

IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF MICHIGAN  
SOUTHERN DIVISION

UNITED STATES OF AMERICA,

Plaintiff,

V.

ENBRIDGE ENERGY, LIMITED  
PARTNERSHIP,

ENBRIDGE PIPELINES (LAKEHEAD) L.L.C.,  
ENBRIDGE ENERGY PARTNERS, L.P.,  
ENBRIDGE ENERGY MANAGEMENT, L.L.C.,  
ENBRIDGE ENERGY COMPANY, INC. ,  
ENBRIDGE EMPLOYEE SERVICES, INC.,  
ENBRIDGE OPERATIONAL SERVICES, INC.,  
ENBRIDGE PIPELINES INC., and  
ENBRIDGE EMPLOYEE SERVICES CANADA  
INC.,

Defendants.

Civil Action No. 1:16-cv-914

Judge Gordon J. Quist

## SIXTH MODIFICATION OF CONSENT DECREE

WHEREAS, the United States of America, on behalf of the United States Environmental Protection Agency (“EPA”) and the United States Coast Guard, filed a complaint in this matter on July 20, 2016, asserting claims against Enbridge Energy, Limited Partnership and several affiliated entities (hereinafter collectively referred to as “Enbridge”) under the Clean Water Act, 33 U.S.C. § 1251 *et seq.*, and the Oil Pollution Act, 33 U.S.C. § 2701 *et seq.*, arising from two 2010 oil transmission pipeline failures that resulted in discharges of oil into waters of the United States.

WHEREAS, on May 23, 2017, this Court approved and entered a Consent Decree resolving claims that the United States asserted against Enbridge in this action.

WHEREAS, the Consent Decree establishes numerous requirements applicable to fourteen separate oil transmission pipelines in the United States owned and operated by Enbridge known as the “Lakehead System.”

WHEREAS, Section VII.D of the Consent Decree includes provisions pertaining to an In-Line Inspection (“ILI”) Based Spill Prevention Program, including provisions governing the identification, excavation, and mitigation or repair of various features, including Crack features, Corrosion features, and Geometric features (including dents) detected on Lakehead System pipelines, to the extent that such features qualify as Features Requiring Excavation.

WHEREAS, certain of the dig selection criteria used to identify Features Requiring Excavation under the Consent Decree refer to, and depend in part upon, the Established Maximum Operating Pressure (“Established MOP”) applicable to the location where a particular feature is located.

WHEREAS, as initially approved by the Court, Paragraph 10.s of the Consent Decree defined “Established MOP” for Consent Decree purposes by incorporating maximum operating pressure values listed in spreadsheets initially published on or about July 20, 2016, when the Consent Decree was initially lodged with the Court pending public notice and comment.

WHEREAS, effective August 12, 2020, the Fifth Modification of Consent Decree revised the definition of Established MOP to incorporate a limited revision of certain Established MOP values applicable to Lakehead System Line 61.

WHEREAS, the Pipeline Hazardous Materials and Safety Administration (“PHMSA”) has also promulgated certain regulations governing the allowable maximum operating pressures

on certain pipelines including Enbridge's Lakehead System pipelines, including regulations promulgated at 49 C.F.R. §§ 195.106 and 195.406.

WHEREAS, the Established MOP values incorporated into the Consent Decree were based upon and intended to be consistent with PHMSA regulations governing maximum operating pressure.

WHEREAS, consistent with PHMSA advisory bulletins, Enbridge started a Maximum Operating Pressure Verification program in 2015 (the "MOP Verification Project") to validate the maximum operating pressure values for every girth weld segment (joint) in the Enbridge Liquids Pipeline system, including the Lakehead System pipelines subject to the Consent Decree.

WHEREAS, as part of this MOP Verification Project, Enbridge reviewed numerous sources of information relevant to determining allowable maximum operating pressure consistent with PHMSA regulations, including Material Test Reports (MTRs), hydrostatic pressure test records, alignment sheets, as-built surveys, records of routine pipeline maintenance activities such as pipe replacements and valve installations, and ILI data. Multiple Enbridge departments assisted in the verification of this data.

WHEREAS, as one part of the MOP Verification Project, Enbridge reviewed available information on Lakehead System pipeline pipe properties, such as pipe grade and pipe wall thickness, that are relevant to determining the maximum operating pressure allowable during normal pipeline operations under 49 C.F.R. §§ 195.106 and 195.406.

WHEREAS, as part of its review of pipe properties, Enbridge considered, among other things, pipe wall thickness information obtained from In-Line Inspection tools measurements.

WHEREAS, in some instances In-Line Inspection tools may provide more precise information about pipe wall thickness of particular joints than information previously used to develop some of the Established MOP values currently in effect.

WHEREAS, based on its review of the best pipe wall thickness information currently available, Enbridge has identified a number of Lakehead System pipeline joints with pipe wall thickness values that differed from wall thickness values considered when current Established MOP values were adopted – including a number of joints where nominal pipe wall thickness was less than the pipe wall thickness value considered at the time the current Established MOP values were adopted.

WHEREAS, as part of its MOP Verification Project, Enbridge recalculated the internal design pressure, in accordance with 49 C.F.R. § 195.106, of all joints where pipe properties, including pipe wall thickness, differed from properties used for previous calculations of internal design pressure.

WHEREAS, under applicable PHMSA regulations, maximum operating pressure during normal operations may not exceed the internal design pressure of pipe calculated in accordance with 49 C.F.R. § 195.106

WHEREAS, as of December 24, 2020, Enbridge had completed its MOP Verification Project.

