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I. WCSB Supply Anticipated to Double by 2015

3. As the Manager of Commodity Forecasting, I have reviewed the various studies prepared by the Canadian Association of Petroleum Producers ("CAPP") and the Canadian National Energy Board ("NEB"), and I have independently developed a long term forecast[1] of WCSB crude oil supply[2] and disposition in North America for Enbridge and its affiliates. These supply forecasts demonstrate the need for additional market access for Canadian crude to various U.S. markets. The construction of the Southern Access Extension to Patoka, the recovery of costs of which is the subject of this Offer of Settlement, will provide access for Canadian crude to extended U.S. markets.

4. As part of Enbridge's budgeting and strategic planning process, I prepared a short and long term WCSB crude oil supply and disposition forecast. On June 15, 2006, I provided a report to Senior Management, which I have attached as Attachment A to my affidavit. The long range forecast from 2005 to 2015 shows WCSB production increasing from 2.18 million barrels per day to 3.97 million barrels per day, an increase of 82% during this ten-year period.

5. In May 2006, CAPP issued its Canadian Crude Oil Production and Supply Forecast for 2006 to 2020[3]. CAPP's forecast resulted in higher production volumes than I had

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[1] The CAPP study is available at http://www.capp.ca/raw.asp?x=1&dt=NTV&e=PDF&dn=103586 . The NEB study is available at http://www.neb-one.gc.ca/energy/EnergyReports/EMAOilSandsOpportunitiesChallenges2015_2006/EMAOilSandsOpportunities2015Canada2006_e.pdf .

[2] WCSB Production is comprised of Conventional Light, Conventional Heavy, Condensate, Upgraded Bitumen (SCO) and Non-Upgraded Bitumen.

[3] Which can be found at http://www.neb-one.gc.ca/energy/EnergyReports/EMAOilSandsOpportunitiesChallenges2015_2006/EMAOilSandsOpportunities2015Canada2006_e.pdf.

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developed for Enbridge. Specifically, CAPP forecasts that by 2015 crude production will be 4.39 million barrels per day, which translates to a 101% increase in WCSB production.

6. The NEB also published a forecast issued in June 2006 entitled "Canada's Oil Sands Opportunities and Challenges to 2015."[4] This forecast supports both the Enbridge and CAPP forecasts, showing an increase in WCSB production from 2.18 to 3.86 million barrels per day by 2015, an increase of 77%.

7. All of these published forecasts demonstrate that Canadian crude oil supply is increasing at a rapid rate. Canada is a key source of crude oil imports into the United States; in 2005 Canada ranked as the top supplier to the U.S., surpassing more volatile traditional sources. Attachment D to my Affidavit shows the imports to the United States by country, as well as Enbridge's role (i.e. 64% of US imports from Canada) in delivering Canadian crude oil to U.S markets. For these reasons, additional Enbridge pipeline capacity to extended markets is required.

II. Demand in the U.S. Midwest Markets for Canadian Crude Supports the Conclusion that the Southern Access Extension Will Be Utilized

8. My analysis indicates that as of 2005, the historical markets in Canada and the United States are approaching saturation and are experiencing increasing difficulty accommodating additional Canadian crude supply. Market saturation is particularly acute for the Canadian heavy sour crude grades. As synthetic crude production continues to increase, it too will likely begin to encounter market saturation issues in its historical market area. In 2006, Enbridge commissioned a study by the independent petroleum consulting firm Muse, Stancil &

[4] The NEB study is available at http://www.neb-one.gc.ca/energy/EnergyReports/EMAOilSandsOpportunitiesChallenges2015_2006/EMAOilSandsOpportunities2015Canada2006_e.pdf.

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Co. to examine various questions regarding the proposed Southern Access Extension Project. *See* Report of Muse, Stancil & Co., Economic Benefits of the Southern Access Extension Project 2010-2020 (August 2006) ("Muse Report") (attached hereto as Attachment B). As indicated in the Muse Report, market saturation has led to widening discounts of Canadian heavy sour crude prices relative to other heavy sour crude grades available on the U.S. Gulf Coast. These market dynamics make Canadian crude attractive as a supply source vis-à-vis other foreign sources for the refiners in the Midwest. *See id.* at 7 - 10.

9. As a result, several Midwestern refineries in the United States have announced that they will undertake significant capital investments to modify their refinery facilities in order to process increasing amounts of Canadian WCSB crude supply. According to the Muse Report, Frontier, Marathon, Sunoco, ConocoPhillips, and BP have all announced plans to modify their refineries in the Midwest between 2009-2015, which could result in additional demand for WCSB production in excess of 500,000 barrels per day. *See id.* at 9.

10. In addition to these refinery initiatives, producers also have been seeking access to new markets outside of the historical northern region of the U.S. The Spearhead pipeline owned by Enbridge, currently flows from Chicago to Cushing, Oklahoma (having been reversed in 2005-06 from its former Cushing to Chicago service). Spearhead now brings up to 125,000 b/d of Canadian crude to U.S. markets accessible through Cushing. Similarly, the Mobil pipeline, owned by ExxonMobil, has been reversed to ship Canadian crude south from Patoka to Beaumont, Texas at the U.S. Gulf Coast. The Mobil pipeline, with a current capacity of approximately 66,000 barrels per day, provides access from Beaumont to the largest refining market in the U.S. Access to the Cushing and U.S. Gulf Coast markets has helped narrow the differential between WCSB production and other foreign sourced crudes. *See* http://www.neb-one.gc.ca/energy/EnergyReports/TACdnHydrocarbonTransportation2006_e.pdf.

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11. As my forecast (Attachment A hereto) report shows, the demand for WCSB crude in 2005 was approximately 2.2 million barrels, which effectively matched the available supply that year. In 2005, the majority of the WCSB crude supply was delivered to PADD II markets (approximately 1,042,000 b/d) with the remainder going to Western Canada (approximately 574,000 b/d), Ontario (approximately 212,000 b/d), PADD III (approximately 9,000 b/d), PADD IV (approximately 274,000 b/d), and PADD V (approximately 83,000 b/d). Attachment A shows the significance of the PADD II market for WCSB production.

