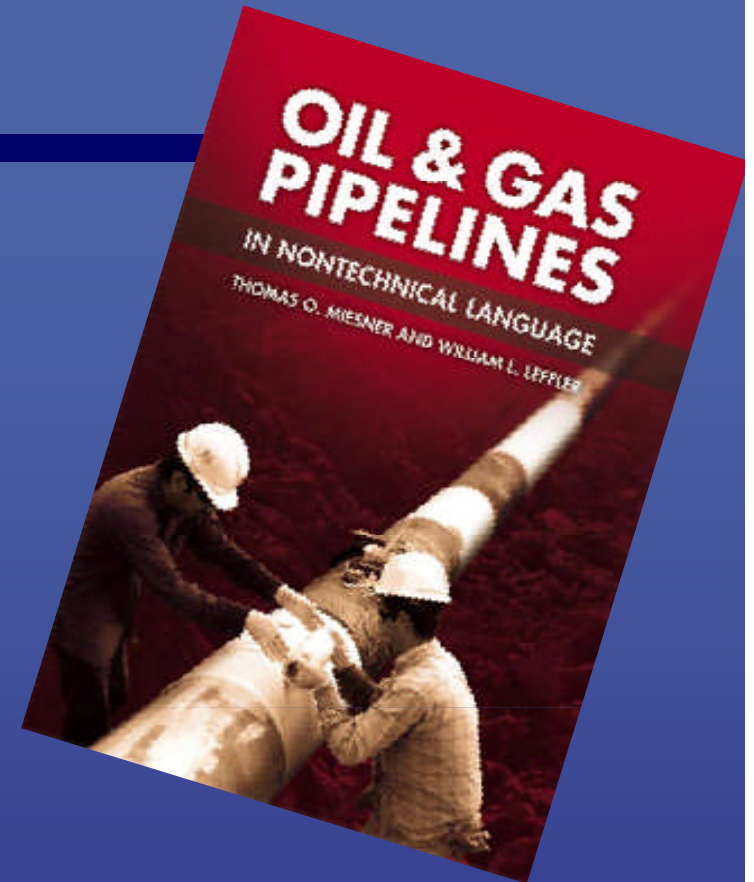


Introduction to Pipeline Economics

By
Tom Miesner
Miesner, LLC

Tom Miesner

- ❖ 26 years with Conoco
 - ❖ Pipeline Eng, Ops, JV, BD, & Exec
 - ❖ Downstream strategy and BD
- ❖ Industry groups and boards
- ❖ President Conoco Pipeline
- ❖ Chairman AOPL
- ❖ Principal Miesner, LLC
 - ❖ Pipeline Education and Training
 - ❖ Strategy and Project Development
 - ❖ Expert Testimony, Litigations and Arbitration Consulting
 - ❖ Appraisals and Independent Opinions
 - ❖ Process Improvement
- ❖ Author – *Oil and Gas Pipelines in NonTechnical Language*



Teaching Modules – Day One

1. Pipelines, Types, Roles, And Customers
2. History Of Pipelines
3. Basic Hydraulics
4. Organizations and People
5. Pipeline Field Operations
6. Natural Gas Control Center Operations
7. Oil Pipeline Control Center Operations
8. Introduction to Controls and Scada

Teaching Modules – Day 2

9. Introduction to Leak Detection
10. Major Components and How They Work
11. Maintenance
12. Introduction to Engineering and Design
13. Introduction to Construction
14. Investment Decisions
15. The People and Organizations
16. Satisfying Stakeholders

Module Overview

- ❖ Role in the oil and gas value chain
- ❖ Evolution of the pipeline business model
- ❖ Ownership forms
- ❖ Current U. S. pipeline business model
- ❖ Business Development and Economics
 - ❖ Organic growth
 - ❖ Grassroots projects
- ❖ Maintenance economics
- ❖ Valuations

Oil Value Chain



The Business of Oil and Gas Pipelines

- ❖ Pipelines provide transportation functions
- ❖ In most cases they charge a tariff and do not own the commodity they move
- ❖ Pipelines serve a “midstream” function in the oil and gas value chains, hooking other parts of the value chain together.
- ❖ Some are independently owned and publicly traded
- ❖ Others are subsidiaries of integrated oil or gas companies
- ❖ Partnerships are quite common in the pipeline company as means to spread risk.

Evolution of U. S. Oil Pipeline Ownership

Time Period	Ownership
Mid 1990's to present day	Investors and integrated oil companies – massive redeployment as integrated majors shed lines to MLPs (Buckeye formed in 1986, Enron Liquids Pipeline in 1992, and Kinder Morgan in 1997)
Post war to mid late 1980's	Primarily integrated oil companies, often as joint ventures (Colonial 1968, Explorer 1971, TAPS 1977) limited independent ownership (Buckeye/PennCentral)
1942 to 1944	Big Inch and Little Inch built by the government for crude oil and products services respectively. Later sold to Texas Eastern for gas service
Early 1900's to early 1940's	Integrated oil companies as well as producers and refiners – regulations evolve making most oil pipelines common carriers and limiting earnings
Late 1860s to early 1900's	Entrepreneurs, crude oil producers, and Standard Oil – a rambunctious time as Standard Oil tried to gain from railroads and independent producers

Developed from multiple industry and company web sites.

Ownership

Common Pipeline Ownership Forms

- ❖ Stock company
- ❖ Partnership or Limited Liability Company (LLC)
- ❖ Undivided Joint Interest (UDI)
- ❖ Master Limited Partnership (MLP)

Stock Companies

- ❖ Owners own stock in the pipeline company
- ❖ The pipeline company owns the assets
- ❖ Normally governed by a board of directors or management committee
- ❖ May be operated by one of the owners or by an operating company
- ❖ Pipeline has one tariff
- ❖ Operator markets space and handles shipper relations
- ❖ Directors or shareholders decide on major financial decisions such as expansions
- ❖ Owners receive dividends

Partnership or LLC Companies

- ❖ Owners own a percentage of the pipeline company
- ❖ The pipeline company owns the assets
- ❖ Normally governed by a or management committee
- ❖ May be operated by one of the owners or by an operating company
- ❖ Pipeline has one tariff
- ❖ Operator markets space and handles shipper relations
- ❖ Directors or shareholders decide on major financial decisions such as expansions
- ❖ Owners received distributions

Undivided Joint Interest Pipelines

- ❖ Each owner has the right to certain capacity and owns a certain portion of each asset
- ❖ Normally one owner operates on behalf of the other owners
- ❖ But each owner publishes their own tariffs and markets their own space
- ❖ Portions of shipper relations are handled by the operator and others by the owners
- ❖ Normally owners can choose to participate or not in expansions
- ❖ Normally oil pipelines and not gas pipelines

Master Limited Partnerships

- ❖ General partner (GP) and limited partners (LP)
- ❖ GP manages the company
- ❖ LP's are investors
- ❖ "Units" rather than shares
- ❖ Units trade on stock exchanges
- ❖ Owners receive distribution vs dividends
- ❖ Distributions are pretax
- ❖ Part may be treated as return of capital
- ❖ Part to all of the taxes may be deferred until the unit are sold

General Partner Economics

- ❖ GP and LP both want increased distributions
- ❖ GP is given an incentive to grow distributions
- ❖ One possible arrangement
 - ❖ GP owns 2% of the company.
 - ❖ As long as distributions are below a certain amount per unit the GP receives their proportionate share.
- ❖ If GP grows distributions they receive increasingly larger percentages of each increase. For example...