WHEREAS, as a result of this MOP Verification Project, Enbridge has determined the maximum operating pressure values allowable, consistent with PHMSA regulations, at numerous locations on its pipelines, including Lakehead System pipelines subject to the Consent Decree. At a number of locations on Lakehead System pipelines, maximum operating pressure values that Enbridge determined to be allowable consistent with PHMSA regulations (“Project MOP

values”) differ from Established MOP values applicable to the same locations under the Consent Decree.

WHEREAS, Enbridge provided the United States with data indicating that there are a total of 17,771 joints on Lakehead System pipelines where Project MOP values are at least 5 pounds per square inch (“psi”) greater than Established MOP values in effect for such joints prior to the Effective Date of this Sixth Modification of Consent Decree (referred to herein as “17,771 Joints”), and an additional 4,645 Lakehead System pipeline joints where Project MOP values are at least 5 psi lower than Established MOP values in effect for such joints prior to the Effective Date of this Sixth Modification of Consent Decree (referred to herein as “4,645 Joints”).

WHEREAS, the parties wish to revise the definition of Established MOP in the Consent Decree to incorporate certain updated maximum operating pressure values, consistent with PHMSA regulations that govern maximum operating pressure allowable during normal operating conditions, while assuring that the revised Established MOP values will not reduce pipeline safety.

WHEREAS, as part of an assessment of potential impacts of adopting Project MOP values, Enbridge examined a subset of Lakehead System pipeline joints where MOP Verification Project MOP values are greater than Established MOP values. For each of the 125 joints examined by Enbridge as part of this assessment, Enbridge compared the Project MOP value to the Predicted Burst Pressure of each detected feature on the joint. On each of the 125 joints examined, the Project MOP value was sufficiently below the Predicted Burst Pressure of features present, that no features present on those joints would meet dig selection criteria if the Project

MOP values were adopted for purposes of identification of Features Requiring Excavation under the Consent Decree.

WHEREAS, at this time Enbridge has not fully completed an analysis that compares Project MOP values to the Predicted Burst Pressures of all features on the remaining 17,771 joints where Project MOP values are higher than Established MOP values.

WHEREAS, under the Consent Decree, information on pipe grade and pipe wall thickness is used in calculating the Predicted Burst Pressure and Remaining Life of various features detected on Lakehead System pipelines, as well as in establishing appropriate pressure restrictions required for particular features.

WHEREAS, in the case of pipe joints where the MOP Verification Project resulted in a reduced wall thickness determination, the parties wish to assure that Remaining Life calculations and pressure restrictions applicable to features on such joints are based on the current wall thickness information.

WHEREAS, the parties now wish to revise the definition of Established MOP to incorporate certain revised Project MOP values applicable to specified locations which are listed in Attachment A.

WHEREAS, the parties anticipate the possibility of incorporating additional revisions to Established MOP values for any areas where future pipe replacement, valve installation or similar maintenance activities, or new information result in changes to pipe or the configuration of joints.

WHEREAS, the parties also wish to clarify that the operating pressures on Lakehead System pipelines may not exceed the Established MOP values used to identify Features

Requiring Excavation under the Consent Decree, except in circumstances described in 49 C.F.R. § 195.406(b)

NOW THEREFORE, before taking any further testimony, without further adjudication of any issue of fact or law, and upon the consent and agreement of the Parties, it is hereby ORDERED, ADJUDGED, and DECREED as follows:

1. Subparagraph 10.s of the Consent Decree is modified to read as follows:

10. \* \* \*

s. “Established Maximum Operating Pressure” or “Established MOP” or “MOP” shall mean, with respect to each Lakehead System pipeline segment, the MOP values that are specified in column [E] of the spreadsheets located at <https://www.epa.gov/enbridge-spill-michigan/enbridge-revised-maximum-operating-pressure-values>. Enbridge certifies that each MOP value listed in such spreadsheets is less than or equal to the maximum operating pressure allowable under 49 C.F.R. § 195.406(a) at the specified location during normal operations. Each line in the referenced spreadsheets lists an MOP value that is applicable to the entire distance between (i) the girth weld location identified in column D of that line and (ii) the girth weld location identified in column D of the next line of the spreadsheet. (For purposes of the Sixth Modification of Consent Decree each such distance may be referred to as a “girth weld segment.”) The Parties may, by written agreement, revise MOP values applicable to one or more pipeline locations listed in the above-referenced spreadsheets, including revisions to account for any changes in the number of girth weld segments in a particular pipeline section, provided that

each revised MOP value is determined in conformance with 49 C.F.R. § 195.406(a). The United States agrees that it shall not unreasonably withhold agreement with a proposed revision.

2. Paragraph 20 of the Consent Decree is modified to add the following Subparagraphs after the existing text:

20. \* \* \*

a. Except as provided below in Subparagraphs 20.b and 20.c of the Sixth Modification of Consent Decree, Enbridge shall assure that the pressure at each location on each Lakehead System pipeline does not at any time exceed either of the following: (1) the Established MOP applicable to such location, or (2) any Consent Decree pressure restriction applicable to such location.

b. During any pressure surge or other variation from normal operations on any Lakehead System pipeline other than Original U.S. Line 3, operating pressures within the pipeline segment where the surge or other variation from normal operations occurred may exceed one or more pressure restrictions established under Subparagraphs 52.b, 59.c.(1)(B) or 59.c.(2)(B) of this Consent Decree with respect to locations within such pipeline segment, provided, however, that the operating pressure at the location of each such pressure restriction may not at any time exceed 110 percent of the pressure limit established by that pressure restriction. Operating pressures may not exceed pressure restrictions established pursuant to any other provisions of the Consent Decree at any time, including during surges or other variations from normal operations.

c. Subject to the requirements of Subparagraph 20.b of this Consent Decree, during any pressure surge or other variation from normal operations on any Lakehead System



pipeline other than Original U.S. Line 3, operating pressures within the pipeline segment where such surge or other variation from normal operations occurred may exceed Established MOP values applicable to one or more locations within such pipeline segment, provided that pressures may not at any time exceed 110 percent of any Established MOP within the pipeline segment where the surge or other variation from normal operations occurred. Nothing in this Subparagraph 20.c shall alter or affect requirements of Subparagraph 22.c of this Consent Decree limiting allowable operating pressure on Original U.S. Line 3 at all times.

d. Overpressure Event Reporting.

