,216,891)
186	Natural Gas Pipeline	12/1/2022	12/31/2022	(15.50)	01/11/23	(11.00)	(26.50)	18,379	(487,046)
187	Ozark Gas Transmission	12/1/2022	12/31/2022	(15.50)	01/23/23	(23.00)	(38.50)	39,506	(1,520,996)
188	Panhandle Eastern Pipe Line C	12/1/2022	12/31/2022	(15.50)	01/23/23	(23.00)	(38.50)	374,626	(14,423,089)
189	Southern Star Central Gas Pip	12/1/2022	12/31/2022	(15.50)	01/19/23	(19.00)	(34.50)	7,695	(265,480)
190	Tetco	12/1/2022	12/31/2022	(15.50)	01/20/23	(20.00)	(35.50)	285,685	(10,141,802)
191	Twin Eagle Resource AMA Inv	12/1/2022	12/31/2022	(15.50)	01/26/23	(26.00)	(41.50)	1,905,451	(79,076,233)
192	Twin Eagle Resource AMA Inv	12/1/2022	12/31/2022	(15.50)	01/26/23	(26.00)	(41.50)	204,426	(8,483,691)
193	Total						(40.61)	\$ 46,150,078	\$ (1,874,365,320)

Liberty Utilities Missouri  
Lead-Lag Study Ending December 31, 2022  
O&M Expenses

Line	Description	(Lead)/Lag Days	Reference
1	<u>Operation and Maintenance Expenses</u>		
2	O&M, Labor	(12.96)	C-1
3	401k	2.04	C-2
4	Pension Expense	(54.00)	C-3
5	OPEB	(240.50)	C-4
6	Benefits	(29.37)	C-5
7	O&M, Other Non-Labor	(38.23)	C-6
8	<u>Total O&amp;M Expenses</u>		



Liberty Utilities Missouri  
 Lead-Lag Study Ending December 31, 2022  
 Federal Income Taxes

(Lead)/Lag Days

Line	Description	Service Period Start	Service Period End	Midpoint of Service Period	Payment Date	Percent of Taxes Due	Midpoint to Payment Date	(Lead)/Lag Days
1	First Quarter	1/1/2022	12/31/2022	(182.50)	4/15/2022	25.00%	77.50	19.38
2	Second Quarter	1/1/2022	12/31/2022	(182.50)	6/15/2022	25.00%	16.50	4.13
3	Third Quarter	1/1/2022	12/31/2022	(182.50)	9/15/2022	25.00%	(75.50)	(18.88)
4	Fourth Quarter	1/1/2022	12/31/2022	(182.50)	12/15/2022	25.00%	(166.50)	(41.63)
5	<b>Federal Income Tax (Lead)/Lag Days</b>							<b>(37.00)</b>

Liberty Utilities Missouri  
 Lead-Lag Study Ending December 31, 2022  
 State Income Taxes

(Lead)/Lag Days

Line	Description	Service Period Start	Service Period End	Midpoint of Service Period	Payment Date	Percent of Taxes Due	Midpoint to Payment Date	(Lead)/Lag Days
1	First Quarter	1/1/2022	12/31/2022	(182.50)	4/15/2022	25.00%	77.50	19.38
2	Second Quarter	1/1/2022	12/31/2022	(182.50)	6/15/2022	25.00%	16.50	4.13
3	Third Quarter	1/1/2022	12/31/2022	(182.50)	9/15/2022	25.00%	(75.50)	(18.88)
4	Fourth Quarter	1/1/2022	12/31/2022	(182.50)	12/15/2022	25.00%	(166.50)	(41.63)
5	<u>State Income Tax (Lead)/Lag Days</u>							<u>(37.00)</u>

Liberty Utilities Missouri  
Lead-Lag Study Ending December 31, 2022  
Taxes Other Than Income Taxes

Line	Description	(Lead)/Lag Days	Reference
1	Payroll Taxes		
2	FICA	(11.96)	E-1
3	Federal Unemployment	(75.29)	E-2
4	Ad Valorem	(293.53)	E-3

Liberty Utilities Missouri  
Lead-Lag Study Ending December 31, 2022  
O&M Expenses - Missouri PSC Assessment

