



2017 Capitalization Rate Study
Final

Liquid Pipelines

MONTANA DEPARTMENT OF REVENUE

**Yield Capitalization Rate Study
Industry: Liquid Pipelines
2017 Assessment Year**

Capital Structure

Equity	65.00%	<i>Page LP-4</i>
Debt	35.00%	<i>Page LP-4</i>

Equity Cost of Capital

Capital Asset Pricing Model	9.69%	<i>Page LP-5</i>
Dividend Growth Model (g = Earnings Growth)	11.70%	<i>Page LP-9</i>
Dividend Growth Model (g = Dividend Growth)	10.25%	<i>Page LP-9</i>
	10.10%	

Debt Cost of Capital

Standard and Poor's Yield to Maturity	5.15%	<i>Page LP-15</i>
Mergent's Corporate Bond Yields:		
A	3.96%	
Baa - Corporate (Annual Avg)	4.72%	
Baa - Corporate (4th Qtr Avg)	4.64%	
Baa - Corporate (December)	4.83%	
	5.00%	

Liquid Pipelines - Weighted Average Cost of Capital (WACC)

Source of Capital	Capital Structure	Cost of Capital	Marginal Tax Rate	After-tax Cost of Capital	Weighted Cost
Equity	65.00%	10.10%		10.10%	6.57%
Debt	35.00%	5.00%	38.00%	3.10%	1.09%
WACC	100.00%				7.65%
WACC (Rounded)					7.70%

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**Direct Capitalization Rate Study
Industry: Liquid Pipelines
2017 Assessment Year**

Capital Structure

Equity	65.00%	<i>Page LP-4</i>
Debt	35.00%	<i>Page LP-4</i>

Equity Cost of Capital

NOI After-tax	5.50%	<i>Page LP-16</i>
GCF	8.00%	<i>Page LP-16</i>

Debt Cost of Capital

Standard and Poor's Current Yield	6.60%	<i>Page LP-19</i>
Calculated Current Yield	4.75%	<i>Page LP-20</i>
	6.00%	

Liquid Pipelines - NOI After-tax Direct Capitalization Rate

Source of Capital	Capital Structure	Cost of Capital	Marginal Tax Rate	After-tax Cost of Capital	Weighted Cost
Equity	65.00%	5.50%		5.50%	3.58%
Debt	35.00%	6.00%	38.00%	3.72%	1.30%
Total	100.00%				4.88%
Total (Rounded)					4.90%

Liquid Pipelines - GCF Direct Capitalization Rate

Source of Capital	Capital Structure	Cost of Capital	Marginal Tax Rate	After-tax Cost of Capital	Weighted Cost
Equity	65.00%	8.00%		8.00%	5.20%
Debt	35.00%	6.00%	38.00%	3.72%	1.30%
WACC	100.00%				6.50%
Total (Rounded)					6.60%

MONTANA DEPARTMENT OF REVENUE

**Support for Capital Structure
Industry: Liquid Pipelines
2017 Assessment Year**

A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Company	Ticker Symbol	Industry Group	Financial Strength	Shares Outstanding	Avg. 4Q Stock Price	MV Common Stock	MV Preferred Stock*	MV Long Term Debt*	PV of Operating Leases	Total Common, Preferred, LT Debt, & OpLeases	% Common	% Preferred	% Debt & OpLeases	
		<i>Value Line</i>	<i>Value Line</i>	<i>10-K</i>	<i>Yahoo</i>	<i>ExF</i>	<i>10-K</i>	<i>10-K</i>	<i>10-K</i>	<i>G+H+I+J</i>	<i>G/K</i>	<i>H/K</i>	<i>(I+J)/K</i>	
				<i>(000)</i>		<i>(\$000)</i>	<i>(\$000)</i>	<i>(\$000)</i>	<i>(\$000)</i>	<i>(\$000)</i>				
Buckeye	BPL	PIPEMLP	B+	140,264	64.44	9,039,066	0	4,333,488	154,282	13,526,836	67%	0%	33%	
Enbridge Energy Partners LP	EEP	PIPEMLP	B	262,208	25.31	6,636,058	1,191,500	6,500,000	106,017	14,433,575	46%	8%	46%	
Enterprise Products	EPD	PIPEMLP	B+	2,117,588	25.67	54,354,965	0	21,950,000	357,138	76,662,104	71%	0%	29%	
Magellan Midstream Partners LP	MMP	PIPEMLP	B++	227,427	64.31	14,624,693	0	4,262,321	195,729	19,082,744	77%	0%	23%	
Nustar Energy LP	NS	PIPEMLP	B	78,616	43.32	3,405,786	218,400	3,084,762	132,289	6,841,237	50%	3%	47%	
Phillips 66 Partners	PSXP	PIPEMLP	B+	107,182	57.28	6,139,559	0	2,357,000	3,647,136	12,143,695	51%	0%	49%	
Plains All American PL LP	PAA	PIPEMLP	B+	669,194	27.15	18,170,859	1,508,000	10,400,000	0	30,078,859	60%	5%	35%	
Sunoco Logistics Partners L.P.	SXL	PIPEMLP	B+	322,382	28.01	9,031,002	0	5,400,000	15,567	14,446,569	63%	0%	37%	
Tesororo Logistics LP	TLLP	PIPEMLP	B+	102,981	50.21	5,170,186	0	4,300,000	99,221	9,569,407	54%	0%	46%	
Valero Energy Partners LP	VLP	PIPEMLP	B+	67,426	47.34	3,192,057	0	906,670	172,746	4,271,473	75%	0%	25%	
All Companies						129,764,233		2,917,900	63,494,241	4,880,126	201,056,499	65%	1%	34%
Average												61%	2%	37%
Median												61%	0%	36%
High												77%	8%	49%
Low												46%	0%	23%
Say												65%	0%	35%

*Market value of preferred stock assumed to equal book value. Market value of long term debt is fair value.

Notes/Rational for Changes to Guideline Companies

2017 Guideline Company Changes

- Removed Holly Energy Part. LP (HEP) different ownership structure than the majority of the industry.
- Removed Holly Frontier Corporation (HFC) different ownership structure than the majority of the industry.
- Removed Kinder Morgan Inc. (KMI) different ownership structure than the majority of the industry.
- Removed NuStar GP Holdings, LLC (NSH) to focus on limited partners.
- Removed Plains GP Holdings LP (PAGP) to focus on limited partners.

MONTANA DEPARTMENT OF REVENUE

Capital Asset Pricing Model (CAPM)

Industry: Liquid Pipelines

2017 Assessment Year

$$k_e = R_f + \beta \times ERP$$

		Liquid PL
$k_e =$	Cost of Equity	9.69%
$R_f =$	Risk Free Rate	2.79%
$\beta =$	Beta	1.15
$ERP =$	Equity Risk Premium ($R_m - R_f$)	6.00%
$R_m =$	Market Rate of Return	8.79%

Risk Free Rate Measures (R_f):

The Value Line Investment Survey: Selection & Opinion¹

January 6, 2017

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Selected Yields on Taxable U.S. Treasury Securities

10-year	2.51%
30-year	3.09%

Federal Reserve Statistical Release² and U.S. Department of the Treasury, Daily Treasury Yield Curve Rates³

U.S. government securities, Treasury constant maturities, Nominal, December 30, 2016

10-year	2.45%
20-year	2.79%
30-year	3.06%

Risk Free Rate Selected

2.79%

¹ "Value Line Selection & Opinion", Value Line (January 6, 2017)

² <https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H.15>

³ <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2016>

MONTANA DEPARTMENT OF REVENUE

**Capital Asset Pricing Model (CAPM)
Industry: Liquid Pipelines
2017 Assessment Year**

$$k_e = R_f + \beta \times ERP$$

Equity Risk Premium Measures (ERP = R_m - R_f)

DOR S&P 500, 3 Stage Dividend Growth Model (See Exhibit)

	<u>R_m⁴</u>	<u>R_m</u>	<u>R_f</u>	<u>ERP</u>
ERP - <i>Ex Ante</i>	8.00%	8.00%	2.79%	5.21%

Duff & Phelps, 2017 Valuation Handbook

		<u>R_m⁴</u>	<u>R_m</u>	<u>R_f</u>	<u>ERP</u>
ERP "Historical" - <i>Ex Post</i>	<i>Arithmetic Avg.</i>	9.73%	9.66%	2.72%	6.94%
ERP "Supply-side" - <i>Ex Post</i>	<i>Arithmetic Avg.</i>	8.76%	8.69%	2.72%	5.97%
ERP "Adj. Supply-side" - <i>Ex Post</i>	<i>Arithmetic Avg.</i>	7.89%	7.82%	2.72%	5.10%
ERP "Conditional" - <i>Ex Ante</i>			9.50%	4.00%	5.50%

Damodaran Implied ERP (Jan 1, 2017)

	<u>R_m⁴</u>	<u>R_m</u>	<u>R_f</u>	<u>ERP</u>
Implied Premium (FCFE) - <i>Ex Ante</i>	8.48%	8.14%	2.45%	5.69%
Implied Premium (FCFE with sustainable payout) - <i>Ex Ante</i>	7.29%	6.95%	2.45%	4.50%

	<u>R_m⁴</u>	<u>R_m</u>	<u>R_f</u>	<u>ERP</u>
<u>Average</u>	8.36%	8.39%		5.56%
<u>Median</u>	8.24%	8.14%		5.50%
<u>High</u>	9.73%	9.66%		6.94%
<u>Low</u>	7.29%	6.95%		4.50%

Equity Risk Premium Selected

8.79%	2.79%	6.00%
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⁴ R_m estimated using selected Risk Free Rate (R_f)

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Capital Asset Pricing Model (CAPM)
 Industry: Liquid Pipelines
 2017 Assessment Year

$$k_e = R_f + \beta \times ERP$$

Inflation and Growth Estimates⁵

	<u>Inflation</u> (CPI)	<u>Real Growth</u> (GDP)	<u>Nominal</u> <u>Growth</u>	<u>Nominal Growth</u>	
				<u>Low</u>	<u>High</u>
Livingston Survey	2.30%	2.20%	4.50%		
Survey of Professional Forecasters	2.30%	2.45%	4.75%		
Congressional Budget Office	2.53%	2.17%	4.70%		
Office of Budget and Management	2.38%	2.07%	4.45%		
OASDI Trustee Report	2.70%	2.70%	5.40%		
Average	2.44%	2.32%	4.76%		
Median	2.38%	2.20%	4.58%		
High	2.70%	2.70%	5.40%		
Low	2.30%	2.07%	4.37%		
Say	2.40%	2.20%	4.60%	4.37%	5.40%
Rounded				4.00%	6.00%