12. As discussed in the Affidavit of Wilf Schrage (Exhibit IV to the Offer of Settlement), producers and shippers requested that Enbridge develop a project to bring additional crude supply from the Western Canadian Sedimentary Basin to extended markets in the U.S. Midwest. In response, Enbridge Energy developed the Southern Access project in stages to provide additional capacity from Alberta to markets in Chicago and the Patoka hub in southern Illinois. The proposed Extension, which is the subject of this Offer of Settlement, is the final component of the Southern Access Project.

13. The need for the Southern Access Project is demonstrated in CAPP's analysis of the available and proposed export pipeline capacity, which is used to calculate any surplus or shortage in available capacity. Table V of the CAPP forecast is reproduced as Attachment C to this Affidavit. In Table V, CAPP analyzes the available capacity (Enbridge + Non-Enbridge) + Proposed Projects (Enbridge + Non-Enbridge) and calculates the surplus or shortages against its projected growth in supply. According to this table, without the new proposed projects there will be a capacity shortfall of 140,000 bbls/d as early as 2009. With the proposed Enbridge Southern Access Project and Non-Enbridge projects, the shortfall is pushed off to 2011 but the shortfall increases to 215,000 bbls/d. Even with the Southern Access Project, additional pipeline projects are required to transport this immense incremental growth in Canadian production.

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14. The Southern Access Extension provides needed pipeline capacity to allow the refining markets supplied from the Patoka Hub to get access to WCSB supply. There is aggregate crude capacity in refineries served by Patoka of 951,400 bbls/d. Current pipeline capacity from WCSB, however, is only 230,000 bbls/d (from a combination of Mustang and Platte pipelines). The construction of the Southern Access Mainline Extension will provide refiners served through Patoka with access to an additional 400,000 bbls/d of WCSB supply.

15. The Muse Report provides some insight into the usefulness of the Southern Access Extension from the perspective of the refiners in the Midwest and elsewhere, within the context of the overall market for Canadian WCSB crude. As discussed in the Muse Report, "[a] number of Midwestern refiners have announced that they are developing refinery upgrade projects – and these projects have a common theme – they are intended to increase the capability of the refineries to process Canadian crude." Refiners are investing substantial capital to upgrade these refineries because of: 1) attractiveness of Canadian crude; 2) improved security of supply; 3) shorter delivery times; and 4) where applicable, integration of a company's upstream production business with their refinery. Based on a detailed analysis, the Muse Report projects utilization of the Southern Access Extension to range from 158,000 b/d in 2010 (the first full year of operation) to as much as 567,000 b/d in 2020. Muse Report, at 14. The Muse Report is thus supportive of my analysis that there will be a market for Canadian crude in the markets supplied by the Southern Access Extension and, accordingly, that the Southern Access Extension will be utilized.

16. Based upon my forecast of Canadian WCSB production (which is supported by the CAPP and NEB forecasts) and increasing demand for WCSB in the Midwest markets, including Patoka, the utilization of the Southern Access Extension can be expected to steadily grow as Canadian crude production rises, even under current refinery configurations. In

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addition, there is the distinct possibility that demand growth for Canadian crude in the markets supplied by the Southern Access Extension will be further fueled by refinery upgrading projects that are specifically intended to increase their capability to process Canadian crude.

Juan Garcia

Subscribed and sworn to before me this 31 day of August 2006, by Juan Garcia.

Andre B. Kerkovius
A Notary Public in and for the Province of Alberta

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June 15, 2006

ENBRIDGE

Long Range Forecast (2006-2015)

Introduction

This document summarizes the results of Enbridge's 2006 Long Range forecast. In the fourth quarter of 2005, Enbridge surveyed western Canadian crude oil producers, pipelines and provincial governments to determine future crude oil supply out of the Western Canadian Sedimentary Basin (WCSB). Refiners were also approached for information on crude demand for their respective facilities. The respondents were asked to provide information for a period of 10 years, from 2006 to 2015.

Supply data was balanced against refinery demands to determine the likely production and disposition of western Canadian crude. A preliminary forecast consisting of two scenarios, a market unconstrained and a market constrained supply, was developed and presented at a series of meetings with industry participants. Feedback from these meetings was compiled and incorporated into the final Long Range Forecast detailed in this document.

Mainly as a result of significantly higher crude oil price expectations, the unconstrained and constrained supply cases for the 2006 Long Range Forecast expect greater future production from the 2005 Long Range Forecast. In the market constrained case the limiting factor for production growth is the downstream market and its ability to process incremental blended bitumen (Dilbit and Synbit) and the availability of sufficient export pipeline capacity – primarily to the west coast (China and California) and US Gulf Coast. The market unconstrained supply case has three key assumptions that differentiate it from the market constrained supply case: significant new access and demand for *western Canadian heavy crude to the US Gulf Coast by 2010, considerable growth in export volumes* to the west coast starting in 2010, and incremental imported condensate supply available for blending in 2009. For the unconstrained supply case to occur, a combination of incremental heavy crude demand and lower cost diluent available to bitumen producers, and significant new pipeline infrastructure will be required.

MARKET UNCONSTRAINED SUPPLY CASE

Western Canadian Sedimentary Basin Production and Disposition

- Steady production growth is anticipated in the WCSB. Production is expected to grow from 2.18 MMBPD in 2005 to 3.97 MMBPD (excluding imported condensate) by 2015, an increase of 82 percent.

- Conventional light crude production is expected to continue to decline, from 526 kBPD in 2005 to 464 kBPD in 2015. Light crude production is expected to grow modestly for 2006 and stay level in 2007, as drilling activity responds to high prices. In 2008, it is forecast that production will revert to the long-term historical average decline rate of approximately 3-4 percent.

- Conventional heavy crude production is expected to continue to decline at an average rate of approximately 3 percent per year through the forecast period.