(1) For purposes of the Sixth Modification of Consent Decree, an “Overpressure Event” is defined as an event that results in an exceedance of one or more Established MOPs or one or more pressure restrictions on any single Lakehead System pipeline. An Overpressure Event encompasses not only the initiating event but also all appropriate actions initiated by the operator to return to normal operation including but not limited to restarting the pipeline after shutdown. An event meeting the stated criteria shall be considered a single Overpressure Event even if it affects more than one station-to-station section of an affected pipeline.

(2) Within 10 Days after becoming aware of any Overpressure Event where pressure on any Lakehead System pipeline other than Original U.S. Line 3 exceeds any of the following: (A) 110 percent of any Established MOP, (B) 110 percent of any applicable pressure restriction established pursuant to Subparagraph 52.b, 59.c.(1)(B), or 59.c.(2)(B) of this Consent Decree, or (C) any applicable pressure restriction established pursuant to any other provision of this Consent Decree, Enbridge shall provide written notice to EPA and the Independent Third Party of the Overpressure Event.

(3) In each Semi-Annual Report required pursuant to Section IX of the Consent Decree, Enbridge shall provide the following information with respect to each Overpressure Event that occurred during the semi-annual reporting period:

(A) With respect to each Lakehead System pipeline other than Original U.S. Line 3, Enbridge shall identify each Overpressure Event where pressure exceeded one or more of the following: (i) 110 percent of any Established MOP, (ii) 110 percent of any pressure restriction established pursuant to Subparagraph 52.b, 59.c.(1)(B), or 59c.(2)(B) of this Consent Decree, or (iii) any pressure restriction established pursuant to any other provisions of this Consent Decree. For each such Overpressure Event identified, Enbridge shall provide all of the information specified in 49 C.F.R. § 195.56(b)(1)-(8).

(B) With respect to Original U.S. Line 3, Enbridge shall identify each Overpressure Event where pressure on Original U.S. Line 3 exceeded either of the following: (i) any Established MOP, or (ii) any pressure restriction applicable to that pipeline. The Semi-Annual Report covering the period when the Overpressure Event occurred shall include all of the information specified in 49 C.F.R. § 195.56(b)(1)-(8).

e. The provisions of Subparagraph 20.a limiting allowable operating pressures on Lakehead System pipelines other than Original U.S. Line 3 shall be effective as of the Effective Date of this Modification. Nothing in the Sixth Modification of Consent Decree shall be construed to apply to any Overpressure Event that occurred prior to the Effective Date of this Sixth Modification of Consent Decree on any on Lakehead System pipeline other than Original U.S. Line 3.

3. Modify Paragraph 37 by adding the following text below the table ending on page 39:

a. Re-evaluation of Certain Features Based on Revised Pipe Wall Thickness Information Documented During the MOP Verification Project. As provided below in this Paragraph 37, Enbridge shall assure that revised pipe wall thickness information documented during the MOP Verification Project is used to identify any additional features that meet dig selection criteria under Section VII.D of the Consent Decree, as well as to establish or revise certain pressure restrictions in accordance with requirements set forth in Section VII.D of the Consent Decree.

b. Within 30 Days after the Effective Date of the Sixth Modification of Consent Decree, Enbridge shall submit to EPA and the Independent Third Party a report identifying each of the 17,771 Joints and 4,645 Joints which was updated, based on the MOP Verification Project, to have a thinner nominal wall thickness value (“Updated Wall Thickness Value”) to determine the internal design pressure of the joint

c. As provided below in this Subparagraph 37.c, Enbridge shall re-evaluate the Predicted Burst Pressure and Remaining Life of Crack features, Corrosion features, intersecting Crack/Corrosion features, and intersecting Dent/Corrosion features located on joints identified pursuant to Subparagraph 37.b of this Consent Decree using the Updated Wall Thickness Values.

(1) Within 30 Days after the Effective Date of this Sixth Modification of Consent Decree, Enbridge shall review the most recent Predicted Burst Pressure calculation and the most recent Remaining Life calculation for each Crack feature, Corrosion feature, intersecting Crack/Corrosion feature, and intersecting Dent/Corrosion feature located on joints identified pursuant to Subparagraph 37.b of this Consent Decree

and identify each such calculation that used a nominal wall thickness value that is greater than the Updated Wall Thickness Value.

(2) For each Predicted Burst Pressure calculation and each Remaining Life calculation identified under Subparagraph 37.c.(1), Enbridge shall, within 60 Days of the Effective Date of this Sixth Modification of Consent Decree, perform a recalculation using the Updated Wall Thickness Value.

(A) Nothing in this Subparagraph 37.c.(2) shall be construed to require Enbridge to recalculate the Predicted Burst Pressure of any feature referred to in Subparagraphs 42.a – d of this Consent Decree.

(B) Predicted Burst Pressure and Remaining Life recalculations required pursuant to Subparagraph 37.c.(2) shall be performed in accordance with the Consent Decree.

(3) Based on the recalculations required pursuant to Subparagraph 37.c.(2) of this Consent Decree, Enbridge shall determine whether any features not previously identified as Features Requiring Excavation meet dig selection criteria under Section VII.D of the Consent Decree. Enbridge shall add each such newly identified Feature Requiring Excavation to the Dig List within five Days after completing the recalculation of Predicted Burst Pressure or Remaining Life of such feature, as applicable.

d. As provided below in this Subparagraph 37.d, Enbridge shall re-evaluate specified Corrosion features located on the joints identified pursuant to Subparagraph 37.b to determine the depth of such features, expressed as a percentage of the Updated Wall Thickness Value at the location of the feature.