⁵ Real Growth Sources: "The Livingston Survey", Federal Reserve Bank of Philadelphia (December 9, 2016); "Survey of Professional Forecasters", Federal Reserve Bank of Philadelphia (February 10, 2017); "Congressional Budget Office", An Update to the Budget and Economic Outlook: 2016 to 2026 (August 2016); "Office of Budget and Management", FY 2017 Mid-Session Review (July 15, 2016); "OASDI Trustee Report", Board of Trustees of the Federal Old-Age Survivors Insurance and Federal Disability Insurance Trust Funds (June 22, 2016)

MONTANA DEPARTMENT OF REVENUE

Support for Beta Selection in CAPM
 Industry: Liquid Pipelines
 2017 Assessment Year

A	B	C	D	E
Company	Ticker Symbol	Industry Group	Financial Strength	Beta
		<i>Value Line</i>	<i>Value Line</i>	<i>Value Line</i>
Buckeye	BPL	PIPEMLP	B+	1.10
Enbridge Energy Partners LP	EEP	PIPEMLP	B	1.15
Enterprise Products	EPD	PIPEMLP	B+	1.20
Magellan Midstream Partners LP	MMP	PIPEMLP	B++	1.10
Nustar Energy LP	NS	PIPEMLP	B	1.15
Phillips 66 Partners	PSXP	PIPEMLP	B+	1.15
Plains All American PL LP	PAA	PIPEMLP	B+	1.35
Sunoco Logistics Partners L.P.	SXL	PIPEMLP	B+	1.45
Tesoro Logistics LP	TLLP	PIPEMLP	B+	1.20
Valero Energy Partners LP	VLP	PIPEMLP	B+	1.25
Average				1.21
Median				1.15
High				1.45
Low				1.10
Say				1.15

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**Support for Yield Capitalization Cost of Equity Component - Based on Dividend Growth Model
Industry: Liquid Pipelines
2017 Assessment Year**

$$K_e = (D_1 / P_0) + g$$

K_e = Cost of Equity
 D_1 = Expected Dividend

g = Expected Long Term Growth
 P_0 = Current Price Per Share

A	B	C	D	E	F	G	H	I	J	K
Company Name	Ticker	Avg. 4Q Stock Price	2017 Expected Dividend	Taxable Entity?	2017 Expected Dividend Adj for Tax	Dividend Yield	Multistage Long Term Earnings Growth Estimate	Multistage Long Term Dividends Growth Estimate	Cost of Equity	Cost of Equity
		P_0	D_1		If taxable = "No" $D_1 \times (1-.38)$	D_1/P_0	$g =$ Earnings g	$g =$ Dividends g	K_e $g =$ Earnings g	K_e $g =$ Dividend g
		<i>Yahoo</i>	<i>Value Line</i>			<i>F/C</i>	<i>Multi Stg g Wrksht</i>	<i>Multi Stg g Wrksht</i>	<i>G+H</i>	<i>G+I</i>
Buckeye	BPL	64.44	5.03	No	3.12	4.84%	7.37%	4.85%	12.21%	9.69%
Enbridge Energy Partners LP	EEP	25.31	2.37	No	1.47	5.81%	3.22%	2.96%	9.02%	8.77%
Enterprise Products	EPD	25.67	1.67	No	1.04	4.03%	8.31%	6.74%	12.35%	10.77%
Magellan Midstream Partners LP	MMP	64.31	3.52	No	2.18	3.39%	6.42%	9.25%	9.82%	12.65%
Nustar Energy LP	NS	43.32	0.00	No			-3.83%	3.22%		
Phillips 66 Partners	PSXP	57.28	0.00	No			14.10%	3.22%		
Plains All American PL LP	PAA	27.15	2.20	No	1.36	5.02%	6.11%	3.59%	11.13%	8.62%
Sunoco Logistics Partners L.P.	SXL	28.01	2.20	No	1.36	4.87%	10.20%	11.14%	15.07%	16.01%
Tesoro Logistics LP	TLLP	50.21	0.00	No			8.81%	3.22%		
Valero Energy Partners LP	VLP	47.34	0.00	No			12.59%	3.22%		
Average						4.66%	6.75%	5.35%	11.60%	11.09%
Median						4.85%	7.37%	3.59%	11.67%	10.23%
High						5.81%	14.10%	11.14%	15.07%	16.01%
Low						3.39%	-3.83%	2.96%	9.02%	8.62%
Say									11.70%	10.25%

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Support for Yield Capitalization Cost of Equity Component - Multi-Stage Growth Model
 Industry: Liquid Pipelines
 2017 Assessment Year

Company	Buckeye	BPL
Value Line 5 yr est. earnings growth		9.00%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.09
2	29	0.09
3	28	0.09
4	27	0.09
5	26	0.09
6	25	0.09
7	24	0.08
8	23	0.08
9	22	0.08
10	21	0.08
11	20	0.07
12	19	0.07
13	18	0.07
14	17	0.07
15	16	0.06
16	15	0.06
17	14	0.06
18	13	0.05
19	12	0.05
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		7.37%
Company	Buckeye	BPL
Value Line 5 yr est. div'd growth		5.00%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.05
2	29	0.05
3	28	0.05
4	27	0.05
5	26	0.05
6	25	0.05
7	24	0.05
8	23	0.05
9	22	0.05
10	21	0.05
11	20	0.05
12	19	0.05
13	18	0.05
14	17	0.05
15	16	0.05
16	15	0.05
17	14	0.05
18	13	0.05
19	12	0.05
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		4.85%

Company	Enbridge Partners	EEP
Selected Inflation Rate - CAPM		2.40%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.02
2	29	0.02
3	28	0.02
4	27	0.02
5	26	0.02
6	25	0.03
7	24	0.03
8	23	0.03
9	22	0.03
10	21	0.03
11	20	0.03
12	19	0.03
13	18	0.04
14	17	0.04
15	16	0.04
16	15	0.04
17	14	0.04
18	13	0.04
19	12	0.04
20	11	0.04
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		3.22%
Company	Enbridge Partners	EEP
Value Line 5 yr est. div'd growth		2.00%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.02
2	29	0.02
3	28	0.02
4	27	0.02
5	26	0.02
6	25	0.02
7	24	0.02
8	23	0.02
9	22	0.03
10	21	0.03
11	20	0.03
12	19	0.03
13	18	0.03
14	17	0.03
15	16	0.04
16	15	0.04
17	14	0.04
18	13	0.04
19	12	0.04
20	11	0.04
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		2.96%

Company	Enterprise Prod.	EPD
Value Line 5 yr est. earnings growth		10.50%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.11
2	29	0.11
3	28	0.11
4	27	0.11
5	26	0.11
6	25	0.10
7	24	0.10
8	23	0.09
9	22	0.09
10	21	0.09
11	20	0.08
12	19	0.08
13	18	0.08
14	17	0.07
15	16	0.07
16	15	0.06
17	14	0.06
18	13	0.06
19	12	0.05
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		8.31%
Company	Enterprise Prod.	EPD
Value Line 5 yr est. div'd growth		8.00%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.08
2	29	0.08
3	28	0.08
4	27	0.08
5	26	0.08
6	25	0.08
7	24	0.08
8	23	0.07
9	22	0.07
10	21	0.07
11	20	0.07
12	19	0.07
13	18	0.06
14	17	0.06
15	16	0.06
16	15	0.06
17	14	0.05
18	13	0.05
19	12	0.05
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		6.74%

MONTANA DEPARTMENT OF REVENUE

Support for Yield Capitalization Cost of Equity Component - Multi-Stage Growth Model
 Industry: Liquid Pipelines
 2017 Assessment Year

Company	Magellan Mid	MMP
Value Line 5 yr est. earnings growth		7.50%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.08
2	29	0.08
3	28	0.08
4	27	0.08
5	26	0.08
6	25	0.07
7	24	0.07
8	23	0.07
9	22	0.07
10	21	0.07
11	20	0.06
12	19	0.06
13	18	0.06
14	17	0.06
15	16	0.06
16	15	0.06
17	14	0.05
18	13	0.05
19	12	0.05
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		6.42%
Value Line 5 yr est. div'd growth		12.00%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.12
2	29	0.12
3	28	0.12
4	27	0.12
5	26	0.12
6	25	0.12
7	24	0.11
8	23	0.11
9	22	0.10
10	21	0.10
11	20	0.09
12	19	0.09
13	18	0.08
14	17	0.08
15	16	0.07
16	15	0.07
17	14	0.06
18	13	0.06
19	12	0.06
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		9.25%

Company	NuStar Energy	NS
Value Line 5 yr est. earnings growth		-8.80%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	-0.09
2	29	-0.09
3	28	-0.09
4	27	-0.09
5	26	-0.09
6	25	-0.08
7	24	-0.07
8	23	-0.06
9	22	-0.05
10	21	-0.05
11	20	-0.04
12	19	-0.03
13	18	-0.02
14	17	-0.01
15	16	0.00
16	15	0.00
17	14	0.01
18	13	0.02
19	12	0.03
20	11	0.04
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		-3.83%
Selected Inflation Rate - CAPM		2.40%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.02
2	29	0.02
3	28	0.02
4	27	0.02
5	26	0.02
6	25	0.03
7	24	0.03
8	23	0.03
9	22	0.03
10	21	0.03
11	20	0.03
12	19	0.03
13	18	0.04
14	17	0.04
15	16	0.04
16	15	0.04
17	14	0.04
18	13	0.04
19	12	0.04
20	11	0.04
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		3.22%

Company	Phillips 66	PSXP
Value Line 5 yr est. earnings growth		19.70%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.20
2	29	0.20
3	28	0.20
4	27	0.20
5	26	0.20
6	25	0.19
7	24	0.18
8	23	0.17
9	22	0.16
10	21	0.15
11	20	0.14
12	19	0.13
13	18	0.12
14	17	0.11
15	16	0.10
16	15	0.09
17	14	0.08
18	13	0.07
19	12	0.06
20	11	0.06
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		14.10%
Selected Inflation Rate - CAPM		2.40%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.02
2	29	0.02
3	28	0.02
4	27	0.02
5	26	0.02
6	25	0.03
7	24	0.03
8	23	0.03
9	22	0.03
10	21	0.03
11	20	0.03
12	19	0.03
13	18	0.04
14	17	0.04
15	16	0.04
16	15	0.04
17	14	0.04
18	13	0.04
19	12	0.04
20	11	0.04
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		3.22%

MONTANA DEPARTMENT OF REVENUE

Support for Yield Capitalization Cost of Equity Component - Multi-Stage Growth Model
 Industry: Liquid Pipelines
 2017 Assessment Year

