Western Canadian NGL Fractionation Outlook
Forward-Looking Information

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Agenda

- Existing Western Canadian NGL Fractionation Capacity
- Historical and Forecasted NGL Production
- Proposed Capacity Expansions
- Beyond Fractionation – Product Egress
- Case Study of Keyera’s Fort Saskatchewan Fractionation Facility
Fort Saskatchewan Fractionation Facilities

1. RFS (Redwater) – Pembina
2. PFS (Ft Sask) – Plains
3. DFS (Ft Sask) – Dow
4. KFS (Ft Sask) – Keyera

Ft. Sask Fractionation Facilities provide ~ 230,000 bpd of capacity
Pembina Fort Saskatchewan (Redwater)

- Initial facility installed in 1998 by TransCanada Midstream
- Handles both C2+ and C3+ feeds via Peace, Brazeau and Northern NGL Pipelines
- Existing capacities
  - 73 MB/d – C2+; 47 MB/d – C3+

Source: ERCB
Plains Fort Saskatchewan (PFS)

- Commissioned in 1983 by Amoco
- Receives C3+ mix off Co-Ed via Ft. Sask Pipeline (FSPL)
- C3/C4 mix shipped via Enbridge to Sarnia, Ontario for further fractionation
- 60 MB/d existing C3+ capacity

Source: ERCB
Dow Fort Saskatchewan (DFS)

- De-ethanization & Fractionation Facility commissioned in May 1993
- Facility owners include Dow, Shell and Keyera
- Receive C2+ feeds from major feeder pipelines – Pembina Peace & Brazeau
- Existing capacities: 69 MB/d – C2+; 31 MB/d – C3+

Source: ERCB
Keyera Fort Saskatchewan (KFS)

- Installed in 1970 and current facility owners are Keyera, Plains and Exxon
- 30 MB/d existing capacity
- Receives C3+ mix feed from Peace Pipeline, truck, Fort Saskatchewan Pipeline (FSPL), Rimbey Pipeline and Dow De-ethanizer

Source: ERCB
Alberta Field Fractionation Facilities

Plains High Prairie
2013 Production: 3,400 bpd

CNRL Knopcik
2013 Production: 2,000 bpd

Keyera Rimbey
2013 Production: 25,000 bpd

Suncor Ferrier
2013 Production: 3,900 bpd

Gibsons Hardisty
2013 Production: 2,800 bpd

Keyera Nevis
2013 Production: 4,200 bpd

Altagas Harmattan
2013 Production: 20,000 bpd

Field Fractionation Represented ~61 MB/d in 2013
Alberta Straddle Plant Facilities (2013 Recoveries)

- **AltaGas Ellerslie (EEEP)**
  - 11,000 bpd of C2
  - 4,000 bpd of C3+

- **AltaGas Joffre (EEP)**
  - 5,000 bpd of C2
  - 1,500 bpd of C3+

- **Inter Pipeline Cochrane**
  - 47,000 bpd of C2
  - 23,000 bpd of C3+

- **Pembina Empress**
  - 28,000 bpd of C2
  - 11,000 bpd of C3+

- **Atco Empress**
  - 5,000 bpd of C2
  - 4,000 bpd of C3+

- **Plains Empress**
  - 36,000 bpd of C2
  - 16,000 bpd of C3+

- **Spectra Empress**
  - 38,000 bpd C2, C3 and C4

Gas Straddle Plants Recovered ~230 MB/d in 2013
Alberta NGL Production
(as extracted from ERCB website)

Historical Liquids Production Relatively Flat
Empress NGL Production
(as extracted from ERCB website)

Empress NGL Production vs Gas Volumes

Downward Trend More Significant at Empress
Western Canadian Sedimentary Basin (WCSB) Gas Production Forecast

- WCSB gas production projected to be over 15 Bcf/d by 2022 due to the development of shale plays
  - Western Canadian drilling is concentrated within the liquids rich area of the basin and includes the Montney, Duvernay, Glaucovite, Cardium, Wilrich, Notikewin, Spirit River formations
  - WCSB growth projection assumes Westcoast LNG exports of ~2.5 bcf/d
Western Canadian Sedimentary Basin (WCSB) NGL Growth Outlook

- North American NGL production has increased by 36% from 2009 through to 2014 due to the development of shale plays
  - Western Canadian shale production is expected to account for approx 15% of future North American NGL production

**North America**

**Western Canadian Sedimentary Basin**

WCSB Forecasted to be 15% of North American Supplies
Industry Response to Forecasted NGL Growth