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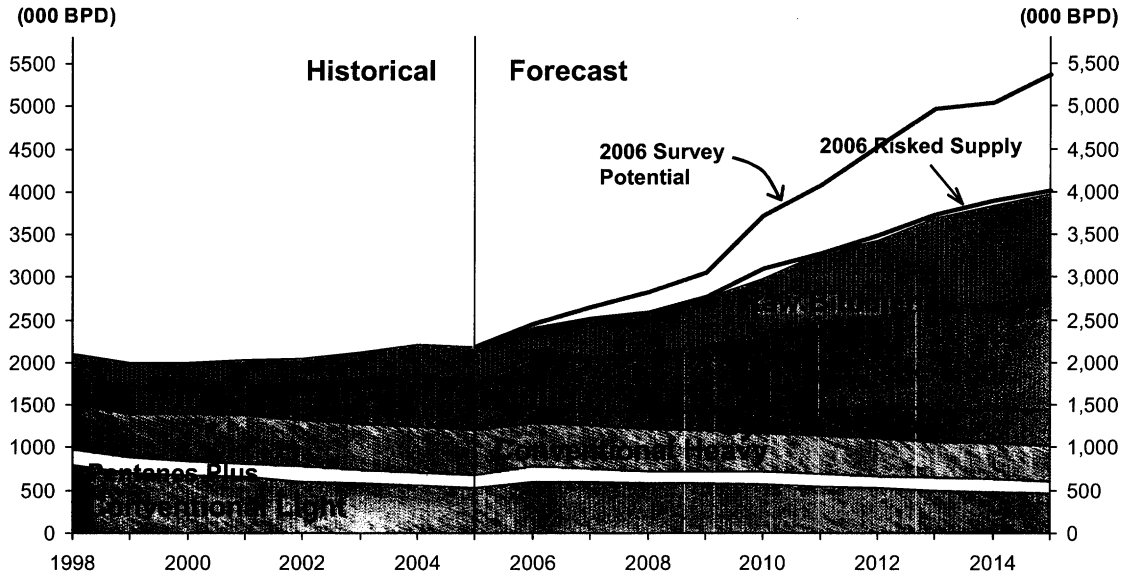
- Through 2015, PADD II, the US Gulf Coast and West Coast Exports are the major growth markets for western Canadian crude. PADD II is expected to increase runs by 1046 kBPD from 2005 to 2015 and movements off the West Coast are expected to reach over 500 kBPD.



PRODUCTION AND DISPOSITION
MARKET UNCONSTRAINED CASE (KBPD)

Western Canada Crude Oil Production	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Conventional Light	798	711	681	654	604	572	550	526	599	597	583	580	571	548	521	501	483	464
Pentanes Plus (excluding recycled)	174	171	165	157	182	189	145	144	179	154	145	145	144	144	144	144	143	143
New Condensate	-	-	-	-	-	-	-	12	31	50	52	101	125	184	221	270	300	301
Conventional Heavy (unblended)	544	521	560	572	537	565	544	526	518	506	491	477	464	452	442	429	420	408
Synthetic Heavy (mined only)	-	-	-	-	-	-	-	-	162	169	213	230	256	277	376	370	401	423
Synthetic Light (mined only)	303	324	314	344	435	521	627	546	603	634	659	754	894	1,037	1,060	1,186	1,244	1,352
Bitumen (unblended)	287	265	279	300	281	293	347	440	345	458	493	563	648	811	882	1,051	1,137	1,182
	2,106	**1,992**	**2,000**	**2,027**	**2,038**	**2,140**	**2,213**	**2,194**	**2,438**	**2,568**	**2,636**	**2,849**	**3,102**	**3,454**	**3,646**	**3,951**	**4,127**	**4,273**
Western Canada Crude Oil Disposition																		
Western Canada	446	461	460	459	453	562	609	574	620	650	642	685	643	641	647	609	617	606
Ontario	382	330	233	213	220	219	225	212	281	257	279	301	306	396	409	404	406	406
PADD IV	160	195	218	228	243	216	234	274	279	266	276	280	265	270	269	262	294	318
PADD V	105	66	64	75	67	54	93	83	92	95	106	145	67	67	51	105	128	101
PADD II Total	1,013	940	1,025	1,052	1,056	1,020	1,026	1,042	1,131	1,250	1,282	1,378	1,522	1,605	1,676	1,866	1,964	2,088
PADD III	-	-	-	-	-	49	27	9	35	50	50	60	100	100	184	239	239	239
West Coast Exports (Gateway)	-	-	-	-	-	-	-	-	-	-	-	-	200	375	410	445	480	515
	2,106	**1,992**	**2,000**	**2,027**	**2,038**	**2,120**	**2,213**	**2,194**	**2,438**	**2,568**	**2,636**	**2,849**	**3,102**	**3,454**	**3,646**	**3,951**	**4,127**	**4,273**

- Demand in Ontario for western Canadian crude increases in 2011 from 2010 by approximately 90 kBPD as a result of declining Atlantic imports and replacement with WCSB crude.

- Synthetic light crude, synthetic heavy crude and raw bitumen are able to more than offset the production decline in conventional crude, thereby increasing total WCSB production.

- Mined light synthetic production is expected to more than double in the next 10 years from 603 kBPD to 1.35 MMBPD. By 2015, approximately 248.5 kBPD of light synthetic crude is forecast to be used as diluent for bitumen blending purposes.

- Mined synthetic heavy and sour production (e.g. Albian Heavy Synthetic and Suncor OSE) grows from 162 kBPD in 2006 to 423 kBPD in 2015.[1]

[1] With the inclusion of output from the stand-alone upgraders, synthetic light and blended volumes differ from the raw synthetic heavy and light production volumes as these include only mined production.

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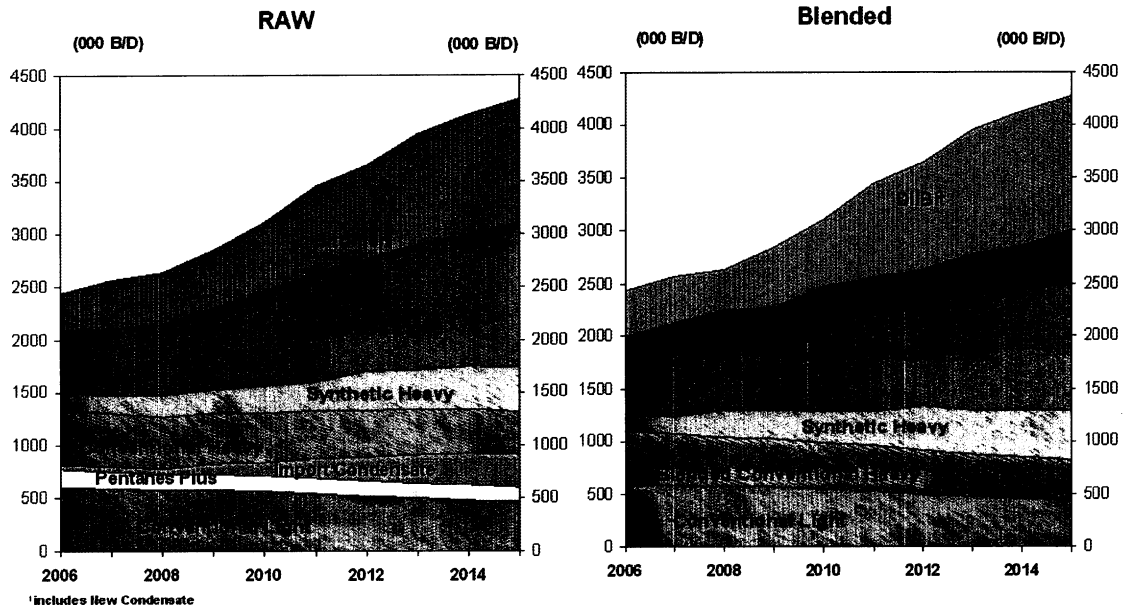