Company	Plains AA PL	PAA
Value Line 5 yr est. earnings growth		7.00%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.07
2	29	0.07
3	28	0.07
4	27	0.07
5	26	0.07
6	25	0.07
7	24	0.07
8	23	0.07
9	22	0.06
10	21	0.06
11	20	0.06
12	19	0.06
13	18	0.06
14	17	0.06
15	16	0.06
16	15	0.05
17	14	0.05
18	13	0.05
19	12	0.05
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		6.11%
Value Line 5 yr est. div'd growth		3.00%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.03
2	29	0.03
3	28	0.03
4	27	0.03
5	26	0.03
6	25	0.03
7	24	0.03
8	23	0.03
9	22	0.03
10	21	0.04
11	20	0.04
12	19	0.04
13	18	0.04
14	17	0.04
15	16	0.04
16	15	0.04
17	14	0.04
18	13	0.04
19	12	0.04
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		3.59%

Company	Sunoco Logistics	SXL
Value Line 5 yr est. earnings growth		13.50%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.14
2	29	0.14
3	28	0.14
4	27	0.14
5	26	0.14
6	25	0.13
7	24	0.12
8	23	0.12
9	22	0.11
10	21	0.11
11	20	0.10
12	19	0.10
13	18	0.09
14	17	0.08
15	16	0.08
16	15	0.07
17	14	0.07
18	13	0.06
19	12	0.06
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		10.20%
Value Line 5 yr est. div'd growth		15.00%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.15
2	29	0.15
3	28	0.15
4	27	0.15
5	26	0.15
6	25	0.14
7	24	0.14
8	23	0.13
9	22	0.12
10	21	0.12
11	20	0.11
12	19	0.10
13	18	0.10
14	17	0.09
15	16	0.09
16	15	0.08
17	14	0.07
18	13	0.07
19	12	0.06
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		11.14%

Company	Tesoro Logistics	TLLP
Value Line 5 yr est. earnings growth		11.30%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.11
2	29	0.11
3	28	0.11
4	27	0.11
5	26	0.11
6	25	0.11
7	24	0.10
8	23	0.10
9	22	0.10
10	21	0.09
11	20	0.09
12	19	0.08
13	18	0.08
14	17	0.08
15	16	0.07
16	15	0.07
17	14	0.06
18	13	0.06
19	12	0.05
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		8.81%
Selected Inflation Rate - CAPM		2.40%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.02
2	29	0.02
3	28	0.02
4	27	0.02
5	26	0.02
6	25	0.03
7	24	0.03
8	23	0.03
9	22	0.03
10	21	0.03
11	20	0.03
12	19	0.03
13	18	0.04
14	17	0.04
15	16	0.04
16	15	0.04
17	14	0.04
18	13	0.04
19	12	0.04
20	11	0.04
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		3.22%

MONTANA DEPARTMENT OF REVENUE

**Support for Yield Capitalization Cost of Equity Component - Multi-Stage Growth Model
Industry: Liquid Pipelines
2017 Assessment Year**

Company	Valero Energy	VLP
Value Line 5 yr est. earnings growth		17.30%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.17
2	29	0.17
3	28	0.17
4	27	0.17
5	26	0.17
6	25	0.17
7	24	0.16
8	23	0.15
9	22	0.14
10	21	0.13
11	20	0.13
12	19	0.12
13	18	0.11
14	17	0.10
15	16	0.09
16	15	0.09
17	14	0.08
18	13	0.07
19	12	0.06
20	11	0.05
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		12.59%
Selected Inflation Rate - CAPM		2.40%
LT nominal economic growth rate		4.60%
Year	Weight	Adj. Growth Rate
1	30	0.02
2	29	0.02
3	28	0.02
4	27	0.02
5	26	0.02
6	25	0.03
7	24	0.03
8	23	0.03
9	22	0.03
10	21	0.03
11	20	0.03
12	19	0.03
13	18	0.04
14	17	0.04
15	16	0.04
16	15	0.04
17	14	0.04
18	13	0.04
19	12	0.04
20	11	0.04
21	10	0.05
22	9	0.05
23	8	0.05
24	7	0.05
25	6	0.05
26	5	0.05
27	4	0.05
28	3	0.05
29	2	0.05
30	1	0.05
Weighted Average		3.22%

MONTANA DEPARTMENT OF REVENUE

Support for Yield Capitalization Cost of Debt Component - Yield to Maturity From Standard & Poor's Bond Guide

