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COQA Meeting

Hotel Monaco

**15 West 200 South
Salt Lake City, Utah 84101
(801) 595-0000
1:00 – 5:00 p.m.**



THE VALUE OF BAKKEN

- **EXECUTIVE SUMMARY**

*** For many years, Bakken Sweet (also known as North Dakota Sweet (“NDS”) and North Dakota Light (“NDL”)) experienced huge lease discounts in the range of \$20.00 - \$25.00 to WTI Benchmark.**



THE VALUE OF BAKKEN

- **EXECUTIVE SUMMARY**

* Recently, expansions in both outbound pipeline capacity and (more importantly) the expertise in growing unit train capacity have narrowed discounts at lease dramatically (-8 to -12).



THE VALUE OF BAKKEN

- **EXECUTIVE SUMMARY**

*** An examination of NDL from a blend and relative refining value shows there is more value in NDL than is apparent. Therefore, as additional outbound capacity grows, NDL values will continue to go higher, even as the Bakken trend grows in production volume.**



ASSAY DATA

LLS	Assay		NDSweet Assay	Cushing Common		WCS
API		38	39.7		39.4	21.6
wt%S		0.34	0.25		0.424	3.44
	Dist					
LightEnds 50<		1.40%	2.62%	LSR-LNAF0/286	20%	
LSR	50/145	3.10%	3.45%			LSR 50/145 3%
LNAP	145/280	13.80%	12.36%			LNAP 145/280 3.00%
HvNAP	280/375	11.40%	9.68%	Lnep-LFO 286/650	50%	HvNAP 280/375 5.00%
Jet	375/450	9.40%	10.46%			Jet 375/450 10%
LFO	450/650	26.40%	27.58%			LFO 450/650 12%
Gasoil	650/1050	27.30%	27.20%			Gasoil 650/1050 37%
VacTar	1050+	7.20%	6.65%	VacTar 1020+	8% to 22%	VacTar 1050+ 29.80%
		100.00%	100.00%			100%

Conventional Syn		Mixed	Sweet	Wyo/Mont
API	32.7	API		32.6
wt%S	0.17	wt%S		0.52
LightEnds 50<	0.50%	LightEnds 50<		1%
LSR	50/145 1%	LSR	50/145	2%
LNAP	145/280 10.50%	LNAP	145/280	6%
HvNap	280/375 14%	HvyNap	280/375	15%
Jet	375/450 11%	Jet	375/450	7%
LFO	450/650 29%	LFO	450/650	27%
Gasoil	650/1050 33%	Gasoil	650/1050	24%
VacTar	1050+ 1.00%	VacTar	1050+	18%
	100.00%			1

EXAMINATION OF RELATIVE REFINING VALUE



ROCKIES



EXAMINATION OF RELATIVE REFINING VALUE - ROCKIES

- **The refining configuration of an average Rockies' Plant is Crude Unit, Cat Cracker, Reformer, Modest Coker, and Desulfurization Unit.**



DATA SYN vs. NDL

Syn	VS	NDL	NDL NDSweet	Assay	5/31/2011 Relative NDL	Value in US\$	Index bbl
Conventional Syn							
API		32.7		39.7		0.32	
wt%S		0.17		0.25		-0.13	
LightEnds	50<	0.50%		2.62%		-0.15	
LSR	50/145	1%		3.45%		-0.2	
LNAP	145/280	10.50%		12.36%		0.32	
HvNap	280/375	14%		9.68%		-0.14	
Jet	375/450	11%		10.46%		-0.02	
LFO	450/650	29%		27.58%		0.02	
Gasoil	650/1050	33%		27.20%		0.23	
VacTar	1050+	1.00%		6.65%		-0.26	
		100.00%		100.00%			
							-0.01

Economic Assumption

Syn to	WTI	10
NDL to	WTI	-6
Cost NDL	logistics	4.5
Cost Syn	logistics	3.5

■	Additional Hydrotreat cost
■	FCC Value
■	Coker Penalty



EXAMINATION OF RELATIVE REFINING VALUE - ROCKIES

- **Domestic Sweet alternatives like NDL price against conventional SYN basis Canada, but value is limited by logistics. If we remove logistical constraints, we find the value of Bakken to local markets is Parity or better to delivered Synthetic (+10 in current market).**

Therefore, we can infer logistics is creating a \$6.00 to \$7.00 discount in NDL currently to refiners in the Rockies.



