



Enbridge Pipelines (North Dakota) LLC

Little Muddy Station Connection Project

# TREE & SHRUB RESTORATION PLAN

North Dakota Public Service Commission

Case No. PU-11-606

*Prepared by:*



February 2013

# **Enbridge Pipelines (North Dakota) LLC Little Muddy Station Connection Project Tree & Shrub Restoration Plan**

## **INTRODUCTION**

On November 14, 2011 Enbridge Pipelines (North Dakota) LLC (Enbridge) filed an Application for Certificate of Corridor Compatibility and a Route Permit with the North Dakota Public Service Commission (Commission) to authorize construction of approximately 6 miles of new 10-inch-diameter pipeline and a new pump station (Little Muddy Pump Station), and to make minor modifications to Enbridge's existing East Fork Station (Little Muddy Station Connection Project or Project). The two stations and the pipeline route are all located in East Fork Township, Williams County, North Dakota. On March 21, 2012, the Commission issued its Findings of Facts, Conclusion of Law and Order (Order) regarding the case (Case No. PU-11-606).

The majority of construction activities on the pipeline and facilities were completed in 2012. Restoration activities will continue in 2013 until final stabilization is achieved.

In accordance with the Tree and Shrub Mitigation Specifications identified in the Commission's Order (see Exhibit A), Enbridge is required to inventory and replace trees and shrubs that were removed during the Project. Cleared trees and shrubs are to be replaced on a two to one basis using the same or similar species. Invasive species will be replaced by a suitable native variety. Impacted landowners were given the option to either have replacement trees and shrubs planted off right-of-way on their property or waiving that requirement and allowing replanting to take place at an alternate location. Following replanting, inspection of the replaced trees and shrubs will be conducted annually for three years to document the condition and survival rate. Enbridge will submit annual reports to the Commission following these inspections. Enbridge understands that if the survival rate is less than 75% after three years from the planting, the Commission may order additional plantings.

Enbridge is hereby submitting the results of its preconstruction tree and shrub inventories, information regarding landowner discussions, planting procedures, and a timeline for replanting. Enbridge requests that the Commission review this plan for adequacy and approval.

## **TREE AND SHRUB INVENTORY**

A preconstruction inventory of the construction right-of-way and station sites was conducted by Carlson McCain, Inc. (Carlson McCain) in April 2012, and is included as Exhibit B. Inventory was taken of planted and naturally growing trees greater than 1 inch in diameter at breast height (DBH), as well as trees and shrubs, regardless of size, located in windbreaks, shelterbelts, other planted areas, and natural growth areas within the construction right-of-way. Colony-forming shrubs located in native growth areas were sampled using the Commission-approved Shrub Sampling Method. Nine tree and shrub species were identified along the project corridor. Actual trees and shrubs removed during construction were recorded for mitigation purposes.

## **RESULTS OF LANDOWNER DISCUSSIONS**

The Commission's Order states that trees and shrubs are to be replaced at a 2:1 ratio. Enbridge was able to significantly reduce the quantity of trees and shrubs removed during construction by minimizing workspaces and avoiding tree windbreaks. Due to these efforts only one landowner was

impacted. Enbridge consulted with this landowner to determine if they would like the replacement trees/shrubs planted off the right-of-way on the landowner's property or at an alternate location. The landowner responded that he desired the replanting to occur off right-of-way on his property (Contact Record/Waiver included as Exhibit C).

## REPLANTING PROCEDURES TO BE IMPLEMENTED

A total of 6 planted shrubs requiring mitigation were removed during construction of the Project. As such, Enbridge is responsible for planting 12 shrubs. Table 1 below provides a summary based on the landowner discussions described above. A more detailed account of the location, type, and quantity of trees and shrubs is provided in Table 3 (Exhibit D).

<b>Project/Segment</b>	<b>Trees to Be Planted on Landowner's Property</b>	<b>Shrubs to be Planted on Landowner's Property</b>	<b>Trees to be Planted on Alt Location</b>	<b>Shrubs to be Planted on Alt Location</b>	<b>Total Trees</b>	<b>Total Shrubs</b>
<b>Little Muddy Pipeline and Stations</b>	0	12	0	0	<b>0</b>	<b>12*</b>

\*Location and quantities of trees/shrubs to be planted on landowner's property included as Exhibit E.

Enbridge has been in recent contact with the North Dakota Forest Service (NDFS), who has indicated an interest in partnering with Enbridge on the tree mitigation effort for this and other active Enbridge projects requiring mitigation. In a January 15, 2013 conference call, NDFS State Forester Larry Kotchman provided details regarding the state's "Trees for North Dakota" program<sup>1</sup>, and stated that NDFS has successfully partnered with other utility companies in North Dakota on similar projects requiring tree mitigation.

In addition to the Little Muddy Station Connection Project, Enbridge has several other ongoing projects in the state which require tree/shrub mitigation per Orders from the Commission. As a result of the Enbridge Project Case No. PU-10-612, PU-10-613, PU-11-232, and PU-11-606, the NDFS is proposing to plant 1,353 trees and shrubs to satisfy the mitigation requirements for these projects (See Table 2).