Industry: Liquid Pipelines
2017 Assessment Year

Company Name	Coupon	CUSIP	Issue	Maturity Date	Years to Maturity	Old S&P Bond Rating	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Avg Full Year	Avg 4th QTR
ONEOK Partners, L.P.	6.65	68268NAC7	Gtd Sr Nt	10/1/2036	20	BBB	8.79	9.23	8.25	7.27	6.91	6.21	5.83	5.93	5.41	5.41	5.84	5.55	6.72%	5.60%
Plains All Amern Pipeline L P	5.88	72650RAF9	Sr Nt	08/15/2016	0	BBB	2.78	2.82	2.25	1.68	2.18	1.98							2.28%	
Plains All Amern Pipeline L P	6.7	72650RAM4	Sr Nt	5/15/2036	20	BBB	8.24	8.79	7.94	7.08	7.32	6.71	5.78	6.01	5.73	5.73	6.27	5.90	6.79%	5.97%
Talisman Energy Inc.	7.25	87425EAE3	Deb	10/15/2027	11	BBB	7.35	8.66	8.79	8.77	8.81	8.82	8.70	8.71	6.78	6.78	7.29	7.06	8.04%	7.04%
USX Corp.	9.375	902905AL2	Deb	05/15/2022	6	BBB	9.46	10.55	9.03	7.50	8.27	7.09	4.74	4.98	4.09	4.09	4.63	4.09	6.54%	4.27%
USX Corp.	8.5	902905AN8	Deb	03/01/2023	7	BBB	8.69	9.62	8.41	7.20	7.74	7.27	6.82	6.60	5.83	5.83	6.37	5.48	7.16%	5.89%
USX Corp.	8.125	902905AQ1	Deb	07/15/2023	7	BBB	8.59	11.90	9.81	7.72	6.93	6.47	5.83	5.75	5.48	5.48	5.75	5.18	7.07%	5.47%
Valero Energy Corp. (New)	8.75	91913YAB6	Nts	06/15/2030	14	BBB	7.23	7.22	6.58	5.94	6.53	5.57	5.62	5.31	5.15	5.15	5.62	5.48	5.95%	5.42%
Valero Energy Corp. (New)	7.5	91913YAE0	Nts	04/15/2032	16	BBB	6.93	6.97	6.33	5.69	6.28	5.80	5.49	5.16	5.00	5.00	5.34	5.33	5.78%	5.22%
Valero Energy Corp. (New)	6.62	91913YAL4	Nts	06/15/2037	21	BBB	6.94	6.79	6.22	5.64	6.42	5.88	5.63	5.34	5.26	5.26	5.74	5.31	5.87%	5.44%
Valero Energy Corp. (New)	6.12	91913YAM2	Nts	06/15/2017	1	BBB	3.06	3.46	2.73	2.00	2.06	2.07	1.23	1.36	0.58	0.58	0.00	0.00	1.59%	0.19%
Williams Ptns L P	7.25	96950HAD2	Sr Nt	2/1/2017	1	BBB	7.23	7.54	5.32	3.10	2.66	1.94	1.83	1.42	1.64	1.64	1.81	2.30	3.20%	1.92%
Anadarko Petroleum Corp.	7.25	032511AH0	Deb	03/15/2025	9	BBB	7.26	7.28	7.15	7.01	6.91	6.21	6.17	6.12	5.71	5.71	5.27	5.03	6.32%	5.34%
Anadarko Petroleum Corp.	7.73	032511AJ6	Deb	09/15/2096	80	BBB	8.57	8.47	7.85	7.22	7.30	6.78	6.81	6.81	6.66	6.66	7.10	6.82	7.25%	6.86%
Anadarko Petroleum Corp.	7.25	032511AK3	Deb	11/15/2096	80	BBB	9.50	9.34	8.40	7.46	7.30	6.78	6.71	6.71	6.43	6.43	6.85	6.50	7.37%	6.59%
Anadarko Petroleum Corp.	7	032511AL1	Deb	11/15/2027	11	BBB	8.70	10.03	8.45	6.86	6.76	6.06	6.02	6.06	5.61	5.61	4.92	4.69	6.65%	5.07%
Anadarko Petroleum Corp.	6.62	032511AM9	Deb	01/15/2028	12	BBB	8.70	10.03	8.45	6.86	6.76	6.06	6.02	6.07	5.66	5.66	5.09	4.84	6.68%	5.20%
Anadarko Petroleum Corp.	7.2	032511AN7	Deb	03/15/2029	13	BBB	8.25	9.58	8.25	6.92	6.83	6.16	5.83	5.87	5.41	5.41	5.12	5.21	6.57%	5.25%
Anadarko Petroleum Corp.	5.95	032511AX5	Sr Nts	09/15/2016	0	BBB	3.42	2.28	3.03	0.77									3.12%	
Anadarko Petroleum Corp.	6.45	032511AY3	Sr Nts	09/15/2036	20	BBB	8.55	8.54	7.18	5.81	6.02	5.40	5.30	5.31	4.96	4.96	5.46	4.98	6.04%	5.13%
Buckeye Partners, L.P.	5.12	118230AE1	Fixed Rf Nts	07/01/2017	1	BBB	3.78	3.78	3.11	2.43	2.41	2.17	2.39	2.49	2.49	2.49	2.63	2.74	2.74%	2.62%
Energy Corp MTN BE	7.32	29265AAE1	MTN Tranche # Tr 00014	7/28/2022	6	BBB	9.51	11.40	9.19	6.98	6.69	6.75	6.53	5.46	4.86	4.86	5.15	5.03	6.87%	5.01%
Energy Transfer Partners, L.P.	6.12	29273RAE9	Sr Nt	2/15/2017	1	BBB-	5.06	5.79	4.59	3.39	2.04	1.83	2.00	1.21	1.43	1.43	1.72	1.73	2.69%	1.63%
Energy Transfer Partners, L.P.	6.62	29273RAF8	Sr Nt	10/15/2036	20	BBB-	8.59	8.30	7.54	6.78	7.01	6.34	5.89	5.28	5.74	5.74	6.19	5.93	6.67%	5.95%
Enterprise Prods Oper L P	8.38	293791AV1	Jr Sub Nt Fixed/Fltg Rate	08/01/2066	50	BBB-	10.48	10.94	10.58	10.21	9.66	9.50	9.14	4.80	0.00	0.00	4.92	4.91	7.09%	3.28%
Kerr-McGee Corp.	7.125	492386AK3	Deb	10/15/2027	11	BBB-	7.85	9.37	8.20	7.03	6.54	6.02	5.98	5.93	5.73	5.73	6.25	5.43	6.67%	5.80%
Kerr-McGee Corp.	7.875	492386AT4	Nts	09/15/2031	15	BBB-	8.10	9.22	7.84	6.46	6.48	6.19	5.94	5.82	5.18	5.18	5.79	5.20	6.45%	5.39%
Kerr-McGee Corp.	6.95	492386AU1	Nts	07/01/2024	8	BBB-	7.20	8.52	6.94	5.35	5.31	4.56	4.52	4.46	3.91	3.91	4.44	4.21	5.28%	4.19%
Sunoco Logistics Ptns Operatio	6.12	86765BAE9	Sr Nt	05/15/2016	0	BBB-	2.12	4.16											3.14%	
Union Pacific Resources Group	7.5	907834AB1	Deb	10/15/2026	10	BBB-	8.25	9.58	8.00	6.41	6.38	5.69	5.66	5.60	4.62	4.62	5.12	4.88	6.23%	4.87%
Union Pacific Resources Group	7.5	907834AC9	Deb	11/01/2096	-116	BBB-	9.50	9.34	8.43	7.52	7.60	7.09	7.02	7.01	6.73	6.73	7.11	6.77	7.57%	6.87%
Union Pacific Resources Group	7.05	907834AF2	Deb	05/15/2018	2	BBB-	4.84	4.84	4.95	5.06	5.13	3.01	3.19	3.29	3.29	3.57	3.60	4.04%	3.64%	
Union Pacific Resources Group	7.15	907834AG0	Deb	05/15/2028	12	BBB-	8.25	9.27	7.86	6.45	6.40	5.86	5.82	5.33	5.31	5.06	4.79	6.31%	5.05%	
Williams Companies, Inc. (The)	7.625	969457AW0	Nts	07/15/2019	3	BBB-	13.20	13.41	13.36	13.30	13.65	12.92	12.88	10.39	8.03	8.03	4.36	4.26	10.65%	5.55%
Williams Companies, Inc. (The)	7.5	969457BB5	Deb	01/15/2031	15	BBB-	12.52	11.10	9.75	8.39	7.84	7.56	6.68	6.02	5.92	5.92	6.38	6.08	7.85%	6.13%
Williams Companies, Inc. (The)	7.75	969457BD1	Nts	06/15/2031	15	BBB-	12.74	11.36	9.94	8.52	8.03	7.69	6.72	6.16	6.17	6.17	6.66	6.26	8.04%	6.36%
Williams Companies, Inc. (The)	7.875	969457BG4	Nts	09/01/2021	5	BBB-	12.08	11.77	9.59	7.41	6.83	6.48	5.53	4.28	4.18	4.18	4.61	4.45	6.78%	4.41%
Williams Companies, Inc. (The)	8.75	969457BM1	Nts	03/15/2032	16	BBB-	13.48	11.67	10.15	8.63	8.34	8.23	6.93	6.37	6.33	6.33	6.88	6.54	8.32%	6.58%
Boardwalk Pipelines Lp	5.5	096629AA8	Nt	2/1/2017	1	BB+	4.40	6.70	5.28	3.86	3.94	2.79	2.00	2.55	2.55	2.55	2.69	2.12	3.45%	2.45%
Boardwalk Pipelines Lp	5.88	096630AA6	Sr Nt	11/15/2016	0	BB+	5.03	5.86	5.70	5.53	2.26	1.98	2.17	1.29					3.73%	
Pioneer Natural Resources Co.	6.88	723787AF4	Sr Nts	05/01/2018	2	BB+	4.94	5.05	3.97	2.88	2.87	2.19	2.10	2.20	1.97	1.97	2.26	2.19	2.88%	2.14%
Pioneer Natural Resources Co.	6.65	723787AG2	Sr Nts	03/15/2017	1	BB+	5.04	5.03	4.05	3.07	2.16	1.70	1.73	2.33	1.37	1.37	1.38	1.58	2.57%	1.44%
Chesapeake Energy Corp.	6.5	165167BS5	Sr Nts	08/15/2017	1	BB-			10.61	21.21	12.15	15.47	11.70	6.49	4.36	4.36	2.56	1.65	9.06%	2.86%
Chesapeake Energy Corp.	6.88	165167BU0	Sr Nts	11/15/2020	4	BB-			11.48	22.96	19.47	17.66	16.04	10.54	8.58	8.58	8.85	6.64	13.08%	8.02%
Chesapeake Energy Corp.	2.75	165167BW6	Contingent Sr Nt Conv	11/15/2035	19	BB-	2.76		12.40	24.79	24.83	24.85	24.87	24.90	24.99	24.99			21.04%	24.99%
Chesapeake Energy Corp.	2.5	165167BZ9	Contingent Sr Nt Conv	5/15/2037	21	BB-	7.11	8.73	6.35	3.96	2.98	2.95	2.85	2.56	2.53	2.53	2.51	2.47	3.96%	2.50%
Chesapeake Energy Corp.	2.5	165167CA3	Sr Contingent Conv Nt	5/15/2037	21	BB-	7.11	8.73	6.35	3.96	2.98	2.95	2.85	2.56	2.53	2.53	2.51	2.47	3.96%	2.50%
Chesapeake Energy Corp.	2.25	165167CB1	Contingent Sr Nt Conv	12/15/2038	22	BB-	10.21	12.99	9.31	5.63	4.17	3.51	3.36	2.85	2.65	2.65	2.59	2.35	5.19%	2.53%
Chesapeake Energy Corp.	7.25	165167CC9	Sr Nt	12/15/2018	2	BB-			10.88	21.76	15.85	14.86	11.94	7.48	5.84	5.84	5.28	3.01	10.27%	4.71%
Plains Exploration & Production	7	726505AC4	SrNts	03/15/2017	1	BB-														
KN Energy	6.67	482620AS0	Deb	11/01/2027	11	BB	7.29	7.30	7.30	7.30	7.31	7.31	7.31	7.32	7.32	7.32	7.33	7.33	7.31%	7.33%
KN Energy	7.25	482620AW1	Sr Deb	03/01/2028	12	BB	8.76	8.60	8.23	7.85	5.96	6.78	6.10	6.21	6.24	6.24	7.01	6.33	7.03%	6.53%
Range Resources Corp.	7.5	75281AAH2	Sr Sub Nts	10/01/2017	1	BB	5.12	5.02	4.88	4.74	4.58	4.38	4.18	3.93	3.29	3.29	2.93	2.43	4.06%	2.88%
Range Resources Corp.	7.25	75281AAJ8	Sr Sub Nts	05/01/2018	2	BB	5.51	5.45	5.39	5.32	5.24	5.15	5.06	4.95	4.71	4.71	4.58	4.41	5.04%	4.57%
Berry Petroleum Co.	8.25	085789AC9	Sr SubNts	11/01/2016	0	B	2.68	2.10	1.11	0.12									1.50%	
Cimarex Energy Co.	7.12	171798AA9	SrNts	05/01/2017	1	NR	4.17	3.99	3.74	3.49	3.19	2.79	2.35	1.74					3.18%	
Pioneer Natural Resources Co.	7.2	723787AB3	Sr Nt	06/15/2028	12	NR	6.25	6.92	6.34	5.75	5.87	5.46	4.72	4.79	4.30	4.30	4.86	4.82	5.36%	4.66%
Range Resources Corp.	7.5	75281AAG4	Sr Sub Nts	05/15/2016	0	NR														
Sunoco, Inc.	5.75	86764PAD1	Nts	01/15/2017	1	NR	5.03	4.48	3.76	3.03	2.39	2.13	2.33	1.55	1.43	1.43	1.77		2.67%	1.60%
Texaco Capital	7.5	881685BD2	GtdDeb	03/01/2043	27	NR														

117 111 110 112 112 110 110 109 109 106 106 104 103 114 106

NOTES:

		All Bonds	
		Annual	4th Qtr
Data downloaded from the S&P website and missing data supplemented from month end Bond Guides when available.			
means the data was not available in S&P Guide			
means issuance matured or called			
		All Ratings	
		5.31%	4.66%

MONTANA DEPARTMENT OF REVENUE

Support for Direct Capitalization Cost of Equity (k_e)

Industry: Liquid Pipelines

2017 Assessment Year

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Company	Ticker Symbol	Avg. 4Q Stock Price	VL Historic EPS	VL Est EPS	VL Historic P/E Ratio	VL Est P/E Ratio	Ke Estimate - Earnings (Hist. P/E)	Ke Estimate - Earnings (Est. P/E)	VL Historic Cash Flow Per Share	VL Est Cash Flow Per Share	VL Historic P/CF Ratio	VL Est P/CF Ratio	Ke Estimate - Cash Flow (Hist. P/CF)	Ke Estimate - Cash Flow (Est. P/CF)
		<i>Yahoo</i>	<i>Value Line</i>	<i>Value Line</i>	<i>C/D</i>	<i>C/E</i>	<i>1/F</i>	<i>1/G</i>	<i>Value Line</i>	<i>Value Line</i>	<i>C/J</i>	<i>C/K</i>	<i>1/L</i>	<i>1/M</i>
Buckeye	BPL	64.44	4.03	4.35	15.99	14.81	6.25%	6.75%	5.09	5.60	12.66	11.51	7.90%	8.69%
Enbridge Energy Partners LP	EEP	25.31	0.32	0.50	79.09	50.62	1.26%	1.98%	2.26	2.15	11.20	11.77	8.93%	8.50%
Enterprise Products	EPD	25.67	1.20	1.40	21.39	18.33	4.68%	5.45%	2.01	1.95	12.77	13.16	7.83%	7.60%
Magellan Midstream Partners LP	MMP	64.31	3.52	3.80	18.27	16.92	5.47%	5.91%	4.34	4.30	14.82	14.95	6.75%	6.69%
Nustar Energy LP	NS	43.32	1.76	0.00	24.61		4.06%		2.36	0.00	18.36		5.45%	
Phillips 66 Partners	PSXP	57.28	2.20	0.00	26.04		3.84%		3.63	0.00	15.78		6.34%	
Plains All American PL LP	PAA	27.15	0.41	1.60	66.23	16.97	1.51%	5.89%	3.36	1.05	8.08	25.86	12.37%	3.87%
Sunoco Logistics Partners L.P.	SXL	28.01	0.97	1.20	28.88	23.34	3.46%	4.28%	1.81	2.35	15.48	11.92	6.46%	8.39%
Tesoro Logistics LP	TLLP	50.21	1.87	0.00	26.85		3.72%		5.40	0.00	9.30		10.76%	
Valero Energy Partners LP	VLP	47.34	2.82	0.00	16.79		5.96%		3.41	0.00	13.88		7.20%	
Average					32.41	23.50	4.02%	5.04%			13.23	14.86	8.00%	7.29%
Median					25.33	17.65	3.95%	5.67%			13.33	12.54	7.52%	7.99%
High					79.09	50.62	6.25%	6.75%			18.36	25.86	12.37%	8.69%
Low					15.99	14.81	1.26%	1.98%			8.08	11.51	5.45%	3.87%
Say							5.50%						8.00%	