MARKET UNCONSTRAINED CASE (KBPD)

RAW PRODUCTION	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bitumen (unblended)	345	458	493	563	648	811	882	1,051	1,137	1,182
Synthetic Light (mined only)	603	634	659	754	894	1,037	1,060	1,186	1,244	1,352
Synthetic Heavy (mined only)	162	169	213	230	256	277	376	370	401	423
Conventional Heavy (unblended)	518	506	491	477	464	452	442	429	420	408
New Condensate	31	50	52	101	125	184	221	270	300	301
Pentanes Plus (excluding recycled)	179	154	145	145	144	144	144	144	143	143
Conventional Light	599	597	583	580	571	548	521	501	483	464
	2,438	**2,568**	**2,636**	**2,849**	**3,102**	**3,454**	**3,646**	**3,951**	**4,127**	**4,273**

BLENDED PRODUCTION										
DilBit	435	445	391	568	626	891	1,018	1,166	1,272	1,272
SynBit	72	298	372	278	351	310	277	383	407	497
Synthetic Light	674	584	577	700	839	970	1,013	1,104	1,150	1,209
Synthetic Heavy	162	169	259	276	302	323	422	416	447	469
Blended Conventional Heavy	510	491	469	460	437	434	418	406	395	386
Conventional Light	585	581	567	566	547	526	498	477	457	440
	2,438	**2,568**	**2,636**	**2,849**	**3,102**	**3,454**	**3,646**	**3,951**	**4,127**	**4,273**

- Raw bitumen production will increasingly require synthetic as diluent (depicted in the chart above and included as SynBit). The new condensate supply available in 2009 relieves some of the pressure on synthetic crude used for diluent but demand for synthetic-bitumen blend is still forecast to grow.

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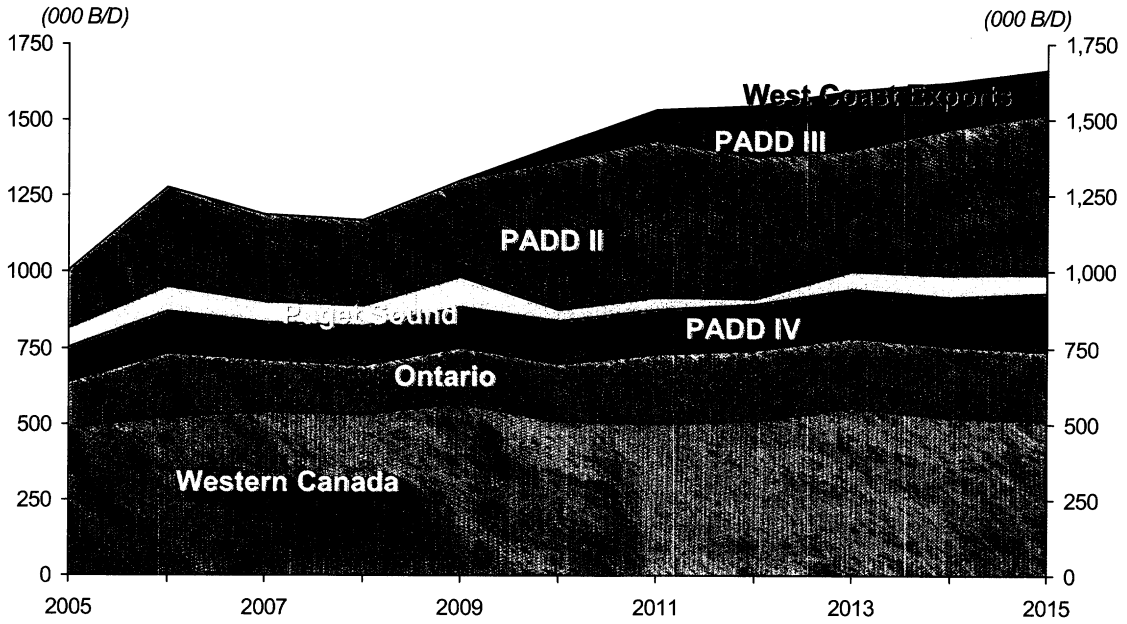
Light and Equivalent Disposition – Market Unconstrained Supply



MARKET UNCONSTRAINED CASE (KBPD)

Supply of Light and Equivalent	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Light Sweet	335	321	308	309	296	286	270	259	245	235
Light Sour	250	260	260	257	250	240	227	218	212	204
Synthetic (mined only)	567	484	473	614	742	882	923	994	1,041	1,104
Upgraded Heavy	116	120	125	120	128	122	125	125	125	122
Pentanes Plus (excluding diluent)	11	4	4	3	3	3	2	2	2	2
	1,279	**1,189**	**1,169**	**1,303**	**1,419**	**1,533**	**1,547**	**1,598**	**1,625**	**1,667**
Disposition of Light and Equivalent										
West Coast	-	-	-	-	-	50	63	75	88	100
PADD III	-	-	-	-	53	52	104	121	64	45
PADD II	325	287	282	318	488	517	468	400	482	530
PADD V	85	67	66	98	39	39	18	60	71	61
PADD IV	136	125	127	132	138	145	151	158	160	189
Ontario	210	171	165	186	191	229	237	232	238	233
Western Canada	523	539	529	568	509	501	506	552	520	508
	1,279	**1,189**	**1,169**	**1,303**	**1,419**	**1,533**	**1,547**	**1,598**	**1,625**	**1,667**

- Total demand of light crude and equivalent grows by approximately 388 kBPD through the forecast period. The timing and magnitude of differences between new synthetic projects and synthetic required as diluent for bitumen blending translates into an uneven pattern of growth/decline disposition for light and equivalent crude.