❖ 2%	0 – 60 cents
❖ 15%	61 – 72 cents
❖ 25%	73 – 93 cents
❖ 50%	94+ cents

Limited Partner Economics

- ❖ Limited partners typically are looking for
 - ❖ Income
 - ❖ Tax savings
 - ❖ Growth
- ❖ Income
 - ❖ Normally distribute pretax income less ongoing capex needs
 - ❖ Typically trade at 2 to 2.5 percent above 10 year T bill
- ❖ Tax Savings
 - ❖ Portion of distribution shielded from current tax as return of capital
 - ❖ Return of capital lowers tax basis and taxes must be paid on sale
- ❖ Growth – Purchases and new investment opportunities

The Pipeline Business Model

Earnings = Revenue – Expenses

❖ Revenues

❖ Transportation

- ❖ Rate per unit
- ❖ Units moved

❖ Storage

- ❖ Space
- ❖ Time
- ❖ Movements
- ❖ Other

❖ Expenses – the big three and other

- ❖ People
- ❖ Power
- ❖ Maintenance
- ❖ Other

Rate Setting Mechanisms

- ❖ Cost of service – Interstate gas and oil
 - ❖ Valuation (rate base)
 - ❖ Allowed return
 - ❖ Equity
 - ❖ Debt
 - ❖ Operating and other costs
 - ❖ Volumes
- ❖ Annual index adjustments – Oil
- ❖ Market based rates – Oil and Gas
- ❖ Negotiated rates – Gas and Oil
- ❖ Commission rate filings – LDC

• Many years of history, involving multiple entities, and changes in accounting laws, make regulations and calculations complex

Cost of Service

Overall Return on and of Rate Base

Return on debt + return on equity +
income tax allowance on return on equity =
Total return on rate base

Total return on rate base + depreciation +
allowable expenses =
allowable revenue

Allowable revenue/total volumes =
Rate per unit volume

Return on Rate Base

Average adjusted net original cost rate base X debt
component of capital structure X cost of debt =
return on debt

Average adjusted net original cost rate base X
equity component of capital structure X cost of
equity = return on equity

Income Tax Allowance

- ❖ Return on equity (net income after taxes)
- ❖ Composite state and federal income tax rate

One - composite state and federal income tax rate =
factor to gross up for federal and state income tax

Net income after taxes X
Factor from above =
Income tax allowance

Development of Rate Base

Gross carrier property in service + gross right of way + land =
Total gross carrier property

Accumulated depreciation of carrier property in service +
Accumulated depreciation of right of way =
Accumulated depreciation

Total gross carrier property – accumulated depreciation =
net original rate base

Net original rate base – accumulated deferred taxes =
Adjusted net original rate base

Progressive yearly average = Average adjusted original rate base

Overall Return on and of Rate Base

Return on debt + return on equity +
income tax allowance on return on equity =
Total return on rate base

Total return on rate base + depreciation +
allowable expenses =
allowable revenue

Allowable revenue/total volumes =
Rate per unit volume

Annual Index Adjustment – Oil Pipelines

- ❖ Title XVIII of the Energy Policy Act of 1992
 - ❖ Deemed rates in effect as of October 24, 1992 which had not been protested as just and reasonable
 - ❖ Allowed protest under “substantial change”
- ❖ Rates in effect at that time could be adjusted annually based on a published index
 - ❖ Started with PPI-FG minus a productivity improvement of 1 percent
 - ❖ Currently at PPI-FG plus 1.3 percent
- ❖ For a review of the Energy Policy Act of 1992 and its impact on oil pipeline rates see an article by Steven Reed and Pantelis Michalopoulos, available at http://www.eba-net.org/elj/Energy%20Journals/Vol16_No1_1995_Oil_Pipeline.pdf

Market Based Rates

- ❖ Oil market based rates grew from a 1987 Buckeye Pipe Line Company rate case
- ❖ FERC Order 636 issued in 1992 opened the door to gas market based rates
- ❖ Pipelines file with the FERC various studies showing they lack “market power” (The market(s) they serve is (are) competitive to the extent market forces will effectively mitigate rate increases)
- ❖ Allows the pipeline to file rates without cost of service or other support
- ❖ Can be in effect for some but not all markets served by a pipeline

Negotiated Rates

- ❖ Pipelines and customers negotiate rates
 - ❖ Unusual or changed circumstances
 - ❖ Desired expansions
 - ❖ Market changes
 - ❖ Changes in service
- ❖ Open seasons for new and expansion projects
 - ❖ Non binding expression of interest
 - ❖ Binding open seasons
 - ❖ Regulatory approval

Crude Oil Pipeline Tariff

F.E.R.C. No. 121
Cancels F.E.R.C. No. 80

ConocoPhillips Pipe Line Company

Local Proportional Tariff Applying On Crude Petroleum

The rates published in this tariff are for the transportation of Crude Petroleum by pipeline, subject to the regulations named in ConocoPhillips Pipe Line Company F.E.R.C. No. 2 and supplements thereto or subsequent issues thereof. Rates are payable in United States currency.

From	To	Rate in Cents per Barrel of 42 United States Gallons
Jal, Lea County, New Mexico Wink, Winkler County, Texas Midland, Midland County, Texas Colorado City, Scurry County, Texas	Ponca City, Kay County, Oklahoma	[1] 64.40

The provisions published herein will, if effective, not result in an effect on the quality of the human environment.

[1] Increased Rate.

Filed in compliance with 18 CFR 342.3 (Indexing).

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Issued by
Margaret A. Yaeger, President
ConocoPhillips Pipe Line Company
P. O. Box 2197
Houston, Texas 77252-2197

Compiled by
Larry Vickrey, Director, Tariffs
ConocoPhillips Pipe Line Company
P. O. Box 2197
Houston, Texas 77252-2197
(281) 293-2135
Fax: (281) 293-3024

Typical Oil Pipeline Tariff Table of Contents

Topic	Revision Date	Size
Table of Contents		
2. Informational Topics	9/10/2007	104KB
3. Product Specifications (effective April 2, 2008) NEW!	3/3/2008	703KB
4. Quality Assurance	11/16/2007	34KB
5. Tariffs	9/10/2007	6KB
▶ Tariff Filing Letter (March 3, 2008) NEW!	3/3/2008	69KB
▶ Tariff Filing Letter (Aug 24, 2007)	8/24/2007	77KB
▶ FERC 87 Rates Tariff	5/31/2007	1300KB
▶ FERC 86 Rules & Regulations Tariff	2/14/2007	51KB
▶ FERC 86 Supplement No. 3 Rules & Regulations Tariff	8/24/2007	17KB
▶ FERC 86 Supplement No. 4 Rules & Regulations Tariff (cancels Supplement No. 3, effective April 2, 2008) NEW!	3/3/2008	101KB
▶ FERC 88 Joint Rates Tariff with ConocoPhillips	5/31/2007	57KB
▶ FERC 88 Tariff Supplement No. 1	8/24/2007	14KB
▶ FERC 88 Tariff Supplement No. 2 (cancels Supplement No. 1, effective April 2, 2008) NEW!	3/3/2008	44KB
▶ FERC 89 Joint Rates Tariff with Bengal Pipeline	5/31/2007	26KB
▶ LAPSC 1 Local Rates Tariff for Baton Rouge Barge Dock	4/11/2006	187KB
7. Invoicing Information	9/10/2007	20KB
8. Scheduling Exam	1/1/2000	14KB

