

**ENBRIDGE PIPELINES (FSP) L.L.C.**

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**ILLINOIS COMMERCE COMMISSION**

**DOCKET NO. 12-0347**

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**TESTIMONY OF**

**NEIL K. EARNEST**

**MUSE, STANCIL & CO.**

**July 3, 2012**

**TESTIMONY OF**  
**NEIL K. EARNEST**  
**VICE PRESIDENT AND DIRECTOR**  
**MUSE, STANCIL & CO.**

1           Q.     PLEASE STATE YOUR FULL NAME, POSITION, AND BUSINESS  
2                    ADDRESS.

3           A.     My name is Neil K. Earnest. I am a Vice President and Director at Muse,  
4                    Stancil & Co. (Muse), assigned to the firm's corporate headquarters  
5                    located at 15455 Dallas Parkway, Suite 350, Addison, Texas, 75001.

6           Q.     CAN YOU BRIEFLY DESCRIBE YOUR EDUCATIONAL AND  
7                    PROFESSIONAL BACKGROUND?

8           A.     The primary focus of my career has been assisting clients in the refining  
9                    industry and other closely-related industries. As a consultant, I have  
10                  worked on a broad range of refining assignments around the world. In  
11                  recent years, I have directed a number of studies concerning the supply  
12                  and demand for Western Canadian crude oils in the North American  
13                  markets, as well as studies considering the supply and demand for refining  
14                  products in North America. Prior to joining Muse in 1991, I was with  
15                  Phillips Petroleum Co. for 11 years in a variety of refinery and  
16                  headquarter positions. I hold a B.S. degree in chemical engineering from  
17                  Michigan State University and an M.B.A. degree from the University of

18 Houston – Clear Lake. I am a registered Professional Engineer in Texas.  
19 My curriculum vitae is attached as Attachment A.

20 Q. WHAT IS MUSE?

21 A. Muse is an international energy consulting firm with its headquarters in  
22 the Dallas, Texas, area with additional offices in Houston, London, and  
23 Singapore. The company was established in 1984 and is employee-  
24 owned. Most of the firm’s consultants are engineers with direct industry  
25 experience and wide-ranging consulting expertise.

26 Muse professionals provide a wide variety of technical and economic  
27 services, often blending expertise in both areas, to assist clients in the  
28 evaluation of issues and opportunities in the energy sector. Such projects  
29 include, but are not limited to, market analyses, project development,  
30 project feasibility analyses, mergers and acquisition advisory, due  
31 diligence assessment, and dispute resolution services. The company is  
32 routinely retained to assist clients with interests in the downstream energy  
33 industry including crude oil and natural gas valuation and marketing,  
34 hydrocarbon transportation, crude oil refining, gas processing, refined  
35 products distribution and marketing, and gas transmission and distribution.

36 Q. ARE YOU FAMILIAR WITH THE FLANAGAN SOUTH PROJECT  
37 (THE "PROJECT") AND THE RELATED APPLICATION BEFORE  
38 THE ILLINOIS COMMERCE COMMISSION?

39 A. Yes. The Project is designed to transport up to 600 thousand barrels per  
40 day ("kb/d") of U.S. and Canadian crude oil from the Flanagan terminal,  
41 located southwest of Chicago, to the large crude oil storage and  
42 transportation hub at Cushing, Oklahoma.

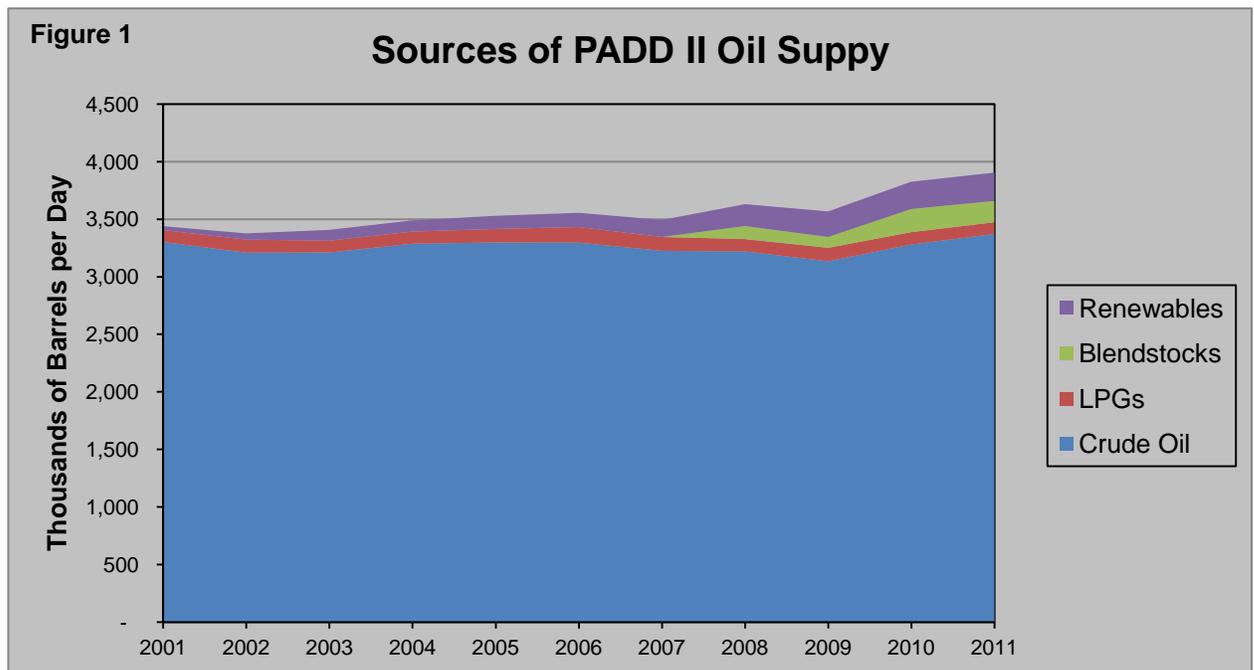
43 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

44 A. I have been engaged by Enbridge to provide expert witness testimony  
45 addressing the need for the Flanagan South Project. This testimony has  
46 the following objectives:

- 47 • Offer an overview of the oil supply chain in the Midwest and Gulf  
48 Coast, so as to provide background on the role of crude oil pipelines  
49 and the refining sector in meeting consumer demand for refined  
50 petroleum products;
- 51 • Provide an analysis of the shifting patterns of North American crude  
52 oil supply that is influencing the need for additional pipeline  
53 infrastructure;
- 54 • Address the U.S. national security implications of non-North  
55 American imports versus Canadian crude supply; and,
- 56 • Discuss the potential impact of the Project on the competitive position  
57 of the Illinois refineries.