(1) For each Corrosion feature located on joints identified pursuant to Subparagraph 37.b of the Consent Decree, Enbridge shall, within 30 Days after the Effective Date of this Sixth Modification of Consent Decree, review the most recent calculation of feature depth expressed as a percentage of pipe wall thickness, and Enbridge shall identify each such feature depth calculation that used a nominal wall thickness value that is greater than Updated Wall Thickness value applicable to the joint where the feature is located.

(2) For each Corrosion feature depth calculation identified pursuant to Subparagraph 37.d.(1), Enbridge shall, within 60 Days of the Effective Date of this Sixth Modification of Consent Decree, perform a recalculation of the feature depth using the Updated Wall Thickness Value applicable to the joint where the feature is located.

(A) The provisions of this Subparagraph 37.d.(2) shall not apply to: Corrosion features previously mitigated as described in Subparagraph 42.a, previously repaired Corrosion features that meet conditions specified in Subparagraph 42.b, or Corrosion features identified using an ultrasonic wall measurement (“USWM”) ILI tool.

(3) Enbridge shall add to the Dig List each newly identified Corrosion feature that meets any dig selection criteria under Table 2 of the Consent Decree. Enbridge shall add each such newly identified Feature Requiring Excavation to the Dig List within five Days after completing the feature depth recalculation relating to such feature.

e. Establishing Pressure Restrictions Consistent with Revised Pipe Wall Thickness Information. For each Feature Requiring Excavation identified pursuant to

Subparagraph 37.c.(3) and Subparagraph 37.d.(3) of the Consent Decree, Enbridge shall assure that any pressure restriction applicable to each such feature meets applicable requirements specified in Section VII.D of the Consent Decree when the Updated Wall Thickness Value applicable to the feature location is taken into account. Enbridge shall establish each pressure restriction required by this Subparagraph within two Days after completing the applicable recalculation required under Subparagraph 37.c.(2) and Subparagraph 37.d.(2).

4. Subparagraph 164.e of the Consent Decree is modified by adding the following text at the end of the existing Subparagraph:

164.     \*         \*         \*

          e.       \*         \*         \*

For purposes of this Subparagraph 164.e, each separate Overpressure Event (as defined in Paragraph 20.d.(1)) shall be treated as a single violation of Paragraph 20, regardless of the number of separate girth weld segments affected by such surge or variation from normal operating conditions.

5. The first sentence of Paragraph 144 of the Consent Decree is revised to read as follows:

144. Enbridge shall include in the Semi-Annual Report all information that is expressly required under Paragraphs 20.d.(3), 29, 31, 49, 96, and 110.c of the Consent Decree. \* \* \*

6. Public Comment. This Sixth Modification of Consent Decree will be lodged with the Court for a period of not less than 30 days for public notice and comment in accordance with 28 C.F.R. § 50.7. The United States reserves the right to withdraw from or withhold its consent if

the comments regarding this Sixth Modification of Consent Decree disclose facts or considerations indicating that the Sixth Modification of Consent Decree is inappropriate, improper, or inadequate. Enbridge consents to the entry of this Sixth Modification of Consent Decree without further notice and agrees not to withdraw from or oppose entry of this Sixth Modification of Consent Decree by the Court or challenge any provision of the Sixth Modification of Consent Decree, unless the United States has notified Enbridge in writing that it no longer supports entry of the Sixth Modification of Consent Decree.

7. Effective date. The effective date of this Sixth Modification of Consent Decree shall be the date upon which the Sixth Modification of Consent Decree is entered by the Court following notice and comment in accordance with Paragraph 6 of this Sixth Modification of Consent Decree or a motion to enter the Sixth Modification of Consent Decree is granted, whichever occurs first, as recorded in the Court's docket.

THE UNDERSIGNED PARTY enters into this Sixth Modification of Consent Decree in *United States v. Enbridge Energy, Limited Partnership, et al.*, Civil Action No. 1:16-cv-914 (W.D. MI).

FOR PLAINTIFF UNITED STATES OF AMERICA:

Todd Kim  
Assistant Attorney General  
Environment and Natural Resources Division

s/Steven J. Willey (OH 0025361)  
Senior Counsel  
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THE UNDERSIGNED PARTY enters into this Sixth Modification of Consent Decree in *United States v. Enbridge Energy, Limited Partnership, et al.*, Civil Action No. 1:16-cv-914 (W.D. MI).

ANDREW BYERLY BIRGE  
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THE UNDERSIGNED PARTY enters into this Sixth Modification of Consent Decree in *United States v. Enbridge Energy, Limited Partnership, et al.*, Civil Action No. 1:16-cv-914 (W.D. MI).

FOR PLAINTIFF UNITED STATES OF AMERICA (CONTINUED):

8/13/2021

**X** Jane M. Lupton for

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T. LEVERETT NELSON

Regional Counsel

Signed by: JANE LUPTON

THE UNDERSIGNED PARTY enters into this Sixth Modification of Consent Decree in *United States v. Enbridge Energy, Limited Partnership, et al.*, Civil Action No. 1:16-cv-914 (W.D. MI).

FOR PLAINTIFF UNITED STATES OF AMERICA (CONTINUED):

**Nathan Mark Pollins** Digitally signed by Nathan Mark Pollins  
Date: 2021.08.17 13:48:46 -04'00'

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MARK POLLINS  
Director  
Water Enforcement Division  
Office of Civil Enforcement  
Office of Enforcement and Compliance Assurance  
U.S. Environmental Protection Agency

THE UNDERSIGNED PARTY enters into and agrees to be bound by this Sixth Modification of Consent Decree in *United States v. Enbridge Energy, Limited Partnership, et al.*, Civil Action No. 1:16-cv-914 (W.D. MI).