MONTANA DEPARTMENT OF REVENUE

Support for Direct Capitalization Cost of Debt Component - Current Yield From Standard & Poor's Bond Guide
 Industry: Liquid Pipelines
 2017 Assessment Year

Company Name	Coupon	CUSIP	Issue	Maturity Date	Years to Maturity	Old S&P Bond Rating	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Avg Full Year	Avg 4th QTR
XTO Energy Inc.	5.65	98385XAH9	Sr Nts	04/01/2016	0	AAA	5.60	5.62											5.61%	
XTO Energy Inc.	6.1	98385XAJ5	Sr Nts	04/01/2036	20	AAA	4.69	4.64	4.68	4.71	4.73	4.54	4.55	4.56	4.68	4.68	4.96	5.00	4.70%	4.88%
XTO Energy Inc.	6.25	98385XALO	Sr Nts	08/01/2017	1	AAA	5.81	5.83	5.84	5.85	5.88	5.90	5.93	5.95	6.02	6.02	6.04	6.06	5.93%	6.04%
XTO Energy Inc.	6.75	98385XAM8	Sr Nts	08/01/2037	21	AAA	4.82	4.77	4.80	4.82	4.72	4.55	4.56	4.57	4.73	4.73	4.99	4.97	4.75%	4.90%
XTO Energy Inc.	5.5	98385XAP1	Sr Nts	06/15/2018	2	AAA	5.02	5.03	5.06	5.09	5.07	5.05	5.08	5.11	5.15	5.15	5.19	5.21	5.10%	5.18%
XTO Energy Inc.	6.38	98385XAQ9	Sr Nts	06/15/2038	22	AAA	4.78	4.73	4.71	4.68	4.67	4.52	4.48	4.49	4.67	4.67	4.93	4.88	4.68%	4.83%
Texaco Capital	9.75	881685AN1	GtdDeb	03/15/2020	4	AA	7.76	7.73	7.78	7.82	7.87	7.79	7.87	7.77	7.84	7.84	8.00	8.07	7.84%	7.97%
Texaco Capital	8.875	881685AV3	GtdDeb	09/01/2021	5	AA	6.79	6.74	6.89	7.04	7.08	6.97	7.02	6.73	6.78	6.78	6.96	7.02	6.90%	6.92%
Texaco Capital	8.625	881685AX9	GtdDeb	11/15/2031	15	AA	5.80	5.78	5.78	5.77	5.72	5.49	5.50	5.55	5.48	5.48	5.73	5.74	5.65%	5.65%
Texaco Capital	8.625	881685AY7	GtdDeb	04/01/2032	16	AA	5.74	5.78	5.82	5.85	5.84	5.68	5.70	5.71	5.67	5.67	5.94	5.95	5.78%	5.85%
Texaco Capital	8	881685BB6	GtdDeb	08/01/2032	16	AA	5.62	5.66	5.70	5.73	5.73	5.56	5.58	5.59	5.50	5.50	5.76	5.77	5.64%	5.68%
ANR Pipeline	7.38	001814AQ5	Deb	2/15/2024	8	A-	6.30	6.20	6.23	6.26	6.28	6.15	6.20	6.23	6.32	6.32	6.12	6.13	6.23%	6.19%
ANR Pipeline	9.62	001814AR3	Deb	11/1/2021	5	A-	7.46	7.56	7.54	7.52	7.57	7.32	7.11	7.19	7.23	7.23	7.37	7.45	7.38%	7.35%
EOG Resources, Inc.	5.88	26875PAA9	Sr Nts	09/15/2017	1	A-	5.52	5.55	5.55	5.55	5.57	5.57	5.60	5.60	5.65	5.65	5.68	5.70	5.60%	5.68%
Enron Oil & Gas	6.65	293562AD6	Nts	04/01/2028	12	A	5.73	5.69	5.77	5.85	5.92	5.65	5.66	5.68	5.73	5.73	5.98	5.88	5.77%	5.86%
Atlantic Richfield	9	048825AW3	Deb	04/01/2021	5	A	7.25	7.21	7.37	7.53	7.61	7.45	7.34	7.32	7.22	7.22	7.39	7.43	7.36%	7.35%
Atlantic Richfield	9	048825AY9	Deb	05/01/2031	15	A	6.71	6.59	6.63	6.66	6.69	6.51	6.19	6.24	6.23	6.23	6.54	6.59	6.48%	6.45%
Atlantic Richfield	9.125	048825AZ6	Deb	08/01/2031	15	A	6.33	6.24	6.34	6.43	6.45	6.27	6.22	6.28	6.38	6.38	6.70	6.76	6.40%	6.61%
Atlantic Richfield	8.25	048825BA0	Deb	02/01/2022	6	A	6.83	6.78	6.70	6.61	6.65	6.52	6.60	6.37	6.55	6.55	6.72	6.70	6.63%	6.66%
Atlantic Richfield	8.75	048825BB8	Deb	03/01/2032	16	A	6.63	6.50	6.54	6.57	6.56	6.30	6.31	6.27	6.12	6.12	6.40	6.38	6.39%	6.30%
Burlington Resources Inc.	9.125	122014AE3	Deb	10/01/2021	5	A	7.62	7.54	7.40	7.26	7.22	7.09	7.14	7.31	7.06	7.06	7.21	7.31	7.27%	7.19%
Burlington Resources Inc.	8.2	122014AH6	Deb	03/15/2025	9	A	7.19	7.35	6.90	6.45	6.49	6.27	6.32	6.30	6.38	6.38	6.35	6.32	6.56%	6.35%
Burlington Resources Inc.	6.875	122014AJ2	Deb	02/15/2026	10	A	6.81	6.53	6.21	5.88	5.92	5.94	5.90	5.87	5.80	5.80	6.02	5.95	6.05%	5.92%
Burlington Resources Inc.	7.375	122014AL7	Deb	03/01/2029	13	A	7.18	7.02	6.62	6.22	6.17	5.90	5.92	5.82	5.81	5.81	6.05	5.90	6.20%	5.92%
Burlington Resources Fin	7.2	12201PAB2	Gtd Nt	8/15/2031	15	A	6.65	6.77	6.44	6.10	5.99	5.89	5.63	5.49	5.49	5.49	5.75	5.62	5.94%	5.62%
Conoco Inc	6.95	208251AE8	Nts	04/15/2029	13	A	6.78	6.62	6.23	5.84	5.80	5.56	5.58	5.49	5.47	5.47	5.70	5.56	5.84%	5.58%
ConocoPhillips	5.9	20825CAF1	Nts	10/15/2032	16	A	6.11	6.14	5.67	5.19	5.37	5.05	4.95	5.06	5.00	5.00	5.25	5.13	5.33%	5.13%
Conoco Funding	7.25	20825UAC8	Sr Nt	10/15/2031	15	A	6.68	6.85	6.62	6.38	5.97	5.89	5.68	5.50	5.55	5.55	5.75	5.68	6.01%	5.66%
Louisiana Land/Exp	7.65	546268AG8	Deb	12/01/2023	7	A	6.81	6.67	6.44	6.20	6.23	6.04	6.15	6.13	6.22	6.22	6.42	6.52	6.34%	6.39%
Occidental Petroleum Corp.	9.25	674599BE4	Sr Deb	08/01/2019	3	A	7.63	7.62	7.65	7.67	7.69	7.64	7.70	7.76	7.84	7.84	7.94	7.95	7.74%	7.91%
Occidental Petroleum Corp.	7.2	674599BM6	Sr Deb	4/1/2028	12	A	6.24	6.12	5.86	5.60	5.63	5.42	5.35	5.43	5.49	5.49	5.79	5.79	6.68%	5.69%
Occidental Petroleum Corp.	8.45	674599BT1	Sr Nts	02/15/2029	13	A	6.28	6.16	5.90	5.63	5.96	5.74	5.67	5.76	5.81	5.81	6.13	6.13	5.91%	6.02%
Occidental Pete Corp Med Terr	8.75	67461FED5	MTN Tranche # Tr 00100	1/15/2023	7	A	6.90	6.81	6.85	6.89	6.93	6.78	6.85	6.92	6.99	6.99	7.20	7.14	6.94%	7.11%
Phillips Petroleum	6.65	718507BH8	Deb	07/15/2018	2	A	6.16	6.27	6.19	6.11	6.14	6.11	6.14	6.10	6.13	6.13	6.18	6.21	6.16%	6.17%
Phillips Petroleum	7	718507BK1	Deb	03/30/2029	13	A	7.02	6.86	6.44	6.02	5.97	5.73	5.63	5.53	5.70	5.70	5.92	5.73	6.02%	5.78%
Apache Corp.	7.7	037411AJ4	Nts	03/15/2026	10	BBB+	6.62	6.57	6.55	6.52	6.57	6.32	6.21	6.26	6.24	6.24	6.53	6.44	6.42%	6.40%
Apache Corp.	7.95	037411AK1	Nts	04/15/2026	10	BBB+	6.71	6.66	6.69	6.72	6.59	6.35	6.35	6.20	6.30	6.30	6.60	6.41	6.49%	6.44%
Apache Corp.	7.625	037411AL9	Deb	11/01/2096	80	BBB+	7.95	7.68	6.87	6.05	6.24	5.81	5.60	5.75	5.84	5.84	6.34	5.86	6.32%	6.01%
Apache Corp.	7.38	037411AM7	Deb	08/15/2047	31	BBB+	7.45	7.20	6.50	5.80	5.96	5.61	5.44	5.56	5.51	5.51	5.91	5.53	6.00%	5.65%
Apache Corp.	7	037411AN5	Sr Nts	02/01/2018	2	BBB+	6.59	6.74	6.65	6.55	6.57	6.53	6.55	6.56	6.57	6.57	6.64	6.64	6.60%	6.62%
Apache Corp.	7.62	037411AP0	Sr Nts	07/01/2019	3	BBB+	6.66	7.03	6.89	6.74	6.76	6.66	6.63	6.65	6.63	6.63	6.76	6.74	6.73%	6.71%
Apache Corp.	6	037411AR6	Nts	01/15/2037	21	BBB+	6.84	7.28	6.46	5.64	5.66	5.27	5.23	5.26	5.14	5.14	5.23	5.41	5.23%	5.26%
Canadian Natural Resources L	6.45	136385AE1	Nt	6/30/2033	17	BBB+	7.96	8.57	7.62	6.66	6.62	6.29	5.91	5.87	5.86	5.86	5.97	5.74	6.58%	5.86%
Devon Fin Corp	7.95	251799AA0	Sr Deb	04/15/2032	16	BBB+	8.57	10.26	8.86	7.45	7.47	6.90	6.54	6.61	6.30	6.30	6.54	6.29	7.34%	6.38%
ENSCO International Inc.	7.2	26874QAB6	Deb	11/15/2027	11	BBB+	10.61	12.85	11.79	10.72	10.03	10.00	9.15	9.08	8.06	8.06	8.17	7.86	9.70%	8.03%
Enterprise Products Oper	6.65	293791AP4	Sr Nts'B'	10/15/2034	18	BBB+	6.67	6.41	6.11	5.80	5.88	5.57	5.31	5.39	5.56	5.56	5.79	5.54	5.80%	5.63%
Enterprise Products Oper	5.75	293791AT6	Sr Nts'B'	03/01/2035	19	BBB+	6.33	5.99	5.74	5.48	5.42	5.19	5.05	5.12	5.24	5.24	5.48	5.28	5.46%	5.33%
OceanEnergy	8.25	674812AK8	Sr Nts 'B'	07/01/2018	2	BBB+	8.14	8.24	7.99	7.74	7.59	7.65	7.64	7.83	7.82	7.82	7.88	7.89	7.85%	7.86%
Amerada Hess Corp.	7.875	023551AF1	Nts	10/01/2029	13	BBB	7.96	8.84	7.91	6.97	7.02	6.53	6.54	6.51	6.41	6.41	6.76	6.57	7.04%	6.58%
Amerada Hess Corp.	7.3	023551AJ3	Nts	08/15/2031	15	BBB	8.32	8.62	7.70	6.78	6.76	6.32	6.26	6.31	6.23	6.23	6.63	6.31	6.87%	6.39%
Diamond Shamrock	7.65	252747AF7	Deb	07/01/2026	10	BBB	6.42	6.38	6.13	5.87	6.01	5.92	5.91	5.82	5.89	5.89	6.10	6.16	6.04%	6.05%
Enbridge Energy Partners, L.P.	5.95	29250RAD8	Sr Nts 'B'	06/01/2033	17	BBB	6.81	6.94	6.79	6.63	6.61	6.41	6.42	5.81	5.96	5.96	6.25	6.18	6.40%	6.13%
Enbridge Energy Partners, L.P.	5.88	29250RAH9	Nt	12/15/2016	0	BBB	5.75	5.80	5.77	5.73	5.75	5.74	5.77	5.80	5.84	5.84			5.78%	5.84%
Lakehead Pipe Line Co	7	511546AA1	Sr Nt	10/1/2018	2	BBB	6.63	6.63	6.67	6.71	6.72	6.69	6.72	6.74	6.76	6.76	6.80	6.81	6.72%	6.79%
Marathon Oil Corp.	6.8	565849AB2	Nts	03/15/2032	16	BBB	8.80	9.70	8.34	6.98	7.07	6.63	6.35	6.49	6.25	6.25	6.56	6.12	7.13%	6.31%
Murphy Oil Corp.	7.05	626717AA0	Nts	05/01/2029	13	BBB	10.78	10.94	9.36	7.78	7.15	6.98	6.89	7.19	6.77	6.77	6.76	6.58	7.83%	6.70%