58 Q. WHAT ARE THE SOURCES OF THE OIL THAT MEETS  
 59 CONSUMER DEMAND IN THE MIDWEST?

60 A. Figure 1 provides a historical perspective of the fundamental sources of  
 61 the oil that, once processed in refineries or blended at terminals in the  
 62 region, satisfied most of the consumer demand for petroleum product in



63 the Midwest.<sup>1</sup> In 2011, crude oil and blendstocks (the latter is also mostly  
 64 derived from crude oil at other refineries) constituted about 91 percent of  
 65 the total supply of oil that was processed or blended in PADD II.  
 66 Renewables, primarily fuel-grade ethanol, comprised about 6 percent of  
 67 the total oil supply in 2011, and the balance was provided by liquefied  
 68 petroleum gases (LPGs). The contribution of renewables to total oil

<sup>1</sup> Figure 1 specifically provides data for PADD II, which is the Energy Information Administration’s (EIA) designation for the Midwest and the Mid-Continent. The term PADD stands for Petroleum Administration for Defense District. Attachment B is an EIA map of the U.S. PADDs.

69 supply has increased significantly over the last 10 years. Nonetheless, for  
70 the foreseeable future, crude oil will be the predominant source of oil that  
71 satisfies consumer demand for petroleum products.

72 Q. IS CRUDE OIL'S HIGH PROPORTION OF TOTAL OIL SUPPLY IN  
73 THE MIDWEST REFLECTIVE OF OTHER U.S. REGIONS?

74 A. Yes. On average, based on EIA statistics, 85 percent of the total U.S. oil  
75 supply requirement was met by crude oil in 2011.

76 Q. WHAT TRANSPORTATION MODES ARE USED TO DELIVERY  
77 CRUDE OIL TO PADD II REFINERIES?

78 A. According to EIA data, over the last 10 years, pipelines have made 99.5  
79 percent of the total crude oil deliveries to PADD II refineries. Almost all  
80 of the balance of the deliveries was made by truck.

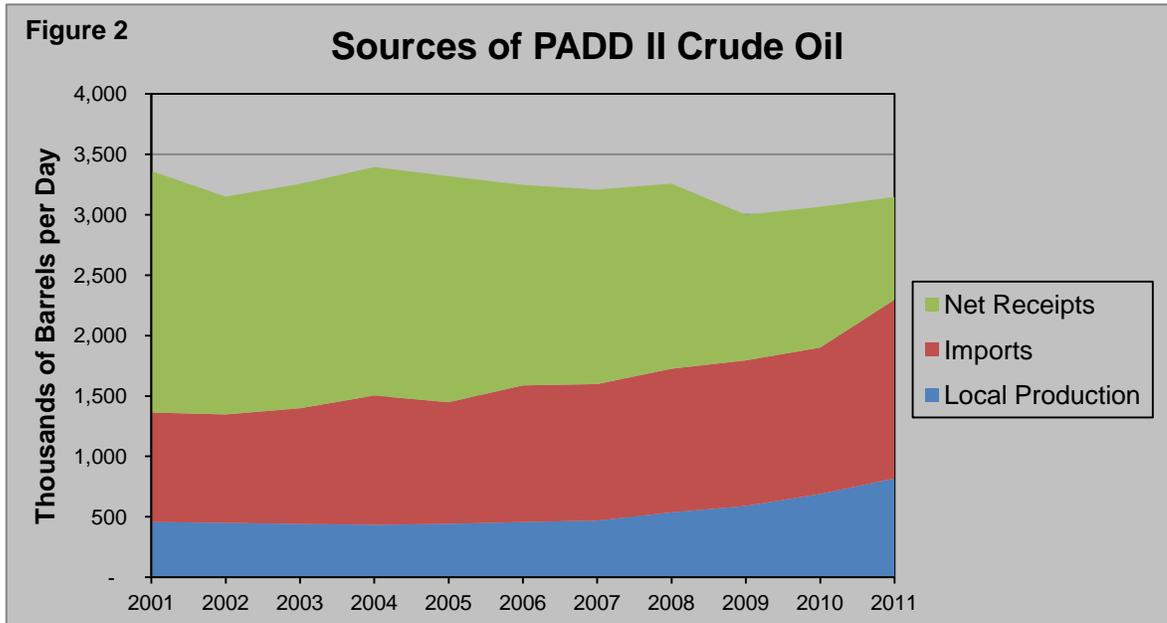
81 Q. WHAT IS YOUR OVERALL ASSESSMENT OF THE NEED FOR  
82 CRUDE OIL PIPELINES IN THE MIDWEST?

83 A. The transportation of crude oil to regional refineries by pipeline is an  
84 absolutely essential component of the total supply chain that delivers  
85 petroleum products to the Midwestern consumers. Pipelines deliver  
86 almost all of the crude oil processed by Midwestern refineries, and it is  
87 crude oil that is the largest fundamental source of oil for the Midwestern  
88 petroleum product consumer.

89 Q. WHAT ARE THE SOURCES OF CRUDE OIL FOR PADD II?

90 A. Figure 2 provides the historical distribution of the sources of the crude oil

91 for PADD II. In 2011, local PADD II production comprised 26 percent of



92 the total crude oil supply, imports (almost entirely Canadian) totaled 47  
 93 percent, and the balance (27 percent) was the net receipts of crude oil from  
 94 other regions of the U.S.<sup>2</sup> In 2011, PADD II transferred 286 kb/d of crude  
 95 oil to other PADDs, while receiving 1,138 kb/d of crude oil, for a net  
 96 receipt volume of 852 kb/d. PADD III (Gulf Coast) is responsible for  
 97 most of the inter-PADD crude oil deliveries to PADD II.