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<sup>1</sup> North Dakota Code 4-21.2

<b>Table 2 Bakken Program Mitigation Overview</b>			
<b>PSC Order</b>	<b>Project/Segment</b>	<b>Total Trees</b>	<b>Total Shrubs</b>
Case No. PU-10-612	Bakken Pipeline Project US	24	72
Case No. PU-10-613	Beaver Lodge Loop Project (BLLP) East	66	10
	BLLP West	774	372
	BLLP - Stanley Station	24	10
Case No. PU-11-232	Berthold Station Expansion Project	26	0
<b>Case No. PU-11-606</b>	<b>Little Muddy Station Connection</b>	<b>0</b>	<b>12</b>
<b>Total Mitigation Requirement</b>		<b>914</b>	<b>476</b>
<i>Total to be Mitigated by BLLP Landowner Directly</i>		160	
<i>Total to be Mitigated by the NDFS</i>		754	476
<b>Combined Total to be Mitigated by the NDFS</b>		<b>1,230</b>	
<b>Additional NDFS-Recommended Planting to Offset mortality</b>		<b>123</b>	
<b>Total to be Planted by NDFS</b>		<b>1,353</b>	

Enbridge is planning to work in partnership with NDFS to complete the tree and shrub replantings and monitoring for the active projects listed in Table 2. The NDFS will coordinate with local Soil Conservation Districts (SCDs) to plant/replace trees and shrubs on impacted landowner's property, where requested. Trees and shrubs targeted for planting at alternative locations will also be administered through NDFS. A copy of the cover letter that summarizes the partnership is included as Exhibit F.

Highlights of the partnership include:

- The *Trees for North Dakota Trust Fund*<sup>2</sup> will be used as a vehicle to orchestrate tree and shrub replantings on private property owners, as well as to make tree planting grants available to public and private landowners. Legislative oversight provides security and assurances that the funds are used for intended tree planting purposes. The program will include funds for site preparation, tree stock, tree planting services, and weed control. Funding for the program will be provided by Enbridge, based on a cost estimate to be provided by the NDFS.
- NDFS staff and/or local SCDs will conduct annual monitoring of the replanted trees/shrubs, and will prepare an annual report detailing the replanting effort and survival rates. Using this data, Enbridge will submit annual reports to the Commission per Tree and Shrub Mitigation Specification #15.

## **TIMELINE FOR REPLANTINGS**

Mechanical planting will generally be utilized where a large number of plantings are required and

<sup>2</sup> established by North Dakota Code 4-21.2-02

hand planting will be employed where there are fewer plantings. Given the small number of shrubs to be replanted, it is assumed hand planting will be utilized. Per discussions with NDFS staff, plantings generally occur between late April and June 1. It is anticipated that the replanting area may require site preparation prior to the plantings, as such, the site may not be suitable for planting until Spring 2014.

## **REPLACEMENT MONITORING**

On Enbridge's behalf, NDFS and/or local SCDs will inspect tree and shrub replacements once a year for three years, on the anniversary of the plantings, and complete a report documenting the status and condition of plantings on or shortly before October 1 of each year. This report will be submitted to the Commission. Survival success rates will be determined by monitoring replacement plantings only and on a species-by-species basis. Enbridge understands the Commission may order additional plantings if survival rates are less than 75%. Based on discussions with NDFS, more trees/shrubs than required are typically planted to account for some anticipated mortality.

**EXHIBIT A**

**North Dakota Public Service Commission's  
Tree and Shrub Mitigation Specifications**

**STATE OF NORTH DAKOTA**  
**PUBLIC SERVICE COMMISSION**

**Enbridge Pipelines (North Dakota), LLC  
Little Muddy Station Connection Project – Williams County  
Siting Application**

**Case No. PU-11-606**

**Tree and Shrub Mitigation Specifications**

**Inventory**

1. Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (e.g., *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*), must be inventoried before cutting. The inventory must record the location, number, and species of trees and shrubs.
2. In windbreaks, shelterbelts and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, must be inventoried for replacement.
3. In native growth areas, trees anticipated to be cleared that are 1 inch diameter at breast height (dbh) or greater must be inventoried for replacement.
4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way must be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs must be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil must be preserved and replaced after construction. Shrubs must be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared must be inventoried for replacement.
6. In native growth areas, trees and shrubs may be inventoried by actual count or by a sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (Commission) and approved prior to the start of construction must define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots must be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

### **Clearing for Construction**

7. Trees and shrubs must be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The maximum width of clear cuts through windbreaks, shelterbelts and all other wooded areas is 50 feet, unless otherwise approved by the Commission.
9. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced must be noted on the inventory.

### **Replacement**

10. Prior to tree and shrub replacement, documentation identifying the number and variety of trees and shrubs removed, as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings, must be filed with the Commission for approval.
11. Two 2-year-old saplings must be planted for every one tree removed. Two shrubs (stem cuttings) must be planted for every one shrub removed.
12. Except in the case of invasive or noxious species, trees and shrubs must be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service. Invasive or noxious species must be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.
13. Landowners must be given the option of having replacement trees and shrubs planted on the landowner's property, either on or off the right-of-way. The landowner must also be given the opportunity to waive those options in writing in order to have replacement trees and shrubs planted off the landowner's property.
14. At the conclusion of the project, documentation identifying the actual number, variety, type, location and date of the replacement plantings must be filed with the Commission.
15. Tree and shrub replacements must be inspected annually, in September, for three years. The first annual inspection must be at least one year from the anniversary date of the original plantings. A report of each annual inspection must be submitted to the Commission by October 1 of each year, documenting the condition of plantings and any woodlands work completed as of September of each year. If after the third annual report the survival rate is less than 75%, the Commission may order additional planting(s).