MONTANA DEPARTMENT OF REVENUE

**Support for Direct Capitalization Cost of Debt Component - Current Yield From Standard & Poor's Bond Guide
Industry: Liquid Pipelines
2017 Assessment Year**

Company Name	Coupon	CUSIP	Issue	Maturity Date	Years to Maturity	Old S&P Bond Rating	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Avg Full Year	Avg 4th QTR
							6.01	6.08	6.07	6.06	6.07	6.08	6.10	6.12						
ONEOK Partners, L.P.	6.15	68268NAB9	Gtd Sr Nt	10/1/2016	0	BBB	6.01	6.08	6.07	6.06	6.07	6.08	6.10	6.12					6.07%	
ONEOK Partners, L.P.	6.65	68268NAC7	Gtd Sr Nt	10/1/2036	20	BBB	8.34	8.70	7.91	7.12	6.84	6.33	6.06	6.13	5.78	5.78	6.07	5.88	6.75%	5.91%
Plains All Amern Pipeline L P	5.88	72650RAF9	Sr Nt	08/15/2016	0	BBB	5.77	5.79	5.80	5.80	5.82	5.84							5.80%	
Plains All Amern Pipeline L P	6.7	72650RAM4	Sr Nt	5/15/2036	20	BBB	7.89	8.33	7.66	6.98	7.16	6.71	6.05	6.21	6.02	6.02	6.39	6.14	6.80%	6.18%
Talisman Energy Inc.	7.25	87425EAE3	Deb	10/15/2027	11	BBB	7.30	8.07	8.10	8.13	8.15	8.16	8.08	8.08	7.00	7.00	7.27	7.15	7.71%	7.14%
USX Corp.	9.375	902905AL2	Deb	05/15/2022	6	BBB	9.41	9.90	9.25	8.60	8.92	8.46	7.60	7.71	7.44	7.44	7.64	7.48	8.32%	7.52%
USX Corp.	8.5	902905AN8	Deb	03/01/2023	7	BBB	8.59	9.00	8.48	7.95	8.18	7.99	7.81	7.73	7.46	7.46	7.66	7.35	7.97%	7.49%
USX Corp.	8.125	902905AQ1	Deb	07/15/2023	7	BBB	8.34	9.93	8.94	7.95	7.62	7.43	7.19	7.17	7.08	7.08	7.19	6.99	7.74%	7.09%
Valero Energy Corp. (New)	8.75	91913YAB6	Nts	06/15/2030	14	BBB	7.71	7.71	7.31	6.91	7.28	6.70	6.74	6.56	6.48	6.48	6.76	6.69	6.94%	6.64%
Valero Energy Corp. (New)	7.5	91913YAE0	Nts	04/15/2032	16	BBB	7.11	7.14	6.73	6.31	6.69	6.39	6.20	6.00	5.92	5.92	6.12	6.12	6.39%	6.05%
Valero Energy Corp. (New)	6.62	91913YAL4	Nts	06/15/2037	21	BBB	6.87	6.75	6.33	5.91	6.47	6.08	5.90	5.71	5.66	5.66	5.99	5.70	6.09%	5.78%
Valero Energy Corp. (New)	6.12	91913YAM2	Nts	06/15/2017	1	BBB	5.88	5.92	5.89	5.85	5.87	5.89	5.87	5.90	5.92	5.92	5.92	5.92	5.92%	5.92%
Williams Ptns L P	7.25	96950HAD2	Sr Nt	2/1/2017	1	BBB	7.24	7.26	7.15	7.03	7.03	7.03	7.05	7.07	7.15	7.15	7.18	7.21	7.13%	7.18%
Anadarko Petroleum Corp.	7.25	032511AH0	Deb	03/15/2025	9	BBB	7.25	7.26	7.20	7.13	7.09	6.78	6.77	6.74	6.58	6.58	6.40	6.31	6.84%	6.43%
Anadarko Petroleum Corp.	7.73	032511AJ6	Deb	09/15/2096	80	BBB	8.57	8.47	7.85	7.22	7.30	6.79	6.81	6.81	6.66	6.66	7.10	6.82	7.25%	6.86%
Anadarko Petroleum Corp.	7.25	032511AK3	Deb	11/15/2096	80	BBB	9.50	9.34	8.40	7.46	7.30	6.78	6.71	6.71	6.44	6.44	6.85	6.50	7.37%	6.60%
Anadarko Petroleum Corp.	7	032511AL1	Deb	11/15/2027	11	BBB	7.99	8.82	7.87	6.92	6.87	6.50	6.48	6.51	6.29	6.29	5.96	5.86	6.86%	6.04%
Anadarko Petroleum Corp.	6.62	032511AM9	Deb	01/15/2028	12	BBB	7.82	8.64	7.70	6.75	6.69	6.33	6.31	6.33	6.14	6.14	5.86	5.75	6.70%	5.92%
Anadarko Petroleum Corp.	7.2	032511AN7	Deb	03/15/2029	13	BBB	7.85	8.73	7.88	7.03	6.98	6.60	6.42	6.44	6.21	6.21	6.06	6.11	6.88%	6.13%
Anadarko Petroleum Corp.	5.95	032511AX5	Sr Nts	09/15/2016	0	BBB	5.85	5.92	5.88	5.83	5.83	5.83	5.83						5.85%	
Anadarko Petroleum Corp.	6.45	032511AY3	Sr Nts	09/15/2036	20	BBB	8.08	8.07	7.04	6.00	6.14	5.72	5.65	5.66	5.43	5.43	5.76	5.45	6.20%	5.55%
Buckeye Partners, L.P.	5.12	118230AE1	Fixed Rt Nts	07/01/2017	1	BBB-	5.03	5.03	5.00	4.97	4.98	4.97	5.00	5.01	5.03	5.03	5.05	5.06	5.01%	5.05%
Energy Corp MTN BE	7.32	29265AAP1	MTN Tranche # Tr 00014	7/28/2022	6	BBB-	8.17	8.95	8.08	7.20	7.09	7.12	7.04	6.70	6.52	6.52	6.62	6.59	7.22%	6.58%
Energy Transfer Partners, L.P.	6.12	29273RAE9	Sr Nt	2/15/2017	1	BBB-	6.06	6.10	6.05	5.99	5.95	5.96	5.99	5.99	6.04	6.04	6.06	6.09	6.03%	6.06%
Energy Transfer Partners, L.P.	6.62	29273RAF6	Sr Nt	10/15/2036	20	BBB-	8.17	7.93	7.34	6.74	6.91	6.42	6.10	6.16	6.00	6.00	6.31	6.13	6.68%	6.15%
Enterprise Prods Oper L P	8.38	293791AV1	Jr Sub Nt Fixed/fltg Rate	08/01/2066	50	BBB-	10.46	10.92	10.56	10.20	9.65	9.49	9.13	4.77			4.89	4.88	8.50%	4.89%
Kerr-McGee Corp.	7.125	492386AK3	Deb	10/15/2027	11	BBB-	7.54	8.45	7.76	7.07	6.81	6.53	6.52	6.50	6.41	6.41	6.66	6.27	6.91%	6.45%
Kerr-McGee Corp.	7.875	492386AT4	Nts	09/15/2031	15	BBB-	8.03	8.85	7.89	6.92	6.94	6.76	6.61	6.54	6.16	6.16	6.53	6.19	6.98%	6.29%
Kerr-McGee Corp.	6.95	492386AU1	Nts	07/01/2024	8	BBB-	7.06	7.66	6.98	6.29	6.27	5.99	5.99	5.97	5.79	5.79	5.99	5.91	6.31%	5.90%
Sunoco Logistics Ptns Operatic	6.12	86765BAE9	Sr Nt	05/15/2016	0	BBB-	6.05	6.09												6.07%
Union Pacific Resources Group	7.5	907834AB1	Deb	10/15/2026	10	BBB-	7.92	8.69	7.81	6.93	6.92	6.58	6.57	6.55	6.11	6.11	6.34	6.24	6.90%	6.23%
Union Pacific Resources Group	7.5	907834AC9	Deb	11/01/2096	-116	BBB-	9.50	9.34	8.43	7.52	7.60	7.09	7.02	7.01	6.74	6.74	7.11	6.77	7.57%	6.87%
Union Pacific Resources Group	7.05	907834AF2	Deb	05/15/2018	2	BBB-	6.73	6.74	6.77	6.79	6.80	6.56	6.60	6.63	6.67	6.67	6.72	6.78	6.70%	6.72%
Union Pacific Resources Group	7.15	907834AG0	Deb	05/15/2028	12	BBB-	7.81	8.44	7.60	6.76	6.73	6.44	6.42	6.18	6.18	6.18	6.06	5.93	6.73%	6.06%
Williams Companies, Inc. (The)	7.625	969457AW0	Nts	07/15/2019	3	BBB-	8.98	9.01	8.96	8.91	8.97	8.76	8.72	8.17	7.70	7.70	7.06	7.06	8.33%	7.27%
Williams Companies, Inc. (The)	7.5	969457BB5	Deb	01/15/2031	15	BBB-	11.29	10.13	9.12	8.10	7.73	7.54	6.97	6.57	6.52	6.52	6.80	6.62	7.83%	6.65%
Williams Companies, Inc. (The)	7.75	969457BD1	Nts	06/15/2031	15	BBB-	11.62	10.47	9.38	8.28	7.94	7.71	7.07	6.72	6.73	6.73	7.04	6.79	8.04%	6.85%
Williams Companies, Inc. (The)	7.875	969457BG4	Nts	09/01/2021	5	BBB-	9.46	9.31	8.52	7.72	7.53	7.42	7.14	6.78	6.78	6.78	6.92	6.89	7.60%	6.86%
Williams Companies, Inc. (The)	8.75	969457BM1	Nts	03/15/2032	16	BBB-	12.65	11.07	9.87	8.66	8.45	8.37	7.47	7.09	7.08	7.08	7.44	7.23	8.54%	7.25%
Boardwalk Pipelines Llc	5.5	096629AA8	Nt	2/1/2017	1	BB+	5.44	5.55	5.49	5.43	5.44	5.41	5.40	5.43	5.46	5.46	5.47	5.48	5.46%	5.47%
Boardwalk Pipelines Lp	5.88	096630AA6	Sr Nt	11/15/2016	0	BB+	5.83	5.87	5.87	5.86	5.77	5.79	5.81	5.81						5.83%
Pioneer Natural Resources Co.	6.88	723787AF4	Sr Nts	05/01/2018	2	BB+	6.60	6.62	6.50	6.38	6.39	6.34	6.35	6.38	6.41	6.41	6.46	6.47	6.44%	6.45%
Pioneer Natural Resources Co.	6.65	723787AG2	Sr Nts	03/15/2017	1	BB+	6.53	6.54	6.50	6.45	6.42	6.42	6.45	6.49	6.52	6.52	6.54	6.58	6.50%	6.55%
Chesapeake Energy Corp.	6.5	165167BS5	Sr Nts	08/15/2017	1	BB-	13.35	16.04	11.89	7.73	6.93	7.14	6.84	6.50	6.39	6.39	6.32	6.31	8.49%	6.34%
Chesapeake Energy Corp.	6.88	165167BU0	Sr Nts	11/15/2020	4	BB-	24.55		6.14	12.27	10.82	10.11	9.51	7.83	7.29	7.29	7.35	6.82	10.00%	7.15%
Chesapeake Energy Corp.	2.75	165167BW6	Contingent Sr Nt Conv	11/15/2035	19	BB-	2.75		11.46	22.91	22.91	22.91	22.91	22.91	22.91	22.91	22.91	22.91	20.04%	22.91%
Chesapeake Energy Corp.	2.5	165167BZ9	Contingent Sr Nt Conv	5/15/2037	21	BB-	5.02	6.21	4.68	3.15	2.70	2.68	2.64	2.52	2.51	2.51	2.50	2.49	3.30%	2.50%
Chesapeake Energy Corp.	2.5	165167CA3	Sr Contingent Conv Nt	5/15/2037	21	BB-	5.02	6.21	4.68	3.15	2.70	2.68	2.64	2.52	2.51	2.51	2.50	2.49	3.30%	2.50%
Chesapeake Energy Corp.	2.25	165167CB1	Contingent Sr Nt Conv	12/15/2038	22	BB-	7.50	10.22	7.08	3.94	3.12	2.79	2.72	2.50	2.41	2.41	2.38	2.29	4.11%	2.36%
Chesapeake Energy Corp.	7.25	165167CC9	Sr Nt	12/15/2018	2	BB-	19.33	23.29	16.68	10.06	8.78	8.55	8.01	7.28	7.05	7.05	6.98	6.71	10.81%	6.91%
Plains Exploration & Production	7	726505AC4	Sr Nts	03/15/2017	1	BB-														
Swift Energy Co.	7.12	870738AF8	Sr Nts	06/01/2017	1	BB-														
KN Energy	6.67	482620AS0	Deb	11/01/2027	11	BB	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01%	7.01%
KN Energy	7.25	482620AW1	Sr Deb	03/01/2028	12	BB	8.16	8.05	7.83	7.60	6.54	6.99	6.62	6.68	6.70	6.70	7.12	6.76	7.15%	6.86%
Range Resources Corp.	7.5	75281AAH2	Sr Sub Nts	10/01/2017	1	BB	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22	7.22%	7.22%
Range Resources Corp.	7.25	75281AAJ8	Sr Sub Nts	05/01/2018	2	BB	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99%	6.99%

