



**THIRD ANNUAL MONITORING REPORT OF
TREE AND SHRUB RECLAMATION
PLANTING SURVIVAL**

Prepared for:

State of North Dakota Public Service Commission

Vantage West Spur Lateral Pipeline

Case No: PU-15-142

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Introduction

This document is the final report of the annual Vantage West Spur Lateral Pipeline monitoring for tree and shrub reclamation planting survival. Vantage Pipeline US LP (Pembina Pipeline Corp.) replanted trees and shrubs removed during construction using the methods outlined in the State of North Dakota Public Service Commission (NDPSC) approved Tree and Shrub Reclamation Plan submitted June 2015. The 47.8 mile pipeline alignment extends from a natural gas processing plant near Williston, North Dakota to an existing pipeline system near Stady, North Dakota within Divide and Williams Counties. The construction right-of-way (ROW) is 100 feet wide, which is made up of 30 feet of permanent right-of-way (PROW) and 70 feet of temporary work space. The PROW will be maintained for the lifetime of the pipeline. Vantage/Pembina Pipeline agrees to comply with all stipulations in the NDPSC's Tree and Shrub Mitigation Specifications, including completing annual inspections for three years following reclamation.

A total of 280 trees and shrubs were removed during pipeline construction (Table 1). Trees and shrubs disturbed by the pipeline construction are required to be replaced at a rate of 2:1. The goal is for $\geq 75\%$ survival (420 plants) three years after planting. This number includes planted trees as well as natural regeneration of trees and shrubs on the disturbed ROW.

Tree and Shrub Reclamation Plantings

An inventory of planted tree and shrub species was documented in a letter to the NDPSC dated May 9, 2016 titled Tree and Shrub Reclamation Plan for Vantage West Spur Pipeline Case No. PU-15-142. Trees and shrubs were planted as part of the pipeline reclamation in May 2016 (Table 1). Vantage worked with landowners along the pipeline ROW to identify desired species and locations for plantings. The replacement tree and shrubs were planted outside of the Vantage West Spur ROW, as requested by the landowners, at home sites, shelterbelts, windbreaks, and near wetlands. Trees and shrubs planted were one and two-year-old saplings purchased from Divide County Conservation District.

Tree and Shrub Reclamation Planting Survival Monitoring

There were 705 individual plants of seven species planted in 2016 at 8 locations for 5 landowners as part of the Vantage West Spur Pipeline tree and shrub mitigation effort. Location details are provided in the 2016 report. Initial survival rate was compromised and 392 additional trees and shrubs were planted in the spring of 2017 (Table 1).

The tree and shrub reclamation planting survival and natural regeneration in the ROW were monitored in August of 2019 in accordance with protocol used for prior monitoring (2017 and 2018). A total of 331 live planted trees and shrubs were documented (Table 1). This data includes 209 trees and shrubs that were not monitored in 2018 because landowner access was not available.

The 2019 monitoring also identified a total of 578 individual trees and shrubs naturally established within the ROW at six different parcels along the West Spur Vantage pipeline. Many rhizomatous shrub species such as silver sage and snowberry naturally regenerate on reclaimed ROW's. It is noteworthy that Rabbitbrush and Broom Snakeweed are combined into one row in Table 1. The 2019 Tree and Shrub Regeneration survey confirmed Broom Snakeweed was prevalent at locations where Rabbitbrush was noted in 2018. Broomed Snakeweed was likely mislabeled in 2018 as Rabbitbrush since no Rabbitbrush was identified on the West Spur Vantage pipeline for 2019. Broom snakeweed was not included in the pre-construction inventory.

Natural Regeneration totals (578) combined with the 331 surviving reclamation plantings result in a grand total of 909 surviving mitigation trees and shrubs. This number exceeds the 75% 2:1 mitigation goal of 420 by 366 plants, or 187% of the mitigation goal. Even if Broom Snakeweed were excluded from the count, the mitigation goal is exceeded by 124 plants, or 130% of the mitigation goal.

Conclusion

Based on the monitoring results presented above, the Vantage West Spur Lateral Pipeline has met and exceeded the tree and shrub mitigation requirements set forth by the NDPSC and no further monitoring is planned. Confirmation is requested from NDPSC that mitigation requirements have been met.

Table 1. Tree and shrub species present on the Vantage West Spur Lateral Pipeline ROW and Parcels During 2019 Monitoring.

| Species | Number Inventoried | 2:1 Mitigation | 2016 Planted | 2017 Planted | 2019 All Plantings Alive | 2019 Natural Regeneration | 2019 Total Count |
|--------------------------------------|--------------------|----------------|--------------|--------------|--------------------------|---------------------------|------------------|
| Caragana | 16 | 32 | -- | -- | -- | -- | -- |
| Chokecherry | 5 | 10 | -- | -- | -- | -- | -- |
| Chokecherry, Caragana | -- | -- | 100 | 62 | 117 | -- | 117 |
| Colorado Blue Spruce | -- | -- | 200 | 170 | 87 | -- | 87 |
| Colorado Blue Spruce, Ponderosa Pine | -- | -- | 100 | 80 | 20 | -- | 20 |
| Cottonwood | 2 | 4 | -- | -- | -- | -- | -- |
| Cottonwood, Ponderosa Pine | -- | -- | 195 | 70 | 21 | -- | 21 |
| Green Ash | 8 | 16 | -- | -- | -- | -- | -- |
| Horizontal Juniper | 33 | 66 | -- | -- | -- | 8 | 8 |
| Poplar | -- | -- | 10 | 10 | 1 | -- | 1 |
| Prairie Rose | 18 | 36 | -- | -- | -- | 214 | 214 |
| Rabbitbrush/ Broom Snake Weed | -- | -- | -- | -- | -- | 242 | 242 |
| Russian Olive | -- | -- | 100 | -- | 85 | -- | 85 |
| Sage | 14 | 28 | -- | -- | -- | -- | -- |
| Silver Buffaloberry | | 0 | -- | -- | -- | -- | -- |
| Silver sagebrush | -- | -- | -- | -- | -- | 1 | 1 |
| Silverberry | 22 | 44 | -- | -- | -- | 9 | 9 |
| Western Snowberry | 162 | 324 | -- | -- | -- | 67 | 67 |
| Winterfat | - | -- | - | - | -- | 2 | 2 |
| Wood's Rose | -- | -- | -- | -- | -- | 35 | 35 |
| Totals | 280 | 560 | 705 | 392 | 331 | 578 | 909 |