FOR DEFENDANTS:

ENBRIDGE ENERGY, LIMITED PARTNERSHIP,  
ENBRIDGE PIPELINES (LAKEHEAD) L.L.C.,  
ENBRIDGE ENERGY PARTNERS, L.P.,  
ENBRIDGE ENERGY MANAGEMENT, L.L.C.,  
ENBRIDGE ENERGY COMPANY, INC., and  
ENBRIDGE EMPLOYEE SERVICES, INC.

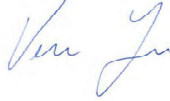
A handwritten signature in blue ink, appearing to read "Michael P. Kobayashi", is written over a horizontal line.

MICHAEL KOBAYASHI, Vice President, U.S. Operations

THE UNDERSIGNED PARTY enters into and agrees to be bound by this Sixth Modification of Consent Decree in *United States v. Enbridge Energy, Limited Partnership, et al.*, Civil Action No. 1:16-cv-914 (W.D. MI).

FOR DEFENDANTS:

ENBRIDGE OPERATIONAL SERVICES, INC.,  
ENBRIDGE PIPELINES INC., and  
ENBRIDGE EMPLOYEE SERVICES CANADA INC.

A handwritten signature in blue ink, appearing to read "Vern Yu", is positioned above a horizontal line.

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VERN YU, President

THIS SIXTH MODIFICATION OF CONSENT DECREE IS HEREBY APPROVED AND  
ENTERED this 20th day of December, 2021.

/s/ Gordon J. Quist  
GORDON J. QUIST  
UNITED STATES DISTRICT JUDGE

Line #	Girthweld Segment Start	Girthweld Segment End	Girthweld number	Right of Way Milepost (approx.) (mi)	Original EMOP (PSI)	New EMOP (PSI)
L0001	GF	CR	13390	789.3861	1,458.71	1,439.93
L0001	GF	CR	15320	792.0437	1,694.29	1,479.96
L0001	GF	CR	25260	805.4918	1,458.71	1,439.93
L0001	GF	CR	31800	814.0719	1,681.19	1,439.93
L0001	GF	CR	43480	829.4096	1,458.71	1,439.93
L0001	GF	CR	47380	834.6168	1,458.71	1,439.93
L0001	GF	CR	56030	845.9075	1,458.71	1,439.93
L0001	GF	CR	69810	864.2943	1,458.71	1,439.93
L0001	GF	CR	70670	865.3177	1,458.71	1,439.93
L0001	GF	CR	78110	875.2105	1,458.71	1,439.93
L0001	GF	CR	79840	877.3452	1,679.47	1,479.96
L0001	GF	CR	86450	885.9725	1,458.71	1,439.93
L0001	GF	CR	94380	896.3257	1,458.71	1,439.93
L0001	GF	CR	97010	899.8069	1,458.71	1,439.93
L0001	GF	CR	104550	909.5918	1,608.21	1,439.93
L0001	GF	CR	104730	909.7247	1,606.77	1,439.93
L0001	CR	PW	44920	941.7477	1,043.69	1,034.46
L0001	CR	PW	45020	941.7882	1,043.69	1,034.46
L0001	CR	PW	45030	941.796	1,043.69	1,034.46
L0001	CR	PW	45040	941.8032	1,043.69	1,034.46
L0001	CR	PW	45050	941.8102	1,043.69	1,034.46
L0001	CR	PW	45060	941.817	1,043.69	1,034.46
L0001	CR	PW	45070	941.8247	1,043.69	1,034.46
L0001	CR	PW	45080	941.8317	1,043.69	1,034.46
L0001	CR	PW	45090	941.8395	1,043.69	1,034.46
L0001	CR	PW	45100	941.8472	1,043.69	1,034.46
L0001	CR	PW	45110	941.8532	1,043.69	1,034.46
L0001	CR	PW	45120	941.8576	1,043.69	1,034.46
L0001	CR	PW	45130	941.8627	1,043.69	1,034.46
L0001	CR	PW	45160	941.8756	1,043.69	1,034.46
L0001	CR	PW	62565	955.3394	1,557.60	1,479.96
L0003	GF	CR	145370	874.9632	495.90	372.00
L0003	GF	CR	145380	874.9686	495.90	372.00
L0003	GF	CR	145390	874.9759	495.90	372.00
L0003	GF	CR	145400	874.9834	495.90	372.00
L0003	GF	CR	145410	874.9910	495.90	372.00
L0003	CR	PW	237340	1079.9119	402.92	370.00
L0003	CR	PW	237350	1079.9122	402.92	370.00
L0003	CR	PW	237360	1079.9149	402.92	370.00
L0003	CR	PW	242880	1083.9588	495.90	403.00
L0003	CR	PW	242890	1083.9665	495.90	403.00
L0003	CR	PW	242900	1083.9740	495.90	403.00
L0003	CR	PW	242910	1083.9818	495.90	403.00
L0003	CR	PW	242920	1083.9895	495.90	403.00
L0003	CR	PW	242930	1083.9971	495.90	403.00
L0004	DN	VG	60	814.1602	1,097.56	990.03