- Both PADD III (Gulf Coast) and the west coast will demand Canadian light crude in levels up to approximately 50-100 kBPD each between 2010 and 2015.

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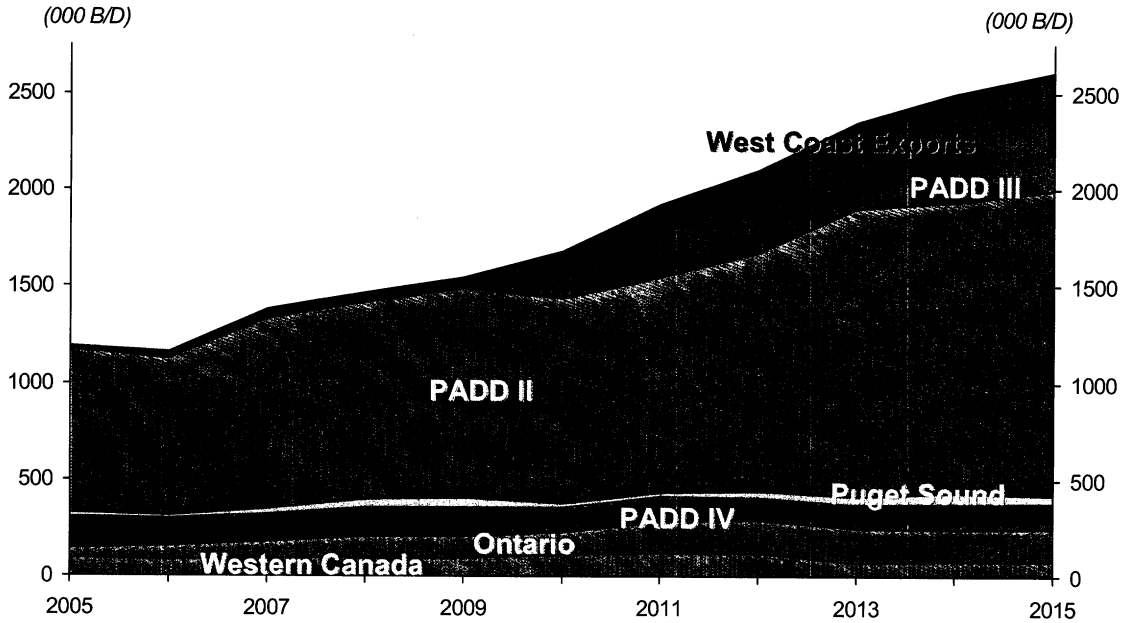
- There is an increase of approximately 40 kBPD in light demand in Ontario in 2011 with deliveries remaining at those levels to 2015 due to the expected displacement of Atlantic barrels by WCSB production.

- The PADD IV market will continue to represent an important, relatively stable demand region for Canadian light crude. Demand growth in PADD IV is to some extent limited by continued strength from local production.

- During the period 2009 through 2012, PADD V will have a preference for tidewater crude given the tight market in conventional light crude, significant volumes of synthetic light exported off the West Coast and the need for synthetic light crude to be used for bitumen blending. Post 2012, the continued growth of synthetic production combined with rising levels of new imported condensate will ultimately allow for more western Canadian crude to flow back into the region.

Blended Heavy Disposition – Market Unconstrained Supply



MARKET UNCONSTRAINED CASE (KBPD)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Blended Heavy Supply	**1,159**	**1,379**	**1,467**	**1,546**	**1,683**	**1,921**	**2,100**	**2,352**	**2,503**	**2,606**
Disposition of Blended Heavy*										
West Coast Exports	-	-	-	-	200	325	347	370	392	415
PADD III	35	50	50	60	47	48	80	80	174	194
PADD II	813	979	1,020	1,082	1,055	1,110	1,230	1,488	1,503	1,579
PADD V	8	28	40	47	28	28	33	45	57	40
PADD IV	143	142	149	148	127	125	118	125	134	129
Ontario	70	86	114	115	115	167	172	172	167	172
Western Canada	89	94	93	95	111	118	119	74	75	77
	1,159	**1,379**	**1,467**	**1,546**	**1,683**	**1,921**	**2,100**	**2,352**	**2,503**	**2,606**

***(excludes upgrader feed)**

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- Demand for heavy crude oil more than doubles from 1.16 MMBPD to 2.61 MMBPD over the forecast period.
- Deliveries to PADD II grow until 2010 when it is assumed that supply is diverted to support shipper commitments on a newly constructed west coast market occurs. Heavy crude disposition to PADD II is slightly lower in 2010 and then recovers with a strong growth pattern in 2011 and beyond.
- Disposition of heavy crude to PADD III, represented primarily by the Gulf Coast region, shows strong growth from 35 kBPD in 2006 to 194 kBPD in 2015.
- Demand in Ontario grows by approximately 50 kBPD in 2011 and remains level to 2015 as WCSB production is expected to replace declining Atlantic production.

