

Williston Basin NGL

Production and Transportation

September 2, 2010

2:00 pm – 4:00 pm

Agenda

- Dan Lippe, Petral
- Alliance Pipeline
- Aux Sable
- ONEOK
- Vantage Pipeline

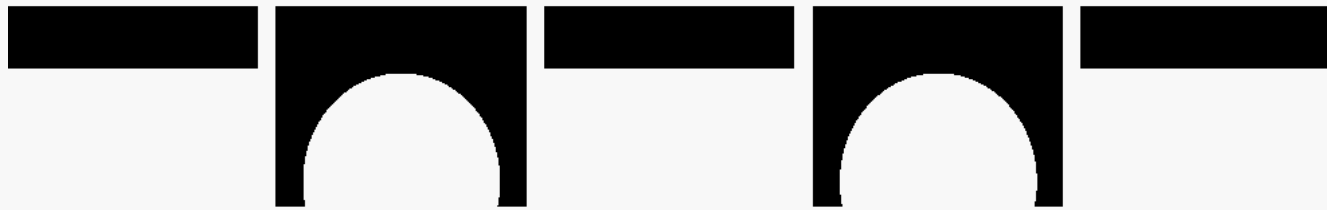
Tips For Viewers

- Q&A tab at the top of screen for questions
- Close all other applications on your computer: Outlook, etc

This meeting is being recorded and will be available at: www.pipeline.nd.gov

**NGL markets in North America:
supply, markets and pricing**

PETRAL CONSULTING

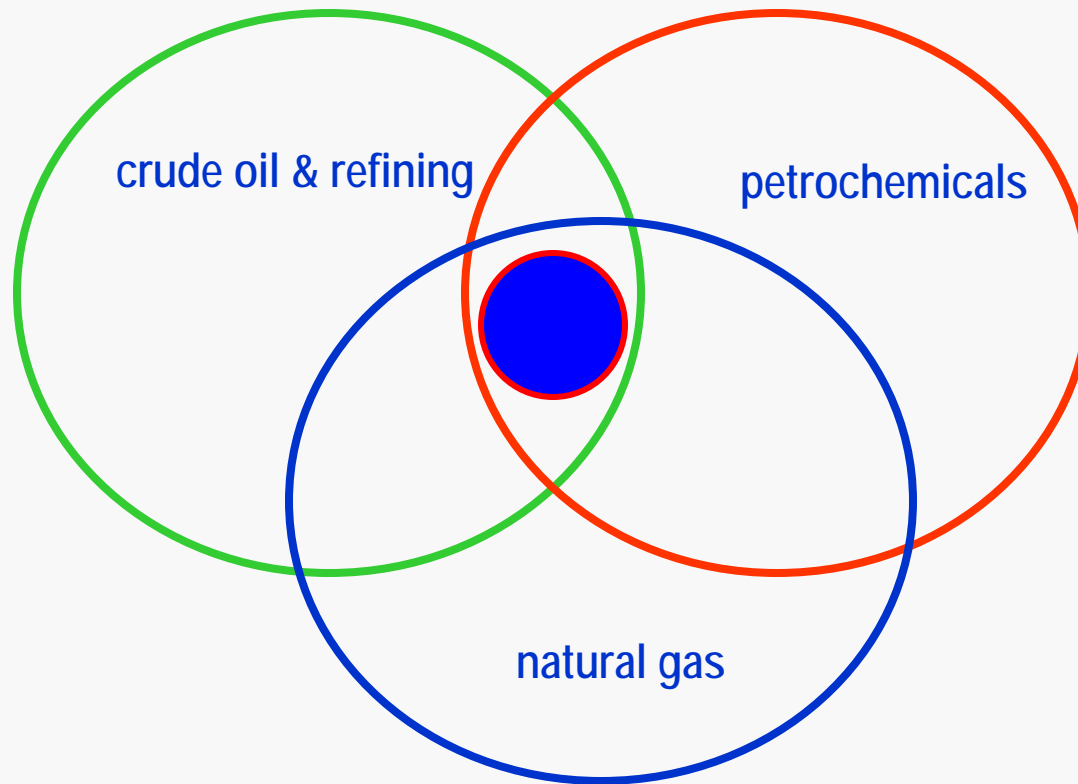


knowledge to bridge the gap

prepared for North Dakota PL Authority
September 2 2010 webinar

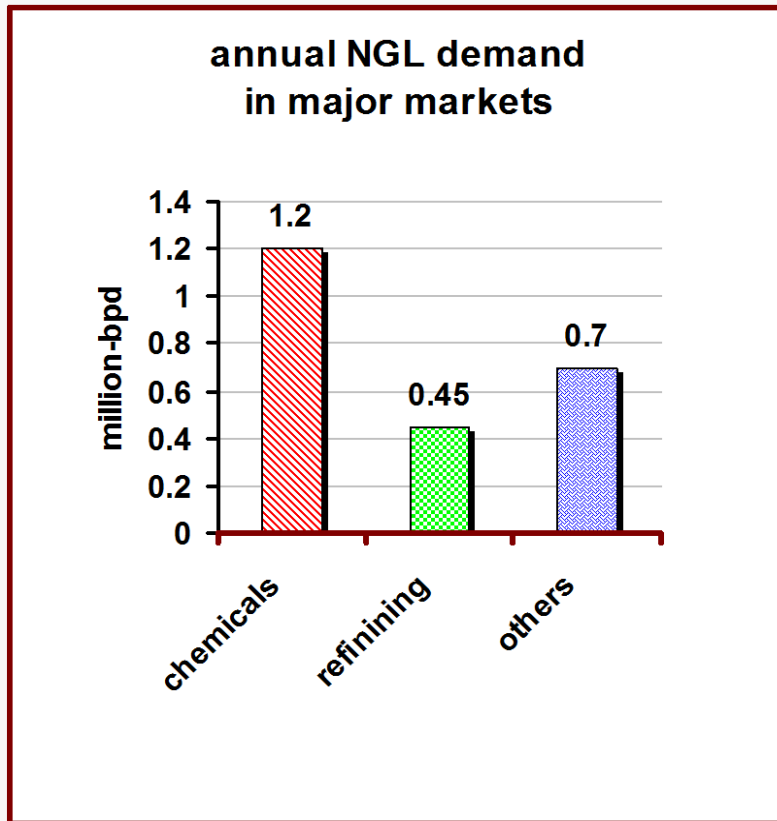
midstream industry

the bull's-eye at the center of the vortex



midstream industry

who are our customers?



- ❖ Ethylene production consumes 50% of U.S. NGL supply – ethane is the U.S. ethylene industry's largest volume feeds & ethylene is ethane's only market
- ❖ Refineries consume 20% of total U.S. NGL supply – primarily butanes & natural gasoline
- ❖ Sales to propane retailers account for the bulk of "others"
- ❖ Weather-driven seasonality affects refinery normal butane demand & retail propane sales; weather-driven seasonality does not directly influence ethylene production rates & feedstock demand

ethylene & NGL feedstock markets the last decade & the next decade

❖ 2005-2009

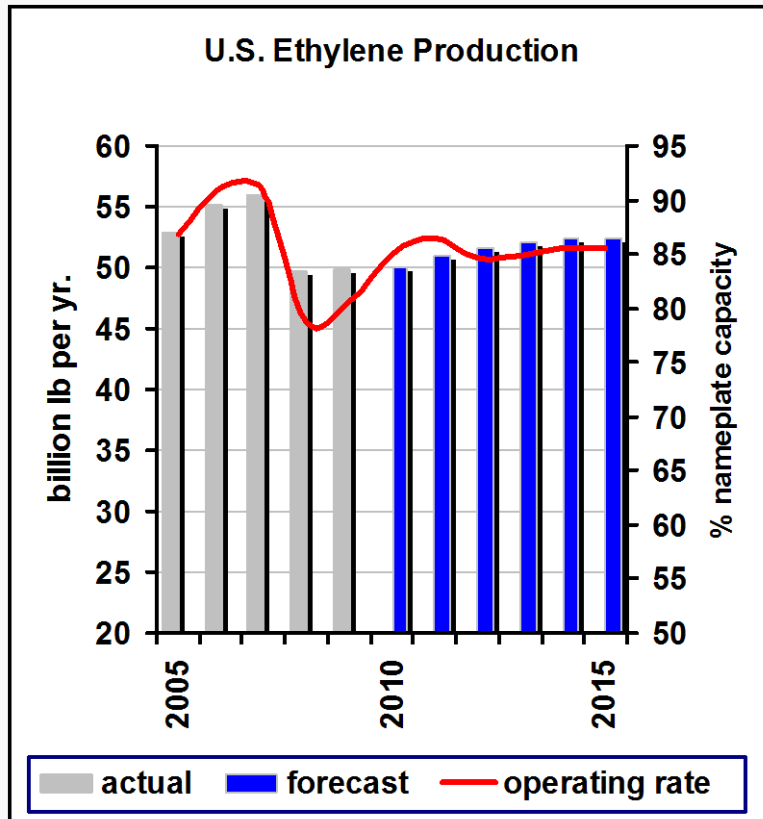
- » Economic recessions affected NGL feedstock markets in 2001-02 & 2007-09.
- » Population growth is a critical factor for PE demand; U.S. & Canada population increased by 22-25 million ethylene production slumped in both recessions but recovery pushed production to a record high in 2007.
- » Domestic producers had little or no cost advantage but were able to maintain PE exports anyway.

❖ 2010-2015

- » One or two recessions are likely but economic growth will be the norm for 7 or 8 years of the decade.
- » U.S. & Canada population expected to increase by 25-30 million by 2020.
- » U.S. producers will respond aggressively to economic incentives to increase ethane cracking capability; they will have cost advantages vs. producers in all other areas except new producers in the Middle East.

ethylene industry production

historic trends & near term forecast



- ❖ Producers operate in response to downstream sales requirements for PE, EO/EG, PVC; most sales are to domestic markets.
- ❖ Producers optimize operations to achieve minimum production costs.
- ❖ Primary markets for U.S. polyethylene exports are Canada, Mexico, and South America; Asia was a small but growing market during 2005-2009 when U.S. production costs were significantly higher than in the Middle East but were always competitive with European and Asian producers.

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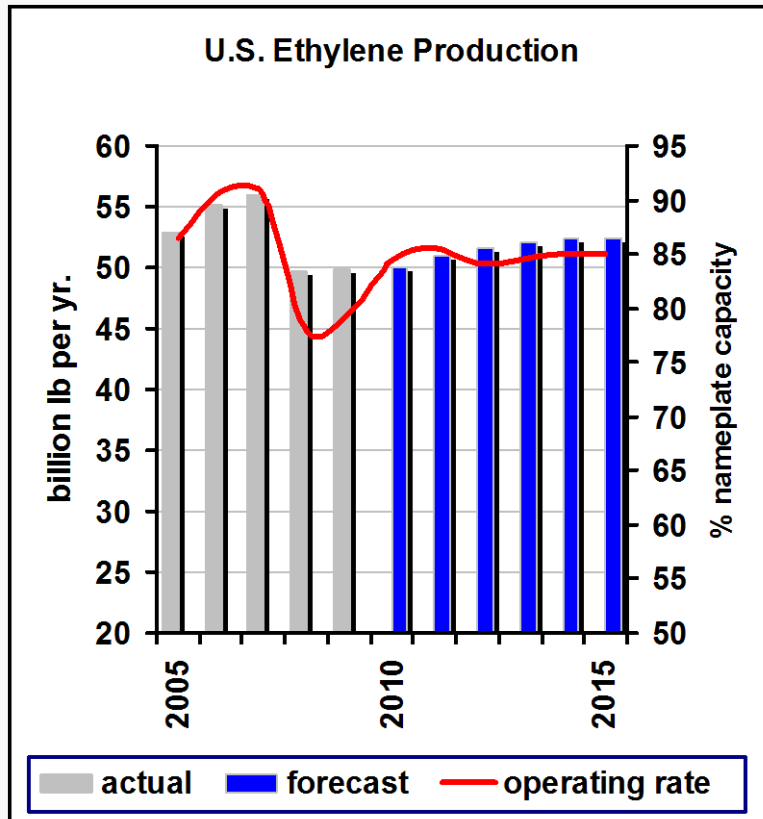
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Slide # 5

ethylene industry production

historic trends & forecast to 2015



- ❖ This forward view is based on 1) no growth in exports & 2) more consumers will “go green” and discontinue use of plastic grocery bags.
- ❖ Based on these considerations, ethylene production will average 51-53 billion lb/yr during 2010-2015
- ❖ if PE demand in Mexico & South America continues to grow at historic rates and U.S. PE producers maintain current market share, ethylene demand in the U.S. has the potential to reach 53-54 billion lb/yr by 2015 & total demand for feedstock will be higher – important for ethane markets.