<sup>2</sup> For crude oil imports, the EIA’s PADD-level import data represents the PADD into which the crude oil first entered the U.S., not necessarily the PADD where the crude oil is processed. Any transfers of imported crude oil into or out of PADD II to other U.S. regions would be captured in the net receipts category.

98 Q. HAVE THERE BEEN CHANGES IN RECENT YEARS IN THE  
99 CRUDE OIL SUPPLY PATTERNS IN THE MIDWEST?

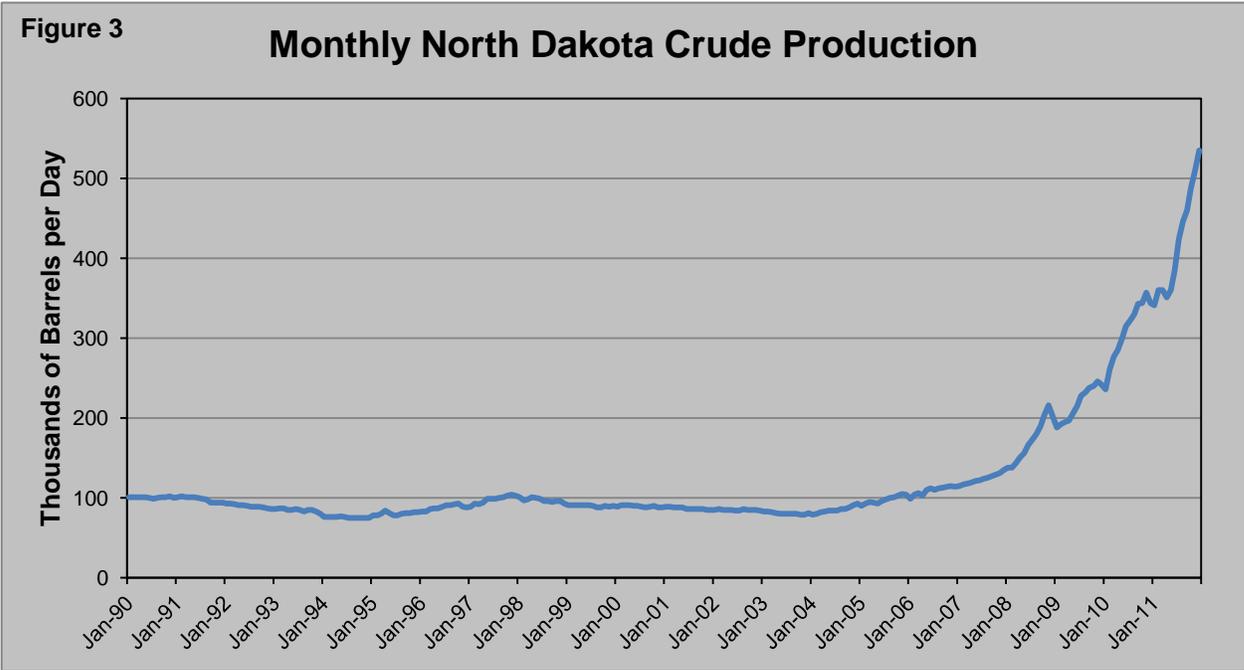
100 A. Yes, crude oil supply patterns for PADD II, and elsewhere in the U.S.,  
101 have been shifting in recent years. As shown in Figure 2 above, in the last  
102 10 years the volume of crude oil that is sourced from local production and  
103 imports in PADD II has risen by almost 1,000 kb/d, with much of the  
104 increase concentrated in the most recent years. This shift in supply pattern  
105 has been primarily driven by the rapidly increasing crude oil production in  
106 both Canada and the Williston Basin.

107 Q. WHAT IS THE WILLISTON BASIN?

108 A. The Williston Basin is an extensive geological structure primarily centered  
109 in North Dakota, extending into eastern Montana and southern  
110 Saskatchewan.<sup>3</sup> The increasing significance of the Williston Basin in  
111 terms of U.S. crude oil supply is observable in the crude oil production  
112 statistics for North Dakota, which now exceeds 530 kb/d, up from  
113 approximately 100 kb/d just a few years ago. See Figure 3. As of  
114 December 2011, North Dakota surpassed California to become the third  
115 largest oil-producing state in the nation, and may soon surpass Alaska to  
116 become the second largest U.S. oil producer.

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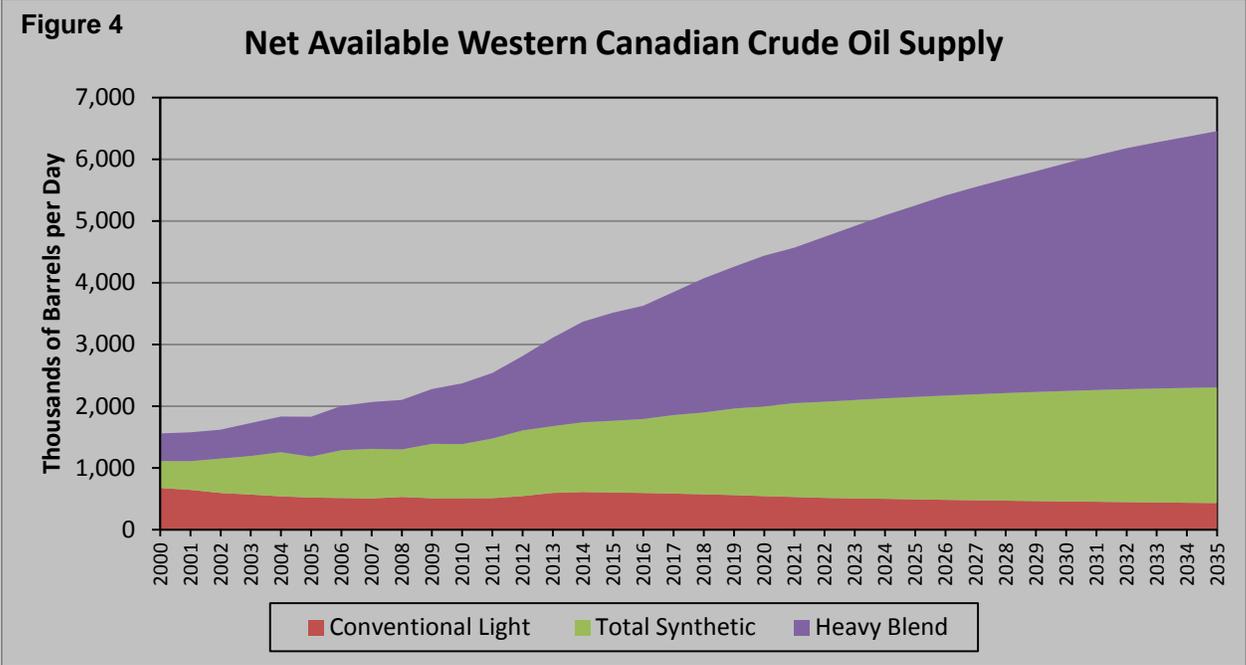
<sup>3</sup> Much of the crude oil produced today in the Williston Basin is from the hydrocarbon-rich Bakken formation. Consequently, the light, sweet crude oil that produced in the Williston Basin is typically called Bakken crude oil by industry, although a portion is actually from other formations.