**EXHIBIT B**

**Tree and Shrub Inventory Report (Carlson McCain)**

# TREE AND SHRUB INVENTORY REPORT

## Little Muddy Station Connection Project

*Project #3882*

*Prepared for:*

Merjent  
Mr. Paul Hartzheim  
TractorWorks Building  
800 Washington Avenue N., Suite 315  
Minneapolis, MN 55401

*May 29, 2012*



2718 Gateway Avenue, Suite 101  
Bismarck, ND 58503  
Tel 701-255-1475  
Fax 701-255-1477  
[www.carlsonmccain.com](http://www.carlsonmccain.com)

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## **1.0 SCOPE OF WORK**

Carlson McCain, Inc. (Carlson McCain) inventoried trees and shrubs along the proposed Little Muddy Station Connection Project (Project) for Enbridge Pipelines (North Dakota) LLC (Enbridge). The proposed Little Muddy Project is oriented northwest to southeast, approximately six miles in length and connects Enbridge's Little Muddy and East Fork Stations. The Project is located in East Fork Township, Williams County, North Dakota.

Trees and shrubs were inventoried in accordance with the North Dakota Public Service Commission (Commission) Tree and Shrub Mitigation Specifications (Specifications) for the Little Muddy Project. The inventory was conducted within the construction right of way (ROW). Carlson McCain biologists Miranda Meehan and Chad Tucker conducted the tree and shrub inventory April 16 and 17, and May 24, 2012.

## **2.0 PROCEDURES**

Carlson McCain utilized the Commission approved “Tree and Shrub Inventory Plan Enbridge Pipelines (North Dakota) LLC, Little Muddy Project” (Inventory Plan) while conducting the tree and shrub inventory. Standard data forms were completed for each inventoried tree/shrub site. Each site was assigned a unique identification that consisted of the site’s section, township, range, and identification number e.g. (26156100-01). Data collected at each site included, observer, date, site id, woodland type, tree/shrub species, tally, and total number. An example can be found in the Inventory Plan (Appendix B).

Trees and shrubs located in windbreaks, shelterbelts, other planted areas, and natural growth areas in the Project ROW were counted by direct stem count. Planted and natural growing trees that were  $\geq 1$  inch diameter breast height (DBH) were inventoried for mitigation replacement.

Colony forming shrubs, located in native growth areas were delineated with a GPS unit and sampled with the Commission approved Shrub Sampling Method. Chokecherry, western snowberry, and junberry are common colony-forming shrubs growing within the Project ROW. The Shrub Sampling Method is described in detail in the Inventory Plan (Appendix B).

### **3.0 RESULTS**

Natural growth and planted trees and shrubs were inventoried at ten individual sites along the proposed Little Muddy Project. Nine tree and shrub species were identified within the Project ROW (Tables 1 and 2). Naturally growing tree and shrub areas were found near wetland areas and on hillsides in native landscapes. Planted tree rows are also present within the Project ROW. Certain tree rows contain planted shrubs.

Cottonwood was the only naturally growing tree species found within the Project ROW. Inventoried native shrubs within the Project ROW included chokecherry, western snowberry, juneberry, and northern hawthorn. Green ash is the most common planted tree. Invasive species, Siberian elm and Siberian peashrub were also planted in tree rows. Tree and Shrub Count Forms are included in Appendix C.

Table 1. Summary of Tree and Shrub Inventory

Species	Common Name	Growth Form	Reproduction	Invasive or Nonnative	Natural Growth	Planted	Overall Total
					≥1"	≥1"	
<i>Amelanchier alnifolia</i>	Juneberry	tree/shrub	seed	No	1170	0	1170
<i>Caragana arborescens</i>	Peashrub (Siberian)	shrub	seed	Yes	0	6	6
<i>Crateagus rotundifolia</i>	Northern Hawthorn	tree/shrub	suckering	No	1	0	1
<i>Fraxinus pennsylvanica</i>	Ash (Green)	tree	seed	No	0	13	13
<i>Populus deltoides</i>	Cottonwood	tree	seed/suckering	No	1	0	1
<i>Prunus virginiana</i>	Chokecherry	shrub	seed/suckering	No	72	0	72
<i>Symphoricarpos occidentalis</i>	Western snowberry	shrub	rhizomatous, colony forming	No	24626	0	24626
<i>Ulmus pumila</i>	Elm (Siberian)	tree	seed	Yes	0	1	1
<b>Totals</b>					<b>25870</b>	<b>20</b>	<b>25890</b>

Table 2. Summary of Tree and Shrub Inventory Sites

Inventory Site	Species	Common Name	Natural Growth	Planted	Overall Total
			≥1"	≥1"	
17156100-01	<i>Populus deltoides</i>	Cottonwood	1	0	1
27156100-01	<i>Crateagus rotundifolia</i>	Northern Hawthorn	1	0	1
27156100-02	<i>Prunus virginiana</i>	Chokecherry	51	0	51
	<i>Symphoricarpos occidentalis</i>	Western snowberry	120	0	120
27156100-03	<i>Symphoricarpos occidentalis</i>	Western snowberry	3,997	0	3,997
27156100-04	<i>Fraxinus pennsylvanica</i>	Ash (Green)	0	12	12
26156100-01	<i>Fraxinus pennsylvanica</i>	Ash (Green)	0	1	1
	<i>Ulmus pumila</i>	Elm (Siberian)	0	1	1
26156100-02	<i>Caragana arborescens</i>	Peashrub (Siberian)	0	6	6
26156100-03	<i>Prunus virginiana</i>	Chokecherry	21	0	21
	<i>Symphoricarpos occidentalis</i>	Western snowberry	18,050	0	18,050
26156100-04	<i>Symphoricarpos occidentalis</i>	Western snowberry	2,125	0	2,125
26156100-05	<i>Symphoricarpos occidentalis</i>	Western snowberry	334	0	334
	<i>Amelanchier alnifolia</i>	Juneberry	1,170	0	1,170

#### 4.0 RECOMMENDATIONS

Carlson McCain makes the following recommendations regarding mitigation:

- **Invasive Species.** Invasive species should be replaced with non-invasive native tree/shrub of similar height and canopy suitable for the mitigation area.
- **Colony-forming Species.** Colony-forming and/or suckering species as described in Section 3 should be cut flush with the ground level where necessary to accommodate construction. These areas should then be allowed to regenerate naturally. Where complete removal is necessary, replacement should be made on a 1:4 basis with stem cuttings. A planting ratio of 1:2 is accurate in areas where moisture is not a limiting growth factor.