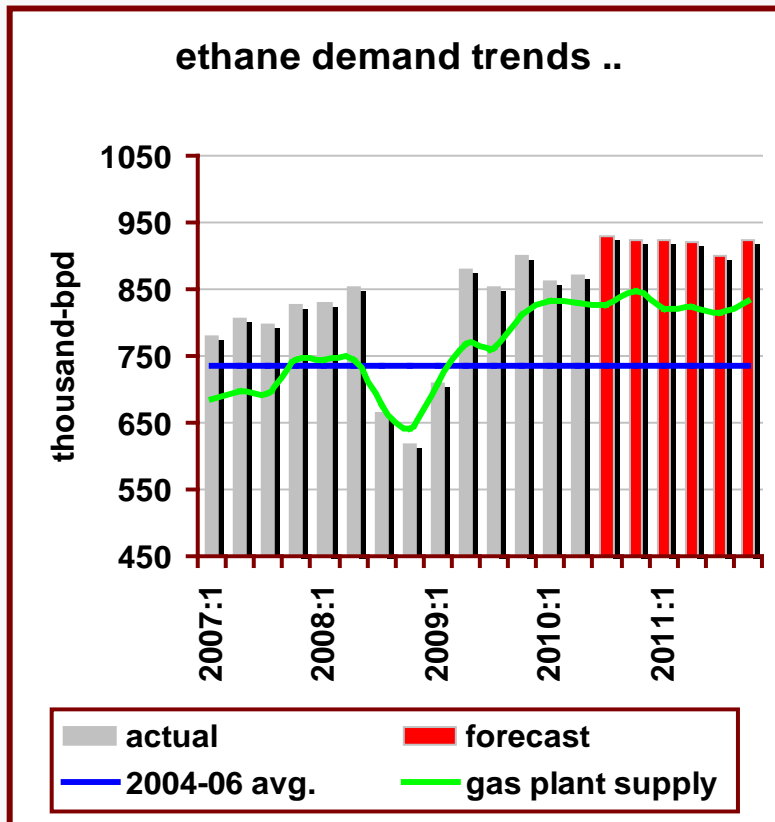
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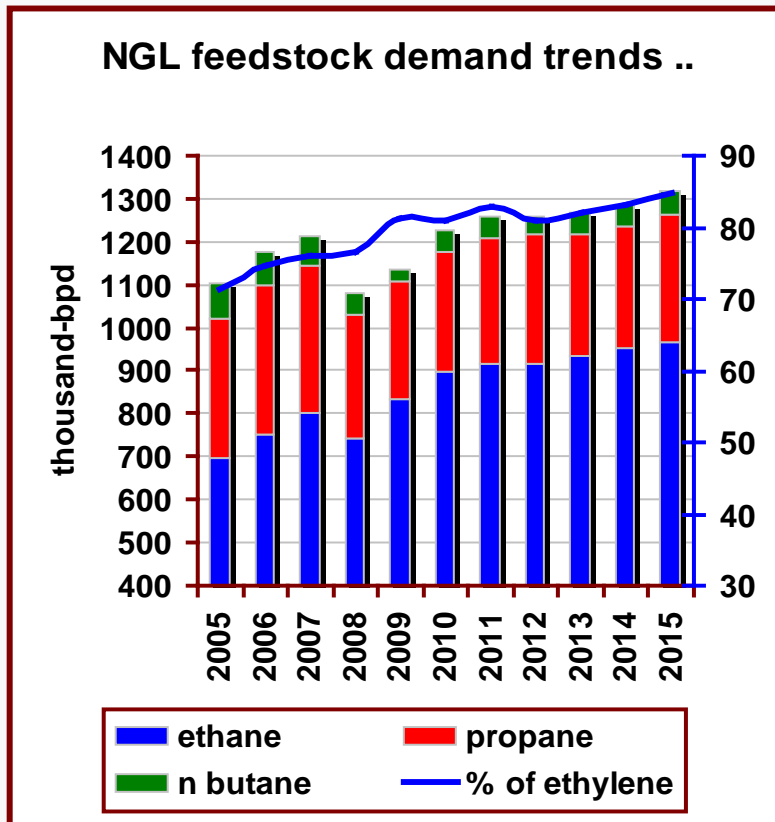
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ethylene producers are midstream's most important customers



- ❖ *U.S. ethylene producers have extensive flexibility to adjust their mix of feeds -- especially important for ethane.*
- ❖ *As ethane supply increased, major ethylene producers increased their capability to consume ethane; a few companies continue to study retrofit options.*

NGL feedstock demand: forecast to 2015



- ❖ *NGL feeds accounted for 72-76% of ethylene production during 2005-2008; the surge in demand for ethane pushed NGL's share of ethylene production to 81% in 2009 & 2010.*
- ❖ *Ethylene from NGL feeds will average 82-85% during 2012 through 2015 & production costs based on NGL feeds will be significantly less expensive than for naphtha & other heavy feeds.*

petrochemical customers: the importance of feedstock flexibility

- ❖ **Feedstock flexibility within the U.S. ethylene industry is a critical parameter for the midstream industry:**
 - » flexibility gives U.S. ethylene producers the capability to offset supply/demand imbalances in various feedstock & co-product markets; they will always increase their use of low cost feeds;
 - » U.S. producers have repeatedly proven their capability to increase ethane cracking capability in response to supply growth & favorable prices.

retail propane demand historic trends & outlook

❖ 2000-2009

- » Residential & commercial (R/C) markets are the dominant retail end uses & 70% of demand is concentrated in the Upper Midwest and Northeast.
- » Demand growth in R/C markets was strong during the 1980's & 1990's but was slower during 2000-2003
- » Total demand in 2009 was 130 mbpd lower than in 2004 & the decline in R/C demand accounted for two-thirds of the total decline.

❖ 2010-2015

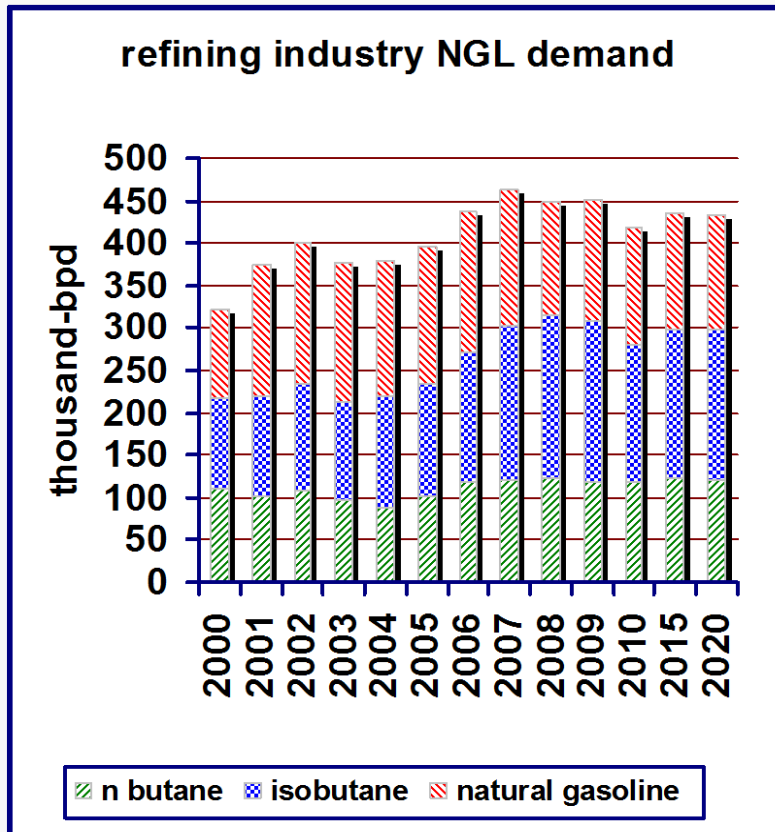
- » R/C demand & total demand are forecast to remain flat at 650 mbpd. Demand in the Upper Midwest will continue to decline but there are signs of demand growth in the northeast.
- » Demand in other end-use sectors is forecast to be stagnant at current volumes.

refining industry outlook

- ❖ U.S. refinery crude runs were essentially constant at 15.0-15.5 million-bpd during 2000-2008; gasoline production was constant at 8 million-bpd.
- ❖ During 2000-2009, U.S. gasoline markets were supply short and imports peaked at 1.15 million-bpd in 2007 vs. 0.56 million-bpd in 2000.
- ❖ Gasoline production will continue to average 8.5-9.0 million-bpd even as demand declines by 0.5-1.0% per year; imports have already declined by 200 mbpd and will decline by 150 mbpd during 2010-2020 but U.S. markets will remain supply short.
- ❖ Steady gasoline production implies steady demand for butanes & natural gasoline.

refinery markets

butanes and natural gasoline



- ❖ Refinery demand for butanes & natural gasoline is ~ 35-40% of ethylene industry NGL demand
- ❖ Congressional action banned the use of MTBE & extended ethanol blending via the RFS. These regulatory changes prompted refiners to produce more alkylate; demand for isobutane increased.
- ❖ More alkylate enabled most refineries to maintain inputs of normal butane and natural gasoline.

NGL supply

historic trends & outlook

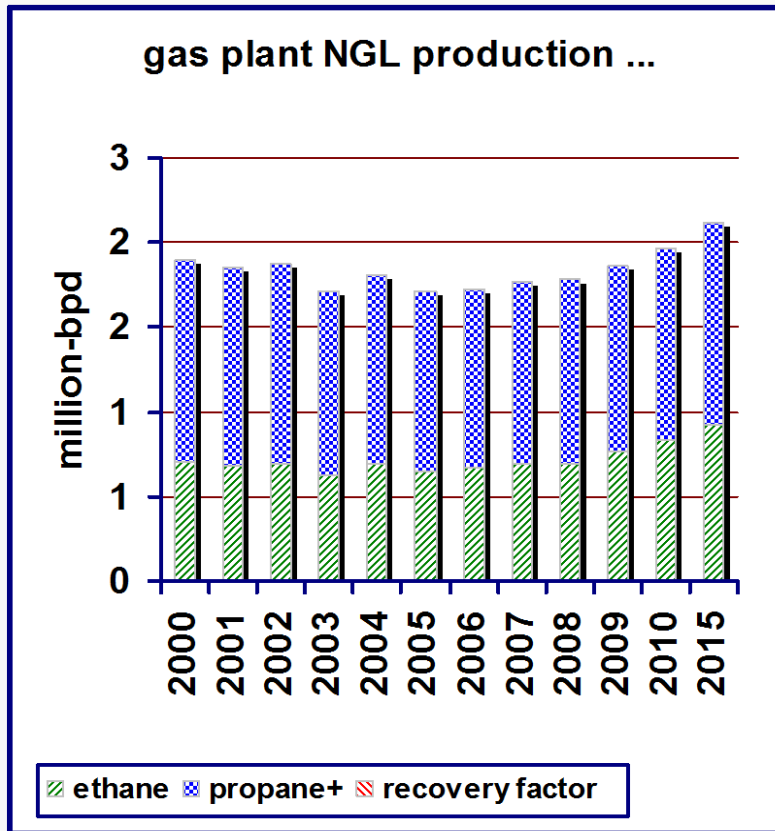
❖ 2000-2009

- » Gas price spikes squeezed gas plant profit margins & caused repeated episodes of ethane rejection during 2000-2003.
- » Rising oil prices sparked improvements in gas plant profit margins after 2004 & pushed margins to record high levels during 2006-08.
- » Raw mix production declined to a low of 1.7 million-bpd in 2005 (Katrina & Rita were factors) but rebounded strongly during 2006-current & averaged 2.0 million-bpd in March/April.