117                    Much of the Williston Basin production is delivered into the Enbridge  
118                    Mainline system and, accordingly, is potentially available for shipment on  
119                    the Project. Consequently, the need in PADD II for crude oil transfers  
120                    from other regions of the U.S. or waterborne imports (delivered to a Gulf  
121                    Coast port, and then shipped via pipeline north into PADD II) has greatly  
122                    decreased in recent years.

123                    Q.    WHAT ARE THE RECENT CRUDE OIL SUPPLY DEVELOPMENTS  
124                    IN WESTERN CANADA?

125           A.     Western Canada is rapidly becoming the most prolific source of crude oil  
126                   in the western hemisphere. After accounting for changes in Canadian  
127                   crude oil consumption, the net crude oil supply in this region that is  
128                   available for export has increased by about 960 kb/d in the last 10 years.  
129                   Figure 4 provides both the historical supply data and a long-term forecast



130 recently released by the National Energy Board (NEB) of Canada.<sup>4</sup> The  
131 forecast is contained in the report: *Canada's Energy Future: Energy*  
132 *Supply and Demand Projections to 2035*, dated November 2011. As  
133 shown by Figure 4, the forward prospects are that Western Canadian crude  
134 oil supply will increase by another 1,900 kb/d by 2020. The forecast  
135 volumes found in the NEB report are similar to those provided in forecasts  
136 performed by the Canadian Association of Petroleum Producers (CAPP)  
137 and Enbridge itself.<sup>5</sup>

138 Q. WHAT ARE IMPLICATIONS OF THESE RISING VOLUMES OF  
139 CRUDE OIL FROM WESTERN CANADA AND THE WILLISTON  
140 BASIN?

141 A. There are a couple of key implications. The first, and most important, is  
142 that the U.S. is becoming much less dependent upon waterborne imports  
143 from elsewhere in the world – imports that, in general, are less reliable and  
144 secure than either domestic or Canadian crude oil production. Second, the  
145 shifting patterns of crude oil production within North America require  
146 changes to the pipeline infrastructure that transports crude oil from the  
147 field to the refineries, as pipelines are the primary means by which crude  
148 oil reaches the refineries. The Project is one of the manifestations of the

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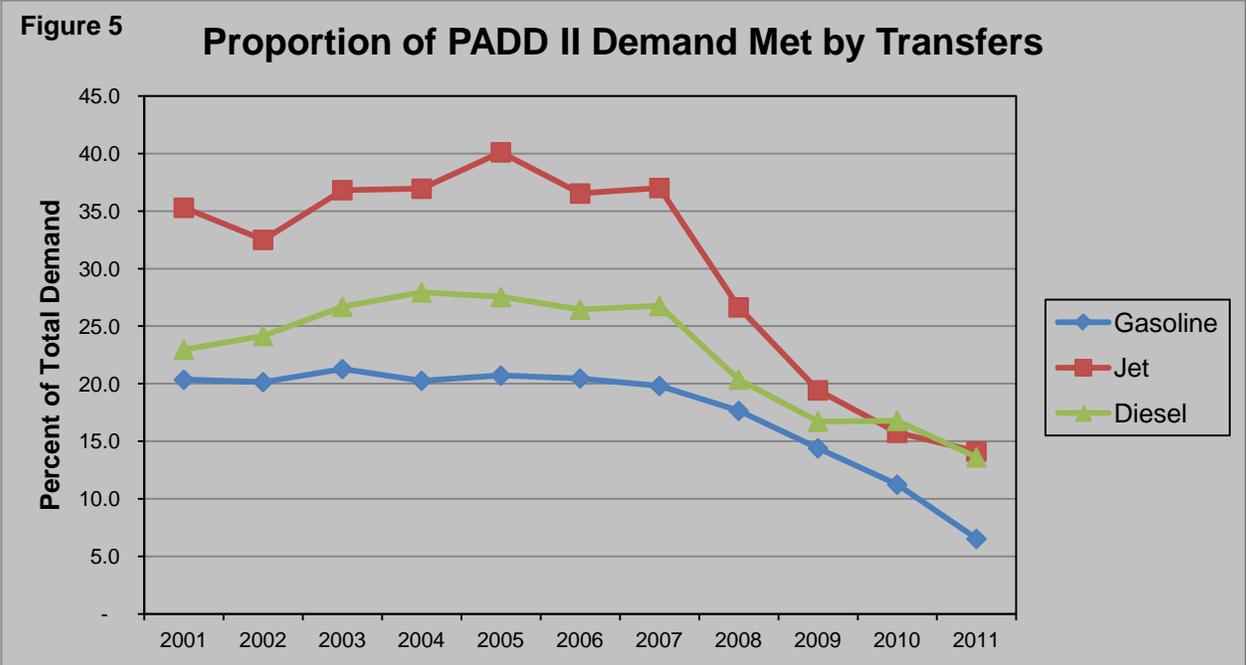
<sup>4</sup> The National Energy Board is an independent federal agency established in 1959 by the Parliament of Canada to regulate international and interprovincial aspects of the oil, gas, and electric utility industries. The purpose of the NEB is to regulate pipelines, energy development, and trade in the Canadian public interest.