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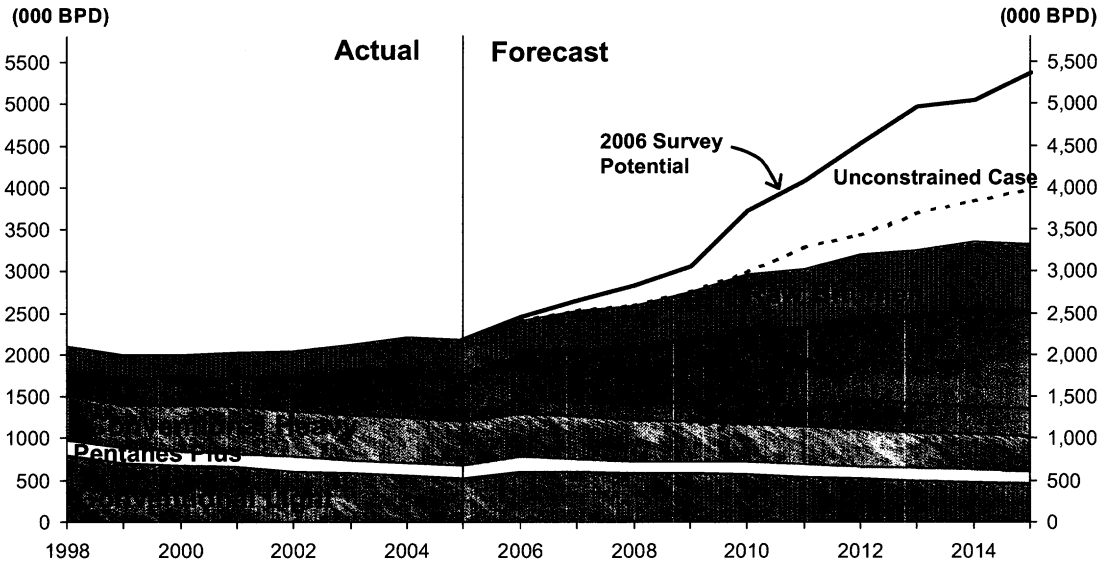
MARKET CONSTRAINED SUPPLY CASE

Western Canadian Sedimentary Basin Production and Disposition

- Production out of western Canada for the constrained supply case is 17 kBPD less than the market unconstrained supply case in 2010. By 2015, the difference in production between the two cases widens to 653 kBPD. Approximately 164 kBPD of the difference is in synthetic light production, while 395 kBPD is in raw bitumen production. The remainder of the total difference is caused by relatively small changes throughout the other crude types.



PRODUCTION AND DISPOSITION
MARKET CONSTRAINED CASE (KBPD)

Western Canada Crude Oil Production	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Conventional Light	799	711	679	654	604	579	554	526	599	597	583	580	571	548	521	501	483	464
Pentanes Plus (excluding recycled)	176	170	164	157	182	151	145	144	178	153	145	145	144	144	143	143	143	143
Imported Condensate	-	-	-	-	-	-	-	12	31	49	52	52	52	53	52	52	52	53
Conventional Heavy (unblended)	541	522	560	572	535	547	541	526	518	506	491	477	464	452	442	429	420	408
Synthetic Heavy (mined only)	302	327	314	346	434	522	629	546	603	169	213	230	269	184	361	341	340	330
Synthetic Light (mined only)	-	-	-	-	-	-	-	-	162	634	659	754	877	1,003	996	1,071	1,133	1,188
Bitumen (unblended)	289	264	277	302	283	321	346	440	345	458	493	563	635	686	743	760	826	787
	2,107	**1,994**	**1,994**	**2,032**	**2,038**	**2,120**	**2,214**	**2,194**	**2,437**	**2,566**	**2,635**	**2,800**	**3,012**	**3,069**	**3,258**	**3,298**	**3,398**	**3,372**
Western Canada Crude Oil Disposition																		
Western Canada	446	461	460	459	453	562	609	574	619	648	642	684	643	638	649	610	600	607
Ontario	382	330	233	213	220	219	225	212	261	248	261	264	260	263	264	267	263	265
PADD IV	160	195	218	228	243	216	234	274	279	266	276	265	285	295	299	308	321	345
PADD V	105	66	64	75	67	54	93	83	92	95	106	111	155	150	136	155	155	155
PADD II Total	1,013	940	1,025	1,052	1,056	1,020	1,026	1,042	1,150	1,259	1,299	1,416	1,599	1,642	1,829	1,878	1,976	1,918
PADD III	-	-	-	-	-	49	27	9	35	50	50	60	70	81	80	80	83	82
West Coast Exports (Gateway)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,106	**1,992**	**2,000**	**2,027**	**2,038**	**2,120**	**2,213**	**2,194**	**2,437**	**2,566**	**2,635**	**2,800**	**3,012**	**3,069**	**3,258**	**3,298**	**3,398**	**3,372**

- The main difference between crude oil disposition in the constrained case versus the unconstrained case is the absence of significant exports off the west coast and expected significant growth in volumes delivered to PADD III. PADD II is the most important growth market in the constrained case with crude demand of 1.04 MMBPD in 2005 growing to 1.92 MMBPD in 2015.

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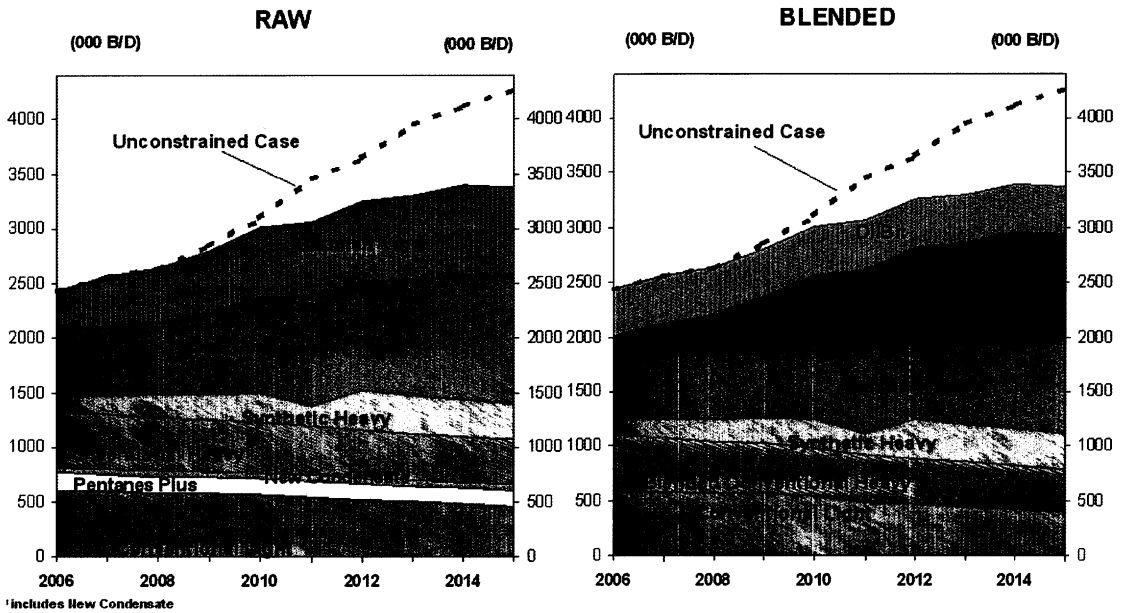
- Ontario refinery runs of WCSB essentially remain flat in contrast to the displacement of Atlantic origin barrels assumed in the unconstrained case.
- The conventional light and heavy supply forecast is essentially unchanged in the unconstrained and constrained cases.