❖ 2010-2015

- » Growing gas production will tend to keep gas prices steady to weaker.
- » As long as Saudi Arabia limits production, oil prices will tend to remain strong; hence, gas plant margins will also remain strong; gas processors will expand processing capacity & infrastructure.
- » NGL production is forecast to increase by 150-200 mbpd; we will see NGL production from new sources of supply due to development of shale plays like Eagle Ford, Granite Wash, Marcellus, and Bakken.

gas plant production ethane and propane+



- ❖ U.S. raw mix production averaged 1.90 million-bpd in 2000, production fell to a low of 1.71 million-bpd in 2005 (Katrina & Rita caused extensive downtime for gas plant in LA and east TX for 4 months)
- ❖ Production recovered to 1.86 million-bpd for 2009 & topped 2.0 million-bpd in March/April 2010.
- ❖ Raw mix pipeline expansions facilitated significant growth in ethane production from WY, CO, and W TX.
- ❖ In 2015, ethane production is forecast to average 915-930 mbpd (760 mbpd in 2009); propane+ production is forecast to average 1.19 million-bpd (1.10 million-bpd in 2009). Total raw mix production is forecast to average 2.1-2.15 million-bpd in 2015.

NGL pricing

fundamental considerations

- ❖ Supply/demand trends (especially for ethane) are critical for understanding NGL price trends. Price/value relationships in the Gulf Coast ethylene feedstock market are the critical economic considerations. In today's market, gas plant recovery costs are of secondary importance.
- ❖ Many multi-feed plants have significant flexibility to produce ethylene from a wide variety of feeds.
- ❖ Historically, the ethylene industry's feedstock flexibility resulted in variation in feedstock demand for ethane and propane in competition with light naphtha. Feedstock flexibility & ethylene feedstock economics will remain the dominant economic influence on ethane & propane prices.

NGL price analysis

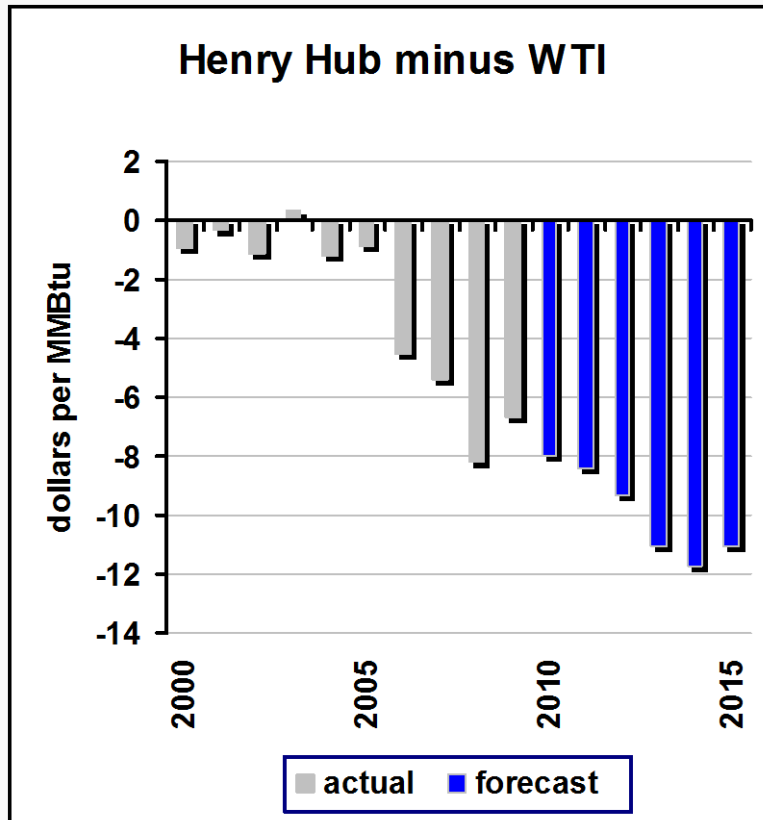
ethylene economic considerations

- ❖ **Ethylene feedstock flexibility considerations create a strong focus on comparative ethylene production costs. PCC evaluates variable production costs for all major feeds for 2 scenarios. One scenario for variable production costs assumes that ethylene producers value all coproducts at spot prices.**
- ❖ **The alternative cost analysis is based on the fact that many ethylene plant do not have the hardware to upgrade all coproduct streams into purity products but instead sell some or all coproducts at discounted prices.**
- ❖ **This analytical approach helps us to understand the changing dynamics of the very dynamic Houston Ship Channel feedstock market. This approach also enforces the discipline of developing price forecasts that are directly consistent with supply/demand forecasts and “big picture” price considerations.**

gas processing profit margins: THE MOST IMPORTANT QUESTIONS

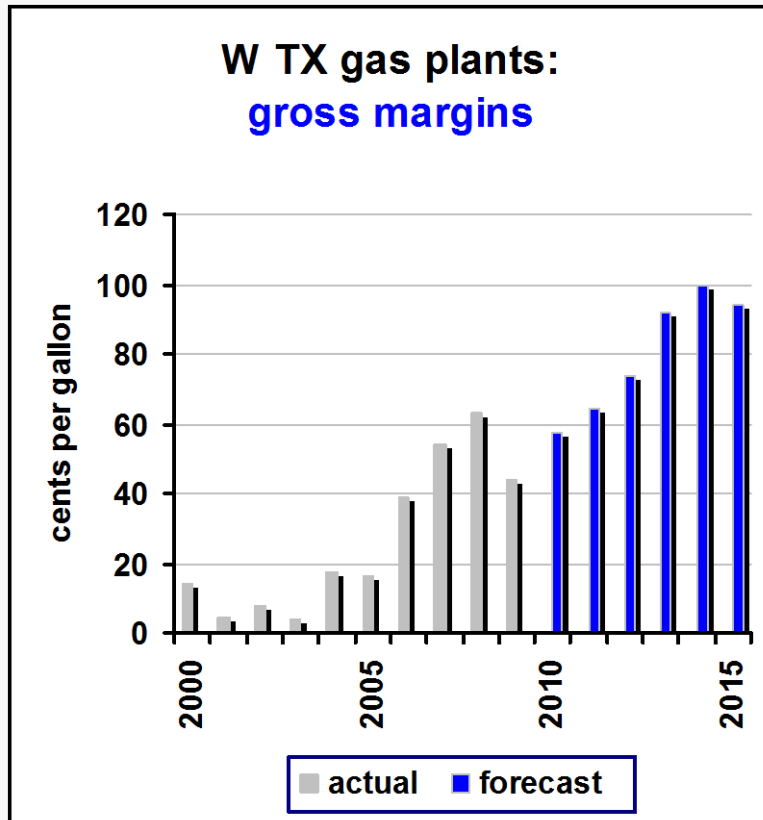
- ❖ What are the determining parameters?
 - » processing margins depend on price differentials between crude oil & natural gas
 - » trends in ethylene feedstock demand are critical for maintaining positive recovery margins for ethane
- ❖ How long will markets support strong crude oil prices & weak natural gas prices?

pricing differentials: Henry Hub minus WTI



- ❖ Natural gas/crude oil price differentials are a function price trends in both commodities // *with very little market overlap & plentiful gas supplies, gas prices will not track oil prices.*
- ❖ *During 2000-2005, Henry Hub & WTI prices were almost in parity; as crude prices rose sharply, gas price discounts were increasingly deeper.*
- ❖ *IF crude prices rise as forecast, gas price discounts will be increasingly deeper & gas plant profit margins will increase.*

gas plant gross margins: for plants in West Texas



- ❖ *Frac spread margins were at break-even or negative during 2001-2003*
- ❖ *NGL prices generally tracked the increase in crude oil prices but gas prices lagged; gross margins rose to unprecedented levels during 2006-2009*
- ❖ *If crude oil prices increase as forecast & natural gas prices remain flat, gross margins have the potential to reach \$1.00 per gallon during 2013-2015. If crude oil prices remain in a range of \$60-80 per barrel, gross margins will average 40-60 cents per gallon.*

wrap up

- ❖ **Plentiful NGL supply contributes to a strong petrochemical industry – the most important market for NGL. Favorable economics encouraged ethylene producers to substantially increase the industry's ethane cracking capability.**
- ❖ **Favorable ethane cracking economics give U.S. ethylene producers competitive advantages vs. producers in Europe and Asia.**
- ❖ **Wide differentials between crude oil & natural gas prices create a very favorable economic environment for both midstream & petrochemical companies.**
- ❖ **Natural gas production from both conventional and shale resources will increase gas plant throughput. NGL recovery from eastern shale plays will create a need for major infrastructure projects.**



North Dakota Pipeline Authority

NGL Webinar – September 2, 2010

Grant Monsour – Business Development
Alliance Pipeline



Forward looking statements and information

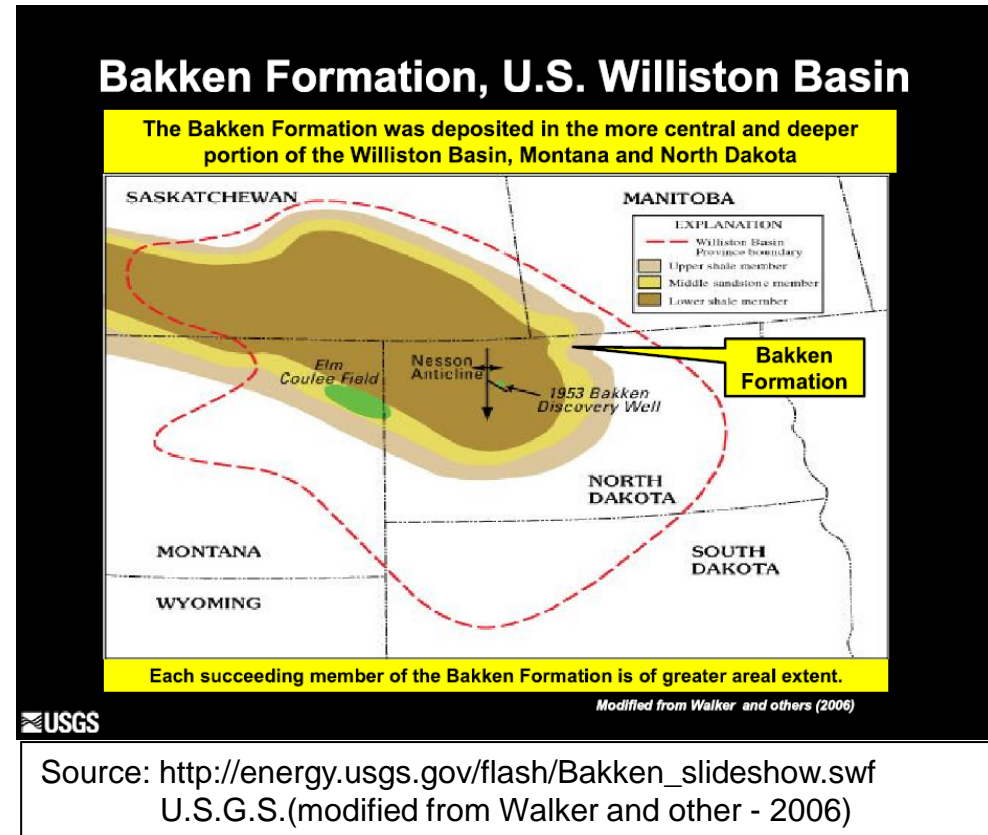
Certain information contained in this presentation, including use of the words “anticipate”, “expects”, and “expected to”, constitute forward looking statements and information. Although Alliance believes that these statements are based on information and assumptions which are current, reasonable and complete, these statements are necessarily subject to a variety of risks and uncertainties including, but not limited to, future operating performance, regulation, economic conditions and fundamentals affecting the oil and gas producing and marketing industries. Should one or more of these risks or uncertainties materialize or fail to materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those expected.