Extracted March 4, 2004 from http://www.colpipe.com/cs_man.asp

Typical Oil Pipeline Rate Table

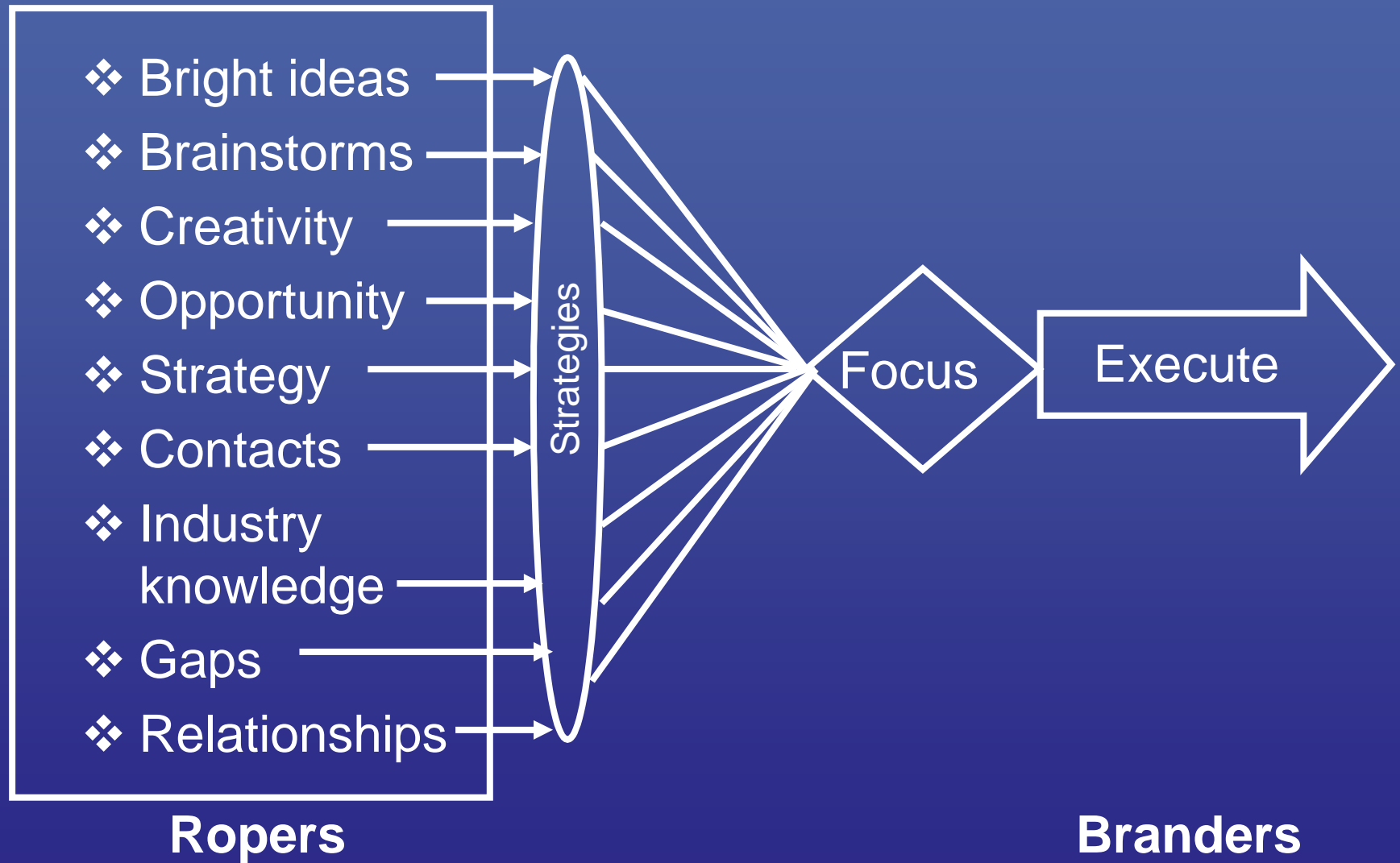
[I] Increase. All Rates on This Page are Increased.					
TABLE OF RATES					
Rates in Cents per Barrel of 42 United States Gallons					
ITEM	DESTINATION	POINTS OF ORIGIN			
		Houston (Pasadena) Harris County, Texas	Hebert (Beaumont- Port Arthur) Jefferson County, Texas	Lake Charles Calcasieu Parish, Louisiana	Krotz Springs St. Landry Parish, Louisiana
1	<u>State of Alabama</u>				
	Birmingham (Jefferson County)	79.20	72.95	70.64	62.99
	Birmingham-Helena (Shelby County)	[P] 79.20	[P] 72.95	[P] 70.64	[P] 62.99
	Oxford (Calhoun County)	86.05	79.80	77.49	69.84
30	<u>State of Georgia</u>				
	Albany (Dougherty County)	101.02	94.77	92.46	84.81
	Albany-South (Dougherty County)	101.02	94.77	92.46	84.81
	Americus (Sumter County)	100.24	93.99	91.68	84.03
	Athens (Clarke County)	[F1] 95.94	[F1] 89.69	[F1] 87.38	[F1] 79.73
	Atlanta-Chattahoochee (Fulton County)	91.71	85.46	83.15	75.50
	Atlanta-Doraville (DeKalb County)	91.71	85.46	83.15	75.50
	Atlanta-Wm. B. Hartsfield Atlanta International Airport (Fulton County) (4)	107.02	100.77	98.46	90.81
	Atlanta-Powder Springs (Cobb County)	91.71	85.46	83.15	75.50
	Bainbridge (Decatur County)	103.16	96.91	94.60	86.95
	Griffin (Spaulding County)	94.65	88.40	86.09	78.44
	Lookout Mountain-Chattanooga (Walker County)	97.11	90.86	88.55	80.90
	Macon (Bibb County)	97.11	90.86	88.55	80.90

Extracted March 4, 2004 from http://www.colpipe.com/cs_man.asp

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Business Development

The Role of Business Development



Types of Business Development

- ❖ Short term optimization of current assets
 - ❖ Requires limited capital expenditures
 - ❖ Results in incremental earnings
 - ❖ Connections
 - ❖ Debottlenecks
 - ❖ Special services
 - ❖ Small capacity increases
- ❖ Long term expansion of the business
 - ❖ Involves new assets or new business models
 - ❖ Normally requires medium to large capital expenditures
 - ❖ Significant earnings increases (hopefully)
 - ❖ Most acquisitions
 - ❖ Major expansions
 - ❖ Extensions of service