[1]Includes New Condensate

MARKET CONSTRAINED CASE (KBPD)

RAW PRODUCTION	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bitumen (unblended)	345	458	493	563	635	686	743	760	826	787
Synthetic Light (mined only)	603	634	659	754	877	1,003	996	1,071	1,133	1,188
Synthetic Heavy (mined only)	162	169	213	230	269	184	361	341	340	330
Conventional Heavy (unblended)	518	506	491	477	464	452	442	429	420	408
Imported Condensate	31	49	52	52	52	53	52	52	52	53
Pentanes Plus (excluding recycled)	178	153	145	145	144	144	143	143	143	143
Conventional Light	599	597	583	580	571	548	521	501	483	464
	2,437	**2,566**	**2,635**	**2,800**	**3,012**	**3,069**	**3,258**	**3,298**	**3,398**	**3,372**
BLENDED PRODUCTION										
DilBit	433	443	437	428	452	454	440	432	432	436
SynBit	72	298	372	520	635	742	877	915	1,043	959
Synthetic Light	674	584	577	595	680	767	693	756	762	860
Synthetic Heavy	162	169	213	230	269	184	361	341	340	330
Blended Conventional Heavy	510	491	469	460	437	434	418	406	395	387
Conventional Light	585	581	567	566	539	489	469	448	425	401
	2,437	**2,566**	**2,635**	**2,800**	**3,012**	**3,069**	**3,258**	**3,298**	**3,398**	**3,372**

- The main difference between the two market demand cases is reflected in the size of the DilBit and SynBit blended crude streams. In the constrained case, in the absence of a new source of condensate diluent, there is 174 kBPD less DilBit in 2010 and 836 kBPD in 2015. Consequently, in the constrained case, there is approximately 284 kBPD more SynBit in 2010 and 462 kBPD more in 2015 in the constrained case, a significant difference caused by the relatively flat levels of SynBit production forecast in the unconstrained case.

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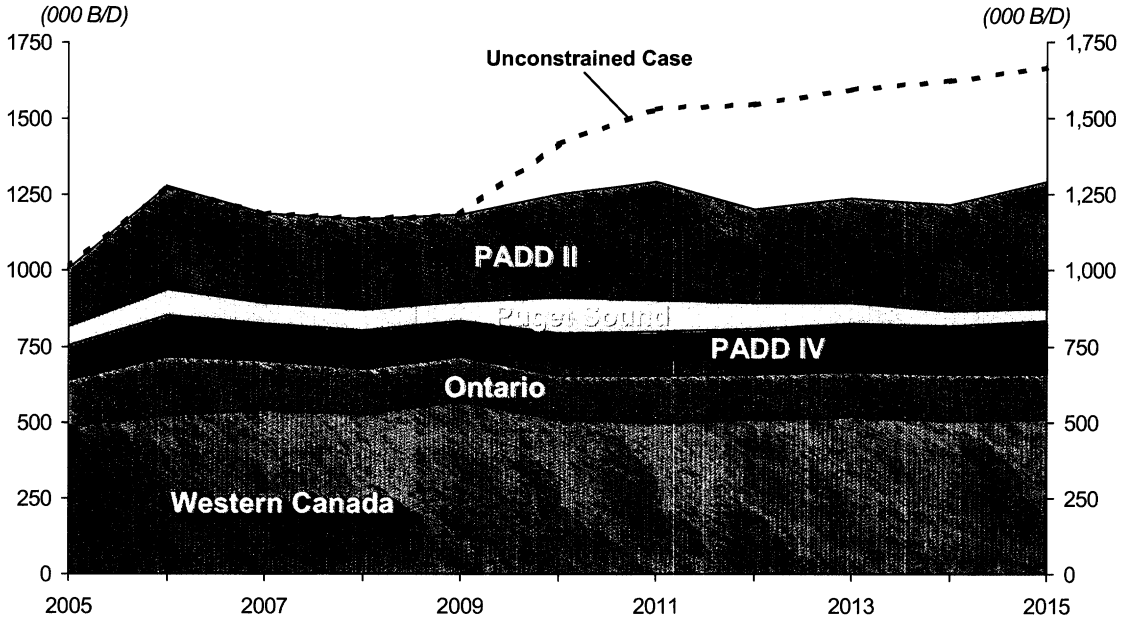
- Primarily as a result of the greater size of the Synbit stream in the constrained case, the quantity of light synthetic delivered to markets in 2015 is approximately 349 kBPD lower than in the unconstrained case in 2015. Total synthetic heavy production delivered to markets in the constrained case is lower than the unconstrained case by 139 kBPD in 2015.

Light and Equivalent Disposition – Market Constrained Supply



MARKET CONSTRAINED CASE (KBPD)

Supply of Light and Equivalent	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Light Sweet	335	321	308	309	289	248	242	230	213	197
Light Sour	250	260	260	257	250	240	227	218	212	204
Synthetic (mined only)	567	484	473	493	583	679	604	662	665	767
Upgraded Heavy	116	120	125	120	128	122	125	125	125	122
Pentanes Plus (excluding diluent)	11	4	4	3	3	3	2	2	2	2
	1,279	**1,189**	**1,169**	**1,182**	**1,252**	**1,293**	**1,200**	**1,237**	**1,216**	**1,292**
Disposition of Light and Equivalent										
PADD III	-	-	-	-	-	-	-	-	-	-
PADD II	341	296	300	284	342	392	307	345	348	416
PADD V	86	67	66	65	118	103	84	67	52	42
PADD IV	136	125	127	117	138	145	151	158	160	177
Ontario	192	162	148	148	145	153	149	152	153	150
Western Canada	523	539	528	568	509	499	509	516	503	508
	1,279	**1,189**	**1,169**	**1,182**	**1,252**	**1,293**	**1,200**	**1,237**	**1,216**	**1,292**

- Total demand of light crude and equivalent is essentially flat, growing by only 13 kBPD throughout the forecast period with demand in western Canada and PADD IV essentially the same in both cases.