Enbridge will develop a tree/shrub mitigation plan for Commission's approval.

## 5.0 REFERENCES

Enbridge Pipelines (North Dakota) LLC. Tree and Shrub Inventory Plan. Enbridge Pipelines (North Dakota) LLC, Little Muddy Project. Case No. PU-11-606. May 2012.

North Dakota Tree Handbook. North Dakota Tree Information Center. North Dakota State University. ND Forest Service. <http://www.ag.ndsu.edu/trees/handbook/ndhand-1.htm>  
Accessed April 2012.

North Dakota Public Service Commission. North Dakota Public Service Commission Certification Relating to Order Provisions Transmission Facility Siting. Case Number PU-11-606. Tree and Shrub Mitigation Specifications. 3p.

# APPENDIX A

## Tree and Shrub Mitigation Specifications

## Case No. PU-11-606

### Tree and Shrub Mitigation Specifications

#### Inventory

1. Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (*e.g.*, *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*), shall be inventoried before cutting. The inventory shall record the location, number, and species of trees and shrubs.
2. In windbreaks, shelterbelts and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, shall be inventoried for replacement.
3. In native growth areas, trees anticipated to be cleared that are 1-inch diameter at breast height ("dbh") or greater shall be inventoried for replacement.
4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way shall be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs shall be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil shall be preserved and replaced after construction. Shrubs shall be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared shall be inventoried for replacement.
6. In native growth areas, trees and shrubs may be inventoried by actual count or by sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (Commission) and approved prior to the start of construction shall define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots shall be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

## **Clearing for Construction**

7. Trees and shrubs shall be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The width of clear cuts through windbreaks, shelterbelts and all other wooded areas shall be limited to 50 feet or less unless otherwise approved by the NDPSC.
9. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced shall be noted on the inventory.

## **Replacement**

10. Prior to tree/shrub replacement, documentation identifying the number and variety of trees removed as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings shall be filed with the NSPSC for approval.
11. Two 2-year-old saplings shall be planted for every one tree removed. Two shrubs (stem cuttings) shall be planted for every one shrub removed.
12. Except in the case of invasive or noxious species, trees and shrubs shall be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service. Invasive or noxious species shall be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.
13. Landowners shall be given the option of having replacement trees/shrubs planted off the right-of-way on the landowner's property or waiving that requirement in writing and allowing those replacement trees/shrubs to be planted at alternative locations.
14. At the conclusion of the project, documentation identifying the actual number, variety, type, location, and date of the replacement plantings shall be filed with the NDPSC.
15. Tree/shrub replacements shall be inspected once a year for three years, on about the anniversary of the plantings, and, on or shortly before October 1 of each year, a report shall be submitted to the NDPSC documenting the condition of replacement planting and any woodlands work completed. If after three years from the anniversary of the plantings the survival rate is less than 75%, the NDPSC may order additional planting(s).

## APPENDIX B

### Tree and Shrub Inventory Plan

# Tree and Shrub Inventory Plan

Enbridge Pipelines (North Dakota) LLC  
Little Muddy Station Connection Project

Case No. PU-11-606

Prepared for:

Enbridge Pipelines (North Dakota) LLC

May 2012

### **Introduction**

Enbridge Pipelines (North Dakota) LLC proposes to construct, own, and operate an approximate six-mile-long pipeline from the new Little Muddy Station to the existing Enbridge East Fork Station in Williams County, North Dakota. The case number for the Little Muddy Station Connection Project (Project) is PU-11-606. Enbridge Pipelines (North Dakota) LLC will comply with the tree and shrub mitigation specifications as outlined in the North Dakota Public Service Commission (Commission) Certification Relating to Order Provisions Transmission Facility Siting. Enbridge Pipelines (North Dakota) LLC proposes to contract Carlson McCain, Inc. for the tree and shrub inventory. The tree and shrub mitigation specifications are found in Appendix A of this Tree and Shrub Inventory Plan. Specifically, this Plan outlines the process for completing the tree and shrub inventory.

### **Windbreaks, Shelterbelts, and Other Planted Areas**

In windbreaks, shelterbelts, and other planted areas, trees and shrubs anticipated to be cleared regardless of size will be counted by direct stem count. Trees that are one-inch or greater diameter at breast height (DBH) will be inventoried for replacement.

In windbreaks, shelterbelts, and other planted areas, shrubs that form colonies (such as buffalo currant, chokecherry, dogwood, plum, pussy willow, sandbar willow, western snowberry, and Woods rose) and that are cut flush with the ground surface and not cleared, so as to leave the naturally occurring seed bank and root stock intact will not be direct stem counted. Instead, the area will be delineated on an aerial photo and indicated on construction drawings to not be cleared or have the ground disturbed. If ground disturbance occurs, Enbridge Pipelines (North Dakota) LLC will conduct a direct stem count of the disturbance area or estimate the number of stems cleared using a Commission approved sampling estimate method (see Shrub Sampling Method, Appendix C).

### **Native Growth Areas**

In native growth areas, trees that are one-inch or greater diameter at breast height (DBH) will be inventoried for replacement.

In high-density woodland areas, a Commission approved sampling method may be used in place of individual counting (see Tree Sampling Method, Appendix D).

