



Tennessee Gas Pipeline 300 Line Project: 325 Loop The New Jersey Highlands Post- Construction Monitoring Report Year 1



DRAFT- February 19, 2013



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TENNESSEE GAS PIPELINE COMPANY, L.L.C.
300 LINE PROJECT- 325 LOOP
NEW JERSEY HIGHLANDS REGION
30-inch Loop 325, Sussex and Passaic Counties, Pennsylvania

POST-CONSTRUCTION
MONITORING REPORT - YEAR 1

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* PLEASE NOTE: Due to file size limitations, the appendices have been removed from this file. The complete draft report including appendices is available for review in the Highlands Council office by appointment. Please contact keri.benscoter@highlands.state.nj.us for an appointment.



1.0 INTRODUCTION

As part of Tennessee Gas Pipeline Company, L.L.C.’s (“Tennessee”) 300 Line Project (“Project”), Tennessee developed a Comprehensive Mitigation Plan (“Plan”) in support of the Loop 325 segment of the Project located within New Jersey’s Highlands Region in Sussex and Passaic Counties, New Jersey. Tennessee requested a determination from the New Jersey Highlands Council (“Council”) and the New Jersey Department of Environmental Protection (“NJDEP”) that the Loop 325 segment of the Project is exempt from the Highlands Water Protection and Planning Act, N.J.S.A. 13:20-1 et seq. (“Act”), and the Plan was developed to set forth a plan of construction and restoration by which Tennessee would avoid, minimize, and mitigate any impacts to Highlands Region resources so that there will be no net loss of such resources. The requested exemption was granted by the Council and the NJDEP.

The Project was constructed and placed in-service on November 1, 2011, following receipt of authority from the Federal Energy Regulatory Commission (“FERC”).

As part of the Plan, Tennessee agreed to provide copies to the Council of the Project’s periodic status reports filed with the FERC (initially filed weekly, and now filed quarterly as of August 2012), and Tennessee has provided and will continue to provide those reports to the Council. In addition, as discussed in Section 2.2.2 of the Plan, Tennessee agreed to prepare and provide to the Council an annual monitoring report, for three years following construction or until such time as wetland revegetation is successful, to document the status of the open water buffer revegetation efforts in the Highlands Region. Also, as discussed in Section 2.24.2.6 of the Plan, Tennessee agreed to prepare and provide to the Council an annual monitoring report, for three years following construction, to document restoration of the Highlands resource areas in the Highlands Region, including examining areas for invasive species.

Tennessee has contracted with Tetra Tech, Inc. (“Tetra Tech”) to provide post-construction monitoring for the Loop 325 segment of the Project located in the Highlands Region. This monitoring report has been prepared to comply with the monitoring requirements from the Plan, as outlined above, for the first year of restoration activities following completion of construction and placing the Project in-service. The post-construction monitoring discussed herein involves the completion of vegetation monitoring of all disturbed wetlands, waterbodies, and uplands in the Highlands Regions, as shown in the alignment sheets (set forth in Appendix A).

This report provides results of the first year of post-construction monitoring, including purpose and objectives (Section 1.0), survey area description (Section 2.0), monitoring methods (Section 3.0), monitoring results (Section 4.0), and a discussion of monitoring results (Section 5.0).

1.1 Purpose and Objectives

For this Project, Tennessee developed two Project-specific Environmental Construction Plans -- one for the portion of the Project located in New Jersey and one for the portion of the Project located in Pennsylvania (TGP, 2010). For ease of reference, the Project-specific Environmental Construction Plan for New Jersey will be referred to as “ECP” in this report. The ECP describes the basic environmental construction techniques that were implemented during the construction and will be followed during restoration and maintenance. The ECP incorporates generally the



provisions set forth in the FERC’s “Wetland and Waterbody Construction and Mitigation Procedures” and FERC’s “Upland Erosion Control, Revegetation and Maintenance Plan”, with a few variations approved by the FERC, as well as the terms and conditions of the New Jersey Highlands Council Comprehensive Mitigation Plan. The ECP further incorporates guidelines and recommendations, including those set forth in permits, from the U.S. Army Corps of Engineers (“USACE”), the U.S. Department of Agriculture, and the Natural Resources Conservation Service (“NRCS”).