L0004	VG	PL	50	848.4284	1,048.80	990.03
L0004	PL	CR	50	877.3577	1,034.36	990.03
L0004	CR	CS	6300	916.5304	1,124.97	990.03
L0004	CR	CS	8700	919.0760	1,121.52	990.03
L0004	CR	CS	12340	922.8141	1,132.00	990.03
L0004	CR	CS	27870	939.6382	1,153.15	990.03
L0004	CR	CS	28540	940.1688	1,401.02	990.03
L0004	CS	DR	2180	955.3539	1,131.32	990.03
L0004	CS	DR	4550	958.0645	1,125.90	990.03
L0004	CS	DR	9380	963.6611	1,132.17	990.03
L0004	CS	DR	12190	966.5535	1,123.60	990.03
L0004	CS	DR	18720	973.3474	1,129.62	990.03
L0004	DR	FW	22720	1021.1117	1,140.94	990.03
L0004	FW	WR	2560	1046.9755	1,150.10	990.03
L0004	FW	WR	8700	1052.6798	1,141.20	990.03
L0004	FW	WR	11190	1055.2236	1,123.81	990.03
L0004	WR	PW	7260	1087.1109	1,151.88	990.03
L0004	WR	PW	16110	1094.0363	1,146.58	990.03
L0004	WR	PW	21390	1098.0872	1,148.03	990.03
L0005	PE	IR	222271	1255.0870	727.08	701.63
L0005	MA	BC	114518	1562.8406	741.48	704.33
L0005	MA	BC	208078	1631.1336	759.26	704.33
L0006A	PE	AM	47190	33.412	646.46	619.09
L0006A	PE	AM	161780	113.1635	744.10	719.97
L0006A	PE	AM	161853	113.2024	743.39	719.97
L0006A	PE	AM	161930	113.2099	743.44	719.97
L0006A	PE	AM	161990	113.2342	742.51	719.97
L0006A	PE	AM	324940	227.53	771.40	719.97
L0006A	PE	AM	325030	227.5597	771.22	719.97
L0006A	AM	GT	60	227.5959	770.92	719.97
L0006A	AM	GT	170	227.6272	770.93	719.97
L0006A	AM	GT	283250	424.0335	634.15	634.02
L0006A	AM	GT	284580	424.9634	619.88	619.09
L0006A	AM	GT	284590	424.9665	641.33	619.09
L0014	PE	AM	10160	13.3288	1,480.00	1,439.93
L0014	PE	AM	19620	25.7064	1,480.00	1,439.93
L0014	PE	AM	25050	32.8778	1,480.00	1,439.93
L0014	PE	AM	26390	34.5251	1,480.00	1,439.93
L0014	PE	AM	42460	55.3128	1,480.00	1,439.93
L0014	PE	AM	68550	88.0551	1,480.00	1,439.93
L0014	PE	AM	69270	88.9126	1,480.00	1,439.93
L0014	PE	AM	77040	99.0992	1,480.00	1,439.93
L0014	PE	AM	78150	100.5562	1,480.00	1,439.93
L0014	PE	AM	85180	110.0155	1,480.00	1,439.93
L0014	PE	AM	87610	113.0284	1,480.00	1,439.93
L0014	PE	AM	96010	124.1801	1,470.67	1,439.93
L0014	PE	AM	106910	138.2715	1,448.25	1,439.93
L0014	PE	AM	111060	143.4395	1,451.33	1,439.93
L0014	PE	AM	112020	144.6683	1,454.40	1,439.93



L0014	PE	AM	134470	173.2861	1,480.00	1,439.93
L0014	PE	AM	144540	186.3350	1,455.38	1,439.93
L0014	PE	AM	146240	188.3640	1,455.61	1,439.93
L0014	AM	MK	11530	242.2753	1,447.20	1,439.93
L0014	AM	MK	20460	253.1490	1,480.00	1,439.93
L0014	AM	MK	22570	255.6166	1,474.71	1,439.93
L0014	AM	MK	60830	304.4152	1,452.19	1,439.93
L0014	AM	MK	67210	312.3219	1,466.99	1,439.93
L0014	AM	MK	68090	313.4034	1,475.18	1,439.93
L0014	AM	MK	81850	331.2906	1,448.10	1,377.60
L0014	AM	MK	89540	341.2837	1,447.99	1,439.93
L0014	AM	MK	98190	352.3329	1,480.00	1,439.93
L0014	AM	MK	112630	370.4861	1,480.00	1,439.93
L0014	AM	MK	123590	384.4969	1,480.00	1,439.93
L0014	AM	MK	136230	400.5907	1,480.00	1,439.93
L0014	AM	MK	138467	403.4952	1,576.14	1,479.96
L0014	AM	MK	145619	412.4367	1,576.14	1,479.96
L0014	AM	MK	146951	414.1708	1,576.14	1575.00
L0014	AM	MK	149910	417.9219	1,480.00	1,439.93
L0014	AM	MK	151210	419.6909	1,480.00	1,439.93
L0014	AM	MK	159574	430.7614	1,576.14	1,479.96
L0014	AM	MK	166293	438.8703	1,645.36	1,581.75
L0014	AM	MK	168879	441.6306	1654.00	1581.75
L0014	AM	MK	168881	441.6391	1654.00	1581.75
L0014	AM	MK	168889	441.6456	1654.00	1581.75
L0014	AM	MK	168891	441.6464	1654.00	1581.75
L0014	AM	MK	168899	441.6543	1654.00	1581.75
L0014	AM	MK	168901	441.6616	1654.00	1581.75
L0014	AM	MK	168909	441.6695	1654.00	1581.75
L0014	AM	MK	168911	441.6751	1654.00	1581.75
L0014	AM	MK	169650	442.4823	1,480.00	1,439.93
L0014	AM	MK	171220	444.3450	1,480.00	1,439.93
L0014	AM	MK	172850	446.2318	1,480.00	1,439.93
L0014	AM	MK	180690	455.7114	1,480.00	1,439.93
L0014	AM	MK	182820	458.3126	1,604.52	1,581.75
L0064	GL	GT	9820	466.5032	1,480.00	1,440.22
L0064	GL	GT	10230	466.8803	1,753.15	1,575.00
L0064	GL	GT	10240	466.8925	1,755.25	1,575.00
L0064	GL	GT	11660	468.3938	1,754.45	1,575.83
L0064	GL	GT	11820	468.5442	1,756.25	1,575.00
L0064	GL	GT	11850	468.5645	1,756.27	1,575.00
L0064	GL	GT	13260	469.9424	1,480.00	1,439.93
L0064	GL	GT	13950	470.6991	1,763.06	1,575.83
L0064	GL	GT	16900	473.7328	1,774.91	1,575.83
L0064	GL	GT	16910	473.7451	1,775.10	1,575.83
L0064	GL	GT	16920	473.7574	1,775.50	1,575.83
L0064	GL	GT	17250	474.0920	1,781.79	1,575.83
L0064	GL	GT	17260	474.1001	1,780.76	1,575.83
L0064	GL	GT	17890	474.6828	1,784.59	1,575.83