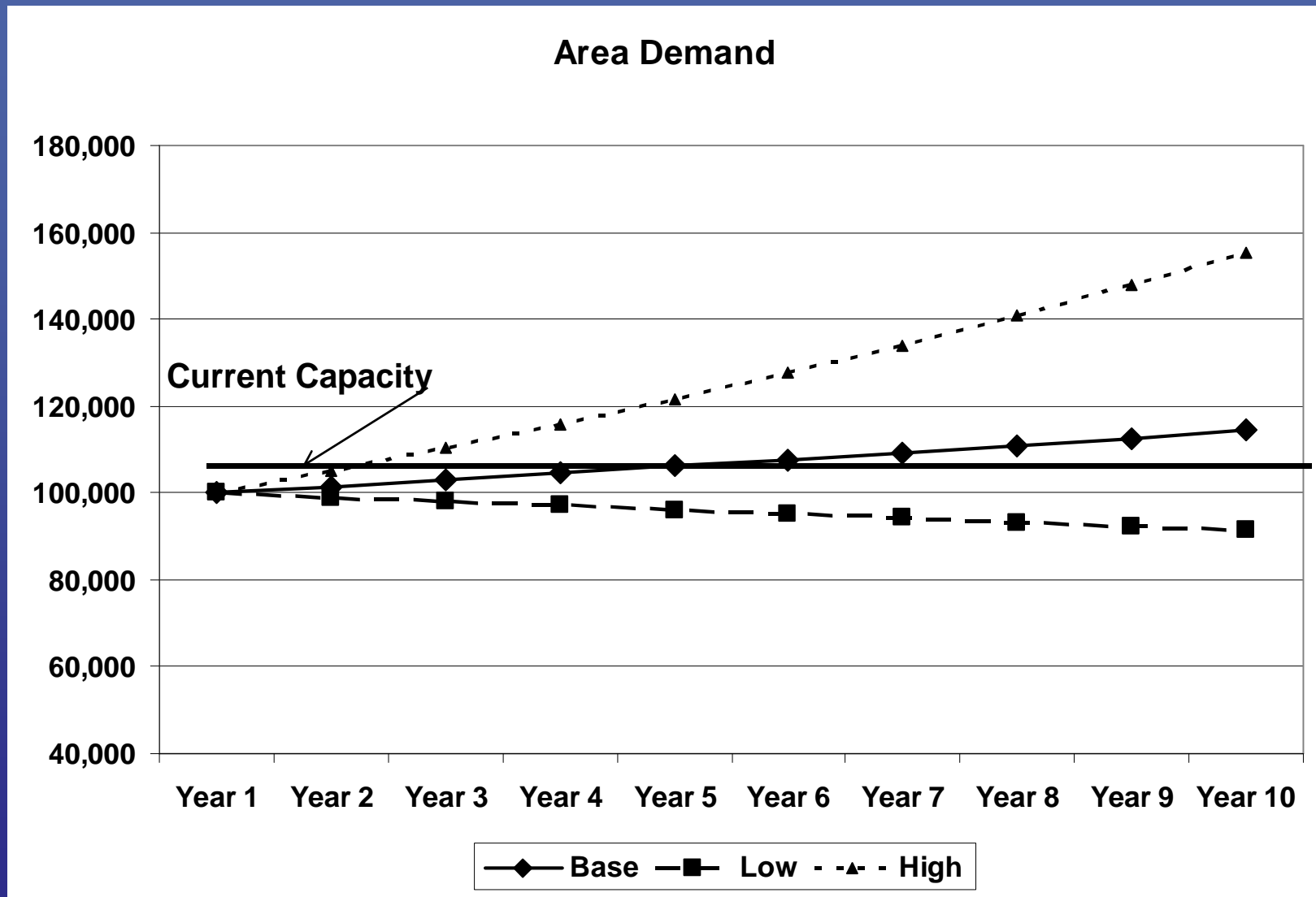
Project Economics

- ❖ Select origins and destinations
- ❖ Estimate (normally ranges or high, low, and base)
 - ❖ Volumes
 - ❖ Rates
 - ❖ Capital costs
 - ❖ Operating expenses
 - ❖ Life
- ❖ Select required returns
- ❖ Calculate preliminary economics
- ❖ Refine economics
- ❖ Conduct negotiations
- ❖ Receive management agreement
- ❖ Sign agreements

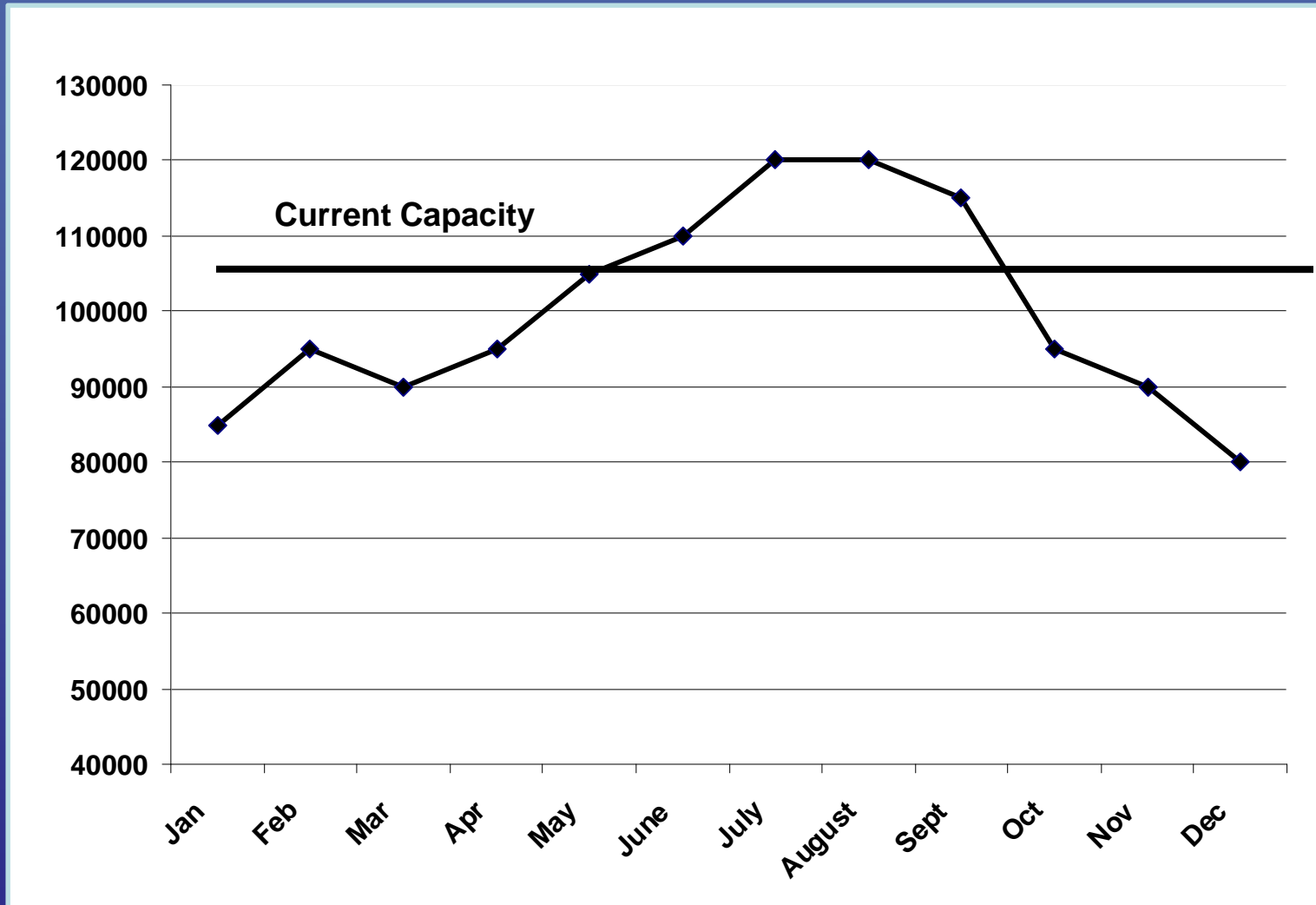
Project Economics – Required Information

- ❖ Project description
- ❖ Agreed cases
 - ❖ Route
 - ❖ Supply and demand
 - ❖ Competition
- ❖ Estimates
 - ❖ Volumes
 - ❖ Rates
 - ❖ Capital costs
 - ❖ Operating expenses
- ❖ Assumptions
 - ❖ Required return
 - ❖ Tax
 - ❖ Inflation