The purpose of monitoring for the Project was to provide Year 1 post-construction inspection of vegetation restoration to document Tennessee’s adherence to the New Jersey Highlands Council Comprehensive Mitigation Plan, as well as the ECP and other permits issued for the Project including: FERC Certificate of Public Convenience & Necessity, US Fish and Wildlife Service Clearance Letters, Bureau of Land Management – Right of Entry, New Jersey Historic Preservation Office Clearance, New Jersey DEP Land Use Regulation Program – Highlands Applicability and Water Quality Management Plan Consistency Determination, New Jersey DEP Division of Water Supply – Temporary Dewatering Permit, New Jersey DEP Land Use Regulation Program – Freshwater Wetlands and Flood Hazard Area Permits, New Jersey DEP Bureau of Water Allocation – Short Term Water Use Permit by Rule, New Jersey Division of Fisheries and Wildlife – Water Lowering Permit, NJPDES GP – 5G3 Construction Activity Stormwater Permit (GP), and Stormwater Discharge from the Soil and Water Conservation Districts (referred to as “permits” in the remaining document).

Tasks and objectives associated with the post-construction monitoring as outlined in the CMP include:

- Monitor and record the success of revegetation in the Highlands resource areas for the first three years post-construction (November 1, 2011 to October 31, 2014), or until wetland revegetation is successful.
- Identify the presence of non-native species and determine if there is a need for treatment or additional restoration measures.
- Prepare a report suitable for filing with the New Jersey Highlands Commission identifying the status of the revegetation efforts on a yearly basis for three years post-construction. The purpose of this report is to document areas of successful revegetation and minimize the need for redundant monitoring of successful areas during subsequent years. The report will include data on percent cover achieved and problem areas (e.g., weed invasion issues and poor vegetation).



2.0 SURVEY AREA

The monitoring program included a survey of all disturbed workspaces within FERC-approved permanent rights-of-way and temporary workspaces (collectively, “ROWs”) for the Loop 325 segment of the Project, including all upland areas and wetlands and waterbodies, as delineated prior to initiation of construction. This does not include temporarily used access roads as rights of entry have expired. Appendix A to this report provides the Project alignment sheets and temporary workspaces, along with the aquatic resources identified.



3.0 METHODS

The monitoring effort focused on several key criteria established in the ECP and the Comprehensive Mitigation Plan for guidance to assess and evaluate restoration success. The methods developed for this effort were designed to meet a variety of success/compliance criteria as outlined in the ECP as well as the Comprehensive Mitigation Plan.

3.1 General

During this first post-construction monitoring year (November 1, 2011 to October 31, 2012), the ROW was monitored along the entire Project, including the Loop 325 segment. Tetra Tech used a two-person team led by a qualified biologist experienced in wetland delineation and linear natural gas pipeline project restoration to walk all portions of the ROW. The Environmental Inspector for the Loop 325 segment accompanied the biologist and provided general ROW support regarding access and known areas where there are concerns with the status of restoration, including recently restored areas.

Parameters evaluated included grade, hydrology, percent vegetative cover, vegetation vigor, community composition, and evidence of nuisance weed invasion. Throughout the Loop 325 segment, the community on the disturbed ROW was compared with an undisturbed portion of the same or similar community located adjacent to the disturbed area. The field team made qualitative and quantitative assessments to determine successful revegetation based on criteria outlined in the ECP and applicable permits. Additional information such as the proper installation of slope breakers, restoration of stream bed, banks, and flow, and third party impacts was also collected to further evaluate the overall restoration of each aquatic feature. Appendix B to this report provides a listing and description of the parameters collected; however, GPS data was collected for wetlands and waterbodies, while general upland area concerns were documented in field notebooks and maps.

Monitoring was performed to evaluate restoration success of each waterbody and wetland feature previously mapped during pre-construction surveys. Each waterbody and wetland feature evaluation was identified with a single GPS point recorded in the approximate center of the wetland or waterbody, and an individual field form completed within the GPS data logger for each feature. Each feature was identified as restored or not restored and additional data was collected to document the restoration or reasons for not meeting success criteria. Those resources not successfully restored were assigned priority values for remedial action. Remedial action ranged from high, requiring immediate action, to low, requiring monitoring next growing season (i.e., area is estimated to need an additional growing season to reach restoration criteria).

Tetra Tech formulated, maintained, and updated a monitoring results Microsoft Access database to store and track monitoring data. The database contained data entry fields that matched the associated GPS data dictionary developed to facilitate the accurate collection of monitoring data. Tetra Tech used GPS units to designate each monitored resource and spatially link this information to the project footprint. Although a GPS data dictionary was used to collect monitoring information, field forms were developed for the project in case of GPS malfunction.