Agenda

- Background - Bakken
- NGL Markets – Supply and Demand
- Alliance Pipeline – Committed to North Dakota
- Conclusions
 - Bantry Meter Station
- Questions

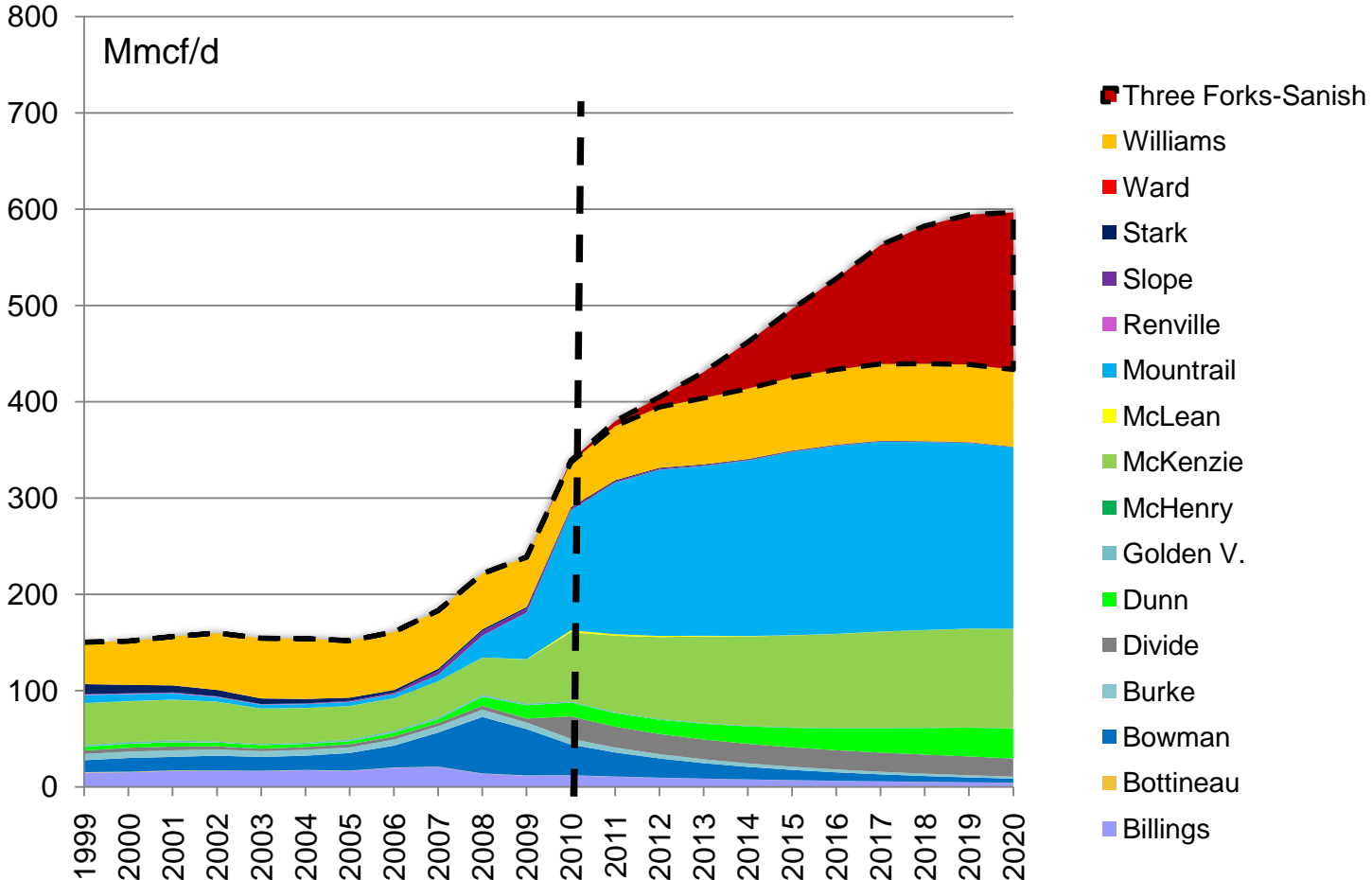
North Dakota – 4th Largest Oil & Gas Producing State

- Bakken located in the Williston Basin overlapping Saskatchewan, Manitoba, Montana and North Dakota
- 50+ Bcf of recoverable associated gas reserves - liquids-rich at 1400+ btu per standard cubic foot
- Pecan Pipeline deliveries to Alliance Pipeline since April 2010 with a waiver allowing over 1500 btu per standard cubic foot



✓ **Capacity available on Alliance Pipeline**

North Dakota Natural Gas Production Alliance Pipeline Base Case Forecast



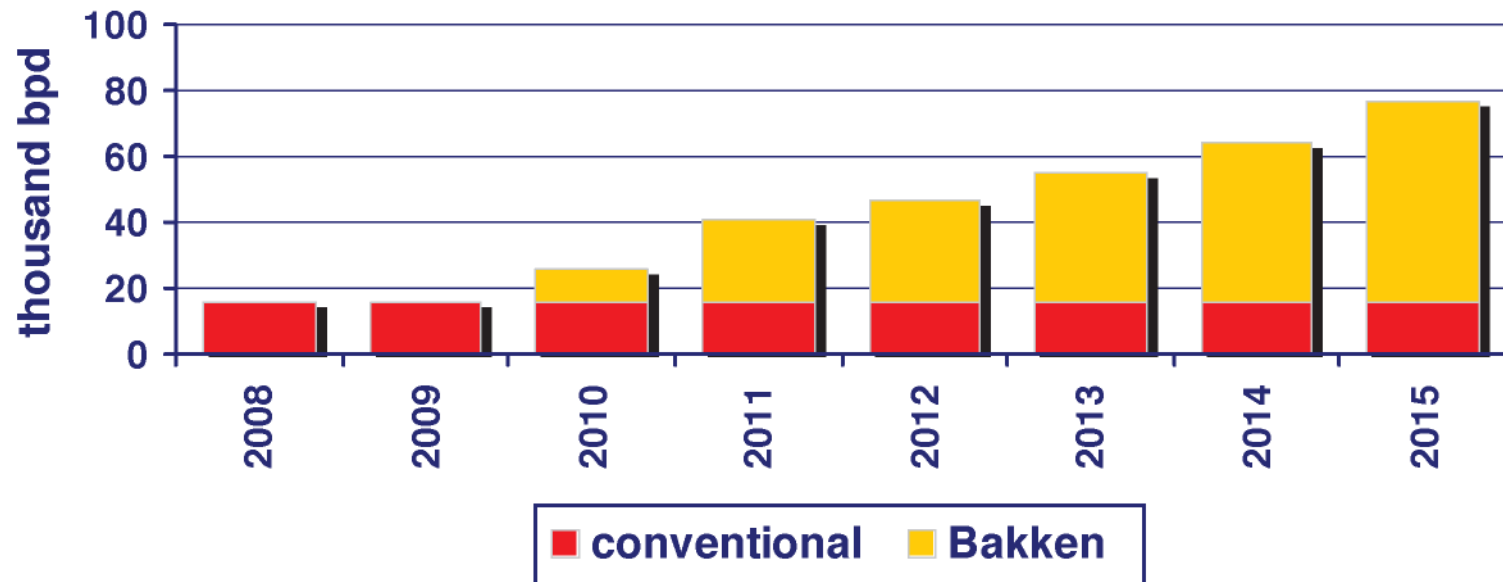
Source: Alliance Pipeline 2010 analysis of data from IHS Energy Enerdeq / North Dakota Division of Minerals Resources, Oil & Gas Division



NGL Marketing

Bakken Forecast to 2015

Raw Mix Recovery from Conventional & Bakken Gas

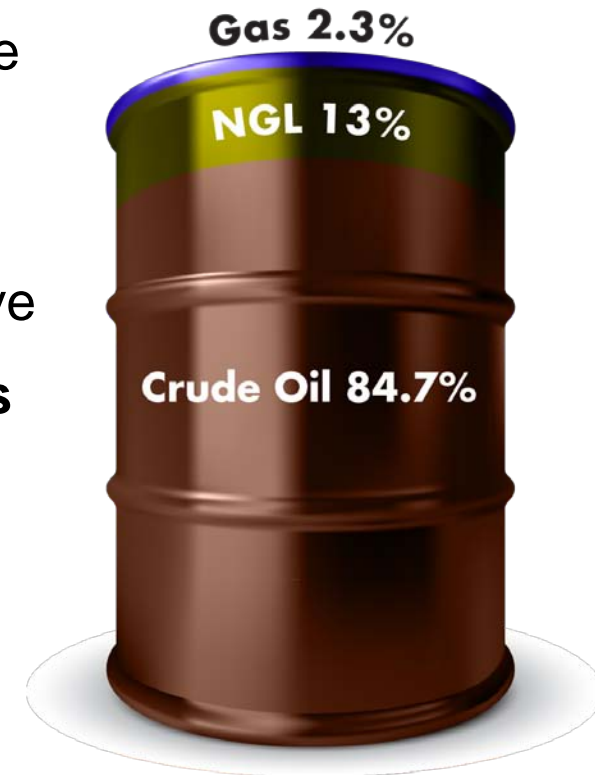


Source: Daniel Lippe. Petral Worldwide Inc. presented at the GPA March 12, 2010 in Austin Texas.

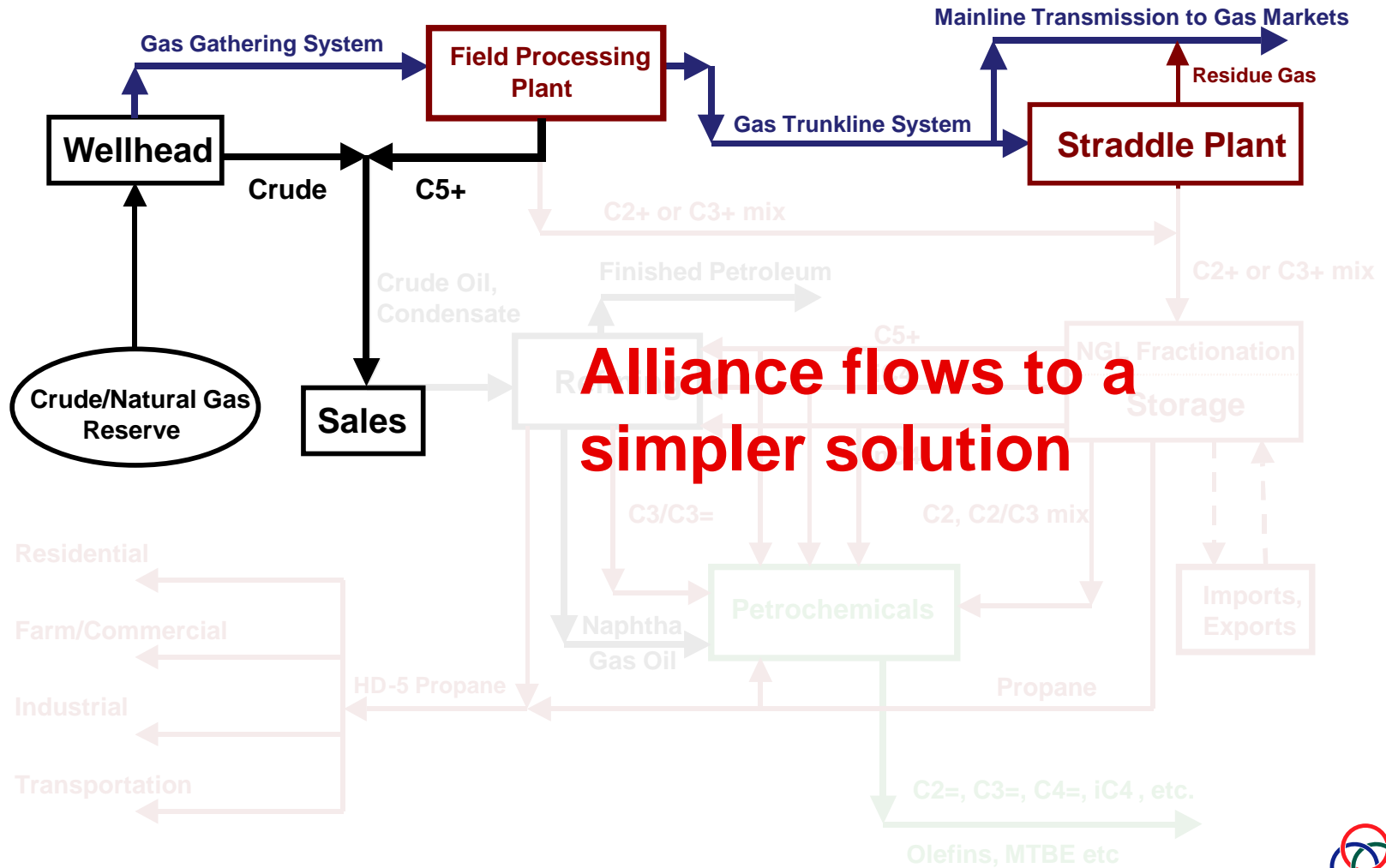
NGL Marketing

"Rockin' the Bakken"

- Significant potential being proven from the Sanish / Three Forks horizons
- With the market favoring oil over natural gas the potential is huge
- Significant infill drilling potential
- Producers are still ramping up the learning curve
- Bakken Reserves: **4 Bbbl Oil → 1.85 Tcf Gas**
& 148,000 Mbbbl NGL
- Gas to Oil Ratio of 1 bbl to 1.0 Mcf
 - 600,000 bbl/d → 600,000 Mcf/d
 - Estimated reserve life of 22 years