Line	Service Period Start	Service Period End	Midpoint of Service Period	Payment Date	Payment Amount	Total (Lead)/Lag Days	Dollar Days
1	07/01/21	06/30/22	(182.50)	01/31/22	\$ 1,058	(32.50)	\$ (34,392)
2	07/01/21	06/30/22	(182.50)	02/28/22	1,058	(60.50)	(64,023)
3	07/01/21	06/30/22	(182.50)	03/28/22	1,058	(88.50)	(93,653)
4	07/01/21	06/30/22	(182.50)	04/30/22	1,058	(121.50)	(128,575)
5	07/01/21	06/30/22	(182.50)	05/30/22	1,058	(151.50)	(160,322)
6	07/01/21	06/30/22	(182.50)	06/30/22	1,058	(182.50)	(193,125)
7	07/01/22	06/30/23	(182.50)	07/30/22	1,110	152.50	169,214
8	07/01/22	06/30/23	(182.50)	08/30/22	1,110	121.50	134,816
9	07/01/22	06/30/23	(182.50)	09/30/22	1,110	90.50	100,419
10	07/01/22	06/30/23	(182.50)	10/30/22	1,110	60.50	67,131
11	07/01/22	06/30/23	(182.50)	11/30/22	1,110	29.50	32,733
12	07/01/22	06/30/23	(182.50)	12/30/22	1,110	(0.50)	(555)
13	07/01/21	06/30/22	(182.50)	01/31/22	6,818	(32.50)	(221,570)
14	07/01/21	06/30/22	(182.50)	02/28/22	6,818	(60.50)	(412,461)
15	07/01/21	06/30/22	(182.50)	03/28/22	6,818	(88.50)	(603,352)
16	07/01/21	06/30/22	(182.50)	04/30/22	6,818	(121.50)	(828,331)
17	07/01/21	06/30/22	(182.50)	05/30/22	6,818	(151.50)	(1,032,857)
18	07/01/21	06/30/22	(182.50)	06/30/22	6,818	(182.50)	(1,244,197)
19	07/01/22	06/30/23	(182.50)	07/30/22	6,931	152.50	1,056,984
20	07/01/22	06/30/23	(182.50)	08/30/22	6,931	121.50	842,121
21	07/01/22	06/30/23	(182.50)	09/30/22	6,931	90.50	627,259
22	07/01/22	06/30/23	(182.50)	10/30/22	6,931	60.50	419,328
23	07/01/22	06/30/23	(182.50)	11/30/22	6,931	29.50	204,466
24	07/01/22	06/30/23	(182.50)	12/30/22	6,931	(0.50)	(3,466)
25	07/01/21	06/30/22	(182.50)	01/31/22	4,951	(32.50)	(160,914)
26	07/01/21	06/30/22	(182.50)	02/28/22	4,951	(60.50)	(299,548)
27	07/01/21	06/30/22	(182.50)	03/28/22	4,951	(88.50)	(438,182)
28	07/01/21	06/30/22	(182.50)	04/30/22	4,951	(121.50)	(601,572)
29	07/01/21	06/30/22	(182.50)	05/30/22	4,951	(151.50)	(750,108)
30	07/01/21	06/30/22	(182.50)	06/30/22	4,951	(182.50)	(903,592)
31	07/01/22	06/30/23	(182.50)	07/30/22	5,106	152.50	778,705
32	07/01/22	06/30/23	(182.50)	08/30/22	5,106	121.50	620,411
33	07/01/22	06/30/23	(182.50)	09/30/22	5,106	90.50	462,117
34	07/01/22	06/30/23	(182.50)	10/30/22	5,106	60.50	308,929
35	07/01/22	06/30/23	(182.50)	11/30/22	5,106	29.50	150,635
36	07/01/22	06/30/23	(182.50)	12/30/22	5,106	(0.50)	(2,553)
37	Total				\$ 155,843	(14.13)	\$ (2,202,085)

Liberty Utilities Missouri  
 Lead-Lag Study Ending December 31, 2022  
 Interest Expense Payment

Line	Description	Service Period Begin	Service Period End	Midpoint of Service Period	Payment Date	Amount	Lead-Lag Days	Dollar-Days	Composite Lead-Lag Days
1	Internal Transfer	01/30/22	07/30/22	(91.00)	7/29/2022	\$ 1,216,960	(90.00)	\$ (109,526,400)	
2	Internal Transfer	08/01/22	01/30/23	(91.50)	1/31/2023	1,216,960	(92.50)	(112,568,800)	
3	<b>Total</b>					\$ 2,433,920		\$ (222,095,200)	(91.25)