» Keyera
  - KFS De-ethanizer/Fractionation Expansion
  - Rimbey Fractionation Expansion

» Pembina
  - RFS Fractionation Expansions
  - NGL Gathering System Expansions

» Other greenfield solutions being considered
  - Fractionators
  - NGL gathering systems
  - Petrochemical facilities
Keyera Fort Saskatchewan De-ethanizer

- Adding a 30,000 bpd de-ethanizer at Keyera Ft. Saskatchewan (KFS)
- Gross costs of ~$200 million, including pipeline connections and conversion of cavern to C2+ raw feed storage
- Expected on-stream around year end
Fractionation Expansion
Keyera Fort Saskatchewan

» 35,000 bpd C3+ fractionator expansion
  ▪ Estimated cost of $225 million
  ▪ Anticipated on-stream Q1 2016
» Brings site total to 65,000 bpd
Fractionation Expansion Pembina RFS II (RFS III)

- Twinning existing fractionator with 73,000 bpd unit (RFSII)
  - Estimated cost of $415 million
  - Anticipated on-stream Q4 2015
- Further ethane plus fractionation expansion planned for Q3 2017 (RFSIII)
  - Incremental 55,000 bpd
- Brings site total to ~200,000 bpd
LNG Developments

» 22 publicly proposed LNG export projects in Canada
  ▪ 19 in BC

» 9 export licenses approved

» First gas produced expected to be from liquids rich zones

» Edmonton/Fort Saskatchewan energy hub potential destination for NGL production
Beyond Fractionation - Product Egress

» Incremental NGL production will need to access North American and world markets

» C5+ can be consumed in Alberta by oil sands producers for use as diluent

» Ethane, propane, and butane are all to varying degrees long in supply

» Potential for construction of new petrochemical facilities for local consumption
Beyond Fractionation - Product Egress (C2)

» WCSB shale plays are rich with ethane

» Growth volumes need to rely on petrochemical expansions and LNG. Otherwise ethane rejection will occur as supply ramps up.

» Petchems are importing ethane from U.S. via the Vantage pipeline
  - Provides access to Bakken ethane
Beyond Fractionation - Product Egress (C3)

- Propane production is significantly outpacing demand in WCSB

- Kinder Morgan Cochin pipeline changed service in Spring/2014 and is no longer available for exporting propane from Alberta.

- Even greater reliance on rail for transportation

- Appears the acquisition of rail cars and construction of incremental rail loading terminals is lagging for the upcoming winter season
Beyond Fractionation - Product Egress (C3)

- Long-term solutions likely include:
  - Canadian West Coast export facilities – Access Asian markets
  - U.S. West Coast and Gulf Coast export facilities
  - Western Canadian Petrochemical facilities – PDH and crackers

» WCSB supplies currently delivered to eastern markets are expected to be uncompetitive as resource plays like the Marcellus and Utica continue to grow
Beyond Fractionation - Product Egress (C4)

» Increasing Canadian demand through increased use as a solvent for the oil sands and within diluent for transport of bitumen

» Excess NA butane will rely on LPG export facilities and domestic demand growth from refineries and petrochemical facilities

» Propane export facilities will have capabilities for butane as well
Strong demand for use as a diluent in transporting bitumen

Canadian demand to significantly outpace WCSB supply so continued reliance on U.S. imports

- Oil sands production expected to require as much as 750 MB/d
- WCSB supply is projected to be 200 MB/d by 2020
- U.S. imports to occur via both rail and pipe

Crude by rail slightly lessens the supply/demand imbalance
Case Study: Keyera Fort Saskatchewan Fractionation

» Historical

» Cumulative capacities of frac facilities were slightly greater than the available NGL mix supply

» Annual competitive environment with Pembina, Dow and Plains (BP) for supply contracts

» Vintage of frac facilities (1970 – 98) so no new capital investments were being made

» Without new capital investments pricing for frac services has been market based

» Approximate historical pricing ($/bbl)

2008 2009 2010 2011 2012 2013 2014
2.5 2.7 2.7 2.9 3.0 3.5 4.0
Case Study: Keyera Fort Saskatchewan Fractionation

- **Future**

  - Increased mix supply has increased demand for frac capacity and allowed for us to sign contracts underpinning an expansion of our fractionator at KFS
  - New pricing now being established and driven by the capital investment required
  - Step change for Keyera’s customers in terms of the new tariff for frac services
  - Sanctioned project for 35 kbd expansion
    - Cost estimate is $225 million
  - New tariff to support the investment is in the 4.5 to 5.0 per bbl range
    - Depends somewhat on volume, term, take-or-pay element, other services
Questions?