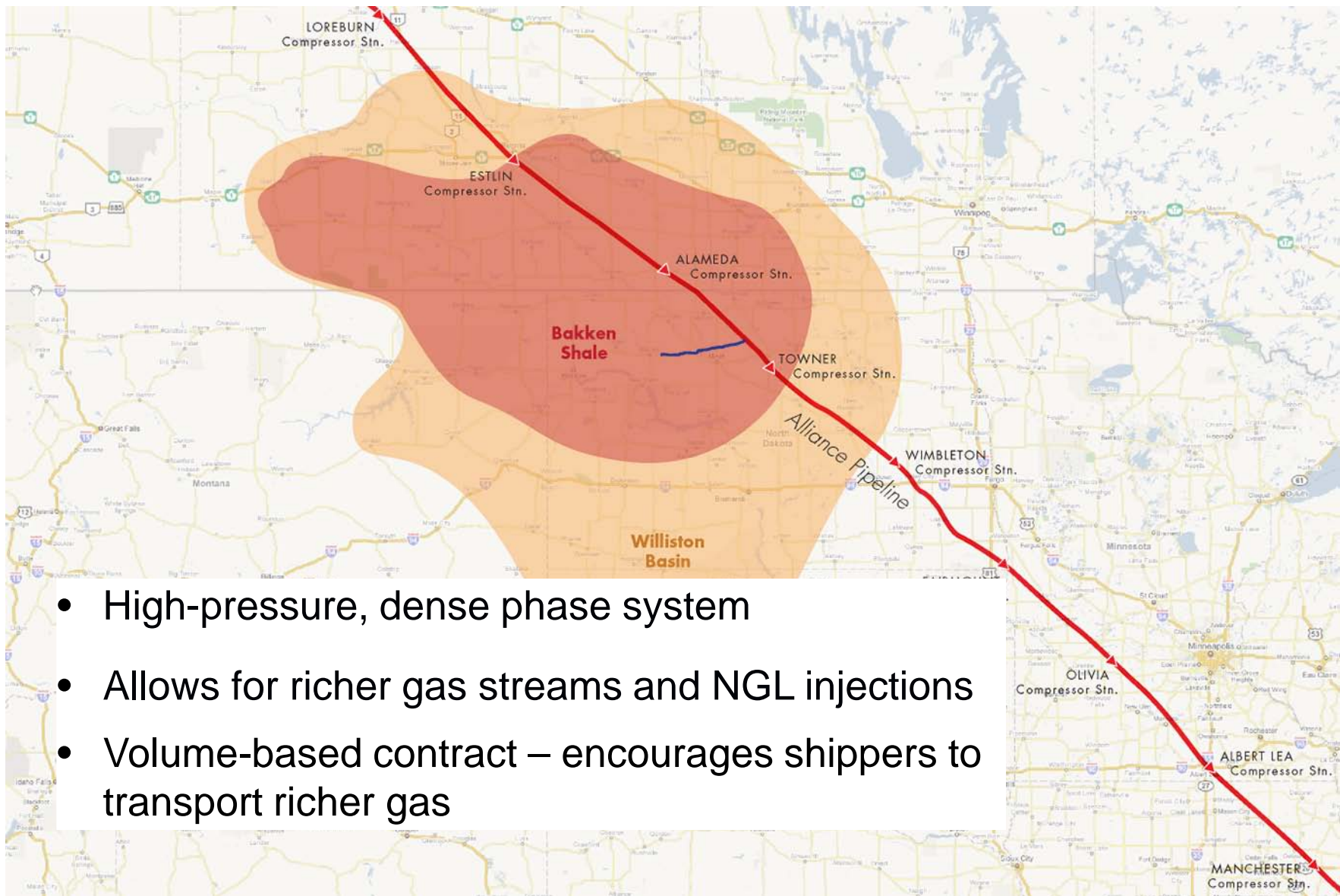


NGL Marketing



Alliance flows to a simpler solution

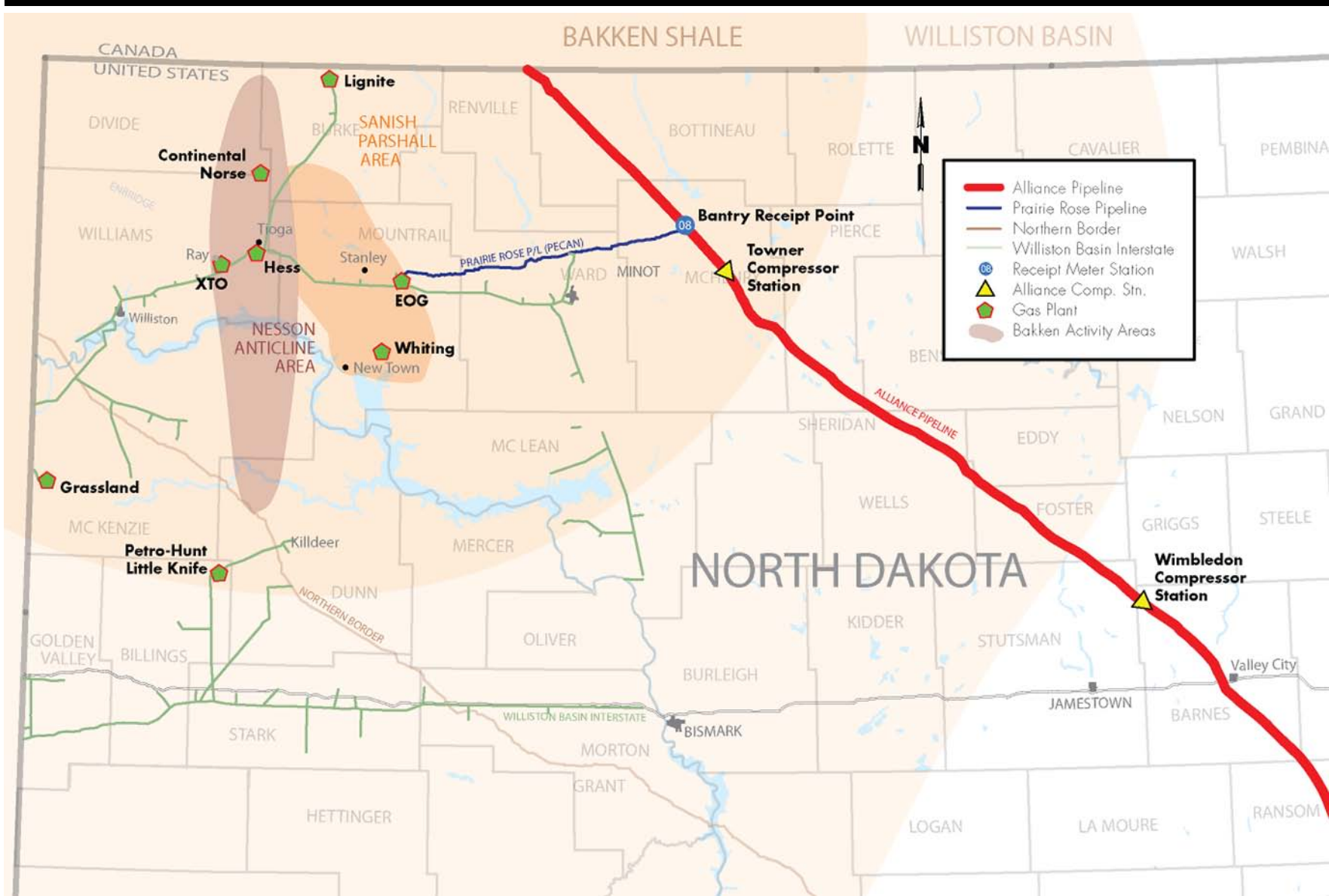
Alliance Pipeline System



- High-pressure, dense phase system
- Allows for richer gas streams and NGL injections
- Volume-based contract – encourages shippers to transport richer gas

Alliance Pipeline System

Area Map with Gas Processing Plants



Conclusions

- **In resource plays, infrastructure needs to lead production development activity**
- **Crude oil and NGL returns offer a high netback to producers and will provide the cash streams necessary to support capital commitments on oil and gas development**
- **Producers can save \$\$mm in capital and operating fees by using a dehydration/stabilizer plant vs. a complex field gas processing plant**

Capacity is available on the Alliance Pipeline!









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Summary

Questions?



**“A significant presence in the North American
gas processing business.”**

Aux Sable

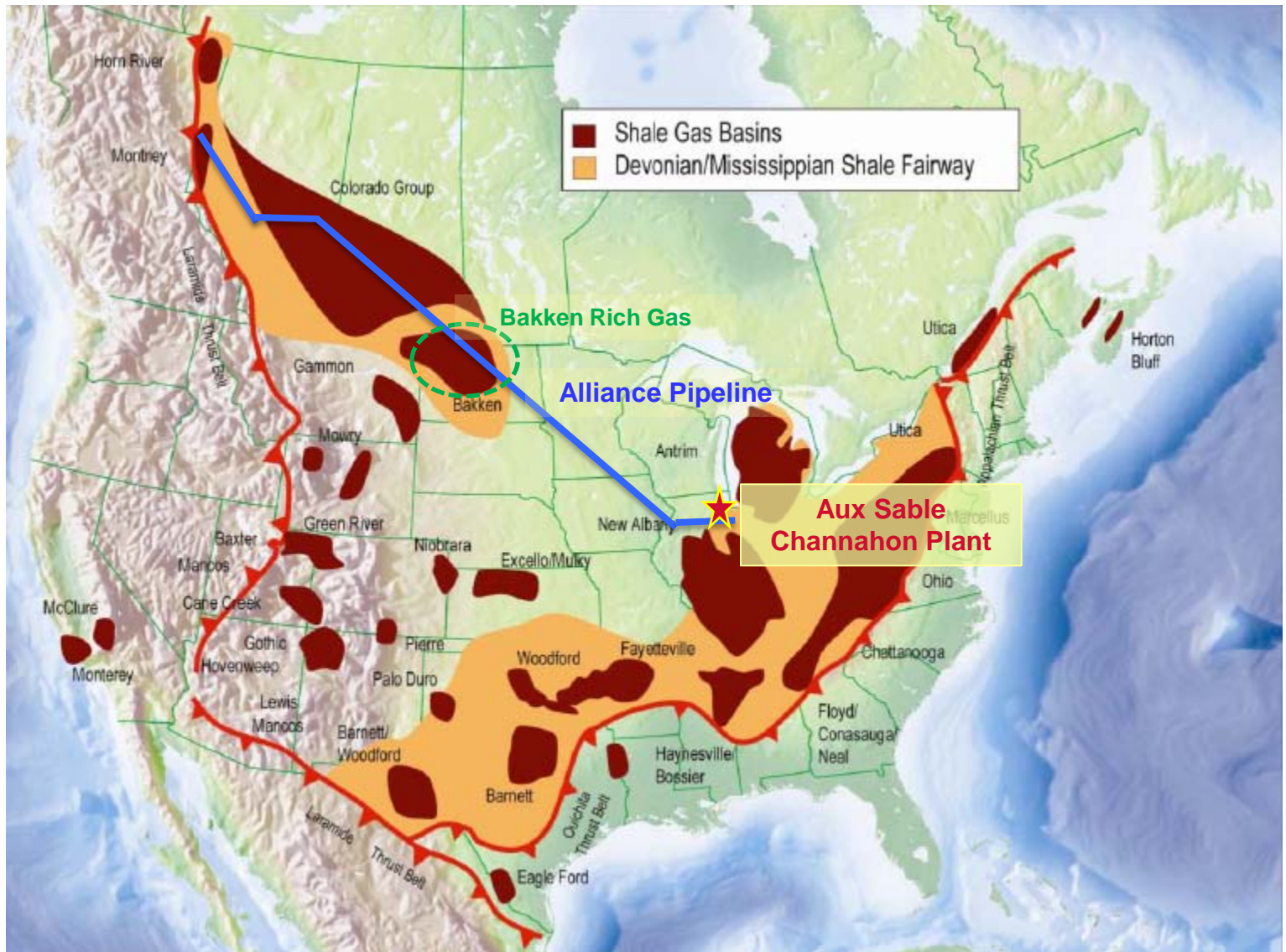
ND Pipeline Authority Webinar

September 2, 2010

Who Is Aux Sable?