<sup>5</sup> For example, the 2011 CAPP forecast is predicting a 1,644 kb/d increase in Western Canadian crude oil supply between 2011 and 2020.

149 need to re-configure the crude oil pipeline infrastructure in North  
150 America.

151 Q. ARE REFINING INDUSTRY DEVELOPMENTS ON THE GULF  
152 COAST OF RELEVANCE TO MIDWESTERN PETROLEUM  
153 PRODUCT CONSUMERS?

154 A. Yes. Figure 5 provides the proportion of gasoline, jet fuel, and diesel that  
155 is satisfied via the transfer of these petroleum products from other regions  
156 of the U.S. Most of the petroleum product transfers are from the Gulf



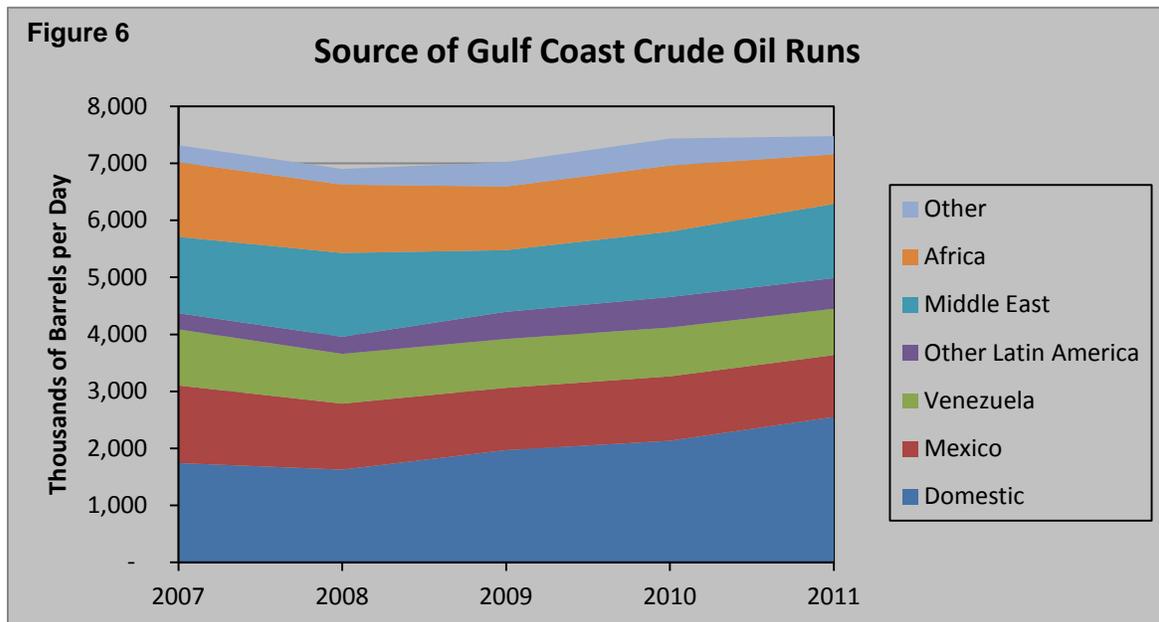
157 Coast, which is home to approximately 43 percent of total U.S. refining  
158 capacity, and is one of the largest refining complexes in the world.  
159 Moreover, the Gulf Coast refining capacity has been increasing in recent  
160 years, although overall refining capacity in the U.S. has been

161 comparatively static. Since 2006, Gulf Coast refiners have added about  
162 380 kb/d of crude oil distillation capacity, and another 325 kb/d of  
163 capacity will shortly be commissioned at the Motiva Enterprises Port  
164 Arthur, Texas refinery.

165 The proportion of total PADD II petroleum product supply that is met by  
166 deliveries from other PADDs has decreased in recent years, due to a  
167 combination of lower demand and higher local production, particularly of  
168 gasoline which includes a rising proportion of fuel-grade ethanol.  
169 Nonetheless, transfers of petroleum product from the Gulf Coast and other  
170 regions remain a vital source of supply for the energy consumers of the  
171 Midwest. Moreover, even though the proportion of total petroleum  
172 product demand that is met by transfers has dropped, the absolute volume  
173 of net petroleum product transfers remains sizable. For example, in 2011  
174 the total net transfers of gasoline, jet fuel, and diesel into PADD II was  
175 521 kb/d. This highlights the degree of interdependence between the U.S.  
176 regions in terms of satisfying the need of consumers for petroleum  
177 products around the country.

178 Q. TO WHAT DEGREE ARE THE GULF COAST REFINERS  
179 DEPENDENT UPON FOREIGN CRUDE OIL IMPORTS?

180 A. In 2011, the U.S. imported approximately 60 percent of its total crude oil  
 181 requirements. For the key Gulf Coast refining area, which the Project will  
 182 link to the rising volumes of Western Canadian crude oil production,  
 183 imports satisfied about 65 percent of total crude oil requirements in 2011,  
 184 down from 76 percent in 2007. Figure 6 provides the volumes of foreign  
 185 imports delivered into Gulf Coast for the last 5 years. And, it is the Gulf  
 186 Coast that is the primary supplier of petroleum products to the Midwest.  
 187 As can be seen from Figure 6, the Gulf Coast refining complex, which  
 188 constitutes approximately 50 percent of total U.S. refining capacity,