In native growth areas, shrubs that form colonies (such as buffalo currant, chokecherry, dogwood, plum, pussy willow, sandbar willow, western snowberry, and Woods rose) and that are cut flush with the ground surface and not cleared, so as to leave the naturally occurring seed bank and root stock intact will not be direct stem counted. Instead, the area will be delineated on an aerial photo and indicated on construction drawings to not be cleared or have the ground disturbed. If ground disturbance occurs, Enbridge Pipelines (North Dakota) LLC will conduct a direct stem count of the disturbance area or estimate the number of stems cleared using a Commission approved sampling estimate method (see Shrub Sampling Method, Appendix C).

### **Tree Sampling Method**

Per the Commission's Tree and Shrub Inventory Specifications (Inventory Specification No. 6 in Appendix A), in high-density woodland areas, Enbridge Pipelines (North Dakota) LLC proposes the following sampling method for the tree inventory. The dimensions of the entire woodland stand within the Project right-of-way (ROW) will be delineated to determine the area of the woodland. Tree and shrub counts will

be made in representative sample site areas within the woodland. Transects will be developed and the circular sample sites placed along the transect. The number of sample sites within a woodland stand will be dependent on woodland size and uniformity. A smaller, more uniform woodland stand would require fewer sample sites than a larger, less uniform woodland stand.

The sample sites will be 0.10 acre (37.42-foot radius circle). A rope 37.42 feet in length will be attached to a central stake and rotated in a circle (Appendix D). Trees and shrubs within the circle will be counted. Tree and shrub density for the entire woodland area within the ROW will be calculated based on the average density from all of the sample locations within the woodland, weighted against the woodland size.

### **Shrub Sampling Method**

Per the Commission's Tree and Shrub Inventory Specifications (Inventory Specification No. 6 in Appendix A), in high-density woodland areas, Enbridge Pipelines (North Dakota) LLC proposes the following sampling method for the shrub inventory. The dimensions of the entire woodland stand within the ROW will be delineated to determine the area of the woodland. Shrub counts will be made in representative sample site areas within the woodland. Transects will be developed and the circular sample sites placed along the transect. The number of sample sites within a woodland stand will be dependent on woodland size and uniformity. A smaller, more uniform woodland stand would require fewer sample sites than a larger, less uniform woodland stand.

The sample sites will be 0.01 acre (3.72-foot radius circle). A rope 3.72 feet in length will be attached to a central stake and rotated in a circle (Appendix C). Shrubs within the circle will be counted. Tree and shrub density for the entire woodland area within the ROW will be calculated based on the average density from all of the sample locations within the woodland, weighted against the woodland size.

## Appendix A

Case No. PU-11-606

### Tree and Shrub Mitigation Specifications

#### Inventory

1. Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (*e.g.*, *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*), shall be inventoried before cutting. The inventory shall record the location, number, and species of trees and shrubs.
2. In windbreaks, shelterbelts and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, shall be inventoried for replacement.
3. In native growth areas, trees anticipated to be cleared that are 1-inch diameter at breast height ("dbh") or greater shall be inventoried for replacement.
4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way shall be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs shall be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil shall be preserved and replaced after construction. Shrubs shall be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared shall be inventoried for replacement.
6. In native growth areas, trees and shrubs may be inventoried by actual count or by sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (Commission) and approved prior to the start of construction shall define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots shall be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

## **Clearing for Construction**

7. Trees and shrubs shall be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The width of clear cuts through windbreaks, shelterbelts and all other wooded areas shall be limited to 50 feet or less unless otherwise approved by the NDPSC.
9. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced shall be noted on the inventory.

## **Replacement**

10. Prior to tree/shrub replacement, documentation identifying the number and variety of trees removed as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings shall be filed with the NSPSC for approval.
11. Two 2-year-old saplings shall be planted for every one tree removed. Two shrubs (stem cuttings) shall be planted for every one shrub removed.
12. Except in the case of invasive or noxious species, trees and shrubs shall be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service. Invasive or noxious species shall be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.
13. Landowners shall be given the option of having replacement trees/shrubs planted off the right-of-way on the landowner's property or waiving that requirement in writing and allowing those replacement trees/shrubs to be planted at alternative locations.
14. At the conclusion of the project, documentation identifying the actual number, variety, type, location, and date of the replacement plantings shall be filed with the NDPSC.
15. Tree/shrub replacements shall be inspected once a year for three years, on about the anniversary of the plantings, and, on or shortly before October 1 of each year, a report shall be submitted to the NDPSC documenting the condition of replacement planting and any woodlands work completed. If after three years from the anniversary of the plantings the survival rate is less than 75%, the NDPSC may order additional planting(s).

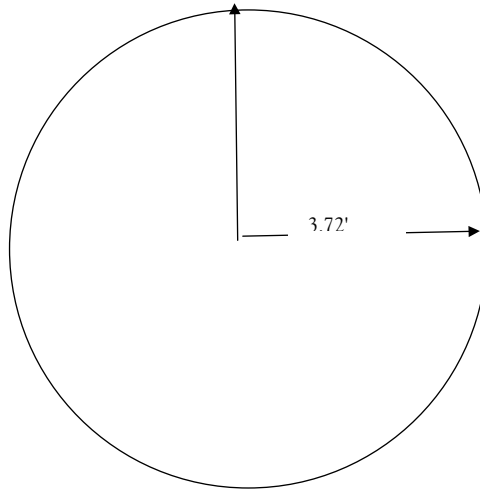


## Appendix C

### Shrub Sampling Method

#### Sample Plot

- Circular sample plots with a radius of 3.72 feet, or area equivalent to 0.01 acres created with a central stake and rope.
- The rope, 3.72 feet in length, anchored to the central stake and rotated in a circle