EXAMINATION OF EXPORT MARKET & RRV

- **LLS Based – Eastern Padd 2 or
St James Proper**



DATA LLS vs. NDJ

LLS	Vs.	NDL	at	STJMS	Relative	Value	Index
LLS	Assay			NDSweet Assay	NDL	USD	BBL
API		38		39.7			1.25
wt%S		0.34		0.25			1.85
	Dist						
LightEnds	50<	1.40%		2.62%			0.92
LSR	50/145	3.10%		3.45%			1.01
LNAP	145/280	13.80%		12.36%			1.15
HvNAP	280/375	11.40%		9.68%			1.53
Jet	375/450	9.40%		10.46%			0.19
LFO	450/650	26.40%		27.58%			0.26
Gasoil	650/1050	27.30%		27.20%			0.15
VacTar	1050+	7.20%		6.65%			1.75
		100.00%		100.00%			

10.06

Economic Assumptions

lease	(\$6)	NDL toWTI		
Rail Car	\$10	to St James		
LL/TI	\$15	at StJms		
Blend Valu	0			
Group/Rockies	even	USGC	Products	



- **Based on derived RRV, refiners able to unit train NDL to St James are saving \$10.00 per bbl.**
- **Unit train car demand is highest on record, but remains a limiting factor in USGC LLS based crude offset.**
- **WTI/Brent divergence is singular reason for pipeline project expansions from Northern Tier US/Canada to USGC.**



QUESTION:

- What projects will go forward?
(XL, Monarch, Enterprise?)

EXAMINATION OF EXPORT BLEND MARKET (CUSHING)

DATA

CUSHING vs. NDL/WCS



Dom Swt	Vs. Cushing	NDL/WCS at Common	Cushing NDL/WCS	Relative Value NDL/WCS USD	Index BBL
		39.4 0.424	39 0.427	0.27 1.25	
LSR-LNAF 0/286		20%	n/a	n/a	
Lnap-LFO 286/650		50%	n/a	n/a	
VacTar	1020+	8% to 22%	n/a	n/a	

1.52

Economic Assumptions

lease	(\$6)	NDL toWTI		
Rail Car	\$5	to Cush		
WTI	\$0	at Cush		
No Assay		Spec	Cush	
Group/Rockies		even		Products
WCS/TI	(\$13)	at Cush		
ND/WCS	17/1	at Cush		



- The RRV of Cushing Common vs. 17 to 1 NDL/WCS is muted as there is no distillation spec at Enterprise Cushing.
- **Inferred value using API + WT%s is \$1.50 per bbl.**
- **Although a slight benefit, the better use of rail car supply is to a St James related market. (No Brent/TI divergence at Cushing!)**



EXAMINATION OF BLEND VALUE OF WYOMING/MONTANA MIX TO NDJ

Mix Sweet Vs.		NDL	at	STJMS	Relative	Value	Index
Mixed	Sweet	Wyo/Mont		NDSweet Assay	NDL	USD	BBL
API		32.6		39.7		1.75	
wt%S		0.52		0.25		0.86	
LightEnds	50<	1%		2.62%		0.43	
LSR	50/145	2%		3.45%		0.25	
LNAP	145/280	6%		12.36%		1.25	
HvyNap	280/375	15%		9.68%		0.35	
Jet	375/450	7%		10.46%		0.76	
LFO	450/650	27%		27.58%		0.15	
Gasoil	650/1050	24%		27.20%		0.1	
VacTar	1050+	18%		6.65%		2.65	
		1		100.00%			

8.55

Economic Assumptions

lease (\$6) NDJ toWTI
 lease (\$10) MXD toTI

Logistics in Parity



- **The Market differential of Mixed Sweet Vs. NDL is \$4.00, but is exceeded by the RRV index number by an additional \$4.00.**
- **This infers more blend value than is currently being captured and portends additional possible degradation in common carrier lines.**



Conclusions

- 1) **NDL Bakken is a highly valuable light sweet crude that will grow in value as more outbound logistics can be developed.**
- 2) **Rockies refiners will need to adjust pricing of NDL to remain competitive with export values.**
- 3) **Rockies refiners will have added pressure from lower value sweet blends from Montana and Wyoming that will degrade the pool of high valued NDL.**