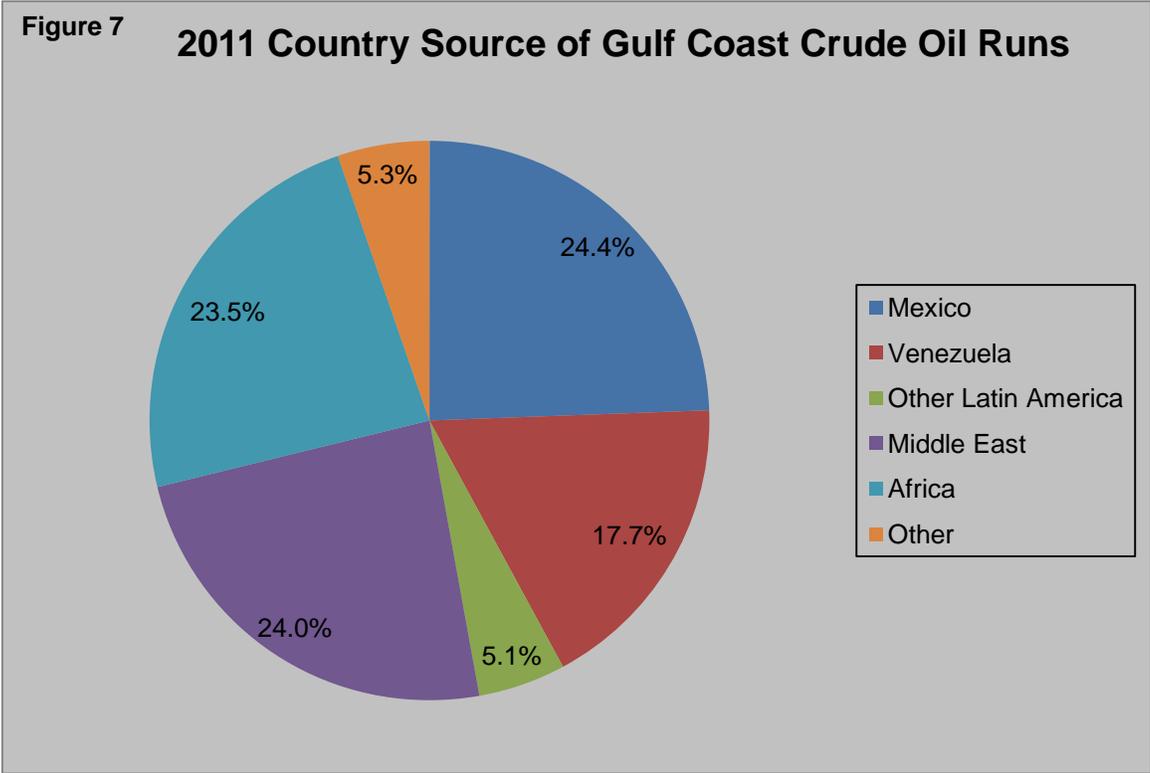


189 remains dependent upon non-North American imports of crude oil.<sup>6</sup>

<sup>6</sup> Current Canadian crude oil imports into the Gulf Coast, which are in the “Other” category, are negligible in the context of total Gulf Coast crude oil runs.

190 Q. WHAT ARE THE U.S. NATIONAL SECURITY IMPLICATIONS OF  
191 THE COUNTRY SOURCES FOR GULF COAST CRUDE IMPORTS?

192 A. As shown in Figure 7, in 2011, 24 percent of the Gulf Coast crude oil  
193 imports originated from the Middle East, a region that historically has  
194 been a volatile source of crude oil supply. The recent turmoil in Libya,



195 and now Syria, combined with the ongoing tension with Iran over its  
196 nuclear program, are just the latest of many examples of volatility and  
197 instability in the Middle East. The supply security situation in the  
198 Midwest is now quite different, due to its access to secure Western  
199 Canadian crude oil supplies. In the 1990s, the large refineries in the  
200 general Chicago area received a substantial portion of their crude oil

201 supply from offshore imports landed at a Gulf Coast port and transported  
202 north by pipeline, with all of the attendant supply security risks associated  
203 with offshore imports. By 2011, these refineries received almost all of  
204 their crude oil imports from Canada, and have shed most of their supply  
205 security risks.

206 A second key source of crude oil imports for the Gulf Coast is Latin  
207 America. Crude oil imports from Latin America, primarily Mexico and  
208 Venezuela, have been generally flat for the last 5 years, with the lower  
209 import volumes from Mexico and Venezuela mostly offset by higher  
210 imports from other Latin America countries. However, Mexican crude oil  
211 production has recently been in decline. Political tension between the U.S.  
212 and Venezuela, which historically has been an important U.S. crude oil  
213 supply source, has been rising in recent years and Venezuela has begun  
214 intentionally diversifying its crude oil exports away from the U.S. For  
215 example, Venezuelan crude oil exports to China have risen from 39 kb/d  
216 in 2005 to 231 kb/d in 2011. Mexico and Venezuela are also the primary  
217 source for the sizable volumes of heavy sour crude oil that are processed  
218 by Gulf Coast refineries. Western Canada also produces large volumes of  
219 heavy sour crude oil that the Gulf Coast refineries are designed to process.

220 Q. IS IT LIKELY THAT THE CANADIAN CRUDE OIL THAT IS  
221 SHIPPED ON THE PROJECT WILL BE EXPORTED FROM THE U.S.  
222 ONCE IT REACHES THE GULF COAST?

223 A. No, it is very unlikely. Figure 6 above provides the volume and source of  
224 the crude oil imports into the Gulf Coast over the last 5 years. As can be  
225 seen, an enormous volume of crude oil is currently imported into the Gulf  
226 Coast, and this is a key reason why the Canadian crude oil producers are  
227 interested in accessing the Gulf Coast market via the Project. The  
228 objective is to satisfy the sizable existing crude oil demand on the Gulf  
229 Coast, not to export crude oil to some other market. Moreover, the Gulf  
230 Coast is ill-suited to serve as an export location for Canadian crude oil  
231 producers, as it is distant from potential markets in Europe or Asia. With  
232 regard to satisfying growing Asian crude oil demand, it would make far  
233 more sense for the Canadian oil industry to construct additional pipeline  
234 capacity to the coast of British Columbia and transport crude oil directly to  
235 Asia by tankers, than to transport crude oil to the Gulf Coast and then by  
236 tanker to Asia. Both the pipeline and tanker voyage length to Asia is  
237 much longer (and, thus, more costly) via the Gulf Coast than via British  
238 Columbia.

239 Q. WILL THE PROJECT CHANGE THE COMPETITIVENESS OF THE  
240 ILLINOIS REFINERIES RELATIVE TO THE REFINING INDUSTRY  
241 ON THE GULF COAST?

