Black Wax Issues

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Utah Energy Profile

From Energy Information Administration

- Utah produces about 1.2% of the nation’s oil
- Contains about 1.5% of the reserves – 286 million barrels
- Natural gas percentages are higher
- Large reserves of coal
- Oil sands
- Oil shale

- Most of the oil production is high pour point paraffinic crude oil – Black Wax
Black Wax Issues

• Only small amounts are mixed with non-paraffinic crudes and pipelined
• Most black wax is trucked
• Cost and environmental considerations
• Challenges in refining
• Cost differential
IOGCC Study - 2007
Rocky Mountain Region
Crude Oil Market Dynamics

Final Report
IOGCC Governors’ Task Force
January 2007

- Investigate the crude oil market dynamics in the Rockies
- Identify the conditions causing the precipitous price drop, and the expected duration of these conditions
- Recommend both near and long-term actions that could be taken to correct this situation
Report Findings

- Excess supplies are causing significant price differentials.
- Canadian imports will increase. – good for energy security. Canadian imports can overload regional take away capacity and depress local prices.
- The key is to eliminate the bottlenecks that prevent oil in the Rockies from reaching destinations where it can maintain higher values.
- Exporting pipeline capacity is expected to increase.
- There has been no significant change in refinery capacity in the region, although incremental expansions have been executed.
- Refinery processing dynamics have changed due to the increase in production of sour feed.
Recommendations

• Proactively promote pipeline and refinery development
• Infrastructure development
• Better regulatory framework
• Tax policy to incentivize infrastructure development
• Work with Tribal groups
• Market transparency and facilitation
Some History

• In 1991 three big waterfloods
  – Redwash, Wonsits Valley, Walker Hollow
• A small company – Lomax Exploration
• U.S.DOE Class I Reservoir Program
  – Research partner – University of Utah
• Beginning of the Greater Monument Butte Waterflood program
Oil Production

Production, Millions of Barrels per Year

Year

Monument Butte

- To date, invested > $750 million
- 1,340 producing oil wells
- 584 class II water injection wells
- Increased oil production 176% to 17,000 BOPD

From Newfield Production
Black Wax Characteristics

• Good API gravity
• Low viscosity at temperature
• Low sulfur
• High pour point
  – Implications on product distributions
  – Implications on transport and storage within the refinery
• High resid and gas oil fraction
Black Wax Characteristics

From Vince Memmott
Compositions

Simulated Distillation

- 19.8% not detected
Black Wax is not Bitumen!

• Upgrading technologies
  – Carbon rejection
  – Hydrogen addition

• For rich paraffinic feedstock, nonideal

• Chemical production?
  – Alpha olefins
    • Detergent manufacture
    • Other chemical uses
Refining Considerations

• Mature industry
• Unit coordination
  – Crackers
  – Hydrotreaters, etc.
• Flexibility in adjusting feedstock mix
  – Different oils available
• Maximize specific distillates/products
• Capital expenditures specifically for black wax
Technological Solutions

• Pour point depressants
• Mixing and transporting; diluents
• Slurry transport – emulsions
• Partial upgrading – wellhead or central
• Microbial processing
• Refining – A project currently being planned by Uinta Partners
• Other
Combined Thermal/Catalytic
Resid Conversion

![Resid Conversion Chart](image)
Summary

• Transportation is the biggest problem with Black Wax even though the high pour point oil causes production, storage and refining problems

• Solving this problem will result in significant benefits to all stakeholders