- Aux Sable US owns and operates a 2.1 bcf/d extraction and fractionation plant at terminus of Alliance Pipeline (Channahon, IL)
 - Has been operating for 10 years...has processed over 5700 bcf of gas and produced over 220 million barrels of NGLs over this period
 - capable of extracting and fractionating 92,000 bpd of spec NGL products (ethane, propane, normal butane, iso-butane and natural gasoline)currently producing about 72,000 bpd
 - processes Bakken gas received from Prairie Rose Pipeline
 - processes NGL mix received by truck & rail car
 - extensive spec product storage/delivery capacity in Chicago area
- Aux Sable Canada owns a gas processing plant/pipeline in Septimus, British Columbia and an upgrader off-gas processing plant in Fort Saskatchewan, Alberta
- Focused on developing rich gas supply along the Alliance pipeline corridor route from Fort St. John , B.C. to Chicago, Illinois.

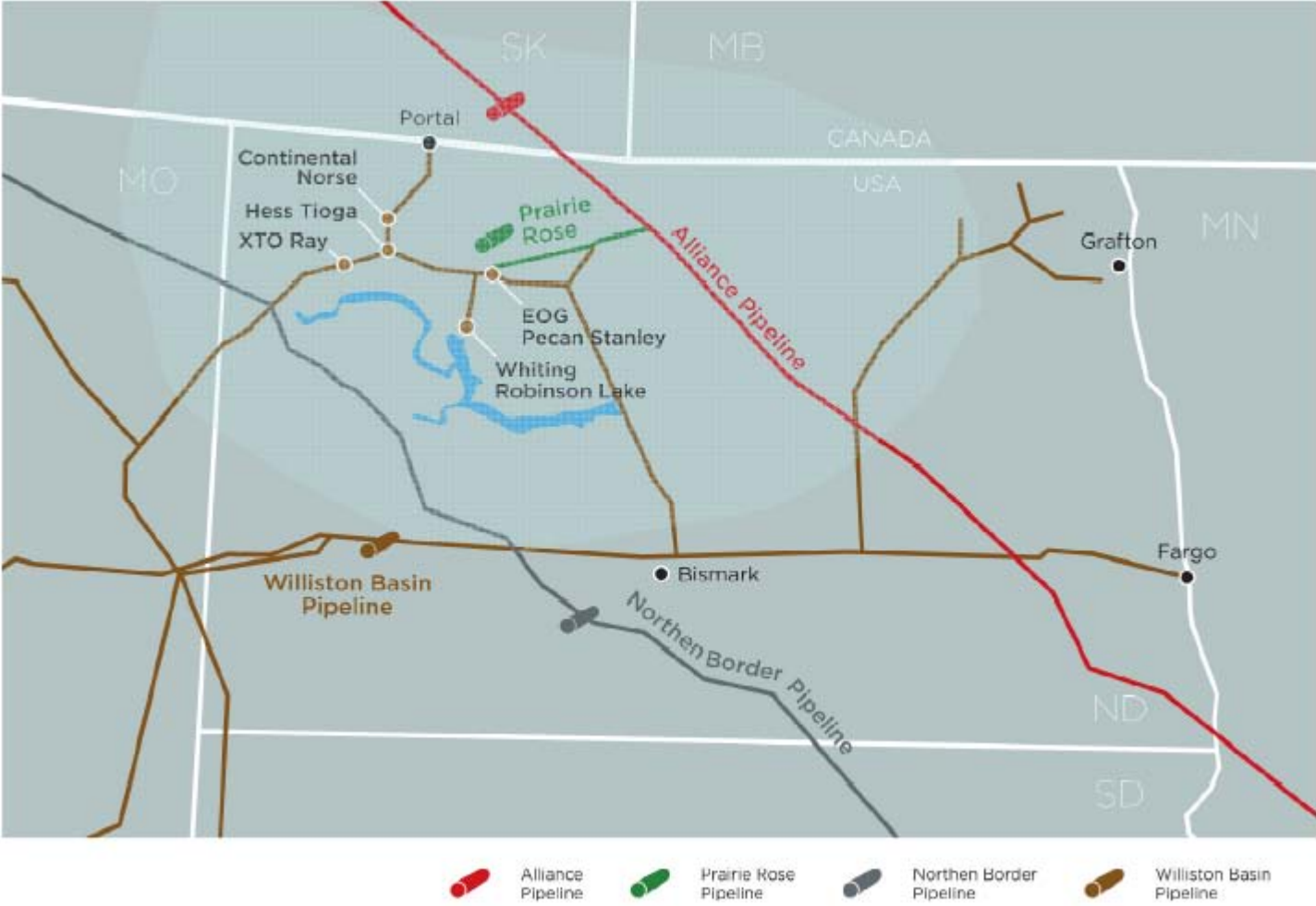
North American Shale Plays



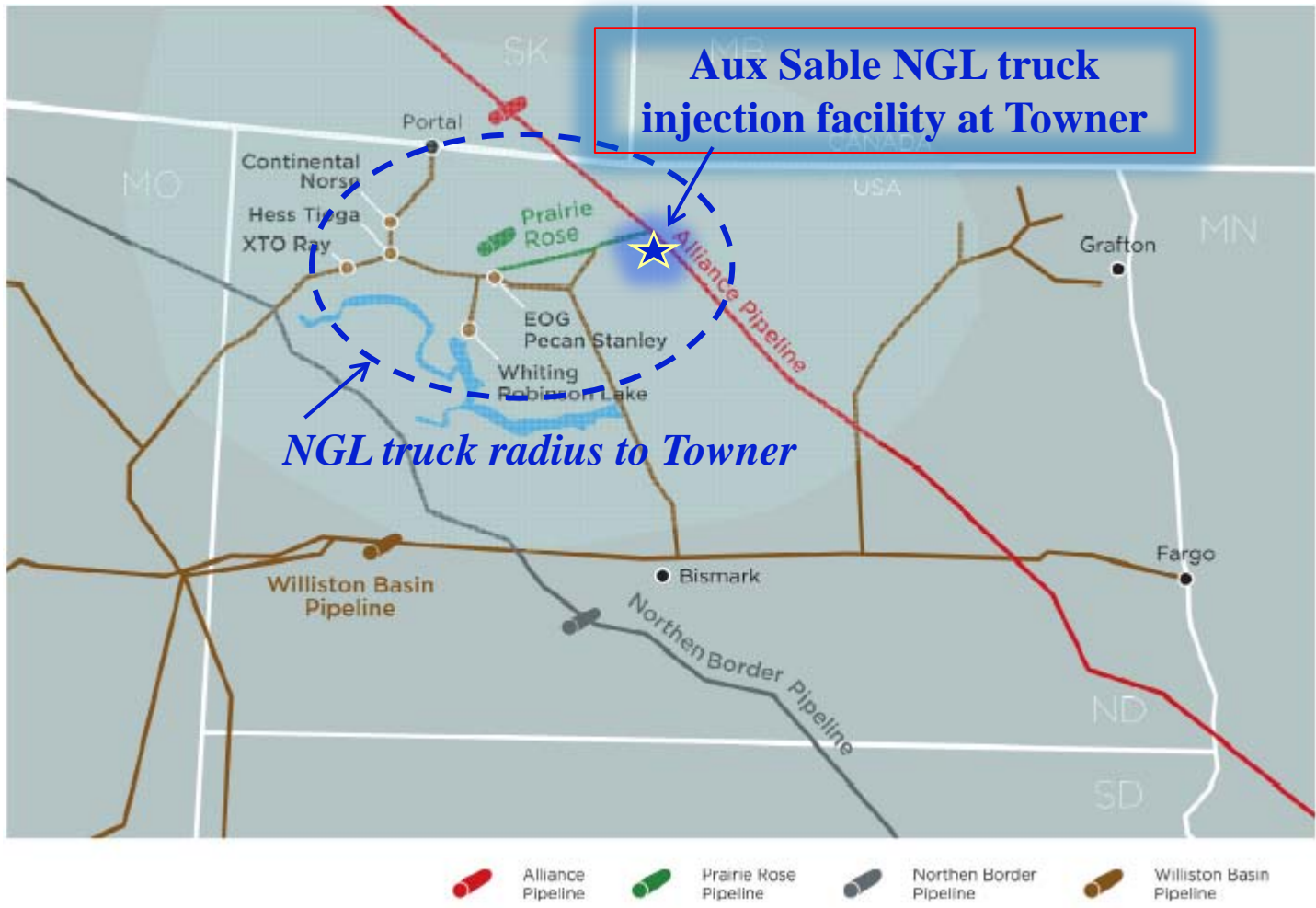
*AUX SABLE U.S. Channahon
NGL Extraction & Fractionation Facility*



Current Bakken Infrastructure



Proposed NGL Truck injection facility



Contacts

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Additional information can be found at

<http://www.auxsable.com/>



North Dakota Pipeline Authority NGL Webinar

September 2, 2010



Terry Spencer

Chief Operating Officer
ONEOK Partners

Forward-Looking Statement

Statements contained in this presentation that include company expectations or predictions should be considered forward-looking statements that are covered by the safe harbor provisions of the Securities Act of 1933 and the Securities and Exchange Act of 1934.

It is important to note that the actual results of company earnings could differ materially from those projected in such forward-looking statements.

For additional information, refer to ONEOK's and ONEOK Partners' Securities and Exchange Commission filings.

What We'll Cover

Key Points

- ONEOK Partners is a diversified, midstream natural gas and natural gas liquids company
- Our Bakken Shale footprint
- Our \$1.1 billion in growth projects to accommodate prolific supply growth in our core areas
- Our additional growth opportunities from integrated and well-positioned assets

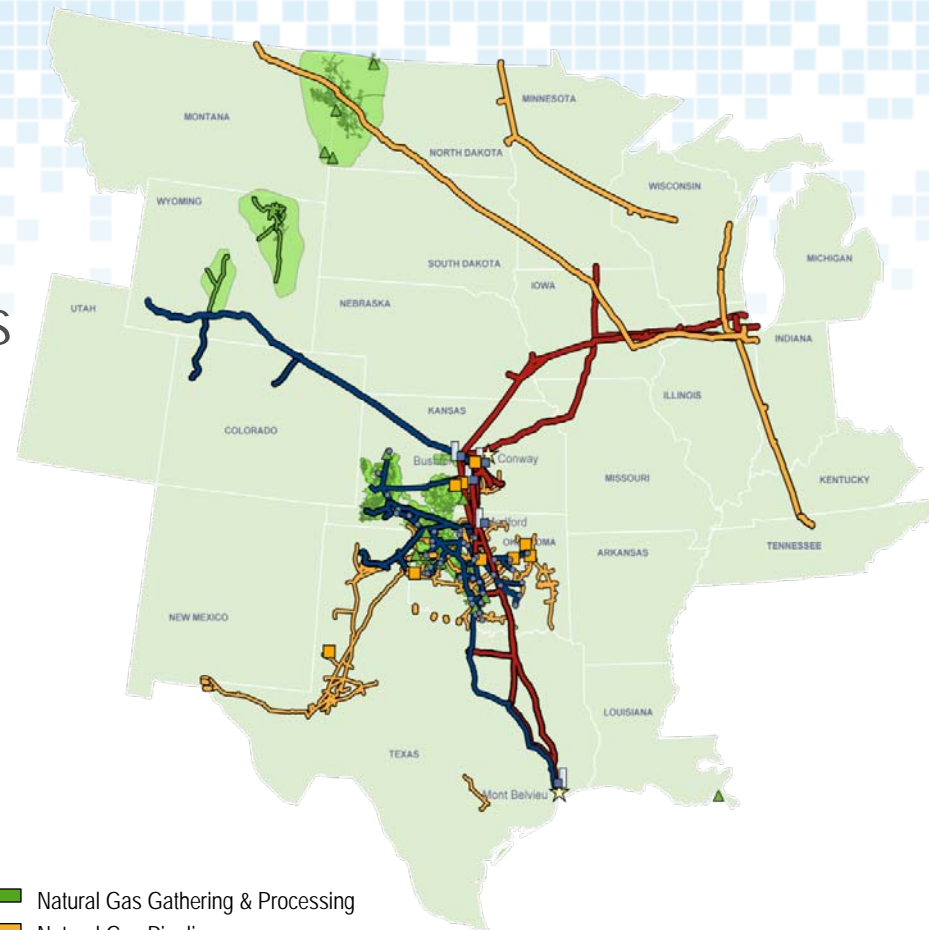
ONEOK Partners Overview

ONEOK Partners

At a Glance



- Significant midstream natural gas and natural gas liquids assets
- *Non-discretionary* services
- Predominantly fee-based earnings
- Commitment to growth
 - Capital projects provide fee-based earnings
 - Acquisition opportunities
 - Consistent track record of distribution growth
- Aligned interests:
 - ONEOK: General Partner
 - ONEOK: 42.8 percent owner