242 A. No. Due to higher transportation costs to the Gulf Coast (relative to  
243 Illinois), Canadian crude oil will be more costly for Gulf Coast refineries  
244 than for Illinois (and other Midwestern) refineries. As a practical matter,  
245 Canadian crude oil producers cannot sell the same crude grade to different  
246 refiners at different prices. Refiners are sophisticated buyers and are well  
247 aware of the Canadian crude pricing dynamics, and will always seek to  
248 pay no more than the crude value that results from the Canadians' most  
249 distant sale, i.e., at the Gulf Coast. The Canadian crude oil producer's  
250 ability to price discriminate, based in refinery location, is further limited  
251 by the refiner's ability to purchase crude oil in Canada and make their own  
252 transportation arrangements if necessary. In this circumstance, the  
253 Canadian producer may not even know the ultimate destination of the  
254 purchased crude oil.

255 Consequently, as the Canadian crude oil producers expand their market to  
256 the Gulf Coast, the Canadian crude oil cost for Illinois refineries will be  
257 less than the cost for Gulf Coast refineries. Therefore, relative to  
258 refineries on the Gulf Coast, Illinois refineries will continue to have a cost  
259 advantage for Canadian crude oil, which translates directly into an  
260 improved competitive position.

261 Q. DOES THIS CONCLUDE YOUR TESTIMONY?

262 A. Yes, subject to any request by Enbridge to submit reply or rebuttal  
263 testimony.

# **Attachment A**

ATTACHMENT A

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**RESUME**

**NEIL K. EARNEST**

**Education:** B.S. Chemical Engineering – 1981 - Michigan State University  
M.B.A. - 1986  
University of Houston – Clear Lake

**Experience:**

Muse, Stancil & Co. Present  
Position:  
Vice President and Director

Phillips Petroleum Company 1981-1991  
Positions:  
Process Senior Engineer  
Economics Engineer  
Staff Process Engineer

**Professional Registration:** Chemical Engineer, Texas, #75398

**Summary of Experience:**

Neil Earnest has 30 years of experience in the downstream sector of the energy business, which includes petroleum refining, crude and product logistics, petrochemical manufacturing, and petroleum product marketing. He has extensive experience in refinery operations analysis, asset valuation in support of acquisition and merger activities, crude and refined product marketing studies, and project development. Mr. Earnest has consulted for operating companies, government agencies, financial and insurance institutions, and law firms.

As a consultant, he has worked on a broad range of assignments in the downstream sector around the world. Mr. Earnest has also headed numerous Muse studies for Canadian upstream clients addressing a broad range of issues concerning the crude markets. Mr. Earnest began his career at Phillips Petroleum Company, where he spent eight years in a variety of roles at Phillips' largest refinery and petrochemical plant plus several years in corporate planning/engineering.

**Representative Consulting Experience:**

**Asset Valuation:**

As director for the M&A practice area, has over the last eight years frequently headed the Muse teams that have assisted clients contemplating downstream acquisitions or divestitures. Several representative assignments follow:

1. Provided detailed valuations of a number of North American refineries for a variety of clients.
2. Prepared a detailed valuation of the refining and marketing assets of a Western Europe fuels refinery. Included projecting refinery cash flow considering the evolving environmental, product demand, and product specification issues regarding Europe.
3. Developed a detailed valuation of the combined sale value of the European downstream assets of a major oil company.
4. Provided economic, technical, and LP modeling assistance to a corporate team considering entry into the Asian Pacific refining industry.
5. Conducted due diligence of, and assessed the potential for investment in four state-owned African refineries.
6. Assisted a U.S. client considering the merger of their refining assets with another refiner. The assistance included an assessment of the competitive position of the potential merger partner.
7. Performed a physical inspection and assessed the merits of a large-scale investment in a large cracking refinery in the Former Soviet Union.

**Market and Competitive Analysis:**

Has provided a broad range of market studies and competitive analysis. Clients include pipeline companies, refiners, and crude producers. Several representative examples follow:

1. Managed a major study on behalf of the Canadian Association of Petroleum Producers that provided an economic and business assessment of the merits of a new multi-billion dollar export crude pipeline.
2. Headed the Muse team that provided the market analysis that supported a Canadian upgrader's \$5.5 billion expansion program.
3. Have assisted a number of Canadian producers with the strategy development to advance their synthetic and heavy sour crude programs.
4. Assisted a client with the development of a marketing program for a new, high acid, North Sea crude.
5. Provided the market analysis in support of a new proposed product pipeline in the Rockies.
6. Assisted several clients with quantifying the value of their equity crude to specific purchasers. The purchasers were either being considered for term contracts or were large volume buyers.

7. For a refiner considering a major upgrade, performed an assessment of their medium- and long-term competitive position in their region.

**Project Analysis:**

1. Performed an in-depth evaluation of resid upgrading options for a large Middle East refinery.
2. Developed the configuration, yields, and operating costs for a proposed Middle East refinery.
3. Assisted a U.S. client considering the economic merit of a proposed joint venture involving the installation of process units from a shutdown facility in the client's refinery.
4. Performed a detailed study for a U.S. client considering various resid upgrading options.
5. Provided the yield consultant report required by the U.S. Export-Import Bank for a proposed refining project in Russia.
6. Assisted a South American client with process optimization in connection with a major upgrade of their lube manufacturing facilities.
7. Performed a technical and economic analysis for a South American client considering the construction of a resid FCC unit.

**Litigation Support:**

1. Assisted legal counsel in cases concerning damages for such matters as breach of contract and crude contamination.
2. Provided expert assistance to a client contesting EPA enforcement actions.
3. Provided economic and technical assistance to clients concerning the fair market value of refining assets for property tax purposes.

**Expert Witness Cases:**

1. Chevron v. El Paso Tax Appraisal District
2. Private Arbitration: Koch Shipping Inc., Koch Supply & Trading Company, and Koch Refining Company, L.P. v. Mobil Shipping and Transportation Company
3. Provided expert report in 2006 on behalf of Enbridge Pipelines regarding the market demand for Canadian crude oils and quantified the benefits that would flow to Illinois and other U.S. consumers regarding the Southern Access Pipeline. Report filed with the Illinois Commerce Commission.