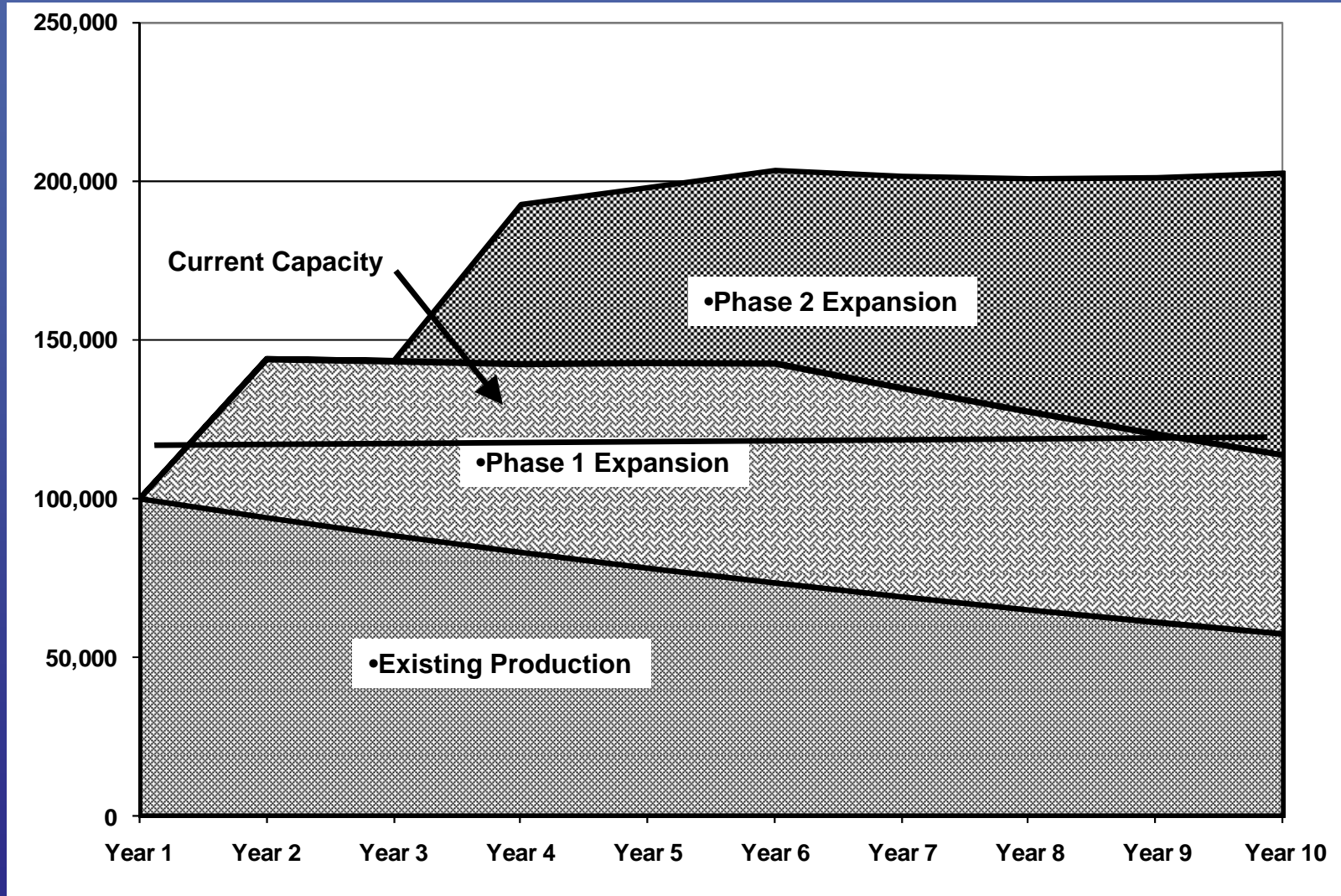
Annual Demand Example



Monthly Demand Example



Production Volume Estimates



Estimating Rates

- ❖ Cost of service
- ❖ Competition
- ❖ Shipper negotiations
- ❖ Open seasons

Estimating the Rate

<u>Origin</u>	<u>Destination</u>	<u>Rate</u>	<u>Commodity</u>
Norco	Baton Rouge	\$0.23	Products
Clovelly	Norco	\$0.23	Crude Oil
Baton Rouge, LA	East Baton Rouge	\$0.33	Benzene
Baton Rouge, LA	Sorrento Storage and return	\$0.37	Isobutane
Baton Rouge, LA	Sorrento Storage and return	\$0.37	Propane
Baton Rouge, LA	Sorrento Storage and return	\$0.37	Raw Make
Baton Rouge, LA	Sorrento Storage and return	\$0.37	Butylene
Baton Rouge, LA	Sorrento Storage and return	\$0.37	Field Nat. Gasoline
Choctaw Dome Storage	Anchorage Chemical Terminal	\$0.53	Light Hydrocarbons
Enterprise Bayou Sorrel, LA	Baton Rouge, LA	\$0.42	Propylene
Enterprise Lou-Tex PL	Baton Rouge, LA	\$0.38	Propylene
Baton Rouge Gas Plant	Garden City Gas Plant	\$0.51	Light Hydrocarbons
Garden City Gas Plant	Anchorage Chemical Terminal	\$0.53	Light Hydrocarbons
Geismar, LA	Baton Rouge	\$0.42	Normal Butane
Geismar, LA	Baton Rouge	\$0.44	Isobutane
Geismar, LA	Baton Rouge	\$0.44	Propane
Geismar, LA	Baton Rouge	\$0.44	Propylene
Geismar, LA	Baton Rouge	\$0.44	Butylenes
Sorrento Storage, LA	Baton Rouge or Sorrento	\$0.44	Propane
Palquemines Parish, LA	St. James Parish	<u>\$0.63</u>	Liqified Petroleum
Average		\$0.41	

Estimating Capital and Operating Costs

❖ Capital costs

- ❖ Perform preliminary design (s)
- ❖ Establish cost estimate range(s)
 - ❖ Clean sheet estimate
 - ❖ Rules of thumb

❖ Operating costs

- ❖ Categories
 - ❖ People
 - ❖ Power
 - ❖ Maintenance
 - ❖ Other
- ❖ Inflation factors

Calculating IRR

Investment	\$ 10,000	Years									
		1	2	3	4	5	6	7	8	9	10
		(\$M)									
Volumes (MBPD)		50	52	54	57	60	63	63	63	63	63
Rate		<u>0.34</u>	<u>0.34</u>	<u>0.34</u>	<u>0.34</u>	<u>0.34</u>	<u>0.34</u>	<u>0.34</u>	<u>0.34</u>	<u>0.34</u>	<u>0.34</u>
Total Revenue		6,205	6,391	6,711	7,046	7,399	7,768	7,768	7,768	7,768	7,768
Salaries		925	953	981	1,011	1,041	1,072	1,104	1,138	1,172	1,207
Benefits		278	286	294	303	312	322	331	341	352	362
Fuel and Power		1,132	1,166	1,201	1,237	1,274	1,312	1,352	1,392	1,434	1,477
Supplies		50	52	53	55	56	58	60	61	63	65
Maintenance		745	767	790	814	839	864	890	916	944	972
Insurance		200	206	212	219	225	232	239	246	253	261
Property Taxes		75	77	80	82	84	87	90	92	95	98
Other		450	464	477	492	506	522	537	553	570	587
Depreciation		<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>
Total Expenses		4,855	4,970	5,089	5,212	5,338	5,468	5,602	5,741	5,883	6,029
Pretax Income		1,351	1,421	1,621	1,834	2,060	2,300	2,166	2,028	1,886	1,739
Income Tax		<u>473</u>	<u>497</u>	<u>568</u>	<u>642</u>	<u>721</u>	<u>805</u>	<u>758</u>	<u>710</u>	<u>660</u>	<u>609</u>
Earnings		878	924	1,054	1,192	1,339	1,495	1,408	1,318	1,226	1,131
Cash flow	\$(10,000)	1,878	1,924	2,054	2,192	2,339	2,495	2,408	2,318	2,226	2,131
IRR		17%									
NPV @12%		\$1,938									