#### Shrub Counts

- Direct stem counts from each plot
- Talled on work sheet by species

#### Woodland size

- GPS points taken in the field around boundary
- GIS used to calculate acreage

#### Calculations

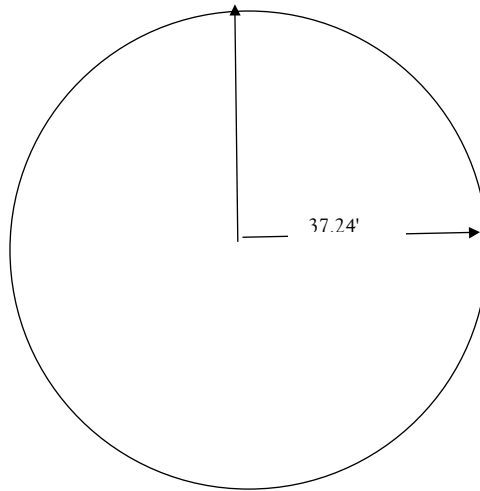
- Average determined from all plots sampled in a woodland area or area is equivalent to stems/0.01 acre
- Converted to a per acre basis (average times 100)
- Total number per woodland determined by multiplying average number per acre with woodland size

## Appendix D

### Tree Sampling Method

#### Sample Plot

- Circular sample plots with a radius of 37.24 feet, or area equivalent to 0.10 acres created with a central stake and rope.
- The rope, 37.24 feet in length, anchored to the central stake and rotated in a circle



#### Tree Counts

- Direct stem counts from each sample site
- Talled on work sheet by species

#### Woodland size

- GPS points taken in the field around boundary
- GIS used to calculate acreage

#### Calculations

- Average determined from all plots sampled in a woodland area or area is equivalent to stems/0.10 acre
- Converted to a per acre basis (average times 10)
- Total number per woodland determined by multiplying average number per acre with woodland size

## APPENDIX C

### Tree and Shrub Count Forms

**TREE/SHRUB INVENTORY**

Project Name: *Little Muddy*

Sampled by: *CT/mm*

Date: *4/16/12*

Location / Site ID:

Woodland Type (circle): Native Planted Plot Size (circle): 3.72 ft 37.2 ft

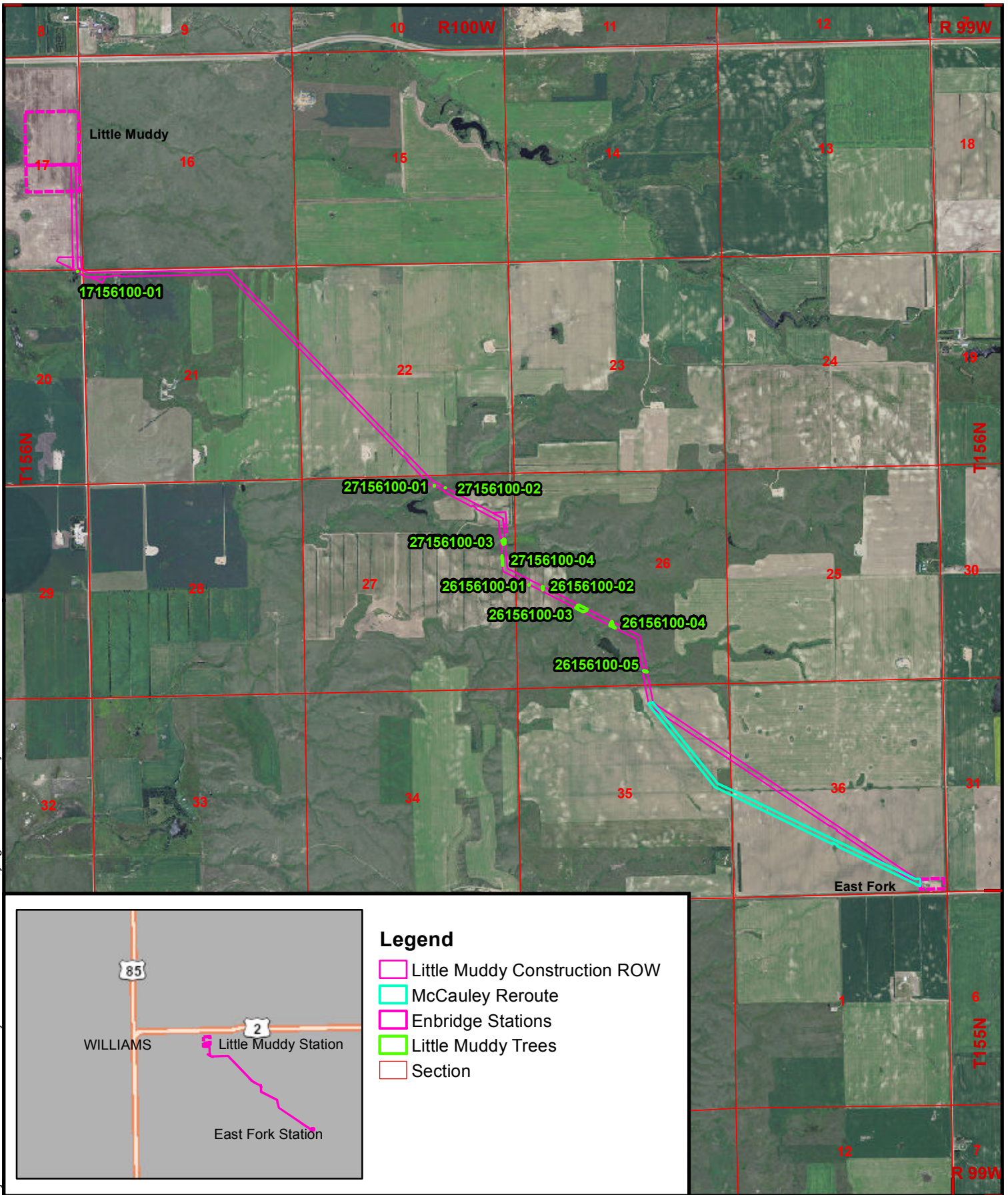
SPECIES	Planted	Native		TOTAL
	All trees shrubs	Trees >1"	All shrubs	
<i>17156100-01</i>				
<i>POPDEL</i>		<i>1</i>		<i>1</i>
<i>27156100-01</i>				
<i>CRAROT</i>			<i>1</i>	<i>1</i>
<i>27156100-02</i>				
<i>PRUVIR</i>			<i>51</i>	<i>51</i>
<i>SYMOC</i>			<i>120</i>	<i>120</i>
<i>27156100-03</i>				
<i>SYMOC (3.72' plot)</i>			<i>22</i>	<i>3997</i>
<i>27156100-04</i>				
<i>FRAPEN</i>	<i>12</i>			<i>12</i>
<i>26156100-01</i>				
<i>ULM PUM</i>	<i>1</i>			<i>1</i>
<i>FRAPEN</i>	<i>1</i>			<i>1</i>
<i>26156100-02</i>				
<i>CARARB</i>	<i>6</i>			<i>6</i>