3.2 Upland Monitoring

In accordance with the ECP, Tennessee committed to completing three years of post-construction monitoring inspections of all disturbed areas to determine the success of upland revegetation. Tennessee agreed to submit associated results in periodic status reports filed with the FERC and provided to the Council, initially on a weekly basis and now quarterly, as of August 2012. Tennessee is conducting these inspections and preparing and filing the status reports, and has developed “punch list” items for corrective action for the Project. Any issues in the upland problem areas discovered during this effort were provided to Tennessee by Tetra Tech for further examination and corrective action.

3.3 Wetland Monitoring

The following tasks were implemented during the wetland monitoring:

- Observed and noted hydrological conditions such as inundation and saturation;
- Compared the percent cover, percent cover of hydrophytes, and distribution of hydrophytes between off-ROW and on-ROW wetland areas;
- Visually estimated wetland shape, topography, and area reduction or increase compared to preconstruction conditions (as shown on construction alignment sheets);
- Visually inspected the restoration of all waterbody crossings located within wetlands;
- Photo-documented each restored wetland; and,
- Noted other pertinent observations such as wildlife use, eroded or unstable areas, noxious and invasive plants, and potential third party impacts.

Tetra Tech monitored all areas previously identified as wetlands during preconstruction surveys and subsequently impacted by construction. The assessment of successful revegetation of each wetland was based on criteria in the ECP and USACE NWP 12 requirements (TGP, 2010). Specifically, wetland revegetation shall generally be considered successful if cover of herbaceous and/or woody species is at least 80 percent similar in type, density, and distribution of vegetation in adjacent wetlands undisturbed by construction. Problems noted with any of the attributes collected for wetlands resulted in the resource being identified as a problem area (i.e., not restored) and the appropriate priority level for remedial action assigned.

3.4 Waterbody Monitoring

The following tasks were implemented during waterbody monitoring:

- Visually estimated percent cover and success of vegetation restoration (e.g., $\geq 80\%$ of the cover of the off-ROW cover);
- Visually inspected the restoration of all waterbody crossings (i.e., bed, banks, and flow);
- Photo-documented representative conditions of each restored area; and
- Noted other pertinent observations such as wildlife use, eroded or unstable areas, noxious and invasive plants, and potential third party impacts.

Tetra Tech monitored waterbodies previously identified during preconstruction surveys and subsequently impacted by construction. The assessment of successful revegetation of each waterbody was based on criteria in the ECP and USACE NWP 12 requirements (TGP 2010). Problems noted with any of the attributes collected for waterbodies resulted in the resource being



identified as a problem area (i.e., not restored) and the appropriate priority level for remedial action assigned.



4.0 RESULTS

4.1 Highlands Region

In summary, 80 wetlands and waterbodies were evaluated, consisting of 46 wetlands and 34 waterbodies (Table 1) within the Highlands Region. Of the 80 resources, 46 were successfully restored and 34 were identified as problem areas (Table 1). Of the 34 problem areas, 28 were assigned low priority, 4 medium priority, and 2 high priority areas. Low priority areas were generally areas that were recently restored and an additional growing season is expected to allow the area to restore properly. Restoration is expected to be successful in the second year following construction and no remedial action is recommended. These areas will be monitored during the Year 2 monitoring effort. Information on medium and high priority areas were conveyed to Tennessee and have been or are currently being addressed (Table 2). These medium and high problem areas will also be monitored during the Year 2 monitoring to ensure successful restoration. Appendix C provides the Year 1 database output summaries; Appendix D provides the Year 1 medium and high problem area detail reports; and Appendix E provides photographic documentation of all of the wetlands and waterbodies inspected.

4.1.1 Wetland Monitoring

Of the 46 wetlands evaluated, 22 were successfully restored and 24 were identified as problem areas (Table 1). Of the 24 problem areas, 22 were low priority and targeted for Year 2 monitoring, and 2 were medium priority areas that have been or are currently being addressed by Tennessee (Table 2). No high priority areas were recorded. Failure was attributable to not meeting one or more of the FERC criteria (i.e., $\geq 80\%$ vegetation cover and/or $\geq 80\%$ cover of hydrophytes). Not meeting FERC criteria was mostly attributable to ORV use, insufficient time to establish proper vegetation type, and/or the presence of weedy/invasive species. Table 3 provides a summary of wetland monitoring results and Summary Report-Wetlands in Appendix C provides the results for each wetland.