Economics of Non-Return Projects

Non-return Expenditure Levels

- ❖ Minimum expenditure level
 1. Maintain production capability
 2. Comply with rules and regulations
 3. Maintain risk at acceptable levels
- ❖ The overall business must provide positive return
- ❖ Capital vs maintenance is an accounting issue

- ❖ 1 and 2 can be quantified, but what about 3?
- ❖ Risk (consequences vs probability) can be ranked
- ❖ In the final analysis this is a management judgement

Performing Pipeline Appraisals

The Appraisal Process

- ❖ Seeks to determine what price the assets would command in the market place
- ❖ Requires a thorough understanding of the industry and the market place
- ❖ Combines calculations and facts with judgment and decision making
- ❖ Must be conducted by an independent appraiser with no economic ties

Appraisal Methodologies

- ❖ Economic value
 - ❖ How much is it worth?
 - ❖ Good measure for productive assets
- ❖ Comparable Sales
 - ❖ Based on sales price of similar items
 - ❖ Good measure for nonproductive assets
- ❖ Reconstruction cost new
 - ❖ Serves as an upper price limit
 - ❖ May have to be raised for going concern value or lowered to recognize wear and tear
- ❖ Highest and best use
 - ❖ Reflects value in alternative service

Economic Value Calculations

❖ Present value

- ❖ Forecast annual cash flow
 - ❖ Revenue
 - ❖ Expenses (cash and noncash)
- ❖ Determine discount rate
- ❖ Discount cash flows to the present

❖ Multiples

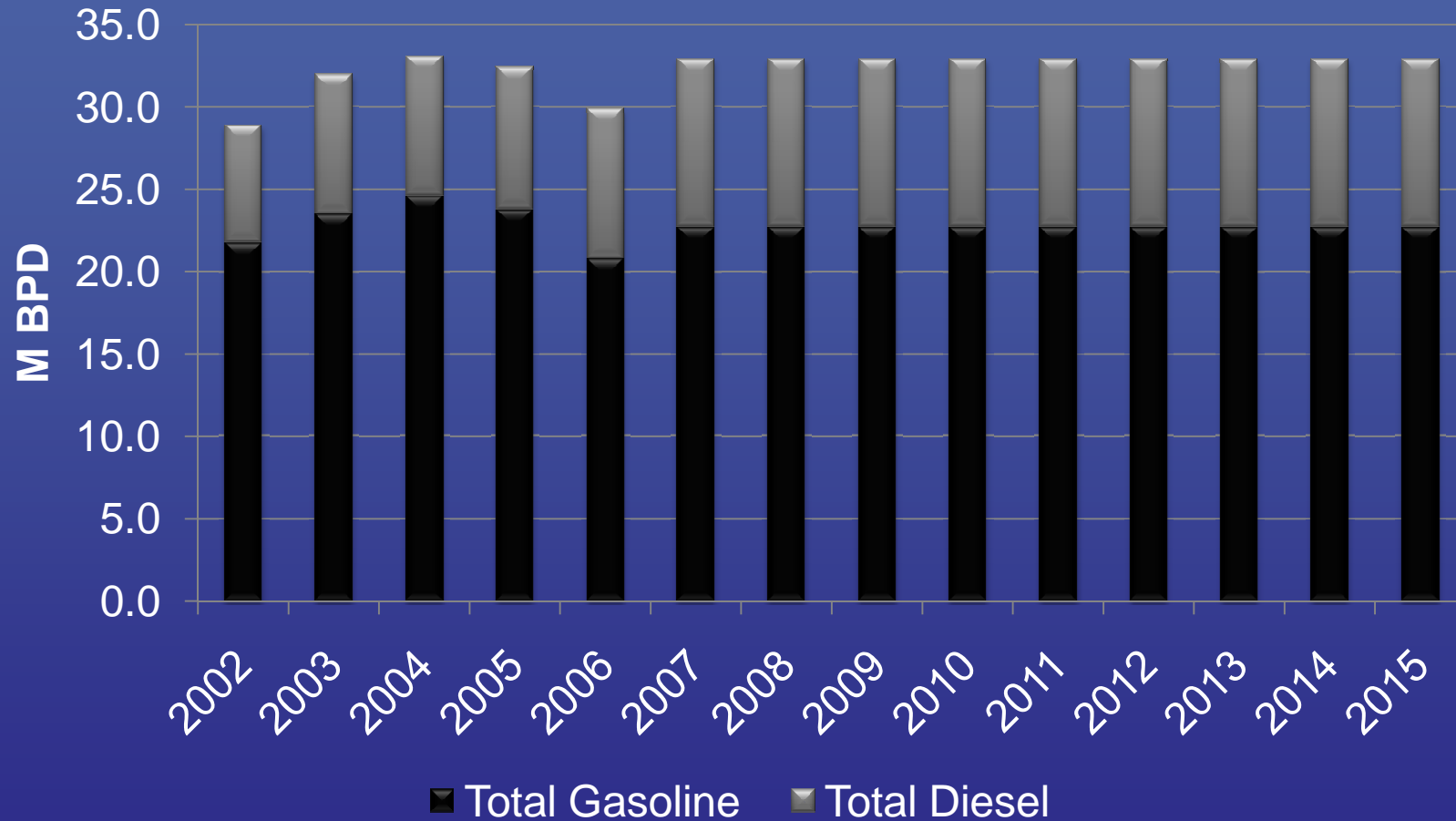
- ❖ EBITDA
- ❖ Free cash flow
- ❖ Distributable cash
- ❖ Others as agreed