MONTANA DEPARTMENT OF REVENUE

**Support for Direct Capitalization Cost of Debt Component - Current Yield From Standard & Poor's Bond Guide
Industry: Liquid Pipelines
2017 Assessment Year**

Company Name	Coupon	CUSIP	Issue	Maturity Date	Years to Maturity	Old S&P Bond Rating	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Avg Full Year	Avg 4th QTR
Berry Petroleum Co.	8.25	085789AC9	Sr SubNts	11/01/2016	0	B	7.92	7.92	7.92	7.92										
Cimarex Energy Co.	7.12	171798AA9	SrNts	05/01/2017	1	NR	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87
Pioneer Natural Resources Co.	7.2	723787AB3	Sr Nt	6/15/2028	12	NR	6.67	7.04	6.73	6.41	6.48	6.27	5.91	5.95	5.73	5.73	6.00	5.99	6.24%	5.91%
Range Resources Corp.	7.5	75281AAG4	Sr Sub Nts	05/15/2016	0	NR														
Sunoco, Inc.	5.75	86764PAD1	Nts	01/15/2017	1	NR	5.71	5.68	5.66	5.64	5.63	5.64	5.66	5.66	5.70	5.70	5.72		5.67%	5.71%
Texaco Capital	7.5	881685BD2	GtdDeb	03/01/2043	27	NR														
							118	114	112	112	111	111	110	109	106	106	106	105	113	107

NOTES:

Data downloaded from the S&P website and missing data supplemented from month end Bond Guides when available.

means the data was not available in S&P Guide
means issuance matured or called

All Bonds	
Annual	4th Qtr

<u>All Bonds</u>		
All Ratings	6.71%	6.37%
Investment Grade (BBB- & Above)	6.60%	6.29%
<u>Bonds With 20 or More Years to Maturity</u>		
All Ratings	6.61%	6.56%
Investment Grade (BBB- & Above)	6.27%	5.67%
Say:	6.60%	

MONTANA DEPARTMENT OF REVENUE

Support for Direct Capitalization Cost of Debt Component - Calculated Current Yield

Industry: Liquid Pipelines

2017 Assessment Year

A	B	C	D	E	F	G	H	I	J	K
Company	2016 Ticker	YE 2016 Interest Exp.	YE 2015 MV LT Debt	YE 2015 BV LT Debt	YE 2016 MV LT Debt	YE 2016 BV LT Debt	2016 Avg MV LT Debt	2016 Current Yield	2016 Avg BV LT Debt	MTBR
Source		10-K	10-K	10-K	10-K	10-K	(D+F)/2	(C/H)	(E+G)/2	(H/J)
		(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)		(\$000)	
Buckeye Partners	BPL	194,922	3,530,433	3,844,312	4,333,488	4,217,695	3,931,961	4.96%	4,031,004	0.98
Enbridge Energy Partners LP	EEP	445,500	5,900,000	-	6,500,000	-	6,200,000		-	
Enterprise Products	EPD	982,600	19,510,000	20,870,000	21,950,000	20,850,000	20,730,000	4.74%	20,860,000	0.99
Magellan Midstream Partners LP	MMP	145,862	3,284,791	3,439,622	4,262,321	4,087,192	3,773,556	3.87%	3,763,407	1.00
Nustar Energy LP	NS	138,350	2,929,438	3,055,612	3,084,762	3,014,364	3,007,100	4.60%	3,034,988	0.99
Phillips 66 Partners	PSXP	52,000	1,900,000	2,064,000	2,357,000	2,435,000	2,128,500	2.44%	2,249,500	0.95
Plains All American PL LP	PAA	467,000	8,600,000	9,800,000	10,400,000	10,300,000	9,500,000	4.92%	10,050,000	0.95
Sunoco Logistics Partners LP	SXL	270,000	4,200,000	5,100,000	5,400,000	5,400,000	4,800,000	5.63%	5,250,000	0.91
Tesoro Logistics LP	TLLP	191,000	2,800,000	2,900,000	4,300,000	4,100,000	3,550,000	5.38%	3,500,000	1.01
Valero Energy Partners	VLP	14,915	545,000	545,000	906,670	895,355	725,835	2.05%	720,178	1.01
		2,456,649					52,146,952	4.71%	53,459,076	0.98
Average								4.29%		0.98
Median								4.74%		0.99
High								5.63%		1.01
Low								2.05%		0.91
Say								4.75%		0.99