- Given the forecast declines in conventional light crude and the expected strong demand for synthetic used as diluent, the Puget Sound refining region is not expected to be able to compete for the light barrel past 2011 and replaces it with synthetic heavy. This is further described in the following section in the following section.

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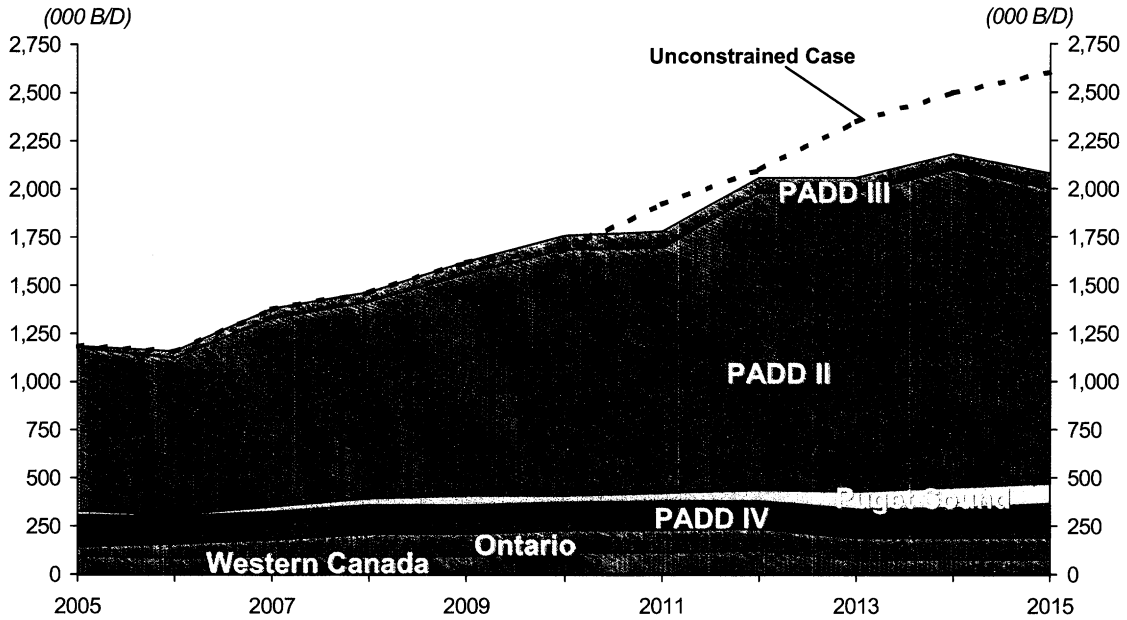
Blended Heavy Disposition – Market Constrained Supply

- Blended heavy crude demand grows by 922 kBPD from 2006 to 2015; that is 525 kBPD less than in the unconstrained supply case. For the constrained case, currently connected markets and a moderate level of new access to the Cushing and Gulf Coast refining regions starting in 2006 are expected to absorb all of the growth in heavy crude production.

- The PADD II refining market is the main growth area with an 87% demand increase over the forecast period. As previously mentioned, some synthetic heavy is run in PADD V, making up for the conventional light and synthetic light lost to competing demand areas.



MARKET CONSTRAINED CASE (KBPD)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Blended Heavy Supply	**1,158**	**1,377**	**1,466**	**1,618**	**1,760**	**1,776**	**2,058**	**2,061**	**2,181**	**2,080**
Disposition of Blended Heavy*										
PADD III	35	50	50	60	70	81	80	80	83	82
PADD II	816	979	1,020	1,155	1,280	1,272	1,544	1,555	1,650	1,524
PADD V	6	28	40	47	36	47	52	88	103	114
PADD IV	143	142	149	148	147	150	148	150	160	169
Ontario	69	86	114	115	115	110	115	115	110	115
Western Canada	89	92	92	94	111	117	118	72	75	77
	1,158	**1,377**	**1,466**	**1,618**	**1,760**	**1,776**	**2,058**	**2,061**	**2,181**	**2,080**

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MUSE
STANCIL

ECONOMIC BENEFITS OF THE SOUTHERN ACCESS EXTENSION PROJECT 2010 – 2020

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INTRODUCTION

Enbridge is developing a pipeline project to extend its existing crude pipeline system south from the Chicago area to Patoka, which is a key crude storage and pipeline interconnection hub located in southern Illinois. The project, referred to as the Southern Access Extension Project, involves the construction of 178-miles of 36-inch pipeline with an initial capacity of 400,000 b/d. The pipeline can be expanded up to 800,000 b/d at relatively low cost via the installation of additional pumping capacity.

Muse, Stancil & Co. (Muse) has been engaged to provide an assessment of the benefits of the Southern Access Extension Project. The key Southern Access Extension benefits include:

- Improved Canadian crude distribution throughout the Canadian crude marketplace
- Shortened transit time from Canada to U.S. customer refineries
- Improved crude quality at the refinery delivery point

The project benefits are summarized in Table I, and are further detailed in the body of the report.

TABLE I
ESTIMATED SOUTHERN ACCESS EXTENSION BENEFITS
(Millions of Dollars per Year)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Improved Distribution	786	238	8	277	460	387	2,521	1,699	1,320	2,499	2,994
Shortened Transit Time	10	14	13	20	24	25	25	25	25	25	25
Improved Crude Quality	9	9	9	9	9	9	9	9	9	9	9
Total	**804**	**261**	**30**	**306**	**494**	**421**	**2,556**	**1,734**	**1,354**	**2,533**	**3,028**

Muse is an independent consulting firm that specializes in assisting clients in the downstream sector of the oil and gas industry. Muse provides an integrated

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combination of economic, marketing, and technical consulting services to the global refining industry. Our clients include major and independent oil companies, pipeline companies, petrochemical concerns, trading houses, engineering and construction companies, government agencies, and financial institutions. Typical assignments have involved feasibility and market studies, performance evaluation and operations optimization, asset valuations for mergers and acquisitions, and project development. Headquartered in the Dallas area, Muse has additional offices in London, Houston, and Singapore.