## APPENDIX D

Figure

E:\Projects\ENB\3882 - Little Muddy Tree-Shrub-Weed Inventory\figures\Little Muddy Tree.mxd  
June 2012



### Legend

-  Little Muddy Construction ROW
-  McCauley Reroute
-  Enbridge Stations
-  Little Muddy Trees
-  Section

1:38,016

1 inch = 0.6 miles

0 0.15 0.3 0.6 Miles

Basemap: NAIP Orthophoto 2010  
Williams County, North Dakota



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www.carlsonmccain.com

**Figure 1**  
Tree / Shrub Locations  
Little Muddy Project  
Enbridge Pipelines (North Dakota)  
LLC

**EXHIBIT C**

**Landowner Waiver and Contact Records**

**Enbridge Pipelines (North Dakota) LLC ("Enbridge")  
Little Muddy Station Connection Project  
Tree Mitigation Waiver (Case No. PU-11-606)**

Date November 16<sup>th</sup>, 2012

Landowner Name Thomas Irgens and Judith Irgens Little Muddy Tract No. 41156000026020

Description of tree/shrub mitigation activities \_\_\_\_\_  
\_\_\_\_\_

Under the North Dakota Public Service Commission (Case No. PU-11-606) Tree and Shrub Mitigation Specifications, landowners have the option of:

- Planting replacement trees/shrubs off the right-of-way on the landowner's property; or
- Planting replacement trees/shrubs at alternate locations at Enbridge's discretion

Please indicate your selection by marking the appropriate box above.

I, \_\_\_\_\_, am the landowner of Little Muddy Tract No. 41156000026020. I hereby waive the requirement of planting replacement trees/shrubs off the right-of-way on my property.

I understand the terms described herein. I voluntarily sign this document.

Signature  Date Nov 16, 2012

Printed Name Thomas Irgens Phone (701) 770-1158

Signature \_\_\_\_\_ Date \_\_\_\_\_

Printed Name Judith Irgens Phone (701) 859-3412

Street Address 6260 129<sup>th</sup> Avenue NW, Epping, North Dakota Zip 58843

**EXHIBIT D**

**Landowner Approval and Tree/Shrub Mitigation Plans**

**Table 3  
Landowner Approval and Tree/Shrub Mitigation Plans**

<b>Tract</b>	<b>Trees/Shrubs Removed<sup>1</sup></b>	<b>Invasive Species</b>	<b>Mitigation Requirement<sup>2</sup></b>	<b>Trees/Shrubs Mitigation Plan Planting Requirements<sup>3</sup></b>	<b>Location (Tract or Alt. Location)<sup>4</sup></b>
11	6 Siberian Peashrubs	Yes	2:1 Replacement	12 native shrubs	Tract

<sup>1</sup> Does not include shrubs that will regenerate naturally (i.e., Native Topsoil Preserved and Replaced (see item no. 5 in ND PSC Tree and Shrub Mitigation Specifications, Case No. PU-10-613)).