L0064	GL	GT	17900	474.6945	1,784.59	1,575.83
L0064	GL	GT	17910	474.7061	1,784.76	1,575.83
L0064	GL	GT	24100	480.4605	1,788.36	1,575.83
L0064	GL	GT	24410	480.7276	1,790.24	1,575.83
L0064	GL	GT	24610	480.8461	1,788.62	1,575.83
L0064	GL	GT	24620	480.8551	1,788.55	1,575.83
L0064	GL	GT	25730	481.7510	1,480.00	1,440.22
L0065	GF	CR	11830	786.2806	1,421.84	1,260.00
L0065	GF	CR	17820	793.5264	1,422.80	1,260.00
L0065	GF	CR	70010	860.0130	1,386.11	1,260.00
L0065	GF	CR	70020	860.0178	1,386.00	1,260.00
L0067	GF	CR	4390	776.7262	1,485.36	1,479.96
L0067	GF	CR	25320	801.1220	1,495.08	1,479.96
L0067	CR	PW	17540	927.8357	1,485.47	1,479.96
L0067	CR	PW	21000	930.2141	1,487.50	1,479.96
L0067	CR	PW	34130	941.0296	1,502.64	1,479.96
L0067	CR	PW	34590	941.5568	1,493.73	1,479.96
L0067	CR	PW	48400	953.9703	1,507.44	1,312.91
L0067	CR	PW	49450	954.8928	1,501.75	1,479.96
L0067	CR	PW	53650	958.4634	1,297.24	1,136.54
L0067	CR	PW	53660	958.4719	1,297.22	1,136.54
L0067	CR	PW	53670	958.4775	1,297.21	1,136.54
L0067	CR	PW	53680	958.4912	1,297.22	1,136.54
L0067	CR	PW	53690	958.5047	1,297.18	1,136.54
L0067	CR	PW	53700	958.5193	1,297.12	1,136.54
L0067	CR	PW	53810	958.6671	1,296.27	1,136.54
L0067	CR	PW	95170	997.2722	1,503.68	1,479.96
L0067	CR	PW	106950	1010.5572	1,500.57	1,479.96
L0067	CR	PW	143460	1047.7376	1,309.67	1,136.54
L0078	GT	SK	111	465.5890	1,768.00	1,480.00
L0078	GT	SK	77417	538.4775	1,785.60	1,480.00
L0078	GT	SK	118132	577.3805	1,765.60	1,480.00
L0078	GT	SK	118141	577.3839	1,765.60	1,480.00
L0078	GT	SK	118171	577.3957	1,765.60	1,480.00
L0078	GT	SK	119251	578.6419	1,596.32	1,480.00
L0078	GT	SK	147561	608.2517	1,580.80	1,480.00
L0078	GT	SK	150351	611.1934	1,593.48	1,480.00
L0078	GT	SK	151261	612.0041	1,582.71	1,480.00
L0078	GT	SK	177991	639.1076	1,608.99	1,480.00
L0078	GT	SK	191571	651.3674	1,738.40	1,480.00
L0078	GT	SK	192071	651.5976	1,820.00	1,671.43
L0078	SK	RW	381031	752.7269	1,691.93	1,480.00
L0078	SK	RW	381041	752.7276	1,691.93	1,480.00
L0078	SK	RW	381049	752.7278	1,691.93	1,480.00
L0078	SK	RW	381411	753.1665	1,693.10	1,566.00
L0078	SK	RW	420697	753.1679	1,693.10	1,480.00
L0078	SK	RW	420707	753.1684	1,693.10	1,566.00