Example of Pretax Income Calculations

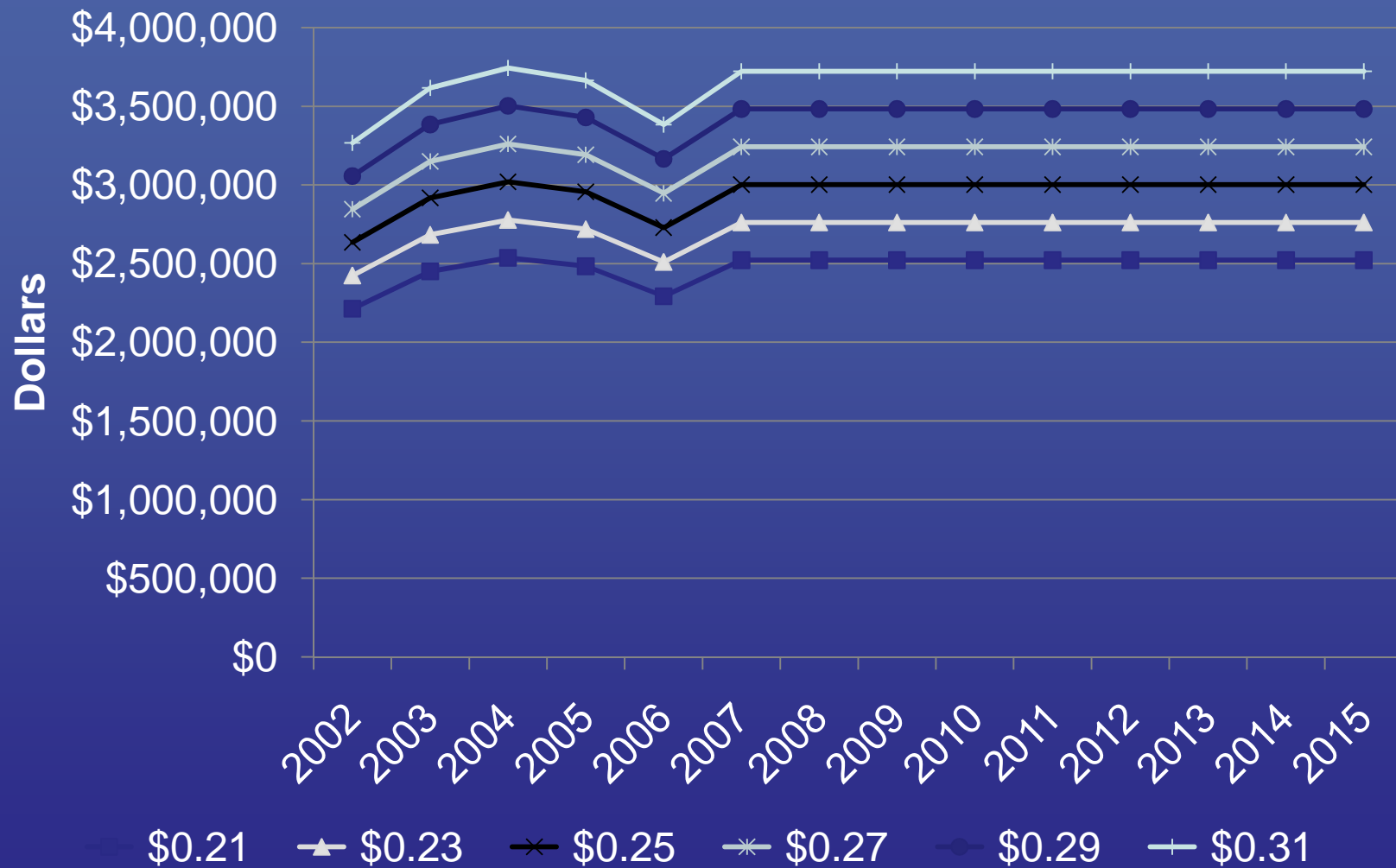
Category	Year 1	Year 2	Year 3	Year 4	Year 5
Volumes (BPD)	50,000	51,500	53,045	54,636	56,275
Rate	\$0.50	\$0.51	\$0.52	\$0.53	\$0.54
Total Revenue	\$9,125,000	\$9,586,725	\$10,071,813	\$10,581,447	\$11,116,868
Salaries and Wages	\$2,500,000	2,575,000	2,652,250	2,731,818	2,813,772
Benefits	\$875,000	\$901,250	\$928,288	\$956,136	\$984,820
Fuel and Power	\$3,050,000	3,233,000	3,426,980	3,632,599	3,850,555
Operating Supplies	\$425,000	437,750	450,883	464,409	478,341
Maintenance	\$250,000	257,500	265,225	273,182	281,377
Insurance	\$75,000	77,250	79,568	81,955	84,413
Property Taxes	\$150,000	154,500	159,135	163,909	168,826
Other	\$725,000	746,750	769,153	792,227	815,994
Depreciation	\$450,000	450,000	450,000	450,000	450,000
Total Expenses	\$8,500,000	\$8,833,000	\$9,181,480	\$9,546,234	\$9,928,099
Pretax Income	\$625,000	\$753,725	\$890,333	\$1,035,213	\$1,188,769

Economic Valuation Scoping Example

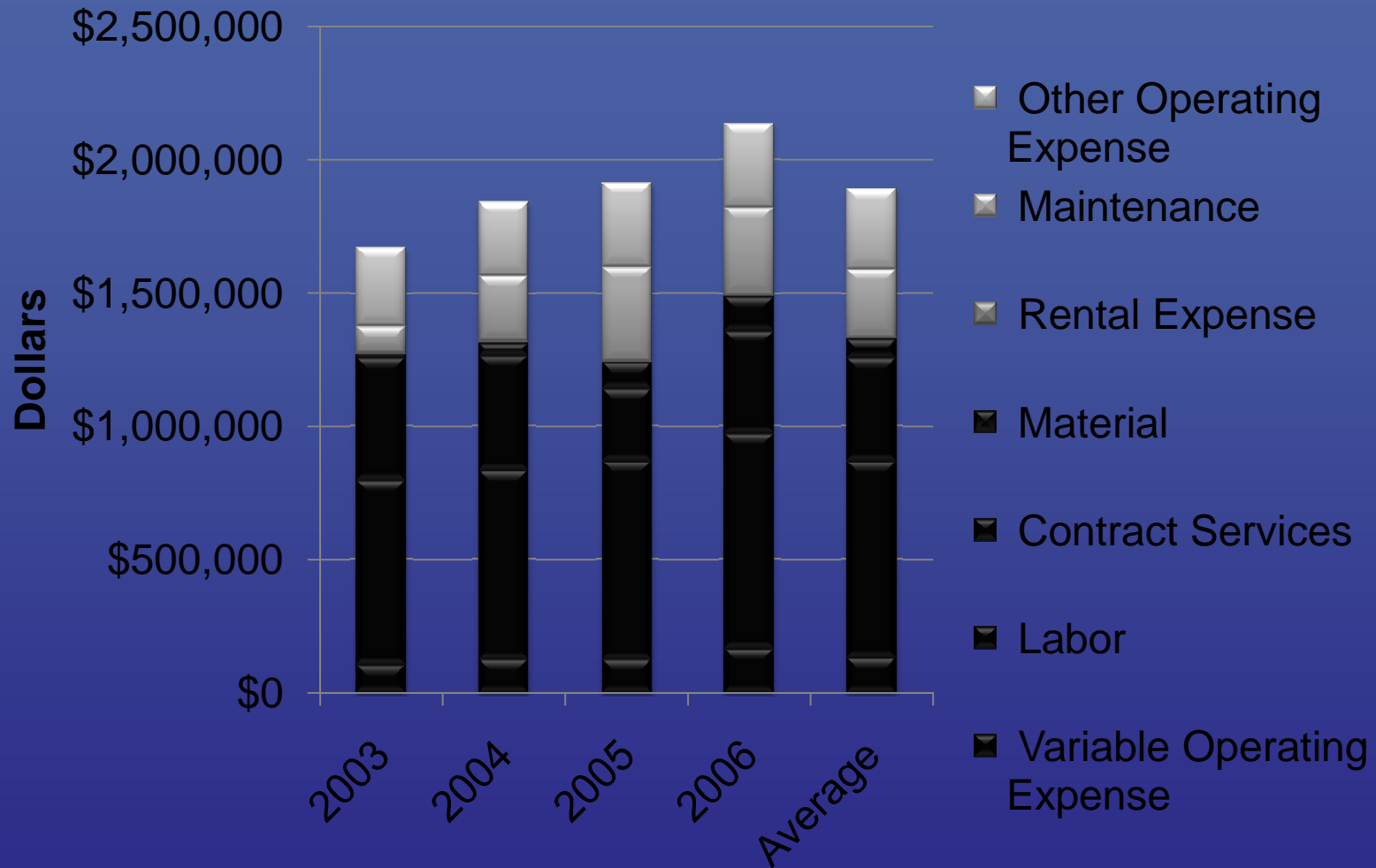
Terminal Volumes



Revenue at Various Rates



Operating Expenses



Valuation Assumptions

	Low	Mid	High
Revenue	\$2,300,000	\$2,750,000	\$3,250,000
Expenses	\$1,700,000	\$1,900,000	\$2,100,000
Multiple	10	12	16