4.1.2 Waterbody Monitoring

Of the 34 evaluated waterbodies, 24 were successfully restored and 10 were identified as problem areas (Table 1). Of the 10 problem areas, 6 were low priority and targeted for Year 2 monitoring. There were 2 medium priority areas that have been or are currently being addressed by Tennessee and 2 high priority areas that have been or are being addressed immediately by Tennessee (Table 2). The primary reasons for failure of a waterbody included problems with vegetation cover and density, problems associated with erosion, and/or third-party problems.



5.0 DISCUSSION

Along the Loop 325 segment in the Highlands Region, 58 percent (46/80) of the wetlands and waterbodies met the criteria for successful restoration. Although 42 percent (34) of the resources failed to pass the Year 1 inspection, 82 percent (28/34) were identified as low priority areas. It is expected that with an additional growing season these areas will meet project requirements. These areas will be monitored in Year 2, and remedial action will be determined if successful revegetation is not achieved. Of the 34 unsuccessful resources, 4 were identified as medium priority and 2 as high priority areas were identified which require immediate action by Tennessee personnel. Medium and high priority areas will also be monitored in Year 2 for successful restoration.

Approximately 48 percent (22/46) of the wetlands investigated were successfully restored with proper vegetation cover, density, and composition of hydrophytes. Of the 24 wetlands that failed to meet success criteria, 22 were recovering, and in need of another growing to allow these areas to meet project requirements. These areas will again be evaluated for successful restoration in Year 2 (2013). The remaining 2 areas were identified as requiring remedial action and are currently being addressed by Tennessee. Restricting access to these areas is expected to result in full recovery of the majority of these areas.

Approximately 71 percent (24/34) of the waterbodies investigated were successfully restored with proper restoration of bed, banks, flow, and vegetation. Of the 10 waterbodies that failed to meet success criteria, 6 were recovering, and in need of another growing season to allow these areas to meet project requirements. These areas will again be evaluated for successful restoration in Year 2 (2013). The remaining 4 areas were identified as requiring remedial action and are currently being addressed by Tennessee. Restoring and stabilizing the banks, and restricting access are expected to result in full recovery of the majority of these areas.

Upland areas were also examined for successful restoration. All problem areas were documented in field notebooks and on maps. The problem areas discovered were primarily due to a lack of vegetation. It is expected that with an additional growing season, these areas will meet percent cover standards. These areas will be monitored in Year 2, and remedial action will be determined if successful revegetation is not achieved.

In summary, we believe the Year 1 monitoring purpose and objectives were met. Post-construction monitoring requirements set forth in the ECP as well as the Comprehensive Mitigation Plan were addressed and used to document the restoration success of the Highlands region. Notable outcomes from the monitoring include:

- 1) A complete walkover and inspection of Project wetland and waterbodies to assess successful restoration was performed during the 2011 growing season.



- 2) A large number of parameters were collected for each evaluation to allow determination of successful restoration based on Project ECP for New Jersey and USACE NWP 12 criteria.
- 3) Priority-level assignments to problem areas were used to facilitate remedial action response by Tennessee.

The results presented herein, on-going remedial actions, and continued monitoring will provide a sound foundation for coordinating and planning the Year 2 effort.



6.0 REFERENCES

Federal Energy Regulatory Commission (FERC). 2003a. Upland Erosion Control, Revegetation, and Maintenance Plan (Plan)

Federal Energy Regulatory Commission (FERC). 2003b. Wetland and Waterbody Construction and Mitigation Procedures (Procedures)

Tennessee Gas Pipeline Company (TGP). September 2009. Comprehensive Mitigation Plan: Highlands Region.

Tennessee Gas Pipeline Company (TGP). July 2010. Environmental Construction Plan.



Table 1. Post-construction monitoring Year 1 results by resource type.

	Waterbodies	Wetlands	Total
Evaluated	34	46	80
Restored	24	22	46
Problem Areas	10	24	34

Table 2. Post-construction monitoring Year 1 problem area summary.

Priority	Waterbodies	Wetlands	Total
Low-Monitor Next Season	6	22	28
Medium-Action Required	2	2	4
High-Immediate Action Required	2	0	2



Table 3. Post-construction monitoring Year 1 wetland restoration summary.

Description	#
Wetlands monitored	46
Wetlands restored	22
Wetlands failed	24
Wetlands with < 80% cover – all vegetation ¹	11
Wetlands with < 80% cover – hydrophytes ²	9
Wetlands impacted by third party	3

¹ Wetland failed to meet FERC requirement if the density (i.e., percent cover) was less than 80 percent of the adjacent wetland.

² Wetland failed to meet FERC requirement if the type (i.e., hydrophytes) was less than 80 percent of the adjacent wetland.



APPENDIX A

Resource Figures

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