- Natural Gas Gathering & Processing
- Natural Gas Pipelines
- Natural Gas Liquids Gathering Pipeline
- Natural Gas Liquids Distribution Pipelines

ONEOK Partners

Strong Asset Position

- Strategic assets connecting prolific supply basins to key markets
- Embedded growth opportunities within existing operating footprint
- Exposure to shale plays, including Bakken

Natural Gas



- Two businesses
 - Gathering & Processing
 - Pipelines
- Diversified supply basins, producers and contracts mitigate earnings volatility
- Earnings on pipelines are predominantly fee based

Natural Gas Liquids

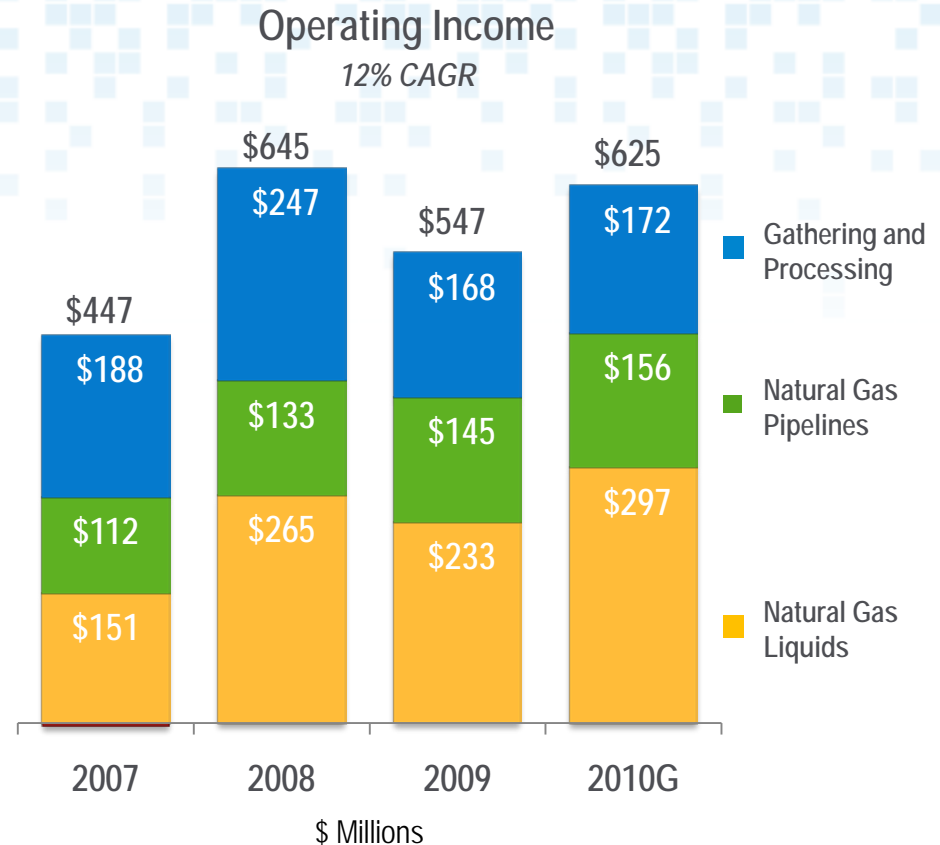


- One integrated business:
 - Includes gathering, fractionation, storage and pipelines
- Links key NGL market centers at Conway and Mont Belvieu
- Earnings are predominantly fee based

ONEOK Partners

Diversified, Premier Midstream Energy Company

- More than 67% in fee-based earnings
- Commodity price risk in gathering and processing mitigated with hedging
- Growing NGL business



Bakken Shale Footprint

Bakken Shale

Overview

- Recoverable reserves
 - Possibly the largest find in U.S. history next to Alaska*
 - Technological advances significantly increases recoverable oil
- Crude-oil economics
- NGL-rich
 - Substantially higher than Woodford and Marcellus Shales
- Infrastructure needed
 - Gathering and processing
 - NGL takeaway capacity

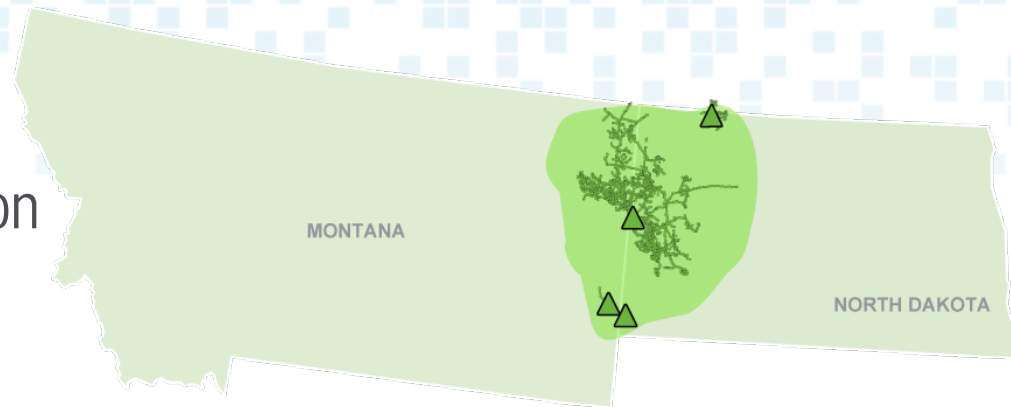


*Source: North Dakota Petroleum Council

Bakken Shale

ONEOK Partners' Footprint

- Largest third-party gatherer of natural gas in region
- Ability to access multiple sources of production in region
- Large operating footprint with acreage dedications
- Aggressive well-connect history:
 - 2008: 217
 - 2009: 190
 - 2010: 250+ (Est.)
 - 2011: 400 (Est.)

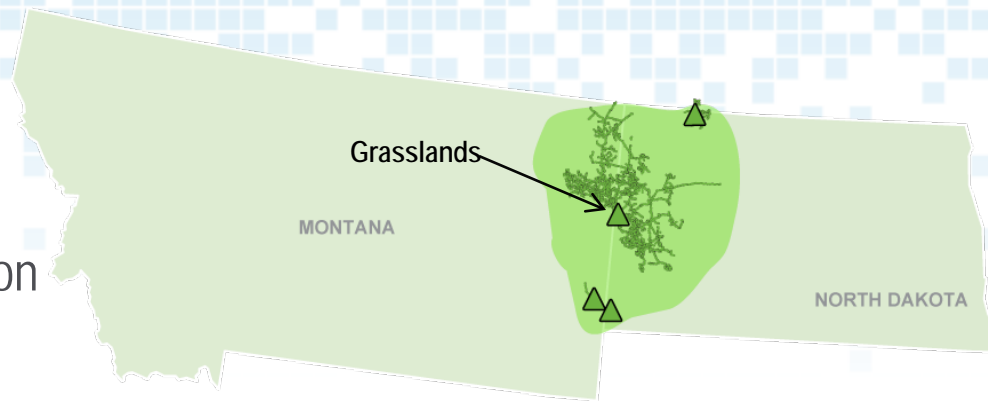


Strong commitment to
supply growth

Bakken Shale

ONEOK Partners Assets

- 4 natural gas processing plants
 - Current capacity of 124 MMcf/d
 - Grasslands is largest facility
 - Processing capacity expansion completed in March 2009
- 4,400 miles of gathering infrastructure
- 52,000 bhp of total compression
- Approximately \$1.1 billion of growth projects planned

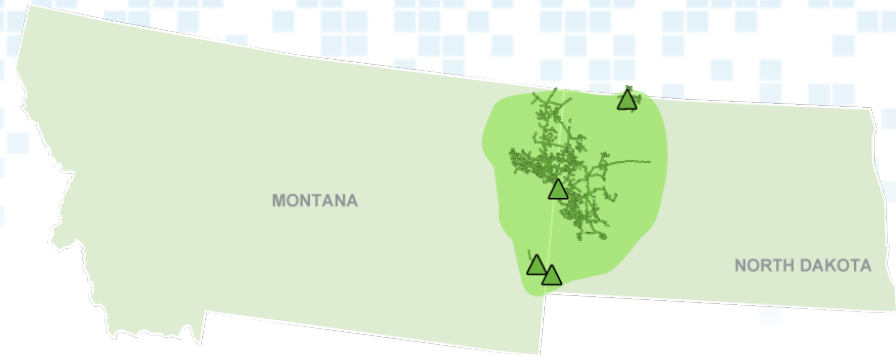


Expanding Footprint

Bakken Shale

ONEOK Partners Statistics

- Field office located in Sidney, MT
 - Site offices in western ND
- 2009 Payroll
 - More than \$5.4 million in payroll for North Dakota and Montana
- Employees
 - More than 80 local employees dedicated to Williston Basin assets
- 93% of natural gas processed from North Dakota sources
- Active in North Dakota Petroleum Council



Growth Projects

Bakken Shale

Growth Projects

- Gathering and Processing
 - Approximately \$400 million
 - New 100 MMcf/d natural gas processing facility
 - Well-connects, upgrades and expansions to existing infrastructure
- Natural Gas Liquids
 - Approximately \$700 million
 - New NGL pipeline
 - Overland Pass Pipeline expansion
 - Bushton fractionator expansion

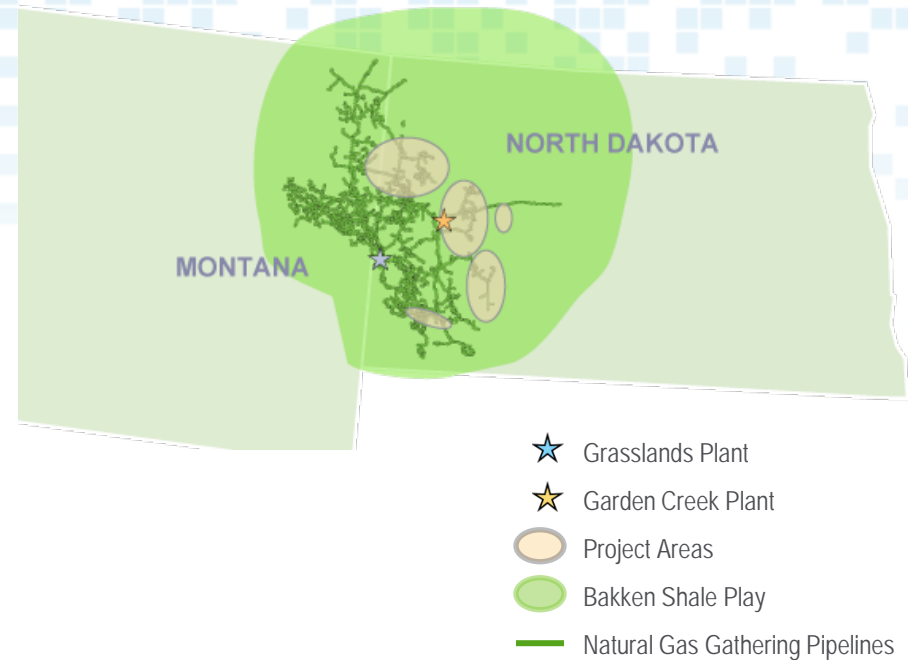


Approximately \$1.1 Billion

Bakken Shale

Natural Gas Gathering and Processing Investments

- Garden Creek plant
 - 100 MMcf/d natural gas processing facility
 - \$150-\$210 million
 - Completed by end of 2011
 - Doubles processing capacity in region
- Well-connects, upgrades and expansions to existing infrastructure
 - \$200-\$205 million in 2010-2011
 - Includes \$90 million to connect 250+ wells in 2010, 400 in 2011



\$350 million to \$415 million

Bakken Shale

Natural Gas Liquids Investments

- Bakken Pipeline
 - \$450-\$550 million
 - 525-to 615-mile NGL pipeline from Bakken Shale to Overland Pass Pipeline
 - NGL raw-feed
- Overland Pass Pipeline Expansion
 - \$35-\$40 million (50% interest)
 - Additional pump stations
 - Expansion of existing pump stations
- Fractionator expansion at Bushton, Kan.
 - \$110-\$140 million
 - Increase capacity to 210 MBbl/d from 150 MBbl/d



- Overland Pass Pipeline Expansion
- Bakken Pipeline
- Bushton Fractionator Expansion

\$595 million to \$730 million

Conclusions

Key Points

- ONEOK Partners is a premier midstream energy company
 - Experienced team
 - Proven track record of growth
 - Responsible corporate citizen
 - Experienced operator in many diverse supply basins
- ONEOK Partners has a significant asset position in the Bakken Shale
 - Projects developed and funded to accommodate anticipated growth in the Bakken Shale
 - Aggressive well-connect track record and strong relationships with producers, enabling supply growth to our systems
 - Abundant growth opportunities around existing operating footprint





MISTRAL ENERGY INC.

