Canadian Crude Quality Technical Association
Project Update
COQG Meeting
February 8th, 2007
CCQTA
Active Projects List

• Heavy Oil Manual
• Iron Fouling
• NGL Contamination
• Phosphorus in Crude
• Oilsands Bitumen Processability
• TAN Phase III

New Projects

Contact: president@ccqta.com or secretary@ccqta.com

February 8, 2007
Heavy Oil Manual Project Status

• Project funded by general membership
• Goal is to review methods applied to heavy oils and bitumens, identify issues associated with their application to a heavy oil matrix, and provide recommendations/upgrades to the test methods

• TAN, asphaltenes, Sample preparation and density completed
• Project manager – Bryan Fuhr 1-780-450-5032

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Iron Fouling Project

Goal

• Project goal is to understand role of iron as a contaminant in condensate and crude oil
  – as an emulsion stabilizer
  – as a process foulant, i.e., in furnaces, reboilers, fuel gas filters, etc.
  – as a process contaminant, e.g., catalytic units

• Project manager - Jack Suggett - 1-780-645-2807
Iron Fouling Project
Participants

- ConocoPhillips
- Flint Hills Resources
- CITGO
- NCRA
- IOL
- Nalco
- Chevron
- Encana
- Halliburton
- NCUT

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Iron Fouling Project
Target Processes

• Emulsions created during desalting
  – CITGO
  – Others

• Hydrotreater/FCCU catalyst
  – BP Toledo
  – CITGO Lemont
  – IOL Strathcona

• Process Foulant/DIB reboiler
  – Chevron Burnaby
  – IOL Strathcona

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Iron Fouling Project
Target Streams

• Condensate
  – Condensate produced from NGL plants
  – CRW equalized

• Light Sweet Canadian Crude
  – Peace, Rainbow, Federated, BC Light, MSW

• Canadian Heavy
  – WCS, Lloyd blends
Iron Fouling Project

Q1/07 Activities

• Document refinery fouling and/or processing issues associated with iron
• Identify the various methods/applications where iron is used, managed, transported during crude oil production
• Identify the multiple source(s) of iron in light crude, heavy crude and condensates.
• Investigate the sources of condensate used as diluent for heavy crude oils
NGL Contamination Status

• Project is examining the nature and source of plant fouling associated with processing field butane
• Refiners employing mechanical filtration to help manage problem
• Fractionators continue to report reboiler fouling
• Work is focusing on tracking contamination back to a source
• Project manager – Bob Falkiner 1-416-441-7145

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NGL Contamination
Participants

- ARC
- BP
- Keyera
- Maxxam
- Pall Filters
- Provident

Alberta Envirofuels
Dow Chemical
Imperial Oil
Nova Corporation
Petro-Canada
Halliburton

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Phosphorus in Crude Status

- Project group awaiting 1st Qt. results of CAPP spec.
- Other activities include pilot plant testing of alternative gellant chemistries
- Project manager – Bruce Kennedy 1-416-986-6722
Phosphorus in Crude
Project Participants

- BJ Services
- CCS Energy
- Chevron
- Clearwater
- Enerchem
- Halliburton
- REV Fluids
- Imperial Oil
- Maxxam
- Nalco
- NewAlta
- Petro-Canada
- United Refining

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Oilsands Bitumen Processability Project - Goal

• Project focuses on anticipated processability issues associated with refining oilsands bitumen
• Salts, solids, sulfur, nitrogen, metals identified as key area of concern/focus.
• Project manager – Bruce Randolph 1 - 918-661-5077
Oilsands Bitumen Processability Project - Participants

- ConocoPhillips
- Marathon
- CITGO
- NCRA
- NCUT
- Suncor
- Encana

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February 8, 2007
Oilsands Bitumen Processability Project – Targeted Streams

• Produced oilsands bitumen,
  – Petro-Canada - Fort Mackay
  – Encana - Christina Lake
  – Encana – Foster Creek
  – Suncor - Firebag
  – ConocoPhillips - Surmont
  – Shell – Albian Heavy Synthetic

• Others
  – WCS

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Oilsands Bitumen Processability Project - Q1/07 Activities

• Prepare questionnaire/request for data - to be distributed to producers.
• Review, assess and compile existing data provided by producers, research organizations.
• Identify information gaps & Q2 follow-up activities.
TAN Project Phase III

Goal

• Phase III goal is to validate results of Phase II by conducting corrosion testing under vacuum conditions
  – Minimize influence of (H₂S) sulfur passivation
• First step involves validating new autoclave by running high Tan SJV
• Project manager – Randy Segato 1-403-920-8994
TAN Project Phase II
Project Participants

• NCUT
• Suncor
• ConocoPhillips
• NCRA
• ENCANA
• JACOS
• IOL
• ARC
• Petro-Canada

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TAN Project - Phase III
Test Conditions

- Autoclave Testing – each sample
  - 1 week at 10 mm vacuum and 315 C
  - Test using spinning cage in liquid phase
  - Mixing velocity of 4 m/s
  - Replenishment – continuous – fully replaced every 12 hours
TAN Project - Phase III
Analysis Protocol

• Sulphur speciation of autoclave feed
• Determine metal loss on coupons
• Inspect coupons with SEM technique for sulfidic passivation and evidence of NAC
• Examine reactive species through high resolution MS and adaptation of iron powder test
  – React gas-oil with excess iron powder, filter, then extract and measure dissolved iron naphthenate compounds by MS

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TAN Project - Phase III
Proposed Samples ~10 gas-oils

- Repeat Samples
  - Oilsands #1
  - Oilsands #2
  - Bitumen #1
  - High TAN SJV

- New Samples
  - Upgrader gas-oils
    - Synbit blends
  - Others
  - WCS

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Next meetings

• Project meetings to be held in Calgary on March 27th & 28th.
• CCQTA AGM scheduled for mid June.
• Project meetings scheduled for Edmonton in September.
• CCQTA GM in Calgary in December