## Attachment A - Revised Higher EMOP Values

Line #	Girthweld Segment Start	Girthweld Segment End	Girthweld number	Right of Way Milepost (approx.) (mi)	Original EMOP (PSI)	New EMOP (PSI)
L0002	GF	CR	79323	828.7806	769.33	775.50
L0002	GF	CR	79329	828.7837	769.33	776.45
L0002	GF	CR	79335	828.7846	769.48	776.57
L0002	GF	CR	79341	828.7910	769.48	776.73
L0002	GF	CR	79347	828.7975	769.48	776.89
L0002	GF	CR	79353	828.8039	769.48	776.94
L0002	GF	CR	79359	828.8103	770.54	776.98
L0002	GF	CR	79365	828.8165	770.75	776.97
L0002	GF	CR	79371	828.8174	770.75	776.81
L0002	GF	CR	146220	877.0145	653.49	683.39
L0002	GF	CR	146225	877.0181	653.48	683.39
L0002	GF	CR	146230	877.0183	653.46	683.39
L0002	GF	CR	146280	877.0255	683.27	686.77
L0002	CR	DR	40	909.3696	605.98	730.61
L0002	CR	DR	60860	953.3281	669.75	728.70
L0002	CR	DR	60870	953.3290	669.70	728.70
L0002	CR	DR	60880	953.3292	725.48	728.70
L0002	CR	DR	60890	953.3298	725.45	728.70
L0002	CR	DR	60900	953.3302	725.43	728.64
L0002	DR	PW	141360	1098.1174	704.92	812.69
L0002	DR	PW	141370	1098.1233	704.92	812.69
L0002	DR	PW	141380	1098.1283	704.92	812.69
L0004	CS	DR	5	953.0127	634.02	1,187.86
L0004	CS	DR	10	953.0133	634.02	1,187.86
L0004	CS	DR	15	953.0134	634.02	1,187.86
L0004	CS	DR	20	953.0140	634.02	1,187.86
L0004	CS	DR	30	953.0179	634.02	1,187.86
L0004	CS	DR	40	953.0216	634.02	1,187.86
L0004	CS	DR	45	953.0219	634.02	1,187.86
L0004	CS	DR	50	953.0223	634.02	1,187.86
L0004	CS	DR	60	953.0227	634.02	1,187.86
L0004	CS	DR	70	953.0231	634.02	1,187.86
L0004	CS	DR	80	953.0240	634.02	1,187.86
L0004	CS	DR	90	953.0393	634.02	1,187.86
L0006A	AM	GT	109513	304.5836	619.88	634.02
L0006A	AM	GT	109519	304.5851	619.88	634.02
L0006A	AM	GT	283260	424.0411	619.88	634.17
L0006A	AM	GT	344170	465.3805	667.59	667.61
L0006A	AM	GT	344180	465.3806	667.59	667.61
L0006A	AM	GT	344190	465.3813	667.59	667.61
L0014	AM	MK	3121	231.8645	1,378.60	1,581.75
L0014	AM	MK	3131	231.8728	1,378.60	1,581.75
L0014	AM	MK	3141	231.8812	1,378.60	1,581.75
L0014	AM	MK	85161	335.5703	1,378.60	1,488.95
L0014	AM	MK	85169	335.5712	1,378.60	1,661.60
L0014	AM	MK	85171	335.5729	1,378.60	1,661.60

L0014	AM	MK	85179	335.5804	1,458.12	1,661.60
L0014	AM	MK	85181	335.5880	1,458.12	1,661.60
L0014	AM	MK	85189	335.5955	1,457.78	1,661.60
L0014	AM	MK	85191	335.6040	1,457.66	1,661.60
L0014	AM	MK	85199	335.6114	1,457.66	1,661.60
L0014	AM	MK	85201	335.6198	1,457.78	1,661.60
L0014	AM	MK	85209	335.6216	1,378.60	1,488.95
L0014	AM	MK	167741	440.3279	1,576.14	1,581.75
L0014	AM	MK	167749	440.3300	1,576.14	1,581.75
L0014	AM	MK	167751	440.3451	1,576.14	1,581.75
L0014	AM	MK	167759	440.3540	1,576.14	1,581.75
L0014	AM	MK	167761	440.3691	1,644.00	1,712.51
L0014	AM	MK	167769	440.3699	1,644.00	1,757.60
L0014	AM	MK	167771	440.3712	1,644.00	1,757.60
L0014	AM	MK	167779	440.3723	1,644.00	1,757.60
L0014	AM	MK	167781	440.3755	1,644.00	1,757.60
L0014	AM	MK	167789	440.3822	1,644.34	1,757.60
L0014	AM	MK	167791	440.3906	1,644.34	1,757.60
L0014	AM	MK	167799	440.3981	1,644.34	1,757.60
L0014	AM	MK	167801	440.4064	1,648.78	1,757.60
L0014	AM	MK	167809	440.4137	1,648.78	1,757.60
L0014	AM	MK	167811	440.4222	1,650.26	1,757.60
L0014	AM	MK	167819	440.4297	1,650.26	1,757.60
L0014	AM	MK	167821	440.4372	1,651.51	1,757.60
L0014	AM	MK	167829	440.4447	1,651.51	1,757.60
L0014	AM	MK	168859	441.6123	1,654.35	1,712.51
L0014	AM	MK	168861	441.6131	1,654.24	1,800.80
L0014	AM	MK	168869	441.6158	1,654.24	1,800.80
L0014	AM	MK	168871	441.6232	1,654.24	1,800.80
L0078	GT	SK	157381	618.8096	1,400.00	1,480.00
L0078	GT	SK	166591	627.6629	1,400.00	1,480.00
L0078	GT	SK	172151	633.5327	1,400.00	1,480.00
L0078	GT	SK	183611	644.5859	1,400.00	1,480.00
L0078	SK	RW	307931	679.7448	1,260.00	1,432.41
L0078	SK	RW	307941	679.7455	1,260.00	1,432.41
L0078	SK	RW	307949	679.7459	1,260.00	1,432.41
L0078	SK	RW	322041	692.6030	1,424.13	1,430.40
L0078	SK	RW	333181	702.2671	1,398.22	1,430.40
L0078	SK	RW	336981	706.0296	1,260.00	1,464.09
L0078	SK	RW	336991	706.0303	1,260.00	1,464.11
L0078	SK	RW	336999	706.0305	1,260.00	1,464.11
L0078	SK	RW	340721	710.4191	1,260.00	1,442.39
L0078	SK	RW	340731	710.4198	1,260.00	1,442.39
L0078	SK	RW	340739	710.4200	1,260.00	1,442.39
L0078	SK	RW	345231	715.3517	1,260.00	1,479.29
L0078	SK	RW	345241	715.3524	1,260.00	1,479.31
L0078	SK	RW	345249	715.3526	1,260.00	1,479.31