## Enbridge Ex. 4

4. Provided expert report and direct Testimony before the National Energy Board (Canada) regarding the Southern Lights Project, on behalf of Enbridge Pipelines, Inc. with hearings held in Calgary, Alberta in 2007
5. Expert report and direct Testimony before the National Energy Board (Canada) regarding the Alberta Clipper Project, on behalf of Enbridge Pipelines, Inc. with hearings held in Calgary, Alberta in 2007
6. Provided expert report in 2007 on behalf of Enbridge Pipelines to the National Energy Board (Canada) regarding the crude supply and demand for Ontario and Montréal refineries.
7. Provided expert reports in 2007 to the U.S. Federal Energy Regulatory Commission on behalf of Enbridge Pipelines regarding the expected utilization of the Southern Access Extension pipeline, as well as other non-rate shipper benefits that ensued from the commissioning of the pipeline. Also provided written affidavit in response to intervener's expert.
8. Provided direct Testimony in 2008 before the Minnesota Public Utility Commission regarding the Alberta Clipper Project, on behalf of Enbridge Pipelines, Inc.
9. Direct Testimony in February 2008 before the International Court of Arbitration, with hearings held in Zurich, Switzerland on behalf of Louis Dreyfus S.A.S. (Respondent) against Ronald W. de Ruuk, as Bankruptcy Administrator for Holding Tusculum B.V., (Claimant). Testifying expert at hearings on behalf of the respondent regarding the value of the Wilhelmshaven, Germany refinery. Also co-authored valuation report and responses to claimant's experts. Approximate damage claim: US\$300-500 million.
10. Provided expert report in May 2009 and oral testimony to the International Court of Arbitration on behalf of Mobil Cerro Negro, Ltd (Claimant) against Petroleos de Venezuela, SA.
11. Expert report and direct Testimony before the National Energy Board (Canada) regarding the Keystone XL Project, on behalf of Enbridge Pipelines, Inc. with hearings held in Calgary, Alberta in 2009.
12. Provided expert and reply report in 2009 on behalf of Enbridge Pipelines to the National Energy Board (Canada) regarding the medium-term prospects for Line 9 in westbound service.

#### **Enbridge Ex. 4**

13. Provided expert and reply reports, in 2010 and 2011, to the International Centre for Settlement of Investment Disputes on behalf of Venezuelan Holdings B.V., et.al. (Claimant) against the Bolivarian Republic of Venezuela, and oral testimony at the hearing held in Paris in 2012.
14. Provided expert report in 2011 on behalf of Enbridge Bakken Pipeline Company to the National Energy Board (Canada) regarding the market prospects for North Dakota crude oil.
15. Provided oral testimony in 2011 on behalf of Enbridge Pipelines to the National Energy Board (Canada) regarding the Southern Lights Pipeline.
16. Submitted expert and rebuttal reports, in 2011, to the U.S. Federal Energy Regulatory Commission on behalf of Enbridge Pipelines regarding the Southern Lights Pipeline followed by oral testimony at the hearing in Washington, D.C., in 2012.

*Publications/Presentations*

1. "Refinery-Profitability Statistics Begin"  
*Oil & Gas Journal*  
January 15, 2001
2. "Canadian Crude Market Outlook"  
Alberta Department of Energy Workshop #2  
March 2002
3. "View from the Market: The Refiner's Perspective"  
CERI 2003 World Oil Conference  
January 2003
4. "Traditional Markets and New Opportunities"  
CERI 2004 World Oil Conference  
March 2004
5. "Independent Views on Markets for Oil Sands and Pipeline Capacity"  
TD Newcrest Oil Sands Forum 2004  
July 2004
6. "Independent Views of Markets for Oil Sands and Pipeline Capacity"  
2004 NPRA  
July 7, 2004
7. "The Canadian Crude Market"  
2005 Canadian Crude Oil Conference  
September 7 – 9, 2005
8. "The Canadian Crude Market"  
3rd Annual Canadian Oil Sands Summit  
January 17, 2006
9. "Bigger is Better"  
4th Annual Oil Sands Forum – Oil Sands Market Overview  
July 6, 2006
10. "U.S. Market for Canadian Crude – Oil Sands Market Overview"  
Crude Oil Quality Group General Meeting  
November 9, 2006
11. "Future Markets for Canadian Crude"  
4th Annual Canadian Oil Sands Summit  
January 17, 2007

12. "Canadian Crude Market Outlook"  
3<sup>rd</sup> Annual Enbridge Mid-Continent Shippers Conference  
January 31, 2007
13. "New Market Outlook for Canadian Crude"  
42<sup>nd</sup> Annual Enbridge Jasper Conference  
June 6, 2007
14. "Canadian Oil Market – Opportunities and Challenges"  
5th Annual Canadian Oil Sands Summit  
January 16, 2008
15. "Canadian Crude Market and Outlook"  
Argus US/Canada Asphalt Conference 2008  
April 16-18, 2008
16. "Oil Sands Integration with the U.S. Market – A Revised Perspective"  
20<sup>th</sup> Annual Canadian Crude Oil Conference  
September 10, 2008
17. "The Economy and Oil Demand: Where are They Taking the Oil Market?"  
CERI 2009 Oil Conference  
April 6, 2009
18. "Oil Sands Integration with the Global Markets – A Revised Perspective"  
TD Newcrest London Oil Sands Forum 2009  
January 19, 2009
19. "Oil Sands Integration with the Global Markets"  
TD Newcrest Canadian Unconventional Oil Forum 2009  
July 8, 2009
20. "Implications of Expanding Canadian Pipeline Infrastructure"  
Argus Americas Crude Summit 2010  
January 27-28, 2010
21. "Counter-Party Risk"  
T.D. Newcrest – Unconventional Oil & Gas Forum  
July 15, 2010
22. "U.S. Downstream in the New Economic Reality"  
Annual Canadian Crude Oil Conference  
September 8, 2010

23. *“The Road to Recovery”*  
Argus 4th Annual Americas Asphalt Summit  
March 31, 2011
24. *“Crack Spreads are Back: Which PADDs Stand to Benefit and How Long Will It Last?”*  
TD Securities – Unconventional Energy Conference  
July 6, 2011
25. *“Overall Market Landscape for Canadian Crude Oil:*  
Argus – Americas Crude Summit 2012  
January 26, 2012
26. *Canadian Crude Landscape and Market Expansion Prospects”*  
Argus – Americas Asphalt Summit 2012  
March 28, 2012

# **Attachment B**

ATTACHMENT B

# Petroleum Administration for Defense Districts