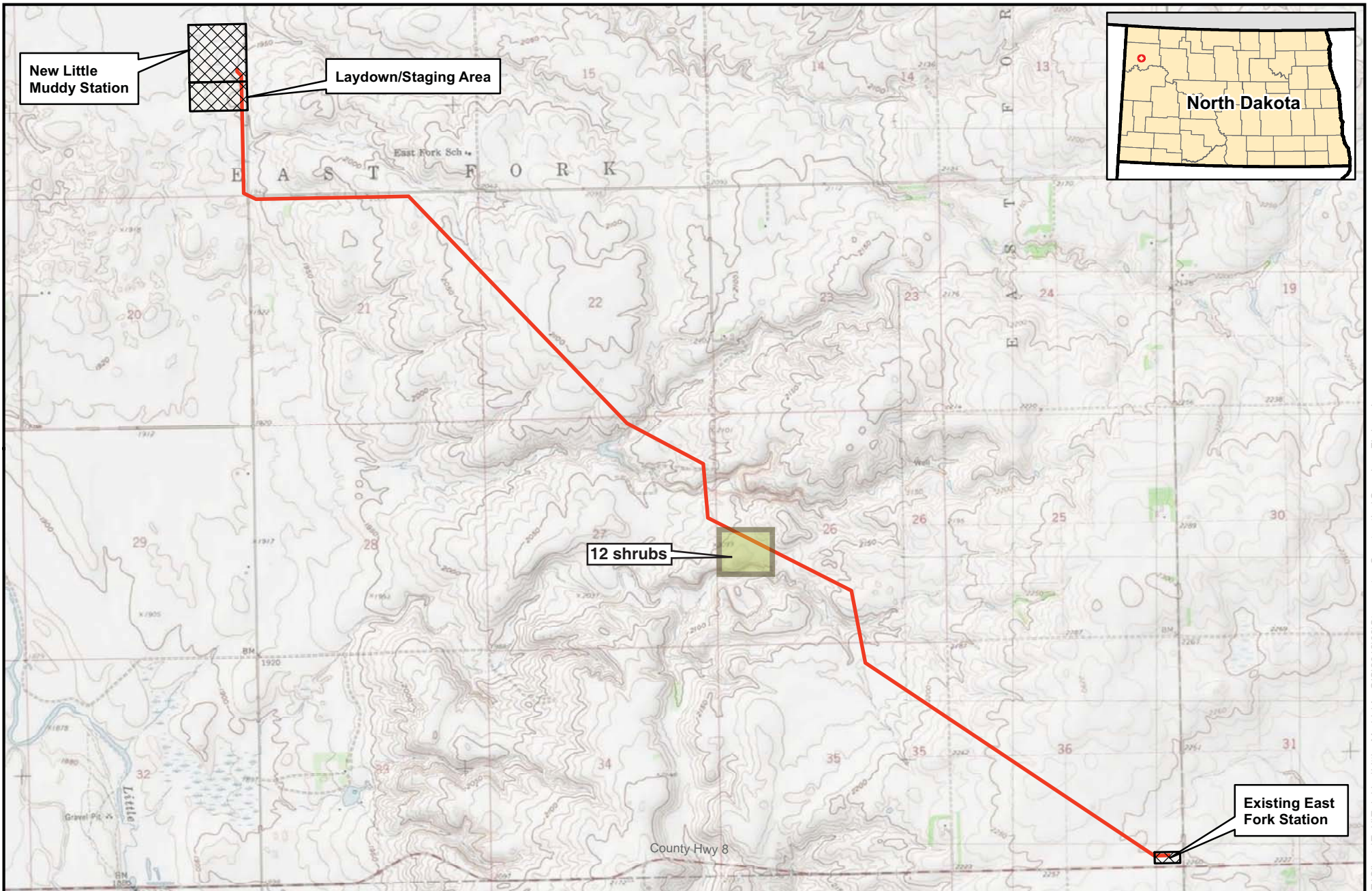
<sup>2</sup> Tree replacement shall be on a 2 to 1 basis with 2-year-old saplings. Shrub replacement shall be on a 2 to 1 basis with stem cuttings (see item no. 11 in ND PSC Tree and Shrub Mitigation Specifications, Case No. PU-10-613).

<sup>3</sup> Replacement species should be non-invasive native tree/shrub of similar height and canopy (or as approved by the NDFS) suitable for the mitigation area (see Section 4.0 of Tree and Shrub Inventory Reports included as Exhibit B).

<sup>4</sup> Landowners shall be given the option of having replacement trees/shrubs planted off the right-of-way on the landowner's property or waiving that requirement in writing and allowing those replacement trees/shrubs to be planted at alternative locations (see item no. 13 in ND PSC Tree and Shrub Mitigation Specifications, Case No. PU-10-613).

**EXHIBIT E**

**Tree Mitigation Figure: Mitigation on Landowner's Property**



New Little Muddy Station

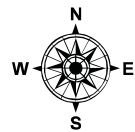
Laydown/Staging Area

North Dakota

12 shrubs




Existing East Fork Station

0 1,500 3,000 Feet



### Little Muddy Station Connection Project

Tree Mitigation on the Landowner's Property  
Williams County, North Dakota

-  Pipeline
-  Facility Location
-  Tract with mitigation



**EXHIBIT F**

**Letter from the North Dakota Forest Service - February 1, 2013**



## NORTH DAKOTA FOREST SERVICE

“To care for, protect and improve forest and natural resources to enhance the quality of life for present and future generations.”

February 1, 2013

Angela Ronayne, PE  
Merjent, Tractor Works Building  
800 Washington Avenue North  
Suite 315  
Minneapolis, MN 55401

Dear Ms. Ronayne,

Attached for your consideration is a draft program concept outline for the North Dakota Mitigation Tree Planting Partnership Program between the North Dakota Forest Service and Enbridge. The January 29, 2013, document outlines a proposed program to replace trees and shrubs to comply with the North Dakota Public Service Commission mitigation requirements. This three-year program would be financed through an award from Enbridge to the North Dakota Forest Service. The project ending date is anticipated to be December 31, 2015. The estimated number of trees/shrubs to be planted is 1,529 including all the anticipated plantings, as well as additional stock to offset mortality.

The award to finance this program would be deposited in the Trees for North Dakota Trust Fund, a special fund in the state treasury. The award would be designated for this Mitigation Tree Planting Partnership Program and managed by the North Dakota Forest Service. The proposed program cost per tree/shrub is \$9.00. The program would be initiated by the North Dakota Forest Service and its natural resource partners and private vendors upon the receipt of the tree planting mitigation payment.

Thank you for the opportunity to assist Enbridge with its mitigation tree planting obligations set forth by the North Dakota Public Service Commission. We look forward to discussing the draft program concept outline with you, your staff and environmental consultants. Please do not hesitate to contact our office if you need further assistance or information. Thank you again for considering our services.

Sincerely,

A handwritten signature in black ink that reads "Larry A. Kotchman".

Larry A. Kotchman  
State Forester

Enclosure