MONTANA DEPARTMENT OF REVENUE

Support of Stock Price - From YAHOO Finance

Industry: Liquid Pipelines

2017 Assessment Year

Ticker	Company														End of	4th Qtr	Annual
			Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Year Closing	Average	Average
BPL	Buckeye	high	\$ 77.67	\$ 77.83	\$ 78.30	\$ 81.93	\$ 82.98	\$ 79.42	\$ 76.56	\$ 75.16	\$ 71.26	\$ 72.43	\$ 70.23	\$ 68.50	\$ 65.96	\$64.44	\$71.01
		low	\$ 69.52	\$ 70.66	\$ 73.44	\$ 74.43	\$ 77.28	\$ 73.93	\$ 69.39	\$ 52.91	\$ 54.85	\$ 59.26	\$ 64.20	\$ 52.04			
COP	ConocoPhillips Inc	high	\$ 69.48	\$ 70.11	\$ 65.36	\$ 69.72	\$ 68.36	\$ 64.47	\$ 61.51	\$ 51.88	\$ 50.91	\$ 56.69	\$ 57.24	\$ 54.75	\$ 46.69	\$51.97	\$57.99
		low	\$ 60.64	\$ 63.41	\$ 60.57	\$ 62.57	\$ 63.11	\$ 60.86	\$ 50.25	\$ 41.10	\$ 45.72	\$ 47.54	\$ 51.03	\$ 44.56			
CVX	ChevronTexaco Corp	high	\$ 113.00	\$ 112.93	\$ 107.69	\$ 112.20	\$ 110.80	\$ 103.75	\$ 96.67	\$ 87.33	\$ 80.47	\$ 91.98	\$ 98.64	\$ 94.00	\$ 89.96	\$89.00	\$95.66
		low	\$ 98.88	\$ 102.97	\$ 100.66	\$ 104.08	\$ 102.38	\$ 96.22	\$ 88.01	\$ 69.58	\$ 74.31	\$ 77.31	\$ 87.79	\$ 84.25			
EEP	Enbridge Energy Partners LP	high	\$ 41.06	\$ 41.39	\$ 39.38	\$ 38.38	\$ 38.53	\$ 37.32	\$ 34.49	\$ 31.35	\$ 28.04	\$ 28.22	\$ 29.99	\$ 25.07	\$ 23.07	\$25.31	\$32.20
		low	\$ 36.90	\$ 38.01	\$ 35.07	\$ 35.64	\$ 36.19	\$ 32.93	\$ 29.54	\$ 24.21	\$ 22.40	\$ 24.78	\$ 24.48	\$ 19.31			
EPD	Enterprise Products	high	\$ 36.98	\$ 36.00	\$ 33.45	\$ 34.49	\$ 34.73	\$ 32.60	\$ 31.17	\$ 29.92	\$ 28.24	\$ 29.02	\$ 28.65	\$ 26.17	\$ 25.58	\$25.67	\$29.74
		low	\$ 31.03	\$ 32.55	\$ 30.71	\$ 32.41	\$ 32.42	\$ 29.53	\$ 26.91	\$ 24.62	\$ 22.01	\$ 25.09	\$ 24.32	\$ 20.76			
HEP	Holly Energy Part. LP	high	\$ 35.10	\$ 35.00	\$ 33.35	\$ 34.46	\$ 34.53	\$ 36.40	\$ 35.34	\$ 35.11	\$ 34.34	\$ 34.94	\$ 35.51	\$ 33.49	\$ 31.14	\$31.79	\$32.26
		low	\$ 29.76	\$ 31.88	\$ 29.57	\$ 30.00	\$ 31.05	\$ 32.55	\$ 30.60	\$ 28.32	\$ 26.25	\$ 28.02	\$ 32.04	\$ 26.75			
HFC	HollyFrontier Corporation	high	\$ 38.49	\$ 45.05	\$ 43.76	\$ 40.95	\$ 43.71	\$ 42.78	\$ 49.54	\$ 54.73	\$ 51.43	\$ 51.61	\$ 52.30	\$ 50.44	\$ 39.89	\$47.55	\$43.55
		low	\$ 30.15	\$ 36.14	\$ 37.58	\$ 35.89	\$ 38.67	\$ 39.83	\$ 42.68	\$ 43.56	\$ 44.90	\$ 44.78	\$ 47.16	\$ 39.00			
KMI	Kinder Morgan Inc.	high	\$ 42.93	\$ 42.33	\$ 42.30	\$ 44.71	\$ 43.34	\$ 41.47	\$ 38.58	\$ 34.81	\$ 32.09	\$ 32.89	\$ 27.78	\$ 23.62	\$ 14.92	\$24.61	\$34.99
		low	\$ 39.95	\$ 40.34	\$ 39.45	\$ 41.56	\$ 41.42	\$ 38.33	\$ 34.12	\$ 28.50	\$ 25.81	\$ 26.60	\$ 22.57	\$ 14.22			
MMP	Magellan Midstream Partners LP	high	\$ 85.85	\$ 85.09	\$ 82.65	\$ 84.99	\$ 85.49	\$ 80.29	\$ 76.04	\$ 72.91	\$ 71.75	\$ 70.26	\$ 69.87	\$ 70.01	\$ 67.92	\$64.31	\$72.85
		low	\$ 72.90	\$ 76.63	\$ 75.51	\$ 76.57	\$ 79.61	\$ 73.36	\$ 66.55	\$ 61.37	\$ 55.05	\$ 59.67	\$ 61.51	\$ 54.51			
NS	Nustar Energy LP	high	\$ 61.92	\$ 63.78	\$ 63.78	\$ 68.10	\$ 67.68	\$ 63.02	\$ 60.48	\$ 56.43	\$ 53.50	\$ 52.24	\$ 51.61	\$ 40.80	\$ 40.10	\$43.32	\$54.83
		low	\$ 54.58	\$ 60.32	\$ 58.54	\$ 60.49	\$ 62.25	\$ 58.81	\$ 54.43	\$ 45.98	\$ 42.00	\$ 44.06	\$ 40.02	\$ 31.20			
NSH	NuStar GP Holdings, LLC	high	\$ 37.71	\$ 39.53	\$ 37.87	\$ 39.66	\$ 39.44	\$ 39.94	\$ 38.40	\$ 34.99	\$ 33.74	\$ 31.55	\$ 29.72	\$ 24.99	\$ 21.15	\$24.89	\$32.74
		low	\$ 30.77	\$ 35.93	\$ 33.73	\$ 34.03	\$ 36.95	\$ 37.18	\$ 32.29	\$ 29.74	\$ 24.46	\$ 25.89	\$ 22.12	\$ 15.06			
PAA	Plains All American PL LP	high	\$ 52.64	\$ 52.70	\$ 52.25	\$ 51.71	\$ 50.63	\$ 47.98	\$ 44.29	\$ 41.65	\$ 35.97	\$ 34.98	\$ 33.00	\$ 24.76	\$ 23.10	\$27.15	\$40.25
		low	\$ 45.84	\$ 48.71	\$ 45.81	\$ 48.56	\$ 46.12	\$ 43.00	\$ 38.56	\$ 30.06	\$ 26.71	\$ 29.24	\$ 23.11	\$ 17.83			
PAGP	Plains GP Holdings, L.P.	high	\$ 28.20	\$ 28.81	\$ 28.96	\$ 29.87	\$ 29.79	\$ 28.39	\$ 26.64	\$ 25.67	\$ 20.02	\$ 19.49	\$ 16.26	\$ 12.80	\$ 9.45	\$13.61	\$22.60
		low	\$ 24.01	\$ 26.24	\$ 27.06	\$ 27.26	\$ 27.57	\$ 25.81	\$ 23.52	\$ 16.59	\$ 16.28	\$ 15.51	\$ 10.41	\$ 7.18			

MONTANA DEPARTMENT OF REVENUE

Support of Stock Price - From YAHOO Finance

Industry: Liquid Pipelines

2017 Assessment Year

Ticker	Company														End of Year Closing	4th Qtr Average	Annual Average
			Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15			
PSXP	Phillips 66 Partners	high	\$ 81.63	\$ 79.81	\$ 74.99	\$ 76.94	\$ 76.95	\$ 75.20	\$ 72.25	\$ 63.49	\$ 61.91	\$ 61.73	\$ 66.75	\$ 62.99	\$ 61.40	\$57.28	\$64.60
		low	\$ 61.50	\$ 69.60	\$ 66.84	\$ 67.46	\$ 70.12	\$ 69.21	\$ 56.10	\$ 40.00	\$ 42.83	\$ 48.58	\$ 57.44	\$ 46.20			
SXL	Sunoco Logistics Partners L.P.	high	\$ 43.49	\$ 46.72	\$ 44.40	\$ 44.74	\$ 44.90	\$ 40.12	\$ 38.65	\$ 37.50	\$ 34.06	\$ 32.89	\$ 32.18	\$ 28.21	\$ 25.70	\$28.01	\$36.06
		low	\$ 36.62	\$ 41.15	\$ 39.79	\$ 40.77	\$ 39.02	\$ 37.10	\$ 33.63	\$ 29.17	\$ 25.44	\$ 26.63	\$ 26.76	\$ 21.41			
TLLP	Tesoro Logistics LP	high	\$ 59.80	\$ 60.19	\$ 57.70	\$ 61.74	\$ 59.92	\$ 60.37	\$ 57.90	\$ 55.83	\$ 53.72	\$ 56.85	\$ 56.92	\$ 51.83	\$ 50.32	\$50.21	\$53.50
		low	\$ 49.33	\$ 54.00	\$ 50.78	\$ 53.01	\$ 55.60	\$ 55.34	\$ 50.84	\$ 46.52	\$ 40.14	\$ 44.44	\$ 49.95	\$ 41.24			
VLP	Valero Energy Partners LP	high	\$ 50.69	\$ 54.92	\$ 55.00	\$ 53.64	\$ 52.56	\$ 54.87	\$ 52.44	\$ 52.09	\$ 54.50	\$ 51.23	\$ 52.49	\$ 53.25	\$ 51.61	\$47.34	\$48.55
		low	\$ 38.53	\$ 47.77	\$ 48.40	\$ 48.13	\$ 48.54	\$ 49.45	\$ 41.02	\$ 40.74	\$ 37.96	\$ 41.94	\$ 44.50	\$ 40.64			
WMB	Williams Cos	high	\$ 45.57	\$ 50.69	\$ 51.15	\$ 52.88	\$ 54.49	\$ 61.38	\$ 58.77	\$ 55.42	\$ 48.47	\$ 44.51	\$ 40.76	\$ 36.97	\$ 25.70	\$35.54	\$45.63
		low	\$ 40.07	\$ 43.61	\$ 45.70	\$ 49.64	\$ 48.41	\$ 46.28	\$ 51.34	\$ 43.33	\$ 34.64	\$ 36.60	\$ 33.48	\$ 20.95			
XOM	Exxon Mobil	high	\$ 93.05	\$ 93.45	\$ 88.52	\$ 88.67	\$ 90.09	\$ 85.97	\$ 83.53	\$ 79.29	\$ 75.47	\$ 83.88	\$ 87.44	\$ 82.13	\$ 77.95	\$79.70	\$82.53
		low	\$ 86.03	\$ 87.50	\$ 82.68	\$ 83.81	\$ 84.77	\$ 82.80	\$ 78.93	\$ 66.55	\$ 71.51	\$ 73.03	\$ 77.91	\$ 73.79			