Revenue/Expense Combinations	EBITDA
Mid/Mid	\$ 850,000
Low/High	\$ 200,000
High/Low	\$1,550,000

Valuation Matrix and Value

	10	12	16
\$ 200,000	\$2,000,000	\$ 2,400,000	\$ 3,200,000
\$ 850,000	\$8,500,000	\$10,200,200	\$13,600,000
\$1,550,000	\$15,500,000	\$18,600,000	\$24,800,000

This analysis considers the economic value of the terminals as distribution assets. Based on this consideration and the interest in asset based investments in the petroleum sector the economic value of the terminals as distribution assets is between \$10 and \$25 million with the value likely towards the upper end of the range.

Comparable Sales

- ❖ Common method to perform real estate appraisals
- ❖ Begin with comparable sales
- ❖ Make adjustments to compensate for dissimilarities
- ❖ Average several adjusted values together
- ❖ Works well when there are many sales of similar items (houses in a subdivision for example)
- ❖ Does not work well for pipelines because of differences
- ❖ Can work well for terminals and tank farms

Reconstruction Cost

- ❖ Develop a design for the replacement asset
- ❖ Develop a cost estimate based on the design
- ❖ Level of detail may vary
- ❖ The objective is accuracy, not precision
- ❖ May lower the RCN number to account for age and condition of the asset
- ❖ Based on the theory that no one would pay more than the replacement cost
- ❖ But, there may be going concern value drive by permitting and construction risk
- ❖ Generally serves as a ceiling value

Example Reconstruction Cost New

	<u>Unit Costs</u>			
	Materials	Labor	Misc	ROW
	(\$ Per Dia Inch Mile)	(\$ Per Dia Inch Mile)	(\$ Per Mile)	(\$ Per Mile)

	\$11,000	\$21,000	\$387,000	\$89,000
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Calculations

Cost Per Mile Based on Normalization

10-Inch	\$110,000	\$210,000	\$387,000	\$89,000	\$796,000
6-Inch	\$66,000	\$126,000	\$241,000	\$66,000	\$499,000

Total Cost Based Normalization Except for Misc @ 20%

10-Inch	\$8,946,300	\$17,079,300	\$6,652,794	\$7,238,370	\$39,916,764
6-Inch	\$337,260	\$643,860	\$263,676	\$337,260	<u>\$1,582,056</u>
Total					\$41,498,820

Highest and Best Use

- ❖ Examines other uses for the asset
- ❖ Abandoned pipeline could be taken up and used as structural steel
- ❖ Pump or compressor sites could be used to build high rise condos
- ❖ Pipeline rights of ways could be used for fiber optic cables
- ❖ Requires logic checks to ensure assumptions are reasonable
- ❖ Usually the highest and best use of a pipeline will be as a pipeline but it may be in alternative service for example, a crude oil line converted to gas service

Gas Gathering Line Appraisal Example

- ❖ Owners wanted to transfer ownership
- ❖ Put together team
 - ❖ Engineering
 - ❖ Operations
 - ❖ Environmental
 - ❖ Financial
 - ❖ Economic
- ❖ Conducted site tour
- ❖ Analyzed historical and developed forecast data
- ❖ Blended economic value and RCN
- ❖ Produced substantive report with rational
- ❖ Worked with auditors

Economic Cases Considered

- ❖ Case 1 - Minimum Daily Quantities for the first 10 years only.
- ❖ Case 2 - Volumes based on total reserves from the production forecast.
- ❖ Case 3 - Minimum Daily Quantities for the first 10 years and then keeping the year 10 MDQ level for the next 5 years.
- ❖ Case 4 - Only developed volumes from the production forecast
- ❖ Case 5 - The pipeline earns a FERC cost of service return.

Economic Valuation Calculations

Appendix G - Case 1

Assumptions

Volumes based on MDQ from Agreement	
Rate per MMBtu until pipeline is paid back	\$0.50
Rate per MMBtu after payback	\$0.25
Inflation Rate	3.0%
Discount Rate	8.00%

Year	MDQ (MMBtu/day)	MDQ (MMBtu/Year)	Revenue	Pipeline Payout Balance	Cumulative Payout	Management Fee	Opex	EBITDA
2005	1,500	547,500	\$273,750	\$2,336,092.00	\$273,750	\$5,475	\$110,000	\$158,275
2006	2,000	730,000	\$365,000	\$1,971,092.00	\$638,750	\$7,300	\$113,300	\$244,400
2007	3,000	1,095,000	\$547,500	\$1,423,592.00	\$1,186,250	\$10,950	\$116,699	\$419,851
2008	4,000	1,460,000	\$730,000	\$693,592.00	\$1,916,250	\$14,600	\$120,200	\$595,200
2009	5,000	1,825,000	\$803,046	\$0.00	\$2,609,842	\$16,061	\$123,806	\$663,179
2010	6,000	2,190,000	\$563,925			\$11,279	\$127,520	\$425,126
2011	7,000	2,555,000	\$677,650			\$13,553	\$131,346	\$532,751
2012	8,000	2,920,000	\$797,691			\$15,954	\$135,286	\$646,451
2013	9,000	3,285,000	\$924,324			\$18,486	\$139,345	\$766,493
2014	10,000	3,650,000	\$1,057,838			\$21,157	\$143,525	\$893,156
2015		237,330	\$70,846			\$1,417	\$147,831	-\$78,402
2016		142,331	\$43,762			\$875	\$152,266	-\$109,379
2017		100,129	\$31,710			\$634	\$156,834	-\$125,758
2018		69,034	\$21,863			\$437	\$161,539	-\$140,113
2019			\$0			\$0	\$166,385	-\$166,385
2020			\$0			\$0	\$171,376	-\$171,376
2021			\$0			\$0	\$176,518	-\$176,518
Totals		18,980,000	\$6,101,973			\$122,039	\$1,037,727	\$4,942,207
Average								\$617,776
Net Present Value								\$3,437,713.18

Economic Value based on COS

Appendix G - Case 5

FERC Allowed Debt and Equity Return Plus Depreciation

Year	Allowed Return
2007	\$404,000
2008	\$374,000
2009	\$349,000
2010	\$326,000
2011	\$303,000
2012	\$283,000
2013	\$267,000
2014	\$254,000
2015	\$240,000
2016	\$227,000
2017	\$214,000
2018	\$201,000
2019	\$187,000
2020	\$90,000
2021	
Total	\$3,719,000
Average	\$265,643
NPV	\$2,385,167

Module Overview

- ❖ Role in the oil and gas value chain
- ❖ Evolution of the pipeline business model
- ❖ Ownership forms
- ❖ Current U. S. pipeline business model
- ❖ Business Development and Economics
 - ❖ Organic growth
 - ❖ Grassroots projects
- ❖ Maintenance economics
- ❖ Valuations

For more information please contact

Tom Miesner

tom@miesnerllc.com

281-579-8877