Vantage Ethane Pipeline

North Dakota Pipeline Authority

Webinar: September 2, 2010

Agenda

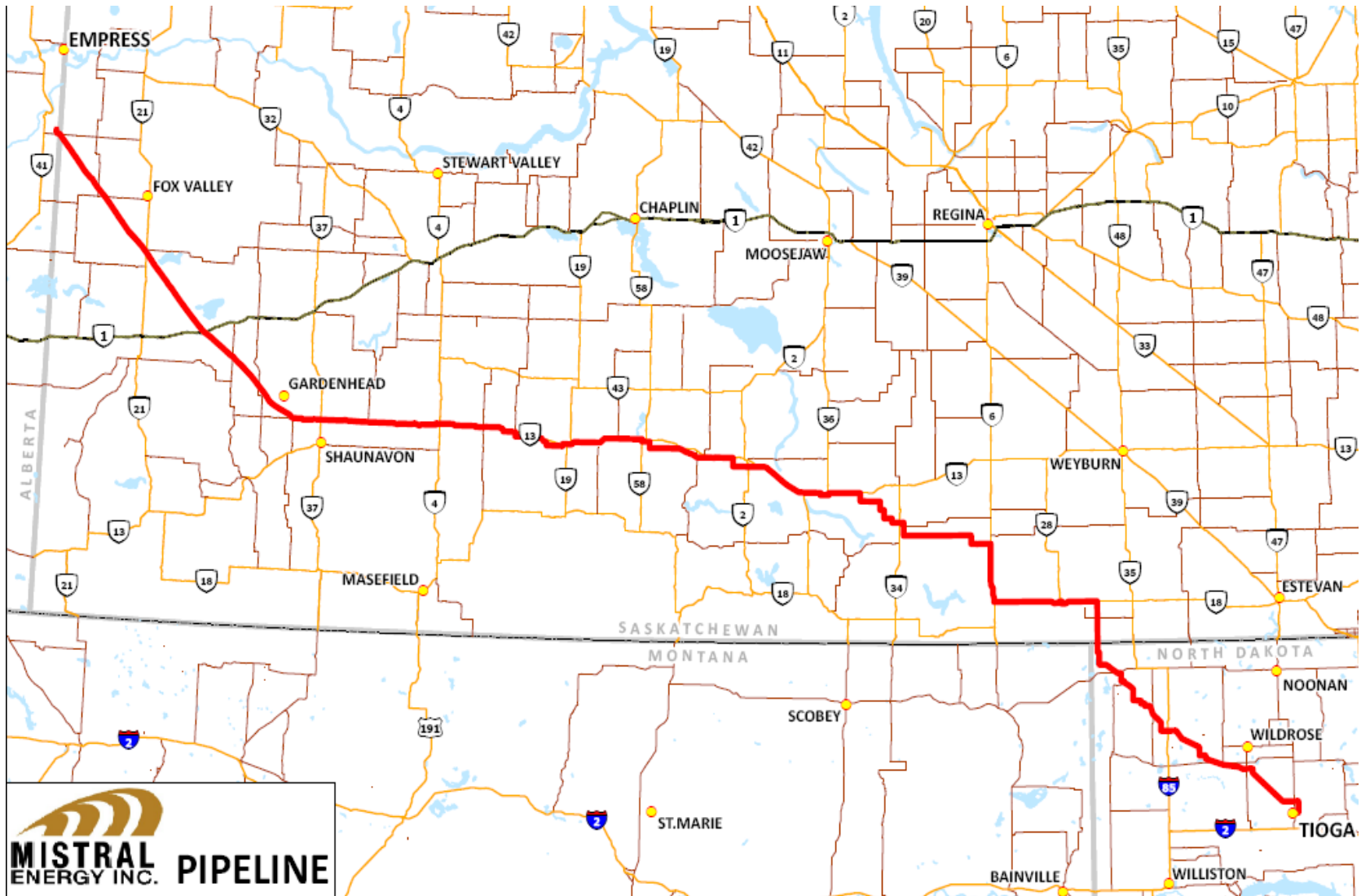
- Vantage Pipeline description and status
- Ethane recovery economics and BOE reserves
- Comparison of US and Canadian ethane markets
 - US market overview
 - Canadian market overview
- NGL infrastructure development

Vantage Ethane Pipeline

- ~430 miles: Tioga, N.D. to Empress, Alberta
- Purity (specification) ethane only, no other NGLs at this time
- Vantage will interconnect with the Alberta Ethane Gathering System (AEGS) and deliver to petrochemical sites in Alberta
- July 2010: Press release confirms Hess Tioga as 'anchor tenant' supply for pipeline.
- Target in-service date: Third quarter 2012

- 10” Pipeline: Initial capacity of **40,000** bpd, expandable to **54,000** bpd with additional pump stations
- 12” Pipeline: Initial capacity of **65,000** bpd, expandable to ~80,000 bpd with additional pump stations
- Choice of 10” or 12” Must be confirmed by end of November 2010, in time for US and Canadian federal regulatory applications.

Proposed Routing



- About 35 staff currently engaged in land, survey, engineering and environmental activities required for main line application.
- Laterals will be added to connect additional supply in Saskatchewan, North Dakota, Montana.
- These will be separate pipeline applications under state/provincial permitting and regulation.
- Commercial discussions underway with plant operators.

Why Recover Ethane?

- Most plants can leave ethane in the gas.

Why build a turboexpander and de-ethanizer?

- Incremental NGLs
- BOE computation detail
- Turboexpander economics

Ethane BOE Example

- Dewpoint/ refrigeration plant produces 4 mmscf/d of “1185” heat value gas.
- 4 mmscf/d = **667 BOE/d** at 6:1 conversion
- Turboexpander plant: Same gas stream becomes 3.2 mmscf/d and 533 bbl of incremental ethane and other NGL.
- Production = **1040 BOE/d**
~50% incremental BOE/d on sales gas.

BOE Conversion Details



CORP. GAS - BOE CONVERSION FACTOR **6**
 CORP. NGL - BOE CONVERSION FACTOR **1**

BASE CASE: SELL AS GAS (Dewpoint Plant)

| | | |
|---------------------------|------------|-------|
| Sales to WBI/local system | mBTU/d | 4,747 |
| Gas heat value | mBTU/mmscf | 1,187 |
| | mmscf/d | 4.00 |

GAS PRODUCTION

667 BOE PER DAY

ALTERNATE CASE: Cryo Plant

| | | | | |
|-----------------------|---------------|-------|-------------------|-----|
| Est. Ethane Yield | bbl/d | 407 | BOE Equivalent | 407 |
| Est. Propane Yield | bbl/d | 52 | | 52 |
| Est. Butane Yield | bbl/d | 31 | | 31 |
| Est. Condensate Yield | bbl/d | 18 | | 18 |
| Residue Gas | mBTU/d | 3,192 | | |
| | mmscf per day | 3.20 | | 533 |

1,040 BOE PER DAY

Ethane

- Assume 'net value' is 5c/gal above gas value
- Example new plant estimated ethane = 5,000 bpd or 210,000 gpd
- Incremental ethane income ~ **\$3.8 MM** per year.

Propane, Butane, Condensate

- Estimate *incremental* C3/C4/C5+ production with turbo plant is ~ 750 bpd
- Assume margin above gas is ~\$15 per bbl
- Incremental C3+ income ~ **\$4.1 MM** per year

- Ethane primary use is petrochemical feedstock.
- Otherwise leave it in the gas and sell it at gas BTU value.

Petrochemical Industry – Ethane Markets

- Finite number of end-users and demand
- No import-export to balance supply-demand (very different than crude, gas, propane, etc...)
- Some noteworthy differences between US and Canada petrochemical industries...

- US ethane consumers are almost all located on Gulf Coast.
- Most Gulf coast petchems can utilize multiple NGL feedstocks. Not fully tied to ethane, will select based on value: cost of feedstock and value of products yielded.
- Total US Petchem ethane demand **~800,000 to 900,000** bpd
- All demand except ~60,000 bpd is located in gulf coast region.

U.S. Ethane Market: Supply

Regional Fractionators:

- Midcontinent: (KS, OK) 232,000 bpd
- Permian Basin: 58,000 bpd

Fractionators at Demand Centers:

- South Texas: 118,000 bpd
- Mont Belvieu/Beaumont: 320,000 bpd
- Louisiana Gulf Coast: 112,000 bpd

Total **840,000 bpd**

- Gas producers targeting rich gas
- Market studies indicate potential ethane supply increase over the next few years:
 - Eagle Ford shale ~ 60,000 bpd
 - Marcellus shale ~ 80,000 bpd
 - LNG imports ~ 50,000 bpd
 - Granite Wash? Rockies?
 - Bakken: 40,000-80,000 bpd
- Risk for >250,000 bpd addition to 850,000 bpd market, some ethane netbacks below gas value

EnVantage / Morgan Stanley (June 14th)

- “The Mid-Continent is currently and will continue to be the swing processor for ethane. Any additional ethane supplies in this region will only make matters worse. Independent processors in this region with little or no integration will have the greatest economic risk.”

Wachovia / Wells Fargo (June 2010)

- “Fractionation Expansions And Marcellus NGLs Could Tip The Ethane Market Into Oversupply Beginning In 2012. ...we believe the ethane market could become oversupplied by 75-100 Mbbls/d beginning in 2012. ..., we believe ethane prices could trade closer to natural gas than crude oil. ...”

Alberta Ethane Market

- Four world scale ethane crackers, Nova Chemicals (3) and Dow Chemical (1)
- Alberta Potential demand of ~220,000 bpd compares well with US demand of 850,000 bpd
- Alberta rich gas and ethane in decline. New shale gas is generally low NGL content
- Current ethane supply forecast for 2012 is ~160,000 bpd.
- Alberta market offers an alternative for the Williston basin and can absorb ~60,000+ bpd...

Alberta Ethane Market

- Only two buyers, about 5-6 major sellers. No trading hub for price discovery.
- Ethane is sold under confidential long-term agreements.
- Alberta industry was built on providing a guaranteed margin for ethane extraction – “gas plus” pricing.
- Will also purchase ethane on prices indexed to other (Conway, Belvieu) NGL markers.

- Leave it in the gas...
- Take Williston C2 to Conway (new pipe)
- Send Williston C2 to Alliance (in rich gas)
- **Sell ethane to Alberta via Vantage**

Advantages of Alberta ethane sale

- Avoid Conway oversupply, price index to Belvieu, or
- Lock in a margin with 'gas-plus' pricing
- Decrease risk of US oversupply of ethane with a direct sale to major end-users.

“Netback” Structure: **BASIS** less **TOLLS**

- **BASIS:** Negotiated price at Empress, AB. Gas-plus, Conway/Belview index, or hybrid.
- **TOLLS:** cost of ‘new’ pipe facilities, Vantage pipeline, lateral to point of connection.
- Vantage Pipeline toll is ~\$US 0.11/gal for long term arrangement, firm capacity.
- Surcharges for shorter term, flow above firm capacity.

Other NGL Issues

- Numerous plants and expansions planned in North Dakota by producers and midstreamers
- Several parties spending capital on small deethanizers, fractionators, storage, truck/rail loading sites, rail spurs.
- Propane, butane, terminal needs should have good rail access.
- Logistical problems can be experienced for areas farther away from the main rail service.

Y-grade Value Proposition

- Economy of scale for centralized facility: deethanizer, frac, storage, loading, rail spur
- Additional pipe not excessive. Replace/re-license some ethane laterals for y-grade
- Provides a home for “NGL mix” trucked in from small plants too small for pipe connection
- Opportunity to establish NGL gathering pipe across the basin and frac and marketing hub.
- Aggregate volumes for future pipelines

For further information

Vantage Pipeline

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